

Panasonic

AQUAREA

AQUAREA INSTALLATION GUIDE 1.6

MONOBLOC SOLUTIONS H & J GENERATION



heating & cooling solutions



Welcome

Thank you for selecting a Panasonic Aquarea Monobloc A2W Heat Pump. Panasonic has been manufacturing A2W (Air to Water) Heat Pumps since 1973 and have become synonymous with market leading performance, efficiency and reliability.

Panasonic Aquarea Monobloc heat pump comes as standard with the following items:

1. Heat Pump Controller
2. Circulating Pump
3. Expansion Vessel (for primary hot water)
4. Strainer (Filter)
5. Magnetic Filter (J Series)
6. Pressure Relief Valve
7. Bottom Mounting Rails
8. Built in Electric Backup Heater used for:
 - a. Additional output support, depending on design (if required)
 - b. Backup for DHW tank sterilisation operation (if required)
 - c. Heat Pump protection in cold periods (if required)
 - d. Assistance with defrost operation (if required)

By including the above components inside the Heat Pump, the Panasonic Aquarea is one of the most compact A2W heat pumps on the market. This reduces the number of additional components that would otherwise need to be purchased and installed inside the property. This makes it ideal for retrofit projects and equally beneficial to new builds, where internal space is limited. Due to the high quality mounting system of the compressor and subsequent suppression of noise transmission, Panasonic Monobloc units do not require flexible hoses to transition from the Heat Pump to the pipe work used in the installation.

This Installation Guide covers various installation layouts:

1. Direct Connection - Auto Bypass (Single Zone)
2. Hydraulic Separation – Low Loss Header (Single Zone)
3. Hydraulic Separation - Buffer Tank (Single Zone)
4. Hydraulic Separation - Pre Plumbed Cylinder with built in Buffer Tank (Single Zone)
5. Two Zone - Direct Flow Temperatures
6. Two Zone - 1 Zone Direct Flow , 1 Zone Mixed Flow Temperatures
7. Two Zone - Mixed Flow Temperatures
8. Bi-Valent (Hybrid) – Heat Pump & Boiler

Implementing the correct hydraulic layout with the coinciding controller setup, as detailed in this guide, will enable the Heat Pump system to operate efficiently and reliably. This makes for a smooth installation, a happy installer and a happy end user. The heating distribution design does not fall within the scope of this guide regarding the layout or individual controls. Layouts are for indication purpose only and Panasonic accept no liability covering designs.

This installation guide does not replace the Installation Manual or Service Manual, which both provide more in-depth guidance to installation requirements. Installation/Service manuals can be downloaded directly from Panasonic Pro Club.

www.panasonicproclub.com

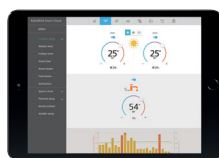
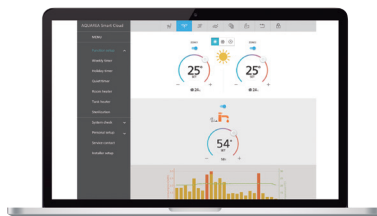
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Aquarea Smart Cloud for end users

The most advanced heating control for today and for the future. Aquarea can be connected to the Cloud with CZ-TAW1C, enabling both end user control and remote maintenance by service partners.

WATCH DEMO



* User interface image may change without notification.



More possibilities with IFTTT.

IF This Then That: IFTTT service enables user to automatically trigger actions for Aquarea system based on other apps, web services or devices.

Connect your Aquarea to your voice assistant, get an e-mail if your Aquarea gets an error or automatically turn on your Aquarea on Heat Mode when outdoor temperature drops below specified level.

https://ifttt.com/aquarea_smart_cloud



Easy and powerful energy management

The Aquarea Smart Cloud is much more than a simple thermostat for switching a heating device ON or OFF. It is a powerful and intuitive service for remotely controlling a range of heating and hot water functions, including monitoring energy consumption.

How does it work?

After connecting an Aquarea J or H generation to the cloud by wireless LAN or by wired LAN, the user accesses the Cloud portal to remotely operate various functions of their heat pump. They can also permit service partners to access personalised functions for remote maintenance and monitoring.

Requirements

1. Aquarea J or H Generation with either built in Wifi or with the CZ-TAW1C Wifi Module Accessory
2. In-house internet connection with router wireless LAN or wired LAN
3. A Panasonic ID, available from: <https://aquarea-smart.panasonic.com/>

Functions:

- Visualisation and Control
- Scheduling
- Energy Statistics
- Malfunction notification

Advantages

Energy savings, comfort and control from anywhere. Increased efficiency and resources management, operating costs savings and owner satisfaction.

The Aquarea Smart Cloud services are focused on enabling full remote maintenance of the Aquarea system. This allows maintenance specialists to engage in predictive maintenance and system fine-tuning, as well as fixing malfunctions when they occur.

Aquarea compatibility	J and H Generation
Connection point	CN-CNT Aquarea port
Home router connection	Wireless or Wired LAN
Temperature sensor	Can use remote controller sensor
Tablet or PC browser compatibility*	Yes
Operation from remote – ON/OFF – Temperature setting Mode selection – DHW setting – Error codes – Scheduling	Yes
Heating areas	Up to 2 zones
Power consumption estimation – Operation log history	Yes – Yes

* Check browsers and version compatibility.

Aquarea Service Cloud for Installers / Maintenance

WATCH DEMO



The real remote maintenance made simple

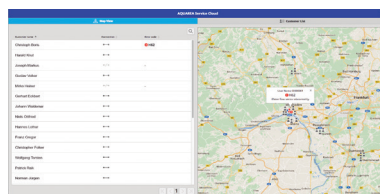
The Aquarea Service Cloud allows installers to take care of their customers' heating systems remotely. It saves time and money and shortens the response time, thus increasing the customers' satisfaction.

Advanced functions for remote maintenance with professional screens:

- Global view at a glance
- Error log history
- Full system information
- Statistics always available
- Most settings available

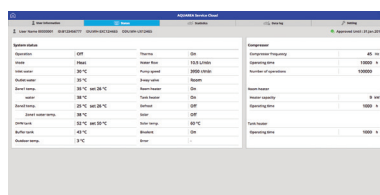
Home page.

Status of connected users at a glance. 2 view options: map view or list view.



Status tab.

Current status of unit with a maximum 28 parameters.



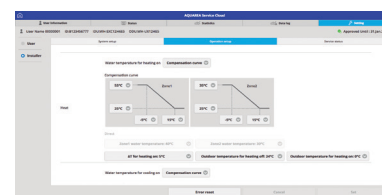
Statistics tab.

Customisable statistics of a maximum of 73 parameters. Available anytime with the information of the last 7 days.



Settings tab.

Most of the user and installer settings can be done remotely.



Activation of the Aquarea Service Cloud

Requirements.

Hardware and connection	End user registration	Installer / maintenance registration
J or H Generation Aquarea connected to CZ-TAW1C	Get Panasonic ID	Get Service ID
In-house internet connection with Wireless LAN or Wired LAN	Aquarea Smart Cloud	Aquarea Service Cloud

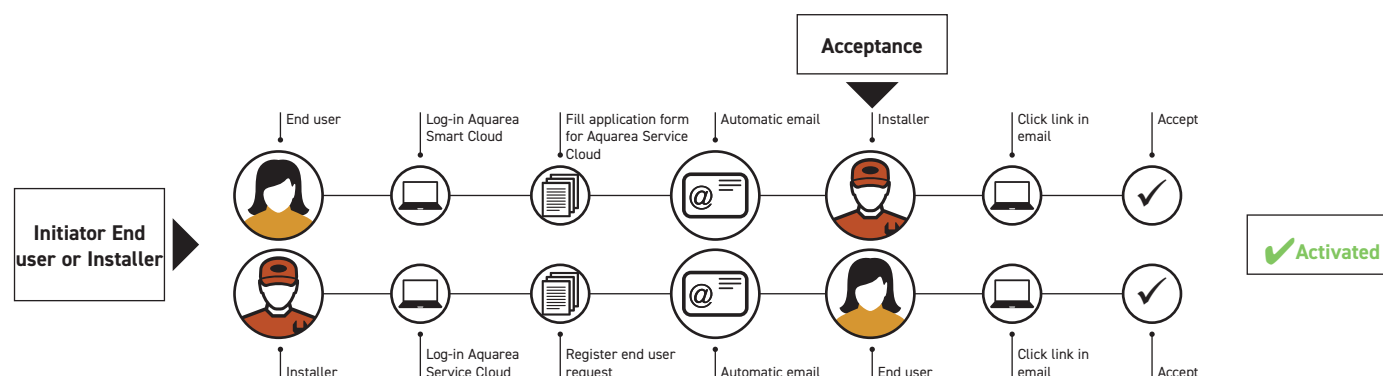
Connecting the unit to the Aquarea Service Cloud.

The process can be initiated by the end user or by the installer.

The end user can select and change the installer's level of control anytime (4 levels).

Installer registration: <https://aquarea-service.panasonic.com/>

End user registration: <https://aquarea-smart.panasonic.com/>



PRO Club. The professional website of Panasonic

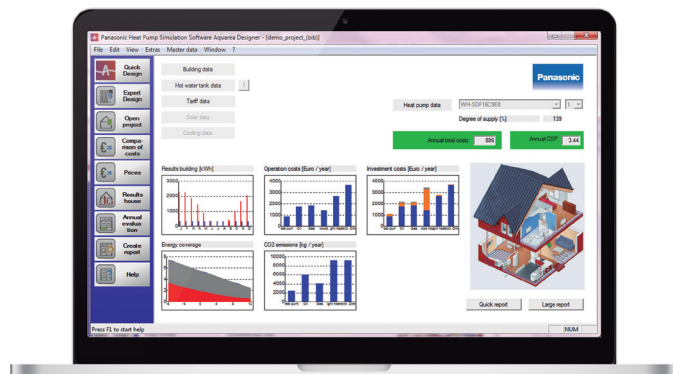


This Installation Guide is to assist and supplement the installation of the Heat Pump system. If you require full Installation Instructions or Service Manuals please download these from Panasonic Pro Club.

Panasonic has an impressive range of support services for designers, specifiers, engineers and distributors working in the heating and cooling industry. Panasonic PRO Club is the online tool which makes your life easier! You just have to register and many useful tools and features are freely available to you, where ever you are, from your computer or smart phone!

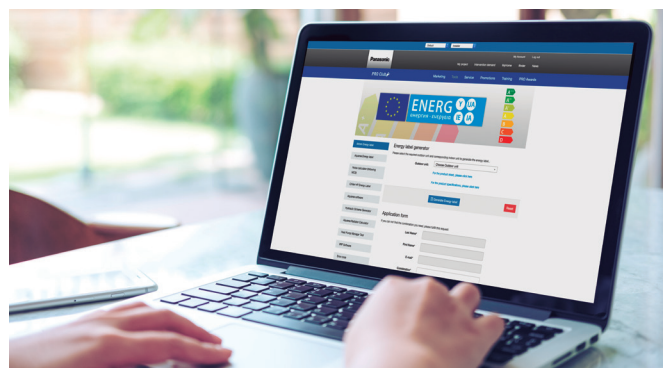
Aquarea Designer

Panasonic provides bespoke software helping system designers, installers and dealers to very quickly design and size systems, create wiring diagrams and issue bills of quantities at the push of a button.



Panasonic helps you to calculate the system label

Since 26th September 2015, installers can be assured that all products manufactured after this date will be sold with the required ErP labels which will aid installers with their paperwork. While it is the manufacturer's responsibility to issue their products with the required labels, the installers will need to calculate and issue an efficiency label for the entire heating system. Whether installing a new heating system or installing new boilers, controls or renewables into an existing system, it is, and will continue to be, the installer's responsibility to calculate and issue efficiency labels. Calculators which assist installers with this process are available on the Panasonic Heating and Cooling Solutions website.



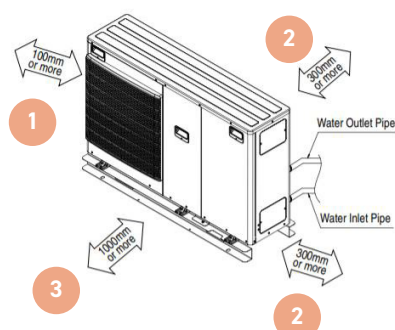
PRO Club

Download on
www.panasonicproclub.com or
connect simply with your smart
phone to the PRO Club using this
QR



Outdoor Siting of Unit

Providing the required clearance around the outdoor unit allows the system to operate properly, since this is the renewable input energy for the system (free air).



Clearance around unit required for operation. For Single & Twin fan units:

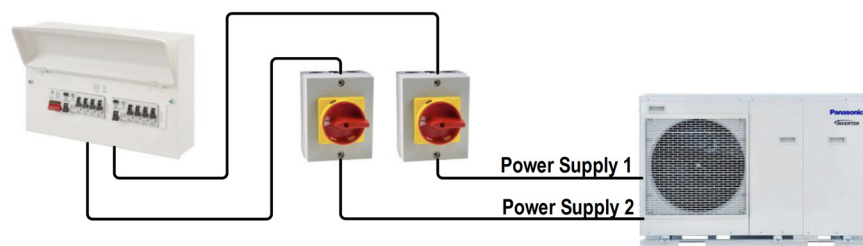
1. Minimum Distance 100mm
2. Minimum Distance 300mm
3. Minimum Distance 1000mm

If the unit is sited within 1 mile of a coastal area then ensure the unit is treated by Bronz-Glow or an equivalent treatment. Panasonic can provide this treatment at an additional cost prior to delivery of equipment.

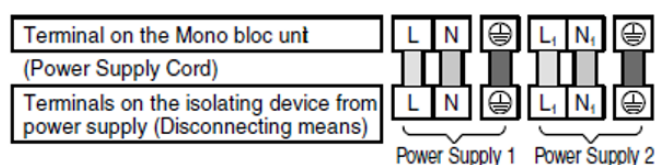
Electrical Requirements - Single Phase

Power supply 1: supplies power to the Compressor, PCB's Fan and Circulating Pump

Power supply 2: supplies power to Internal Backup heater and external DHW immersion booster heater if present and controlled by the Heat Pump. Ensure the cable, circuit breaker and isolator is suitably sized to accommodate the current drawn by the backup heater when it is set to its maximum potential of backup heater output (the kW is indicated by the number after the series letter "H" or "J" in model reference).



Model (single Phase)	Power Supply 1 (Compressor) Circuit Breaker Size	Recommended RCD	Power Supply 2 (BackUp Electric) Circuit Breaker Size	Recommended RCD
WH-MDC05J3E5	16A	30mA, 2P, type B	16A	30mA, 2P, type AC
WH-MDC07J3E5	25A	30mA, 2P, type B	16A	30mA, 2P, type AC
WH-MDC09J3E5	25A	30mA, 2P, type B	16A	30mA, 2P, type AC
WH-MDC12H6E5	30A	30mA, 2P, type B	30A	30mA, 2P, type AC
WH-MDC16H6E5	30A	30mA, 2P, type B	30A	30mA, 2P, type AC
WH-MXC09J3E5	30A	30mA, 2P, type B	30A	30mA, 2P, type AC
WH-MXC12J6E5	30A	30mA, 2P, type B	30A	30mA, 2P, type AC

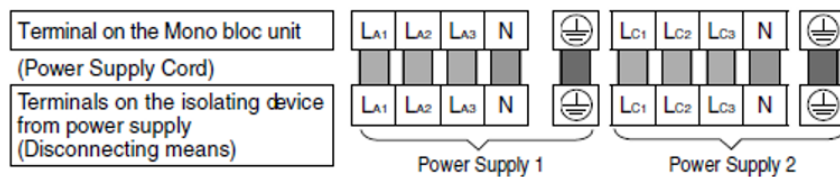


Electrical Requirements - Three Phase

Power supply 1: supplies power to the Compressor, PCB's Fan, and Circulating Pump

Power supply 2: supplies power to Internal Backup heater and external DHW immersion booster heater if present and controlled by the Heat Pump. Ensure the cable, circuit breaker and isolator is suitably sized to accommodate the current drawn by the backup heater when it is set to its maximum potential (the kW is indicated by the number after the series letter "H" or "J" in model reference). *WH-MXC093E8 power supply 2 is single phase.

Model (three Phase)	Power Supply 1 (Compressor) Circuit Breaker Size	Recommended RCD	Power Supply 2 (BackUp Electric) Circuit Breaker Size	Recommended RCD
WH-MXC09J3E8	20A	30mA, 4P, type B	16A	30mA, 2P, type AC
WH-MXC12J9E8	20A	30mA, 4P, type B	20A	30mA, 4P, type AC
WH-MXC16J9E8	20A	30mA, 4P, type B	20A	30mA, 4P, type AC



Primary Pipework (Heating) Sizing Guide

Correct sizing of pipework will allow the maximum energy generated by the unit (in kW) to be delivered to the distribution system. Under sizing will cause noisy pipe work and reduced output.

kW Output	Copper Pipe Size O/D (mm)*
5kW	22
7kW	22
9kW	28
12kW	28
16kW	35

Table of recommendations for pipework

If plastic pipe is used, then larger O/D size than indicated will be required, according to the model installed. (i.e. 9kW will be 35mm in plastic).

***Please note that these sizes are for guidance only and may differ dependant on pipe run, pressure losses within the system and number of bends.**

Expansion Vessel

Unit Type	Expansion Vessel Volume (Litres)	Maximum System Volume Before an Additional Expansion Vessel is required to be fitted (Litres)
Single Fan	6	150
Twin Fan	10	200

The expansion vessel is built into the outdoor unit and will accommodate the heating system only. The DHW expansion vessel will be supplied with the cylinder and fitted separately.

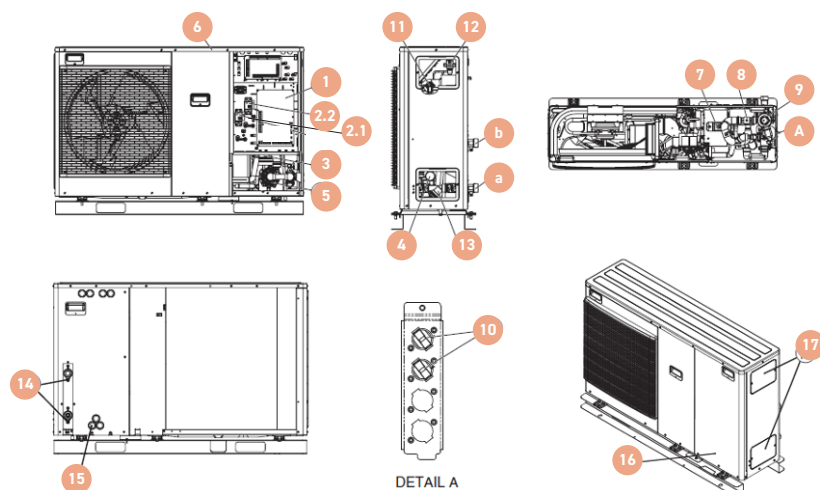
If the system volume is more than indicated in the table or has more than a 7m head height an additional expansion vessel will have to be fitted.

Flow Rates

kW output of unit	5	7	9	12	16
Flow rate (L/min)	14.3	20.1	25.8	34.4	45.9

The table indicates the required flow rates, which are necessary in order to deliver the stated capacity of the Heat Pump. Failure to achieve the required flow rate, will result poor efficiency and performance. A flow rate < 7 l/min (single fan) and < 11 l/min (twin fan) will cause the system to incur a H62 error.

Main Components (Single Fan Unit)



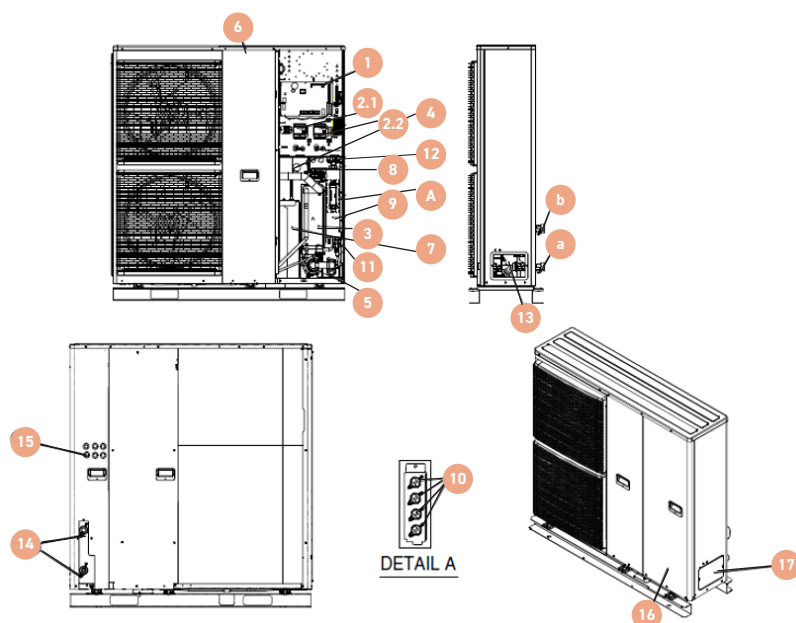
Component Name

1. PCB
- 2.1 Single Phase RCCB (Main Power)
- 2.2 Single Phase RCCB (Backup Heater)
3. Heat Exchanger
4. Water Pressure Gauge
5. Water Pump
6. Cabinet Top Plate
7. Expansion Vessel
8. Flow Sensor
9. Heater Assembly
10. Overload Protector
11. Pressure Relief Valve
12. Air Purge Valve
13. Strainer (+ magnetic filter for "J" series onwards)
14. Plug (2 Pieces)
15. Bushing (7 Pieces)
16. Cabinet Front Plate
17. Cover (2 Pieces)

Connector Name

- a. Water Inlet - 1 1/4" bsp
- b. Water Outlet - 1 1/4" bsp

Main Components (Twin Fan Unit)



Component Name

1. PCB
- 2.1 Single Phase RCCB (Main Power)
- 2.2 Single Phase RCCB (Backup Heater)
3. Heat Exchanger
4. Water Pressure Gauge
5. Water Pump
6. Cabinet Top Plate
7. Expansion Vessel (Not Visible)
8. Flow Sensor
9. Heater Assembly
10. Overload Protector (4 Pieces)
11. Pressure Relief Valve
12. Air Purge Valve
13. Strainer (+ magnetic filter for "J" series onwards)
14. Plug (2 Pieces)
15. Bushing (6 Pieces)
16. Cabinet Front Plate
17. Cover

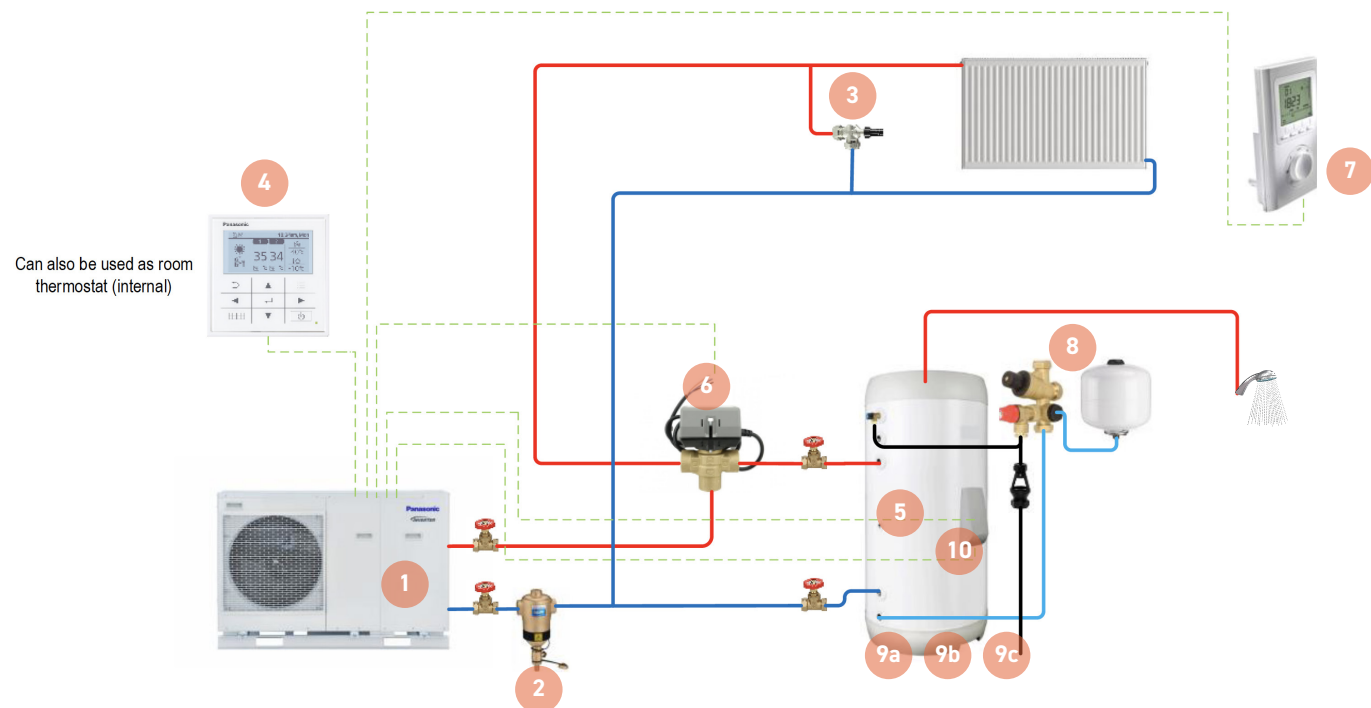
Connector Name

- a. Water Inlet - 1 1/4" bsp
- b. Water Outlet - 1 1/4" bsp

Installation Schematic

Auto Bypass Install:

This hydraulic installation would typically be used in a new build property, where no secondary circulating pump is installed and sufficient open water volume is present (to prevent short cycling). Circulation of primary heating water would be provided by the circulating pump within the Panasonic outdoor unit.



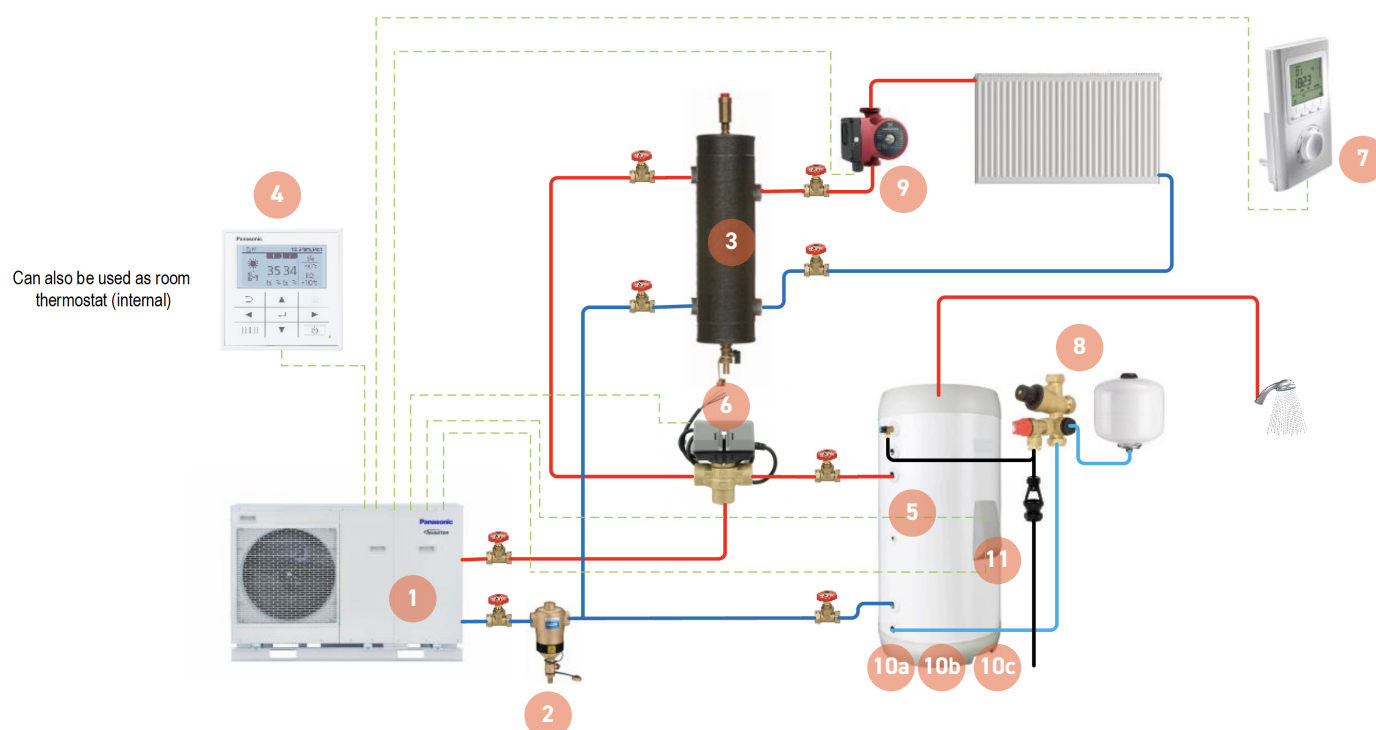
Number	Description	Type of Recommendation	Panasonic Part Number
1	Monobloc Unit	Mandatory	- - -
2	Magnetic Particle Filter	Mandatory on "H" Series Recommended on "J" Series*	- - -
3	Auto Bypass	Mandatory (field supplied)	- - -
4	Remote Controller	Supplied with Monobloc Unit	- - -
5	Tank Sensor	Supplied with a Panasonic DHW tank, if 3rd party tank used then has to be purchased separately (20m)	PAW-TS2
6	3 Way Valve	Mandatory if DHW tank installed	PAW-3WYVLV-HW
7	Room Thermostat (external)	Recommended (can be field supplied)	PAW-A2W-RTWIRED
8	G3 Kit	Mandatory (supplied with tank)	- - -
9a	200L DHW Cylinder	Mandatory if DHW is required	KIT-G3TD20C1E5-1
9b	300L DHW Cylinder (1.8m ² Coil)	Mandatory if DHW is required	KIT-G3TD30C1E5-1
9c	300L DHW Cylinder (2.35m ² Coil)	Mandatory if DHW is required	KIT-G3TD30C1E5HI-1
10	Immersion (Booster) Heater	Mandatory	- - -

*"J" series has a small inbuilt magnetic particle filter.

Installation Schematic

Low Loss Header:

A typical installation for retrofit installations, where primary pipe work is independent of the distribution system. This means the primary and secondary sides are "hydraulically separated". Both side of the system are unable to inhibit each others flow. The distribution pump must be installed on the outlet of the low loss header to avoid negative pressure through the system.



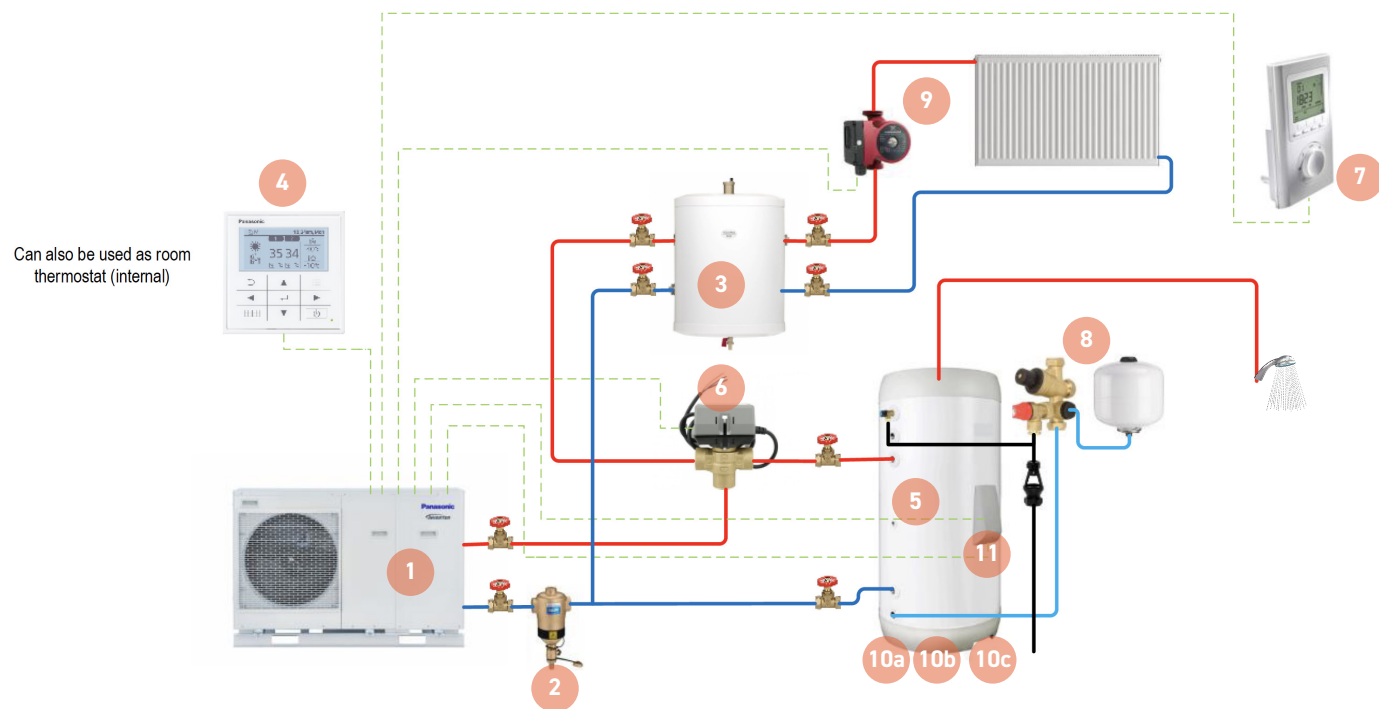
Number	Description	Type of Recommendation	Panasonic Part Number
1	Monobloc Unit	Mandatory	- - -
2	Magnetic Particle Filter	Mandatory on "H" Series Recommended on "J" Series*	- - -
3	Low Loss Header	Recommended (field supplied)	- - -
4	Remote Controller	Supplied with Monobloc Unit	- - -
5	Tank Sensor	Supplied with a Panasonic DHW tank, if 3rd party tank used then has to be purchased separately (20m)	PAW-TS2
6	3 Way Valve	Mandatory if DHW tank installed	PAW-3WYVLV-HW
7	Room Thermostat (external)	Recommended (can be field supplied)	PAW-A2W-RTWIRED
8	G3 Kit	Mandatory (supplied with tank)	PAW-G3KIT
9	Circulating Pump	Mandatory (field supplied)	- - -
10a	200L DHW Cylinder	Mandatory if DHW is required	KIT-G3TD20C1E5-1
10b	300L DHW Cylinder (1.8m ² Coil)	Mandatory if DHW is required	KIT-G3TD30C1E5-1
10c	300L DHW Cylinder (2.35m ² Coil)	Mandatory if DHW is required	KIT-G3TD30C1E5HI-1
11	Immersion (Booster) Heater	Mandatory	- - -

*"J" series has a small inbuilt magnetic particle filter.

Installation Schematic

Buffer Tank:

Using a Buffer tank is the ideal installation design. This allows the setup of a heat pump and heating circuit to operate at their optimum level of performance and efficiency. The buffer tank also provides open water volume between heat pump and heating circuit, which also helps reduce the stop/start cycles of the compressor. Where underfloor is connected, the volume stored allows a quicker response time. Stored volume also allows more efficient defrost cycles, without the need for direct electric backup support to be activated. This layout is highly advisable when the heating circuit is designed and installed by a 3rd party and therefore, also provides a definitive separation of liability for both parties. The buffer tank is a 'neutral' point in the system. The distribution pump must be installed on the outlet to the heating system to avoid negative pressure.



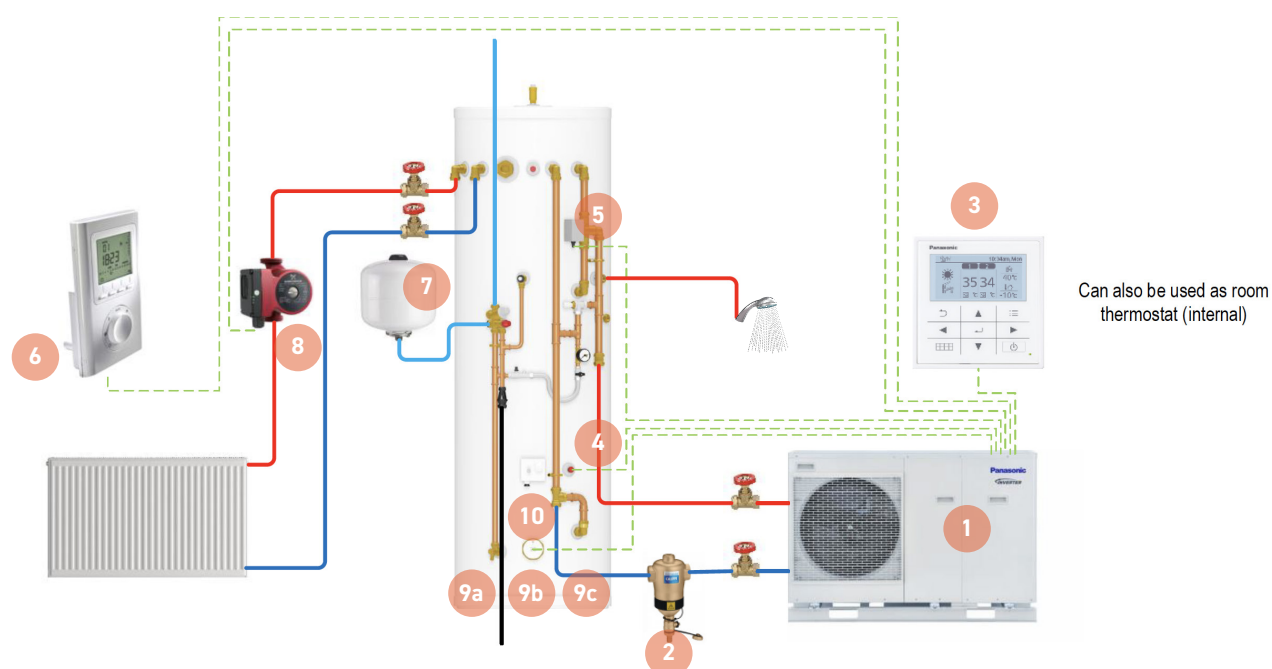
Number	Description	Type of Recommendation	Panasonic Part Number
1	Monobloc Unit	Mandatory	---
2	Magnetic Particle Filter	Mandatory on "H" Series Recommended on "J" Series*	---
3	Buffer Tank	Recommended (field supplied)	PAW-BTANK50L-2
4	Remote Controller	Supplied with Monobloc Unit	---
5	Tank Sensor	Supplied with a Panasonic DHW tank, if 3rd party tank used then has to be purchased separately (20m)	PAW-TS2
6	3 Way Valve	Mandatory if DHW tank installed	PAW-3WYVLV-HW
7	Room Thermostat (external)	Recommended (can be field supplied)	PAW-A2W-RTWIRED
8	G3 Kit	Mandatory (supplied with tank)	---
9	Circulating Pump	Mandatory (field supplied)	---
10a	200L DHW Cylinder	Mandatory if DHW is required	KIT-G3TD20C1E5-1
10b	300L DHW Cylinder (1.8m ² Coil)	Mandatory if DHW is required	KIT-G3TD30C1E5-1
10c	300L DHW Cylinder (2.35m ² Coil)	Mandatory if DHW is required	KIT-G3TD30C1E5HI-1
11	Immersion (Booster) Heater	Mandatory	---

*"J" series has a small inbuilt magnetic particle filter.

DHW Installation Schematic

Pre-plumbed Duo Tank (Cylinder, Buffer tank , 3 port valve and associated pipework in one product):

This layout shows a cylinder, buffer tank & 3 port valve installation using the Panasonic designed pre-plumbed cylinder/buffer Duo tank. The benefit of the pre-plumbed Panasonic Duo Tank is not having to find space for buffer tank. Along with the 3 port valve and associated pipework being pre-plumbed, this product saves time and makes for an all round more compact looking installation.



Number	Description	Type of Recommendation	Panasonic Part Number
1	Monobloc Unit	Mandatory	---
2	Magnetic Particle Filter	Mandatory on "H" Series Recommended on "J" Series*	---
3	Remote Controller	Supplied with Monobloc Unit	---
4	Tank Sensor	Supplied with a Panasonic DHW tank, if 3rd party tank used then has to be purchased separately (20m)	PAW-TS2
5	3 Way Valve	Mandatory if DHW tank installed	PAW-3WYVLV-HW
6	Room Thermostat (external)	Recommended (can be field supplied)	PAW-A2W-RTWIRED
7	G3 Kit	Mandatory (supplied with tank)	---
8	Circulating Pump	Mandatory (field supplied)	---
9a	200/70L DHW/Buffer Cylinder	Mandatory if DHW is required	PAW-TD20B7PP-UK
9b	235/65L DHW Buffer Cylinder	Mandatory if DHW is required	PAW-TD23B6E5PP-UK
9c	300/70L DHW Buffer Cylinder	Mandatory if DHW is required	PAW-TD30B7PP-UK
10	Immersion (Booster) Heater	Mandatory	---

*"J" series has a small inbuilt magnetic particle filter.

Code Of Practice for The Preparation, Commissioning and Maintenance of Domestic Central Heating and Cooling Water Systems

Flushing Options and Compliance with BS 7593:2019 & Relevant Local Building Regulations

When it comes to maintaining the efficiency and longevity of heating systems, flushing of the system is an essential process for ensuring clean water flows through the heat pump, radiators, and pipework. However, for system flushing to be both effective and compliant with local relevant building regulations, it's important to consider standards like BS 7593:2019.

BS 7593:2019 - Code of Practice for the Preparation, Commissioning, and Maintenance of Domestic Central Heating and Cooling Systems

BS 7593:2019 provides guidance on the best practices for the cleaning, maintenance, and protection of domestic heating systems, with a key focus on cleaning and flushing to maintain water quality, in the context of this standard, flushing is used to remove sludge, limescale and other debris that can accumulate over time, causing blockages, corrosion, and inefficiency. Flushing of brand-new systems is also essential to remove all residue left from the manufacturing and installation process.

Key takeaways from BS 7593:2019 related to system flushing include:

- **System Cleaning:** Flushing should be carried out during the commissioning process or when a system shows signs of inefficiency, such as cold spots on radiators or boiler noise.
- **Chemical Treatment:** After flushing, the use of chemical inhibitors is required to prevent corrosion and further sludge build-up. The right post-flush treatment ensures the system remains protected.
- **Professional Installation:** The standard emphasises the importance of professional expertise when performing a flush to avoid damage to the system and ensure proper system operation.
- **Types of flushing:** Further guidance can be found in BS7593 on the different types of flushing methods. Powerflushing, Mains pressure clean and flush and Gravity clean and flush.

Relevant Local Building Regulations

Relevant local building regulations focus on energy efficiency and the conservation of fuel and power in buildings, including both new and existing homes. As heating systems account for a significant portion of a building's energy use, ensuring their optimal efficiency.

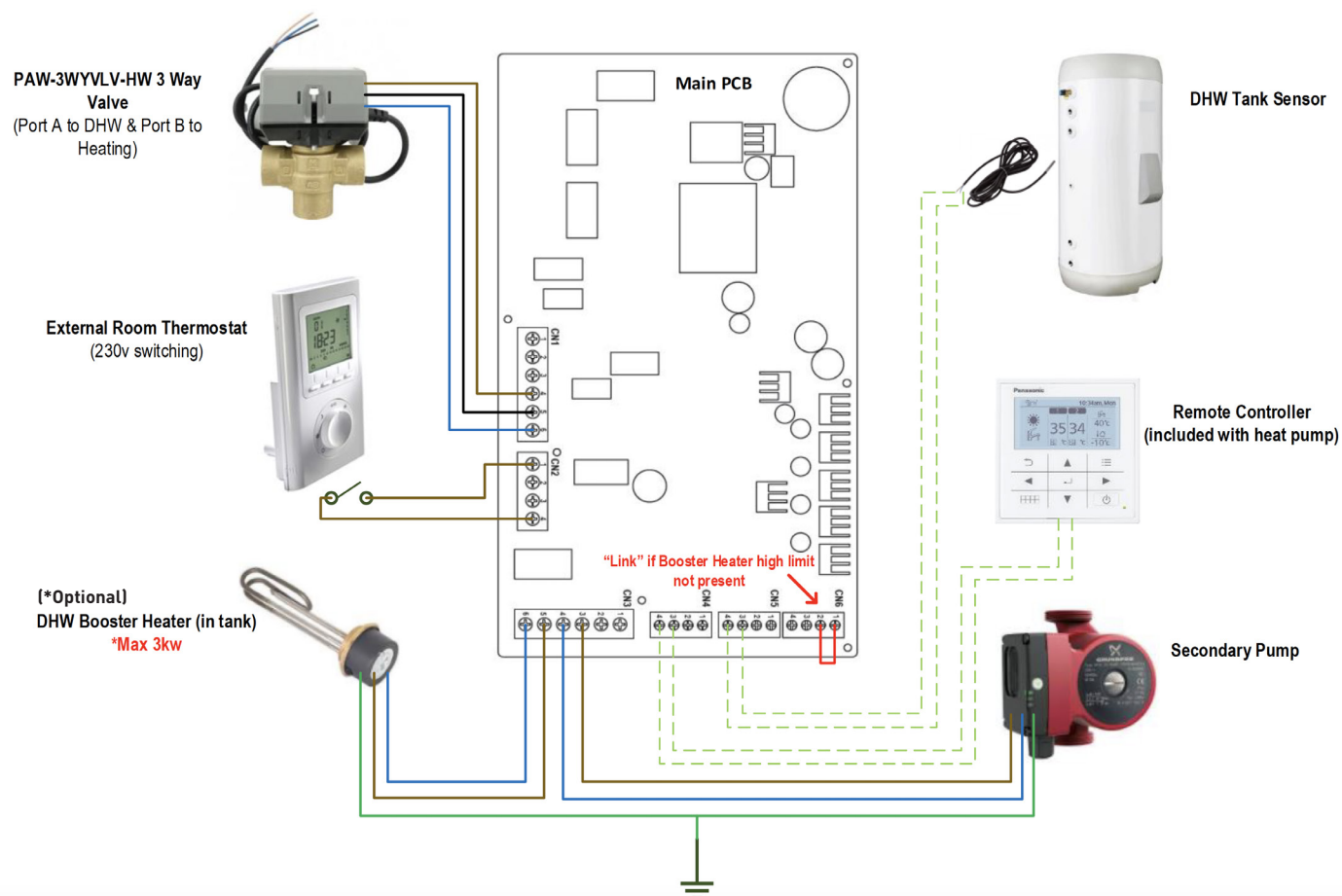
Flushing plays a direct role in supporting compliance with relevant local building regulations, specifically in improving the efficiency of the heating system. When a heating system is clogged with sludge or debris, it must work harder to circulate heat, leading to wasted energy, component failure and higher running costs.

Why adequate flushing is Key to System Efficiency and Compliance

A clean, well-maintained heating system is more efficient, uses less energy, and is more reliable over time. By ensuring that your flushing procedure adheres to BS 7593:2019 and helps meet relevant local building regulations objectives, you can not only improve system performance but also ensure compliance with key regulations aimed at reducing carbon footprints and enhancing energy efficiency.



Wiring



Please check the following before commencing start up.

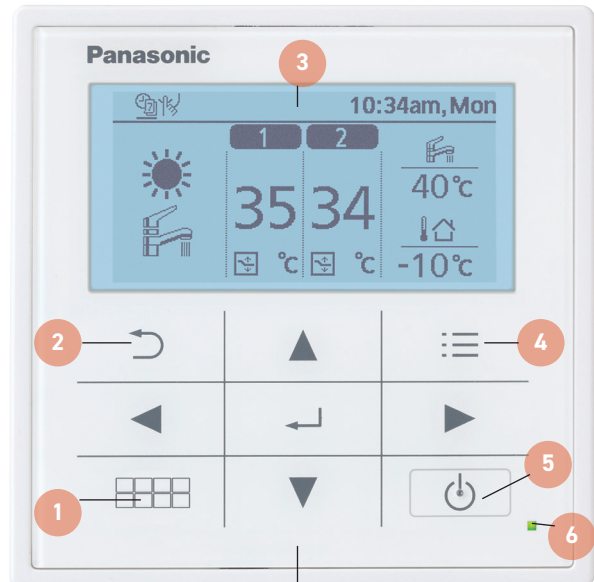
- Check all electrical wiring and connections
- Make sure all auto air vents are open and the pressure relief valves are closed
- Make sure the system is filled with the correct fluid to around 2 Bar (minimum 1.5 Bar).
- Check the expansion vessel is large enough for the system (see page 8).
- Check all fuses and circuit breakers.
- Check that Primary Pipework (heating) is sized correctly for the unit installed (see page 8) to ensure the flow rate required can be achieved. (If the flow rate is too low, the system will not operate).
- In Monobloc heat pumps, the water goes outside the building. The unit can protect itself against freezing up, but if the power goes off, there is a risk that the unit will freeze and cause damage. To prevent this, we recommend putting a propylene glycol mixture in the system. It is important that the glycol concentration is adequate to protect the unit. If the unit freezes up, the warranty will become void. See full warranty terms and conditions for more details.

*Connection of DHW booster heater element to the heat pump is optional, only required if you wish the heat pump to control the operationally use. Independent wiring & control can be an alternative arrangement.

Remote Controller Simple Setup

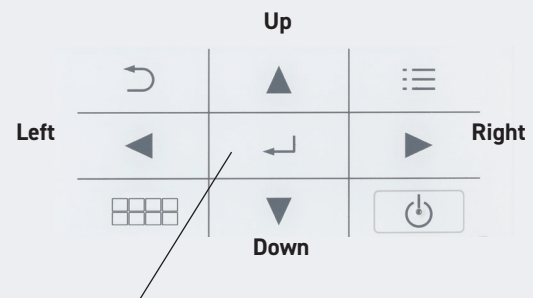
Buttons / Indicator

- 1 Quick Menu Button**
(For more details, refer to the separate Quick Menu Guide.)
- 2 Back button**
Returns to the previous screen
- 3 LCD Display**
- 4 Main Menu button**
For function setup
- 5 ON/OFF button**
Starts/Stops operation
- 6 Operation indicator**
Illuminates during operation, blinks during alarm.



Cross key buttons

Selects an item.



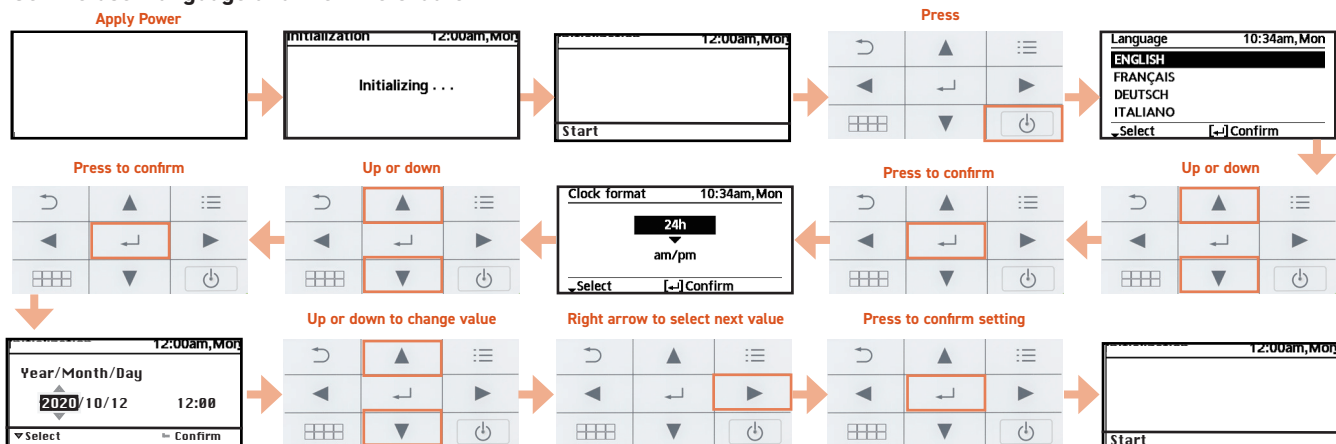
Enter button

Fixes the selected content.

Step 1: Initial Setup

When the heat pump is powered up for the first time, the remote controller will automatically enter the initial settings screen.

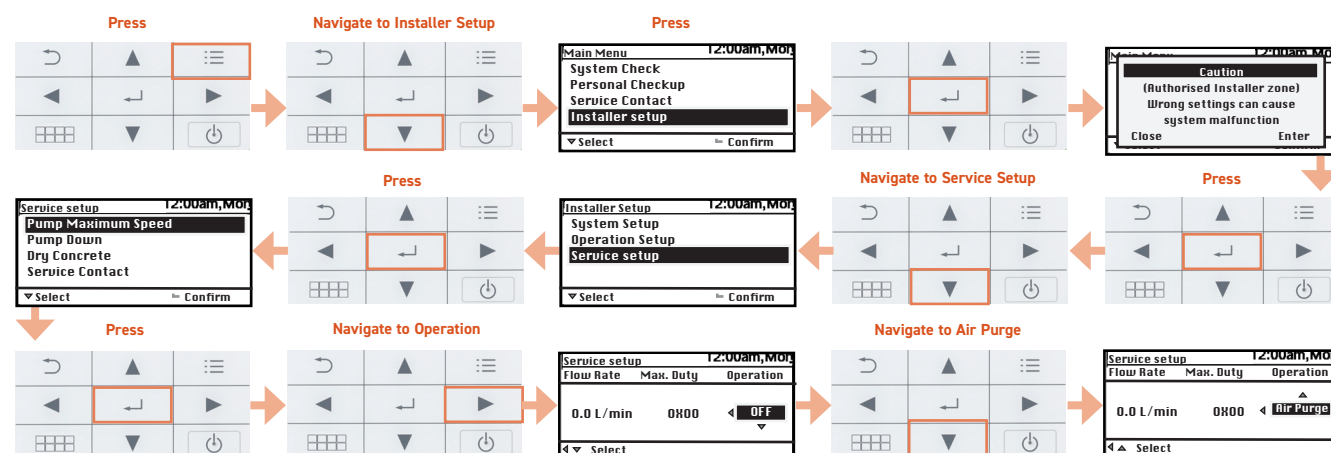
Set the user language and the time & date:



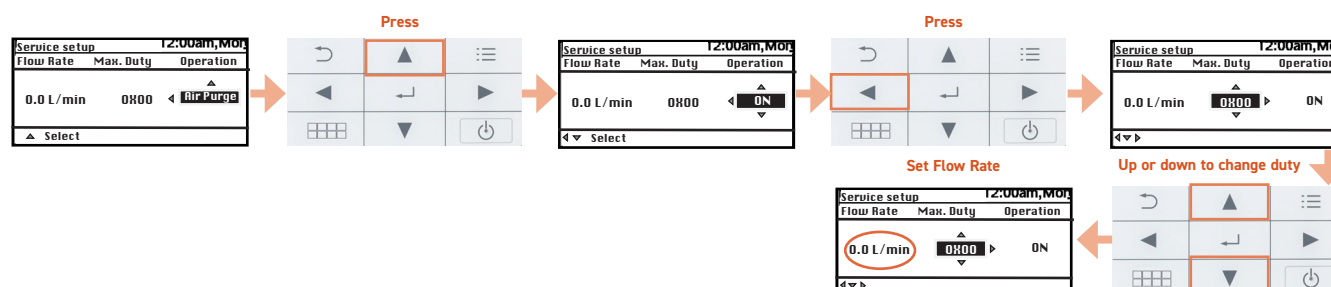
Do not press  at this stage. The controller must remain off (LED in bottom right hand corner will be off).

Step 2: Air purge & set max pump speed

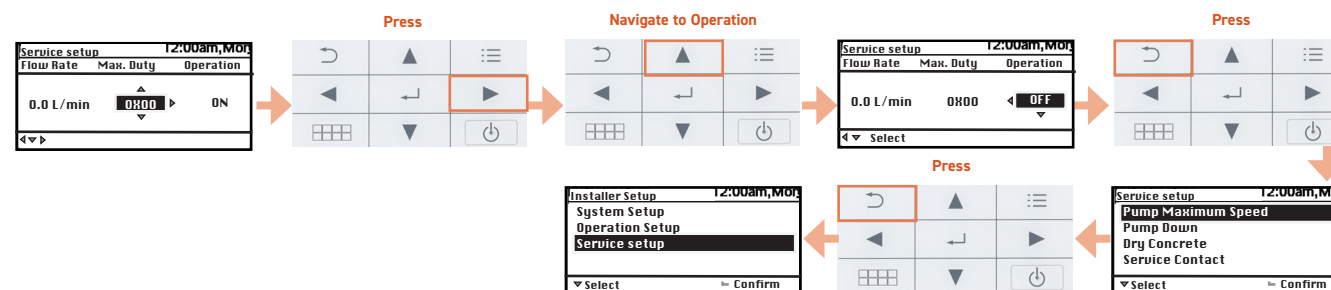
a) Switch on “Air Purge” to run the circulating pump: This will help fill and vent the heating system.



b) Set maximum pump speed: Use the flow rate display. The numbers are shown in hexadecimal and simply refer to the pump duty. Increase or decrease until the desired flow rate is shown, this will be the maximum pump speed.



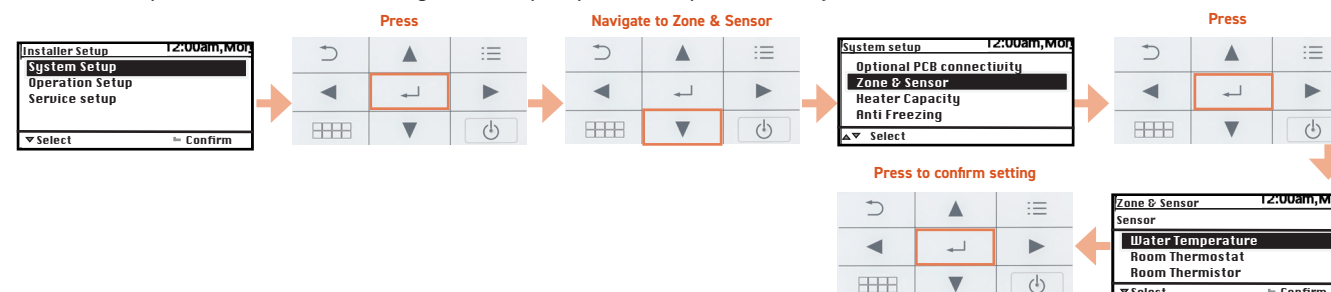
c) Return to Installer Setup Menu:



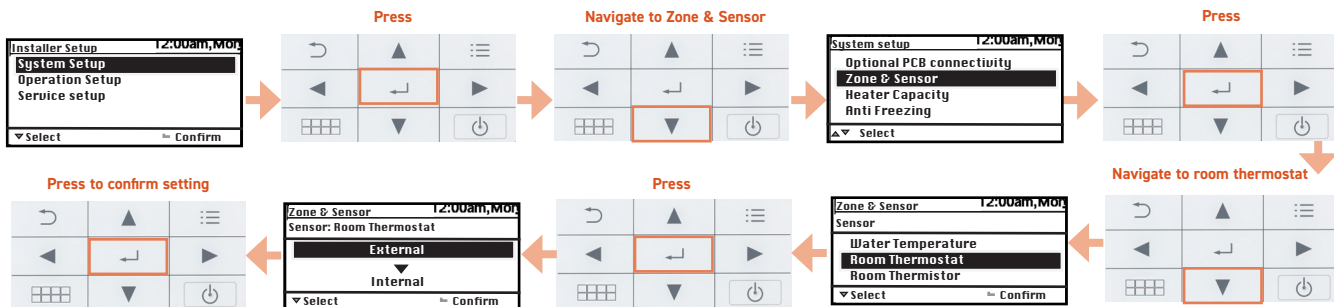
Step 3: System Setup

a) **Zone and Sensor setting:** This is how the heat pump will be controlled in heating mode. This can be controlled using:

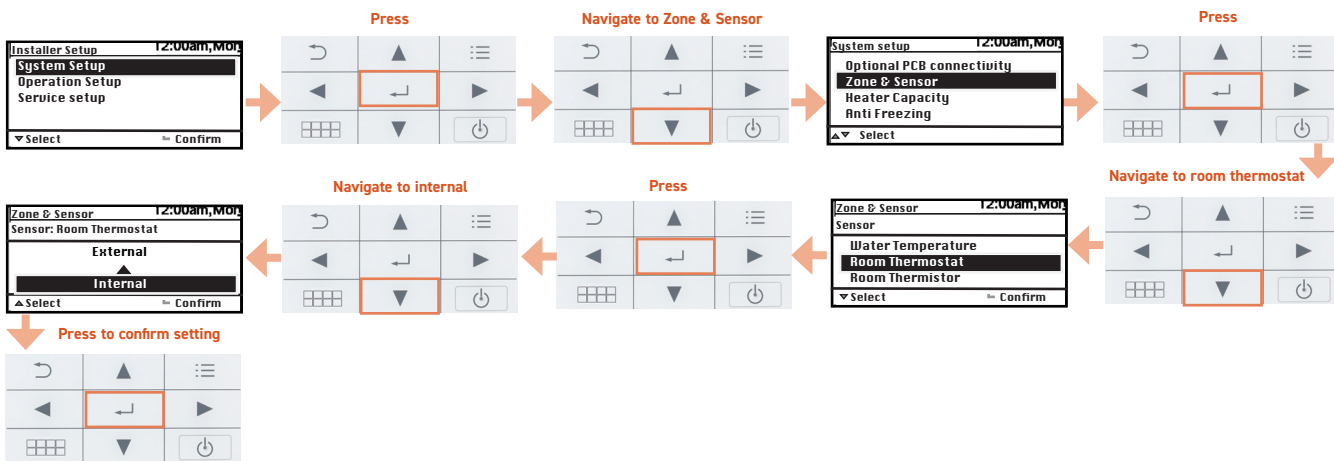
i. Water Temperature: Controlled using the heat pump flow temperature only. No room thermostat will be used.



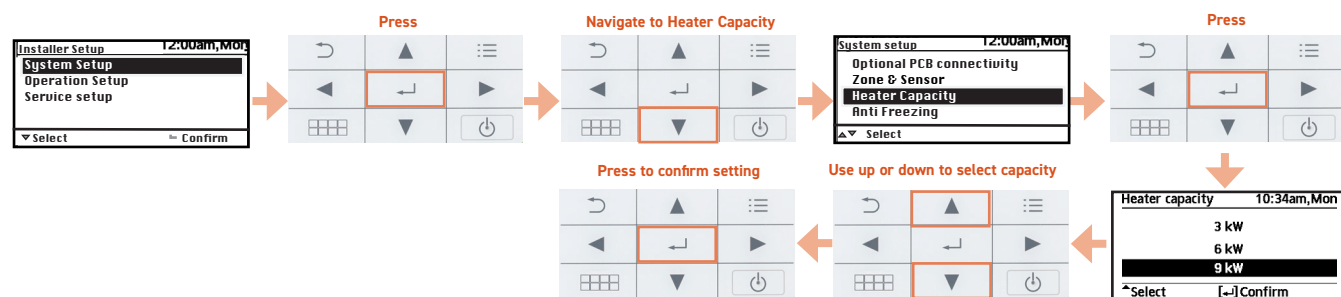
ii. Room Thermostat (External): Controlled using a 3rd party room thermostat using 230v switching.



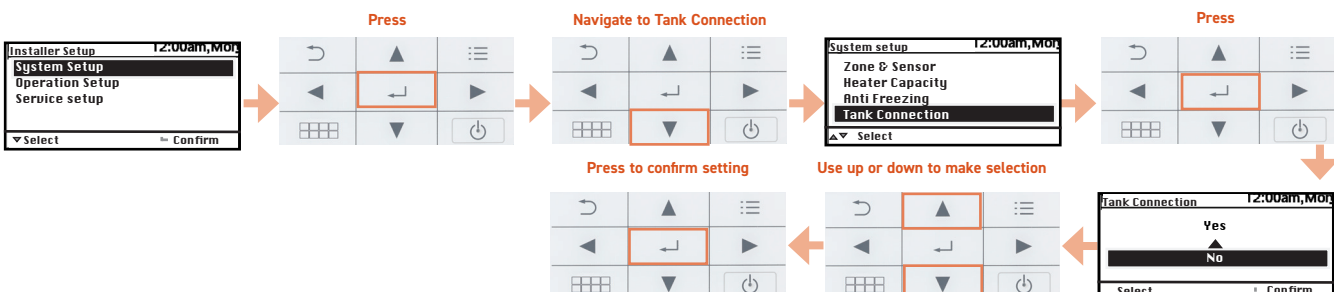
iii. Room Thermostat (Internal): Controlled using the heat pump remote controller as the room temperature sensor.



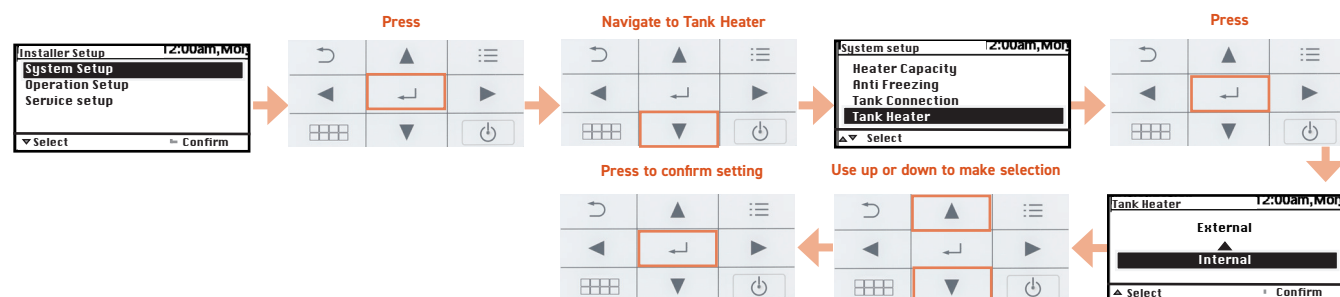
b) Heater Capacity Setting: This is to set the maximum capacity of the built in electrical element inside the monobloc heat pump. This is only applicable on heat pumps with 6kw or 9kw back-up heaters.



c) Tank Connection Setting: This is to tell the heat pump that it is going to be serving a DHW tank as well as heating. This must be set to "YES" when connecting a DHW tank to the system.



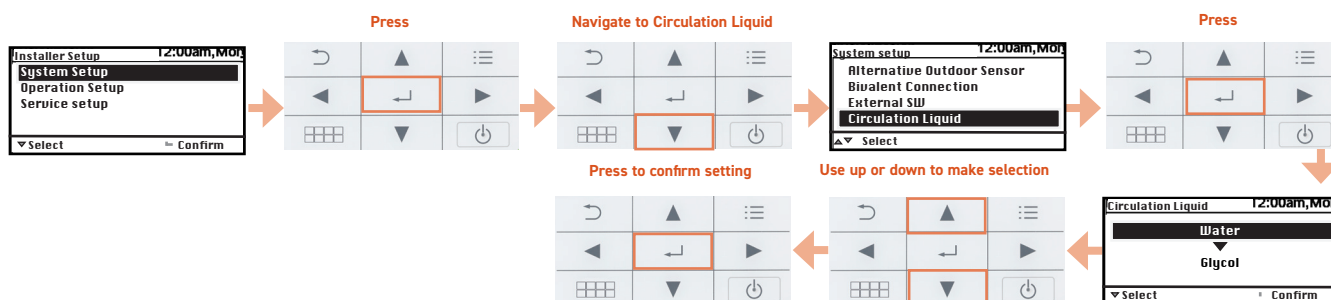
d) Tank Heater: This setting tells the system whether to use the built in “backup” electric heater (**internal** to the heat pump) or DHW tank “booster” (immersion) heater (**external** to the heat pump) for DHW electrical assistance.



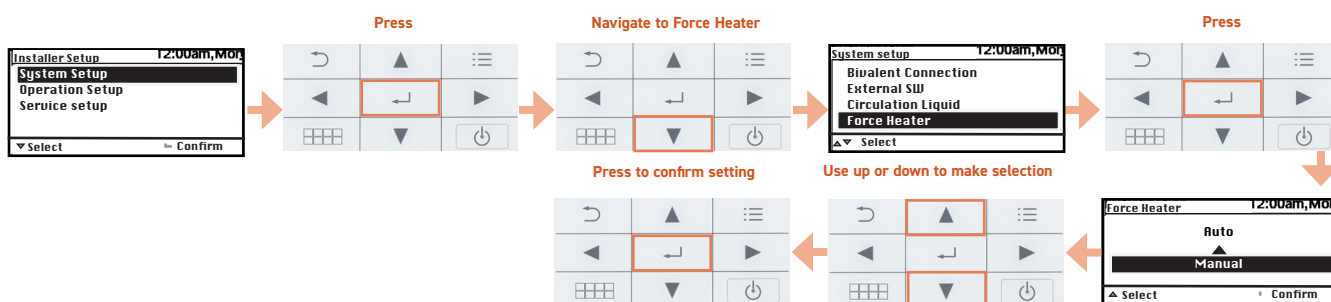
When set to “External,” “Tank heater ON time” must be set. This is the delay time that the system will wait, after beginning a DHW cycle, before automatically engaging the booster heater.

Tank Heater	
Tank Heater: ON Time	
Range (0.20 - 3.00)	
Steps: 0.05	0.20
▲ Select	Confirm

e) Circulation Liquid Setting: This is to indicate if the heat pump is filled with glycol or water.



f) Force Heater Setting: This is to engage the electrical backup for heating & DHW, in the event of an error, manually or automatically.



g) Return to Installer Menu

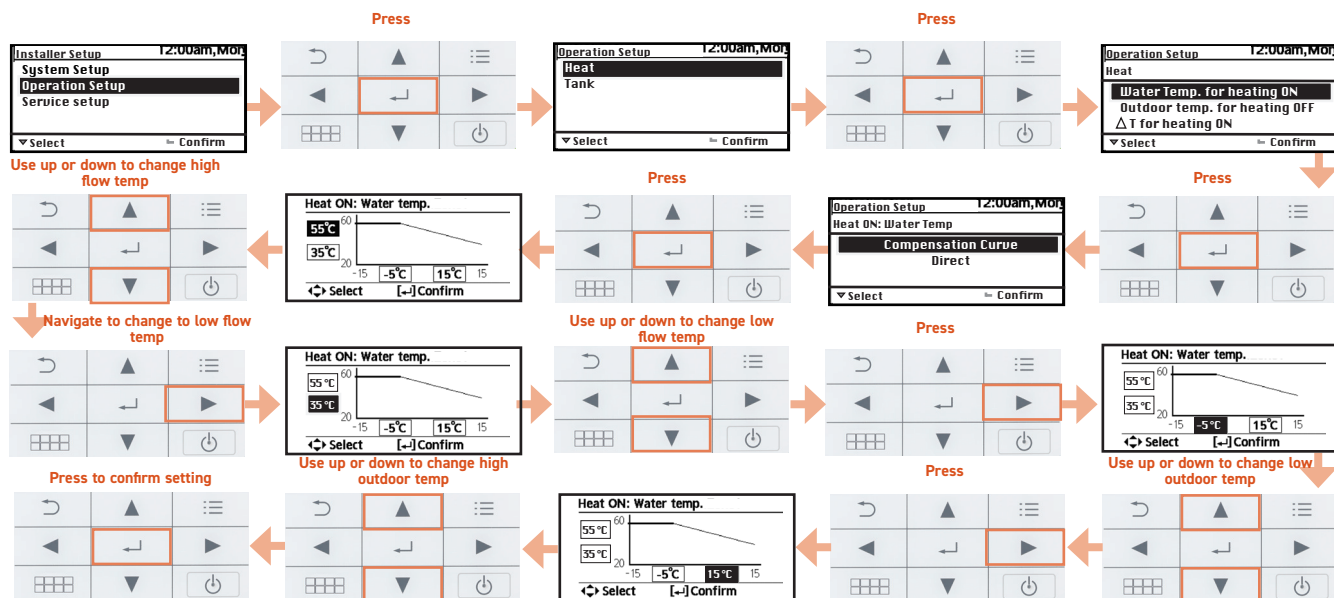
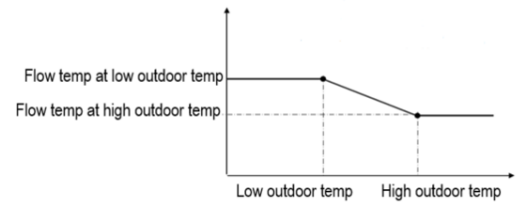


Step 4: Operation Setup

a) Heating Settings: This is where flow temperature settings are made.

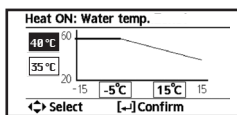
i. Water temperature for heating on: Set if the heat pump will operate with a weather compensated flow temperature or a direct (fixed) flow temperature.

- **Compensation Curve:** These settings are entirely dependent on the heating system design. The heat pump will regulate it's flow temperature with respect to the outdoor temperature. The colder it is outside, the hotter the flow temperature will be.

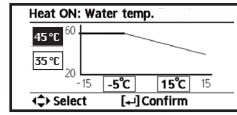


Suggested compensation curve settings (use as a guide only):

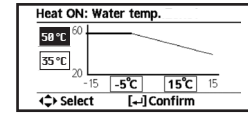
Under floor heating



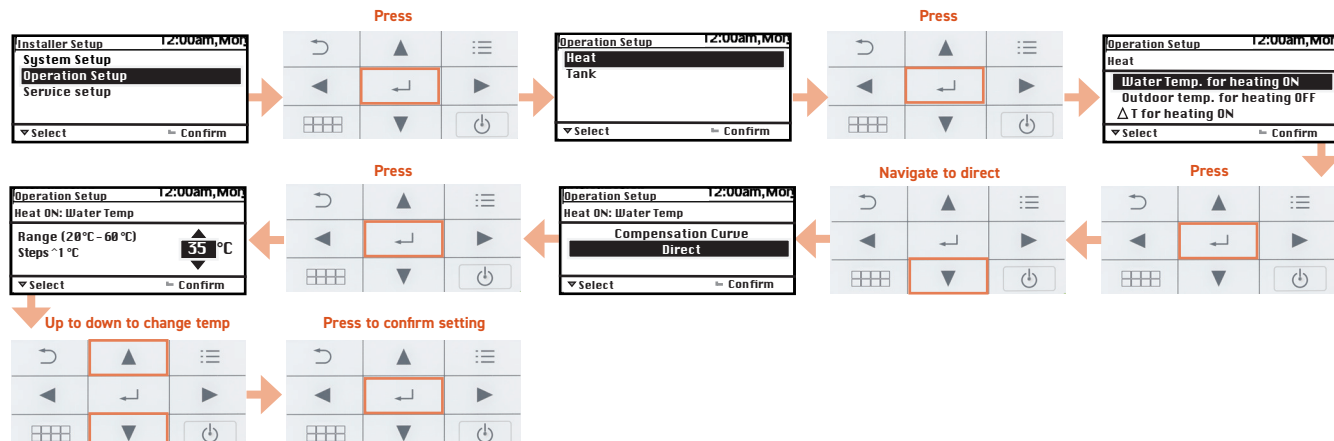
New build property (radiators)



Old property (radiators)



- **Direct Flow Temperature:** This will set a fixed flow temperature with no reference to outside temperature.



Suggested direct temperature settings (use as a guide only):

Under floor heating

Operation Setup 12:00am, Mon	
Heat ON: Water Temp	
Range (20°C - 60°C)	55 °C
Steps 1 °C	
▼ Select	Confirm

New build property (radiators)

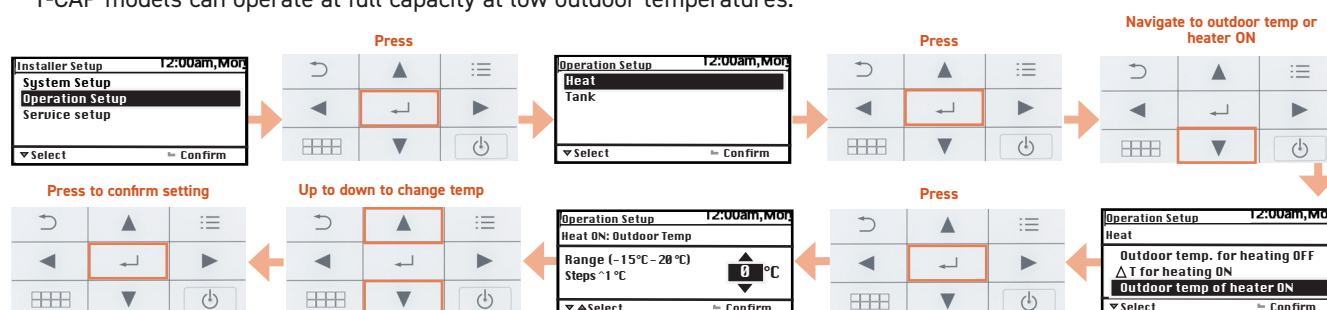
Operation Setup 12:00am, Mon	
Heat ON: Water Temp	
Range (20°C - 60°C)	45 °C
Steps 1 °C	
▼ Select	Confirm

Old property (radiators)

Operation Setup 12:00am, Mon	
Heat ON: Water Temp	
Range (20°C - 60°C)	55 °C
Steps 1 °C	
▼ Select	Confirm

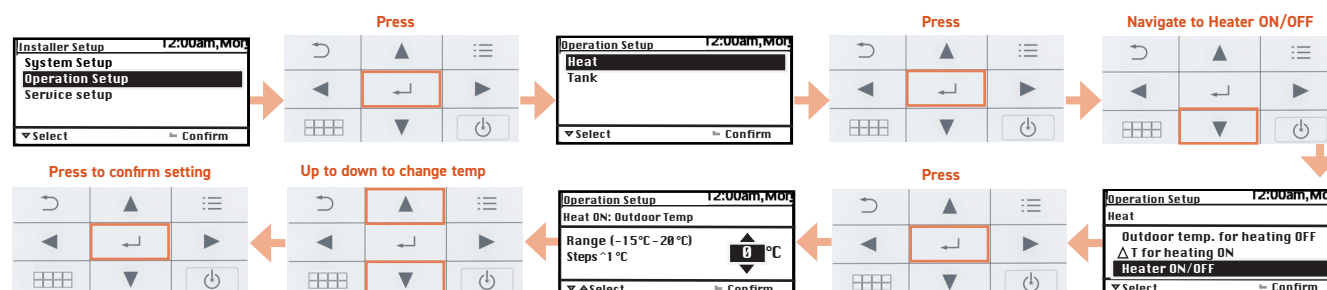
ii.a. Outdoor temperature for heater ON (H Series): This is the outdoor temperature at which the electrical backup heater will be permitted to operate below, to assist the heat pump.

* T-CAP models can operate at full capacity at low outdoor temperatures.



ii.b. Outdoor temperature for heater ON (J Series): This is the outdoor temperature at which the electrical backup heater will be permitted to operate below, to assist the heat pump.

* T-CAP models can operate at full capacity at low outdoor temperatures.



b) Tank Settings: This is where DHW and priority settings are made.

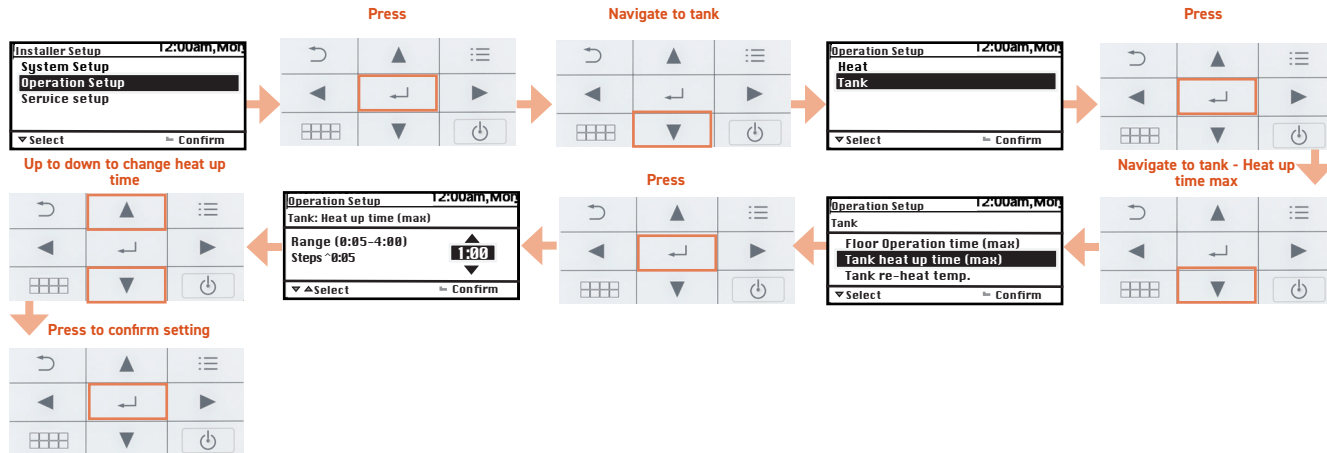
i. Floor operation time: This setting refers to heating priority and is rarely implemented in most systems; however, it should be set to avoid lack of DHW.



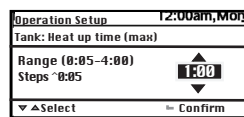
Suggested floor operation time settings (use as a guide only):

Operation Setup 12:00am, Mon	
Tank: Floor ope. time (max)	
Range (0:30 - 10:00)	1:00
Steps 0:30	
▼ Select	Confirm

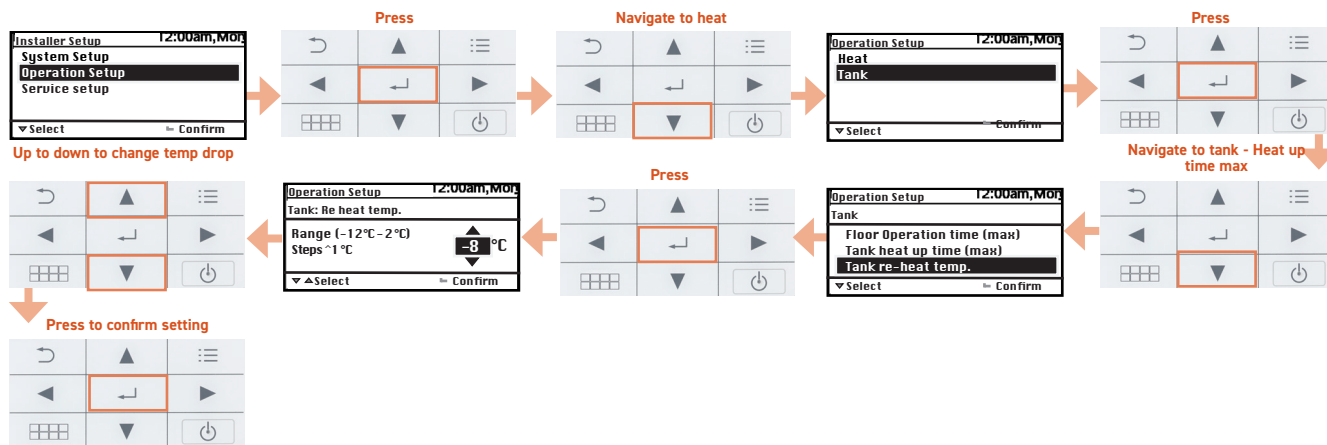
ii. Tank heat up time (max): DHW priority setting.



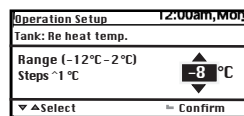
Suggested tank heat up time (max) settings (use as a guide only):



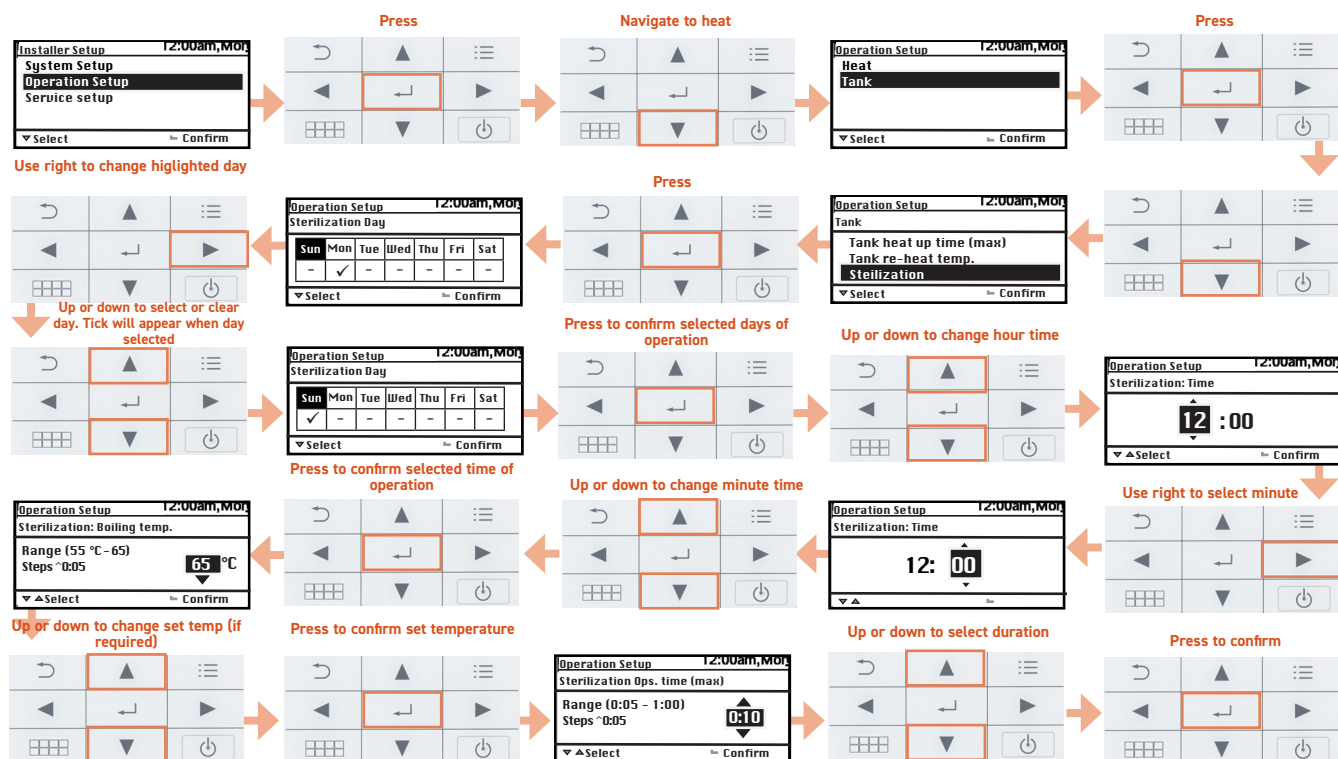
iii. Tank re-heat temp: This is the temperature drop in the DHW tank before the heat pump will begin to re-heat DHW.



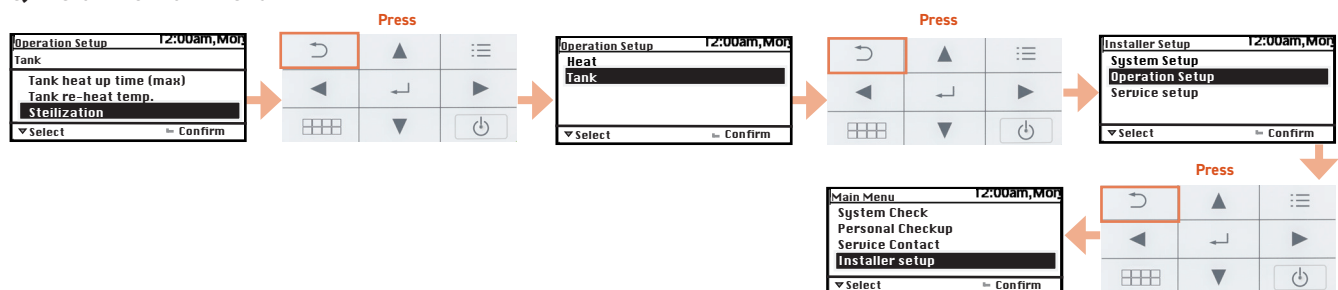
Suggested tank heat up time (max) settings (use as a guide only):



iv. **Sterilization:** This is an anti-legionella function used to raise the temperature of the DHW periodically.

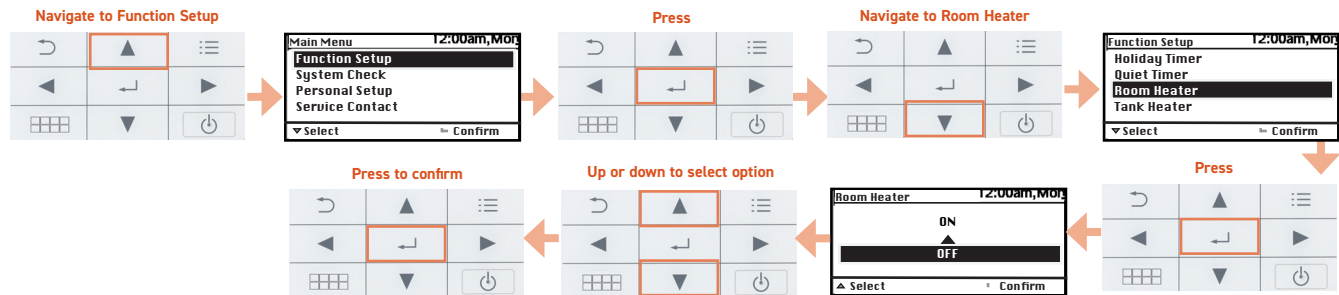


c) **Return to Main Menu:**

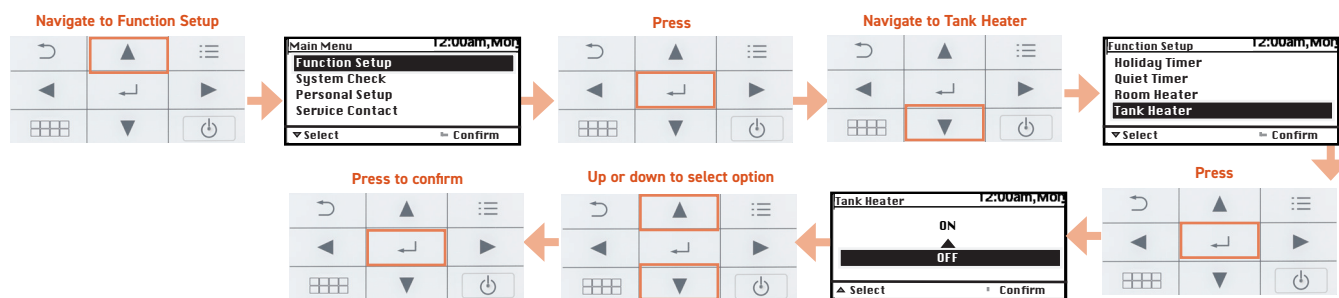


Step 5: Function Setup

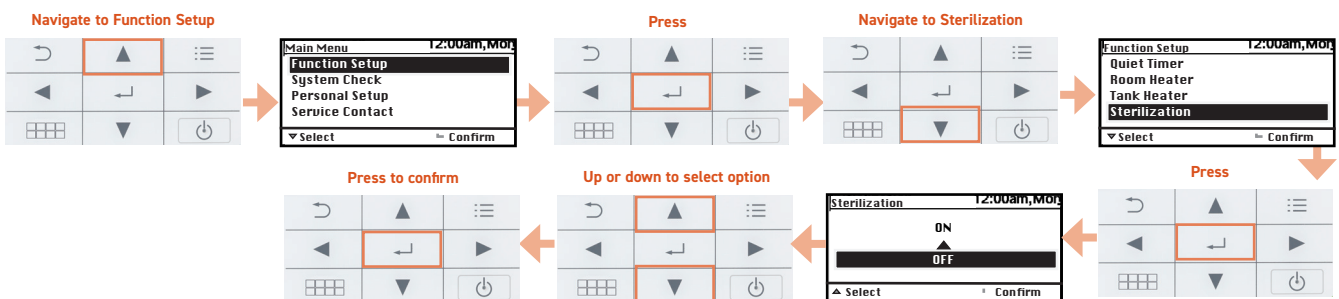
a) Room Heater: This setting enables the backup heater to activated in heating mode, if required. If set to "No", it will never activate (except for anti-freeze or defrost function).



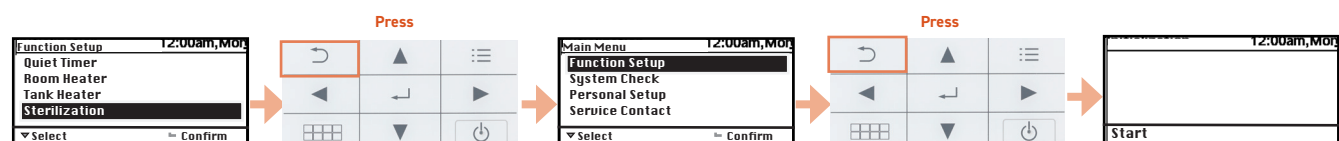
b) Tank Heater: This setting enables the backup heater or booster heater (which ever it is set to in system setup) to activate in DHW mode. If set to "No", it will never activate.



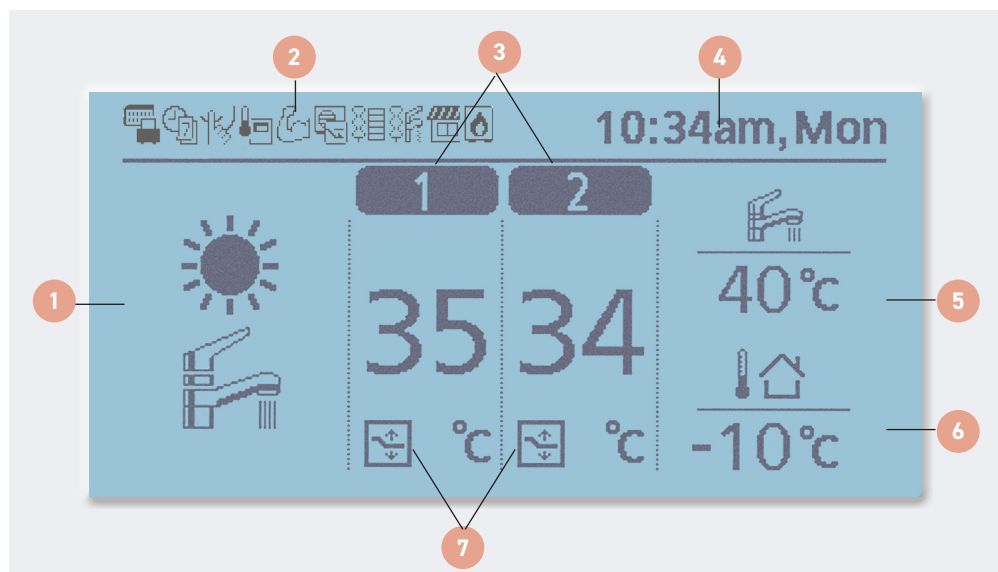
c) Sterilization: This setting enables the DHW sterilization function. If set to "No", it will never activate.



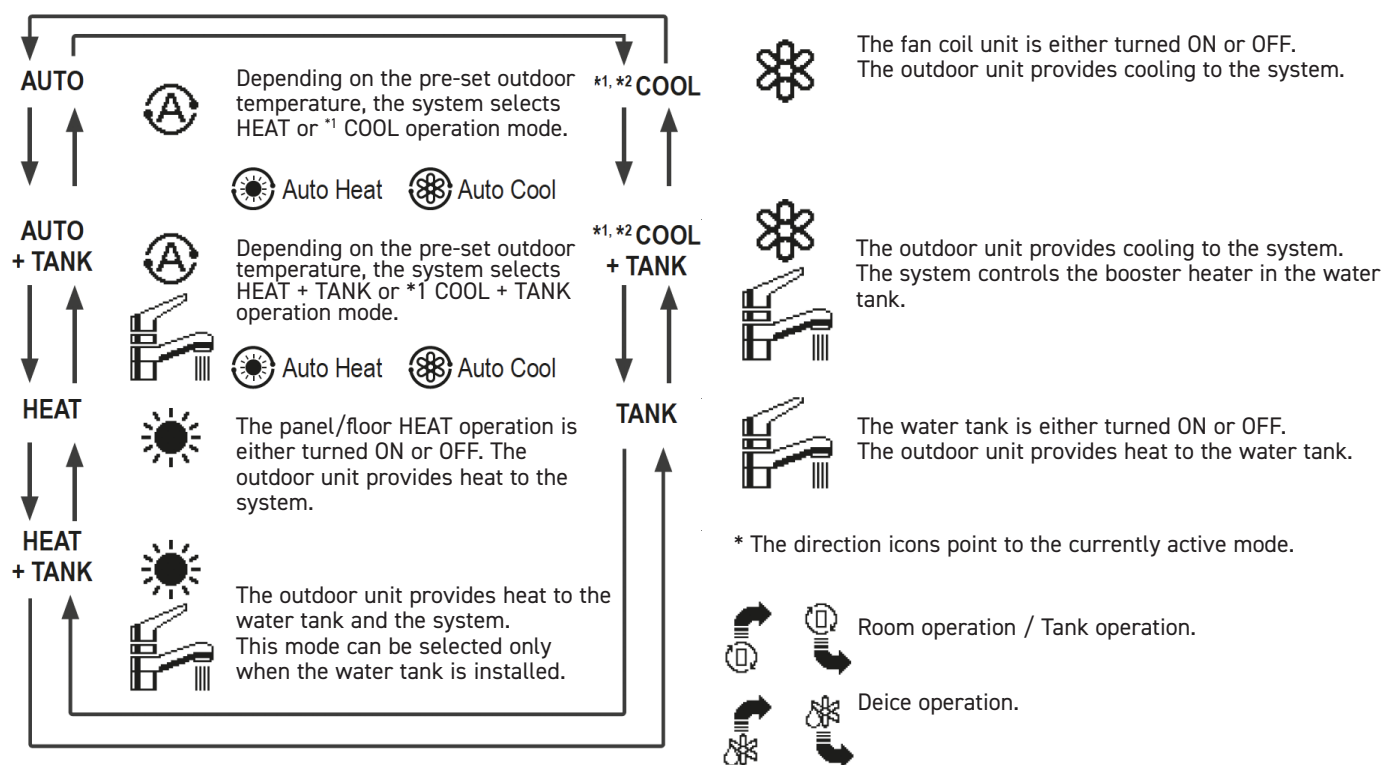
d) Return to Main Screen:



Step 6: Operating the system



1 Mode selection



*1 The system is locked to operate without COOL mode. It can be unlocked only by authorised installers or our authorised service partners.
 *2 Only displayed when COOL mode is unlocked (This means when COOL mode is available).

2 Operations icons

The status of operation is displayed. These icons will not display (under operation OFF screen) whenever the operation is OFF except weekly timer.

	Holiday operation status		Weekly Timer operation status		Solar status
	Quiet operation status		Powerful operation status		Bivalent status (Boiler)
	Zone: Room Thermostat > Internal sensor status		Tank Heater status		
	Room Heater status		Demand Control or SG ready or SHP status		

3 Temperature of each zone

4 Time and Day

5 Water tank temperature

6 Outdoor temperature

7 Sensor type/Set temperature type icons

	Water Temperature -> Compensation curve		Water Temperature -> Direct		Pool only
	Room Thermostat -> External		Room Thermostat -> Internal		Room Thermistor

Switching the Heat Pump On

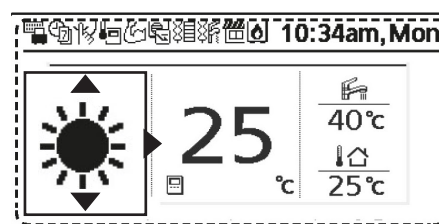
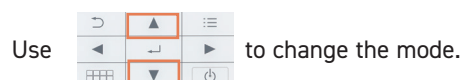
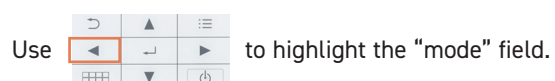


The green LED in the bottom right hand corner will light up and the display will show

(Display may differ depending on system settings)



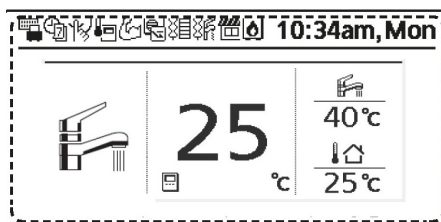
Changing the mode



Heating only

DHW Only

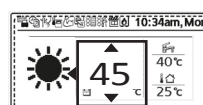
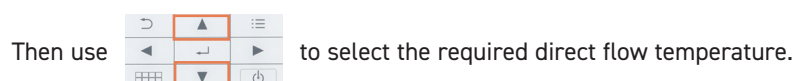
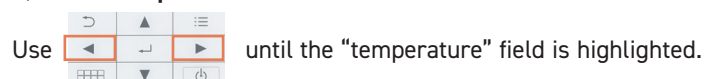
Heating & DHW



Changing the Heating Temperature:

This depends on the zone & sensor / water temp for heating on settings.
Follow the below procedure for the setup you have:

1) Water Temperature - Direct

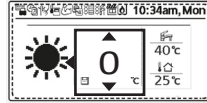


The heat pump will operate to achieve and maintain this flow temperature during heating mode only.

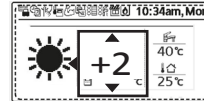
(The value in the "temperature" field, when it is not highlighted, is the actual flow temperature.)

2) Water Temperature - Weather Compensation

Use  until the "temperature" field is highlighted.



Then use  to select the compensation curve shift (offset) value.



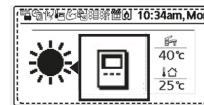
This allows the heat curve to be fine tuned. The relationship between flow and outdoor temperature remains constant but the overall temperatures are increased or decreased together.

(The value in the "temperature" field, when it is not highlighted, is the actual flow temperature.)

3) Room Thermostat (External) - Direct

The room temperature setpoint can only be changed on the room thermostat itself. This will tell the heat pump to run or stop in heating mode. The heat pump will simply work to the direct flow temperature that was set in the operation setup.

If the "temperature" field is highlighted, room thermostat (external) icon will show but no changes can be made.



(The value in the "temperature" field, when it is not highlighted, is the actual flow temperature.)

4) Room Thermostat (External) - Weather Compensation

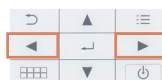
The room temperature setpoint can only be changed on the room thermostat itself. This will tell the heat pump to run or stop in heating mode. The heat pump will simply work to a weather compensated flow temperature according to the heat curve that was set in the operation setup.

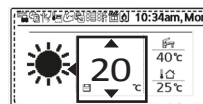
If the "temperature" field is highlighted, room thermostat (external) icon will show but no changes can be made.



(The value in the "temperature" field, when it is not highlighted, is the actual flow temperature.)

5) Room Thermostat (Internal) - Direct

Use  until the "temperature" field is highlighted.



Then use  to select the desired room temperature setpoint.

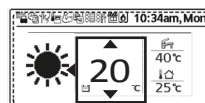


The heat pump will operate to achieve and maintain this room temperature using the direct flow temperature.

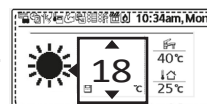
(The value in the "temperature" field, when it is not highlighted, is the actual room temperature.)

6) Room Thermostat (Internal) - Weather Compensation

Use  until the "temperature" field is highlighted.



Then use  to select the desired room temperature setpoint.



The heat pump will operate to achieve and maintain this room temperature using the weather compensated flow temperature.

(The value in the "temperature" field, when it is not highlighted, is the actual room temperature.)

7) Changing the DHW Temperature

The DHW setpoint can only be changed when the heat pump is in DHW or DHW & Heating mode.

Use  to highlight "tank setpoint" field.



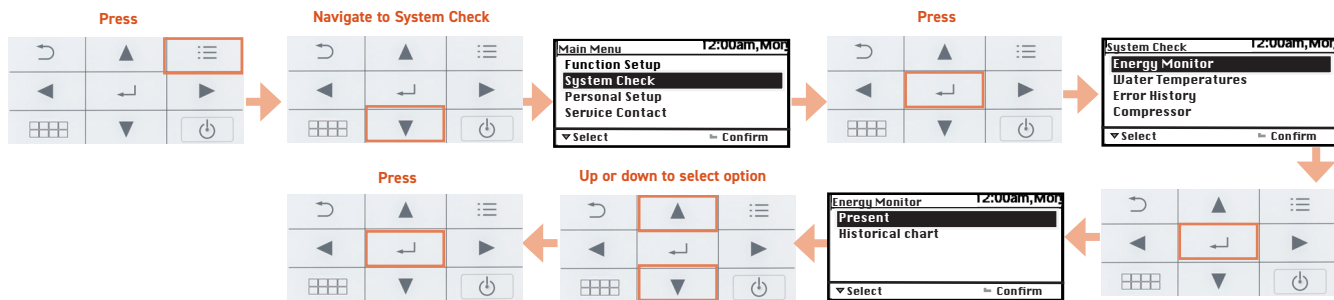
Then use  to select the desired DHW temperature.

(The value in the "DHW setpoint" field, when it is not highlighted, is the actual DHW temperature.)

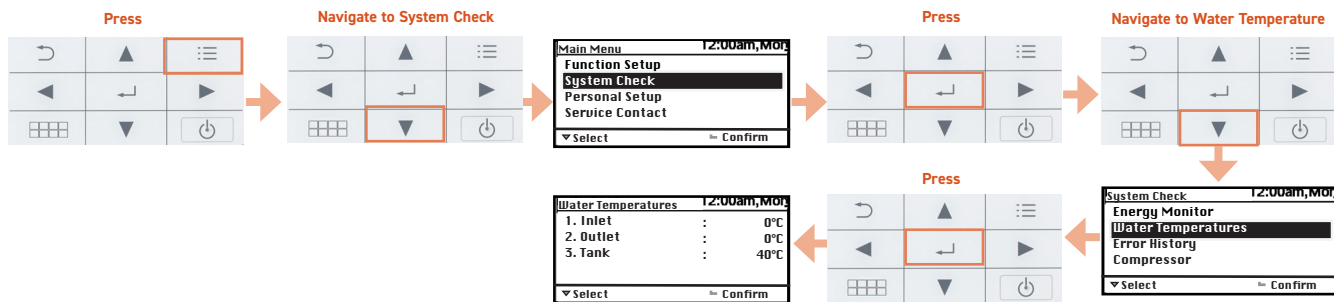
Step 7a: System Checks "H" Series

While the heat pump is operating, system checks can be made with reference to sensor readings and other operating information.

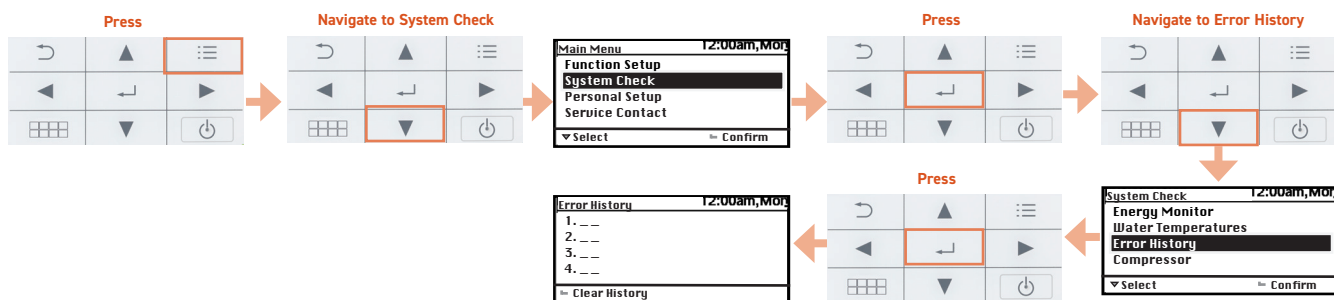
a) Energy Monitor*: Shows current and historical performance data.



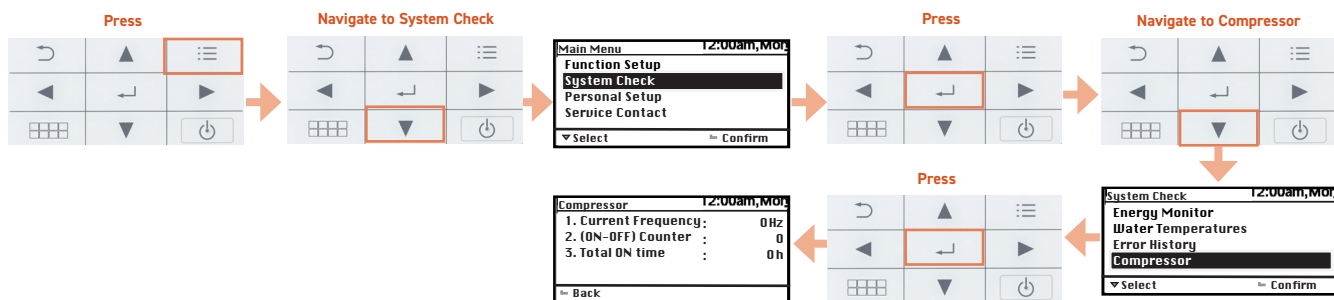
b) Water Temperatures: Shows current outlet/inlet etc temperatures.



c) Error History: Shows any stored system errors.

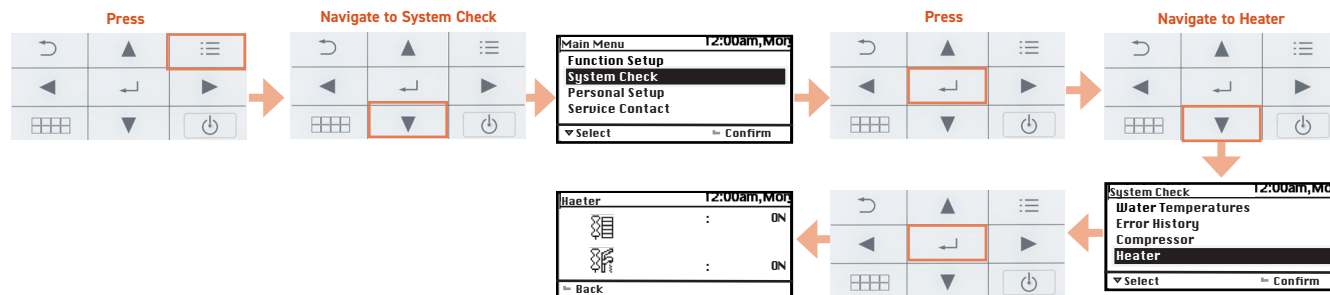


d) Compressor: Shows information about the compressor.



*Energy Monitor is for indication purposes only, this is not a calibrated monitor.

e) Heater: Shows information about the electrical backup/booster heaters for heating and DHW.



f) Quick Flow rate Check: Check the actual flow rate of the system while it's running.



SCAN TO VIEW OUR YOUTUBE
INSTALLATION PLAYLIST

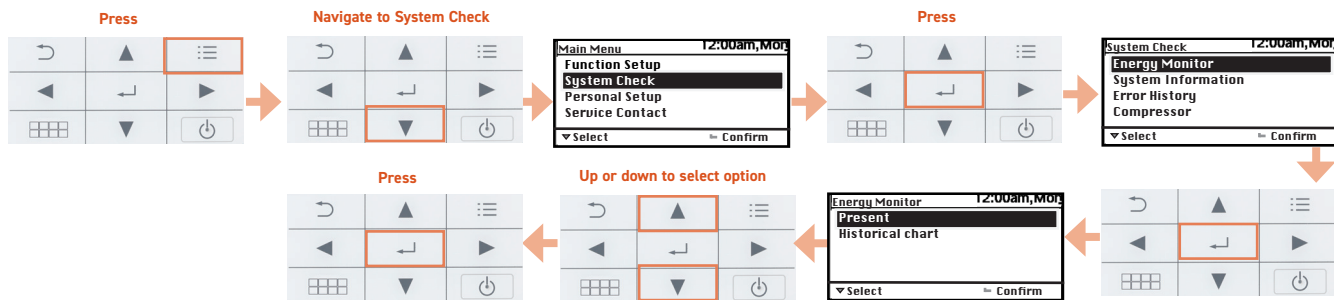


Covering 'H' Series onwards:
Set up Timer
Performance Check
Water Temperature Check
Water Flow Rate Check

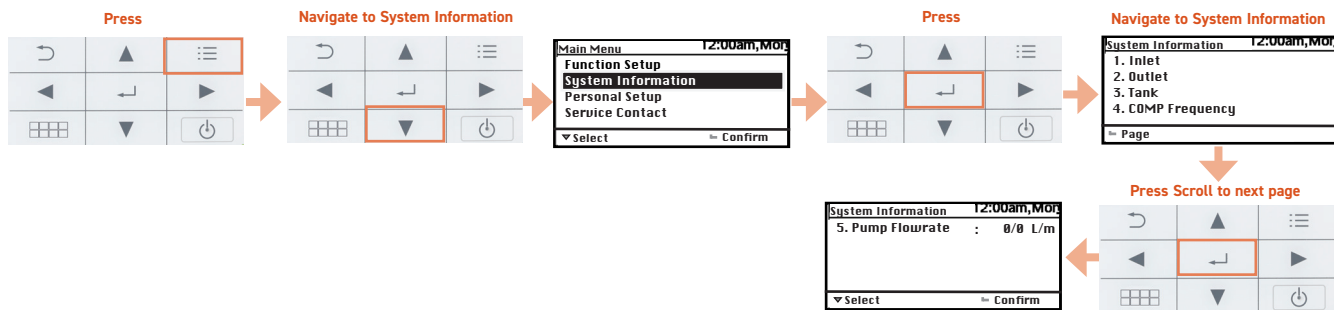
Step 7b: System Checks “J” Series

While the heat pump is operating, system checks can be made with reference to sensor readings and other operating information.

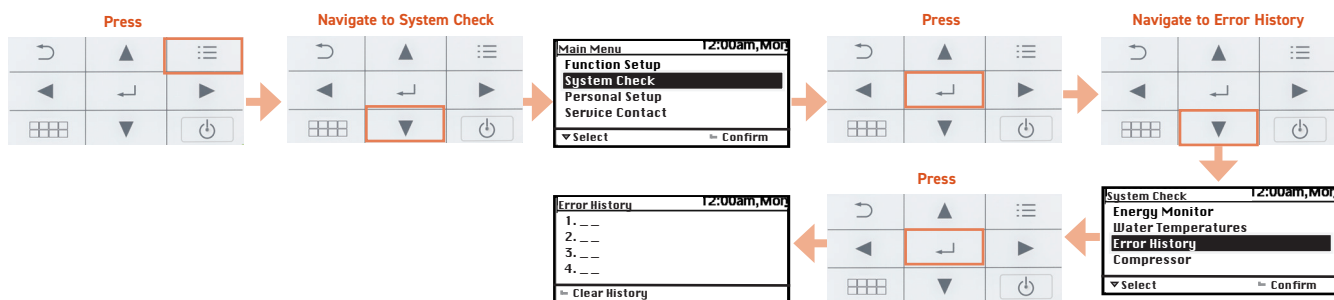
a) Energy Monitor*: Shows current and historical performance data.



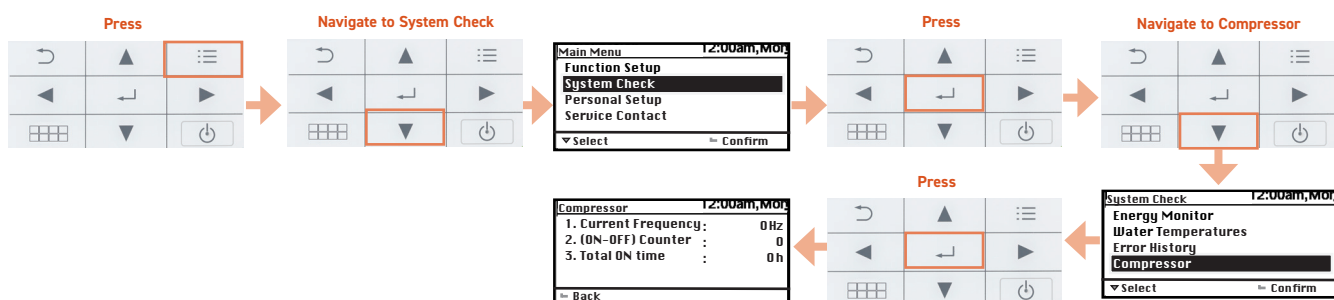
b) System Information: Shows current outlet/inlet etc temperatures.



c) Error History: Shows any stored system errors.

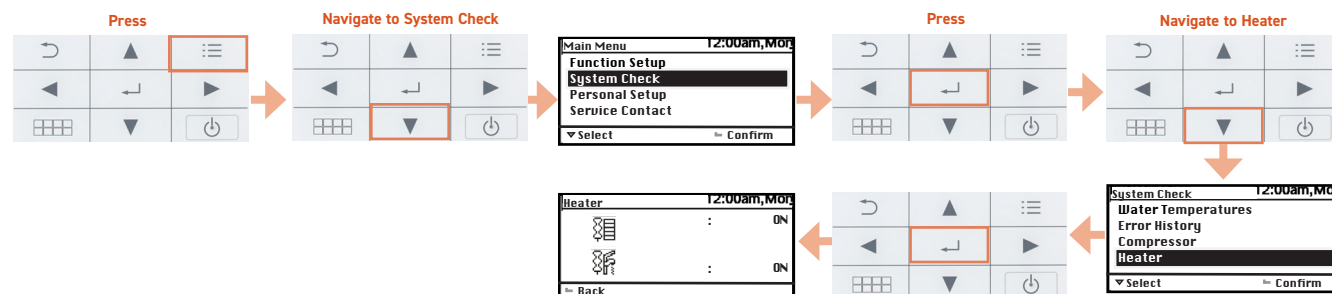


d) Compressor: Shows information about the compressor.



*Energy Monitor is for indication purposes only, this is not a calibrated monitor.

e) Heater: Shows information about the electrical backup/booster heaters for heating and DHW.



f) Quick Flow rate Check: Check the actual flow rate of the system while it's running.



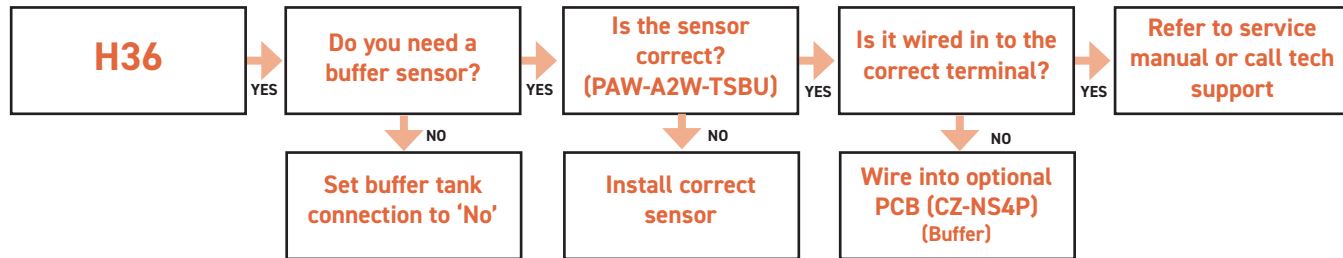
Error Codes during commissioning

To check the error code:

- When the abnormality occurs the system will stop and OFF/ON control panel LED will blink.
- The error code of the abnormality will be display on the control panel.

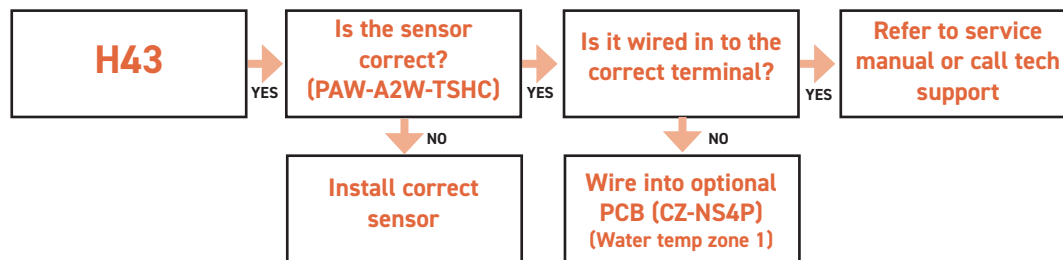
H36: Abnormal Buffer Tank Sensor

This is due to "Buffer Tank Connection" setting "Yes" and the system can't see the buffer sensor.



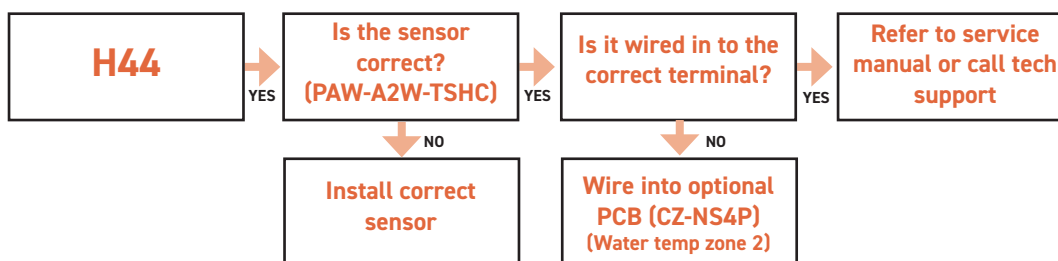
H43: Abnormal water temperature sensor Zone 1

When the Optional PCB (CZ-NS4P) is used, the system requires a zone water temperature sensor. This error means the system can't see the sensor.



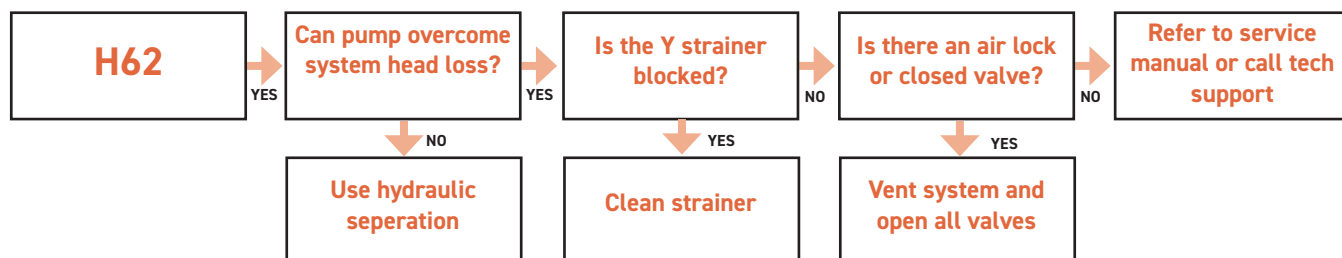
H44: Abnormal water temperature sensor Zone 2

When the Optional PCB (CZ-NS4P) is used and using 2 zone configuration, the system requires a zone water temperature sensor. This error means the system can't see the sensor.



H62: Primary Flow Error

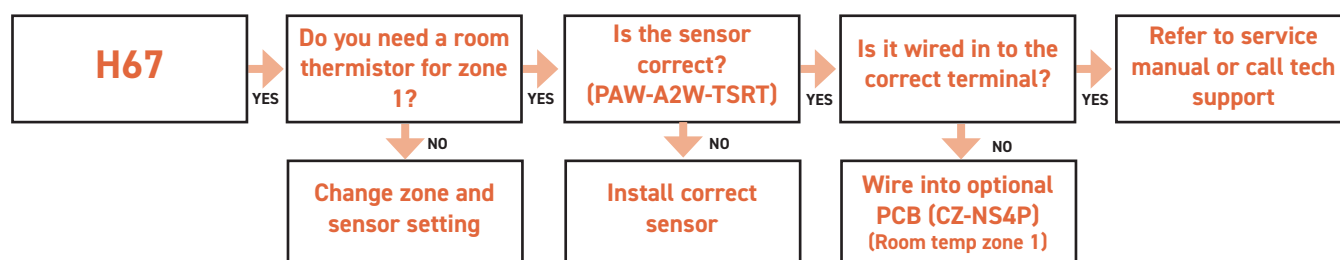
This error occurs when the flow sensor detects a problem with the primary flow rate. This is usually because the flow rate is too low.



Error Codes during commissioning

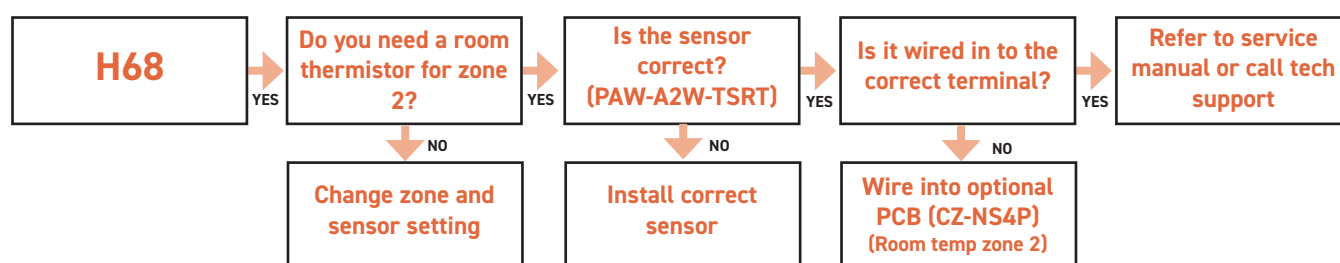
H67: Abnormal Room Thermistor Zone 1

This is due to "Zone & Sensor" setting Zone 1 set to "Room Thermistor", but the system can't see the thermistor.



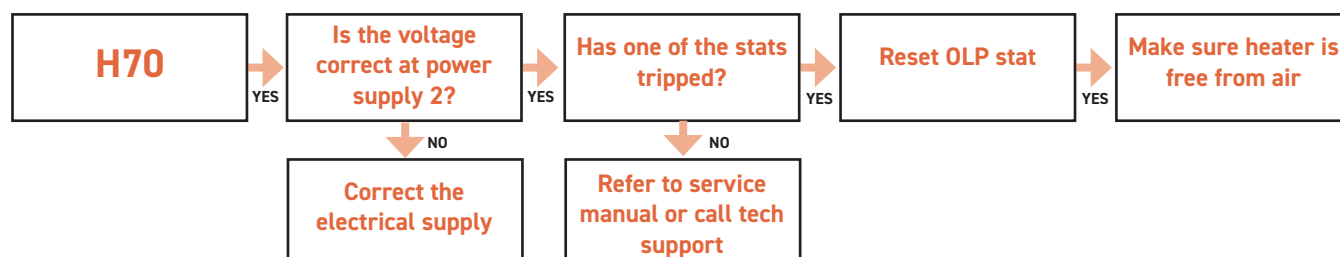
H68: Abnormal Room Thermistor Zone 2

This is due to "Zone & Sensor" setting Zone 2 set to "Room Thermistor", but the system can't see the thermistor.



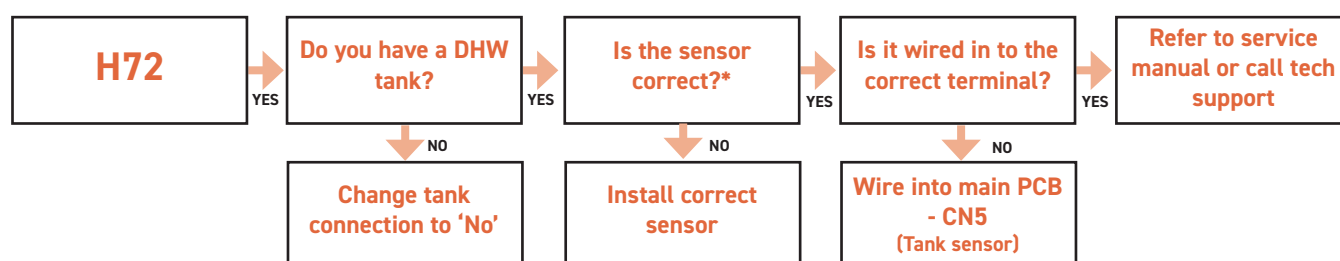
H70: Backup Heater OLP (over load protection)

The internal electrical backup heater has built in over heat thermostats. If one of these trip and become open circuit, H70 occurs. The system will also show H70 when the backup heater power supply is missing. This error will only occur at the time when the backup heater is activated.



H72: Abnormal DHW Tank Sensor

This is due to "Tank Connection" set to "Yes" but the system can't see the tank sensor.



* Optional Panasonic tank sensor

PAW-TS1 (Tank sensor with 6 m cable length)

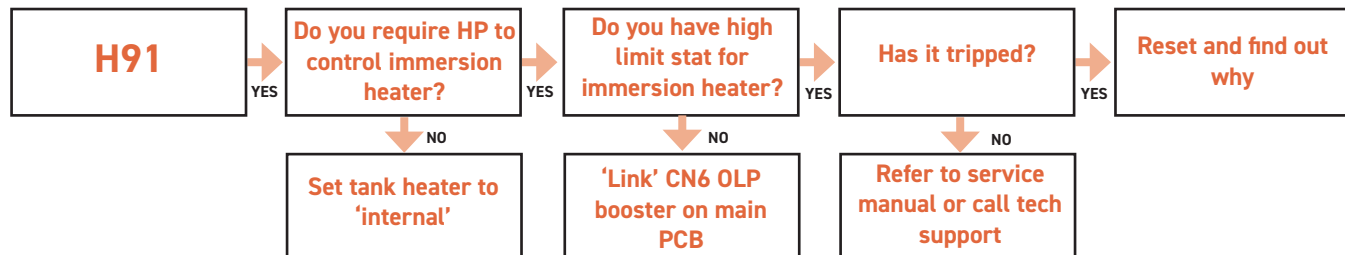
PAW-TS2 (Tank sensor with 20 m cable length)

PAW-TS4 (Tank sensor with 6 m cable length and only 6 mm diameter)

CZ-TK1 (Tank sensor kit for third party tank with copper pocket and 20m length sensor cable)

H91: Tank Heater OLP (over load protection)

When "Tank Heater" set to "External" the system will error if the tank heater OLP is open circuit. This is like a high limit for the booster (immersion) heater. This error will only occur when the booster heater is actually activated.



Panasonic Technical Support contact details

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Email: Technical.PHVACUK@eu.panasonic.com

Advanced Installations

2 zone setup - Heating circuit

The basic principle is that both heating circuits will draw off the buffer tank independently, using their own circulating pump. The flow temperature of each zone is monitored by the heat pump using zone water temperature sensors, which are mandatory to the installation. These sensors are placed on the flow pipe for both circuits. Both zones can be set to differing flow temperatures but can only be physically regulated differently when mixing valves are used. (e.g. If zone 1 is a radiator circuit set to operate at 50°C and zone 2 is an UFH circuit set to operate at 35°C, the heat pump would operate to 50°C and control zone 2 mixing valve to blend 50°C down to 35°C. Of course, the mixing valve is not necessary if the UFH manifold already has a thermostatic blending valve built in; therefore, the flow temperature setting could be the same for both circuits.) The heat pump will always operate to the higher of the two flow temperature settings in heating mode and the cooler of the two flow temperature settings in cooling mode.

Both zones can be controlled using either:

- **Water Temperature** (flow temperature for each zone, no room temperatures are used)
- **Room Thermostat** Internal (remote controller sensor as room temperature reference)
- **Room Thermostat** External (3rd party thermostat as room temperature reference)
- **Room Thermistor** (Panasonic room sensor as room temperature reference*)

*both zones can be controlled by differing methods.

Accessories that are MANDATORY for 2 zone installations:

- Optional PCB (CZ-NS4P)
- 2x Zone Water Sensors (PAW-A2W-TSHC)
- Circulating Pumps (Field Supplied)

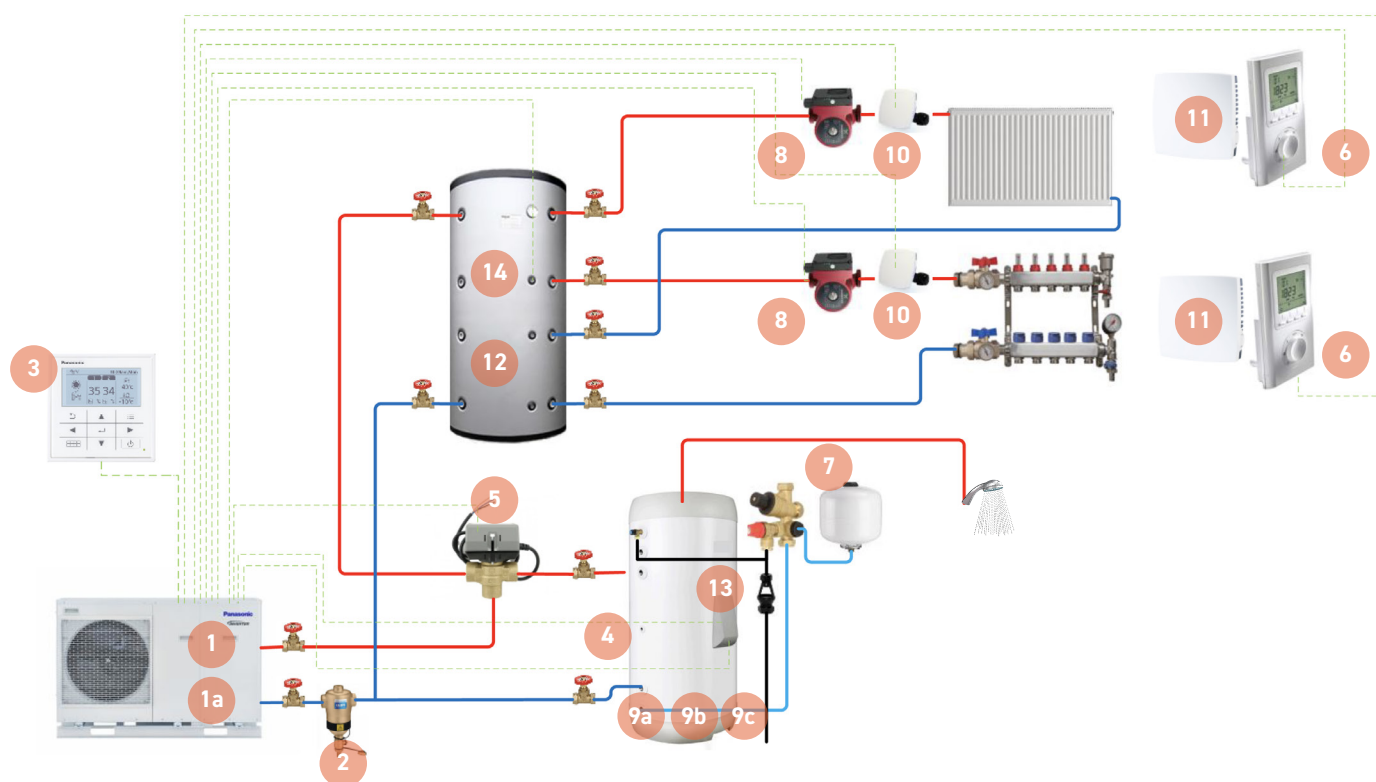
Accessories that are optional (depending on your installation) for 2 zone installations:

- Panasonic Room Thermistor (PAW-A2W-TSRT)
- Buffer Tank Sensor (PAW-A2W-TSBU)
- Panasonic Room Thermostat 230V switching (PAW-A2W-RTWIRED)
- Panasonic Wireless Room Thermostat 230V switching (PAW-A2W-RTWIRELESS)
- 3rd Party Room Thermostat 230V switching (Field Supplied)
- Blending Valves (Field Supplied)

Installation Schematic

2 Zone - Direct Flow Temperatures:

Both circuits can be set to different flow temperatures but the heat pump will always work to the higher of the two (heating mode) and lower of the two (cooling mode).



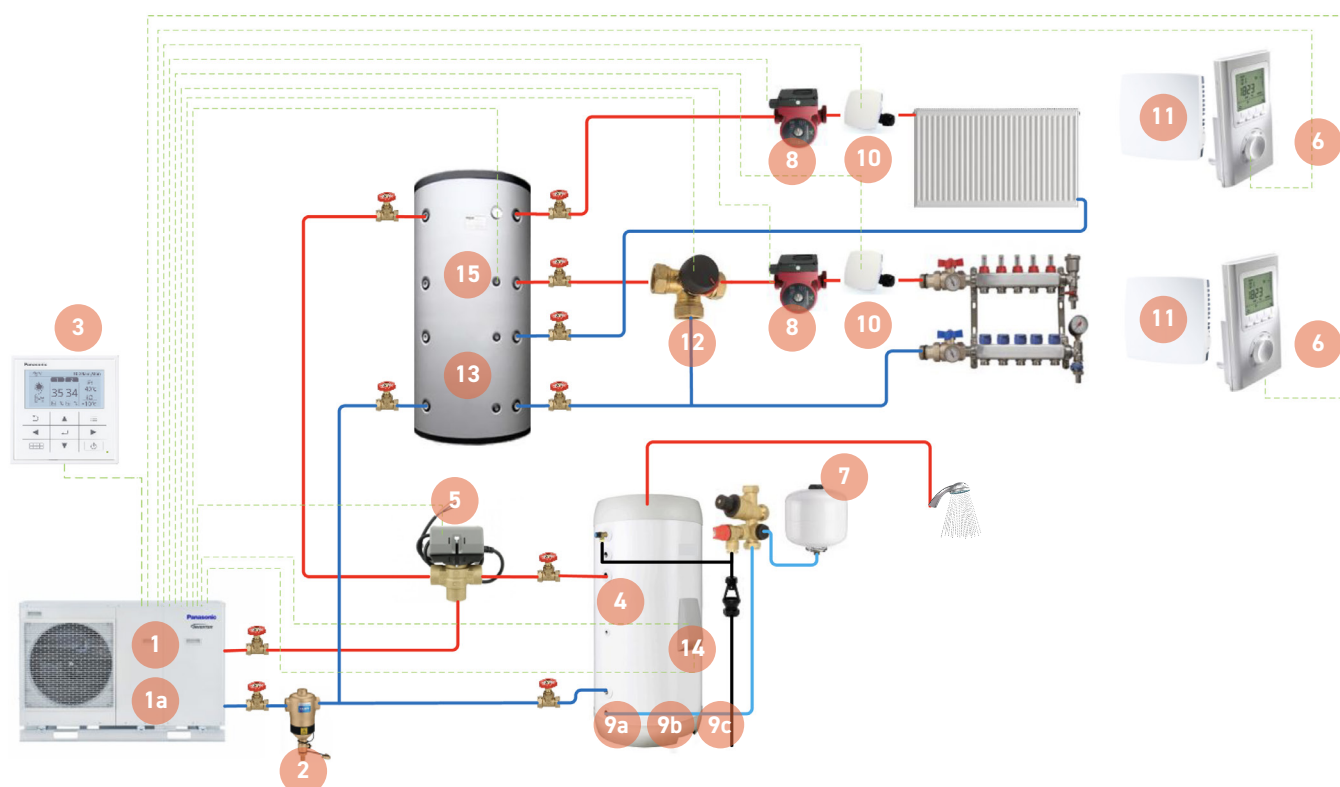
Number	Description	Type of Recommendation	Panasonic Part Number
1	Monobloc Unit	Mandatory	---
1a	PCB for advanced functions	Mandatory	CZ-NS4P
2	Magnetic Particle Filter	Mandatory on "H" Series Recommended on "J" Series*	---
3	Remote Controller	Supplied with Monobloc Unit	---
4	Tank Sensor	Supplied with a Panasonic DHW tank, if 3rd party tank used then has to be purchased separately (20m)	PAW-TS2
5	3 Way Valve	Mandatory if DHW tank installed	PAW-3WYVLV-HW
6	Room Thermostat (external)	Recommended (can be field supplied)	PAW-A2W-RTWIRED
7	G3 Kit	Mandatory (supplied with tank)	---
8	Circulating Pump	Mandatory (field supplied)	---
9a	200L DHW Cylinder	Mandatory if DHW is required	KIT-G3TD20C1E5-1
9b	300L DHW Cylinder (1.8m2 Coil)	Mandatory if DHW is required	KIT-G3TD30C1E5-1
9c	300L DHW Cylinder (2.35m2 Coil)	Mandatory if DHW is required	KIT-G3TD30C1E5HI-1
10	Zone Water Sensor	Mandatory	PAW-A2W-TSHC
11	Zone Room Thermistor	Mandatory	PAW-A2W-TSRT
12	Buffer Tank	Mandatory (field supplied)	---
13	Immersion (Booster) Heater	Mandatory	---
14	Buffer Sensor	Mandatory	PAW-A2W-TSBU

*"J" series has a small inbuilt magnetic particle filter.

Installation Schematic

2 Zone Layout - Direct & Mixed:

One zone is direct and the other can be mixed to blend the flow temperature down (heating mode). No settings need to be made to incorporate the mixing valve, simply wire it in.



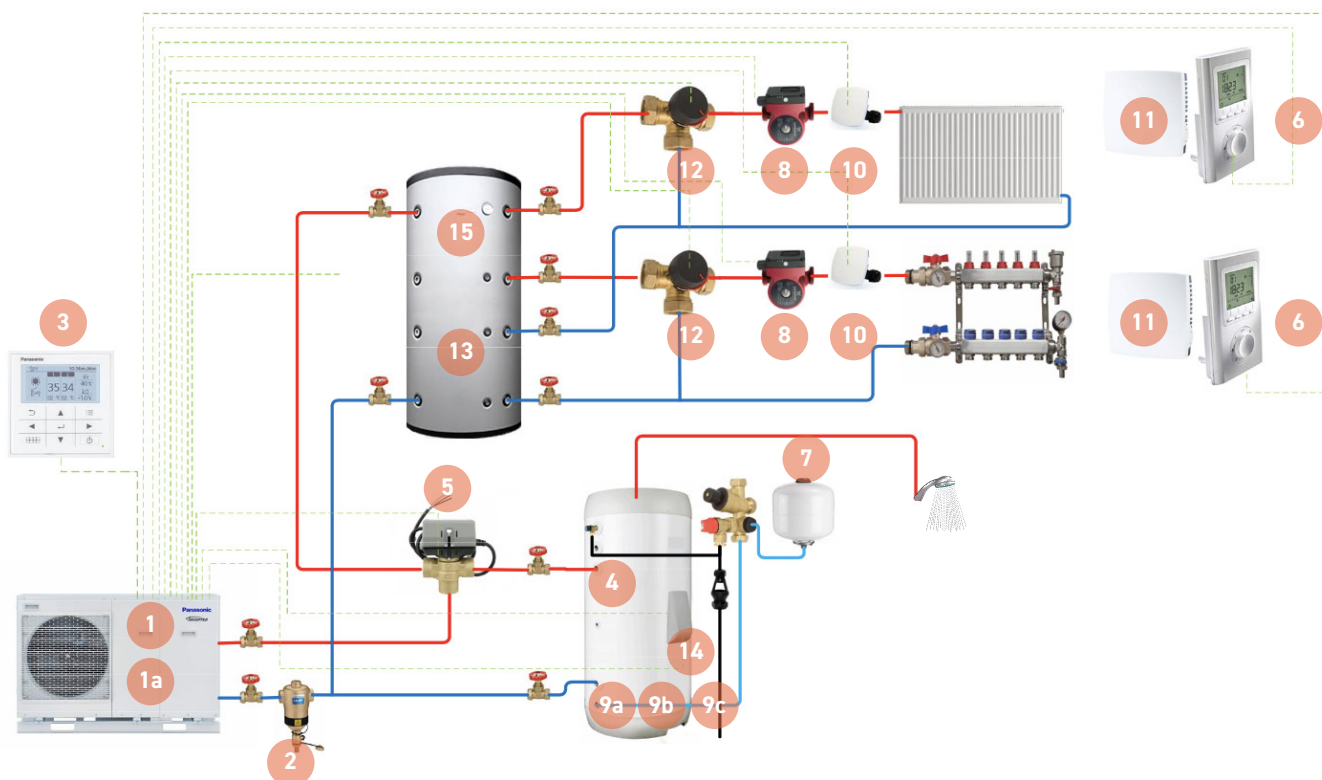
Number	Description	Type of Recommendation	Panasonic Part Number
1	Monobloc Unit	Mandatory	---
1a	PCB for advanced functions	Mandatory	CZ-NS4P
2	Magnetic Particle Filter	Mandatory on "H" Series Recommended on "J" Series*	---
3	Remote Controller	Supplied with Monobloc Unit	---
4	Tank Sensor	Supplied with a Panasonic DHW tank, if 3rd party tank used then has to be purchased separately (20m)	PAW-TS2
5	3 Way Valve	Mandatory if DHW tank installed	PAW-3WYVLV-HW
6	Room Thermostat (external)	Recommended (can be field supplied)	PAW-A2W-RTWIRED
7	G3 Kit	Mandatory (supplied with tank)	---
8	Circulating Pump	Mandatory (field supplied)	---
9a	200L DHW Cylinder	Mandatory if DHW is required	KIT-G3TD20C1E5-1
9b	300L DHW Cylinder (1.8m2 Coil)	Mandatory if DHW is required	KIT-G3TD30C1E5-1
9c	300L DHW Cylinder (2.35m2 Coil)	Mandatory if DHW is required	KIT-G3TD30C1E5HI-1
10	Zone Water Sensor	Mandatory	PAW-A2W-TSHC
11	Zone Room Thermistor	Mandatory	PAW-A2W-TSRT
12	Mixer Valve	Mandatory (field supplied)	---
13	Buffer Tank	Mandatory (field supplied)	---
14	Immersion (Booster) Heater	Mandatory	---
15	Buffer Sensor	Mandatory	PAW-A2W-TSBU

*"J" series has a small inbuilt magnetic particle filter.

Installation Schematic

2 Zone Layout - Both Mixed:

Both circuits can regulate their flow temperature independently. The heat pump will always work to the higher of the two (heating mode) and lower of the two (cooling mode). No settings need to be made to incorporate the mixing valves, simply wire them in.

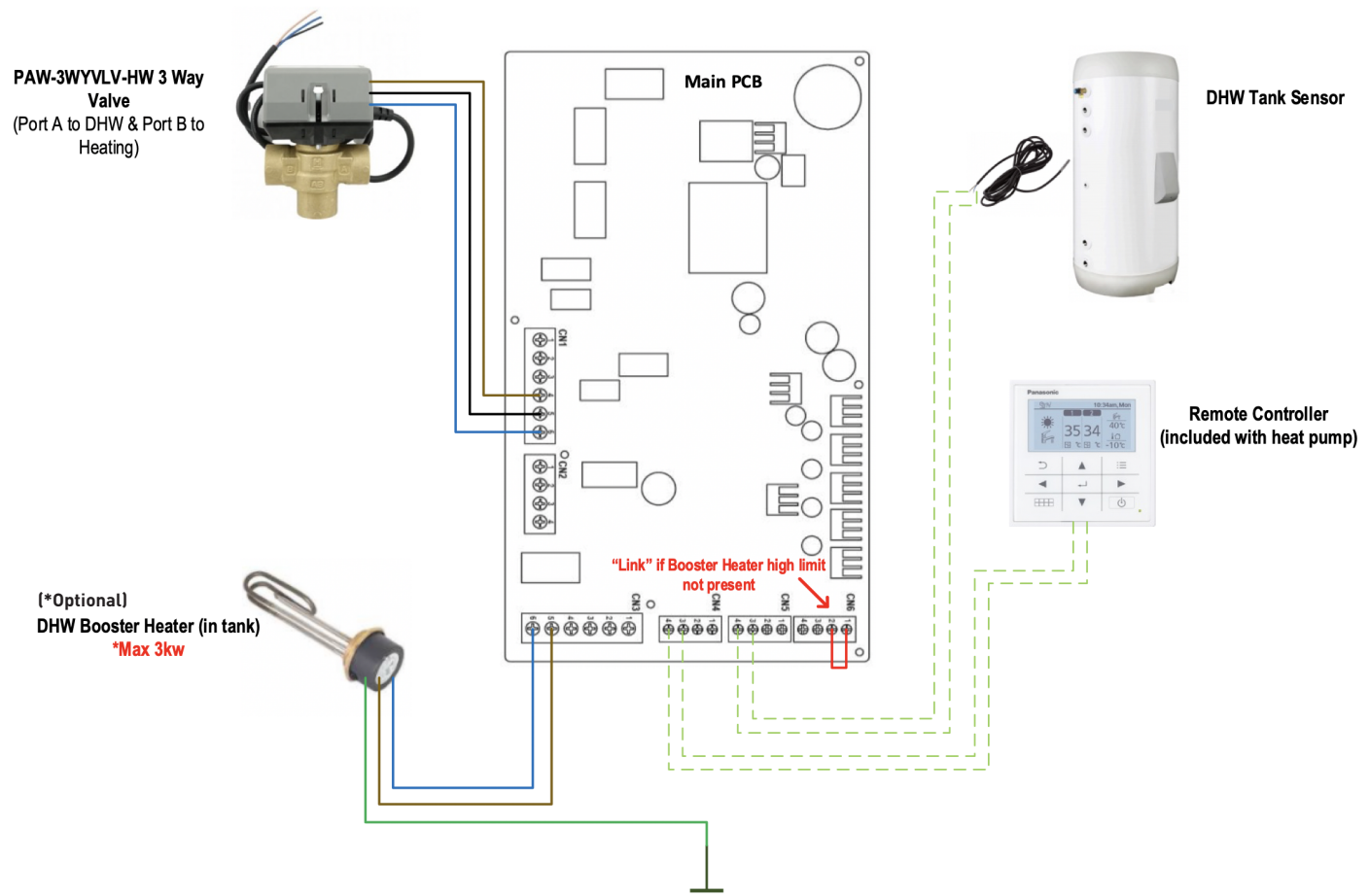


Number	Description	Type of Recommendation	Panasonic Part Number
1	Monobloc Unit	Mandatory	- - -
1a	PCB for advanced functions	Mandatory	CZ-NS4P
2	Magnetic Particle Filter	Mandatory on "H" Series Recommended on "J" Series*	- - -
3	Remote Controller	Supplied with Monobloc Unit	- - -
4	Tank Sensor	Supplied with a Panasonic DHW tank, if 3rd party tank used then has to be purchased separately (20m)	PAW-TS2
5	3 Way Valve	Mandatory if DHW tank installed	PAW-3WYVLV-HW
6	Room Thermostat (external)	Recommended (can be field supplied)	PAW-A2W-RTWIRED
7	G3 Kit	Mandatory (supplied with tank)	- - -
8	Circulating Pump	Mandatory (field supplied)	- - -
9a	200L DHW Cylinder	Mandatory if DHW is required	KIT-G3TD20C1E5-1
9b	300L DHW Cylinder (1.8m2 Coil)	Mandatory if DHW is required	KIT-G3TD30C1E5-1
9c	300L DHW Cylinder (2.35m2 Coil)	Mandatory if DHW is required	KIT-G3TD30C1E5HI-1
10	Zone Water Sensor	Mandatory	PAW-A2W-TSHC
11	Zone Room Thermistor	Mandatory	PAW-A2W-TSRT
12	Mixer Valve	Mandatory (field supplied)	- - -
13	Buffer Tank	Mandatory (field supplied)	- - -
14	Immersion (Booster) Heater	Mandatory	- - -
15	Buffer Sensor	Mandatory	PAW-A2W-TSBU

*"J" series has a small inbuilt magnetic particle filter.

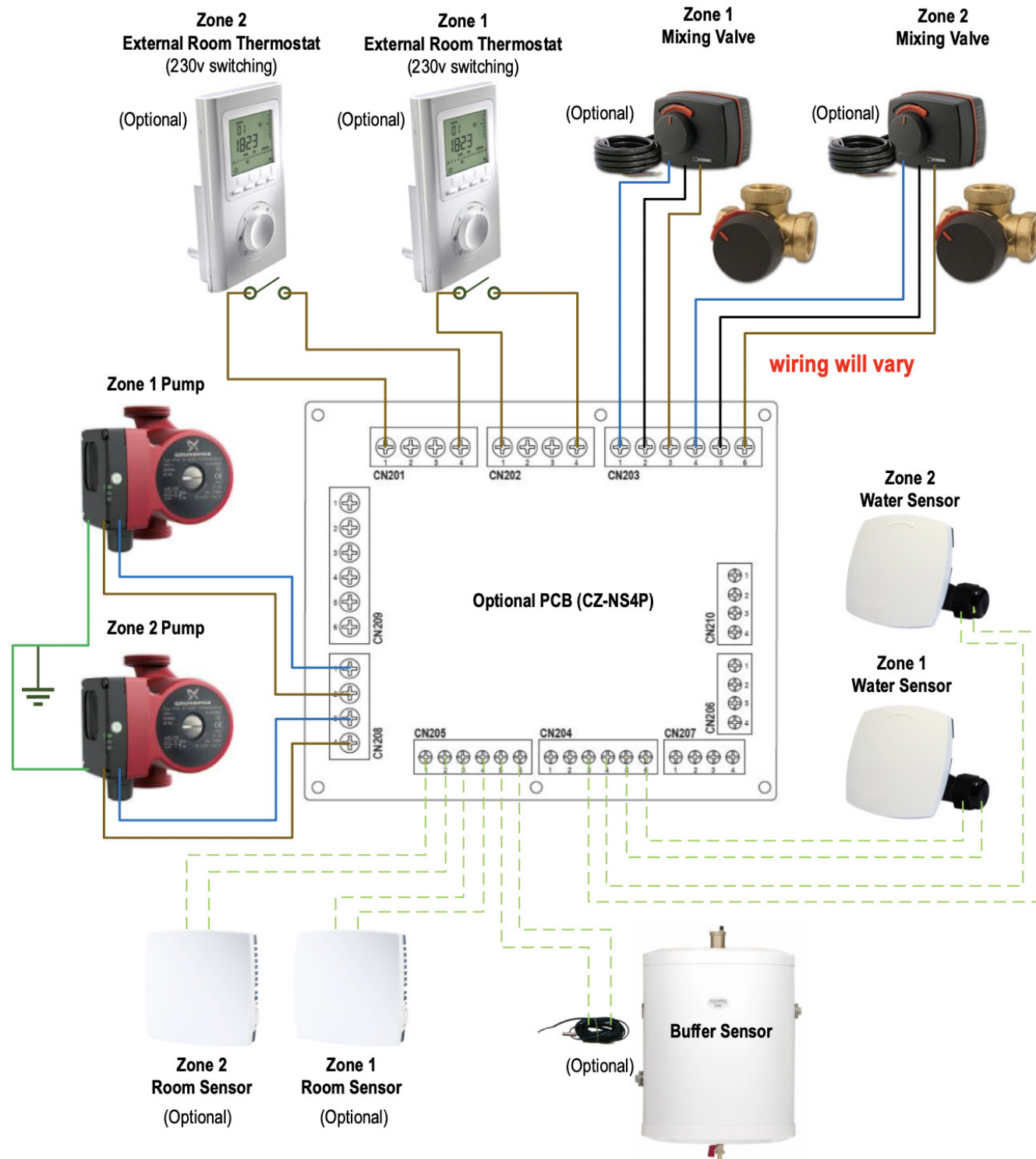
2 Zone Wiring (Main PCB)

(See next facing page for additional PCB wiring)



*Connection of DHW booster heater element to the heat pump is optional, only required if you wish the heat pump to control the operationally use. Independent wiring & control can be an alternative arrangement.

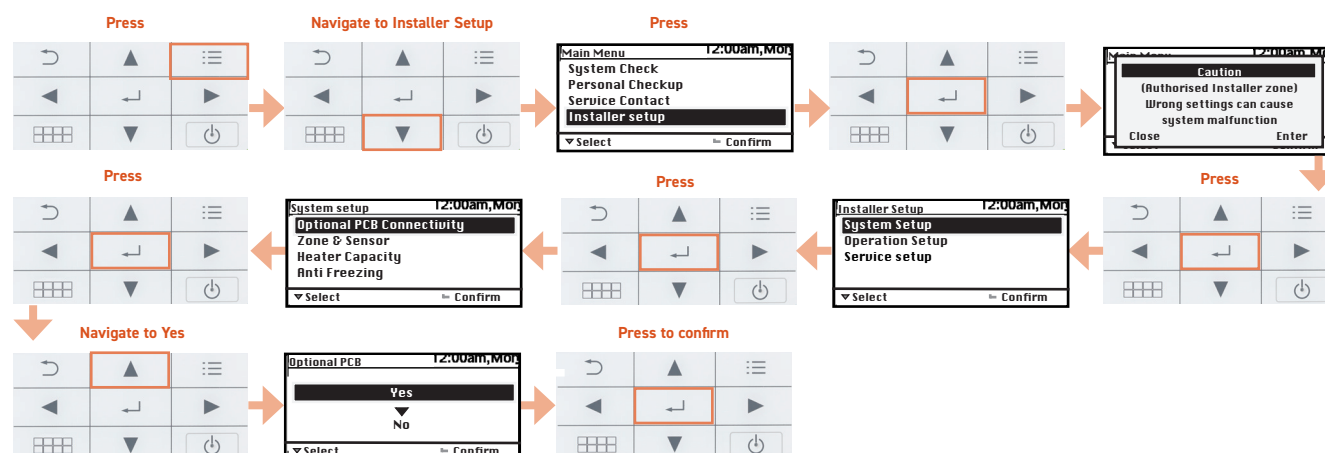
2 Zone Wiring (Optional PCB)



2 Zone Controller Setup

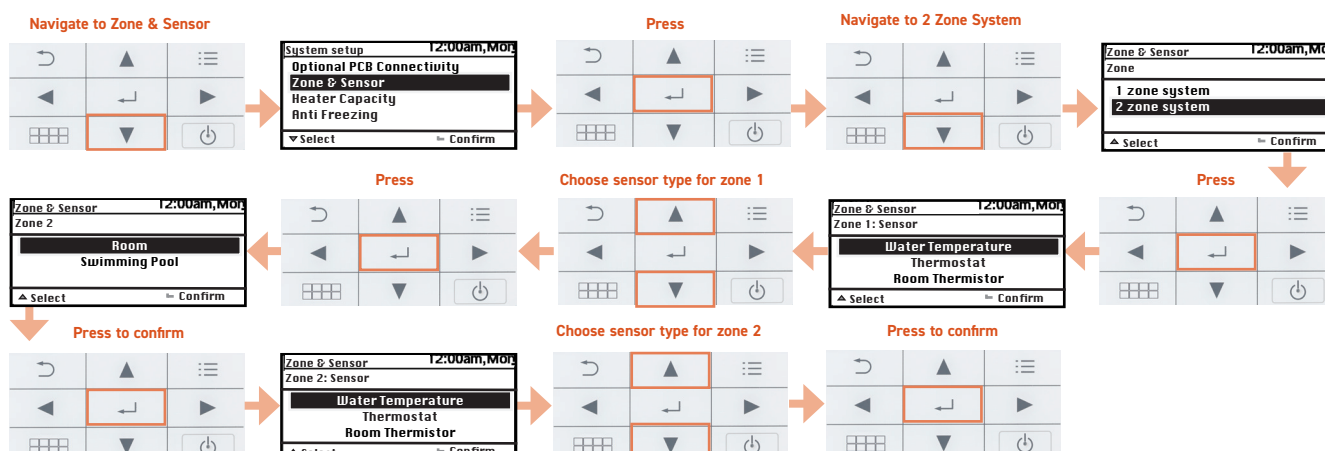
Step 1: Optional PCB Connectivity

2 zone configuration requires the Optional PCB (CZ-NS4P) to be physically installed and confirmed as being present in the system.



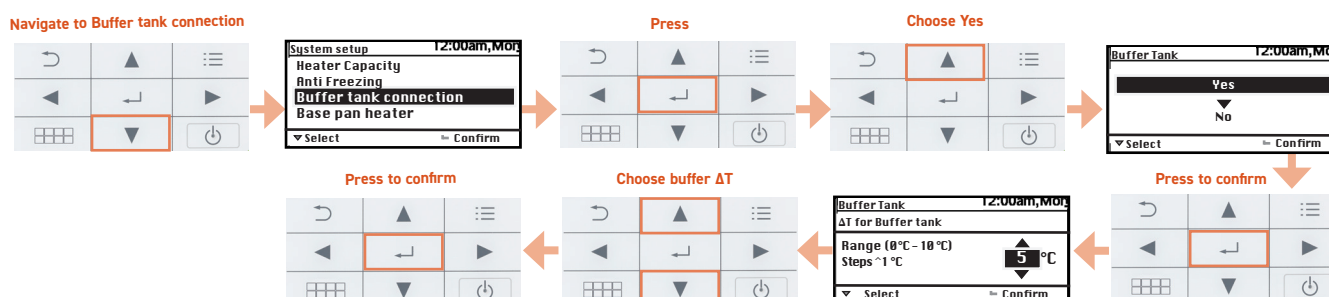
Step 2: Set Zone & Sensor Type

This is where you tell the heat pump that it will be connected to 2 zones and how it will be controlling them.



Step 3: Set Buffer Tank Sensor (optional)

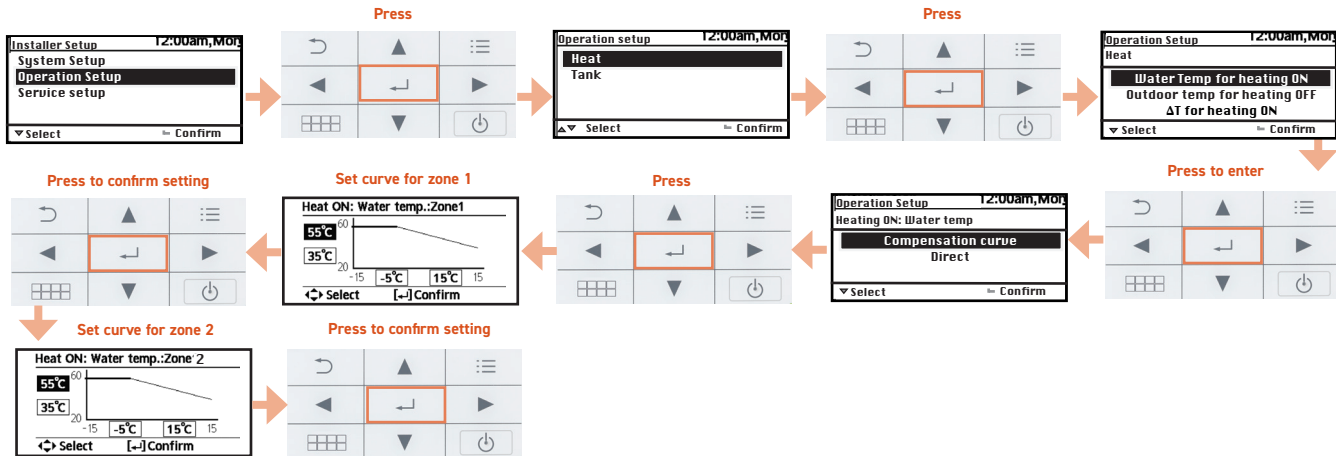
This is where you tell the heat pump whether it will be monitoring the temperature of the buffer tank. The buffer tank can then be set to achieve a higher setpoint to that of the heating circuits. This is the Buffer ΔT , the difference in setpoint between primary and secondary sides.



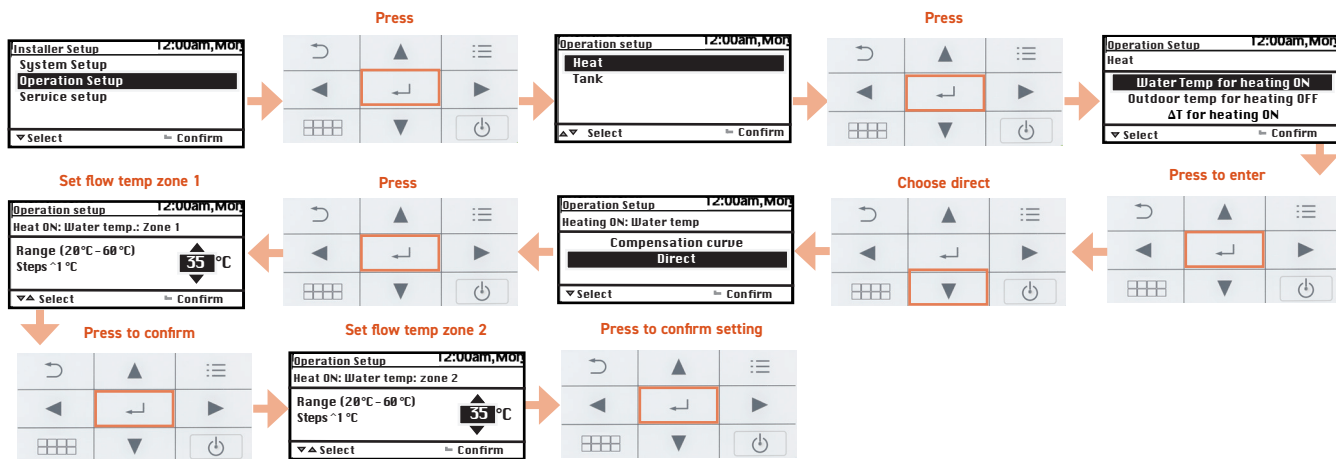
Step 4: Operation Setup (Heating Settings)

This is where you set whether the zone water flow temperatures will be direct (fixed flow temperature) or weather compensated. These settings are exactly the same as described previously for a single zone system. You just need to choose the settings for the second zone.

Both zones compensation curve:

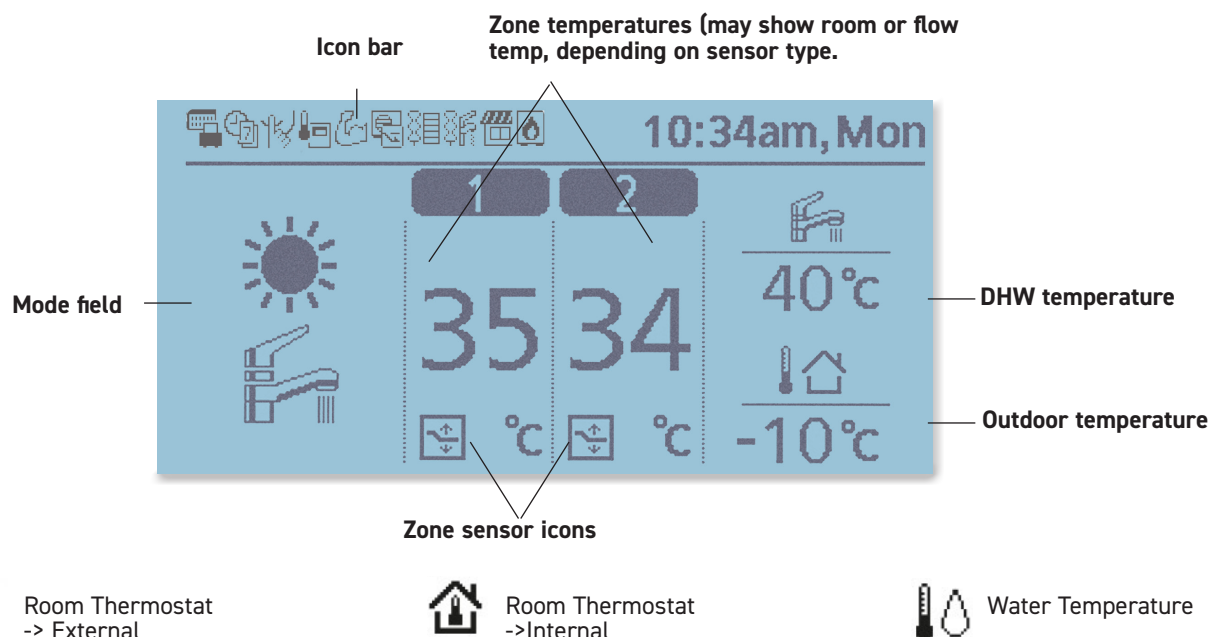


Both zones direct



Operating 2 Zones

The main screen will vary depending on how the 2 zone system is being controlled. All functions are the same as a single zone system. The only difference is the inclusion of a second zone, which can be adjusted and switched on/off).



Changing Zone Temperature:

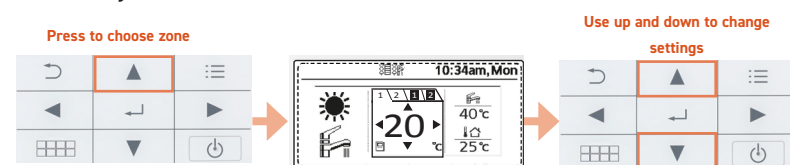
This will depend on the zone sensor setting.

If set to "Room Thermostat (Internal)" or "Room Thermistor", the temperature shown will be the room temperature. This temperature can be adjusted from here.

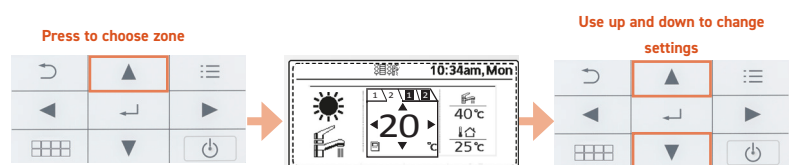
If set to "Room Thermostat (External)", the temperature shown is the flow temperature. This temperature can't be changed here.

If set to "Water Temperature" and "Compensation Curve", the temperature shown is the flow temperature. The off-set can be adjusted. If set to "Water Temperature" and "Direct", the temperature shown is the flow temperature. This temperature can be adjusted from here.

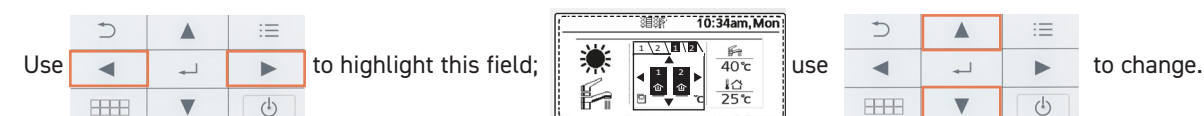
Zone 1 Adjust



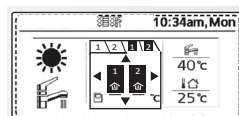
Zone 2 Adjust



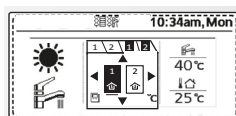
Switching Zone On/OFF:



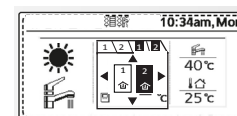
Zone 1 ON, Zone 2 ON



Zone 1 ON, Zone 2 OFF



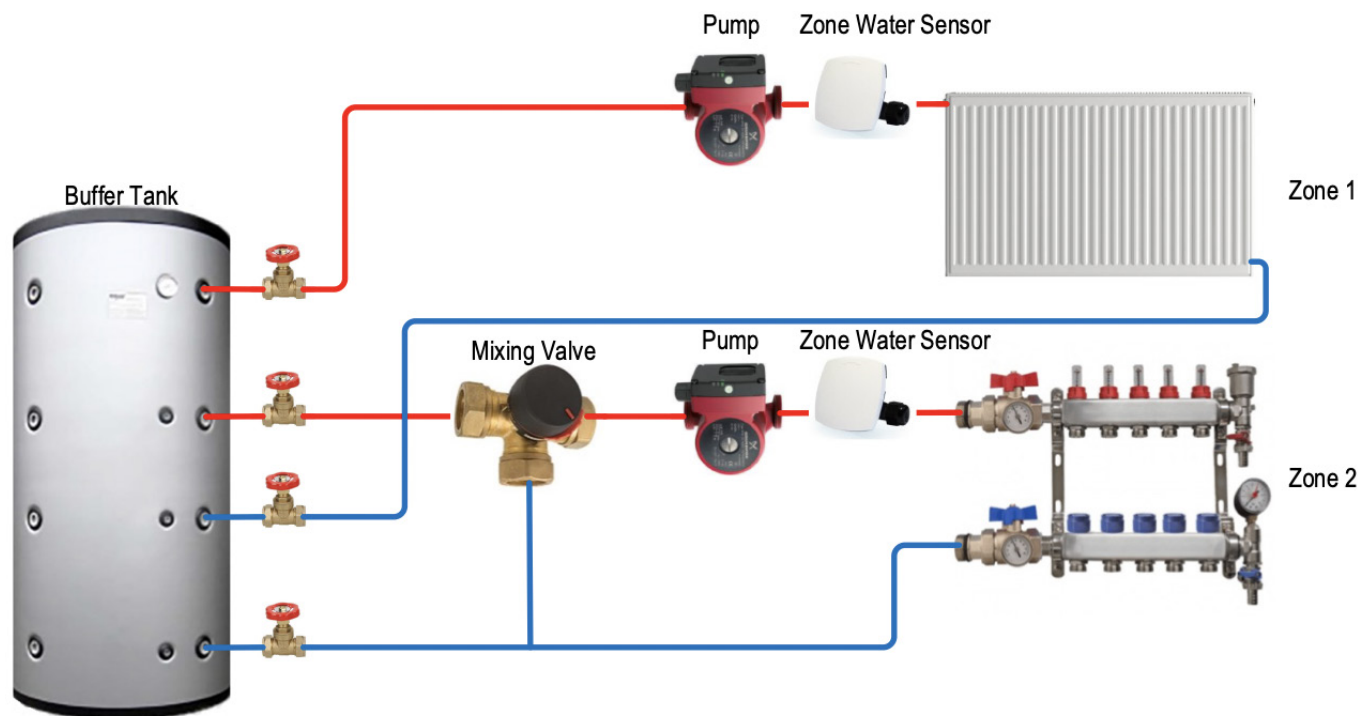
Zone 1 OFF, Zone 2 ON



Mixing Valves

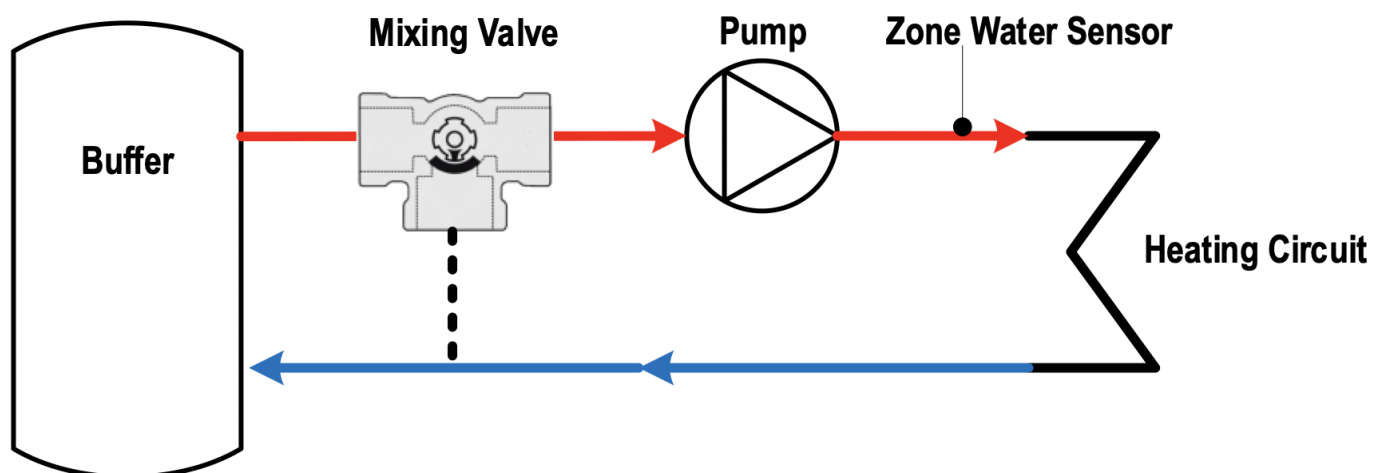
Mixing valves are used to blend circuit temperatures to meet the 'zones' target flow temperature. These are often used when two zones require different flow temperatures (e.g. zone 1 is radiators and zone 2 is under floor heating). The heat pump is able to control 2 mixing valves (one per zone), if required.

Example



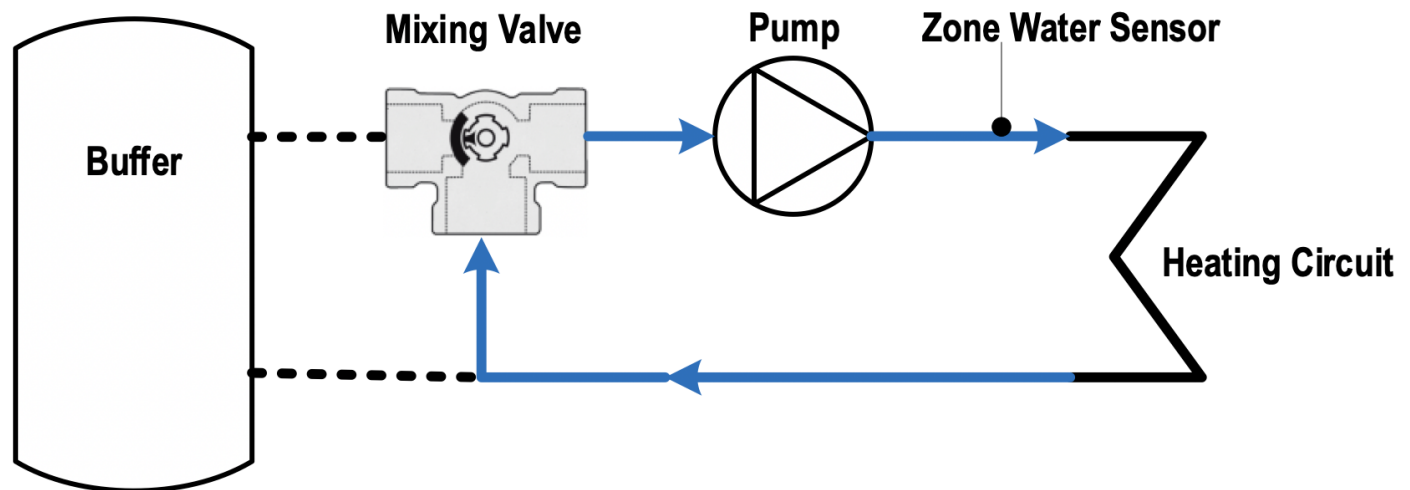
The system needs to know the flow temperature of circuit in order to make adjustments. This is why the zone water sensors are needed.

Fully Open: The valve is fully open to the buffer. The heating circuit receives the same temperature water from the buffer tank. No mixing from the return.

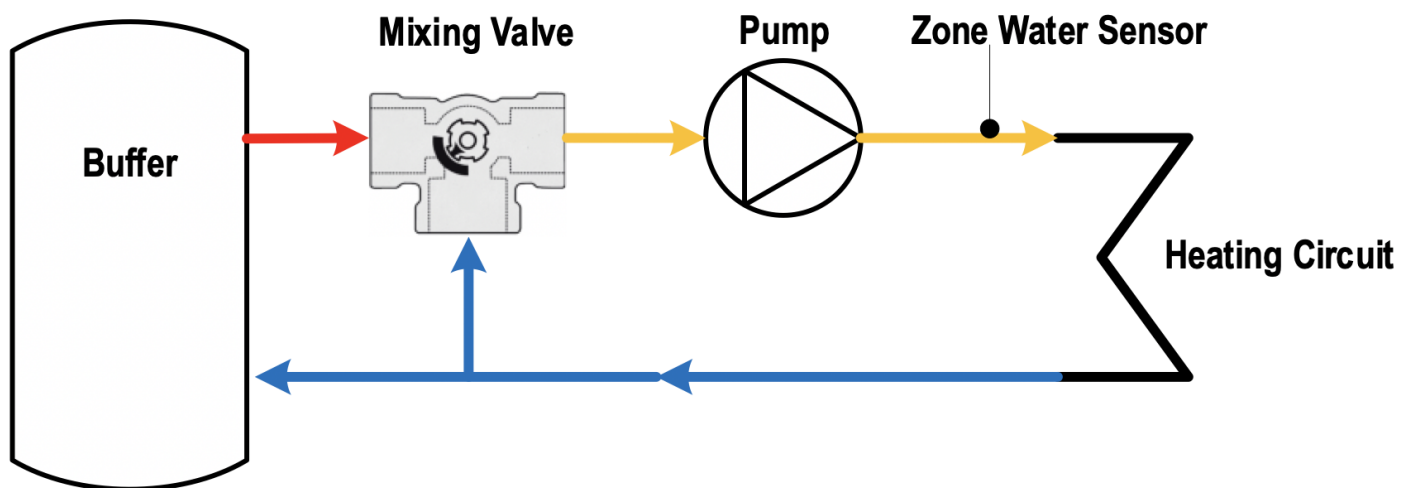


Mixing Valves

Fully Closed: The valve is fully closed off from the buffer. The heating circuit is circulating upon itself.



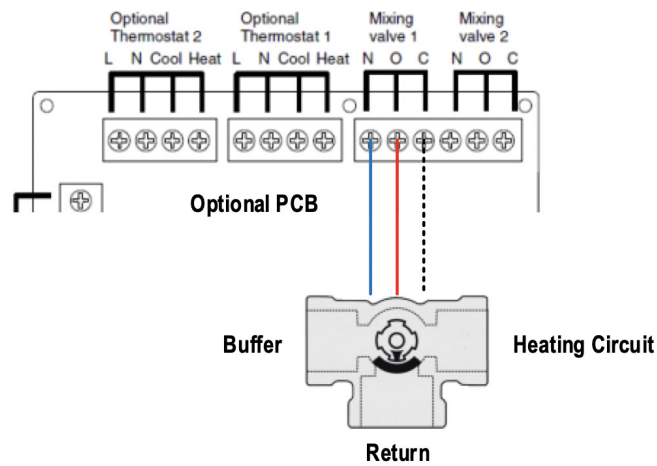
Mixing: The valve is open to both the buffer and return from the circuit. The flow temperature is blended down to the required temperature. The valve regulates itself to maintain a steady temperature.



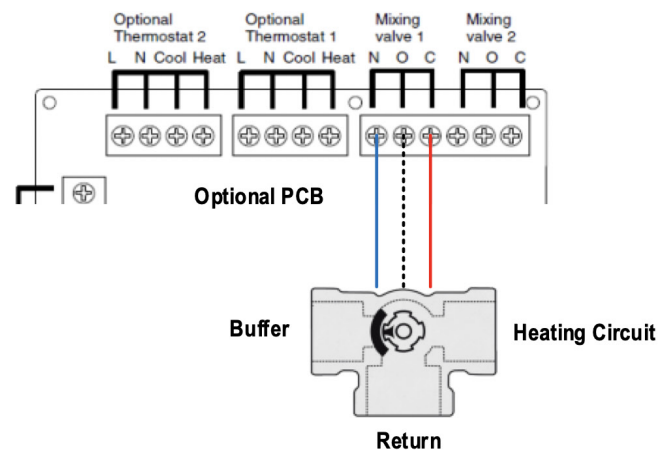
Wiring

Wiring will vary depending on the type and orientation of the valve. Usually 3 point control will be used, where control wires are energised alternately. The valve should be wired in such a way that when "O" is energised (230V), the shoe will rotate in the direction to close off the return port. When "C" is energised (230V), the shoe will rotate to close off the buffer port. The heating circuit port will always be open.

"O" (open) energised



"C" (closed) energised



Advanced Installations

Bivalent Heating Setup

Aquarea is able to control a fossil fuel boiler as part of the heating system. The basic principle is that the heat pump will have full control of all aspects of the system and will run the backup boiler as and when required, depending on system design and settings. Zoning, solar, swimming pool or any other system control setup remains unchanged by bivalent control. The boiler needs to be connected into the system in parallel and preferably, into a buffer tank. The control signal, to the run the boiler, is made by closing a “dry contact” on the heat pump main PCB. **The boiler operation and temperature is managed by the boiler controls.** The heat pump simply gives a signal to run. The boiler is required to have its own circulating pump.

J series models also have the option to remotely enable/disable boiler or heat pump operation using 3rd party switch permutations (Smart Grid control. This will be explained.

There are 3 different bivalent control methods:

- **Alternative:** Heat pump and boiler operate independent of each other, never together. Once the outside temperatures drops below “Turn On” setpoint, heat pump stops and boiler takes over.
- **Parallel:** Heat pump and boiler can operate together. Once the outside temperatures drops below “Turn On” setpoint, boiler runs as well as heat pump.
- **Advanced Parallel:** Heat pump and boiler can operate together. Certain control conditions need to be met before boiler is signalled to run, which will be explained. Advanced Parallel configuration requires optional PCB (CZ-NS4P) and buffer tank sensor (PAW-A2W-TSBU).

Buffer tank sensor is not strictly necessary with “Alternative” or “Parallel” setups but it's recommended, as the system will function better. “Advanced Parallel” setups always require a buffer tank sensor and water zone(s) sensor and will not work without one. This guide will demonstrate layouts using a buffer sensor for all control methods.

Accessories that are advised for Bivalent installations:

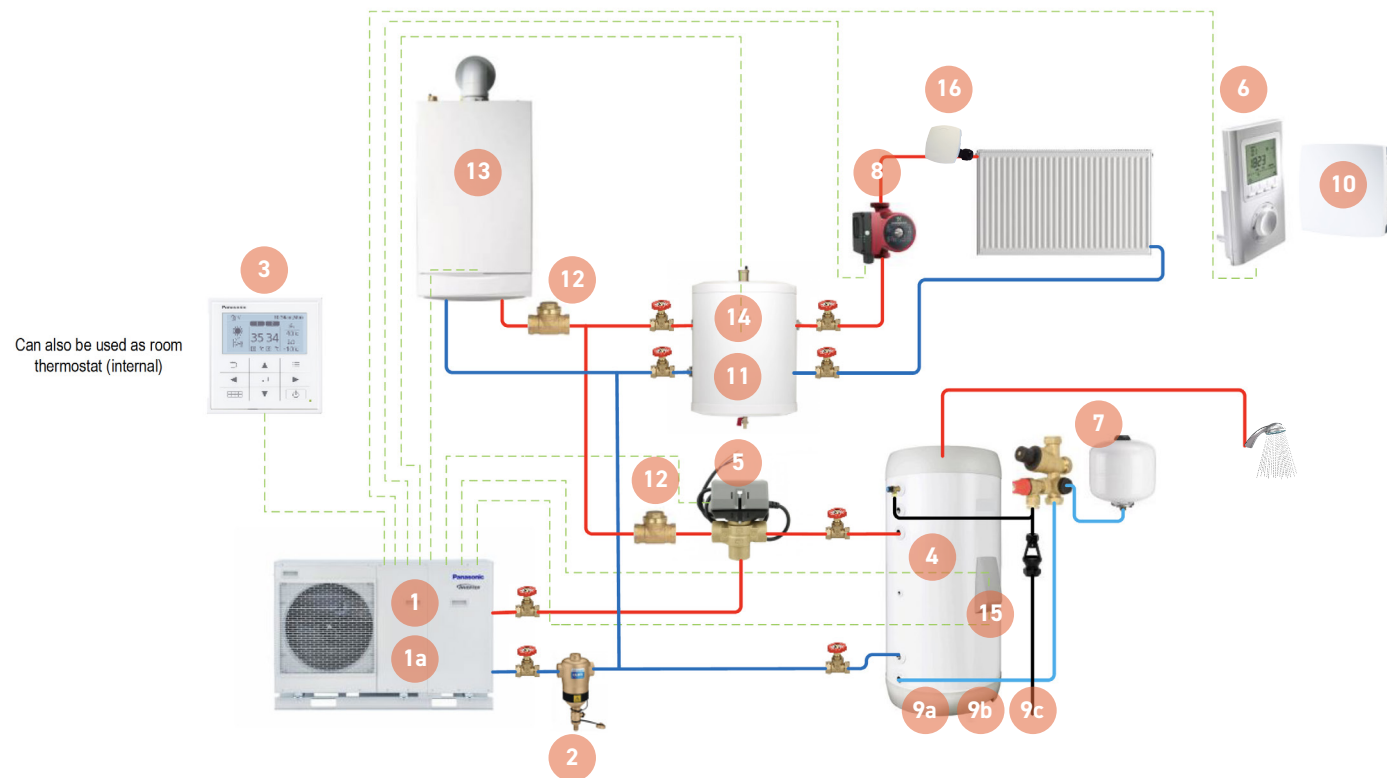
- Optional PCB (CZ-NS4P)
- Buffer Tank Sensor (PAW-A2W-TSBU)
- Zone Water Sensor (PAW-A2W-TSHC) Note – 2 required for 2 zone setups

*Note: 2 zone sensors are required for a 2 zone setup

Installation Schematic

Basic Layout:

This layout uses a 4 port buffer tank, so the heat pump and boiler are connected in parallel. Non-return valves maybe required to avoid bypassing depending on pressure losses through the common piping. The boiler must have its own circulating pump, which is controlled by the boiler. Boiler temperature is managed by the boiler controls.



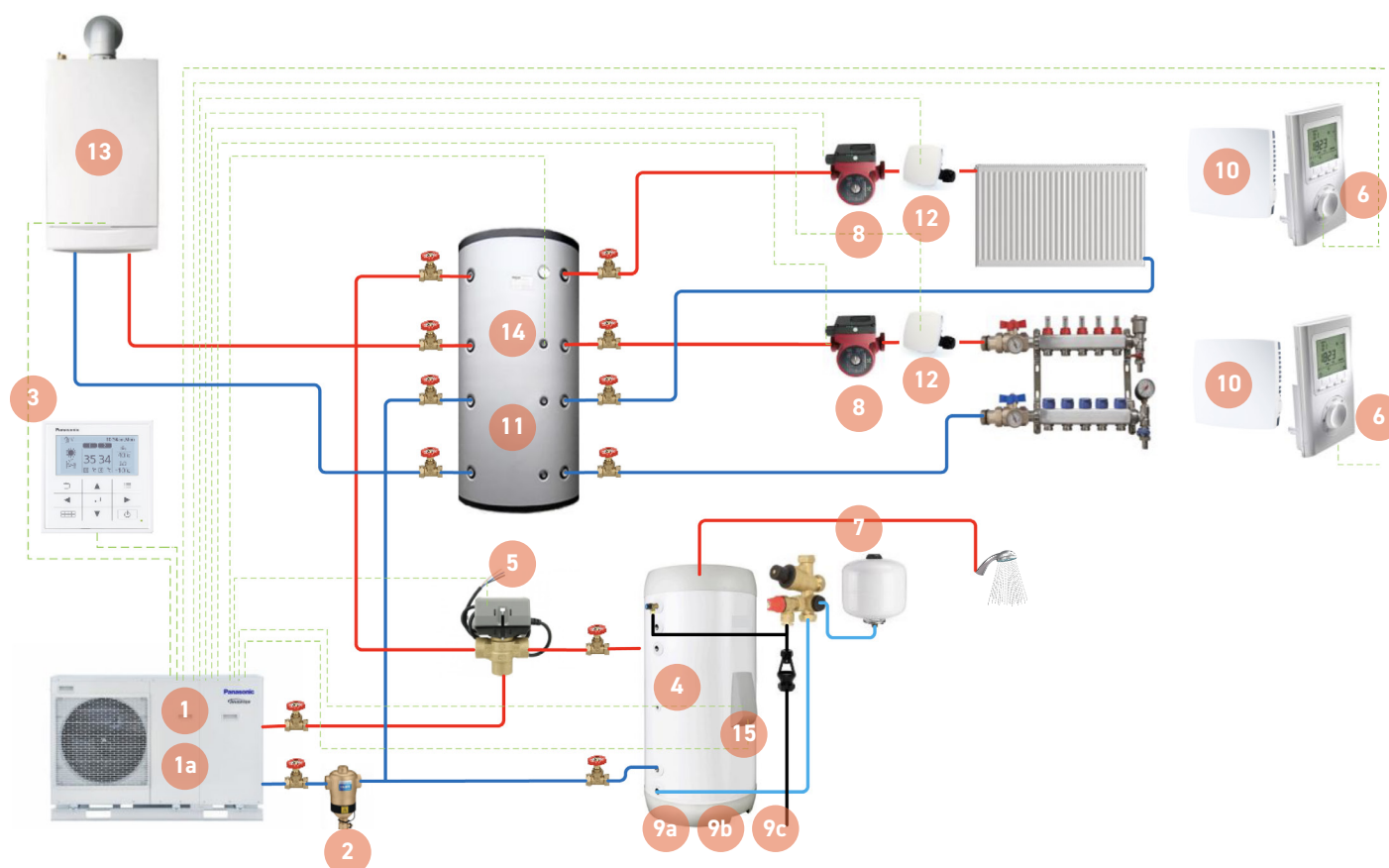
Number	Description	Type of Recommendation	Panasonic Part Number
1	Monobloc Unit	Mandatory	---
1a	PCB for advanced functions	Mandatory	CZ-NS4P
2	Magnetic Particle Filter	Mandatory on "H" Series Recommended on "J" Series*	---
3	Remote Controller	Supplied with Monobloc Unit	---
4	Tank Sensor	Supplied with a Panasonic DHW tank, if 3rd party tank used then has to be purchased separately (20m)	PAW-TS2
5	3 Way Valve	Mandatory if DHW tank installed	PAW-3WYVLV-HW
6	Room Thermostat (external)	Recommended (can be field supplied)	PAW-A2W-RTWIRED
7	G3 Kit	Mandatory (supplied with tank)	---
8	Circulating Pump	Mandatory (field supplied)	---
9a	200L DHW Cylinder	Mandatory if DHW is required	KIT-G3TD20C1E5-1
9b	300L DHW Cylinder (1.8m ² Coil)	Mandatory if DHW is required	KIT-G3TD30C1E5-1
9c	300L DHW Cylinder (2.35m ² Coil)	Mandatory if DHW is required	KIT-G3TD30C1E5HI-1
10	Zone Room Thermistor	Mandatory	PAW-A2W-TSRT
11	Buffer Tank	Mandatory (field supplied)	PAW-BTANK50L-2
12	Non return valve	Mandatory	---
13	Boiler	Mandatory (field supplied)	---
14	Buffer Sensor	Mandatory	PAW-A2W-TSBU
15	Immersion (Booster) Heater	Mandatory	---
16	Zone Water Sensor	Mandatory	PAW-A2W-TSHC

Installation Schematic

Independent Buffer Connection:

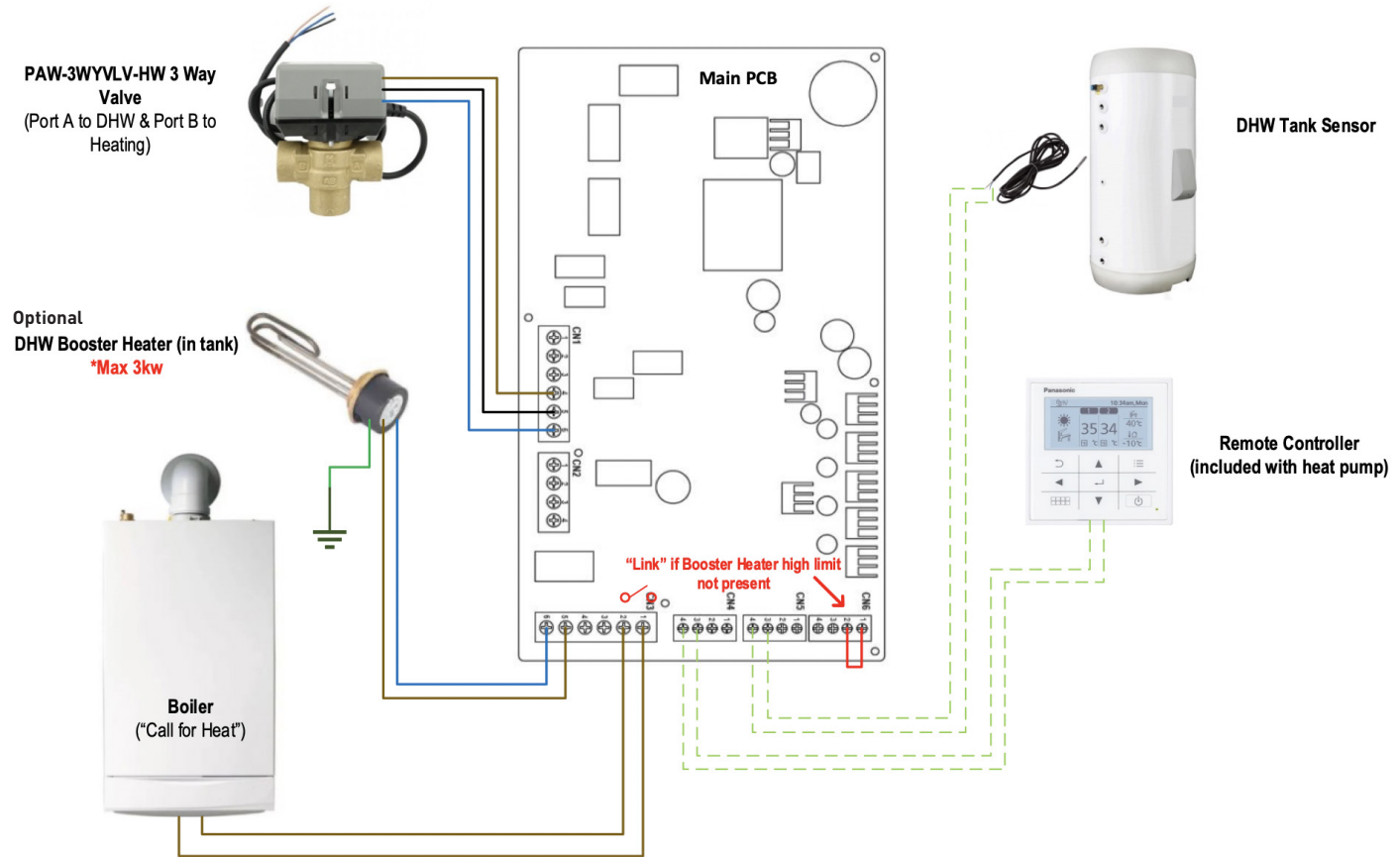
This layout demonstrates the heat pump and boiler directly connected to the buffer tank independently. It also shows a direct 2 zone setup, which has no impact on the bivalent setup at all. Bivalent setup is the same for all system verities. The boiler must have its own circulating pump, which is controlled by the boiler. Boiler temperature is managed by the boiler controls.

*Heating circuit may vary - 2 Zone heating circuit below is used for illustration.



Number	Description	Type of Recommendation	Panasonic Part Number
1	Monobloc Unit	Mandatory	---
1a	PCB for advanced functions	Mandatory	CZ-NS4P
2	Magnetic Particle Filter	Mandatory on "H" Series Recommended on "J" Series*	---
3	Remote Controller	Supplied with Monobloc Unit	---
4	Tank Sensor	Supplied with a Panasonic DHW tank, if 3rd party tank used then has to be purchased separately (20m)	PAW-TS2
5	3 Way Valve	Mandatory if DHW tank installed	PAW-3WYVLV-HW
6	Room Thermostat (external)	Recommended (can be field supplied)	PAW-A2W-RTWIRED
7	G3 Kit	Mandatory (supplied with tank)	---
8	Circulating Pump	Mandatory (field supplied)	---
9a	200/70L DHW/Buffer Cylinder	Mandatory if DHW is required	PAW-TD20B7PP-UK
9b	25/65L DHW Buffer Cylinder	Mandatory if DHW is required	PAW-TD23B6E5PP-UK
9c	300/70L DHW Buffer Cylinder	Mandatory if DHW is required	PAW-TD30B7PP-UK
10	Zone Room Thermistor	Mandatory	PAW-A2W-TSRT
11	Buffer Tank	Mandatory (field supplied)	---
12	Zone Water Sensor	Mandatory	PAW-A2W-TSHC
13	Boiler	Mandatory (field supplied)	---
14	Buffer Sensor	Mandatory	PAW-A2W-TSBU
15	Immersion (Booster) Heater	Mandatory	---

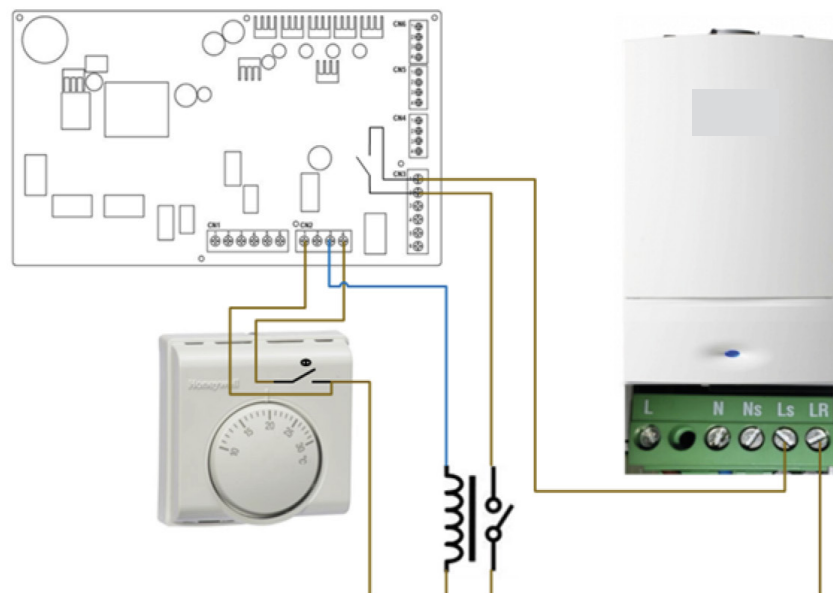
Bivalent Wiring (Main PCB)



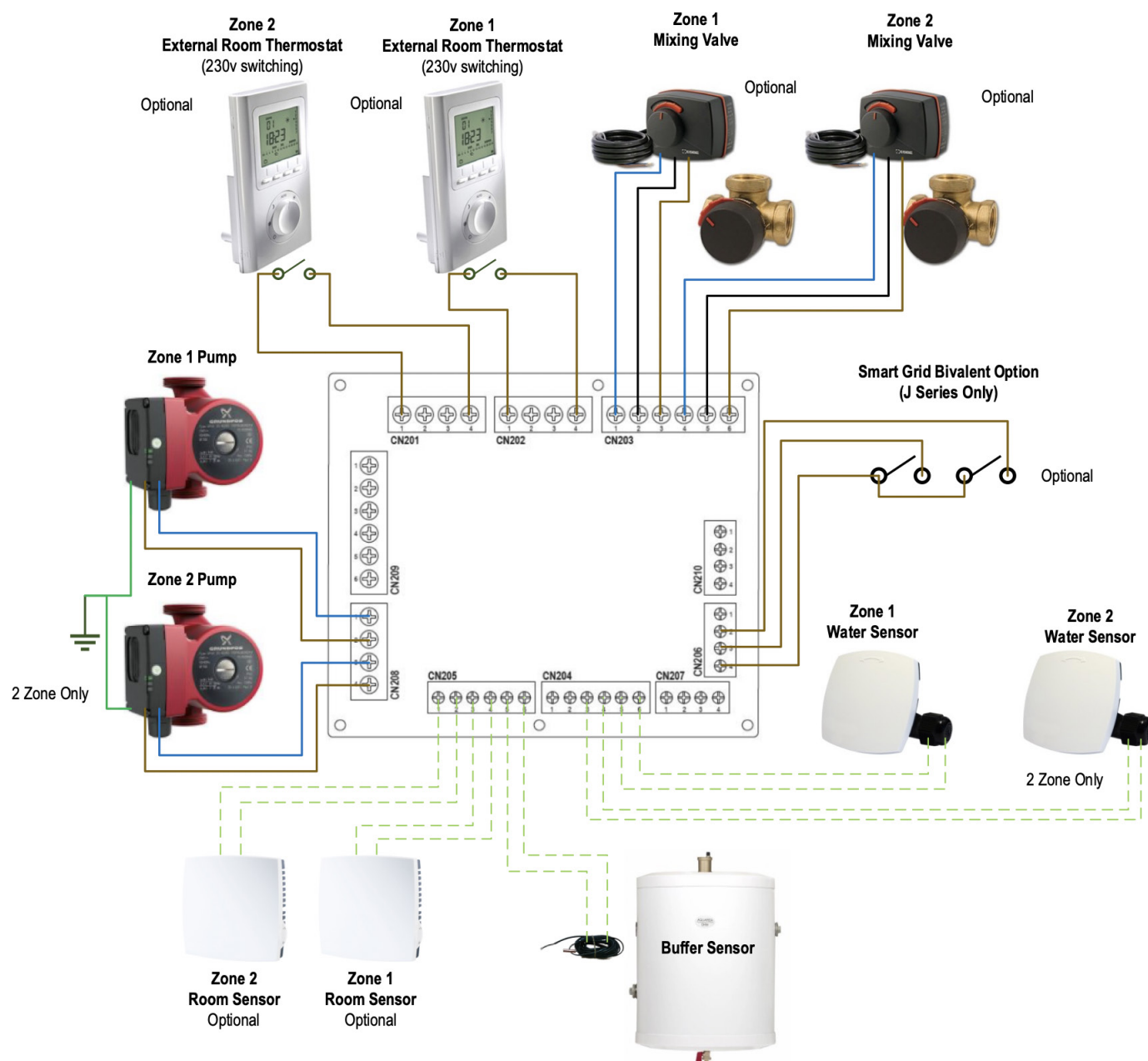
*The above diagram shows wiring for all components. Components will vary depending on the installation type and the control strategy.

Wiring when a 3rd Party Room Thermostat is used in Bivalent operation*. (Main PCB).

This replaces the Panasonic Remote Controller in above schematic.



Bivalent Wiring (Optional PCB)



The Above layout is for illustration purposes;

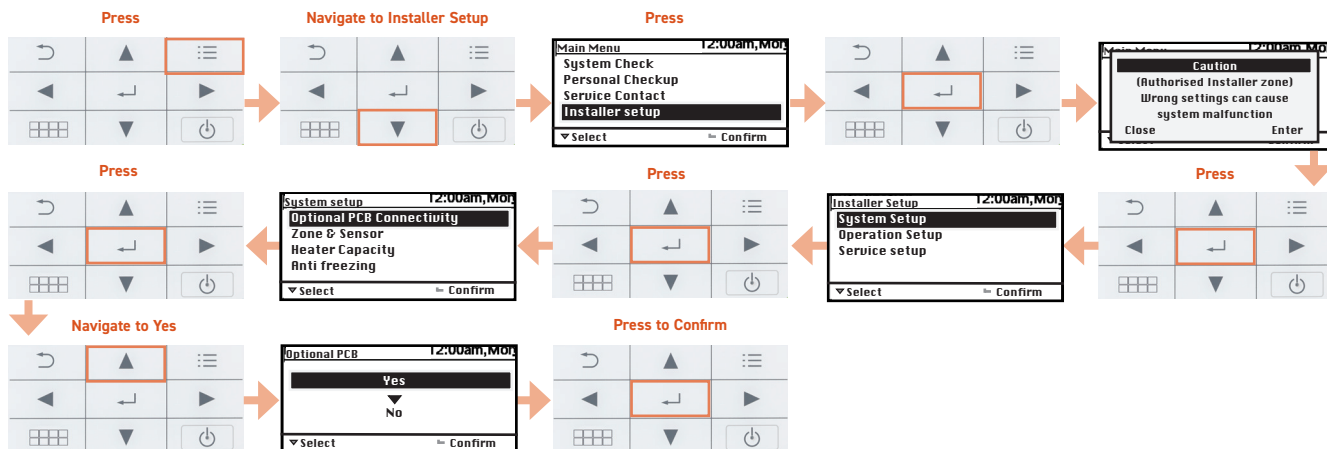
- Heating system may only have one heating zone
- Mixing valves may already be included in the heating design (underfloor heating)
- Zone pumps may also be included in the heating design (underfloor heating)
- Zone Room sensors will allow a more efficient heating settings to be applied

*The above diagram shows wiring for all components. Components will vary depending on the installation type and the control strategy.

Bivalent Controller Setup

Step 1: Optional PCB Connectivity

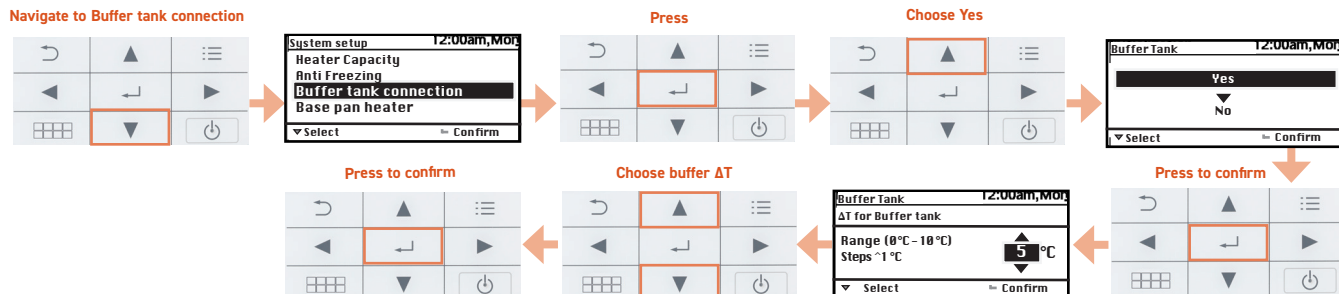
Bivalent configuration with buffer tank sensor requires the Optional PCB (CZ-NS4P) to be physically installed and confirmed as being present in the system



Step 2: Set Buffer Tank Sensor

This is where you tell the heat pump whether it will be monitoring the temperature of the buffer tank. The buffer tank can then be set to achieve a higher setpoint to that of the heating circuits. This is the Buffer ΔT , the difference in setpoint between primary and secondary sides.

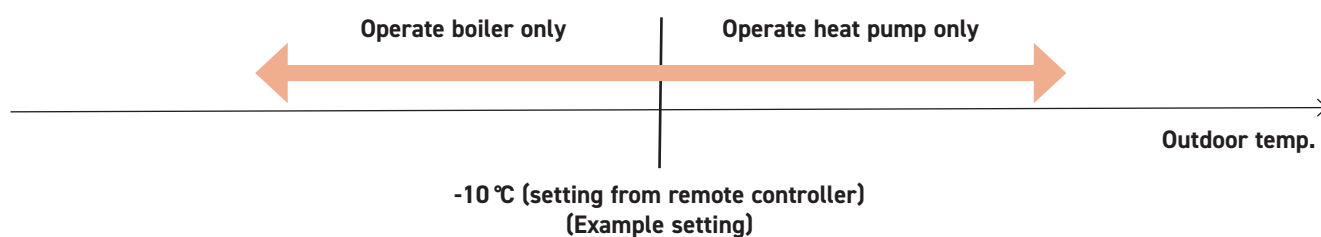
The buffer target temperature will be the required zone flow temperature (highest temperature zone) + Buffer ΔT .

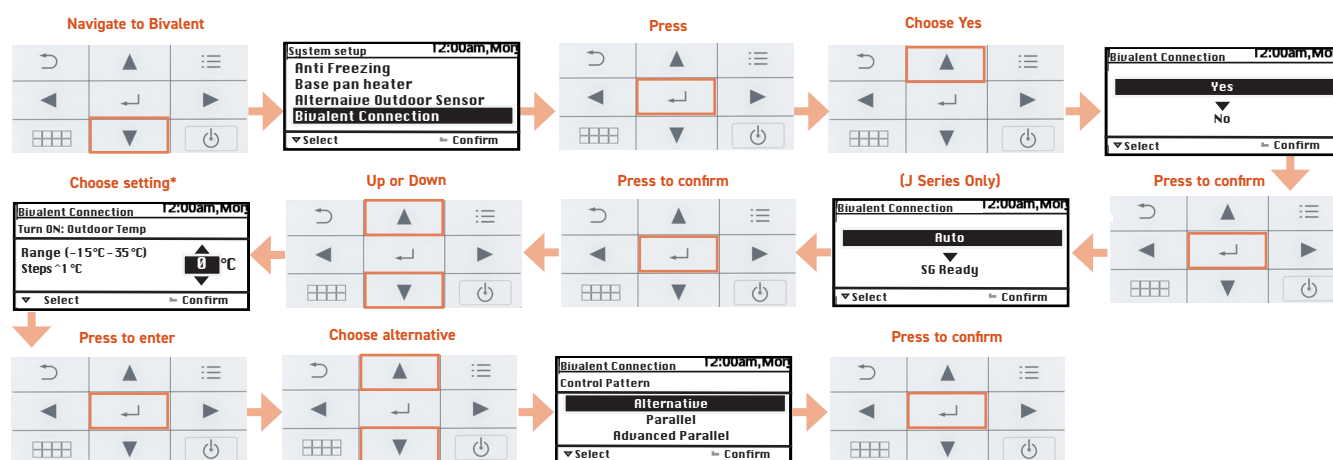


Step 3: Bivalent Settings

This is where you tell the heat pump that it will be controlling a boiler. This is also where you set the control conditions of the bivalent system. First of all, you need to decide which bivalent method is needed: Alternative, Parallel or Advanced Parallel.

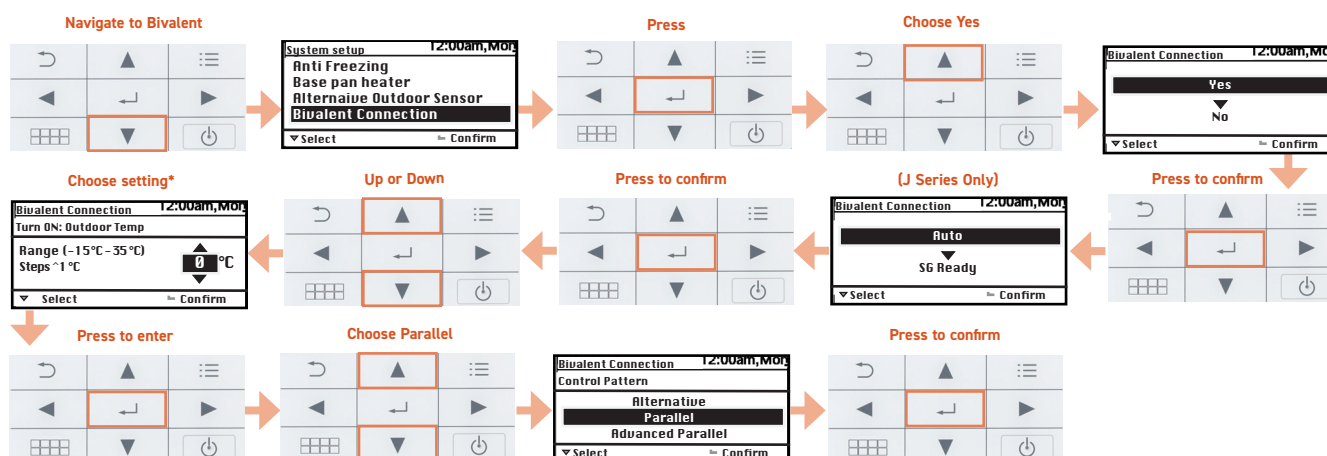
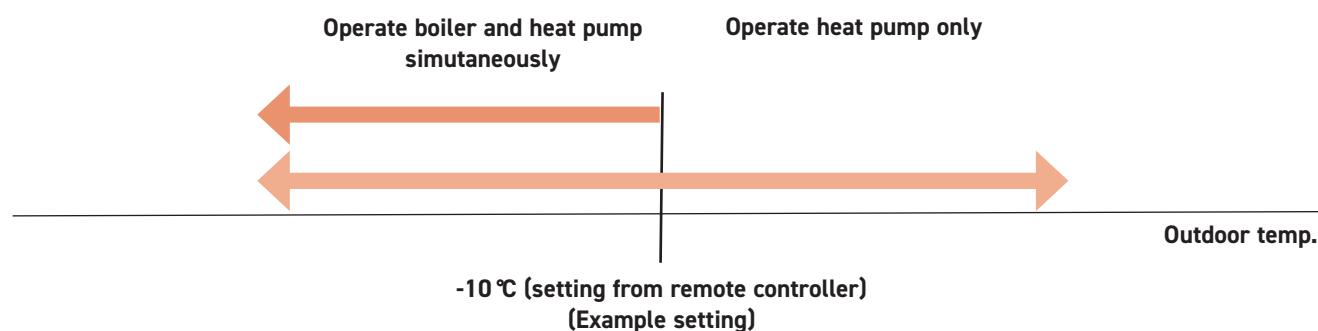
Alternative: Heat pump and boiler operate independent of each other, never together. Once the outside temperatures drops below "Turn On" setpoint, heat pump stops and boiler takes over.





* **“Turn On” set point**: This is the setting at which the outside temperature must be at or below before bivalent operation starts.

Parallel: Heat pump and boiler can operate together. Once the outside temperatures drops below “Turn On” setpoint, boiler runs as well as heat pump.



* **“Turn On” set point**: This is the setting at which the outside temperature must be at or below before bivalent operation starts.

Advanced Parallel: Heat pump and boiler can operate together. Certain control conditions need to be met before boiler is signalled to run. These conditions are:

Boiler signal turns ON when
 Outdoor ambient < Outdoor Ambient Set AND
 Buffer tank temperature < Target Buffer Tank Temperature + [START_TEMP] for [START_TIMER]

Boiler signal turns OFF when
 Outdoor ambient > Outdoor Ambient Set + [-2°C] OR
 Buffer Tank temperature > Target Buffer Tank temperature + [STOP_TEMP] for [STOP_TIMER]

On Temp: This is the setting at which the outside temperature must be at or below before bivalent operation starts.

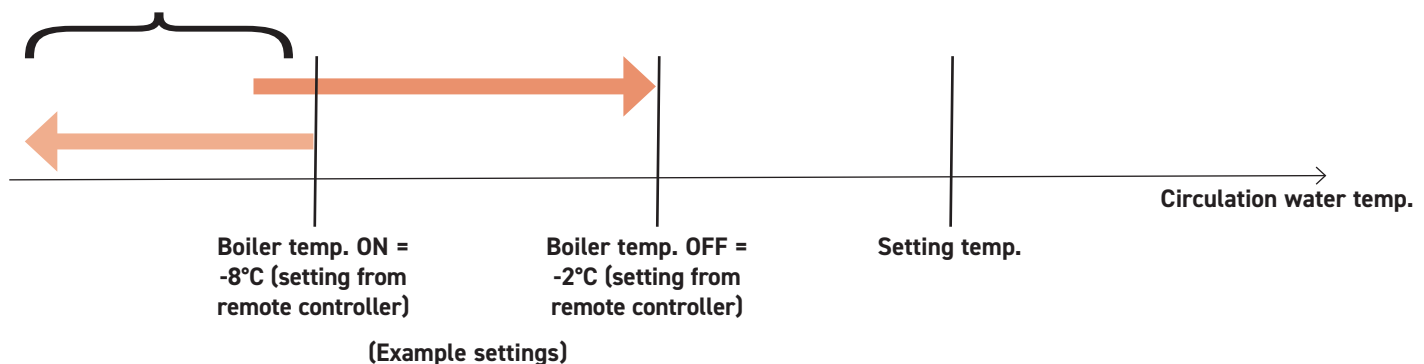
Heat Start Target Temperature: This is the amount that the current buffer temperature must be below the buffer target temperature before "Heat Start Delay" timer will begin.

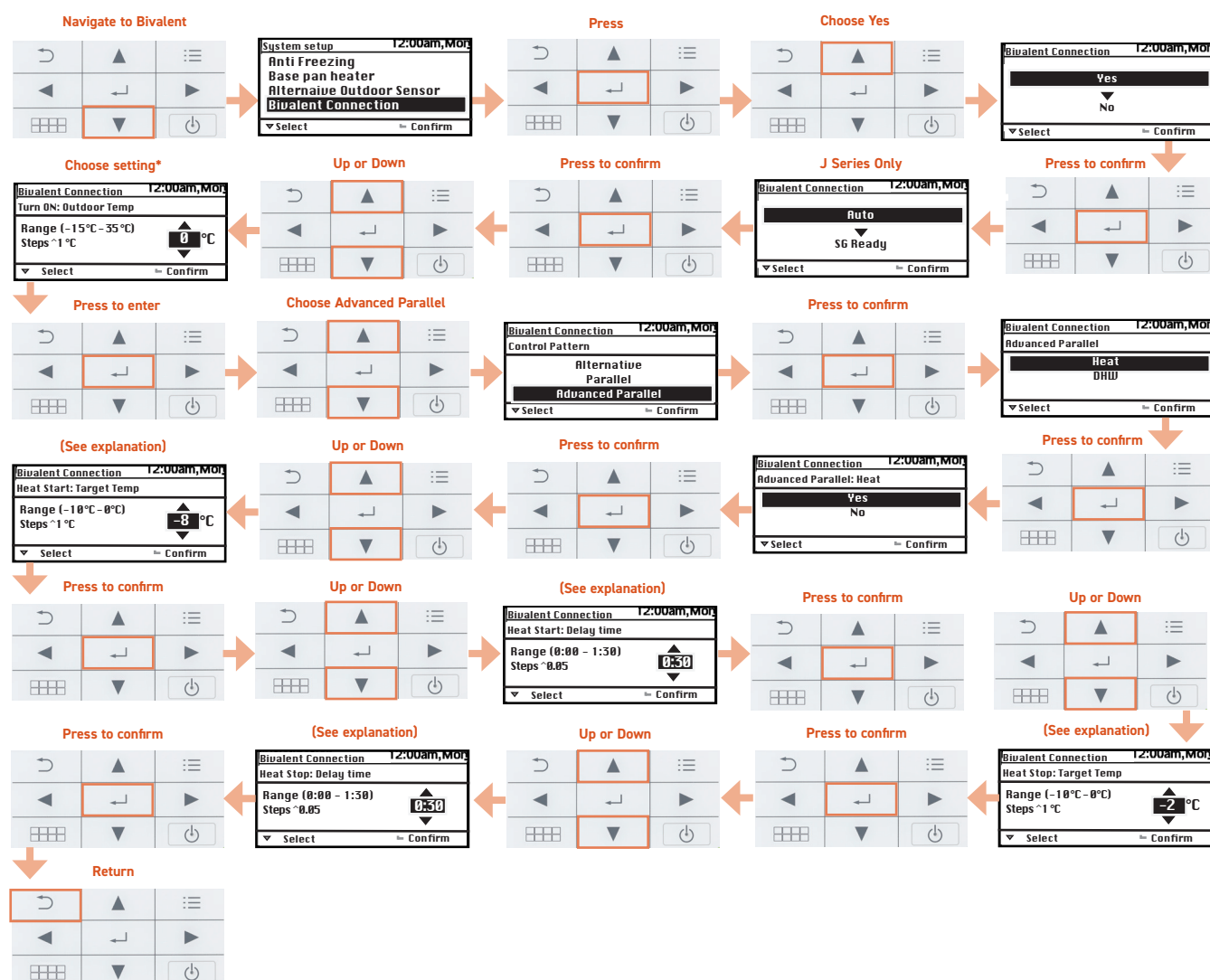
Heat Start Delay: The buffer temperature must remain at or below "Heat Start Target Temperature", for this delay time period, before the boiler is signalled to run.

Heat Stop Target Temperature: The amount the current buffer temperature must be within the buffer target temperature before "Heat Stop Delay" timer will begin.

Heat Stop Delay: The buffer temperature must remain at or above "Heat Stop Target Temperature", for this delay time period, before the boiler is signalled to stop running.

Although heat pump operates water temperature does not reach this temperature for more than 30 minutes (setting from remote controller)



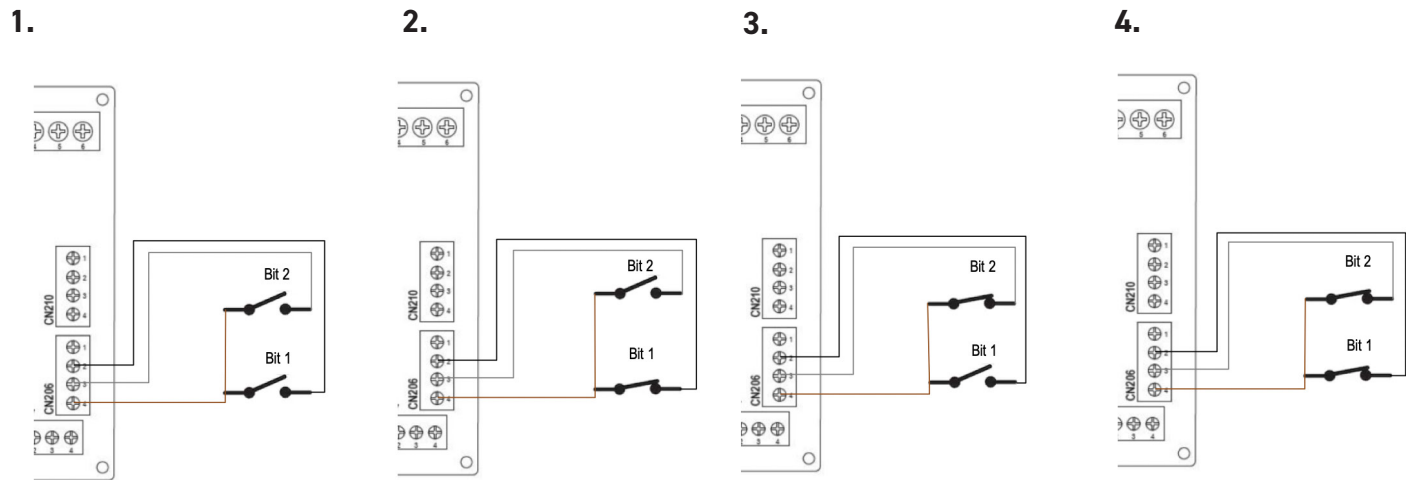


* **“Turn On” set point:** This is the setting at which the outside temperature must be at or below before bivalent operation starts.

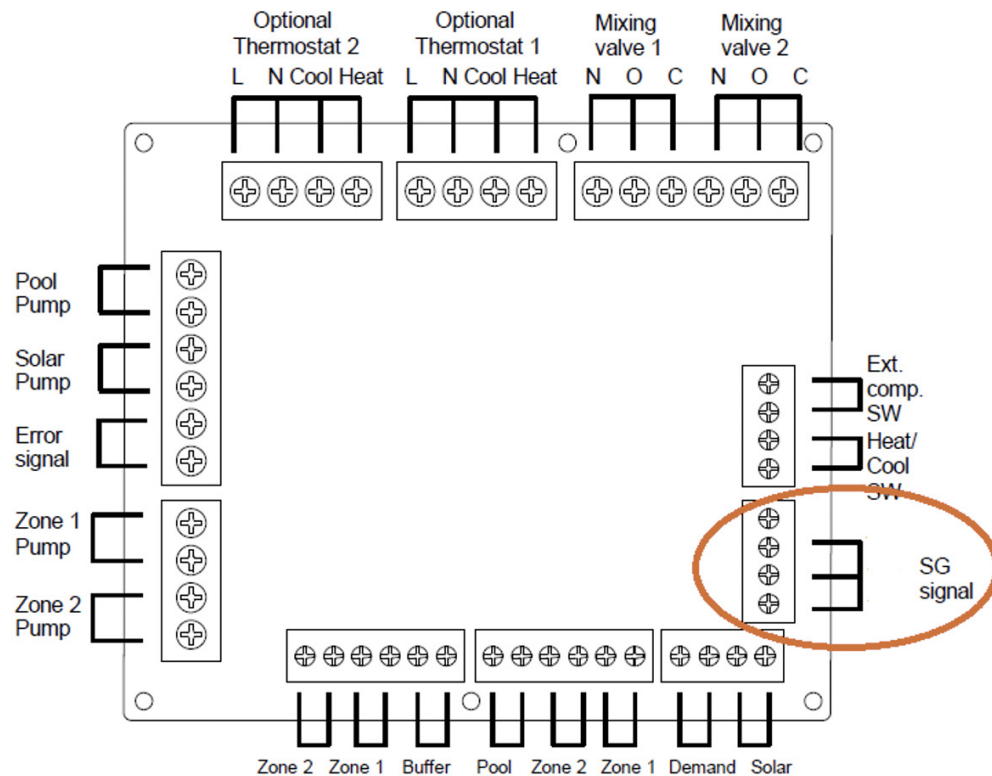
Smart Grid (SG) Bivalent Option for J Series

It's possible to use external 3rd party inputs to remotely choose which heat source the system should use. This makes use of the smart grid switch inputs. These inputs allow 4 different options:

SG Signal Recommended RCD			Operation Pattern
	VCC-bit1	VCC-bit2	
1	Open	Open	Heat pump OFF, Boiler OFF
2	Short	Open	Heat pump ON, Boiler OFF
3	Open	Short	Heat pump OFF, Boiler ON
4	Short	Short	Heat pump ON, Boiler ON



System must be set to "SG Ready" instead of "Auto" in Bivalent Setup menu.



Accessories and Control

Buffer Tank



PAW-BTANK50L-2

Buffer tank for J and H Generation. Stainless Steel, tank sensor pocket, can be wall mounted.

Sanitary Tank accessories



PAW-TS1

Tank sensor with 6 m cable length.

PAW-TS2

Tank sensor with 20 m cable length.

PAW-TS4

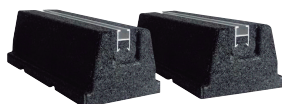
Tank sensor with 6 m cable length and only 6 mm diameter.



CZ-TK1

Temperature sensor kit for third party tank (with copper pocket and m length sensor cable).

Special outdoor supports



PAW-GRDBSE20

Outdoor base ground support for noise and vibration absorption (x x mm, kg).

Hydraulic accessories



PAW-3WYVLV-HW

3 way valve for DHW Tanks.



PAW-A2W-AFVLV

Anti-freeze valve.
(2 required per heat pump)

Room Thermostats



PAW-A2W-RTWIRED

Wired LCD room thermostat with weekly timer.



PAW-A2W-RTWIRELESS

Wireless LCD room thermostat with weekly timer.

Connectivity Solutions



CZ-TAW1C

Aquarea Smart Cloud for remote control and maintenance through wireless or wired LAN.

CZ-TAW1-CBL

10 m extension cable for CZ-TAW1C.



PAW-AW-MBS-H

Modbus Interface for J and H Generation.



PAW-AZAW-MBS-1

Modbus Interface for J and H Generation. (Airzone).

Sensors



PAW-A2W-TSOD

Outdoor ambient sensor.



PAW-A2W-TSRT

Zone room sensor.



PAW-A2W-TSHC

Zone water sensor.



PAW-A2W-TSS0

Solar sensor.



PAW-A2W-TSBU

Buffer tank sensor.

Warranty terms and conditions

Please speak to us about on site training courses.



The Standard warranty 3 years parts and labour (A2W exc. Labour).

- The unit should be installed by a competent person
- The installation instructions supplied with the unit must be followed
- Annual maintenance records must be kept



The Extended warranty 5 years parts and labour.

- The unit should be installed by a competent person
- The installation instructions supplied with the unit must be followed
- Annual maintenance records must be kept
- The installer must have completed the relevant Panasonic training
- The installer must register the unit on PRO Club (VRF and A2W units require additional commissioning documentation uploading onto PRO Club)



The Extended+ warranty 7 years parts and labour.

- The unit should be installed by a competent person
- The installation instructions supplied with the unit must be followed
- Annual maintenance records must be kept
- The installer must be a current PRO Partner or Elite PRO Partner and must have completed the relevant Panasonic training
- The Installer must register the unit on PRO Club (VRF and A2W units require additional commissioning documentation uploading onto PRO Club)
- A2W units must be installed with a CZ-TAW1C adapter

* CZ-TAW1C Installation is mandatory on all Air to Water installations for 7 year warranty to be granted. For retrofit installations, the CZ-TAW1C must be installed and the smart cloud service activated. For new build installations, smart cloud activation is not mandatory for the 7 year warranty to be granted.

Where do I register my unit for warranty?

Warranty registration can be completed through the PRO Club platform, or for PRO Partners via the 24 hour support centre via e-mail: propartner.uk@eu.panasonic.com or phone 01189 287 569.



Spare parts ordering - in warranty requests.

- Ring the air to water technical service support line on: 01707 378670 to diagnose the issue and receive a warranty request code
- Receive and complete the in warranty spare parts form as provided by the technical team
- Complete and return the form to the following inbox: uk-aircon-service@eu.panasonic.com
- The spare part request is processed and the item(s) distributed



Our commitment to quality extends far beyond our products, which is why we have developed a partner scheme designed to support installers who love our solutions as much as we do.

To find out more about how you can become a Panasonic PRO Partner and have access to a complete range of benefits including extended warranty, business support and reward points, click on the link below:
www.aircon.panasonic.eu/GB_en/propartner



PANASONIC AQUAREA A2W COMMISSIONING CHECKLIST (H & J SERIES ONLY)

Panasonic
heating & cooling solutions

This Commissioning Checklist is to be completed in full by the competent person who commissioned the heat pump and associated equipment as a means of demonstrating compliance with the appropriate Building Regulations and Manufacturers Requirements.

Failure to install and commission this equipment according to the manufactures instructions will invalidate the warranty. This does not affect your statutory rights.

Customer's Name	
Address	
Postcode	

Information			
Heat Pump Model (Outdoor)		Serial Number	
Heat Pump Model (Indoor)		Serial Number	
Cylinder Model		DHW Tank Booster Heater Capacity	(kW)
Coil Surface Area of Cylinder	(m ²)	Serial Number	
Boiler Model (Bi-valent system)		Installation Company Address	
Installation Company Name			
		Post Code	

Outdoor Unit			
Sited in correct, agreed location (covering planning & noise requirements)?		Secured to a solid base?	
Is the unit installed according to manufactures clearances?		All external pipes insulated?	
Has suitable consideration been made for condensate water?		Isolators fitted by unit?	

Refrigeration Details (Not required for Monobloc)			
Refrigeration Pipe Length Between Indoor and Outdoor Unit	(m)	Additional Refrigerant Charge Added (if required)	(g)
Name of Qualified Refrigeration Engineer		Company Name	

Bi-Valent (Hybrid) Connection			
Mains Gas Boiler		Oil Boiler	
		LPG Boiler	
		Electric Heater	

Electrical Connection	
Power Supply 1 Cable and Breaker Sized Correctly	Power Supply 2 Cable and Breaker Sized Correctly

Controls - System and Heat Pump			
Automatic Bypass Fitted		Volumiser Fitted (2 pipe) Volume	
Buffer Tank Fitted (4 pipe) Volume	(L)	3rd Party Heating Controls	(L)
Thermostatic Radiator Valves		Outdoor Ambient Air Sensor (PAW-A2W-TSOD)	
Buffer Tank Sensor Fitted (PAW-A2W-TSBU)		Panasonic Optional Upgrade PCB Fitted (CZ-NS4P)	
Panasonic Room Thermistor Fitted (PAW-AW-TSRT)		2 x 2 Port Valve (DHW Control)	
3 Port Valve (DHW Control)		Plastic Pipe Size (O/D) Used On Primary Circuit	
Copper Pipe (O/D) Size Used on Primary Circuit			

System Check			
The System Has Been Flushed And Cleaned In Accordance With BS7593:2019 And Heat Pump Manufactures Water Quality Instructions Y/N:			
The System Has Been Filled and Pressure Tested (Y/N):		Inhibitor Used:	
Glycol (Antifreeze) Used:		% of Glycol in the System	(%)

PANASONIC AQUAREA A2W COMMISSIONING CHECKLIST (H & J SERIES ONLY)

System Set Up

Heating Settings Zone 1			
Direct Outlet Temperature Used	(°C)		
Compensation Curve			
Outlet Temperature at Outdoor Low	(°C) (example 55°C)	Low Outdoor Temperature	(°C) (example -3°C)
Outlet Temperature at Outdoor High	(°C) (example 35°C)	High Outdoor Temperature	(°C) (example +15°C)
Heating Settings Zone 2			
Direct Temperature	(°C)		
Compensation Curve			
Outlet Temperature at Outdoor Low	(°C) (example 55°C)	Low Outdoor Temperature	(°C) (example -3°C)
Outlet Temperature at Outdoor High	(°C) (example 35°C)	High Outdoor Temperature	(°C) (example +15°C)
Outdoor Temperature for Heating OFF	(°C) (example 18°C)	Outdoor Temp. for Backup Heater ON	(°C) (example -3°C)
Heating Settings Zone 2 (Pool)			
Secondary Side Flow Temperature Set-point	(°C)	Pool DeltaT	(°C)

DHW Settings

Target DHW Tank Set Temperature	(°C)	Tank Heat Up Time (max)	(Recommended max 60 mins)
Tank: Re-heat Temp	(°C) (between -2 / -12°C)	Floor Operation Time (max)	(Recommended max 2 hours)
Tank Heater: Internal (Backup) or External (Booster):		Tank Heater on Time (delay)	

Sterilization Settings

Sterilization Day		Sterilization Time	(h:m)	Sterilization Temp	(°C)	Sterilization Duration	(Minutes)
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Backup Heater Setting

Room Heater Enabled	Y	N	Backup Heater Capacity Setting (3,6 or 9kW depending on the model)	(kW)
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Bi-Valent (Hybrid)

Control (Alternative)		Control (Parallel)		Control (Advanced Parallel)	
Outdoor Temperature for Bi-Valent on	(°C)	Smart Grid Bi-Valent (J Series Only)		Auto Bi-Valent (J Series Only)	

System Set Up

Heating Mode					
Outside Ambient Temperature	(°C)	Water Outlet Temperature	(°C)	Flow Rate	(L/Min)
		Water Inlet Temperature	(°C)	Compressor Frequency	(Hz)
DHW Mode					
Outside Ambient Temperature	(°C)	Tank Target Temperature	(°C)	Flow Rate	(L/Min)
		Water Outlet Temperature	(°C)		
		Water Inlet Temperature	(°C)	Compressor Frequency	(Hz)

Commissioning Engineer's Name	
Commissioning Engineer's Signature	
Customer's Name	
Date of Commissioning	
*Customer's Signature	



Notes:

This image shows a full page of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, typical of notebook paper. There are no margins, text, or other markings on the page.

For more information on system design and schematics use the QR codes below:



Direct Single Zone Panasonic Control



Direct Two Zone Panasonic Controls



Indirect Buffer Single Zone Panasonic Controls



Indirect Buffer Two Zone Panasonic Controls



Indirect Two Zone T-CAP Cascade System with 2 Units

Panasonic®

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www.Panasonic.co.uk/aircon
01707 378 670 – Technical
Technical.PHVACUK@eu.panasonic.com

Heating & Cooling Solutions
Panasonic Heating & Ventilation, Air Conditioning
Building 3, Albany Place, Hydeway, Welwyn Garden City, AL7 3BT

Panasonic Ireland. A branch of Panasonic Marketing Europe GmbH
Unit 1, The Courtyard, Kilcarbery Business Park
Nangor Road, Dublin 22



Do not add or replace refrigerant other than the specified type. Manufacturer is not responsible for the damage and deterioration in safety due to usage of the other refrigerant.
The outdoor units in this catalogue contains fluorinated greenhouse gases with a GWP higher than 150.