Panasonic

Panasonic Aquarea air-to-water heat pumps

Planning and installation manual

for bi-bloc and mono-bloc systems

heating & cooling solutions

AQUAREA

Notes:

Panasonic Aquarea air-to-water heat pumps

Planning and installation manual

for bi-bloc and mono-bloc systems

Original Installation and Commissioning Instructions (English)

Version of the documentation: 02/2022

Table of Contents

1 Range of Aquarea heat pump models

	3 kW	5 kW	7 kW
Aquarea High Performance			
All in One 1 Phase 3 Phase	 WH-ADC0309J3E5 WH-ADC0309J3E5B WH-ADC0309J3E5C WH-UD03JE5	 WH-ADC0309J3E5 WH-ADC0309J3E5B WH-ADC0309J3E5C WH-UD05JE5	 WH-ADC0309J3E5 WH-ADC0309J3E5B WH-ADC0309J3E5C WH-UD07JE5
Bi-bloc 1 Phase 3 Phase	 WH-SDC0305J3E5 WH-UD03JE5	 WH-SDC0305J3E5 WH-UD05JE5	 WH-SDC0709J3E5 WH-UD07JE5
Mono-bloc 1 Phase		 WH-MDC05J3E5	 WH-MDC07J3E5
Aquarea T-CAP			
All in One 1 Phase 3 Phase			
Bi-bloc 1 Phase 3 Phase			
Mono-bloc 1 Phase 3 Phase			
Aquarea HT			
Bi-bloc 1 Phase 3 Phase			
Mono-bloc 1 Phase			

Heating. Cooling. DHW. WH-__E5 1 Phase // WH-__E8 3 Phase. Green color: J Generation models with R32 refrigerant.

	9 kW	12 kW	16 kW
	 WH-ADC0309J3E5 WH-ADC0309J3E5B WH-ADC0309J3E5C WH-UD09JE5-1 WH-ADC0916H9E8 WH-UD09HE8	 WH-ADC1216H6E5 WH-UD12HE5 WH-ADC0916H9E8 WH-UD12HE8 WH-ADC1216H6E5C WH-UD12HE5	 WH-ADC1216H6E5 WH-UD16HE5 WH-ADC0916H9E8 WH-UD16HE8 WH-ADC1216H6E5C WH-UD16HE5
	 WH-SDC0709J3E5 WH-UD09JE5-1 WH-SDC09H3E8 WH-UD09HE8	 WH-SDC12H6E5 WH-UD12HE5 WH-SDC12H9E8 WH-UD12HE8	 WH-SDC16H6E5 WH-UD16HE5 WH-SDC16H9E8 WH-UD16HE8
	 WH-MDC09J3E5	 WH-MDC12H6E5	 WH-MDC16H6E5
	 WH-ADC1216H6E5 WH-UX09HE5 WH-ADC0916H9E8 WH-UX09HE8 WH-ADC0916H9E8 WH-UQ09HE8 WH-ADC1216H6E5C WH-UX09HE5	 WH-ADC1216H6E5 WH-UX12HE5 WH-ADC0916H9E8 WH-UX12HE8 WH-ADC0916H9E8 WH-UQ12HE8 WH-ADC1216H6E5C WH-UX12HE5	 WH-ADC0916H9E8 WH-UX16HE8 WH-ADC0916H9E8 WH-UQ16HE8
	 WH-SXC09H3E5 WH-UX09HE5 WH-SXC09H3E8 WH-UX09HE8 WH-SQC09H3E8 WH-UQ09HE8	 WH-SXC12H6E5 WH-UX12HE5 WH-SXC12H9E8 WH-UX12HE8 WH-SQC12H9E8 WH-UQ12HE8	 WH-SXC16H9E8 WH-UX16HE8 WH-SQC16H9E8 WH-UQ16HE8
	 WH-MXC09H3E5 WH-MXC09H3E8 WH-MXC09J3E5 WH-MXC09J3E8	 WH-MXC12H6E5 WH-MXC12H9E8 WH-MXC12J6E5 WH-MXC12J9E8	 WH-MXC16H9E8 WH-MXC16J9E8
	 WH-SHF09F3E5 WH-UH09FE5 WH-SHF09F3E8 WH-UH09FE8	 WH-SHF12F6E5 WH-UH12FE5 WH-SHF12F9E8 WH-UH12FE8	
	 WH-MHF09G3E5	 WH-MHF12G6E5	

2 General

About this manual

This Manual describes the planning, design, installation and commissioning of Panasonic Aquarea air-to-water heat pumps. The key information is to be found in the following three main chapters.

Chapter 4 - Product Description - contains information covering the following aspects:

- Air-to-water heat pumps method of function
- Model types, functions and technical data relating to the Aquarea heat pump systems
- Accessories

Chapter 5 - Planning - contains information covering the following aspects:

- Selection and design of the heat pump for specific use
- Selection of the installation site
- Planning and preparing for installation

Chapter 6 - Installation - contains information covering the following aspects:

- Installation of the refrigerating, hydraulic and electrical components
- Commissioning

You will also find in Chapter 7 - Maintenance - a description of the key maintenance tasks and in the Appendix an overview of the error codes and operating instructions for the models of the J Generation.

In addition to the information contained in this Manual, attention must also be paid to the information in the installation and operating instructions for the respective device.

Products covered

The current Aquarea heat pump systems are covered in this Manual: mono-bloc systems, bi-bloc systems and All in One (AiO) systems, which are a combination of a hydrokit and a hot water tank. A detailed overview of the models covered can be found at → *1 Model range, p. 8*.

Intended use

Aquarea air-to-water heat pumps from Panasonic are intended for use in space heating and domestic hot water (DHW) production and represent complete, high-quality heating systems. If required, they can be combined with hot water tanks, solar thermal or photovoltaic systems and/or further heat sources powered by electricity, oil or gas.

The intended use of the heat pumps requires adherence to the information and instructions contained in this Manual, especially the safety-related information.

Any other use is considered improper and can lead to significant damage.

Panasonic assumes no liability for any damage resulting from improper use.

Target groups

This Manual is aimed at specialist planning and installation operations.

Installation and commissioning of the heat pumps may only be carried out by qualified technicians.

Only persons authorised by the manufacturer may make any changes, conversions and repairs. Any changes or conversions made by customers themselves will basically exclude any liability being incurred by the manufacturer for any damage resulting from this in exactly the same way as with improper use.

Operation of the heat pumps can, in contrast, also be undertaken by private persons.

Information for using this Manual

Various notices, symbols and text representations used in this Manual are briefly explained below.

Safety-related information

Safety-related information, including product safety labels, safety notes and warning messages, warns the user about dangers and provides instructions for the safe and proper use of the product. In this manual, the following layout and symbols are used for warning messages:

WARNING

This signal word warns of a potentially hazardous situation which can lead to death or severe injury.

► Follow the instructions given in the warning messages in order to prevent this.

CAUTION

This signal word warns of a potentially hazardous situation which can result in slight or moderate injury.

► Follow the instructions given in the warning messages in order to prevent this.

ATTENTION

This signal word warns of a situation which can result in material damage occurring.

► Follow the instructions given in the warning messages in order to prevent this.

Additional warning symbols

Warning of electric shock

Further information

IMPORTANT

Important information which must be observed in all cases in order to ensure that the devices function in the intended manner.

Note

Notice for further useful information.

Text representations

►	indicates handling instructions in a warning message
1., 2., 3. ... or a, b, c ...	indicates operating steps which must be executed in the order specified
●	indicates a list
Accentuation	indicates important terms or text passages
(1)	indicates references to image keys in the running text
→ *Cross-reference*	indicates a cross-reference (with hyperlink function)
www.Hyperlink.com	indicates an internet address (with hyperlink function)

3 Safety Notes

To avoid possible harm to persons or damage to products, read and follow these safety notes.

3.1 General Safety Notes for preventing electric shocks and other hazards to health

WARNING

Danger to life from electric shock!

The devices are operated with 230 V or 400 V alternating current. Improper installation can present a danger to life from electric shock as well as a danger of fire occurring due to overheating.

- ► Electrical installation work must be undertaken by a trained electrician.
- ► Service and maintenance work must only be carried out by an accredited electrician or an authorised dealer.
- ► Keep children and people unfamiliar with the equipment away from any installation work.
- ► Adherence to national and local standards and provisions is to be observed when carrying out any installation work.
- ► Ensure that all cables and power connections, including those already in place, are of adequate dimensions for the electrical power of the heat pump.
- ► Only use licensed power cords for connecting to a power source. No modified cables or extension cables are to be used for connecting to the power source.
- ► The heat pumps must be duly earthed. Earthing is not to be undertaken via gas or water pipes, lightning conductors or earthing for a telephone system.
- ► Adherence is to be paid to the respective national electrical wiring regulations and safety arrangements with regard to residual current. Panasonic recommends using a residual current circuit breaker (RCCB).

CAUTION

Danger of frostbite from the skin coming into contact with the refrigerant

Direct contact of the skin with the refrigerant can cause frostbite.

- ► Work on the refrigeration circuit and in connection with the refrigerant must be carried out by a trained technician or an authorised trader holding a refrigerant handling certificate.
- ► Wear gloves when handling refrigerants (e.g. when emptying or filling the refrigeration circuit).
- ► Observe the Safety Notes in force for the respective refrigerant (R32, R410A or R407C).

Danger of fire and explosion caused by inflammable gases

A danger of fire or explosion arises when any leakages of inflammable gases occur at the installation site of the heat pump.

- ► Do not install heat pumps at sites where inflammable gases can escape.

Danger due to toxic gases if the refrigerant comes into contact with fire

Toxic gases can be created when escaped refrigerants come into contact with fire.

For this reason, if refrigerants escape during installation or operation:

- ► Extinguish any sources of fire (if present).
- ► Thoroughly ventilate the room in which the heat pump is installed.

Danger of explosion and injury caused by pressure in the refrigeration circuit being too high

In the event of improper installation, leaks can occur at the connections of the refrigerant pipes, leading to air being sucked in while the compressor is operating. This results in increased pressure in the refrigeration circuit, leading in turn to increased risk of explosion or injury.

- ► Carry out installation of the refrigerant pipes in a proper manner and check that there are no leaks in the installation before turning on the compressor.
- ► Before the refrigerant pipes are removed or work is carried out on the pipes, switch the compressor off.

Danger of illnesses caused by colonies of bacteria in the water

The risk of colonies of bacteria, particularly of Legionella, in the water can be raised with an open water circuit.

- ► Only deploy devices in a closed water system.

3.2 General Safety Notes relating to preventing material damage

ATTENTION

Danger of the devices being damaged by incorrect refrigerant

The devices must only be operated with the refrigerants described in this Manual or the respective operating instructions. The use of other refrigerants or multi-component refrigerants can lead to the devices being damaged and to safety risks. Panasonic will not accept any responsibility or liability whatsoever if incorrect refrigerants are used.

- ► Only use R32 refrigerant for Aquarea High Performance and T-CAP series models of the J Generation, only use R410A refrigerant for the Aquarea High Performance and T-CAP series models of the H Generation and only use R407C refrigerant for the Aquarea HT series models of the F and G Generation.
- ► Do not mix the prescribed refrigerant with refrigerants of another type or replace it with a refrigerant of another type.

Danger of other material damage to the devices, e.g. due to vibrations, water leaks or fire

- ► Any work on the water circuit must be carried out by a trained technician.
- ► All relevant European and national provisions (including EN 61770 “Electrical appliances connected to the water mains”) are to be observed in installation work for the water circuit.
- ► Adhere to the conditions prescribed for the installation site:
  - Indoor units (hydrokits or All in One units) are only to be installed in indoor areas.
  - Outdoor units and mono-bloc devices are only to be installed in outdoor areas.
- ► Adhere to the prescribed sequence of installation steps.
- ► Only use parts and tools delivered with the equipment or as specified.
- ► As far as possible, avoid installation of outdoor units and mono-bloc devices near the sea, in regions with a high content of sulphur or at sites where large quantities of oil (e.g. machine oil, etc.) are present, as this may result in shortened operating life.

3.3 General further information

The following Notices contain recommendations or further assistance.

Notices

- Whether air-to-water heat pumps are subject to approval depends on the national and local regulations in force at the installation site. In addition, all valid regulations, especially in the area of noise, must be observed.
- Attention must be paid to both the Safety Notes and information in the operating instructions for the respective devices and the information contained in this Manual.

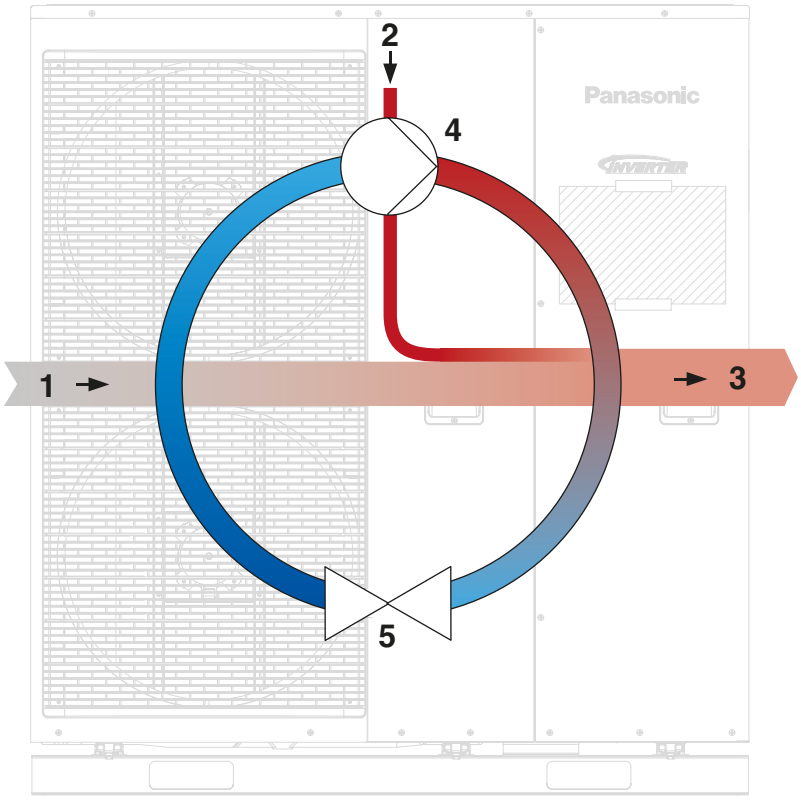
4 Product Description

4.1 Operating Principle

Pleasant indoor temperatures just above 20 °C are needed to ensure living comfort. This temperature does not differ much over most of the year, no matter what the outside temperature is.

In contrast to heating with burners, which generate temperatures of several hundred degrees as part of the combustion process, a heat pump generates only the temperature that is needed at the moment. The Aquarea air-to-water heat pump uses the thermal energy contained in the ambient air to heat the building and to provide hot water. In other words, the system uses freely available ambient heat. Power is only needed to supply the compressor, the electronics and the pumps, and in extremely low outside temperatures, to operate the integrated electric backup heater.

Functioning principle of an air-to-water heat pump



1 Thermal energy contained in the ambient air (evaporator)
2 Power
3 Useful heat (condenser)
4 Compressor
5 Expansion valve

In a circulation process, ambient heat is brought to a higher temperature level. An environmentally-compatible refrigerant passes through four steps:

- In the evaporator (**1**), the refrigerant boils and goes from the liquid phase to the gaseous phase. In this step, heat is extracted from the environment.
- In the compressor (**4**), the pressure of the gaseous refrigerant is sharply increased, and the temperature also rises. This step takes place with supply of electrical energy (**2**).
- In the condenser (**3**), gaseous refrigerant condenses and transfers the heat of condensation to the water to be heated, while it also cools down at the same time.
- When passing through the expansion valve (**5**), the pressure of the fluid refrigerant drops so abruptly that its temperature drops sharply and it can absorb ambient heat again.

This circulation process runs continuously and can be controlled using the Inverter Plus technology of the Aquarea heat pump in such a manner that the current heat requirement is covered.

By inverting the circulation process, it becomes a refrigeration machine. Aquarea heat pumps can thus also be used for space cooling.

Coefficient of Performance and Seasonal Efficiency

The Coefficient of Performance (COP) of a heat pump for the heating mode is defined as the ratio of the emitted thermal output to the electrical power consumed and thus says something about the efficiency of the heat pump at a given moment. The COP of heat pumps differs, depending on the outside temperature and temperature of the generated heat. It is generally true that the COP drops with increasing the temperature difference between the outside temperature and the temperature of the useful heat. A comparison of the efficiency of various heat pumps is only possible at the same temperature. COPs for air-to-water heat pumps are usually measured and stated at the following temperatures for better comparability:

Outside temperature	Useful heat
A–15	W35
A–7	W35
A7	W35
A2	W55

(**A** stands for Air, **W** stands for Water)

Example

Coefficient of Performance = 5.33 (A7 / W35)

At an outside temperature of 7 °C, the air-to-water heat pump generates hot water at 35 °C with a COP of 5.33. Thus, it is possible to generate 5.33 kilowatt hours of heat from one kilowatt hour of power.

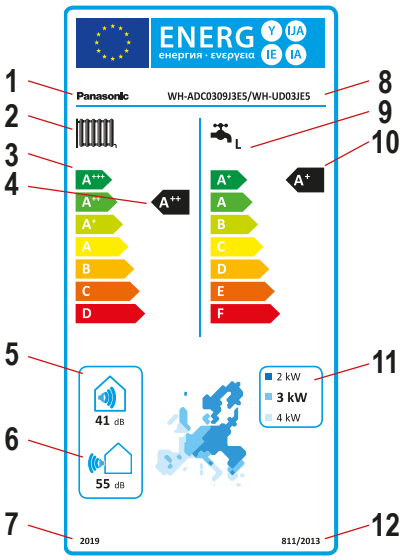
A clearer view on a heat pump's performance under real operating conditions is provided by the Seasonal Coefficient of Performance (SCOP). As specified in EN 14825, the SCOP is defined as the total reference annual heating load QH divided by the total annual power consumption QHE, where QHE includes the COPs (measured at defined operating states), the energy consumption in non-active mode, the rated heating capacity and the duration in active mode (dependent on three simplified climate zones across Europe based on outdoor air temperatures weighted by their occurrences in assumed hours per year).

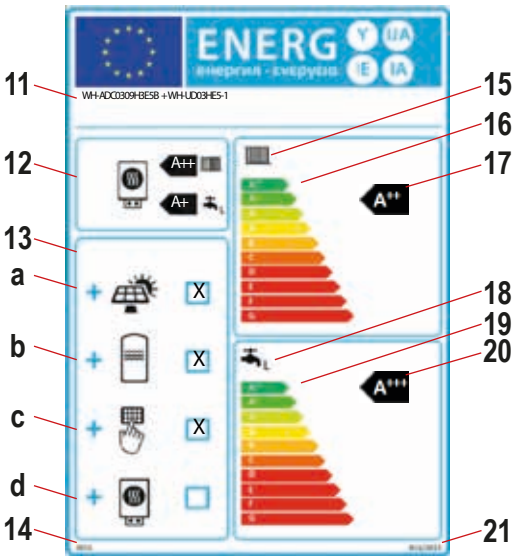
The classification of heat pumps in terms of efficiency, which is stated on the EU energy label, is based on the seasonal space heating energy efficiency η_s, which in turn is calculated from the SCOP.

Similar to the COP for the heating mode is the power factor for the cooling mode (EER = energy efficiency ratio) defined as the ratio of the emitted cooling power to the consumed electrical power.

EU Ecodesign Directive

The European Union's Ecodesign Directive 2009/125/EG provides the framework for establishing the determination of the EU-wide valid requirements applicable for the product design, with which the environmental loads and the CO_2-emission by energy consumption-related products are to be reduced throughout their total life cycle. The Ecodesign Directive must be implemented in every EU member state into national law (e.g. in Germany by the Energy consumption relevant products act (EVPG 2008) or in Austria by the Ecodesign Ordinance (ODV 2007)).





Example of Product Energy label (left)

1 Manufacturer
2 Symbol for space heating function
3 Energy efficiency class scale for space heating
4 Energy efficiency class for space heating
5 Sound power level indoors
6 Sound power level outdoors
7 Year of validity of the Regulation
8 Product name
9 Symbol for water heating function with indication of the load profile
10 Energy efficiency class for water heating
11 Rated heating capacity (kW) for the three European climate zones
12 Regulation number

Example of Package Energy Label (right)

11 Manufacturer and product name
12 Package system
13 Package options:
a Solar system
b Hot water tank
c Control
d Additional heat source (e.g. boiler)
14 Year of validity of the Regulation
15 Symbol for space heating function
16 Energy efficiency class scale for space heating
17 Energy efficiency class for space heating
18 Symbol for domestic hot water function with indication of the load profile
19 Energy efficiency class scale for water heating
20 Energy efficiency class for water heating
21 Regulation number

According to this Ecodesign Directive (or ErP Directive - Energy related products), boilers and heat pumps (among other heat generating devices), hot water tanks and domestic ventilation devices must fulfill product-specific minimum requirements in respect of the energy efficiency. Moreover, individual products as well as so called "packages" (e.g. heater plus controls) must be provided with a product or package energy efficiency label. Energy efficiency is calculated according to uniform criteria and indicated on the label as energy efficiency class (A+++ to D for space heating, A+ to F for water heating).

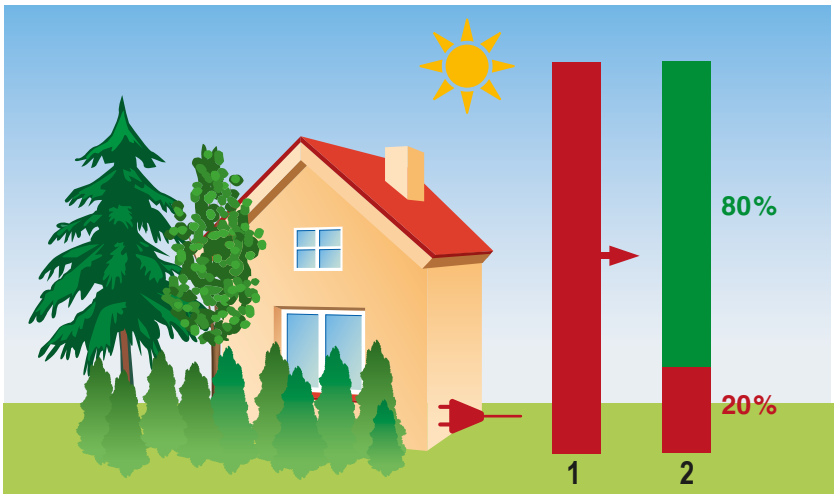
Economical and Environment-Friendly

More than 79 % of the end energy utilisation in the household is used for heating and domestic hot water production. At the same time, the fuel prices (oil, gas, wooden pellets) are subject to high price variations and are becoming more and more expensive.

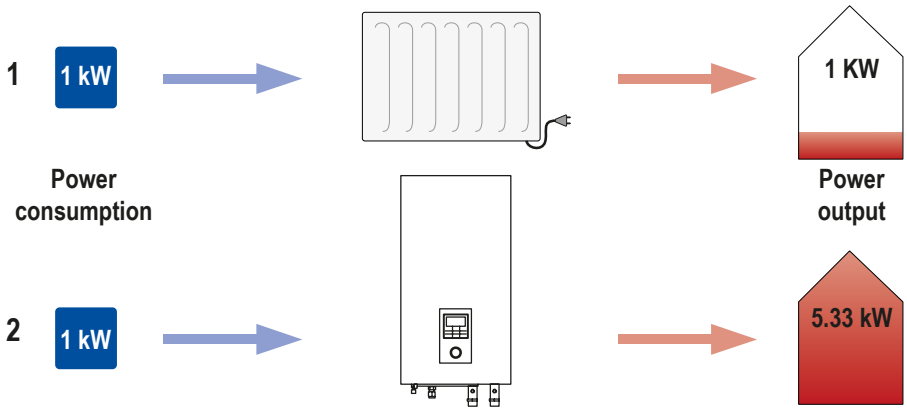
On the other hand, with an Aquarea heat pump, up to 80 % cost-free ambient heat can be used. Only the remaining component of 20 % power needs to be sourced for the operation of the heat

pumps. In comparison with a heating, which is purely based on electrical power, the power sourcing is thus reduced to a quarter for the same heat production.

Comparison of the power requirement of an Aquarea heat pump with a purely electrical heater for the same heat production



1 Conventional electrical heater 2 Aquarea heat pump



As against heating systems using fuel, the dependence on oil prices and uncertain energy imports is thus reduced. In addition, the part of renewable energy fraction of the electric power consumed is already around 20 % and shows a rising tendency. Other than the ambient heat, therefore, the power used for heat pumps is also going to increasingly come from renewable energy.

In addition to the low use of electrical power, the lack of a need for stack emission measurements also contributes towards low operating costs. The investment capital for an Aquarea heat pump is comparatively low in comparison with the other heating systems having a natural gas connection, chimney, oil tank or earth probes.

Optionally, the Aquarea heat pumps can also be operated with cooling function and supplemented with a solar system and a heat recovery ventilation system. This in turn helps increase comfort and efficiency.

Based on the environmental and energy policies of the European Union, each member state may offer national state-promoted market incentive programmes for air/water heat pumps including direct investment cost allowances. State-funded promotions are usually linked to certain conditions, like e.g. minimum requirements related to the seasonal energy efficiency or annual power consumption, which must be verifiable through heat and power meters or similar tools. A hydraulic balance and the adjustment of the heating curve may also be required. Details are given in the respective current European and national promotion directives.

Note

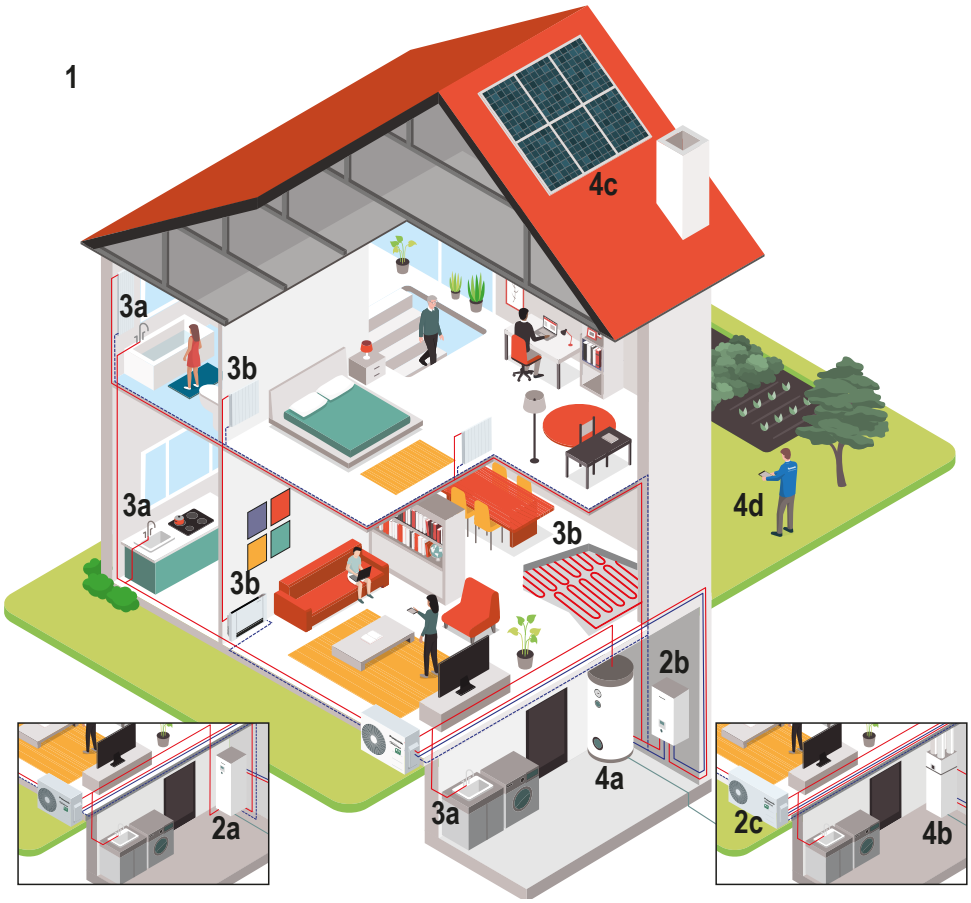
With the Aquarea Designer, Panasonic offers a cost-free programme for heat pump dimensioning, which can be used for calculating the annual COP (see the section “Panasonic Aquarea Designer” in the planning chapter).

Test certificates for applying for state promotion can be downloaded if required from the Download area of the Panasonic ProClub at www.PanasonicProClub.com.

4.2 Heat Source

Air, as a source of heat, is available everywhere and can be used at very little cost and in any amount by using air-heat exchangers combined with fans. However, the outside temperature has major variations during the year and the requirement for heat varies inversely. That means that much more heat needs to be generated when the source of heat itself is at its coldest. This must be taken into consideration at the time of planning, so that the living comfort remains constant.

Similarly, the noise generation of the fans and the air flow should be taken into consideration; minimum distances to the adjacent properties should be observed and the installation location should be selected accordingly.



1 Heat source: ambient air
2 Heat pump system:
2a All in One system
2b Bi-bloc system
2c Mono-bloc system
3 Heat use:
3a Domestic hot water production (DHW)
3b Space heating/cooling (radiators, fan coil units, floor / ceiling / wall surface-embedded systems)
4 Optional accessories
4a Hot water tank
4b Heat recovery ventilation system atop a hot water tank
4c Solar panels
4d Cloud-based control systems

4.3 Heat pump

4.3.1 Functioning and Characteristics

Panasonic has developed the heat pump, as the core of the heat pump system, in three different model series. This makes it possible to offer the best possible solution to address individual heat supply requirements for buildings:

- Aquarea High Performance
  Ideal for low-consumption houses with low-temperature radiators or underfloor heating.
- Aquarea T-CAP
  For applications where the nominal heating capacity must be maintained even at outside temperatures ranging from -7 or -20 °C. Care is taken to ensure that sufficient power output is always available for heating the house, even at extremely low outside temperatures, even without support from an additional heat source.
- Aquarea HT
  For houses with traditional high temperature radiators (e.g. in refurbishment projecs), because Aquarea HT provides supply water temperatures up to 65 °C without any support from other heating systems, even at outside temperatures of -15 °C.

For all series - except the HT series - a cooling function can be activated. Moreover, all Aquarea heat pump series offer the choice of either a mono-bloc system (comprising just an outdoor unit), or a bi-bloc system (comprising an outdoor unit and a hydrokit) (→ *4.5 Model types, p. 23*).

4.3.2 Operating mode

In general: The greater the difference between the outside temperature and temperature of the useful heat, the lower is the COP of the heat pump. As high temperature differences seldom occur over the course of the year on properly planned heat pump systems, brief additional re-heating using backup heaters is often accepted. As an alternative to backup heater, you can also work with a peak load or alternative heat source, such as a condensing boiler or a fireplace. Four operating modes are distinguished as follows:

- Monovalent operating mode:
  The heat pump serves as the sole heat source.
- Mono-energetic operating mode:
  One type of energy (electricity) is used in various heat sources (electric heat pump + electric heating element for peak load).
- Bivalent alternative operating mode:
  As an alternative to the heat pump, a second heat source supplies the object using another type of energy (e.g. fireplace instead of heat pump for outside temperatures < -5 °C).
- Bivalent parallel operating mode:
  Besides the heat pump, a second heat source is used using another type of energy. Both heat sources are operated simultaneously (e.g. heat pump + condensing boiler for outside temperatures < 0 °C).

IMPORTANT

If the heat pump in combination with an electric backup heater is operated mono-energetically, the backup heater should cover a maximum of 15 % of the heat requirement.

4.4 Heat use

4.4.1 Heating

In contrast with heat sources with burners, which generate supply water temperatures of over 80 °C, the maximum water outlet temperature of the Aquarea heat pump is limited to 60 °C (Aquarea High Performance J Generation) or 65 °C (Aquarea T-CAP J Generation and Aquarea HT) without using the backup heater. This must be taken into consideration during the planning of the heating circuits. Surface-embedded systems (i.e. underfloor, ceiling or wall heating) that have a supply water temperature of up to 35 °C and a supply/return water temperature difference (ΔT) of 5 K are recommended. An advantage of underfloor heating with wet screed laying is its high storage capacity, which eliminates the need for a buffer tank for bridging power cut-off times by the energy supply company.

Fan coils have the advantage of good heat emission to the ambient air with quick control performance. Besides, they can be used for both the heating and cooling modes to the same extent.

If radiators are used, plan with the lowest possible design temperature of, for example, 45 °C, to ensure high efficiency of the heat pump system. An internal backup heater of 3 to 9 kW with its mono-energetic operating mode ensures high heating comfort of the Aquarea heat pump even at very low outside temperatures. Alternatively, a bivalent operation is also possible in combination with an external heat source.

The Aquarea heat pump has an outside temperature-dependent control of the supply water temperature and can thus actuate a heating circuit with a room thermostat. The other heating circuits can be controlled through additional heating circuit controllers or a superordinate system controller.

4.4.2 Domestic hot water production

The Aquarea heat pump can also produce domestic hot water (DHW), and this function is integrated in the controls. It switches to this operating mode when necessary and systematically actuates the tank for hot water production through a 3-way valve.

For reasons of efficiency, the hot water temperature is set to a value below 60 °C in heat pump operation. A hot water temperature of 45 °C is normally sufficient and does not compromise comfort in any way. If the hot water temperature is, however, too low, there is the risk of Legionella to be considered; the growth of Legionella is particularly likely in water temperatures between 30 and 50 °C.

Panasonic hot water tanks are fitted with an electrical heating rod (DHW tank booster heater) for comfortable hot water supply, which is only switched on when needed or for Legionella prophylaxis (sterilisation).

Aquarea heat pumps can be easily combined without a problem with solar systems, which can take over hot water production to a large extent in the summer.

CAUTION

Danger of illnesses due to growth of Legionella in water

Legionella can grow in hot water tanks, and can cause infectious diseases in humans.

► Respect European and national requirements for avoiding Legionella multiplication (example in Germany: DVGW Worksheet W551). For domestic hot water tanks with more than 400 litres volume as well as in buildings with more than two residential units, there may be higher requirements than for one- and two-family houses.

ATTENTION

Danger of damage to water tank due to inadequate water quality

If the contents of chloride and sulphate exceed 250 mg/l, water pretreatment is required. The warranty is invalidated at values above 250 mg/l.

► When using the Panasonic hot water tank, make sure that the water quality conforms to Directive 98/83/EC on drinking water quality.

4.4.3 Cooling

The cooling mode is switched on manually through the operating panel or the wired remote controller or automatically through defined temperature threshold values. Switching to heating mode is also done manually at the end of the cooling period or automatically using the defined temperature threshold.

Space cooling is possible through surface-embedded systems such as floor and wall heaters, cooling ceilings or particularly using fan coils. Individual heating circuits that are not suitable for cooling mode can be disabled by control through a 2-way valve. For all transfer systems, in the cooling mode at high humidity, the temperature on the surface could fall below the dew point, which can cause condensation of water. This should be prevented especially in surface-embedded systems either by using a dew point sensor to control the supply water temperature and increase it by mixing supply water with return water as needed, or by switching the cooling mode off if required. Fan coils can be operated with much lower supply water temperatures, compared to the use of surface-embedded systems for cooling mode, and therefore have greater cooling capacities. However, fan coils for cooling mode must always be fitted with a condensation drain and have tubes with diffusion-proof heat insulation.

ATTENTION

Danger of damage to building or risk of slipping in the floor area

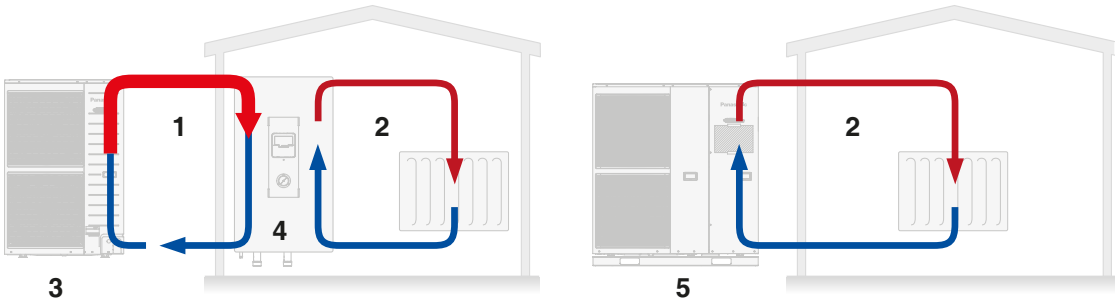
In the cooling mode, a drop below dew point can cause condensation of moisture from the air on the surface of the heat transfer systems. This can damage the building or pose the risk of slipping in the floor area.

- ► Prevent the temperature from dropping below the dew point by suitable placement of dew point sensors.
- ► Alternatively, the condensate that forms can be safely drained.
- ► In addition, insulate the pipes concerned to prevent diffusion.

4.5 Model types

4.5.1 Bi-bloc system and mono-bloc system

Difference between bi-bloc system (left) and mono-bloc system (right)



1 Refrigerant circuit
2 Heating circuit (water)
3 Outdoor unit
4 Indoor unit (hydrokit / All in One unit)
5 Mono-bloc unit

Bi-bloc system

The bi-bloc system consists of an outdoor unit installed in the open air and an indoor unit, either standard hydrokit or All in One unit, which is usually installed in the boiler room or in another frost-free room. The two units of a bi-bloc system are linked through refrigerant pipes, so there is no danger of freezing. The heat pump is operated through the operating panel on the indoor unit.

The All in One unit is a space-saving combination of the hydrokit and a high-quality stainless steel hot water tank. It can be installed quickly and smoothly, because the internal pipes of the device unit are already laid and the pipe connections are placed on the underside of the device.

Mono-bloc system

The mono-bloc system consists of one single unit that is set up outdoors. No refrigerant pipes are needed for the installation; only the heating system needs to be connected to it. Mono-bloc systems are easier to install, but need more space. Moreover, as the heating water leaves the building envelope, it can freeze in the event of power failure or if the electricity supply is cut off by the network operator.

The heat pump is operated by using the wired remote controller, which is placed in the building and is linked to the mono-bloc unit with a cable of max. 15 meter length.

ATTENTION

Danger of water pipes freezing in outside temperatures below 0 °C

Once the heating circuit of a mono-bloc system is filled with water and the outside temperature falls below 0 °C, there is a risk that the water pipes may freeze up. This can cause a lot of damage to the device.

The client should therefore ensure the absence of frost by taking one of the following measures:

- ► Operate the heating circuit using a food-safe antifreeze mixture (propylene glycol).
- ► Provide an additional cabinet heating in the mono-bloc unit, to prevent the heating circuit from freezing up.
- ► Drain the water from the heating circuit with field-supplied equipment (manually or automatically) before freezing starts.

4.5.2 Series

The Aquarea heat pump system has three different series that are in turn available in multiple model variants. An overview of the complete range can be found at the beginning of this manual (→ *1 Model range, p. 8*).

With the large number of different model variants, which illustrates the large variety of characteristics and functions of the Aquarea heat pumps, Panasonic can achieve a high level of flexibility and adaptability for the most varied applications. This is intended to offer the best possible solution to address individual heat supply and air-conditioning requirements for buildings using Aquarea heat pumps.

The following table shows the Aquarea heat pump series and their key characteristics in the context of typical applications.

Overview of Aquarea series and model variants

Aquarea High Performance	Aquarea T-CAP	Aquarea HT
Heating - Cooling - DHW	Heating - Cooling - DHW	Heating - DHW
Single phase from 3 to 16 kW Three phase from 9 to 16 kW	Single phase from 9 to 12 kW Three phase from 9 to 16 kW	Single phase from 9 to 12 kW Three phase from 9 to 12 kW
Connectable to		
Radiators - Fan coil - Underfloor heating - DHW	Radiators - Fan coil - Underfloor heating - DHW	Traditional high-temperature radiators - DHW
Application		
Normal installation	For extreme cold ambient	Retrofit for old radiators
Energy efficiency		
A+++ / A++	A++ / A++	A++ / A++
Heating 35 °C / 55 °C [1]	Heating 35 °C / 55 °C [1]	Heating 35 °C / 55 °C [1]
Minimum outdoor temperature		
-20 °C	-28 °C (All in One and Bi-bloc) -20 °C (Mono-bloc) [2]	-20 °C
Minimum outdoor temperature to provide constant capacity at 35 °C supply water temperature		
-7 °C (not for all units)	-20 °C [2]	-15 °C
Supply temperature for heating. Maximum / Heat pump only		
75 °C [3] / 55 °C [4] (or 60 °C for Aquarea J Generation)	75 °C [3] / 60 °C [4] (65 °C [5] for Aquarea J Generation)	75 °C [3] / 65 °C

Aquarea High Performance	Aquarea T-CAP	Aquarea HT
Control and connectivity		
Smart Grid Contact[6] Wireless LAN Ready	Smart Grid Contact[6] Wireless LAN Ready	Smart Grid Contact[6]
Range		
All in One from 3 to 16 kW (185 L) Bi-bloc from 3 to 16 kW Mono-bloc from 5 to 9 kW	All in One from 9 to 16 kW (185 L) Bi-bloc from 9 to 16 kW Mono-bloc from 9 to 16 kW	Bi-bloc from 9 to 12 kW Mono-bloc from 9 to 12 kW

Note: All data in this chart is applicable in most of models in each line up, check product specs to confirm.
1 Scale from A+++ to D
2 9 and 12 kW
3 DHW maximum temperature with heater.
4 In case of outdoor temperature over -10 °C.
5 It is possible to set temperature to 65 °C on remote controller. Normally, outlet water temperature is 60 °C or lower. In case of ΔT setting with remote controller is 15 °C and the outdoor ambient temperature is 5 to 20 °C, outlet water temperature 65 °C is possible.
6 J and H Generation with CZ-NS4P, F and G Generation with Heat Pump Manager.

Besides the notable differences as in mono-bloc and bi-bloc systems or hydrokit and All in One unit, all models have the same working principle and can therefore be described together in respect of many planning-relevant properties. The relevant differences, even those between different product generations, will be pointed out at the appropriate point.

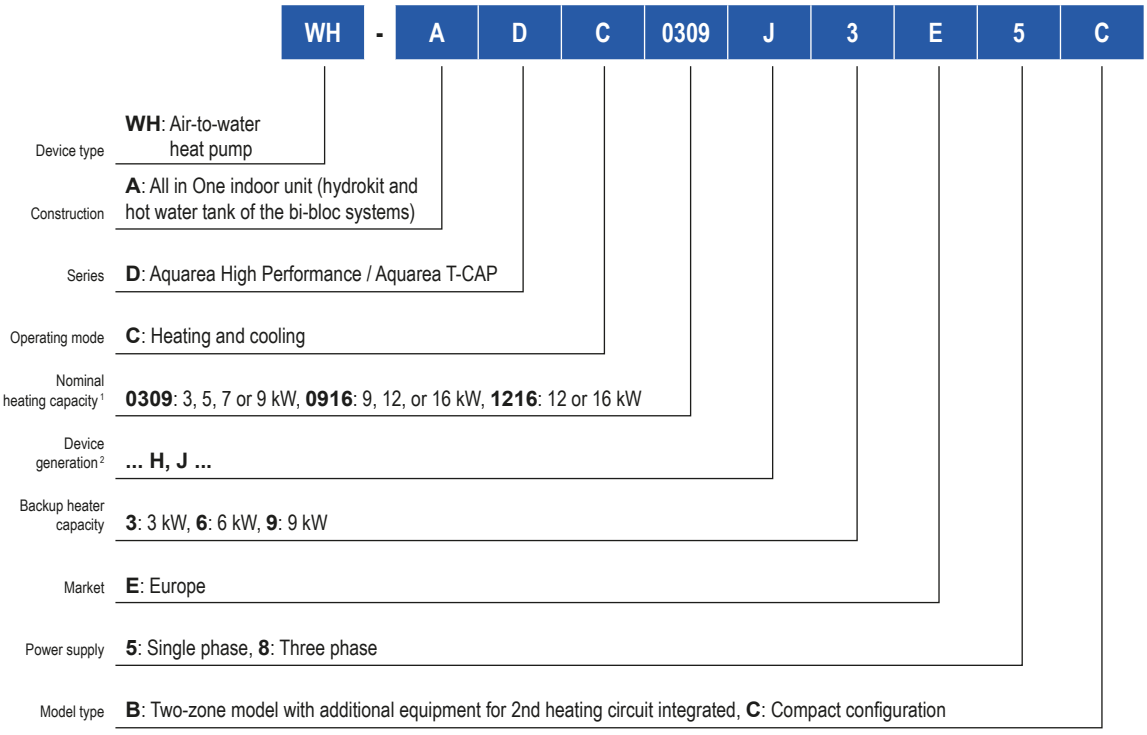
4.5.3 Model code

For easy and clear denomination of the different Aquarea models, a model code is used, from which the models with their respective specific properties and functions can be read off.

Example

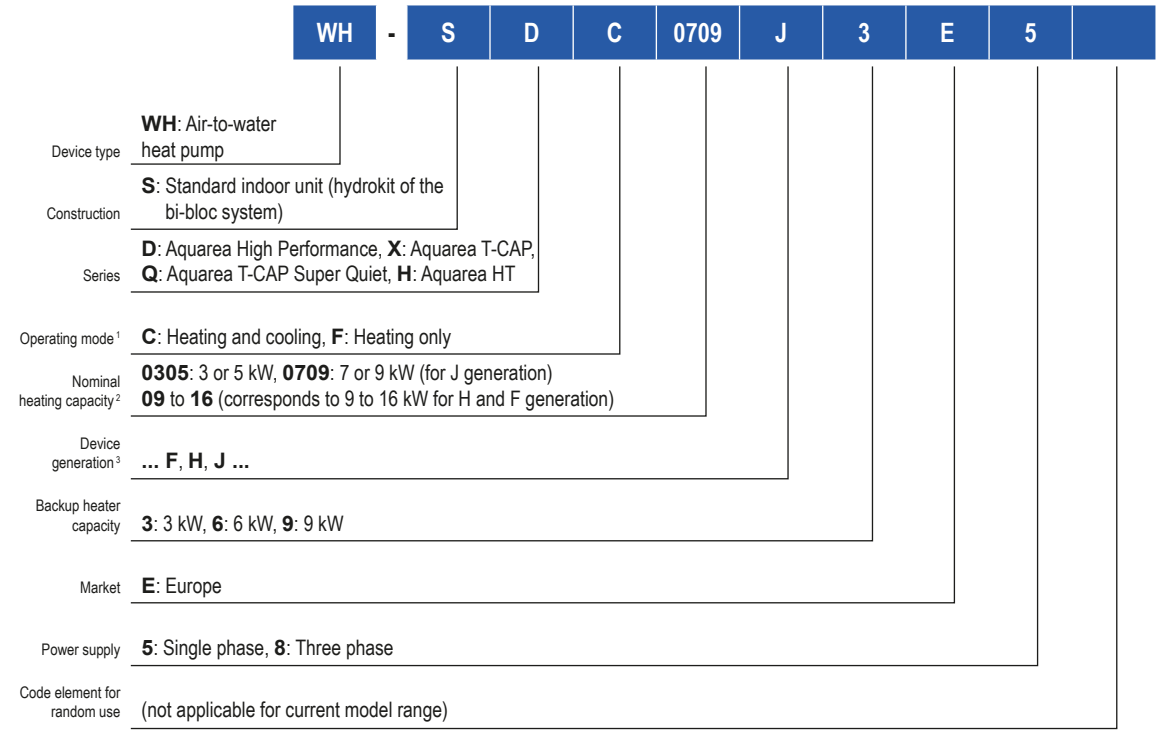
WH-MDC05J3E5 is a heat pump unit (WH-) in mono-bloc design (M) of the High Performance series (D) with cooling function (C), a nominal power of 5 kW (05) of the J generation (J) for the European market (E) with a single phase power supply (5).

Model code for All in One indoor units (bi-bloc systems)



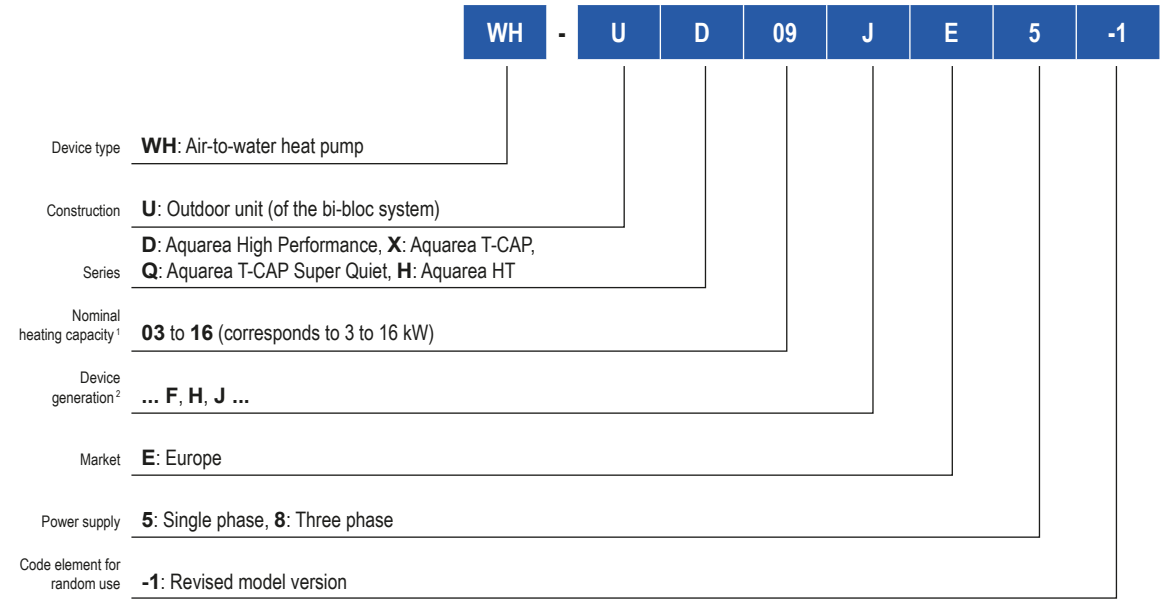
1 The available capacities differ according to the series. An overview is given in the model range (→ *1 Model range, p. 8*).
2 J generation requires refrigerant R32, H generation requires refrigerant R410A.

Model code for standard indoor units (bi-bloc systems)



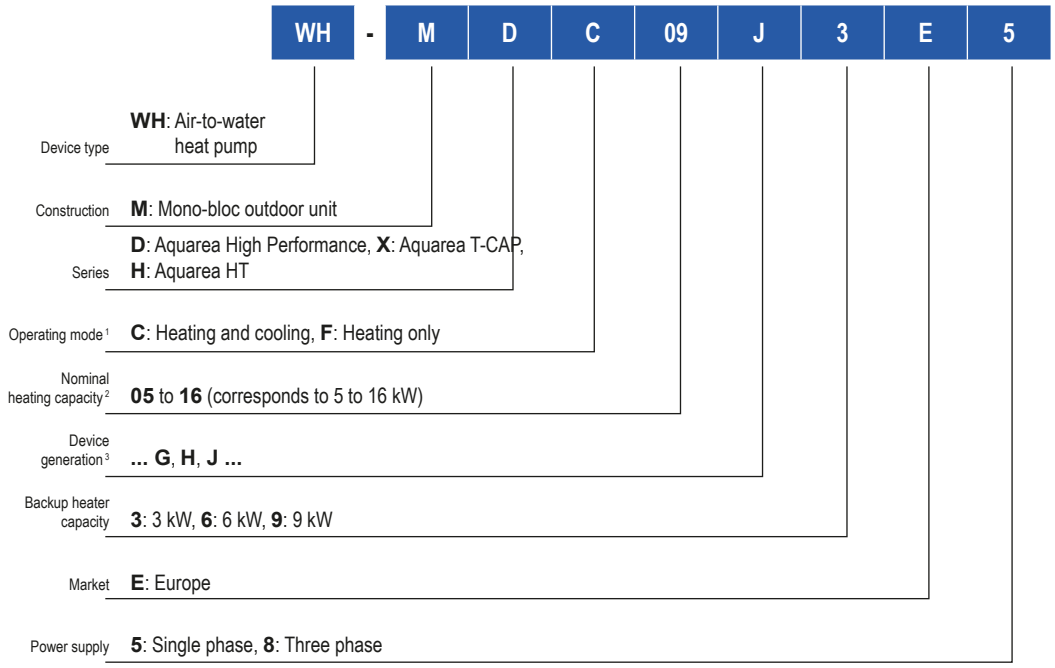
1 The models of the Aquarea HT series can only be used for heating mode and have no cooling function.
2 The available capacities differ according to the series. An overview is given in the model range (→ *1 Model range, p. 8*).
3 J generation requires refrigerant R32, H generation requires refrigerant R410A, F generation requires refrigerant R407C.

Model code for outdoor units (bi-bloc systems)



1 The available capacities differ according to the series. An overview is given in the model range (→ *1 Model range, p. 8*).
2 J generation requires refrigerant R32, H generation requires refrigerant R410A, F generation requires refrigerant R407C.

Model code for mono-bloc units



1 The devices of the Aquarea HT series can only be used for heating mode and have no cooling function.
2 The available capacities differ according to the series. An overview is given in the model range (→ *1 Model range, p. 8*).
3 J generation requires refrigerant R32, H generation requires refrigerant R410A, F generation requires refrigerant R407C.

4

4.6 Functions and technical data

4.6.1 Product features

Energy efficiency and environment friendliness

- Up to 80 % of the energy is obtained from the ambient air for greater energy efficiency
- COP of 5.33 for the single phase 3 kW bi-bloc and All in One systems or COP of 5.08 for the single-phase 5 kW mono-bloc system for A7/W35 (all High Performance series, J Generation)
- Inverter technology allows for a demand-controlled power output of the device and thus contributes to energy savings
- Environmentally friendly refrigerants (R32 and R410A for Aquarea High Performance and T-CAP, R407C for Aquarea HT)
- All systems are fitted with a high-efficiency pump

High Comfort

- Optimum control
- Models available for heating only (HT) or for heating and cooling (High Performance and T-CAP)
- Optimised performance based on return water temperature
- Integrated control of the hot water tank and heating
- 24-hours timer with mode control
- Model WH-ADC0309J3E5B complete with all necessary equipment for control of two individual heating zones
- Extremely compact model WH-ADC0309J3E5C optimised for combination with optional Heat recovery Ventilation Unit (HRV)

Easy operation

- Contol panel for standard and All in One bi-bloc systems is integrated in the hydrokit, but can be installed separately within the building in the same way as the control panel for mono-bloc systems
- Easy programming via the control panel
- For safety reasons, the hydrokits, All in One units and mono-bloc units are all fitted with a residual current circuit breaker (RCCB).

Easy Maintenance and Assembly

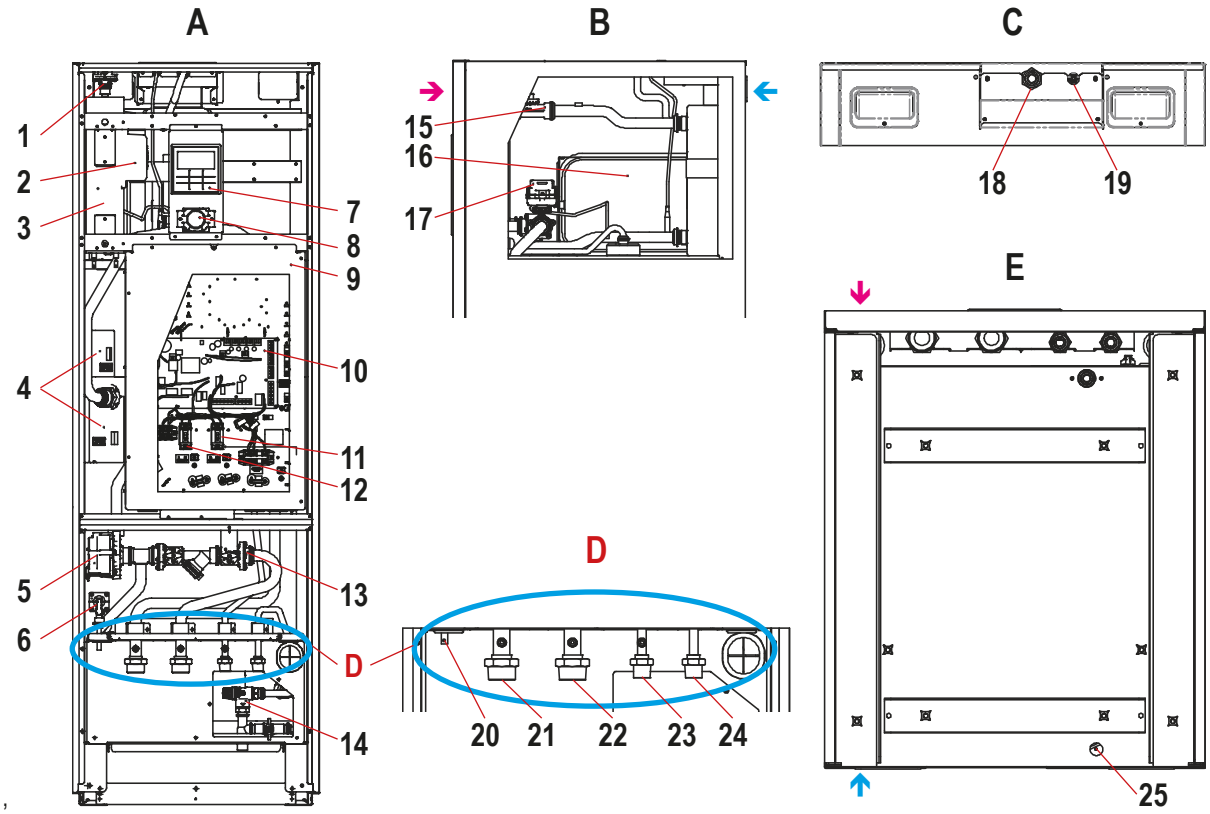
- Compact design
- Easy control of the water pressure by using the hydraulic gauge in the front panel of the hydrokit or All in One unit
- All units are easy to open for optimum accessibility of all internal parts
- All in One units with factory-fitted pipe connections are easy to install
- Flexible installation possibilites due to long pipe runs
- Pipe runs of up to 30 metres with a height difference up to 20 metres possible (depending on model)
- Pipe connections to the outdoor units can be made in four directions (front, rear, side, below)
- Mono-bloc systems are particularly easy to install, because there are no refrigerant connections to be made

4.6.2 Bi-bloc system

The Aquarea bi-bloc system consists of an indoor unit (which can be a hydrokit or an All in One unit) and an outdoor unit. Both units of the bi-bloc system are configured such that they are mutually matched to one another as a kit, i.e. the outdoor units cannot be combined arbitrarily with the different indoor units. A suitable Aquarea bi-bloc system kit is available for all typical applications.

4.6.2.1 Components

All in One unit | J generation | Standard configuration (for 1 heating zone)
WH-ADC0309J3E5



➔ Front side, ➔ Rear side

A Internal view (seen from front side)
1 Air purge valve
2 Overload protector (not visible)
3 Backup heater assembly
4 Hot water tank temperature sensor (not visible)
5 Water circulation pump
6 Pressure relief valve
7 Remote controller
8 Water pressure gauge
9 Control board cover (hinged)
10 Main PCB
11 RCCB (for backup heater)
12 RCCB (for power supply)
13 Magnetic water filter set
14 Safety valve

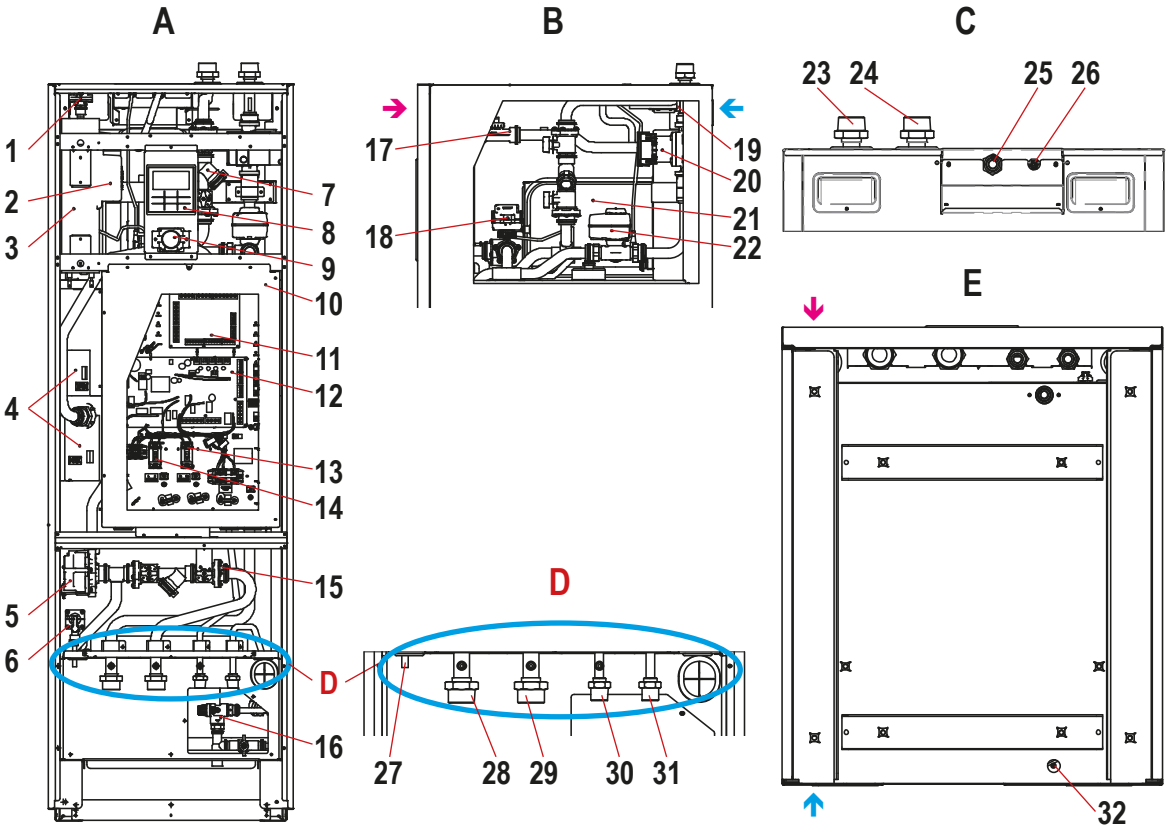
B Internal detail view of upper section (seen from right side)
15 Vortex water flow sensor
16 Expansion vessel
17 3-way valve

C Detail view of upper section (seen from rear side)
18 Refrigerant gas line
19 Refrigerant liquid line

D Detail view of piping connections
20 Pressure relief valve drainage tap
21 Supply water outlet (to space heating)
22 Return water inlet (from space heating)
23 Supply water outlet (to hot water tank)
24 Fresh water inlet

E Bottom view
25 Condensate drain hole

All in One unit | J generation | Two-zone configuration (for 2 heating zones)
WH-ADC0309J3E5B



➔ Front side, ➔ Rear side

A Internal view (seen from front side)
1 Air purge valve
2 Overload protector (not visible)
3 Backup heater assembly
4 Hot water tank temperature sensor (not visible)
5 Zone 1 Water circulation pump
6 Pressure relief valve
7 Zone 2 Water filter set
8 Remote controller
9 Water pressure gauge
10 Control board cover (hinged)
11 Main PCB
12 Optional PCB
13 RCCB (for backup heater)
14 RCCB (for power supply)
15 Magnetic water filter set
16 Safety valve

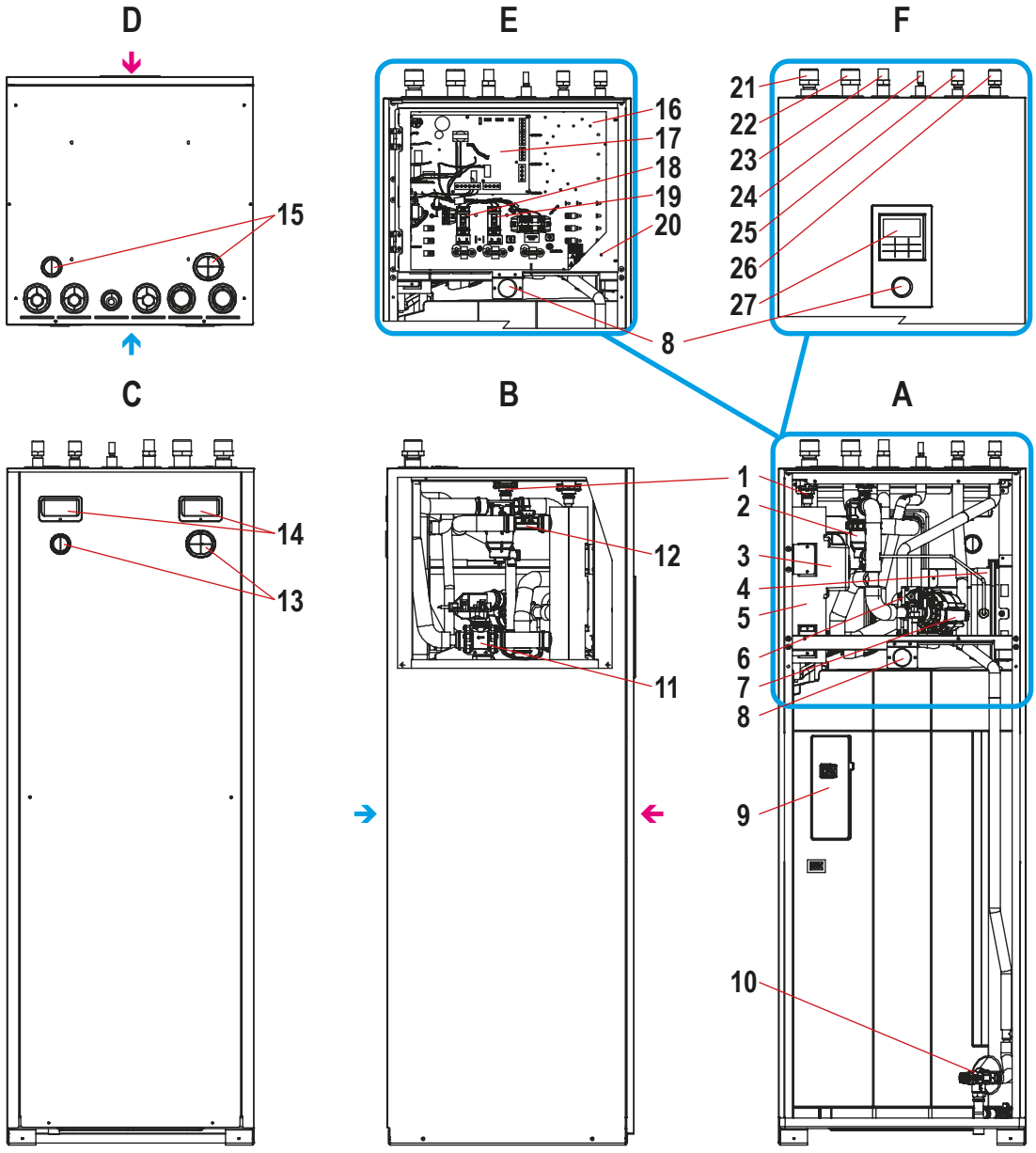
B Internal detail view of upper section (seen from right side)
17 Vortex water flow sensor
18 3-way valve
19 Zone 2 Water temperature sensor
20 Zone 2 Circulating water pump
21 Expansion vessel
22 Zone 2 Mixing valve

C Detail view of upper section (seen from rear side)
23 Zone 2 Supply water outlet (to space heating)
24 Zone 2 Return water inlet (from space heating)
25 Refrigerant gas line
26 Refrigerant liquid line

D Detail view of piping connections
27 Pressure relief valve drainage tap
28 Zone 1 Supply water outlet (to space heating)
29 Zone 1 Return water inlet (from space heating)
30 Supply water outlet (to hot water tank)
31 Fresh water inlet

E Bottom view
32 Condensate drain hole

All in One unit | J and H generation | Compact configuration (for 1 heating zone)
WH-ADC0309J3E5C, WH-ADC1216H6E5C



➔ Front side, ➔ Rear side

A Internal view (seen from front side)
1 Air purge valve
2 Magnetic water filter set
3 Overload protector (not visible)
4 Expansion vessel
5 Backup heater assembly
6 Pressure relief valve
7 Water circulation pump
8 Water pressure gauge
9 Hot water tank temperature sensor (not visible)
10 Safety valve

B Internal view of upper section (seen from left side)
11 3-way valve
12 Vortex water flow sensor

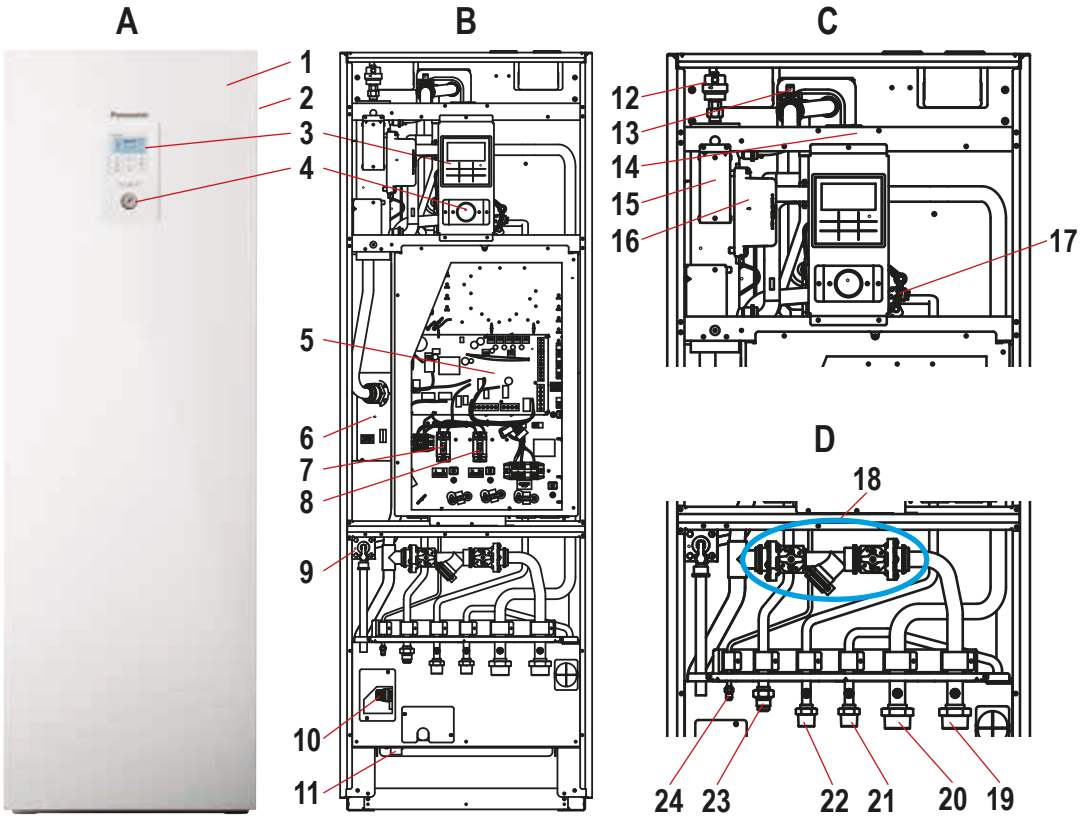
C Rear view
13 Back side cable gland (x 2)
14 Handle (x 2)

D Top view
15 Top side cable gland (x 2)

E Internal detail view of upper section (seen from front side)
16 Control board
17 Main PCB
18 RCCB (for power supply)
19 RCCB (for backup heater)
20 Control board cover

F Detail view of upper section with piping connections
21 Supply water outlet (to space heating/ cooling)
22 Return water inlet (from space heating/ cooling)
23 Refrigerant gas line
24 Refrigerant liquid line
25 Fresh water inlet
26 Supply water outlet (to hot water tank)
27 Remote controller

All in One unit | H generation | Standard configuration (for 1 heating zone)
WH-ADC1216H6E5, WH-ADC0916H9E8



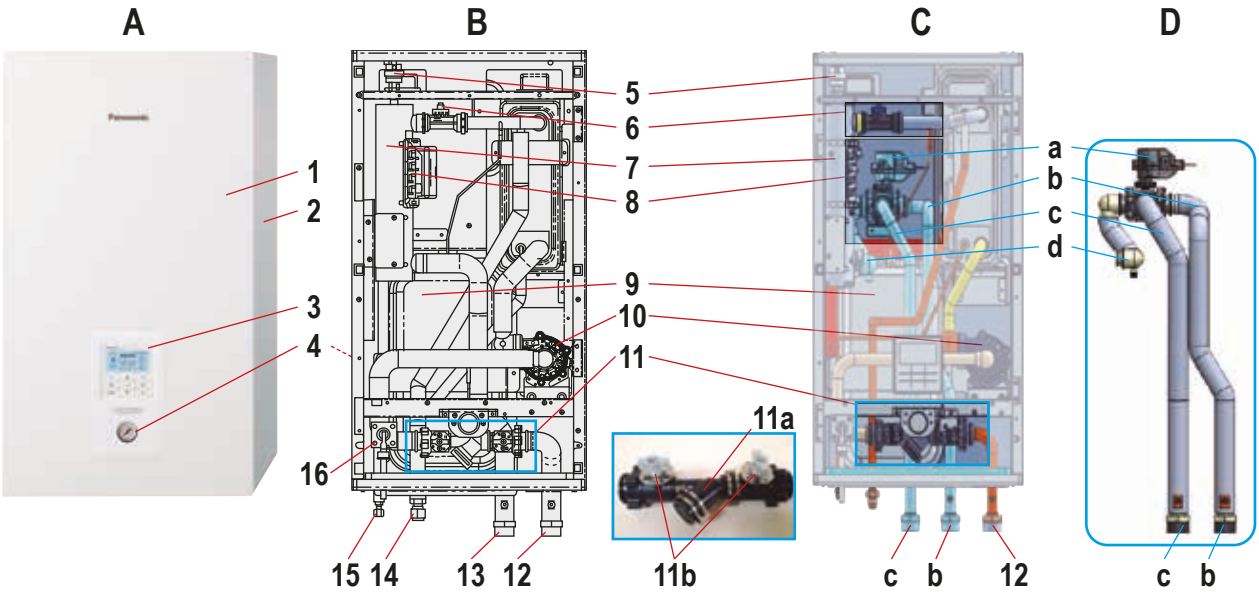
A Exterior view
1 Front panel
2 Side panel
3 Remote controller
4 Water pressure gauge

B Internal view (seen from front side)
5 Main PCB
6 Hot water tank temperature sensor (not visible)
7 RCCB (for power supply)
8 RCCB (for backup heater)
9 Pressure relief valve
10 Safety valve
11 Hot water tank drainage nozzle

C Detailed view of upper section
12 Air purge valve
13 Vortex water flow sensor
14 3-way-valve (not visible)
15 Backup heater
16 Overload protector (x 2)
17 Water circulation pump

D Detail view of lower section (pipe connections)
18 Water filter set (strainer with 2 stop valves)
19 Return water inlet (from space heating/cooling)
20 Supply water outlet (to space heating/cooling)
21 Fresh water inlet
22 Supply water outlet (to hot water tank)
23 Refrigerant gas line
24 Refrigerant liquid line

Hydrokit | J and H generation
WH-SDC**J3E5, WH-SDC**H*E5, WH-SDC**H*E8,**
WH-SXCH*E5, WH-SXC**H*E8, WH-SQC**H*E5, WH-SQC**H*E8**



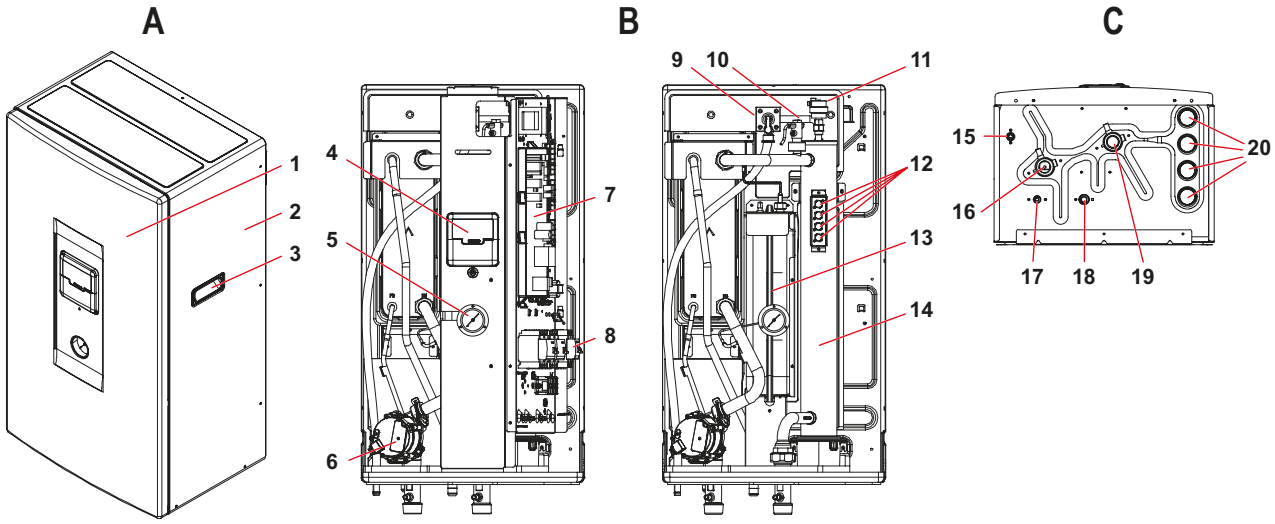
A Exterior view
1 Front panel
2 Side panel
3 Remote controller
4 Water pressure gauge

B Internal view (seen from front side)
5 Air purge valve
6 Vortex water flow sensor
7 Backup heater
8 Overload protector (x 2)
9 Expansion vessel (10 litres)
10 Water circulation pump
11 Magnetic water filter set* (strainer with 2 stop valves)
11a Strainer
11b Stop valve (x 2)
12 Return water inlet (from space heating/cooling)
13 Supply water outlet (to space heating/cooling)
14 Refrigerant gas line
15 Refrigerant liquid line
16 Safety valve

C Internal detail view (seen from front side) with optional 3-way valve set CZ-NV1 installed
D Detail view of optional 3-way valve set CZ-NV1
a 3-way valve (for domestic hot water production)
b Supply water outlet (to space heating/cooling)
c Supply water outlet (to hot water tank)
d Common supply water inlet

* For H generation: standard (non-magnetic) water filter set

Hydrokit | F generation – Only for HT series
WH-SHFF*E5, WH-SHF**F*E8**



A Exterior view
1 Front panel
2 Side panel
3 Handle

B Internal view (seen from front side)
4 Remote controller
5 Water pressure gauge
6 Water circulation pump
7 PCB
8 RCCB (for power supply)
9 Safety valve
10 Water flow sensor
11 Air purge valve
12 Overload protector
13 Expansion vessel (10 litres)
14 Backup heater

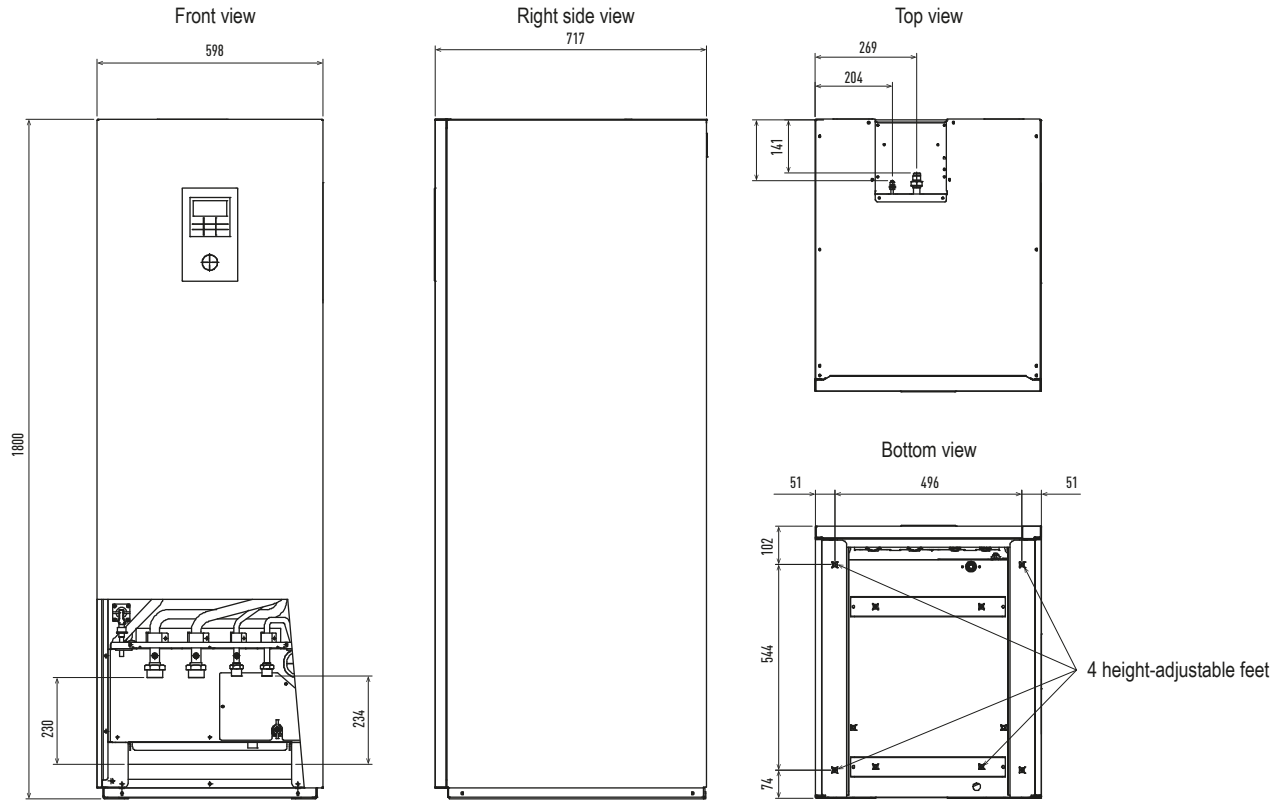
C Bottom view
15 Condensate drain hole
16 Return water inlet (from space heating/cooling)
17 Refrigerant liquid line
18 Refrigerant gas line
19 Supply water outlet (to space heating/cooling)
20 Cable gland (x 4)

4.6.2.2 Dimensions

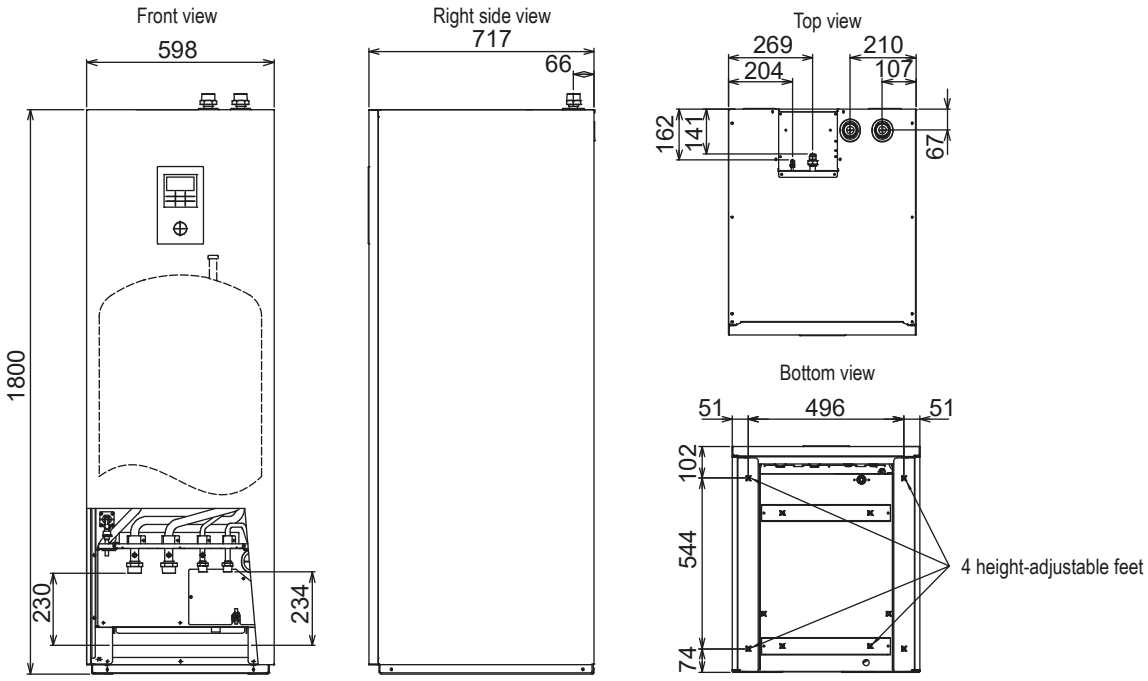
Note
All dimensions are indicated in millimetres (mm); the figures are, however, not to scale.

Indoor units

All in One unit (Standard) | J generation
WH-ADC0309J3E5

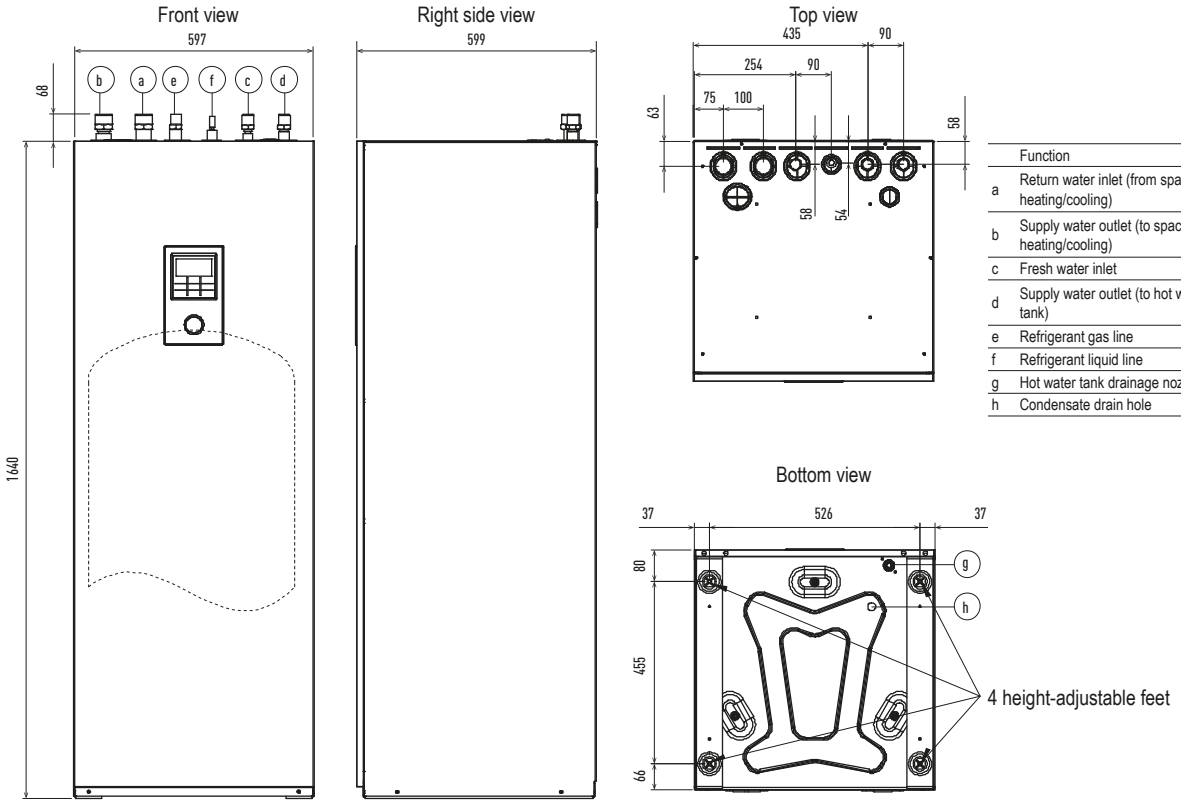


All in One unit (Two-zone) | J generation
WH-ADC0309J3E5B



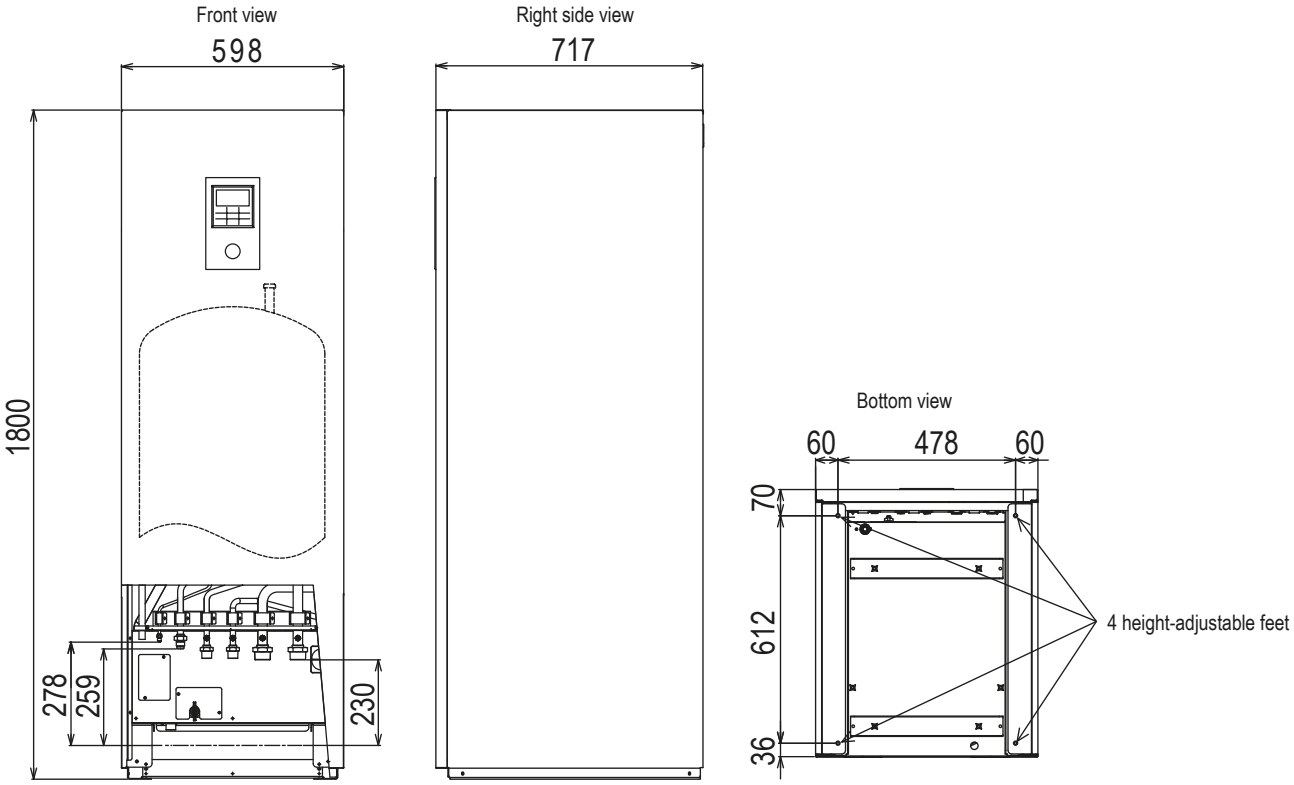
4

All in One unit (Compact) | J and H generation
WH-ADC0309J3E5C, WH-ADC1216H6E5C

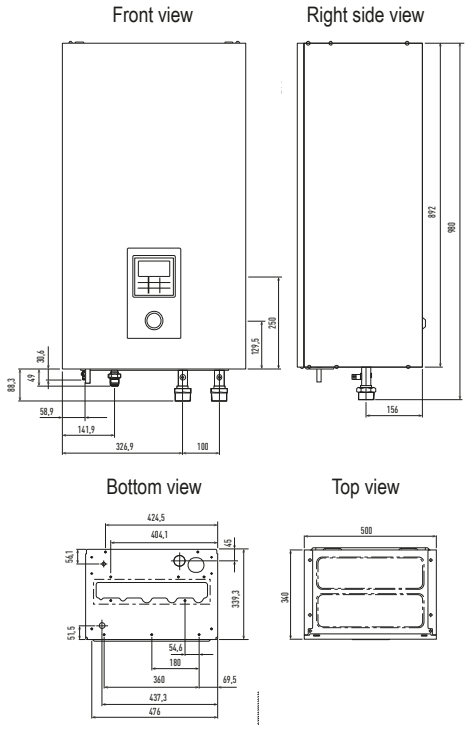


	Function	Connector size
a	Return water inlet (from space heating/cooling)	R 1¼"
b	Supply water outlet (to space heating/cooling)	R 1¼"
c	Fresh water inlet	R ¾"
d	Supply water outlet (to hot water tank)	R ¾"
e	Refrigerant gas line	7/8-14UNF
f	Refrigerant liquid line	7/16-20UNF
g	Hot water tank drainage nozzle	Rc 1/2"
h	Condensate drain hole	–

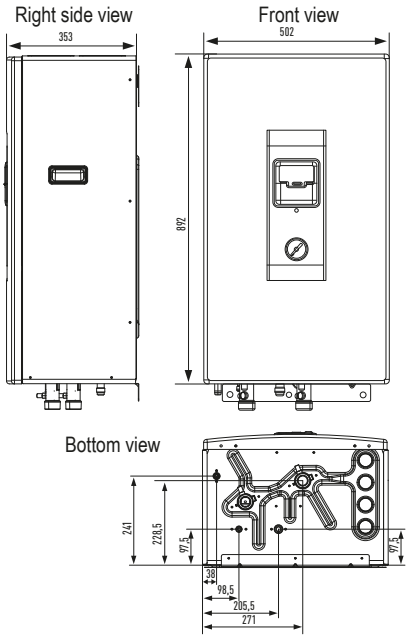
All in One unit (Standard) | H generation
WH-ADC1216H6E5, WH-ADC0916H9E8



Hydrokit | J and H generation
WH-SDC**J3E5, WH-SDC**H*E5, WH-SDC**H*E8,**
WH-SXCH*E5, WH-SXC**H*E8, WH-SQC**H*E5, WH-SQC**H*E8**



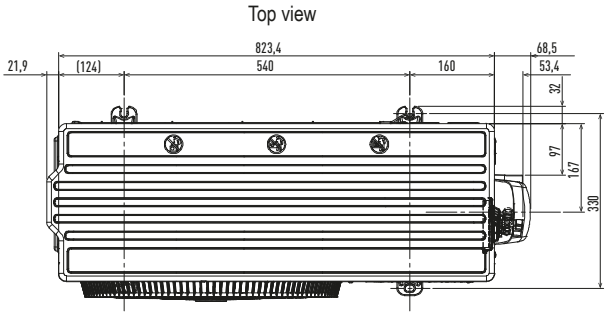
Hydrokit | F generation
WH-SHFF*E5, WH-SHF**F*E8**

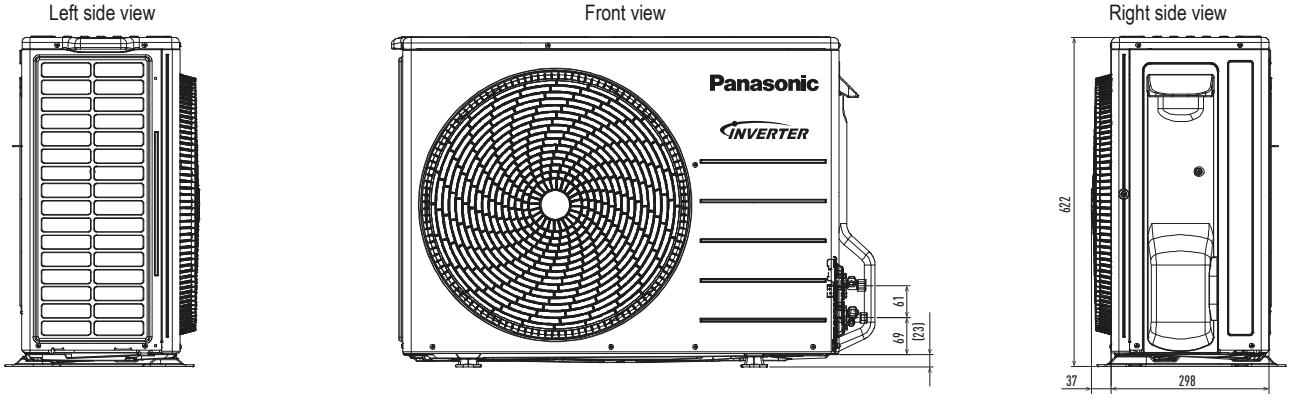


4

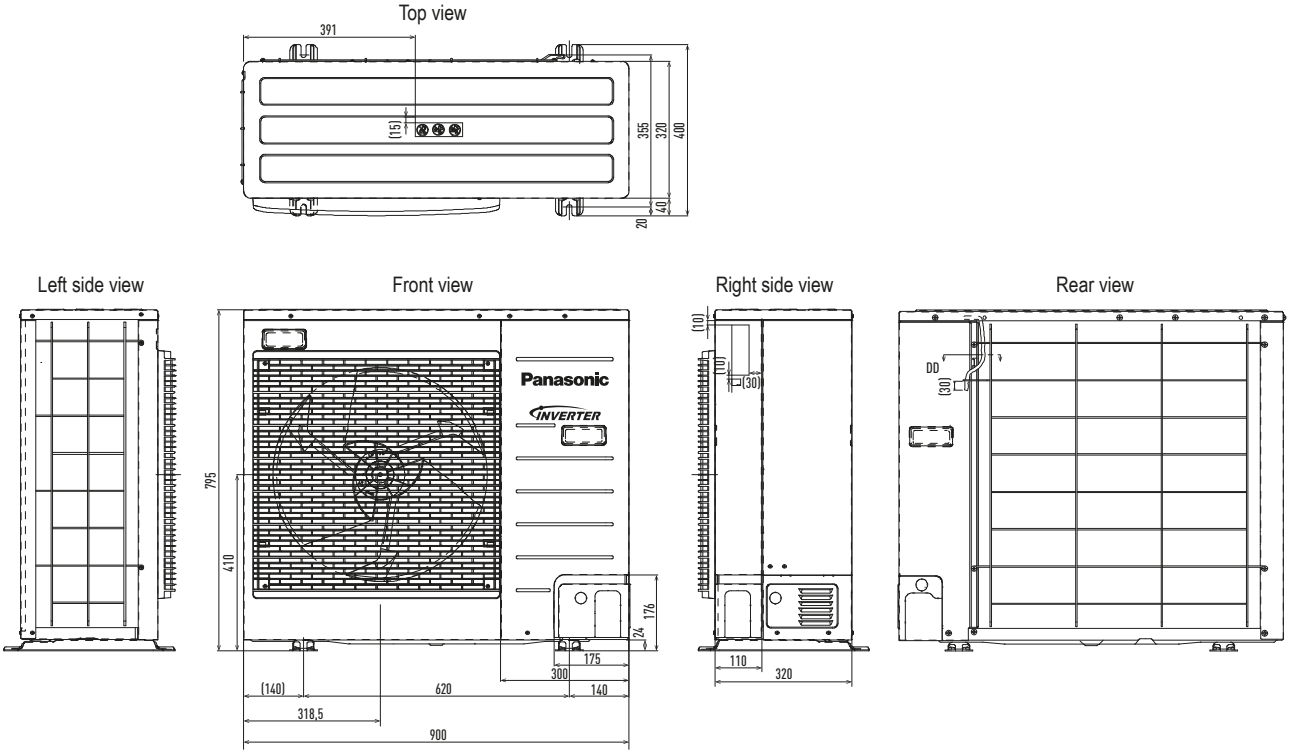
Outdoor units

Aquarea High Performance bi-bloc outdoor unit | 3 and 5 kW
WH-UD03JE5, WH-UD05JE5

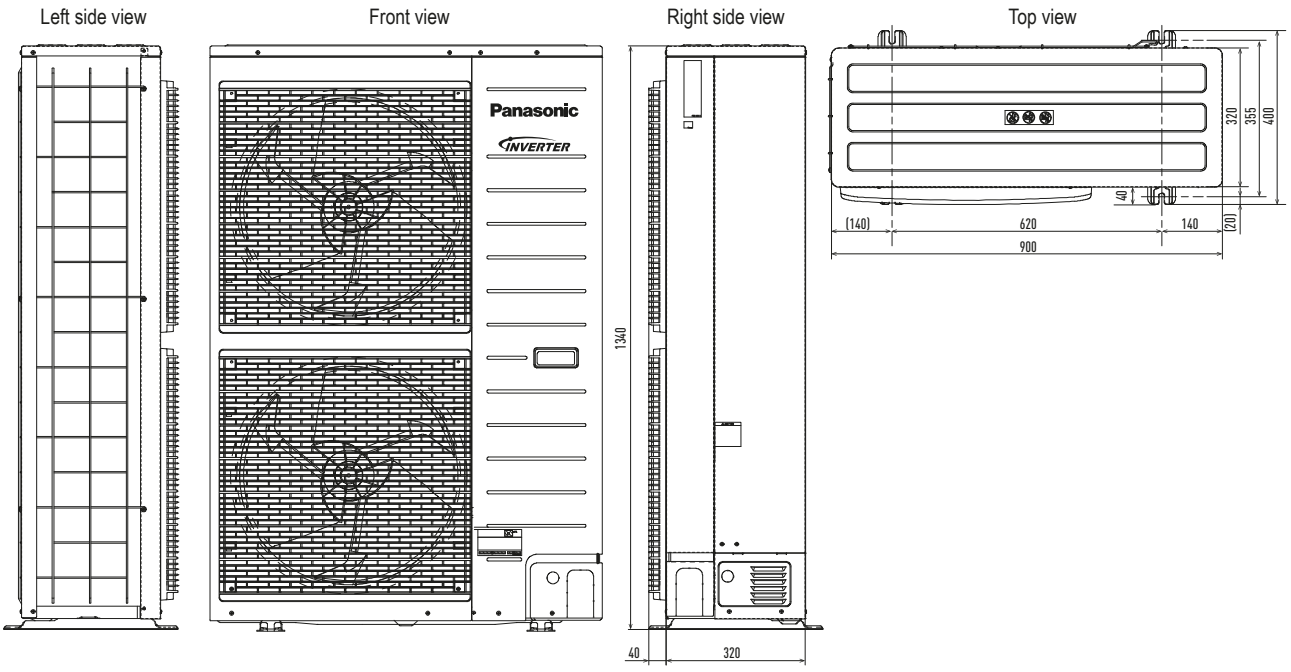




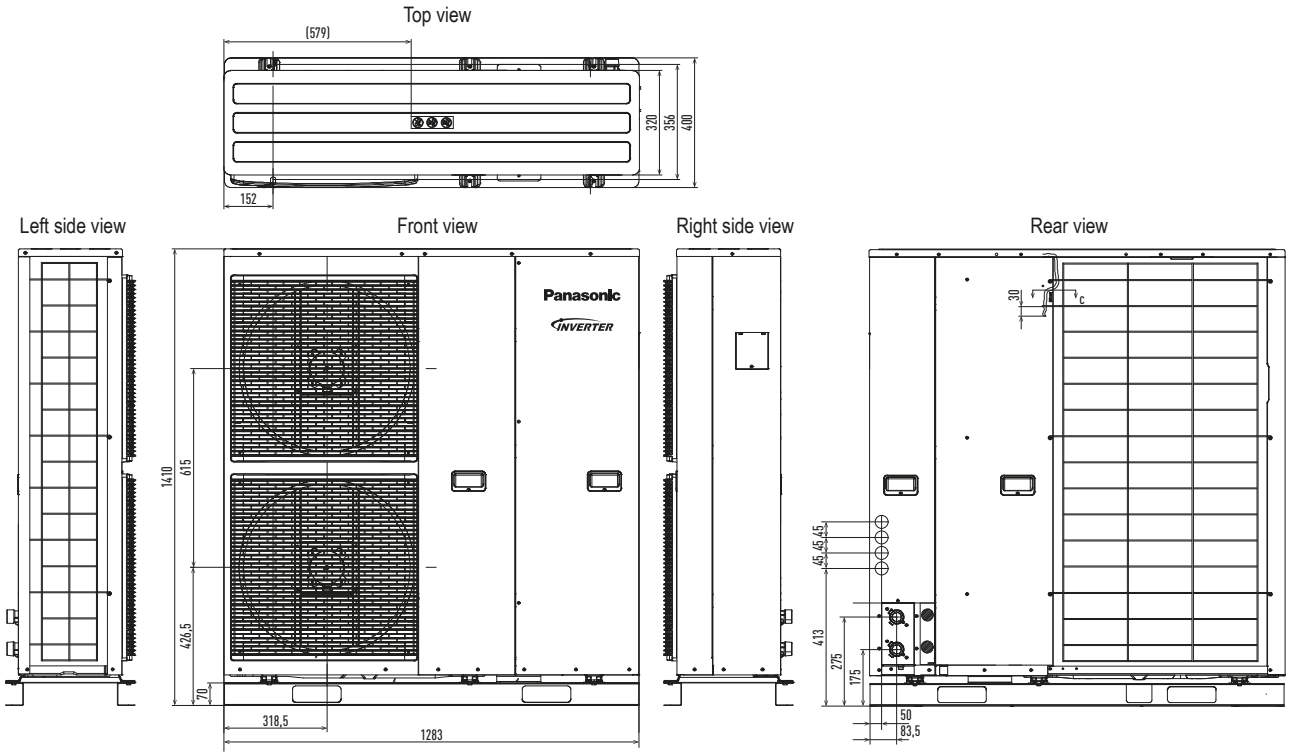
Aquarea High Performance bi-bloc outdoor unit | 7 and 9 kW
WH-UD07JE5, WH-UD09JE5-1



Aquarea High Performance, T-CAP and HT bi-bloc outdoor unit | 9 to 16 kW
WH-UDHE5, WH-UD**HE8**
WH-UXHE5, WH-UX**HE8**
WH-UHFE5, WH-UH**FE8**



T-CAP Super Quiet bi-bloc outdoor unit | 9 to 16 kW
WH-UQHE8**



4

4.6.2.3 Technical Data

All in One systems | Aquarea High Performance | J Generation | Single Phase | Heating and Cooling | 1 or 2 zones | R32

					Single phase (Power to indoor)			
Kit 1 zone (for 2 zone add B at the end)					**KIT-ADC03JE5**	**KIT-ADC05JE5**	**KIT-ADC07JE5**	**KIT-ADC09JE5-1**
Heating capacity / COP (A +7 °C, W 35 °C)				kW / –	3.20 / 5.33	5.00 / 5.00	7.00 / 4.76	9.00 / 4.48
Heating capacity / COP (A +7 °C, W 55 °C)				kW / –	3.20 / 2.81	5.00 / 2.72	7.00 / 2.82	8.95 / 2.78
Heating capacity / COP (A +2 °C, W 35 °C)				kW / –	3.20 / 3.64	4.20 / 3.18	6.85 / 3.41	7.00 / 3.40
Heating capacity / COP (A +2 °C, W 55 °C)				kW / –	3.20 / 2.19	4.10 / 1.99	6.20 / 2.21	6.30 / 2.16
Heating capacity / COP (A -7 °C, W 35 °C)				kW / –	3.30 / 2.80	4.20 / 2.59	5.60 / 2.87	6.12 / 2.78
Heating capacity / COP (A -7 °C, W 55 °C)				kW / –	3.20 / 1.79	3.55 / 1.71	5.25 / 1.94	5.90 / 1.93
Cooling capacity / EER (A 35 °C, W 7 °C)				kW / –	3.20 / 3.52	4.50 / 3.00	6.70 / 3.03	8.20 / 2.72
Cooling capacity / EER (A 35 °C, W 18 °C)				kW / –	3.20 / 4.71	4.80 / 4.29	6.70 / 4.72	9.00 / 4.18
ErP data for Space Heating								
Average climate	Seasonal energy efficiency (ηs,h)	W35 / W55		%	200 / 136	200 / 136	193 / 130	193 / 130
	SCOP	W35 / W55			5.07 / 3.47	5.07 / 3.47	4.90 / 3.32	4.90 / 3.32
	Energy class [1]	W35 / W55			A+++ / A++	A+++ / A++	A+++ / A++	A+++ / A++
Warm climate	Seasonal energy efficiency (ηs,h)	W35 / W55		%	245 / 165	245 / 165	227 / 160	227 / 160
	SCOP	W35 / W55			6.20 / 4.20	6.20 / 4.20	5.75 / 4.07	5.75 / 4.07
	Energy class [1]	W35 / W55			A+++ / A+++	A+++ / A+++	A+++ / A+++	A+++ / A+++
Cold climate	Seasonal energy efficiency (ηs,h)	W35 / W55		%	157 / 110	157 / 110	164 / 116	164 / 116
	SCOP	W35 / W55			4.00 / 2.83	4.00 / 2.83	4.18 / 2.98	4.18 / 2.98
	Energy class [1]	W35 / W55			A++ / A+	A++ / A+	A++ / A+	A++ / A+
Indoor unit 1 zone hydrokit					**WH-ADC0309J3E5**	**WH-ADC0309J3E5**	**WH-ADC0309J3E5**	**WH-ADC0309J3E5**
Indoor unit 2 zones built-in hydrokit					**WH-ADC0309J3E5B**	**WH-ADC0309J3E5B**	**WH-ADC0309J3E5B**	**WH-ADC0309J3E5B**
Sound pressure	Heat / Cool			dB(A)	28 / 28	28 / 28	28 / 28	28 / 28
Dimension	H x W x D			mm	1,800 x 598 x 717	1,800 x 598 x 717	1,800 x 598 x 717	1,800 x 598 x 717
Net weight 1 zone / 2 zones				kg	122 / 130	122 / 130	122 / 130	122 / 130
Water pipe connector				Inch	R 1¼	R 1¼	R 1¼	R 1¼
A class pump	Number of speeds				Variable Speed	Variable Speed	Variable Speed	Variable Speed
	Input power (Min / Max)			W	30 / 120	30 / 120	30 / 120	30 / 120
Heating water flow (ΔT=5 K. 35 °C)				l/min	9.20	14.30	20.10	25.80
Capacity of integrated electric heater				kW	3.00	3.00	3.00	3.00
Recommended fuse				A	16 / 16	16 / 16	25 / 16	25 / 16
Recommended+ cable size, supply 1 / 2				mm²	3 x 1.5 / 3 x 1.5	3 x 1.5 / 3 x 1.5	3 x 2.5 / 3 x 1.5	3 x 2.5 / 3 x 1.5
Water volume				l	185	185	185	185
Maximum water temperature				°C	65	65	65	65
Material inside tank					Stainless steel	Stainless steel	Stainless steel	Stainless steel
Tapping profile according EN16147					L	L	L	L
ErP data for Water Heating								
Average climate	Seasonal energy efficiency (ηw,h)			%	132	132	120	120
	SCOP				3.30	3.30	3.00	3.00
	Energy class [2]				A+	A+	A+	A+
Warm climate	Seasonal energy efficiency (ηw,h)			%	155	155	140	140
	SCOP				3.88	3.88	3.50	3.50
	Energy class [2]				A+	A+	A+	A+
Cold climate	Seasonal energy efficiency (ηw,h)			%	99	99	99	99
	SCOP				2.48	2.48	2.47	2.47
	Energy class [2]				A	A	A	A
Outdoor unit					**WH-UD03JE5**	**WH-UD05JE5**	**WH-UD07JE5**	**WH-UD09JE5-1**
Sound power [3]	Heat			dB(A)	55	55	59	59
Dimension / Net weight	H x W x D			mm / kg	622 x 824 x 298 / 37	622 x 824 x 298 / 37	795 x 875 x 320 / 61	795 x 875 x 320 / 61
Refrigerant (R32) / CO_2 Eq.				kg / t	0.9 / 0.608	0.9 / 0.608	1.27 / 0.857	1.27 / 0.857
Pipe diameter	Liquid / Gas			Inch (mm)	1/4 (6.35) / 1/2 (12.70)	1/4 (6.35) / 1/2 (12.70)	1/4 (6.35) / 5/8 (15.88)	1/4 (6.35) / 5/8 (15.88)
Pipe length range / Elevation difference (in/out)				m / m	3 ~ 25 / 20	3 ~ 25 / 20	3 ~ 50 / 30	3 ~ 50 / 30
Pipe length for additional gas / Additional gas amount				m / g/m	10 / 20	10 / 20	10 / 25	10 / 25
Operation range	Outdoor ambient		Heat	°C	-20 ~ +35	-20 ~ +35	-20 ~ +35	-20 ~ +35
			Cool	°C	+10 ~ +43	+10 ~ +43	+10 ~ +43	+10 ~ +43
	Water outlet		Heat	°C	20 ~ 60	20 ~ 60	20 ~ 60	20 ~ 60
			Cool	°C	5 ~ 20	5 ~ 20	5 ~ 20	5 ~ 20

1 Scale from A+++ to D.

2 Scale from A+ to F.

3 Sound power in accordance to 811/2013, 813/2013 and EN12102-1:2017 at +7 °C.

Notes:

EER and COP calculation is based in accordance to EN14511.

This product is designed to comply with the European Water Quality Directive 98/83/EC amended by 2015/1787/EU. The lifespan of the product is not guaranteed in the case of the use of groundwater, such as spring water or well water, the use of tap water when salt or other impurities are contained, nor in areas of acidic water quality. Maintenance and warranty costs related to these cases are the customer's responsibility.

All in One systems | Aquarea High Performance | H Generation | Single Phase / Three Phase | Heating and Cooling | R410A

				Single phase (Power to indoor)		Three phase (Power to indoor)		
Kit				**KIT-ADC12HE5**	**KIT-ADC16HE5**	**KIT-ADC09HE8**	**KIT-ADC12HE8**	**KIT-ADC16HE8**
Heating capacity / COP (A +7 °C, W 35 °C)			kW / –	12.00 / 4.74	16.00 / 4.28	9.00 / 4.84	12.00 / 4.74	16.00 / 4.28
Heating capacity / COP (A +7 °C, W 55 °C)			kW / –	12.00 / 2.93	14.50 / 2.72	9.00 / 2.94	12.00 / 2.93	14.50 / 2.72
Heating capacity / COP (A +2 °C, W 35 °C)			kW / –	11.40 / 3.44	13.00 / 3.28	9.00 / 3.59	11.40 / 3.44	13.00 / 3.28
Heating capacity / COP (A +2 °C, W 55 °C)			kW / –	9.10 / 2.23	9.80 / 2.21	8.80 / 2.23	9.10 / 2.23	9.80 / 2.21
Heating capacity / COP (A -7 °C, W 35 °C)			kW / –	10.00 / 2.73	11.40 / 2.57	9.00 / 2.85	10.00 / 2.73	11.40 / 2.57
Heating capacity / COP (A -7 °C, W 55 °C)			kW / –	8.20 / 1.95	9.00 / 1.85	7.90 / 2.05	8.20 / 1.95	9.00 / 1.85
Cooling capacity / EER (A 35 °C, W 7 °C)			kW / –	10.00 / 2.81	12.20 / 2.56	7.00 / 3.17	10.00 / 2.85	12.20 / 2.56
Cooling capacity / EER (A 35 °C, W 18 °C)			kW / –	10.00 / 4.17	12.20 / 4.12	7.00 / 4.67	10.00 / 4.26	12.20 / 4.12
ErP data for Space Heating								
Average climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	190 / 134	190 / 130	190 / 133	190 / 134	190 / 130
	SCOP	W35 / W55		4.82 / 3.42	4.82 / 3.33	4.81 / 3.41	4.82 / 3.42	4.82 / 3.33
	Energy class [1]	W35 / W55		A+++ / A++	A+++ / A++	A+++ / A++	A+++ / A++	A+++ / A++
Warm climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	245 / 159	245 / 169	245 / 159	245 / 159	245 / 169
	SCOP	W35 / W55		6.21 / 4.05	6.21 / 4.30	6.21 / 4.05	6.21 / 4.05	6.20 / 4.30
	Energy class [1]	W35 / W55		A+++ / A+++	A+++ / A+++	A+++ / A+++	A+++ / A+++	A+++ / A+++
Cold climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	168 / 121	168 / 121	168 / 121	168 / 121	168 / 121
	SCOP	W35 / W55		4.29 / 3.10	4.28 / 3.10	4.28 / 3.10	4.29 / 3.10	4.28 / 3.10
	Energy class [1]	W35 / W55		A++ / A+	A++ / A+	A++ / A+	A++ / A+	A++ / A+
Indoor unit				**WH-ADC1216H6E5**	**WH-ADC1216H6E5**	**WH-ADC0916H9E8**	**WH-ADC0916H9E8**	**WH-ADC0916H9E8**
Sound pressure	Heat / Cool		dB(A)	**33 / 33**	**33 / 33**	**33 / 33**	**33 / 33**	**33 / 33**
Dimension	H x W x D		mm	**1,800 x 598 x 717**	**1,800 x 598 x 717**	**1,800 x 598 x 717**	**1,800 x 598 x 717**	**1,800 x 598 x 717**
Net weight			kg	**124**	**124**	**126**	**126**	**126**
Water pipe connector			Inch	**R1¼**	**R1¼**	**R1¼**	**R1¼**	**R1¼**
A class pump	Number of speeds			**Variable Speed**	**Variable Speed**	**Variable Speed**	**Variable Speed**	**Variable Speed**
	Input power (Min / Max)		W	**36 / 152**	**36 / 152**	**36 / 152**	**36 / 152**	**36 / 152**
Heating water flow (ΔT=5 K. 35 °C)			l/min	**34.4**	**45.9**	**25.8**	**34.4**	**45.9**
Capacity of integrated electric heater			kW	**6.00**	**6.00**	**9.00**	**9.00**	**9.00**
Recommended fuse			A	**30 / 30**	**30 / 30**	**16 / 16**	**16 / 16**	**16 / 16**
Recommended cable size, supply 1 / 2			mm²	**3 x 4.0 / 3 x 4.0**	**3 x 4.0 / 3 x 4.0**	**5 x 1.5 / 5 x 1.5**	**5 x 1.5 / 5 x 1.5**	**5 x 1.5 / 5 x 1.5**
Water volume			l	**185**	**185**	**185**	**185**	**185**
Maximum water temperature			°C	**65**	**65**	**65**	**65**	**65**
Material inside tank				**Stainless steel**	**Stainless steel**	**Stainless steel**	**Stainless steel**	**Stainless steel**
Tapping profile according EN16147				**L**	**L**	**L**	**L**	**L**
ErP data for Water Heating								
Average climate	Seasonal energy efficiency (ηw,h)		%	**95**	**91**	**95**	**95**	**91**
	SCOP			**2.37**	**2.28**	**2.37**	**2.37**	**2.27**
	Energy class [2]			**A**	**A**	**A**	**A**	**A**
Warm climate	Seasonal energy efficiency (ηw,h)		%	**110**	**107**	**110**	**110**	**107**
	SCOP			**2.75**	**2.67**	**2.75**	**2.75**	**2.67**
	Energy class [2]			**A**	**A**	**A**	**A**	**A**
Cold climate	Seasonal energy efficiency (ηw,h)		%	**75**	**72**	**75**	**75**	**72**
	SCOP			**1.87**	**1.80**	**1.87**	**1.87**	**1.80**
	Energy class [2]			**A**	**B**	**A**	**A**	**B**
Outdoor unit				**WH-UD12HE5**	**WH-UD16HE5**	**WH-UD09HE8**	**WH-UD12HE8**	**WH-UD16HE8**
Sound power [3]	Heat		dB(A)	65	65	65	65	65
Dimension / Net weight	H x W x D		mm / kg	1,340 x 900 x 320 / 101	1,340 x 900 x 320 / 101	1,340 x 900 x 320 / 107	1,340 x 900 x 320 / 107	1,340 x 900 x 320 / 107
Refrigerant (R410A) / CO_2 Eq.			kg / t	2.55 / 5.324	2.55 / 5.324	2.55 / 5.324	2.55 / 5.324	2.55 / 5.324
Pipe diameter	Liquid / Gas		Inch (mm)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)
Pipe length range / Elevation difference (in/out)			m / m	3 ~ 50 / 30	3 ~ 50 / 30	3 ~ 30 / 20	3 ~ 30 / 20	3 ~ 30 / 20
Pipe length for additional gas / Additional gas amount			m / g/m	10 / 50	10 / 50	10 / 50	10 / 50	10 / 50
Operation range	Outdoor ambient	Heat	°C	-20 ~ +35	-20 ~ +35	-20 ~ +35	-20 ~ +35	-20 ~ +35
		Cool	°C	+16 ~ +43	+16 ~ +43	+16 ~ +43	+16 ~ +43	+16 ~ +43
	Water outlet	Heat	°C	20 ~ 55	20 ~ 55	20 ~ 55	20 ~ 55	20 ~ 55
		Cool	°C	5 ~ 20	5 ~ 20	5 ~ 20	5 ~ 20	5 ~ 20

1 Scale from A+++ to D.

2 Scale from A+ to F.

3 Sound power in accordance to 811/2013, 813/2013 and EN12102-1:2017 at +7 °C.

Notes:

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All in One Compact systems | Aquarea High Performance | J Generation | Single Phase | Heating and Cooling | R32

				Single phase (Power to indoor)			
Kit				**KIT-ADC03JE5C**	**KIT-ADC05JE5C**	**KIT-ADC07JE5C**	**KIT-ADC09JE5C-1**
Heating capacity / COP (A +7 °C, W 35 °C)			kW / –	3.20 / 5.33	5.00 / 5.00	7.00 / 4.76	9.00 / 4.48
Heating capacity / COP (A +7 °C, W 55 °C)			kW / –	3.20 / 2.81	5.00 / 2.72	7.00 / 2.82	8.95 / 2.78
Heating capacity / COP (A +2 °C, W 35 °C)			kW / –	3.20 / 3.64	4.20 / 3.18	6.85 / 3.41	7.00 / 3.40
Heating capacity / COP (A +2 °C, W 55 °C)			kW / –	3.20 / 2.19	4.10 / 1.99	6.20 / 2.21	6.30 / 2.16
Heating capacity / COP (A -7 °C, W 35 °C)			kW / –	3.30 / 2.80	4.20 / 2.59	5.60 / 2.87	6.12 / 2.78
Heating capacity / COP (A -7 °C, W 55 °C)			kW / –	3.20 / 1.79	3.55 / 1.71	5.25 / 1.94	5.90 / 1.93
Cooling capacity / EER (A 35 °C, W 7 °C)			kW / –	3.20 / 3.52	4.50 / 3.00	6.70 / 3.03	8.20 / 2.72
Cooling capacity / EER (A 35 °C, W 18 °C)			kW / –	3.20 / 4.71	4.80 / 4.29	6.70 / 4.72	9.00 / 4.18
ErP data for Space Heating							
Average climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	200 / 136	200 / 136	193 / 130	193 / 130
	SCOP	W35 / W55		5.07 / 3.47	5.07 / 3.47	4.90 / 3.32	4.90 / 3.32
	Energy class [1]	W35 / W55		A+++ / A++	A+++ / A++	A+++ / A++	A+++ / A++
Warm climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	245 / 165	245 / 165	227 / 160	227 / 160
	SCOP	W35 / W55		6.20 / 4.20	6.20 / 4.20	5.75 / 4.07	5.75 / 4.07
	Energy class [1]	W35 / W55		A+++ / A+++	A+++ / A+++	A+++ / A+++	A+++ / A+++
Cold climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	157 / 110	157 / 110	164 / 116	164 / 116
	SCOP	W35 / W55		4.00 / 2.83	4.00 / 2.83	4.18 / 2.98	4.18 / 2.98
	Energy class [1]	W35 / W55		A++ / A+	A++ / A+	A++ / A+	A++ / A+
Indoor unit				**WH-ADC0309J3E5C**	**WH-ADC0309J3E5C**	**WH-ADC0309J3E5C**	**WH-ADC0309J3E5C**
Sound pressure	Heat / Cool		dB(A)	28 / 28	28 / 28	28 / 28	28 / 28
Dimension	H x W x D		mm	1,640 x 598 x 600	1,640 x 598 x 600	1,640 x 598 x 600	1,640 x 598 x 600
Net weight			kg	101	101	101	101
Water pipe connector			Inch	R 1¼	R 1¼	R 1¼	R 1¼
A class pump	Number of speeds			Variable Speed	Variable Speed	Variable Speed	Variable Speed
	Input power (Min / Max)		W	30 / 120	30 / 120	30 / 120	30 / 120
Heating water flow (ΔT=5 K. 35 °C)			l/min	9.20	14.30	20.10	25.80
Capacity of integrated electric heater			kW	3.00	3.00	3.00	3.00
Recommended fuse			A	16 / 16	16 / 16	25 / 16	25 / 16
Recommended cable size, supply 1 / 2			mm²	3 x 1.5 / 3 x 1.5	3 x 1.5 / 3 x 1.5	3 x 2.5 / 3 x 1.5	3 x 2.5 / 3 x 1.5
Water volume			l	185	185	185	185
Maximum water temperature			°C	65	65	65	65
Material inside tank				Stainless steel	Stainless steel	Stainless steel	Stainless steel
Tapping profile according EN16147				L	L	L	L
ErP data for Water Heating							
Average climate	Seasonal energy efficiency (ηw,h)		%	128	128	116	116
	SCOP			3.20	3.20	2.90	2.90
	Energy class [2]			A+	A+	A+	A+
Warm climate	Seasonal energy efficiency (ηw,h)		%	154	154	134	134
	SCOP			3.86	3.86	3.35	3.35
	Energy class [2]			A+	A+	A+	A+
Cold climate	Seasonal energy efficiency (ηw,h)		%	99	99	98	98
	SCOP			2.48	2.48	2.45	2.45
	Energy class [2]			A	A	A	A
Outdoor unit				**WH-UD03JE5**	**WH-UD05JE5**	**WH-UD07JE5**	**WH-UD09JE5-1**
Sound power [3]	Heat		dB(A)	55	55	59	59
Dimension / Net weight	H x W x D		mm / kg	622 x 824 x 298 / 37	622 x 824 x 298 / 37	795 x 875 x 320 / 61	795 x 875 x 320 / 61
Refrigerant (R32) / CO_2 Eq.			kg / T	0.9 / 0.608	0.9 / 0.608	1.27 / 0.857	1.27 / 0.857
Pipe diameter	Liquid / Gas		Inch (mm)	1/4 (6.35) / 1/2 (12.70)	1/4 (6.35) / 1/2 (12.70)	1/4 (6.35) / 5/8 (15.88)	1/4 (6.35) / 5/8 (15.88)
Pipe length range / Elevation difference (in/out)			m / m	3 ~ 25 / 20	3 ~ 25 / 20	3 ~ 50 / 30	3 ~ 50 / 30
Pipe length for additional gas / Additional gas amount			m / g/m	10 / 20	10 / 20	10 / 25	10 / 25
Operation range	Outdoor ambient	Heat	°C	-20 ~ +35	-20 ~ +35	-20 ~ +35	-20 ~ +35
		Cool	°C	+10 ~ +43	+10 ~ +43	+10 ~ +43	+10 ~ +43
	Water outlet	Heat	°C	20 ~ 60	20 ~ 60	20 ~ 60	20 ~ 60
		Cool	°C	5 ~ 20	5 ~ 20	5 ~ 20	5 ~ 20

1 Scale from A+++ to D.

2 Scale from A+ to F.

3 Sound power in accordance to 811/2013, 813/2013 and EN12102-1:2017 at +7 °C.

Notes:

EER and COP calculation is based in accordance to EN14511.

This product is designed to comply with the European Water Quality Directive 98/83/EC amended by 2015/1787/EU. The lifespan of the product is not guaranteed in the case of the use of groundwater, such as spring water or well water, the use of tap water when salt or other impurities are contained, nor in areas of acidic water quality. Maintenance and warranty costs related to these cases are the customer's responsibility.

All in One Compact systems | Aquarea High Performance | H Generation | Single Phase | Heating and Cooling | R410A

				Single phase (Power to indoor)	
Kit				**KIT-ADC12HE5C**	**KIT-ADC16HE5C**
Heating capacity / COP (A +7 °C, W 35 °C)			kW / –	12.00 / 4.74	16.00 / 4.28
Heating capacity / COP (A +7 °C, W 55 °C)			kW / –	—/—	—/—
Heating capacity / COP (A +2 °C, W 35 °C)			kW / –	11.40 / 3.44	13.00 / 3.28
Heating capacity / COP (A +2 °C, W 55 °C)			kW / –	—/—	—/—
Heating capacity / COP (A -7 °C, W 35 °C)			kW / –	—/—	—/—
Heating capacity / COP (A -7 °C, W 55 °C)			kW / –	—/—	—/—
Cooling capacity / EER (A 35 °C, W 7 °C)			kW / –	10.00 / 2.81	12.20 / 2.56
Cooling capacity / EER (A 35 °C, W 18 °C)			kW / –	—/—	—/—
ErP data for Space Heating					
Average climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	190 / 134	190 / 130
	SCOP	W35 / W55		4.82 / 3.42	4.82 / 3.33
	Energy class [1]	W35 / W55		A+++ / A++	A+++ / A++
Warm climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	245 / 159	245 / 169
	SCOP	W35 / W55		6.21 / 4.05	6.20 / 4.30
	Energy class [1]	W35 / W55		A+++ / A+++	A+++ / A+++
Cold climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	168 / 121	168 / 121
	SCOP	W35 / W55		4.29 / 3.10	4.28 / 3.10
	Energy class [1]	W35 / W55		A++ / A+	A++ / A+
Indoor unit				**WH-ADC1216H6E5C**	**WH-ADC1216H6E5C**
Sound pressure	Heat / Cool		dB(A)	33 / 33	33 / 33
Dimension	H x W x D		mm	1,640 x 598 x 600	1,640 x 598 x 600
Net weight			kg	101	101
Water pipe connector			Inch	R 1¼	R 1¼
A class pump	Number of speeds			Variable Speed	Variable Speed
	Input power (Min / Max)		W	—/—	—/—
Heating water flow (ΔT=5 K. 35 °C)			l/min	34.40	45.90
Capacity of integrated electric heater			kW	6.00	6.00
Recommended fuse			A	—/—	—/—
Recommended cable size, supply 1 / 2			mm²	—/—	—/—
Water volume			l	185	185
Maximum water temperature			°C	65	65
Material inside tank				Stainless steel	Stainless steel
Tapping profile according EN16147				—	—
ErP data for Water Heating					
Average climate	Seasonal energy efficiency (ηw,h)		%	92	88
	SCOP			2.30	2.20
	Energy class [2]			—	—
Warm climate	Seasonal energy efficiency (ηw,h)		%	107	104
	SCOP			2.67	2.59
	Energy class [2]			—	—
Cold climate	Seasonal energy efficiency (ηw,h)		%	72	70
	SCOP			1.81	1.74
	Energy class [2]			—	—
Outdoor unit				**WH-UD12HE5**	**WH-UD16HE5**
Sound power [3]	Heat		dB(A)	65	65
Dimension / Net weight	H x W x D		mm / kg	1,340 x 900 x 320 / 101	1,340 x 900 x 320 / 101
Refrigerant (R410A) / CO_2 Eq.			kg / t	2.55 / 5.324	2.55 / 5.324
Pipe diameter	Liquid / Gas		Inch (mm)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)
Pipe length range / Elevation difference (in/out)			m / m	3 ~ 50 / 30	3 ~ 50 / 30
Pipe length for additional gas / Additional gas amount			m / g/m	10 / 50	10 / 50
Operation range	Outdoor ambient	Heat	°C	-20 ~ +35	-20 ~ +35
		Cool	°C	+16 ~ +43	+16 ~ +43
	Water outlet	Heat	°C	20 ~ 55	20 ~ 55
		Cool	°C	5 ~ 20	5 ~ 20

1 Scale from A+++ to D.

2 Scale from A+ to F.

3 Sound power in accordance to 811/2013, 813/2013 and EN12102-1:2017 at +7 °C.

Notes:

EER and COP calculation is based in accordance to EN14511.

This product is designed to comply with the European Water Quality Directive 98/83/EC amended by 2015/1787/EU. The lifespan of the product is not guaranteed in the case of the use of groundwater, such as spring water or well water, the use of tap water when salt or other impurities are contained, nor in areas of acidic water quality. Maintenance and warranty costs related to these cases are the customer's responsibility.

All in One systems | Aquarea T-CAP | H Generation | Single Phase / Three Phase | Heating and Cooling | R410A

				Single phase (Power to indoor)		Three phase (Power to indoor)		
Kit				**KIT-AXC09HE5**	**KIT-AXC12HE5**	**KIT-AXC09HE8**	**KIT-AXC12HE8**	**KIT-AXC16HE8**
Heating capacity / COP (A +7 °C, W 35 °C)			kW / –	9.00 / 4.84	12.00 / 4.74	9.00 / 4.84	12.00 / 4.74	16.00 / 4.28
Heating capacity / COP (A +7 °C, W 55 °C)			kW / –	9.00 / 2.94	12.00 / 2.88	9.00 / 2.94	12.00 / 2.88	16.00 / 2.71
Heating capacity / COP (A +2 °C, W 35 °C)			kW / –	9.00 / 3.59	12.00 / 3.44	9.00 / 3.59	12.00 / 3.44	16.00 / 3.10
Heating capacity / COP (A +2 °C, W 55 °C)			kW / –	9.00 / 2.21	12.00 / 2.19	9.00 / 2.21	12.00 / 2.19	16.00 / 2.13
Heating capacity / COP (A -7 °C, W 35 °C)			kW / –	9.00 / 2.85	12.00 / 2.72	9.00 / 2.85	12.00 / 2.72	16.00 / 2.49
Heating capacity / COP (A -7 °C, W 55 °C)			kW / –	9.00 / 2.02	12.00 / 1.92	9.00 / 2.02	12.00 / 1.92	16.00 / 1.86
Cooling capacity / EER (A 35 °C, W 7 °C)			kW / –	7.00 / 3.17	10.00 / 2.81	7.00 / 3.17	10.00 / 2.81	12.20 / 2.57
Cooling capacity / EER (A 35 °C, W 18 °C)			kW / –	7.00 / 5.19	10.00 / 5.13	7.00 / 5.19	10.00 / 5.13	12.20 / 3.49
ErP data for Space Heating								
Average climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	181 / 130	170 / 130	181 / 130	170 / 130	160 / 125
	SCOP	W35 / W55		4.59 / 3.32	4.32 / 3.32	4.59 / 3.32	4.32 / 3.32	4.08 / 3.20
	Energy class [1]	W35 / W55		A+++ / A++	A++ / A++	A+++ / A++	A++ / A++	A++ / A++
Warm climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	235 / 158	231 / 158	235 / 158	231 / 158	231 / 159
	SCOP	W35 / W55		5.95 / 4.02	5.86 / 4.02	5.95 / 4.02	5.86 / 4.02	5.86 / 4.05
	Energy class [1]	W35 / W55		A+++ / A+++	A+++ / A+++	A+++ / A+++	A+++ / A+++	A+++ / A+++
Cold climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	160 / 125	160 / 125	160 / 125	160 / 125	150 / 125
	SCOP	W35 / W55		4.08 / 3.20	4.08 / 3.20	4.08 / 3.20	4.08 / 3.20	3.83 / 3.20
	Energy class [1]	W35 / W55		A++ / A++	A++ / A++	A++ / A++	A++ / A++	A++ / A++
Indoor unit				**WH-ADC1216H6E5**	**WH-ADC1216H6E5**	**WH-ADC0916H9E8**	**WH-ADC0916H9E8**	**WH-ADC0916H9E8**
Sound pressure	Heat / Cool		dB(A)	33 / 33	33 / 33	33 / 33	33 / 33	33 / 33
Dimension	H x W x D		mm	1,800 x 598 x 717	1,800 x 598 x 717	1,800 x 598 x 717	1,800 x 598 x 717	1,800 x 598 x 717
Net weight			kg	124	124	126	126	126
Water pipe connector			Inch	R1¼	R1¼	R1¼	R1¼	R1¼
A class pump	Number of speeds			Variable Speed	Variable Speed	Variable Speed	Variable Speed	Variable Speed
	Input power (Min / Max)		W	36 / 152	36 / 152	36 / 152	36 / 152	36 / 152
Heating water flow (ΔT=5 K. 35 °C)			l/min	25.8	34.4	25.8	34.4	45.9
Capacity of integrated electric heater			kW	6	6	9	9	9
Recommended fuse			A	30 / 30	30 / 30	16 / 16	16 / 16	16 / 16
Recommended cable size, supply 1 / 2			mm²	3 x 4.0 / 3 x 4.0	3 x 4.0 / 3 x 4.0	5 x 1.5 / 5 x 1.5	5 x 1.5 / 5 x 1.5	5 x 1.5 / 5 x 1.5
Water volume			l	185	185	185	185	185
Maximum water temperature			°C	65	65	65	65	65
Material inside tank				Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Tapping profile according EN16147				L	L	L	L	L
ErP data for Water Heating								
Average climate	Seasonal energy efficiency (ηw,h)		%	95	95	95	95	91 /
	SCOP			2.37	2.37	2.37	2.37	2.27
	Energy class [2]			A	A	A	A	A
Warm climate	Seasonal energy efficiency (ηw,h)		%	110	110	110	110 /	107
	SCOP			2.75	2.75	2.75	2.75	2.67
	Energy class [2]			A	A	A	A	A
Cold climate	Seasonal energy efficiency (ηw,h)		%	75	75	75	75	72
	SCOP			1.87	1.87	1.87	1.87	1.80
	Energy class [2]			A	A	A	A	B
Outdoor unit				**WH-UX09HE5**	**WH-UX12HE5**	**WH-UX09HE8**	**WH-UX12HE8**	**WH-UX16HE8**
Sound power [3]	Heat		dB(A)	66	66	65	65	67
Dimension / Net weight	H x W x D		mm / kg	1,340 x 900 x 320 / 101	1,340 x 900 x 320 / 101	1,340 x 900 x 320 / 108	1,340 x 900 x 320 / 108	1,340 x 900 x 320 / 118
Refrigerant (R410A) / CO_2 Eq.			kg / t	2.85 / 5.951	2.85 / 5.951	2.85 / 5.951	2.85 / 5.951	2.90 / 6.055
Pipe diameter	Liquid / Gas		Inch (mm)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)
Pipe length range / Elevation difference (in/out)			m / m	3 ~ 30 / 20	3 ~ 30 / 20	3 ~ 30 / 20	3 ~ 30 / 20	3 ~ 30 / 20
Pipe length for additional gas / Additional gas amount			m / g/m	10 / 50	10 / 50	10 / 50	10 / 50	10 / 50
Operation range	Outdoor ambient	Heat	°C	-28 ~ +35	-28 ~ +35	-28 ~ +35	-28 ~ +35	-28 ~ +35
		Cool	°C	+16 ~ +43	+16 ~ +43	+16 ~ +43	+16 ~ +43	+16 ~ +43
	Water outlet	Heat	°C	20 ~ 60	20 ~ 60	20 ~ 60	20 ~ 60	20 ~ 60
		Cool	°C	5 ~ 20	5 ~ 20	5 ~ 20	5 ~ 20	5 ~ 20

1 Scale from A+++ to D.

2 Scale from A+ to F.

3 Sound power in accordance to 811/2013, 813/2013 and EN12102-1:2017 at +7 °C.

Notes:

EER and COP calculation is based in accordance to EN14511.

This product is designed to comply with the European Water Quality Directive 98/83/EC amended by 2015/1787/EU. The lifespan of the product is not guaranteed in the case of the use of groundwater, such as spring water or well water, the use of tap water when salt or other impurities are contained, nor in areas of acidic water quality. Maintenance and warranty costs related to these cases are the customer's responsibility.

All in One systems | Aquarea T-CAP | H Generation | Three Phase | Super Quiet | Heating and Cooling | R410A

				Three phase (Power to indoor)		
Kit				**KIT-AQC09HE8**	**KIT-AQC12HE8**	**KIT-AQC16HE8**
Heating capacity / COP (A +7 °C, W 35 °C)			kW / –	9.00 / 4.84	12.00 / 4.74	16.00 / 4.28
Heating capacity / COP (A +7 °C, W 55 °C)			kW / –	9.00 / 2.94	12.00 / 2.88	16.00 / 2.71
Heating capacity / COP (A +2 °C, W 35 °C)			kW / –	9.00 / 3.59	12.00 / 3.44	16.00 / 3.10
Heating capacity / COP (A +2 °C, W 55 °C)			kW / –	9.00 / 2.21	12.00 / 2.19	16.00 / 2.13
Heating capacity / COP (A -7 °C, W 35 °C)			kW / –	9.00 / 2.85	12.00 / 2.72	16.00 / 2.49
Heating capacity / COP (A -7 °C, W 55 °C)			kW / –	9.00 / 2.02	12.00 / 1.92	16.00 / 1.86
Cooling capacity / EER (A 35 °C, W 7 °C)			kW / –	7.00 / 3.17	10.00 / 2.81	12.20 / 2.57
Cooling capacity / EER (A 35 °C, W 18 °C)			kW / –	7.00 / 5.19	10.00 / 5.13	12.20 / 3.49
ErP data for Space Heating						
Average climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	181 / 130	170 / 130	160 / 125
	SCOP	W35 / W55		4.59 / 3.32	4.32 / 3.32	4.08 / 3.20
	Energy class [1]	W35 / W55		A+++ / A++	A++ / A++	A++ / A++
Warm climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	235 / 158	231 / 158	231 / 159
	SCOP	W35 / W55		5.95 / 4.02	5.86 / 4.02	5.86 / 4.05
	Energy class [1]	W35 / W55		A+++ / A+++	A+++ / A+++	A+++ / A+++
Cold climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	160 / 125	160 / 125	150 / 125
	SCOP	W35 / W55		4.08 / 3.20	4.08 / 3.20	3.83 / 3.20
	Energy class [1]	W35 / W55		A++ / A++	A++ / A++	A++ / A++
Indoor unit				**WH-ADC0916H9E8**	**WH-ADC0916H9E8**	**WH-ADC0916H9E8**
Sound pressure	Heat / Cool		dB(A)	33 / 33	33 / 33	33 / 33
Dimension	H x W x D		mm	1,800 x 598 x 717	1,800 x 598 x 717	1,800 x 598 x 717
Net weight			kg	126	126	126
Water pipe connector			Inch	R 1¼	R 1¼	R 1¼
A class pump	Number of speeds			Variable Speed	Variable Speed	Variable Speed
	Input power (Min / Max)		W	36 / 152	36 / 152	36 / 152
Heating water flow (ΔT=5 K. 35 °C)			l/min	25.8	34.4	45.9
Capacity of integrated electric heater			kW	9	9	9
Recommended fuse			A	16 / 16	16 / 16	16 / 16
Recommended cable size, supply 1 / 2			mm²	5 x 1.5 / 5 x 1.5	5 x 1.5 / 5 x 1.5	5 x 1.5 / 5 x 1.5
Water volume			l	185	185	185
Maximum water temperature			°C	65	65	65
Material inside tank				Stainless steel	Stainless steel	Stainless steel
Tapping profile according EN16147				L	L	L
ErP data for Water Heating						
Average climate	Seasonal energy efficiency (ηw,h)		%	95	95	91
	SCOP			2.37	2.37	2.27
	Energy class [2]			A	A	A
Warm climate	Seasonal energy efficiency (ηw,h)		%	110	110	107
	SCOP			2.75	2.75	2.67
	Energy class [2]			A	A	A
Cold climate	Seasonal energy efficiency (ηw,h)		%	75	75	72
	SCOP			1.87	1.87	1.80
	Energy class [2]			A	A	B
Outdoor unit				**WH-UQ09HE8**	**WH-UQ12HE8**	**WH-UQ16HE8**
Sound power [3]	Heat		dB(A)	58	58	62
Dimension / Net weight	H x W x D		mm / kg	1,410 x 1,283 x 320 / 151	1,410 x 1,283 x 320 / 151	1,410 x 1,283 x 320 / 161
Refrigerant (R410A) / CO_2 Eq.			kg / t	2.85 / 5.951	2.85 / 5.951	2.99 / 6.243
Pipe diameter	Liquid / Gas		Inch (mm)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)
Pipe length range / Elevation difference (in/out)			m / m	3 ~ 30 / 20	3 ~ 30 / 20	3 ~ 30 / 20
Pipe length for additional gas / Additional gas amount			m / g/m	10 / 50	10 / 50	10 / 50
Operation range	Outdoor ambient	Heat	°C	-28 ~ +35	-28 ~ +35	-28 ~ +35
		Cool	°C	+16 ~ +43	+16 ~ +43	+16 ~ +43
	Water outlet	Heat	°C	20 ~ 60	20 ~ 60	20 ~ 60
		Cool	°C	5 ~ 20	5 ~ 20	5 ~ 20

1 Scale from A+++ to D.

2 Scale from A+ to F.

3 Sound power in accordance to 811/2013, 813/2013 and EN12102-1:2017 at +7 °C.

Notes:

EER and COP calculation is based in accordance to EN14511.

This product is designed to comply with the European Water Quality Directive 98/83/EC amended by 2015/1787/EU. The lifespan of the product is not guaranteed in the case of the use of groundwater, such as spring water or well water, the use of tap water when salt or other impurities are contained, nor in areas of acidic water quality. Maintenance and warranty costs related to these cases are the customer's responsibility.

All in One Compact systems | T-CAP | H Generation | Single Phase | Heating and Cooling | R410A

				Single phase (Power to indoor)	
Kit				**KIT-AXC09HE5C**	**KIT-AXC12HE5C**
Heating capacity / COP (A +7 °C, W 35 °C)			kW / –	9.00 / 4.84	12.00 / 4.74
Heating capacity / COP (A +7 °C, W 55 °C)			kW / –	— / —	— / —
Heating capacity / COP (A +2 °C, W 35 °C)			kW / –	9.00 / 3.59	12.00 / 3.44
Heating capacity / COP (A +2 °C, W 55 °C)			kW / –	— / —	— / —
Heating capacity / COP (A -7 °C, W 35 °C)			kW / –	— / —	— / —
Heating capacity / COP (A -7 °C, W 55 °C)			kW / –	— / —	— / —
Cooling capacity / EER (A 35 °C, W 7 °C)			kW / –	7.00 / 3.17	10.00 / 2.81
Cooling capacity / EER (A 35 °C, W 18 °C)			kW / –	— / —	— / —
ErP data for Space Heating					
Average climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	181 / 130	170 / 130
	SCOP	W35 / W55		4.59 / 3.32	4.32 / 3.32
	Energy class [1]	W35 / W55		A+++ / A++	A++ / A++
Warm climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	235 / 158	231 / 158
	SCOP	W35 / W55		5.95 / 4.02	5.86 / 4.02
	Energy class [1]	W35 / W55		A+++ / A+++	A+++ / A+++
Cold climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	160 / 125	160 / 125
	SCOP	W35 / W55		4.08 / 3.20	4.08 / 3.20
	Energy class [1]	W35 / W55		A++ / A++	A++ / A++
Indoor unit				**WH-ADC1216H6E5C**	**WH-ADC1216H6E5C**
Sound pressure	Heat / Cool		dB(A)	33 / 33	33 / 33
Dimension	H x W x D		mm	1,640 x 598 x 600	1,640 x 598 x 600
Net weight			kg	101	101
Water pipe connector			Inch	R 1¼	R 1¼
A class pump	Number of speeds			Variable Speed	Variable Speed
	Input power (Min / Max)		W	— / —	— / —
Heating water flow (ΔT=5 K. 35 °C)			l/min	25.80	34.40
Capacity of integrated electric heater			kW	6.00	6.00
Recommended fuse			A	— / —	— / —
Recommended cable size, supply 1 / 2			mm²	— / —	— / —
Water volume			l	185	185
Maximum water temperature			°C	60	60
Material inside tank				Stainless steel	Stainless steel
Tapping profile according EN16147				—	—
ErP data for Water Heating					
Average climate	Seasonal energy efficiency (ηw,h)		%	92	92
	SCOP			2.30	2.30
	Energy class [2]			—	—
Warm climate	Seasonal energy efficiency (ηw,h)		%	107	107
	SCOP			2.67	2.67
	Energy class [2]			—	—
Cold climate	Seasonal energy efficiency (ηw,h)		%	72	72
	SCOP			1.81	1.81
	Energy class [2]			—	—
Outdoor unit				**WH-UX09HE5**	**WH-UX12HE5**
Sound power [3]	Heat		dB(A)	66	66
Dimension / Net weight	H x W x D		mm / kg	1,340 x 900 x 320 / 101	1,340 x 900 x 320 / 101
Refrigerant (R410A) / CO_2 Eq.			kg / t	2.85 / 5.951	2.85 / 5.951
Pipe diameter	Liquid / Gas		Inch (mm)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)
Pipe length range / Elevation difference (in/out)			m / m	3 ~ 30 / 20	3 ~ 30 / 20
Pipe length for additional gas / Additional gas amount			m / g/m	10 / 50	10 / 50
Operation range	Outdoor ambient	Heat	°C	-28 ~ +35	-28 ~ +35
		Cool	°C	+16 ~ +43	+16 ~ +43
	Water outlet	Heat	°C	20 ~ 60	20 ~ 60
		Cool	°C	5 ~ 20	5 ~ 20

1 Scale from A+++ to D.

2 Scale from A+ to F.

3 Sound power in accordance to 811/2013, 813/2013 and EN12102-1:2017 at +7 °C.

Notes:

EER and COP calculation is based in accordance to EN14511.

This product is designed to comply with the European Water Quality Directive 98/83/EC amended by 2015/1787/EU. The lifespan of the product is not guaranteed in the case of the use of groundwater, such as spring water or well water, the use of tap water when salt or other impurities are contained, nor in areas of acidic water quality. Maintenance and warranty costs related to these cases are the customer's responsibility.

Bi-bloc systems | Aquarea High Performance | J Generation | Single Phase | Heating and Cooling | R32

				Single phase (Power to indoor)			
Kit				**KIT-WC03J3E5**	**KIT-WC05J3E5**	**KIT-WC07J3E5**	**KIT-WC09J3E5**
Heating capacity / COP (A +7 °C, W 35 °C)			kW / –	3.20 / 5.33	5.00 / 5.00	7.00 / 4.76	9.00 / 4.48
Heating capacity / COP (A +7 °C, W 55 °C)			kW / –	3.20 / 2.81	5.00 / 2.72	7.00 / 2.82	8.95 / 2.78
Heating capacity / COP (A +2 °C, W 35 °C)			kW / –	3.20 / 3.64	4.20 / 3.18	6.85 / 3.41	7.00 / 3.40
Heating capacity / COP (A +2 °C, W 55 °C)			kW / –	3.20 / 2.19	4.10 / 1.99	6.20 / 2.21	6.30 / 2.16
Heating capacity / COP (A -7 °C, W 35 °C)			kW / –	3.30 / 2.80	4.20 / 2.59	5.60 / 2.87	6.12 / 2.78
Heating capacity / COP (A -7 °C, W 55 °C)			kW / –	3.20 / 1.79	3.55 / 1.71	5.25 / 1.94	5.90 / 1.93
Cooling capacity / EER (A 35 °C, W 7 °C)			kW / –	3.20 / 3.52	4.50 / 3.00	6.70 / 3.03	8.20 / 2.72
Cooling capacity / EER (A 35 °C, W 18 °C)			kW / –	3.20 / 4.71	4.80 / 4.29	6.70 / 4.72	9.00 / 4.18
ErP data for Space Heating							
Average climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	200 / 136	200 / 136	193 / 130	193 / 130
	SCOP	W35 / W55		5.07 / 3.47	5.07 / 3.47	4.90 / 3.32	4.90 / 3.32
	Energy class [1]	W35 / W55		A+++ / A++	A+++ / A++	A+++ / A++	A+++ / A++
Warm climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	245 / 165	245 / 165	227 / 160	227 / 160
	SCOP	W35 / W55		6.20 / 4.20	6.20 / 4.20	5.75 / 4.07	5.75 / 4.07
	Energy class [1]	W35 / W55		A+++ / A+++	A+++ / A+++	A+++ / A+++	A+++ / A+++
Cold climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	157 / 110	157 / 110	164 / 116	164 / 116
	SCOP	W35 / W55		4.00 / 2.83	4.00 / 2.83	4.18 / 2.98	4.18 / 2.98
	Energy class [1]	W35 / W55		A++ / A+	A++ / A+	A++ / A+	A++ / A+
Indoor unit				**WH-SDC0305J3E5**	**WH-SDC0305J3E5**	**WH-SDC0709J3E5**	**WH-SDC0709J3E5**
Sound pressure	Heat / Cool		dB(A)	28 / 28	28 / 28	30 / 30	30 / 31
Dimension	H x W x D		mm	892 x 500 x 340	892 x 500 x 340	892 x 500 x 340	892 x 500 x 340
Net weight			kg	42	42	42	42
Water pipe connector			Inch	R 1¼	R 1¼	R 1¼	R 1¼
A class pump	Number of speeds			Variable Speed	Variable Speed	Variable Speed	Variable Speed
	Input power (Min / Max)		W	30 / 100	33 / 106	34 / 114	40 / 120
Heating water flow (ΔT=5 K. 35 °C)			l/min	9.2	14.3	20.1	25.8
Capacity of integrated electric heater			kW	3	3	3	3
Recommended fuse			A	15 / 30	15 / 30	15 / 30	15 / 30
Recommended cable size, supply 1 / 2			mm²	3 x 1.5 / 3 x 1.5	3 x 1.5 / 3 x 1.5	3 x 2.5 / 3 x 1.5	3 x 2.5 / 3 x 1.5
Outdoor unit				**WH-UD03JE5**	**WH-UD05JE5**	**WH-UD07JE5**	**WH-UD09JE5-1**
Sound power [2]	Heat		dB(A)	55	55	59	59
Dimension	H x W x D		mm	622 x 824 x 298	622 x 824 x 298	795 x 875 x 320	795 x 875 x 320
Net weight			kg	37	37	61	61
Refrigerant (R32) / CO_2 Eq.			kg / t	0.9 / 0.608	0.9 / 0.608	1.27 / 0.857	1.27 / 0.857
Pipe diameter	Liquid / Gas		Inch (mm)	1/4 (6.35) / 1/2 (12.70)	1/4 (6.35) / 1/2 (12.70)	1/4 (6.35) / 5/8 (15.88)	1/4 (6.35) / 5/8 (15.88)
Pipe length range			m	3 ~ 25	3 ~ 25	3 ~ 50	3 ~ 50
Elevation difference (in/out)			m	20	20	30	30
Pipe length for additional gas			m	10	10	10	10
Additional gas amount			g/m	20	20	25	25
Operation range	Outdoor ambient	Heat	°C	-20 ~ +35	-20 ~ +35	-20 ~ +35	-20 ~ +35
		Cool	°C	+10 ~ +43	+10 ~ +43	+10 ~ +43	+10 ~ +43
	Water outlet	Heat	°C	20 ~ 60	20 ~ 60	20 ~ 60	20 ~ 60
		Cool	°C	5 ~ 20	5 ~ 20	5 ~ 20	5 ~ 20

1 Scale from A+++ to D.

2 Sound power in accordance to 811/2013, 813/2013 and EN12102-1:2017 at +7 °C.

Note:

EER and COP calculation is based in accordance to EN14511.

Bi-bloc systems | Aquarea High Performance | H Generation | Single Phase / Three Phase | Heating and Cooling | R410A

					Single phase		Three phase (Power to indoor)		
Kit					**KIT-WC12H6E5**	**KIT-WC16H6E5**	**KIT-WC09H3E8**	**KIT-WC12H9E8**	**KIT-WC16H9E8**
Heating capacity / COP (A +7 °C, W 35 °C)				kW / –	12.00 / 4.74	16.00 / 4.28	9.00 / 4.84	12.00 / 4.74	16.00 / 4.28
Heating capacity / COP (A +7 °C, W 55 °C)				kW / –	12.00 / 2.93	14.50 / 2.72	9.00 / 2.94	12.00 / 2.93	14.50 / 2.72
Heating capacity / COP (A +2 °C, W 35 °C)				kW / –	11.40 / 3.44	13.00 / 3.28	9.00 / 3.59	11.40 / 3.44	13.00 / 3.28
Heating capacity / COP (A +2 °C, W 55 °C)				kW / –	9.10 / 2.23	9.80 / 2.21	8.80 / 2.23	9.10 / 2.23	9.80 / 2.21
Heating capacity / COP (A -7 °C, W 35 °C)				kW / –	10.00 / 2.73	11.40 / 2.57	9.00 / 2.85	10.00 / 2.73	11.40 / 2.57
Heating capacity / COP (A -7 °C, W 55 °C)				kW / –	8.20 / 1.95	9.00 / 1.85	7.90 / 2.05	8.20 / 1.95	9.00 / 1.85
Cooling capacity / EER (A 35 °C, W 7 °C)				kW / –	10.00 / 2.81	12.20 / 2.56	7.00 / 3.17	10.00 / 2.85	12.20 / 2.56
Cooling capacity / EER (A 35 °C, W 18 °C)				kW / –	10.00 / 4.17	12.20 / 4.12	7.00 / 4.67	10.00 / 4.26	12.20 / 4.12
ErP data for Space Heating									
Average climate	Seasonal energy efficiency (ηs,h)	W35 / W55		%	190 / 134	190 / 130	190 / 133	190 / 134	190 / 130
	SCOP	W35 / W55			4.82 / 3.42	4.82 / 3.33	4.81 / 3.41	4.82 / 3.42	4.82 / 3.33
	Energy class [1]	W35 / W55			A+++ / A++	A+++ / A++	A+++ / A++	A+++ / A++	A+++ / A++
Warm climate	Seasonal energy efficiency (ηs,h)	W35 / W55		%	245 / 159	245 / 169	245 / 159	245 / 159	245 / 169
	SCOP	W35 / W55			6.21 / 4.05	6.21 / 4.30	6.21 / 4.05	6.21 / 4.05	6.20 / 4.30
	Energy class [1]	W35 / W55			A+++ / A+++	A+++ / A+++	A+++ / A+++	A+++ / A+++	A+++ / A+++
Cold climate	Seasonal energy efficiency (ηs,h)	W35 / W55		%	168 / 121	168 / 121	168 / 121	168 / 121	168 / 121
	SCOP	W35 / W55			4.29 / 3.10	4.28 / 3.10	4.28 / 3.10	4.29 / 3.10	4.28 / 3.10
	Energy class [1]	W35 / W55			A++ / A+	A++ / A+	A++ / A+	A++ / A+	A++ / A+
Indoor unit					**WH-SDC12H6E5**	**WH-SDC16H6E5**	**WH-SDC09H3E8**	**WH-SDC12H9E8**	**WH-SDC16H9E8**
Sound pressure	Heat / Cool			dB(A)	33 / 33	33 / 33	33 / 33	33 / 33	33 / 33
Dimension	H x W x D			mm	892 x 500 x 340	892 x 500 x 340	892 x 500 x 340	892 x 500 x 340	892 x 500 x 340
Net weight				kg	43	44	43	44	45
Water pipe connector				Inch	R1¼	R1¼	R1¼	R1¼	R1¼
A class pump	Number of speeds				Variable Speed	Variable Speed	Variable Speed	Variable Speed	Variable Speed
	Input power (Min / Max)			W	34 / 110	30 / 105	32 / 102	34 / 110	30 / 105
Heating water flow (ΔT=5 K. 35 °C)				l/min	34.4	45.9	25.8	34.4	45.9
Capacity of integrated electric heater				kW	6	6	3	9	9
Recommended fuse				A	30 / 30	30 / 30	15 / 30	15 / 30	15 / 30
Recommended cable size, supply 1 / 2				mm²	3 x 4.0 or 6.0 / 3 x 4.0	3 x 4.0 or 6.0 / 3 x 4.0	5 x 1.5 / 5 x 1.5	5 x 1.5 / 5 x 1.5	5 x 1.5 / 5 x 1.5
Outdoor unit					**WH-UD12HE5**	**WH-UD16HE5**	**WH-UD09HE8**	**WH-UD12HE8**	**WH-UD16HE8**
Sound power [2]	Heat			dB(A)	65	65	65	65	65
Dimension	H x W x D			mm	1,340 x 900 x 320	1,340 x 900 x 320	1,340 x 900 x 320	1,340 x 900 x 320	1,340 x 900 x 320
Net weight				kg	101	101	107	107	107
Refrigerant (R410A) / CO_2 Eq.				kg / t	2.55 / 5.324	2.55 / 5.324	2.55 / 5.324	2.55 / 5.324	2.55 / 5.324
Pipe diameter	Liquid / Gas			Inch (mm)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)
Pipe length range				m	3 ~ 50	3 ~ 50	3 ~ 30	3 ~ 30	3 ~ 30
Elevation difference (in/out)				m	30	30	20	20	20
Pipe length for additional gas				m	10	10	10	10	10
Additional gas amount				g/m	50	50	50	50	50
Operation range	Outdoor ambient		Heat	°C	-20 ~ +35	-20 ~ +35	-20 ~ +35	-20 ~ +35	-20 ~ +35
			Cool	°C	+16 ~ +43	+16 ~ +43	+16 ~ +43	+16 ~ +43	+16 ~ +43
	Water outlet		Heat	°C	20 ~ 55	20 ~ 55	20 ~ 55	20 ~ 55	20 ~ 55
			Cool	°C	5 ~ 20	5 ~ 20	5 ~ 20	5 ~ 20	5 ~ 20

1 Scale from A+++ to D.

2 Sound power in accordance to 811/2013, 813/2013 and EN12102-1:2017 at +7 °C.

Note:

EER and COP calculation is based in accordance to EN14511.

Bi-bloc systems | T-CAP | H Generation | Single Phase / Three Phase | Heating and Cooling | R410A

				Single phase (Power to indoor)		Three phase (Power to indoor)		
Kit				**KIT-WXC09H3E5**	**KIT-WXC12H6E5**	**KIT-WXC09H3E8**	**KIT-WXC12H9E8**	**KIT-WXC16H9E8**
Heating capacity / COP (A +7 °C, W 35 °C)			kW / –	9.00 / 4.84	12.00 / 4.74	9.00 / 4.84	12.00 / 4.74	16.00 / 4.28
Heating capacity / COP (A +7 °C, W 55 °C)			kW / –	9.00 / 2.94	12.00 / 2.88	9.00 / 2.94	12.00 / 2.88	16.00 / 2.71
Heating capacity / COP (A +2 °C, W 35 °C)			kW / –	9.00 / 3.59	12.00 / 3.44	9.00 / 3.59	12.00 / 3.44	16.00 / 3.10
Heating capacity / COP (A +2 °C, W 55 °C)			kW / –	9.00 / 2.21	12.00 / 2.19	9.00 / 2.21	12.00 / 2.19	16.00 / 2.13
Heating capacity / COP (A -7 °C, W 35 °C)			kW / –	9.00 / 2.85	12.00 / 2.72	9.00 / 2.85	12.00 / 2.72	16.00 / 2.49
Heating capacity / COP (A -7 °C, W 55 °C)			kW / –	9.00 / 2.02	12.00 / 1.92	9.00 / 2.02	12.00 / 1.92	16.00 / 1.86
Cooling capacity / EER (A 35 °C, W 7 °C)			kW / –	7.00 / 3.17	10.00 / 2.81	7.00 / 3.17	10.00 / 2.81	12.20 / 2.57
Cooling capacity / EER (A 35 °C, W 18 °C)			kW / –	7.00 / 5.19	10.00 / 5.13	7.00 / 5.19	10.00 / 5.13	12.20 / 3.49
ErP data for Space Heating								
Average climate	Seasonal energy efficiency ($\eta_{s,h}$)	W35 / W55	%	181 / 130	170 / 130	181 / 130	170 / 130	160 / 125
	SCOP	W35 / W55		4.59 / 3.32	4.32 / 3.32	4.59 / 3.32	4.32 / 3.32	4.08 / 3.20
	Energy class [1]	W35 / W55		A+++ / A++	A++ / A++	A+++ / A++	A++ / A++	A++ / A++
Warm climate	Seasonal energy efficiency ($\eta_{s,h}$)	W35 / W55	%	235 / 158	231 / 158	235 / 158	231 / 158	231 / 159
	SCOP	W35 / W55		5.95 / 4.02	5.86 / 4.02	5.95 / 4.02	5.86 / 4.02	5.86 / 4.05
	Energy class [1]	W35 / W55		A+++ / A+++	A+++ / A+++	A+++ / A+++	A+++ / A+++	A+++ / A+++
Cold climate	Seasonal energy efficiency ($\eta_{s,h}$)	W35 / W55	%	160 / 125	160 / 125	160 / 125	160 / 125	150 / 125
	SCOP	W35 / W55		4.08 / 3.20	4.08 / 3.20	4.08 / 3.20	4.08 / 3.20	3.83 / 3.20
	Energy class [1]	W35 / W55		A++ / A++	A++ / A++	A++ / A++	A++ / A++	A++ / A++
Indoor unit				**WH-SXC09H3E5**	**WH-SXC12H6E5**	**WH-SXC09H3E8**	**WH-SXC12H9E8**	**WH-SXC16H9E8**
Sound pressure	Heat / Cool		dB(A)	33 / 33	33 / 33	33 / 33	33 / 33	33 / 33
Dimension	H x W x D		mm	892 x 500 x 340	892 x 500 x 340	892 x 500 x 340	892 x 500 x 340	892 x 500 x 340
Net weight			kg	43	43	43	44	45
Water pipe connector			Inch	R 1¼	R 1¼	R 1¼	R 1¼	R 1¼
A class pump	Number of speeds			Variable Speed	Variable Speed	Variable Speed	Variable Speed	Variable Speed
	Input power (Min / Max)		W	32 / 102	34 / 110	32 / 102	34 / 110	30 / 105
Heating water flow (ΔT=5 K. 35 °C)			l/min	25.8	34.4	25.8	34.4	45.9
Capacity of integrated electric heater			kW	3	6	3	9	9
Recommended fuse			A	30 / 30	30 / 30	16 / 16	16 / 16	16 / 16
Recommended cable size, supply 1 / 2			mm²	3 x 4.0 or 6.0 / 3 x 4.0	3 x 4.0 or 6.0 / 3 x 4.0	5 x 1.5 / 3 x 1.5	5 x 1.5 / 5 x 1.5	5 x 1.5 / 5 x 1.5
Outdoor unit				**WH-UX09HE5**	**WH-UX12HE5**	**WH-UX09HE8**	**WH-UX12HE8**	**WH-UX16HE8**
Sound power [2]	Heat		dB(A)	66	66	65	65	67
Dimension	H x W x D		mm	1,340 x 900 x 320	1,340 x 900 x 320	1,340 x 900 x 320	1,340 x 900 x 320	1,340 x 900 x 320
Net weight			kg	101	101	108	108	118
Refrigerant (R410A) / CO_2 Eq.			kg / t	2.85 / 5.951	2.85 / 5.951	2.85 / 5.951	2.85 / 5.951	2.90 / 6.055
Pipe diameter	Liquid / Gas		Inch (mm)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)
Pipe length range			m	3 ~ 30	3 ~ 30	3 ~ 30	3 ~ 30	3 ~ 30
Elevation difference (in/out)			m	20	20	20	20	20
Pipe length for additional gas			m	10	10	10	10	10
Additional gas amount			g/m	50	50	50	50	50
Operation range	Outdoor ambient	Heat	°C	-28 ~ +35	-28 ~ +35	-28 ~ +35	-28 ~ +35	-28 ~ +35
		Cool	°C	+16 ~ +43	+16 ~ +43	+16 ~ +43	+16 ~ +43	+16 ~ +43
	Water outlet	Heat	°C	20 ~ 60	20 ~ 60	20 ~ 60	20 ~ 60	20 ~ 60
		Cool	°C	5 ~ 20	5 ~ 20	5 ~ 20	5 ~ 20	5 ~ 20

1 Scale from A+++ to D.

2 Sound power in accordance to 811/2013, 813/2013 and EN12102-1:2017 at +7 °C.

Note:

EER and COP calculation is based in accordance to EN14511.

Bi-bloc systems | Aquarea T-CAP | H Generation | Three Phase | Super Quiet | Heating and Cooling | R410A

				Three phase (Power to indoor)		
Kit				**KIT-WQC09H3E8**	**KIT-WQC12H9E8**	**KIT-WQC16H9E8**
Heating capacity / COP (A +7 °C, W 35 °C)			kW / –	9.00 / 4.84	12.00 / 4.74	16.00 / 4.28
Heating capacity / COP (A +7 °C, W 55 °C)			kW / –	9.00 / 2.94	12.00 / 2.88	16.00 / 2.71
Heating capacity / COP (A +2 °C, W 35 °C)			kW / –	9.00 / 3.59	12.00 / 3.44	16.00 / 3.10
Heating capacity / COP (A +2 °C, W 55 °C)			kW / –	9.00 / 2.21	12.00 / 2.19	16.00 / 2.13
Heating capacity / COP (A -7 °C, W 35 °C)			kW / –	9.00 / 2.85	12.00 / 2.72	16.00 / 2.49
Heating capacity / COP (A -7 °C, W 55 °C)			kW / –	9.00 / 2.02	12.00 / 1.92	16.00 / 1.86
Cooling capacity / EER (A 35 °C, W 7 °C)			kW / –	7.00 / 3.17	10.00 / 2.81	12.20 / 2.57
Cooling capacity / EER (A 35 °C, W 18 °C)			kW / –	7.00 / 5.19	10.00 / 5.13	12.20 / 3.49
ErP data for Space Heating						
Average climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	181 / 130	170 / 130	160 / 125
	SCOP	W35 / W55		4.59 / 3.32	4.32 / 3.32	4.08 / 3.20
	Energy class [1]	W35 / W55		A+++ / A++	A++ / A++	A++ / A++
Warm climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	235 / 158	231 / 158	231 / 159
	SCOP	W35 / W55		5.95 / 4.02	5.86 / 4.02	5.86 / 4.05
	Energy class [1]	W35 / W55		A+++ / A+++	A+++ / A+++	A+++ / A+++
Cold climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	160 / 125	160 / 125	150 / 125
	SCOP	W35 / W55		4.08 / 3.20	4.08 / 3.20	3.83 / 3.20
	Energy class [1]	W35 / W55		A++ / A++	A++ / A++	A++ / A++
Indoor unit				**WH-SQC09H3E8**	**WH-SQC12H9E8**	**WH-SQC16H9E8**
Sound pressure	Heat / Cool		dB(A)	33 / 33	33 / 33	33 / 33
Dimension	H x W x D		mm	892 x 500 x 340	892 x 500 x 340	892 x 500 x 340
Net weight			kg	43	44	45
Water pipe connector			Inch	R 1¼	R 1¼	R 1¼
A class pump	Number of speeds			Variable Speed	Variable Speed	Variable Speed
	Input power (Min / Max)		W	32 / 102	34 / 110	30 / 105
Heating water flow (ΔT=5 K. 35 °C)			l/min	25.8	34.4	45.9
Capacity of integrated electric heater			kW	3	9	9
Recommended fuse			A	15 / 30	15 / 30	15 / 30
Recommended cable size, supply 1 / 2			mm²	5 x 1.5 / 3 x 1.5	5 x 1.5 / 5 x 1.5	5 x 1.5 / 5 x 1.5
Outdoor unit				**WH-UQ09HE8**	**WH-UQ12HE8**	**WH-UQ16HE8**
Sound power [2]	Heat		dB(A)	58	58	62
Dimension	H x W x D		mm	1,410 x 1,283 x 320	1,410 x 1,283 x 320	1,410 x 1,283 x 320
Net weight			kg	151	151	161
Refrigerant (R410A) / CO_2 Eq.			kg / t	2.85 / 5.951	2.85 / 5.951	2.99 / 6.243
Pipe diameter	Liquid / Gas		Inch (mm)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)	3/8 (9.52) / 5/8 (15.88)
Pipe length range			m	3 ~ 30	3 ~ 30	3 ~ 30
Elevation difference (in/out)			m	20	20	20
Pipe length for additional gas			m	10	10	10
Additional gas amount			g/m	50	50	50
Operation range	Outdoor ambient	Heat	°C	-28 ~ +35	-28 ~ +35	-28 ~ +35
		Cool	°C	+16 ~ +43	+16 ~ +43	+16 ~ +43
	Water outlet	Heat	°C	20 ~ 60	20 ~ 60	20 ~ 60
		Cool	°C	5 ~ 20	5 ~ 20	5 ~ 20

1 Scale from A+++ to D.

2 Sound power in accordance to 811/2013, 813/2013 and EN12102-1:2017 at +7 °C.

Note:

EER and COP calculation is based in accordance to EN14511.

Bi-bloc systems | Aquarea HT | F Generation | Single Phase / Three Phase | Heating Only | R407C

				Single phase (Power to indoor)		Three phase (Power to indoor)	
Kit				**KIT-WHF09F3E5**	**KIT-WHF12F6E5**	**KIT-WHF09F3E8**	**KIT-WHF12F9E8**
Heating capacity / COP (A +7 °C, W 35 °C)			kW / COP	9,00 / 4,64	12,00 / 4,46	9,00 / 4,64	12,00 / 4,46
Heating capacity / COP (A +7 °C, W 65 °C)			kW / COP	9,00 / 2,48	12,00 / 2,41	9,00 / 2,48	12,00 / 2,41
Heating capacity / COP (A +2 °C, W 35 °C)			kW / COP	9,00 / 3,45	12,00 / 3,26	9,00 / 3,45	12,00 / 3,26
Heating capacity / COP (A +2 °C, W 65 °C)			kW / COP	9,00 / 2,06	10,30 / 2,01	9,00 / 2,06	10,30 / 2,01
Heating capacity / COP (A -7 °C, W 35 °C)			kW / COP	9,00 / 2,74	12,00 / 2,52	9,00 / 2,74	12,00 / 2,52
Heating capacity / COP (A -7 °C, W 65 °C)			kW / COP	9,00 / 1,79	9,60 / 1,77	9,00 / 1,79	9,60 / 1,77
ErP data for Space Heating							
Average climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	153 / 125	150 / 125	153 / 125	150 / 125
	SCOP	W35 / W55		3,90 / 3,20	3,82 / 3,21	3,90 / 3,20	3,82 / 3,21
	Energy class [1]	W35 / W55		A++ / A++	A++ / A++	A++ / A++	A++ / A++
Warm climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	191 / 156	188 / 156	191 / 156	188 / 156
	SCOP	W35 / W55		4,84 / 3,97	4,77 / 3,97	4,84 / 3,97	4,77 / 3,97
	Energy class [1]	W35 / W55		A+++ / A+++	A+++ / A+++	A+++ / A+++	A+++ / A+++
Cold climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	137 / 116	134 / 113	137 / 116	134 / 113
	SCOP	W35 / W55		3,50 / 2,97	3,42 / 2,90	3,50 / 2,97	3,42 / 2,90
	Energy class [1]	W35 / W55		A+ / A+	A+ / A+	A+ / A+	A+ / A+
Indoor unit				**WH-SHF09F3E5**	**WH-SHF12F6E5**	**WH-SHF09F3E8**	**WH-SHF12F9E8**
Sound pressure			dB(A)	33	33	33	33
Dimension	H x W x D		mm	892 x 502 x 353	892 x 502 x 353	892 x 502 x 353	892 x 502 x 353
Net weight			kg	46	47	47	48
Water pipe connector			Inch	R 1¼	R 1¼	R 1¼	R 1¼
A class pump	Number of speeds			7	7	7	7
	Input power (Min / Max)		W	38 / 100	40 / 106	38 / 100	40 / 106
Heating water flow (ΔT=5 K. 35 °C)			L/min	25,8	34,4	25,8	34,4
Capacity of integrated electric heater			kW	3	6	3	9
Recommended fuse			A	30 / 30	30 / 30	30 / 16	30 / 16
Recommended cable size, supply 1 / 2			mm²	3 x 4,0 or 6,0 / 3 x 4,0	3 x 4,0 or 6,0 / 3 x 4,0	5 x 1,5 / 3 x 1,5	5 x 1,5 / 5 x 1,5
Outdoor unit				**WH-UH09FE5**	**WH-UH12FE5**	**WH-UH09FE8**	**WH-UH12FE8**
Sound power [1)]			dB(A)	—	—	—	—
Dimension	H x W x D		mm	1340 x 900 x 320	1340 x 900 x 320	1340 x 900 x 320	1340 x 900 x 320
Net weight			kg	104	104	110	110
Refrigerant (R407C) / CO_2 Eq.			kg / T	2,90 / 5,145	2,90 / 5,145	2,90 / 5,145	2,90 / 5,145
Pipe diameter	Liquid / Gas		Inch (mm)	3/8 (9,52) / 5/8 (15,88)	3/8 (9,52) / 5/8 (15,88)	3/8 (9,52) / 5/8 (15,88)	3/8 (9,52) / 5/8 (15,88)
Pipe length range			m	3 ~ 30	3 ~ 30	3 ~ 30	3 ~ 30
Elevation difference (in/out)			m	20	20	20	20
Pipe length for additional gas			m	10	10	10	10
Additional gas amount			g/m	70	70	70	70
Operation range	Outdoor ambient	Heat	°C	-20 ~ +35	-20 ~ +35	-20 ~ +35	-20 ~ +35
	Water outlet	Heat	°C	25 ~ 65	25 ~ 65	25 ~ 65	25 ~ 65

1 Scale from A+++ to D.

2 Sound power in accordance to 811/2013, 813/2013 and EN12102-1:2017 at +7 °C.

Note:

EER and COP calculation is based in accordance to EN14511.

4.6.3 Mono-bloc system

The mono-bloc system consists of one single unit that is installed outdoors and can be connected directly to the heating circuit. The operation is effected via wired remote controller inside the building.

ATTENTION

Danger of water pipes freezing in ambient temperatures below 0 °C

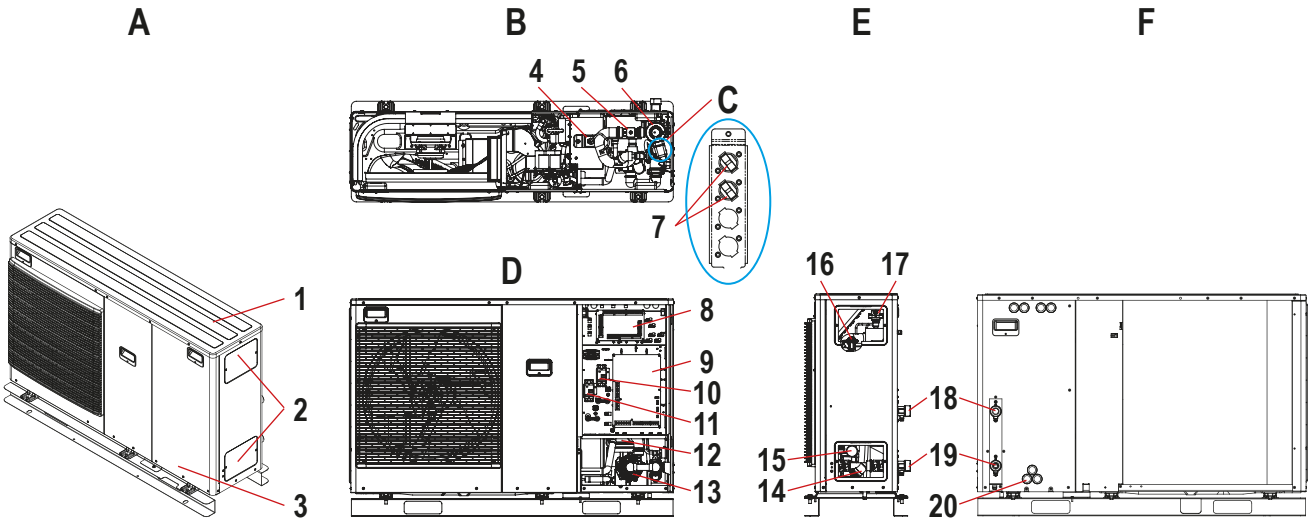
When the heating circuit is filled with water and the outside temperature falls below 0 °C, the water pipes of the mono-bloc system are at risk of freezing up. This can damage the mono-bloc unit.

The client should therefore ensure the absence of frost by taking one of the following measures:

- ► Operate the heating circuit using a food-safe antifreeze mixture (propylene glycol).
- ► Equip the mono-bloc unit with an optional base pan heater, to prevent the heating circuit from freezing up.
- ► Drain the heating circuit by using a field-supplied draining device (manually or automatically) before freezing starts.

4.6.3.1 Components

Mono-bloc unit | High Performance | J generation | 5 to 9 kW
WH-MDCJ3E5**



A Exterior view
1 Top panel
2 Valve covers
3 Front panel

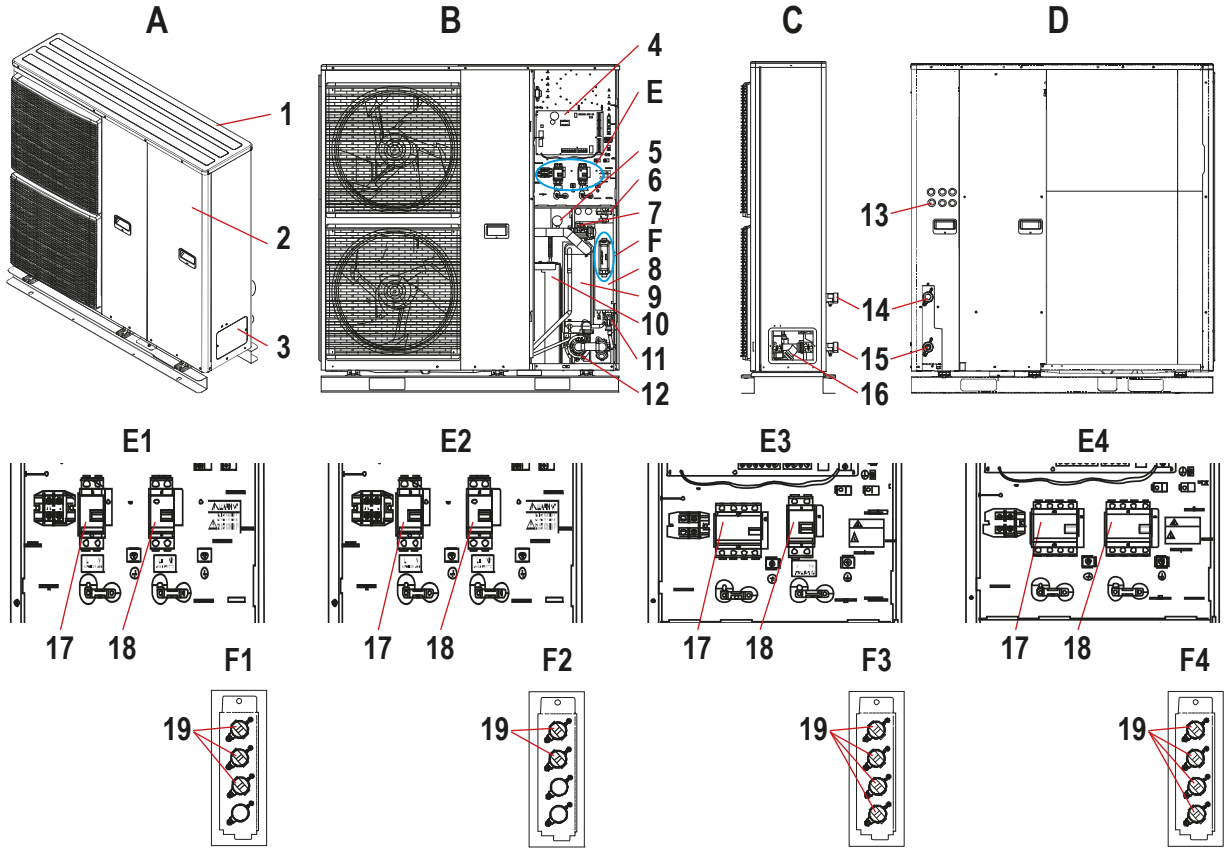
B Top view (with opened top panel)
4 Expansion vessel (6 litres)
5 Water flow sensor
6 Backup heater

C Detailed view of overload protectors
7 Overload protector (x 2)

D Front view (with opened front panel)
8 Optional PCB
9 Main PCB
10 RCCB (for power supply)
11 RCCB (for backup heater)
12 Heat exchanger
13 Water circulation pump

E Side view
F Rear view
14 Magnetic water filter set* (strainer with 2 stop valves)
15 Water pressure gauge (only visible without cover)
16 Pressure relief valve (only visible without cover)
17 Air purge valve (only visible without cover)
18 Supply water outlet (to space heating)
19 Return water inlet (from space heating)
20 Cable gland (x 3)

Mono-bloc unit | High Performance | H generation | 9 and 12 kW (WH-MDCH6E5)**
Mono-bloc unit | T-CAP | J generation | 9 to 16 kW (WH-MXCJ3E5, WH-MXC**J*E8)**
Mono-bloc unit | T-CAP | H generation | 9 to 16 kW (WH-MXCH3E5, WH-MXC**H*E8)**
Mono-bloc unit | HT | G generation | 9 and 12 kW (WH-MHFG*E5)**



A Exterior view
1 Top panel
2 Front panel
3 Valve cover

B Front view (with opened front panel)
4 Main PCB
5 Water pressure gauge
6 Air purge valve
7 Water flow sensor
8 Backup heater
9 Heat exchanger
10 Expansion vessel (10 litres; not visible)
11 Pressure relief valve
12 Water circulation pump

C Side elevation
D Rear view
13 Cable glands (x 6)
14 Supply water outlet (to space heating/cooling a)
15 Return water inlet (from space heating/cooling a)
16 Water filter set (strainer with 2 stop valves)

E Detail view (model-specific b)
17 RCCB (for power supply)
18 RCCB (for backup heater)

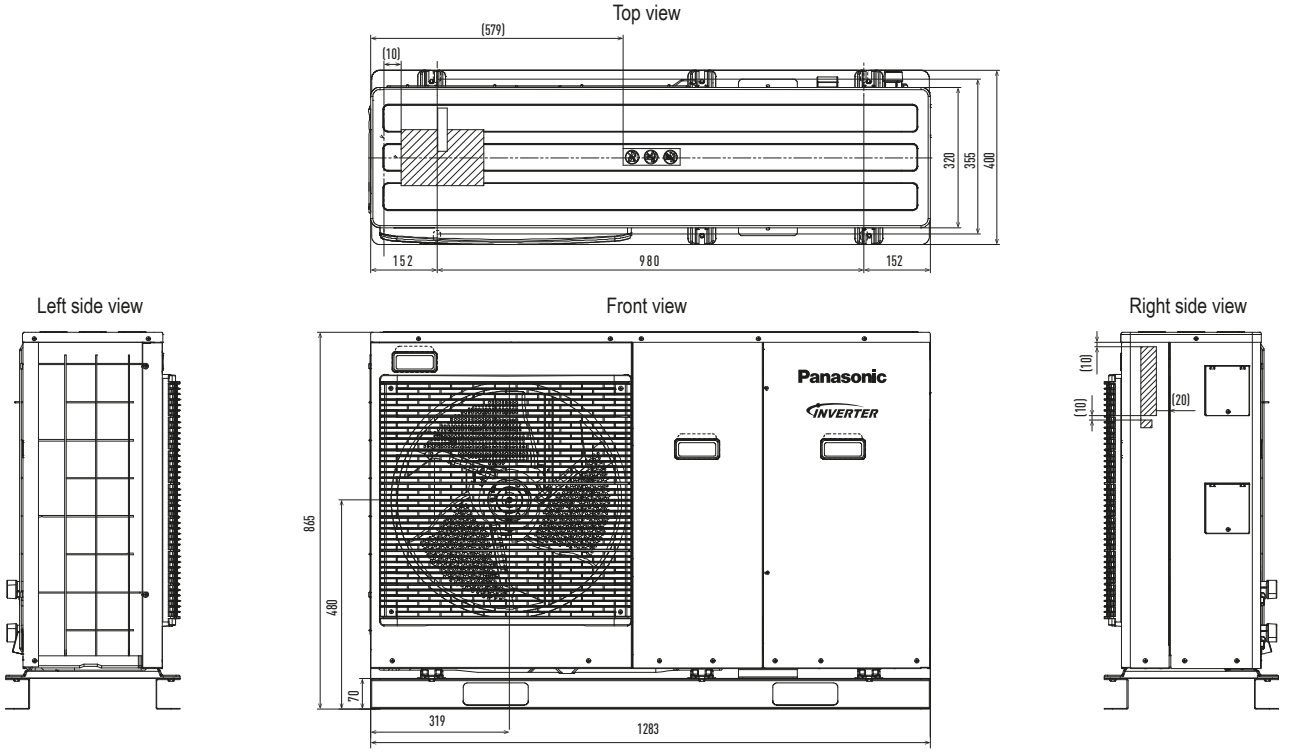
F Detail view (model-specific b)
19 Overload protection

a Cooling not available for HT models
b E1/F1: WH-MDC12H6E5, WH-MDC16H6E5, WH-MXC12J6E5, WH-MXC12H6E5, WH-MHF12G6E5
E2/F2: WH-MXC09J3E5, WH-MXC09H3E5, WH-MHF09G3E5
E3/F3: WH-MXC09J3E8, WH-MXC09H3E8
E4/F4: WH-MXC12J9E8, WH-MXC16J9E8, WH-MXC12H9E8, WH-MXC16H9E8

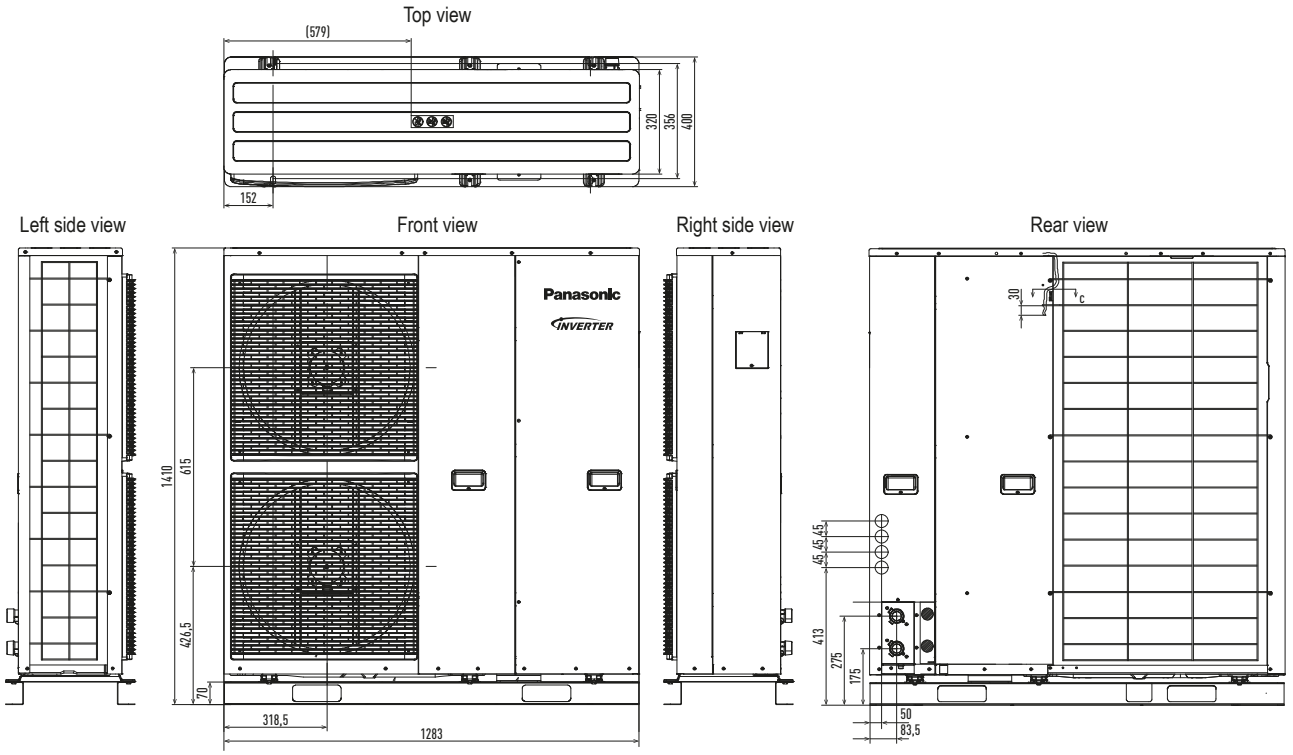
4.6.3.2 Dimensions

Note
All dimensions are indicated in millimetres (mm); the figures are, however, not to scale.

Aquarea High Performance mono-bloc unit | J generation | 5 to 9 kW
WH-MDCJ3E5**



Aquarea High Performance, T-CAP and HT mono-bloc unit | 9 to 16 kW
WH-MDCH6E5**
WH-MXCJ3E5, WH-MXC**J*E8, WH-MXC**H3E5, WH-MXC**H*E8**
WH-MHFG*E5**



4.6.3.3 Technical Data

Mono-bloc systems | Aquarea High Performance | J Generation | Single Phase | Heating and Cooling | R32

				Single phase		
Outdoor unit				**WH-MDC05J3E5**	**WH-MDC07J3E5**	**WH-MDC09J3E5**
Heating capacity / COP (A +7 °C, W 35 °C)			kW / –	5.00 / 5.08	7.00 / 4.76	9.00 / 4.48
Heating capacity / COP (A +7 °C, W 55 °C)			kW / –	5.00 / 3.01	7.00 / 2.82	8.95 / 2.78
Heating capacity / COP (A +2 °C, W 35 °C)			kW / –	5.00 / 3.57	7.00 / 3.40	7.45 / 3.13
Heating capacity / COP (A +2 °C, W 55 °C)			kW / –	5.00 / 2.27	6.30 / 2.16	7.00 / 2.12
Heating capacity / COP (A -7 °C, W 35 °C)			kW / –	5.00 / 2.78	6.80 / 2.81	7.50 / 2.63
Heating capacity / COP (A -7 °C, W 55 °C)			kW / –	5.00 / 1.85	6.30 / 1.86	7.00 / 1.80
Cooling capacity / EER (A 35 °C, W 7 °C)			kW / –	5.00 / 3.31	7.00 / 3.06	9.00 / 2.71
Cooling capacity / EER (A 35 °C, W 18 °C)			kW / –	5.00 / 5.05	7.00 / 4.73	9.00 / 4.25
ErP data for Space Heating						
Average climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	202 / 142	193 / 130	193 / 130
	SCOP	W35 / W55		5.12 / 3.63	4.90 / 3.32	4.90 / 3.32
	Energy class [1]	W35 / W55		A+++ / A++	A+++ / A++	A+++ / A++
Warm climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	237 / 165	227 / 160	227 / 160
	SCOP	W35 / W55		6.00 / 4.20	5.75 / 4.07	5.75 / 4.07
	Energy class [1]	W35 / W55		A+++ / A+++	A+++ / A+++	A+++ / A+++
Cold climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	160 / 115	164 / 116	164 / 116
	SCOP	W35 / W55		4.08 / 2.95	4.18 / 2.98	4.18 / 2.98
	Energy class [1]	W35 / W55		A++ / A+	A++ / A+	A++ / A+
Sound power [2]	Heat		dB(A)	59	59	59
Dimension	H x W x D		mm	865 x 1,283 x 320	865 x 1,283 x 320	865 x 1,283 x 320
Net weight			kg	99	104	104
Refrigerant (R32) / CO_2 Eq. [3]			kg / t	1.3 / 0.878	1.3 / 0.878	1.3 / 0.878
Water pipe connector			Inch	R 1¼	R 1¼	R 1¼
Pump	Number of speeds			Variable Speed	Variable Speed	Variable Speed
	Input power (Min / Max)		W	34 / 96	36 / 100	39 / 108
Heating water flow (ΔT=5 K. 35 °C)			l/min	14.3	20.1	25.8
Capacity of integrated electric heater			kW	3	3	3
Input power	Heat		kW	0.985	1.47	2.01
	Cool		kW	1.51	2.29	3.32
Running and starting current	Heat		A	4.7	7.0	9.3
	Cool		A	7.0	10.5	14.7
Current 1			A	12	17	17
Current 2			A	13	13	13
Recommended fuse			A	30 / 15	30 / 15	30 / 16
Recommended cable size, supply 1 / 2			mm²	3 x 1.5 / 3 x 1.5	3 x 2.5 / 3 x 1.5	3 x 2.5 / 3 x 1.5
Operation range	Outdoor ambient	Heat	°C	-20 ~ 35	-20 ~ 35	-20 ~ 35
		Cool	°C	+10 ~ +43	+10 ~ +43	+10 ~ +43
	Water outlet	Heat	°C	20 ~ 60	20 ~ 60	20 ~ 60
		Cool	°C	5 ~ 20	5 ~ 20	5 ~ 20

1 Scale from A+++ to D.

2 Sound power in accordance to 811/2013, 813/2013 and EN12102-1:2017 at +7 °C.

3 WH-MDC models are hermetically sealed.

Note:

EER and COP calculation is based in accordance to EN14511.

Mono-bloc systems | Aquarea High Performance | H Generation | Single Phase | Heating and Cooling | R410A

				Single phase	
Outdoor unit				**WH-MDC12H6E5**	**WH-MDC16H6E5**
Heating capacity / COP (A +7 °C, W 35 °C)			kW / –	12.00 / 4.74	16.00 / 4.28
Heating capacity / COP (A +7 °C, W 55 °C)			kW / –	12.00 / 2.93	14.50 / 2.72
Heating capacity / COP (A +2 °C, W 35 °C)			kW / –	11.40 / 3.44	13.00 / 3.28
Heating capacity / COP (A +2 °C, W 55 °C)			kW / –	9.10 / 2.23	9.80 / 2.21
Heating capacity / COP (A -7 °C, W 35 °C)			kW / –	10.00 / 2.73	11.40 / 2.57
Heating capacity / COP (A -7 °C, W 55 °C)			kW / –	8.20 / 1.95	9.00 / 1.84
Cooling capacity / EER (A 35 °C, W 7 °C)			kW / –	10.00 / 2.81	12.20 / 2.56
Cooling capacity / EER (A 35 °C, W 18 °C)			kW / –	10.00 / 4.65	12.20 / 4.12
ErP data for Space Heating					
Average climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	190 / 134	190 / 130
	SCOP	W35 / W55		4.83 / 3.43	4.83 / 3.33
	Energy class [1]	W35 / W55		A+++ / A++	A+++ / A++
Warm climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	245 / 159	245 / 169
	SCOP	W35 / W55		6.20 / 4.05	6.20 / 4.30
	Energy class [1]	W35 / W55		A+++ / A+++	A+++ / A+++
Cold climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	168 / 121	168 / 121
	SCOP	W35 / W55		4.28 / 3.10	4.28 / 3.10
	Energy class [1]	W35 / W55		A++ / A+	A++ / A+
Sound power [2]	Heat		dB(A)	65	65
Dimension	H x W x D		mm	1,410 x 1,283 x 320	1,410 x 1,283 x 320
Net weight			kg	140	140
Refrigerant (R410A) / CO_2 Eq. [3]			kg / t	2.10 / 4.385	2.10 / 4.385
Water pipe connector			Inch	R 1¼	R 1¼
Pump	Number of speeds			Variable Speed	Variable Speed
	Input power (Min / Max)		W	34 / 110	38 / 120
Heating water flow (ΔT=5 K. 35 °C)			l/min	34.4	45.9
Capacity of integrated electric heater			kW	6	6
Input Power	Heat		kW	2.53	3.74
	Cool		kW	3.56	4.76
Running and Starting current	Heat		A	11.7	16.9
	Cool		A	16.2	21.5
Current 1			A	24.0	26.0
Current 2			A	26.0	26.0
Recommended fuse			A	30 / 30	30 / 30
Recommended cable size, supply 1 / 2			mm²	3 x 4.0 or 6.0 / 3 x 4.0	3 x 4.0 or 6.0 / 3 x 4.0
Operation range	Outdoor ambient	Heat	°C	-20 ~ +35	-20 ~ +35
		Cool	°C	+16 ~ +43	+16 ~ +43
	Water outlet	Heat	°C	25 ~ 55	25 ~ 55
		Cool	°C	5 ~ 20	5 ~ 20

1 Scale from A+++ to D.

2 Sound power in accordance to 811/2013, 813/2013 and EN12102-1:2017 at +7 °C.

3 WH-MDC models are hermetically sealed.

Note:

EER and COP calculation is based in accordance to EN14511.

Mono-bloc systems | Aquarea T-CAP | J Generation | Single Phase / Three Phase | Heating and Cooling | R32

					Single phase		Three phase		
Outdoor unit					**WH-MXC09J3E5**	**WH-MXC12J6E5**	**WH-MXC09J3E8** [5]	**WH-MXC12J9E8** [5]	**WH-MXC16J9E8** [5]
Heating capacity / COP (A +7 °C, W 35 °C)				kW / –	9.00 / 5.08	12.00 / 4.80	9.00 / —	12.00 / —	16.00 / —
Heating capacity / COP (A +7 °C, W 55 °C)				kW / –	9.00 / 3.08	12.00 / 3.05	—	—	—
Heating capacity / COP (A +2 °C, W 35 °C)				kW / –	9.00 / 3.81	12.00 / 3.53	9.00 / —	12.00 / —	16.00 / —
Heating capacity / COP (A +2 °C, W 55 °C)				kW / –	9.00 / 2.54	12.00 / 2.42	—	—	—
Heating capacity / COP (A -7 °C, W 35 °C)				kW / –	9.00 / 3.08	12.00 / 2.82	—	—	—
Heating capacity / COP (A -7 °C, W 55 °C)				kW / –	9.00 / 2.12	12.00 / 2.00	—	—	—
Cooling capacity / EER (A 35 °C, W 7 °C)				kW / –	9.00 / 3.18	12.00 / 2.90	9.00 / —	12.00 / —	14.50 / —
Cooling capacity / EER (A 35 °C, W 18 °C)				kW / –	9.00 / 4.62	12.00 / 3.95	—	—	—
ErP data for Space Heating									
Average climate	Seasonal energy efficiency (ηs,h)	W35 / W55		%	195 / 140	195 / 140	—	—	—
	SCOP	W35 / W55			4.96 / 3.57	4.96 / 3.57	—	—	—
	Energy class [1]	W35 / W55			A+++ / A++	A+++ / A++	A+++ / A++	A+++ / A++	A++ / A++
Warm climate	Seasonal energy efficiency (ηs,h)	W35 / W55		%	256 / 171	256 / 171	—	—	—
	SCOP	W35 / W55			6.47 / 4.34	6.47 / 4.34	—	—	—
	Energy class [1]	W35 / W55			A+++ / A+++	A+++ / A+++	A+++ / A+++	A+++ / A+++	A+++ / A+++
Cold climate	Seasonal energy efficiency (ηs,h)	W35 / W55		%	169 / 127	169 / 127	—	—	—
	SCOP	W35 / W55			4.31 / 3.26	4.31 / 3.26	—	—	—
	Energy class [1]	W35 / W55			A++ / A++	A++ / A++	A++ / A++	A++ / A++	A++ / A++
Sound power [2]	Heat			dB(A)	65	65	65	65	66
Dimension	H x W x D			mm	1,410 x 1,283 x 320	1,410 x 1,283 x 320	1,410 x 1,283 x 320	1,410 x 1,283 x 320	1,410 x 1,283 x 320
Net weight				kg	140	140	151	151	164
Refrigerant (R32) / CO_2 Eq. [3]				kg / t	1.60 / 1.080	1.60 / 1.080	1.60 / 1.080	1.60 / 1.080	1.80 / 1.215
Water pipe connector				Inch	R 1¼	R 1¼	R 1¼	R 1¼	R 1¼
Pump	Number of speeds				Variable Speed	Variable Speed	Variable Speed	Variable Speed	Variable Speed
	Input power (Min / Max)			W	32 / 102	34 / 110	32 / 102	34 / 110	38 / 120
Heating water flow (ΔT=5 K. 35 °C)				l/min	25.8	34.4	25.8	34.4	45.9
Capacity of integrated electric heater				kW	3	6	3	9	9
Input power	Heat			kW	1.77	2.50	1.77	2.50	—
	Cool			kW	2.83	4.14	2.83	4.14	—
Running and starting current	Heat			A	8.3	11.6	—	—	—
	Cool			A	13.1	19.1	—	—	—
Current 1				A	29.0	29.0	14.7	11.9	15.5
Current 2				A	13.0	26.0	13.0	13.0	13.0
Recommended fuse, supply 1 / 2				A	30 / 30	30 / 30	20 / 16	20 / 20	20 / 20
Recommended cable size, supply 1 / 2				mm²	3 x 4.0 or 6.0 / 3 x 4.0	3 x 4.0 or 6.0 / 3 x 4.0	5 x 1.5 / 3 x 1.5	5 x 1.5 / 5 x 1.5	5 x 2.5 / 5 x 1.5
Operation range	Outdoor ambient		Heat	°C	-20 ~ +35	-20 ~ +35	-20 ~ +35	-20 ~ +35	-20 ~ +35
			Cool	°C	10 ~ +43	10 ~ +43	10 ~ +43	10 ~ +43	10 ~ +43
	Water outlet [4]		Heat	°C	20 ~ 65	20 ~ 65	20 ~ 65	20 ~ 65	20 ~ 65
			Cool	°C	5 ~ 20	5 ~ 20	5 ~ 20	5 ~ 20	5 ~ 20

1 Scale from A+++ to D.

2 Sound power in accordance to 811/2013, 813/2013 and EN12102-1:2017 at +7 °C.

3 WH-MXC models are hermetically sealed.

4 A water outlet temperature of 65 °C is only possible if ΔT is manually set to 15 °C on the remote controller and ambient temperatures are between 5 and 20 °C. Otherwise max. water outlet temperature is 60 °C.

5 All data is tentative.

Note:

EER and COP calculation is based in accordance to EN14511.

Mono-bloc systems | Aquarea T-CAP | H Generation | Single Phase / Three Phase | Heating and Cooling | R410A

				Single phase		Three phase		
Outdoor unit				**WH-MXC09H3E5**	**WH-MXC12H6E5**	**WH-MXC09H3E8**	**WH-MXC12H9E8**	**WH-MXC16H9E8**
Heating capacity / COP (A +7 °C, W 35 °C)			kW / –	9.00 / 4.84	12.00 / 4.74	9.00 / 4.84	12.00 / 4.74	16.00 / 4.28
Heating capacity / COP (A +7 °C, W 55 °C)			kW / –	9.00 / 2.94	12.00 / 2.88	9.00 / 2.94	12.00 / 2.88	16.00 / 2.71
Heating capacity / COP (A +2 °C, W 35 °C)			kW / –	9.00 / 3.59	12.00 / 3.44	9.00 / 3.59	12.00 / 3.44	16.00 / 3.10
Heating capacity / COP (A +2 °C, W 55 °C)			kW / –	9.00 / 2.21	12.00 / 2.19	9.00 / 2.21	12.00 / 2.19	16.00 / 2.13
Heating capacity / COP (A -7 °C, W 35 °C)			kW / –	9.00 / 2.85	12.00 / 2.72	9.00 / 2.85	12.00 / 2.72	16.00 / 2.49
Heating capacity / COP (A -7 °C, W 55 °C)			kW / –	9.00 / 2.02	12.00 / 1.92	9.00 / 2.02	12.00 / 1.92	16.00 / 1.86
Cooling capacity / EER (A 35 °C, W 7 °C)			kW / –	7.00 / 3.17	10.00 / 2.81	7.00 / 3.17	10.00 / 2.81	12.20 / 2.56
Cooling capacity / EER (A 35 °C, W 18 °C)			kW / –	7.00 / 5.19	10.00 / 5.13	7.00 / 5.19	10.00 / 5.13	12.20 / 3.49
ErP data for Space Heating								
Average climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	181 / 130	170 / 130	181 / 130	170 / 130	160 / 125
	SCOP	W35 / W55		4.59 / 3.32	4.32 / 3.32	4.59 / 3.32	4.32 / 3.32	4.08 / 3.20
	Energy class [1]	W35 / W55		A+++ / A++	A++ / A++	A+++ / A++	A++ / A++	A++ / A++
Warm climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	235 / 158	231 / 158	235 / 158	231 / 158	231 / 159
	SCOP	W35 / W55		5.95 / 4.03	5.86 / 4.02	5.95 / 4.02	5.86 / 4.02	5.86 / 4.05
	Energy class [1]	W35 / W55		A+++ / A+++	A+++ / A+++	A+++ / A+++	A+++ / A+++	A+++ / A+++
Cold climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	160 / 125	160 / 125	160 / 125	160 / 125	150 / 125
	SCOP	W35 / W55		4.08 / 3.20	4.08 / 3.20	4.08 / 3.20	4.08 / 3.20	3.83 / 3.20
	Energy class [1]	W35 / W55		A++ / A++	A++ / A++	A++ / A++	A++ / A++	A++ / A++
Sound power [2]	Heat		dB(A)	65	65	65	65	66
Dimension	H x W x D		mm	1,410 x 1,283 x 320	1,410 x 1,283 x 320	1,410 x 1,283 x 320	1,410 x 1,283 x 320	1,410 x 1,283 x 320
Net weight			kg	142	142	151	151	164
Refrigerant (R410A) / CO_2 Eq. [3]			kg / t	2.30 / 4.802	2.30 / 4.802	2.30 / 4.802	2.30 / 4.802	2.35 / 4.907
Water pipe connector			Inch	R 1¼	R 1¼	R 1¼	R 1¼	R 1¼
Pump	Number of speeds			Variable Speed	Variable Speed	Variable Speed	Variable Speed	Variable Speed
	Input power (Min / Max)		W	32 / 102	34 / 110	32 / 102	34 / 110	38 / 120
Heating water flow (ΔT=5 K. 35 °C)			l/min	25.8	34.4	25.8	34.4	45.9
Capacity of integrated electric heater			kW	3	6	3	9	9
Input power	Heat		kW	1.86	2.53	1.86	2.53	3.74
	Cool		kW	2.21	3.56	2.21	3.56	4.76
Running and starting current	Heat		A	8.8	11.7	3.0	4.0	5.7
	Cool		A	10.4	16.5	3.5	5.3	7.1
Current 1			A	29.0	29.0	14.7	11.9	15.5
Current 2			A	13.0	26.0	13.0	13.0	13.0
Recommended fuse			A	30 / 30	30 / 30	16 / 16	16 / 16	16 / 16
Recommended cable size, supply 1 / 2			mm²	3 x 4.0 or 6.0 / 3 x 4.0	3 x 4.0 or 6.0 / 3 x 4.0	5 x 1.5 / 3 x 1.5	5 x 1.5 / 5 x 1.5	5 x 1.5 / 5 x 1.5
Operation range	Outdoor ambient	Heat	°C	-20 ~ +35	-20 ~ +35	-20 ~ +35	-20 ~ +35	-20 ~ +35
		Cool	°C	+16 ~ +43	+16 ~ +43	+16 ~ +43	+16 ~ +43	+16 ~ +43
	Water outlet	Heat	°C	20 ~ 60	20 ~ 60	20 ~ 60	20 ~ 60	20 ~ 60
		Cool	°C	5 ~ 20	5 ~ 20	5 ~ 20	5 ~ 20	5 ~ 20

1 Scale from A+++ to D.

2 Sound power in accordance to 811/2013, 813/2013 and EN12102-1:2017 at +7 °C.

3 WH-MXC models are hermetically sealed.

Note:

EER and COP calculation is based in accordance to EN14511.

Mono-bloc systems | Aquarea HT | G Generation | Single Phase | Heating only | R407C

				Single phase	
Outdoor unit				**WH-MHF09G3E5**	**WH-MHF12G6E5**
Heating capacity / COP (A +7 °C, W 35 °C)			kW / –	9.00 / 4.64	12.00 / 4.46
Heating capacity / COP (A +7 °C, W 65 °C)			kW / –	9.00 / 2.48	12.00 / 2.41
Heating capacity / COP (A +2 °C, W 35 °C)			kW / –	9.00 / 3.45	12.00 / 3.26
Heating capacity / COP (A +2 °C, W 65 °C)			kW / –	9.00 / 2.06	10.30 / 2.01
Heating capacity / COP (A -7 °C, W 35 °C)			kW / –	9.00 / 2.74	12.00 / 2.52
Heating capacity / COP (A -7 °C, W 65 °C)			kW / –	9.00 / 1.79	9.60 / 1.77
ErP data for Space Heating					
Average climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	153 / 125	150 / 125
	SCOP	W35 / W55		3.90 / 3.20	3.82 / 3.21
	Energy class [1]	W35 / W55		A++ / A++	A++ / A++
Warm climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	191 / 156	188 / 156
	SCOP	W35 / W55		4.84 / 3.97	4.77 / 3.97
	Energy class [1]	W35 / W55		A+++ / A+++	A+++ / A+++
Cold climate	Seasonal energy efficiency (ηs,h)	W35 / W55	%	137 / 116	134 / 113
	SCOP	W35 / W55		3.50 / 2.97	3.42 / 2.90
	Energy class [1]	W35 / W55		A+ / A+	A+ / A+
Sound power [2]			dB(A)	—	—
Dimension	H x W x D		mm	1,410 x 1,283 x 320	1,410 x 1,283 x 320
Net weight			kg	151	151
Refrigerant (R407C) / CO_2 Eq. [3]			kg / t	1.92 / 3.406	1.92 / 3.406
Water pipe connector			Inch	R 1¼	R 1¼
Pump	Number of speeds			7	7
	Input power (Min / Max)		W	—	—
Heating water flow (ΔT=5 K. 35 °C)			l/min	25.8	34.4
Capacity of integrated electric heater			kW	3	6
Input power			kW	1.94	2.69
Running and starting current			A	9.3	12.8
Current 1			A	28.5	29.0
Current 2			A	13.0	26.0
Recommended fuse			A	30 / 30	30 / 30
Recommended cable size, supply 1 / 2			mm²	3 x 4.0 or 6.0 / 3 x 4.0	3 x 4.0 or 6.0 / 3 x 4.0
Operation range	Outdoor ambient	Heat	°C	-20 ~ +35	-20 ~ +35
	Water outlet	Heat	°C	25 ~ 65	25 ~ 65

1 Scale from A+++ to D.

2 Sound power in accordance to 811/2013, 813/2013 and EN12102-1:2017 at +7 °C.

3 WH-MHF models are hermetically sealed.

Note:

EER and COP calculation is based in accordance to EN14511.

4.7 Control

4.7.1 Remote controller

The Aquarea heat pumps can be operated and programmed through the remote controller included in the scope of delivery. The remote controller has a display for showing the most important operating parameters and various control buttons for retrieving, setting, activating and deactivating the control functions.

To combine the Aquarea heat pumps with external devices such as a solar system or a room thermostat, the remote controller is equipped with the requisite interfaces. The corresponding functions are only available if the accessories in question are connected and activated (→ *4.7.2 External interfaces (inputs/outputs), p. 65*, → *4.8 Accessories, p. 72*, → *6.8.2 Connecting accessories, p. 181*).

In the case of bi-bloc systems, the remote controller is integrated into the hydrokit or All in One unit, but can be removed from the device to another room for separate installation. In the case of mono-bloc systems, the remote controller is always installed separately in the building. The method for installing the remote controller is identical in both cases (→ *6.8.3 Installing and connecting the remote controller, p. 184*).

Depending on the device generation (F, G, H, J ...), the heat pumps are equipped with various remote controllers that provide different functions.

While the same remote controller is used for all models of one generation, all functions of the remote controller are not directly available for all models of that generation. (For example, the domestic hot water mode is directly available in bi-bloc systems with All in One unit having an internal domestic hot water tank, while in bi-bloc systems with standard hydrokit and external

domestic hot water tank this function is available only after the external domestic water temperature sensor is installed, electrically connected and enabled via the remote controller.)

IMPORTANT

As it is not possible to cover all variants of remote controller functions for all models within the scope of this manual, only the most recent remote controller for the J generation and its functions are explained in detail to serve as an example.

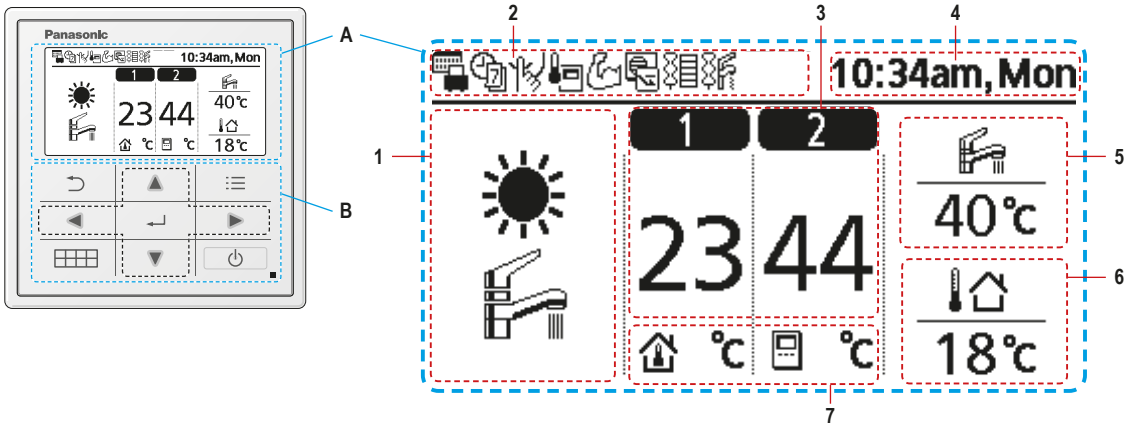
However, not all functions stated here will be available for all models. Therefore, in order to be sure about the valid functions of each model, it is absolutely mandatory to refer to the operating instructions or service manual for the relevant model when operating the device.

4.7.1.1 Remote controller for J and H generation models

The remote controller is in the scope of delivery of the following models:

Bi-bloc systems with All in One unit	Bi-bloc systems with hydrokit	Mono-bloc systems
High Performance | J Generation | R32	**High Performance | J Generation | R32**	**High Performance | J Generation | R32**
WH-ADC0309J3E5 + WH-UD**JE5(-1)	WH-SDC**J3E5 + WH-UD**JE5(-1)	WH-MDC**J3E5
WH-ADC0309J3E5B + WH-UD**JE5(-1)	**High Performance | H Generation | R410A**	**High Performance | H Generation | R410A**
WH-ADC0309J3E5C + WH-UD**JE5(-1)	WH-SDC**H6E5 + WH-UD**HE5	WH-MDC**H6E5
High Performance | H Generation | R410A	WH-SDC**H3E8 + WH-UD**HE8	**T-CAP | J Generation | R32**
WH-ADC1216H6E5 + WH-UD**HE5	**T-CAP | H Generation | R410A**	WH-MXC**J3E5
WH-ADC0916H9E8 + WH-UD**HE8	WH-SXC**H3E5 + WH-UX**HE5	WH-MXC**J3E8
T-CAP | H Generation | R410A	WH-SXC**H3E8 + WH-UX**HE8	**T-CAP | H Generation | R410A**
WH-ADC1216H6E5 + WH-UX**HE5	WH-SQC**H3E8 + WH-UQ**HE8	WH-MXC**H3E5
WH-ADC1216H6E5C + WH-UX**HE5		WH-MXC**H3E8
WH-ADC0916H9E8 + WH-UX**HE8		
WH-ADC0916H9E8 + WH-UQ**HE8		

4.7.1.2 Design and functions of the remote controller



Basic Functions

A Display
Graphic, background-illuminated LCD display with easily understandable symbols as well as plain text menu displays in 10 different user languages.

1 Operating mode
Display of the set operating mode or of the current operating mode:

Heating
Cooling
Auto
Auto heating
Auto cooling
Domestic hot water production
Heat pump in operation

2 Operating Symbols
Display of the currently set function:

Holiday mode
Weekly timer
Quiet mode
Operation with remote controller as room thermostat
Powerful operation mode
Demand control, SG ready or SHP
Electric heating element for space heating
Electric heating element for water heating
Solar mode
Bivalent heating source

3 Heating Circuit Temperature
Display of the temperature of the heating circuit in question. If the temperature is bordered with a line, it is the set temperature.

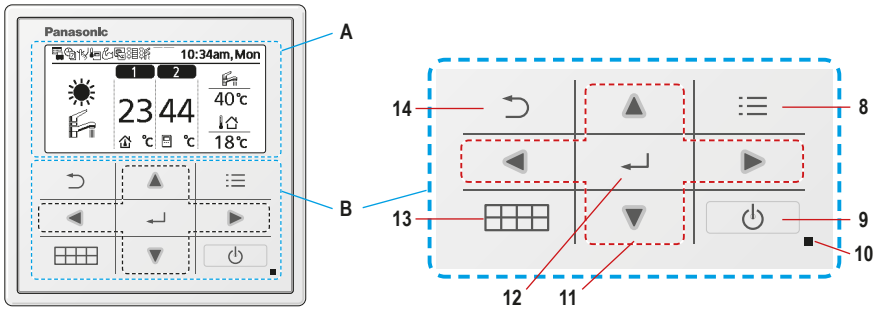
4 Time
Display of the current clock time and the day of the week

5 Tank temperature
Display of the current domestic hot water tank temperature. If the temperature is bordered with a line, it is the set temperature.

6 Outside temperature
Display of the current outside temperature.

7 Temperature sensor
Display of the temperature sensors and the current temperatures

Internal room thermostat
Supply water temperature based on compensation curve
External room thermostat
Supply water temperature → Directly set
Swimming pool temperature set



B Key Pad
Touch keys with easily understandable symbols facilitate the operation and support intuitive menu control.

8 Main menu button
Invoking the main menu, which enables users to gain access to all functions, options and parameters with corresponding authorisation.

9 ON/OFF button
Switching the device on / off

10 Operation indicator ■
Lights up during operation and flashes if there is a fault.

11 Navigation keys (arrow keys) ▲ Up ▼ Down ◀ Left ▶ Right
Selecting a menu element or entering a value

12 Confirmation Key ↵
Confirming the selected setting or the selected value

13 Quick menu button ⊞
Invoking the Quick Menu with the following options:

Force DHW	Quiet mode	Force defrost
Powerful operation mode	Force heater	Error reset
	Weekly timer	Remote controller lock

14 Back button ⮌
Return to the previous display or to the previous element

Other functions

Weekly timer
Setting a weekly timer with up to six switching programmes per day (deactivated if the cooling/heating switch is activated or the Force heater mode is on).

Holiday timer
Setting a holiday period timer to either switch off the system or to reduce the temperature during this period and thus save energy. The weekly timer can be deactivated during this time, so that it will be restored automatically upon completion of the holiday timer period.

Quiet timer
Setting up to six programmes for the quiet mode to reduce the sound level for the set duration.

Backup heater for space heating
Enabling of the backup heater for the heating mode

Backup heater for hot water production
Enabling of the backup heater for the domestic hot water mode

Sterilisation
Activation or deactivation of automatic sterilisation. Observe the locally valid laws and provisions when setting the sterilisation function. If necessary, please contact your authorised installer or service partner.

Domestic hot water mode (DHW)
Selection of the desired domestic hot water mode (Standard / Smart). In standard mode, the fill time for the hot water tank is shorter, but the energy consumption is lower in Smart mode. Only available if the domestic hot water tank is activated.

Another option is the selection of the tank sensor to be used (Top / Center). With the top sensor selected, the process for heating up the tank is retarded so that energy consumption is reduced. Setting should be changed to Center when the hot water becomes insufficient. Not available for H generation models.

Domestic hot water capacity
Selection of the desired heating capacity (Variable / Standard) for the domestic hot water tank heat-up. In Variable mode, the tank water is heated up fast, then the tank temperature is kept stable with more efficient part-load operation. In Standard mode, the tank water is heated up uniformly with rated heating capacity. Not available for H generation models.

Selection of the Temperature Sensor
Selecting between water temperature sensor, room temperature sensor and room thermostat. In the case of room thermostat, there is another option, to select between external and internal temperature sensor.

Backup heater capacity
Selection of the maximum power setting desired for the electrical heating element for the heating mode; 3 kW / 6 kW / 9 kW (depending on the model concerned)

Anti freezing
Activating or deactivating the anti-freezing function while the device is switched off.

Base pan heater
Choice whether an optional base pan heater is connected or not and its use type:
Type A - The base pan heater is only switched on during defrost mode.
Type B -The base pan heater is switched on at temperatures of 5 °C and below.

Alternative outdoor sensor
Selection of an alternative outdoor temperature sensor.

Bivalent heating
Selection of a bivalent heating system, so that an additional heat source, e.g. a heating boiler, can heat up the buffer tank and the domestic hot water tank, if the heat pump capacity is not sufficient at lower outside temperatures. The bivalent function can be operated in alternative mode (heat pump and heating boiler are operated alternately) or in parallel mode (heat pump and heating boiler are operated simultaneously) or be set in advanced parallel mode (heat pump is operated and heating boiler is activated for buffer tank and/or domestic hot water, depending on the setting options activated for switching behaviour).

Circulating liquid
Selection as to whether water or glycol is being used as the heating medium.

Pump maximum speed (pump control)
Setting of flow rate and maximum duty, and switching the pump on / off.

Pump down
Switching the pump-down mode on

Dry concrete
Setting and switching on dry concrete function for drying screed and walls (exclusively during the construction phase).

Force heater
Option to turn on a forced heating mode either manually (by default) or automatically.

Force defrost
Option to turn on forced defrost moder either manually (by default) or automatically. If auto selection is set, outdoor unit will start defrost operation when heating operation has continued for many hours during low outdoor temperature. Not available for H generation models.

Defrost signal
Option to turn on defrost signal to stop fan coil during defrost operation (Yes / No). If defrost signal set to Yes, bivalent function will not be available to use. Not available for H generation models.

Pump flowrate
Option to set variable flow pump control (ΔT) or fixed pump duty control (Max. duty). Not available for H generation models.

System Monitoring

Energy monitor
Display of a diagram with current or recorded data (Present / Historical chart) with regard to energy consumption, generation or COP. It is possible to have recording intervals of 1 day, 1 month or 1 year. The energy consumption for heating mode, optionally cooling mode and hot water mode as well as total energy consumption is recorded.

System information
Display of all current system information, i.e. inlet water temperature, outlet water temperature, zone 1 temperature, zone 2 temperature, domestic hot water tank temperature, buffer tank temperature, solar circuit temperature, pool temperature, compressor frequency and pump flow rate. Not all items available for H generation models.

Error history
Display of the last occurring error code in reverse chronological order (i.e. the last signal first).

Compressor
Display of technical data on compressor operation, e.g. current compressor frequency, number of starts and total operating time.

Backup heater
Display of the operating hours of the backup heater for space heating/domestic hot water mode respectively.

Note

Detailed information about the control functions is given in the operating instructions (→ *8.1 Operating instructions extract (J Generation), p. 200*) and in the Service manual of the device concerned.

Additional functions of the remote controller on connecting the optional PCB CZ-NS4P

The installation of the optional PCB CZ-NS4P (→ *4.7.2 External interfaces (inputs/outputs), p. 65*) allows the following additional functions to be selected or set.

Control and temperature regulation of a connected buffer tank
Selection of connected buffer tank as well as setting of the temperature difference (ΔT). Only available if the buffer tank is activated.

Control of two heating circuits (including swimming pool heating)
Selection of the number of heating circuits (1 zone or 2 zone system). After a system with two heating circuits has been selected, information is to be provided as to whether the respective heating circuit is being used for space or swimming pool heating. If “swimming pool” has been selected, a temperature difference of “ΔT for swimming pool” must be set between 2 and 10 K.

Input for externally switching off the outdoor unit
Dry contact for an external input signal for switching off the compressor in the outdoor unit (if contact closed). The function must be enabled through the remote controller of the heat pump.

Integration of a solar system (solar thermal panels)
Selection of the buffer tank or of the domestic hot water tank for the solar system as well as setting of the difference between switching on and off temperatures, the frost protection temperature and the upper temperature limit. Only available if the solar system is activated.

External error signal
Dry contact for output of an error message signal (if contact closed) to an external display unit. Even if the fault has been acknowledged through the external display, the error signal remains internally active.

SG ready control
Dry contact with two inputs (Vcc-Bit1 and Vcc-Bit2). The following settings are possible:

Operating state		SG-Ready-Signal	
		Vcc-Bit1	Vcc-Bit2
1	Heat Pump Lock: Heat pump and backup heater are switched off.	1	0
2	Automatic operation: Heat pump runs in normal mode	0	0
3	Increased capacity: Capacity setting 1 (in %) for heating and domestic hot water	0	1
4	Maximum capacity: Capacity setting 2 (in %) for heating and domestic hot water	1	1

The function must be enabled through the remote controller of the heat pump. Moreover, especially the increased-capacity settings 1 and 2 must be configured via the remote controller. A similar control pattern applies for cooling operation. Not available for cooling operation for H generation models.

SG ready control for bivalent system
In case of a bivalent system, its control pattern can be selected (Auto / SG ready). When the SG ready control pattern is selected, the following settings are possible on the two SG ready inputs (Vcc-Bit1 and Vcc-Bit2:

Operating state		SG-Ready-Signal	
		Vcc-Bit1	Vcc-Bit2
1	Heat Pump OFF, Boiler OFF	0	0
2	Heat Pump ON, Boiler OFF	1	0
3	Heat Pump OFF, Boiler ON	0	1
4	Heat Pump ON, Boiler ON	1	1

Not available for H generation models.

Demand control

Limiting the operating current according to the actual power requirement through a 0--10 Volt input signal. For safety reasons, a minimum operating current is applied for every device. For the change between two power stages, there is a switching hysteresis of 0.2 V (see table). The voltage values are only taken into consideration to the first decimal place and not rounded. The valid assignments between input signal and power stage are as follows:

Analogue input (V)	Power (%)		
0.0	Not active		
0.1 – 0.6			
0.7	10	Not active	
0.8			
0.9 – 1.1	10		
1.2	15	10	
1.3			
1.4 – 1.6	15		
1.7	20	15	
1.8			
1.9 – 2.1	20		
2.2	25	20	
2.3			
2.4 – 2.6	25		
2.7	30	25	
2.8			
2.9 – 31	30		
3.2	35	30	
3.3			
3.4 – 3.6	35		
3.7	40	35	
3.8			

Analogue input (V)	Power (%)	
3.9 – 4.1	40	
4.2	45	40
4.3		
4.4 – 4.6	45	
4.7	50	45
4.8		
4.9 – 5.1	50	
5.2	55	50
5.3		
5.4 – 5.6	55	
5.7	60	55
5.8		
5.9 – 6.1	60	
6.2	65	60
6.3		
6.4 – 6.6	65	
6.7	70	65
6.8		
6.9 – 7.1	70	
7.2	75	70
7.3		

Analogue input (V)	Power (%)	
7.4 – 7.6	75	
7.7	80	75
7.8		
7.9 – 8.1	80	
8.2	85	80
8.3		
8.4 – 8.6	85	
8.7	90	85
8.8		
8.9 – 9.1	90	
9.2	95	90
9.3		
9.4 – 9.6	95	
9.7	100	95
9.8		
9.9	100	

Heating/Cooling Switch

Dry contact for the switching between heating (contact open) and cooling (contact closed). The function must be enabled and configured via the remote controller of the heat pump.

4.7.1.3 Remote controller for F and G generation models

The remote controller is in the scope of delivery of the following models:

Bi-bloc systems	Mono-bloc systems
HT | F Generation | R407C	**HT | G Generation | R407C**
WH-SHF**F*E5 + WH-UH**FE5	WH-MHF**G*E5
WH-SHF**F*E8 + WH-UH**FE8	

Note

An overview of the structure and functions of the remote controller for the models of the F and G generations is given in the planning handbook for bi-bloc systems or mono-bloc systems from 2014.

Detailed information about the regulation functions is also given in the operating instructions and in the service manual of the device in question.

4.7.2 External interfaces (inputs/outputs)

The Aquarea heat pumps offer the option of connecting useful accessories through external interfaces, such as an external room thermostat or integrating the heat pump in a building management system (BMS).

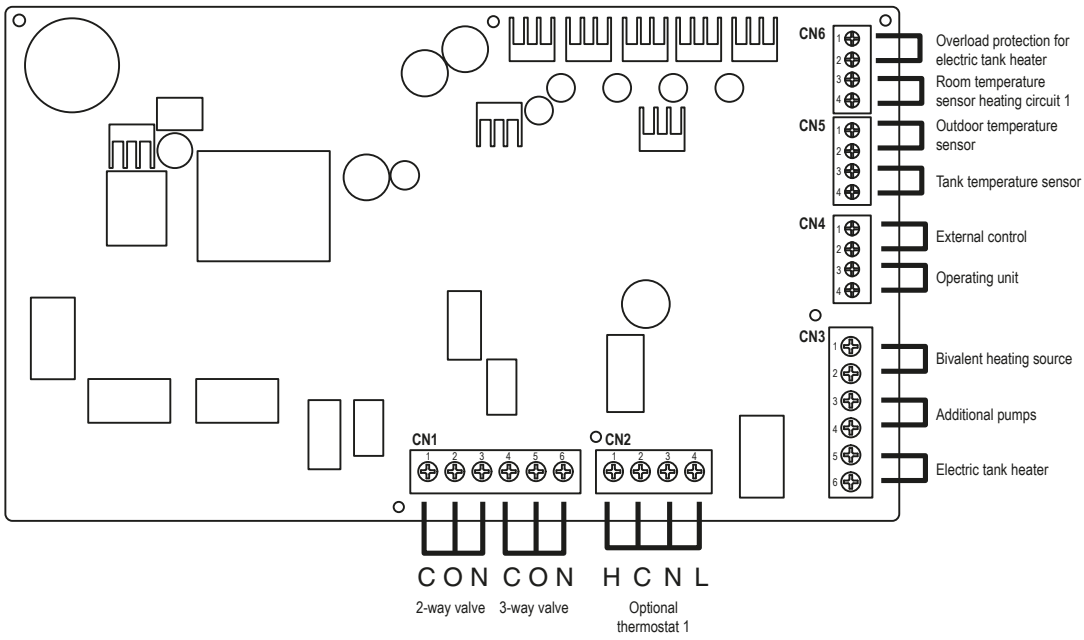
4.7.2.1 External interfaces for J and H generation models

The overview of external interfaces is valid for the following models:

Bi-bloc systems with All in One unit	Bi-bloc systems with hydrokit	Mono-bloc systems
High Performance | J Generation | R32	**High Performance | J Generation | R32**	**High Performance | J Generation | R32**
WH-ADC0309J3E5 + WH-UD**JE5(-1)	WH-SDC**J3E5 + WH-UD**JE5(-1)	WH-MDC**J3E5
WH-ADC0309J3E5B + WH-UD**JE5(-1)	**High Performance | H Generation | R410A**	**High Performance | H Generation | R410A**
WH-ADC0309J3E5C + WH-UD**JE5(-1)	WH-SDC**H6E5 + WH-UD**HE5	WH-MDC**H6E5
High Performance | H Generation | R410A	WH-SDC**H3E8 + WH-UD**HE8	**T-CAP | J Generation | R32**
WH-ADC1216H6E5 + WH-UD**HE5	**T-CAP | H Generation | R410A**	WH-MXC**J3E5
WH-ADC1216H6E5C + WH-UD**HE5	WH-SXC**H3E5 + WH-UX**HE5	WH-MXC**J3E8
WH-ADC0916H9E8 + WH-UD**HE8	WH-SXC**H3E8 + WH-UX**HE8	**T-CAP | H Generation | R410A**
T-CAP | H Generation | R410A	WH-SQC**H3E8 + WH-UQ**HE8	WH-MXC**H3E5
WH-ADC1216H6E5 + WH-UX**HE5		WH-MXC**H3E8
WH-ADC1216H6E5C + WH-UX**HE5		
WH-ADC0916H9E8 + WH-UX**HE8		
WH-ADC0916H9E8 + WH-UQ**HE8		

Main PCB

Overview of the external interfaces



Terminals	Connection	Function	Condition	Cable cross section
CN1 1 to 3	2-way valve	Allows locking a heating circuit in the cooling mode. 230 V AC, N = Neutral, O = Open, C = Closed	Maximum total cable length: 50 m	3 × min. 1.5 mm²
CN1 4 to 6	3-way valve	Allows switchover between heating circuits on connecting hot water tank. 230 V AC, N = Neutral, O = Open, C = Closed = Direction	Maximum total cable length: 50 m	3 × min. 1.5 mm²
CN2 1 to 4	Optional thermostat 1	Heating / cooling demand from thermostat. L N = 230 V AC, H = Heating, C = Cooling	Only functions if the optional PCB CZ-NS4P is not connected. Maximum total cable length: 50 m	3 or 4 × min. 0.5 mm²

Terminals	Connection	Function	Condition	Cable cross section
CN3 1 to 2	Bivalent heating source	Allows connection of a second heating source for bivalent operating mode. Dry contact	System setting needed. Maximum total cable length: 50 m	2 × min. 0.5 mm²
CN3 3 to 4	Additional pump	Support of the pumps integrated in the indoor unit, if their capacity is not sufficient. 230 V AC	Maximum total cable length: 50 m	2 × min. 1.5 mm²
CN3 5 to 6	Electric tank heater	Power supply for electric tank heater 230 V AC	Maximum total cable length: 50 m	3 × min. 1.5 mm²
CN4 1 to 2	External control	Allows external ON/OFF switching of the operation. Dry contact, Open = not in operation, Closed = in operation	System setting needed. Maximum total cable length: 50 m	2 × min. 0.5 mm²
CN4 3 to 4	Remote controller	Integrated in front covers and connected in the case of bi-bloc systems, supplied loose in the case of mono-bloc systems.	Use two-core cable for separate assembly and extensions. Maximum total cable length: 50 m	2 × min. 0.3 mm²
CN5 1 to 2	Outdoor temperature sensor AW-A2W-TSOD	For exact measurement of the outside temperature, for example if the outdoor unit is exposed to direct sunlight.	Maximum total cable length: 30 m	2 × min. 0.3 mm²
CN5 3 to 4	Tank temperature sensor		Use component according to the Panasonic specifications. Maximum total cable length: 30 m	2 × min. 0.3 mm²
CN6 1 to 2	Overload protection for electric tank heater	Allows connection of the overload protection for the electric heater of the domestic hot water tank Dry contact, Vcc-Bit1, Vcc-Bit2, Open / Closed	System setting needed. Maximum total cable length: 30 m	2 × min. 0.5 mm²
CN5 3 to 4	Room temperature sensor PAW-A2W-TSRT for heating circuit 1	For measurement of the indoor temperature in a room other than the one where the indoor unit is installed	Only functions if the optional PCB CZ-NS4P is not connected. Maximum total cable length: 30 m	2 × min. 0.3 mm²

Connection conditions

2-way valve:

- The 2-way valve must be a spring-loaded electronic valve.
- The valve cable must be 3 x min. 1.5 mm² and conform to the code 60245 IEC 57 or higher or a similar double insulated jacket cable.
- The 2-way valve must bear the CE mark.
- The maximum load of the valve is 9.8 VA.
- Maximum total cable length: 50 m

3-way valve:

- The 3-way valve must be a spring-loaded electronic valve.
- The valve cable must be 3 x min. 1.5 mm² and conform to the code 60245 IEC 57 or higher or a similar double insulated jacket cable.
- The component must bear the CE mark.
- In the de-energised state, the flow way must be directed towards the heating side.
- The maximum load of the valve is 9.8 VA.
- Maximum total cable length: 50 m

Room thermostat

- The room thermostat cable must be 4 or 3 x min. 0.5 mm² and conform to the code 60245 IEC 57 or higher or a similar double insulated jacket cable.
- Maximum total cable length: 50 m

Electric heater of the domestic hot water tank

- The maximum power output of the electric tank heater should be maximum 3 kW.
- The cable of the electric tank heater must be 3 x min. 1.5 mm² and conform to the code 60245 IEC 57 or higher.
- Maximum total cable length: 50 m

Additional pump:

- The cable of the additional pump must be 2 x min. 1.5 mm² and conform to the code 60245 IEC 57 or higher.
- Maximum total cable length: 50 m

Bivalent heat source:

- The connecting cable of the bivalent heat source must be 2 x min. 0.5 mm² and conform to the code 60245 IEC 57 or higher.
- Maximum total cable length: 50 m

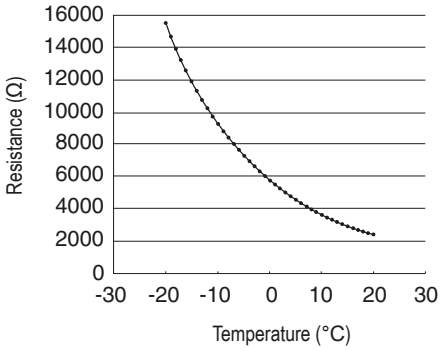
External control (remote switch):

- Use a single pole switch with a contact distance of min. 3.0 mm as remote switch.
- The cable must be 2 x min. 0.5 mm² and have a double insulated PVC or rubber jacket cable.
- The switch used must bear the CE mark.
- The maximum operating current must be less than 3 Arms.
- Maximum total cable length: 50 m

Temperature sensor of the hot water tank:

- The temperature sensor of the hot water tank must be a conductor of heat. The following figure shows the characteristic of the sensor.

Characteristic curve of the tank temperature sensor



- The cable must be 2 x min. 0.3 mm² and have a double insulated PVC or rubber jacket cable (insulation strength min. 30 V).
- Maximum total cable length: 30 m

Room temperature sensor:

- The cable of the room temperature sensor for heating circuit 1 must be 2 x min. 0.3 mm² and have a double insulated PVC or rubber jacket cable.
- Maximum total cable length: 30 m

Outdoor temperature sensor:

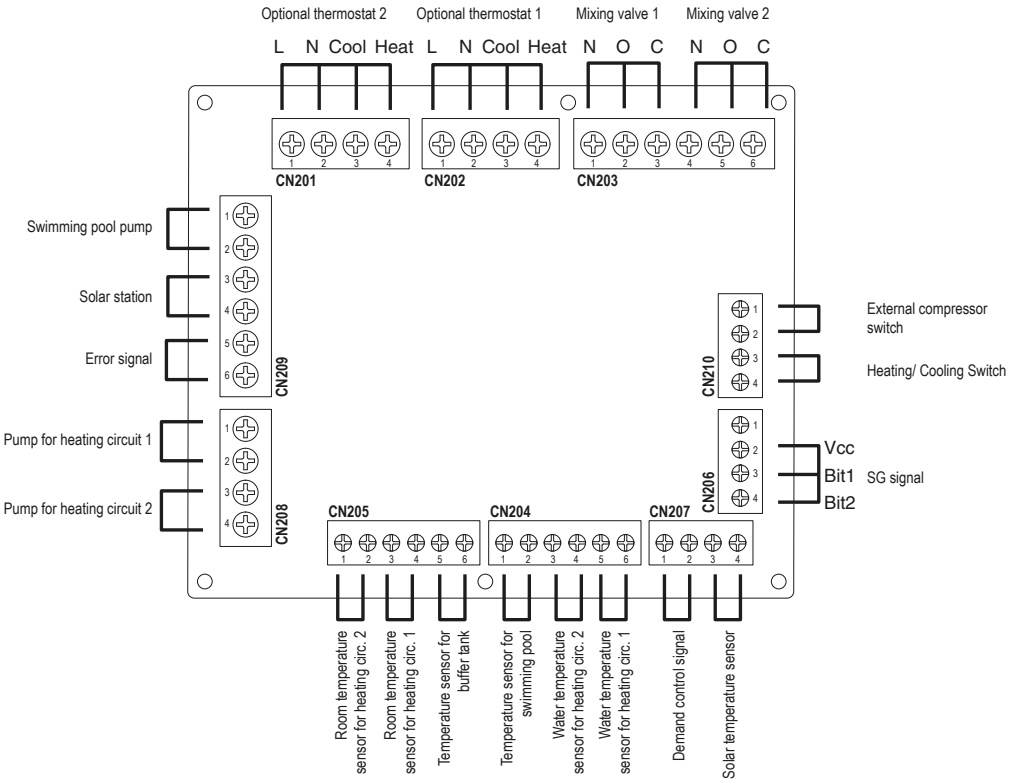
- The cable of the outdoor temperature sensor must be 2 x min. 0.3 mm² and have a double insulated PVC or rubber jacket cable.
- Maximum total cable length: 30 m

Overload protection

- The cable of the overload protection should be 2 x min. 0.5 mm² and have a double insulated PVC- or rubber-jacket cable.
- Maximum total cable length: 30 m

Optional PCB CZ-NS4P

Overview of the external interfaces



Terminals	Connection	Function	Condition	Cable cross section
CN201 1 to 4	Optional thermostat 2	Heating / cooling demand from thermostat. L N = 230 V AC, Heat = heating, Cool = cooling	Maximum total cable length: 50 m	4 × min. 0.5 mm²
CN202 1 to 4	Optional thermostat 1			
CN203 1 to 3	Mixing valve 1	230 V AC, N = Neutral, O = Open, C = Closed = Direction reversal Actuation duration: 30 to 120 s	Maximum total cable length: 50 m	3 × min. 1.5 mm²
CN203 4 to 6	Mixing valve 2			
CN204 1 to 2	Temperature sensor for swimming pool PAW-A2W-TSHC		Maximum total cable length: 30 m	2 × min. 0.3 mm²
CN204 3 to 4	Supply temperature sensor for heat. c. 2 PAW-A2W-TSHC	For measuring the water temperature in the respective heating circuit	Maximum total cable length: 30 m	2 × min. 0.3 mm²
CN204 5 to 6	Supply temperature sensor for heat. c. 1 PAW-A2W-TSHC			
CN205 1 to 2	Room temperature sensor for heat. c. 2 PAW-A2W-TSRT		Maximum total cable length: 30 m	2 × min. 0.3 mm²
CN205 3 to 4	Room temperature sensor for heat. c. 1 PAW-A2W-TSRT			

Terminals	Connection	Function	Condition	Cable cross section
CN205 5 to 6	Temperature sensor for buffer tank PAW-A2W-TSBU	For measuring the buffer tank temperature	Maximum total cable length: 30 m	2 × min. 0.3 mm²
CN206 2 to 4	SG signal	Smart Grid switch Dry contact, Vcc-Bit1, Vcc-Bit2, Open / Closed	Must be connected to both contacts. System setting needed. Maximum total cable length: 50 m	3 × min. 0.3 mm²
CN207 1 to 2	Demand control signal	0–10 V DC signal.	Must be connected to 0-10 V DC control. System setting needed. Maximum total cable length: 50 m	2 × min. 0.3 mm²
CN207 3 to 4	Solar temperature sensor PAW-A2W-TSSO	For measuring the solar module temperature	Maximum total cable length: 30 m	2 × min. 0.3 mm²
CN208 1 to 2	Pump for heating circuit 1	230 V AC, <500 W	Maximum total cable length: 50 m	2 × min. 1.5 mm²
CN208 3 to 4	Pump for heating circuit 2			
CN209 1 to 2	Swimming pool pump	230 V AC	Maximum total cable length: 50 m	2 × min. 1.5 mm²
CN209 3 to 4	Solar system	230 V AC	Maximum total cable length: 50 m	2 × min. 1.5 mm²
CN209 5 to 6	Error signal			
CN210 1 to 2	External compressor switch	Dry contact, Open = Outdoor unit ON, Closed = Outdoor unit OFF	System setting needed. Maximum total cable length: 50 m	2 × min. 0.3 mm²
CN210 3 to 4	Heating/ Cooling Switch	Dry contact, Open = Heating, Closed = Cooling	System setting needed. Maximum total cable length: 50 m	2 × min. 0.3 mm²

Connection conditions

The connection of the optional PCB allows temperature control for two heating circuits. Mixing valves, circulation pumps and temperature sensors for heating circuits 1 and 2 are to be connected to the corresponding terminals of the optional PCB. The temperatures in the two heating circuits are controlled mutually independently by the remote controller.

Pumps for heating circuits 1 and 2:

- The cables of the pumps for heating circuits 1 and 2 must each be 2 x min. 1.5 mm² and conform to the code 60245 IEC 57 or higher.
- Maximum total cable length: 50 m

Solar system:

- The cable of the solar system must be 2 x min. 1.5 mm² and conform to the code 60245 IEC 57 or higher.
- Maximum total cable length: 50 m

Swimming pool pump:

- The cable of the swimming pool pump must be 2 x min. 1.5 mm² and conform to the code 60245 IEC 57 or higher.
- Maximum total cable length: 50 m

Room thermostat for heating circuits 1 and 2:

- The cables of the room thermostats for heating circuits 1 and 2 must each be 4 x min. 0.5 mm² and conform to the code 60245 IEC 57 or higher.
- Maximum total cable length: 50 m

Mixing valves for heating circuits 1 and 2:

- The cables of the mixing valves for heating circuits 1 and 2 must each be 3 x min. 1.5 mm² and conform to the code 60245 IEC 57 or higher.
- Maximum total cable length: 50 m

Room temperature sensor for heating circuits 1 and 2:

- The cables of the room temperature sensor for heating circuits 1 and 2 must each be 2 x min. 0.3 mm² and have a double insulated PVC or rubber jacket cable (insulation strength of minimum 30 V).
- Maximum total cable length: 30 m

Temperature sensors for buffer tank, swimming pool and solar station:

- The cables of the temperature sensors for the buffer tank, the swimming pool and the solar station must each be 2 x min. 0.3 mm² and have a double insulated PVC or rubber jacket cable (insulation strength of minimum 30 V).
- Maximum total cable length: 30 m

Supply temperature sensor for heating circuits 1 and 2:

- The cables of the supply temperature sensor for heating circuits 1 and 2 must each be 2 x min. 0.3 mm² and have a double insulated PVC or rubber jacket cable.
- Maximum total cable length: 30 m

Demand control signal:

- The cable of the demand control signal must be 2 x min. 0.3 mm² and have a double insulated PVC or rubber jacket cable.
- Maximum total cable length: 50 m

SG signal:

- The cable of the SG signal must be 3 x min. 0.3 mm² have a double insulated PVC or rubber jacket cable.
- Maximum total cable length: 50 m

Heating/Cooling selector switch:

- The cable of the heating/cooling selector switch must be 2 x min. 0.3 mm² and have a double insulated PVC or rubber jacket cable.
- Maximum total cable length: 50 m

External compressor switch:

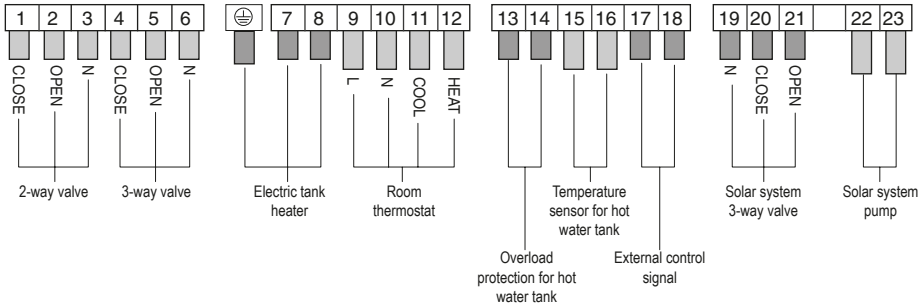
- The cable of the external compressor switch must be 2 x min. 0.3 mm² and have a double insulated PVC or rubber jacket cable.
- Maximum total cable length: 50 m

4.7.2.2 External interfaces for F and G generation models

The overview of external interfaces is valid for the following models:

Bi-bloc systems	Mono-bloc systems
HT | F Generation | R407C	**HT | G Generation | R407C**
WH-SHF**F*E5 + WH-UH**FE5	WH-MHF**G*E5
WH-SHF**F*E8 + WH-UH**FE8	

Overview of the external interfaces



Terminals	Connection	Function	Condition	Cable cross section
1 to 3	2-way valve	Output for actuation of the 2-way valve (e.g. for floor heating, cooling)		3 × min. 0.5 mm²
4 to 6	3-way valve	Output for actuation of the 3-way valve (e.g. for heating, domestic hot water tank)		3 × min. 0.5 mm²
Earth to 8	Electric tank heater	Output for on/off switch of the electric tank heater	The maximum power output of the electric tank heater should be maximum 3 kW.	3 × min. 1.5 mm²
9 to 12	Room thermostat	Input for room thermostat signals		4, or 3 × min. 0.5 mm²
13 to 14	Overload protection for domestic hot water tank	Input for overload protection of the domestic hot water tank	The terminals 13/14 must be used if overload protection is not used for the hot water tank.	2 × min. 0.5 mm²
15 to 16	Temperature sensor of the hot water tank	Input for temperature sensor of the domestic hot water tank		2 × min. 0.5 mm²
17 to 18	External control signal	Input for the external control signal	These two terminals are bridged at the time of dispatch. Connection: 1-pin (min. 3 mm contact distance)	2 × min. 0.5 mm²
19 to 21	Solar system 3-way valve	Output for actuation of the solar system 3-way valve		3 × min. 0.5 mm²
22 to 23	Solar system pump	Input of the ON signal of solar system pump 2 (230 V AC)	Use optional solar connection PCB CZ-NS1P, CZ-NS2P or CZ-NS3P.	2 × min. 0.5 mm²

4

4.8 Accessories

4.8.1 Domestic hot water tanks

A domestic hot water tank is used for the production and intermediate storage of domestic hot water (DHW). By integrating a solar system, solar heat can also be stored in this intermediate storage and used in addition to the heat from the Aquarea heat pump. An electric booster heater (tank heater) additionally ensures maximum comfort, even at very low outside temperatures, and can also be used for sterilisation.

Panasonic offers various DHW tank models in different sizes for easy domestic hot water production for different requirements.

The scope of delivery for most of the DHW tanks includes the following:

- Electric tank heater (except for PAW-TA15C1E5STD and PAW-TA20C1E5C)
- Safety valve, supplied loose (for stainless steel hot water tanks only)
- Immersion temperature sensor with sleeve and 2 m cable
- Sacrificial magnesium anode (for enamelled hot water tanks only)
- Thermostatic overload protection
- Adjustable feet
- Insulation in polyurethane foam (Panasonic U-Vacua™ insulation with minimised thermal conductivity in case of stainless steel hot water tanks)
- 3-way switchover valve set PAW-3WYVLV-SI or CZ-NV1 available as optional accessory.

Note

When installing a domestic hot water tank, observe the respective installation instructions enclosed with each model. The installation instructions may contain important information about specific water quality requirements and about additional accessories, which are needed for the installation of the tank in the heating system and which must be provided by the client.

4.8.1.1 Stainless steel domestic hot water tanks

PAW-TD20C1E5 / PAW-TD30C1E5 / PAW-TD30C1E5-HI

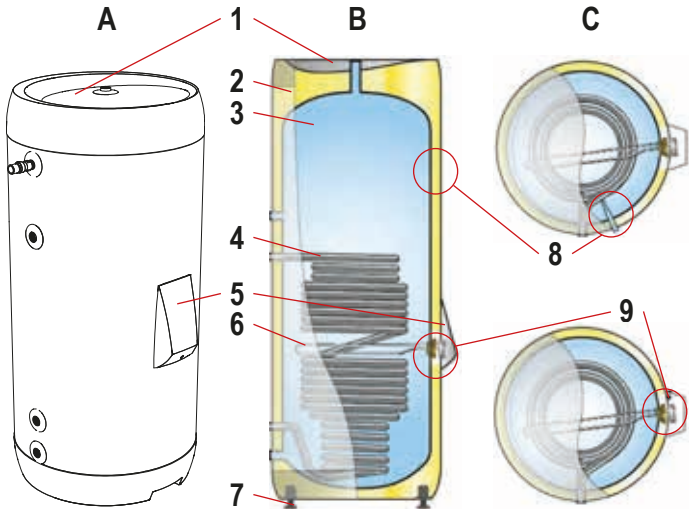
PAW-TD20C1E5

PAW-TD30C1E5

PAW-TD30C1E5-HI

These compact hot water tanks are made of stainless steel, which guarantees a long life cycle. They are available in two different sizes with 200 and 300 litre capacities. All three models with energy efficiency class A need no sacrificial anode and are maintenance-free.

Components

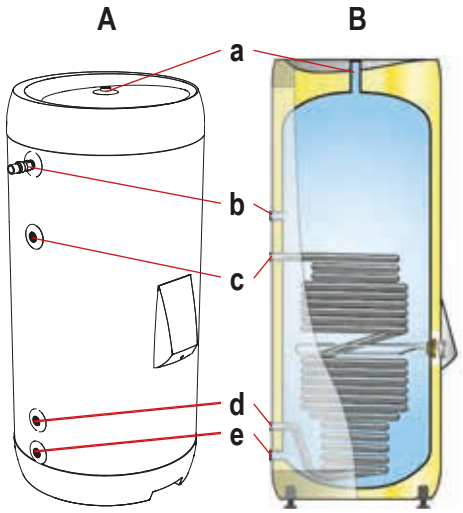


A External view
B Internal view (seen from front side)
1 Lid
2 Heat insulation
3 Hot water tank
4 Heat exchanger coil
5 Connection box cover
6 Electric tank heater
7 Adjustable foot (x 4)

C Internal view (seen from top side)
8 Temperature sensor (PAW-TD20C1E5, PAW-TD30C1E5-HI)
9 Temperature sensor (PAW-TD30C1E5)

Note: Schematic figure of TD30C1E5 shown as an example for all models.

Connections

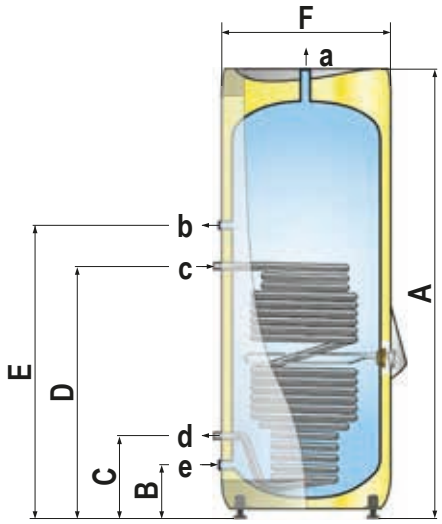


	Connection	PAW-TD20C1E5	PAW-TD30C1E5	PAW-TD30C1E5-HI
a	Hot water outlet	3/4“ BSP female	3/4“ BSP female	3/4“ BSP female
b	Circulation pipe inlet	3/4“ BSP female	3/4“ BSP female	3/4“ BSP female
c	Supply water inlet from the heat pump	3/4“ BSP female	3/4“ BSP female	3/4“ BSP female
d	Return water outlet to the heat pump	3/4“ BSP female	3/4“ BSP female	3/4“ BSP female
e	Fresh water inlet	3/4“ BSP female	3/4“ BSP female	3/4“ BSP female

Unit: Inches (")

Note: Schematic figure of TD30C1E5 shown as an example for all models.

Dimensions



Dimension	PAW-TD20C1E5	PAW-TD30C1E5	PAW-TD30C1E5-HI
A	1,270	1,750	1,750
B	155	155	155
C	266	266	266
D	866	866	1,245
E	966	1,036	1,245
F (Ø)	595	595	595

Unit: mm

Note: Schematic figure of TD30C1E5 shown as an example for all models.

Technical data

Domestic hot water tanks			Stainless steel hot water tanks		
Model			PAW-TD20C1E5	PAW-TD30C1E5	PAW-TD30C1E5-HI
Water volume		l	192	284	280
Max. water temperature		°C	75	75	75
Dimensions	Height / Diameter	mm	1,270 / 595	1,750 / 595	1,750 / 595
Weight (net / incl. water filling)		kg	50 / —	61 / —	65 / -
Power of electric tank heater		kW	1.5	1.5	1.5
Power supply		V	230	230	230
Material inside the tank			Stainless steel	Stainless steel	Stainless steel
Heat exchanger surface		m²	1.8	1.8	2.35
Energy loss in standby at 65 °C [1]		kWh/24 h	1.01	1.18	1.18
3 way valve accessory PAW-3WYVLV-HW or CZ-NV1			Optional	Optional	Optional
20 m temperature sensor cable included			Yes	Yes	Yes
Energy losses		W	42	49	49
Energy efficiency class [2]			A	A	A
Warranty of the inner vessel			2 Years	2 Years	2 Years
Maintenance required			No	No	No

1 Insulation tested according to EN 12897

2 Energy efficiency class scale from A+ to F.

Note: Stainless Steel Tanks are produced by OSO.

4.8.1.2 Enamelled domestic hot water tanks

With their generously dimensioned heating surfaces for increased heat transfer, the enamelled hot water tanks are optimally suited for combination with Aquarea heat pumps. They are all equipped with a sacrificial anode for improved protection against corrosion and reach a maximum supply water temperature of 95 °C.

PAW-TA15C1E5STD / PAW-TA20C1E5STD / PAW-TA30C1E5STD / PAW-TA40C1E5STD

PAW-TA15C1E5STD

PAW-TA20C1E5STD
PAW-TA30C1E5STD

PAW-TA40C1E5STD

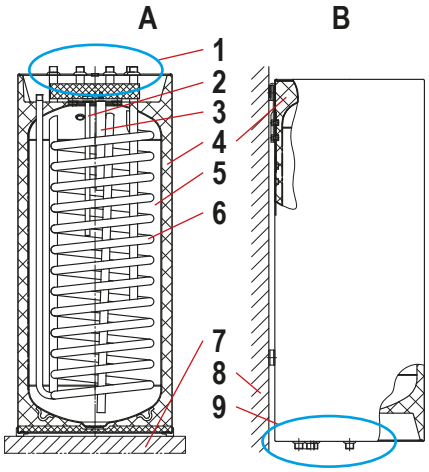
With their generously dimensioned heating surfaces for increased heat transfer, the enamelled hot water tanks are optimally suited for combination with Aquarea heat pumps.

PAW-TA15C1E5STD has a capacity of 150 litres, no electric tank heater and is suitable for floor-standing or wall-mounted installation.

The other three tanks have capacities of 200, 300 and 400 litres respectively, an electric tank heater with flange connection in the lower tank area, and they can only be installed standing in vertical position.

4

Components



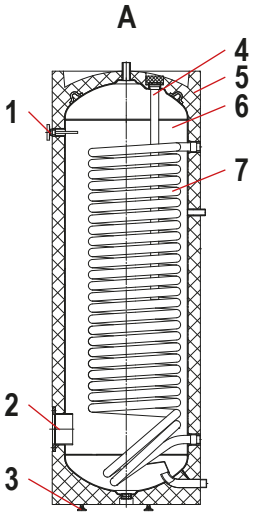
PAW-TA15C1E5STD

A Internal view (seen from front side) for floor-standing installation

1 Water piping connections on top side
2 Immersion tube for control
3 Sacrificial magnesium anode
4 Heat insulation
5 Hot water tank
6 Heat exchanger coil
7 Floor

B External view (seen from left side) for wall-mounted installation

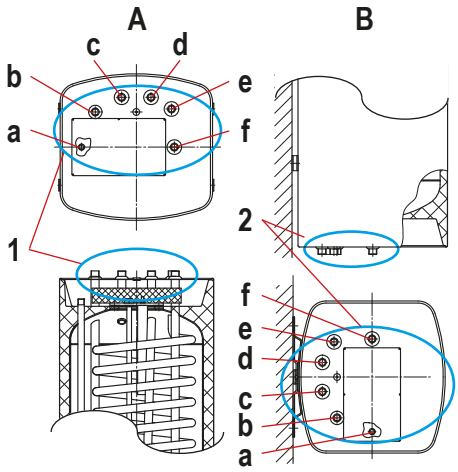
4 Heat insulation
8 Wall
9 Water piping connections on bottom side



A Internal view
1 Thermometer
2 Cover of electric tank heater (Ø 180 mm)
3 Adjustable foot (x 3, 120° angle)
4 Sacrificial magnesium anode
5 Heat insulation (50 mm thick)
6 Hot water tank
7 Heat exchanger coil

PAW-TA20C1E5STD / PAW-TA30C1E5STD / PAW-TA40C1E5STD

Connections



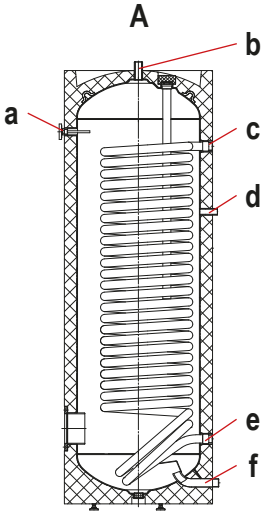
A Top view for floor-standing installation
1 Detail view of water piping connections on top side

B Bottom view for wall-mounted installation
2 Detail view of water piping connections on bottom side

	Connection	PAW-TA15C1E5STD
a	Air purge outlet	G 1/2”
b	Hot water outlet	G 3/4”
c	Return water outlet to the heat pump	G 3/4”
d	Fresh water inlet	G 3/4”
e	Supply water inlet from the heat pump	G 3/4”
f	Circulation pipe inlet	G 3/4”

Unit: Inches (")

PAW-TA15C1E5STD

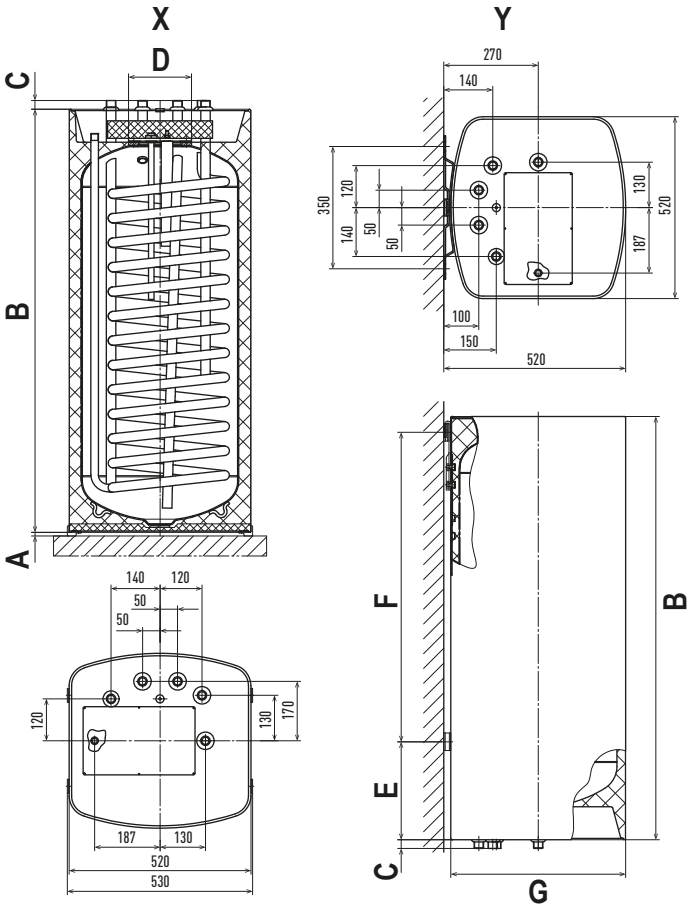


	Connection	PAW-TA20C1E5STD	PAW-TA30C1E5STD	PAW-TA40C1E5STD
a	Thermometer	G 1/2”	G 1/2”	G 1/2”
b	Hot water outlet	G 1”	G 1”	G 1”
c	Supply water inlet from the heat pump	G 1”	G 1”	G 1”
d	Circulation pipe inlet	G 3/4” (160 – 400 l), G 1” (500 l)	G 3/4” (160 – 400 l), G 1” (500 l)	G 3/4” (160 – 400 l), G 1” (500 l)
e	Return water outlet to the heat pump	G 1”	G 1”	G 1”
f	Fresh water inlet	G 1”	G 1”	G 1”

Unit: Inches (")

PAW-TA20C1E5STD / PAW-TA30C1E5STD / PAW-TA40C1E5STD

Dimensions

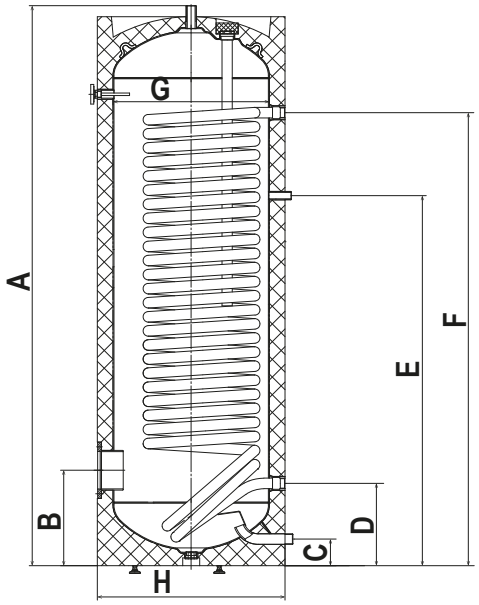


PAW-TA15C1E5STD

X Floor-standing installation
Y Wall-mounted installation

Dimension	PAW-TA15C1E5STD
A	10
B	1,210
C	25
D (Ø)	180
E	280
F	885
G (Ø)	500

Unit: mm



PAW-TA20C1E5STD / PAW-TA30C1E5STD / PAW-TA40C1E5STD

Dimension	PAW-TA20C1E5STD	PAW-TA30C1E5STD	PAW-TA40C1E5STD
A	1,340	1,797	1,832
B	305	305	345
C	85	85	85
D	263	263	320
E	803	983	1,000
F	966	1,036	1,245
G (Ø inside)	500	500	570
H (Ø outside)	610	610	680

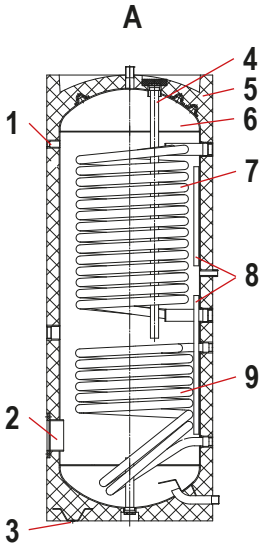
Unit: mm

PAW-TA30C2E5STD

PAW-TA30C2E5STD

This enamelled hot water tank offers, besides all the above-mentioned properties, the additional option of using it as a bivalent tank with two heat exchangers e.g. for combination with a solar system.

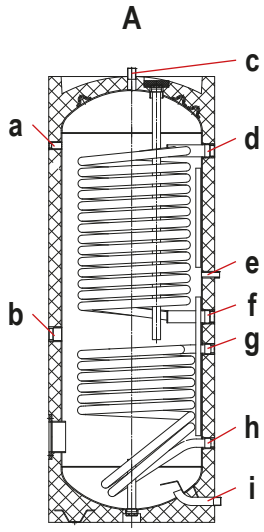
Components



A Internal view

1 Thermometer
2 Cover of electric tank heater (Ø 180 mm)
3 Adjustable foot (x 3, 120° angle)
4 Sacrificial magnesium anode
5 Heat insulation
6 Hot water tank
7 Heat exchanger coil 1 (heat pump circuit)
8 Sensor channel
9 Heat exchanger coil 2 (solar circuit)

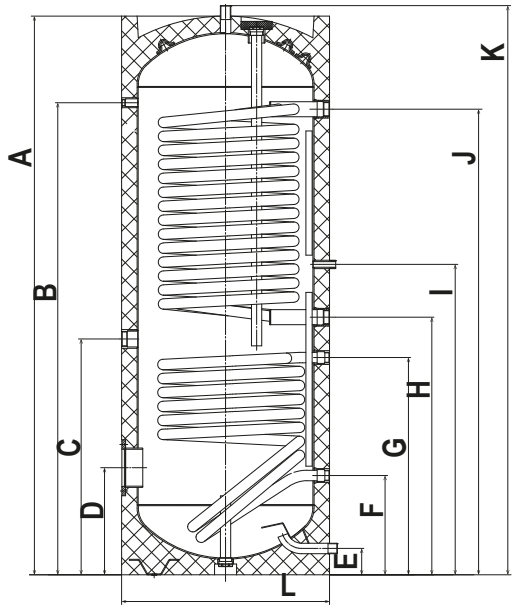
Connections



	Connection	PAW-TA30C2E5STD
a	Thermometer	G 1/2"
b	Additional electric heater (optional)	G 6/4"
c	Hot water outlet	G 1"
d	Supply water inlet from the heat pump	G 5/4"
e	Circulation pipe inlet	G 3/4"
f	Return water outlet to the heat pump	G 5/4"
g	Supply water inlet from the solar system	G 1"
h	Return water outlet to the solar system	G 1"
i	Fresh water inlet	G 1"

Unit: Inches (")

Dimensions



Dimension	PAW-TA30C2E5STD
A	1,800
B	1,521
C	760
D	345
E	85
F	320
G	700
H	830
I	1,000
J	1,500
K	1,834
L (Ø)	670

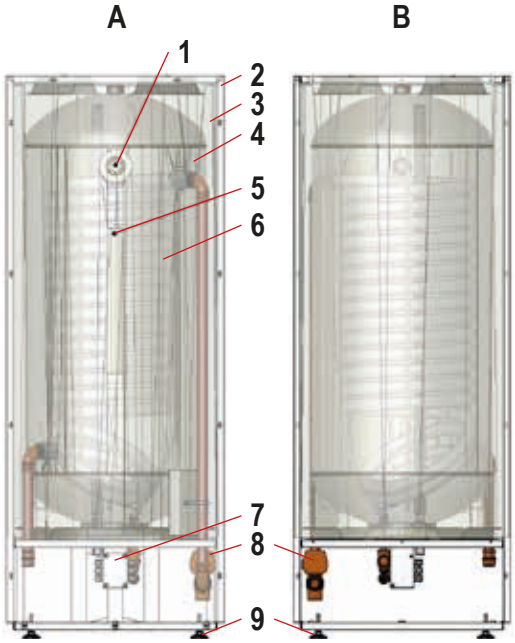
Unit: mm

PAW-TA20C1E5C

PAW-TA20C1E5C

This enamelled hot water tank has a square footprint and the outer dimensions of a regular household device like e.g. a refrigerator. It is best suited for combinaion with the Panasonic Heat recovery ventilation unit, because the ventilation unit has the same footprint and fits perfectly on top the compact hot water tank.

Components



A Internal view (seen from front side)
1 Sacrificial magnesium anode
2 Square housing
3 Heat insulation
4 Hot water tank
5 Water temperature sensor
6 Heat exchanger coil
7 Connection box (for 3-way valve and sensor)

B Internal view (seen from rear side)
8 3-way valve
9 Adjustable foot (x 4)

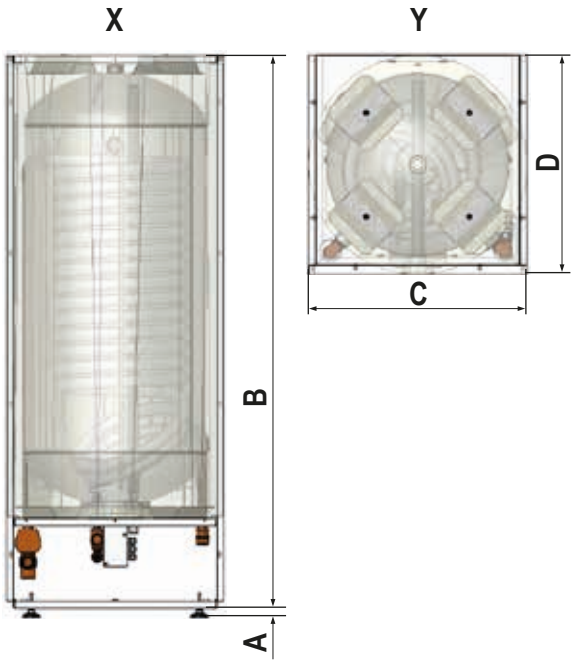
Connections

	Connection	PAW-TA20C1E5C
a	Supply water outlet to heating circuit	1"
b	Supply water inlet from the heat pump	1"
c	Circulation pipe inlet (plugged)	1/2"
d	Fresh water inlet	3/4"
e	Hot water outlet	3/4"
f	Return water outlet to the heat pump	1"

Unit: Inches (")

4

Dimensions



X Rear view
Y Top view

Dimension	PAW-TA20C1E5C
A	0 – 20
B	1,530
C	600
D	600

Unit: mm

Technical Data

Domestic hot water tanks			Enamelled hot water tanks				Enamelled hot water tank with 2 heat exchangers (bivalent: Solar + HP)	Square Tank
Model			**PAW-TA15C1E5STD**	**PAW-TA20C1E5STD**	**PAW-TA30C1E5STD**	**PAW-TA40C1E5STD**	**PAW-TA30C2E5STD**	**PAW-TA20C1E5C**
Water volume		l	150	200	290	380	350	200
Max. water temperature		°C	95	95	95	95	95	95
Dimensions	Height / Diameter	mm	1,210 / 520	1,340 / 610	1,800 / 610	1,835 / 670	1,835 / 670	1,550 x 600 x 600
Weight (net / incl. water filling)		kg	109 / 254	90 / 280	120 / 389	191 / 572	169 / 519	134 / 327
Power of electric tank heater		kW	—	3.00	3.00	3.00	3.00	—
Power supply		V	—	230	230	230	230	—
Material inside the tank			Enamelled	Enamelled	Enamelled	Enamelled	Enamelled	Enamelled
Heat exchanger surface		m²	1.2	1.8	2.6	3.8	3.5 / 1.2	1.83
Energy loss in standby at 65 °C [1]		kWh/24 h	1.45	1.37	1.61	1.76	1.76	1.37
3 way valve accessory PAW-3WYVLV-HW or CZ-NV1			Optional	Optional	Optional	Optional	Optional	Built-in 3 way valve
20 m temperature sensor cable included			Yes	Yes	Yes	Yes	Yes	Yes
Energy losses		W	60	57	67	73	73	57
Energy efficiency class [2]			C	B	B	B	B	B
Warranty of the inner vessel			5 years	5 years	5 years	5 years	5 years	5 years
Maintenance required			Every 2 years	Every 2 years	Every 2 years	Every 2 years	Every 2 years	Every 2 years

1 Insulation tested according to EN 12897

2 Energy efficiency class scale from A+ to F.

Note: Enamelled Tanks and Square Tank are produced by AEmail.

4.8.2 Buffer Tanks

PAW-BTANK50L-2

PAW-BTANK100L

PAW-BTANK200L

PAW-BTANK300L

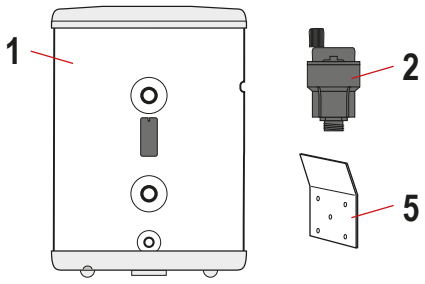
Panasonic offers a variety of stainless steel buffer tanks in different sizes. A buffer tank can reduce the number of start and stop sequences for the air/water heat pump, thus prolonging the lifecycle of the heat pump, increasing the energy efficiency of the heating system and providing greater comfort.

Note

When installing a buffer tank, observe the respective installation instructions enclosed with each model. The installation instructions may contain important information about specific water quality requirements and about additional accessories, which are needed for the installation of the tank in the heating system and which must be provided by the client.

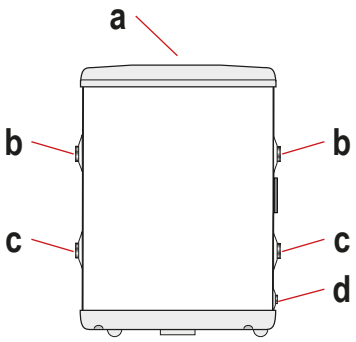
PAW-BTANK50L-2 / PAW-BTANK100L

Components



1 Buffer tank with sensor bracket
2 Automatic air vent (included)
3 Drain cock (included)
4 1“ brass plug with o-ring seal (included)
5 Wall bracket (incl. only for PAW-BTANK50L-2)

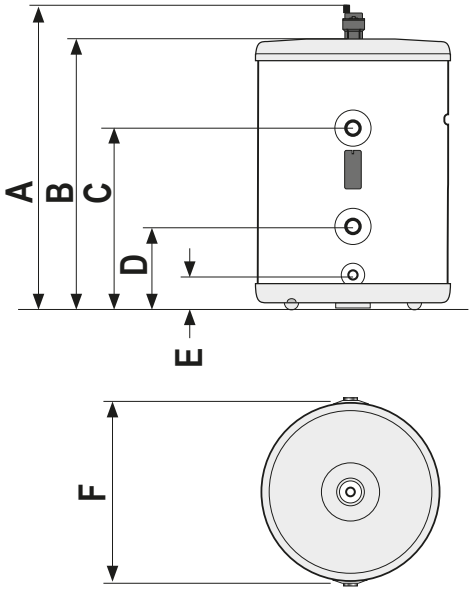
Connections



	Connection	PAW-BTANK50L-2 / PAW-BTANK100L
a	Air purge valve	1/2" BSPP female
b	Upper supply/return connection	1" BSPP female
c	Lower supply/return connection	1" BSPP female
d	Drain valve	1/4" BSPP female

Unit: Inches (")

Dimensions

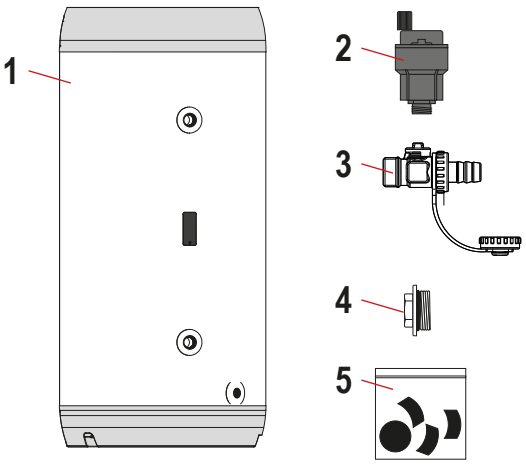


Dimension	PAW-BTANK50L-2	PAW-BTANK100L
A	704	1,243
B	636	1,175
C	422	962
D	192	192
E	96	96
F (Ø)	435	435

Unit: mm

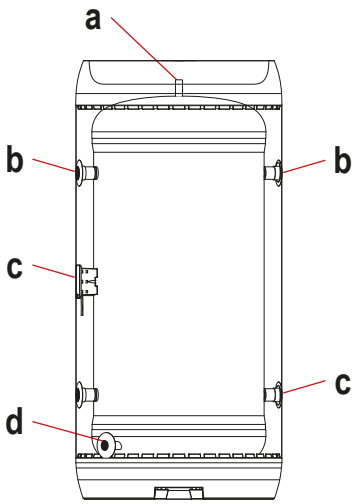
PAW-BTANK200L / PAW-BTANK300L

Components



1 Buffer tank with sensor bracket
2 Automatic air vent (included)
3 Drain cock (included)
4 1“ brass plug with o-ring seal (included)
5 Cooling kit (insulation pads to be fitted on cooling systems to avoid condensation)

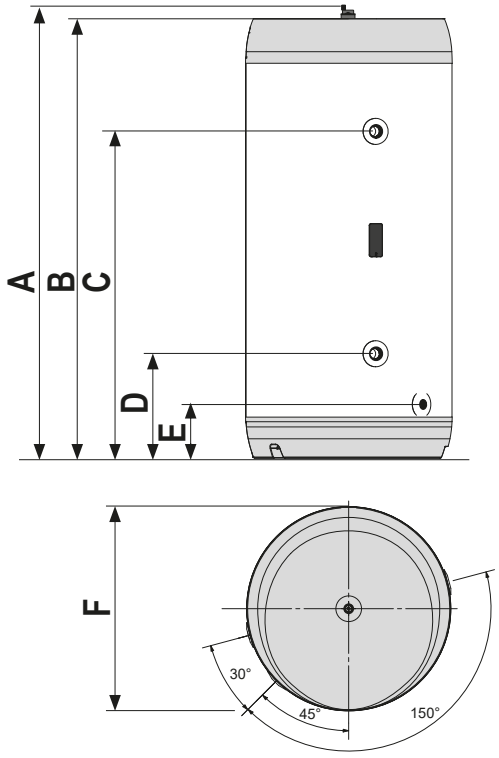
Connections



	Connection	PAW-BTANK200L / PAW-BTANK300L
a	Air purge valve	1/2" BSPP female
b	Upper supply/return connection	1" BSPP female
c	Lower supply/return connection	1" BSPP female
d	Drain valve	1/2" BSPP female

Unit: Inches (")

Dimensions



Dimension	PAW-BTANK200L	PAW-BTANK300L
A	1,340	1,820
B	1,275	1,755
C	941	1,421
D	301	301
E	155	155
F (Ø)	595	595

Unit: mm

Technical data

Buffer tanks					
Model		PAW-BTANK50L-2	PAW-BTANK100L	PAW-BTANK200L	PAW-BTANK300L
Capacity	l	48	100	199	289
Energy losses	W	35	55	50	66
Energy Efficiency Class (scale from A+ to F)		B	C	B	B
Material		Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
Dimension (Hight / Diameter)	mm	636 / 430	1175 / 430	1275 / 595	1755 / 595
Net weight	kg	17	28	47	57

Notes: Automatic air vent and drain cock are included. Built-in sensor pocket (sensor not included). Buffer Tanks are produced by OSO.

4.8.3 Combo Tanks

The Combo Tanks are modern high-performance tanks, which were developed especially for the requirements of the Aquarea heat pumps. They are a combination of a larger domestic hot water tank located in the upper area of the tank and a smaller buffer tank located in the lower area. This makes the Combo Tanks an ideal solution to supply a household with domestic hot water and heating for radiators or underfloor heating. These compact models ensure very low standby losses and quick assembly due to the pre-installed assembly groups such as 3-way valve or electric tank heater (with safety thermostat and error signal contact)

The use of a Combo Tank helps implement multiple functions efficiently and easily, such as:

- Domestic hot water production
- Hydraulic disconnection of heat pump and heat consumer circuits
- Ensuring minimum required water volume in the heating system
- Buffer function for optimum operation of the Aquarea heat pumps

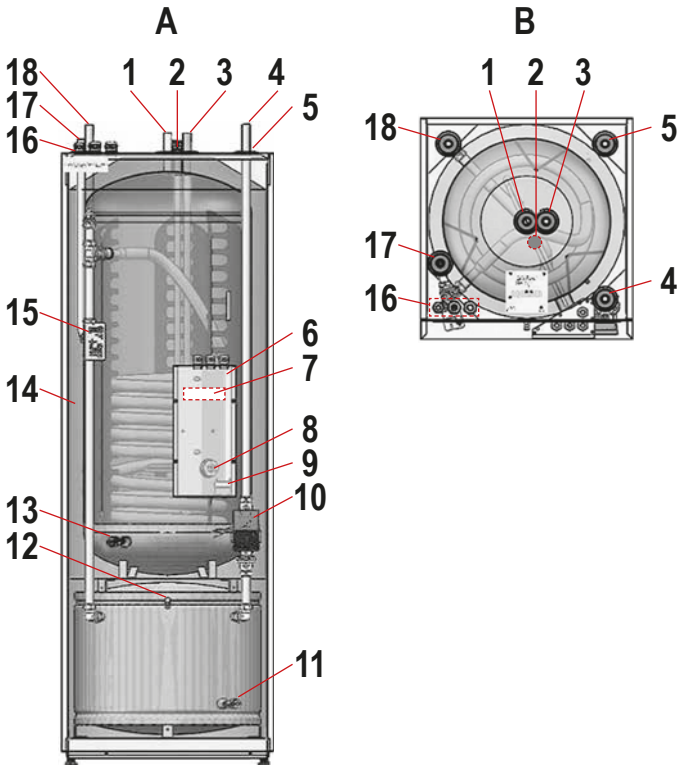
Panasonic offers one enamelled Combo Tank (PAW-TD20B8E3-2) and one stainless steel Combo Tank (PAW-TD23B6E5).

Note

When installing a Combo Tank, observe the respective installation instructions enclosed with each model. The installation instructions may contain important information about specific water quality requirements and about additional accessories, which are needed for the installation of the tank in the heating system and which must be provided by the client.

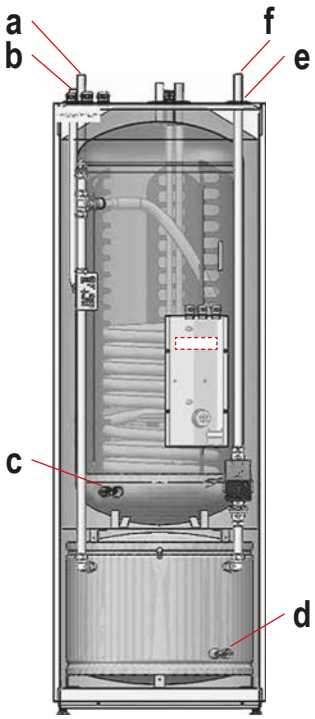
Enamelled Combo Tank: PAW-TD20B8E3-2

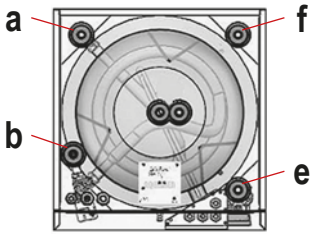
Components



A	**Internal view (seen from front side)**
B	**Top view**
1	Hot water outlet
2	Sacrificial anode
3	Fresh water inlet
4	Supply water outlet to heating circuit
5	Return water inlet from heating circuit (only seen in top view)
6	Connection box
7	Connection terminal block (for 3-way valve, heating circuit pump, electric tank heater and temperature sensor)
8	Electric tank heater (3 kW)
9	Overheating protection
10	Circulation pump (High efficiency pump)
11	Drain valve of the buffer tank
12	Air purge valve
13	Drain valve of the hot water tank
14	Heat insulation (Polyurethane, 50 mm)
15	3-way-valve
16	Cable gland (x 3)
17	Supply water inlet from the heat pump
18	Return water outlet to the heat pump

Connections



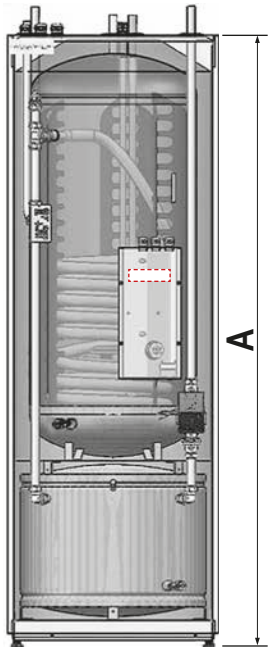


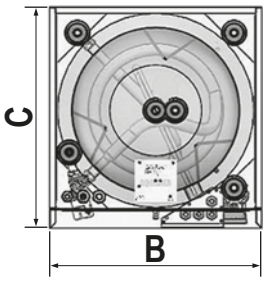
	Connection	PAW-TD20B8E3-2
a	Return water outlet to the heat pump	3/4" (male)
b	Supply water inlet from the heat pump	3/4" (male)
c	Drain valve of the hot water tank	1/2" (female)
d	Drain valve of the buffer tank	1/2" (female)
e	Supply water outlet to heating circuit	3/4" (male)
f	Return water inlet from heating circuit	3/4" (male)

Unit: Inches (")

4

Dimensions



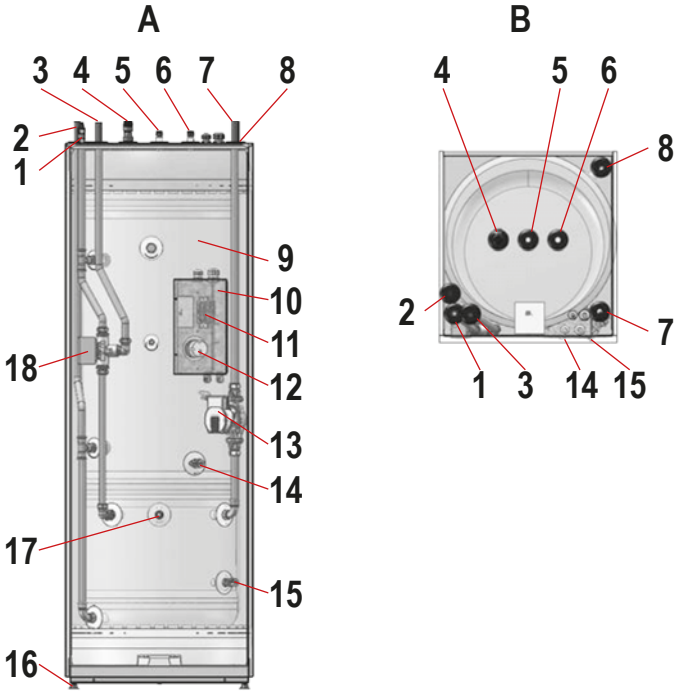


Dimension	PAW-TD20B8E3-2
A	1,770
B	640
C	690

Unit: mm

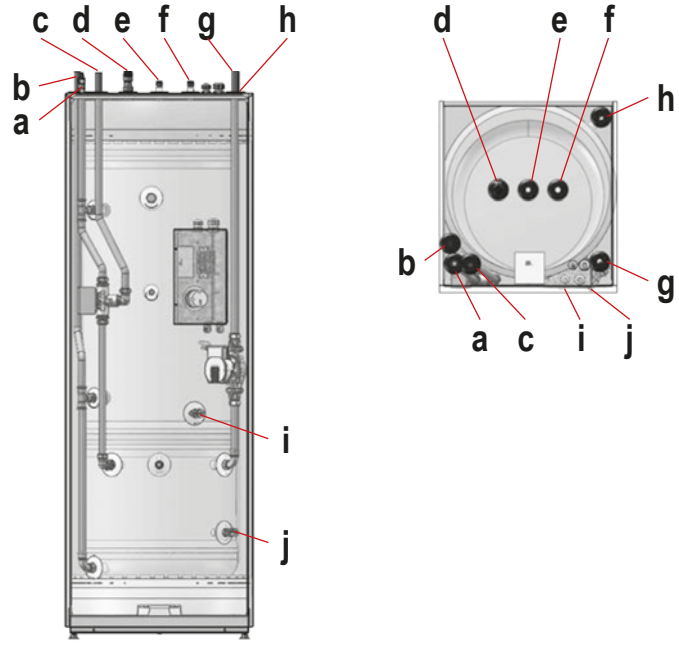
Stainless steel Combo Tank: PAW-TD23B6E5

Components



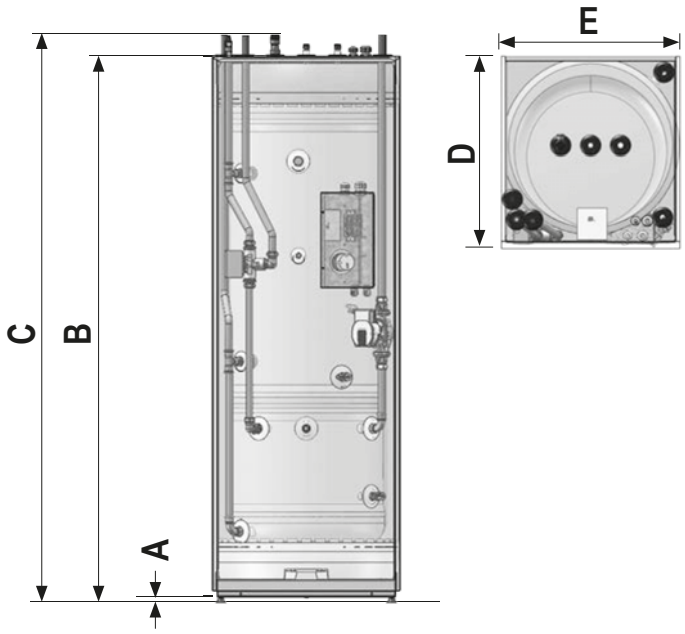
A Internal view (seen from front side)
B Top view
1 Air purge valve for DHW tank
2 Return water outlet to the heat pump
3 Supply water inlet from the heat pump
4 Temperature and pressure valve
5 Hot water outlet
6 Fresh water inlet
7 Supply water outlet to heating circuit
8 Return water inlet from heating circuit (only seen in top view)
9 Domestic hot water tank
10 Connection box
11 Connection terminal block
12 Electric tank heater
13 Circulation pump
14 Drain valve of the hot water tank
15 Drain valve of the buffer tank
16 Adjustable foot (x 4)
17 Air purge valve of the buffer tank
18 3-way-valve

Connections



	Connection	PAW-TD23B6E5
a	Air purge valve for hot water tank	1/8"
b	Return water outlet to the heat pump	22 mm
c	Supply water inlet from the heat pump	22 mm
d	Temperature and pressure valve	3/4"
e	Hot water outlet	22 mm
f	Fresh water inlet	22 mm
g	Supply water outlet to heating circuit	22 mm
h	Return water inlet from heating circuit	22 mm
i	Drain valve of the hot water tank	DN15
j	Drain valve of the buffer tank	DN15

Dimensions



A Internal view (seen from front side)
B Top view

Dimension	PAW-TD23B6E5
A	17 – 37
B	1,751
C	1,853
D	646
E	599

Unit: mm

Technical Data

Combo Tanks		Enamelled		Stainless steel	
Model		PAW-TD20B8E3-2		PAW-TD23B6E5	
Dimension H x W x D	mm	1,770 x 640 x 690		1,750 x 600 x 646	
Weight (empty)	kg	150		111	
Volume	l	185 + 80		230 + 60	
Power supply	V / Phase / Hz	230 / 1 / 50		230 / 1 / 50	
		Hot water tank	Buffer tank	Hot water tank	Buffer tank
Volume	l	185	80	230	60
Max working pressure	MPa (bar)	0.8 (8)	0.6 (6)	1.0 (10)	0.3 (3.0)
Pressure test	MPa (bar)	1.2 (12)	0.9 (9)	1.5 (15)	0.39 (3.9)
Max working temp	°C	90	90	80	80
Connections	mm	Ø22	Ø22	Ø22	Ø22, copper
Material		S 275 JR vitrified	S235 JR	EN 14521	EN 14521
Insulation (material / thickness)	– / mm	PUR / 50	PUR / 40	PUR / 50	PUR / 50
Heating coil surface	m²	2.1	—	1.8	—
Electrical heater	W	3000	—	2800	—
Energy loss at 65 °C [1]	kWh/24h	1.3	—	1.25	—
Energy efficiency class [2]		B	B	B	A
Standing loss	W	53	46	52	29

1 Tested pursuant to EN 12897:2006.
2 According to EU Regulation 812/2013.
Note: Enamelled Combo Tank is produced by Lapesa. Stainless Steel Combo Tank is produced by OSO.

4.8.4 Residential ventilation unit with heat recovery

PAW-A2W-VENTA-L / PAW-A2W-VENTA-R

PAW-A2W-VENTA-L

PAW-A2W-VENTA-R

The Panasonic residential ventilation unit with heat recovery is designed to serve two important purposes: ensuring a good indoor air quality and recovering heat that would otherwise be lost through manual ventilation.

The ventilation unit provides fresh filtered outside air to a residential building while keeping a high thermal comfort within the building by using the exhaust indoor air to precondition the incoming air, leading to lower heating requirements in the building. To this end, the unit is equipped with a highly energy-efficient rotary heat exchanger with EC technology fans.

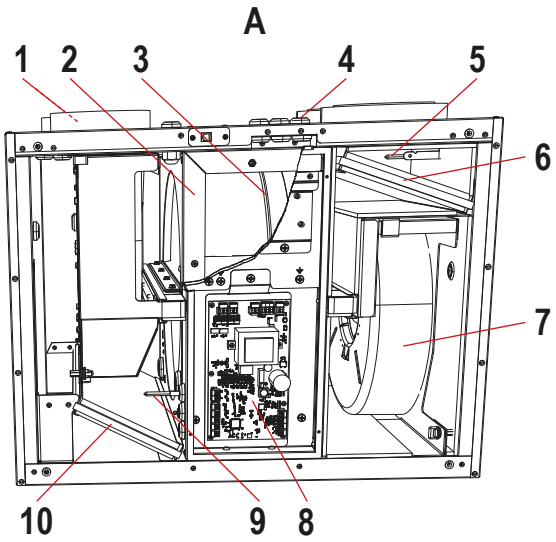
For a space-saving solution, the compact ventilation unit is optimised for installation atop the Panasonic Square Tank (PAW-TA20C1E5C) or the Aquarea All in One Compact indoor units (WH-ADC0309J3E5C, WH-ADC1216H6E5C). However, it can also be combined with Aquarea mono-bloc or bi-bloc systems. In all these cases, the residential ventilation unit and the Aquarea heat pump can be controlled with one single user-friendly controller.

The residential ventilation unit is available in two versions: with the supply air connection on the left-hand side (PAW-A2W-VENTA-L) or on the right-hand side (PAW-A2W-VENTA-R).

Note

When installing a residential ventilation unit, observe the respective installation instructions enclosed with each model. The installation instructions may contain important information about additional accessories, which are needed for the installation and which must be provided by the client.

Components

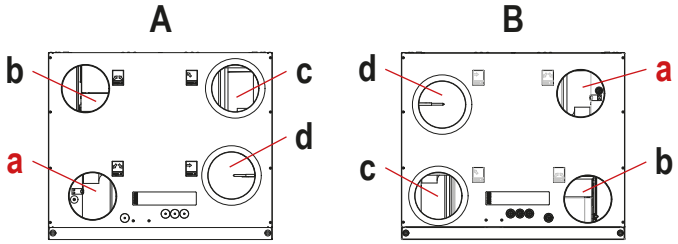


A Internal view (seen from front side)

1 Supply air sensor (only visible from top)
2 Rotating heat exchanger
3 Drive belt for rotating heat exchanger
4 Cable glands for external PCB connections
5 Outdoor air sensor
6 Supply air filter
7 Exhaust air fan
8 Main printed circuit board (PCB)
9 Relative humidity/Extract air temperature sensor
10 Exhaust air filter

Note: Internal view of PAW-A2W-VENTA-L shown as an example.

Duct connections



PAW-A2W-VENTA-L PAW-A2W-VENTA-R

A PAW-A2W-VENTA-L
B PAW-A2W-VENTA-R

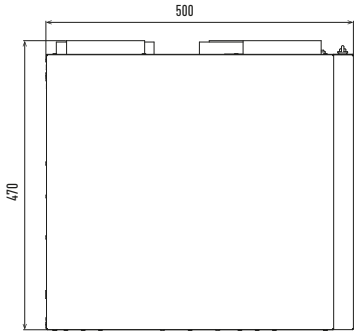
	Duct connection	Diameter
a	Supply air connection	125
b	Return air connection	125
c	Exhaust air connection	125
d	Outdoor air connection	125

Unit: mm

Dimensions

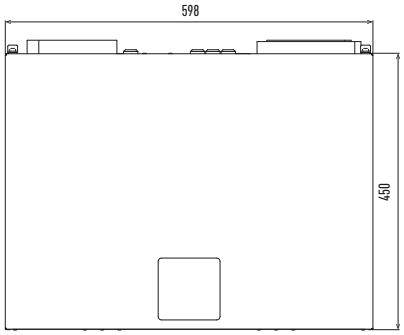
PAW-A2W-VENTA-L/-R

Left side view



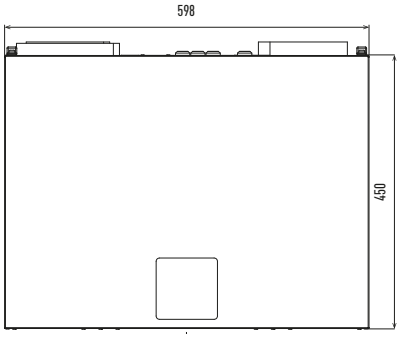
PAW-A2W-VENTA-L

Front view



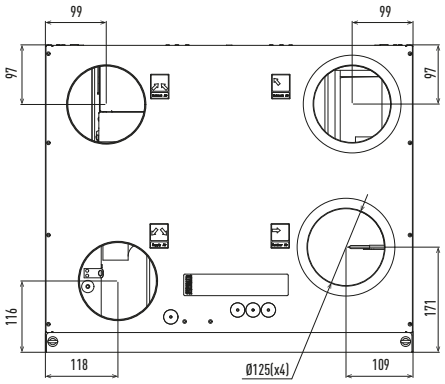
PAW-A2W-VENTA-R

Front view



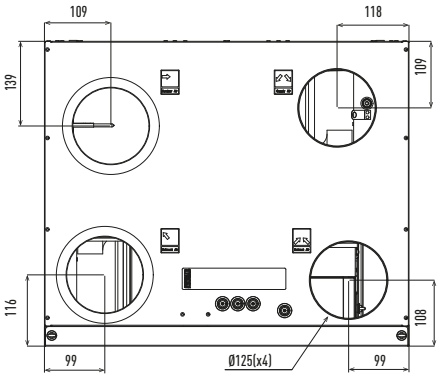
PAW-A2W-VENTA-L

Top view



PAW-A2W-VENTA-R

Top view



Unit: mm

Technical data

Heat recovery Ventilation unit		PAW-A2W-VENTA-L	PAW-A2W-VENTA-R
Supply side		Left	Right
Nominal airflow rate @ 50 Pa	m³/h	204	
Maximum airflow rate @ 100 Pa	m³/h	292	
Specific fan power (SFP) @ 204 m³/h		1.24	
Heat exchanger rotor drive type		Variable speed	
Exchanger type		Rotating	
Heat recovery efficiency 1		84 %	
Power supply	V / Ph / Hz	230 / 1 / 50	
Power consumption	W	176	
Energy Class, basic unit		A	
Energy Class, unit with local control on demand		A	
Noise level	dB(A)	40	
Dimension (W x H x D)	mm	598 x 450 x 500	
Weight	kg	46	
Mounting position		Vertical	

Heat recovery Ventilation unit		PAW-A2W-VENTA-L	PAW-A2W-VENTA-R
Duct connections	mm	DN125	
Filter class, supply air		F7/ePM1 60 %	
Filter class, exhaust air		M5/ePM10 50 %	
Minimum outdoor temperature	°C	-20	

1) Heat recovery efficiency according to EN 13141-7.

Note:

Heat recovery Ventilation unit is produced by Systemair.

4.8.5 Recommended on-site accessories

Panasonic recommends the following on-site accessories It is particularly advisable to use building components and accessories recommended by the manufacturer. Use the correct interfaces (→ *4.7.2 External interfaces (inputs/outputs), p. 65*) and connection conditions when connecting the accessories.

Overview of the specifications of the recommended on-site accessories

Construction / Indoor unit type							Bi-bloc systems					Mono-bloc systems	
							with All in One unit			with hydrokit			
Device generation							J / H			F	J / H	G	J / H
Model type (configuration)							–	B	C				
No.	Component	Quantity	Description	Model	Power supply	Make							
A	2-way valve set	1	Electrical motor actuator	SFA21/18	230 V AC	Siemens	●[2]	●[2]	●[2]	●[2]	●[2]	●[2]	●[2]
			2-way valve	VVI46/25	–								
B	3-way valve set	2	Electrical motor actuator	SFA21/18	230 V AC	Siemens	●	●	●	●	●	●	●
			3-way valve	VXI46/25	–								
C	Room thermostat	1	Analogue	RAA20	230 V AC	Siemens	●	●	●	●	●	●	●
			Programmable	REV200									
D	Room thermostat	1	Wired	PAW-A2W-RTWIRED	230 V AC	[1]	●	●	●	●	●	●	●
			Wireless	PAW-A2W-RTWIRELESS	230 V AC	[1]							
E	Mixing valve	1	–	167032	230 V AC	Caleffi	●	[3]	●	●	●	●	●
F	Pump	1	–	Yonos 25/6	230 V AC	Wilo	●	[3]	●		●		●
G	Temperature sensor for buffer tank	1	–	PAW-A2W-TSBU	–	[1]	●	[3]	●		●		●
H	Outdoor temperature sensor	1	–	PAW-A2W-TSOD	–	[1]	●	[3]	●		●		●
I	Inflow temperature sensor for heating circuit	1	–	PAW-A2W-TSHC	–	[1]	●	[3]	●		●		●
J	Room temperature sensor	1	–	PAW-A2W-TSRT	–	[1]	●	[3]	●		●		●
K	Solar sensor	1	–	PAW-A2W-TSSO	–	[1]	●	[3]	●		●		●
L	Base pan heater for outdoor/ mono-bloc units	1	Only for models with 3 or 5 kW	CZ-NE2P		Panasonic	●	●	●		●		●
M	Base pan heater for outdoor/ mono-bloc units	1	For all models after the F generation with > 5 kW	CZ-NE3P		Panasonic	●	●	●	●	●	●	●
N	Additional PCB for expanded controller functionality	1	–	CZ-NS4P		Panasonic	●	[3]	●		●		●
O	Interface for the control over the Internet via Aquarea Smart Cloud	1	–	CZ-TAW1		Panasonic	●	●	●		●		●
P	10 m extension cable for CZ-TAW1			CZ-TAW1-CBL		Panasonic							●

1 To be sourced through Panasonic
2 Only for unlocked cooling mode
3 Already installed at the time of dispatch

We recommend that the client-provided accessories be sourced from the manufacturers named in the table.

5 Planning

IMPORTANT

The planning of the heat pump system is described in this chapter with the example of Germany, i.e. some of the legal regulations, planning aids, information sources, parameters, promotion programmes etc. may apply only to Germany. For planning a heat pump system in other European countries, the corresponding specifications and information sources must be determined and taken into account when planning.

Planning steps

There are multiple steps involved in planning the heat pump system. The list of individual steps given below also points to the corresponding sections in which the concrete planning steps are described:

1. Refrigeration technology and performance criteria (→ *5.1, p. 92*)
   > Determination of design outside temperature θe and design heat load (→ *5.1.1, p. 92*)
   > Determination of the domestic hot water demand (→ *5.1.2, p. 93*)
   > Determination of the heating surface temperature (→ *5.1.3, p. 94*)
   > Operating mode and determination of the bivalence point (→ *5.1.4, p. 94*)
   > Determination of the pipe length correction factor for bi-bloc systems (→ *5.1.5, p. 95*)
   > Example: Calculation of the total heating capacity required (→ *5.1.6, p. 95*)
   > Cooling (→ *5.1.7, p. 96*)
2. Installation criteria (→ *5.2, p. 97*)
   > Acoustics (→ *5.2.1, p. 97*)
   > Installation of a bi-bloc system (→ *5.2.2, p. 100*)
   > Installation of a mono-bloc system (→ *5.2.3, p. 109*)
3. Hydraulics (→ *5.3, p. 112*)
4. Electricals (→ *5.4, p. 116*)
5. Heating and cooling capacity depending on supply water temperature and outside temperature (→ *5.5, p. 128*)
6. Application examples (→ *5.6, p. 136*)

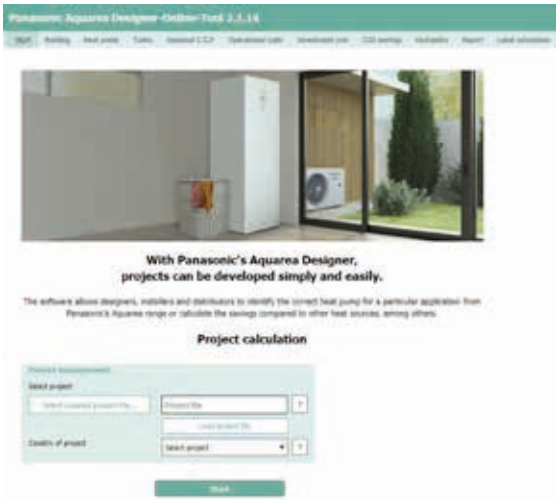
Planning with Panasonic Aquarea Designer Online Tool

For easy and quick calculation as well as optimisation of heating systems with heat pump, Panasonic offers the Aquarea Designer Online Tool, which is accessible for free on www.PanasonicProClub.com.

The online tool offers the following functions:

- Design of the heat pump based on the building and consumption data
- Design calculation based on the integrated climate and weather database
- Quick selection of the suitable heat pump
- Calculation of the Bivalence point
- Calculation of the seasonal coefficient of performance
- Cost comparison
- Report download possible

View of the initial screen of the Panasonic Aquarea Designer Online Tool



5.1 Refrigeration technology and performance criteria

5.1.1 Determination of design outside temperature and design heat load

The heat load of a building is determined according to EN 12831 “Energy performance of buildings - Method for calculation of the design heat load” and the possible valid national appendices and is seen in the planning documents for new buildings. The design heat load is calculated for the design outside temperature θe. The design outside temperature is the lowest two-day average of the outside temperature, which has been reached or fallen below 10 times in 20 years. The design outside temperature is therefore suitable as the design point for the heat pump.

Example of Germany: Determination of the design outside temperature θe according to EN 12831 Annexure 1

Location	Design outside temperature θe (°C)	Annual average of the outside temperature (°C)
Berlin	-14	9.5
Bremerhaven	-10	9.0
Eisenach	-16	8.8
Frankfurt / Main	-12	10.2
Hamburg-Fuhlsbüttel	-12	8.5
Constance	-12	7.9
Magdeburg	-14	9.5
Munich	-16	7.9
Nuremberg	-16	7.9
Rostock-Warnemünde	-10	8.4

For existing buildings, you can alternatively use the approximate calculation method to determine the heating load as described below. It should serve as a reference point, because a number of factors play a role in the calculation, such as house type, heat insulation and the ventilation behaviour. In the course of the years, the specific heat requirement of buildings has dropped steadily due to the ever stricter heat insulation requirements. Due to this fact, the performances per square metre of heated living space stated in the table below can be used.

Example of Germany: Typical values for the specific heating load of residential buildings for rough determination of the design heat load

Existing building up to 1977	130 to 200 W / m²
Building after 1977	70 to 130 W / m²
Building after 1982	60 to 100 W / m²
Building after 1995	40 to 60 W / m²
Building after 2002	30 to 50 W / m²
Low energy house	25 to 40 W / m²
Ultra-low energy house	15 to 30 W / m²
Passive	10 W / m²

Example

In the case of a residential house in Frankfurt/Main from the year 1992 with a heated living space of 120 m², the design heat load thus calculated is 9.6 kW (80 W/m²).

The design outside temperature for the residential house can be read from the table of the design outside temperatures for the observed location with θe = -12 °C. The heat pump should therefore provide the determined heating capacity of 9.6 kW at an outside temperature of -12 °C.

IMPORTANT

The approximate calculation method shown only yields rough reference values for the heat load. For correct designing, a heating expert must precisely calculate the required heating capacity in order to provide the correct design. Panasonic cannot be held responsible for any wrong calculations under any circumstances.

5.1.2 Determination of the domestic hot water demand

The domestic hot water demand can only be estimated based on the following table for various comfort expectations.

Example of Germany: Typical domestic hot water demand per person for one or two family houses at 45 °C tapping temperature.

Comfort expectation	Daily requirement per person in litres (45 °C)	kW per person and day
Low	15 to 30	0.6 to 1.2
Normal	30 to 60	1.2 to 2.4
High	60 to 120	2.4 to 4.8
Washing machine or dishwasher with hot water mode	≈ 20 (See manufacturer's documents)	0.8

Depending on the number of persons and the comfort expectations, the domestic hot water demand can be very different. It is advisable to select the size of the domestic hot water tank according to the domestic hot water demand. It is important to make sure that the hot water output capacity required (e.g. 120 litres for a bath) is covered by the tank volume. At the same time, do not choose an unnecessarily large tank volume, to ensure low dwell time in the tank. For one and two family houses, the tank sizes given in the following table are recommended.

Example of Germany: Recommended tank sizes for one and two family houses

Persons	Tank volume
2 to 3	200 l
3 to 6	300 l
> 6	> 300 l

CAUTION

Danger of illnesses due to growth of Legionella in water

Legionella can grow in domestic hot water tanks, and can cause infectious diseases in humans.

► Respect European and national requirements for avoiding Legionella multiplication (example in Germany: DVGW Worksheet W551). For domestic hot water tanks with more than 400 litres volume as well as in buildings with more than two residential units, there may be higher requirements than for one and two family houses.

IMPORTANT

The domestic hot water demand has the highest influence on the degree of coverage of solar systems for domestic hot water production. A proven ratio between tank volume and the surface area of the solar collectors is between 50 to 80 litres per square metre of collector area.

Hot water circulation increases the heat demand for the domestic hot water production and can be up to 100 % of the heat load for domestic hot water production if the connection distance is very long. Hot water circulation pumps should therefore always be operated in a time- and temperature-dependent manner.

5.1.3 Determination of the heating surface temperature

The temperature of the heating surfaces at design outside temperature should not be taken any higher than 55 °C. Surface-embedded heating systems with a supply temperature of 35 °C and radiators with a supply temperature of 45 °C are recommended. When replacing heat sources with burners in existing buildings for an Aquarea heat pump, reduce the supply temperature as much as possible by using additional heat insulation and refurbishing measures. Conventional heat sources with burners are operated with supply temperatures up to 75 °C. By adapting proper refurbishing measures, the old radiators can often continue to be used at a lower temperature and thermal output. For this purpose, check on the basis of conversion factors, whether the heating capacity of the radiators suffices even at a lower supply temperature.

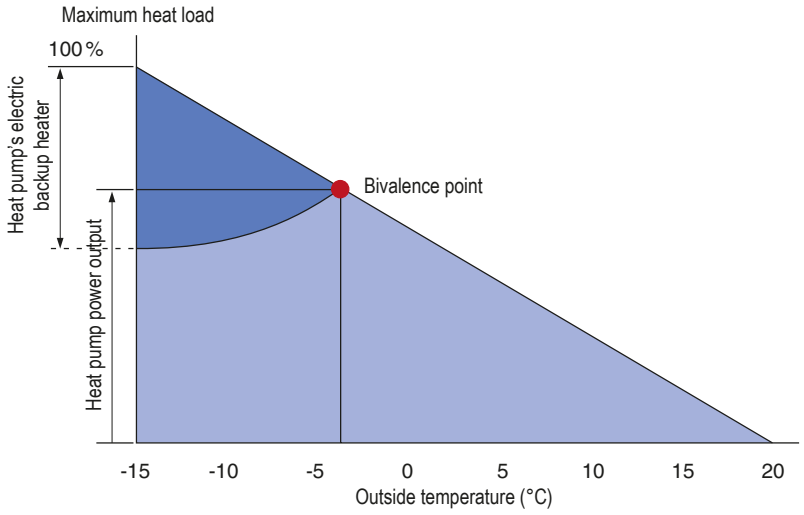
If it is not possible to reduce the supply temperature, the Aquarea HT series with supply temperatures up to 65 °C can be used.

5.1.4 Operating mode and determination of the bivalence point

First, the desired operating mode of the heat pump must be defined (→ *4.3.2 Operating mode, p. 20*). In order not to over-dimension the heat pump and to save on costs, a bivalent mode is preferred. In this case, another heat source is hooked up below a defined outside temperature and the associated heating capacity of the heat pump. The additional heat source can be integrated externally (e.g. a boiler or fireplace) or internally through the electric backup heater of the heat pump. If the additional heat source uses electric power for heat production, the operating mode is called mono-energetic.

The bivalent mode only supports the air-to-water heat pump while the outside temperatures are very low. As this is the case only for a few days a year, the heat generated by the electric backup heater only amounts to a few percent of the totally generated amount of heat.

Bivalent parallel operating mode (mono-energetic) via the heat pump's internal electric backup heater



IMPORTANT

The bivalence point is defined individually for each building (→ *5.1.6 Calculation example: total heating capacity required, p. 95*). Due to the inverter technology, Aquarea heat pumps can work efficiently even below their nominal capacity, without cycling.

5.1.5 Determination of the pipe length correction factor for bi-bloc systems

The performance of bi-bloc systems with hydrokit or All in One indoor unit falls in proportion to the increase in length of the refrigerant pipe. Depending on the nominal capacity of the heat pump, the decrease of performance differs for the models with up to 7 kW nominal capacity and the models with more than 7 kW nominal capacity (see the tables below).

Pipe length correction factors for bi-bloc systems up to 7 kW nominal capacity

Length of refrigerant pipe (one way)	up to 10 m	up to 20 m	up to 30 m
Pipe length correction factor	1.0	0.95	0.90

Pipe length correction factors for bi-bloc systems above 9 kW nominal capacity

Length of refrigerant pipe (one way)	up to 7 m	up to 10 m	up to 20 m	up to 30 m
Pipe length correction factor	1.0	0.95	0.90	0.85

5.1.6 Example: Calculation of the total heating capacity required

The main requirements for the air-to-water heat pump are defined through the design heat load and the design outside temperature. Moreover, the domestic hot water demand and electricity shutdown times imposed by the electric utility company must be taken into account. Also, the length of the connection pipes between outdoor unit and indoor unit (hydrokit or All in One unit) or between mono-bloc unit and the building are to be considered, because long pipes lead to a lower heating capacity. And not the least, besides the heat pump power, the supply water temperature at design outside temperature is also decisive for selecting the right heat pump.

On the other hand, Aquarea heat pumps have an internal electric backup heater, which can provide additional heating capacity while outside temperatures are very low.

For calculating the total heating capacity required, all the above-mentioned criteria should be taken into consideration together:

1. Design outside temperature
2. Design heat load
3. Tank charging (time required for domestic hot water production with the heat pump)
4. Possible electricity shutdown times imposed by the utility company (e.g. 1 x per day for 2 hours)
5. Pipe length correction factor

$$\text{Heating capacity} \geq \frac{\text{Design heat load x 24 h}}{\text{(24 h – tank charging – shutdown times) x pipe length correction factor}}$$

IMPORTANT

In new buildings, a phase of building drying usually takes place in the initial two years after occupation, when the humidity from the construction phase escapes from the building; during this time the heat demand is higher than after the phase of building drying. This increased heat demand can be covered by the heat pump's internal electric backup heater.

Example

- Residential house in Frankfurt/Main with a heat load of 9.6 kW for a design outside temperature of θe = -12 °C
- Domestic hot water production for four persons with normal comfort expectation (45 litres per person and day at 45 °C tapping temperature or 1.8 kWh): 4 x 1.8 = 7.2 kWh per day. For domestic hot water production, a heat pump with a heating capacity of 9.6 kW would need 7.2 kWh / 9.6 kW = 0.75 h operation. Rounding up, this results in a tank charging time of 1 hour (1 h).
- The pipe length correction factor is yielded on the basis of a connection distance of 15 m (one way) as the mean value of 0.95 and 0.90 for a pipe length correction factor = 0.93

$$\text{Total heating capacity required} \geq \frac{9.6 \text{ x } 24 \text{ h}}{(24 \text{ h} - 1 \text{ h}) \times 0.93} = \frac{230.4}{21.39} \quad 10.77 \text{ kW}$$

The additional consideration of an electricity shutdown time of 2 hrs per day results in:

$$\text{Total heating capacity required} \geq \frac{9{,}6 \times 24 \text{ h}}{(24 \text{ h} - 1 \text{ h} - 2 \text{ h}) \times 0.93} = \frac{230.4}{19.53} \quad 11.80 \text{ kW}$$

The calculated total heating capacity required must be generated while maintaining the supply water temperature of 35 °C required for underfloor heating.

IMPORTANT

The determination of the total heating capacity required, shown above, can deviate a little from the detailed calculation with the Aquarea Designer, but can be used quickly as a rule-of-thumb guide and without using a calculation programme.

5.1.7 Cooling

For Aquarea heat pump models with cooling function (High Performance and T-CAP series), the cooling function must be activated by a qualified service technician during commsissioning. After that, the cooling mode can be switched on/off and controlled by the end user via the remote controller.

ATTENTION

Risk of damage to building or of slipping on the floor

In cooling mode, a temperature drop below dew point can cause condensation of moisture from the air on the surface of the heat transfer systems. This can damage the building or pose the risk of slipping on the floor.

- ► Prevent the temperature from dropping below the dew point by suitable placement of dew point sensors.
- ► Alternatively, safely drain the condensate that forms.
- ► In addition, insulate the pipes concerned to prevent diffusion.

5.1.7.1 Cooling with underfloor heating

Underfloor heating (or any surface embedded heating system) is generally suitable for the cooling mode, however cannot be operated with very low supply water temperatures, because the level of comfort drops, and the danger of falling below the dew point arises. In general, therefore, the surface temperature should be limited to at least 20 °C. If the temperature difference between supply and return water temperature (ΔT) is 3 to 4 K, it is possible to achieve a specific cooling capacity of 30 to 40 W/m². The cooling capacity is influenced considerably by the pipe distance and the pipe diameter of the underfloor heating as well as the floor covering. In the case of a tiled floor, the heat transfer is significantly better than, say, with a carpeted floor, which directly affects the cooling capacity.

Due to the systemic limits to the cooling capacity of underfloor heating, room cooling cannot be regulated to a fixed indoor temperature. However, at least the supply water temperature must be set to a value that prevents the room temperatur from dropping below dew point.

5.1.7.2 Cooling with fan coils

Fan coils can be operated with very much lower supply water temperatures than underfloor heating. Correspondingly, fan coils allow you to achieve a higher cooling capacity than underfloor heating and also greater comfort due to the type of room climate control. Due to the low supply water temperatures, which can be obtained when using fan coils for room cooling, the pipe must be covered by a diffusion-proof insulation and the condensate must be drained via a connection pipe to the house drainage system or to the outside.

5.2 Installation criteria

5.2.1 Acoustics

5.2.1.1 Sound pressure level

Sound is produced when air is made to start vibrating. This vibration widens as a pressure wave in the air and this way travels from the sound emission source to the eardrum of the human ear (immission point). Irrespective of the type of sound (language or engine sound), the sound can be measured as sound pressure. The higher the sound pressure, the louder is the sound perception. The human ear can perceive a range from 20 x 10^{-6} Pa (audible threshold) to 20 Pa (pain threshold). This range, which corresponds to a ratio of 1:1,000,000, is however not perceived by the human ear in a linear manner, but a logarithmic one. For this reason, the sound pressure is also not indicated as pressure but as a sound pressure level in Decibels (dB).

Typical sound situations and thereby occurring sound pressure levels and sound pressures

Sound	Sound pressure level in dB (A)	Sound pressure in µPa	Sensitivity
Woods	20	100	Very soft
Library	40	1,000	Soft

Conversation	55	10,000	Normal
Road	80	100,000	Loud
Press air hammer	100	1,000,000	Very loud

The result of the non-linear perception of the sound pressure is that two equally loud sound sources are not perceived doubly as loud as one sound source, but only as 3 dB louder than one sound source. Doubling the sound intensity (volume) of a sound is linked to a sound pressure level increase by 10 dB.

The measurable sound pressure level, which is converted into a rating level, in order to take into account other factors such as tonal components of a sound, is the decisive condition for maintaining the limit values. This must not exceed the valid immission guide values for immission points outside buildings (example of Germany: Technical Instructions on Noise Abatement (TA Lärm)).

Example of Germany: Immission guide values according to "TA Lärm"

Industrial Areas	By day and night	70 dB(A)
Commercial areas	By day	65 dB(A)
	By night	50 dB(A)
Business zones	By day	60 dB(A)
	By night	45 dB(A)
General residential zones	By day	55 dB(A)
	By night	40 dB(A)
Purely residential areas	By day	50 dB(A)
	By night	35 dB(A)
Spa areas, hospitals	By day	45 dB(A)
	By night	35 dB(A)

The values relate to the measurable value at a distance of 0.5 m from the centre of the opened window of the room affected and requiring protection. They are mean values and may be exceeded by short sound peaks.

The measurable sound pressure level depends on the distance to the sound source and decreases with increasing distance.

5.2.1.2 Sound power level for approximate calculation of the sound pressure level

The sound power level is a quantity for rating the sound source independently of the distance and direction of the sound propagation. It is a mathematically determinable quantity, which is determined for individual devices in laboratory measurements under defined conditions. Based on the sound power level of a specific device, the sound pressure level can be roughly determined at a certain distance and for corresponding sound propagation conditions for a given situation.

Sound propagates equally in all directions with the sound power of the sound source. The area, through which the sound passes, increases as the distance to the sound source increases. This results in a continuous reduction in the sound pressure level for the same sound power.

The sound pressure level is also affected by the following factors during the sound propagation:

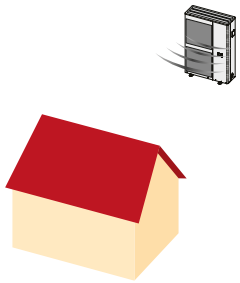
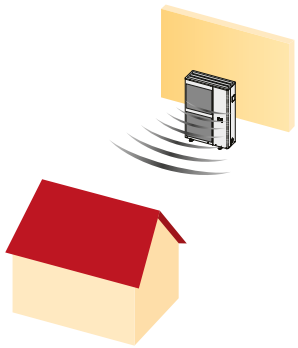
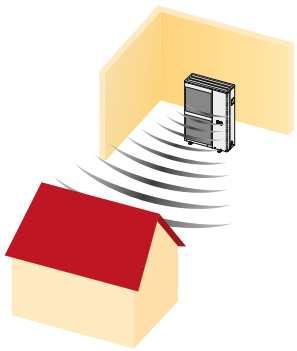
- Acoustical shadows cast by obstacles such as buildings, walls or land formations
- Reflection on reverberant surfaces such as walls, glass facades, buildings or asphalted floors as well as stone flooring
- Absorption of the sound, for example by grass, bark mulch, leaves or freshly fallen snow
- Wind can strengthen or reduce the sound pressure level (depending on the wind direction)

A rough determination of the sound pressure level L_{Aeq} at a certain location at a distance r to the heat pump can be calculated with the following formula and based on the sound power level L_{Waeq}:

$$L_{Aeq} = L_{WAeq} + 10 \times \log \left(\frac{Q}{4 \times \pi \times r^2} \right)$$

This only requires the direction factor Q in addition, which takes into account the spatial propagation conditions of the sound source.

Direction factor Q for different arrangements of the sound source

Sound propagation	In half space (1 boundary: floor)	In quarter space (2 boundaries: floor + 1 wall)	In eighth space (3 boundaries: floor + 2 walls)
Q=	2	4	8
Arrangement			

Example

The outdoor unit WH-UX16HE8 of a T-CAP bi-bloc system has a sound power level of 67 dB(A) and is set up such that the sound can propagate in the quarter space (Q = 4). The sound pressure level at 10 m distance is then:

$$L_{Aeq}\,(10\,m) = 67\,dB\,(A) + 10 \times \log \left(\frac{4}{4 \times \pi \times 10^2} \right) = 42\,dB\,(A)$$

At a distance of 20 m, the sound pressure level is however still only:

$$L_{Aeq}\,(20\,m) = 67\,dB\,(A) + 10 \times \log \left(\frac{4}{4 \times \pi \times 20^2} \right) = 36\,dB\,(A)$$

The sound pressure level can roughly be calculated even more easily by using the table below, by subtracting the table value from the device-specific sound power level (→ *4.6.2.3 Technical Data (bi-bloc systems), p. 40*, → *4.6.3.3 Technical Data (mono-bloc systems), p. 55*).

Table for rough determination of the sound pressure level based on the sound power level

Guide factor Q		Distance from the sound source (m)								
		1	2	4	5	6	8	10	12	15
	2	-8	-14	-20	-22	-23.5	-26	-28	-29.5	-31.5
	4	-5	-11	-17	-19	-20.5	-23	-25	-26.5	-28.5
	8	-2	-8	-14	-16	-17.5	-20	-22	-23.5	-25.5

IMPORTANT

The sound propagation can be facilitated or reduced by selecting the installation location. Avoid setting up on reverberant floor surfaces. Sound propagation can be reduced further by construction obstacles, but the air flow should not be hindered.

Choice of the blowing direction of the outdoor or mono-bloc unit should preferably be towards the road, because neighbouring rooms requiring protection rarely face in this direction.

If in doubt, use an acoustician's services.

5.2.2 Installation of a bi-bloc system

A bi-bloc system consists of an outdoor unit and an indoor unit (hydrokit or All in One unit). Depending on the power output and model, the outdoor unit has one or two fans and thus their installed size differs (→ *1 Model range, p. 8*).

In general, the following points should be remembered regarding the distance between outdoor unit and indoor unit of a bi-bloc system:

- If the length of the refrigerant pipes is greater than the pre-filled pipe length of the device (10 m), the quantity of additional refrigerant stated in the technical data must be added (→ *4.6.2.3 Technical Data (bi-bloc systems), p. 40*).
- The maximum length of the refrigerant pipes between indoor and outdoor unit is 25, 30 or 50 m, depending on the model (→ *4.6.2.3 Technical Data (bi-bloc systems), p. 40*). This value must not be exceeded.
- The minimum length of the refrigerant pipes between indoor and outdoor unit is 3 m and must not fall below that value.
- The maximum elevation difference between indoor and outdoor unit is 20 or 30 m, depending on the model (→ *4.6.2.3 Technical Data (bi-bloc systems), p. 40*). This value must not be exceeded.
- The wall thickness of the copper tubes for the refrigerant pipes must be larger than 0.8 mm.

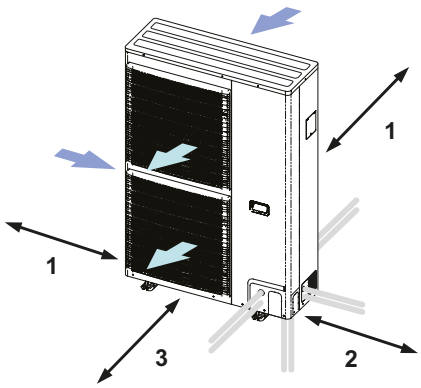
5.2.2.1 Installation conditions for outdoor units

The installation conditions for the outdoor unit are as follows:

- The outdoor unit is designed for outdoor installation only and must not be installed indoors.
- For condensed water drainage in defrost mode, drainage is recommended via a drain pipe to the frost-free ground with gravel fill (→ *5.2.2.3 Securing the outdoor unit, p. 102*).
- Maintain the minimum distances (→ *5.2.2.2 Minimum distances (outdoor units), p. 101*).
- The heat emission of the outdoor unit must not be impeded by additional protection devices such as awnings or such.
- No objects should be put up that can cause short-circuiting of the exhaust air. Even when using multiple outdoor units (e.g. in case of heat pump cascades), avoid any air flow short-circuiting (→ *5.2.2.3 Securing the outdoor unit, p. 102*).
- The operating noise of the outdoor unit must not cause any nuisance to the user or to neighbours. In certain countries or regions, the installation of air-to-water heat pumps may require permission. All provisions regarding noise valid at the location must be taken into account (→ *5.2.1 Acoustics, p. 97*).
- Additional anti-vibration dampers can be used for enhanced noise isolation.
- Installing an outdoor unit near to the sea, in regions with a high content of sulphur or at sites where large quantities of oil (e.g. machine oil, etc.) are present, may shorten its operating lifecycle.
- The outdoor unit is to be installed on a concrete foundation or a stable ground frame, which may be located on the outer wall of a building. Also, it must be horizontally aligned and bolted down (ø 10 mm).
- In the case of installation locations experiencing strong winds e.g. on building rooftops or between buildings, the outdoor unit must be additionally secured by field-supplied means to prevent tipping over (e.g. by bracing).

5.2.2.2 Minimum distances for outdoor units

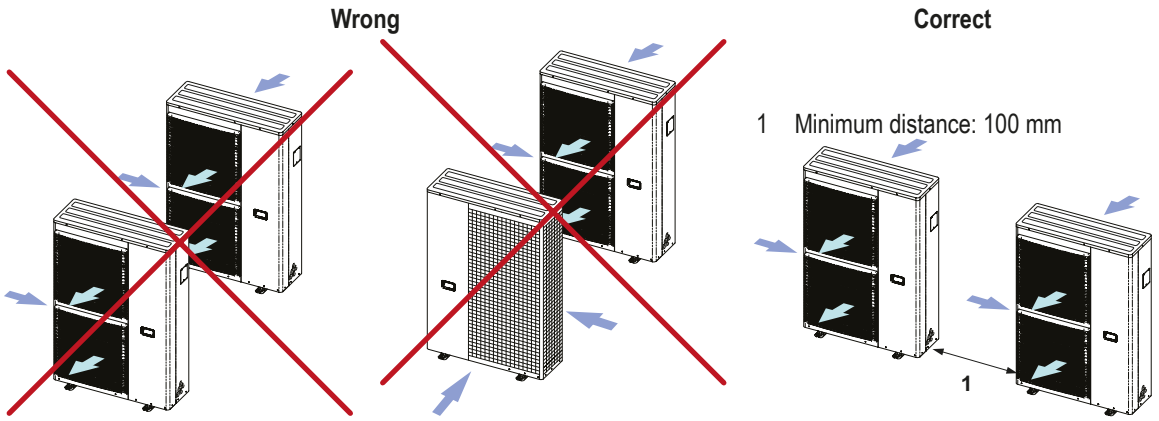
Minimum distance of the outdoor unit to the neighbouring walls and objects with representation of the air flow direction



1 Minimum distance: 100 mm
2 Minimum distance: 300 mm
3 Minimum distance: 1,000 mm

Notes:
The refrigerant pipe connections can be made in four directions (front, rear, side, bottom).
Note: Schematic figure for explanation purposes only.

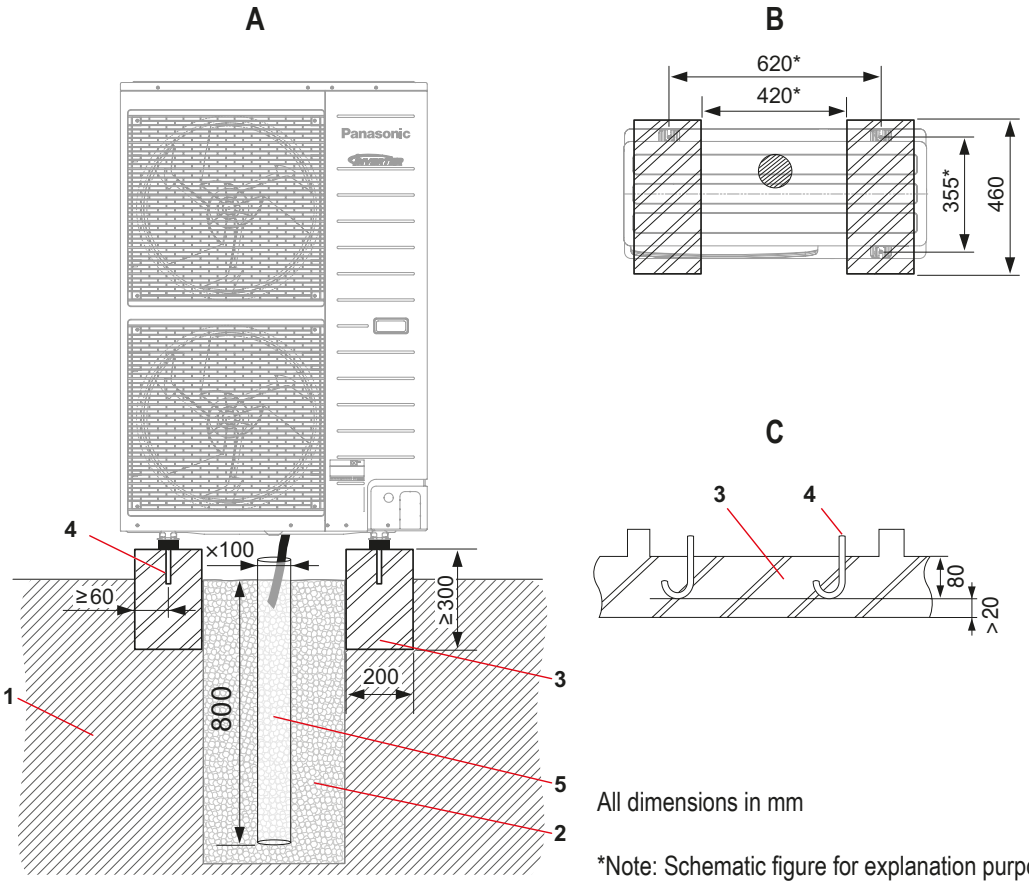
Correct arrangement of multiple outdoor units with representation of the air flow direction



5.2.2.3 Securing the outdoor unit

The outdoor unit must be mounted on a flat, horizontal and solid surface. Besides the weight of the device, the weight of the water must also be taken into account. The unit is to be mounted with four M12 anchor bolts, each having a tensile force of more than 15,000 N.

Minimum requirements for anchoring the outdoor unit on the ground by means of a foundation (A and B) or directly in the floor plate (C)



All dimensions in mm

*Note: Schematic figure for explanation purposes only.

A Front view: Anchoring by means of foundation
1 Ground
2 Gravel filling
3 Strip foundation
4 Anchor bolts
5 Drain pipe

B Top view

C Detailed view: Anchoring in the floor plate
3 Strip foundation
4 Anchor bolts

5.2.2.4 Requirements of the room for installation of the indoor unit

When designing the installation room, consider all devices and components of the heat pump system, which are not installed outside the building:

- Hydrokit or All in One unit (only for bi-bloc systems).
- Pipes, cables and wall bushings should be arranged in a useful manner and using the shortest path (electrical cables, refrigerant and heating water pipes).
- Tank (domestic hot water tank as well as possibly buffer tank)

Further, see that the installation room is dry and frost-free and that the installation location is easily accessible for maintenance work.

Required volume of the installation room

In bi-bloc systems, the refrigerant is partly in the building, which must be taken into consideration with respect to the minimum required volume. If no special machine room is available according to EN 378 - Part 1, the minimum required volume of the installation room (V_{min}) according to EN 378 – Part 1) is calculated for heat pumps as follows:

$$V_{min} = \frac{G}{c}$$

Where:

G = Refrigerant charge in kg

c = practical limit in kg / m³
(for R32 is c = 0.061 kg/m³, for R410A is c = 0.44 kg/m³; for R407C is c = 0.31 kg/m³)

ATTENTION

Danger of the devices being damaged by incorrect refrigerant

The devices must only be operated with the refrigerants described in this Manual or the respective operating instructions. The use of other refrigerants or multi-component refrigerants can lead to the devices being damaged and to safety risks. Panasonic will not accept any responsibility or liability whatsoever if incorrect refrigerants are used.

► Only use R32 refrigerant for Aquarea High Performance and T-CAP series models of the J Generation, only use R410A refrigerant for the Aquarea High Performance and T-CAP series models of the H Generation and only use R407C refrigerant for the Aquarea HT series models of the F and G Generation.

► Do not mix the prescribed refrigerant with refrigerants of another type or replace it with a refrigerant of another type.

IMPORTANT

The refrigerant and the refrigerant charge quantity differ for the individual models and are also dependent on the additional refrigerant charge, which is added in the field due to longer pipe runs exceeding the pre-filled pipe length. Details to be taken from the technical data (→ *4.6.2.3 Technical Data (bi-bloc systems), p. 40*, → *4.6.3.3 Technical Data (mono-bloc systems), p. 55*).

Indoor floor area requirement for R32 models

Due to the classification of R32 with regard to safety, toxicity and flammability, limitations regarding the refrigerant quantity in relation to the floor area must be observed based on the applicable standards:

- If the total refrigerant charge in the system is <1.84 kg, no additional minimum floor area is required.
- If the total refrigerant charge in the system is ≥1.84 kg, perform the following steps to determine, if the room is large enough to install the indoor unit or if any additional safety measures need to be taken.

Symbol	Description	Unit
m_c	Total refrigerant charge in system where: Total refrigerant charge in system, m_c (kg) = Pre-charged refrigerant amount in unit (kg) + Additional refrigerant amount after installation (kg)	kg
m_{max}	Maximum allowed refrigerant charge	kg
m_{excess}	Excess refrigerant charge quantity ($m_c - m_{max}$)	kg
A_{room}	Floor area of the installation room	m²
B_{room}	Floor area of the room adjacent to the installation room	m²
H	Installation height	m
VA_{min}	Minimum ventilation opening area	cm²
$A_{min\ total}$	Minimum required total floor area ($A_{room} + B_{room}$)	m²

Step A: Determine the maximum allowed refrigerant charge (m_{max}):

1. Calculate the floor area of the installation room (A_{room}).
2. Based on Table I (see below), select the maximum allowed refrigerant charge (m_{max}), which corresponds to the calculated A_{room} value.
3. If the maximum allowed refrigerant charge is larger than the total refrigerant charge in the system ($m_{max} > m_c$), the unit can be installed in the installation room at the installation height of H = 600 mm, which is specified in Table I, and without additional floor area or any additional ventilation.
4. If not ($m_{max} < m_c$), proceed to Step B and Step C, to determine how the floor area of the installation room (A_{room}) can be “enlarged” by the floor area of an adjacent room (B_{room}) by providing sufficiently large ventilation openings between the two rooms.

Table I: Maximum refrigerant charge allowed in a room

A_{room} (m^2)	Maximum refrigerant charge (m_{max}) (kg)	A_{room} (m^2)	Maximum refrigerant charge (m_{max}) (kg)	A_{room} (m^2)	Maximum refrigerant charge (m_{max}) (kg)
	H = 0.6 m		H = 0.6 m		H = 0.6 m
1	0.138	16	1.371	31	1.909
2	0.276	17	1.413	32	1.939
3	0.414	18	1.454	33	1.969
4	0.553	19	1.494	34	1.999
5	0.691	20	1.533	35	2.028
6	0.829	21	1.571	36	2.057
7	0.907	22	1.608	37	2.085
8	0.970	23	1.644	38	2.113
9	1.028	24	1.679	39	2.141
10	1.084	25	1.714	40	2.168
11	1.137	26	1.748	41	2.195
12	1.187	27	1.781	42	2.221
13	1.236	28	1.814	43	2.248
14	1.283	29	1.846	44	2.274
15	1.328	30	1.877		

Notes:

For H values lower than 0.6 m, the value of H is to be considered as 0.6 m to comply to IEC 60335-2-40:2018 Clause GG2.

For intermediate A_{room} values, the value that corresponds to the **lower** A_{room} value from the table is to be considered.

Example: For A_{room} = 10.5 m^2, the value that corresponds to "A_{room} = 10 m^2" is to be considered.

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Step B: Determine compliance of total floor area (A_{room} + B_{room}) to minimum required total floor area ($A_{min\ total}$):

1. Calculate the floor area (B_{room}) of the room adjacent to the installation room.
2. Determine the minimum required total floor area ($A_{min\ total}$) based on the total refrigerant charge (m_c) as specified in Table II (see below).
3. If the total floor area of both rooms (A_{room} + B_{room}) exceeds the minimum required total floor area ($A_{min\ total}$), proceed to Step C, to determine how large the ventilation openings between the two rooms must be. If not, the unit must not be installed.

Table II: Minimum allowed total floor area

m_c (kg)	Minimum floor area ($A_{min\ total}$) (m^2)	m_c (kg)	Minimum floor area ($A_{min\ total}$) (m^2)	m_c (kg)	Minimum floor area ($A_{min\ total}$) (m^2)
	H = 0.6 m		H = 0.6 m		H = 0.6 m
1.84	28.81	2.00	34.04	2.16	39.71
1.86	29.44	2.02	34.73	2.18	40.45
1.88	30.08	2.04	35.42	2.20	41.19
1.90	30.72	2.06	36.12	2.22	41.94
1.92	31.37	2.08	36.82	2.24	42.70
1.94	32.03	2.10	37.53	2.26	43.47
1.96	32.70	2.12	38.25	2.27	43.86
1.98	33.37	2.14	38.98		

Notes:

For H values lower than 0.6 m, the value of H is to be considered as 0.6 m to comply to IEC 60335-2-40:2018 Clause GG2.

For intermediate m_c values, the value that corresponds to the **higher** m_c value from the table is to be considered.

Example: If m_c = 1.85 kg, the value that corresponds to "m_c = 1.86 kg" is to be considered.

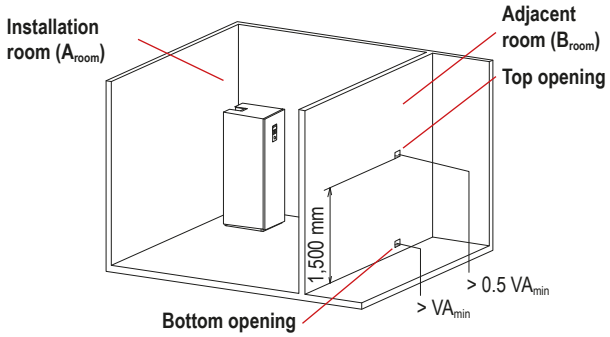
Systems with total refrigerant charge lower than 1.84 kg are not subjected to any floor area requirements.

Charges above 2.27 kg are not allowed in the unit.

Step C: Determine the minimum venting opening area (VA_{min}) for natural ventilation:

1. Determine the excess refrigerant charge quantity (m_{excess}), as specified in Table III (see below).
2. Then determine the minimum ventilation opening area (VA_{min}) corresponding to the determined m_{excess} value, as specified in Table III, for natural ventilation between the installation room and the adjacent room.
3. The unit can be installed in a specific room only if the following conditions are fulfilled:

> Two permanent openings, one at the bottom, another at the top, are made between the installation room and the adjacent room for ventilation purposes.



> The bottom opening fulfills the following requirements:
- Must comply to the minimum area requirement of VA_{min}.
- Opening must be located 300 mm from the floor.
- At least 50 % of required opening area must be 200 mm from the floor.
- The bottom of the opening shall not be higher than the point of release when the unit is installed and must be situated 100 mm above the floor.
- Must be as close as possible to the floor and lower than H.

> The top opening fulfills the following requirements:
- The total size of the top opening must be more than 50 % of VA_{min}.
- Opening must be located 1500 mm above the floor.

> The height of the openings must more than 20 mm.

> A direct ventilation opening to outside is NOT encouraged for ventilation opening (because the user might block the opening when it is cold).

> The value of H is considered as 0.6 m to comply to IEC 60335-2-40:2018 Clause GG2.

Table III: Minimum venting opening area for natural ventilation

m_c (kg)	m_{max} (kg)	$m_{excess} = m_c - m_{max}$ (kg)	Minimum venting opening area (VA_{min}) (cm^2)
			H = 0.6 m
2.27	0.1	2.17	878
2.27	0.3	1.97	797
2.27	0.5	1.77	716
2.27	0.7	1.57	635
2.27	0.9	1.37	570
2.27	1.1	1.17	538
2.27	1.3	0.97	485
2.27	1.5	0.77	414
2.27	1.7	0.57	326
2.27	1.9	0.37	224

Notes:

For H values lower than 0.6 m, the value of H is to be considered as 0.6 m to comply to IEC 60335-2-40:2018 Clause GG2.

For intermediate m_{excess} values, the value that corresponds to the **higher** m_{excess} value from the table is to be considered.

Example: m_{excess} = 1.45 kg, the value that corresponds to "m_{excess} = 1.6 kg" is to be considered.

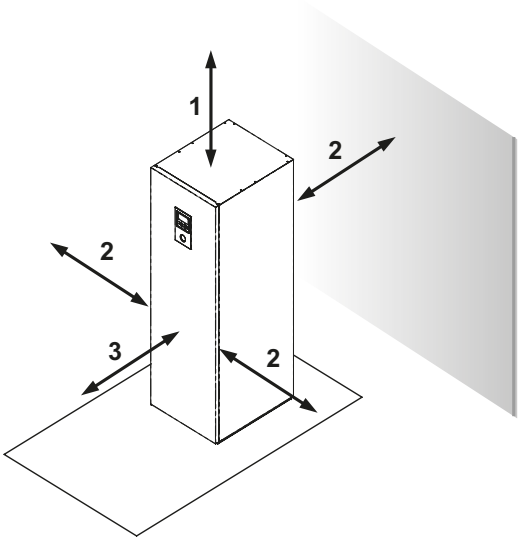
5.2.2.5 Installation conditions for indoor units (hydrokit or All in One unit)

The installation conditions for the indoor units are as follows:

- The indoor units are designed for indoor installation only and must not be installed outdoors.
- The installation space must be dry and frost-free and the installation location easily accessible for maintenance work.
- Pipes, cables and wall bushings should be arranged in a useful manner and using the shortest path (electrical cables, refrigerant and heating water pipes).
- Ensure good air circulation in the installation room.
- There must not be any heat or vapour sources near the indoor unit. Even laundries or other rooms with high humidity are not suitable, because high humidity causes rusting and can damage the device.
- The condensed water from the condensation drain of the indoor unit should be able to flow away freely without obstacles, because incorrect draining can cause damage.
- Development of noise in the room should be taken into account (→ *5.2.1 Acoustics, p. 97*).
- Do not mount the device near the door.
- Maintain the minimum distances (→ *5.2.2.6 Minimum distances (indoor units), p. 107*).
- The hydrokit must be installed vertically on the wall, where the wall should be strong and solid, so that no vibration occurs.
- The All in One unit must be installed standing vertically on the floor, where the floor should be strong enough to withstand the weight of the water-filled unit.
- In case electrical devices are installed on wooden buildings with metal strips or cable cleats, no electrical contacts are allowed between device and building according to the corresponding standards for electrical work.

5.2.2.6 Minimum distances for indoor units (hydrokit or All in One unit)

All in One unit J or H generation



Minimum distances All in One unit J generation

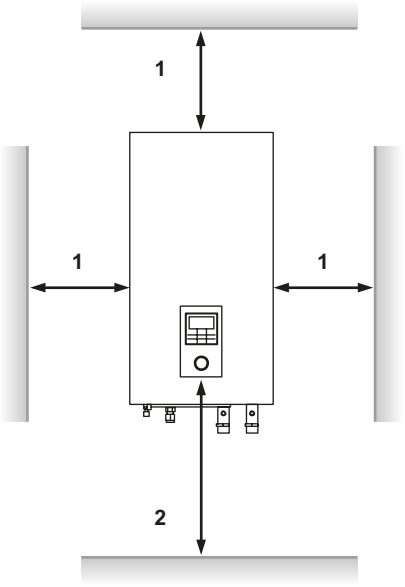
1 Minimum distance: 350 mm
2 Minimum distance: 100 mm
3 Minimum distance: 700 mm

Minimum distances All in One unit H generation

1 Minimum distance: 300 mm
2 Minimum distance: 100 mm
3 Minimum distance: 700 mm

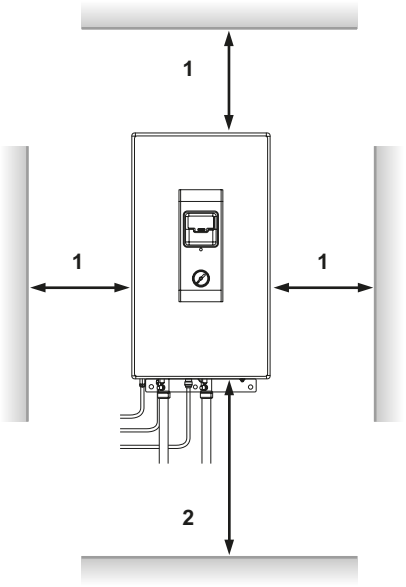
Note: Schematic figure for explanation purposes only.

Hydrokit H generation



Minimum distances hydrokit H generation
1 Minimum distance: 100 mm
2 Minimum distance: 800 mm

Hydrokit F generation



Minimum distances hydrokit F generation
1 Minimum distance: 300 mm
2 Minimum distance: 600 mm

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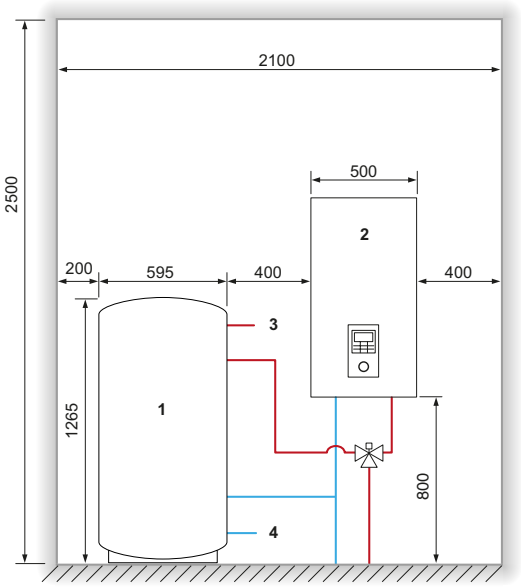
IMPORTANT

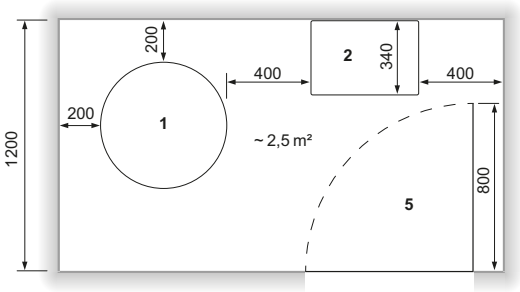
As the compressor is in the outdoor unit of the bi-bloc system, only the operation of the circulation pump in the hydrokit or All in One unit needs to be taken into consideration as the cause for the development of operating noise.

Example of an installation room with hydrokit and domestic hot water tank

Front view



Top view



1 Domestic hot water tank
2 Hydrokit
3 Hot water outlet
4 Fresh water inlet
5 Door to the installation room

Note: Schematic figure for explanation purposes only.

IMPORTANT

Due to the available volume of about 6.25 m³, the installation room in this example is only suitable for single-phase systems of the Aquarea High Performance series with R410A refrigerant.
For all other models with a larger quantity of R410A or using one of the two other refrigerants (R32, R407C) the practical limit c will be exceeded (for R32 is c = 0.061 kg/m³, for R410A is c = 0.44 kg/m³ and for R407C is c = 0.31 kg/m³).

5.2.3 Installation of a mono-bloc system

The mono-bloc system only has one outdoor unit with one or two fans, depending on the power output and model (→ *1 Model range, p. 8*).

The outdoor unit of the mono-bloc system is connected to the heating circuit within the building by water pipes which are routed in direct contact with the outdoor air. As these water pipes can freeze at outside temperatures below 0 °C, they must be insulated according to the locally valid European, national and regional specifications and guidelines.

ATTENTION

Danger of water pipes freezing in outside temperatures below 0 °C

When the heating circuit is filled with water and the outside temperature falls below 0 °C, the water pipes of the mono-bloc system are at risk of freezing up. This can damage the mono-bloc unit.

The client should therefore ensure the absence of frost by taking **one** of the following measures:

- ► Operate the heating circuit using a food-safe antifreeze mixture (propylene glycol).
- ► Equip the mono-bloc unit with an optional base pan heater, to prevent the heating circuit from freezing up.
- ► Drain the heating circuit by using a field-supplied draining device (manually or automatically) before freezing starts.

5.2.3.1 installation conditions for mono-bloc units

The installation conditions for mono-bloc units are as follows:

- The mono-bloc units are designed for outdoor installation only and must not be installed indoors.
- For condensed water drainage in defrost mode, drainage is recommended via a drain pipe to the frost-free ground with gravel fill (→ *5.2.3.3 Securing the mono-bloc unit, p. 111*).
- Maintain the minimum distances (→ *5.2.3.2 Minimum distances (mono-bloc units), S. 110*).
- The heat emission of the mono-bloc unit must not be impeded by additional protection devices such as awnings or such.
- No objects should be put up that can cause short-circuiting of the exhaust air. Even when using multiple mono-bloc units (e.g. in case of heat pump cascades), avoid air flow short-circuiting (→ *5.2.3.3 Securing the mono-bloc unit, p. 111*).
- The operating noise of the outdoor unit must not cause any nuisance to the user or to neighbours. In certain countries or regions, the installation of air-to-water heat pumps may in certain countries or regions require permission. All provisions regarding noise valid at the location must be taken into account (→ *5.2.1 Acoustics, p. 97*).
- Additional anti-vibration dampers can be used for enhanced noise isolation.
- Installing a mono-bloc unit near to the sea, in regions with a high content of sulphur or at sites where large quantities of oil (e.g. machine oil, etc.) are present, may shorten its operating lifecycle.
- In the case of installation locations experiencing strong winds e.g. on building rooftops or between buildings, the mono-bloc unit must be additionally secured by field-supplied means to prevent tipping over (e.g. by bracing).

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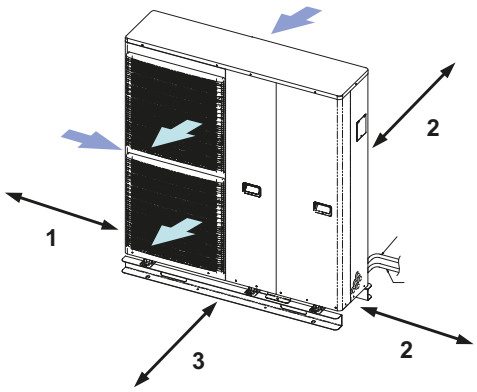
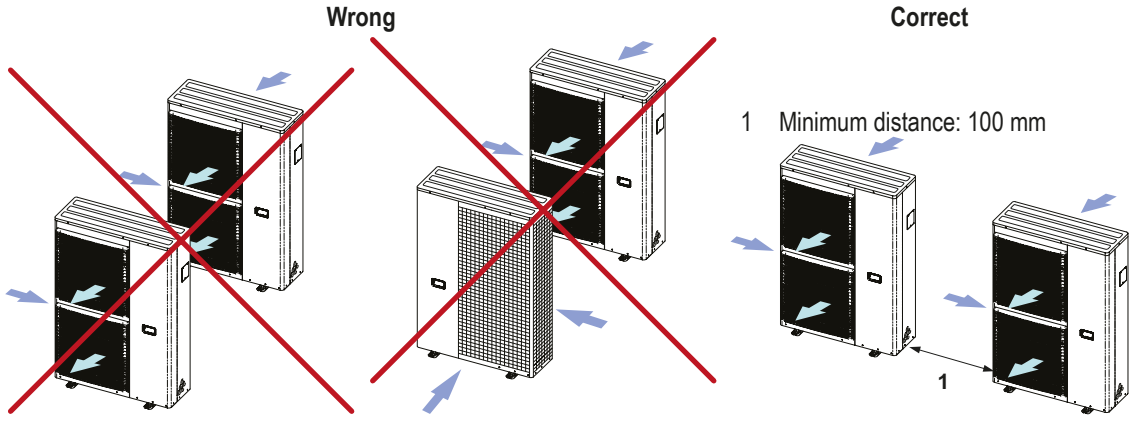
5.2.3.2 Minimum distances for mono-bloc units

Minimum distance of the mono-bloc unit to the neighbouring walls and objects with representation of the air flow direction



1 Minimum distance: 100 mm
2 Minimum distance: 300 mm
3 Minimum distance: 1,000 mm

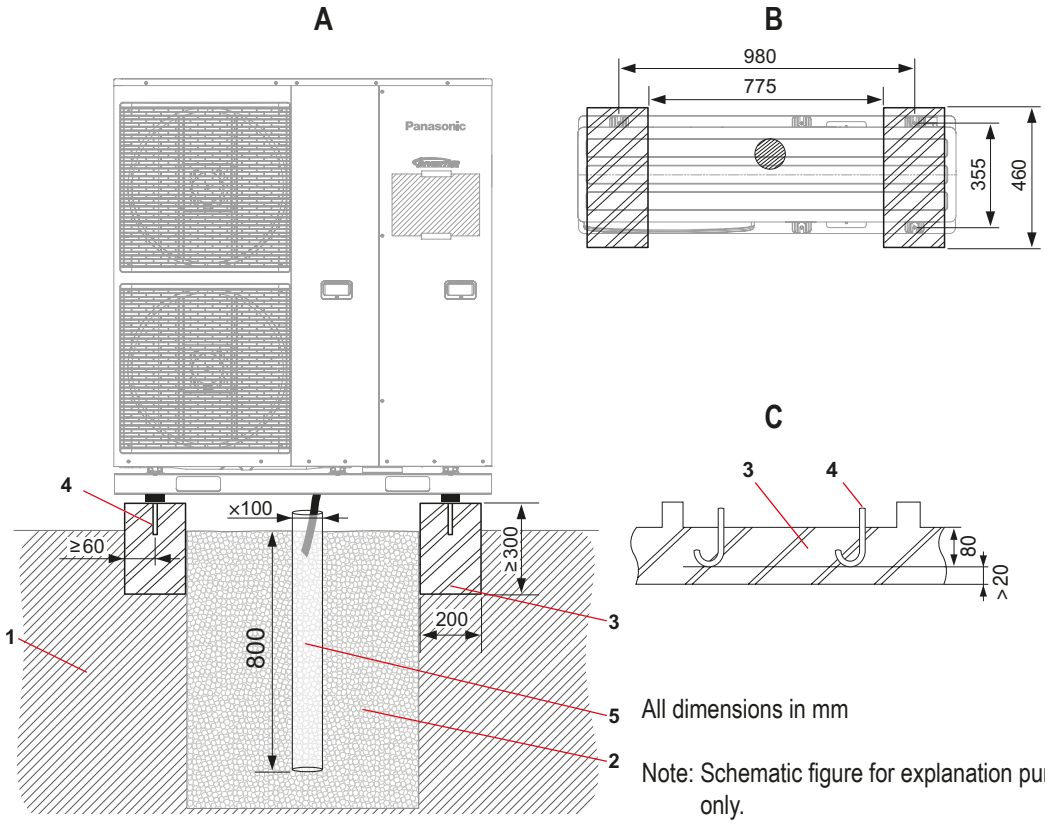
Correct arrangement of multiple mono-bloc devices with representation of the air flow direction



5.2.3.3 Securing the mono-bloc unit

The mono-bloc unit must be mounted on a flat, horizontal and solid surface. Besides the weight of the device, the weight of the water must also be taken into account. The unit is to be mounted with four M12 anchor bolts, each having a tensile force of more than 15,000 N.

Minimum requirements for anchoring the mono-bloc unit on the ground by means of a foundation (A and B) or directly in the floor plate (C)



All dimensions in mm

Note: Schematic figure for explanation purposes only.

A Front view: Anchoring by means of foundation
1 Ground
2 Gravel filling
3 Strip foundation
4 Anchor bolts
5 Drain pipes

B Top view

C Detailed view: Anchoring in the floor plate
3 Strip foundation
4 Anchor bolts

5.3 Hydraulics

5.3.1 Hydraulic integration

All Aquarea heat pump systems have an integrated water circulation pump that transports the heating water into the heat transfer system. A high-efficiency pump is used for the purpose.

In general, a hydraulic separation of heat pump circuit and heat consumer circuit is always advisable if a different volumetric flows must be provided for the consumer circuit than is required for the heat pump circuit. In such a case, separate pumps must be provided for the respective circuits. To avoid these pumps influencing each other with their different pressure and volumetric flow parameters, hydraulic separation is necessary.

If, besides the integrated water circulation pump, one or more water circulation pumps are required for the respective heating circuits, hydraulic separation of the heat pump circuit and the heat consumer circuit through a buffer tank or a low-loss header (hydraulic balancer) must be effected.

If hydraulic integration is to be achieved without hydraulic separation, it must be ensured that the minimum flow rate of the respective heat pump (→ *4.6.2.3 Technical Data (bi-bloc systems), S. 40*, → *4.6.3.3 Technical Data (mono-bloc systems), p. 55*) is maintained at all times. Using automatically regulating mixers or thermostat valves bears the risk that the hot water circulation is throttled down so low that the flow rate falls below the minimum. To rule this out, Panasonic recommends to always equip heat transfer systems, which have no hydraulic separation, with an overflow valve between the supply and the return heating pipe. The overflow valve is to be designed for the nominal flow rate of the respective heat pump.

Another option is a bypass in the form of multiple non-adjustable or permanently opened heating circuits. Rooms with a continuously high heat requirement, such as bathrooms, are particularly suited for this purpose. Even for this variant, it is necessary to ensure that the minimum flow rate of the heat pump is always guaranteed.

Magnetic filter

For protection of the heat pump, Panasonic recommends installing a magnetic filter on site just before the water inlet (water return) connection on the heat pump.

System volume

Depending on the nominal heating capacity of the heat pump system, the recommendations for the minimum total water volume in the system are as follows:

- Nominal heating capacity up to and including 9 kW: 30 litres
- Nominal heating capacity above 12 kW up to and including 16 kW: 50 litres

IMPORTANT

If the total water volume in the system is below the indicated values, the system volume should be increased, e.g. by using a buffer or an additional vessel.

5.3.2 Pump discharge head

Discharge head and displacement volume of the integrated water circulation pumps depend on the respective heat pump model (see technical data of the respective pump).

Pipe network resistance

Designing the pump discharge head requires consideration of all components of the pipe network and their individual resistances for nominal flow rate. Choose components such as mixers, valves and heat meters such that the nominal throughput is matched to the nominal flow rate of the heat pump system.

Consideration of the nominal flow rate

For efficient heat generation, heat pumps use a temperature difference of about 5 K between the supply and return water flow. This distinguishes them from heat sources with boilers, which can work without any problem with a temperature difference of about 10 or 20 K between the supply and return water flow. A consequence of the small temperature difference in heat pumps is that the flow rate of heat pumps, which is needed to transport the heat within the circuit, must be higher than for heat sources with boilers with the same thermal output. The nominal flow rate and the resulting resistance of the pipe network must therefore be given special attention at the time of design.

Consideration of the nominal pipe width

The pressure drop in the pipe rises exponentially with the flow rate. This means that doubling the flow rate causes the pressure drop to increase by a factor of 4. The decisive aspect for this is the flow speed in the pipe that depends on the flow rate and inner diameter.

As an alternative to a pipe network calculation, a nomogram can be used to determine the pressure drop across pipe segments. Recommendations for designing the main distribution circuit are:

- The flow speed should be in the range of 0.3 to max. 1.5 m/s.
- The pressure drop per metre should be about 0.1 kPa/m.

Based on these criteria, the required nominal pipe width can be read off from the copper tube nomogram. To determine the pipe network resistance of a complete pipe run, first, the pressure drop per metre must be multiplied by the length of each pipe segment, and then the pressure drops of all segments must be summed up. The total resistance of a complete pipe run is obtained as the total pressure drop of all pipe segments multiplied by a lump sum supplement factor of 1.5.

IMPORTANT

The total of the individual resistances of all components of the pipe network must not exceed the pump discharge head for the nominal flow rate. If the pipe network resistance is too high, the unit's integrated water circulation pump cannot achieve the nominal flow rate. The heat pump control functions will register a shortfall of the minimum circulation quantity and throw an alarm.

5.3.3 Hydraulic balancing

Hydraulic balancing of the heat transfer system is the process of optimising the set flow rates for several pipe segments through regulating valves. This prevents individual building areas from being excessively overheated, while other areas with a lower flow rate remain cold. Hydraulic balancing therefore raises the living comfort and is, at the same time, also a requirement for efficient operation of the air-to-water heat pump. Therefore, hydraulic balancing is also a prerequisite for the financial promotion of heat pumps.

5.3.4 Special points related to cooling

Hydraulically, a heat pump system with cooling mode does not differ from a heating-only system. However, to correctly determine the total annual amount of heat and cold delivered by the heat pump, which is needed to calculate the seasonal coefficient of performance, it is necessary to use energy meters which record the amount of heat as well as the amount of cold.

5.3.5 Expansion vessel

The Aquarea heat pumps have an integral expansion vessel with a model-specific volume of 6 or 10 litres (see table) and an initial pressure of 1 bar.

The volume of the expansion vessel is adequate for heating systems whose total water quantity and its static height (difference of the highest point of the system to the expansion vessel) must not exceed defined limits.

Model-specific limit values for the integrated expansion vessel

		WH-MDC05J3E5 WH-MDC07J3E5 WH-MDC09J3E5	All other models
Expansion vessel volume	l	6	10
Initial pressure	bar	1	1
Total water quantity in the heating system (max.)	l	150	200
Static height	m	7	7
Pressure stage safety valve (max.)	bar	3	3

In case the total quantity of water is greater than 150 or 200 litres, or greater static heights are required, it is necessary to maintain the pressure by means of an expansion vessel to be installed on site. Generally, pay attention to the pressure stage of the safety valve. This is given in the technical data and is maximum 3 bar.

The following criteria must be taken into consideration when designing the necessary expansion vessel nominal volume V_N.

Nominal volume	V_N	(nominal volume of the expansion vessel)
Expansion volume	V_e	(expansion volume of the expansion vessel)
System volume	V_A	(total volume of the heating system)
Water reserve	V_V	(volume of the water reserve)
Maximum temperature	T_{max}	(highest temperature in the system e.g. 60 °C)
Final pressure of the safety valve	p_e	(depends on the safety valve, max. 2.5 bar)
Initial pressure of expansion vessel	p_0	(initial pressure 1 bar)

$$V_N = (V_e + V_V) \frac{p_e + 1}{p_e - p_0}$$

1. The expansion volume V_e is obtained from the system volume, and the maximum temperature is obtained from the coefficient of expansion of water according to the following table:

T_{max} (°C)	40	50	60	70	80	90	100
n (%)	0.93	1.29	1.71	2.22	2.81	3.47	4.21

   Percentage expansion of water:

$$V_e = V_A \frac{n}{100}$$

2. The volume of the water reserve V_V can be calculated in a simplified manner as follows:

   $V_V = 0.2 \times V_N$ (for a nominal volume $V_N < 15$ litres) or

   $V_V = 0.005 \times V_A$ (for a nominal volume $V_N > 15$ litres, where $V_V \geq 3$ litres)

3. The final pressure of the safety valve p_e is obtained from the response pressure of the safety valve minus a tolerance of 0.5 bar:

   p_e = Safety valve response pressure – 0.5 bar

4. Select the initial pressure p_0 such that it corresponds to the static height of the heating system plus a supplement factor of max. 0.5 bar. 10 metres static height corresponds to 1 bar. Adjust the initial pressure of the Aquarea expansion vessel, if necessary.

Note

The calculation of the expansion vessel is done according to EN 12828 “Heating systems in buildings – Design for water-based heating systems”. The design programs for expansion vessels, which are provided by the respective manufactuerer, can be used to design the expansion vessel based on the local requirements. These programs can also determine the required initial pressures to be set on the expansion vessel.

5.3.6 Heating water quality

ATTENTION

Danger of damage to pipes due to corrosion

Ingress of oxygen into open water systems can cause excessive corrosion of the pipes and the subsequent problems in operation.

► Install Aquarea heat pumps only as closed systems without direct contact of the heating water to the ambient air.

To avoid damage to the heating system and to the heat pump, use water that complies with the currently valid version of the European Water Quality Directive 98/83/EC and respect any corresponding national requirements, which are applicable. It is recommended to avoid the use of groundwater, such as spring water or well water, the use of tap water, when salt or other impurities are contained, and the use of acidic water. Furthermore, the heating system is to be thoroughly purged before filling with heating water.

5.3.7 Use of buffer tanks

Buffer tanks can fulfil three functions in the context of heat pumps:

- Bridging electricity shutdown times imposed by the electric utility company
- Hydraulic separation of heat pump circuit and heat transfer system
- Extension of the heat pump run time to avoid frequent on/off switching (cycling), which reduces the system efficiency

Thanks to inverter technology, system performance can be controlled by Aquarea heat pumps based on the current heat demand. The heat pumps can therefore be operated even without a buffer tank, to achieve higher efficiency and save on space. To bridge electricity shutdown times imposed by the electric utility company, heat transfer systems with greater tank capacity such as under-floor heating can provide adequate intermediate storage.

5.4 Electricals

5.4.1 Electrical connection to a power source

WARNING

Danger to life from electric shock!

The devices are operated with 230 V or 400 V alternating current. Improper installation can present a danger to life from electric shock as well as a danger of fire occurring due to overheating.

- ► Electrical installation work must be undertaken by a trained electrician.
- ► Adherence to national and local standards and regulations is to be observed when carrying out any installation work.
- ► The heat pumps must be duly earthed. Earthing is not to be undertaken via gas or water pipes, lightning conductors or earthing for a telephone system.
- ► Adherence is to be paid to the respective national electrical wiring regulations and safety arrangements with regard to residual current. Panasonic recommends using a residual current circuit breaker (RCCB).

ATTENTION

Danger of damage due to unprofessional installation

- ► When making electrical wiring connections, respect the relevant requirements for cable type, cable cross-section and recommended fuse (→ *4.6.2.3 Technical Data (bi-bloc systems), p. 40*, → *4.6.3.3 Technical Data (mono-bloc systems), p. 55*), the minimum required contact clearance (5 mm) and the maximum permissible cable length (if indicated) as well as the connecting conditions for the individual devices mentioned below.
- ► The connection to the electricity supply must be led via a disconnetor. The disconnetor must have a contact clearance of minimum 3.0 mm.
- ► For the protection fuse of the mains power supply connections, bear in mind the power consumption and the cable cross-sections used. An unsuitable fuse can cause premature triggering or damage the cable. Respect the relevant rules, especially IEC 60364-4-43 and IEC 60364-5-52 or their national implementation.

In general, the Aquarea heat pumps can either be single-phase or three-phase devices. Depending on the nominal heating capacity and the power of the internal electric backup heater, the individual models further differ in the type of the mains connections.

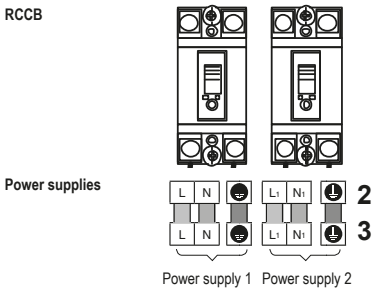
In the case of a mono-bloc system, the mains connection is made directly on the mono-bloc unit. In the case of a bi-bloc system, the mains connection is on the indoor unit (hydrokit or All in One unit), while the power supply to the outdoor unit is provided by an additional connecting cable between indoor unit and outdoor unit.

An overview of the said differences is shown in the following tables. The connection conditions for the individual devices are explained in paragraphs following each table.

Bi-bloc systems with All in One unit

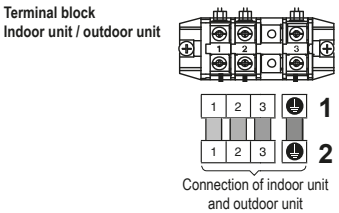
Models	Power supply 1				Power supply 2			
	Phases	Max. current consumption (A)	Max. power consumption (kW)	Min. cable size (mm^2)	Phases	Max. current consumption (A)	Max. power consumption (kW)	Min. cable size (mm^2)
WH-ADC0309J3E5(B/C) + WH-UD03JE5	1	12.0	2.59	3 x 1.5	1	13.0	3.0	3 x 1.5
WH-ADC0309J3E5(B/C) + WH-UD05JE5	1	12.0	2.59	3 x 1.5	1	13.0	3.0	3 x 1.5
WH-ADC0309J3E5(B/C) + WH-UD07JE5	1	15.9	3.47	3 x 2.5	1	13.0	3.0	3 x 1.5
WH-ADC0309J3E5(B/C) + WH-UD09JE5-1	1	15.9	3.47	3 x 2.5	1	13.0	3.0	3 x 1.5
WH-ADC1216H6E5 + WH-UD12HE5	1	24.0	5.30	3 x 4.0	1	26.0	6.0	3 x 4.0
WH-ADC1216H6E5 + WH-UD16HE5	1	26.0	5.74	3 x 4.0	1	26.0	6.0	3 x 4.0
WH-ADC1216H6E5 + WH-UX09HE5	1	29.0	6.27	3 x 4.0	1	26.0	6.0	3 x 4.0
WH-ADC1216H6E5 + WH-UX12HE5	1	29.0	6.27	3 x 4.0	1	26.0	6.0	3 x 4.0
WH-ADC1216H6E5C + WH-UD12HE5	1	24.0	5.30	3 x 2.5	1	26.0	6.0	3 x 4.0
WH-ADC1216H6E5C + WH-UD16HE5	1	26.0	5.74	3 x 4.0	1	26.0	6.0	3 x 4.0
WH-ADC1216H6E5C + WH-UX09HE5	1	29.0	6.27	3 x 4.0	1	26.0	6.0	3 x 4.0
WH-ADC1216H6E5C + WH-UX12HE5	1	29.0	6.27	3 x 4.0	1	26.0	6.0	3 x 4.0

RCCB and power supplies



Indoor unit / outdoor unit connection

1 Terminals on outdoor unit
2 Terminals on indoor unit
3 Terminals on disconnector of the power supply



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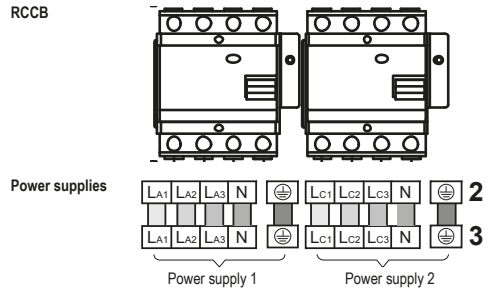
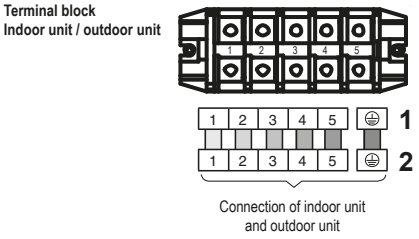
Models	Power supply 1				Power supply 2			
	Phases	Max. current consumption (A)	Max. power consumption (kW)	Min. cable size (mm^2)	Phases	Max. current consumption (A)	Max. power consumption (kW)	Min. cable size (mm^2)
WH-ADC0916H9E8 + WH-UD09HE8	3	8.8	5.85	5 x 1.5	3	13.0	9.0	5 x 1.5
WH-ADC0916H9E8 + WH-UD12HE8	3	8.8	5.85	5 x 1.5	3	13.0	9.0	5 x 1.5
WH-ADC0916H9E8 + WH-UD16HE8	3	9.9	6.59	5 x 1.5	3	13.0	9.0	5 x 1.5
WH-ADC0916H9E8 + WH-UX09HE8	3	10.4	6.85	5 x 1.5	3	13.0	9.0	5 x 1.5
WH-ADC0916H9E8 + WH-UX12HE8	3	11.9	7.91	5 x 1.5	3	13.0	9.0	5 x 1.5
WH-ADC0916H9E8 + WH-UX16HE8	3	15.5	10.27	5 x 1.5	3	13.0	9.0	5 x 1.5
WH-ADC0916H9E8 + WH-UQ09HE8	3	10.4	6.85	5 x 1.5	3	13.0	9.0	5 x 1.5
WH-ADC0916H9E8 + WH-UQ12HE8	3	11.9	7.91	5 x 1.5	3	13.0	9.0	5 x 1.5
WH-ADC0916H9E8 + WH-UQ16HE8	3	15.5	10.27	5 x 1.5	3	13.0	9.0	5 x 1.5

RCCB and power supplies



Indoor unit / outdoor unit connection

1 Terminals on outdoor unit
2 Terminals on indoor unit
3 Terminals on disconnector of the power supply



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Connection conditions

- For the connection to the power supply, an approved polychloroprene-sheathed power cord, type designation 60245 IEC 57 or heavier cord, is to be used for mains connection 1 and mains connection 2.
- As connecting cable between indoor and outdoor units, an approved polychloroprene-sheathed flexible cord, type designation 60245 IEC 57 or heavier cord, is to be used.

For All in One unit WH-ADC0309J3E5 or WH-ADC0309J3E5B:

- The equipment's power supply 1 complies with IEC/EN 61000-3-2.
- The equipment's power supply 1 complies with IEC/EN 61000-3-3 and can be connected to current supply network.
- The equipment's power supply 2 complies with IEC/EN 61000-3-2.
- The equipment's power supply 2 complies with IEC/EN 61000-3-11 and shall be connected to suitable supply network, with the following maximum permissible system impedance Z_{max} = 0.352 Ω at the interface. Please liaise with supply authority to ensure that the power supply 2 is connected only to a supply of that impedance or less.

For All in One unit WH-ADC0309J3E5C:

- The equipment's power supply 1 complies with IEC/EN 61000-3-2.
- The equipment's power supply 1 complies with IEC/EN 61000-3-3 and can be connected to current supply network.
- The equipment's power supply 2 complies with IEC/EN 61000-3-2.
- The equipment's power supply 2 complies with IEC/EN 61000-3-11 and shall be connected to suitable supply network, with the following maximum permissible system impedance Z_{max} = 0.450 Ω at the interface. Please liaise with supply authority to ensure that the power supply 2 is connected only to a supply of that impedance or less.

For All in One unit WH-ADC1216H6E5:

- The equipment's power supply 1 complies with IEC/EN 61000-3-12 provided that the short-circuit power S_{sc} is greater than or equal to 2,200 kW at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a short-circuit power S_{sc} greater than or equal to 2,200 kW.
- The equipment's power supply 1 shall be connected to a suitable supply network, having service current capacity ≥ 100 A per phase. Please liaise with supply authority to ensure that the service current capacity at the interface point is sufficient for the installation of the equipment.
- The equipment's mains connection 2 complies with IEC/EN 61000-3-12.
- The equipment's mains connection 2 shall be connected to suitable supply network, with the following maximum permissible system impedance Z_{max} at the interface point: 0.271 Ω. Please liaise with supply authority to ensure that the power supply 2 is connected only to a supply of that impedance or less.

For All in One unit WH-ADC1216H6E5C:

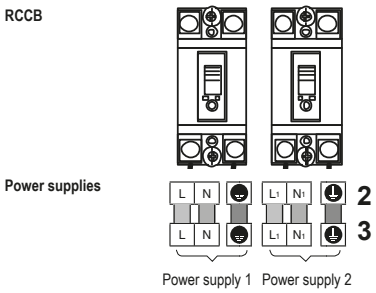
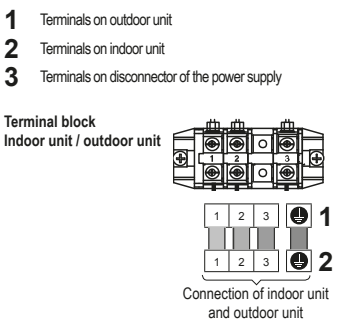
- The equipment's power supply 1 complies with IEC/EN 61000-3-12.
- The equipment's power supply 1 shall be connected to a suitable supply network, having service current capacity ≥ 100 A per phase. Please liaise with supply authority to ensure that the service current capacity at the interface point is sufficient for the installation of the equipment.
- The equipment's power supply 2 complies with IEC/EN 61000-3-12.
- The equipment's power supply 2 shall be connected to a suitable supply network, with the following maximum permissible system impedance Z_{max} at the interface point: 0.255 Ω. Please liaise with supply authority to ensure that the mains connection 2 is connected only to a supply of that impedance or less.

For All in One unit WH-ADC0916H9E8:

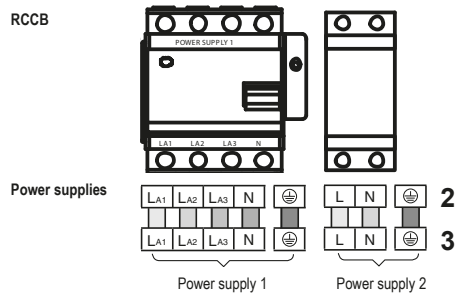
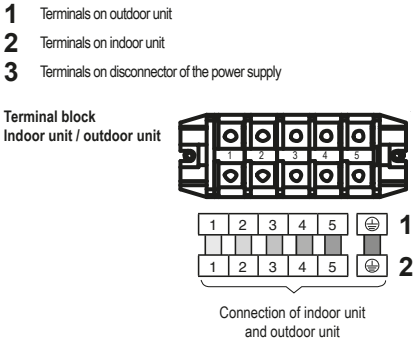
- The equipment's power supply 1 complies with IEC/EN 61000-3-2.
- The equipment's power supply 1 complies with IEC/EN 61000-3-3 and can be connected to current supply network.
- The equipment's power supply 2 complies with IEC/EN 61000-3-2.
- The equipment's power supply 2 complies with IEC/EN 61000-3-3 and can be connected to current supply network.

Bi-bloc systems with hydrokit

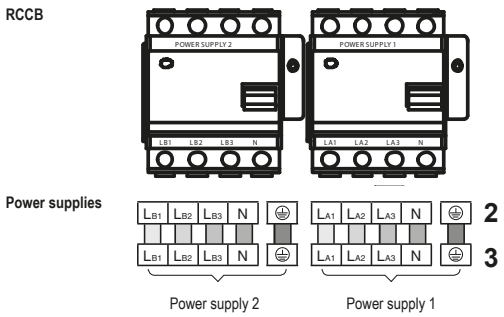
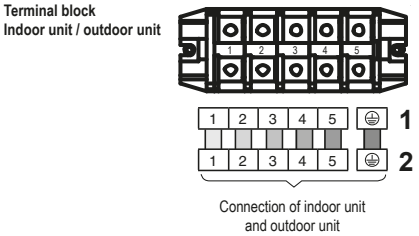
Models	Power supply 1				Power supply 2			
	Phases	Max. current consumption (A)	Max. power consumption (kW)	Min. cable size (mm^2)	Phases	Max. current consumption (A)	Max. power consumption (kW)	Min. cable size (mm^2)
WH-SDC0305J3E5 + WH-UD03JE5	1	12.0	2.59	3 x 1.5	1	13.0	3.0	3 x 1.5
WH-SDC0305J3E5 + WH-UD05JE5	1	12.0	2.59	3 x 1.5	1	13.0	3.0	3 x 1.5
WH-SDC0709J3E5 + WH-UD07JE5	1	15.9	3.47	3 x 2.5	1	13.0	3.0	3 x 1.5
WH-SDC0709J3E5 + WH-UD09JE5-1	1	15.9	3.47	3 x 2.5	1	13.0	3.0	3 x 1.5
WH-SDC12H6E5 + WH-UD12HE5	1	24.0	5.30	3 x 4.0	1	26.0	6.0	3 x 4.0
WH-SDC16H6E5 + WH-UD16HE5	1	26.0	5.74	3 x 4.0	1	26.0	6.0	3 x 4.0
WH-SXC09H3E5 + WH-UX09HE5	1	29.0	6.27	3 x 4.0	1	13.0	3.0	3 x 4.0
WH-SXC12H6E5 + WH-UX12HE5	1	29.0	6.27	3 x 4.0	1	26.0	6.0	3 x 4.0
WH-SHF09F3E5 + WH-UH09FE5	1	28.5	6.09	3 x 4.0 or 3 x 6.0	1	13.0	3.0	3 x 4.0
WH-SHF12F6E5 + WH-UH12FE5	1	29.0	6.20	3 x 4.0 or 3 x 6.0	1	26.0	6.0	3 x 4.0

RCCB and power supplies	Indoor unit / outdoor unit connection
	

Models	Power supply 1				Power supply 2			
	Phases	Max. current consumption (A)	Max. power consumption (kW)	Min. cable size (mm^2)	Phases	Max. current consumption (A)	Max. power consumption (kW)	Min. cable size (mm^2)
WH-SDC09H3E8 + WH-UD09HE8	3	13.1	8.85	5 x 1.5	1	13.0	3.0	3 x 1.5
WH-SXC09H3E8 + WH-UX09HE8	3	14.7	9.85	5 x 1.5	1	13.0	3.0	3 x 1.5
WH-SQC09H3E8 + WH-UQ09HE8	3	14.7	9.85	5 x 1.5	1	13.0	3.0	3 x 1.5
WH-SHF09F3E8 + WH-UH09FE8	3	14.5	9.67	5 x 1.5	1	13.0	3.0	3 x 1.5

	RCCB and power supplies	Indoor unit /outdoor unit connection
		

Models	Power supply 1				Power supply 2			
	Phases	Max. current consumption (A)	Max. power consumption (kW)	Min. cable size (mm^2)	Phases	Max. current consumption (A)	Max. power consumption (kW)	Min. cable size (mm^2)
WH-SDC12H9E8 + WH-UD12HE8	3	8.8	5.85	5 x 1.5	3	13.0	9.0	5 x 1.5
WH-SDC16H9E8 + WH-UD16HE8	3	9.9	6.59	5 x 1.5	3	13.0	9.0	5 x 1.5
WH-SXC12H9E8 + WH-UX12HE8	3	11.9	7.91	5 x 1.5	3	13.0	9.0	5 x 1.5
WH-SXC16H9E8 + WH-UX16HE8	3	15.5	10.27	5 x 1.5	3	13.0	9.0	5 x 1.5
WH-SQC12H9E8 + WH-UQ12HE8	3	11.9	7.91	5 x 1.5	3	13.0	9.0	5 x 1.5
WH-SQC16H9E8 + WH-UQ16HE8	3	15.5	10.27	5 x 1.5	3	13.0	9.0	5 x 1.5
WH-SHF12F9E8 + WH-UH12FE8	3	10.8	7.07	5 x 1.5	3	13.0	9.0	5 x 1.5

	RCCB and power supplies	Indoor unit / outdoor unit connection
		

Connection conditions

For hydrokits of the J and H generation:

- For the connection to the power supply, an approved polychloroprene-sheathed power cord, type designation 60245 IEC 57 or heavier cord, is to be used for mains connection 1 and mains connection 2.
- As connecting cable between indoor and outdoor units, an approved polychloroprene-sheathed flexible cord, type designation 60245 IEC 57 or heavier cord, is to be used.

For hydrokit WH-SDC0305J3E5 or WH-SDC0709J3E5:

- The equipment's power supply 1 complies with IEC/EN 61000-3-2.
- The equipment's power supply 1 complies with IEC/EN 61000-3-3 and can be connected to current supply network.
- The equipment's power supply 2 complies with IEC/EN 61000-3-2.
- The equipment's power supply 2 complies with IEC/EN 61000-3-11 and shall be connected to suitable supply network, with the following maximum permissible system impedance Z_{max} = 0.352 Ω at the interface. Please liaise with supply authority to ensure that the power supply 2 is connected only to a supply of that impedance or less.

For hydrokit WH-SDC12H6E5 or WH-SDC16H6E5:

- The equipment's power supply 1 complies with IEC/EN 61000-3-12 provided that the short circuit power S_{SC} is greater than or equal to 2,200 kW at the interface point between the user's supply and the public system. It is the responsible of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a short short circuit power S_{SC} greater than or equal to 2,200 kW.
- The equipment's power supply 1 complies with IEC/EN 61000-3-11 and shall be connected to a suitable supply network, having service current capacity ≥ 100 A per phase. Please liaise with supply authority that the service current capacity at the interface point is sufficient for the installation of the equipment.
- The equipment's power supply 2 complies with IEC/EN 61000-3-12.
- The equipment's power supply 2 complies with IEC/EN 61000-3-11 and shall be connected to suitable supply network, with the following maximum permissible system impedance Z_{max} = 0.271 Ω at the interface. Please liaise with supply authority to ensure that the power supply 2 is connected only to a supply of that impedance or less.

For hydrokit WH-SXC09H3E5 or WH-SXC12H6E5:

- The equipment's power supply 1 complies with IEC/EN 61000-3-12 provided that the short circuit power S_{SC} is greater than or equal to 1,700 kW at the interface point between the user's supply and the public system. It is the responsible of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a short short circuit power S_{SC} greater than or equal to 1,700 kW.
- The equipment's power supply 1 complies with IEC/EN 61000-3-11 and shall be connected to a suitable supply net work, having service current capacity ≥ 100 A per phase. Please liaise with supply authority that the service current capacity at the interface point is sufficient for the installation of the equipment.
- The equipment's power supply 2 complies with IEC/EN 61000-3-12.
- The equipment's power supply 2 complies with IEC/EN 61000-3-11 and shall be connected to suitable supply network, with the following maximum permissible system impedance Z_{max} = 0.271 Ω at the interface. Please liaise with supply authority to ensure that the power supply 2 is connected only to a supply of that impedance or less.

For hydrokit WH-SDC09H3E8, WH-SXC09H3E8 or WH-SQC09H3E8:

- The equipment's Power Supply 1 complies with IEC/EN 61000-3-2.
- The equipment's Power Supply 1 complies with IEC/EN 61000-3-3 and can be connected to current supply network.
- The equipment's Power Supply 2 complies with IEC/EN 61000-3-2.
- The equipment's Power Supply 2 complies with IEC/EN 61000-3-11 and shall be connected to suitable supply network, with the following maximum permissible system impedance Z_{max} = 0.426 Ω at the interface. Please liaise with supply authority to ensure that the power supply 2 is connected only to a supply of that impedance or less.

For hydrokit WH-SDC12H9E8, WH-SDC16H9E8, WH-SXC12H9E8, WH-SXC16H9E8, WH-SQC12H9E8 or WH-SQC16H9E8:

- The equipment's power supply 1 complies with IEC/EN 61000-3-2.
- The equipment's power supply 1 complies with IEC/EN 61000-3-3 and can be connected to current supply network.
- The equipment's power supply 2 complies with IEC/EN 61000-3-2.
- The equipment's power supply 2 complies with IEC/EN 61000-3-3 and can be connected to current supply network.

For hydrokits of the F generation:

- For the connection to the power supply, an approved polychloroprene-sheathed power cord, type designation 60245 IEC 57 or heavier cord, is to be used for mains connection 1 and mains connection 2.
- As connecting cable between indoor and outdoor units, an approved polychloroprene-sheathed flexible cord, type designation 60245 IEC 57 or heavier cord, is to be used.

For hydrokit WH-SHF09F3E5 or WH-SHF12F6E5.

- The equipment's power supply 1 complies with IEC/EN 61000-3-12 provided that the short circuit power SSC is greater than or equal to 1,100 kW at the interface point between the user's supply and the public system. It is the responsible of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a short short circuit power S_{SC} greater than or equal to 1,100 kW.
- The equipment's power supply 1 shall be connected to a suitable supply net work, having service current capacity ≥ 100 A per phase. Please liaise with supply authority that the service current capacity at the interface point is sufficient for the installation of the equipment.
- The equipment's power supply 2 complies with IEC/EN 61000-3-12.
- The equipment's power supply 2 shall be connected to suitable supply network, with the following maximum permissible system impedance Z_{max} = 0.244 Ω at the interface. Please liaise with supply authority to ensure that the power supply 2 is connected only to a supply of that impedance or less.

For hydrokit WH-SHF09F3E8:

- The equipment's power supply 1 complies with IEC/EN 61000-3-12.
- The equipment's power supply 2 complies with IEC/EN 61000-3-12.

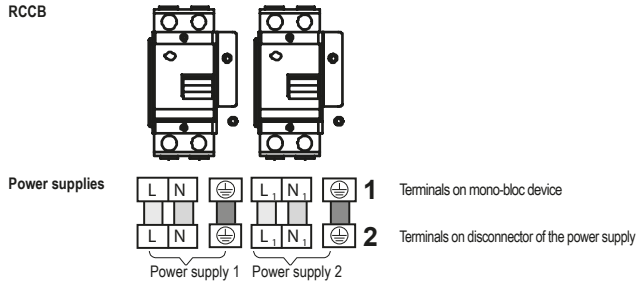
For hydrokit WH-SHF12F9E8

- The equipment's power supply 1 complies with IEC/EN 61000-3-12.
- The equipment's power supply 2 complies with IEC/EN 61000-3-12.
- The equipment's power supply 2 shall be connected to suitable supply network, with the following maximum permissible system impedance Z_{max} = 0.449 Ω at the interface. Please liaise with supply authority to ensure that the power supply 2 is connected only to a supply of that impedance or less.

Mono-bloc systems

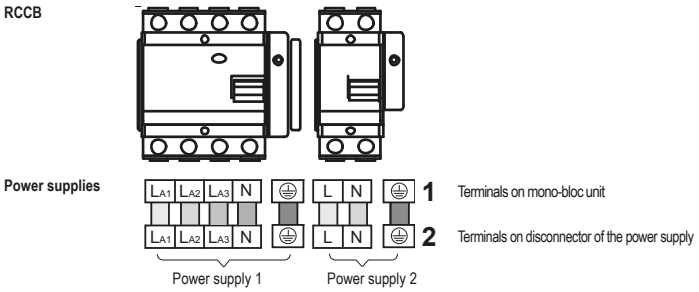
Models	Power supply 1				Power supply 2			
	Phases	Max. current consumption (A)	Max. power consumption (kW)	Min. cable size (mm²)	Phases	Max. current consumption (A)	Max. power consumption (kW)	Min. cable size (mm²)
WH-MDC05J3E5	1	12.0	2.59	3 x 1.5	1	13.0	3.0	3 x 1.5
WH-MDC07J3E5	1	17.0	3.71	3 x 2.5	1	13.0	3.0	3 x 1.5
WH-MDC09J3E5	1	17.0	3.83	3 x 2.5	1	13.0	3.0	3 x 1.5
WH-MDC12H6E5	1	24.0	5.30	3 x 4.0	1	26.0	6.0	3 x 4.0
WH-MDC16H6E5	1	26.0	5.74	3 x 4.0	1	26.0	6.0	3 x 4.0
WH-MXC09J3E5	1	29.0	6.27	3 x 4.0	1	13.0	3.0	3 x 4.0
WH-MXC12J6E5	1	29.0	6.27	3 x 4.0	1	26.0	6.0	3 x 4.0
WH-MXC09H3E5	1	29.0	6.27	3 x 4.0	1	13.0	3.0	3 x 4.0
WH-MXC12H6E5	1	29.0	6.27	3 x 4.0	1	26.0	6.0	3 x 4.0
WH-MHF09G3E5	1	28.5	6.09	3 x 4.0 or 3 x 6.0	1	13.0	3.0	3 x 4.0
WH-MHF12G6E5	1	29.0	6.20	3 x 4.0 or 3 x 6.0	1	26.0	6.0	3 x 4.0

RCCB and power supplies

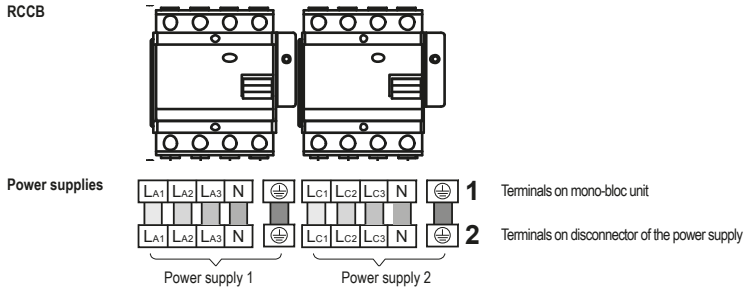


Models	Power supply 1				Power supply 2			
	Phases	Max. current consumption (A)	Max. power consumption (kW)	Min. cable size (mm²)	Phases	Max. current consumption (A)	Max. power consumption (kW)	Min. cable size (mm²)
WH-MXC09J3E8	3	14.7	9.99	5 x 1.5	1	13.0	3.0	3 x 1.5
WH-MXC09H3E8	3	14.7	9.96	5 x 1.5	1	13.0	3.0	3 x 2.5

RCCB and power supplies



Models	Power supply 1				Power supply 2			
	Phases	Max. current consumption (A)	Max. power consumption (kW)	Min. cable size (mm²)	Phases	Max. current consumption (A)	Max. power consumption (kW)	Min. cable size (mm²)
WH-MXC12J9E8	3	11.8	7.93	5 x 1.5	3	13.0	9.0	5 x 1.5
WH-MXC16J9E8	3	–	–	5 x 2.5	3	–	–	5 x 1.5
WH-MXC12H9E8	3	11.9	7.96	5 x 1.5	3	13.0	9.0	5 x 1.5
WH-MXC16H9E8	3	15.5	10.48	5 x 1.5	3	13.0	9.0	5 x 1.5
	RCCB and power supply							



Connection conditions

For mono-bloc units of the J and H generation

- For the connection to the power supply, an approved polychloroprene-sheathed power cord, type designation 60245 IEC 57 or heavier cord, is to be used for mains connection 1 and mains connection 2.

For mono-bloc unit WH-MDC05J3E5:

- The equipment's power supply 1 complies with IEC/EN 61000-3-2.
- The equipment's power supply 1 complies with IEC/EN 61000-3-3 and can be connected to current supply network.
- The equipment's power supply 2 complies with IEC/EN 61000-3-2.
- The equipment's power supply 2 complies with IEC/EN 61000-3-11 and shall be connected to suitable supply network, with the following maximum permissible system impedance Z_{max} = 0.450 Ω at the interface. Please liaise with supply authority to ensure that the power supply 2 is connected only to a supply of that impedance or less.

For mono-bloc unit WH-MDC07J3E5 or WH-MDC09J3E5:

- This equipment's power supply 1 complies with IEC/EN 61000-3-12.
- The equipment's power supply 1 complies with IEC/EN 61000-3-11 and shall be connected to a suitable supply network, having services current capacity ≥ 100 A per phase. Please liaise with supply authority that the service current capacity at the interface point is sufficient for the installation of the equipment.
- The equipment's power supply 2 complies with IEC/EN 61000-3-2.
- The equipment's power supply 2 complies with IEC/EN 61000-3-11 and shall be connected to suitable supply network, with the following maximum permissible system impedance Z_{max} = 0.450 Ω at the interface. Please liaise with supply authority to ensure that the power supply 2 is connected only to a supply of that impedance or less.

For mono-bloc unit WH-MDC12H6E5 or WH-MDC16H6E5:

- This equipment's power supply 1 complies with IEC/EN 61000-3-12 provided that the short circuit power Ssc is greater than or equal to 1,100 kW at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a short circuit power Ssc greater than or equal to 1,100 kW.
- The equipment's power supply 1 complies with IEC/EN 61000-3-11 and shall be connected to a suitable supply network, having services current capacity ≥ 100 A per phase. Please liaise with supply authority that the service current capacity at the interface point is sufficient for the installation of the equipment.
- The equipment's power supply 2 complies with IEC/EN 61000-3-12.
- The equipment's power supply 2 complies with IEC/EN 61000-3-11 and shall be connected to suitable supply network, with the following maximum permissible system impedance Zmax = 0.193 Ω at the interface. Please liaise with supply authority to ensure that the power supply 2 is connected only to a supply of that impedance or less.

For mono-bloc unit WH-MXC09J3E5 or WH-MXC09H3E5:

- This equipment's power supply 1 complies with IEC/EN 61000-3-12 provided that the short circuit power Ssc is greater than or equal to 1,900 kW at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a short circuit power Ssc greater than or equal to 1,900 kW.
- The equipment's power supply 1 complies with IEC/EN 61000-3-11 and shall be connected to a suitable supply network, having services current capacity ≥ 100 A per phase. Please liaise with supply authority that the service current capacity at the interface point is sufficient for the installation of the equipment.
- The equipment's power supply 2 complies with IEC/EN 61000-3-2.
- The equipment's power supply 2 complies with IEC/EN 61000-3-3 and can be connected to current supply network.

For mono-bloc unit WH-MXC12J6E5 or WH-MXC12H6E5:

- This equipment's power supply 1 complies with IEC/EN 61000-3-12 provided that the short circuit power Ssc is greater than or equal to 1,900 kW at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a short circuit power Ssc greater than or equal to 1,900 kW.
- The equipment's power supply 1 complies with IEC/EN 61000-3-11 and shall be connected to a suitable supply network, having services current capacity ≥ 100 A per phase. Please liaise with supply authority that the service current capacity at the interface point is sufficient for the installation of the equipment.
- This equipment's power supply 2 complies with IEC/EN 61000-3-12.
- The equipment's power supply 2 complies with IEC/EN 61000-3-11 and shall be connected to suitable supply network, with the following maximum permissible system impedance Zmax = 0.193 Ω at the interface. Please liaise with supply authority to ensure that the power supply 2 is connected only to a supply of that impedance or less.

For hydrokit WH-MXC09J3E8 or WH-MXC09H3E8:

- The equipment's power supply 1 complies with IEC/EN 61000-3-2.
- The equipment's power supply 1 complies with IEC/EN 61000-3-3 and can be connected to current supply network.
- The equipment's power supply 2 complies with IEC/EN 61000-3-2.
- The equipment's power supply 2 complies with IEC/EN 61000-3-11 and shall be connected to suitable supply network, with the following maximum permissible system impedance Zmax = 0.426 Ω at the interface. Please liaise with supply authority to ensure that the power supply 2 is connected only to a supply of that impedance or less.

For hydrokit WH-MXC12J9E8 or WH-MXC16J9E8:

- For model WH-MXC12J9E8, the equipment's power supply 1 complies with IEC/EN61000-3-2.
  For model WH-MXC16J9E8, the equipment's power supply 1 complies with IEC/EN61000-3-12 provided that the short-circuit power Ssc is greater than or equals to 550 kVA at the interface point between the user's supply and the public system.
  It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary that the equipment is connected only to supply with a short-circuit power Ssc greater than or equal to 550 kVA.
- The equipment's power supply 1 complies with IEC/EN 61000-3-3 and can be connected to current supply network.
- The equipment's power supply 2 complies with IEC/EN 61000-3-2.
- The equipment's power supply 2 complies with IEC/EN 61000-3-3 and can be connected to current supply network.

For hydrokit WH-MXC12H9E8 or WH-MXC16H9E8:

- The equipment's power supply 1 complies with IEC/EN 61000-3-2.
- The equipment's power supply 1 complies with IEC/EN 61000-3-3 and can be connected to current supply network.
- The equipment's power supply 2 complies with IEC/EN 61000-3-2.
- The equipment's power supply 2 complies with IEC/EN 61000-3-3 and can be connected to current supply network.

For mono-bloc units of the G generation

- For the connection to the power supply, an approved polychloroprene-sheathed power cord, type designation 60245 IEC 57 or heavier cord, is to be used for mains connection 1 and mains connection 2.

For mono-bloc unit WH-MHF09G3E5 or WH-MHF12G6E5:

- This equipment's power supply 1 complies with IEC/EN 61000-3-12 provided that the short circuit power Ssc is greater than or equal to 1,200 kW at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a short circuit power Ssc greater than or equal to 1,200 kW.
- The equipment's power supply 1 complies with IEC/EN 61000-3-11 and shall be connected to a suitable supply network, having services current capacity ≥ 100 A per phase. Please liaise with supply authority that the service current capacity at the interface point is sufficient for the installation of the equipment.
- The equipment's power supply 2 complies with IEC/EN 61000-3-11 and shall be connected to suitable supply network, with the following maximum permissible system impedance Zmax = 0.257 Ω at the interface. Please liaise with supply authority to ensure that the power supply 2 is connected only to a supply of that impedance or less.

5.4.2 Electricity meters and rates

For connecting a heat pump to the power grid, consent should be obtained from the competent electric utility company and connection conditions should be requested. In this context, it is also necessary to provide data regarding the building and about the heat pump and its operating mode. If it is possible to utilise special electricity tariffs for heat pumps, possible electricity shutdown times and their duration are to be requested and taken into account for design.

The power consumption of the heat pump is measured by a dedicated electricity meter, to which all power connections of the heat pump are connected, and used to determine the seasonal coefficient of performance and to calculate a deviating special heat pump tariff.

ATTENTION

Danger of water pipes freezing up during electricity shutdown times by the utility company

If electricity shutdown times imposed by the electric utility company coincide with frost periods, there can be frost damage, if the device ensuring frost-free operation of the heat pump is also affected by the electricity shutdown times.

► Wen connecting the base pan heater or other devices ensuring frost-free operation to the power grid, make sure that it cannot be affected by the electricity shutdown times.

5.5 Heating and cooling capacity depending on supply water temperature and outside temperature

Key for the capacity tables

The values in the capacity tables show the Panasonic measurement data matching with EN 14511-2. The data should be considered as reference values and do not offer any performance guarantee.

T_{amb}: Ambient temperature (°C)
LWC: Leaving water condenser temperature (°C)
HC: Heating capacity (kW)
CC: Cooling capacity (kW)

IP: Input power (kW)
COP: Coefficient of performance (heating mode)
EER: Energy efficiency ratio (cooling mode)

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WH-UD03JE5															
Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	25	25	25	35	35	35	45	45	45	55	55	55	60	60	60
-20	2,50	1,11	2,25	2,52	1,31	1,92	2,24	1,59	1,41	2,12	1,80	1,18	—	—	—
-15	3,00	1,14	2,63	3,20	1,37	2,34	3,00	1,62	1,85	2,75	1,92	1,43	—	—	—
-7	2,99	0,91	3,29	3,30	1,18	2,80	3,25	1,47	2,21	3,20	1,79	1,79	3,00	1,88	1,60
2	2,92	0,69	4,23	3,20	0,88	3,64	3,20	1,13	2,83	3,20	1,46	2,19	3,15	1,67	1,89
7	3,09	0,49	6,31	3,20	0,60	5,33	3,20	0,84	3,81	3,20	1,14	2,81	2,95	1,22	2,42
25	3,27	0,23	14,22	3,27	0,38	8,61	3,61	0,63	5,73	4,06	1,11	3,66	4,03	1,14	3,54
WH-UD05JE5															
Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	25	25	25	35	35	35	45	45	45	55	55	55	60	60	60
-20	3,60	1,57	2,29	3,51	1,81	1,94	3,16	1,99	1,59	2,46	2,11	1,17	—	—	—
-15	4,46	1,72	2,59	4,20	1,93	2,18	3,75	2,18	1,72	3,00	2,12	1,42	—	—	—
-7	4,18	1,33	3,14	4,20	1,62	2,59	3,80	1,82	2,09	3,55	2,08	1,71	3,25	2,15	1,51
2	4,07	1,01	4,03	4,20	1,32	3,18	4,20	1,64	2,56	4,10	2,06	1,99	4,10	2,21	1,86
7	5,20	0,83	6,27	5,00	1,00	5,00	5,00	1,41	3,55	5,00	1,84	2,72	4,25	2,10	2,02
25	5,00	0,52	9,62	5,00	0,72	6,94	5,30	0,98	5,41	5,60	1,27	4,41	4,80	1,27	3,78
WH-UD07JE5															
Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	25	25	25	35	35	35	45	45	45	55	55	55	60	60	60
-20	4,33	1,64	2,64	3,98	1,88	2,12	3,83	2,26	1,69	3,30	2,77	1,19	—	—	—
-15	5,16	1,69	3,05	4,75	2,00	2,38	4,65	2,40	1,94	4,50	2,96	1,52	—	—	—
-7	5,64	1,56	3,62	5,60	1,95	2,87	5,50	2,30	2,39	5,25	2,70	1,94	4,98	2,90	1,72
2	6,80	1,57	4,33	6,85	2,01	3,41	6,75	2,40	2,81	6,20	2,80	2,21	6,18	2,91	2,12
7	7,55	1,15	6,57	7,00	1,47	4,76	7,00	1,96	3,57	7,00	2,48	2,82	6,86	2,75	2,49
25	7,00	0,62	11,29	6,88	0,90	7,64	7,00	1,33	5,26	6,92	1,75	3,95	6,83	1,90	3,59

WH-UD09JE5-1

Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	25	25	25	35	35	35	45	45	45	55	55	55	60	60	60
-20	4,95	1,93	2,56	6,20	3,00	2,07	5,28	3,09	1,71	4,23	3,33	1,27	—	—	—
-15	7,58	2,70	2,81	7,40	3,20	2,31	6,29	3,26	1,93	5,20	3,42	1,52	—	—	—
-7	6,39	1,81	3,53	6,12	2,20	2,78	5,88	2,61	2,25	5,90	3,06	1,93	5,65	3,24	1,74
2	6,96	1,61	4,32	7,00	2,06	3,40	6,85	2,50	2,74	6,30	2,92	2,16	7,26	3,33	2,18
7	9,44	1,55	6,09	9,00	2,01	4,48	9,00	2,61	3,45	8,95	3,22	2,78	8,62	3,47	2,48
25	8,27	0,95	8,71	8,12	1,29	6,29	8,71	1,80	4,84	7,83	1,97	3,97	6,08	1,72	3,53

WH-UD03JE5

Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	14	14	14	18	18	18
16	3.56	0.57	6.25	4.32	0.55	7.85	3.47	0.41	8.46
25	3.29	0.73	4.51	4.06	0.72	5.64	3.27	0.52	6.29
35	3.20	0.91	3.52	3.56	0.93	3.83	3.20	0.68	4.71
43	2.68	1.06	2.53	3.34	1.09	3.06	2.79	0.82	3.40

WH-UD05JE5

Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	14	14	14	18	18	18
16	3.59	0.56	6.41	4.23	0.54	7.83	4.79	0.52	9.21
25	4.61	1.18	3.91	5.54	1.21	4.58	5.23	0.90	5.81
35	4.50	1.50	3.00	5.08	1.51	3.36	4.80	1.12	4.29
43	3.77	1.71	2.20	4.94	1.80	2.74	4.30	1.35	3.19

WH-UD07JE5

Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	14	14	14	18	18	18
16	5.20	0.81	6.42	6.62	0.73	9.07	7.04	0.72	9.78
25	7.40	1.73	4.28	9.30	1.78	5.22	7.65	1.10	6.95
35	6.70	2.21	3.03	8.10	2.23	3.63	6.70	1.42	4.72
43	4.50	1.99	2.26	5.44	2.00	2.72	5.10	1.71	2.98

WH-UD09JE5-1

Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	14	14	14	18	18	18
16	6.85	1.18	5.81	8.80	1.15	7.65	9.11	1.15	7.92
25	9.00	2.35	3.83	10.40	2.48	4.19	9.10	1.58	5.76
35	8.20	3.02	2.72	9.90	3.02	3.28	9.00	2.15	4.19
43	3.80	1.99	1.91	4.70	1.97	2.39	5.35	1.99	2.69

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WH-UD12HE5

Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	9.30	3.46	2.69	8.90	3.62	2.46	8.50	3.79	2.24	8.10	3.95	2.05	7.50	4.05	1.85	7.00	4.16	1.68
-7	10.40	3.37	3.09	10.00	3.66	2.73	9.60	3.95	2.43	9.20	4.24	2.17	8.70	4.26	2.04	8.20	4.27	1.92
2	11.80	3.10	3.81	11.40	3.31	3.44	11.00	3.53	3.12	10.60	3.74	2.83	9.80	3.94	2.49	9.10	4.14	2.20
7	12.00	2.10	5.71	12.00	2.53	4.74	12.00	2.96	4.05	12.00	3.39	3.54	12.00	3.78	3.17	12.00	4.16	2.88
25	12.00	1.38	8.70	12.00	1.66	7.23	11.80	1.94	6.08	11.70	2.23	5.25	11.50	2.49	4.62	11.40	2.74	4.16

WH-UD16HE5

Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	10.60	4.09	2.59	10.30	4.38	2.35	10.00	4.67	2.14	9.70	4.96	1.96	8.80	4.94	1.78	7.90	4.91	1.61
-7	11.90	4.03	2.95	11.40	4.43	2.57	10.80	4.83	2.24	10.30	5.22	1.97	9.60	5.09	1.89	9.00	4.95	1.82
2	13.50	3.74	3.61	13.00	3.96	3.28	12.40	4.18	2.97	11.90	4.40	2.70	10.80	4.46	2.42	9.80	4.51	2.17
7	16.00	3.21	4.98	16.00	3.74	4.28	16.00	4.27	3.75	16.00	4.80	3.33	15.20	5.11	2.97	14.50	5.41	2.68
25	16.00	2.31	6.93	16.00	2.69	5.95	16.00	3.07	5.21	16.00	3.45	4.64	16.00	3.67	4.36	15.90	3.89	4.09

WH-UD12HE5

Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	14	14	14	18	18	18
16	7.86	1.18	6.66	13.15	1.40	9.39	10.00	1.73	5.78
25	12.08	2.90	4.17	15.70	2.05	7.66	10.00	1.97	5.08
35	10.00	2.56	3.91	12.00	2.67	4.49	10.00	2.40	4.17
43	7.80	3.80	2.05	11.10	3.19	3.48	8.00	2.85	2.81

WH-UD16HE5

Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	14	14	14	18	18	18
16	9.20	1.62	5.68	16.40	2.58	6.36	12.20	2.45	4.98
25	14.40	3.92	3.67	19.20	3.83	5.01	12.20	2.79	4.37
35	12.20	4.76	2.56	15.00	4.98	3.01	12.20	2.96	4.12
43	7.75	3.40	2.28	13.80	5.95	2.32	9.70	4.00	2.43

Bi-bloc systems | Aquarea High Performance | H Generation | Three Phase | Heating and Cooling | R410A

WH-UD09HE8

Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	8.65	3.06	2.83	8.30	3.21	2.59	7.95	3.41	2.33	7.60	3.61	2.11	7.15	3.71	1.93	6.70	3.81	1.76
-7	9.35	2.91	3.21	9.00	3.16	2.85	8.85	3.54	2.50	8.70	3.92	2.22	8.30	3.89	2.13	7.90	3.86	2.05
2	9.31	2.35	3.96	9.00	2.51	3.59	9.00	2.78	3.24	9.00	3.05	2.95	8.90	3.49	2.55	8.80	3.94	2.23
7	9.00	1.54	5.84	9.00	1.86	4.84	9.00	2.16	4.17	9.00	2.46	3.66	9.00	2.76	3.26	9.00	3.06	2.94
25	9.00	1.05	8.57	9.00	1.24	7.26	8.73	1.44	6.06	8.46	1.64	5.16	8.28	1.82	4.55	8.10	2.00	4.05

WH-UD12HE8

Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	9.30	3.46	2.69	8.90	3.62	2.46	8.50	3.79	2.24	8.10	3.95	2.05	7.50	4.05	1.85	7.00	4.16	1.68
-7	10.40	3.37	3.09	10.00	3.66	2.73	9.60	3.95	2.43	9.20	4.24	2.17	8.70	4.26	2.04	8.20	4.27	1.92
2	11.80	3.10	3.81	11.40	3.31	3.44	11.00	3.53	3.12	10.60	3.74	2.83	9.80	3.94	2.49	9.10	4.14	2.20
7	12.00	2.10	5.71	12.00	2.53	4.74	12.00	2.96	4.05	12.00	3.39	3.54	12.00	3.78	3.17	12.00	4.16	2.88
25	12.00	1.38	8.70	12.00	1.66	7.23	11.80	1.94	6.08	11.70	2.23	5.25	11.50	2.49	4.62	11.40	2.74	4.16

WH-UD16HE8

Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	10.60	4.09	2.59	10.30	4.38	2.35	10.00	4.67	2.14	9.70	4.96	1.96	8.80	4.94	1.78	7.90	4.91	1.61
-7	11.90	4.03	2.95	11.40	4.43	2.57	10.80	4.83	2.24	10.30	5.22	1.97	9.60	5.09	1.89	9.00	4.95	1.82
2	13.50	3.74	3.61	13.00	3.96	3.28	12.40	4.18	2.97	11.90	4.40	2.70	10.80	4.46	2.42	9.80	4.51	2.17
7	16.00	3.21	4.98	16.00	3.74	4.28	16.00	4.27	3.75	16.00	4.80	3.33	15.20	5.11	2.97	14.50	5.41	2.68
25	16.00	2.31	6.93	16.00	2.69	5.95	16.00	3.07	5.21	16.00	3.45	4.64	16.00	3.67	4.36	15.90	3.89	4.09

WH-UD09HE8

Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	14	14	14	18	18	18
16	7.50	1.15	6.52	9.10	1.20	7.58	7.00	1.13	6.19
25	8.35	1.77	4.72	10.90	1.78	6.12	7.00	1.24	5.65
35	7.00	2.23	3.14	8.30	2.32	3.58	7.00	1.52	4.61
43	5.52	2.54	2.17	7.69	2.77	2.78	5.60	1.80	3.11

WH-UD12HE8

Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	14	14	14	18	18	18
16	7.86	1.18	6.66	13.15	1.40	9.39	10.00	1.73	5.78
25	12.08	2.90	4.17	15.70	2.05	7.66	10.00	1.97	5.08
35	10.00	2.56	3.91	12.00	2.67	4.49	10.00	2.40	4.17
43	7.80	3.80	2.05	11.10	3.19	3.48	8.00	2.85	2.81

WH-UD16HE8

Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	14	14	14	18	18	18
16	9.20	1.62	5.68	16.40	2.58	6.36	12.20	2.45	4.98
25	14.40	3.92	3.67	19.20	3.83	5.01	12.20	2.79	4.37
35	12.20	4.76	2.56	15.00	4.98	3.01	12.20	2.96	4.12
43	7.75	3.40	2.28	13.80	5.95	2.32	9.70	4.00	2.43

Mono-bloc systems | Aquarea High Performance | J Generation | Single Phase | Heating and Cooling | R32

WH-MDC05J3E5

Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	25	25	25	35	35	35	45	45	45	55	55	55	60	60	60
-20	4.37	1.73	2.53	4.16	2.03	2.05	3.84	2.37	1.62	3.43	2.64	1.30	—	—	—
-15	5.13	1.78	2.88	5.00	2.17	2.30	4.75	2.51	1.89	3.70	2.45	1.51	—	—	—
-7	5.17	1.49	3.47	5.00	1.80	2.78	4.80	2.16	2.22	5.00	2.70	1.85	4.68	2.71	1.73
2	5.00	1.11	4.50	5.00	1.40	3.57	5.00	1.81	2.76	5.00	2.20	2.27	4.80	2.40	2.00
7	5.09	0.78	6.53	5.00	0.99	5.05	5.00	1.31	3.82	5.00	1.66	3.01	4.58	1.90	2.41
25	4.96	0.77	6.44	5.04	0.90	5.60	5.31	1.16	4.58	5.61	1.34	4.19	5.15	1.33	3.87

WH-MDC07J3E5

Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	25	25	25	35	35	35	45	45	45	55	55	55	60	60	60
-20	4.86	2.03	2.39	4.66	2.35	1.98	4.44	2.75	1.61	4.23	3.13	1.35	—	—	—
-15	5.80	2.11	2.75	5.60	2.40	2.33	5.30	2.84	1.87	5.00	3.32	1.51	—	—	—
-7	6.76	2.07	3.27	6.80	2.42	2.81	6.30	2.82	2.23	6.30	3.39	1.86	4.74	2.76	1.72
2	6.83	1.66	4.11	7.00	2.06	3.40	6.85	2.50	2.74	6.30	2.92	2.16	4.80	2.40	2.00
7	7.32	1.19	6.15	7.00	1.47	4.76	7.00	1.96	3.57	7.00	2.48	2.82	6.18	2.44	2.53
25	6.80	0.64	10.63	6.67	0.93	7.17	6.79	1.38	4.92	6.70	1.80	3.72	6.22	1.78	3.49

WH-MDC09J3E5

Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	25	25	25	35	35	35	45	45	45	55	55	55	60	60	60
-20	5.33	2.36	2.26	6.43	3.60	1.79	5.78	3.83	1.51	4.83	3.64	1.33	—	—	—
-15	7.76	3.20	2.43	7.60	3.41	2.23	7.00	3.71	1.89	5.60	3.80	1.47	—	—	—
-7	7.39	2.45	3.02	7.50	2.85	2.63	7.30	3.37	2.17	7.00	3.89	1.80	6.44	3.67	1.75
2	7.38	1.89	3.90	7.45	2.38	3.13	7.00	2.85	2.46	7.00	3.30	2.12	5.46	2.72	2.01
7	9.15	1.59	5.75	9.00	2.01	4.48	9.00	2.61	3.45	8.95	3.22	2.78	7.25	2.87	2.53
25	8.02	0.98	8.18	7.88	1.32	5.97	8.46	1.86	4.55	7.60	2.03	3.74	6.30	1.87	3.37

WH-MDC05J3E5

Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	14	14	14	18	18	18
16	5.18	0.82	6.32	6.17	0.84	7.35	5.78	0.60	9.63
25	5.38	1.22	4.41	6.64	1.25	5.31	5.55	0.78	7.12
35	5.00	1.54	3.25	5.86	1.61	3.64	5.00	0.99	5.05
43	4.19	1.85	2.26	5.36	1.92	2.79	4.37	1.30	3.36

WH-MDC07J3E5

Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	14	14	14	18	18	18
16	5.38	0.83	6.48	6.69	0.85	7.87	7.65	0.76	10.07
25	6.96	1.82	3.82	9.06	1.98	4.58	7.58	1.23	6.16
35	7.00	2.29	3.06	8.37	2.47	3.39	7.00	1.48	4.73
43	5.60	2.55	2.20	6.87	2.58	2.66	6.10	1.88	3.24

WH-MDC09J3E5

Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	14	14	14	18	18	18
16	6.89	1.21	5.69	8.65	1.23	7.03	9.82	1.19	8.25
25	9.50	2.84	3.35	11.55	3.06	3.77	9.68	1.82	5.32
35	9.00	3.32	2.71	10.10	3.51	2.88	9.00	2.12	4.25
43	5.42	2.56	2.12	6.56	2.56	2.56	7.40	2.56	2.89

Mono-bloc systems | Aquarea High Performance | H Generation | Single Phase | Heating and Cooling |R410A

WH-MDC12H6E5

Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	9.30	3.46	2.69	8.90	3.62	2.46	8.50	3.79	2.24	8.10	3.95	2.05	—	—	—	7.00	4.10	1.71
-7	10.40	3.37	3.09	10.00	3.66	2.73	9.60	3.95	2.43	9.20	4.24	2.17	—	—	—	8.20	4.21	1.95
2	11.80	3.10	3.81	11.40	3.31	3.44	11.00	3.53	3.12	10.60	3.74	2.83	—	—	—	9.10	4.08	2.23
7	12.00	2.10	5.71	12.00	2.53	4.74	12.00	2.96	4.05	12.00	3.39	3.54	—	—	—	12.00	4.10	2.93
12	12.00	1.38	8.70	12.00	1.66	7.23	11.80	1.94	6.08	11.70	2.23	5.25	—	—	—	11.40	2.74	4.16

WH-MDC16H6E5

Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	10.60	4.09	2.59	10.30	4.38	2.35	10.00	4.67	2.14	9.70	4.96	1.96	7.90	4.84	1.63	—	—	—
-7	11.90	4.03	2.95	11.40	4.43	2.57	10.80	4.83	2.24	10.30	5.22	1.97	9.00	4.88	1.84	—	—	—
2	13.50	13.74	0.98	13.00	3.96	3.28	12.40	4.18	2.97	11.90	4.40	2.70	9.80	4.44	2.21	—	—	—
7	16.00	3.21	4.98	16.00	3.74	4.28	16.00	4.27	3.75	16.00	4.80	3.33	14.50	5.33	2.72	—	—	—
12	16.00	2.31	6.93	16.00	2.69	5.95	16.00	3.07	5.21	16.00	3.45	4.64	15.90	3.89	4.09	—	—	—

WH-MDC12H6E5

Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	14	14	14	18	18	18
16	7.86	1.18	6.66	13.15	2.05	6.41	10.00	1.73	5.78
25	12.08	2.90	4.17	15.70	3.05	5.15	10.00	1.97	5.08
35	10.00	3.56	2.81	12.00	3.67	3.27	10.00	2.15	4.65
43	7.80	3.80	2.05	11.10	3.19	3.48	8.00	2.85	2.81

WH-MDC16H6E5

Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	14	14	14	18	18	18
16	9.20	1.62	5.68	16.40	2.58	6.36	12.20	2.45	4.98
25	14.40	3.92	3.67	19.20	3.83	5.01	12.20	2.79	4.37
35	12.20	4.76	2.56	15.00	4.98	3.01	12.20	2.96	4.12
43	7.75	3.40	2.28	13.80	5.95	2.32	9.70	4.00	2.43

Bi-bloc systems | Aquarea T-CAP | H Generation | Single Phase / Three Phase | Heating and Cooling | R410A

WH-UX09HE5																		
Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	9.00	3.24	2.78	9.00	3.51	2.56	9.00	3.91	2.30	9.00	4.30	2.09	9.00	4.73	1.90	9.00	5.16	1.74
-7	9.00	2.71	3.32	9.00	3.16	2.85	9.00	3.62	2.49	9.00	4.07	2.21	9.00	4.27	2.11	9.00	4.46	2.02
2	9.00	2.36	3.81	9.00	2.51	3.59	9.00	2.78	3.24	9.00	3.05	2.95	9.00	3.56	2.53	9.00	4.07	2.21
7	9.00	1.64	5.49	9.00	1.86	4.84	9.00	2.16	4.17	9.00	2.46	3.66	9.00	2.76	3.26	9.00	3.06	2.94
25	13.60	1.50	9.07	13.60	1.71	7.95	13.20	1.93	6.84	12.80	2.14	5.98	12.00	2.41	4.98	11.20	2.67	4.19
WH-UX12HE5																		
Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	12.00	4.75	2.53	12.00	4.96	2.42	12.00	5.41	2.22	11.00	5.38	2.04	10.80	5.82	1.86	10.50	6.26	1.68
-7	12.00	3.85	3.12	12.00	4.41	2.72	12.00	4.98	2.41	12.00	5.54	2.17	12.00	5.90	2.03	12.00	6.26	1.92
2	12.00	3.19	3.76	12.00	3.49	3.44	12.00	3.87	3.10	12.00	4.25	2.82	12.00	4.86	2.47	12.00	5.47	2.19
7	12.00	2.18	5.50	12.00	2.53	4.74	12.00	2.96	4.05	12.00	3.39	3.54	12.00	3.78	3.17	12.00	4.16	2.88
25	13.60	1.55	8.77	13.60	1.76	7.73	13.40	2.10	6.38	13.20	2.43	5.43	12.60	2.66	4.74	12.00	2.89	4.15
WH-UX09HE8																		
Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	9.00	3.24	2.78	9.00	3.51	2.56	9.00	3.91	2.30	9.00	4.30	2.09	9.00	4.73	1.90	9.00	5.16	1.74
-7	9.00	2.71	3.32	9.00	3.16	2.85	9.00	3.62	2.49	9.00	4.07	2.21	9.00	4.27	2.11	9.00	4.46	2.02
2	9.00	2.36	3.81	9.00	2.51	3.59	9.00	2.78	3.24	9.00	3.05	2.95	9.00	3.56	2.53	9.00	4.07	2.21
7	9.00	1.64	5.49	9.00	1.86	4.84	9.00	2.16	4.17	9.00	2.46	3.66	9.00	2.76	3.26	9.00	3.06	2.94
25	13.60	1.50	9.07	13.60	1.71	7.95	13.20	1.93	6.84	12.80	2.14	5.98	12.00	2.41	4.98	11.20	2.67	4.19
WH-UX12HE8																		
Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	12.00	4.75	2.53	12.00	4.96	2.42	12.00	5.41	2.22	12.00	5.86	2.05	11.80	6.24	1.89	11.60	6.62	1.75
-7	12.00	3.85	3.12	12.00	4.41	2.72	12.00	4.98	2.41	12.00	5.54	2.17	12.00	5.90	2.03	12.00	6.26	1.92
2	12.00	3.19	3.76	12.00	3.49	3.44	12.00	3.87	3.10	12.00	4.25	2.82	12.00	4.86	2.47	12.00	5.47	2.19
7	12.00	2.18	5.50	12.00	2.53	4.74	12.00	2.96	4.05	12.00	3.39	3.54	12.00	3.78	3.17	12.00	4.16	2.88
25	13.60	1.55	8.77	13.60	1.76	7.73	13.40	2.10	6.38	13.20	2.43	5.43	12.60	2.66	4.74	12.00	2.89	4.15
WH-UX16HE8																		
Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	16.00	6.30	2.54	16.00	6.89	2.32	16.00	7.45	2.15	16.00	8.10	1.98	16.00	8.48	1.89	15.20	8.96	1.70
-7	16.00	5.85	2.74	16.00	6.42	2.49	16.00	7.00	2.29	16.00	7.57	2.11	16.00	8.10	1.98	16.00	8.62	1.86
2	16.00	4.67	3.43	16.00	5.21	3.07	16.00	5.74	2.79	16.00	6.31	2.54	16.00	6.90	2.32	16.00	7.50	2.13
7	16.00	3.35	4.78	16.00	3.74	4.28	16.00	4.30	3.72	16.00	4.80	3.33	16.00	5.43	2.95	16.00	5.91	2.71
16	16.00	2.59	6.18	16.00	3.18	5.03	16.00	3.71	4.31	16.00	4.27	3.75	16.00	4.86	3.29	16.00	5.22	3.07
25	16.00	2.02	7.92	16.00	2.58	6.20	16.00	2.91	5.50	16.00	3.36	4.76	16.00	3.74	4.28	16.00	4.00	4.00

	WH-UX09HE5									WH-UX12HE5								
Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	14	14	14	18	18	18	7	7	7	14	14	14	18	18	18
18	7,00	1,36	5,15	8,55	1,41	6,06	7,00	1,00	7,00	10,00	1,75	5,71	13,20	1,96	6,73	10,00	1,40	7,14
25	7,65	1,91	4,01	11,10	1,98	5,61	7,00	1,10	6,36	11,20	2,67	4,19	16,50	3,01	5,48	10,00	1,60	6,25
35	7,00	2,21	3,17	9,23	2,37	3,89	7,00	1,35	5,19	10,00	3,56	2,81	12,55	3,63	3,46	10,00	1,95	5,13
43	6,25	2,66	2,35	8,55	2,71	3,15	5,60	1,60	3,50	8,00	3,35	2,39	10,00	3,46	2,89	8,00	2,30	3,48
	WH-UX09HE8						WH-UX12HE8						WH-UX16HE8					
Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	18	18	18	7	7	7	18	18	18	7	7	7	18	18	18
18	7,00	1,36	5,15	—	—	—	7,50	1,41	5,32	—	—	—	8,50	1,70	5,00	10,00	1,70	5,88
25	7,65	1,91	4,01	—	—	—	8,90	2,16	4,12	—	—	—	14,00	4,00	3,50	14,00	2,94	4,76
35	7,00	2,21	3,17	—	—	—	10,00	3,56	2,81	—	—	—	12,20	4,76	2,56	12,20	3,50	3,49
43	6,25	2,66	2,35	—	—	—	8,00	3,01	2,66	—	—	—	7,10	3,31	2,15	9,80	3,31	2,96

Bi-bloc systems | Aquarea T-CAP | H Generation | Three Phase | Super Quiet | Heating and Cooling | R410A

WH-UQ09HE8																		
Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	9.00	3.24	2.78	9.00	3.51	2.56	9.00	3.91	2.30	9.00	4.30	2.09	9.00	4.73	1.90	9.00	5.16	1.74
-7	9.00	2.71	3.32	9.00	3.16	2.85	9.00	3.62	2.49	9.00	4.07	2.21	9.00	4.27	2.11	9.00	4.46	2.02
2	9.00	2.36	3.81	9.00	2.51	3.59	9.00	2.78	3.24	9.00	3.05	2.95	9.00	3.56	2.53	9.00	4.07	2.21
7	9.00	1.64	5.49	9.00	1.86	4.84	9.00	2.16	4.17	9.00	2.46	3.66	9.00	2.76	3.26	9.00	3.06	2.94
25	13.60	1.50	9.07	13.60	1.71	7.95	13.20	1.93	6.84	12.80	2.14	5.98	12.00	2.41	4.98	11.20	2.67	4.19

WH-UQ12HE8

Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	12.00	4.75	2.53	12.00	4.96	2.42	12.00	5.41	2.22	12.00	5.86	2.05	11.80	6.24	1.89	11.60	6.62	1.75
-7	12.00	3.85	3.12	12.00	4.41	2.72	12.00	4.98	2.41	12.00	5.54	2.17	12.00	5.90	2.03	12.00	6.26	1.92
2	12.00	3.19	3.76	12.00	3.49	3.44	12.00	3.87	3.10	12.00	4.25	2.82	12.00	4.86	2.47	12.00	5.47	2.19
7	12.00	2.18	5.50	12.00	2.53	4.74	12.00	2.96	4.05	12.00	3.39	3.54	12.00	3.78	3.17	12.00	4.16	2.88
25	13.60	1.55	8.77	13.60	1.76	7.73	13.40	2.10	6.38	13.20	2.43	5.43	12.60	2.66	4.74	12.00	2.89	4.15

WH-UQ16HE8

Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	16.00	6.30	2.54	16.00	6.89	2.32	16.00	7.45	2.15	16.00	8.10	1.98	16.00	8.48	1.89	15.20	8.96	1.70
-7	16.00	5.85	2.74	16.00	6.42	2.49	16.00	7.00	2.29	16.00	7.57	2.11	16.00	8.10	1.98	16.00	8.62	1.86
2	16.00	4.67	3.43	16.00	5.21	3.07	16.00	5.74	2.79	16.00	6.31	2.54	16.00	6.90	2.32	16.00	7.50	2.13
7	16.00	3.35	4.78	16.00	3.74	4.28	16.00	4.30	3.72	16.00	4.80	3.33	16.00	5.43	2.95	16.00	5.91	2.71
16	16.00	2.59	6.18	16.00	3.18	5.03	16.00	3.71	4.31	16.00	4.27	3.75	16.00	4.86	3.29	16.00	5.22	3.07
25	16.00	2.02	7.92	16.00	2.58	6.20	16.00	2.91	5.50	16.00	3.36	4.76	16.00	3.74	4.28	16.00	4.00	4.00

WH-UQ09HE8

Tamb	CC	IP	EER	CC	IP	EER
LWC	7	7	7	18	18	18
18	7.00	1.36	5.15	—	—	—
25	7.65	1.91	4.01	—	—	—
35	7.00	2.21	3.17	—	—	—
43	6.25	2.66	2.35	—	—	—

WH-UQ12HE8

Tamb	CC	IP	EER	CC	IP	EER
LWC	7	7	7	18	18	18
18	7.50	1.41	5.32	—	—	—
25	8.90	2.16	4.12	—	—	—
35	10.00	3.56	2.81	—	—	—
43	8.00	3.01	2.66	—	—	—

WH-UQ16HE8

Tamb	CC	IP	EER	CC	IP	EER
LWC	7	7	7	18	18	18
18	8.50	1.70	5.00	10.00	1.70	5.88
25	14.00	4.00	3.50	14.00	2.94	4.76
35	12.20	4.76	2.56	12.20	3.50	3.49
43	7.10	3.31	2.15	9.80	3.31	2.96

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Mono-bloc systems | Aquarea T-CAP | J Generation | Single Phase | Heating and Cooling | R32

WH-MXC09J3E5

Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	25	25	25	35	35	35	45	45	45	55	55	55	60	60	60
-20	9.00	3.44	2.62	9.00	3.95	2.28	9.00	4.65	1.94	7.90	5.58	1.42	—	—	—
-15	9.00	2.98	3.02	9.00	3.41	2.64	9.00	4.04	2.23	9.00	4.83	1.86	8.70	5.37	1.62
-7	10.50	2.72	3.86	9.00	2.92	3.08	9.00	3.54	2.54	9.00	4.24	2.12	9.00	4.62	1.95
2	10.80	2.14	5.05	9.00	2.36	3.81	9.00	2.91	3.09	9.00	3.55	2.54	9.00	4.05	2.22
7	9.00	1.38	6.52	9.00	1.77	5.08	9.00	2.37	3.80	9.00	2.92	3.08	9.00	3.29	2.74
25	9.00	0.77	11.69	9.00	1.00	9.00	10.00	1.67	5.99	10.00	2.28	4.39	11.00	2.86	3.85

WH-MXC12J6E5

Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	25	25	25	35	35	35	45	45	45	55	55	55	60	60	60
-20	12.00	5.02	2.39	12.00	5.80	2.07	11.00	5.95	1.85	10.00	6.50	1.54	—	—	—
-15	12.00	4.14	2.90	12.00	4.83	2.48	11.00	5.20	2.12	10.50	6.00	1.75	8.90	6.30	1.41
-7	13.50	4.30	3.14	12.00	4.25	2.82	12.00	5.02	2.39	12.00	6.00	2.00	11.00	6.30	1.75
2	14.50	3.23	4.49	12.00	3.40	3.53	12.00	4.20	2.86	12.00	4.95	2.42	12.00	5.77	2.08
7	12.00	2.00	6.00	12.00	2.50	4.80	12.00	3.24	3.70	12.00	3.94	3.05	12.00	4.52	2.65
25	12.00	1.20	10.00	12.00	1.49	8.05	12.00	2.10	5.71	12.00	2.75	4.36	12.00	3.11	3.86

WH-MXC09J3E5

Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	14	14	14	18	18	18
16	9.00	1.61	5.59	11.00	1.49	7.38	11.40	1.30	8.77
25	9.00	2.00	4.50	12.60	2.38	5.29	10.50	1.54	6.82
35	9.00	2.83	3.18	10.90	2.98	3.66	9.00	1.95	4.62
43	7.20	3.26	2.21	8.70	3.23	2.69	7.30	2.43	3.00

WH-MXC12J6E5									
Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	14	14	14	18	18	18
16	11.40	2.10	5.43	13.60	2.09	6.51	15.00	2.06	7.28
25	12.00	2.87	4.18	15.70	3.60	4.36	14.00	2.56	5.47
35	12.00	4.14	2.90	13.60	4.35	3.13	12.00	3.04	3.95
43	10.30	4.89	2.11	11.80	4.98	2.37	10.40	3.72	2.80

Mono-bloc systems | Aquarea T-CAP | H Generation | Single Phase / Three Phase | Heating and Cooling | R410A

WH-MXC09H3E5 / WH-MXC09H3E8																		
Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	9.00	3.24	2.78	9.00	3.51	2.56	9.00	3.91	2.30	9.00	4.30	2.09	9.00	4.73	1.90	9.00	5.16	1.74
-7	9.00	2.71	3.32	9.00	3.16	2.85	9.00	3.62	2.49	9.00	4.07	2.21	9.00	4.27	2.11	9.00	4.46	2.02
2	9.00	2.36	3.81	9.00	2.51	3.59	9.00	2.78	3.24	9.00	3.05	2.95	9.00	3.56	2.53	9.00	4.07	2.21
7	9.00	1.64	5.49	9.00	1.86	4.84	9.00	2.16	4.17	9.00	2.46	3.66	9.00	2.76	3.26	9.00	3.06	2.94
25	13.60	1.50	9.07	13.60	1.71	7.95	13.20	1.93	6.84	12.80	2.14	5.98	12.00	2.41	4.98	11.20	2.67	4.19
WH-MXC12H6E5																		
Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	12.00	4.75	2.53	12.00	4.96	2.42	12.00	5.41	2.22	11.00	5.38	2.04	10.80	5.82	1.86	10.50	6.26	1.68
-7	12.00	3.85	3.12	12.00	4.41	2.72	12.00	4.98	2.41	12.00	5.54	2.17	12.00	5.90	2.03	12.00	6.26	1.92
2	12.00	3.19	3.76	12.00	3.49	3.44	12.00	3.87	3.10	12.00	4.25	2.82	12.00	4.86	2.47	12.00	5.47	2.19
7	12.00	2.18	5.50	12.00	2.53	4.74	12.00	2.96	4.05	12.00	3.39	3.54	12.00	3.78	3.17	12.00	4.16	2.88
25	13.60	1.55	8.77	13.60	1.76	7.73	13.40	2.10	6.38	13.20	2.43	5.43	12.60	2.66	4.74	12.00	2.89	4.15
WH-MXC12H9E8																		
Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	12.00	4.75	2.53	12.00	4.96	2.42	12.00	5.41	2.22	12.00	5.86	2.05	11.80	6.24	1.89	11.60	6.62	1.75
-7	12.00	3.85	3.12	12.00	4.41	2.72	12.00	4.98	2.41	12.00	5.54	2.17	12.00	5.90	2.03	12.00	6.26	1.92
2	12.00	3.19	3.76	12.00	3.49	3.44	12.00	3.87	3.10	12.00	4.25	2.82	12.00	4.86	2.47	12.00	5.47	2.19
7	12.00	2.18	5.50	12.00	2.53	4.74	12.00	2.96	4.05	12.00	3.39	3.54	12.00	3.78	3.17	12.00	4.16	2.88
25	13.60	1.55	8.77	13.60	1.76	7.73	13.40	2.10	6.38	13.20	2.43	5.43	12.60	2.66	4.74	12.00	2.89	4.15
WH-MXC16H9E8																		
Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	16.00	6.30	2.54	16.00	6.89	2.32	16.00	7.45	2.15	16.00	8.10	1.98	16.00	8.48	1.89	15.20	8.96	1.70
-7	16.00	5.85	2.74	16.00	6.42	2.49	16.00	7.00	2.29	16.00	7.57	2.11	16.00	8.10	1.98	16.00	8.62	1.86
2	16.00	4.67	3.43	16.00	5.21	3.07	16.00	5.74	2.79	16.00	6.31	2.54	16.00	6.90	2.32	16.00	7.50	2.13
7	16.00	3.35	4.78	16.00	3.74	4.28	16.00	4.30	3.72	16.00	4.80	3.33	16.00	5.43	2.95	16.00	5.91	2.71
16	16.00	2.59	6.18	16.00	3.18	5.03	16.00	3.71	4.31	16.00	4.27	3.75	16.00	4.86	3.29	16.00	5.22	3.07
25	16.00	2.02	7.92	16.00	2.58	6.20	16.00	2.91	5.50	16.00	3.36	4.76	16.00	3.74	4.28	16.00	4.00	4.00

	WH-MXC09H3E5									WH-MXC12H6E5								
Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	14	14	14	18	18	18	7	7	7	14	14	14	18	18	18
18	7.00	1.36	5.15	8.55	1.41	6.06	7.00	1.00	7.00	10.00	1.75	5.71	13.20	1.96	6.73	10.00	1.40	7.14
25	7.65	1.91	4.01	11.10	1.98	5.61	7.00	1.10	6.36	11.20	2.67	4.19	16.50	3.01	5.48	10.00	1.60	6.25
35	7.00	2.21	3.17	9.23	2.37	3.89	7.00	1.35	5.19	10.00	3.56	2.81	12.55	3.63	3.46	10.00	1.95	5.13
43	6.25	2.66	2.35	8.55	2.71	3.15	5.60	1.60	3.50	8.00	3.35	2.39	10.00	3.46	2.89	8.00	2.30	3.48
	WH-MXC09H3E8						WH-MXC12H9E8						WH-MXC16H9E8					
Tamb	CC	IP	EER	CC	IP	EER	CC	IP	EER	CC	IP	EER	CC	IP	EER	CC	IP	EER
LWC	7	7	7	18	18	18	7	7	7	18	18	18	7	7	7	18	18	18
18	7.00	1.36	5.15	—	—	—	7.50	1.41	5.32	—	—	—	8.50	1.70	5.00	10.00	1.70	5.88
25	7.65	1.91	4.01	—	—	—	8.90	2.16	4.12	—	—	—	14.00	4.00	3.50	14.00	2.94	4.76
35	7.00	2.21	3.17	—	—	—	10.00	3.56	2.81	—	—	—	12.20	4.76	2.56	12.20	3.50	3.49
43	6.25	2.66	2.35	—	—	—	8.00	3.01	2.66	—	—	—	7.10	3.31	2.15	9.80	3.31	2.96

Bi-bloc systems | Aquarea HT | F Generation | Single Phase / Three Phase | Heating Only | R407C

WH-UH09FE5																							
Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55	60	60	60	65	65	65
-15	9.00	3.46	2.60	9.00	3.71	2.43	9.00	4.01	2.24	8.80	4.26	2.07	8.60	4.61	1.87	8.50	4.91	1.73	8.00	5.06	1.58	7.80	5.86	1.33
-7	9.00	3.06	2.94	9.00	3.29	2.74	9.00	3.56	2.53	8.90	3.83	2.32	8.90	4.11	2.17	8.90	4.46	2.00	8.90	4.96	1.79	8.90	5.46	1.63
2	9.00	2.43	3.70	9.00	2.61	3.45	9.00	2.91	3.09	9.00	3.21	2.80	9.00	3.55	2.54	9.00	3.88	2.32	9.00	4.35	2.07	9.00	4.76	1.89
7	9.00	1.82	4.95	9.00	1.94	4.64	9.00	2.21	4.07	9.00	2.46	3.66	9.00	2.76	3.26	9.00	3.06	2.94	9.00	3.46	2.60	9.00	3.96	2.27
16	9.00	1.46	6.16	9.00	1.56	5.77	9.00	1.81	4.97	8.90	2.02	4.41	8.80	2.31	3.81	8.60	2.52	3.41	8.20	2.77	2.96	8.20	3.18	2.58
25	12.00	1.66	7.23	12.00	1.76	6.82	12.00	2.01	5.97	10.80	2.14	5.05	10.60	2.46	4.31	10.20	2.66	3.83	9.80	2.89	3.39	9.60	3.31	2.90
WH-UH12FE5																								
Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55	60	60	60	65	65	65
-15	12.00	5.16	2.33	12.00	5.53	2.17	11.00	5.51	2.00	10.60	5.53	1.92	10.30	5.63	1.83	9.70	5.76	1.68	9.00	6.01	1.50	8.00	6.11	1.31
-7	12.00	4.43	2.71	12.00	4.76	2.52	11.50	4.91	2.34	11.20	5.06	2.21	10.80	5.16	2.09	10.10	5.28	1.91	10.00	5.66	1.77	9.60	5.91	1.62
2	12.00	3.42	3.51	12.00	3.68	3.26	11.50	3.86	2.98	11.30	4.14	2.73	11.00	4.51	2.44	10.80	4.86	2.22	10.65	5.31	2.01	10.30	5.59	1.84
7	12.00	2.52	4.76	12.00	2.69	4.46	12.00	3.06	3.92	12.00	3.44	3.49	12.00	3.81	3.15	12.00	4.28	2.80	12.00	4.76	2.52	12.00	5.41	2.22
16	12.00	2.03	5.91	12.00	2.17	5.53	12.00	2.52	4.76	12.00	2.86	4.20	11.50	3.19	3.61	11.50	3.48	3.30	11.00	3.82	2.88	11.00	4.37	2.52
25	12.00	1.66	7.23	12.00	1.76	6.82	12.00	2.01	5.97	11.80	2.41	4.90	11.20	2.64	4.24	10.80	2.86	3.78	10.50	3.11	3.38	10.30	3.62	2.85
WH-UH09FE8																								
Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55	60	60	60	65	65	65
-15	9.00	3.46	2.60	9.00	3.71	2.43	9.00	4.01	2.24	8.80	4.26	2.07	8.60	4.61	1.87	8.50	4.91	1.73	8.00	5.06	1.58	7.80	5.86	1.33
-7	9.00	3.06	2.94	9.00	3.29	2.74	9.00	3.56	2.53	8.90	3.83	2.32	8.90	4.11	2.17	8.90	4.46	2.00	8.90	4.96	1.79	8.90	5.46	1.63
2	9.00	2.43	3.70	9.00	2.61	3.45	9.00	2.91	3.09	9.00	3.21	2.80	9.00	3.55	2.54	9.00	3.88	2.32	9.00	4.35	2.07	9.00	4.76	1.89
7	9.00	1.82	4.95	9.00	1.94	4.64	9.00	2.21	4.07	9.00	2.46	3.66	9.00	2.76	3.26	9.00	3.06	2.94	9.00	3.46	2.60	9.00	3.96	2.27
16	9.00	1.46	6.16	9.00	1.56	5.77	9.00	1.81	4.97	8.90	2.02	4.41	8.80	2.31	3.81	8.60	2.52	3.41	8.20	2.77	2.96	8.20	3.18	2.58
25	12.00	1.66	7.23	12.00	1.76	6.82	12.00	2.01	5.97	10.80	2.14	5.05	10.60	2.46	4.31	10.20	2.66	3.83	9.80	2.89	3.39	9.60	3.31	2.90
WH-UH12FE8																								
Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55	60	60	60	65	65	65
-15	12.00	5.16	2.33	12.00	5.53	2.17	11.00	5.51	2.00	10.60	5.53	1.92	10.30	5.63	1.83	9.70	5.76	1.68	9.00	6.01	1.50	8.00	6.11	1.31
-7	12.00	4.43	2.71	12.00	4.76	2.52	11.50	4.91	2.34	11.20	5.06	2.21	10.80	5.16	2.09	10.10	5.28	1.91	10.00	5.66	1.77	9.60	5.91	1.62
2	12.00	3.42	3.51	12.00	3.68	3.26	11.50	3.86	2.98	11.30	4.14	2.73	11.00	4.51	2.44	10.80	4.86	2.22	10.65	5.31	2.01	10.30	5.59	1.84
7	12.00	2.52	4.76	12.00	2.69	4.46	12.00	3.06	3.92	12.00	3.44	3.49	12.00	3.81	3.15	12.00	4.28	2.80	12.00	4.76	2.52	12.00	5.41	2.22
16	12.00	2.03	5.91	12.00	2.17	5.53	12.00	2.52	4.76	12.00	2.86	4.20	11.50	3.19	3.61	11.50	3.48	3.30	11.00	3.82	2.88	11.00	4.37	2.52
25	12.00	1.66	7.23	12.00	1.76	6.82	12.00	2.01	5.97	11.80	2.41	4.90	11.20	2.64	4.24	10.80	2.86	3.78	10.50	3.11	3.38	10.30	3.62	2.85

Mono-bloc systems | Aquarea HT | G Generation | Single Phase | Heating Only | R407C

WH-MHF09G3E5																		
Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	9.00	3.46	2.60	9.00	3.71	2.43	9.00	4.01	2.24	8.80	4.26	2.07	8.50	4.71	1.80	7.80	5.38	1.45
-7	9.00	3.06	2.94	9.00	3.29	2.74	9.00	3.56	2.53	8.90	3.83	2.32	8.90	4.28	2.08	9.00	5.02	1.79
2	9.00	2.43	3.70	9.00	2.61	3.45	9.00	2.91	3.09	9.00	3.21	2.80	9.00	3.72	2.42	9.00	4.37	2.06
7	9.00	1.82	4.95	9.00	1.94	4.64	9.00	2.21	4.07	9.00	2.46	3.66	9.00	2.99	3.01	9.00	3.64	2.47
25	9.00	1.52	5.92	9.00	1.70	5.29	9.00	1.88	4.79	9.00	2.16	4.17	9.00	2.63	3.42	9.00	3.20	2.81
WH-MHF12G6E5																		
Tamb	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
LWC	30	30	30	35	35	35	40	40	40	45	45	45	50	50	50	55	55	55
-15	12.00	5.16	2.33	12.00	5.53	2.17	11.00	5.51	2.00	10.80	5.49	1.97	9.70	5.52	1.76	8.00	5.61	1.43
-7	12.00	4.43	2.71	12.00	4.76	2.52	11.50	4.91	2.34	11.20	5.06	2.21	10.10	5.06	2.00	9.60	5.43	1.77
2	12.00	3.42	3.51	12.00	3.68	3.26	11.50	3.86	2.98	11.30	4.14	2.73	10.80	4.66	2.32	10.30	5.13	2.01
7	12.00	2.52	4.76	12.00	2.69	4.46	12.00	3.06	3.92	12.00	3.44	3.49	12.00	4.10	2.93	12.00	4.97	2.41
25	12.00	2.03	5.91	12.00	2.36	5.08	12.00	2.69	4.46	12.00	3.02	3.97	12.00	3.61	3.32	12.00	4.37	2.75

5.6 Application examples

This section illustrates various application examples for Aquarea air-to-water heat pumps.

IMPORTANT

The figures used are purely schematic representations showing the principal components and can be used as the basis for designing concrete systems. They do not, however, include all the components needed according to EN 12828 nor all necessary safety devices.

Please follow all the relevant standards and guidelines while designing concrete systems.

The following application examples only relate to the current bi-bloc systems of the J or H generation with hydrokit or with All in One unit in standard or two-zone configuration (“B”) (→ *4.6.2.1 Components (bi-bloc systems), p. 29*).

The hydraulic schematics were created with the Hydraulic Scheme Generator. Based on the installation requirements entered, this online tool creates an exact hydraulic schematic to facilitate the proper connection of the heat pumps. Panasonic provides it free of cost at www.PanasonicProClub.com.

You will find a detailed legend for all the hydraulic schematics subsequent to the graphic representations (→ *5.6.9 Key for the application examples, p. 145*).

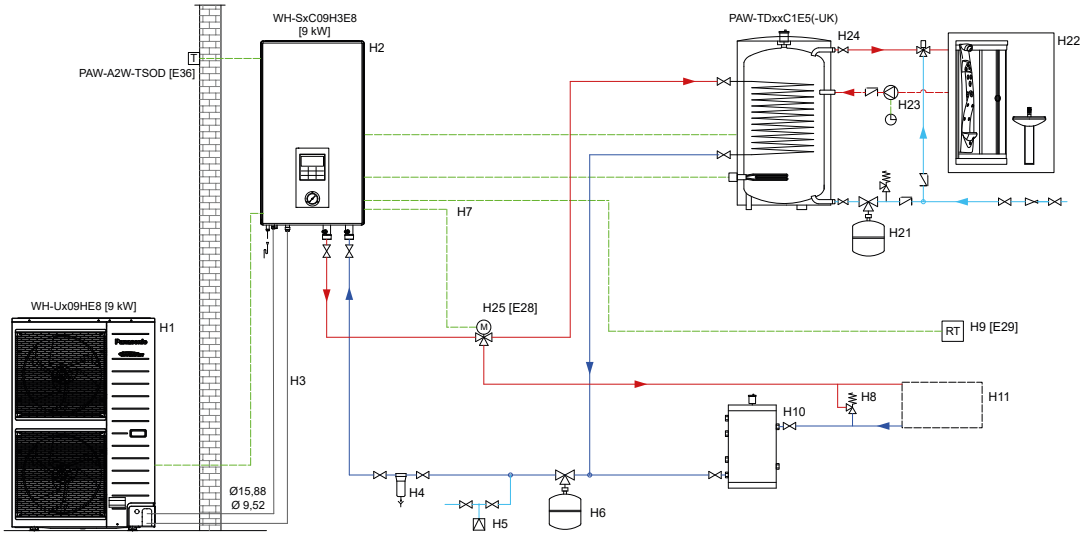
Details about the settings on the remote controller for the various application examples are given in the operating instructions for the respective device.

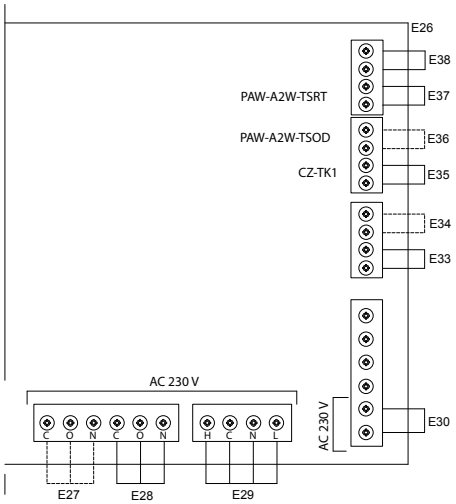
Note

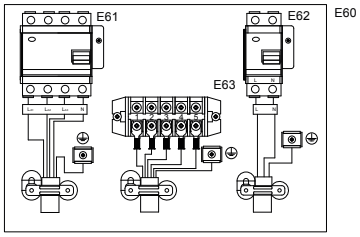
You will find information about application examples with bi-bloc systems of earlier generations in the Planning Manual of 2014.

5.6.1 Example 1: One-zone system without buffer tank

Hydrokit, T-CAP, 9 kW, 3 Ph, domestic hot water tank

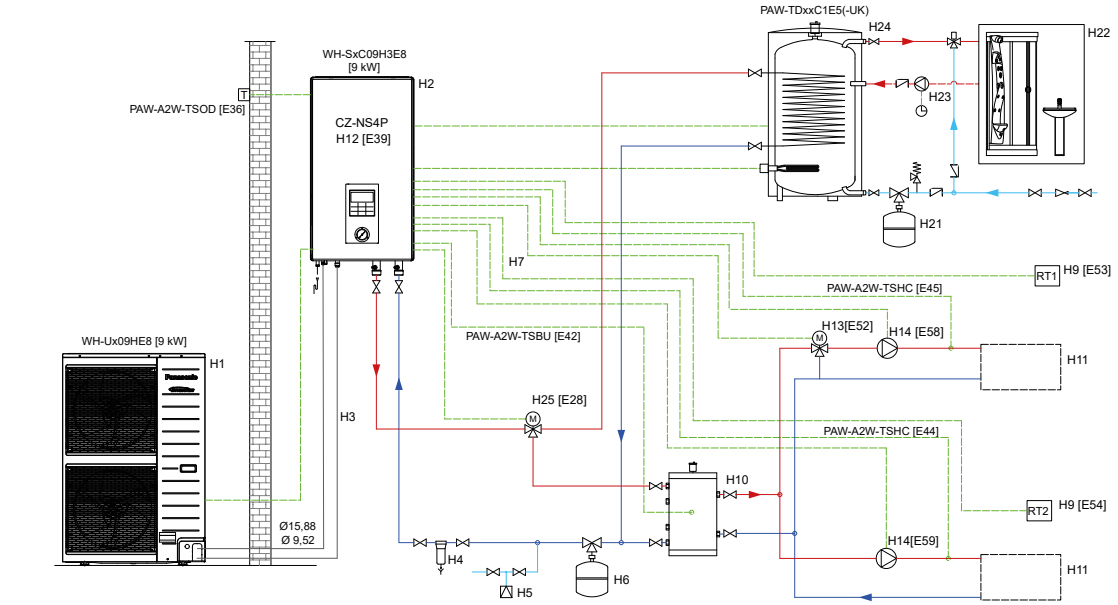


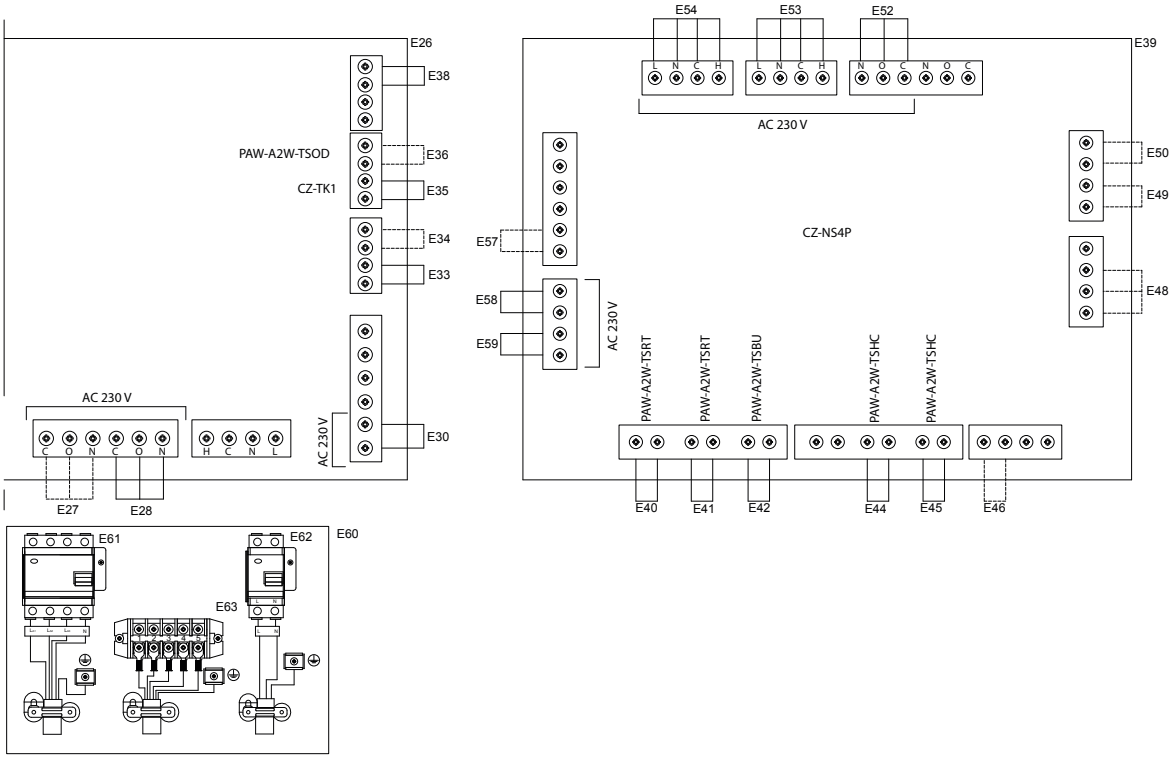




5.6.2 Example 2: Two-zone system with buffer tank

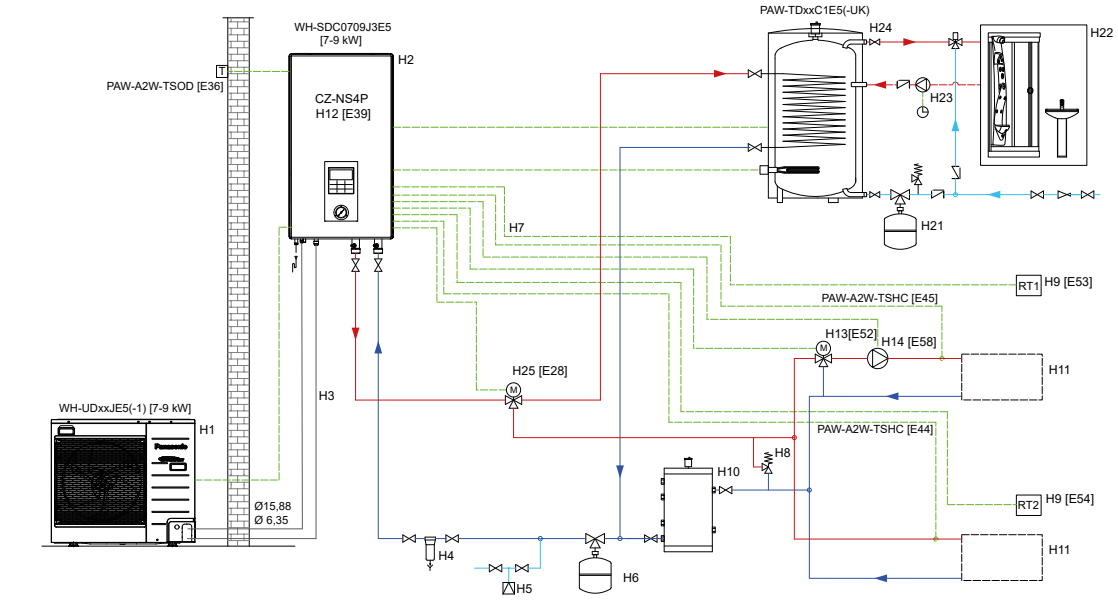
Hydrokit, T-CAP, 9 kW, 3 Ph, domestic hot water tank

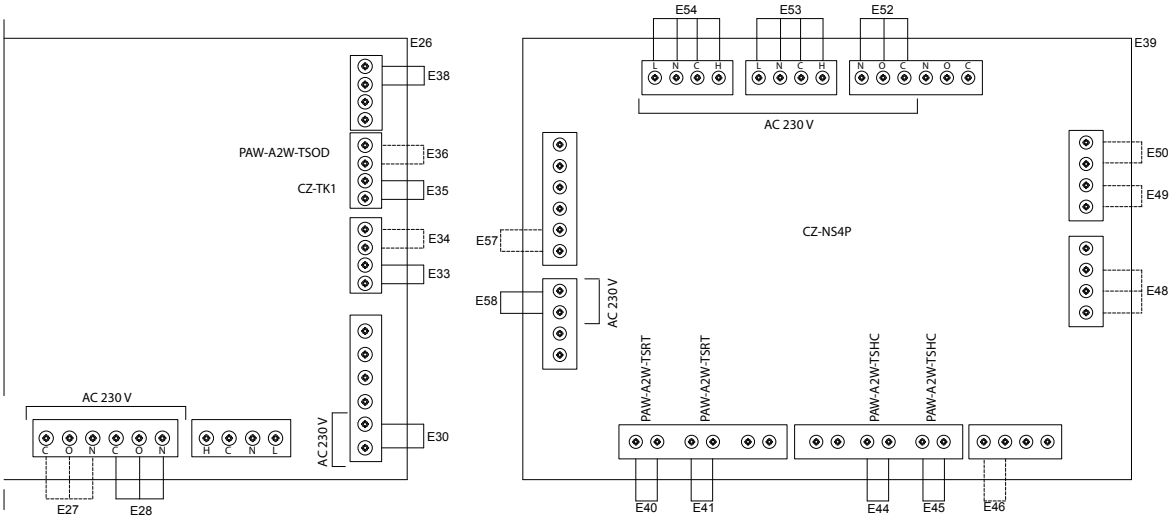


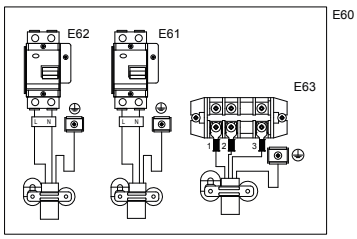


5.6.3 Example 3: Single-phase two-zone system

Hydrokit, High Performance, 7/9 kW, domestic hot water tank

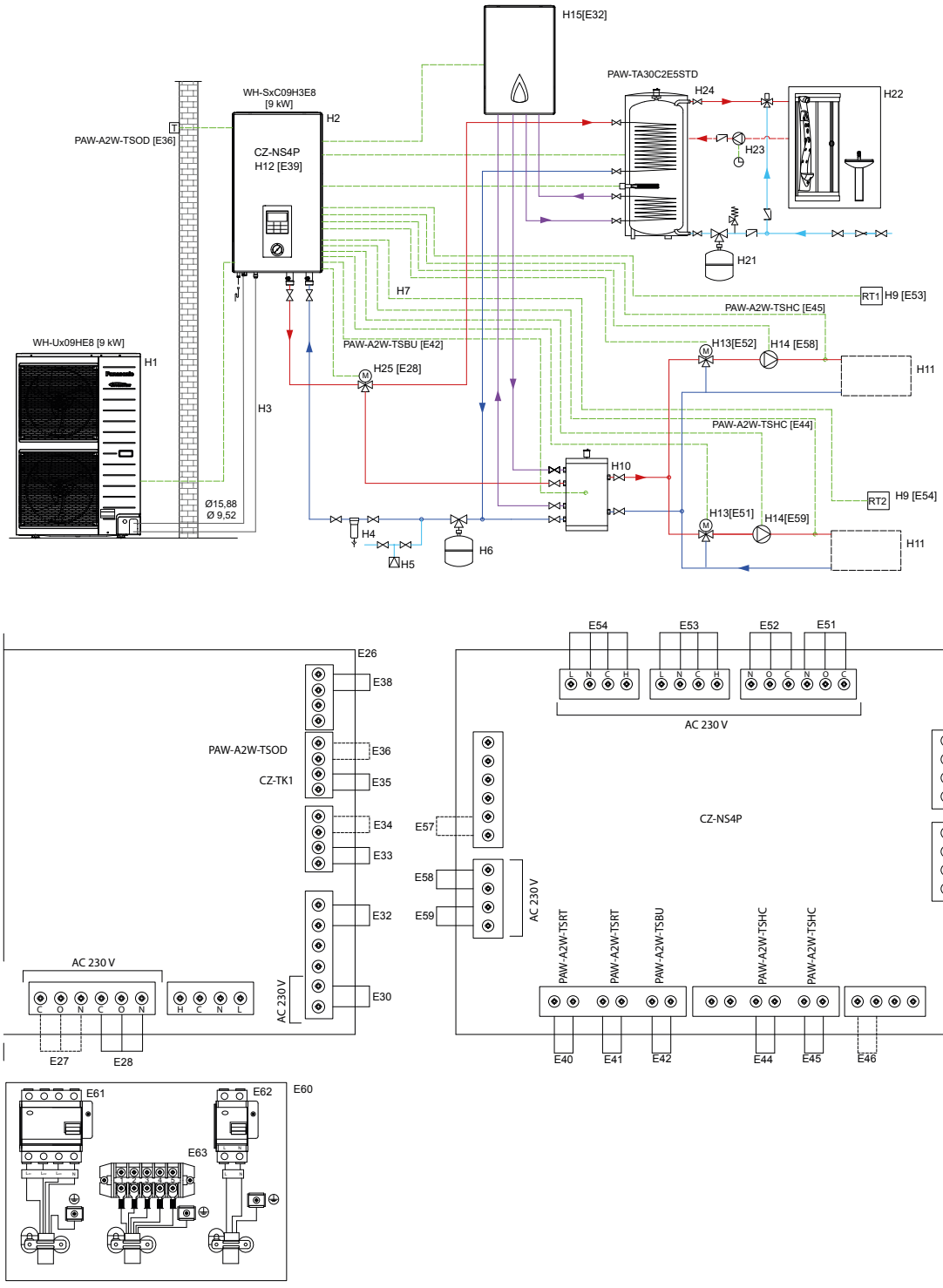






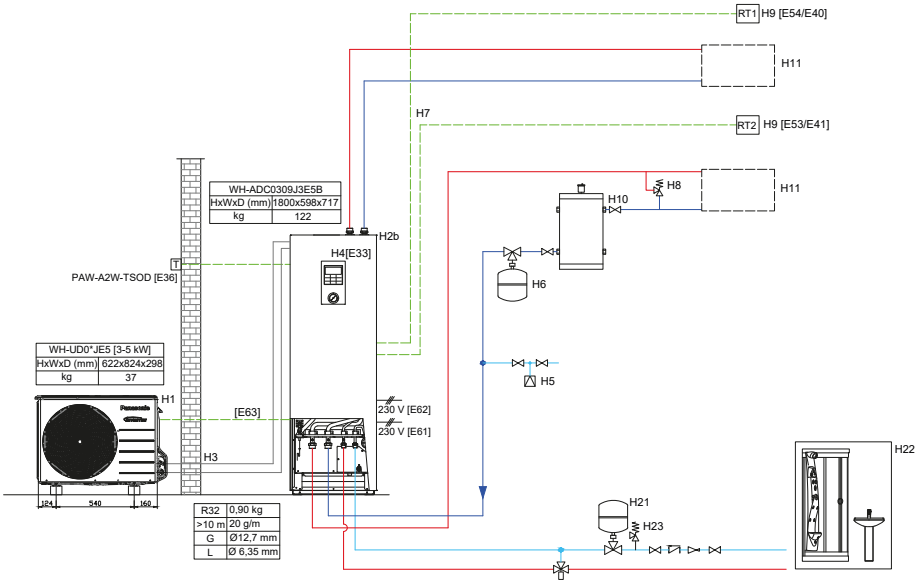
5.6.4 Example 4: Bivalent two-zone system with buffer tank

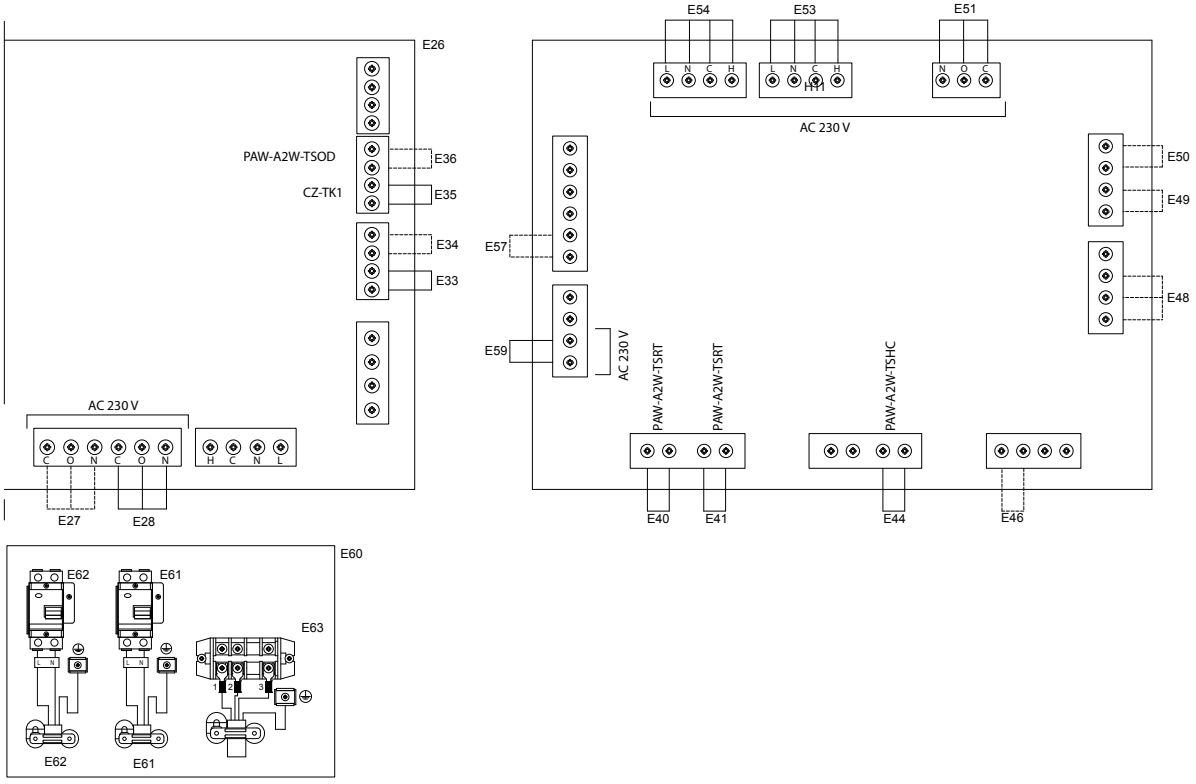
Hydrokit, T-CAP, 9 kW, second heat source, domestic ot water tank, 2 heating zones



5.6.5 Example 5: Two-zone system with integrated domestic hot water tank

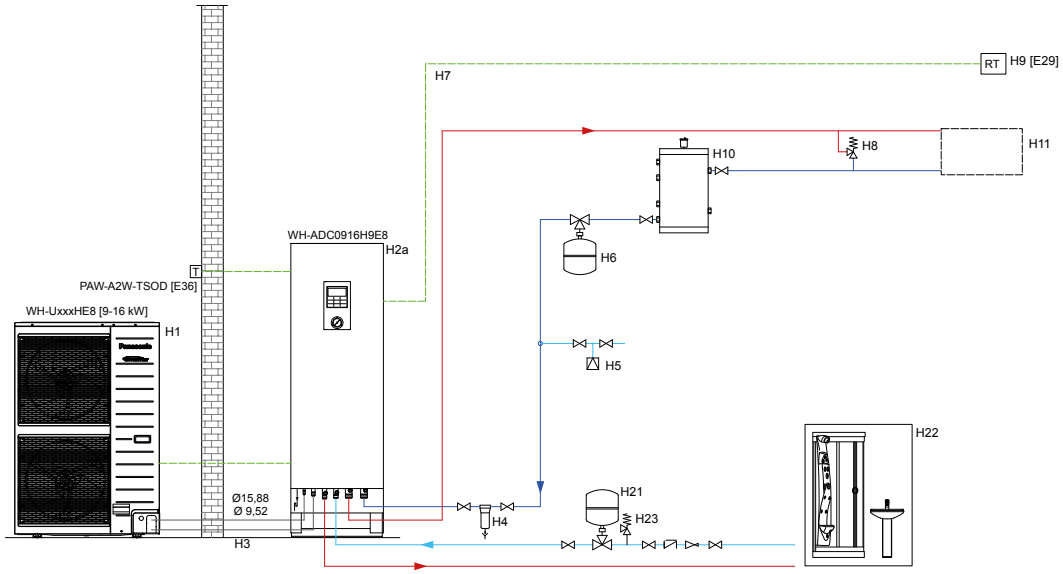
All in One unit in two-zone configuration (“B”), High Performance, 3/5 kW

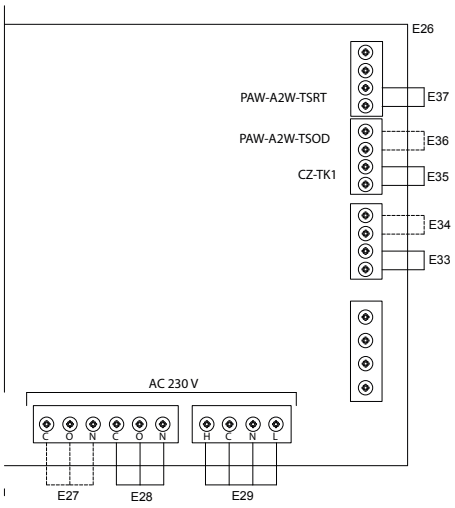


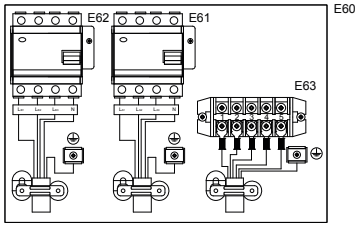


5.6.6 Example 6: One-zone system with integrated domestic hot water tank

All in One unit in standard configuration, High Performance, 9/12/16 kW

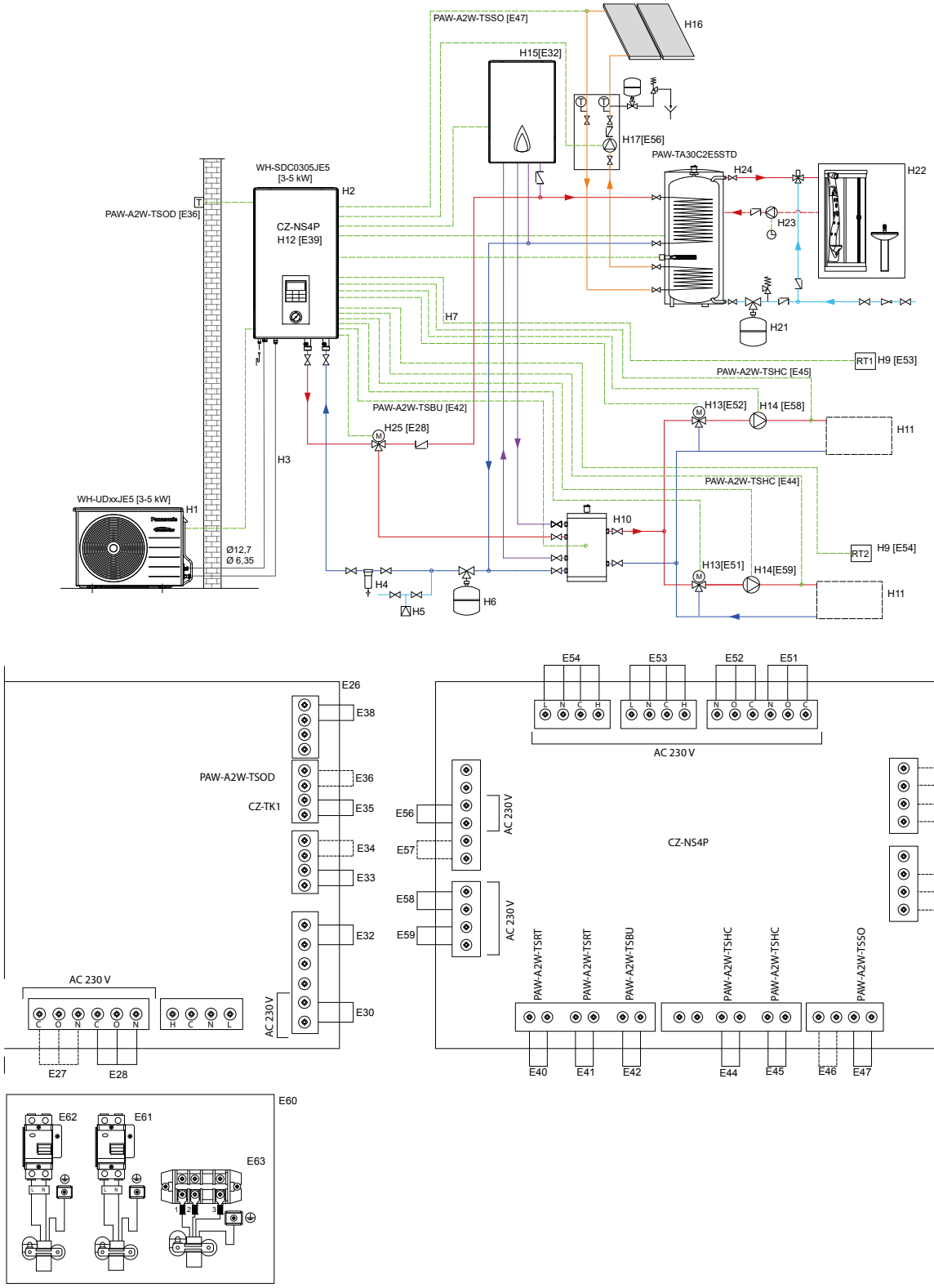






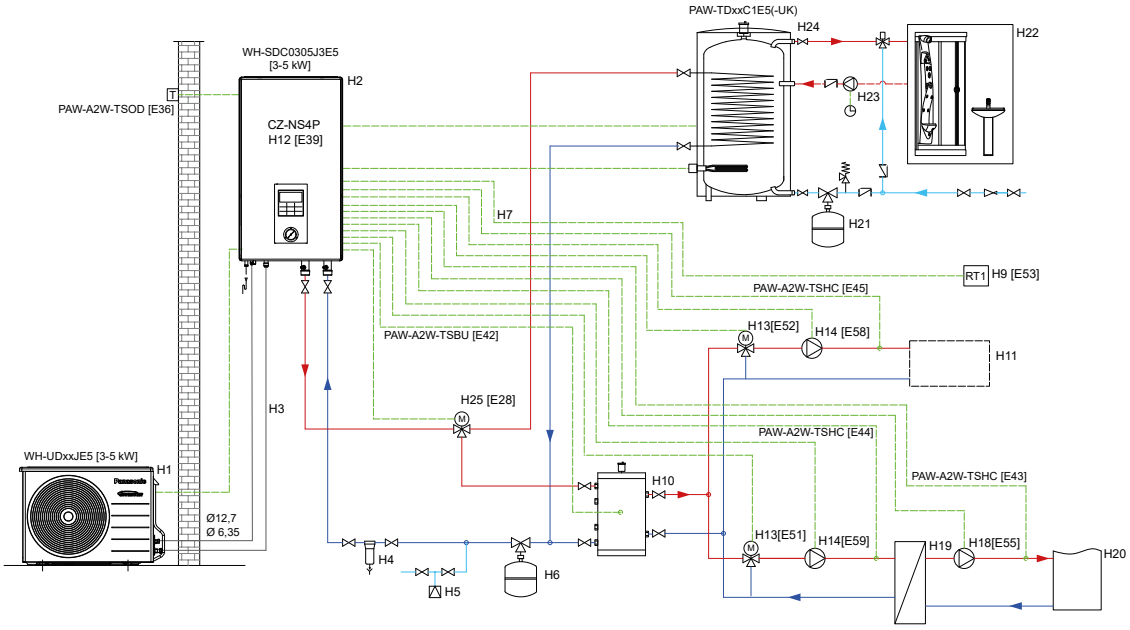
5.6.7 Example 7: Bivalent two-zone system with solar heating system

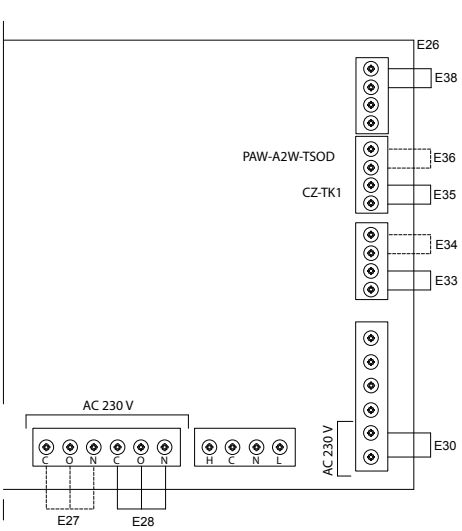
Hydrokit, second heat source, solar heat, bivalent hot water tank, buffer tank

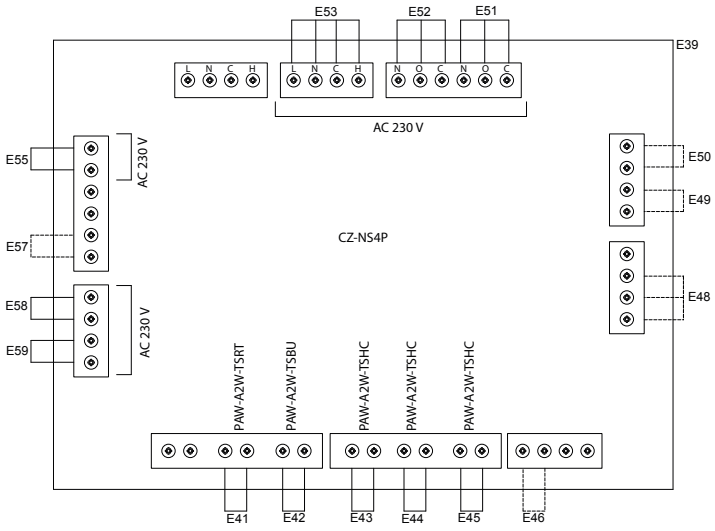


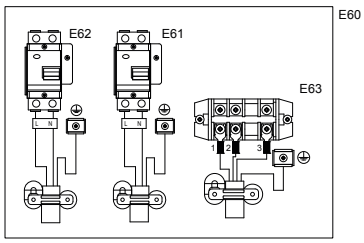
5.6.8 Example 8: Two-zone system with swimming pool

Hydrokit, domestic hot water tank, buffer tank, swimming pool heating









5.6.9 Key for the application examples

Key for the hydraulic part

H1 Outdoor unit of the bi-bloc system (provide condensation drain on the outdoor unit)

H2 Indoor unit of the bi-bloc system: In all models of the J and H generation a strainer and a flow sensor form part of the scope of delivery.

H2a Indoor unit (All in One unit) of the bi-bloc system: The All in One unit includes a 200 litres domestic hot water tank, a tank temperature sensor, a 3-way valve and a hydrokit. The All in One unit must be set up inside a building. In all models of the J and H generation, a strainer and a flow sensor form part of the scope of delivery.

H2b Indoor unit (All in One unit in two-zone configuration ("B")) of the bi-bloc system: The two-zone All in One unit ("B") with additional equipment for a second heating circuit contains a 200 litres domestic hot water tank, a tank temperature sensor, a 3-way valve, a hydrokit, a mixing valve, a water circulation pump, a supply water temperature sensor and a strainer for the additional mixed heating circuit (in the "upper section"). The All in One unit must be set up inside a building. In all models of the J and H generation, a strainer and a flow sensor form part of the scope of delivery.

H3 The heat pumps are charged with R32 (J generation) or R410A refrigerant (H generation). For all bi-bloc systems a maximum connection distance and a maximum height difference between indoor and outdoor unit applies, which is specified in the technical data and must be observed. For all bi-bloc systems, the minimum connection distance between indoor and outdoor units is 3 m.

H4 Magnetic filter (recommended)

H5 Filling and non-return valve

H6 Expansion vessel: Every heat pump has a 6 or 10 litres expansion vessel that is designed for a total water capacity in the heating system of 200 litres for an supply water temperature of 55 °C. For any deviation from one of these conditions, another expansion vessel must be provided on site.

H7 Electrical connections: Depending on hydraulic schematics and the components to be controlled

H8 Overflow valve

H9 Optional thermostat: Every heating circuit can be controlled by an optional thermostat, either by means of a room temperature sensor or the remote controller (this can be used for one heating circuit only).

H10 Buffer tank: The recommended total water capacity in the primary circuit (when all heating/cooling circuits are closed), is at least 30 litres for systems up to and including 9 kW nominal heating capacity (A7/W35), and at least 50 litres for systems with 12 and 16 kW nominal heating capacity (A7/W35).

H11 Heating/cooling circuit: If the heat pump is connected directly to the heating system, the minimum water flow rate must be ensured at all the times. For this purpose, an overflow valve (recommended size: 1 inch) or a 3-way valve must be installed in the supply pipe to the room heating devices (fan coil unit, hide-away unit etc.) or a heating thermostat must be removed to ensure a sufficient water flow rate. For an underfloor heating, a safety thermostat must be provided (for heating mode) and a dew point sensor (for cooling mode).

H12 Optional PCB CZ-NS4P – required for this schematic

H13 Mixing valve with three point regulation

H14 Water pump for secondary circuit: The selection is to be made depending on the requirements of the secondary circuit.

H15 Bivalent heat source

H16 Solar thermal system

H17 Solar pump

H18 Swimming pool pump

H19 Heat exchanger for swimming pool (to be dimensioned appropriately)

H20 Swimming pool

H21 Expansion vessel (in fresh water supply)

H22 Sanitary facilities

H23 (only bi-bloc systems with hydrokit)
Optional circulation pump with timer switch

H23 (only bi-bloc systems with All in One unit)
For All in One units of the J and H generation, a safety valve (opening pressure: 8 bar) is integrated in the domestic hot water tank.

H24 Domestic hot water tank: In the case of Panasonic domestic hot water tanks, the tank temperature sensor is included in the scope of delivery. When using third party tanks, one of the following temperature sensors must be ordered separately from Panasonic: CZ-TK1 (temperature sensor installation kit for third party tanks with dip sleeve and 6 m long cable) or PAW-TS1 / PAW-TS2 (temperature sensor for third party tank with 6 or 20 m long cable). As the hot water tank PAW-TG15C1EZ from Panasonic does not have any circulation connection, the circulation pipeline must be connected to the cold water entry pipeline when installing this tank.

H25 3-way changeover valve: As a 3-way valve, you can use either a Panasonic CZ-NV1, which is installed inside the hydrokit, or an external valve such as a Panasonic 3WYVLV-SI. The tank temperature sensor must be ordered separately (see explanation for H24).

Shut-off valve

Non-return valve

Safety valve

Thermostatic mixing valve

Pressure regulator

Pipes of the bivalent heat source

Pipes of the solar heat circuit

Pipes

Pipes for fresh water supply

(only systems with hydrokit)
Pipes of the circulation circuit

Electric cable

5

Key for the electric part

E26 Main PCB: The maximum cable length for sensor inputs is 30 m. The maximum cable length for other inputs and other outputs is 50 m.
E27 2-way valve: Opened in heating mode and closed in cooling mode.
E28 3-way valve: Opened in domestic hot water production and closed in heating or cooling mode.
E29 Optional thermostat: Every heating circuit can be controlled by an optional thermostat (E29 for one heating circuit, E53 and E54 for two heating circuits), either by means of a room temperature sensor (E37 for one heating circuit, E40 and E41 for two heating circuits) or by means of the remote controller (E33, this can be used for one heating circuit only).
E30 Electric tank heater
E31 Control output for additional circulation pump
E32 On/off switch of the bivalent heat source (dry contact)
E33 Remote controller: The remote controller for the heat pumps of the J and H generation can be used as a room thermostat for one heating circuit. The maximum cable length is 50 m.
E34 External on/off switch (dry contact)
E35 Temperature sensor for domestic hot water tank
E36 Outdoor temperature sensor (optional)
E37 Room temperature sensor for heating zone 1 (see explanation for E29)
E38 Overload protection of the electric tank heater: If an external electric tank heater is used and is controlled by means of the Panasonic heat pump, a contact bridge must be placed on this input.
E39 Optional PCB CZ-NS4P: The maximum cable length for sensor inputs is 30 m. The maximum cable length for other inputs and other outputs is 50 m. If the optional supplementary PCB is installed, the connections for the external room thermostat 1 and the room temperature sensor 1 are deactivated on the main PCB.
E40 Room temperature sensor for heating zone 2 (see explanation for E29)
E41 Room temperature sensor for heating zone 1 (see explanation for E29)
E42 Buffer tank temperature sensor
E43 Swimming pool temperature sensor
E44 Supply water temperature sensor for heating zone 2
E45 Supply water temperature sensor for heating zone 1
E46 Demand control by means of 0--10 Volt signal
E47 Solar temperature sensor
E48 Smart Grid signal (for functions of the intelligent power grid): The set-point for the domestic hot water production or the heating mode can be raised in two stages via the two contacts, if photovoltaics modules are connected and electricity is currently being produced.
E49 External heating/ cooling switchover
E50 Input for the electric utility company
E51 Mixing valve heating zone 2
E52 Mixing valve heating zone 1
E53 Optional thermostat 1 (see explanation for E29)
E54 Optional thermostat 2 (see explanation for E29)
E55 Swimming pool pump
E56 Solar pump
E57 Alarm output (dry contact)
E58 Pump for heating zone 1
E59 Pump for heating zone 2
E60 Power supply connections in indoor unit (hydrokit/All in One unit)
E61 Power supply 1 - Main power supply
E62 Power supply 2 - Power supply for electric backup heater
E63 Indoor unit / outdoor unit connection: The power supply of the outdoor unit is provided via the connection line from the indoor unit (hydrokit/All in One unit), so no separate power supply need be provided in the outdoor unit.

Important: All the items mentioned on this page are only examples and can vary according to the project. Always respect the technical documentation provided by Panasonic.

6 Installation

The correct installation of the devices as well as their hydraulic and electrical connections are described in this chapter.

It is meant for qualified installers and electrical professionals. It is not meant for lay persons.

Electrical and water installation work must be carried out by the corresponding professionals. A defective installation due to not paying any or scant attention to the instructions in this chapter can lead to injuries or damage.

As installer, pay attention to the following instructions:

1. Ensure that you have read and understood the installation and safety notes before you begin work.
2. Keep this installation manual safely together with the device after installation.
3. After installation, perform a test run to ensure that no malfunctioning occurs.
4. Subsequently, explain the operation, maintenance and servicing of the devices to the user according to the operating instructions. Also point out to the user that he should keep the operating instructions in a safe place.
5. If you have questions or doubts relating to the installation, contact a professional installer or the dealer.

Note

The figures of the following installation instructions predominantly feature models of the J and H generation. The instructions are, however, correspondingly valid for F and G generation models.

Detailed installation instructions for the F and G generation models are given in the planning manual for bi-bloc systems or mono-bloc systems from 2014 as well as in the installation instructions and in the service manual of the respective device.

6.1 Safety notes for installation

Pay particular attention to the following safety notes before and during installation:

WARNING

Danger to life from electric shock!

The devices are operated with 230 V or 400 V alternating current. Improper installation can present a danger to life from electric shock as well as a danger of fire occurring due to overheating.

- ► Electrical installation work must be undertaken by a trained electrician.
- ► Service and maintenance work must only be carried out by an accredited electrician or an authorised dealer.
- ► Keep children and people unfamiliar with the equipment away from any installation work.
- ► Adherence to national and local standards and provisions is to be observed when carrying out any installation work.
- ► Ensure that all cables and power connections, including those already in place, are of adequate dimensions for the electrical power of the heat pump.
- ► Only use licensed power cords for connecting to a power source. No modified cables or extension cables are to be used for connecting to the power source.
- ► The heat pumps must be duly earthed. Earthing is not to be undertaken via gas or water pipes, lightning conductors or earthing for a telephone system.
- ► Adherence is to be paid to the respective national electrical wiring regulations and safety arrangements with regard to residual current. Panasonic recommends using a residual current circuit breaker (RCCB).

CAUTION

Danger of frostbite from the skin coming into contact with the refrigerant

Direct contact of the skin with the refrigerant can cause frostbite.

- ► Work on the refrigeration circuit and in connection with the refrigerant must be carried out by a trained technician or an authorised trader holding a refrigerant handling certificate.
- ► Wear gloves when handling refrigerants (e.g. when emptying or filling the refrigeration circuit).
- ► Observe the Safety Notes in force for the respective refrigerant (R32, R410A or R407C).

Danger of fire and explosion caused by inflammable gases

A danger of fire or explosion arises when any leakages of inflammable gases occur at the installation site of the heat pump.

- ► Do not install heat pumps at sites where inflammable gases can escape.

Danger due to toxic gases if the refrigerant comes into contact with fire

Toxic gases can be created when escaped refrigerants come into contact with fire.

For this reason, if refrigerants escape during installation or operation:

- ► Extinguish any sources of fire (if present).
- ► Thoroughly ventilate the room in which the heat pump is installed..

Danger of explosion and injury caused by pressure in the refrigeration circuit being too high

In the event of improper installation, leaks can occur at the connections of the refrigerant pipes, leading to air being sucked in while the compressor is operating. This results in increased pressure in the refrigeration circuit, leading in turn to increased risk of explosion or injury.

- ► Carry out installation of the refrigerant pipes in a proper manner and check that there are no leaks in the installation before turning on the compressor.
- ► Before the refrigerant pipes are removed or work is carried out on the pipes, switch the compressor off.

ATTENTION

Danger of the devices being damaged by incorrect refrigerant

The devices must only be operated with the refrigerants described in this Manual or the respective operating instructions. The use of other refrigerants or multi-component refrigerants can lead to the devices being damaged and to safety risks. Panasonic will not accept any responsibility or liability whatsoever if incorrect refrigerants are used.

- ► Only use R32 refrigerant for Aquarea High Performance and T-CAP series models of the J Generation, only use R410A refrigerant for the Aquarea High Performance and T-CAP series models of the H Generation and only use R407C refrigerant for the Aquarea HT series models of the F and G Generation.
- ► Do not mix the prescribed refrigerant with refrigerants of another type or replace it with a refrigerant of another type.

Danger of other material damage to the devices, e.g. due to vibrations, water leaks or fire

- ► Any work on the water circuit must be carried out by a trained technician.
- ► All relevant European and national provisions (including EN 61770 “Electrical appliances connected to the water mains”) are to be observed in installation work for the water circuit.
- ► Adhere to the conditions prescribed for the installation site:
  - Indoor units (hydrokits or All in One units) are only to be installed in indoor areas.
  - Outdoor units and mono-bloc devices are only to be installed in outdoor areas.

- ► Adhere to the prescribed sequence of installation steps.
- ► Only use parts and tools delivered with the equipment or as specified.
- ► As far as possible, avoid installation of outdoor units and mono-bloc devices near the sea, in regions with a high content of sulphur or at sites where large quantities of oil (e.g. machine oil, etc.) are present, as this may result in shortened operating life.

6.2 Preparing for installation

Read the following sections carefully before you begin the installation work and follow the instructions given in them.

Requirements for installation

Ascertain that all the requirements for installation are met. This includes clearing and defining the following important aspects during the planning phase (respect the references to elaborate explanations about the respective topic in this manual):

1. Determine the power demand and the refrigeration requirements for the heating system to be installed (→ *5.1 Refrigeration technology and performance criteria, p. 92*).
2. Based on the performance features of Aquarea air-to-water heat pumps, select the model suitable for the power demand (→ *4.6 Functions and technical data, p. 27*).
3. Based on the ambient conditions and the installation criteria for the various model types, determine the optimum installation location for the indoor and outdoor unit or the mono-bloc unit (→ *5.2 Installation criteria, p. 97*).
4. Determine the requirements for the hydraulic connection of the devices (→ *5.3 Hydraulics, p. 112*). Always conform to the valid legal provisions.
5. Determine the requirements for the electrical connection of the devices (→ *5.4 Electricals, p. 116*). Always conform to the valid legal provisions.
6. Ensure that the accessories supplied are fully available, e.g. based on the following table. Owing to the continuous development and improvement of the products, the kind and range of the accessories supplied can, however, change at any time. So also always check the list of the accessories supplied in the installation manual accompanying the device in question.

No.	Component	Qty..	Description	Bi-bloc systems					Mono-bloc systems	
				with All in One unit			with hydrokit			
				J or H generation / Standard config.	J or H generation / 2-zone config. "B"	J or H generation / Compact config.	F-Generation	J or H generation	G generation	J or H generation
a	Top mounting plate	1	for F generation				•			
b	Top mounting plate	1	for J or H generation					•		
c	Drain elbow	1	for condensation hose	•	•	•	•	•	•	•
d	Packing	1	for drain elbow	•	•	•		•		
e	Bottom mounting plate	1	for F generation				•			
f	Bottom mounting plate	1	for J or H generation					•		
g	Screw	3	to fasten the hydrokit to the bottom mounting plate				•	•		
h	Rubber cap	8					•		•	•
i	Cable sleeve	2					•			
j	Remote controller cover	1	for separate installation of the remote controller	•	•	•		•		
k	Adjustable feet	4		•	•	•				
l	Reducing adapter	1		•	•					
m	Local remote controller	1							•	•[1]

1 Assembly accessory is to be provided on site.

Transport and handling of the devices

CAUTION

Danger of injury due to carrying of heavy loads

As the devices are very heavy, they must always be carried by at least two persons, otherwise there is a danger of injury due to overloading.

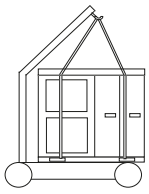
- ► Deploy as many persons as necessary to carry the devices in order to avoid injuries and physical overloading.
- ► Use mechanical hoists for loads that are too heavy to lift.

Observe the following instructions for transporting and handling the devices.

1. Transport the devices with caution, so that they are not damaged. Special caution is necessary when lowering and moving the outdoor units and mono-bloc units at the installation location.
2. Remove the packaging material only when the devices have been placed at the desired installation location.
3. Depending on the weight of the devices (→ *4.6.2.3 Technical Data (bi-bloc systems), p. 40*, → *4.6.3.3 Technical Data (mono-bloc systems), p. 55*) you will need two to four persons and/or a suitable mechanical hoist.

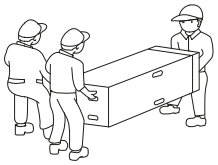
   Examples of transport:

Outdoor unit or mono-bloc unit



Large, heavy devices should only be moved by means of appropriate hoists. The hoists can be attached by lugs on the base construction of the device.

All in One indoor unit



The All in One unit can be transported in a horizontal or vertical position.

If it is transported in a horizontal position, the front side of the packaging material (with the word “FRONT” printed on it) must face upwards.

If it is transported in a vertical position, grip inside the hand holes on the sides and push the device into the desired position.

4. Also align the devices absolutely horizontally when setting on an uneven surface. For this purpose, you can use the adjustable feet, for example, which are included in the scope of delivery of All in One units.

Tools needed

In general, it is advisable to use the following tools for the installation:

- Phillips head screw driver
- Spirit level
- Electric drill
- Core hole drill (ø 70 mm)
- Hexagon wrench set
- Adjustable spanner set
- Knife
- Gas leak detector
- Measuring tape
- Megohm meter
- Multimeter
- Torque wrench

Additionally, the following tools are needed for installing bi-bloc systems:

- Pipe cutter
- Reamer
- Deburrer
- Thermometer
- Vacuum pump
- Manometer station

Note

Owing to the continuous development and improvement of our products, there may be technical modifications in the future that could not yet be included in this manual. Therefore, please also read and observe the model-specific installation instructions provided with every device.

6.3 Creating a hole in the wall

ATTENTION

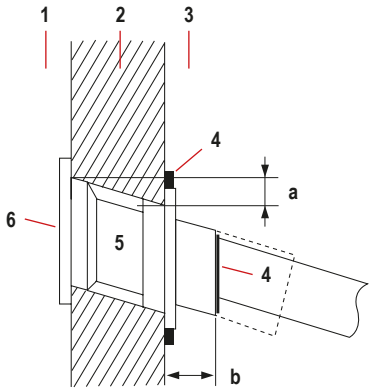
Danger of cables being chewed through by rodents in hollow walls

If wall holes exist in hollow walls, rodents could get in and chew through cables.

► In order to prevent cables being chewed through, always use a wall grommet.

Carry out the following steps to make the wall hole:

1. Ensure that the selected installation location for the indoor and outdoor unit or for the mono-bloc unit fulfils the installation criteria (→ *5.2.2 Installation (bi-bloc systems), p. 100*, → *5.2.3 Installation (mono-bloc systems), p. 109*).
2. Drill a wall hole of 70 mm diameter at the appropriate point. The hole must be made according to the illustration (see below) with a slope of 5 to 7 mm towards the interior of the room.
3. For hollow walls, always insert a suitable wall grommet or sleeve DN 70 (to be provided by the customer) into the wall hole. You may have to cut the sleeve so that it projects on the outside by about 15 mm.
4. Seal the outer side using a suitable sealing compound (provided by the customer) after fitting all cables.



1 Inside
2 Wall
3 Outside
4 Sealing compound
5 Sleeve for cable grommet
6 Line bushing ø 70 mm

a approx. 5 – 7 mm
b 15 mm

6.4 Setting up devices

CAUTION

Danger of injury due to carrying of heavy loads

As the devices are very heavy, overloading poses a danger of injury while lifting and carrying them.

► Always have the devices lifted and carried by more than one person and plan a sufficient number of persons for the installation.

► For very high loads, use a suitable hoist.

6.4.1 Indoor units

All in One units

Carry out the following steps to install the All in One unit:

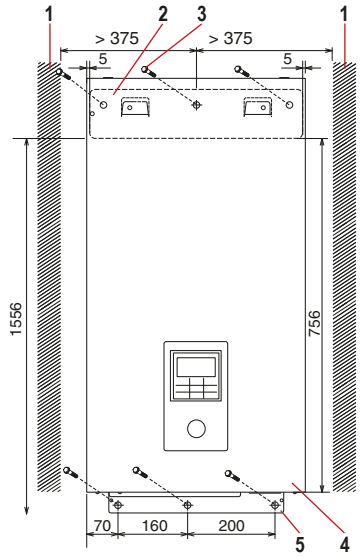
1. Carefully unpack the All in One unit at the installation location.
2. Align the device by means of the adjustable feet (use spirit level).

Hydrokits

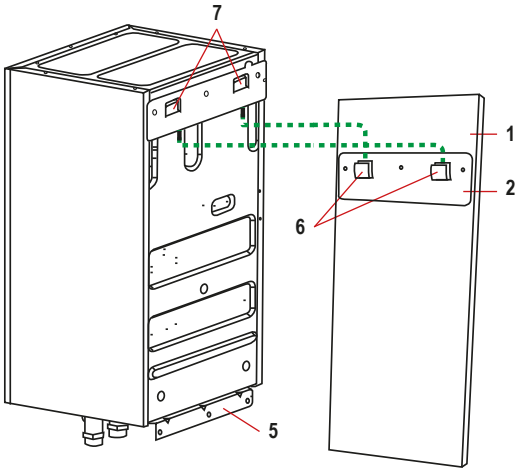
Carry out the following steps to install the hydrokit:

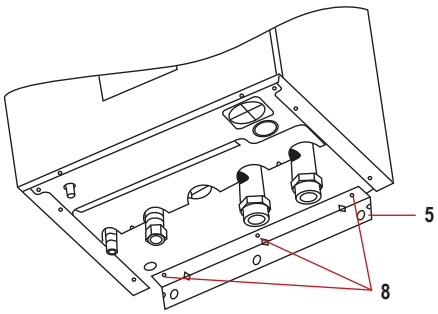
1. Exercise caution as you unpack the hydrokit at the installation site.
2. Attach the two mounting plates contained in the scope of delivery on the wall as shown in the illustration (below). For this, use six M8 hexagon screws, washers and dowels with threaded insert (all to be provided on site). Ensure horizontal alignment (use spirit level). Maintain the minimum distances from the wall and floor specified in the corresponding illustration.
3. Have the hydrokit lifted by two persons and suspend the hydrokit by the slots on its rear side, engaging them in the hooks of the top mounting plate. Ensure that the hooks engage properly by moving them left and right.
4. In addition, attach the hydrokit by using three Phillips head screws on the bottom mounting plate.

Hydrokit J or H generation



1 Wall
2 Top mounting plate
3 Hexagon screw M8 with washer
4 Hydrokit
5 Bottom mounting plate
6 Hooks
7 Slots
8 Phillips head screw





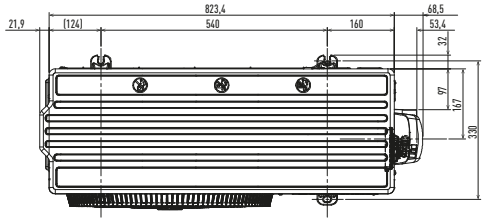
6.4.2 Outdoor units and mono-bloc units

Carry out the following steps to install the outdoor unit or mono-bloc unit:

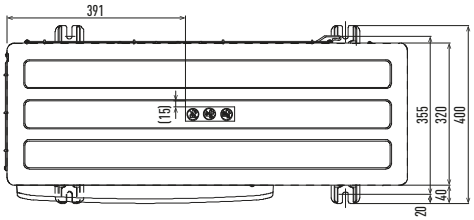
1. Exercise caution when unpacking the device at the installation site.
2. Attach the device to a concrete foundation or a strong ground frame by means of four anchor bolts as shown in the illustration (see below) e.g. on the outer wall of a building. Ensure horizontal alignment of the device. Also observe the instructions in the sections on attaching the devices (→ *5.2.2.3 Securing the outdoor unit, p. 102*, → *5.2.3.3 Securing the mono-bloc unit, p. 111*).

Drilling template for outdoor units and mono-bloc units

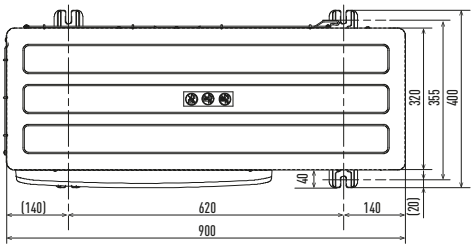
Aquarea High Performance bi-bloc outdoor unit | 3 and 5 kW
WH-UD03JE5, WH-UD05JE5



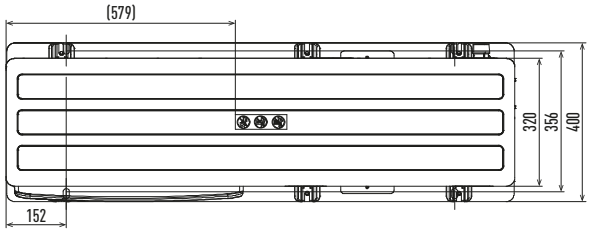
Aquarea High Performance bi-bloc outdoor unit | 9 and 7 kW
WH-UD07JE5, WH-UD09JE5-1



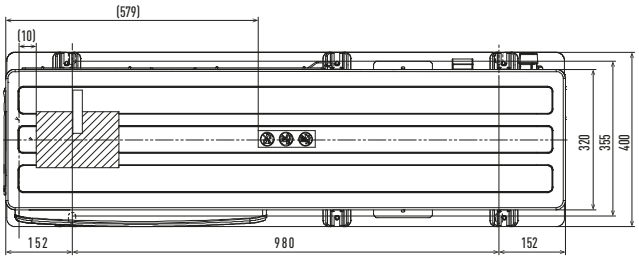
Aquarea High Performance, T-CAP and HT bi-bloc outdoor unit | 9 to 16 kW
WH-UDHE5, WH-UD**HE8, WH-UX**HE5, WH-UX**HE8, WH-UH**FE5, WH-UH**FE8**



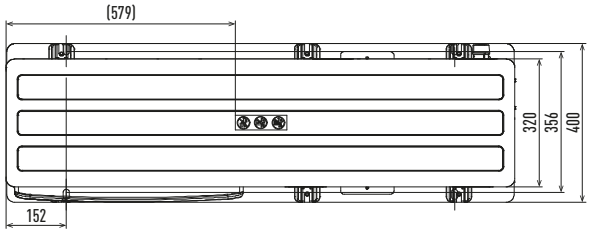
T-CAP Super Quiet bi-bloc outdoor unit | 9 to 16 kW
WH-UQHE8**



Aquarea High Performance mono-bloc unit | J generation | 5 to 9 kW
WH-MDCJ3E5**



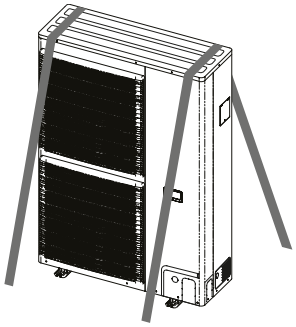
Aquarea High Performance, T-CAP and HT mono-bloc unit | 9 to 16 kW
WH-MDCH6E5, WH-MXC**J3E5, WH-MXC**J*E8, WH-MXC**H3E5, WH-MXC**H*E8, WH-MHF**G*E5**



When fastening the outdoor unit or mono-bloc unit to a base frame or a bracket on the building outer wall, vibration dampers must be mounted under the device. When fastening on a concrete foundation, it is advisable to use vibration dampers.

In the case of installation locations experiencing strong winds e.g. on building rooftops or between buildings, the outdoor unit or mono-bloc unit must be additionally secured in the field to prevent tipping over (e.g. by bracing).

Bracing as support against tilting



Note: Schematic figure for explanation purposes only.

IMPORTANT

If the periods in outside temperatures below 0 °C are long, ground frost can cause the condensate to form ice. The result can be that the condensate cannot drain off and faults arise in the heat pump operation. For safe drainage of condensation water even at outside temperatures below 0 °C, a drain pipe is recommended, reaching into the frost-free area of the underground (→ *5.2.2.3 Securing the outdoor unit, p. 102*, → *5.2.3.3 Securing the mono-bloc unit, p. 111*).

6.5 Opening devices

WARNING

Danger to life from electric shock

The devices are operated with 230 V or 400 V alternating current. Touching the live electrical cables can be life-threatening due to electrical shock.

► Before opening the device, make sure that the entire system is disconnected from the electric supply. Especially in case of outdoor units of bi-bloc systems, see that the electric supply of the hydrokit or All in One unit, the tank and the electrical heater is disconnected.

6

6.5.1 All in One units

Removing and replacing the front plate

CAUTION

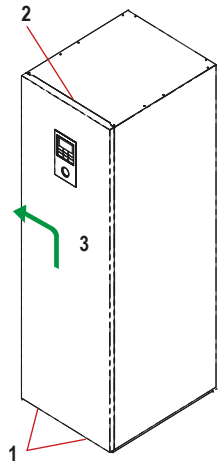
Danger of injury due to crushing

As the front plate is heavy, lifting it off poses a danger of injury by crushing of hands and fingers.

► Lift the heavy front plate with caution, possibly having two persons do it, from the hooks on the device housing.

Carry out the following steps to open the front plate:

1. Remove the two fixing screws (**1**) on the front plate.
2. Push up the front plate to release it from the hook (**2**) at the upper edge.
3. Lift up the front plate with both hands and remove it from the hooks (**3**).
4. To place the front plate back, proceed in the reverse order. See that the hook engages correctly.



Note: Schematic figure for explanation purposes only.

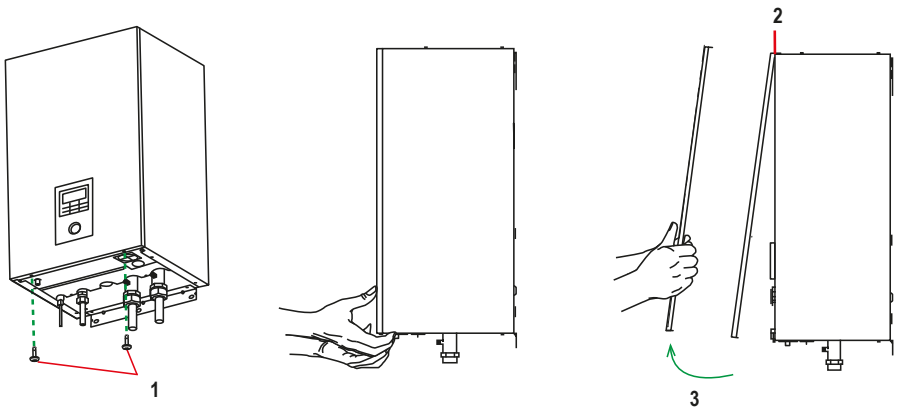
6.5.2 Hydrokits

Removing and replacing the front plate

Carry out the following steps to remove the front plate:

1. Remove the fixing screws (**1**) on the front plate.
2. Exercise caution as you pull out the bottom part of the front plate towards you to release the front plate from the left and right hooks (**2**).
3. Lift up the front plate with both hands and remove it from the hooks (**3**).
4. To replace the front plate, proceed in the reverse order. See that the right and left hook engage correctly.

Hydrokit J and H generation



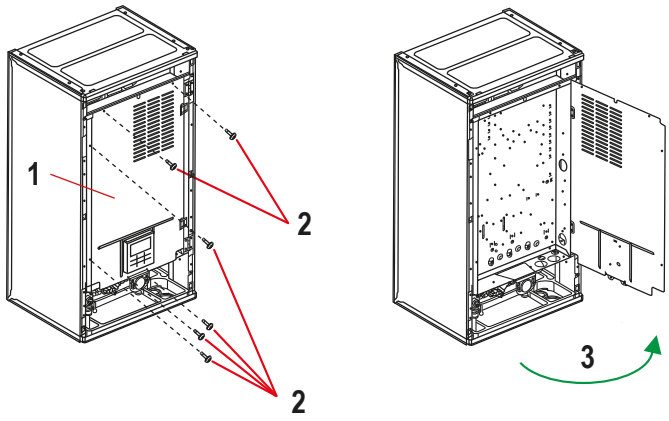
Two screws at the bottom edge of the front plate

Opening and reclosing the connection box

Carry out the following steps to open the cover of the connection box for the hydrokit of the J or H generation:

1. Remove the front plate as described earlier.
2. Remove the six fixing screws (2) on the cover of the connection box (1).
3. Swing the cover to the right (3).
4. To close the cover of the connection box, proceed in the reverse order.

Hydrokit J or H generation



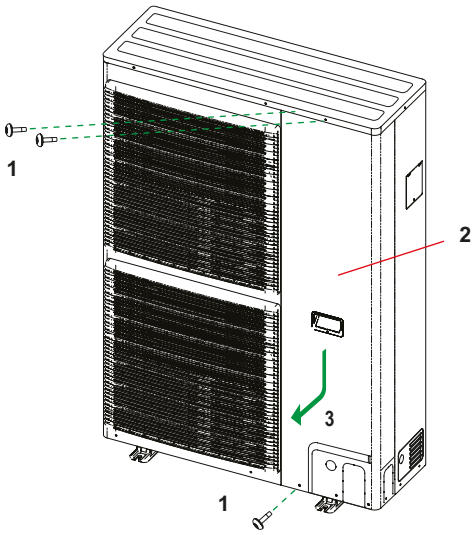
6.5.3 Outdoor units and mono-bloc units

Removing and replacing the front plate

Carry out the following steps to remove the front plate i.e. the cover of the connection box on the front side of the outdoor unit or mono-bloc unit:

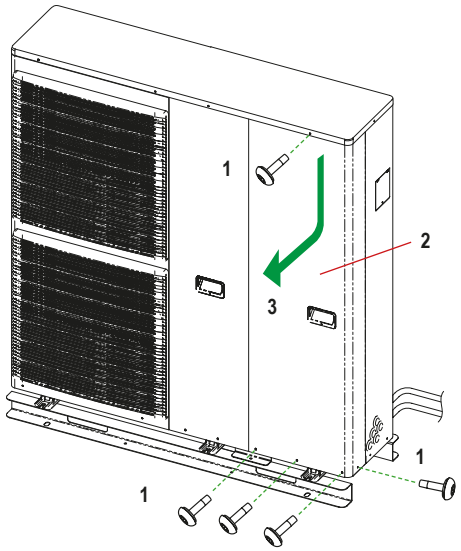
1. Remove the fixing screws (**1**) on the front plate (**2**).
2. Push the front plate downwards (**3**), to release the latches.
3. Then pull the front plate to yourself to remove it.
4. To replace the front plate, proceed in the reverse order.

Outdoor units



A WH-UX16HE8 outdoor unit is shown as an example. For other outdoor unit types*, proceed similarly as appropriate.

Mono-bloc units



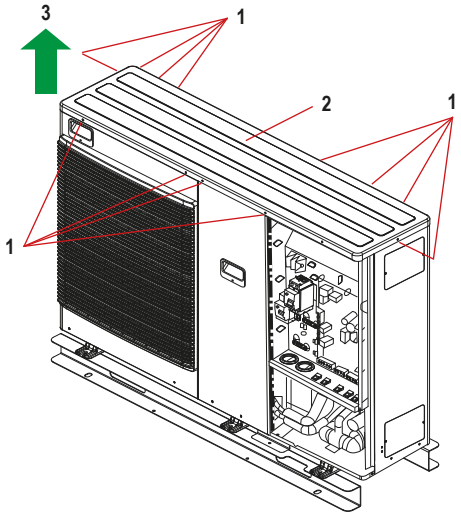
A WH-MDC16H6E5 mono-bloc unit is shown as an example. For other mono-bloc unit types*, proceed similarly as appropriate.

* cfr. → *1 Model range, p. 8*

Removing top cover plate and replacing it

Carry out the following steps to remove the top cover plate of the outdoor unit or mono-bloc unit:

1. Remove the fixing screws (1) along the edge of the cover plate (**2**).
2. Lift the cover plate from the device (**3**).
3. To replace the top cover plate, proceed in the reverse order.



A WH-MDC05J3E5 mono-bloc unit is shown as an example. For other outdoor and mono-bloc unit types*, proceed similarly as appropriate.

* cfr. → *1 Model range, p. 8*

6.6 Connecting the refrigeration circuit

Note

For the installation of mono-bloc units, you can skip chapter 6.6 “Connecting the refrigeration circuit”. Continue with section → *6.7 Connecting the heating circuit, p. 165*.

Requirements for correctly configured flare fittings

ATTENTION

Danger of leakages due to incorrect tool

Using a wrong tool, e.g. a pipe wrench, can deform or damage the flare nut. This can cause leakages.

► Use a suitable adjustable spanner or ring spanner.

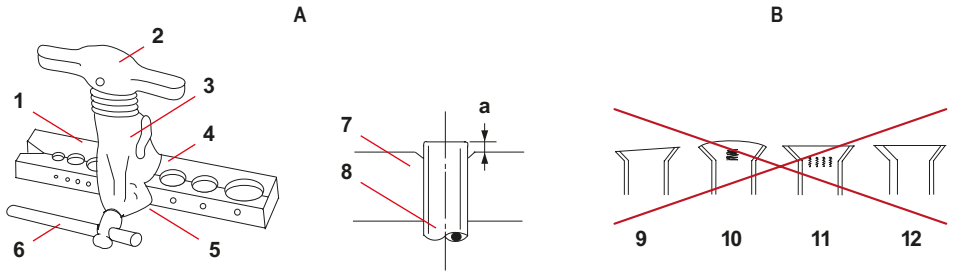
Danger of leakages caused by exceeding the tightening torque

Too high a tightening torque can cause deformation and consequently leakages.

► Observe the correct torque when tightening the flare nut (→ *Permissible tightening torques of refrigerant pipes (All in One units), p. 162*, → *Permissible tightening torques of refrigerant pipes (Hydrokits), p. 163*, → *Permissible tightening torques of refrigerant pipes (Outdoor units), p. 164*).

The pipes of the refrigeration circuit are connected with flare fittings. When cutting and flaring pipes, adhere to the following specifications in order to avoid leakages and malfunctions.

1. Use only copper tubes conforming to the requirements of the EN 12735-1 for refrigerant pipes used in refrigeration and air conditioning.
2. Cut the tubes to the required length using a tube cutter.
3. Remove the burrs using a reamer.
4. Hold the tube ends downwards when deburring, so that chips will not fall into the tube.
5. Insert the flare nut onto the tube and only then begin flaring the tube ends.
6. Check the quality of the flare at the tube end: When properly flared, the internal surface of the flare will evenly shine and be of even thickness. Moreover, the surface of the flare part that comes into contact with the connection must be completely even and smooth.

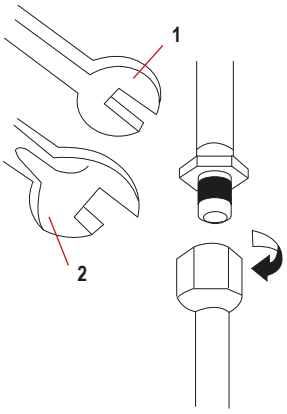


A	**Tube expander**	5	Arrow marking	**B**	**Unprofessional flaring**
1	Bar	6	Clamp handle	9	Inclined
2	Handle	7	Bar	10	Surface damaged
3	Yoke	8	Copper tube	11	Cracked
4	Core	a	0 – 0.5 mm	12	Uneven thickness

6.6.1 Connecting refrigerant pipes to the indoor unit

Carry out the following steps to connect refrigerant pipes to the indoor unit:

1. Determine the tube length and cut the tube to the required length using a tube cutter.
2. Remove the burr on the cut edges.
3. Insert the flare nut (which, at the time of dispatch, is screwed onto the connection nozzle of the indoor unit) onto the tube end.
4. Flare the tube ends.
5. Align the flared tube and the connecting pipe centrally and first tighten the flare nut by hand and then with a torque wrench and an adjustable spanner to counter it. Maintain the correct torques (→ *Permissible tightening torques of refrigerant pipes (All in One units), p. 162*, → *Permissible tightening torques of refrigerant pipes (Hydrokits), p. 163*).

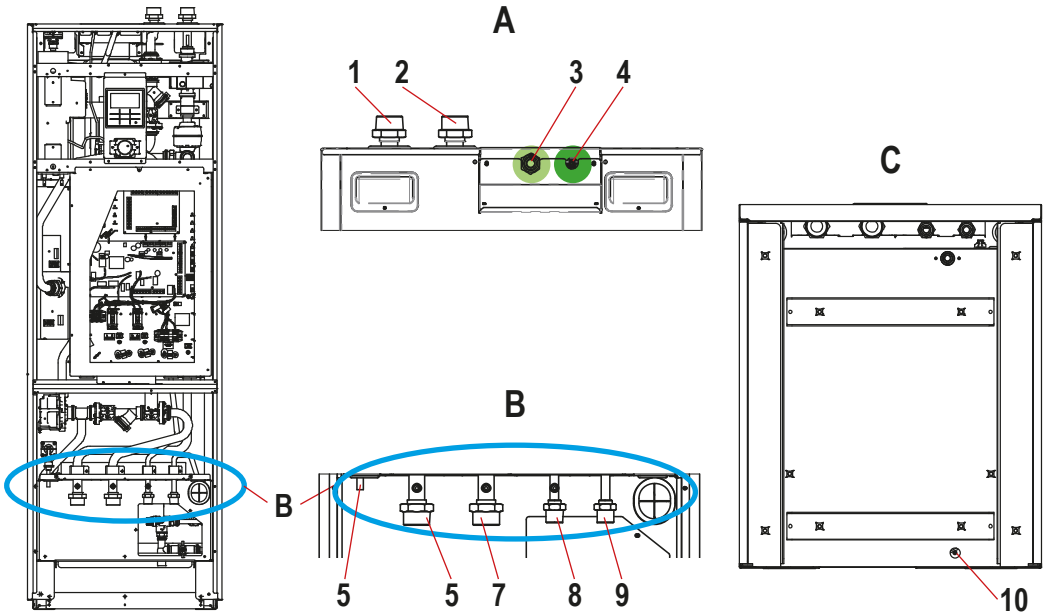


1 Adjustable spanner
2 Torque wrench

6. Route the pipes through the wall grommet to the outdoor unit.

All in One units

All in One unit | J generation | Standard configuration (WH-ADC0309J3E5 for 1 heating zone) or Two-zone configuration (WH-ADC0309J3E5B for 2 heating zones)



A Detail view of upper section (seen from rear side)

1 Zone 2 Supply water outlet (to space heating), only in two-zone configuration
2 Zone 2 Return water inlet (from space heating), only in two-zone configuration
3 Refrigerant gas line
4 Refrigerant liquid line

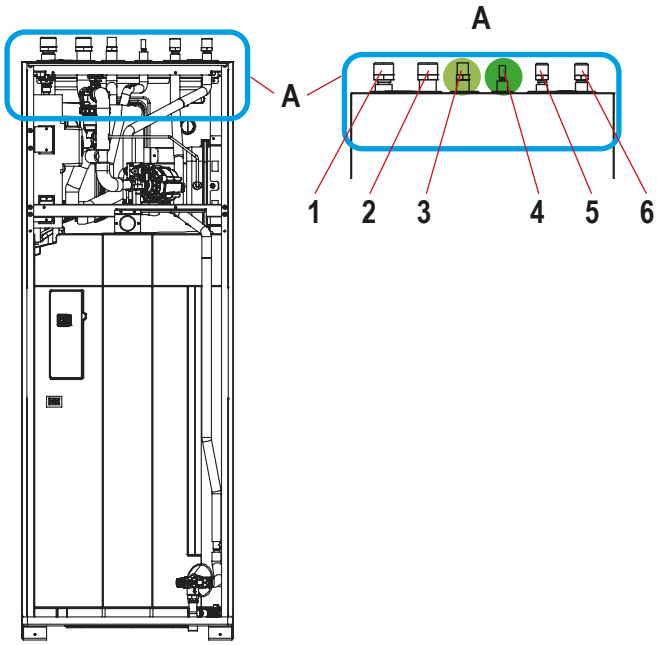
B Detail view of piping connections

5 Safety valve drainage tap
6 Zone 1 Supply water outlet (to space heating)
7 Zone 1 Return water inlet (from space heating)
8 Supply water outlet (to hot water tank)
9 Fresh water inlet

C Bottom view

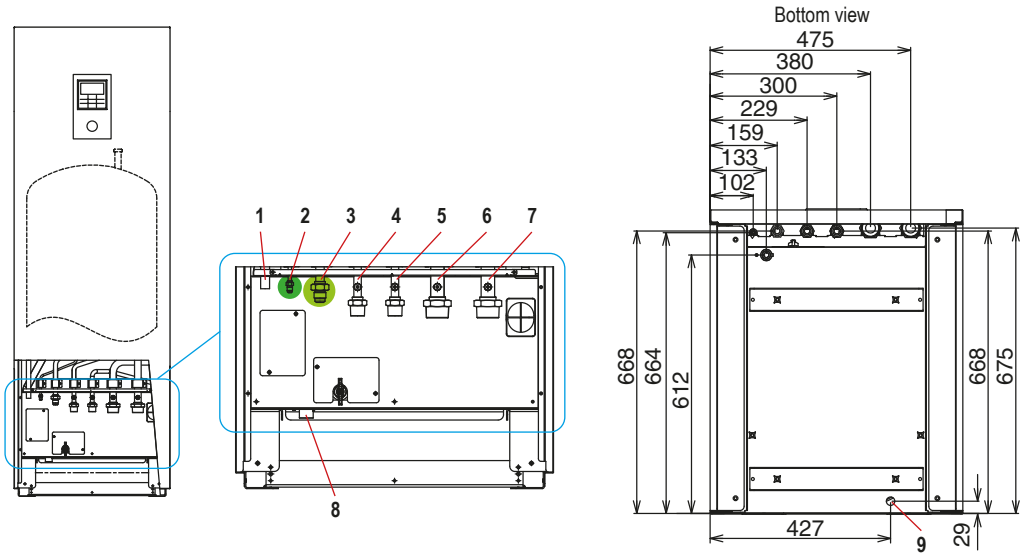
10 Condensate drain hole

All in One unit | J and H generation | Compact configuration (for 1 heating zone)
WH-ADC0309J3E5C, WH-ADC1216H6E5C



A **Detail view of upper section with piping connections**
1 Supply water outlet (to space heating/cooling)
2 Return water inlet (from space heating/cooling)
3 Refrigerant gas line
4 Refrigerant liquid line
5 Fresh water inlet
6 Supply water outlet (to hot water tank)

All in One unit | H generation | Standard configuration (for 1 heating zone)
WH-ADC1216H6E5, WH-ADC0916H9E8



1 Safety valve drainage tap
2 Refrigerant liquid line
3 Refrigerant gas line
4 Supply water outlet (to hot water tank)
5 Fresh water inlet
6 Supply water outlet (to space heating/cooling)
7 Return water inlet (from space heating/cooling)
8 Hot water tank drainage nozzle
9 Condensate drain hole

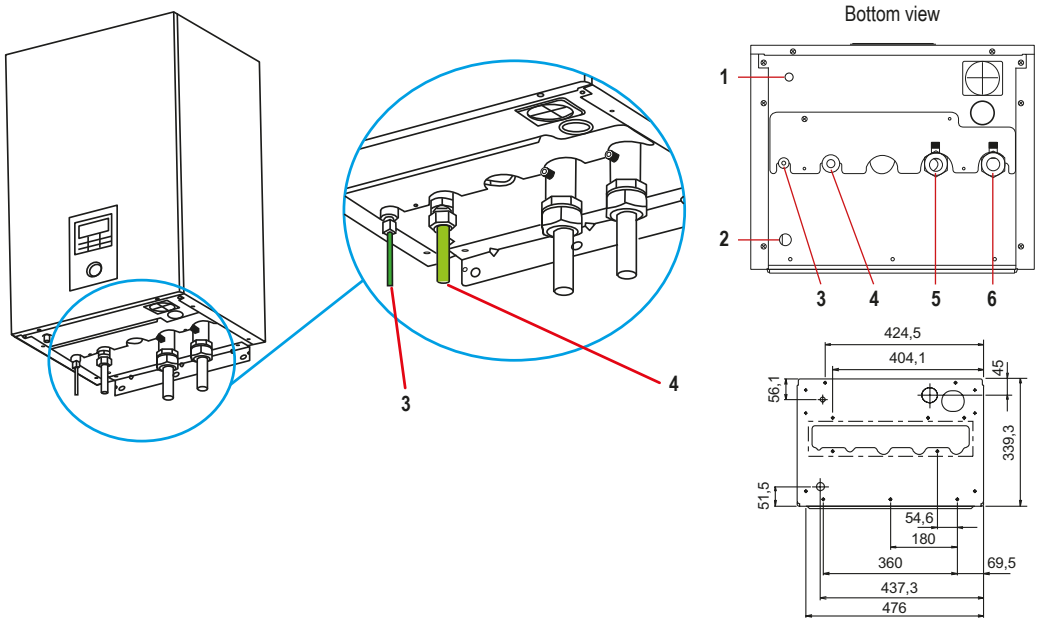
Permissible tightening torques of the refrigerant pipes – All in One units J and H generation

Bi-bloc systems with All in One unit	Note	Refrigerant gas pipe		Refrigerant liquid pipe	
		Diameter mm (inches)	Torque Nm	Diameter mm (inches)	Torque Nm
High Performance | J Generation | R32					
WH-ADC0309J3E5(B/C) + WH-UD03JE5	1	12.7 (1/2)	55	6.35 (1/4)	18
WH-ADC0309J3E5(B/C) + WH-UD05JE5	1	12.7 (1/2)	55	6.35 (1/4)	18
WH-ADC0309J3E5(B/C) + WH-UD07JE5		15.88 (5/8)	65	6.35 (1/4)	18
WH-ADC0309J3E5(B/C) + WH-UD09JE5-1		15.88 (5/8)	65	6.35 (1/4)	18
High Performance | H Generation | R410A					
WH-ADC1216H6E5 + WH-UD**HE5		15.88 (5/8)	65	9.52 (3/8)	42
WH-ADC1216H6E5C + WH-UD**HE5		15.88 (5/8)	65	9.52 (3/8)	42
WH-ADC0916H9E8 + WH-UD**HE8		15.88 (5/8)	65	9.52 (3/8)	42
T-CAP | H Generation | R410A					
WH-ADC1216H6E5 + WH-UX**HE5		15.88 (5/8)	65	9.52 (3/8)	42
WH-ADC1216H6E5C + WH-UX**HE5		15.88 (5/8)	65	9.52 (3/8)	42
WH-ADC0916H9E8 + WH-UX**HE8		15.88 (5/8)	65	9.52 (3/8)	42
WH-ADC0916H9E8 + WH-UQ**HE8		15.88 (5/8)	65	9.52 (3/8)	42

1 In these indoor unit/outdoor unit combinations, the reducing adapter, supplied with the All in One unit, must be installed in the refrigerant gas pipe.

Hydrokits

Hydrokit | J and H generation
WH-SDC****J3E5, WH-SDC**H*E5, WH-SDC**H*E8, WH-SXC**H*E5, WH-SXC**H*E8, WH-SQC**H*E5, WH-SQC**H*E8



1 Condensate drain hole
2 Safety valve drainage tap
3 Refrigerant liquid line
4 Refrigerant gas line
5 Supply water outlet (to space heating/cooling)
6 Return water inlet (from space heating/cooling)

Permissible tightening torques of the refrigerant pipes – Hydrokits

Bi-bloc systems with hydrokit	Refrigerant gas pipe		Refrigerant liquid pipe	
	Diameter mm (inches)	Torque Nm	Diameter mm (inches)	Torque Nm
High Performance | J Generation | R32				
WH-SDC0305J3E5 + WH-UD03JE5	12.7 (1/2)	55	6.35 (1/4)	18
WH-SDC0305J3E5 + WH-UD05JE5	12.7 (1/2)	55	6.35 (1/4)	18
WH-SDC0709J3E5 + WH-UD07JE5	15.88 (5/8)	65	6.35 (1/4)	18
WH-SDC0709J3E5 + WH-UD09JE5-1	15.88 (5/8)	65	6.35 (1/4)	18
High Performance | H Generation | R410A				
WH-SDC**H6E5 + WH-UD**HE5	15.88 (5/8)	65	9.52 (3/8)	42
WH-SDC**H3E8 + WH-UD**HE8	15.88 (5/8)	65	9.52 (3/8)	42
T-CAP | H Generation | R410A				
WH-SXC**H3E5 + WH-UX**HE5	15.88 (5/8)	65	9.52 (3/8)	42
WH-SXC**H3E8 + WH-UX**HE8	15.88 (5/8)	65	9.52 (3/8)	42
WH-SQC**H3E8 + WH-UQ**HE8	15.88 (5/8)	65	9.52 (3/8)	42
HT | F Generation | R407C				
WH-SHF**F*E5 + WH-UH**FE5	15.88 (5/8)	65	9.52 (3/8)	42
WH-SHF**F*E8 + WH-UH**FE8	15.88 (5/8)	65	9.52 (3/8)	42

6.6.2 Connecting refrigerant pipes to the outdoor unit

WARNING

Danger to life from electric shock

The devices are operated with 230 V or 400 V alternating current. Touching the live electrical cables can be life-threatening due to electrical shock.

► Before opening the outdoor unit, make sure that the entire system (including hydrokit or All in One unit, tank and electrical heater) is disconnected from the electric supply.

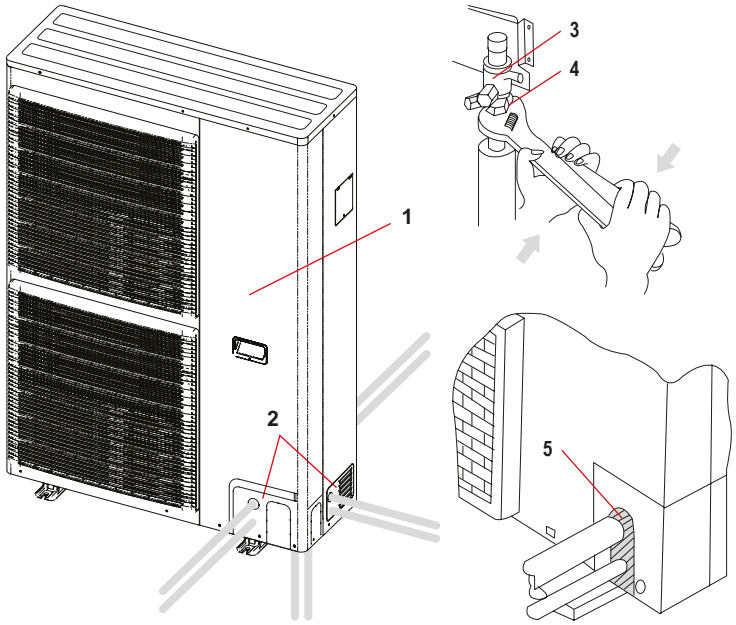
IMPORTANT

The pipes can be routed out of the unit in four directions: to the front, back, right and left side. Select the direction most suitable for the installation location.

Carry out the following steps to connect the prepared refrigerant pipes coming from the indoor unit to the outdoor unit:

1. Open the outdoor unit (→ *6.5 Opening devices, p. 155*).
2. Remove the selected pipe panel (2) and provide it with suitable holes for the pipes.
3. Mount the pipe panel again so that rain will not enter the outdoor unit.
4. Align the flared tube and the connecting pipe centrally and first tighten the flare nut by hand and then with a torque wrench and an adjustable spanner to counter it. Ensure the correct torques (→ *Permissible tightening torques of refrigerant pipes (Outdoor units), p. 164*).
5. Close the opening around the pipes entering the outdoor unit using thermal insulation or putty (provided on site) to ensure that no gap is left open.

Connections of the refrigerant pipes – outdoor units



1 Front plate
2 Pipe panels
3 Impermissible location to place the adjustable spanner
4 Correct location to place the adjustable spanner
5 Thermal insulation or putty

Permissible tightening torques of the refrigerant pipes – Outdoor units

Outdoor units for bi-bloc systems	Refrigerant gas pipe		Refrigerant liquid pipe	
	Diameter mm (inches)	Torque Nm	Diameter mm (inches)	Torque Nm
High Performance | J Generation | R32				
WH-UD03JE5	12.7 (1/2)	55	6.35 (1/4)	18
WH-UD05JE5	12.7 (1/2)	55	6.35 (1/4)	18
WH-UD07JE5	15.88 (5/8)	65	6.35 (1/4)	18
WH-UD09JE5-1	15.88 (5/8)	65	6.35 (1/4)	18
High Performance | H Generation | R410A				
WH-UD**HE5	15.88 (5/8)	65	9.52 (3/8)	42
WH-UD**HE8	15.88 (5/8)	65	9.52 (3/8)	42
T-CAP | H Generation | R410A				
WH-UX**HE5	15.88 (5/8)	65	9.52 (3/8)	42
WH-UX**HE8	15.88 (5/8)	65	9.52 (3/8)	42
WH-UQ**HE8	15.88 (5/8)	65	9.52 (3/8)	42
HT | F Generation | R407C				
WH-UH**FE5	15.88 (5/8)	65	9.52 (3/8)	42
WH-UH**FE8	15.88 (5/8)	65	9.52 (3/8)	42

6.7 Connecting the heating circuit

CAUTION

Danger of illnesses caused by colonies of bacteria in the water

The risk of colonies of bacteria, particularly of Legionella, in the water can be raised with an open water circuit.

► Only deploy devices in a closed water system.

ATTENTION

Danger of water pipes freezing in outside temperatures below 0 °C

When the heating circuit is filled with water and the outside temperature falls below 0 °C, the water pipes of the mono-bloc system are at risk of freezing up. This can damage the mono-bloc unit.

The client should therefore ensure the absence of frost by taking **one** of the following measures:

► Operate the heating circuit using a food-safe antifreeze mixture (propylene glycol).

► Equip the mono-bloc unit with an optional base pan heater, to prevent the heating circuit from freezing up.

► Drain the heating circuit by using a field-supplied draining device (manually or automatically) before freezing starts.

Danger of corrosion in open systems

Ingress of oxygen into open water systems can cause excessive corrosion of the pipes and the subsequent problems in operation.

► Install Aquarea heat pumps only as closed systems without direct contact of the heating water to the ambient air.

Danger of damage to the hydrokit and other components of the system due to improper working methods when connecting the water heating circuit

To avoid damage to the water-side system components, observe the following instructions:

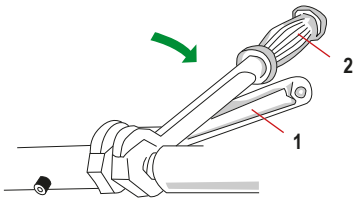
► Ensure that the components installed in the water circuit can withstand high operating water pressures. Use only suitable sealants that are capable of withstanding the pressure and the temperature of the system.

► Do not use worn out pipes.

► Block pipe ends, which are routed through a wall grommet, so that dirt does not enter the pipes.

► Before connecting the device, flush the water-side pipes to remove contaminants, because impurities can damage device components.

- ► Using a wrong tool, e.g. a pipe wrench, can deform or damage the connection. This can cause leakages. Therefore, use a suitable adjustable spanner
- ► Too high a tightening torque can cause deformation and consequently leakages.



1 Adjustable spanner
2 Torque wrench

Therefore, only use a torque wrench to tighten and an adjustable spanner to counter it (see the illustration above).

6.7.1 Connecting water pipes to the indoor unit or mono-bloc unit

Note

Follow the planning documents to connect the water pipes of the heating circuit or follow the application examples (→ *5.6 Application examples, p. 136*).

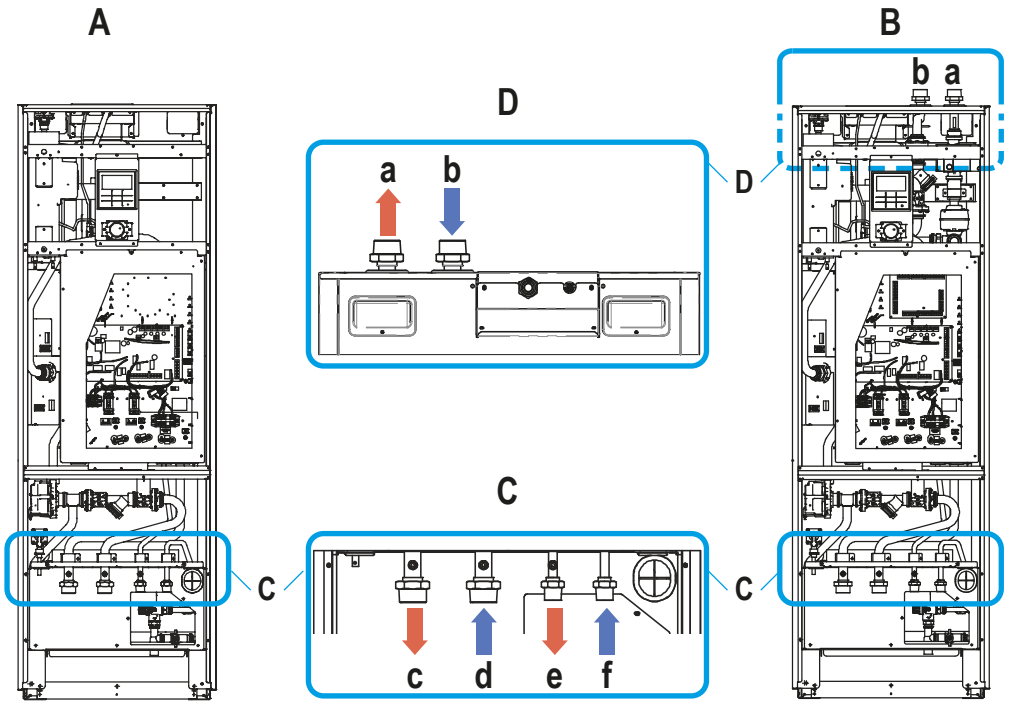
Carry out the following steps to connect the water pipes of the heating circuit to the indoor unit (hydrokit or All in One unit) or the mono-bloc unit:

1. Install the required pipes, valves, strainers and other components according to the planning documents.
2. Connect the water circuit to the supply water outlet and return water inlet of the indoor unit or mono-bloc unit.
3. Use suitable flare nuts to connect the return water inlet (marked “WATER IN”) and supply water outlet (marked “WATER OUT”). Use a torque wrench to tighten the flare nut, and apply the allowable tightening torque in each case (→ *Permissible tightening torques of water pipes (All in One units), p. 169*, → *Permissible tightening torques of water pipes (Hydrokits), p. 169*, → *Permissible tightening torques of water pipes (Mono-bloc units), p. 170*).
4. **Only** for heat pump models of the **F and G Ge**neration: Install a field-supplied strainer (mesh width at least 500 to 600 µm) before the return water inlet of the indoor unit or mono-bloc unit to protect the heat pump. It is advisable to install a shut-off valve before and after the strainer to facilitate later servicing work on the strainer.

   This does not apply to the hydrokit and All in One unit of the J or H Generation, because a strainer with two shut-off valves is integrated as standard with these.

All in One units

Connections of the water pipes – All in One unit | J Generation | Standard and Two-zone configuration
WH-ADC0309J3E5, WH-ADC0309J3E5B



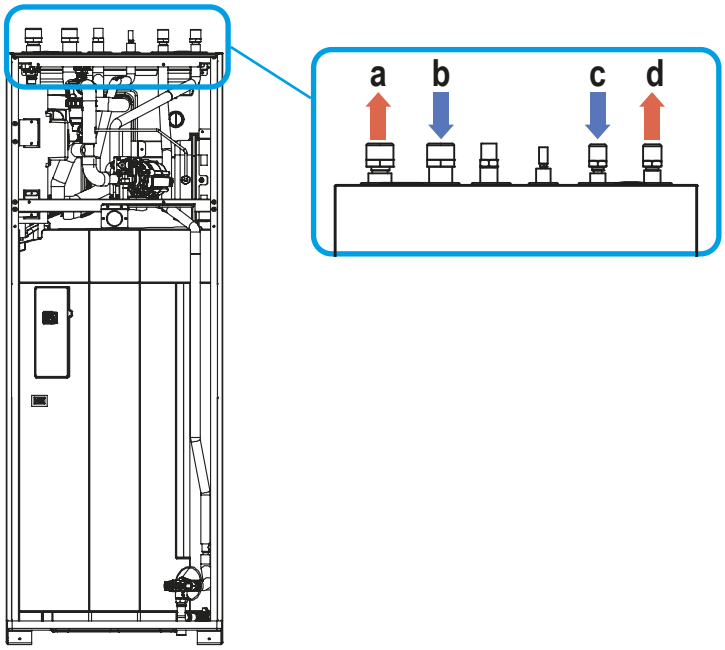
A Standard configuration (for 1 heating zone)
- a (not available)
- b (not available)
- c Zone 1 Supply water outlet (to space heating/cooling)
- d Zone 1 Return water inlet (from space heating/cooling)
- e Supply water outlet (to hot water tank)
- f Fresh water inlet

B Two-zone configuration (for 2 heating zones)
- a Zone 2 Supply water outlet (to space heating/cooling)
- b Zone 2 Return water inlet (from space heating/cooling)
- c Zone 1 Supply water outlet (to space heating/cooling)
- d Zone 1 Return water inlet (from space heating/cooling)
- e Supply water outlet (to hot water tank)
- f Fresh water inlet

C Detail view of piping connections for both configurations

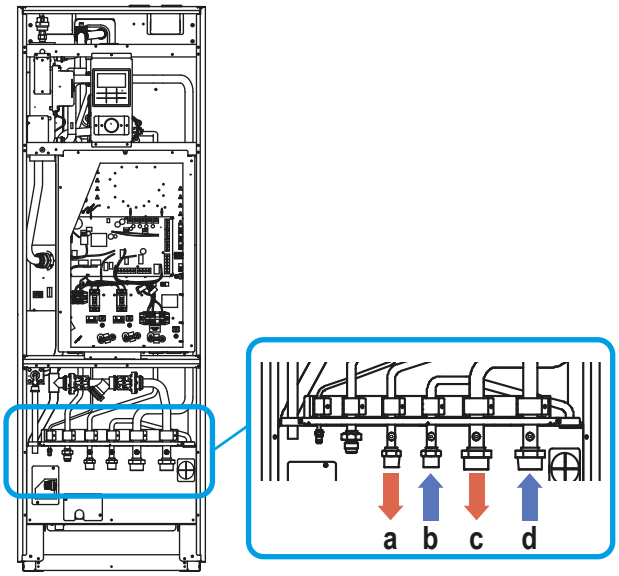
D Detail view of upper section (seen from rear side) only for two-zone configuration

Connections of the water pipes – All in One unit | J and H generation | Compact configuration (for 1 heating zone)
WH-ADC0309J3E5C, WH-ADC1216H6E5C



a Supply water outlet (to space heating/cooling)
b Return water inlet (from space heating/cooling)
c Fresh water inlet
d Supply water outlet (to hot water tank)

Connections of the water pipes – All in One unit | H generation | Standard configuration (for 1 heating zone)
WH-ADC1216H6E5, WH-ADC0916H9E8



a Supply water outlet (to hot water tank)
b Fresh water inlet
c Supply water outlet (to space heating/cooling)
d Return water inlet (from space heating/cooling)

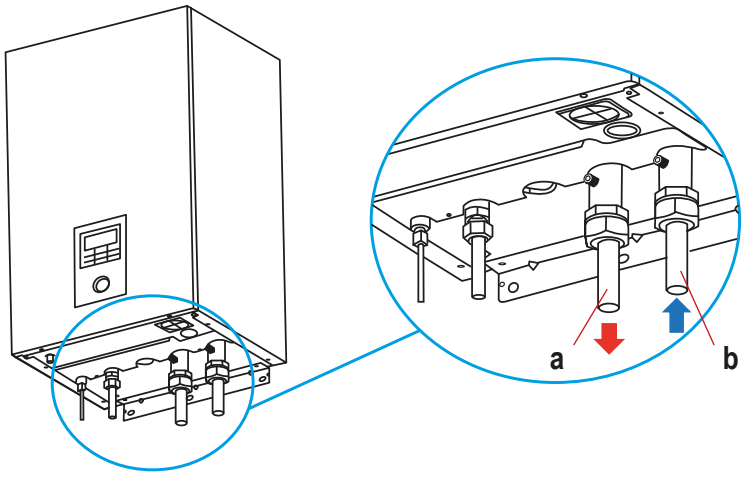
Permissible tightening torques of the water pipes – All in One units

	Connection			
	– Supply water outlet (to space heating/ cooling) [1] – Return water inlet (from space heating/ cooling) [1]		– Supply water outlet (to hot water tank) – Fresh water inlet	
Bi-bloc systems with All in One unit	**Flare nut size**	**Torque Nm**	**Flare nut size**	**Torque Nm**
Any type of All in One unit	RP 1¼“	117.6	RP ¾“	58.8

1) For the All in One unit in two-zone configuration (WH-ADC0309J3E5B), the specified flare nut size and torque apply to the supply and return water pipe connections for both zone 1 and zone 2.

Hydrokits

Connections of the water pipes – Hydrokit J or H Generation



a Supply water outlet (to space heating/cooling)

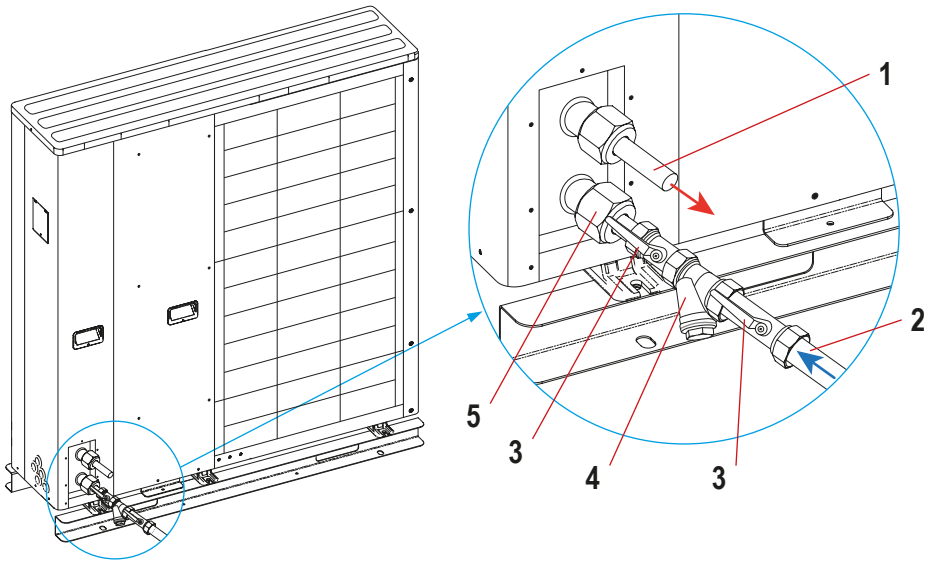
b Return water inlet (from space heating/cooling)

Permissible tightening torques of the water pipes – Hydrokits

	Connection	
	– Supply water outlet (to space heating/cooling) – Return water inlet (from space heating/cooling)	
Bi-bloc systems with hydrokit	**Flare nut size**	**Torque Nm**
Any type of hydrokit	RP 1¼“	117.6

Mono-bloc units

Connections of the water pipes – Mono-bloc units



Typical installation example with strainer

1 Supply water outlet (to space heating/cooling)
2 Return water inlet (from space heating/cooling)
3 Shut-off valve
4 Strainer
5 Flare nut

Permissible tightening torques of the water pipes – Mono-bloc units

	Connection	
Mono-bloc systems	– Supply water outlet (to space heating/cooling) – Return water inlet (from space heating/cooling)	
	Flare nut size	Torque Nm
Any type of mono-bloc unit	RP 1¼"	117.6

5. **Only** for heat pump models of the **F Generation**: Install an overflow valve, if no hydraulic disconnection (e.g. hydraulic shunt or buffer tank) has been provided. Take care to set the overflow valve not for the minimum flow rate, but for the nominal flow rate of the respective heat pump.

   This is only allowable for heat pump models of the F-Generation, because hydraulic disconnection is necessary for all heat pump models of the G- and H-Generation.
6. If a heat pump with cooling function is used, you may have to install 2-way valves for switching off the heating circuits in cooling mode.
7. Install the 3-way switchover valve (to be provided on site) to switch over from heating mode to hot water mode and reverse, if a Panasonic hot water tank is not used. The valve should by default be opened in the direction of the heating circuit. Moreover, the valve should have CE conformity and not exceed a peak load of 12 VA.
8. Connect inflow (water out) and return (water in) of the indoor unit or mono-bloc unit to the heat exchanger of the hot water tank. Take care not to mix up the connections.
9. Install a device for draining the system provided on site.
10. Insulate the pipelines and connections according to the locally valid European, national and regional specifications and guidelines.

6.7.2 Connecting the condensation and water drain pipes

On site, a hose must be connected to the condensation drain of the indoor, outdoor and mono-bloc units as well as to the water drain of the pressure relief valve. For connection to the condensation drain, a drain elbow and a packing are provided for each device. The drain hoses and pipes must be field-supplied.

IMPORTANT

When installing the drain hoses, in addition to the safety notes applicable for the entire heating circuit, pay attention also to the following notes:

- Use commercially available drain hoses with a suitable diameter.

Device	Hose internal diameter	
	Condensation drain outlet including drain elbow (mm)	Safety valve drainage tap (Inch)
All in One unit J or H Generation	17	R ½
Hydrokit J or H Generation	17	3/8
Hydrokit F Generation	17	not specified
Outdoor unit	17	not specified
Mono-bloc unit	15	not specified

- Install the drain hoses with a constant slope and in such a way that the water outlet cannot be clogged.
- Install the drain hoses in a frost-free environment.

  This is particularly important in the case of outdoor and mono-bloc units, because if the periods in outside temperatures below 0 °C are long, ground frost can cause the condensate to form ice. The result can be that the condensate cannot drain off and this will cause malfunctioning in the heat pump operation.

  For safe drainage of condensation water even at outside temperatures below 0 °C, a drain pipe is recommended, reaching into the frost-free area of the underground.
- Do not conduct the drain hoses into a sewage or cleaning connection from which ammoniac, sulphurous gases or the like can rise.

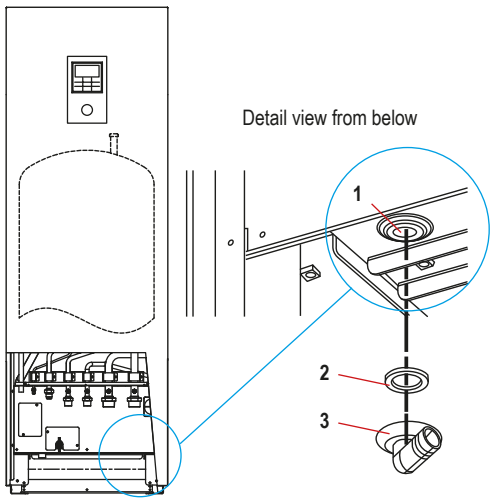
6.7.2.1 Connecting the condensation drain hose

Indoor units

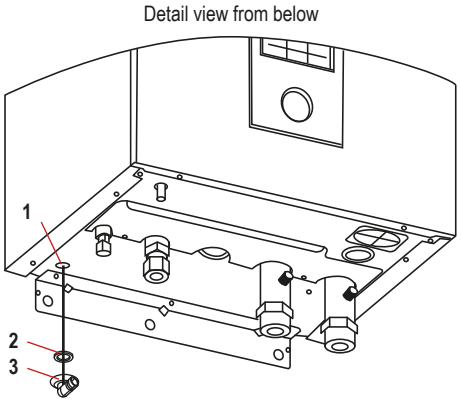
Carry out the following steps to connect the drain hose to the condensation drain outlet of the indoor unit:

1. Assemble the supplied drain elbow with packing on the condensation drain outlet on the underside of the indoor unit, as shown in the illustrations below.
2. Slide the hose onto the drain elbow.
3. Ensure that the drain hose is seated firmly. Use a hose clip to attach the hose, if necessary (to be field-supplied).
4. Lay the drain hose with a constant slope into a suitable receptacle for the condensed water (to be field-supplied).

All in One unit J or H Generation



Hydrokit J or H Generation



1 Condensation drain outlet
2 Packing
3 Drain elbow

Note: Schematic figures for explanation purposes only.

Outdoor units

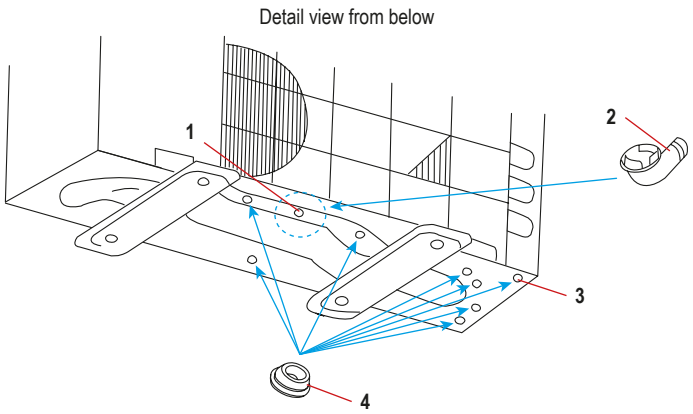
IMPORTANT

When installing the drain hose on the outdoor unit, also observe the following instructions:

- When using the drain elbow, the outdoor unit should be mounted on a sub-base at least 50 mm in height.
- For installation of the outdoor unit on a foundation, the installation method with a strip foundation and gravel filling is recommended (→ *5.2.2.3 Securing the outdoor unit, p. 102*). For a safe drainage of condensation water, even at outside temperatures below 0 °C, a drain pipe is recommended, reaching into the frost-free area of the underground.

Carry out the following steps to connect the drain hose to the condensation outflow of the outdoor unit:

1. Assemble the supplied outlet bend with seal on the condensation drain outlet on the underside of the outdoor unit, as shown in the figures below.
2. Seal the openings on the underside of the outdoor unit using the supplied rubber sealing caps.
3. Slide the hose onto the drain elbow.
4. Ensure that the drain hose is seated firmly. Use a hose clip to attach the hose, if necessary (to be field-supplied).
5. Lay the drain hose with a constant slope. For large drain hose lengths, you may want to use a metal support (to be field-supplied) to prevent the hose from bending.



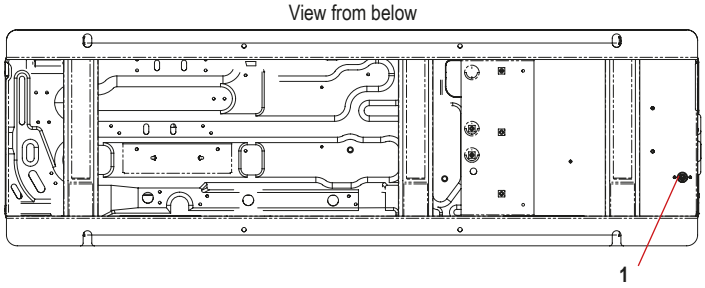
1 Condensation drain outlet
2 Drain elbow
3 Openings
(number depending on model)
4 Rubber sealing caps

Note: Schematic figure for explanation purposes only.

Mono-bloc units

Carry out the following steps to connect the drain hose to the condensation drain outlet of the mono-bloc unit:

1. Slide the drain hose onto the condensation drain outlet on the mono-bloc unit.
2. Ensure that the drain hose is seated firmly. Use a hose clip to attach the hose, if necessary (to be field-supplied).
3. Lay the drain hose with a constant slope. For large drain hose lengths, you may want to use a metal support (to be field-supplied) to prevent the hose from bending.



1 Condensation drain outlet

6.7.2.2 Connecting the safety valve drainage tap

All in One unit J or H Generation

For the All in One Unit of the J or H Generation, a safety valve (initial pressure 8 bar) is integrated into the hot water tank. Safety valve and hot water tank have a common water drain outlet.

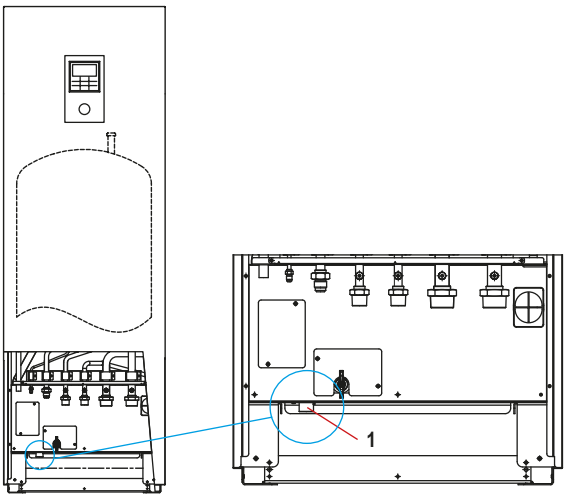
IMPORTANT

When installing the drain pipe on the All in One unit of the J or H Generation, also observe the following instructions:

- The drain pipe must not be longer than 2 m long and not have more than 2 bends.

Carry out the following steps to connect the drain pipe to the safety valve drainage tap of the All in One unit:

1. Use a connection of the size R ½ inches for installing the drain pipe.
2. Lay the drain pipe with a constant slope. The end of the drain pipe must be visible and must not be near electrical components.
3. It is advisable to mount a drain siphon in the drain pipe, which is also visible and is not in the vicinity of electrical components.

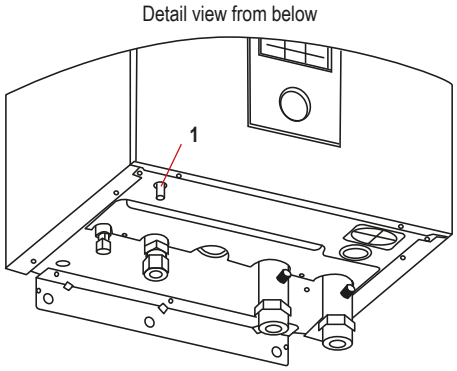


1 Safety valve drainage tap

Hydrokit J or H Generation

Carry out the following steps to connect the drain hose to the safety valve drainage tap of the hydrokit:

1. Slide the drain hose onto the safety valve drainage tap on the hydrokit.
2. Ensure that the drain hose is seated firmly. Use a hose clip to attach the hose, if necessary (to be field-supplied).
3. Lay the drain hose with a constant slope into a suitable receptacle for the condensed water (to be field-supplied).



1 Safety valve drainage tap

6.8 Connecting the electrical wiring

WARNING

Danger to life from electric shock!

The devices are operated with 230 V or 400 V alternating current. Improper installation can present a danger to life from electric shock as well as a danger of fire occurring due to overheating.

- ► Electrical installation work must be undertaken by a trained electrician.
- ► Ensure that you have disconnected the electricity supply before you carry out installation work. Secure the electricity supply against being switched on again unintentionally.

ATTENTION

Danger of damage due to unprofessional installation

- ► When making electrical wiring connections, respect the relevant requirements for cable type, cable cross section and recommended fuse (→ *4.6.2.3 Technical Data (bi-bloc systems), p. 40*, → *4.6.3.3 Technical Data (mono-bloc systems), p. 55*), the minimum required contact clearance and the maximum permissible cable length (if indicated) as well as the connecting conditions for the individual devices (→ *5.4 Electricals, p. 116*).
- ► Pay attention to the correct polarity while connecting the cabling. Connecting the cabling with incorrect polarity can cause electrical shocks or fire.
- ► Guide the cable through cable grommets into the device, so that the cable will not be damaged by sharp edges.
- ► Make sure that the cables do not come into contact with hot objects such as the water pipes, so that the insulation is not damaged.

IMPORTANT

When connecting electrical wiring, also respect the following specifications.

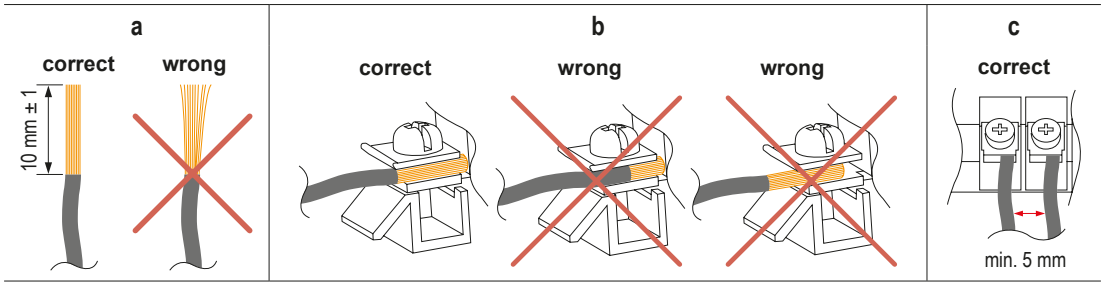
Requirements for correctly configured cable connections

1. Note the following requirements for the insulation:

a. The insulation having a length of 10 mm ±1 mm must be stripped from the wire end. See that no strand is loose and that all strands are clamped.

b. See that the stripped end of the wire is fully inserted into the terminal. Neither should the insulation be inserted in the terminal, nor should the stripped end of the wire project out from the terminal.

c. The gap between the cables must be a minimum of 5 mm.



2. When tightening the terminal screw connections, ensure the following tightening torques:

Terminal screw connection	Tightening torque (Ncm)
M4	157 – 196
M5	196 – 245

3. Note that, for safety reasons, the earth conductor must be longer than the other cables in case the cable slips out from the cable clamp.
4. Use separate cable grommets for power cords on the one hand and accessory cables on the other, to avoid disturbances in control signals.
5. Fasten the power cord by using cable clamps/strain reliefs.
6. Bundle accessory cables together using cable binders.

6.8.1 Connecting power cord

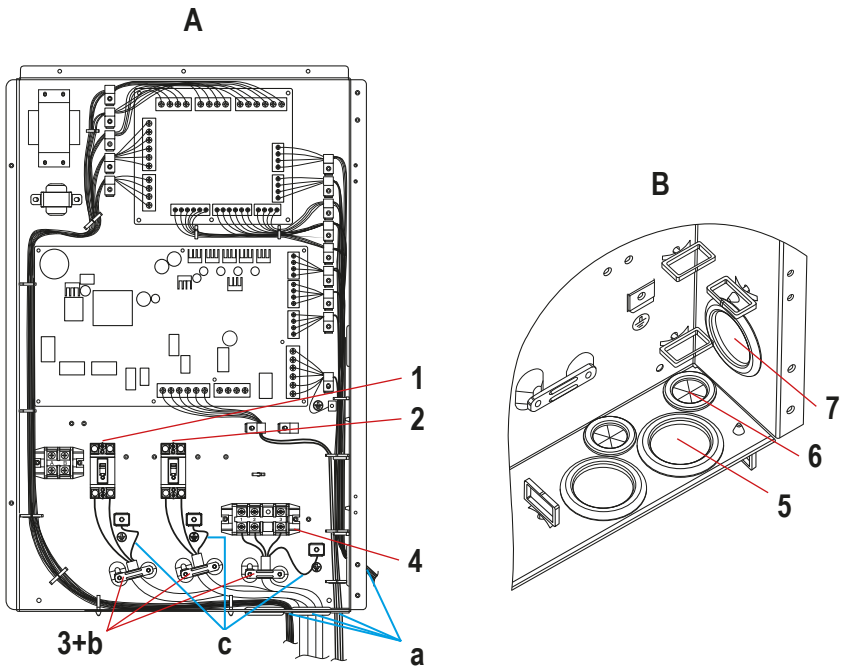
6.8.1.1 Connecting the power cord to the indoor unit

The following method is applicable as appropriate for all indoor units, All in One units and hydrokits of all generations, but will be explained here on the basis of the example of a hydrokit of the H Generation (→ *Installation example (Hydrokits), p. 177*).

Carry out the following steps to connect the power cord to the indoor unit:

1. Open the indoor unit (→ *6.5 Opening devices, p. 155*) and, if applicable, the connection box.
2. Guide the cable through the cable gland (**5**, **a**) into the device.
3. Secure the cable by means of the cable clamps (strain reliefs) (**3**, **b**).
4. Connect the power cords 1 and 2 accordingly to mains connection 1 and 2 (**1**, **2**), according to the installation example below (see below) and the connection diagram following it and ensure that the earth conductor is longer than the other cables in every case (c).
5. Connect the connecting cable to the outdoor unit on the indoor unit terminal (4) and take care to leave the earth conductor longer than the other cables (c). Also ensure that you connect conductors of the same cable colour to the same terminal numbers on outdoor and indoor unit.
6. Connect the other end of the power cord to the power grid via the disconnector which is absolutely required in all cases.
7. Protect the individual power supply connections with a suitably sized fuse according to the cable cross section and the maximum power consumption. Note that the contact clearance between the poles must be a minimum of 3.0 mm.

Installation example: Hydrokit WH-SDC12H6E5



A Connection of the power cord

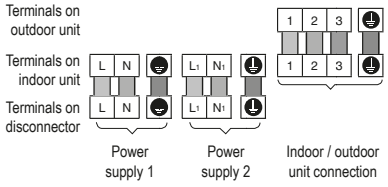
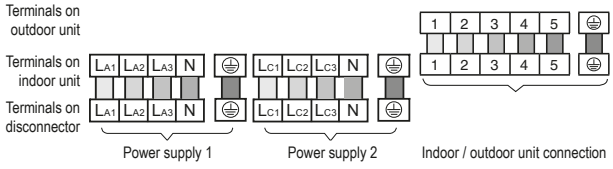
1 RCCB for power supply 1
2 RCCB for power supply 2
3 Cable clamps / strain reliefs
4 Terminal block for indoor / outdoor unit connection cable

B Detailed view: Cable glands

5 Cable gland for power cord 1 and 2 for indoor / outdoor unit connection cable
6+7 Cable glands for control wiring from optional accessories

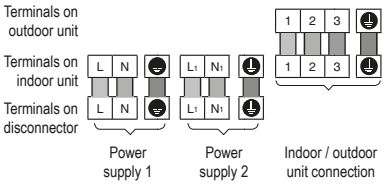
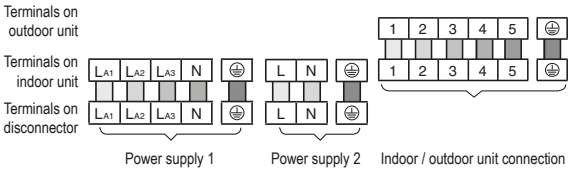
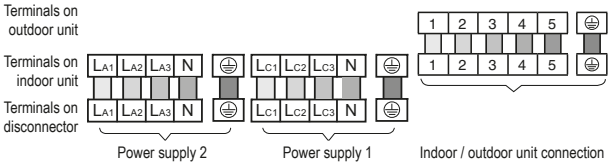
a Use separate cable glands for power cord and accessory cables
b Fix power cord with cable clamps / strain reliefs
c Leave earth conductor longer than the other cables for safety reasons

Connection diagram – All in One units

Models	Connection diagram
WH-ADC0309J3E5(B/C) + WH-UD**JE5(-1) WH-ADC1216H6E5 + WH-UD**HE5 WH-ADC1216H6E5 + WH-UX**HE5 WH-ADC1216H6E5C + WH-UD**HE5 WH-ADC1216H6E5C + WH-UX**HE5	
WH-ADC0916H9E8 + WH-UD**HE8 WH-ADC0916H9E8 + WH-UX**HE8 WH-ADC0916H9E8 + WH-UQ**HE8	

6

Connection diagram – Hydrokits

Models	Connection diagram
WH-SDC****J3E5 + WH-UD**JE5(-1) WH-SDC**H6E5 + WH-UD**HE5 WH-SXC**H*E5 + WH-UX**HE5 WH-SHF**F*E5 + WH-UH**FE5	
WH-SDC09H3E8 + WH-UD09HE8 WH-SXC09H3E8 + WH-UX09HE8 WH-SQC09H3E8 + WH-UQ09HE8 WH-SHF09F3E8 + WH-UH09FE8	
WH-SDC12H9E8 + WH-UD12HE8 WH-SDC16H9E8 + WH-UD16HE8 WH-SXC12H9E8 + WH-UX12HE8 WH-SXC16H9E8 + WH-UX16HE8 WH-SQC12H9E8 + WH-UQ12HE8 WH-SQC16H9E8 + WH-UQ16HE8 WH-SHF12F9E8 + WH-UH12FE8	

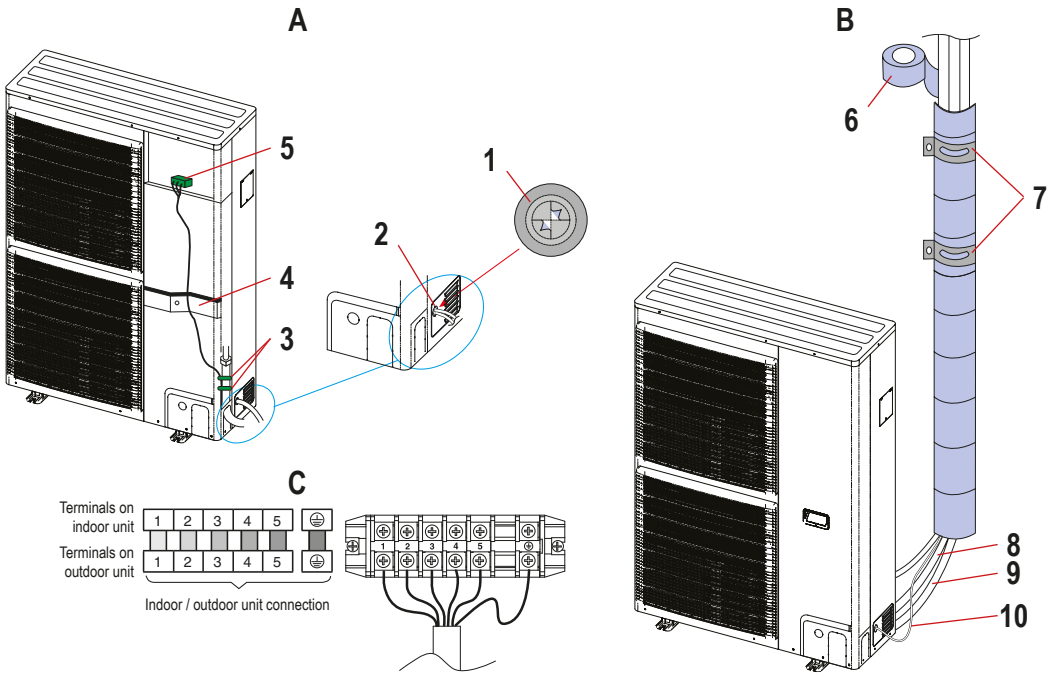
6.8.1.2 Connecting the connection cable between indoor and outdoor unit

The following method is correspondingly applicable for all outdoor units, but will be explained here on the basis of the example of a 12 kW outdoor unit of the H Generation (→ *Installation example (Outdoor units), p. 179*).

Carry out the following steps to connect the connection cable to the outdoor unit:

1. Lay the connecting cable from the indoor unit to the outdoor unit through the wall grommet.
2. Open the outdoor unit (→ *6.5 Opening devices, p. 155*) and, if applicable, the connection box.
3. If several possible cable glands are present on the outdoor unit (depends on the model), select the desired cable gland, insert the rubber cable sleeve provided (**1**) and cut the cable sleeve crosswise using a knife. If not, continue with the next step.
4. Guide the cable through the cable gland (2) into the device.
5. Fix the cable using a cable binders (3) and cable clamps/strain reliefs (4).
6. Connect the connection cable to the outdoor unit terminal (5) according to the following installation example (see below) and take care to leave the earth conductor longer than the other cables (c). Also ensure that you connect conductors of the same cable colour to the same terminal numbers on outdoor and indoor unit.
7. Wrap the tubes and cables with cable tape (6) and fix the cables by using fastening clamps if necessary (7). Alternatively, you can install the tubes and cables in a cable channel.
8. Seal the wall grommet into the building using a suitable sealing compound (to be field-supplied) after installing all cables.

Installation example: Outdoor unit WH-UD12HE8



A	**Connection of the connecting cable**	**B**	**Insulation of the pipe and cable**
1	Rubber cable sleeve (available or not, depending on model)	6	Cable tape or cable duct
2	Cable gland (one of three options depending on the model)	7	Fastening clamps
3	Cable binder	8	Refrigerant liquid line
4	Cable clamp	9	Refrigerant gas line
5	Terminal blocks	10	Connecting cable between indoor and outdoor unit
		C	**Detailed view of terminal block on outdoor unit**

6

6.8.1.3 Connecting power cord to the mono-bloc unit

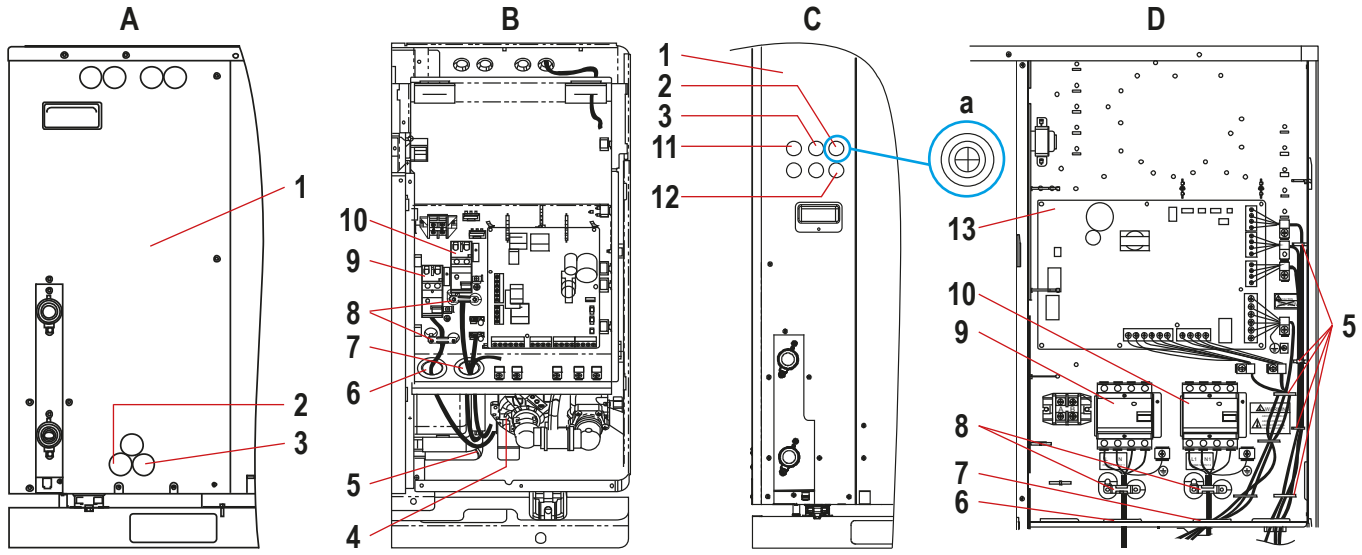
The following method is correspondingly applicable for all mono-bloc devices, but will be explained here on the basis of the example of a 9 kW single-phase model and a 12 kW three-phase model (both J Generation) (→ *Installation example (Mono-bloc units), p. 180*).

Carry out the following steps to connect the power cord to the mono-bloc unit:

1. Open the mono-bloc unit (→ *6.5 Opening devices, p. 155*).
2. If there is a cover on the cable gland on the rear side of the cabinet (depends on model), remove the cover before connecting the cable and re-assemble it afterwards.

   If there is a cable sleeve (depends on model), cut the cable sleeve crosswise using a knife.
3. Guide the cable through the cable glands (2, 3) into the device.
4. Fix the cables using cable binders (5) and cable clamps/strain reliefs (8).
5. Connect the power cords 1 and 2 accordingly to power supply 1 and 2 (9, 10 or 11, 12), according to the following installation example (see below) and the connection diagram following it and take care to leave the earth conductor longer than the other cords in every case. Also see that the cables do not come in contact with the pump (4) or other hot objects such as the water pipes at any point, so that the insulation is not damaged.
6. Connect the other end of the power cord to the power grid via the disconnector which is absolutely required in all cases.
7. Protect the individual power supply connections with a suitably sized fuse according to the cable cross section and the maximum power consumption. Note that the contact clearance between the poles must be a minimum of 3.0 mm.

Installation example: Mono-bloc units WH-MDC09J3E5 and WH-MXF12J9E8



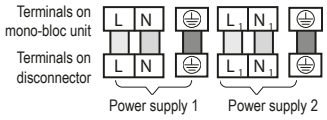
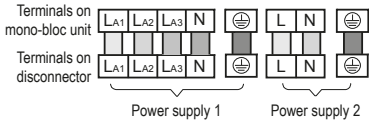
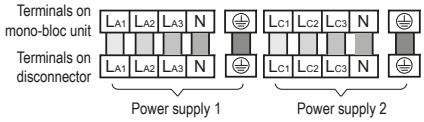
A WH-MDC09J3E5: Detailed view of the Rear Side
1 Rear side of the Cabinet
2 Cable gland for power cord 1
3 Cable gland for power cord 2

B WH-MDC09J3E5: Detailed view of the Front Side
4 Pump
5 Cable binder
6 Internal cable gland for power cord 1
7 Internal cable gland for power cord 2
8 Cable clamps / strain reliefs
9 RCCB for power supply 1
10 RCCB for power supply 2

C WH-MXF12J9E8: Detailed view of the Rear Side
1 Rear side of the Cabinet
2 Cable gland for power cord 1
3 Cable gland for power cord 2
11 Cable gland for remote controller cable
12 Cable gland for optional accessory cables

D WH-MXF12J9E8: View of the Front Side
5 Cable binder
8 Cable clamps / strain reliefs
9 RCCB for power supply 1
10 RCCB for power supply 2
13 Main PCB
a Cut cable sleeve crosswise

Connection diagram – Mono-bloc units

Models	Connection diagram
WH-MDC**J3E5 WH-MDC**H6E5 WH-MXC**J*E5 WH-MXC**H*E5 WH-MHF**G*E5	
WH-MXC09J3E8 WH-MXC09H3E8	
WH-MXC**J9E8 WH-MXC**H9E8	

6.8.2 Connecting the optional on-site accessories

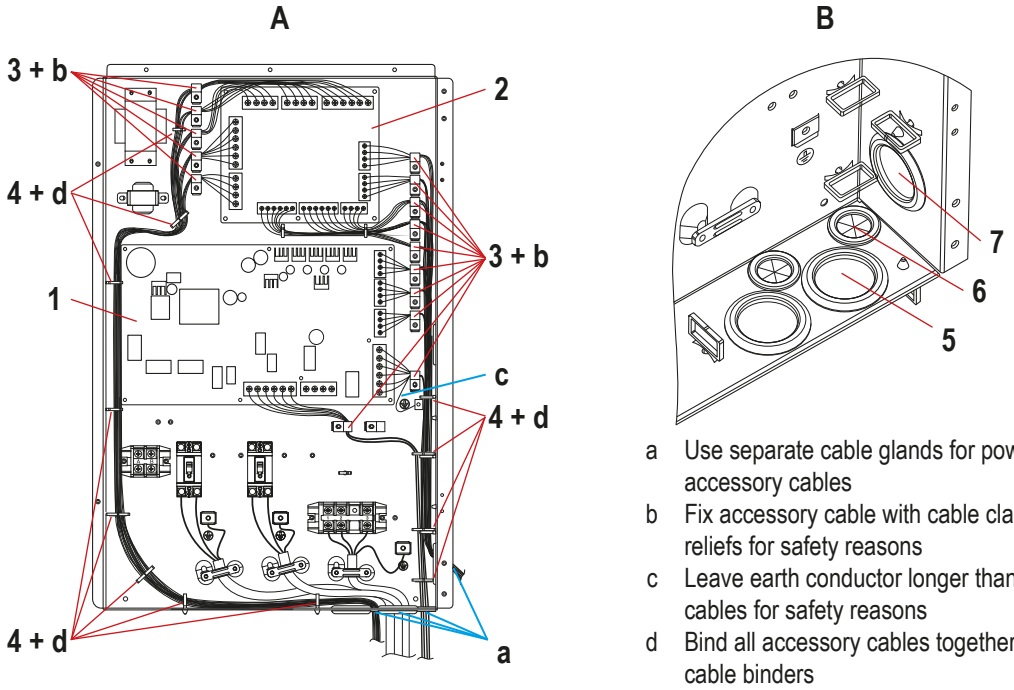
6.8.2.1 Connecting accessories to the indoor unit

The following method is correspondingly applicable for all indoor units, All in One units and hydrokits of all generations, but will be explained here on the basis of the example of a hydrokit of the H Generation (→ *Installation example for accessories (Hydrokits), p. 181*).

Carry out the following steps to connect accessory cables to the external interfaces of the indoor unit:

1. Open the indoor unit (→ *6.5 Opening devices, p. 155*) and, if applicable, the connection box.
2. Guide the cable through the cable glands (**6**/**7**, **a**) into the device as shown in the illustrations below.
3. Fix the cable by using cable clamps/strain reliefs (**3**, **b**) and bundle the accessory cables by means of cable binders (**4**, **d**).
4. Connect the accessory cables according to the installation example below and the subsequent brief overview of the external interfaces (→ *6.8.2.3 Brief Overview of external interfaces, p. 183*) and take care to leave the earth conductor longer than the other cables (**c**).

Installation example for accessories: Hydrokit WH-SDC12H6E5



a Use separate cable glands for power cord and accessory cables
b Fix accessory cable with cable clamps/strain reliefs for safety reasons
c Leave earth conductor longer than the other cables for safety reasons
d Bind all accessory cables together by means of cable binders

A Connection of the accessory cables
1 Main PCB
2 Optional PCB CZ-NS4P
3 Cable clamps / strain reliefs
4 Cable binder

B Detailed view: Cable glands
5 Cable glands for power and connecting cables
6 Cable gland for 3 way-valve, 2-way valve, room thermostat heating zone 1, electric tank heater, additional pump, connection bivalent heating source
7 Cable gland for external control signal, tank temperature sensor, room temperature sensor heating zone 1, outdoor temperature sensor, overload protection hot water tank, remote controller

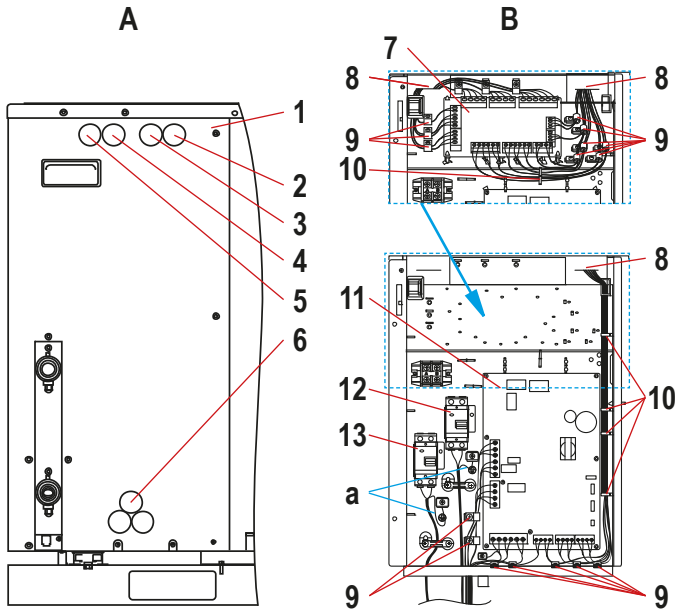
6.8.2.2 Connecting accessories to the mono-bloc unit

The following method is correspondingly applicable for all mono-bloc units, but will be explained here on the basis of the example of a 9 kW single-phase model (J Generation) (→ *Installation example for accessories (Mono-bloc units), p. 182*).

Carry out the following steps to connect accessory cables to the external interfaces of the mono-block unit:

1. Open the mono-bloc unit (→ *6.5 Opening devices, p. 155*).
2. If there is a cover on the cable gland on the rear side of the cabinet (depends on model), remove the cover before connecting the cable and re-assemble it afterwards.
   If there is a cable sleeve (depends on model), cut the cable sleeve crosswise using a knife.
3. Guide the accessory cables through the cable glands according to the illustration below (**2**, **3**, **4**, **5**, **6**, **16**) into the device.
4. Fix the accessory cables using cable binders (**10**, **18**) and cable clamps/strain reliefs (**9**, **19**).
5. Connect the accessory cable according to the installation example below and the subsequent brief overview of the external interfaces (→ *6.8.2.3 Brief Overview of external interfaces, p. 183*) and take care to leave the earth conductor (if present) longer than the other cables (**a**). Also see that the cables do not come in contact with the pump or other hot objects such as the water pipes at any point, so that the insulation is not damaged.

Installation example for accessories: Mono-bloc unit



B WH-MDC09J3E5: Detailed view of the Front Side

7 Optional additional PCB CZ-NS4P
8 Cable glands for accessories cable
9 Cable holder / cable reliefs
10 Cable binder
11 Main PCB
12 FI switch for mains connection 2
13 FI switch for mains connection 1
a Ground connector for safety reasons to be left longer than the other cables

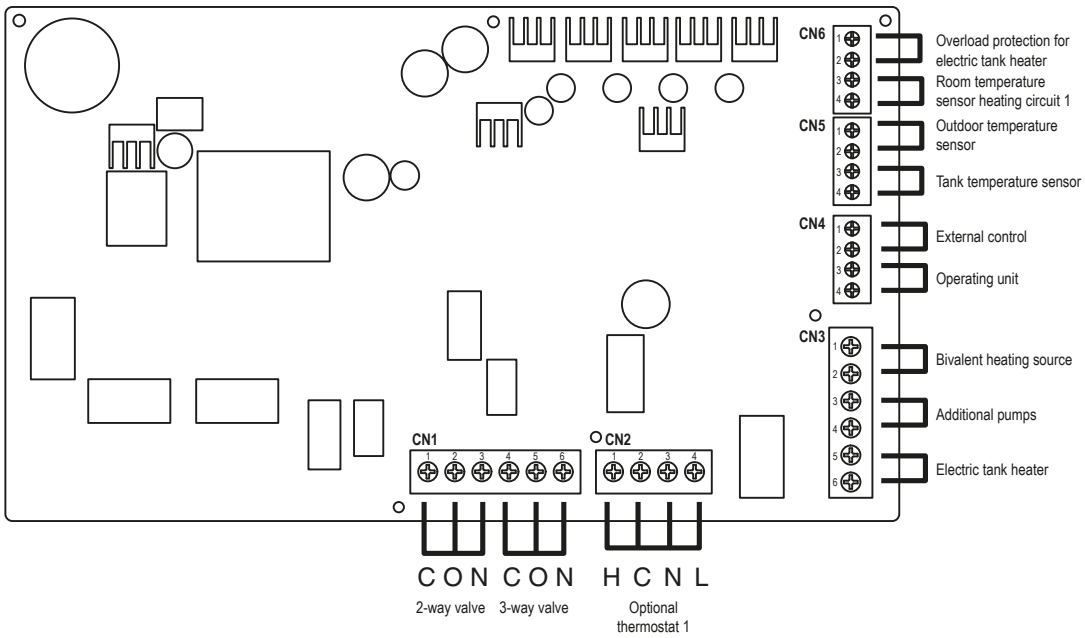
A WH-MDC09J3E5: Detailed view of the Rear Side

1 Rear side of the Cabinet
2 Cable gland for room thermostat heating zone 1, room thermostat heating zone 2, mixing valve heating zone 1, mixing valve heating zone 2
3 Cable gland for pump heating zone 1, pump heating zone 2, solar system, swimming pool pump, alarm signal
4 Cable gland for room temperature sensor heating zone 1, room temperature sensor heating zone 2, buffer tank temperature sensor, swimming pool temperature sensor, water temperature sensor heating zone 1, water temperature sensor heating zone 2, demand control signal, solar temperature sensor, Smart Grid signal, heating/cooling switchover, external outdoor unit switch
5 Cable gland for external control signal, tank temperature sensor, room temperature sensor heating zone 1, outdoor temperature sensor, overload protection hot water tank
6 Cable gland for 3 way-valve, 2-way valve, room thermostat heating zone 1, electric backup heater for heat pump, additional pump, connection of bivalent heat source, remote controller

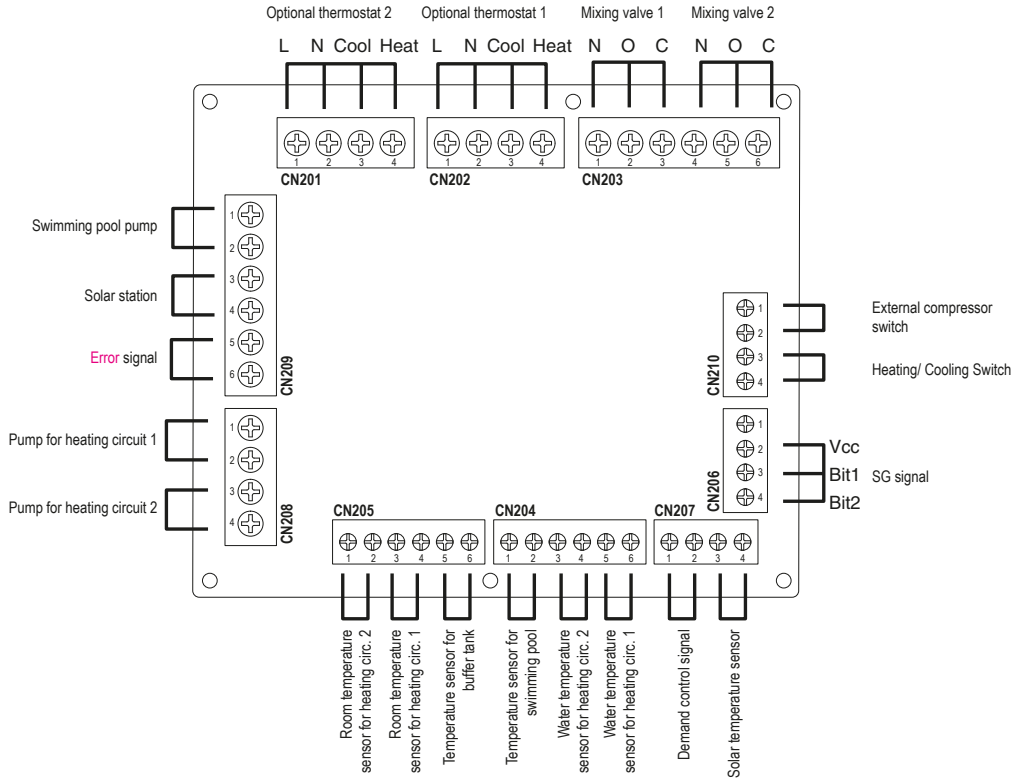
6.8.2.3 Brief Overview of the external interfaces

All in One unit, hydrokit and mono-bloc systems J or H Generation

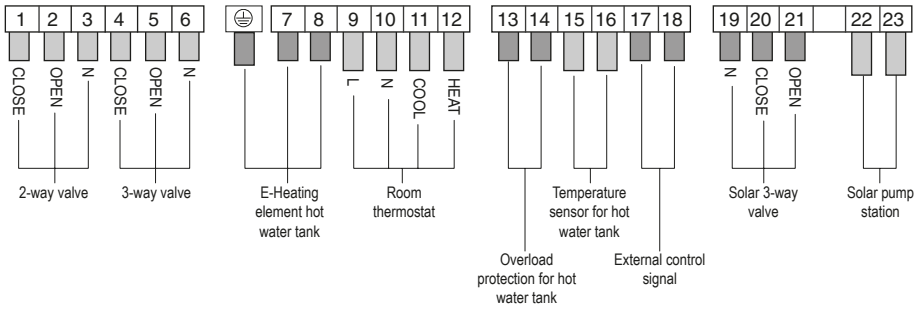
Main PCB



Optional PCB CZ-NS4P



Hydrokit and mono-bloc systems F Generation



Note

For further information about connecting the optional on-site accessories, please refer to the following sections: → *4.7.2 External interfaces (inputs/outputs), p. 65* and → *4.8.5 Recommended on-site accessories, p. 90*.

6.8.3 Installing and connecting the remote controller

Note

This section describes installation and connection of the remote controller only for models of the J and H Generation

Detailed installation instructions for the F and G generation models are given in the planning manual for bi-bloc systems or mono-bloc systems from 2014 as well as in the installation instructions and in the service manual of the respective device.

6

CAUTION

Danger of electrical shock due to unprofessional installation

Unprofessional installation of the remote controller can result in electrical shock or fire.

- ► Respect the connecting conditions for the remote controller (→ *4.7.2.1 External interfaces (J and H generation), p. 66*). Take special care to connect the remote controller not to the terminals for the power supply, but to the correct terminals.
- ► Do not install the cable of the remote controller in the direct vicinity of coolant or condensate pipes.

ATTENTION

Danger of damage or malfunctions due to unprofessional installation

Unprofessional installation of the remote controller can result in damage to or malfunctions in the control signals.

- ► Install the remote controller at a site where no sunshine and condensation humidity can occur because the remote controller is not proofed against vapour or water.
- ► Mount the remote controller on as a flat a site as possible, to avoid any bending and damage to the display.

IMPORTANT

Also follow the following notices to avoid faults and malfunctions of the remote controller:

- Install the cable of the remote controller separately from the cables for the power supply in order to avoid operating disruptions.
- Mount the remote controller at a distance of at least 1 m from television, radio and computer devices in order to avoid electrical interference.
- Mount the remote controller vertically on the wall at a height of 1.0 to 1.5 m above the floor in a position at which the average indoor temperature can be measured.
- To rule out faulty measurements of the indoor temperature, avoid installation locations with direct sunlight or air draughts, places where the air stream can be diverted or which are near to a heat source.
- Select an installation location at which the displays can be easily read.

In bi-bloc systems of the J or H Generation, the remote controller is integrated in the indoor unit (hydrokit or All in One unit) and is hard-wired. It can, however, be dismounted and mounted separately at any desired location, e.g. even on the wall of a different room than the installation room of the indoor unit, to serve as a room thermostat.

In mono-bloc systems of the J or H Generation, the remote controller is supplied separately for on-site installation on the wall.

The cable and assembly material must be field-supplied.

Carry out the following steps to mount the remote controller on the wall and to connect it:

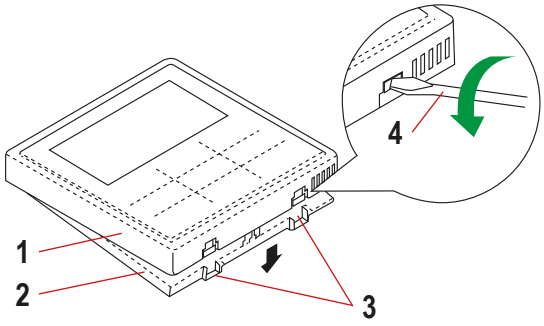
1. For mono-bloc systems: Skip this step and begin wall mounting with step 2.
   For bi-bloc systems: First, demount the remote controller from the indoor unit as follows:

a. Open the cabinet of the remote controller (Fig. **A**), by positioning a slot screw driver (**4**) or a similar tool in the slots (**3**) at the bottom edge and then pry the cabinet top part (**1**) away from the cabinet bottom part (**2**), exercising caution. Take care not to damage the cabinet.

b. Disconnect the electrical wiring of the remote controller (**5**) from the terminals of the indoor unit (**8**) and the remote controller (**9**) (Fig. **B** + **C**).

c. Loosen the three screws (**6**) from the cover of the connection box to remove the bottom part of the remote controller (Fig. **B**).

A



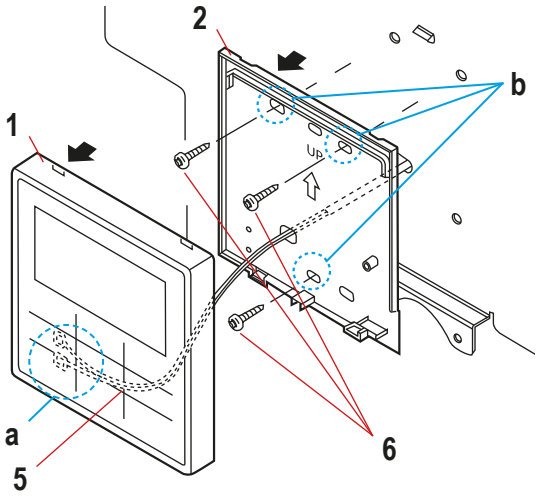
A+B Dismounting the remote controller

1 Cabinet top part
2 Cabinet bottom part
3 Slots
4 Screw driver
5 Electrical wiring of the remote controller (no polarity)
6 Screw

C Schematic detailed representation of the terminals on the indoor unit and remote controller

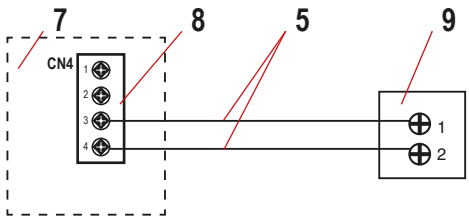
5 Electrical wiring of the remote controller
7 Indoor unit
8 Terminals on indoor unit for the electrical wiring of the remote controller
9 Terminals on the remote controller

B



a Disconnecting the electrical wiring
b Loosening screws

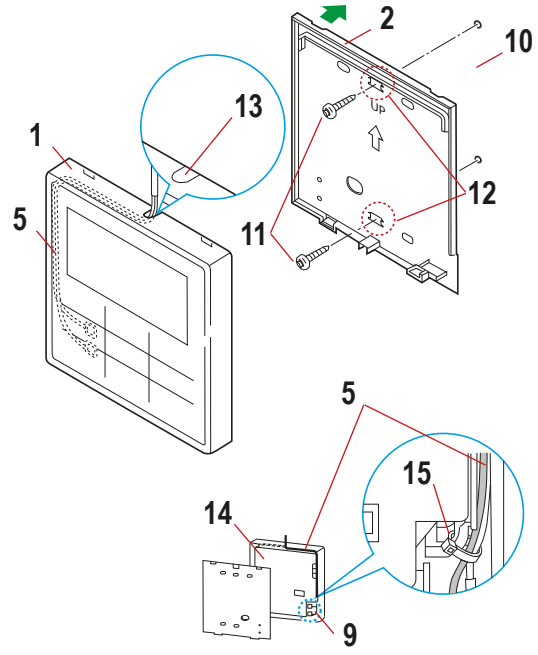
C



6

2. Install a cable (to be field-supplied) that is permissible as electrical wiring of the remote controller (→ *4.7.2.1 External interfaces (J and H generation), p. 66*) from the terminals of the indoor unit to the installation location of the remote controller.
3. Mount the cabinet bottom part (**2**) on the wall (**10**) (Fig. **D**), by screwing two self-tapping screws (**11**) (to be field-supplied) into the wall through the two central openings (**12**) of the cabinet bottom part. See that the bottom part is seated firmly.
4. Using pincer pliers, open the cable gland (**13**) at the top edge of the cabinet top part. Deburr the edges of the cable gland so that the electrical wiring is not damaged.
5. Guide the electrical wiring of the remote controller (**5**) through the cable gland into the remote controller and on the inside of the top part (**14**) along the edge up to the terminals of the remote controller. Fasten the cable using cable binders (**15**).
6. Strip the insulation having a length of 6 mm from the wire end and ensure that the connections of the electrical wiring point in the right direction.
7. Connect the electrical wiring of the remote controller to the terminals of the remote controller (**9**) and the indoor unit (**7**) (Fig. **E**).

D



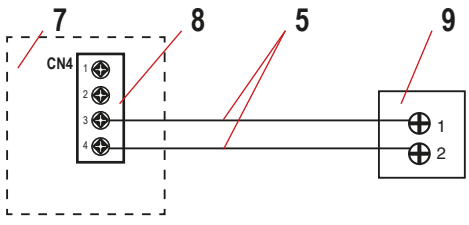
D **Dismounting the remote controller**

1 Cabinet top part
2 Cabinet bottom part
5 Electrical wiring of the remote controller (no polarity, to be field-supplied)
10 Wall
11 Self tapping screws (field-supplied)
12 Opening
13 Cable gland
14 Inside of the cabinet top part
15 Cable binder

E **Schematic detailed representation of the terminals on the indoor unit and remote controller**

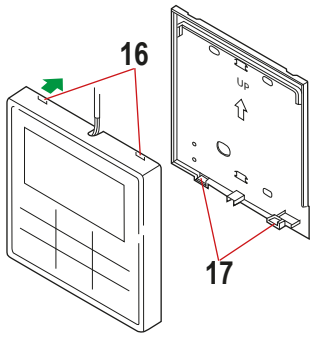
5 Electrical wiring of the remote controller
7 Indoor unit
8 Terminals on indoor unit for the electrical wiring of the remote controller
9 Terminals on the remote controller

E



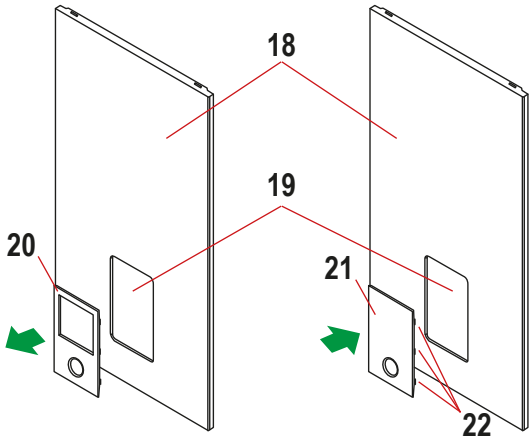
8. Mount the cabinet top part back on the cabinet bottom part by first placing the top part with the two upper claws (**16**) on the bottom part and then pressing the bottom edge of the top part carefully against the bottom part, until the two bottom claws (**17**) latch.
9. For mono-bloc systems: Wall mounting is now concluded.
   For bi-bloc system: Replace the cover of the detached remote controller (**20**) in the front panel (**18**) of the indoor unit by the cover for the remote controller opening (**21**), supplied within the scope of delivery, to seal the opening (**19**). Exercise caution as you press the cover, until the six latching hooks (**22**) engage on the front panel.

F



F	Mounting top/ bottom part
16	Top claws
17	Bottom claws

G



G	Front panel indoor unit
18	Front panel of the indoor unit
19	Remote controller opening
20	Removing the cover of the dismounted remote controller
21	Inserting the cover for the remote controller opening
22	Latching hooks (total 6)

6.9 Starting up the system

Commissioning of the system covers the evacuation of the refrigerant circuit (only for bi-bloc systems), filling the water system, the concluding inspection of the system installation, test run as well as system handover and instruction of the customer.

6.9.1 Evacuating the refrigerant circuit and carrying out a pressure test

Note

In the case of mono-bloc systems, you can skip this section. Continue with section → *6.9.2.2 Filling the heating or cooling circuit, p. 191*.

CAUTION

Danger of injury due to unprofessional handling of refrigerants

Unprofessional handling of refrigerants leads to various dangers of injury such as freezing, fire and the danger of explosions and the danger of intoxination.

- ► Working with the refrigerant must be done by a trained skilled person or an authorised dealer with refrigerant certification.
- ► Observe all the Safety Notes in force for the respective refrigerant (R32, R410A or R407C).

ATTENTION

Danger of the devices being damaged by incorrect refrigerant

The use of other refrigerants or multi-component refrigerants than those indicated in this manual or the respective operating instructions can lead to damage to devices and safety risks.

- ► Only use R32 refrigerant for Aquarea High Performance and T-CAP series models of the J Generation, only use R410A refrigerant for the Aquarea High Performance and T-CAP series models of the H Generation and only use R407C refrigerant for the Aquarea HT series models of the F and G Generation.
- ► Do not mix the prescribed refrigerant with refrigerants of another type or replace it with a refrigerant of another type.

Danger of faults in the refrigerant circuit due to humidity and foreign gases

To avoid faults in the refrigerant circuit due to penetrating humidity or foreign gases, evacuation of the system before commissioning is mandatory.

- ► The system must be evacuated before commissioning and a pressure test be conducted.
- ► If the length of the refrigerant pipes is greater than the pre-filled pipe length of the device (→ *4.6.2.3 Technical Data (bi-bloc systems), S. 40*, → *4.6.3.3 Technical Data (mono-bloc systems), p. 55*), the indicated quantity of additional refrigerant must be added.

Endangerment of the environment due to leaking refrigerant

To keep the endangerment of the environment to a minimum, no refrigerant must be emitted to the environment when working on the refrigerant circuit.

- ► While working on the refrigerant circuit, take suitable measures to ensure that no refrigerant is emitted to the environment.
- ► Remove the refrigerant present in the system by means of a suction station and dispose of it professionally according to the provisions in force.

Carry out the following steps to evacuate the system:

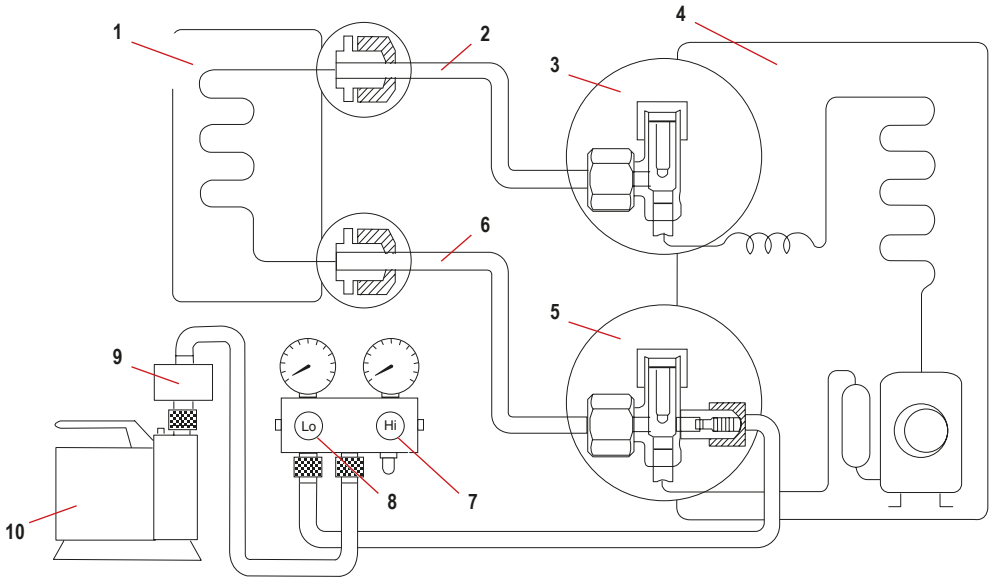
1. Connect the filling hose to the low pressure side of the manometer station and to the service port of the 3-way valve, as shown in the illustration (see below). See that the end of the filling hose with the pin is connected to the service port.
2. Connect the central hose of the manometer station to a vacuum pump with a non-return valve or to a vacuum pump with adapter.
3. Switch on the vacuum pump until the pressure has dropped to a measured value of -1 bar. Evacuate the system for about 30 minutes.

4. Close the valve on the low pressure side of the manometer station and switch off the vacuum pump.
5. Recheck whether the measured value remains constant at -1 bar for 10 minutes.

   Yes: In this case you can assume that the refrigerant circuit is tight and go directly to step 7.

   No: In this case, there is presumably still a leakage in the refrigerant circuit. Remove the leakage by performing step 6.
6. If the manometer display does not remain constant at -1 bar, first tighten the connections. Then evacuate the system again as described above. If the measured value of -1 bar is still not maintained, search and repair the leaking places and then again perform step 5, until the refrigerant circuit is definitely tight.
7. If the manometer display shows -1 bar for 10 minutes, loosen the hose from the vacuum pump and the service port of the 3-way valve.
8. Tighten the valve cap on the service port of the 3-way valve by means of a torque wrench with a torque of 18 Nm.
9. Remove the valve caps on the valve spindles of the 2-way and 3-way valves.
10. Open both the valves completely by using a hexagonal spanner (SW 4) so that the refrigerant streams into the system. Check that the refrigerant quantity is sufficient, otherwise top up with the required refrigerant quantity (→ *4.6.2.3 Technical Data (bi-bloc systems), p. 40*, → *4.6.3.3 Technical Data (mono-bloc systems), p. 55*).
11. Screw the valve caps back onto the valve spindles of the 2-way and 3-way valves.
12. Examine the connections for leakage.

Schematic representation of system evacuation



1 Hydrokit
2 Refrigerant liquid pipe
3 2-way valve, closed
4 Outdoor unit
5 3-way valve, closed
6 Refrigerant discharge pipe
7 Manometer low-pressure side: CLOSED
8 Manometer high-pressure side: OPEN
9 Adapter of the vacuum pump
10 Vacuum pump

6.9.2 Filling and venting the water system

6.9.2.1 Filling hot water tank

Note

The following method describes exclusively how the Panasonic All in One units are filled.

When commissioning bi-bloc systems with hydrokit or mono-bloc systems, which are used in combination with hot water tanks from third party suppliers, follow the installation instructions of the third party supplier, which is supplied with the tank, when filling the hot water tank . In such a case, continue with section → *6.9.2.2 Filling the heating or cooling circuit, p. 191*.

When commissioning bi-bloc systems with hydrokit and mono-bloc systems which are used without hot water tanks, you can skip this section. In this case, too, continue with section → *6.9.2.2 Filling the heating or cooling circuit, p. 191*.

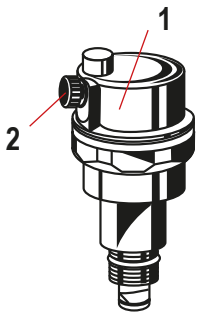
Perform the following steps to fill the hot water tank of the All in One unit:

1. Set the drain valve on the discharge tap of the hot water tank (→ *4.6.2.1 Components (bi-bloc systems), p. 29*) to the closed position.
2. Open all hot water taps in the heating system (water and shower taps)
3. Fill the hot water tank through the fresh water inlet (→ *4.6.2.1 Components (bi-bloc systems), p. 29*). After 20 to 40 minutes, water should come out of the hot water taps. If this does not happen, please contact your Panasonic dealer.
4. Check whether there are any leakages in the pipe connections, and repair them if necessary.

6.9.2.2 Filling the heating or cooling circuit

Perform the following steps to fill and vent the heating or cooling circuit:

1. Open the air purge valve (1), by turning the valve cap (2) of the air purge valve one full turn in an anti-clockwise direction (→ *4.6.2.1 Components (bi-bloc systems), p. 29*, → *4.6.3.1 Components (mono-bloc systems), p. 52*).



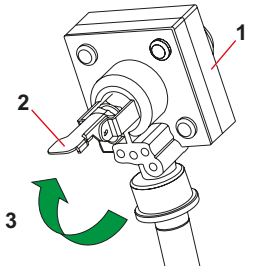
1 Air purge valve
2 Valve cap

2. Turn up all thermostat valves of the heating system and possibly all other stop valves.
3. Connect a filling hose, which has been vacuumed as far as possible, to the water return of the system (→ *4.6.2.1 Components (bi-bloc systems), p. 29*, → *4.6.3.1 Components (mono-bloc systems), p. 52*).
4. Fill water until the manometer shows that the set pressure has been reached.

5. Vent the system as follows:

a. Open the indoor and outdoor unit or the mono-bloc unit (→ *6.5 Opening devices, p. 155*).

b. Set the lever (2) of the pressure relief valve (1), located in the indoor unit or mono-bloc unit (→ *4.6.2.1 Components (bi-bloc systems), p. 29*, → *4.6.3.1 Components (mono-bloc systems), p. 52*) to the horizontal position (**3** – open). The enclosed air can now escape audibly (hissing sounds).



1 Pressure relief valve
2 Lever
3 Setting horizontal in the opening position

c. After a few seconds, set the lever of the pressure relief valve back to the home position (closed).

d. Repeat the sequence until there are no audible sounds of escaping air.

e. Check the system pressure on the manometer. In normal operation, the system pressure should be between 0.5 and 3 bar. Adjust the set pressure if necessary.

6. Then again check the pressure and top up the fluid if necessary.

7. Check whether there are any leakages in the pipe connections, and repair them if necessary.

6.9.3 Checking the system

WARNING

Danger to life from electric shock!

The devices are operated with 230 V or 400 V alternating current. Improper installation can present a danger to life from electric shock as well as a danger of fire occurring due to overheating.

► Ensure that you have disconnected the electricity supply before you carry out installation work. Secure the electricity supply against being switched on again unintentionally.

Note

Instructions for operating the devices using the remote controller are given in the operating instructions of the respective devices.

Carry out the following steps to check the completely installed system, with the power supply switched off:

1. Check if the refrigerant circuit is tight in the indoor and outdoor unit or in the mono-bloc unit. Deficiencies and leakages must be repaired.
2. Check whether all electrical cable installations have been carried out correctly and all connections are firm. Deficiencies, if any, must be repaired.
3. Check whether all pipes have been properly installed and are tight and whether the water system is properly filled with water and vented. Deficiencies and leakages must be repaired.
4. Check the water pressure in the system by means of the integrated manometer (→ *7.1 Checking the water pressure, p. 195*).
5. Check the functioning of the pressure relief valve (→ *7.2 Checking the pressure relief valve, p. 196*).
6. Check the initial pressure of the expansion vessel.

   Observe the specifications for the dimensioning of the expansion vessel (→ *5.3.5 Expansion vessel, p. 113*) and of the total water volume (→ *5.3.1 Hydraulic integration, p. 112*).
7. Check the functioning of the RCCB (→ *7.5 Checking the RCCB, p. 197*).
8. Once you have concluded all checks with positive results, perform a test run to ensure that no malfunctioning will occur after commissioning.

6.9.4 Carrying out a test run

Note

Instructions for operating the devices using the remote controller are given in the operating instructions of the respective devices.

Carry out the following steps to perform a test run of the system:

1. Switch on the power supply.
2. Switch on the residual current circuit breaker (RCCB) of the indoor unit or mono-bloc unit and use the remote controller to switch on the heat pump (to do so, follow the instructions given in the operating instructions of the respective device).
3. Check the water pressure again.

   Under normal operating conditions, the measured value of the manometer should be between 0.5 and 3 bar (0.05 and 0.3 MPa).

   If necessary, adjust the rotational speed level of the circulation pump such that the water pressure is in the normal operating range (to do so, follow the instructions given in the operating instructions of the respective device).

   If the pressure does not reach the normal operating range by setting the rotation speed level, please contact your Panasonic dealer.
4. Check whether the water flow rate lies within the model-specific limits (→ *4.6.2.3 Technical Data (bi-bloc systems), p. 40*, → *4.6.3.3 Technical Data (mono-bloc systems), p. 55*, → *5.3 Hydraulics, p. 112*).

   If necessary, adjust the water flow rate and/or the maximum rotational speed of the circulation pump with the pump control (to do so, follow the instructions given in the operating instructions of the respective device).
5. Reset the overload protection if necessary (→ *7.7 Resetting the thermostatic overload protection, p. 198*):
6. Switch off the heat pump again to terminate the test run.
7. Clean the strainer immediately thereafter (→ *7.4 Cleaning the strainers, p. 196*).
8. Once you have concluded the test run with positive results, you can program the device for the desired operation on the basis of the operating instructions of the respective device.
9. Thereafter, perform the handover of the system to the customer and his instruction in the operation of the device.

6.9.5 Carrying out the system handover and instruction

Carry out the following steps for system handover and instruction:

1. Fill in the commissioning report. Make sure again that all installation and commissioning work has been carried out fully and correctly.
2. Hand over to the customer all documents and instruct him to keep the documents safe. Explain to him the operation based on the operating instructions of the respective device and sign the instructions report and acceptance certification jointly with the customer.

7 Maintenance

In order to ensure optimal performance of the devices, inspections need to be conducted at regular intervals by an authorised specialist installer of the devices, the functioning of the RCCB, the electrical wiring and the piping. This maintenance work should be conducted by authorised Customer Services staff. Please contact your Panasonic dealer for maintenance inspections to be carried out.

The following types of maintenance work should be carried out annually:

- Checking the water pressure
- Checking the pressure relief valve
- Conducting visual checks on the PCBs and terminals
- Cleaning the strainers
- Checking the RCCB
- Checking the air purge valve and venting the system

WARNING

Danger to life from electric shock!

The devices are operated with 230 V or 400 V alternating current. Touching the live electrical cables can be life-threatening.

► Service and maintenance work must only be carried out by an accredited electrician or an authorised dealer.

► Before commencing any maintenance work, ensure that the electricity supply is switched off and is secured against being turned on by mistake.

► Before opening the device, make sure that the entire system is disconnected from the electric supply. Especially in case of outdoor units of bi-bloc systems, see that the electric supply of the hydrokit or All in One unit, the tank and the electrical heater is disconnected.

7.1 Checking the water pressure

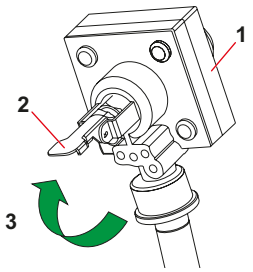
Carry out the following steps:

1. Check the system pressure on the manometer (→ *4.6.2.1 Components (bi-bloc systems), p. 29*, → *4.6.3.1 Components (mono-bloc systems), p. 52*).
   The water pressure should not fall below 0.5 bar (0.05 MPa). Under normal operating conditions, the water pressure should be between 0.5 and 3.0 bar (0.05 and 0.3 MPa).
2. If the system pressure is below the target pressure, top up the fluid (→ *6.9.2 Filling and venting the water system, p. 191*).

7.2 Checking the pressure relief valve

Carry out the following steps:

1. Set the lever (2) of the pressure relief valve (1) located in the indoor unit or mono-bloc unit (→ *4.6.2.1 Components (bi-bloc systems), p. 29*, → *4.6.3.1 Components (mono-bloc systems), p. 52*) to the horizontal position (**3** – open).



1 Pressure relief valve
2 Lever
3 Setting horizontal in the opening position

   Air or fluids should now be heard escaping. If this is not the case, contact an authorised dealer.
2. After a few seconds, set the lever of the pressure relief valve back to the home position (closed).

7.3 Conducting visual checks on the PCBs and terminals

Carry out the following steps:

1. Carry out a visual inspection of the PCBs and terminals for loose connections, damaged cable insulation etc.
2. Repair any deficiencies and defects.

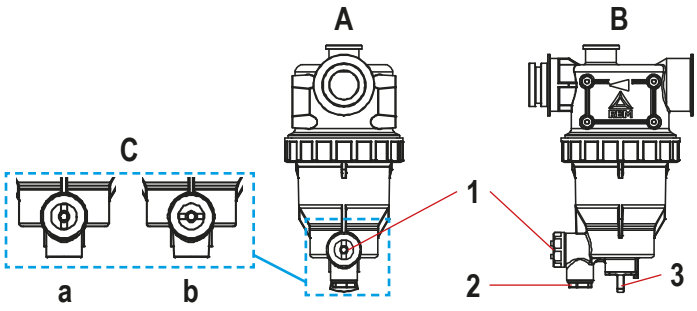
7.4 Cleaning the strainers

Carry out the following steps for a regular strainer:

1. If mounted, close the shut-off valve before and after the strainer.
2. Open the strainer using a spanner. Remove the inserted straining element and ensure that the meshes of the straining element are not damaged.
3. Rinse out the straining element with tap water. Remove any stubborn dirt using a soft brush.
4. Replace the straining element in the strainer and close the strainer using the spanner.
5. Open the shut-off valve again.

Carry out the following steps for a magnetic water filter set, which is included in the All in One unit in Compact configuration of the J and H generation (WH-ADC0309J3E5C, WH-ADC1216H6E5C):

1. Turn the power supply off.
2. Place a container below magnetic water filter set.
3. Turn the magnet bar at bottom of the magnetic water filter set to remove it.
4. Use an Allen key (8 mm), to remove the cap of discharge port.
5. Use Allen key (4 mm), to open the service valve and to release the dirty water from the discharge port into a container. Close the service valve when the container is full to avoid spillage in the tank unit. Dispose the dirty water.
6. Reinstall the cap of discharge port and magnet bar.
7. Re-charge the space heating / cooling circuit with water if necessary.
8. Turn the power supply on.



Magnetic water filter set

A Front view
B Right side view
1 Service valve
2 Discharge port
3 Magnetic bar

C Detail view of service valve
a Service valve open
b Service valve closed

7.5 Checking the residual current circuit breaker (RCCB)

WARNING

Danger to life from electric shock!

Life-threatening voltage levels are present in the device.

► Take care not to touch any live device parts. Only touch the buttons of the residual current circuit breaker (RCCB).

Carry out the following steps:

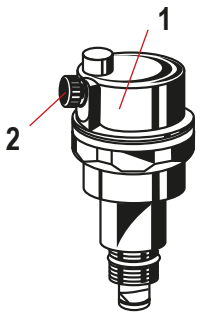
1. Set the RCCB to ON.
2. Switch the electricity supply of the indoor unit or mono-bloc unit on.
3. Press the TEST button on the RCCB.

   If the RCCB is in perfect working order, the lever must be pointing downwards to the OFF (green) position. If this is not the case, contact an authorised dealer.
4. Interrupt the electricity supply of the indoor unit or mono-bloc unit again.
5. Set the lever of the RCCB to ON again.
6. Switch the electricity supply of the indoor unit or mono-bloc unit off again.

7.6 Checking the air purge valve and venting the system

Carry out the following steps:

1. Open the air purge valve (1) by turning the valve cap (2) of the air purge valve one full turn in an anti-clockwise direction (→ *4.6.2.1 Components (bi-bloc systems), p. 29*, → *4.6.3.1 Components (mono-bloc systems), p. 52*).



1 Air purge valve
2 Valve cap

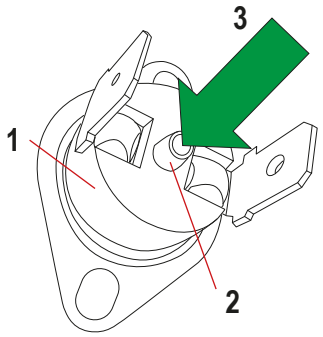
   Air should now be heard escaping.
2. Repeat the sequence until there are no audible sounds of escaping air.
3. Close the air purge valve again by turning in a clockwise direction.

7.7 Resetting the thermostatic overload protection

The overload protection (→ *4.6.2.1 Components (bi-bloc systems), p. 29*, → *4.6.3.1 Components (mono-bloc systems), p. 52*) protects the system against overheating the water.

If the thermostatic overload protection is triggered due to the water temperature being too high, carry out the following steps in order to reset it:

1. Remove the overload protection cover.
2. Using a test pin, lightly press the button (**2**) in the centre in order to reset the thermostatic overload protection.



1 Overload protection
2 Button
3 Pressing

3. Resecure the cover again afterwards.

7.8 Carrying out maintenance work on the refrigerant circuit

CAUTION

Danger of injury due to unprofessional handling of refrigerants

Unprofessional handling of refrigerants leads to various dangers of injury such as freezing, fire and the danger of explosions and the danger of intoxination.

- ► Working with the refrigerant must be done by a trained skilled person or an authorised dealer with refrigerant certification.
- ► Observe all the Safety Notes in force for the respective refrigerant (R32, R410A or R407C).
- ► Before commencing work on the refrigerant circuit, the refrigerant must always be pumped down first.

Note

Instructions for switching on the pump-down operation as well as for operating the devices can be found in the operating instructions for the respective device.

Carry out the following steps:

1. Switch the device to pump-down operating mode on the remote controller. To do so, follow the instructions given in the operating instructions of the respective device.
2. Operate the system in pump-down mode for 10 to 15 minutes (or for 1 to 2 minutes, if the ambient temperature is below 10 °C), in order to pump the refrigerant out of the pipes.
3. Close the 2-way valve fully after the time stated.
4. Close the 3-way valve fully after a further 3 minutes.
5. Stop the pump-down mode on the remote controller. To do so, follow the instructions given in the operating instructions of the respective device.
6. Carry out the required maintenance work on the refrigerant pipes. When doing this, adhere to the Safety Notes and instructions regarding connecting the refrigerant circuit (→ *6.6 Connecting the refrigeration circuit, p. 158*).
7. Start the system up again after the work has been completed (→ *6.9 Starting up the system, p. 188*). When doing this, pay particular attention to the Safety Notes and instructions regarding evacuating the refrigerant circuit (→ *6.9.1 Evacuating the refrigerant circuit and pressure test, p. 188*).

8 Appendix

8.1 Extract from the operating instructions (J Generation)

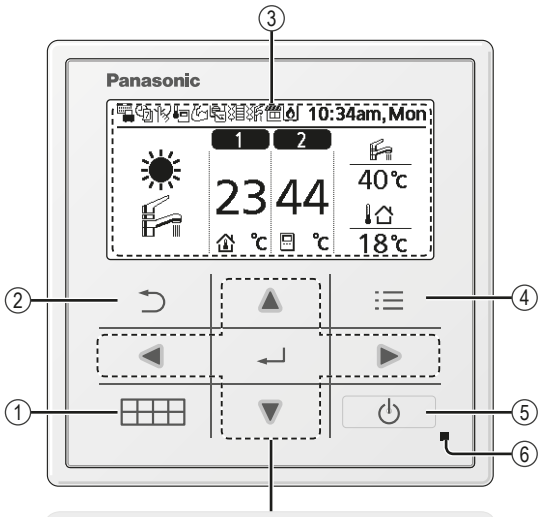
IMPORTANT

As it is not possible to cover the operating instructions for all models within the scope of this manual, only the operation instructions for bi-bloc systems with All in One unit of the J generation are given as an extract from the manual on the following pages to serve as an example.

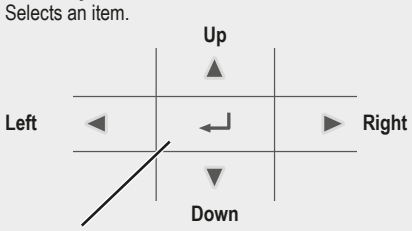
However, not all functions stated here will be available for all models. Therefore, in order to be sure about the valid functions of each model, it is absolutely mandatory to refer to the operating instructions or service manual for the relevant model when operating the device.

Remote Controller buttons and display

Buttons / Indicator	
①	**Quick Menu button** (For more details, refer to the separate Quick Menu Guide.)
②	**Back button** Returns to the previous screen
③	**LCD Display**
④	**Main Menu button** For function setup
⑤	**ON/OFF button** Starts/Stops operation
⑥	**Operation indicator** Illuminates during operation, blinks during alarm.

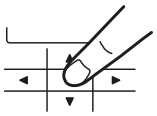


Cross key buttons
Selects an item.

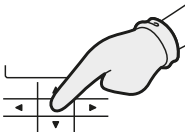


Enter button
Fixes the selected content.

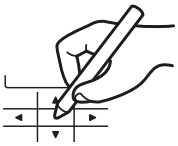
Press centre



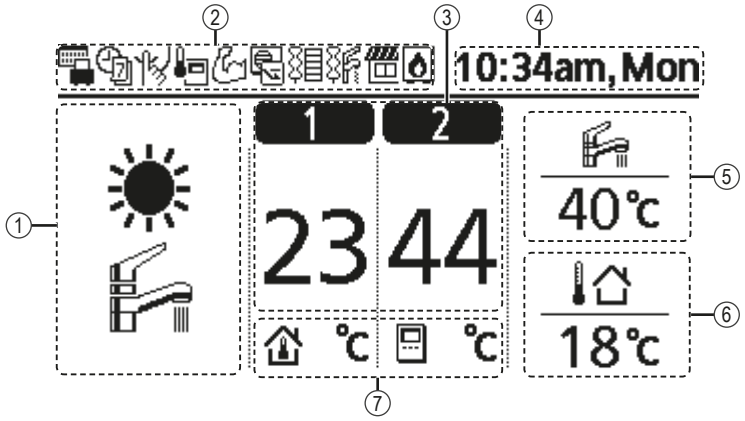
No glove



No pen

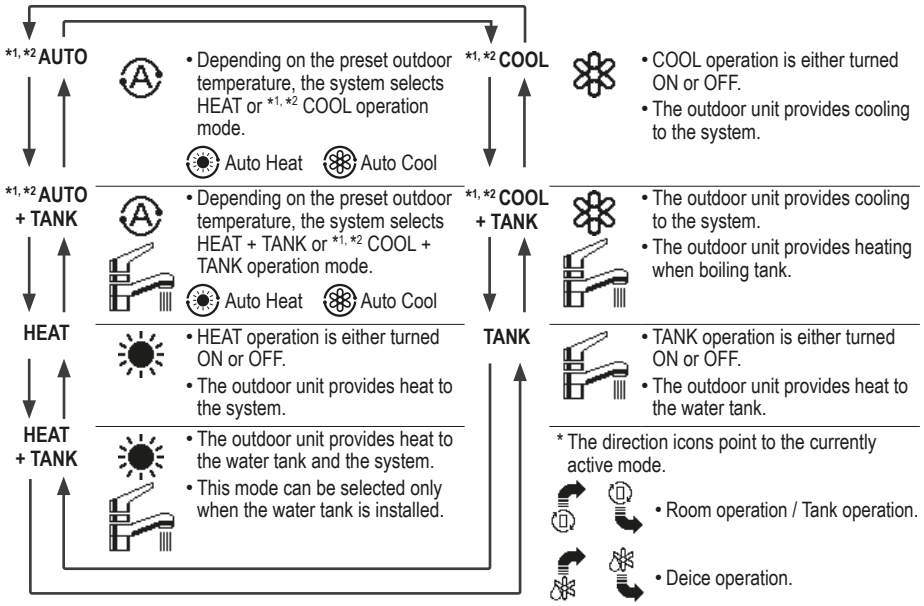


Remote Controller buttons and display



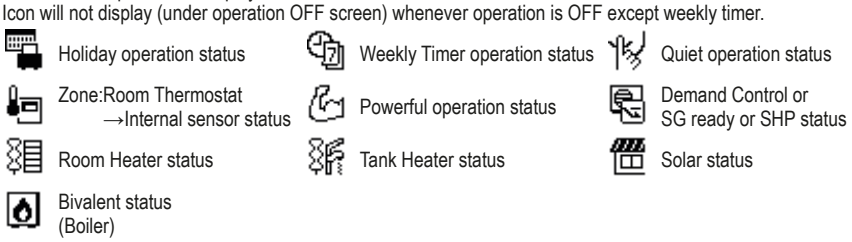
Display

① **Mode selection**



② **Operation icons**

The status of operation is displayed.
Icon will not display (under operation OFF screen) whenever operation is OFF except weekly timer.



*1 The system is locked to operate without COOL mode. It can be unlocked only by authorised installers or our authorised service partners.
*2 Only displayed when COOL mode is unlocked (This means when COOL mode is available).

8

③	**Temperature of each zone**
④	**Time and day**
⑤	**Water Tank temperature**
⑥	**Outdoor temperature**
⑦	**Sensor type/Set temperature type icons** Water Temperature →Compensation curve Water Temperature →Direct Pool only Room Thermostat →External Room Thermostat →Internal Room Thermistor

Initialization

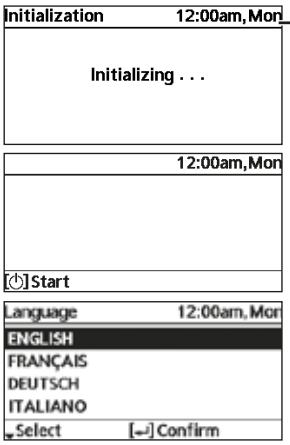
Before starting to install the various menu settings, please initiate the Remote Controller by selecting the language of operation and installing the date and time correctly.
When power is turned on for the first time, it becomes the setting screen automatically. It can also be set from personal setting of the menu.

Selecting the language

Wait while the display is initializing.
When initializing screen ends, it turns to normal screen.
When any button is pressed, language setting screen appears.

① **Scroll with ▼ and ▲ to select the language.**

② **Press ↵ to confirm the selection.**



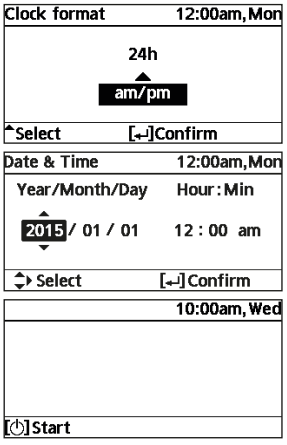
Setting the clock

① **Select with ▼ or ▲ how to display the time, either 24h or am/pm format (for example, 15:00 or 3:00 pm).**

② **Press ↵ to confirm the selection.**

③ **Use ▼ and ▲ to select year, month, day, hour and minutes. (Select and move with ▶ and press ↵ to confirm.)**

④ **Once the time is set, time and day will appear on the display even if the Remote Controller is turned OFF.**

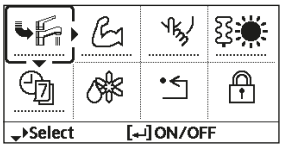


8

Quick Menu

After the initial settings have been completed, you can select a quick menu from the following options and edit the setting.

① **Press ▦ to display the quick menu.**



Force DHW | Powerful | Quiet | Force Heater

Weekly Timer | Force Defrost | Error Reset | R/C Lock

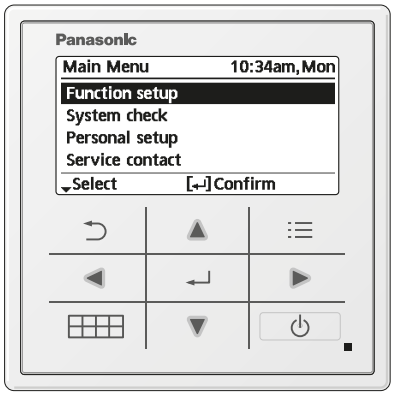
② **Use ▲ ▼ ◀ ▶ to select menu.**

③ **Press ↵ to turn on/off the select menu.**

Menus For user

Select menus and determine settings according to the system available in the household. All initial settings must be done by an authorised dealer or a specialist. It is recommended that all alterations of the initial settings are also done by an authorised dealer or a specialist.

- After initial installation, you may manually adjust the settings.
- The initial setting remains active until the user changes it.
- The Remote Controller can be used for multiple installations.
- Ensure the operation indicator is OFF before setting.
- The system may not work properly if set wrongly. Please consult an authorised dealer.



To display <Main Menu>: ☰

To select menu: ▲ ▼ ◀ ▶

To confirm the selected content: ↵

Menu	Default Setting	Setting Options / Display
1 Function setup		
1.1 > Weekly timer		
Once the weekly timer is set up, User can edit from Quick Menu. To set up to 6 patterns of operation on a daily basis. • Disabled if Heat-Cool SW is select "Yes" or if Force Heater is on.	**Timer setup** Select day of the week and set the patterns needed (Time / Operation ON/OFF / Mode)	Weekly timer 10:34am,Mon Sun Mon Tue Wed Thu Fri Sat 1. 8:00am ON 40℃ 2. 12:00pm ON 24/28℃ 40℃ 3. 1:00pm ON 12/10℃ ◂▸Day ▾Pattern [↵]Edit
	Timer copy Select day of the week	

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Menus For user

Menu	Default Setting	Setting Options / Display
1.2 > Holiday timer		
To save energy, a holiday period may be set to either turn OFF the system or lower the temperature during the period.	OFF	ON ▲ OFF
	> ON	
	Holiday start and end. Date and time	Holiday: End 10:34am, Mon Year/Month/Day Hour : Min ▲ 2015 / 01 / 07 10 : 00 am Select [↵] Confirm
	OFF or lowered temperature	
• Weekly timer setting may be temporarily disabled during Holiday timer setting but it will be restored once the Holiday timer is completed.		
1.3 > Quiet timer		
To operate quietly during the preset period. 6 patterns may be set. Level 0 means the mode is off.	Time to start Quiet : Date and time	Quiet 10:34am, Mon Pattern Time Level 1 8:00am 0 2 5:00pm 1 3 11:00pm 3 Select [↵] Edit
	Level of quietness: 0 ~ 3	
1.4 > Room heater		
To set the room heater ON or OFF.	OFF	ON ▲ OFF
1.5 > Tank heater		
To set the tank heater ON or OFF.	OFF	ON ▲ OFF
1.6 > Sterilization		
To set the auto sterilization ON or OFF.	ON	ON ▼ OFF
• Do not use the system during sterilization in order to prevent scalding with hot water, or overheating of shower. • Ask an authorised dealer to determine the level of sterilization function field settings according to the local laws and regulations.		
1.7 > DHW mode (Domestic Hot Water)		
To set the DHW mode to Standard or Smart. • Standard mode have faster DHW Tank heat up time. Meanwhile Smart mode take longer time to heat up DHW time with lower energy consumption.	Standard	Standard ▼ Smart
To set the tank sensor to Top or Center. • Selection of the tank sensor to top slow down the start of boiling up the tank and reduce power consumption. Please change this selection to “Center” when the hot water becomes insufficient.	Top	Top ▼ Center

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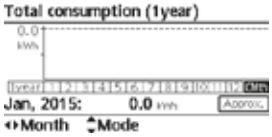
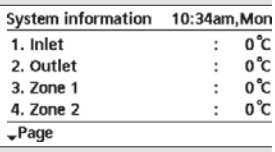
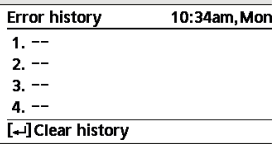
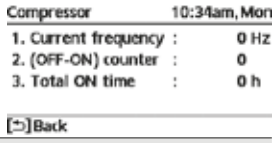
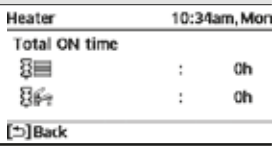
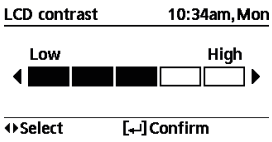
Menus For user

Menu	Default Setting	Setting Options / Display
2 System check		
2.1 > Energy monitor		
Present or historical chart of energy consumption, generation or COP. • COP= Coefficient of Performance. • For historical chart, the period is selected from 1 day/1 week/1year. • Energy consumption (kWh) of heating, *1, *2 cooling, tank and total may be retrieved. • The total power consumption is an estimated value based on AC 230 V and may differ from value measured by precise equipment.	**Present** Select and retrieve **Historical chart** Select and retrieve	
2.2 > System information		
Shows all system information in each area.	**Actual system information of 10 items: Inlet / Outlet / Zone 1 / Zone 2 / Tank / Buffer tank / Solar / Pool / COMP frequency / Pump flowrate** Select and retrieve	
2.3 > Error history • Refer to Troubleshooting for error codes. • The most recent error code is displayed at the top.	Select and retrieve	
2.4 > Compressor		
Shows the compressor performance.	Select and retrieve	
2.5 > Heater		
Total hours of ON time for Room heater/Tank heater.	Select and retrieve	
3 Personal setup		
3.1 > Touch sound		
Turns the operation sound ON/ OFF.	ON	
3.2 > LCD contrast		
Sets the screen contrast.	3	

*1 The system is locked to operate without COOL mode. It can be unlocked only by authorised installers or our authorised service partners.
*2 Only displayed when COOL mode is unlocked (This means when COOL mode is available).

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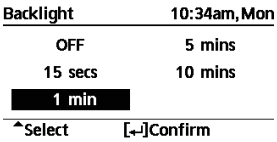
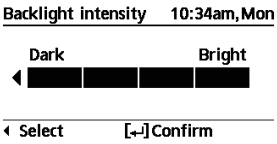
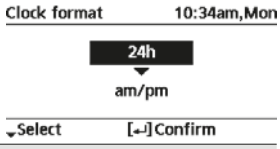
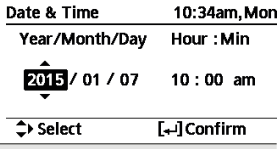
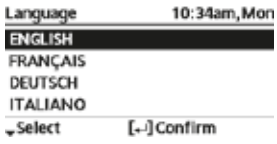
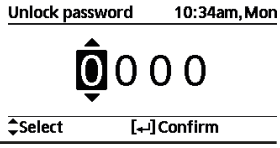
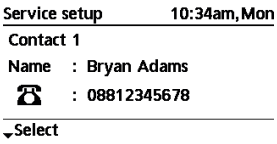
Menu	Default Setting	Setting Options / Display
3.3 > Backlight Sets the duration of screen backlight.	1 min	
3.4 > Backlight intensity Sets screen backlight brightness.	4	
3.5 > Clock format Sets the type of clock display.	24h	
3.6 > Date & Time Sets the present date and time.	Year / Month / Day / Hour / Min	
3.7 > Language Sets the display language for the top screen. • For Greek, please refer to the English version.	ENGLISH / FRANÇAIS / DEUTSCH / ITALIANO / ESPAÑOL / DANISH / SWEDISH / NORWEGIAN / POLISH / CZECH / NEDERLANDS / TÜRKÇE / SUOMI / MAGYAR / SLOVENŠČINA / HRVATSKI / LIETUVIŲ	
3.8 > Unlock password 4 digit password for all the settings.	0000	
4 Service contact		
4.1 > Contact 1 / Contact 2 Preset contact number for installer.	Select and retrieve	

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Menus For installer

Menu	Default Setting	Setting Options / Display
5 Installer setup > System setup		
5.1 > Optional PCB connectivity		
To connect to the external PCB required for servicing.	No	Yes No

• If the external PCB is connected (optional), the system will have following additional functions:

① Buffer tank connection and control over its function and temperature.
② Control over 2 zones (including the swimming pool and the function to heat water in it).
③ Solar function (the solar thermal panels connected to either the DHW (Domestic Hot Water) Tank or the Buffer Tank.
• DHW is not applicable for WH-ADC *models.
④ External compressor switch.
⑤ External error signal.
⑥ SG ready control.
⑦ Demand control.
⑧ Heat-Cool SW

5.2 > Zone & Sensor		
To select the sensors and to select either 1 zone or 2 zone system.	**Zone** • After selecting 1 or 2 zone system, proceed to the selection of room or swimming pool. • If the swimming pool is selected, the temperature must be selected for △T temperature between 0°C ~ 10 °C.	Zone & Sensor 10:34am,Mon Zone 1 Zone system 2 Zones system Select [↵]Confirm
	Sensor * For room thermostat, there is a further selection of external or internal.	Zone & Sensor 10:34am,Mon Sensor Water temperature Room thermostat Room thermistor Select [↵]Confirm
5.3 > Heater capacity		
To reduce the heater power if unnecessary.* 3 kW / 6 kW / 9kW * Options of kW vary depending on the model.		Heater capacity 10:34am,Mon 3 kW [↵]Confirm
5.4 > Anti freezing		
To activate or deactivate the water freeze prevention when the system is OFF	Yes	Yes No
5.5 > DHW capacity		
To select tank heating capacity to variable or standard. Variable capacity heat up tank with fast mode and keep the tank temperature with efficient mode. While standard capacity heat up tank with rated heating capacity.	Variable	Variable Standard

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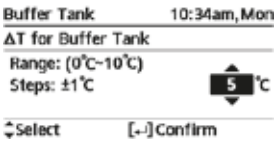
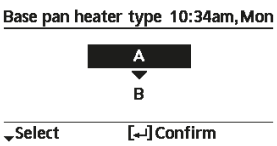
Menu	Default Setting	Setting Options / Display
5.6 > Buffer tank connection		
To connect tank to the system and if selected YES, to set △T temperature. • The optional PCB connectivity must be selected YES to enable the function. • If the optional PCB connectivity is not selected, the function will not appear on the display.	No	
	> Yes	
	5 °C	Set △T for Buffer Tank 
5.7 > Base pan heater		
To select whether or not optional base pan heater is connected. * Type A - The base pan heater activates only during deice operation. * Type B - The base pan heater activates when outdoor ambient temperature is 5 °C or lower.	No	
	> Yes	
	A	Set base pan heater type*. 
5.8 > Alternative outdoor sensor		
To select an alternative outdoor sensor.	No	
5.9 > Bivalent connection		
To select to enable or disable bivalent connection.	No	
> Yes		
To select either auto control pattern or SG ready input control pattern. * This selection only display to select when optional pcb connection set to Yes.	Auto	

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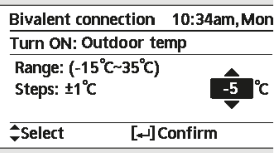
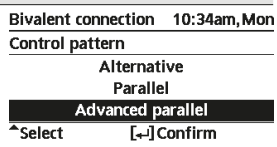
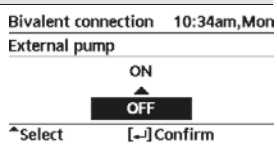
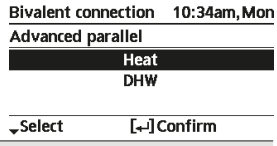
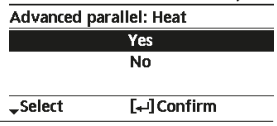
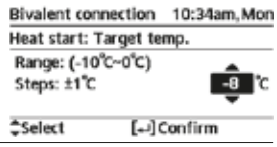
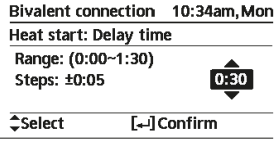
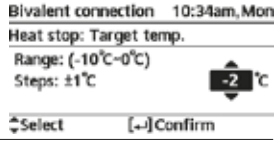
Menus For installer

Menu	Default Setting	Setting Options / Display
To select a bivalent connection to allow an additional heat source such as a boiler to heat-up the buffer tank and domestic hot water tank when heatpump capacity is insufficient at low outdoor temperature. The bivalent feature can be set-up either in alternative mode (heatpump and boiler operate alternately), or in parallel mode (both heatpump and boiler operate simultaneously), or in advance parallel mode (heatpump operates and boiler turns on for buffer-tank and/or domestic hot water depending on the control pattern setting options).	**> Yes > Auto**	
	-5 °C	Set outdoor temperature for turn ON Bivalent connection. 
Yes > After selecting the outdoor temperature		
Control pattern Alternative / Parallel / Advanced parallel • Select advanced parallel for bivalent use of the tanks.		
Control pattern > Alternative		
OFF	Option to set external pump either ON or OFF during bivalent operation. Set to ON if system is simple bivalent connection.	
Control pattern > Advanced parallel		
Heat • "Heat" implies Buffer Tank and "DHW" implies Domestic Hot Water Tank.	Selection of the tank	
Control pattern > Advanced parallel > Heat > Yes		
• Buffer Tank is activated only after selecting "Yes".		
	-8 °C	Set the temperature threshold to start the bivalent heat source. 
	0:30	Delay timer to start the bivalent heat source (in hour and minutes). 
	-2 °C	Set the temperature threshold to stop the bivalent heat source. 

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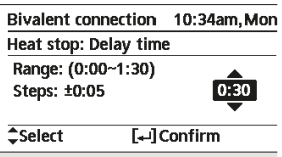
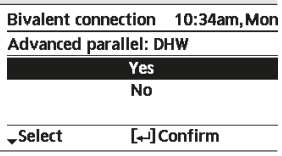
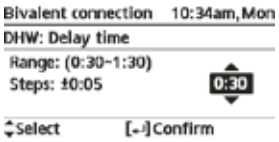
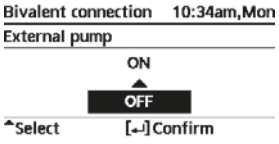
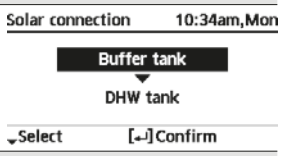
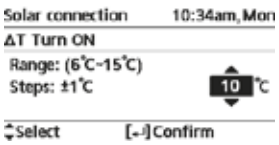
Menu	Default Setting	Setting Options / Display
	0:30	Delay timer to stop the bivalent heat source (in hour and minutes). 
	Control pattern > Advanced parallel > DHW > Yes	
	• DHW Tank is activated only after selecting "Yes".	
	0:30	Delay timer to start the bivalent heat source (in hour and minutes). 
SG ready input control for bivalent system follow below input condition. SG signal: Vcc-bit1 / Vcc-bit2; Operation pattern Open / Open: Heat Pump OFF, Boiler OFF Short / Open: Heat Pump ON, Boiler OFF Open / Short: Heat Pump OFF, Boiler ON Short / Short: Heat Pump ON, Boiler ON	**> Yes > SG ready**	
	OFF	Option to set external pump either ON or OFF during bivalent operation. Set to ON if system is simple bivalent connection. 
5.10 > External SW		
	No	
5.11 > Solar connection		
• The optional PCB connectivity must be selected YES to enable the function. • If the optional PCB connectivity is not selected, the function will not appear on the display. • DHW is not applicable for WH-ADC *models.	No	
	> Yes	
	Buffer tank	Selection of the tank 
	> Yes > After selecting the tank	
	10 °C	Set △T ON temperature 

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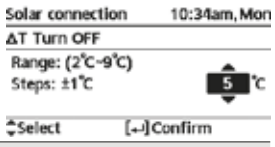
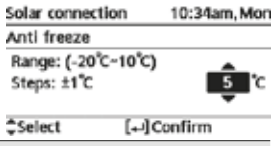
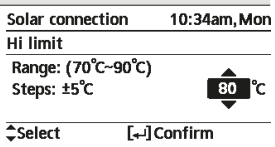
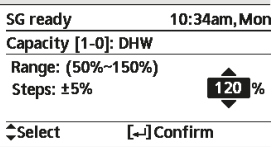
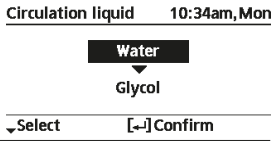
Menus For installer

Menu	Default Setting	Setting Options / Display
	> Yes > After selecting the tank > △T ON temperature	
	5 °C	Set △T OFF temperature 
	> Yes > After selecting the tank > △T ON temperature > △T OFF temperature	
	5 °C	Set Antifreeze temperature 
	> Yes > After selecting the tank > △T ON temperature > △T OFF temperature > After setting the antifreeze temperature	
	80 °C	Set Hi limit 
5.12 > External error signal		
	No	
5.13 > Demand control		
	No	
5.14 > SG ready		
	No	
	> Yes	
	120 %	Capacity (1) & (2) of DHW (in %), Heat (in %) and Cool (in °C) 
5.15 > External compressor SW		
	No	
5.16 > Circulation liquid To select whether to circulate water or glycol in the system.	Water	

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Menu	Default Setting	Setting Options / Display
5.17 > Heat-Cool SW		
	No	Yes ▲ No
5.18 > Force heater		
To turn on Force heater either manually (by default) or automatically.	Manual	Force heater 10:34am,Mon Auto ▲ Manual ▲Select [↵]Confirm
5.19 > Force defrost		
If auto selection is set, outdoor unit will start defrost operation if long heating hour operate during low outdoor temperature.	Manual	Auto ▲ Manual
5.20 > Defrost signal		
To turn on defrost signal to stop fan coil during defrost operation. (If defrost signal set to yes, bivalent function will not available to use)	No	Yes ▲ No
5.21 > Pump flowrate		
To set variable flow pump control or fix pump duty control.	△T	ΔT ▼ Max. Duty

6 Installer setup > Operation setup			
To access to the four major functions or modes.	4 main modes Heat / *1, *2 Cool / *1, *2 Auto / Tank		Operation setup 10:34am,Mon Heat Cool Auto Tank ▼Select [↵]Confirm
6.1 > Heat			
To set various water & ambient temperatures for heating.	Water temp. for heating ON / Outdoor temp. for heating OFF / △T for heating ON / Heater ON/OFF		Operation setup 10:34am,Mon Heat Water temp. for heating ON Outdoor temp. for heating OFF ΔT for heating ON ▼Select [↵]Confirm
	> Water temp. for heating ON		
	Compensation curve	Heating ON temperatures in compensation curve or direct input.	Operation setup 10:34am,Mon Heat ON: Water temp. Compensation curve Direct ▼Select [↵]Confirm

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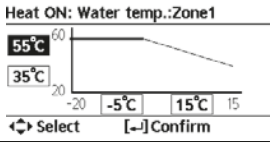
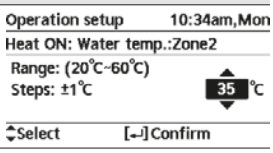
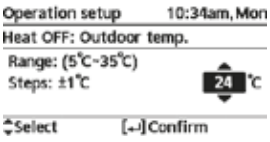
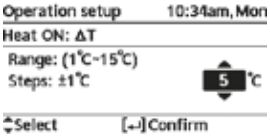
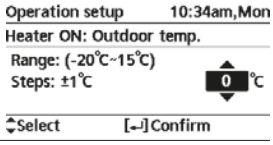
Menus For installer

Menu	Default Setting	Setting Options / Display
	> Water temp. for heating ON > Compensation curve	
	X axis: -5 °C, 15 °C Y axis: 55 °C, 35 °C	Input the 4 temperature points (2 on horizontal X axis, 2 on vertical Y axis). 
	• Temperature range: X axis: -20 °C ~ 15 °C, Y axis: See below • Temperature range for the Y axis input: 1. WH-UD model: 20 °C ~ 60 °C 2. WH-UH model & Back up heater is enabled: 25 °C ~ 65 °C 3. WH-UH model & Back up heater is disabled: 35 °C ~ 65 °C 4. WH-UX model: 20 °C ~ 60 °C • If 2 zone system is selected, the 4 temperature points must also be input for Zone 2. • "Zone 1" and "Zone 2" will not appear on the display if only 1 zone system.	
	> Water temp. for heating ON > Direct	
	35 °C	Temperature for heating ON 
	• Min. ~ Max. range is conditional as follows: 1. WH-UD model: 20 °C ~ 60 °C 2. WH-UH model & Back up heater is enabled: 25 °C ~ 65 °C 3. WH-UH model & Back up heater is disabled: 35 °C ~ 65 °C 4. WH-UX model: 20 °C ~ 60 °C • If 2 zone system is selected, temperature set point must input for Zone 2. • "Zone 1" and "Zone 2" will not appear on the display if only 1 zone system.	
	> Outdoor temp. for heating OFF	
	24 °C	Temperature for heating OFF 
	> △T for heating ON	
	5 °C	Set △T for heating ON. * This setting will not available to set when pump flowrate set to Max. duty. 
	> Heater ON/OFF	
	> Heater ON/OFF > Outdoor temp. for heater ON	
	0 °C	Temperature for heater ON 

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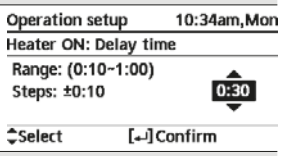
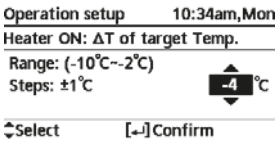
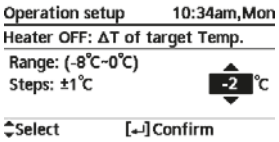
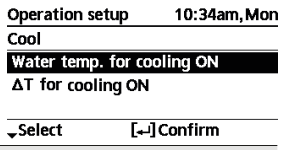
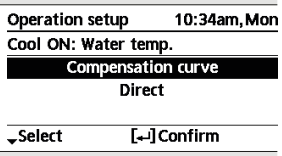
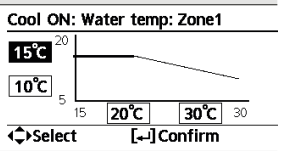
Menu	Default Setting	Setting Options / Display
	> Heater ON/OFF > Delay time for heater ON	
	0:30 min	Delay time for heater to turn on 
	> Heater ON/OFF > Water temperature for heater ON	
	-4 °C	Setting of water temperature to turn on from water set temperature. 
	> Heater ON/OFF > Water temperature for heater OFF	
	-2 °C	Setting of water temperature to turn off from water set temperature. 
6.2 > *1, *2 Cool		
To set various water & ambient temperatures for cooling.	Water temperatures for cooling ON and △T for cooling ON.	
	> Water temp. for cooling ON	
	Compensation curve	Cooling ON temperatures in compensation curve or direct input. 
	> Water temp. for cooling ON > Compensation curve	
	X axis: 20 °C, 30 °C Y axis: 15 °C, 10 °C	Input the 4 temperature points (2 on horizontal X axis, 2 on vertical Y axis) 
	• If 2 zone system is selected, the 4 temperature points must also be input for Zone 2. • "Zone 1" and "Zone 2" will not appear on the display if only 1 zone system.	

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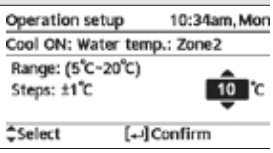
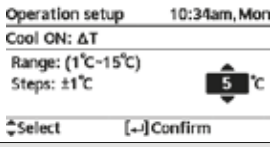
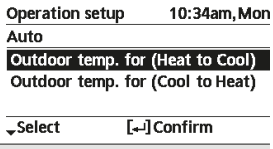
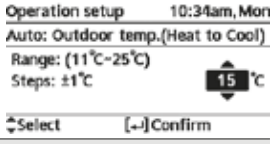
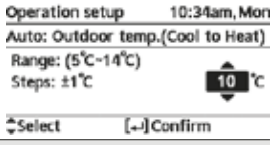
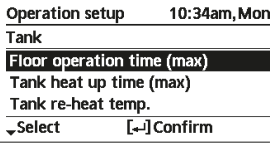
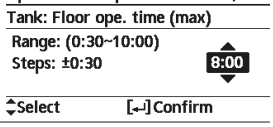
Menus For installer

Menu	Default Setting	Setting Options / Display
	> Water temp. for cooling ON > Direct	
	10 °C	Set temperature for Cooling ON 
	• If 2 zone system is selected, temperature set point must input for Zone 2. • "Zone 1" and "Zone 2" will not appear on the display if only 1 zone system.	
	> △T for cooling ON	
	5 °C	Set △T for cooling ON * This setting will not available to set when pump flowrate set to Max. duty. 
6.3	**> *1, *2 Auto**	
Automatic switch from Heat to Cool or Cool to Heat.	Outdoor temperatures for switching from Heat to Cool or Cool to Heat. Outdoor temp. for (Heat to Cool) / Outdoor temp. for (Cool to Heat)	
	> Outdoor temp. for (Heat to Cool)	
	15 °C	Set outdoor temperature for switching from Heat to Cool. 
	> Outdoor temp. for (Cool to Heat)	
	10 °C	Set outdoor temperature for switching from Cool to Heat. 
6.4	**> Tank**	
Setting functions for the tank.	Floor operation time (max) / Tank heat up time (max) / Tank re-heat temp. / Sterilization	
	• The display will show 3 functions at a time.	
	> Floor operation time (max)	
	8:00	Maximum time for floor operation (in hours and minutes) 

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Menu	Default Setting	Setting Options / Display
	› Tank heat up time (max)	
	1:00	Maximum time for heating the tank (in hours and minutes)
	› Tank re-heat temp.	
	-8 °C	Set temperature to perform reboil of tank water.
	› Sterilization	
	Monday	Sterilization may be set for 1 or more days of the week. Sun / Mon / Tue / Wed / Thu / Fri / Sat
	› Sterilization: Time	
	12:00	Time of the selected day(s) of the week to sterilize the tank 0:00 ~ 23:59
	› Sterilization: Boiling temp.	
	65 °C	Set boiling temperatures for sterilize the tank.
	› Sterilization: Ope. time (max)	
	0:10	Set sterilizing time (in hours and minutes)

7	Installer setup › Service setup		
7.1	**› Pump maximum speed**		
	To set the maximum speed of the pump.	Setting the flow rate, max. duty and operation ON/OFF of the pump. Flow rate: XX:X L/min Max. Duty: 0x40 ~ 0xFE, Pump: ON/OFF/Air Purge	Service setup 10:34am,Mon Flow rate Max. Duty Operation 0.0 L/min 0xCE Air Purge Select

Menus For installer

Menu	Default Setting	Setting Options / Display
7.2 > Pump down		
To set the pump down operation.	**Pump down operation** ON	Pump down operation in progress! [⏻]OFF
7.3 > Dry concrete		
To dry the concrete (floor, walls, etc.) during construction. Do not use this menu for any other purposes and in period other than during construction	Edit to set the temperature of dry concrete. ON / Edit	Service setup 10:34am, Mon Dry concrete ON Edit Select [↵]Confirm
	> Edit	
	Stages: 1 Temperature: 25 °C Heating temperature for drying the concrete. Select the desired stages: 1 ~ 10, range: 1 ~ 99	Service setup 10:34am, Mon Dry concrete: 1/10 Range: (25°C~55°C) Steps: ±1°C 25 °C Select [↵]Confirm
	> ON	
	Confirm the setting temperatures of dry concrete for each stage.	Service setup 10:34am, Mon Dry concrete: Status Stage : 1/10 Water set temp. : 25°C Actual water temp. :25°C/25°C [⏻]OFF
7.4 > Service contact		
To set up to 2 contact names and numbers for the User.	Service engineer's name and contact number. Contact 1 / Contact 2	Service setup 10:34am, Mon Service contact: Contact 1 Contact 2 Select [↵]Confirm
	> Contact 1 / Contact 2	
	Contact name or number. Name / phone icon	Service contact 10:34am, Mon Contact 1 Name : Bryan Adams ☎ : 08812345678 Select [↵]Edit
	Input name and number Contact name: alphabet a ~ z. Contact number: 1 ~ 9	Contact-1 ABC/abc 0-9/Other ABCDEFGHIJKLMNOPQR Space STUVWXYZ abcdefghi BS jklmnopqrstuvwxyz Conf Select [↵]Enter Number: 1 2 3 (4 5 6) 7 8 9 - BS * 0 # _ Conf Select [↵]Enter

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Cleaning instructions

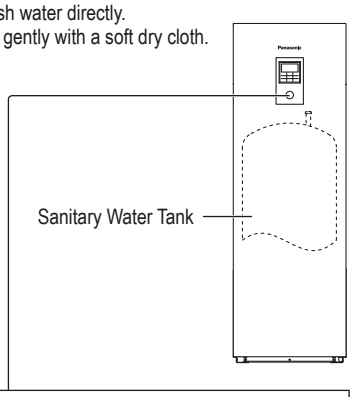
To ensure optimal performance of the system, cleaning has to be carried out at regular intervals.
Consult an authorised dealer.

- **Disconnect the power supply before cleaning.**
- Do not use benzine, thinner or scouring powder.
- Use only soap (≃ pH7) or neutral household detergent.
- Do not use water hotter than 40 °C.

Indoor unit

- Do not splash water directly.

Wipe the unit gently with a soft dry cloth.

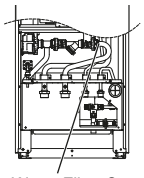


Water pressure gauge

- Do not press or hit the glass cover using hard and sharp objects. Failure to do so may cause damage to the unit.
- Ensure that the water pressure is between 0.05 and 0.3 MPa (0.1 MPa = 1 bar).
- In case the water pressure is out of the above range, consult an authorised dealer.

Water filter

- Clean the water filter at least once a year. Failure to do so may cause the filter to clog up, which may lead to system breakdown. Consult an authorised dealer.
- Please also remove dust on the magnet.



Water Filter Set

Outdoor unit

- Do not obstruct the air inlet and outlet vents. Failure to do so may result in low performance or system breakdown. Remove any obstruction to assure the ventilation.
- When it snows, clean and remove snow around the outdoor unit to prevent the air inlet and outlet vents from being covered with snow.

For extended non-use

- The water inside the Sanitary Water Tank should be drained.
- Disconnect the power supply.

Non serviceable criteria

Disconnect the power supply
then please consult an authorised dealer under the following conditions:

- Abnormal noise during operation.
- Water/foreign particles have entered the Remote Controller.
- Water leaks from the indoor unit.
- Circuit breaker switches off frequently.
- Power cord becomes excessively warm.

MAINTENANCE

User

- In order to ensure optimal performance of the units, user may inspect and clear any obstruction on the air inlet and outlet vents of the outdoor unit.
- Users should not try to service or replace parts of the unit.
- Contact authorised dealer for scheduled inspection.

Dealer

- In order to ensure safety and optimal performance of the units, seasonal inspections on the units, functional check of RCCB/ELCB, field wiring and piping have to be carried out at regular intervals by authorised dealer.
- Specific to the Sanitary Water Tank, it is important to service the Water Filter Set periodically.

Troubleshooting

The following symptoms do not indicate malfunction.

Symptom	Cause
Water flowing sound during operation.	• Refrigerant flow inside the unit.
Operation is delayed a few minutes after restarting.	• The delay is a protection for the compressor.
Outdoor unit emits water/steam.	• Condensation or evaporation occurring in the pipes.
Steam comes out of the outdoor unit in the heating mode.	• It is caused by defrost operation in the heat exchanger.
Outdoor unit does not operate.	• It is caused by the protection control of the system when outdoor temperature is out of the operating range.
System operation switches off.	• It is caused by the protection control of the system. When the water inlet temperature is lower than 10 °C, the compressor stops and the backup heater power turns on.
System is hard to heat up.	• When the panel and the floor are heated simultaneously, warm water temperature may decrease, which may reduce the heating ability of the system. • When the outdoor air temperature is low, the system may need longer time to heat up. • Discharge outlet or intake inlet in the outdoor unit is blocked by some obstacle, such as a pile of snow. • When the preset water outlet temperature is low, the system may need longer time to heat up.
System does not heat up instantly.	• System will take some time to heat up the water if it starts to operate at cold water temperature.
Backup heater is automatically turned ON when it is disabled.	• It is caused by the protection control of the indoor unit heat exchanger.
Operation starts automatically when the timer is not set.	• Sterilization timer has been set.
Loud refrigerant noise continues for several minutes.	• It is caused by protection control during deice operation at outdoor ambient temperature lower than -10 °C.
*1, *2 COOL mode is unavailable.	• System has locked to operate in HEAT mode only.

Check the following before calling for servicing.

Symptom	Check
Operation in HEAT/*1, *2 COOL mode is not working efficiently.	• Set the temperature correctly. • Close the panel heater/cooler valve. • Clear any obstruction in the air inlet and air outlet vents of the outdoor unit.
Noisy during operation.	• Outdoor unit or indoor unit has been installed at an incline. • Close the cover properly.
System does not work.	• Circuit breaker has tripped/activated.
Operation LED is not lit or nothing is displayed on the Remote Controller.	• Power supply is working correctly, or a power failure has occurred.

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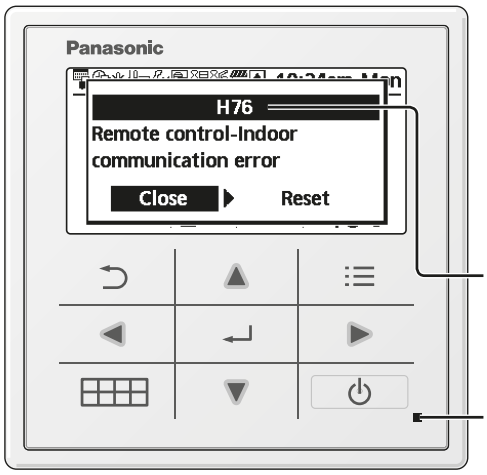

Below is a list of error codes that may appear on the display when there is some trouble with the system setting or operation.

When the display shows an error code as indicated below, contact the number registered in the Remote Controller or a nearest authorised installer.

All switches are disabled except ◀ ▶ and ⮌ .

Error No.	Error explanation
H12	Capacity mismatch
H15	Compressor sensor error
H20	Pump error
H23	Refrigerant sensor error
H27	Service valve error
H28	Solar sensor error
H31	Pool sensor error
H36	Buffer tank sensor error
H38	Brand mismatch error
H42	Low pressure protection
H43	Zone 1 sensor error
H44	Zone 2 sensor error
H62	Water flow error
H63	Low pressure sensor error
H64	High pressure sensor error
H65	Deice water circulation error
H67	External thermistor 1 error
H68	External thermistor 2 error
H70	Back-up heater OLP error
H72	Tank sensor error
H74	PCB communication error
H75	Low water temp protection
H76	RC-Indoor communication error
H90	Indoor-Outdoor communication error
H91	Tank heater OLP error
H95	Voltage connection error
H98	High pressure protection
H99	Indoor freeze prevention

Error No.	Error explanation
F12	Pressure switch activated
F14	Poor compressor rotation
F15	Fan motor lock error
F16	Current protection
F20	Compressor overload protection
F22	Transistor module overload protection
F23	DC peak
F24	Refrigerant cycle error
F25	*1, *2 Cool / heat cycle error
F27	Pressure switch error
F29	Low discharge super heat
F30	Water outlet sensor 2 error
F32	Internal thermostat error
F36	Outdoor ambient sensor error
F37	Water inlet sensor error
F40	Outdoor discharge sensor error
F41	Power factor correction error
F42	Outdoor heat exchanger sensor error
F43	Outdoor defrost sensor error
F45	Water outlet sensor error
F46	Current transformer disconnection
F48	Evaporator outlet sensor error
F49	Bypass outlet sensor error
F95	*1, *2 Cooling high pressure error

* Some error code may not be applicable to your model. Consult authorised dealer for clarification.

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