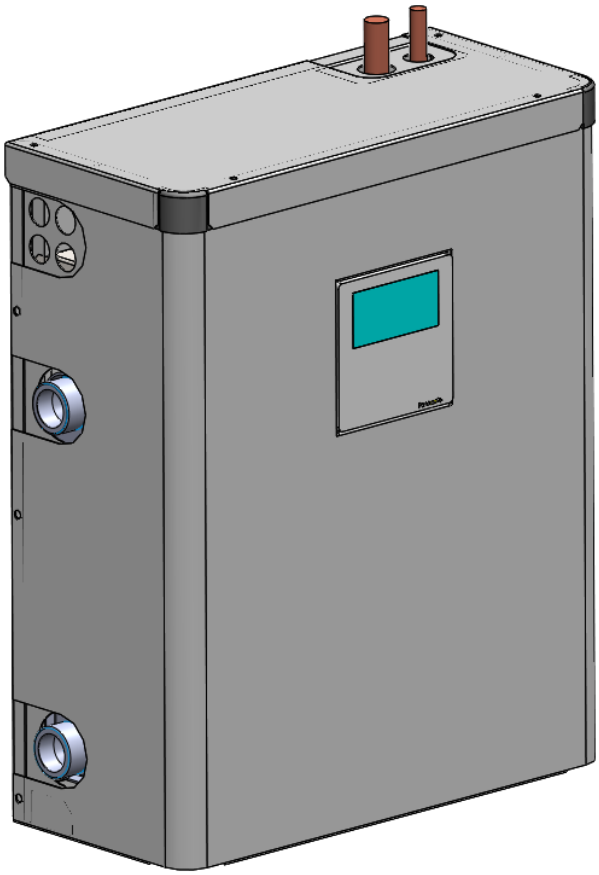
Installation and maintenance manual

WATER HEAT EXCHANGER



English

20 ↓ 25 kW

25 ↓ 30 kW

R32

PAW-200W5APAC-1
PAW-250W5APAC-1

Part number: **374736H**
Supersedes: **374736G**

CE

ISO 9001:2015 certified management system

English

Table of Contents

1 - Foreword

1.1 Introduction

Units, manufactured to state-of-the-art design and implementation standards, ensure top performance, reliability and fitness to any type of air-conditioning systems.

These units are designed for cooling water and for water heating and are unfit for any purposes other than those specified in this manual.

This manual includes all the information required for a proper installation of the units, as well as the relevant operating and maintenance instructions.

It is therefore recommended to read this manual carefully before installation or any operation on the machine. The unit installation and maintenance must be carried out by skilled personnel only (where possible, by an Authorised Service Center).

The manufacturer may not be held liable for any damage to people or property caused by improper installation, start-up and/or improper use of the unit and/or failure to implement the procedures and instructions included in this manual.

1.2 Warranty

These units are delivered complete, tested and ready for installation and operation. Any form of warranty will become null and void in the event that the appliance is modified without manufacturer's prior written authorisation.

In order for this warranty to be valid, the following conditions shall be met:

- The machine must be operated only by skilled personnel from Authorised After-Sales Service.
- Maintenance must be performed only by skilled personnel - from an Authorised After-Sales Center.
- Use only original spare parts.
- Carry out all the planned maintenance provided for by this manual in a timely and proper way.
- The installation procedure and the installation site must be as indicated in this manual.

Failure to comply with any of these conditions will automatically void the warranty.

1.3 An introduction to the manual

For safety reasons, it is imperative to follow the instructions given in this manual. In case of any damage caused by non-compliance with these instructions, the warranty will immediately become null and void.

Conventions used throughout the manual:

	The DANGER sign calls your attention to a certain procedure or practice which, if not followed, may result in serious injury to people and damage to property.
	The WARNING sign precedes those procedures that, if not followed, may result in serious damage to the appliance.
	NOTE indicates important observations.
	The USEFUL TIPS provides valuable information that optimises the efficiency of the appliance.

This manual and its contents, as well as the documentation which accompanies the unit, are and remain the property of manufacturer, which reserves any and all rights therein. This manual may not be copied, in whole or in part, without manufacturer's written authorization.

2 - Safety

2.1 Foreword

These units must be installed in conformity with the provisions of Machinery Directive 2006/42/EC, Electromagnetic Compatibility Directive 2014/30/EU, as well as with other regulations applicable in the country of installation. If these provisions are not complied with, the unit must not be operated.

	**The unit must be grounded, and no installation and/or maintenance operations may be carried out before deenergising the electrical panel of the unit.**

Failure to respect the safety measures mentioned above may result in electrocution hazard and fire in the presence of any short-circuits.

	**Inside the heat exchangers and the refrigeration lines, this unit contains liquid and gaseous refrigerant under pressure. The release of this refrigerant may be dangerous and cause injuries.**

	**The units are not designed to be operated with natural refrigerants, such as hydrocarbons. Manufacturer may not be held liable for any problems deriving from the replacement of original refrigerant or the introduction of hydrocarbons.**

	The used refrigerants are included in group I

- The maximum working pressure values are mentioned on the unit's data plate.
- Suitable safety devices (pressure switches and safety valves) must be installed on the refrigerant line when installing the unit.
- Dedicated guards (removable panels with tools) and danger signs indicate the presence of hot pipes or components (high surface temperature).

	**It is the User's responsibility to ensure that the unit is fit for the conditions of intended use and that both installation and maintenance are carried out by experienced personnel, capable of respecting all the recommendations provided by this manual.** **It is important that the unit is adequately supported, as detailed in this manual. Non-compliance with these recommendations may create hazardous situations for the personnel.**

	**The unit must rest on a base which meets the characteristics specified in this manual; a base with inadequate characteristics is likely to become a source of serious injury to the personnel.**

	The packaging material must not be disposed of in the surrounding environment or burnt.

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2.2 Definitions

OWNER: means the legal representative of the company, body or individual who owns the plant where unit has been installed; he/she has the responsibility of making sure that all the safety regulations specified in this manual are complied with, along with the national laws in force.

INSTALLER: means the legal representative of the company who has been given by the owner the job of positioning and performing the hydraulic, electric and other connections of unit to the plant: he/she is responsible for handling and properly installing the appliance, as specified in this manual and according to the national regulations in force.

OPERATOR: means a person authorised by the owner to do on the unit all the regulation and control operations expressly described in this manual, that must be strictly complied with, without exceeding the scope of the tasks entrusted to them.

ENGINEER: means a person authorised directly by manufacturer or, in all EC countries, excluding Italy, under his full responsibility, by the distributor of the product, to perform any routine and extraordinary maintenance operations, as well as any regulation, control, servicing operations and the replacement of pieces, as may be necessary during the life of the unit.

2.3 General precautions

The OPERATOR must simply use the controls of the unit; he must not open any panel.

When you approach or work on the unit, follow the precautions listed below:

- do not wear loose clothing or jewellery or any other accessory that may be caught in moving parts
- wear suitable personal protective equipment (gloves, goggles etc.) when you have to work in the presence of free flames (welding operations) or with compressed air
- isolate the water supply to the unit, drain the connecting pipes in order to balance the pressure to the atmospheric value before disconnecting them, disassemble connections, filters, joints or other line items
- do not use your hands to check for any pressure drops
- use tools in a good state of repair; be sure to have understood the instructions before using them
- be sure to have removed all tools, electrical cables and any other objects before closing and starting the unit again

2.4 Precautions against residual risks

Prevention of residual risks caused by the control system

- be sure to have perfectly understood the operating instructions before carrying out any operation on the control panel
- when you have to work on the control panel, always keep the operating instructions within reach
- start the unit only after you have checked it is correctly connected to the plant
- promptly inform the ENGINEER about any alarm involving the unit
- do not reset manual restoration alarms unless they have been correctly identified and rectified accordingly

Prevention of residual mechanical risks

- install the unit according to the instructions provided in this manual
- carry out all the periodical maintenance operations prescribed by this manual
- before opening any panelling of the machine, make sure that it is secured and safe to do so

Prevention of residual electrical risks

- connect the unit to the mains according to the instructions provided in this manual
- periodically carry out all the maintenance operations specified by this manual
- disconnect the unit from the mains by the external disconnecting switch before opening the electrical board
- check the proper grounding of the unit before start-up
- check all the electrical connections, the connecting cables, and in particular the insulation; replace worn or damaged cables
- periodically check the board's internal wiring
- do not use cables having an inadequate section or flying connections, even for limited periods of time or in an emergency

Prevention of other residual risks

- make sure that the connections to the unit conform to the instructions provided in this manual and on the unit's panelling
- if you have to disassemble a piece, make sure that it has been properly mounted again before restarting the unit
- when in operation or when charged with refrigerant, do not touch the delivery pipes from the compressor and any other piping or component inside the machine unless wearing protective gloves
- keep a fire extinguisher for electrical appliances near the machine

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- Install safety valves on the refrigeration circuis to a piping network that can channel any overflowing refrigerant outside
- remove any leak of fluid inside and outside the unit
- collect the waste liquids and dry any oil spillage
- do not store flammable liquids near the unit
- do not disperse the refrigerant and the lubricating oil to the atmosphere
- do not approach flames or other sources of heat to refrigerant pipes; welding must be carried out whilst the pipes are empty and purged with Oxygen Free Nitrogen (OFN)
- do not bend/hit pipes containing fluids under pressure

2.5 Precautions during maintenance operations

Maintenance operations can be carried out by authorised technicians only.

Before performing any maintenance operations:

- Make sure a sufficient forced ventilation is present in the room (>500 m3/h)
- If brazing is needed, make sure to completely empty the refrigerant circuit involved by flushing with OFN prior brazing works and assure that OFN flow comes through
- disconnect the unit from the mains with the external disconnecting switch
- place a warning sign “do not turn on - maintenance in progress” on the external disconnecting switch. If possible, the isolating device should be locked off
- make sure that on-off remote controls are inhibited
- wear suitable personal protective equipment (helmet, safety gloves, goggles and shoes etc.)

To carry out any measurements or checks which require the activation of the machine:

- work with the electrical board open only for the necessary time
- close the electrical board as soon as the measurement or check has been completed

The following precautions must be always adopted:

- do not release the fluids of the refrigeration circuit in the surrounding atmosphere
- when replacing an EEPROM or electronic cards, use always suitable devices (extractor, antistatic bracelet, etc.)
- to replace the pump, the evaporator or any other weighty element, make sure that the lifting equipment is consistent with the weight to be lifted
- contact manufacturer for any modifications to the refrigeration, hydraulic or wiring diagram of the unit, as well as to its control logic
- contact manufacturer if it is necessary to perform very difficult disassembly and assembly operations
- use only original spare parts purchased directly from manufacturer or the official retailers of the companies on the recommended spare parts list
- contact manufacturer if it is necessary to move the unit one year after its positioning on site or if you wish to dismantle it.

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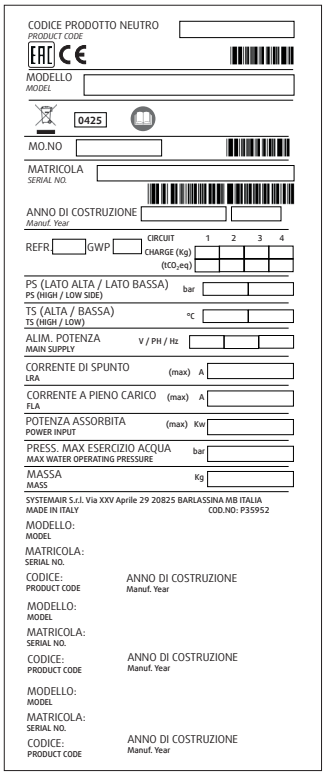
2.6 Safety labels

Identification of the refrigerant - Outside, on the external panel

Identification of the unit - Outside, on the external panel



External Flow Switch and Filter mandatory

E' OBBLIGATORIO L'USO DI FILTRO E FLUSSOSTATO ACQUA
THE USE OF FILTER AND FLOW SWITCH IS MANDATORY
EL USO DEL FILTRO Y DEL INTERRUPTOR DE FLUJO ES OBLIGATORIO
L'UTILISATION DU FILTRE ET DU FLUXOSTAT EST OBLIGATOIRE
DER GEBRAUCH VON FILTER UND STRÖMUNGSWÄCHTER IST VORGESCHRIEBEN.

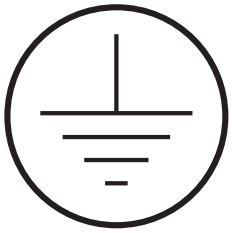
Electrical warning - On the elecrical box panel

	ATTENZIONE ! Prima di aprire togliere tensione	ATTENTION ! Enlever l'alimentation electrique avant d'ouvrir
ACHTUNG ! Vor offnen des gehauses hauptschalter ausschalten	CAUTION ! Disconnect electrical supply before opening	ATENCION ! Cortar la corrente antes de abrir el aparato

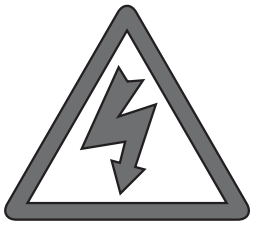
Risk of fire - Outside, on the external panel

Power supply

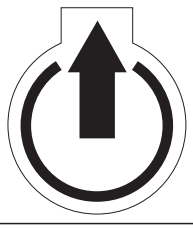
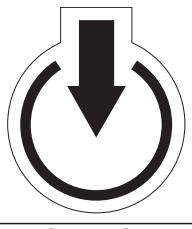
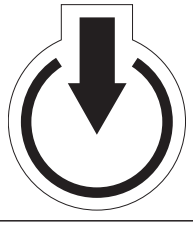
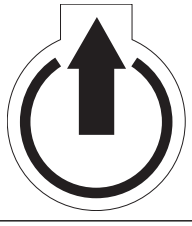
POWER SUPPLY DRAWING-IN PORT	UNIT COMMUNICATION WIRING DRAWING-IN PORT

Grounding connection on the electrical board, adjacent to the connection	Read the instruction on the electrical board
	

On voltage



Water flow connection identification - Adjacent to fittings

	Outlet Heating Flow 55°C	Inlet Cooling Operation
UPPER PORT		
	Inlet Heating Flow 55°C	Outlet Cooling Operation
LOWER PORT		

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2.7 Precaution for Using R32 Refrigerant

The basic installation work procedures are the same as conventional refrigerant (R410A, R22) models. However, pay careful attention to the following points:

- Since the working pressure is higher than that of refrigerant R22 models, some of the piping and installation and service tools are unique. R22 renewal with R32 is possible as long as the pipe thickness is in compliance with EN 14276-2 and flares are remade.
- Models that use refrigerant R32 and R410A have a different charging port thread diameter to prevent erroneous charging with refrigerant R22 and for safety. Therefore, check beforehand. [The charging port thread diameter for R32 and R410A is 12.7 mm (1/2 inch).]
- Be more careful than R22 so that foreign matter (oil, water, etc.) does not enter the piping. Also, when storing the piping, securely seal the opening by pinching, taping, etc. (Handling of R32 is similar to R410A.)

Installation (Space)

- Ensure that the pipe-work installation is kept to a minimum. Avoid using dented pipe and do not allow acute bending.
- Ensure that pipe-work is protected from physical damage.
- Comply with national gas regulations, state municipal rules and legislation. Notify relevant authorities in accordance with all applicable regulations.
- Ensure mechanical connections are accessible for maintenance purposes.
- In cases that require mechanical ventilation, ventilation openings shall be kept clear of obstructions.
- When disposing of the product, follow the precautions in recovery section and comply with national regulations. Always contact local municipal offices for proper handling.
- Interconnecting refrigerant pipework, i.e. pipework external to the unitary components, should be marked with a Class label every two metres where the pipework is visible. This includes pipework located in a ceiling space or any void which a person may access for maintenance or repair work within that space.

Servicing

Service personnel

- Any qualified person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with an industry recognized assessment specification.
- Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of persons competent in the use of flammable refrigerants.
- Servicing shall be performed only as recommended by the manufacturer.

Work

- Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system, the precautions must be followed before conducting work on the system.
- Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapour being present while the work is being performed.
- All maintenance staff and others working in the local area shall be instructed and supervised on the nature of work being carried out.
- Avoid working in confined spaces.
- Wear appropriate protective equipment, including respiratory protection, as conditions warrant.
- Ensure that the conditions within the area have been made safe by limit of use of any flammable material. Keep all sources of ignition and hot metal surfaces away.

Checking for presence of refrigerant

- The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres.
- Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. non sparking, adequately sealed or intrinsically safe.
- In case of leakage/spillage, immediately ventilate area and stay upwind and away from spill/release.
- In case of leakage/spillage, do notify persons downwind of the leaking/spill, isolate immediate hazard area and keep unauthorized personnel out.

Presence of fire extinguisher

- If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available at hand.
- Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

No ignition sources

- No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. He/She must not be smoking when carrying out such work.
- All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which flammable refrigerant can possibly be released to the surrounding space.

- Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks.
- "No Smoking" signs shall be displayed.

Ventilated area

- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work.
- A degree of ventilation shall continue during the period that the work is carried out.
- The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

Checks to the refrigeration equipment

- Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. Use only original spare parts.
- At all times the manufacturer's maintenance and service guidelines shall be followed.
- If in doubt consult the manufacturer's technical department for assistance.
- The following checks shall be applied to installations using flammable refrigerants.

  - The charge size is in accordance with the room size within which the refrigerant containing parts are installed.

  - The ventilation machinery and outlets are operating adequately and are not obstructed.

  - If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant.

  - Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected.

  - Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are properly protected against being so corroded.

Checks to electrical devices

- Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures.
- Initial safety checks shall include but not limit to:

  - Capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking.

  - That there is no live electrical components or exposed wiring while charging, recovering or purging the system.

  - There is continuity of earth bonding.

- At all times the manufacturer's maintenance and service guidelines shall be followed.
- If in doubt consult the manufacturer's technical department for assistance.
- If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily rectified.
- In the event that it is absolutely necessary to continue operation and the fault cannot be immediately rectified a temporary solution may be utilised, but must be deemed safe by a suitably qualified person.
- The owner of the equipment must be informed or reported so all parties are advised thereinafter.

Repairs to sealed components

- During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc.
- If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.
- Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.
- Ensure that apparatus is mounted securely.
- Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres.
- Replacement parts shall be in accordance with the manufacturer's specifications.

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

Repair to intrinsically safe components

- Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.
- Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere.
- The test apparatus shall be at the correct rating.

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- Replace components only with parts specified by the manufacturer. Unspecified parts by manufacturer may result in ignition of refrigerant in the atmosphere from a leak.

Cabling

- Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects.
- The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

Detection of flammable refrigerants

- Under no circumstances shall potential sources of ignition be used in the searching or detection of refrigerant leaks.
- A halide torch (or any other detector using a naked flame) shall not be used.

Leak detection methods

- Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need recalibration. (Detection equipment shall be calibrated in a refrigerant-free area.)
- Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used.
- Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25 % maximum) is confirmed.
- Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.
- If a leak is suspected, all naked flames shall be removed/ extinguished.
- If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

Removal and evacuation

- When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to: • remove refrigerant -> • purge the circuit with inert gas -> • evacuate -> • purge again with inert gas -> • open the circuit by cutting or brazing
- The refrigerant charge shall be recovered into the correct recovery cylinders.
- The system shall be “flushed” with OFN to render the unit safe.
- This process may need to be repeated several times.
- Compressed air or oxygen shall not be used for this task.
- Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum.
- This process shall be repeated until no refrigerant is present within the system.
- When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.
- This operation is absolutely vital if brazing operations on the pipe work are to take place.
- Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.

Charging procedures

- In addition to conventional charging procedures, the following requirements shall be followed.

  - Ensure that contamination of different refrigerants does not occur when using charging equipment.

  - Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.

  - Cylinders shall be kept upright.

  - Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.

  - Label the system with the amount charged, when charging is complete (if not completed prior to charging).

  - Extreme care shall be taken not to over fill the refrigeration system.

- Prior to recharging the system it shall be pressure tested with OFN (refer to Leak detection methods section).
- On completion of charging, but prior to commissioning, the system shall be leak tested.
- A follow up leak test shall be carried out prior to leaving the site.
- Electrostatic charge may accumulate and create a hazardous condition when charging and discharging the refrigerant. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before charging/discharging.

Decommissioning

- Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its details.
- It is recommended good practice that all refrigerants are recovered safely.

- Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of reclaimed refrigerant.
- It is essential that electrical power is available before the task is commenced.

  a) Become familiar with the equipment and its operation.

  b) Isolate system electrically.

  c) Before attempting the procedure ensure that:

  • mechanical handling equipment is available, if required, for handling refrigerant cylinders;

  • all personal protective equipment is available and being used correctly;

  • the recovery process is supervised at all times by a competent person;

  • recovery equipment and cylinders conform to the appropriate standards.

  d) Pump down refrigerant system, if possible.

  e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.

  f) Make sure that cylinder is situated on the scales before recovery takes place.

  g) Start the recovery machine and operate in accordance with manufacturer's instructions.

  h) Do not over fill cylinders. (No more than 80 % volume liquid charge).

  i) Do not exceed the maximum working pressure of the cylinder, even temporarily.

  j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.

  k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

- Electrostatic charge may accumulate and create a hazardous condition when charging or discharging the refrigerant. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before charging/discharging.

Labelling

- Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant.
- The label shall be dated and signed.
- Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

Recovery

- When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.
- When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed.
- Ensure that the correct number of cylinders for holding the total system charge are available.
- All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant).
- Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order.
- Recovery cylinders are evacuated and, if possible, cooled before recovery occurs.
- The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants.
- In addition, a set of calibrated weighing scales shall be available and in good working order.
- Hoses shall be complete with leak-free disconnect couplings and in good condition.
- Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.
- The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged.
- Do not mix refrigerants in recovery units and especially not in cylinders.
- If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant.
- The evacuation process shall be carried out prior to returning the compressor to the suppliers.
- Only electric heating to the compressor body shall be employed to accelerate this process.
- When oil is drained from a system, it shall be carried out safely

3 - Transport, Handling and Storage

3.1 Inspection

The unit shall be immediately inspected upon receipt to identify any damage, since it has been delivered ex works and transported at the customer's risk. It is also necessary to make sure that all the parcels specified on the delivery note have been delivered.

Any damage shall be immediately reported in writing to the carrier. Even if the damage is only on the surface, please also notify our local representative.

The manufacturer disclaims all responsibility for the shipment even if it has been provided for its organisation.

3.2 Handling

Before handling the devices, make sure the site you have chosen for the installation can withstand its weight and support its mechanical impact.

WARNING	Do not lay the WHE unit on its side during transportation. Internal damage could result in malfunction

NOTE	Handle with Care. Lifting must be done from the bottom or from the backrest; do not lift by levering on protruding parts of the machine; use a manual or mechanical lift if necessary

3.3 Storage

If the unit is to be stored for some time prior to installation, take at least the following precautions to prevent damage, corrosion and/or deterioration:

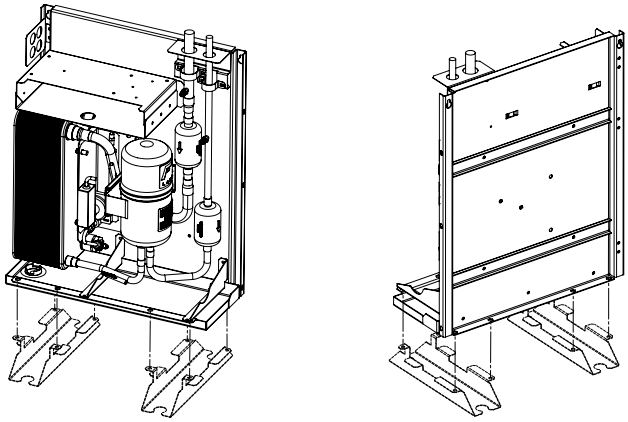
- Make sure all openings, such as for example water connections, are well plugged and sealed.
- Maximum storage temperature is 40 °C.
- Minimum storage temperature is 0 °C.
- Store the units in areas where minimum activity is likely to take place in order to avoid any risk of accidental damage.
- Never use steam to clean the unit.

It is also recommended to visually inspect the equipment at regular intervals.

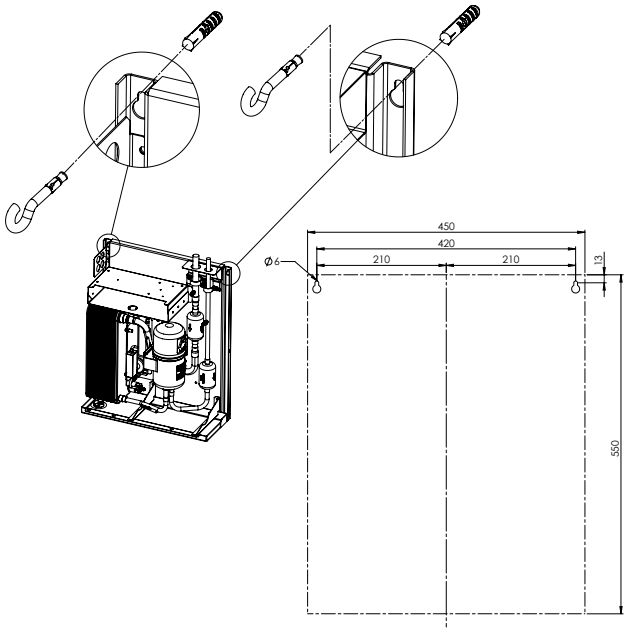
3.4 Anchoring

Floor mounting

For floor mounting application, use the support feet supplied loose with the unit, as shown in figure.



Wall mounting



DANGER	**Danger in case of improper fixing** **The fixing material used must be suitable for the characteristics of the wall.** **Fixing material is not included since different wall materials require different types of fixing devices.** **Check that the wall is able to support the weight of the unit in operation** **Use fixing material suitable for the characteristics of the wall** **Use individual supports if necessary**

4 - Installation

4.1 Installation Site

DANGER	**Before installing the unit, make sure that the building structure and/or the supporting surface can withstand the weight of the device. The weights of the units are detailed in Chapter 8 of this manual.**
WARNING	These units have been designed to be installed on the floor, or on the wall. See chapter 3 (Anchoring) for details, and only for indoor applications.

When selecting the installation site, never forget to consider as follows:

- Provide the required space for inspection and maintenance
- Ensure that the installation location has adequate water drainage. A defect in the piping could cause water leaks into the surrounding property
- Drain pipes should be as short as possible
- Drain pipes must be insulated
- Make sure that drain water cannot cause trouble for surrounding properties
- Use a leveling tool to ensure that the unit is truly horizontal. Water leaks can result if the unit is not horizontally true
- Install the unit in a site where the ambient temperature can never be below 0°C (The unit is not suitable to work with glycol mixture)

4.2 Consideration for A2L refrigerant installation

This product contains R32 refrigerant that has a minimal environmental impact, thanks to its low value of Global Warming Potential (GWP). According to ISO 817, R32 refrigerant is classified as A2L, which is mildly flammable, since the flame propagation rate is low, and non-toxic. R32 refrigerant can burn slowly when all the following conditions are present:

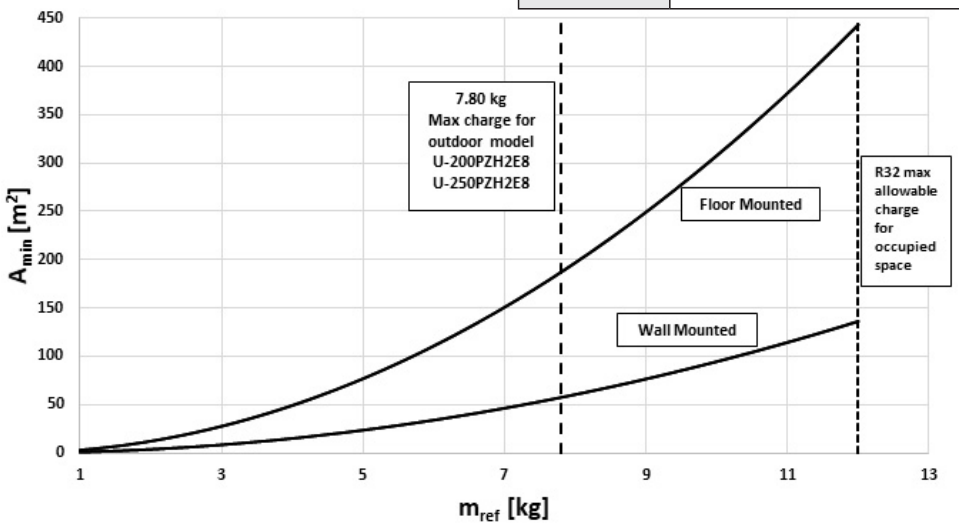
- The concentration is between the lower and upper flammability limit (LFL & UFL).
- T Wind velocity<propagation of flame velocity
- Energy of the ignition source>Minimum ignition energy

Safety class (ISO 817)	A2L
PED Group	1
Practical limit (kg/m3)	0.061
ATEL/ ODL (kg/m3)	0.30
LFL (kg/m3) @ 60°C	0.307
Vapour density @25°C, 101.3 kPa (kg/m3)	2.13
Molecular mass	52.0
Boiling point (°C)	-52
GWP (100 yr ITH)	675
GWP (ARS 100 yr ITH)	677
Autoignition temperature (° C)	648

Minimum surface required for the site of installation

The requirements for installation space of the appliance are determined according to the refrigerant charge amount [mref], used in the appliance. The minimum indoor floor space compared with the amount of refrigerant is defined in EN-378 standard and correspond roughly as shown in the graph below: based on the type of installation (floor mounted or wall mounted), the space required for the room, in which the indoor unit is installed, is different, as a function of the refrigerant charge.

NOTE	A forced ventilation is required if the ratio between the refrigerant charge and the volume of the room in which the WHE is installed is higher than 0.063 kg/m^3



Minimum required surface for the Occupied Space in which the unit is installed for Comfort Application based on R32 charge of the entire system.

4 - Installation

4.3 Hydraulic Connections

Please note that the unit can work in both heating and cooling modes without changing water connections (see 2.6 Safety labels) and without adding any wiring bridge in the differential pressure switch (see Electrical Connections). But in this way you cannot reach 55°C leaving water temperature. Leaving water temp. will be limited to maximum 50°C.

4.4 Connection to the outdoor unit

When connecting the refrigerant pipes to the outdoor unit consider to

- Ensure that the actual length of refrigerant piping between the outdoor unit and the WHE is at least 5 m
- Include bends and vertical lines in at least two places
- A siphon on the gas line at the exit of the WHE unit is recommended
- Refrigerant piping should be secured with supports at least 1.5 m from the units and subsequently along the length of the refrigerant pipework
- If the equivalent tube length used will be 30m or less, no additional charging will be necessary

See table below for details on outdoor and indoor connections

WHE indoor unit		PAW-200W5 APAC-1	PAW-250W5 APAC-1
Outdoor unit		U-200PZH2E8	U-250PZH2E8
Max total tube length		90 m*	60 m*
Max height difference	Outdoor located higher	30 m	
	Outdoor located lower	30 m	
Connection pipe diameter	Liquid	9,52 mm	12,7 mm
	Gas	28,58 mm	28,58 mm
Additional charge per 1 m		60 g/m	80 g/m
Maximum refrigerant amount (outdoor+indoor)		7,8 kg	

* Please note the final pipework length may be less than the maximum shown in order to meet EN 378 installation requirements

4.5 External Water Circuit

The external water circuit shall guarantee a constant water flow rate through the circulating refrigerant/water heat exchanger (evaporator) under steady operating conditions and in case of a load variation.

An external pump is required to overcome pressure drops of the unit and the system (refer to unit pressure drop chapter). Connect the digital input of the pump to the proper clamp of the unit (see wiring diagram chapter). It is the installer's responsibility to provide Pump power supply. Any kind of pump can be connected to the unit based on user needs. Follow the instruction below for 1 phase or 3 phase pump connection

The circuit shall be composed by the following elements:

- Provide a circulation pump which can ensure the necessary flow rate and head
- Refer to total unit pressure drop for a correct pump selection. Refer to the next chapter for the electrical connection of the external pump to the unit
- The water volume of the primary water circuit, shall never be lower than 10 lt/kW in terms of refrigerating capacity. In the event of insufficient water volume, a buffer tank should be installed. This tank is intended to avoid any repetitive start of the compressor.
- A membrane expansion tank complete with a safety valve and a drain which shall be installed and visible.
- Follow the 3 possible configurations in the figures on the next page.

The expansion tank shall be dimensioned in such a way that it can absorb 2% expansion of the total volume of the water in the plant (exchanger, pipelines, uses and storage tank, if available).

A differential pressure switch is mounted as a standard. It will stop the unit whenever it senses a load loss through the heat exchanger which may result in a flow rate problem. With the only exception when the unit is configured to provide 55°C water temperature (heating mode operation), in which case the switch is bypassed.

A drain pipette is supplied loose as a standard. Install the drain pipette on the dedicated hole on the low part of the unit as shown in chapter drainage

In addition it is advisable to:

- Install isolating valves on the lines at the inlet and outlet of the manifolds of the exchangers (evaporator).
- Arrange air vent valves at the high points of the water circuit.
- Arrange drain points complete with plugs, cocks, etc. in the proximity of the low points of the water lines.
- Insulate the water lines to prevent the heat from blowing back into the unit and prevent energy loss.
- Provide a flow rate adjustment valve, so that the hot/cold water flow rate can be adjusted while watching the water temperature during testing. Do not touch the adjustment valve after adjusting
- The hot/cold water flow rate should be within the range shown in the technical data

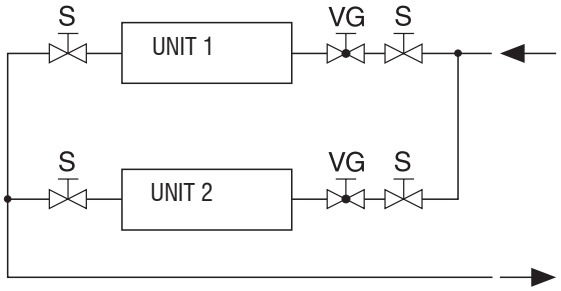
Before filling the installation, remove any impurities, such as sand, crushed stones and welding scales, coating drops and any other material which might damage the evaporator.

It is advisable to flush with disposable water bypassing the exchanger to avoid clogging.

The water used to fill the circuit shall be treated in such as way that the pH will have the correct value. Glycol must not be used.

4 - Installation

When two or several units are connected in parallel, to balance the load losses of the various circuits, it is recommended to execute a “reverse return” connection (see the diagram below).



Legend

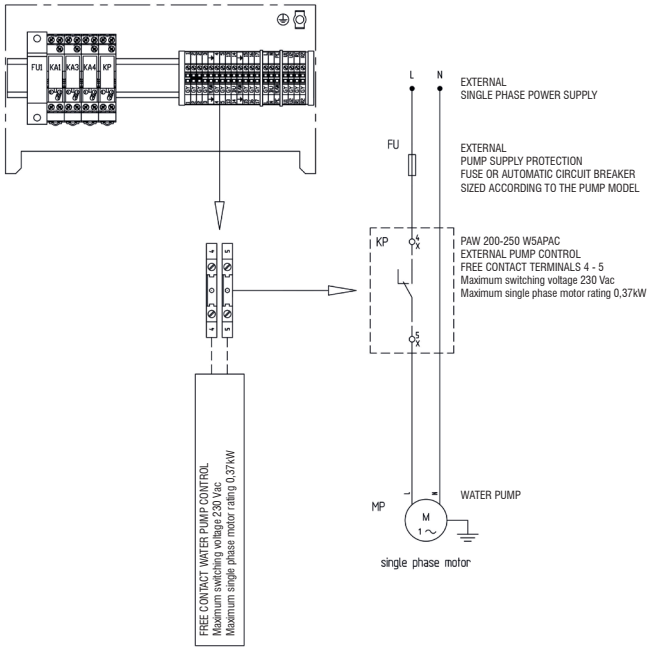
S Isolating valves

VG Balancing valves

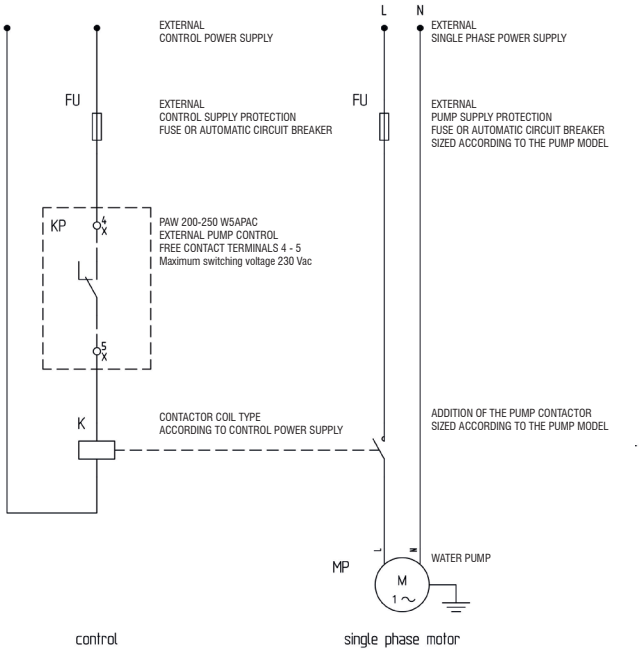
> **WARNING**
>
> Always install the flow switch kit and the water filter kit supplied loose with the unit (see accessory chapter for more information). The lack of these components will void the warranty

Instruction for external pump

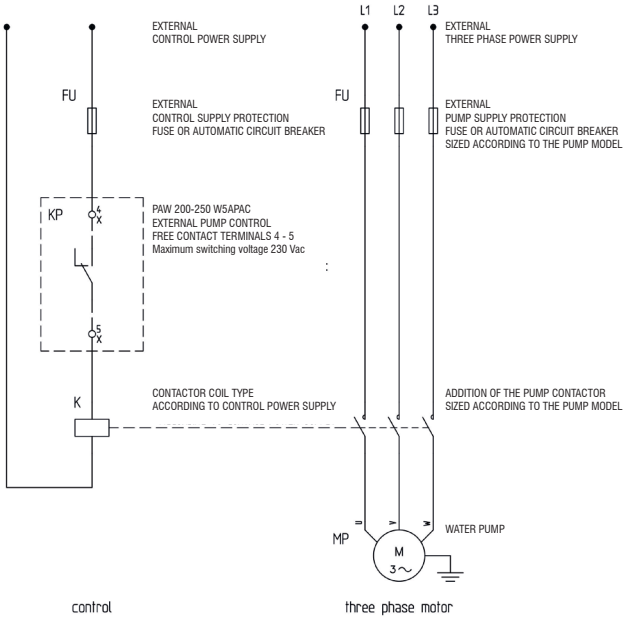
Single phase motor pump < 0,37 kW



Single phase motor pump > 0,37 kW

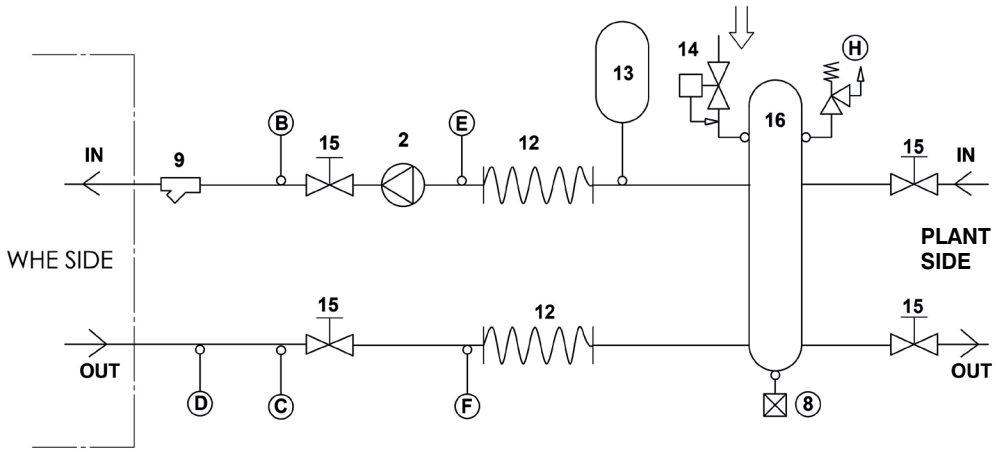


Threephase motor pump

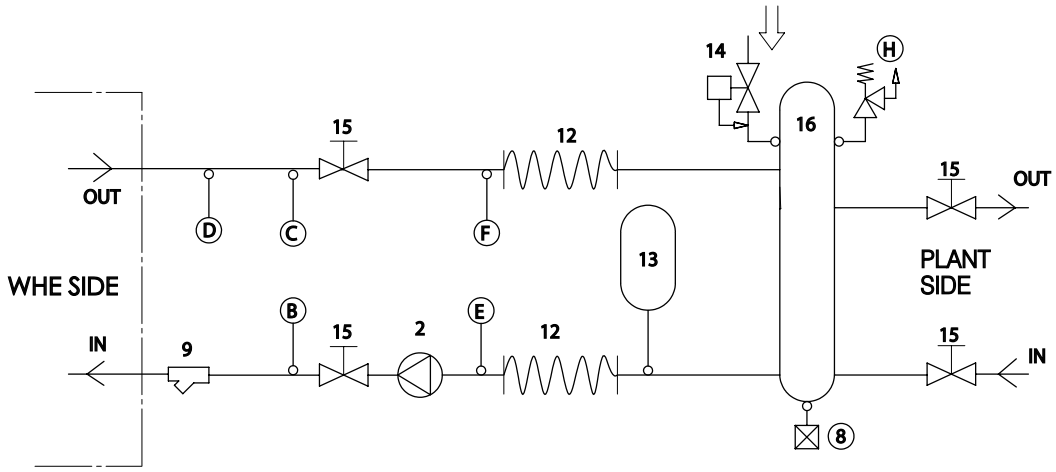


4 - Installation

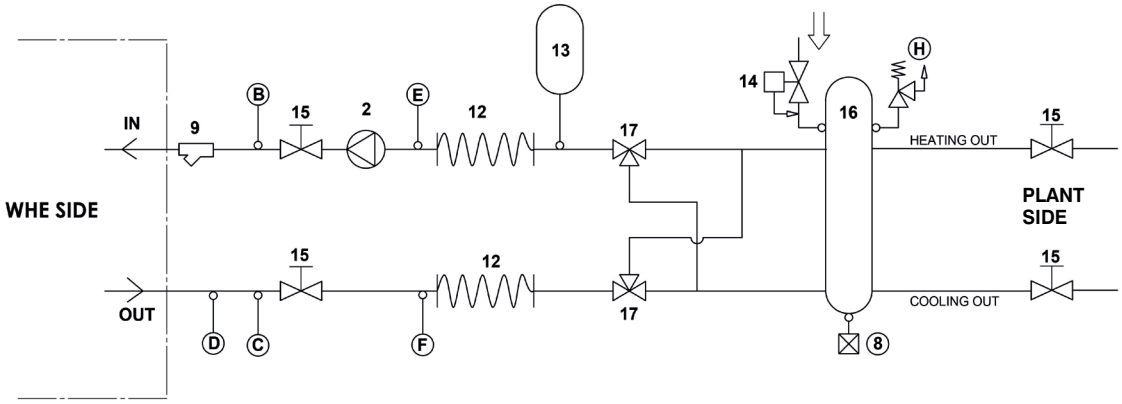
Water circuit - Basic configuration - heating and cooling modes (standard arrangement)



Water circuit - Basic configuration - heating mode (55°C arrangement)

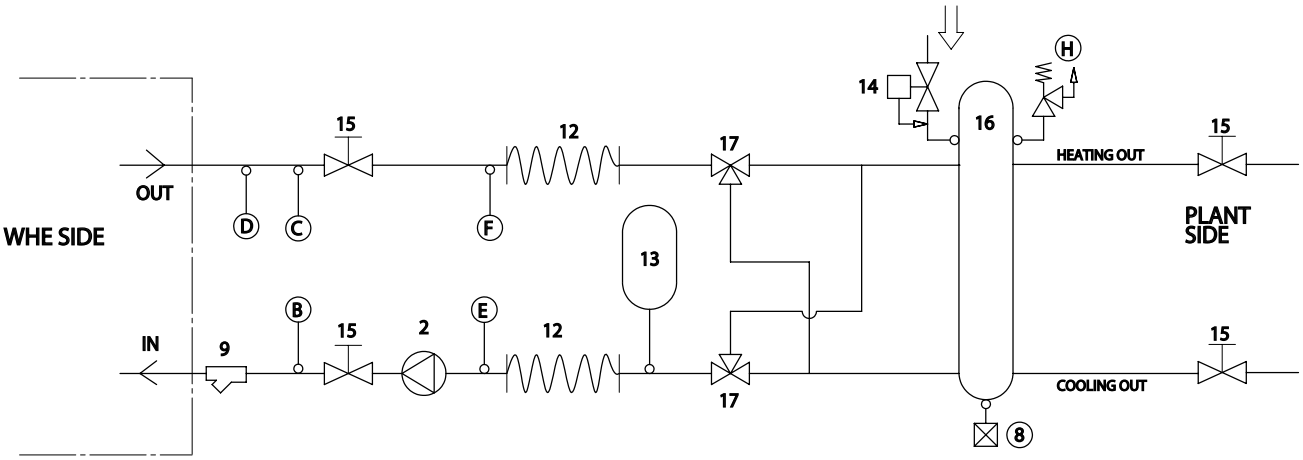


Water circuit - One tank-3 way valve configuration - heating and cooling modes (standard arrangement)

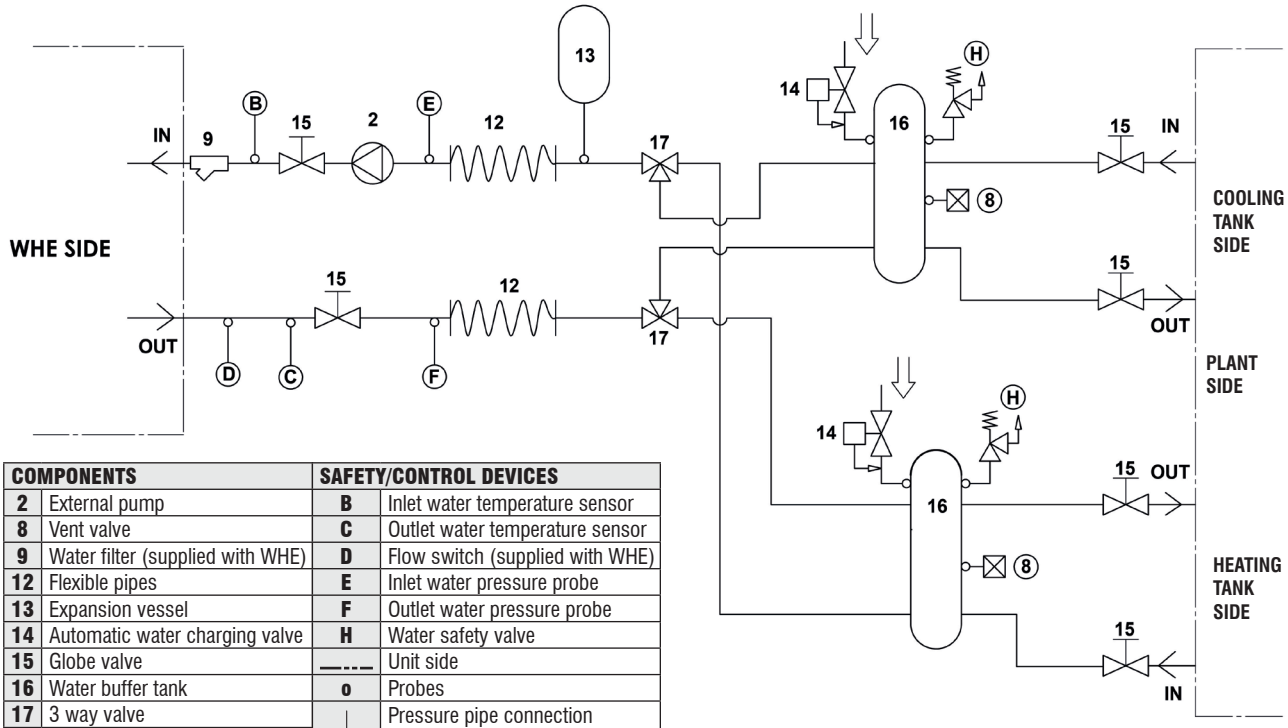


4 - Installation

Water circuit - One tank-3 way valve configuration - heating mode (55°C arrangement)



Water circuit - Two tanks-3 way valve configuration - heating and cooling mode (standard arrangement)



COMPONENTS		SAFETY/CONTROL DEVICES	
2	External pump	B	Inlet water temperature sensor
8	Vent valve	C	Outlet water temperature sensor
9	Water filter (supplied with WHE)	D	Flow switch (supplied with WHE)
12	Flexible pipes	E	Inlet water pressure probe
13	Expansion vessel	F	Outlet water pressure probe
14	Automatic water charging valve	H	Water safety valve
15	Globe valve	—·-·—	Unit side
16	Water buffer tank	o	Probes
17	3 way valve		Pressure pipe connection with shrader valve

4 - Installation

Flow switch

To ensure sufficient water flow through the evaporator, it is essential that a flow switch is installed on the water circuit. The purpose of the flow switch is to stop the unit in the event of interrupted water flow, thus protecting the evaporator from freezing. The flow switch is supplied with a clean contact that must be electrically connected to the terminals shown in the wiring diagram. The flow switch must be set up to intervene when the water flow of the evaporator is lower than the minimum flow declared for the unit in question.

NOTE

The external flow switch must be calibrated in order to guarantee the flow rate of intervention shown in the table below

PAW APAC-1	200	250
Flow rate of intervention (m^3/h)	2.0	2.5

WARNING

For the unit safety the water flow switch must be calibrated at the value shown in the table based on the unit size. Lower flow rates are not allowed, since they could cause heat exchanger freezing , irrevocably damaging the unit. Please note, setting the flow switch intervention at a higher flow rate can cause unexpected alarms. In case the water flow switch trips, before resetting the device manually, check and solve the cause: the manufacturer is not responsible for any damage due to repeated manual resets.

4.6 Water connections

WARNING

The attachments at the water inlet and outlet shall be connected in compliance with the instructions which can be found on the labels in the proximity of the attachments.

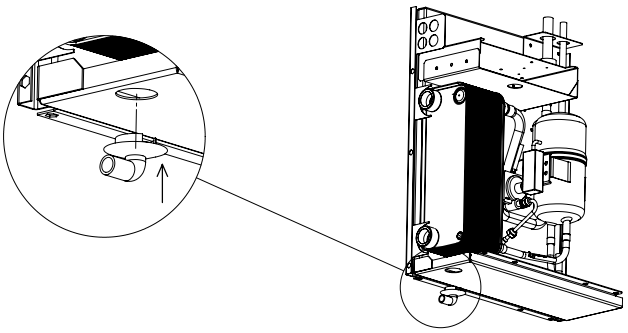
Connect the water lines of the plants with the attachments of the unit whose diameters and positions are shown in Chapter 8.

4.7 Drainage

The drain should allow water to run out naturally, so provide a downward slope of at least 1°.

CAUTION

During cooling operation, the internal components may become cold enough to produce condensation. Install the drain pan and drain pipette (supplied loose), to remove any condensate, as detailed in the figure below.



RECOMMENDED WATER COMPOSITION		
PH	7,5 - 9	
Electrical conductivity	10 - 500	μS/cm
Total hardness	4,5 - 8,5	dH
Temperature	< 60	[°C]
Alkalinity (HCO_3^-)	70-300	ppm
Alkalinity / Sulphates (HCO_3^-/ SO_4^{2-})	> 1	ppm
Sulphates (SO_4^{2-})	< 70	ppm
Chlorides (Cl^-)	< 50	ppm
Free Chlorine	< 0,5	ppm
Phosphates (PO_4^{3-})	< 2	ppm
Ammonia (NH_3)	< 0,5	ppm
Ammonium Ion (NH_4^+)	< 2	ppm
Manganese Ion (Mn^{2+})	< 0,05	ppm
Free Carbon Dioxide (CO_2)	< 5	ppm
Hydrogen Sulfide (H_2S)	< 0,05	ppm
Oxygen Content	< 0,1	ppm
Nitrates (NO_3^-)	< 100	ppm
Manganese (Mn)	< 0,1	ppm
Iron (Fe)	< 0,2	ppm
Aluminium (Al)	< 0,2	ppm

CAUTION

If the water circuit is to be drained for a time exceeding one month, the circuit must be fully charged with nitrogen to prevent any risk of corrosion by differential venting

4 - Installation

4.8 Power supply

Before carrying out any operations on the electrical system, make sure that the unit is deenergized.

It is important that the appliance is grounded.

The company in charge of the installation shall conform to the standards applicable to outdoor electrical connections.

The manufacturer may not be held liable for any damage and/or injury caused by failure to comply with these precautions.

The unit conforms to EN 60204-1.

The following connections shall be provided:

- A single-phase with neutral and grounding connection for the power supply circuit.
- The electrical distribution system shall meet the power absorbed by the appliance.
- The power supply lines and the insulation devices must be designed in such a way that every line is independent.
- It is recommended to install differential switches, to prevent any damage caused by phase drops.
- The power supply cables must be inserted into dedicated openings on the side of the unit (see dimensional drawing for details).

4.9 Electrical connections

The unit must be installed on site according to the usual procedures and standards applicable in the place of installation. The unit must not be operated if its installation has not been carried out according to the instructions provided in this manual.

The power supply lines must consist of insulated copper conductors, dimensioned for the maximum absorbed current.

Connection to terminals must be performed according to the diagram of connections (User's Terminal Box) provided in this manual and according to the wiring diagram which accompanies the unit.

Before connecting the power supply lines, check that the available voltage value does not exceed the range specified in the Electric Data (Chapter 8)

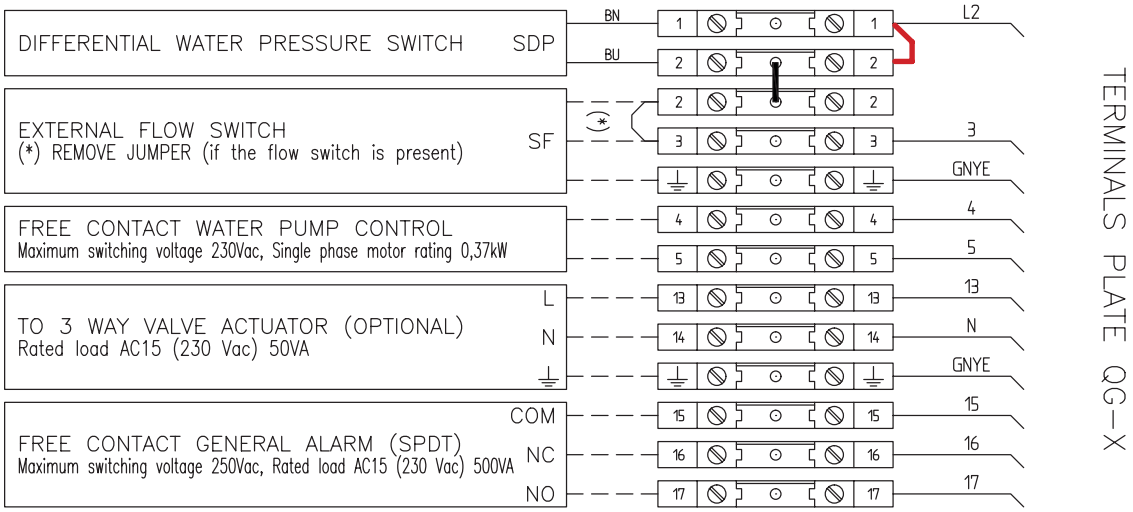
For the operation cables (remote control cable, operation cable for the indoor and outdoor units), use signal cables that are easy to differentiate from the power supply cable (AC220-240V). Also, do not run the power cable with the operation cables. 50mm minimum separation is required

Keep the power supply cable and operation cables, 3 m or more away from the chiller, antenna cable, operation cable, power supply cable and other parts of equipment such as a TV, radio, stereo, interphone, personal computer, word processor and telephone. Noise from such equipment may cause adverse affects

4 - Installation

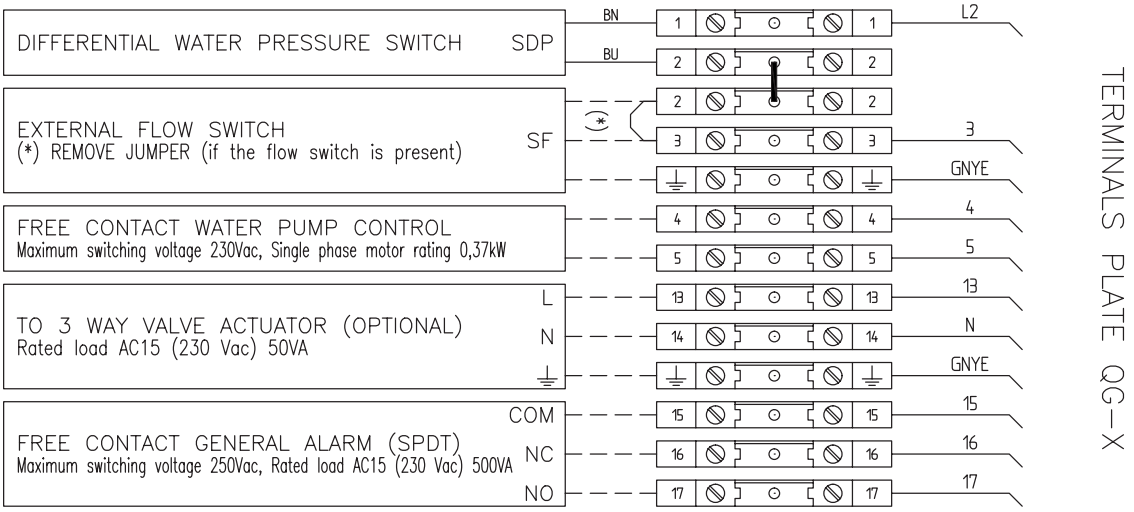
WHE - Electrical Connections

Wiring arrangement for 55°C operation



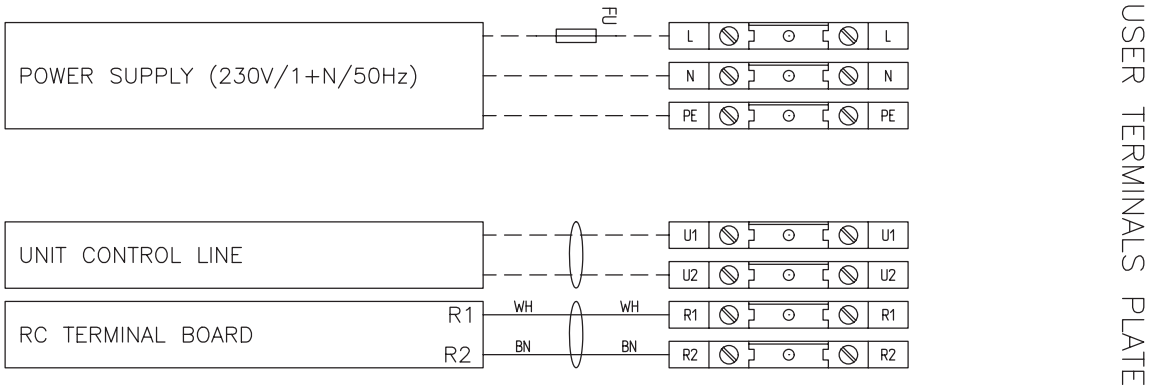
PLEASE NOTE: Wiring bridge added to Differential Pressure Switch to ensure that there is continuity of switch when connected for MT heating operation. This is needed to prevent error when in 55°C heating mode.

Wiring arrangement for standard heating and cooling mode (bridge removed)



Label added to terminal wiring block indicating wiring bridge must be removed when connected in Cooling. This is to prevent incorrect wiring / operation.

PLEASE NOTE:
To operate systems in cooling, please remove bridge (red cable) between terminals 1 & 2 of the differential pressure switch (SDP)



5 - Start-up

WARNING	The unit must be started for the first time by personnel suitably trained by one of Authorised Service Centre. Failure to meet this requirement will immediately void the warranty.
NOTE	The operations carried out by authorised personnel are limited to the start-up of the unit, and do not include any other operation on the plant, such as, for example, electrical and hydraulic connections etc.

5.1 Preliminary check

The checks listed below shall be performed before starting the unit and before the arrival of the personnel authorised.

- Check the cross-section of the power supply and grounding cables; make sure that terminals are tightened and check the correct operation of contactors, with the main switch open.
- Connect the external pump line to terminals 4 and 5 and the flow switch to terminal 2 and 3 (refer to electrical connections for details)
- Check that the components of the external water circuit (pump, user equipment, filters, power supply tank and reservoir, flow switch and filter) have been installed properly, and according to the manufacturer's instructions.
- Check the filling of the hydraulic circuits, and make sure that the fluid circulation is correct, without any trace of leaks and air bubbles. Glycol mixture must not be used.
- Check that the direction of rotation of the pumps is correct, and that fluids have been circulating for at least 12 hours.
- Adjust the liquid distribution network in such a way that the flow rate inside the Water heat exchanger is within the specified range.
- Check that the water quality is to the required specifications.

5.2 Start-up

Start-up sequence:

- Turn on the Main switch.
- Update software on the outdoor unit in case 55°C heating mode is required
- Check the operation of all the external equipment, and make sure that the control devices of the plant are properly calibrated.
- Start the pump and provide the nominal flow rate as indicated in the technical data. In order to do so, a flow meter or a differential pressure transducer across the WHE unit is needed.
- Set the desired fluid temperature on the control board.
- Calibrate the flow switch intervention as described in the accessory chapter

Initial settings

The indoor and outdoor unit control PCB utilises a semiconductor memory element (EEPROM). The settings required for operation were made at the time of shipment. If the EPROM needs to be changed, set the parameters following the next instruction:

1. Keep pressing the , and buttons simultaneously for 4 or more seconds. The "maintenance func" screen appears on the LCD display.

Maintenance func 20:30 (THU)
1. Outdoor unit error data
2. Service contact
3. RC setting mode
4. Test run
Sel. Page [ ] Confirm

2. Press the or to see each menu. If you wish to see the next screen instantly, press the or button. Select "8. detailed settings" on the LCD display and press the button.

Maintenance func 20:30 (THU)
5. Sensor info.
6. Servicing check
7. Simple settings
8. Detailed settings
Sel. Page [ ] Confirm

The "Detailed settings" screen appears on the LCD display.

Select the "Unit no." by pressing the or button for changes.

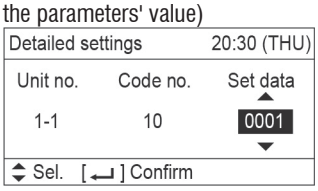
Detailed settings		20:30 (THU)
Unit no.	Code no.	Set data
1-1	10	0001
Sel. Next		

3. Select the "Code no." by pressing the or button. change the "Code no." by pressing the or button (or keeping it pressed).

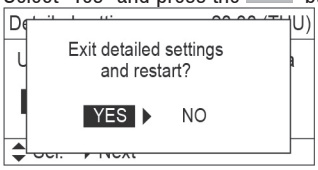
Detailed settings		20:30 (THU)
Unit no.	Code no.	Set data
1-1	10	0001
Sel. Next		

5 - Start-up

4. Select the "Set data" by pressing the ◀ or ▶ button. select one of the "Set data" by pressing the ▲ or ▼ button. then press the ↵ button. (refer to the next table for the parameters' value)



5. Select the "unit no." by pressing the ◀ or ▶ button and press the ↩ button. The "Exit detailed settings and restart?" (Detailed setting-end) screen appears on the LCD display. Select "Yes" and press the ↵ button.



Insert the following parameters in the exact order:

Model Configuration	DN	PAW-200W5APAC-1	PAW-250W5APAC-1
Initial parameters (set at shipment)			
Type	10	31(WE2)	31(WE2)
Indoor unit capacity	11	21 (22.4)	23 (25.0)
Heating intake temperature shift	06	00 (none)	00 (none)
Demand setting	0B	01 (O2)	01 (O2)
Heating preparation display	0C	01 (none)	01 (none)
Cool/heat auto	0D	01 (invalid)	01 (invalid)
Sensor valid	15	31 (all)	31 (all)
Air speed	16	00 (none)	00 (none)
Cooling Upper limit	1F	15 (15°C)	15 (15°C)
Cooling Lower limit	20	05 (5°C)	05 (5°C)
Heating Upper limit	21	50 (50°C)*	50 (50°C)*
Heating Lower limit	22	35 (35°C)	35 (35°C)
Power shut down auto ON	28	01 (valid)	01 (valid)
Indoor unit electronic control valve	2C	6 (none)	6 (none)
Operation mode	2D	10 (C/H)	10 (C/H)

* For heating only application max heating upper limit can be set to 55°C through software upload and according to water flow connection arrangement shown in 2.6 Safety labels

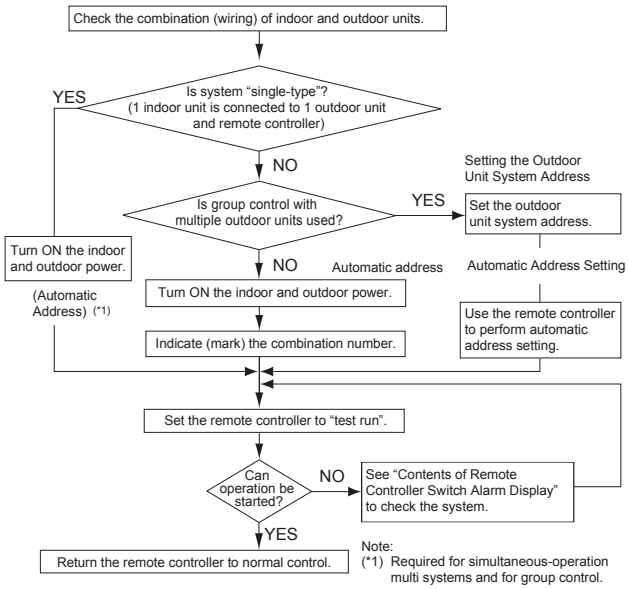
Commissioning settings

On the outdoor unit operating with WHE, always set the following parameters during commissioning**

Model Configuration	DN	PAW-200W5 APAC-1	PAW-250W5 APAC-1
On the Outdoor unit operating with WHE, set the following parameters			
Condensing Temperature lower limit	35	0 (46°C)	0 (46°C)
Condensing Temperature upper limit	36	0 (50°C)	0 (50°C)
High pressure setting for PS	4B	1 (4.15 Mpa)	1 (4.15 Mpa)

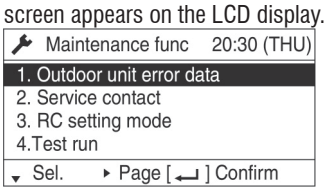
** CZ-RTC2 or CZ-RTC4 remote controllers are required for these settings

5.3 Test run procedure

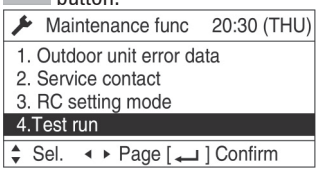


Test run using remote controller

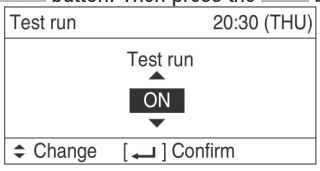
1. Keep pressing the ↩, ↵ and ▶ buttons simultaneously for 4 or more seconds. the "maintenance func" screen appears on the LCD display.



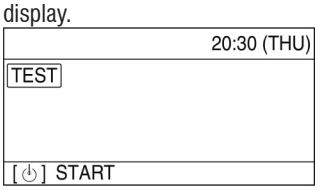
2. Press the ▲ or ▼ button to see each menu. if you wish to see the next screen instantly, press the ◀ or ▶ button. Select "4. Test run" on the LCD display and press the ↵ button.



Change the display from OFF to ON by pressing the ▲ or ▼ button. Then press the ↵ button.



3. Press the  button. "TEST" will be displayed on the LCD display.



4. Press the  button. Test run will be started. Test run setting mode screen appears on the LCD display.

To finish the test operation.

- The test operation can be performed in Heat or Cool mode.
- Temperature cannot be changed.
- The test operation mode is automatically turned off after 60 minutes. (To prevent continuous test operation)
- Outdoor units do not operate for approx. 3 minutes after the power is turned on or operation is stopped.

Attention

- Do not use this mode for purposes other than the test operation. (To prevent overload of the units)
- Read the installation instructions supplied with the units.

5.4 Checking the operation

Check the following:

- The temperature of the water entering the evaporator.
- The temperature of the water leaving the evaporator.
- The level of the water flow rate in the evaporator, if possible.

6 - Control

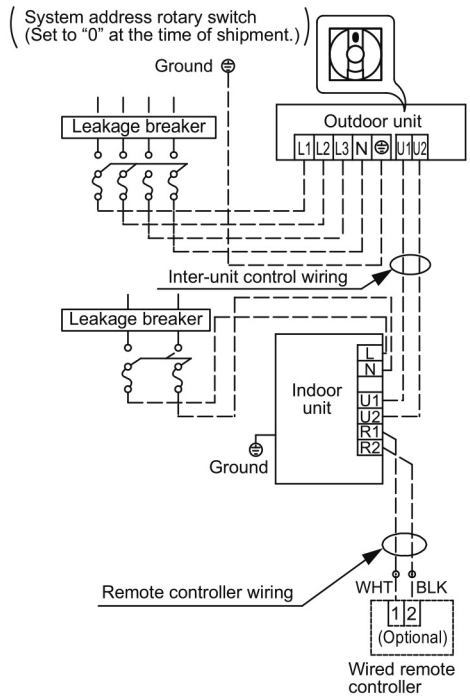
6.1 System Control

System control refers to the link wiring connection for control of simultaneous-operation multi systems, group control, and main-sub remote controller control.

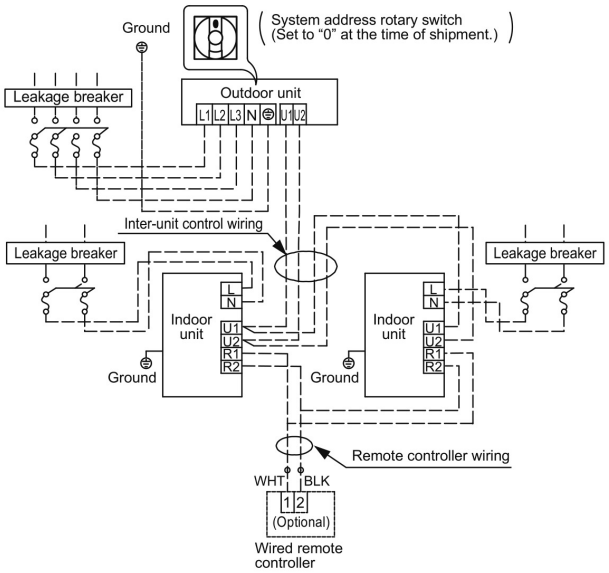
Basic wiring diagram

Be careful to avoid miswiring when connecting the wires. (Miswiring will damage the units.)(for 3-phase Outdoor unit)

Example of SINGLE type



Example of TWIN type



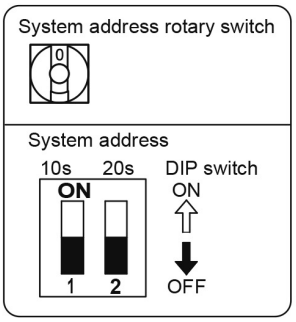
Wiring procedure:

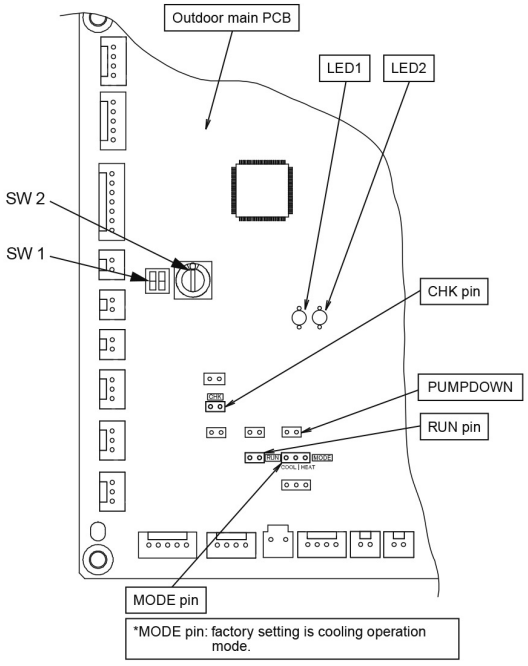
1. Connect the remote controller to the indoor unit remote controller wiring terminal plate (R1, R2). (Remote controller wiring)
2. Connect the indoor units (U1, U2) and the outdoor units (U1, U2). Connect the other outdoor units and indoor units (with different refrigerant systems) in the same way. (Inter-unit control wiring) Connect the remote controller communication wiring to the indoor units (R1, R2) for each refrigerant system. (Remote controller wiring)
3. Connect the remote controller communication wiring (2 wires) from the remote controller wiring terminal plate (R1, R2) on the indoor unit (unit where the remote controller is connected) to the remote controller terminal plates (R1, R2) on the other indoor units. (Remote controller communication wiring)
4. Turn ON both the indoor and outdoor unit power and perform automatic address setting from the remote controller.

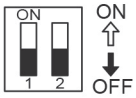
Be sure to use the indoor unit temperature sensor (body sensor) when using this control. (Status at shipment.)

Setting the Outdoor unit system addresses

System address rotary switch
(Set to "0" at time of shipment)





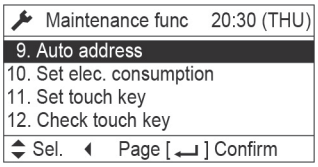
System address No.	System address 10s digit (2P DIP switch)	System address 1s place (Rotary switch)
0 Automatic address (Setting at shipment = “0”)	Both OFF 	“0” setting 
1 (If outdoor unit is No. 1)	Both OFF 	“1” setting 

Automatic address setting using the remote controller

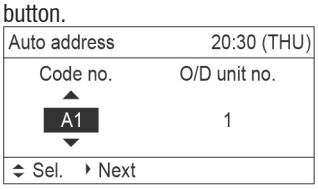
Auto Address Setting from the High-spec Wired Remote Controller (CZ-RTC5B)

1. Keep pressing the , and buttons simultaneously for 4 or more seconds. the "maintenance func" screen appears on the LCD display.

2. Press the or button to see each menu. If you wish to see the next screen instantly, press the or button. Select "9. Auto address" on the LCD display and press the button.



3. The "Auto address" screen appears on the LCD display. Change the "Code no." to "A1" by pressing the or button.



4. Select the “O/D unit no.” by pressing the or button. Select one of the “O/D unit no.” for auto address by pressing the or button. Approximately about 10 minutes are required. When auto address setting is completed, the units return to normal stopped status.

Display During Auto Address Setting

■ On the surface of outdoor unit control P.C. board

Do not short circuit the A.ADD pin again during auto address setting. LEDs 1 and 2 go out and address setting is interrupted. When auto address setting is normally completed, both LEDs 1 and 2 go out. In other cases, correct settings referring to the following table and perform auto address setting again.

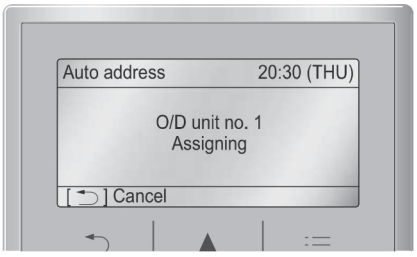
■ Contents of LEDs 1 and 2 on outdoor unit control P.C. board

☼ : Illuminating
✷ : Blinking
● : Go out

LED 1	LED 2	Contents of display
☼	☼	After turned ON power (not during auto address setting), it is entirely impossible to communicate with the indoor unit in the system.
●	☼	After turned ON power (not during auto address setting), although the indoor units more than 1 unit in the system are recognized, there are inconsistencies between the number of indoor units and setting number of indoor units.
✷	✷	Under auto address setting
Alternately		
●	●	Auto address setting completed
✷	✷	There are inconsistencies between the number of indoor units and setting number of indoor units. (at the time of auto address setting)
Simultaneously		
Alternating		After LED1 blinks M times, LED2 blinks N times. This will be repeated: • 2 Blinks - Alarm P • 3 Blinks - Alarm H • 4 Blinks - Alarm E • 5 Blinks - Alarm F • 6 Blinks - Alarm L

✷ Blink: Connect the outdoor unit maintenance remote controller to the RC plug (3P, BLU) on outdoor main unit control P.C. board and make confirmation.

■ Display of remote controller



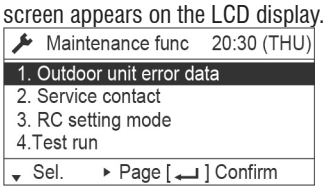
Request concerning recording the indoor/outdoor unit combination numbers.
After auto address setting has been completed, be sure to record them for future reference.
List the outdoor main unit system address and the addresses of the indoor units in that system in an easily visible location (next to the nameplate), using a permanent marker pen or similar means, that cannot be abraded easily.

6 - Control

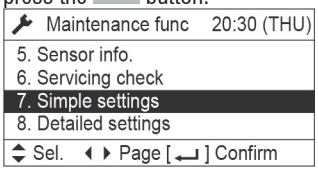
Checking the indoor unit addresses

Use the remote controller to check the indoor unit address. CZ-RTC5B (High-spec wired remote controller)

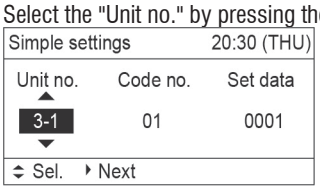
1. Keep pressing the , and buttons simultaneously for 4 or more seconds. the "maintenance func" screen appears on the LCD display.



2. Press the or button to see each menu. If you wish to see the next screen instantly, press the or button. Select "7. Simple settings" on the LCD display and press the button.



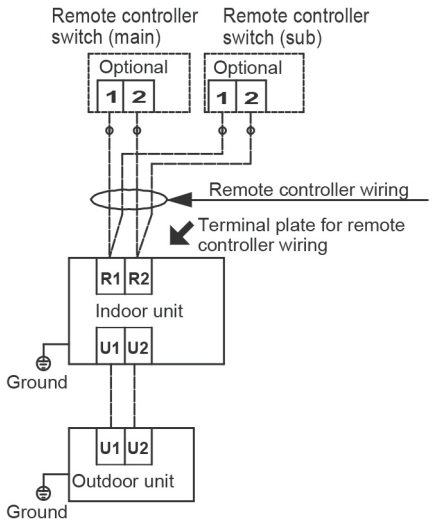
3. The "Simple settings" screen appears on the LCD display. Select the "Unit no." by pressing the or button.



Main-sub remote controller control

Control using 2 remote controller switches Main-sub remote controller control refers to the use of 2 remote controllers to control 1 or multiple indoor units. (A maximum of 2 remote controllers can be connected.)

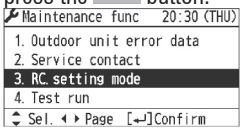
■ Connecting 2 remote controllers to control 1 Indoor unit



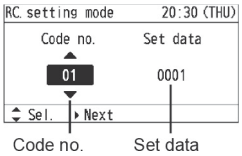
■ Remote controller setting mode (CZ-RTC5B)

1. Press and hold the , and buttons simultaneously for 4 or more seconds.

2. Press the or button to see each menu. If you wish to see the next screen instantly, press the or button. Select "3. RC settings mode" on the LCD display and press the button.



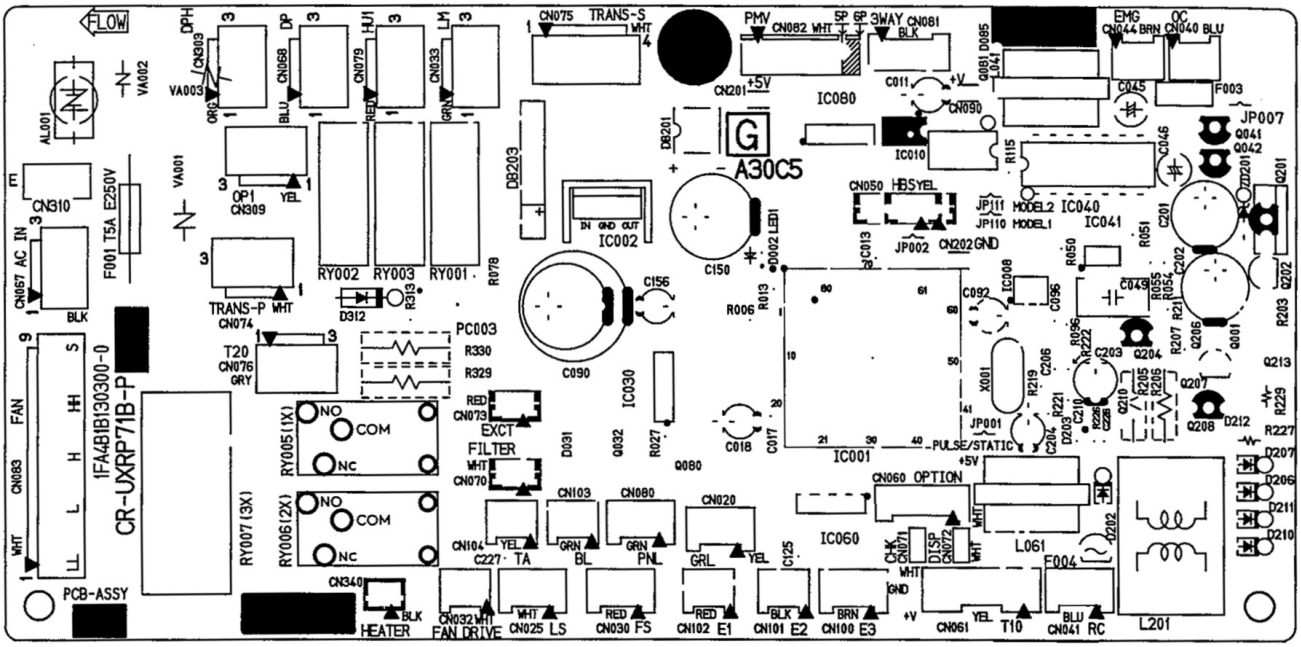
3. Select the Code no. and Set data.



4. Press , after selecting [YES] the unit restart.

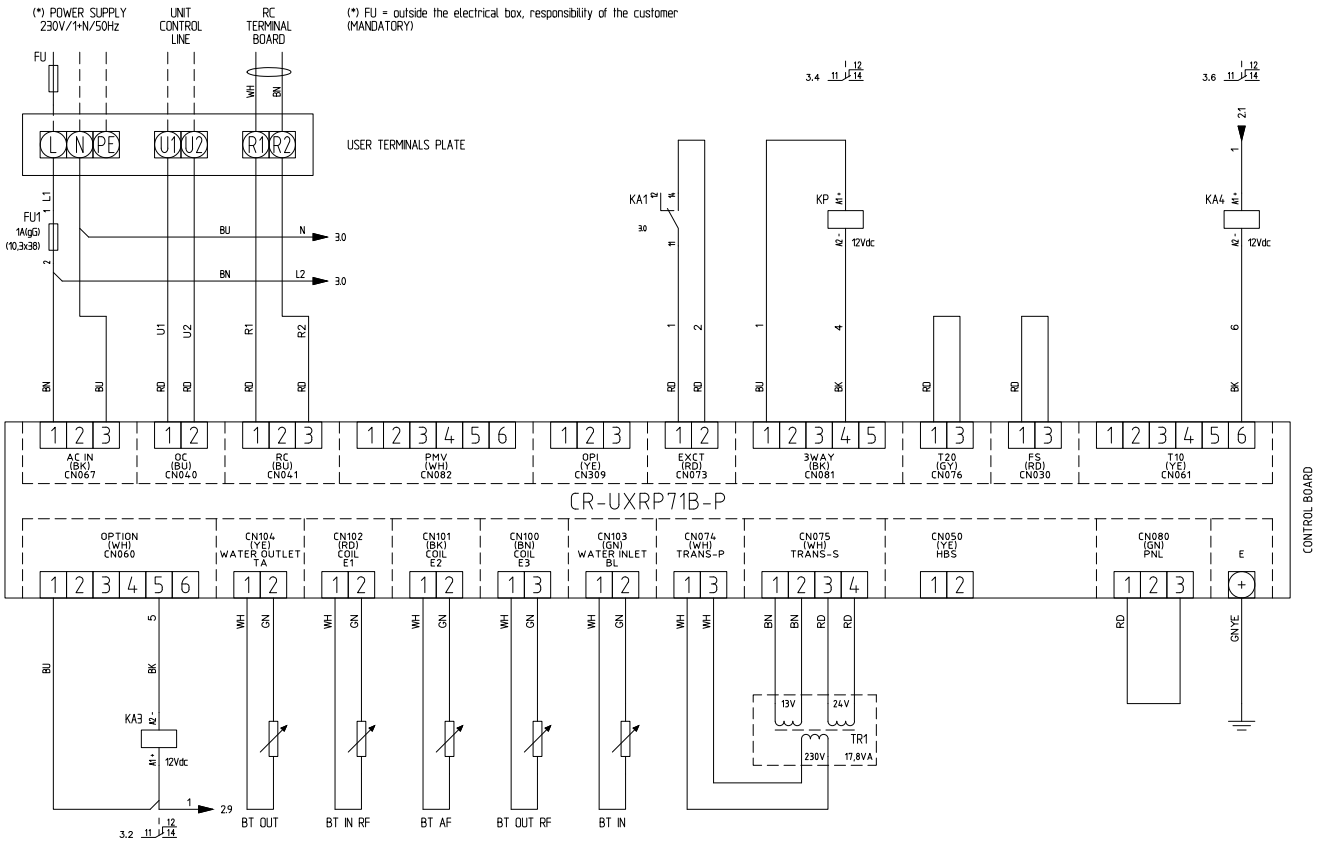
Code no.	Item	Set Data	
		0000	0001
01	Main/Sub	Sub	Main

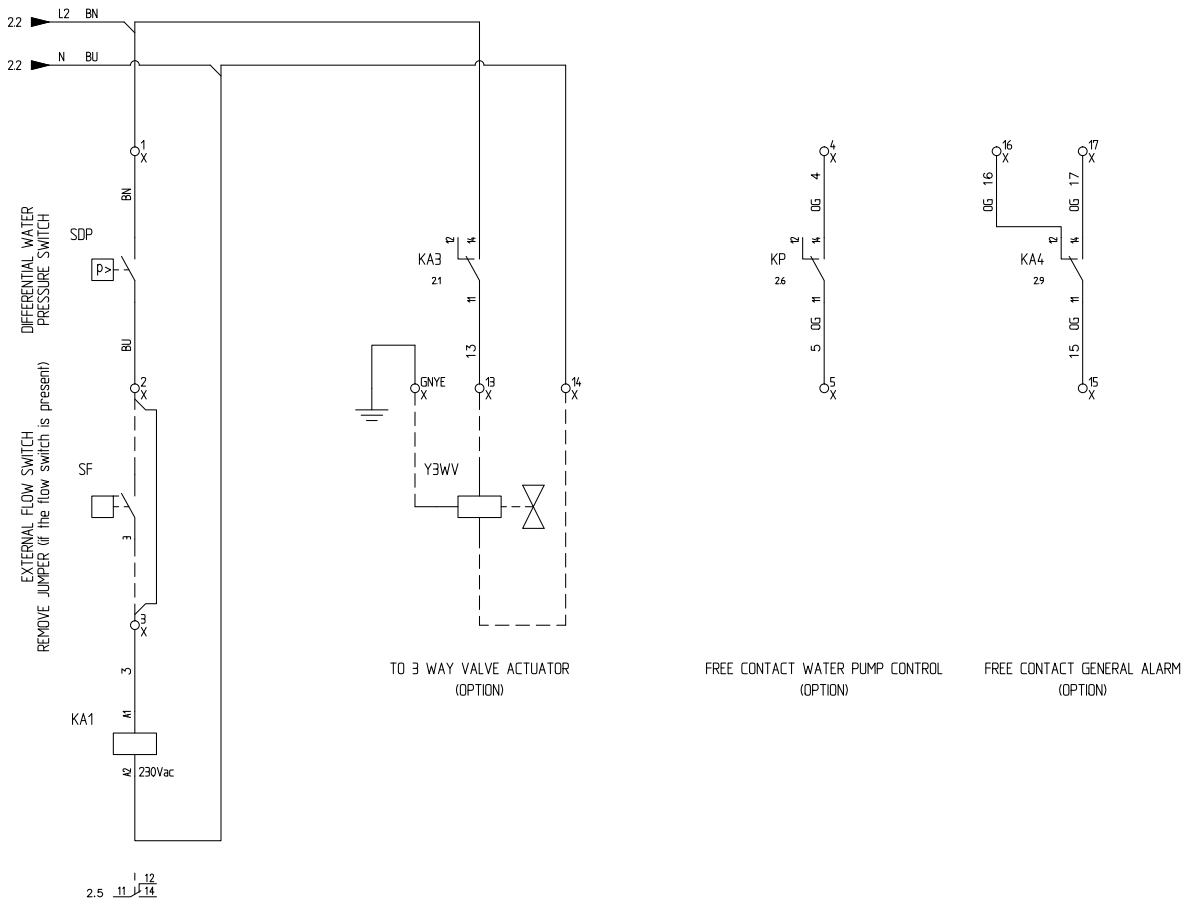
6.2 Circuit Board Controls and Connectors



6 - Control

6.3 WHE Wiring Diagram





7 - Product Description

7.1 General Information

The WHE units are intended to cool down and heat up the water required for air conditioning in residential and small commercial applications.

The units are equipped with refrigerant and hydraulic connections, as well as the internal electrical wiring required for a rapid installation on the field.

An operation test is performed after assembly, with water flowing through the plate heat exchanger, in order to test the intervention of the safety devices and, the proper sealing of pipes and joints, on both the hydraulic and the refrigerant circuit.

The refrigerating circuits of every unit is pressure tested before inspection.

Body and Frame

The base and frame of these units are made with galvanized steel elements, assembled with stainless steel screws. The top and front panel can be removed to ensure easy access to internal components. All galvanized steel parts are protected by epoxy powder paint.

Evaporators

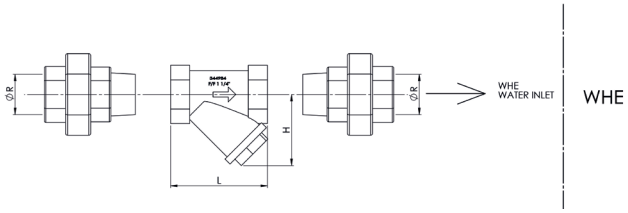
Evaporators are made of stainless steel plates. They are thermally insulated by means of a thick flexible insulating mattress with closed cells. The maximum operating pressures correspond to 10 bar for the water side and to 45 bar for the refrigerant side. Antifreeze protection for the water in the exchangers is ensured by differential pressure switch, and an antifreeze temperature sensor. The water side of these exchangers correspond to the connection to the plant by means of a 1-1/4" male threaded attachment.

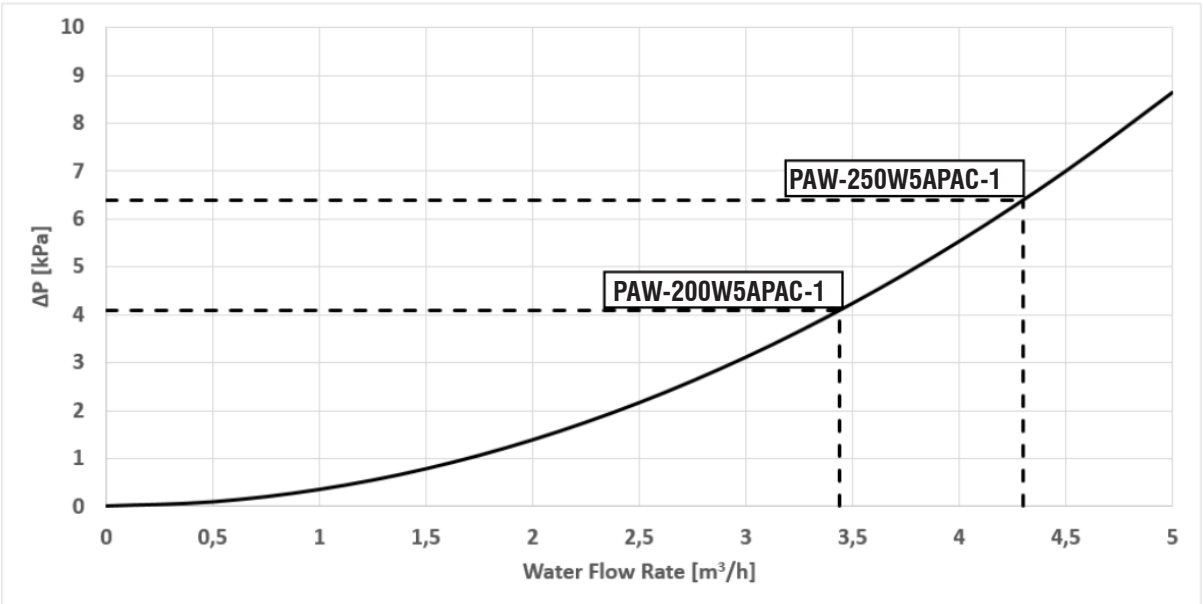
7.2 Accessories

Water Filter Kit - Part Code Number: PAW-01WFL

It is mandatory to install the supplied filter at the water inlet of the WHE

Mechanical Features	
Body material	Brass DELTA C EN1982 CB 754S
Cap material	Brass CW 617N UNI EN 12165
Sand blast finishing	
Betaflex 71 Body Gasket	
Threading to ISO 228/1	
Rhomboidal flattened sheet stainless steel AISI 304 strainer	
Technical features	
Hole Pitch	2 mm
Inscribed Hole Diameter	500 micron
Holes per cm^2	80
Holes % on total surface	48%
Working pressure	PN 20
Leading dimensions	
Nominal Diameter	DN 32
R" (EN10226)	Rp 1 1/4
L	96 mm
H	68 mm
Pressure drops (see graph for pressure drops at nominal flow rate)	
Kv	17





7 - Product Description

Flow Switch Kit - Part Code Number: PAW-01WFS

It is mandatory to install the supplied flow switch kit at the outlet of the WHE

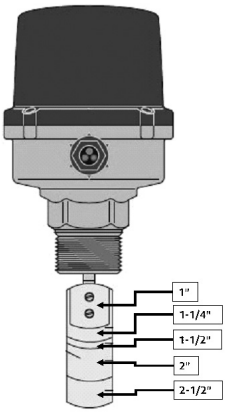
Technical Features	
Connection size	1" NPT male
Max operating pressure	10 bar
Max temperature of the fluid	120°C
Min temperature of the fluid	-30°C
Max ambient temperature	55°C
Electrical Data	
Max Voltage	250 Vac
Current	15 A
Electrical connection	1/2" NPT threaded
Protection class	IP54
Leading Dimensions	
L	200 mm
H	165 mm
R1" (EN10226)	Rp 1 1/4
R2" (EN10226)	Rp 1
Pressure drops (see graph for pressure drops at nominal flow rate)	
Kv	21

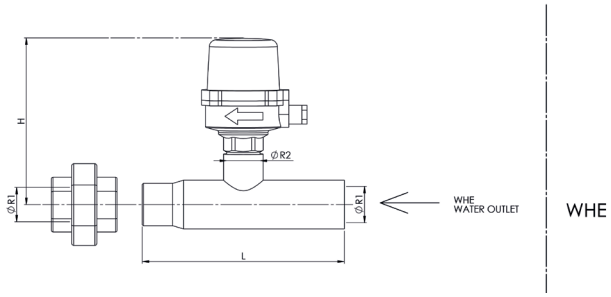
NOTE

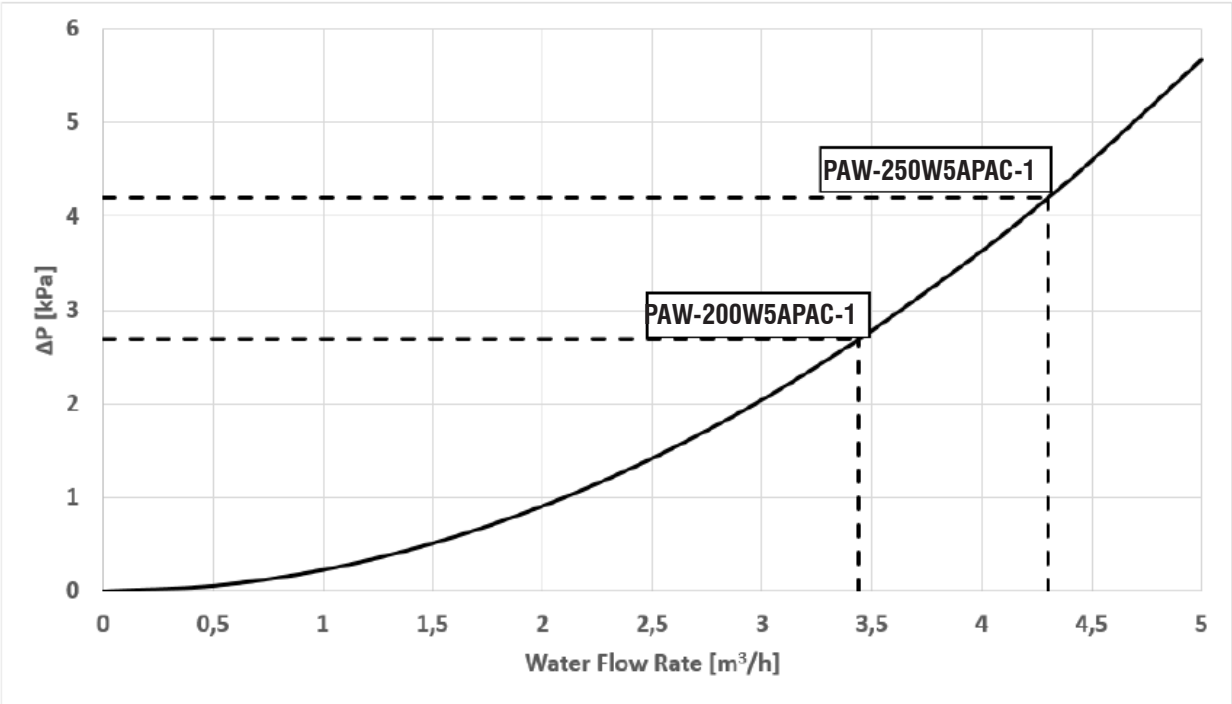
Install the flow switch horizontally as indicated in the figure

WARNING

Use the 1-1/4" paddle and completely screw the flow switch.
Always assure that the flow switch is oriented with the arrow in the direction of the flow







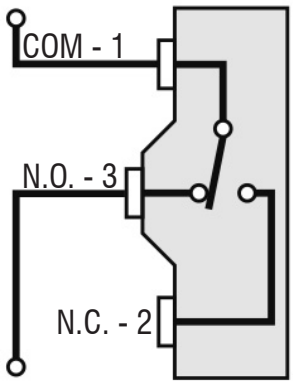
7 - Product Description

Electrical connections

Connect the flow switch as indicated in the figure below:

Connect the common (1) free contact and the Normally Open (3) free contact and the Ground line to the terminal plate

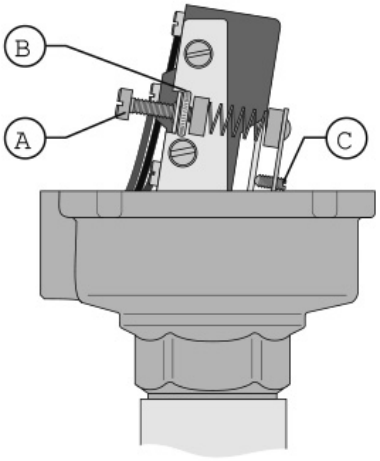
See the electrical terminal plate layout for more information



Calibration

The flow switch must be calibrated on site. It is delivered uncalibrated. The advised calibration flow rate is shown in the table below.

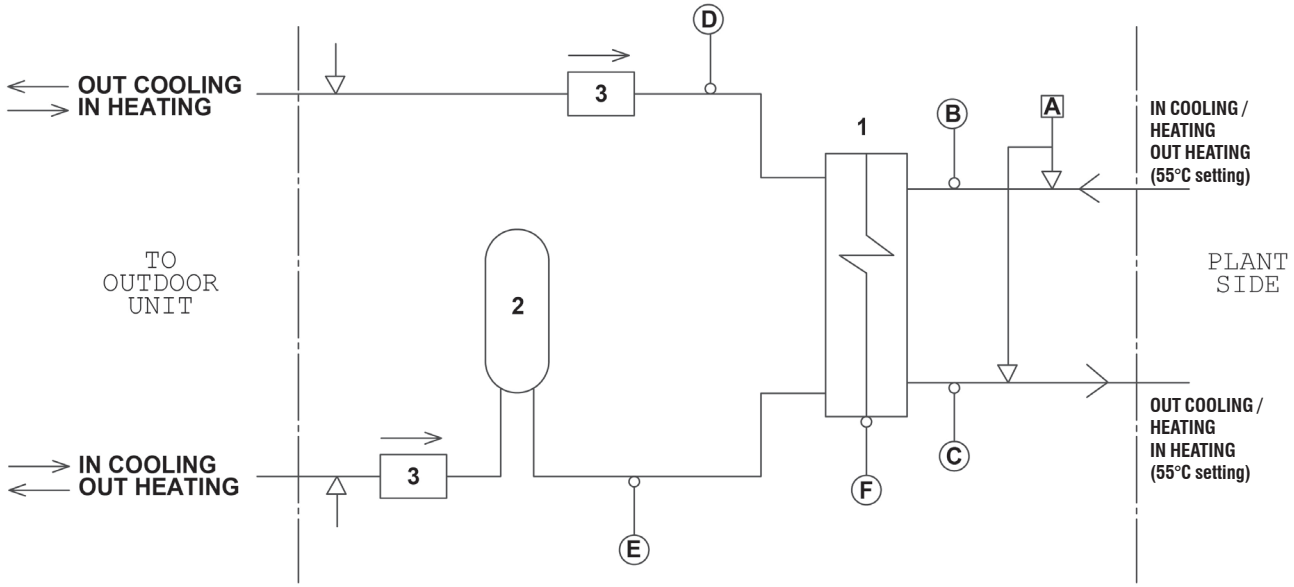
Adjustments should be carried out as follows: turn the calibration screw (A) in a clockwise direction for the contacts to close at higher flow rate values or in a counterclockwise direction for lower flow rate values. When the adjustment has been made lock the screw (A) with the locking ring nut (B). Avoid all contact with the presetting screw (C). An incorrect setting would seriously impair the operation of the switch.



PAW W5APAC-1		200	250
Advised calibration flow rate	m^3/h	2.0	2.5

7 - Product Description

7.3 Circuit diagram



COMPONENTS	
1	Plate heat exchanger
2	Liquid receiver
3	Strainers*

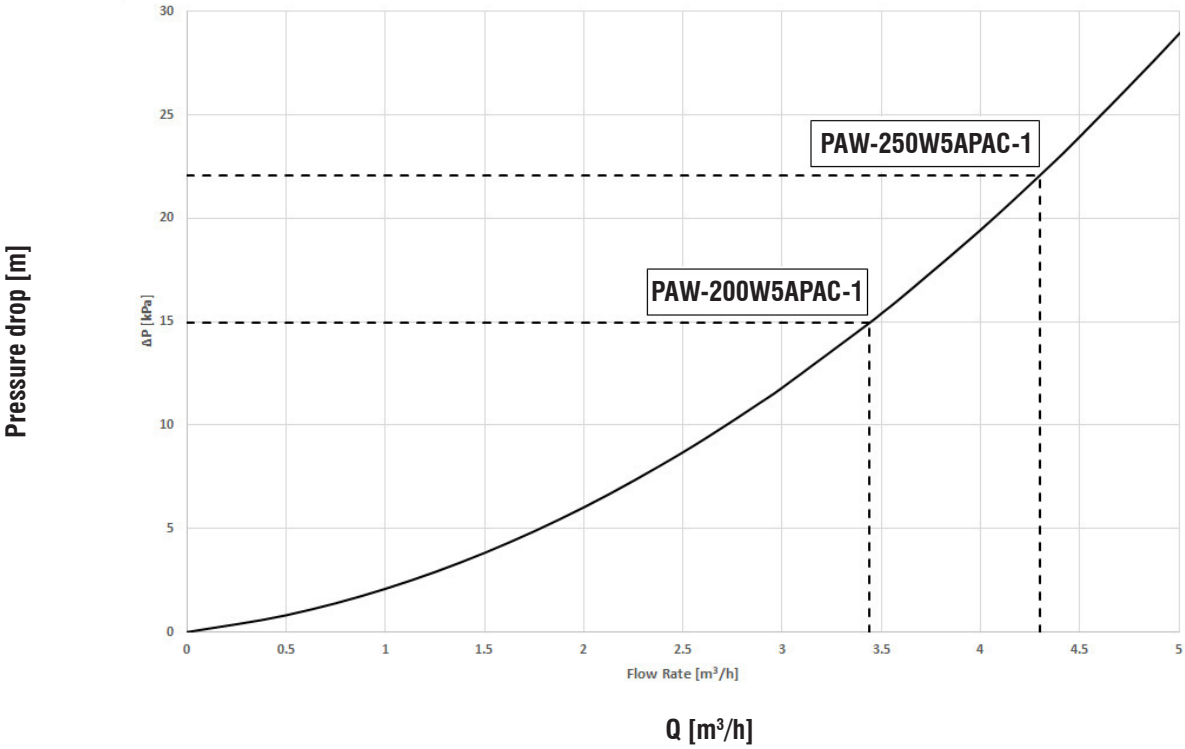
* Refrigerant strainers can work in both flow directions.

SAFETY/CONTROL DEVICES	
A	Water differential pressure switch
B	Inlet water temperature sensor
C	Outlet water temperature sensor
D	Refrigerant probe
E	Refrigerant probe
F	Antifreeze probe
—·-·—	Unit side
o	Probes
	Pressure pipe connection with Schrader valve

8 - Technical Data

8.1 Hydraulic features

WHE Evaporator Water Pressure Drop



NOTE	The Available pressure head, at the exit of the WHE, is calculated by: **Available Head = Pump Static Pressure - WHE Total Pressure Drop** The external water circuit must be dimensioned accordingly The WHE Total Pressure Drop is the sum of the evaporator pressure drop, filter pressure drop and flow switch pressure drop (refer to accessory chapter for information)

8.2 Envelope

PAW-xxx5WAPAC-1 operating limit condition		Indoor Water Leaving Water Temperature, LWT °C	Outdoor Air Temperature, OAT °C
Cooling mode	min	5	-15
	max	15	46
Heating mode	min	35	-20
	max	50*	24

* For heating only application max heating upper limit can be set to 55°C through software upload and according to flow connection shown in 2.6 Safety labels

WARNING	The minimum evaporating temperature allowed in cooling mode on the refrigerant side is -2°C Lower evaporating temperature could cause freezing in the plate heat exchanger

8 - Technical Data

8.3 Physical data

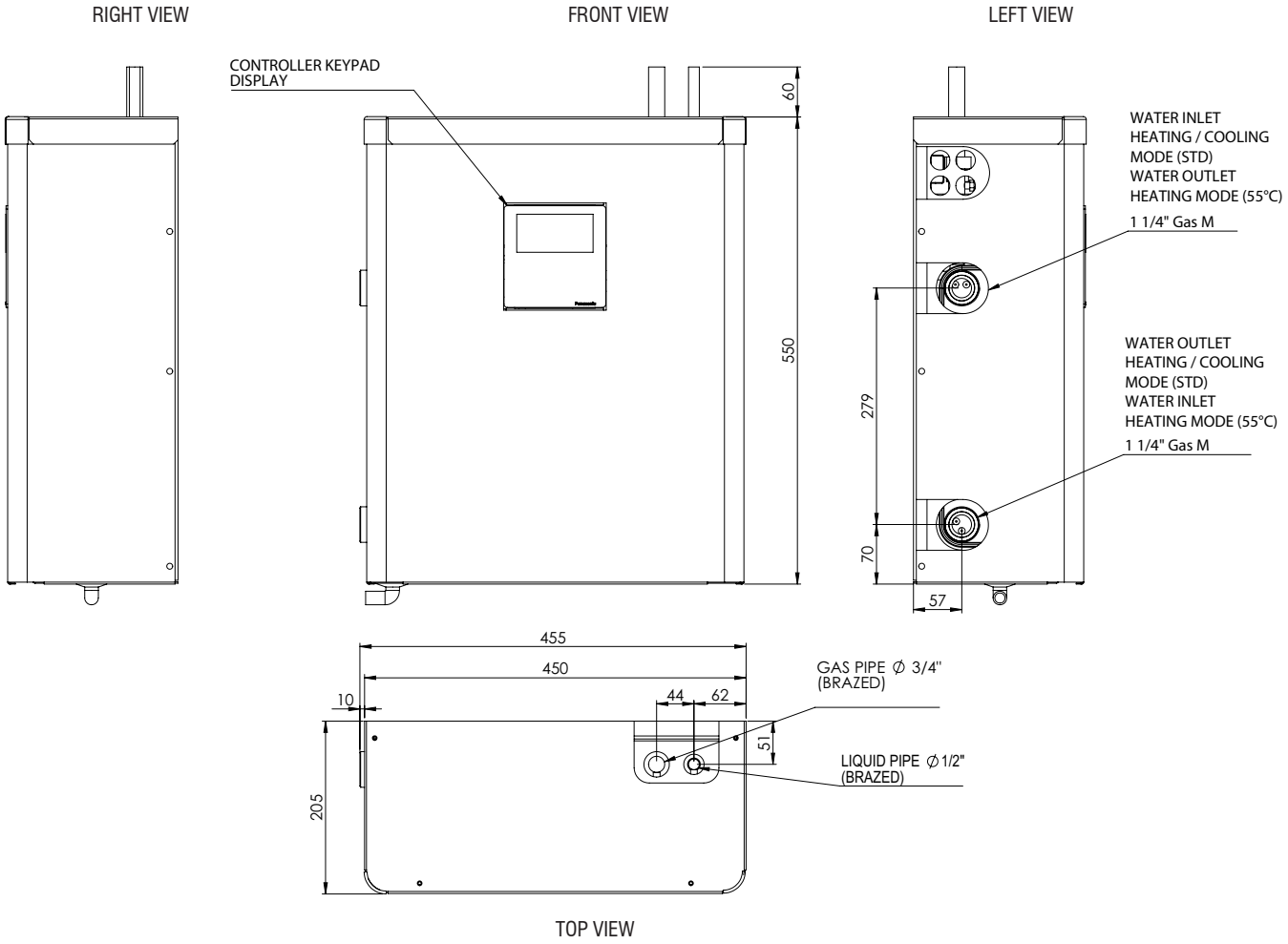
WHE Units

PAW-xxxW5APAC-1		200	250
Power supply	V/ph/Hz	230V/1+N/50Hz	
Number of refrigerant circuits		1	1
REFRIGERANT			
Type		R32	
CAPACITY			
Nominal Cooling Capacity	kW	20	25
Nominal Heating Capacity	kW	23	28
EVAPORATOR			
Type		Plate	
Number		1	1
Water flow rate (cooling ΔT 5K)	m^3/h	3,45	4,30
Water flow rate (heating ΔT 5K)	m^3/h	4,15	4,85
Minimum flow rate	m^3/h	2,00	2,50
Maximum flow rate	m^3/h	6,80	8,00
Pressure drop	kPa	Refer to Hydraulic features	
HYDRAULIC CONNECTIONS (EVAPORATOR)			
Type		Threaded male	
Inlet diameter	inch	1-1/4"	1-1/4"
Outlet diameter	inch	1-1/4"	1-1/4"
WEIGHT			
Shipping weight	kg	35 (including flow switch kit and filter kit)	
Operating weight	kg	27	
DIMENSIONS			
Length	mm	455	
Width	mm	205	
Height	mm	550	

8.4 Electrical data

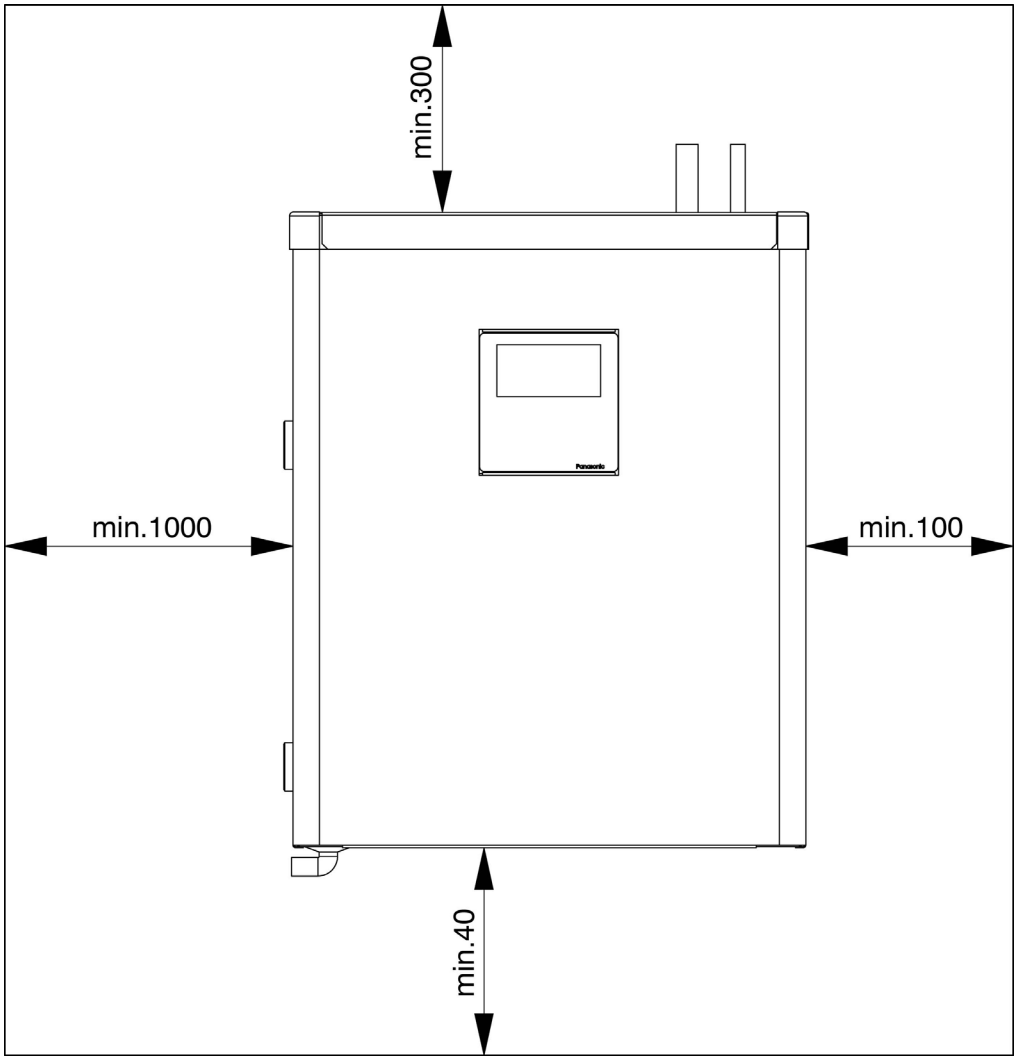
U-xxxPZH2E8		250	500
Rated voltage	V/ph/Hz	230V/1+N/50Hz	
Max. absorbed power	kW	0,024	
Max. current FLA	A	0,1	
External fuses	A	1	
Max. cable cross-section	mm^2	2,5	
CONTROL WIRING			
Inter-unit control wiring	mm^2	0,75 (shielded)	
Remote controller wiring	mm^2	0,75 (shielded)	

8.5 Dimensional Drawings - WHE



8 - Technical Data

8.6 Space Requirements (mm)



8 - Technical Data

8.7 Capacity table

Cooling mode

Cooling Mode	Leaving Water Temperature	Outdoor Air Intake Temperature °C														
		-15			-10			-5			0			5		
MODEL	°C	CC kW	PI kW	EER -	CC kW	PI kW	EER -	CC kW	PI kW	EER -	CC kW	PI kW	EER -	CC kW	PI kW	EER -
U-200PZH2E8	7	21,4	3,24	6,61	21,0	3,28	6,39	20,5	3,65	5,62	20,0	3,73	5,36	21,6	3,81	5,68
PAW-200W5APAC-1	10	22,4	3,17	7,06	22,0	3,21	6,83	21,5	3,59	6,00	21,0	3,66	5,73	22,6	3,74	6,04
U-250PZH2E8	7	27,8	4,41	6,31	27,3	4,47	6,10	26,7	4,97	5,37	26,0	5,08	5,12	28,1	5,19	5,42
PAW-250W5APAC-1	10	29,1	4,32	6,74	28,6	4,38	6,52	28,0	4,88	5,73	27,3	4,99	5,47	29,4	5,10	5,77

Cooling Mode	Leaving Water Temperature	Outdoor Air Intake Temperature °C											
		10			15			20			25		
MODEL	°C	CC kW	PI kW	EER -	CC kW	PI kW	EER -	CC kW	PI kW	EER -	CC kW	PI kW	EER -
U-200PZH2E8	7	21,2	3,89	5,46	20,9	3,97	5,26	22,4	5,48	4,09	21,7	6,14	3,54
PAW-200W5APAC-1	10	22,2	3,82	5,82	21,9	3,90	5,61	23,4	5,41	4,33	22,7	6,07	3,75
U-250PZH2E8	7	27,6	5,29	5,22	27,1	5,40	5,02	29,2	7,46	3,91	28,3	8,35	3,38
PAW-250W5APAC-1	10	28,9	5,20	5,56	28,4	5,31	5,35	30,5	7,37	4,13	29,6	8,26	3,58

Cooling Mode	Leaving Water Temperature	Outdoor Air Intake Temperature °C											
		30			35			40			46		
MODEL	°C	CC kW	PI kW	EER -	CC kW	PI kW	EER -	CC kW	PI kW	EER -	CC kW	PI kW	EER -
U-200PZH2E8	7	21,5	6,74	3,18	20,0	6,61	3,03	17,9	6,14	2,91	17,0	5,82	2,92
PAW-200W5APAC-1	10	22,5	6,68	3,36	21,0	6,54	3,21	18,9	6,07	3,11	18,0	5,75	3,13
U-250PZH2E8	7	27,9	9,18	3,04	26,0	9,00	2,89	23,2	8,35	2,78	22,1	7,92	2,79
PAW-250W5APAC-1	10	29,2	9,09	3,21	27,3	8,91	3,06	24,5	8,26	2,97	23,4	7,83	2,99

Heating mode - LT

Heating Mode	Leaving Water Temperature	Outdoor Air Intake Temperature °C														
		-20			-15			-10			-5			0		
MODEL	°C	HC kW	PI kW	COP -	HC kW	PI kW	COP -	HC kW	PI kW	COP -	HC kW	PI kW	COP -	HC kW	PI kW	COP -
U-200PZH2E8	45	12,7	6,53	1,95	13,9	6,91	2,01	16,6	7,30	2,27	19,9	7,37	2,70	22,7	7,45	3,04
PAW-200W5APAC-1	35	13,3	6,50	2,04	14,6	6,86	2,12	17,2	7,22	2,39	20,7	7,30	2,84	25,2	7,37	3,41
U-250PZH2E8	45	15,2	7,84	1,93	16,6	8,31	1,99	19,7	8,77	2,25	23,7	8,86	2,68	27,0	8,96	3,01
PAW-250W5APAC-1	35	15,8	7,81	2,02	17,4	8,24	2,11	20,5	8,67	2,37	24,7	8,77	2,81	30,0	8,86	3,38

Heating Mode	Leaving Water Temperature	Outdoor Air Intake Temperature °C											
		7			15			20			24		
MODEL	°C	HC kW	PI kW	COP -	HC kW	PI kW	COP -	HC kW	PI kW	COP -	HC kW	PI kW	COP -
U-200PZH2E8	45	23,9	8,01	2,98	22,5	5,48	4,11	22,2	5,12	4,33	21,9	4,84	4,53
PAW-200W5APAC-1	35	26,5	7,93	3,34	25,2	5,40	4,66	24,8	5,04	4,93	24,6	4,76	5,17
U-250PZH2E8	45	28,4	9,63	2,95	26,8	6,56	4,07	26,4	6,16	4,29	26,1	5,81	4,49
PAW-250W5APAC-1	35	31,6	9,53	3,31	30,0	6,49	4,62	29,6	6,06	4,88	29,3	5,72	5,12

8 - Technical Data

Heating mode - MT

Heating Mode	Leaving Water Temperature	Outdoor Air Intake Temperature °C														
		-20			-15			-10			-5			0		
MODEL	°C	HC kW	PI kW	COP -	HC kW	PI kW	COP -	HC kW	PI kW	COP -	HC kW	PI kW	COP -	HC kW	PI kW	COP -
U-200PZH2E8 PAW-200W5APAC-1	35	13,8	6,38	2,17	15,6	6,63	2,35	17,3	6,87	2,52	19,1	7,12	2,68	20,8	7,37	2,82
	40	12,9	6,63	1,95	14,8	6,84	2,17	16,7	7,06	2,37	18,5	7,31	2,54	20,3	7,56	2,68
	45	11,9	6,89	1,74	14,1	7,06	1,99	16,1	7,25	2,23	18,0	7,50	2,40	19,8	7,75	2,55
	50	8,3	7,01	1,18	10,3	7,20	1,42	12,2	7,40	1,65	15,5	7,69	2,02	18,7	7,92	2,35
	55	4,6	7,13	0,65	6,5	7,34	0,88	8,3	7,55	1,10	13,0	7,87	1,65	17,5	8,09	2,17
U-250PZH2E8 PAW-250W5APAC-1	35	16,1	7,42	2,17	18,1	7,70	2,35	20,2	7,99	2,52	22,2	8,28	2,68	24,2	8,57	2,82
	40	15,0	7,63	1,97	17,2	7,92	2,18	19,5	8,21	2,37	21,6	8,50	2,54	23,6	8,79	2,68
	45	13,9	7,85	1,78	16,4	8,14	2,01	18,8	8,43	2,23	20,9	8,72	2,40	22,9	9,01	2,55
	50	9,7	8,14	1,19	12,7	8,40	1,52	14,3	8,67	1,65	18,0	8,94	2,02	21,7	9,21	2,35
	55	5,4	8,42	0,65	9,1	8,67	1,05	9,9	8,91	1,11	15,1	9,16	1,65	20,4	9,40	2,17

Heating Mode	Leaving Water Temperature	Outdoor Air Intake Temperature °C											
		7			15			20			24		
MODEL	°C	HC kW	PI kW	COP -	HC kW	PI kW	COP -	HC kW	PI kW	COP -	HC kW	PI kW	COP -
U-200PZH2E8 PAW-200W5APAC-1	35	23,5	7,56	3,11	27,1	6,66	4,07	26,8	6,36	4,22	26,7	6,12	4,36
	40	22,9	7,75	2,96	26,4	6,91	3,83	26,8	6,61	4,06	26,0	6,38	4,08
	45	22,4	7,94	2,82	25,8	7,15	3,61	26,8	6,86	3,91	25,4	6,63	3,82
	50	21,5	8,03	2,68	25,3	7,43	3,40	26,8	7,17	3,74	24,8	6,92	3,59
	55	20,6	8,13	2,54	24,7	7,71	3,21	26,8	7,49	3,58	24,3	7,21	3,37
U-250PZH2E8 PAW-250W5APAC-1	35	27,3	8,79	3,11	31,4	7,75	4,05	31,2	7,40	4,22	31,0	7,12	4,36
	40	26,7	9,01	2,96	30,6	8,03	3,81	30,4	7,69	3,96	30,3	7,42	4,08
	45	26,0	9,23	2,82	29,9	8,31	3,59	29,7	7,98	3,72	29,5	7,71	3,82
	50	25,0	9,34	2,68	29,3	8,64	3,39	29,0	8,34	3,48	28,9	8,05	3,59
	55	24,0	9,45	2,54	28,7	8,97	3,19	28,4	8,71	3,26	28,2	8,38	3,37

8 - Technical Data

8.8 Performance Specifications

Heating LT
Indoor Unit PAW-200W5APAC-1
Outdoor Unit U-200PZH2E8

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output Design load for heating	Prated (Pdesign)	17	kW	Seasonal space heating energy efficiency	$\eta_{s,h}$	178	%
Declared capacity for heating for part load at indoor temperature 20°C and outdoor temperature Tj				**Declared COP for part load at indoor temperature 20°C and outdoor temperature Tj**			
Tj = -7°C	Pdh	15,22	kW	Tj = -7°C	COP	2,93	- or %
Tj = +2°C	Pdh	9,26	kW	Tj = +2°C	COP	4,17	- or %
Tj = +7°C	Pdh	5,95	kW	Tj = +7°C	COP	6,40	- or %
Tj = +12°C	Pdh	4,95	kW	Tj = +12°C	COP	8,59	- or %
Tj = bivalent temperature	Pdh	17,20	kW	Tj = bivalent temperature	COP	2,10	- or %
Tj = operation limit temperature	Pdh	13,43	kW	Tj = operation limit temperature	COP	1,70	- or %
Tj = -15°C (if TOL is < -20 °C)	Pdh	-	kW	Tj = -15°C (if TOL is < -20 °C)	COP	-	- or %
Bivalent temperature	Tbiv	-10	°C	Operation Limit temperature	TOL	-20	°C
Degradation co-efficient	Cdh	0,9	-	-			
Power consumption in modes other than active mode							
Off mode	POFF	0,028	kW				
Thermostat off mode	PTO	0,130	kW	-			
Standby mode	PSB	0,028	kW				
Crankcase heater mode	PCK	0,009	kW				
Other Items				**Other Items**			
Sound power level (outdoor)	LWA	49 / 79	dB	Rated air flow rate, outdoors	-	9.840	m^3/h
Emission of Nox	Nox	-	mg/kWh	-			
Annual (eletrical) energy consumption	QHE	7.837	kWh				

8 - Technical Data

Heating MT
Indoor Unit PAW-200W5APAC-1
Outdoor Unit U-200PZH2E8

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output Design load for heating	Prated (Pdesign)	15,25	kW	Seasonal space heating energy efficiency	$\eta_{s,h}$	122,32	%
Declared capacity for heating for part load at indoor temperature 20°C and outdoor temperature Tj				**Declared COP for part load at indoor temperature 20°C and outdoor temperature Tj**			
Tj = -7°C	Pdh	13,57	kW	Tj = -7°C	COP	1,97	- or %
Tj = +2°C	Pdh	8,38	kW	Tj = +2°C	COP	2,99	- or %
Tj = +7°C	Pdh	5,44	kW	Tj = +7°C	COP	4,25	- or %
Tj = +12°C	Pdh	4,62	kW	Tj = +12°C	COP	6,37	- or %
Tj = bivalent temperature	Pdh	13,57	kW	Tj = bivalent temperature	COP	1,97	- or %
Tj = operation limit temperature	Pdh	8,2	kW	Tj = operation limit temperature	COP	1,09	- or %
Tj = -15°C (if TOL is < -20 °C)	Pdh	-	kW	Tj = -15°C (if TOL is < -20 °C)	COP	-	- or %
Bivalent temperature	Tbiv	-7	°C	Operation Limit temperature	TOL	-20	°C
Degradation co-efficient	Cdh	0,9	-	-			
Power consumption in modes other than active mode				-			
Off mode	POFF	0,028	kW				
Thermostat off mode	PTO	0,130	kW				
Standby mode	PSB	0,028	kW				
Crankcase heater mode	PCK	0,009	kW				
Other Items				**Other Items**			
Sound power level (outdoor)	LWA	79	dB	Rated air flow rate, outdoors	-	9.840	m^3/h
Emission of Nox	Nox	-	mg/kWh	-			
Annual (eletrical) energy consumption	QHE	10.072	kWh				

8 - Technical Data

Heating LT
Indoor Unit PAW-250W5APAC-1
Outdoor Unit U-250PZH2E8

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output Design load for heating	Prated (Pdesign)	21	kW	Seasonal space heating energy efficiency	$\eta_{s,h}$	178	%
Declared capacity for heating for part load at LWT = 45°C and outdoor temperature Tj				**Declared COP for part load at LWT = 45°C and outdoor temperature Tj**			
Tj = -7°C	Pdh	18,13	kW	Tj = -7°C	COP	2,90	- or %
Tj = +2°C	Pdh	11,04	kW	Tj = +2°C	COP	4,13	- or %
Tj = +7°C	Pdh	7,10	kW	Tj = +7°C	COP	6,39	- or %
Tj = +12°C	Pdh	6,19	kW	Tj = +12°C	COP	8,96	- or %
Tj = bivalent temperature	Pdh	20,50	kW	Tj = bivalent temperature	COP	2,08	- or %
Tj = operation limit temperature	Pdh	15,20	kW	Tj = operation limit temperature	COP	1,72	- or %
Tj = -15°C (if TOL is < -20 °C)	Pdh	-	kW	Tj = -15°C (if TOL is < -20 °C)	COP	-	- or %
Bivalent temperature	Tbiv	-10	°C	Operation Limit temperature	TOL	-20	°C
Degradation co-efficient	Cdh	0,90	-	-			
Power consumption in modes other than active mode							
Off mode	POFF	0,028	kW	-			
Thermostat off mode	PTO	0,130	kW				
Standby mode	PSB	0,028	kW				
Crankcase heater mode	PCK	0,009	kW				
Other Items				**Other Items**			
Sound power level (outdoor)	LWA	49 / 82	dB	Rated air flow rate, outdoors	-	9.600	m^3/h
Emission of Nox	Nox	-	mg/kWh	-			
Annual (eletrical) energy consumption	QHE	9.379	kWh				

8 - Technical Data

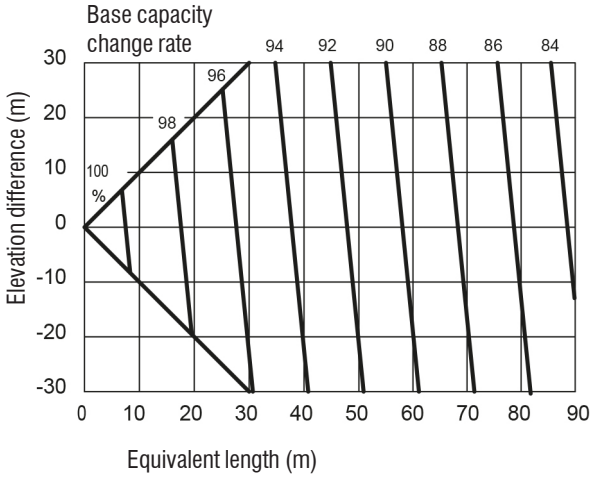
Heating MT
Indoor Unit PAW-250W5APAC-1
Outdoor Unit U-250PZH2E8

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output Design load for heating	Prated (Pdesign)	18,7	kW	Seasonal space heating energy efficiency	$\eta_{s,h}$	124,26	%
Declared capacity for heating for part load at LWT = 45°C and outdoor temperature Tj				**Declared COP for part load at LWT = 45°C and outdoor temperature Tj**			
Tj = -7°C	Pdh	16,50	kW	Tj = -7°C	COP	1,99	- or %
Tj = +2°C	Pdh	10,08	kW	Tj = +2°C	COP	2,99	- or %
Tj = +7°C	Pdh	6,87	kW	Tj = +7°C	COP	4,49	- or %
Tj = +12°C	Pdh	5,78	kW	Tj = +12°C	COP	6,64	- or %
Tj = bivalent temperature	Pdh	16,5	kW	Tj = bivalent temperature	COP	1,99	- or %
Tj = operation limit temperature	Pdh	9,28	kW	Tj = operation limit temperature	COP	1,10	- or %
Tj = -15°C (if TOL is < -20 °C)	Pdh	-	kW	Tj = -15°C (if TOL is < -20 °C)	COP	-	- or %
Bivalent temperature	Tbiv	-7	°C	Operation Limit temperature	TOL	-20	°C
Degradation co-efficient	Cdh	0,90	-	-			
Power consumption in modes other than active mode							
Off mode	POFF	0,028	kW	-			
Thermostat off mode	PTO	0,130	kW				
Standby mode	PSB	0,028	kW				
Crankcase heater mode	PCK	0,009	kW				
Other Items				**Other Items**			
Sound power level (outdoor)	LWA	82	dB	Rated air flow rate, outdoors	-	9.600	m^3/h
Emission of Nox	Nox	-	mg/kWh	-			
Annual (eletrical) energy consumption	QHE	12.167	kWh				

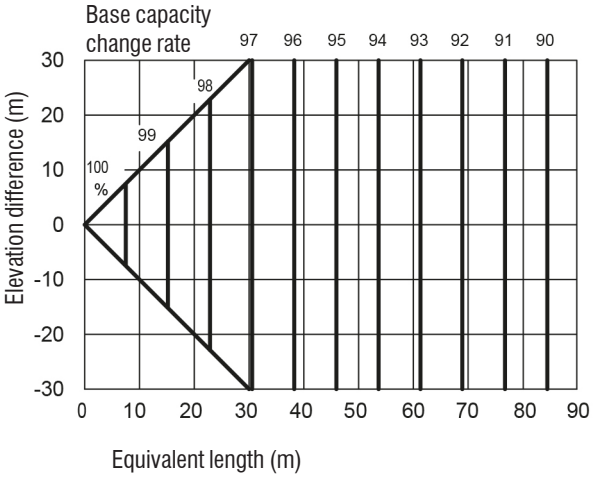
8.9 Performance correction factor due to equivalent pipes length and height of installation

U-200PZH2E8 (For 50 Hz)
PAW-200W5APAC-1

Cooling

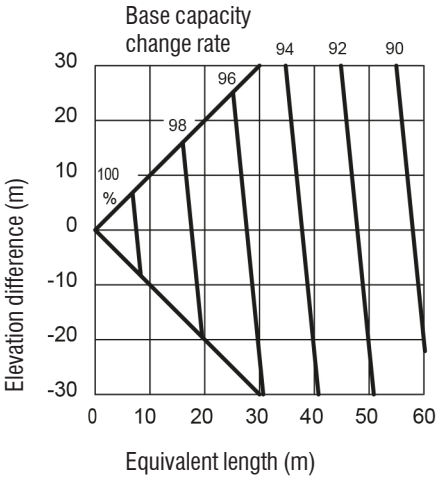


Heating

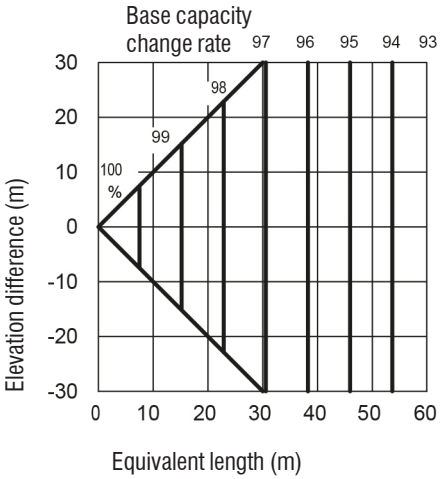


U-250PZH2E8 (For 50 Hz)
PAW-250W5APAC-1

Cooling



Heating



9 - Maintenance

Carefully read the "Safety" section of this manual before carrying out any maintenance operations.

Do not discharge the refrigerant into the atmosphere while the refrigeration circuits are being drained. Use appropriate recovery equipment. When the recovered refrigerant cannot be re-used, dispose of it in safely, in accordance with EU and local legislation.

Unless otherwise specified, the operations described below may be carried out only by a trained maintenance operator.

9.1 General requirements

Units have been designed for continuous operation, providing that they are subjected to regular maintenance, within the limits specified in this manual. Each unit must be serviced according to the programme by the User/Customer, and must be inspected at regular intervals by the personnel of an authorised Service Center.

It is the responsibility of the User to meet these maintenance requirements and/or to enter into an agreement with an authorised Service Center, so as to properly safeguard the operation of the appliance.

During the warranty period, in case of damage or failures caused by improper maintenance, manufacturer will not refund the costs incurred to repair the appliance in its original state.

9.2 Planned maintenance

Maintenance inspections must be carried out according to the program below, by a qualified person.

As a general rule, units cannot be repaired directly by the user, who shall not try to service or repair any failures or anomalies identified during daily inspections. If you are in doubt, please contact an authorised Service Centre.

Operations	Daily	Weekly	Monthly	Beginning of season	End of season
Check the temperature of the leaving fluid	●				
Check the pressure drops in the heat exchanger		●			
Check the insulation of the heat exchanger				●	
Check that piping connections are tightened				●	
Check that the wiring terminals' screws are tightened				●	
Clean the exterior of the unit with water and soap				●	
Check the operation of the external flow switches				●	

9.3 Evaporator

Check at regular intervals that the water side of the heat exchanger is perfectly clean. To do this, measure the pressure drop, water side (see Section 8) or measure the temperature of the liquid leaving and entering the heat exchanger, and compare it to the evaporation temperature.

To obtain an effective heat exchange, the difference between the temperature of the leaving water and the saturated evaporating temperature must be in the 1 - 4 °C range. A greater difference would indicate a low efficiency of the heat exchanger (i.e. the heat exchanger is dirty).

In this case, the heat exchanger must be subjected to chemical cleaning, an operation that shall be carried out by authorised engineers.

For other maintenance operations (extraordinary overhauling, replacement of the heat exchanger etc.), contact an authorised Service Centre.

9.4 Component substitution

Differential Pressure Switch

In case the differential pressure switch need to be changed, put the new one with the positive sign (+) at the capillar connected to the upper port of the heat exchanger

Refrigerant Strainers

In case refrigerant strainers must be changed, install the new one always in protection of the WHE (the arrow on the filter must be in the direction entering the unit)

The strainers can work in both flow directions

10 - Spare Parts

10.1 Spare part list

The table below shows the list of spare parts recommended during the first two years of operation.

Component	Part number
Liquid Receiver	374404
Refrigerant filter 5/8"	371926
Refrigerant filter 1/2"	372673
Refrigerant Thermistor BT IN RF	374792
Refrigerant Thermistor BT OUT RF	374794
Water Thermistor BT AF	374793
Water Thermistor BT IN	374796
Water Thermistor BT OUT	374795
Plate Heat Exchanger	374403
Differential Pressure Switch	372761 (PAW200) 342626 (PAW250)
Drain Pipette	374551
Power Transformer Main TR1	371916
Fuse 1A	342744
Power Relay KP-KA3-KA4	373178
Power Relay KA1	374803
Electronic main board	371914
High-Spec Controller	374797

11 - Dismantling, Demolition and Scrapping

During the draining of the refrigeration circuits, do not let the refrigerant overflow in the surrounding atmosphere.

The circuit must be drained using suitable recovery equipment.

For the disposal, contact the competent authority for information.

Unless otherwise specified, the maintenance operations listed below may be carried out by any trained maintenance operator.

11.1 Generalities

Open each line that supplies the unit, including the ones of control circuits. Make sure that all disconnecting switches are secured in the off position. The power cables can be disconnected and disassembled. Refer to Chapter 4 for the position of connection points.

Remove all the refrigerant from the refrigeration circuits of the unit and store it in suitable containers, using a recovery unit. If its characteristics have remain the same, the refrigerant can be used again. Contact a competent authority to obtain information about disposal. In **NO** event shall the refrigerant be discharged into the atmosphere. The oil in each refrigeration circuit must be drained and collected into a suitable container; then it shall be disposed of in conformity with local regulations that apply to the disposal of waste lubricants. Any oil spillage must be recovered and disposed of in a like manner.

Isolate the unit's heat exchangers from the external hydraulic circuits and drain the heat exchange sections of the plant.

If no shutoff valves have been provided, it may be necessary to drain the whole plant.

If a glycol solution or a similar fluid has been used in the hydraulic circuits, or if chemical additives have been added to the circulating water, the circulating fluid MUST be drained in a proper way.

For NO reason shall a circuit containing glycol water mixture or a similar solution be discharged directly into the drains or surface waters.

Note that this unit is not specified to work with a glycol solution

After draining operations, the piping of the hydraulic networks can be disconnected and disassembled.

Once they have been disconnected as specified, the packaged units can be disassembled in a single piece. First of all, disassemble the anchoring screws and then lift the unit from the position of installation, and hook it to the lifting points provided, using suitable lifting equipment.

To this end, refer to Chapter 4 for the installation of these appliances, to Chapter 8 for their weights and Chapter 3 for handling.

The units that, once disconnected, cannot be removed in a single piece, must be dismantled on site; in this case, be very careful with the weight and handling of each component.

It is always advisable to dismantle the units following the installation steps, but in reverse.

Some residues of oil, glycol water mixture or similar solutions may remain in certain parts of the unit. These residues must be recovered and disposed of according to the procedures specified above.

It is very important to ensure that, while a component of the unit is being removed, all the others are properly supported.

Use only lifting means of adequate capacity.

Once disassembled, the components of the unit can be disposed of in conformity with current regulations.

11.2 WEEE Directive (only EU)

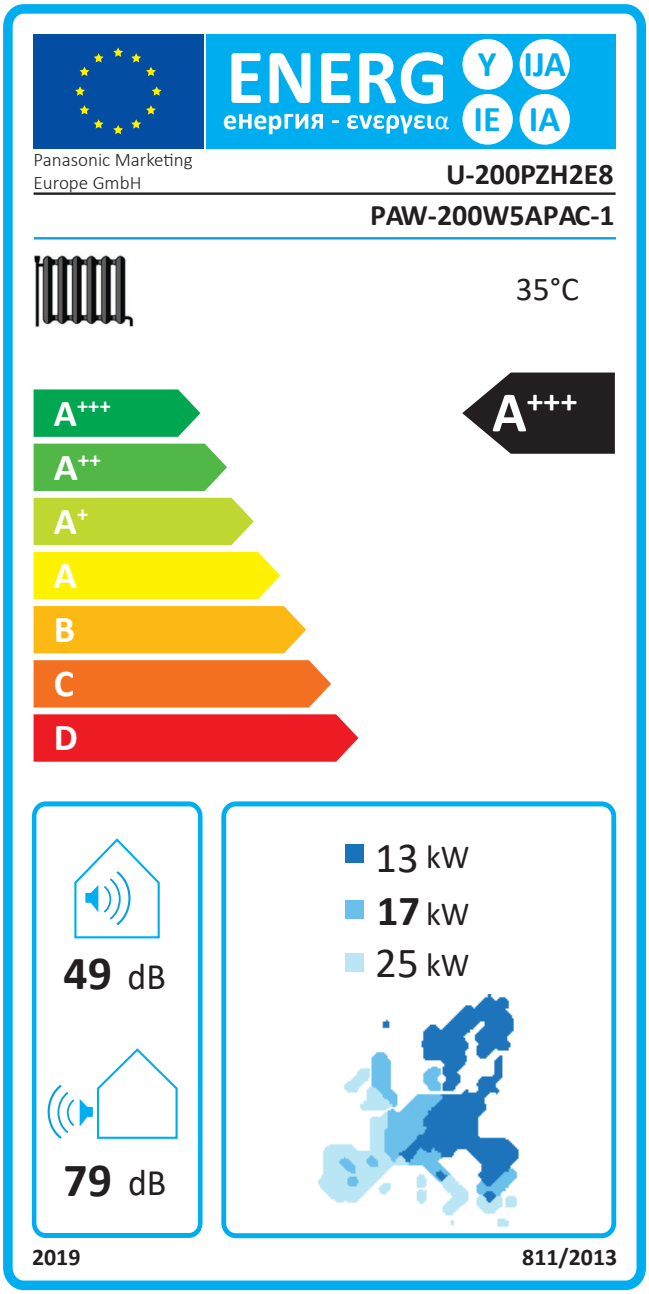
- The WEEE Directive requires that the disposal and recycling of electrical and electronic equipment must be handled through a special collection, in appropriate centers, separate from that used for the disposal of mixed urban waste.
- The user has the obligation not to dispose of the equipment at the end of the useful life as municipal waste, but to send it to a special collection center.
- The units covered by the WEEE Directive are marked with the symbol shown above.
- The potential effects on the environment and human health are detailed in this manual.

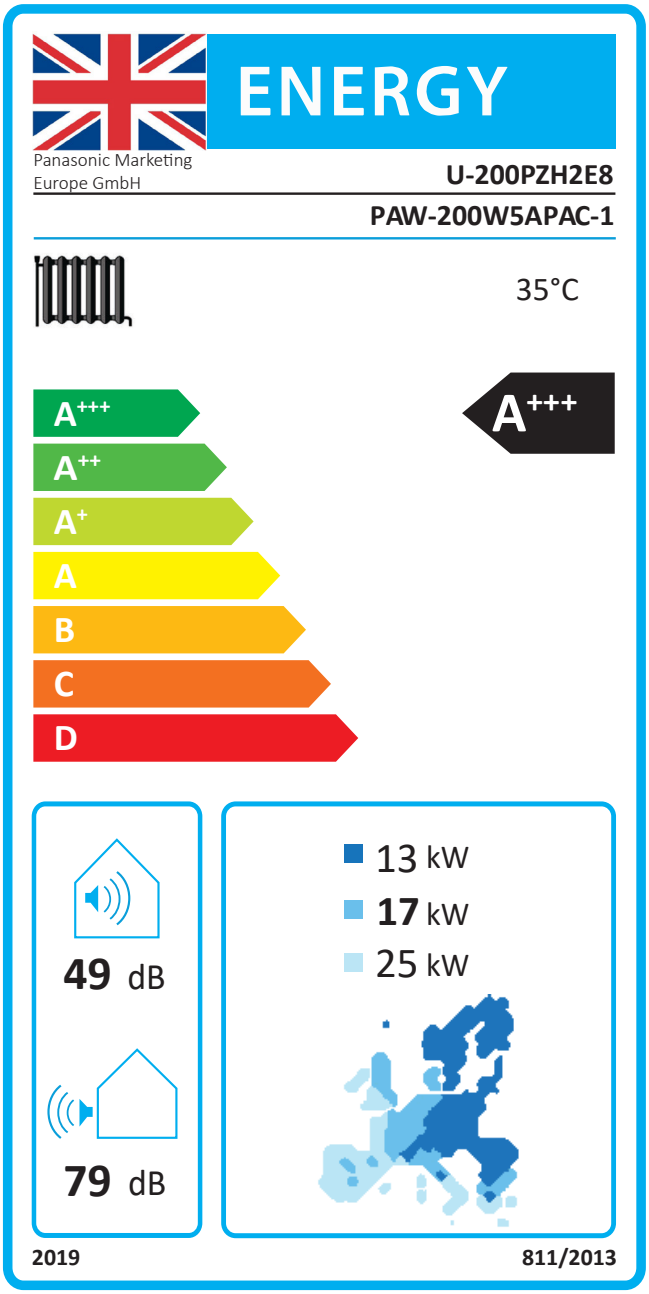
12 - Energy label

12.1 Energy label

U-200PZH2E8

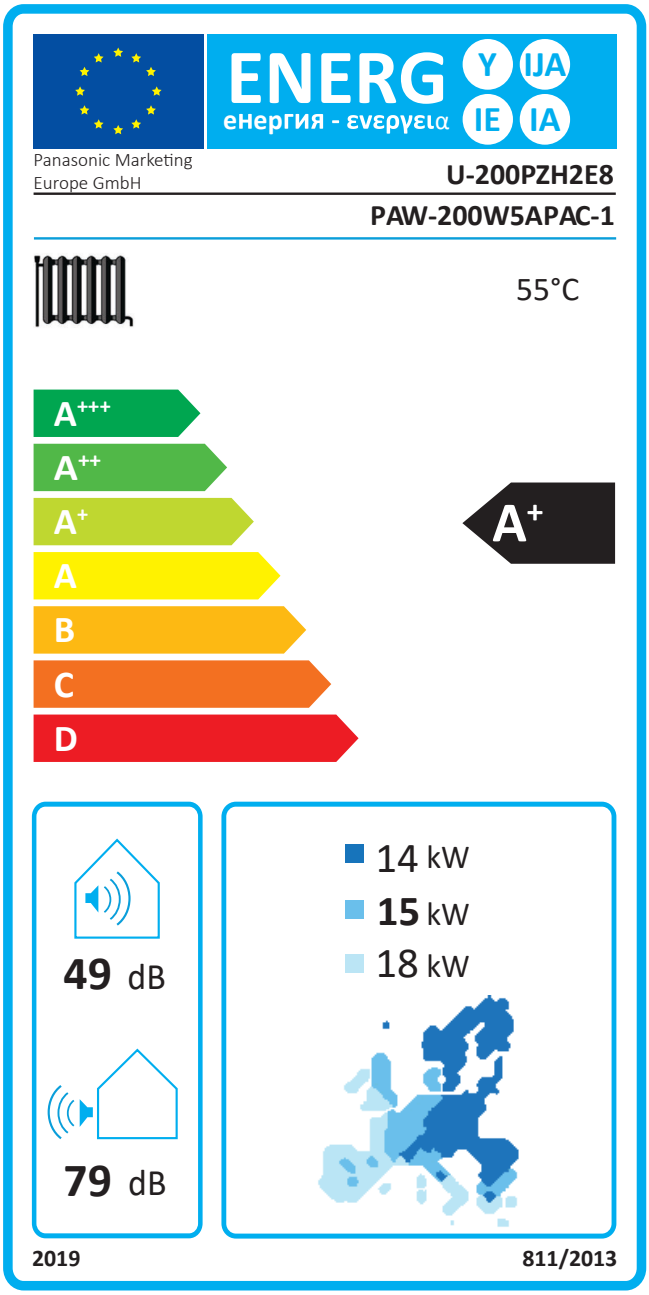
PAW-200W5APAC-1

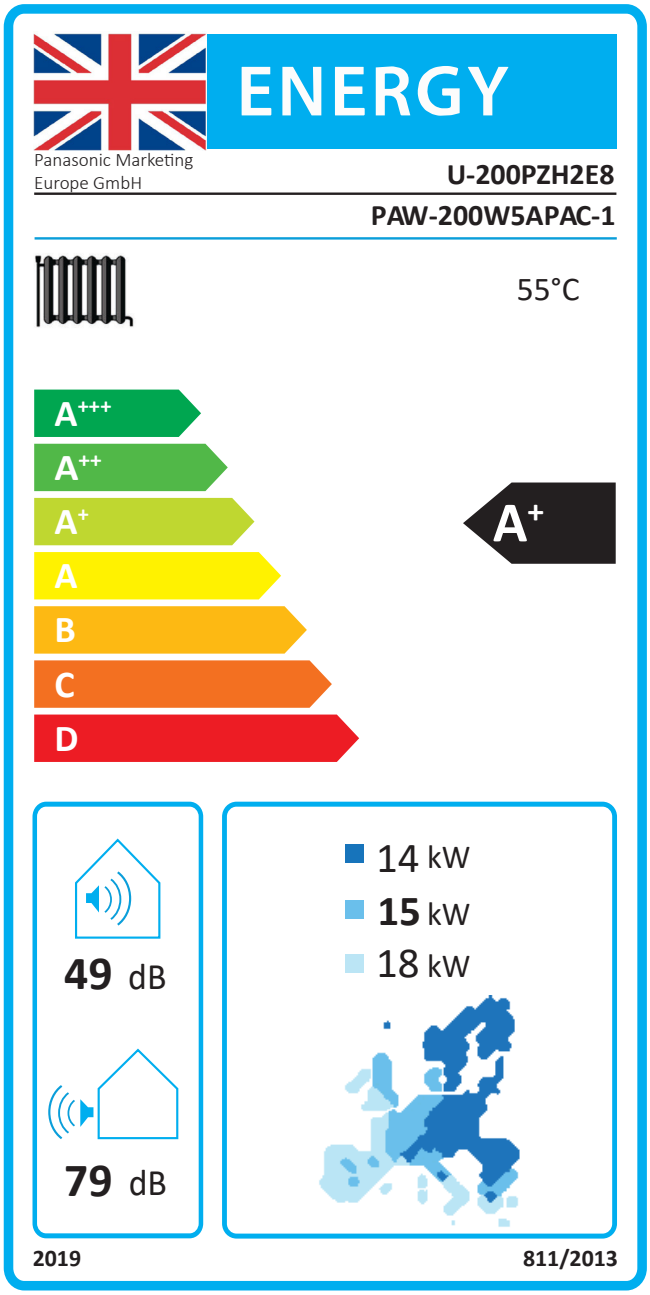




12 - Energy label

U-200PZH2E8
PAW-200W5APAC-1





12 - Energy label

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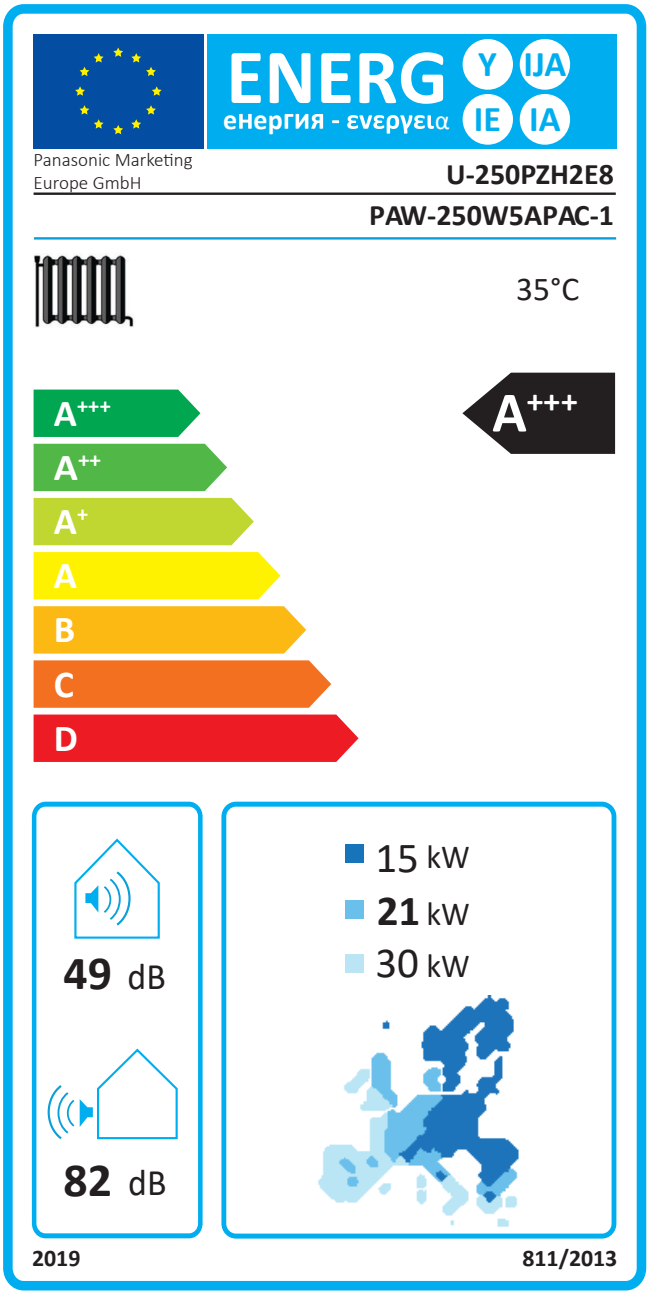

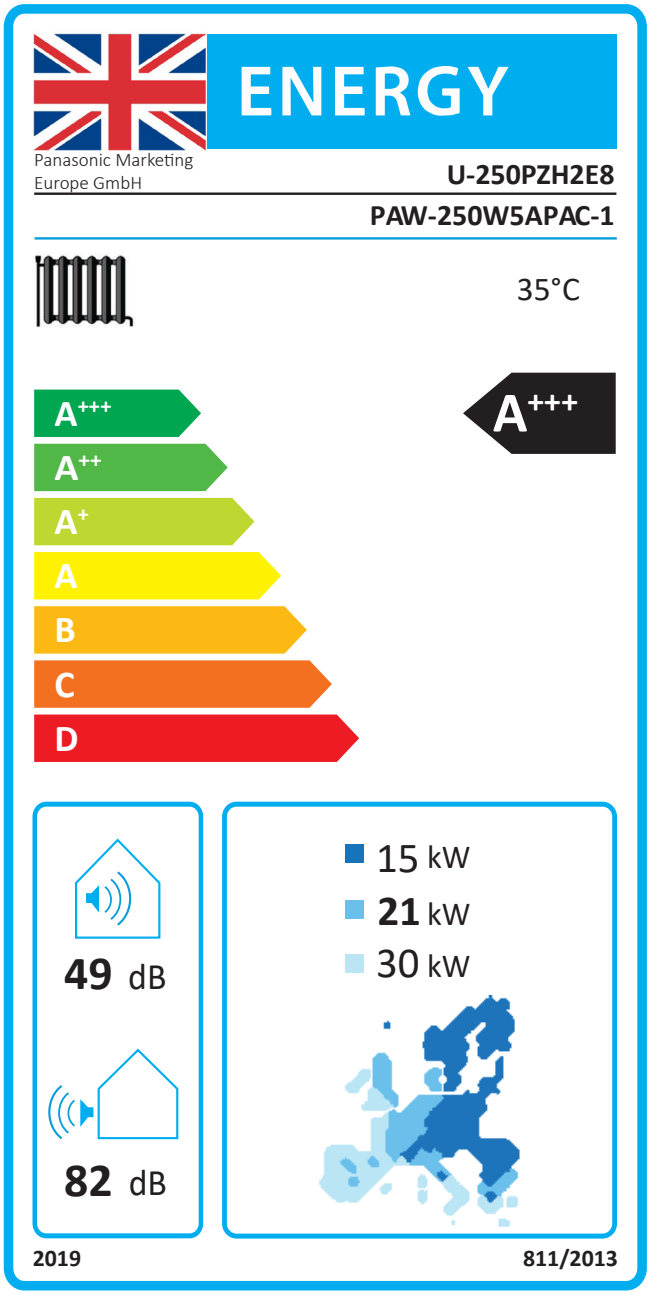

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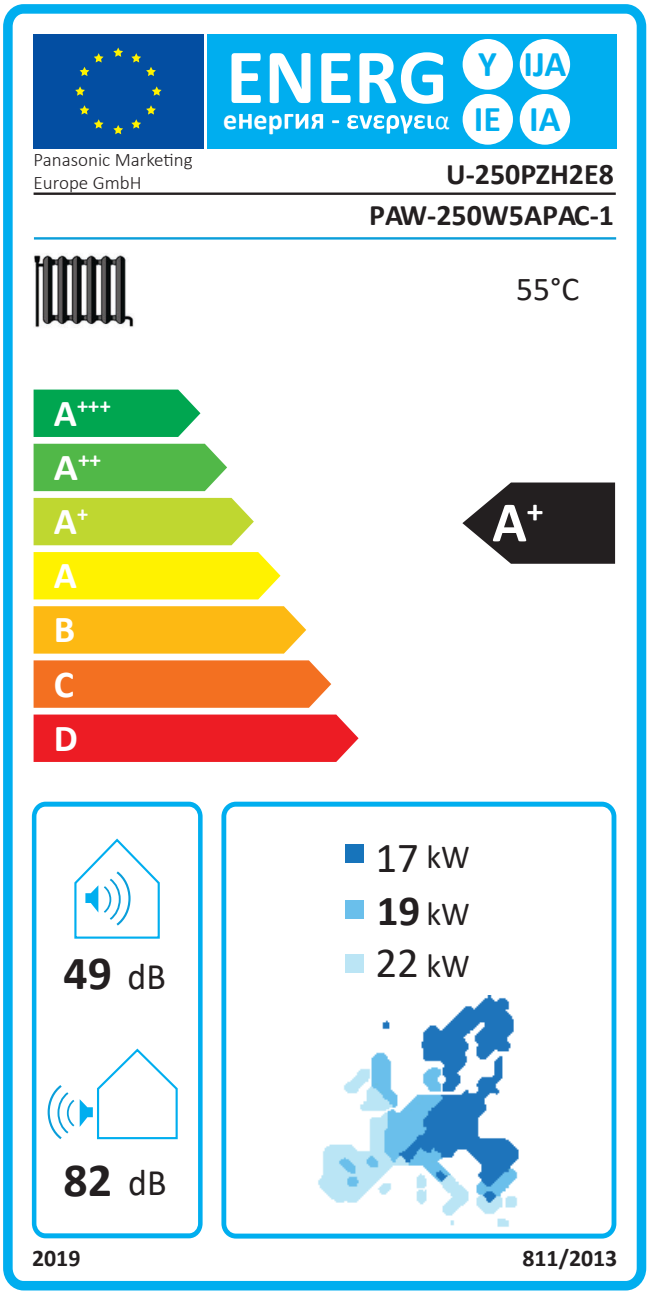

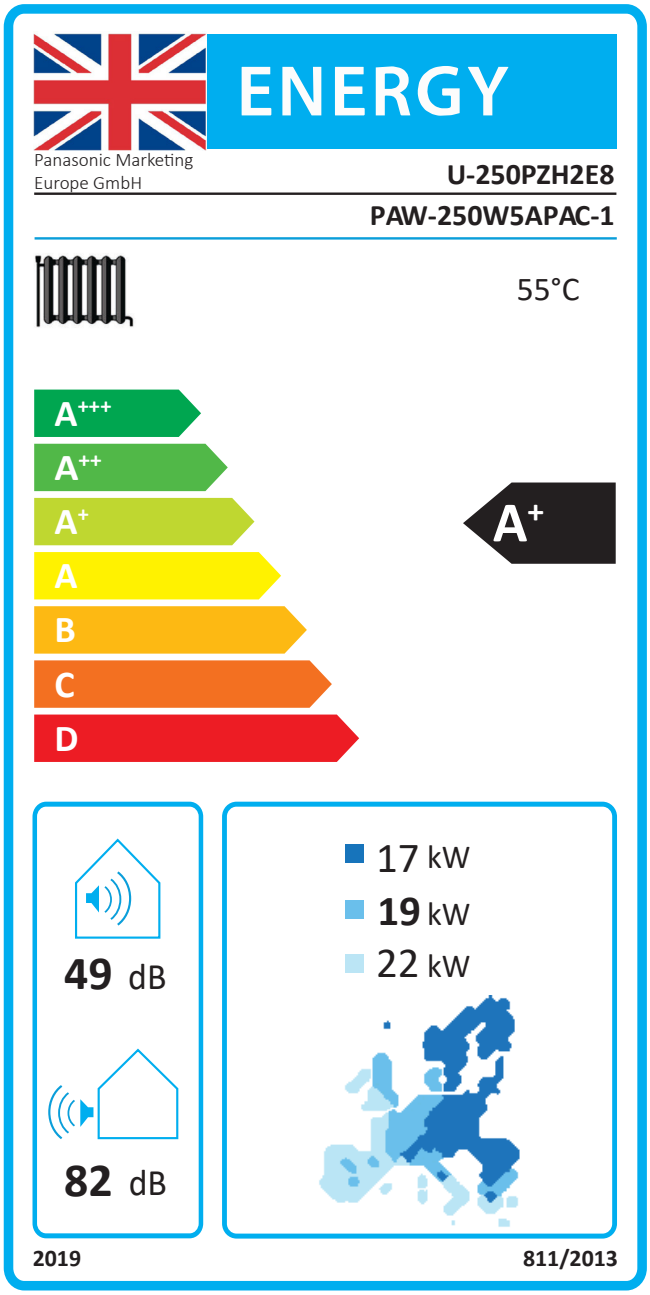

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