MITSUBISHI ELECTRIC

ecodan

Hydrobox
EHSE series
ERSE series

INSTALLATION MANUAL
FOR INSTALLER

For safe and correct use, read this manual and the outdoor unit installation manual thoroughly before installing the hydrobox. English is the original language. The other language versions are translations of the original.

English (EN)

INSTALLATIONSHANDBUCH
FÜR INSTALLATEURE

Aus Sicherheitsgründen und zur richtigen Verwendung vor der Installation der Hydrobox die vorliegende Bedienungsanleitung und die Installationsanleitung der Außeneinheit gründlich durchlesen. Die Originalsprache ist Englisch. Die anderen Sprachversionen sind vom Original übersetzt.

Deutsch (DE)

MANUEL D'INSTALLATION
POUR L'INSTALLATEUR

Pour une utilisation correcte et sûre, lisez soigneusement ce manuel et le manuel d'installation de l'unité extérieure avant d'installer l'ECODAN hydrobox. L'anglais est la langue originale. Les versions fournies dans d'autres langues sont des traductions de l'original.

Français (FR)

INSTALLATIEHANDLEIDING
VOOR DE INSTALLATEUR

Lees voor een veilig en juist gebruik deze handleiding en de installatiehandleiding van de buiten-unit aandachtig door voordat u met de installatie van de hydrobox begint. Engels is de oorspronkelijke taal. De andere taalversies zijn vertalingen van het origineel.

Nederlands (NL)

MANUAL DE INSTALACIÓN
PARA EL INSTALADOR

Para un uso correcto y seguro, lea detalladamente este manual y el manual de instalación de la unidad exterior antes de instalar la Hydrobox. El idioma original del documento es el inglés. Las versiones en los demás idiomas son traducciones del original.

Español (ES)

MANUALE DI INSTALLAZIONE
PER L'INSTALLATORE

Per un utilizzo sicuro e corretto, prima di installare l'Hydrobox leggere attentamente questo manuale e quello di installazione dell'unità esterna. Il testo originale è redatto in lingua inglese. Le altre versioni linguistiche rappresentano traduzioni dell'originale.

Italiano (IT)

MANUAL DE INSTALAÇÃO
PARA O INSTALADOR

Para uma utilização segura e correcta, leia este manual e o manual de instalação da unidade interior antes de instalar o permutador de calor. O idioma original é o inglês. As versões em outros idiomas são traduções do idioma original.

Português (PT)

INSTALLATIONSMANUAL
TIL INSTALLATØREN

Af hensyn til sikker og korrekt brug skal denne vejledning og vejledningen til udendørsenheden læses omhyggeligt, inden hydroboxenheden installeres. Engelsk er det oprindelige sprog. De andre sprogversioner er oversættelser af originalen.

Dansk (DA)

INSTALLATIONSMANUAL
FÖR INSTALLATÖREN

För säker och korrekt användning, läs denna manual och utomhusenhetens installationsmanual innan du installerar hydroboxen. Engelska är originalspråket. De övriga språkversionerna är översättningar av originalet.

Svenska (SV)

INSTALLERINGSHÅNDBOK
FOR MONTØREN

For å sikre en trygg og riktig bruk skal du lese denne håndboken og installeringshåndboken for utendørsenheten grundig før du monterer hydroboksen. Engelsk er originalspråket. De andre språkversjonene er oversettelser av originalen.

Norsk (NO)

ASENNUSOPAS
ASENTAJALLE

Lue turvallista ja asianmukaista käyttöä varten tämä opas ja ulkoyksikön asennusopas huolellisesti ennen hydroboxin asentamista. Alkuperäiskieli on englanti. Muut kieliversiot ovat alkuperäisen käännöksiä.

Suomi (FI)

Руководство по установке
ДЛЯ МОНТАЖНИКОВ

Для безопасного и правильного использования внимательно прочитайте данное руководство и руководство по установке наружного блока перед установкой гидромодуля. Оригинальная версия на английском языке, другие - перевод с оригинала.

Русский (RU)

PŘÍRUČKA PRO INSTALACI
PRO TECHNIKY PROVÁDĚJÍCÍ INSTALACI

Z bezpečnostních důvodů a pro správné použití zásobníkového modulu si před jeho instalací důkladně prostudujte Návod k obsluze a také Příručku pro instalaci venkovní jednotky. Jazyk originálu je angličtina. Jiné jazykové verze jsou překlady z originálu.

Česky (CZ)

INSTRUKCJA MONTAŻU
DLA INSTALATORA

Należy dokładnie zapoznać się z niniejszą instrukcją obsługi i instrukcją montażu jednostki zewnętrznej, aby następnie bezpiecznie i z dobrym skutkiem użytkować moduł wewnętrzny z wbudowanym zasobnikiem CWU.Oryginał dokumentu jest dostępny w języku angielskim. Inne wersje językowe są tłumaczeniami oryginału.

Polski (PL)

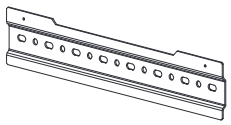
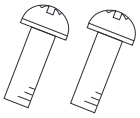
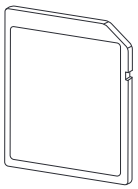
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EN

■ **Heat pumps certification**

The mark "NF heat pumps" is an independent certification program proving that heat pumps' performances and production quality of the factory are conformed with the certification reference NF-414. The combinations of indoor units and outdoor units, and their applications allowed to use the NF PAC mark can be consulted on the website www.marque-nf.com

Accessories (included)		
Back plate	Screw M5×8	SD memory card
		
1	2	1

Abbreviations and glossary

No.	Abbreviations/Word	Description
1	Compensation curve mode	Space heating incorporating outdoor ambient temperature compensation
2	COP	Coefficient of Performance the efficiency of the heat pump
3	Cooling mode	Space cooling through fan-coils or underfloor cooling
4	DHW mode	Domestic hot water heating mode for showers, sinks, etc
5	Flow temperature	Temperature at which water is delivered to the primary circuit
6	Freeze stat. function	Heating control routine to prevent water pipes freezing
7	FTC	Flow temperature controller, the circuit board in charge of controlling the system
8	Heating mode	Space heating through radiators or Underfloor heating
9	Hydrobox	Indoor unit housing the component plumbing parts (NO DHW tank)
10	Legionella	Bacteria potentially found in plumbing, showers and water tanks that may cause Legionnaires disease
11	LP mode	Legionella prevention mode – a function on systems with water tanks to prevent the growth of legionella bacterium
12	PRV	Pressure relief valve
13	Return temperature	Temperature at which water is delivered from the primary circuit
14	TRV	Thermostatic radiator valve – a valve on the entrance or exit of the radiator panel to control the heat output

1 Safety Notices

Please read the following safety precautions carefully.

⚠ WARNING:	⚠ CAUTION:
Precautions that must be observed to prevent injuries or death.	**Precautions that must be observed to prevent damage to unit.**

This installation manual along with the user manual should be left with the product after installation for future reference.
Mitsubishi Electric is not responsible for the failure of locally-supplied parts.

- **Be sure to perform periodical maintenance.**
- **Be sure to follow your local regulations.**
- **Be sure to follow the instructions provided in this manual.**

⚠ WARNING
Mechanical
The hydrobox and outdoor units must not be installed, disassembled, relocated, altered or repaired by the user. Ask an authorised installer or technician. If the unit is installed improperly or modified after installation by the user water leakage, electric shock or fire may result.
The outdoor unit should be securely fixed to a hard level surface capable of bearing its weight.
The hydrobox should be positioned on a hard vertical surface capable of supporting its filled weight to prevent excessive sound or vibration.
Do not position furniture or electrical appliances below the outdoor unit or hydrobox.
The discharge pipework from the emergency/safety devices of the hydrobox should be installed according to local law.
Only use accessories and replacement parts authorised by Mitsubishi Electric ask a qualified technician to fit the parts.
Electrical
All electrical work should be performed by a qualified technician according to local regulations and the instructions given in this manual.
The units must be powered by a dedicated power supply and the correct voltage and circuit breakers must be used.
Wiring should be in accordance with national wiring regulations. Connections must be made securely and without tension on the terminals.
Earth unit correctly.
General
Keep children and pets away from both the hydrobox and outdoor units.
Do not use the hot water produced by the heat pump directly for drinking or cooking. This could cause illness to the user.
Do not stand on the units.
Do not touch switches with wet hands.
Annual maintenance checks on both the hydrobox and the outdoor unit should be conducted by a qualified person.
Do not place contains with liquids on top of the hydrobox. If they leak or spill onto the hydrobox damage to the unit and/or fire could occur.
Do not place any heavy items on top of the hydrobox.
When installing, relocating, or servicing the hydrobox, use only the specified refrigerant (R410A) to charge the refrigerant lines. Do not mix it with any other refrigerant and do not allow air to remain in the lines. If air is mixed with the refrigerant, then it can be the cause of abnormal high pressure in the refrigerant line, and may result in an explosion and other hazards. The use of any refrigerant other than that specified for the system will cause mechanical failure or system malfunction or unit breakdown. In the worst case, this could lead to a serious impediment to securing product safety.
In heating mode, to avoid the heat emitters being damaged by excessively hot water, set the target flow temperature to a minimum of 2ºC below the maximum allowable temperature of all the heat emitters. For Zone2, set the target flow temperature to a minimum of 5ºC below the maximum allowable flow temperature of all the heat emitters in Zone2 circuit.

⚠ CAUTION
Use clean water that meets local quality standards on the primary circuit.
The outdoor unit should be installed in an area with sufficient airflow according to the diagrams in the outdoor unit installation manual.
The hydrobox should be located inside to minimise heat loss.
Water pipe-runs on the primary circuit between outdoor and indoor unit should be kept to a minimum to reduce heat loss.
Ensure condensate from outdoor unit is piped away from the base to avoid puddles of water.
Remove as much air as possible from water circuit.
Refrigerant leakage may cause suffocation. Provide ventilation in accordance with EN378-1.
Be sure to wrap insulation around the piping. Direct contact with the bare piping may result in burns or frostbite.
Never put batteries in your mouth for any reason to avoid accidental ingestion.
Battery ingestion may cause choking and/or poisoning.
Install the unit on a rigid structure to prevent excessive sound or vibration during operation.
If power to the hydrobox is to be turned off (or system switched off) for a long time, the water should be drained.
Preventative measures should be taken against water hammer, such as installing a Water Hammer Arrestor on the primary water circuit, as directed by the manufacturer.
In order to prevent condensation on emitters, adjust flow temperature appropriately and also set the lower limit of the flow temperature on site.

As for the handling of refrigerant, refer to the outdoor unit installation manual.

2 Introduction

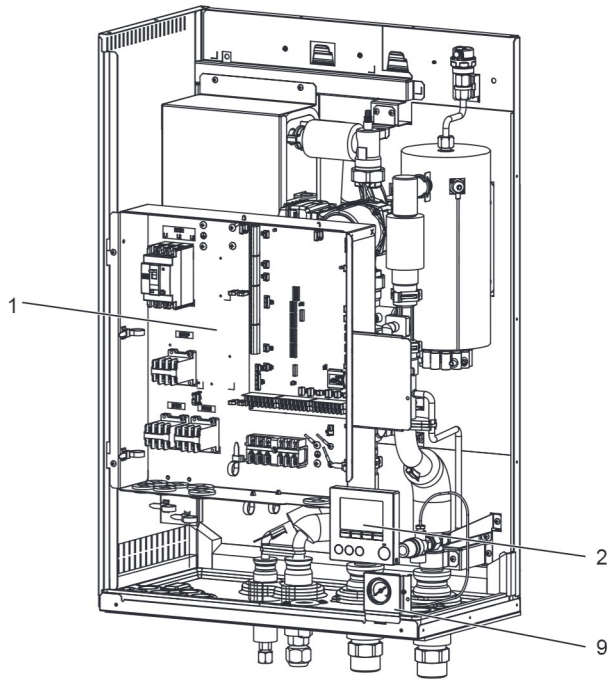
The purpose of this installation manual is to instruct competent persons how to safely and efficiently install and commission the hydrobox system. The target readers of this manual are competent plumbers and/or refrigeration engineers who have attended and passed the requisite Mitsubishi Electric product training and have appropriate qualifications for installation of an unvented hot water hydrobox specific to their country.

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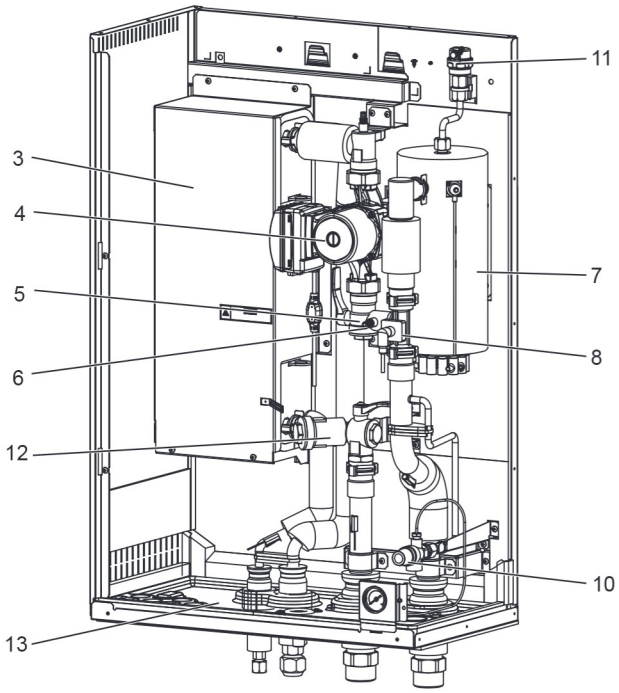
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■ Component Parts

<E*SE-*M*EC>



<Figure 3.1>



<Figure 3.2>

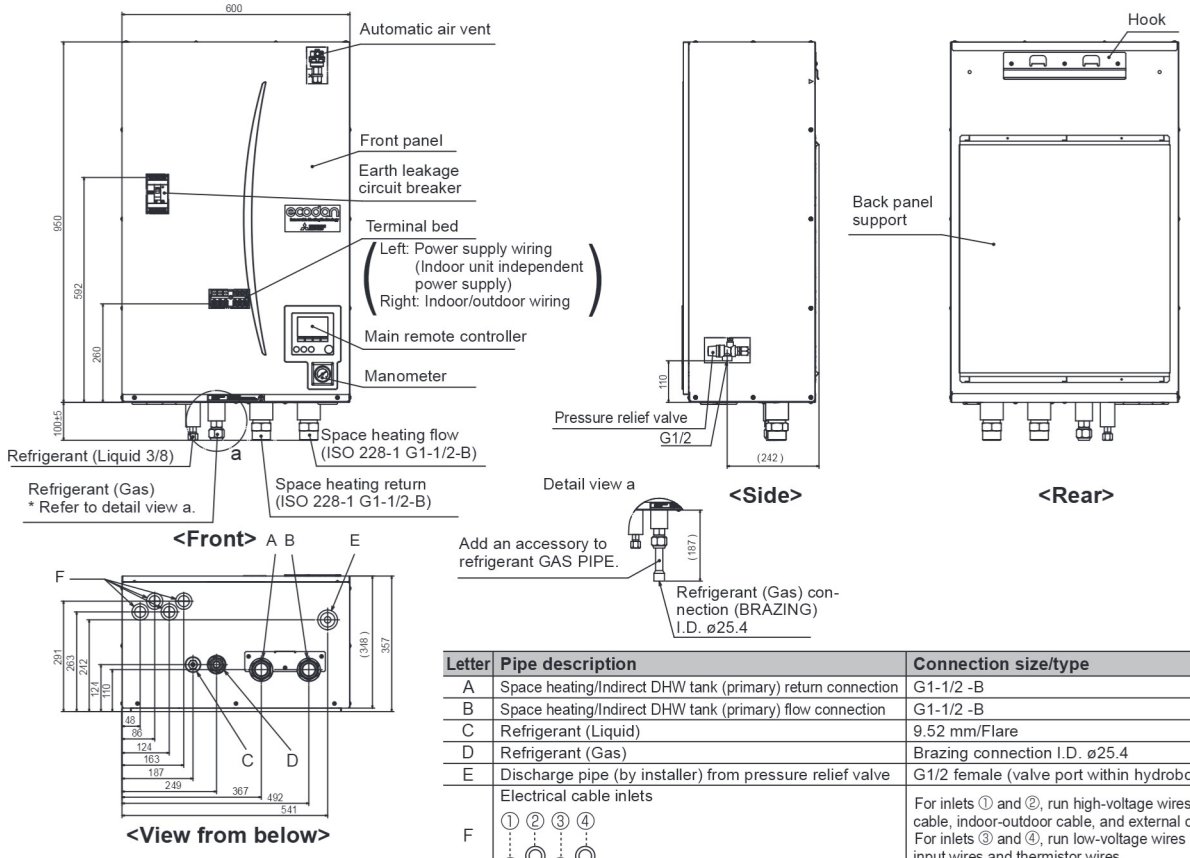
No.	Part name	EHSE-*H*EC	ERSE-*M*EC
1	Control and electrical box	✓	✓
2	Main remote controller	✓	✓
3	Plate heat exchanger (Refrigerant - Water)	✓	✓
4	Water circulation pump	✓	✓
5	Pump valve	✓	✓
6	Drain cock (Primary circuit)	✓	✓
7	Booster heater 1,2	✓	✓
8	Flow sensor	✓	✓
9	Manometer	✓	✓
10	Pressure relief valve (3bar)	✓	✓
11	Automatic air vent	✓	✓
12	Strainer valve	✓	✓
13	Drain pan	—	✓

<Table 3.2>

EN

■ Technical Drawings

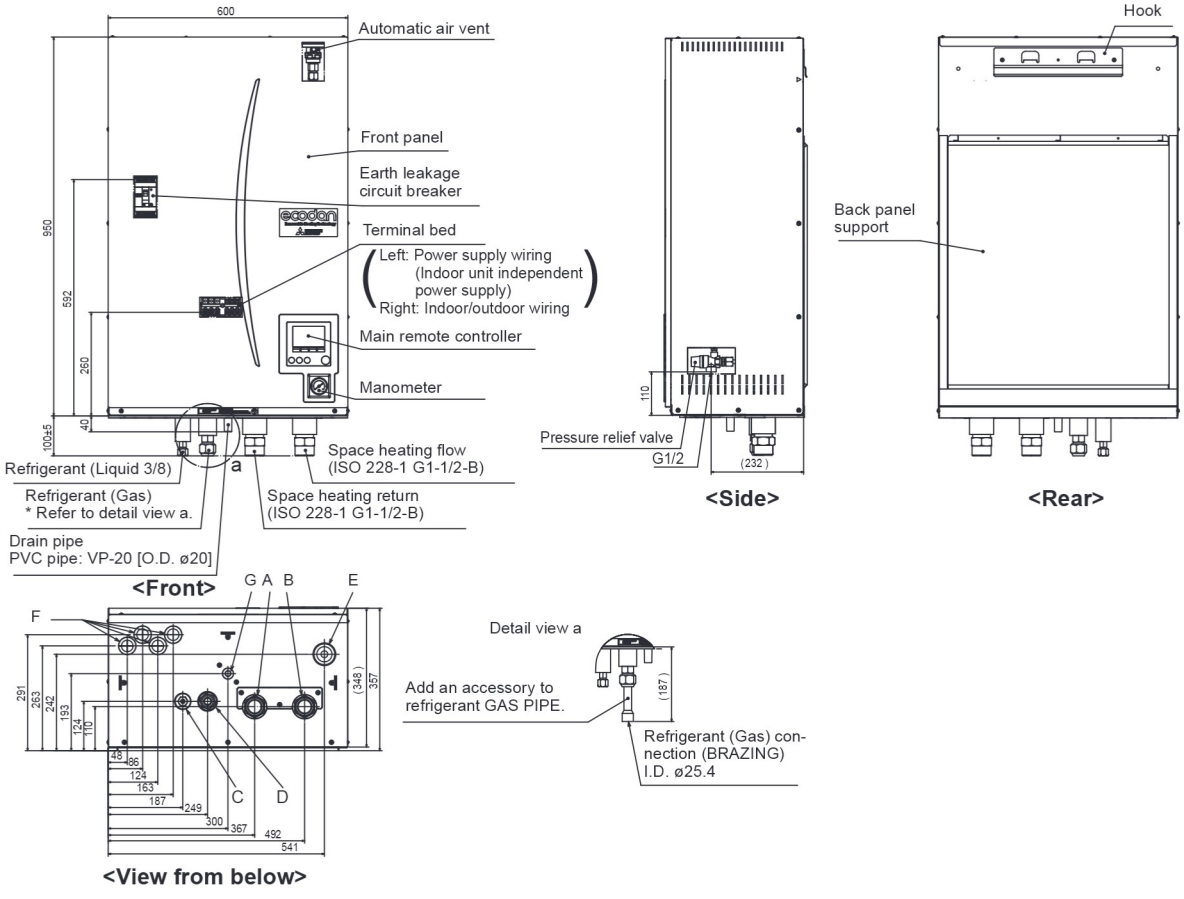
<EHS*> (Heating system)



Letter	Pipe description	Connection size/type
A	Space heating/Indirect DHW tank (primary) return connection	G1-1/2 -B
B	Space heating/Indirect DHW tank (primary) flow connection	G1-1/2 -B
C	Refrigerant (Liquid)	9.52 mm/Flare
D	Refrigerant (Gas)	Brazing connection I.D. ø25.4
E	Discharge pipe (by installer) from pressure relief valve	G1/2 female (valve port within hydrobox casing)
F	Electrical cable inlets ① ② ③ ④	For inlets ① and ②, run high-voltage wires including power cable, indoor-outdoor cable, and external output wires. For inlets ③ and ④, run low-voltage wires including external input wires and thermistor wires. For a wireless receiver (option) cable, use inlet ④.
G	Drain socket	O.D. ø20

<Table 3.3>

<ERS*> (Heating and cooling system)



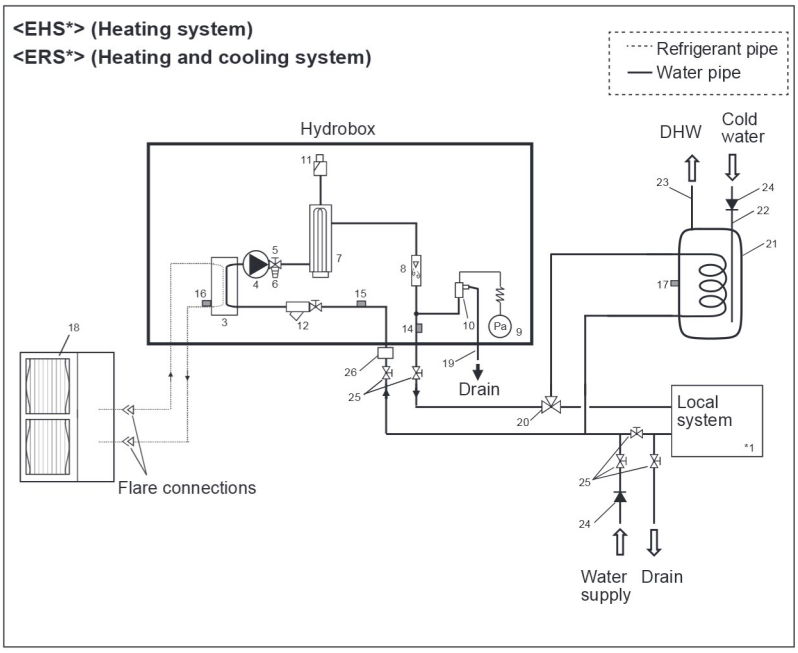
■ Unit Compatibility

Outdoor unit \ Hydrobox	EHSE-YM9EC	EHSE-MEC	ERSE-YM9EC	ERSE-MEC
PUHZ-SW160, 200	✔	✔	✔	✔
PUHZ-SHW230	✔	✔	✔	✔

<Table 3.4>

■ Water circuit diagram

*1 Refer to the following section [Local system].



<Figure 3.3>

Note
- Be sure to follow your local regulations to perform system configuration of the DHW connections.
- DHW connections are not included in the hydrobox package. All required parts are to be sourced locally.
- To enable draining of the hydrobox an isolating valve should be positioned on both the inlet and outlet pipework.
- Be sure to install a strainer on the inlet pipe work to the hydrobox.
- Suitable drain pipework should be attached to all relief valves in accordance with your country's regulations.
- A backflow prevention device must be installed on water supply pipework (IEC 61770).
- When using components made from different metals or connecting pipes made of different metals insulate the joints to prevent a corrosive reaction taking place which will damage the pipework.

No.	Part name	EHSE-YM9EC	EHSE-MEC	ERSE-YM9EC	ERSE-MEC
1	Control and electrical box	✔	✔	✔	✔
2	Main remote controller	✔	✔	✔	✔
3	Plate heat exchanger (Refrigerant - Water)	✔	✔	✔	✔
4	Water circulation pump	✔	✔	✔	✔
5	Pump valve	✔	✔	✔	✔
6	Drain cock (Primary circuit)	✔	✔	✔	✔
7	Booster heater 1, 2	✔	–	✔	–
8	Flow sensor	✔	✔	✔	✔
9	Manometer	✔	✔	✔	✔
10	Pressure relief valve (3 bar)	✔	✔	✔	✔
11	Automatic air vent	✔	✔	✔	✔
12	Strainer valve	✔	✔	✔	✔
13	Drain pan	–	–	✔	✔
14	THW1	✔	✔	✔	✔
15	THW2	✔	✔	✔	✔
16	TH2	✔	✔	✔	✔
17	THW5 (Optional part PAC-TH011TK-E or PAC-TH011TKL-E)	–	–	–	–
18	Outdoor unit	–	–	–	–
19	Drain pipe (Local supply)	–	–	–	–
20	3-way valve (Local supply)	–	–	–	–
21	DHW indirect unvented tank (Local supply)	–	–	–	–
22	Cold water inlet pipe (Local supply)	–	–	–	–
23	DHW outlet pipe (Local supply)	–	–	–	–
24	Back flow prevention device (Local supply)	–	–	–	–
25	Isolating valve (Local supply)	–	–	–	–
26	Magnetic filter (Local supply) (Recommended)	–	–	–	–
27	Strainer (Local supply)	–	–	–	–

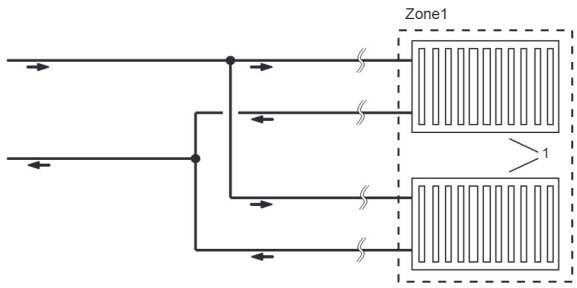
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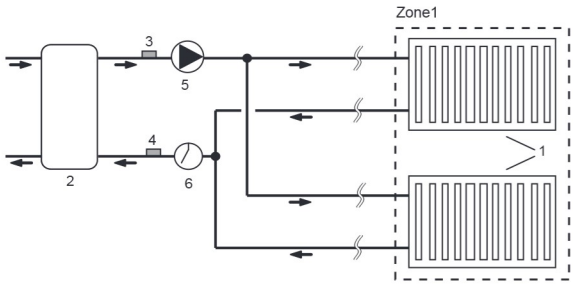
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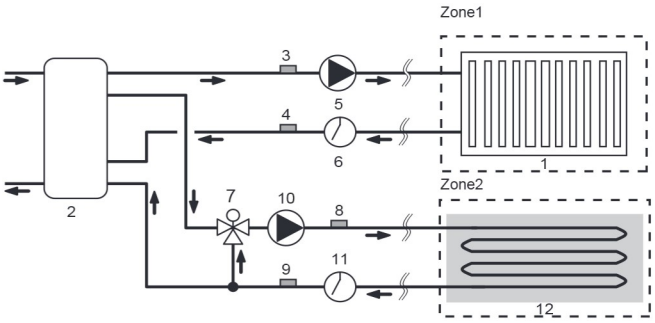
■ Local system

1-zone temperature control

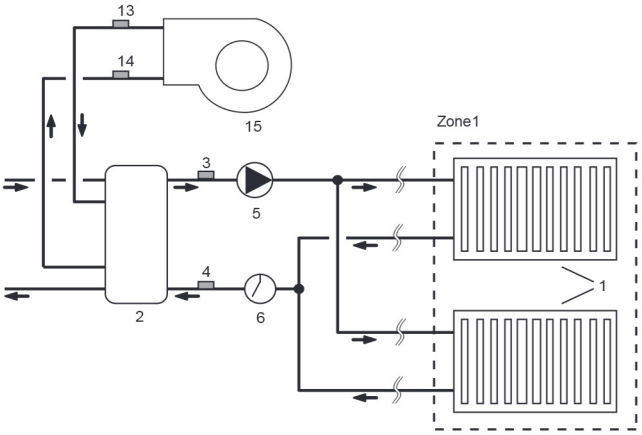




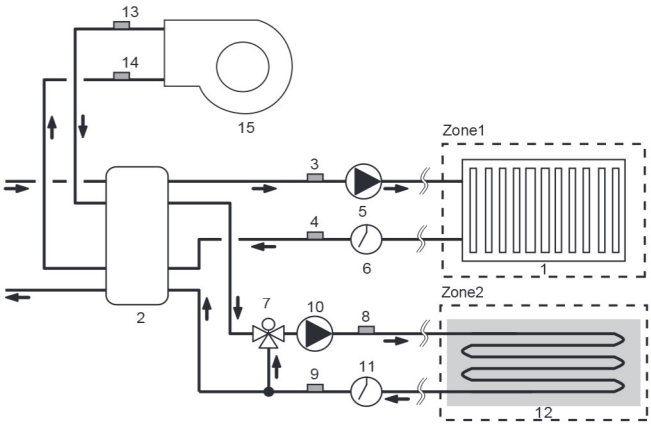
2-zone temperature control



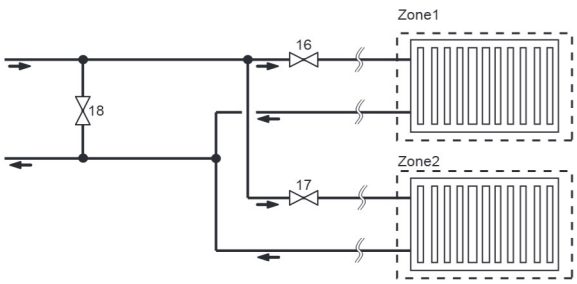
1-zone temperature control with boiler



2-zone temperature control with boiler



1-zone temperature control (2-zone valve ON/OFF control)



1. Zone1 heat emitters (e.g. radiator, fan coil unit) (local supply)
2. Mixing tank (local supply)
3. Zone1 flow water temp. thermistor (THW6)
4. Zone1 return water temp. thermistor (THW7) } Optional part : PAC-TH011-E
5. Zone1 water circulation pump (local supply)
6. Zone1 flow switch (local supply) *
7. Motorized mixing valve (local supply)
8. Zone2 flow water temp. thermistor (THW8)
9. Zone2 return water temp. thermistor (THW9) } Optional part : PAC-TH011-E
10. Zone2 water circulation pump (local supply)
11. Zone2 flow switch (local supply) *
12. Zone2 heat emitters (e.g. underfloor heating) (local supply)
13. Boiler flow water temp. thermistor (THWB1)
14. Boiler return water temp. thermistor (THWB2) } Optional part : PAC-TH011HT-E
15. Boiler
16. Zone1 2-way valve (local supply)
17. Zone2 2-way valve (local supply)
18. Bypass valve (local supply)

* Flow switch specifications: DC12 V / 1 mA / Both normally-open and normally-closed types can be used. (Set DIP switch 3 to select the logics. Refer to " 5.1 DIP switch function".)

■ Energy monitor

End user can monitor accumulated*1 'Consumed electrical energy' and 'Delivered heat energy' in each operation mode*2 on the main remote controller.
*1 Monthly and Year to date
*2 - DHW operation
- Space heating
- Space cooling

Refer to "5.9 Main remote controller" for how to check the energy, and "5.1 DIP switch functions" for the details on DIP-SW setting.
Either one of the following two method is used for monitoring.
Note: Method 1 should be used as a guide. If a certain accuracy is required, the 2nd method should be used.

1. Calculation internally
Electricity consumption is calculated internally based on the energy consumption of outdoor unit, electric heater, water pump(s) and other auxiliaries.
Delivered heat is calculated internally by multiplying delta T (Flow and Return temp.) and flow rate measured by the factory fitted sensors.
Set the electric heater capacity and water pump(s) input according to indoor unit model and specs of additional pump(s) supplied locally. (Refer to the menu tree in "5.9 Main remote controller")

EN

	Booster heater 1	Booster heater 2	Immersion heater *2	Pump 1	Pump 2	Pump 3
Default *1	2 kW	4 kW	0 kW	***	0 W	0 W
ERSE-YM9EC	3 kW	6 kW	0 kW *2	*3	When additional pumps supplied locally are connected as Pump2/3, change setting according to specs of the pumps.	
ERSE-MEC	0 kW	0 kW	0 kW *2	*3		
EHSE-YM9EC	3 kW	6 kW	0 kW *2	*3		
EHSE-MEC	0 kW	0 kW	0 kW *2	*3		

<Table 3.6>

Pump speed	Pump 1
Speed 5 (Default setting)	180 W
Speed 4	172 W
Speed 3	113 W
Speed 2	70 W
Speed 1	38 W

<Table 3.7>

*1 Default setting is used for E*SC(D)/EHPX models. Please change setting according to <Table 3.6>.
*2 Change setting to 3kW when connecting optional immersion heater "PAC-IH03V2-E".
*3 Please change setting according to <Table 3.7>.

When anti-freeze solution (propylene glycol) is used for primary water circuit, set the delivered energy adjustment if necessary.
For further detail of above, refer to "5.9 Main remote controller".

2. Actual measurement by external meter (locally supplied)
FTC has external input terminals for 2 'Electric energy meters' and a 'Heat meter'.
If two 'Electric energy meters' are connected, the 2 recorded values will be combined at the FTC and shown on the main remote controller.
(e.g. Meter 1 for H/P power line, Meter 2 for heater power line)
Refer to the [Signal inputs] section in "5.2 Connecting inputs/outputs" for more information on connectable electric energy meter and heat meter.

<Preparation before the installation and service>

- Prepare the proper tools.
- Prepare the proper protection.
- Allow parts to cool before attempting any maintenance.
- Provide adequate ventilation.
- After stopping the operation of the system, turn off the power-supply breaker and remove the power plug.
- Discharge the capacitor before commencing work involving the electric parts.

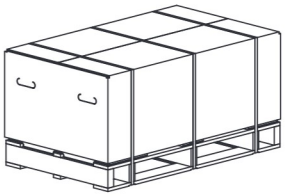
<Precautions during service>

- Do not perform work involving electric parts with wet hands.
- Do not pour water or liquid into the electric parts.
- Do not touch the refrigerant.
- Do not touch the hot or cold surfaces in the refrigerant cycle.
- When the repair or the inspection of the circuit needs to be carried out without turning off the power, exercise great caution not to touch any live parts.

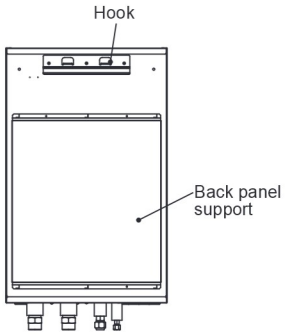
EN

4.1 Location

■ Transportation and Handling



<Figure 4.1.1>



<Figure 4.1.2>

Hydrobox is delivered on a wooden pallet base with cardboard protection.

Care should be taken when transporting the hydrobox so that the casing is not damaged by impact. Do not remove the protective packaging until hydrobox has reached its final location. This will help protect the structure and control panel.

Note:
- **The hydrobox should ALWAYS be moved by a minimum of 2 people.**
- **Do NOT hold piping when moving the hydrobox.**

■ Suitable Location

Before installation the hydrobox should be stored in a frost-free weatherproof location. Units must **NOT** be stacked.

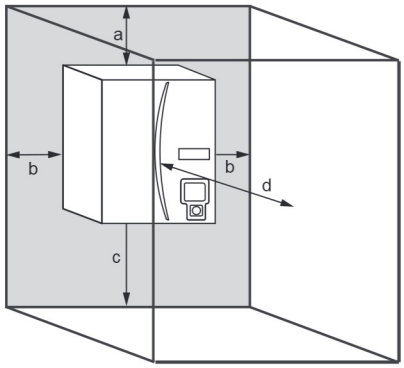
- The hydrobox should be installed indoors in a frost free weather proof location.
- The hydrobox should be positioned on a level wall capable of supporting it's filled weight.
- To find out the weight, refer to "3. Technical Information".
- Care should be taken that minimum distances around and in front of the unit for service access are observed <Figure 4.1.3>.
- Secure the hydrobox to prevent it being knocked over.
- The hook and panel supports should be used to fix the hydrobox to the wall. <Fig. 4.1.2>
- Install the hydrobox where it is not exposed to water/excessive moisture.

■ Service access diagrams

Service access	
Parameter	Dimension (mm)
a	200
b	150
c	500
d	500

<Table 4.1.1>

Sufficient space MUST be left for the provision of discharge pipework as detailed in National and Local building regulations.



<Figure 4.1.3>
Service access

The hydrobox must be located indoors and in a frost-free environment, for example in a utility room.

■ Room Thermostat

If fitting a new room thermostat for this system;
- Position it out of direct sunlight and draughts
- Position it away from internal heat sources
- Position it in a room without a TRV on the radiator/heat emittor
- Position it on an internal wall

Note: Do not position the thermostat excessively close to the external wall. The thermostat may detect the temperature of the wall, which could affect appropriate control of the room temperature.
- Position it approx. 1.5 m above floor level

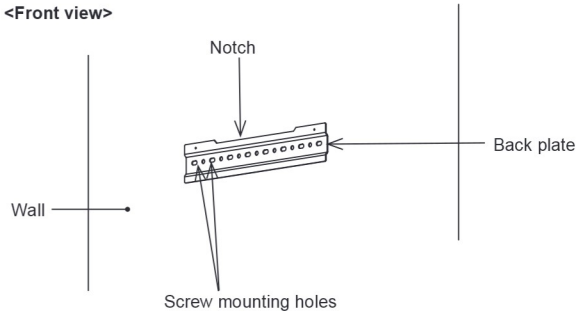
■ Repositioning hydrobox

If you need to move the hydrobox to a new position FULLY DRAIN it before moving to avoid damage to the unit.
Note: Do NOT hold piping when moving the hydrobox.

■ Mounting procedure

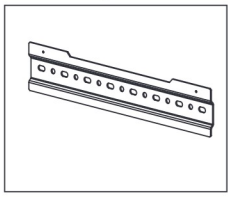
1. Install the included back plate accessory.
   * When installing the back plate, use locally-supplied screws and compatible fixing plugs.

<Front view>



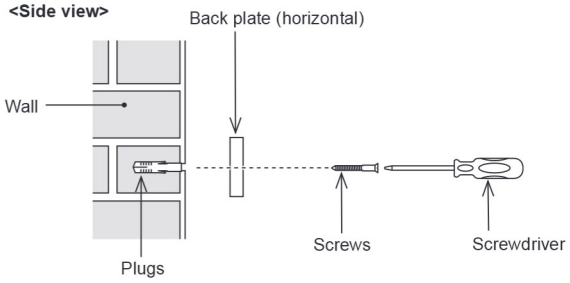
<Figure 4.1.4>

<Accessory>



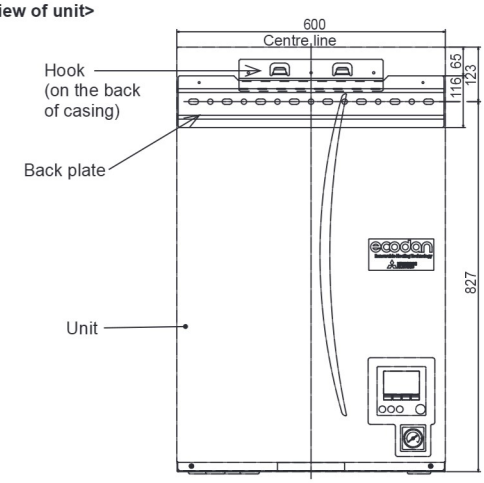
- Ensure that the notch is positioned at the TOP of the back plate.
  The back plate is provided with screw mounting holes that are round or oval.
  To prevent the unit from falling off the wall, choose the appropriate number of holes or hole positions and horizontally secure the back plate to the appropriate wall location.

<Side view>



<Figure 4.1.5>

<Front view of unit>

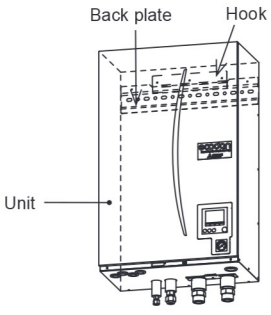


<Figure 4.1.6>

- Figure 4.1.6 shows the relative positions between the unit and the wall secured back plate.
  Referring to the <Figure 4.1.3> Service access, install the back plate.

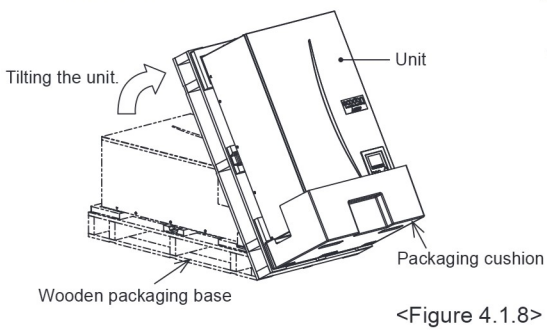
2. Insert the hook on the back of the hydrobox behind the notch of the back plate.
   *The lifting up of the hydrobox is facilitated by first tilting the unit forward using the included packaging cushioning.

Note: Hold the MAIN BODY of the hydrobox when carrying or mounting the hydrobox to a wall.
Holding and supporting the unit by the manometer, water pipe, or refrigerant pipe may result in breakdown of the components and impact on unit's conditions of warranty.

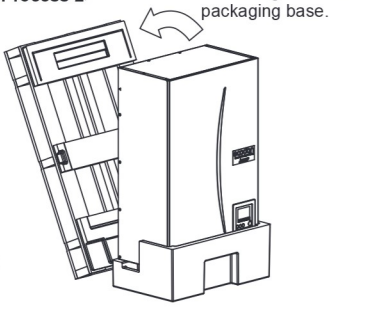


<Figure 4.1.7>

<Process 1>



<Process 2>

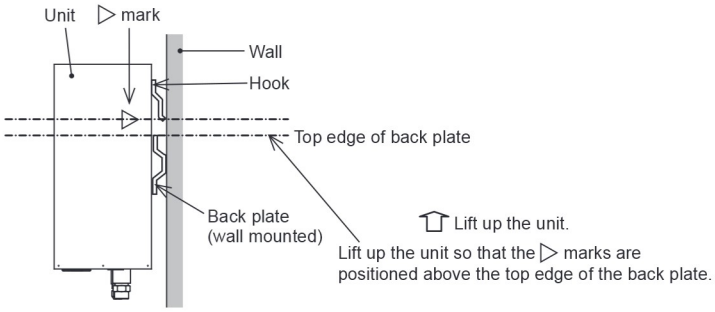


<Figure 4.1.8>

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i) Each of the right and left side panels has a ▷ mark indication.
Lift up the unit so that the ▷ marks are positioned above the top edge of the back plate as shown below.

<Side view of unit>

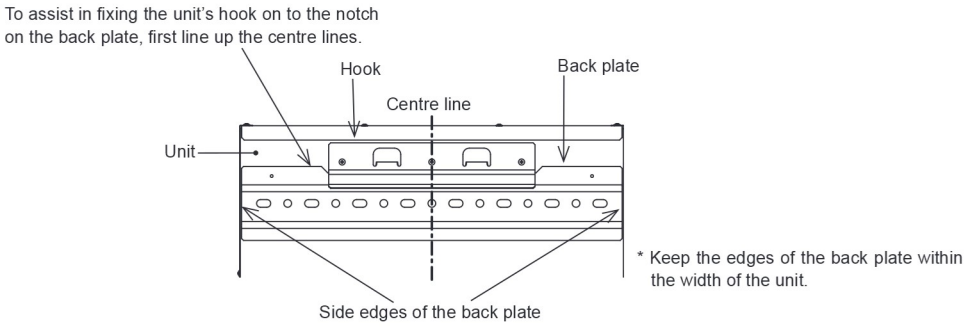


<Figure 4.1.9>

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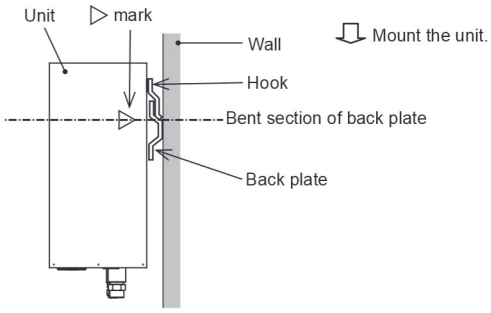
ii) The back plate and the unit share the same width.
When mounting the unit, the centre lines of the back plate and the unit can be aligned by keeping the right and left edges of the back plate within the width of the unit.
The hook on the unit can then be attached to the notch on the back plate. (When mounting, the casing's lower panel support should be in contact with the wall surface.)

<Front view of unit>



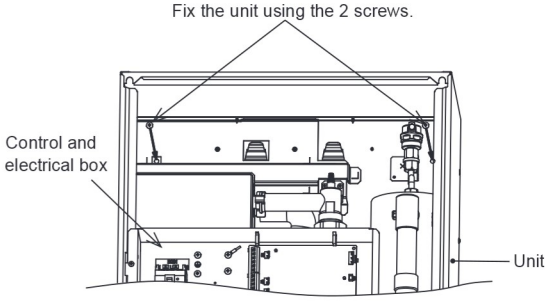
<Figure 4.1.10>

iii) Check and ensure that the ▷ mark is positioned and properly engaged at the bent section level on the back plate as shown.



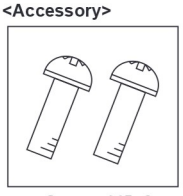
<Figure 4.1.11>

3. Referring to "How to access Internal Components and Control and Electrical Box", fix the unit and the back plate using the included 2 screws (accessory items).



<Figure 4.1.12>

<Accessory>



Screw M5×8

Caution) BEFORE performing field piping, be sure to fit and tighten these two screws.
Otherwise, the hook could be disengaged, and the unit could fall down.

4.2 Water Quality and System Preparation

■ General

- The water in both primary and sanitary circuit should be clean and with pH value of 6.5-8.0.
- The followings are the maximum valves;
  Calcium: 100mg/L, Ca hardness: 250mg/L
  Chlorine: 100mg/L, Copper: 0.3mg/L
  Iron/Manganese: 0.5mg/L
- Other constituents should be to European Directive 98/83 EC standards.
- In known hard water areas, to prevent/minimise scaling, it is beneficial to restrict the routine stored water temperature (DHW max. temp.) to 55°C.

■ Anti-Freeze

Anti-freeze solutions MUST use propylene glycol with a toxicity rating of Class 1 as listed in Clinical Toxicology of Commercial Products, 5th Edition.

Note:

1. Ethylene glycol is toxic and must NOT be used in the primary water circuit in case of any cross-contamination of the potable circuit.

2. For 2-zone valve ON/OFF control, propylene glycol MUST be used.

■ New Installation (primary water circuit)

- Before connecting outdoor unit, thoroughly cleanse pipework of building debris, solder etc using a suitable chemical cleansing agent.
- Flush the system to remove chemical cleanser.
- The responsible installer should decide if anti-freeze solution is necessary for each site's conditions. Corrosion inhibitor however should always be used.

■ How to access Internal Components and Control and Electrical Box

<A> Opening the front panel

1. Remove the two lower screws.
2. Slide front panel upwards slightly and open carefully.
3. Disconnect the relay connector connecting main remote controller cable and the control board cable.

<B> Accessing the back of the control and electrical box

The control and electrical box has a holding screw on the right and is hinged on the left hand side.

1. Remove the holding screws on the control and electrical box.
2. The control and electrical box can then be swung forward on the left hand hinges.

Note:

1. Before accessing back of control and electrical box release cables from the tie straps attached to the cross-support.

2. After servicing, re-secure all cables using straps provided. Reconnect main remote controller cable to its relay connector. Replace front panel and re-secure screws at base.

■ Existing Installation (primary water circuit)

- Before connecting outdoor unit the existing heating circuit MUST be chemically cleansed to remove existing debris from the heating circuit.
- Flush the system to remove chemical cleanser.
- The responsible installer should decide if anti-freeze solution is necessary for each site's conditions. Corrosion inhibitor however should always be used.

When using chemical cleansers and inhibitors always follow manufacturer's instructions and ensure the product is appropriate for the materials used in the water circuit

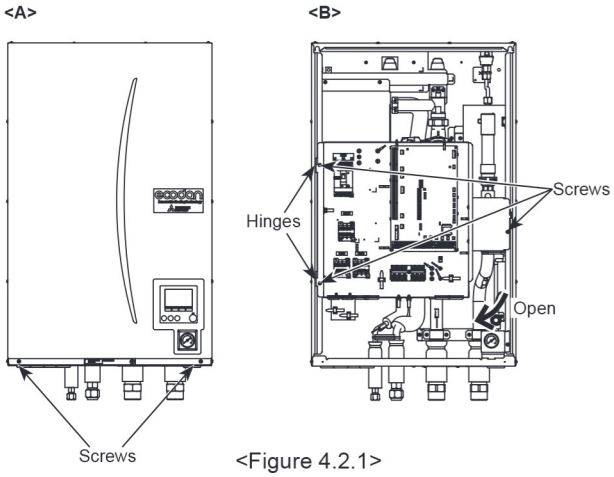
■ Minimum amount of water required in the space heating / cooling circuit

Outdoor heat pump unit	Minimum water quantity [L]
PUHZ-SW160	69
PUHZ-SW200	86
PUHZ-SHW230	99

<Table 4.2.1>

Note:

For 2-zone temperature control system, the value in the table above excludes the amount of stored water in zone 2.



<Figure 4.2.1>

4.3 Water Pipe Work

Note: Prevent the field piping from straining the piping on the hydrobox by fixing it to a wall or applying other methods.

■ Hot Water Pipework

The function of the following safety components of the hydrobox should be checked on installation for any abnormalities;

- Pressure relief valve
- Expansion vessel pre-charge (gas charge pressure)

The instruction on the following pages regarding safe discharge of hot water from Safety devices should be followed carefully.

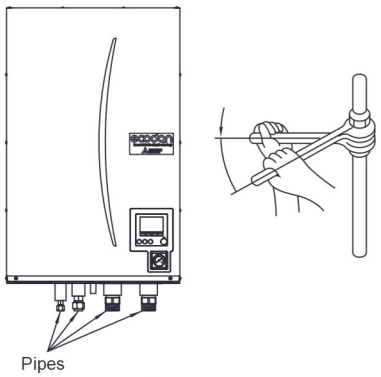
- The pipework will become very hot, so should be insulated to prevent burns.
- When connecting pipework, ensure that no foreign objects such as debris or the like do not enter the pipe.

■ Pipework Connections

Connections to the hydrobox should be made using the G1-1/2 nut as appropriate. (The hydrobox has G1-1/2 (male) thread connections.)
Please apply a gasket not to leak water.
Use two wrenches to tighten piping connection (see <Figure 4.3.1>).

■ Insulation of Pipework

- All exposed water pipework should be insulated to prevent unnecessary heat loss and condensation. To prevent condensate entering the hydrobox, the pipework and connections at the top of the hydrobox should be carefully insulated.
- Cold and hot water pipework should not be run close together where possible, to avoid unwanted heat transfer.
- Pipework between outdoor heat pump unit and hydrobox should be insulated with suitable pipe insulation material with a thermal conductivity of ≤ 0.04 W/m.K.



<Figure 4.3.1>

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■ Drain Pipework (ONLY ERSE series)

The drain pipe should be installed to drain condensing water in Cooling mode.
To prevent dirty water from draining directly onto the floor next to hydrobox, please connect appropriate discharge pipework from the hydrobox.

- Securely install the drain pipe to prevent leakage from the connection.
- Securely insulate the drain pipe to prevent water dripping from the locally supplied drain pipe.
- Install the drain pipe at a down slope of 1/100 or more.
- Do not place the drain pipe in drain channel where sulfuric gas exists.
- After installation, check that the drain pipe drains water properly from the outlet of the pipe to suitable discharge location.

<Installation>

1. Apply polyvinyl chloride type adhesive over the shaded surfaces inside of the drain pipe and on the exterior of the drain socket as shown.
2. Insert the drain socket deeply into the drain pipe <Figure 4.3.2>.

Note: Securely support the locally supplied drain pipe using pipe support to avoid the drain pipe falling from the drain socket.

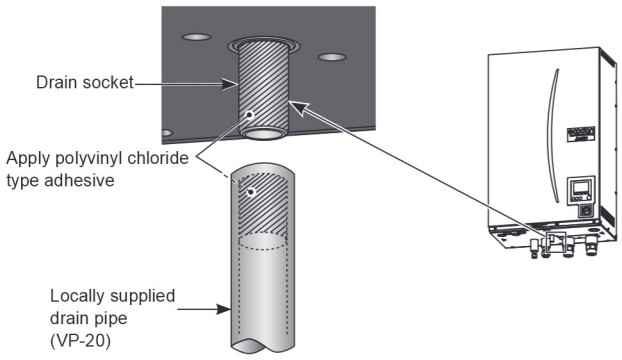
<Checking Drainage>

- Check that the drain pipe drains water properly from the outlet of the pipe.
- Check for any leakage from the connections.

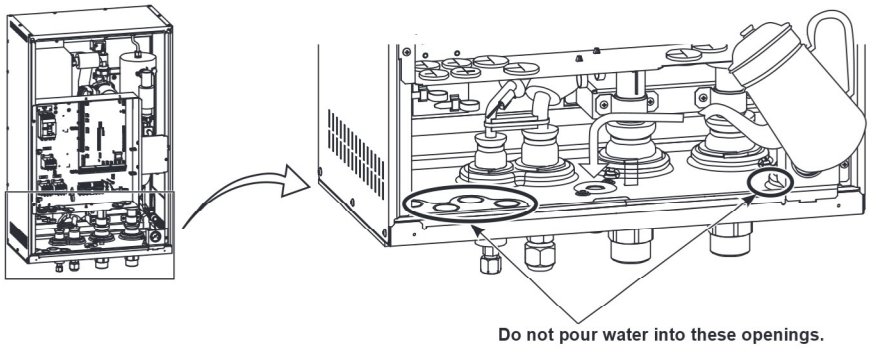
Note: Always check drainage at installation regardless of season.

- Remove the front panel and gradually pour 1 liter of water into the drain pan <Figure 4.3.3>.

Note: Pour water slowly into the drain pan so that water does not overflow from the drain pan.



<Figure 4.3.2>



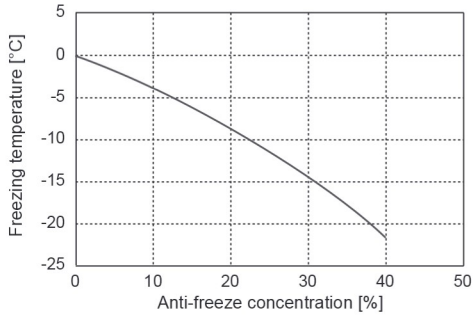
<Figure 4.3.3>

■ Filling the System (Primary Circuit)

1. Check all connections including factory fitted ones are tight.
2. Check the pump valve and the strainer valve are opened completely.
3. Insulate pipework between hydrobox and outdoor unit.
4. Thoroughly clean and flush, system of all debris. (see section 4.2 for instruction.)
5. Fill hydrobox with potable water. Fill primary heating circuit with water and suitable anti-freeze and inhibitor as necessary. **Always use a filling loop with double check valve when filling the primary circuit to avoid back flow contamination of water supply.**

- Anti-freeze should always be used for packaged model systems (see section 4.2 for instruction). It is the responsibility of the installer to decide if anti-freeze solution should be used in split model systems depending on each site's conditions. Corrosion inhibitor should be used in both split model and packaged model systems.
  Figure 4.3.4 shows freezing temperature against anti-freeze concentration. This figure is an example for FERNOX ALPHI-11. For other anti-freeze, please refer to relevant manual.
- When connecting metal pipes of different materials insulate the joints to prevent a corrosive reaction taking place which will damage the pipework.

6. Check for leakages. If leakage is found, retighten the screws onto the connections.
7. Pressurise system to 1 bar.
8. Release all trapped air using air vents during and following heating period.
9. Top up with water as necessary. (If pressure is below 1 bar)



<Figure 4.3.4>

■ Sizing Expansion Vessels

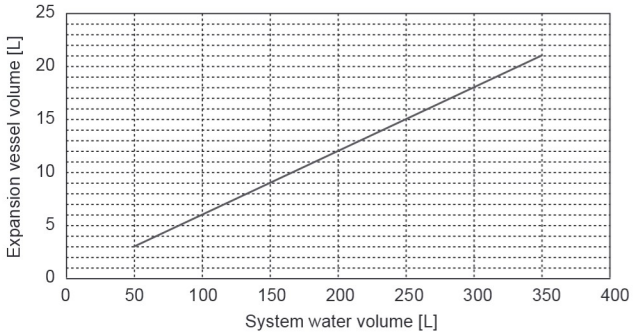
Expansion vessel volume must fit the local system water volume.
To size an expansion vessel both for the heating and cooling circuits the following formula and graph can be used.

$$V = \frac{\varepsilon \times G}{1 - \frac{P_1 + 0.098}{P_2 + 0.098}}$$

Where;
- V : Necessary expansion vessel volume [L]
- ε : Water expansion coefficient
- G : Total volume of water in the system [L]
- P_1 : Expansion vessel setting pressure [MPa]
- P_2 : Max pressure during operation [MPa]

Graph to the right is for the following values
- ε : at 70 °C = 0.0229
- P_1 : 0.1 MPa
- P_2 : 0.3 MPa
- * 30% safety margin has been added.

Expansion vessel sizing



<Figure 4.3.5>

EN

■ Water Circulation Pump Characteristics

Pump speed can be selected by main remote controller setting (see <Figure 4.3.6>).
Adjust the pump speed setting so that the flow rate in the primary circuit is appropriate for the outdoor unit installed (see Table 4.3.1). It may be necessary to add an additional pump to the system depending on the length and lift of the primary circuit.

<Second pump>
If a second pump is required for the installation please read the following carefully.
If a second pump is used in the system it can be positioned in 2 ways.
The position of the pump influences which terminal of the FTC the signal cable should be wired to. If the additional pump(s) have current greater than 1A please use appropriate relay. Pump signal cable can either be wired to TBO.1 1-2 or CNP1 but not both.

Option 1 (Space heating/cooling only)
If the second pump is being used for the heating circuit only then the signal cable should be wired to TBO.1 terminals 3 and 4 (OUT2). In this position the pump can be run at a different speed to the hydrobox's in-built pump.

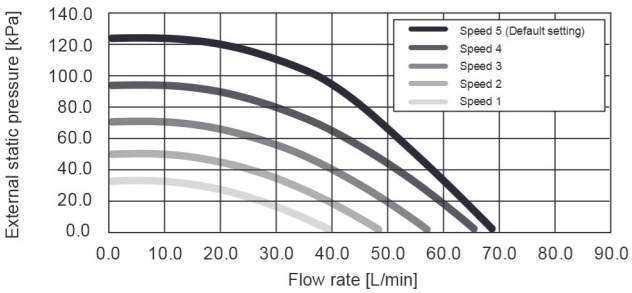
Option 2 (Primary circuit DHW and space heating/cooling)
If the second pump is being used in the primary circuit between the hydrobox and the outdoor unit (Package system ONLY) then the signal cable should be wired to TBO.1 terminals 1 and 2 (OUT1). In this position the pump speed **MUST** match the speed of the hydrobox's in-built pump.
Note: Refer to 5.2 Connecting inputs/outputs.

Outdoor heat pump unit	Water flow rate range [L/min]
PUHZ-SW160	25.8 - 61.5
PUHZ-SW200	28.7 - 61.5
PUHZ-SHW230	28.7 - 61.5

<Table 4.3.1>

* If the water flow rate exceeds 61.5 L/min, the flow speed will be greater than 1.5 m/s, which could erode the pipes.

EHSE/ERSE series



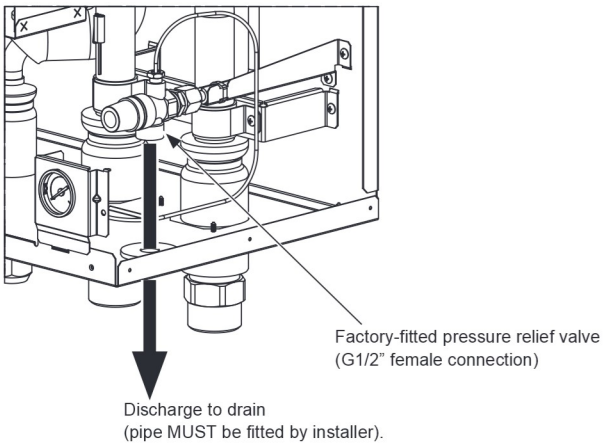
<Figure 4.3.6>

■ Safety Device Connections

The hydrobox contains a pressure relief valve. (see <Figure 4.3.7>) The connection size is G1/2" female. The installer MUST connect appropriate discharge pipework from this valve in accordance with local and national regulations.
Failure to do so will result in discharge from the pressure relief valve directly into the hydrobox and cause serious damage to the product.

All pipework used should be capable of withstanding discharge of hot water. Relief valves should NOT be used for any other purpose, and their discharges should terminate in a safe and appropriate manner in accordance with local regulation requirements.

Note: Beware that the manometer and the pressure relief valve are NOT strained on its capillary side and on its inlet side respectively.
If a pressure relief valve is added, it is essential that no check valve or isolation valve is fitted between the hydrobox connection and the added pressure relief valve (safety matter).



<Figure 4.3.7>

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■ Piping diagram for 2-zone temperature control

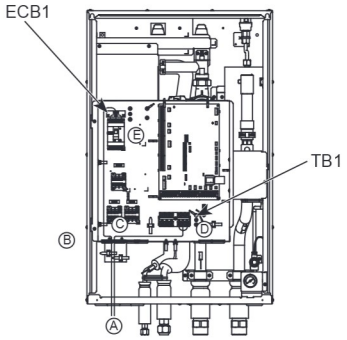
Connect the pipe work and locally supplied parts according to the relevant circuit diagram shown in Section 3. Technical Information, of this manual.
For more details on wiring, refer to "5.3 Wiring for 2-zone temperature controls".

Note: Do not install the thermistors on the mixing tank. This could affect correct monitoring of flow and return temperatures through each zone.
Install the Zone2 flow temp. thermistor (THW8) near the mixing valve.

4.4 Electrical Connection

All electrical work should be carried out by a suitably qualified technician. Failure to comply with this could lead to electrocution, fire, and death. It will also invalidate product warranty. All wiring should be according to national wiring regulations.

Breaker abbreviation	Meaning
ECB1	Earth leakage circuit breaker for booster heater
TB1	Terminal block 1



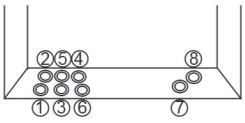
<Figure 4.4.1>

The hydrobox can be powered in two ways.
1. Power cable is run from the outdoor unit to the hydrobox.
2. Hydrobox has independent power source.

Connections should be made to the terminals indicated in the figures to the left below depending on the phase.

Booster heater and immersion heater should be connected independently from one another to dedicated power supplies.

Ⓐ Locally supplied wiring should be inserted through the inlets situated on the base of the hydrobox. (Refer to <Table 3.3>.
Ⓑ Wiring should be fed down the left hand side of the control and electrical box and clamped in place using clips provided.
Ⓒ The wires should be inserted individually through the cable inlets as below.
① Power line (B.H.)
③ Power line (I.H.) (option)
⑤ Indoor-Outdoor wire
⑥ Output wires
⑦ Signal input wires
Wireless receiver (option) wire (PAR-WR51R-E)



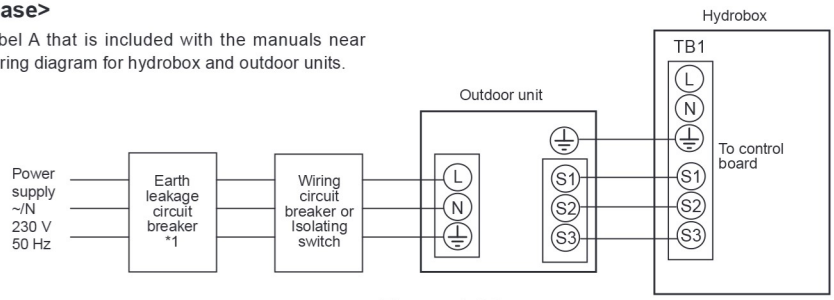
Ⓓ Connect the outdoor unit – hydrobox connecting cable to TB1.
Ⓔ Connect the power cable for the booster heater to ECB1.

• Make sure that ECB1 is ON.

Option 1: Hydrobox powered via outdoor unit

<1 phase>

Affix label A that is included with the manuals near each wiring diagram for hydrobox and outdoor units.



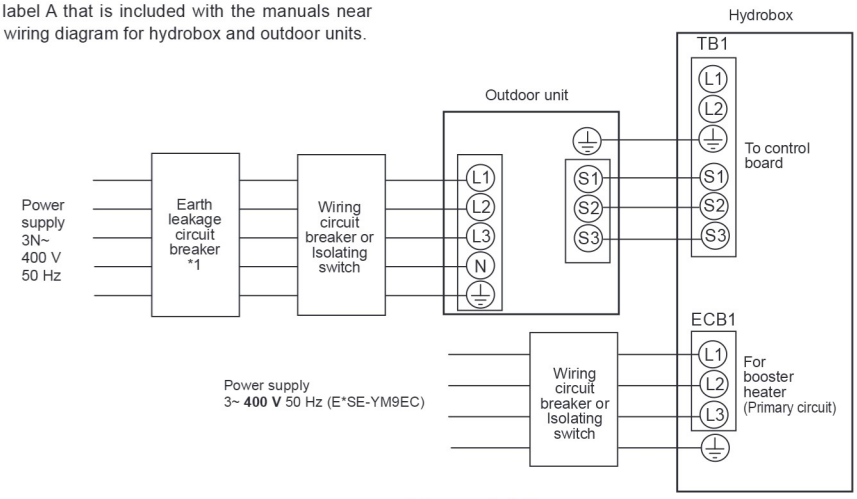
*1 If the installed earth leakage circuit breaker does not have an over-current protection function, install a breaker with that function along the same power line.

<Figure 4.4.2>
Electrical connections 1 phase

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<3 phase>

Affix label A that is included with the manuals near each wiring diagram for hydrobox and outdoor units.



*1 If the installed earth leakage circuit breaker does not have an over-current protection function, install a breaker with that function along the same power line.

Description	Power supply	Capacity	Breaker	Wiring
Booster heater (Primary circuit)	3~ 400 V 50 Hz	9 kW	16 A *1	2.5 mm²

<Figure 4.4.3>
Electrical connections 3 phase

Wiring Wiring No. × size (mm²)	Hydrobox - Outdoor unit	*2	3 × 1.5 (polar)
	Hydrobox - Outdoor unit earth	*2	1 × Min. 1.5
Circuit rating	Hydrobox - Outdoor unit S1 - S2	*3	230 V AC
	Hydrobox - Outdoor unit S2 - S3	*3	24 V DC

*1. A breaker with at least 3.0 mm contact separation in each pole shall be provided. Use earth leakage breaker (NV). The breaker shall be provided to ensure disconnection of all active phase conductors of the supply.

*2. Max. 45 m
If 2.5 mm² used, Max. 50 m
If 2.5 mm² used and S3 separated, Max. 80 m

*3. The values given in the table above are not always measured against the ground value.

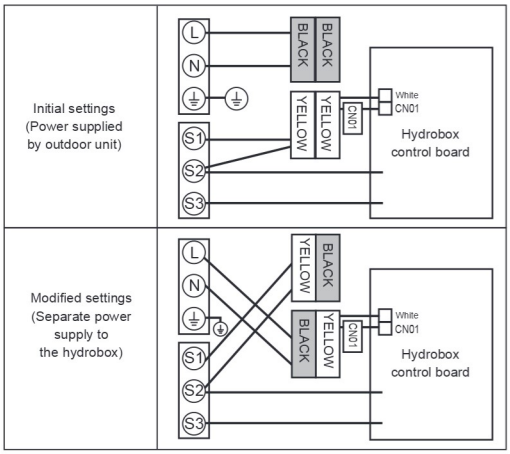
Notes:
1. **Wiring size must comply with the applicable local and national codes.**
2. **Indoor unit/outdoor unit connecting cords shall not be lighter than polychloroprene sheathed flexible cord. (Design 60245 IEC 57)**
   Indoor unit power supply cords shall not be lighter than polychloroprene sheathed flexible cord. (Design 60227 IEC 53)
3. **Install an earth longer than other cables.**
4. **Please keep enough output capacity of power supply for each heater. Insufficient power supply capacity might cause chattering.**

EN

Option2: Hydrobox powered by independent source

If the hydrobox and outdoor units have separate power supplies, the following requirements MUST be carried out:

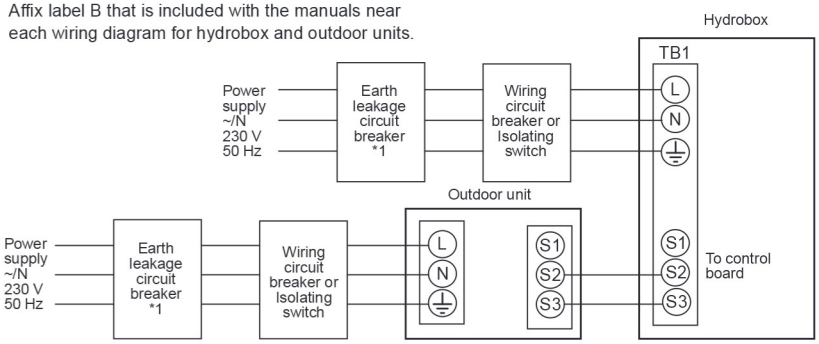
- **Change connector connections in hydrobox control and electrical box (see Figure 4.4.4).**
- **Turn the outdoor unit DIP switch SW8-3 to ON.**
- **Turn on the outdoor unit BEFORE the hydrobox.**
- **Power by independent source is not available for particular models of outdoor unit model.**
  For more detail, refer to the connecting outdoor unit installation manual.



<Figure 4.4.4>

<1 phase>

Affix label B that is included with the manuals near each wiring diagram for hydrobox and outdoor units.

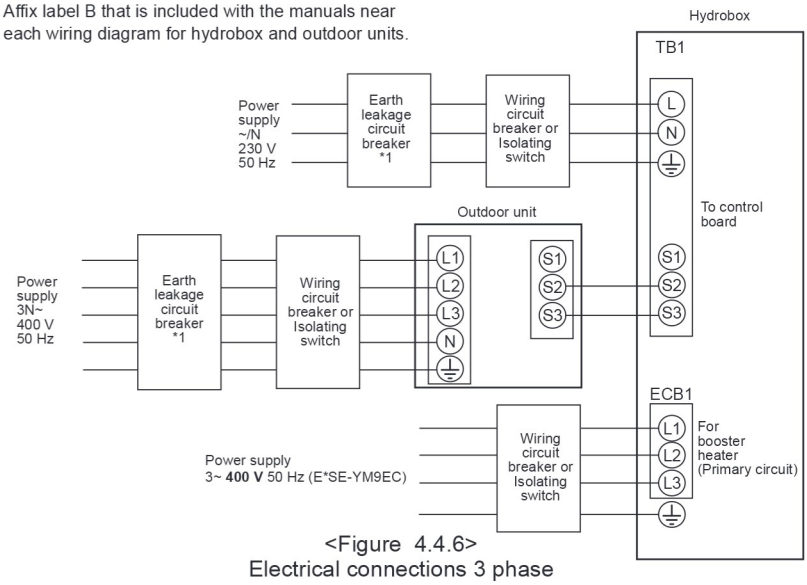


<Figure 4.4.5>
Electrical connections 1 phase

*1 If the installed earth leakage circuit breaker does not have an over-current protection function, install a breaker with that function along the same power line.

<3 phase>

Affix label B that is included with the manuals near each wiring diagram for hydrobox and outdoor units.



<Figure 4.4.6>
Electrical connections 3 phase

*1 If the installed earth leakage circuit breaker does not have an over-current protection function, install a breaker with that function along the same power line.

Description	Power supply	Capacity	Breaker	Wiring
Booster heater (Primary circuit)	3~ 400 V 50 Hz	9 kW	16 A *1	2.5 mm²

Hydrobox power supply			~/N 230 V 50 Hz
Hydrobox input capacity Main switch (Breaker)		*1	16 A
Wiring Wiring No. × size (mm²)	Hydrobox power supply		2 × Min. 1.5
	Hydrobox power supply earth		1 × Min. 1.5
	Hydrobox - Outdoor unit	*2	2 × Min. 0.3
	Hydrobox - Outdoor unit earth		—
Circuit rating	Hydrobox L - N	*3	230 V AC
	Hydrobox - Outdoor unit S1 - S2	*3	—
	Hydrobox - Outdoor unit S2 - S3	*3	24 V DC

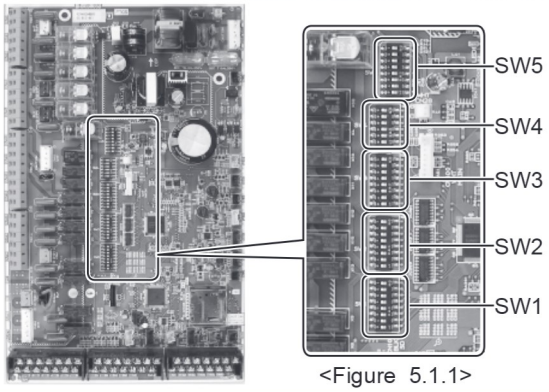
*1. A breaker with at least 3.0 mm contact separation in each pole shall be provided. Use earth leakage breaker (NV).
The breaker shall be provided to ensure disconnection of all active phase conductors of the supply.
*2. Max. 120 m
*3. The values given in the table above are not always measured against the ground value.

Notes:
1. Wiring size must comply with the applicable local and national codes.
2. Indoor unit/outdoor unit connecting cords shall not be lighter than polychloroprene sheathed flexible cord. (Design 60245 IEC 57)
Indoor unit power supply cords shall not be lighter than polychloroprene sheathed flexible cord. (Design 60227 IEC 53)
3. Install an earth longer than other cables.
4. Please keep enough output capacity of power supply for each heater. Insufficient power supply capacity might cause chattering.

5.1 DIP Switch Functions

Located on the FTC printed circuit board are 5 sets of small white switches known as DIP switches. The DIP switch number is printed on the circuit board next to the relevant switches. The word ON is printed on the circuit board and on the DIP switch block itself. To move the switch you will need to use a pin or the corner of a thin metal ruler or similar.

DIP switch settings are listed below in Table 5.1.1.
Make sure to turn off both indoor unit and outdoor unit power supplies before changing the switch settings.



<Figure 5.1.1>

DIP switch		Function	OFF	ON	Default settings: Indoor unit model
SW1	SW1-1	Boiler	WITHOUT Boiler	WITH Boiler	OFF
	SW1-2	Heat pump maximum outlet water temperature	55ºC	60ºC	ON *1
	SW1-3	DHW tank	WITHOUT DHW tank	WITH DHW tank	OFF
	SW1-4	Immersion heater	WITHOUT Immersion heater	WITH Immersion heater	OFF
	SW1-5	Booster heater	WITHOUT Booster heater	WITH Booster heater	OFF: E*SE-MEC ON : E*SE-YM9EC
	SW1-6	Booster heater function	For heating only	For heating and DHW	OFF: E*SE-MEC ON : E*SE-YM9EC
	SW1-7	Outdoor unit type	Split type	Packaged type	OFF
	SW1-8	Wireless remote controller	WITHOUT Wireless remote controller	WITH Wireless remote controller	OFF
SW2	SW2-1	Room thermostat1 input (IN1) logic change	Zone1 operation stop at thermostat short	Zone1 operation stop at thermostat open	OFF
	SW2-2	Flow switch1 input (IN2) logic change	Failure detection at short	Failure detection at open	OFF
	SW2-3	Booster heater capacity restriction	Inactive	Active	OFF
	SW2-4	Cooling mode function	Inactive	Active	OFF: EHSE-*M*EC ON : ERSE-*M*EC
	SW2-5	Automatic switch to backup heat source operation (When outdoor unit stops by error)	Inactive	Active *2	OFF
	SW2-6	Mixing tank	WITHOUT Mixing tank	WITH Mixing tank	OFF
	SW2-7	2-zone temperature control	Inactive	Active *6	OFF
	SW2-8	Flow sensor	WITHOUT Flow sensor	WITH Flow sensor	ON
SW3	SW3-1	Room thermostat 2 input (IN6) logic change	Zone2 operation stop at thermostat short	Zone2 operation stop at thermostat open	OFF
	SW3-2	Flow switch 2 input (IN3) logic change	Failure detection at short	Failure detection at open	OFF
	SW3-3	Flow switch 3 input (IN7) logic change	Failure detection at short	Failure detection at open	OFF
	SW3-4	Electric energy meter	WITHOUT Electric energy meter	WITH Electric energy meter	OFF
	SW3-5	Heating mode function *3	Inactive	Active	ON
	SW3-6	2-zone valve ON/OFF control	Inactive	Active	OFF
	SW3-7	Heat exchanger for DHW	Coil in tank	External plate HEX	OFF
	SW3-8	Heat meter	WITHOUT Heat meter	WITH Heat meter	OFF
SW4	SW4-1	Multiple outdoor units control	Inactive	Active	OFF
	SW4-2	Position of multiple outdoor units control *7	Slave	Master	OFF
	SW4-3	—	—	—	OFF
	SW4-4	Indoor unit only operation (during installation work) *4	Inactive	Active	OFF
	SW4-5	Emergency mode (Heater only operation)	Normal	Emergency mode (Heater only operation)	OFF *5
	SW4-6	Emergency mode (Boiler operation)	Normal	Emergency mode (Boiler operation)	OFF *5
SW5	SW5-1	—	—	—	OFF
	SW5-2	—	—	—	OFF
	SW5-3	Capacity code	—	—	OFF
	SW5-4		—	—	ON
	SW5-5		—	—	ON
	SW5-6		—	—	OFF
	SW5-7		—	—	ON
	SW5-8	—	—	—	OFF

<Table 5.1.1>

Note: ***1. When the hydrobox is connected with a PUHZ-RP/SUHZ-SW outdoor unit of which maximum outlet water temperature is 55ºC, DIP SW1-2 must be changed to OFF.**

***2. OUT11 will be available. For safety reasons, this function is not available for certain errors. (In that case, system operation must be stopped and only the water circulation pump keeps running.)**

***3 This switch functions only when the hydrobox is connected with a PUHZ-FRP outdoor unit. When another type of outdoor unit is connected, the heating mode function is active regardless of the fact that this switch is ON or OFF.**

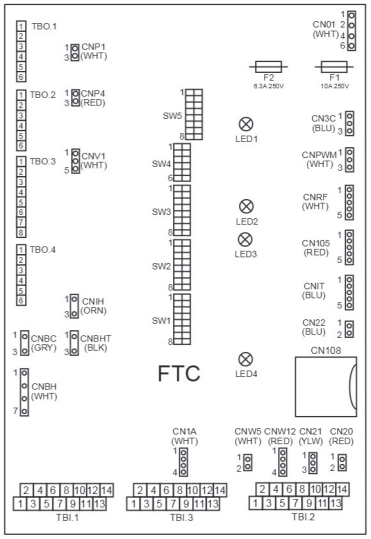
***4. Space heating and DHW can be operated only in indoor unit, like an electric boiler. (Refer to "5.5 Indoor unit only operation".)**

***5. If emergency mode is no longer required, return the switch to OFF position.**

***6. Active only when SW3-6 is set to OFF.**

***7. Active only when SW4-1 is set to ON.**

5.2 Connecting inputs/outputs



<Figure 5.2.1>

When the wires are wired to adjacent terminals use ring terminals and insulate the wires.

EN

■ Signal inputs

Name	Terminal block	Connector	Item	OFF (Open)	ON (Short)
IN1	TBI.1 13-14	—	Room thermostat 1 input	Refer to SW2-1 in <5.1 DIP Switch Functions>.	
IN2	TBI.1 11-12	—	Flow switch 1 input	Refer to SW2-2 in <5.1 DIP Switch Functions>.	
IN3	TBI.1 9-10	—	Flow switch 2 input (Zone1)	Refer to SW3-2 in <5.1 DIP Switch Functions>.	
IN4	TBI.1 7-8	—	Demand control input	Normal	Heat source OFF/ Boiler operation *2
IN5	TBI.1 5-6	—	Outdoor thermostat input *1	Standard operation	Heater operation/ Boiler operation *2
IN6	TBI.1 3-4	—	Room thermostat 2 input	Refer to SW3-1 in <5.1 DIP Switch Functions>.	
IN7	TBI.1 1-2	—	Flow switch 3 input (Zone2)	Refer to SW3-3 in <5.1 DIP Switch Functions>.	
IN8	TBI.3 1-2	—	Electric energy meter 1	*3	
IN9	TBI.3 3-4	—	Electric energy meter 2		
IN10	TBI.3 5-6	—	Heat meter		

*1. If using outdoor thermostat for controlling operation of heaters, the lifetime of the heaters and related parts may be reduced.
*2. To turn on the boiler operation, use the main remote controller to select “Boiler” in “External input setting“ screen in the service menu.
*3. Connectable electric energy meter and heat meter

- Pulse meter type: Voltage free contact for 12VDC detection by FTC (TBI.3 1, 3 and 5 pin have a positive voltage.)
- Pulse duration: Minimum ON time: 40ms
  Minimum OFF time: 100ms
- Possible unit of pulse: 0.1 pulse/kWh 1 pulse/kWh 10 pulse/kWh
  100 pulse/kWh 1000 pulse/kWh

Those values can be set by the main remote controller. (Refer to the menu tree in "5.8 Main remote controller".)

Wiring specification and local supply parts

Item	Name	Model and specifications
Signal input function	Signal input wire	Use sheathed vinyl coated cord or cable. Max. 30 m Wire type: CV, CVS or equivalent Wire size: Stranded wire 0.13 mm² to 1.25 mm² Solid wire: ø0.4 mm to ø1.2 mm
	Switch	Non-voltage “a” contact signals Remote switch: minimum applicable load 12V DC, 1mA

■ Thermistor inputs

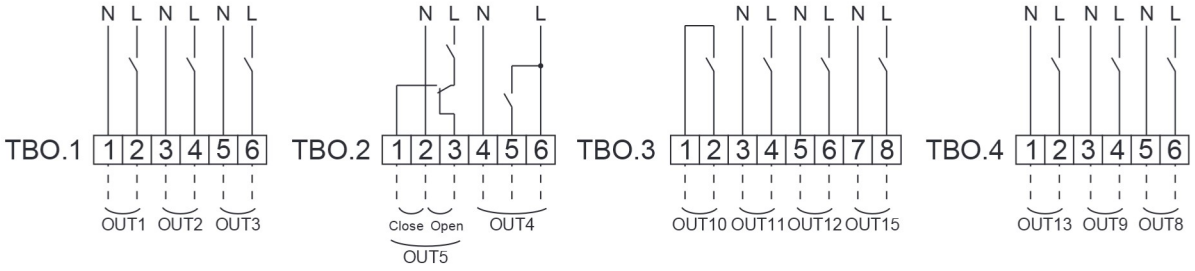
Name	Terminal block	Connector	Item	Optional part model
TH1	—	CN20	Thermistor (Room temp.) (Option)	PAC-SE41TS-E
TH2	—	CN21	Thermistor (Ref. liquid temp.)	—
THW1	—	CNW12 1-2	Thermistor (Flow water temp.)	—
THW2	—	CNW12 3-4	Thermistor (Return water temp.)	—
THW5	—	CNW5	Thermistor (DHW tank water temp.) (Option) *1	PAC-TH011TK-E (5 m) / PAC-TH011TKL-E (30 m)
THW6	TBI.2 3-4	—	Thermistor (Zone1 flow water temp.) (Option) *1	PAC-TH011-E
THW7	TBI.2 5-6	—	Thermistor (Zone1 return water temp.) (Option) *1	
THW8	TBI.2 7-8	—	Thermistor (Zone2 flow water temp.) (Option) *1	PAC-TH011-E
THW9	TBI.2 9-10	—	Thermistor (Zone2 return water temp.) (Option) *1	
THWB1	TBI.2 11-12	—	Thermistor (Boiler flow water temp.) (Option) *1	PAC-TH011HT-E
THWB2	TBI.2 13-14	—	Thermistor (Boiler return water temp.) (Option) *1	

Ensure to wire thermistor wirings away from the power line and/or OUT1 to 15 wirings.
***1. The maximum length of the thermistor wiring is 30 m. When the wires are wired to adjacent terminals, use ring terminals and insulate the wires.**
The length of the optional thermistors are 5 m. If you need to splice and extend the wirings, following points must be carried out.
1) Connect the wirings by soldering.
2) Insulate each connecting point against dust and water.

■ Outputs

Name	Terminal block	Connector	Item	OFF	ON	Signal/Max current	Max. total current
OUT1	TBO.1 1-2	CNP1	Water circulation pump 1 output (Space heating/cooling & DHW)	OFF	ON	230V AC 1.0A Max	4.0A (a)
OUT2	TBO.1 3-4	—	Water circulation pump 2 output (Space heating/cooling for Zone1)	OFF	ON	230V AC 1.0A Max	
OUT3	TBO.1 5-6	—	Water circulation pump 3 output (Space heating/cooling for Zone2) *1	OFF	ON	230V AC 1.0A Max	
			2-way valve 2b output *2				
OUT4	TBO.2 4-6	CNV1	3-way valve (2-way valve 1) output	Heating	DHW	230V AC 0.1A Max	3.0A (b)
OUT5	TBO.2 1-2	—	Mixing valve output *1	Stop	Close	230V AC 0.1A Max	
	TBO.2 2-3				Open		
OUT6	—	CNBH 1-3	Booster heater 1 output	OFF	ON	230V AC 0.5A Max (Relay)	
OUT7	—	CNBH 5-7	Booster heater 2 output	OFF	ON	230V AC 0.5A Max (Relay)	
OUT8	TBO.4 5-6	—	Cooling signal output	OFF	ON	230V AC 0.5A Max	
OUT9	TBO.4 3-4	CNIH	Immersion heater output	OFF	ON	230V AC 0.5A Max (Relay)	
OUT11	TBO.3 3-4	—	Error output	Normal	Error	230V AC 0.5A Max	
OUT12	TBO.3 5-6	—	Defrost output	Normal	Defrost	230V AC 0.5A Max	
OUT13	TBO.4 1-2	—	2-way valve 2a output *2	OFF	ON	230V AC 0.1A Max	
OUT15	TBO.3 7-8	—	Comp ON signal	OFF	ON	230V AC 0.5A Max	
OUT10	TBO.3 1-2	—	Boiler output	OFF	ON	non-voltage contact · 220-240V AC (30V DC) 0.5A or less · 10mA 5V DC or more	—

Do not connect to the terminals that are indicated as "—" in the "Terminal block" field.
***1 For 2-zone temperature control.**
***2 For 2-zone valve ON/OFF control.**



Wiring specification and local supply parts

Item	Name	Model and specifications
External output function	Outputs wire	Use sheathed vinyl coated cord or cable. Max. 30 m Wire type: CV, CVS or equivalent Wire size: Stranded wire 0.25 mm² to 1.5 mm² Solid wire: 0.25 mm² to 1.5 mm²

How to use TBO.1 to 4



Outline view **Top view**

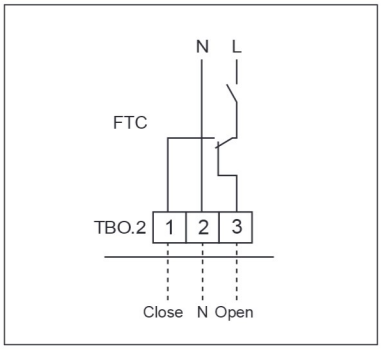
Connect them using either way as shown above.

<Figure 5.2.2>

Note:
1. When the hydrobox is powered via outdoor unit, the maximum grand total current of (a)+(b) is 3.0 A.
2. Do not connect multiple water circulation pumps directly to each output (OUT1, OUT2, and OUT3). In such a case, connect them via (a) relay(s).
3. Do not connect water circulation pumps to both TBO.1 1-2 and CNP1 at the same time.
4. Connect an appropriate surge absorber to OUT10 (TBO.3 1-2) depending on the load at site.
5. Stranded wire should be processed with insulation-covered bar terminal (DIN46228-4 standard compatible type).

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5.3 Wiring for 2-zone temperature control

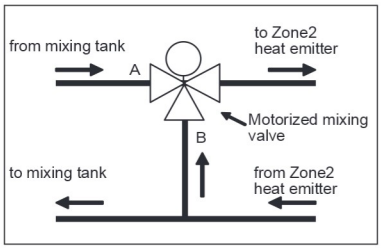


1. Water circulation pump 2 (Zone1 water circulation pump) / Water circulation pump 3 (Zone2 water circulation pump)
   Electrically wire water circulation pumps 2 and 3 to the appropriate output terminals. (Refer to “Outputs” in 5.2.)

2.Flow switch 2 (Zone1 flow switch) / Flow switch 3 (Zone2 flow switch)
   Connect flow switches 2 and 3 to the appropriate terminals. (Refer to “Signal inputs” in 5.2.)
   Set DIP switches 3-2 and 3-3 according to the functions of individual flow switches 2 and 3.
   (Refer to “DIP switch functions” in 5.1.)

3. Thermistor
   Connect the thermistor to monitor the Zone1 flow temperature to the THW6 (TBI. 2-3 and 2-4) terminals.
   Connect the thermistor to monitor the Zone1 return temperature to the THW7 (TBI. 2-5 and 2-6) terminals.
   Connect the thermistor to monitor the Zone2 flow temperature to the THW8 (TBI. 2-7 and 2-8) terminals.
   Connect the thermistor to monitor the Zone2 return temperature to the THW9 (TBI. 2-9 and 2-10) terminals.

The maximum length of the thermistor wiring is 30 m. The length of the optional thermistors are 5 m. If you need to splice and extend the wirings, following points must be carried out.
   1) Connect the wirings by soldering.
   2) Insulate each connecting point against dust and water.



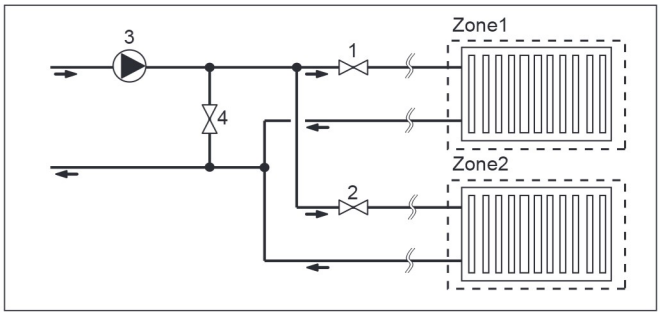
4. Motorized mixing valve
   Connect three wires coming from the motorized mixing valve to the appropriate terminals referring to “Outputs” in 5.2.

Note: Connect the signal line to open Port A (hot water inlet port) to TBO. 2-3 (Open), the signal line to open Port B (cold water inlet port) to TBO. 2-1 (Close) , and the neutral terminal wire to TBO. 2-2 (N).

5.4 2-zone valve ON/OFF control

Opening /closing 2-way valve provides a simple 2-Zone control.
Flow temperature is common for Zone1 and 2.

1. Pipe work



1. Zone1 2-way valve 2a (local supply)
2. Zone2 2-way valve 2b (local supply)
3. Water circulation pump 2 (local supply) *1
4. By-pass valve (local supply) *2

*1 Install according to system in the field.
*2 For safety protection, it is recommended to install a by-pass valve.

Note: 1. Freeze stat function is deactivated whilst this control is ON.
Use anti-freeze solution to avoid freezing, if necessary.
2. When mixing tank and DHW tank are installed, install a 3-way valve (OUT4) in the primary water circuit.

2. DIP switch
Turn DIP switch 3-6 ON.

3. 2-way valve 2a (for Zone1) / 2-way valve 2b (for Zone2)
Electrically wire 2-way valve 2a and 2b to the appropriate external output terminals. (Refer to "External outputs" in 5.2)

4. Room thermostat connection

Heating operation mode	Zone1	Zone2
Room temp. control (Auto adaptation) *3	● Wireless remote controller (option) ● Room temperature thermistor (option) ● Main remote controller (remote positiion)	● Wireless remote controller (option)
Compensation curve or flow temp. control	● Wireless remote controller (option) *4 ● Room temperature thermostat (local supply)	● Wireless remote controller (option) *4 ● Room temperature thermostat (local supply)

***3 Ensure to install the room thermostat for Zone1 in main room since the Room temp. control for Zone1 is prioritized.**
***4 The wireless remote controller can be used as a thermostat.**

5.5 Indoor unit only operation (during installation work)

In the case when DHW or heating operation is required prior to connection of the outdoor unit; i.e. during installation work, an electric heater in indoor unit (*1) can be used.
*1 Model with electric heater only.

1. To start operation
● Check if the indoor unit power supply is OFF, and turn DIP switch 4-4 and 4-5 ON.
● Turn ON the indoor unit power supply.

2. To end operation *
● Turn OFF the indoor unit power supply.
● Turn DIP switch 4-4 and 4-5 OFF.
*When the indoor unit only operation is ended, ensure to check over the settings after outdoor unit is connected.

Note:
Prolonged running of the this operation may affect the life of the electric heater.

5.6 Installation procedure for DHW tank

Note:

- **Be aware that the respective DHW operations are greatly effected by the selections of the components such as tank, immersion heater, or the like.**
- **Follow your local regulations to perform system configuration.**

1. To enable switching of the water circulation circuit between the DHW mode and the heating mode, install a 3-way valve (local supply). The 3-way valve and the DHW tank should be positioned as shown in the system diagram on the page 6, Figure 3.3 as applicable.
   The use of two 2-way valves can perform the same function as a 3-way valve.
2. Install the optional thermistor THW5 (optional part PAC-TH011TK-E/PAC-TH011TKL-E) on the DHW tank.
   It is recommended to position the thermistor at the mid point of the DHW tank capacity. Insulate thermistor from ambient air. Especially for double (insulated) tank, thermistor should be attached to the inner side (to detect the water temperature).
3. Connect the thermistor lead to the CNW5 connector on the FTC.
   If the thermistor lead is too long bundle it with a strap to adjust the length.
4. The output terminals for the 3-way valve is TBO.2 4-5 (OUT4).
   The TBO.2 4-5 terminals on the FTC are shown in the wiring diagram on Page 20.
   Choose the terminals that the 3-way valve is connected to between TBO.2 4-5, or TBO.2 4-6, according to the rated voltage.
   When the rated current of the 3-way valve exceeds 0.1A, be sure to use a relay with maximum voltage and current ratings of 230V AC / 0.1A when connecting to the FTC. Do not directly connect the 3-way valve cable to the FTC.
   Connect the relay cable to the TBO.2 4-5 terminals.
   3-way valve must be of SPST type. SPDT type can NOT be used.
   For systems using 2-way valves instead of a 3-way valve please read the following;

Specification of 2-way valve (local supply)

- Power supply: 230V AC
- Current: 0.1A Max **(If over 0.1A you must use a relay)**
- Type: Normally closed

	Installation position	Electrical connection terminal block	Output signal		
			Heating	DHW	System OFF
2-way valve1	DHW	TBO.2 4-5	OFF (closed)	ON (open)	OFF (closed)
2-way valve2	Heating	TBO.4 1-2	ON (open)	OFF (closed)	OFF (closed)

Note: Should the 2-way valve become blocked the water circulation will stop.
A by-pass valve or circuit should be installed between pump and 2-way valve for safety.
The TBO.4 1-2 terminals on the FTC are shown in the wiring diagram.
The 2-way valve (local supply) should be installed according to the instructions supplied with it. Follow 2-way valve's manufacturer's instructions as to whether to connect an earth cable or not.

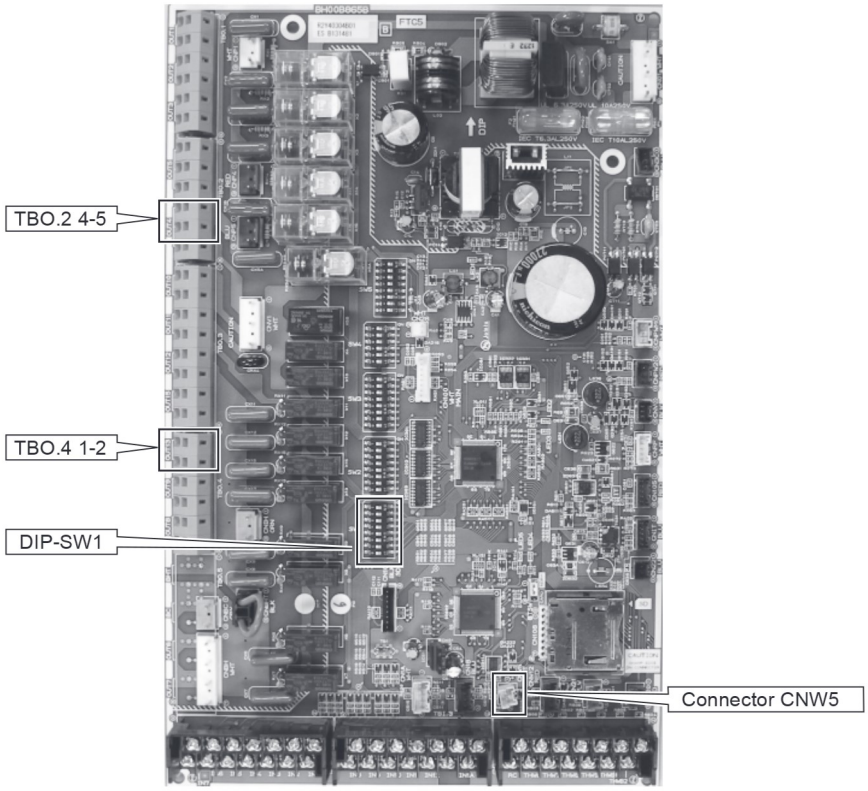
- For the 2-way valve, choose the one that slowly opens and shuts off to prevent water hammer sound.
- Choose the 2-way valve equipped with manual override, which is necessary for topping up or draining of water.

5. Turn the DIP SW1-3 on the FTC to ON.

6. When using an immersion heater (local supply), connect a contact relay cable for the immersion heater to TBO.4 3-4 (OUT9), and turn the DIP SW1-4 to ON. Do NOT directly connect the power cable to the FTC.

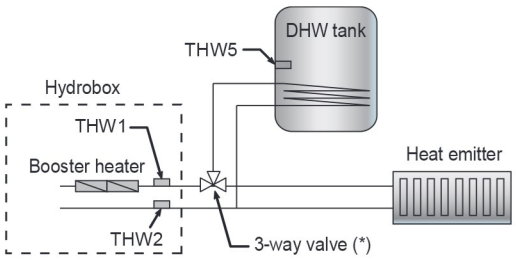
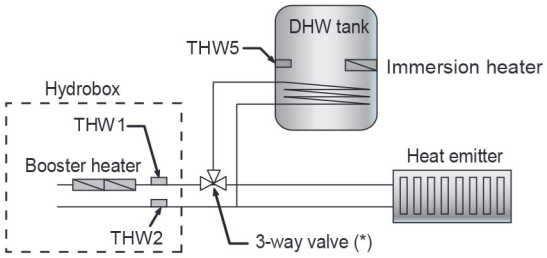
Note:

- When an immersion heater is installed, select appropriate breaker capacity and a cable with appropriate diameter on the basis of heater output.
- When wiring an immersion heater in the field, always install an earth leakage breaker to prevent accidental electric shock.



⚠ **WARNING: When connecting DHW tank**
(1) Attach the optional thermistor THW5 (PAC-TH011TK-E / PAC-TH011TKL-E).
(2) Always use earth leakage breaker when connecting immersion heater.
(3) When installing an immersion heater, be sure that the immersion heater has a built-in direct cut-off thermostat.
(4) Connect a pressure relief valve on the sanitary water side.
(5) It is essential that no check valve or isolating valve is fitted between the hydrobox and the pressure relief valve.

Recommended DHW system
Where system involves a DHW tank:

DHW tank	Immersion heater	Booster heater	BH function	System diagram	Thermistor
Present	Absent	Present	For space heating/ cooling and DHW		THW1: Flow water temp. THW2: Return water temp. THW5: Tank water temp. (optional part PAC-TH011TK-E / PAC-TH011TKL-E)
Present	Present	Present	For space heating/ cooling and DHW		THW1: Flow water temp. THW2: Return water temp. THW5: Tank water temp. (optional part PAC-TH011TK-E / PAC-TH011TKL-E)

*The use of two 2-way valves can perform same function as a 3-way valve.

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5.7 Main remote controller Options

The hydrobox comes factory fitted with a main remote controller. This incorporates a thermistor for temperature monitoring and a graphical user interface to enable set-up, view current status and input scheduling functions. The main remote controller is also used for servicing purposes. This facility is accessed via password protected service menus.

To provide the best efficiency Mitsubishi Electric recommends using automatic adaptation function based on room temperature. To use this function a room thermistor needs to be present in a main living area. This can be done in a number of ways the most convenient are detailed below.

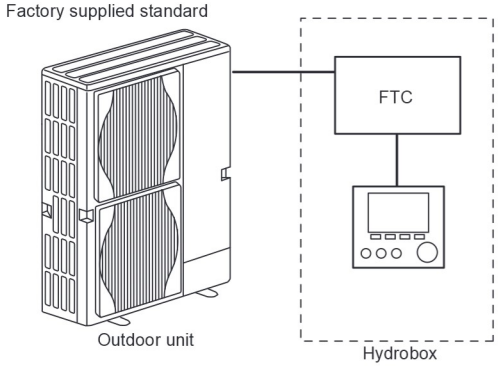
Refer to heating section of this manual for instructions on how to set compensation curve, Flow temp. or Room temp. (Auto adaptation).

For instructions on how to set the thermistor input for the FTC please refer to Initial settings section.

The factory setting for space heating mode is set to Room temp. (auto adaptation). If there is no room sensor present in the system, this setting must be changed to either Compensation curve mode or Flow temp mode.

Note: Auto-adaptation is not available in Cooling mode.

Factory supplied standard



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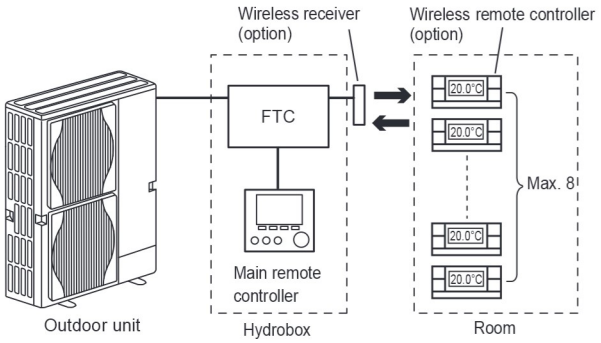
■ 1-zone temperature control

Control option A

This option features the main remote controller and the Mitsubishi Electric wireless remote controller. The wireless remote controller is used to monitor room temperature and can be used to make changes to the space heating settings, boost DHW (*1) and switch to holiday mode without having to directly use the main remote controller.

If more than one wireless remote controller is used, the most recently requested temperature setting will commonly be applied to all rooms by the central control system regardless of which wireless remote controller was used. No hierarchy exists across these remote controllers.

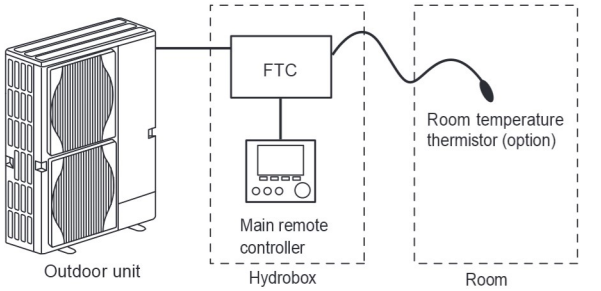
Wire the wireless receiver to FTC referring to the wireless remote controller instruction manual. **Turn DIP SW1-8 to ON.** Before operation configure the wireless remote controller to transmit and receive data referring to the wireless remote controller installation manual.)



Control option B

This option features the main remote controller and the Mitsubishi Electric thermistor wired to FTC. The thermistor is used to monitor room temperature but can not make any changes in control operation. Any changes to DHW (*1) must be made using the main remote controller mounted on the hydrobox.

Wire the thermistor to the TH1 connector on FTC.
The number of room temperature thermistors that can be connected to FTC is always one.



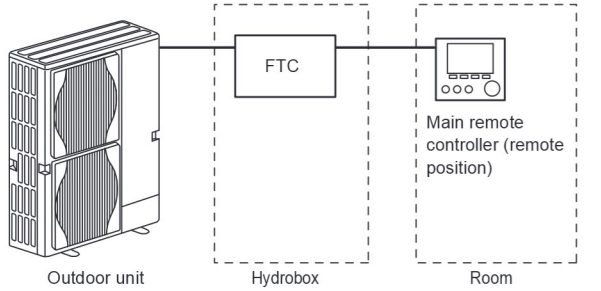
Control option C

This option features the main remote controller being removed from the hydrobox and situated in a different room. A thermistor built in the main remote controller can be used for monitoring the room temperature for Auto Adaptation function whilst keeping all its features of the main remote controller available.

The main remote controller and FTC are connected by a 2-core, 0.3 mm², non-polar cable (local supply) with a maximum length of 500 m.

To use the sensor in the main remote controller, the main remote controller should come off from the hydrobox. Otherwise it will detect the temperature of the hydrobox instead of room temperature. This will affect the output of the space heating.

Note: Wiring for main remote controller cable shall be (5 cm or more) apart from power source wiring so that it is not influenced by electrical noise from power source wiring. (Do NOT insert main remote controller cable and power source wiring in the same conduit.)

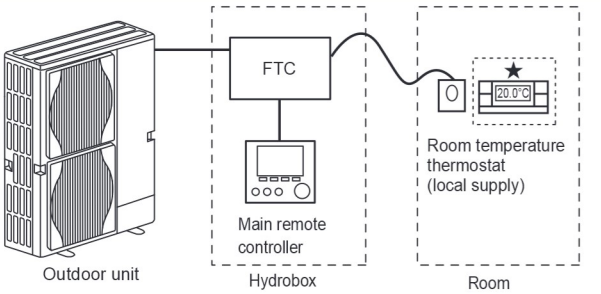


Control option D (Flow temp. or compensation curve only)

This option features the main remote controller and a locally supplied thermostat wired to FTC. The thermostat is used to set the maximum temperature for heating room. Any changes to DHW (*1) must be made using main remote controller mounted on the hydrobox.

The thermostat is wired to IN1 in TBI.1 on FTC. The number of thermostats that can be connected to FTC is always one.

★ The wireless remote controller can be also used as a thermostat.



*1 If applicable

■ 2-zone temperature control

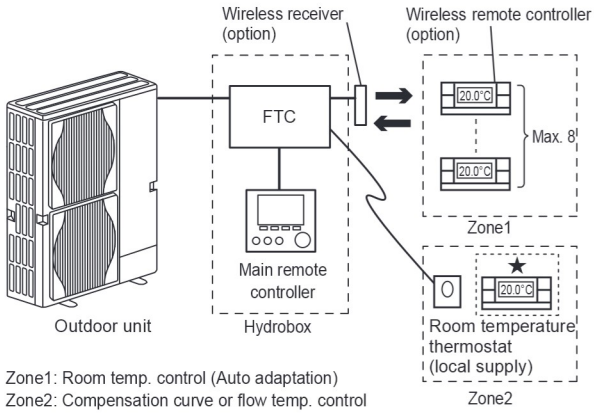
Control option A

This option features the main remote controller, the Mitsubishi Electric wireless remote controller and a locally supplied thermostat.
The wireless remote controller is used to monitor the Zone1 room temperature and the thermostat is used to monitor the Zone2 room temperature.
The thermostat can be also allocated to Zone1 and the wireless remote controller to Zone2.

The wireless remote controller can be also used to make changes to the space heating settings, boost DHW (*1) and switch to holiday mode without having to use the main remote controller.

If more than one wireless remote controller is used, the last temperature setting adjustment/demand will be applied to ALL rooms in same zone.

Wire the wireless receiver to FTC referring to the wireless remote controller instruction manual. Turn DIP SW1-8 to ON. Before operation configure the wireless remote controller to transmit and receive data referring to the wireless remote controller installation manual.)
The thermostat is used to set the maximum temperature for heating Zone2 room.
The thermostat is wired to IN6 on FTC. (If the thermostat is allocated to Zone1, it is wired to IN1 on TBI.1.) (Refer to 5.2.)

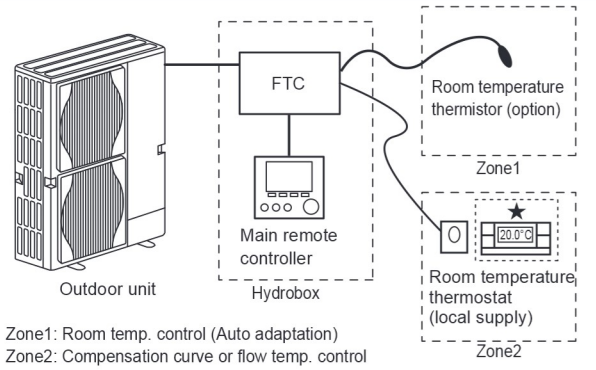


Zone1: Room temp. control (Auto adaptation)
Zone2: Compensation curve or flow temp. control

Control option B

This option features the main remote controller, the Mitsubishi Electric thermistor and a locally supplied thermostat that are wired to FTC.
The thermistor is used to monitor the Zone1 room temperature and the thermostat is used to control the Zone2 room temperature.

The thermostat can be also allocated to Zone1 and the thermistor to Zone2.
The thermistor can not make any changes in control operation. Any changes to DHW (*1) must be made using the main remote controller mounted on the hydrobox.
Wire the thermistor to the TH1 connector on FTC.
The number of room temperature thermistors that can be connected to FTC is always one.
The thermostat is used to set the maximum temperature for heating Zone2 room.
The thermostat is wired to IN6 on FTC. (If the thermostat is allocated to Zone1, wire it to IN1 on TBI.1.) (Refer to 5.2.)



Zone1: Room temp. control (Auto adaptation)
Zone2: Compensation curve or flow temp. control

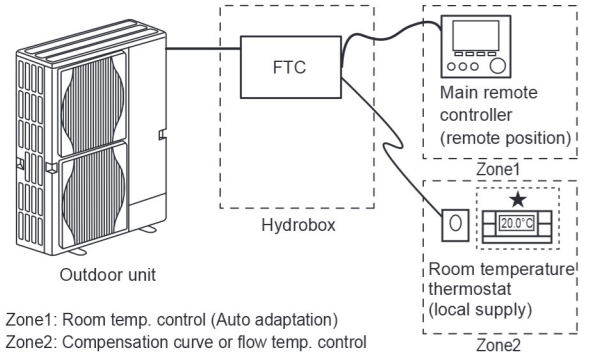
Control option C

This option features the main remote controller (with in-built thermistor) that is removed from the hydrobox to monitor the Zone1 room temperature and a locally supplied thermostat to monitor the Zone2 room temperature.
The thermostat can be also allocated to Zone1 and the thermistor to Zone2.

A thermistor built into the main remote controller can be used for monitoring the room temperature for Auto Adaptation function whilst keeping all its features of the main remote controller available.
The main remote controller and FTC are connected by a 2-core, 0.3 mm², non-polar cable (local supply) with a maximum length of 500 m.
To use the sensor in the main remote controller, the main remote controller should be detached from the hydrobox. Otherwise it will detect the temperature of the hydrobox instead of room temperature. This will affect the output of the space heating.

The thermostat is used to set the maximum temperature for heating Zone2 room.
The thermostat is wired to IN6 on FTC. (If the thermostat is allocated to Zone1, wire it to IN1 on TBI.1.) (Refer to 5.2.)

Note: Wiring for main remote controller cable shall be (5 cm or more) apart from power source wiring so that it is not influenced by electrical noise from power source wiring. (Do NOT insert main remote controller cable and power source wiring in the same conduit.)

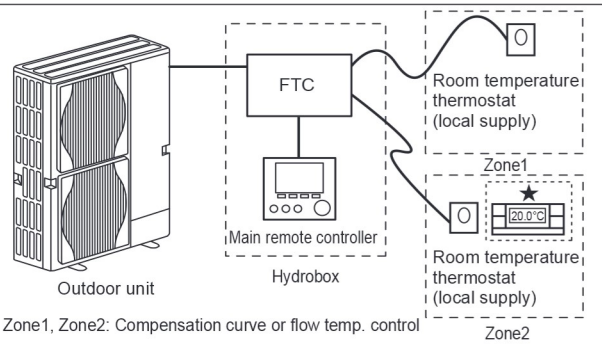


Zone1: Room temp. control (Auto adaptation)
Zone2: Compensation curve or flow temp. control

Control option D

This option features the locally supplied thermostats wired to FTC. The thermostats are individually allocated to Zone1 and Zone2. The thermostats are used to set each maximum temperature for heating Zone1 and Zone2 rooms. Any changes to DHW (*1) must be made using the main remote controller mounted on the hydrobox.

The thermostat for Zone1 is wired to IN1 in TBI.1 on FTC.
The thermostat for Zone2 is wired to IN6 in TBI.1 on FTC.



Zone1, Zone2: Compensation curve or flow temp. control

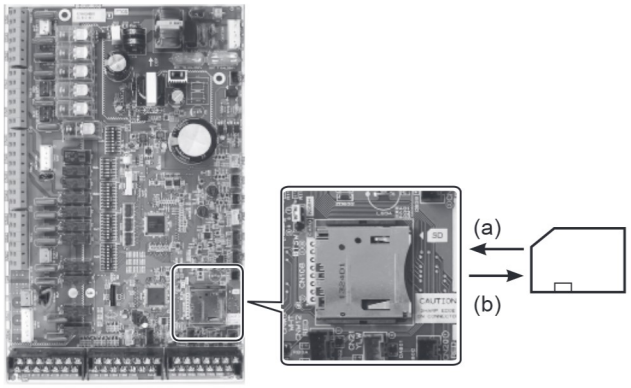
*1 If applicable
*2 For the options above, the sensor types can be exchanged between Zone1 and Zone2. (e.g. Wireless remote controller in Zone1 and Room temp thermostat in Zone2 can be changed to Room temp. thermostat and wireless remote controller, respectively).

★ **The wireless remote controller can be also used as a thermostat.**

5.8 Using SD memory card

The hydrobox is equipped with an SD memory card interface in FTC.
Using an SD memory card can simplify main remote controller settings and can store operating logs. *1

(a) For insertion, push on the SD memory card until it clicks into place.
(b) For ejection, push on the SD memory card until it clicks.
Note: To avoid cutting fingers, do not touch sharp edges of the SD memory card connector (CN108) on the FTC control board.



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<Handling precautions>

(1) Use an SD memory card that complies with the SD standards. Check that the SD memory card has a logo on it of those shown to the right.
(2) SD memory cards to the SD standards include SD, SDHC, miniSD, micro SD, and microSDHC memory cards. The capacities are available up to 32 GB. Choose that with a maximum allowable temperature of 55ºC.
(3) When the SD memory card is a miniSD, miniSDHC, microSD, or micro SDHC memory card, use an SD memory card converter adapter.
(4) Before writing to the SD memory card, release the write-protect switch.



(5) Before inserting or ejecting an SD memory card, make sure to power off the system. If an SD memory card is inserted or ejected with the system powered on, the stored data could be corrupted or the SD memory card be damaged. *An SD memory card is live for a short duration after the system is powered off. Before insertion or ejection wait until the LED lamps on the FTC control board are all off.
(6) The read and write operations have been verified using the following SD memory cards, however, these operations are not always guaranteed as the specifications of these SD memory cards could change.

Manufacturer	Model	Tested in
Verbatim	#44015 0912-61	Mar. 2012
SanDisk	SDSDB-002G-B35	Oct. 2011
Panasonic	RP-SDP04GE1K	Oct. 2011
Arvato	2GB PS8032 TSB 24nm MLC	Jun. 2012
Arvato	2GB PS8035 TSB A19nm MLC	Jul. 2014

Before using a new SD memory card (including the card that comes with the unit), always check that the SD memory card can be safely read and written to by the FTC controller.
<How to check read and write operations>
a) Check for correct wiring of power supply to the system. For more details, refer to section 4.4.
(Do not power on the system at this point.)
b) Insert an SD memory card.
c) Power on the system.
d) The LED4 lamp lights if the read and write operations are successfully completed. If the LED4 lamp continues blinking or does not light, the SD memory card cannot be read or written to by the FTC controller.

(7) Make sure to follow the instruction and the requirement of the SD memory card's manufacturer.
(8) Format the SD memory card if determined unreadable in step (6). This could make it readable.
Download an SD card formatter from the following site.
SD Association homepage: https://www.sdcard.org/home/
(9) FTC supports FAT file system but not NTFS file system.
(10) Mitsubishi Electric is not liable for any damages, in whole or in part, including failure of writing to an SD memory card, and corruption and loss of the saved data, or the like. Back up saved data as necessary.
(11) Do not touch any electronic parts on the FTC control board when inserting or ejecting an SD memory card, or else the control board could fail.

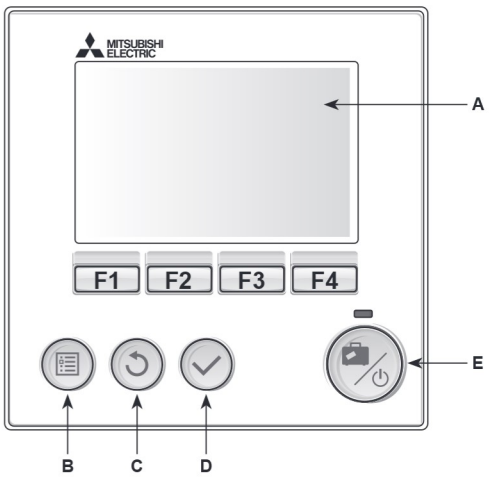
Logos

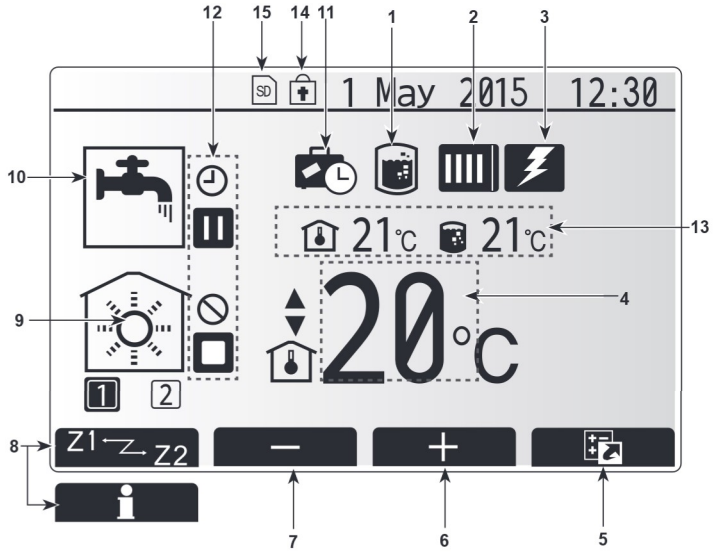
Capacities
2 GB to 32 GB *2
SD speed classes
All

• The SD Logo is a trademark of SD-3C, LLC.
The miniSD logo is a trademark of SD-3C, LLC.
The microSD logo is a trademark of SD-3C, LLC.

*1 To edit main remote controller settings or to check operating data, an Ecodan service tool (for use with PC) is required.
*2 A 2-GB SD memory card stores up to 30 days of operation logs.

5.9 Main remote controller





Main screen

<Main remote controller parts>

Letter	Name	Function
A	Screen	Screen in which all information is displayed
B	Menu	Access to system settings for initial set up and modifications.
C	Back	Return to previous menu.
D	Confirm	Used to select or save. (Enter key)
E	Power/Holiday	If system is switched off pressing once will turn system on. Pressing again when system is switched on will enable Holiday Mode. Holding the button down for 3 secs will turn the system off. (*1)
F1-4	Function keys	Used to scroll through menu and adjust settings. Function is determined by the menu screen visible on screen A.

*1
When the system is switched off or the power supply is disconnected, the hydrobox protection functions (e.g. freeze stat. function) will NOT operate. Please beware that without these safety functions enabled the hydrobox may potentially become exposed to damage.

<Main screen icons>

	Icon	Description
1	Legionella prevention	When this icon is displayed 'Legionella prevention mode' is active.
2	Heat pump	'Heat pump' is running.
		Defrosting
		Emergency heating
3	Electric heater	When this icon is displayed the 'Electric heaters' (booster or immersion heater) are in use.
4	Target temperature	Target flow temperature
		Target room temperature
		Compensation curve
5	OPTION	Pressing the function button below this icon will display the option screen.
6	+	Increase desired temperature.
7	-	Decrease desired temperature.
8	Z1 Z2	Pressing the function button below this icon switches between Zone1 and Zone2.
	Information	Pressing the function button below this icon displays the information screen.
9	Space heating/ cooling mode	Heating mode Zone1 or Zone2
		Cooling mode Zone1 or Zone2
10	DHW mode	Normal or ECO mode
11	Holiday mode	When this icon is displayed 'Holiday mode' activated.
12		Timer
		Prohibited
		Server control
		Stand-by
		Stand-by (*2)
		Stop
		Operating
13	Current temperature	Current room temperature
		Current water temperature of DHW tank
14		The Menu button is locked or the switching of the operation modes between DHW and Heating operations are disabled in the Option screen.(*3)
15		SD memory card is inserted. Normal operation.
		SD memory card is inserted. Abnormal operation.

***2 This unit is in Stand-by whilst other indoor unit(s) is in operation by priority.**
***3 To lock or unlock the Menu, press the BACK and CONFIRM keys simultaneously for 3 seconds.**

■ Setting the Main remote controller

After the power has been connected to the outdoor and hydrobox (See chapter 4.4) the initial system settings can be entered via the main remote controller.

1. Check all breakers and other safety devices are correctly installed and turn on power to the system.
2. When the main remote controller switched on for the first time, the screen automatically goes to Initial settings menu, Language setting screen and Date/Time setting screen in order.
3. Main remote controller will automatically start up. Wait approximately 6 mins whilst the control menus load.
4. When the controller is ready a blank screen with a line running across the top will be displayed.
5. Press button E (Power) (refer to page 27) to turn on the system. Before turning on the system, perform initial settings as instructed below.

■ Main Settings Menu

The main settings menu can be accessed by pressing the MENU button. To reduce the risk of untrained end users altering the settings accidentally there are two access levels to the main settings; and the service section menu is password protected.

User Level – Short press

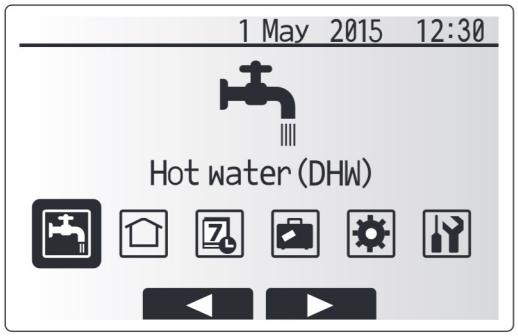
If the MENU button is pressed once for a short time the main settings will be displayed but without the edit function. This will enable the user to view current settings but **NOT** change the parameters.

Installer Level – Long press

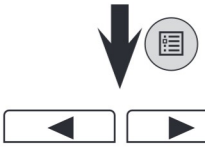
If the MENU button is pressed down for 3 secs the main settings will be displayed with all functionality available.
The color of ◄► buttons is inverted as per right figure.

The following items can be viewed and/or edited (dependent on access level).

- Domestic Hot water (DHW)
- Heating/Cooling
- Schedule timer
- Holiday mode
- Initial settings
- Service (Password protected)



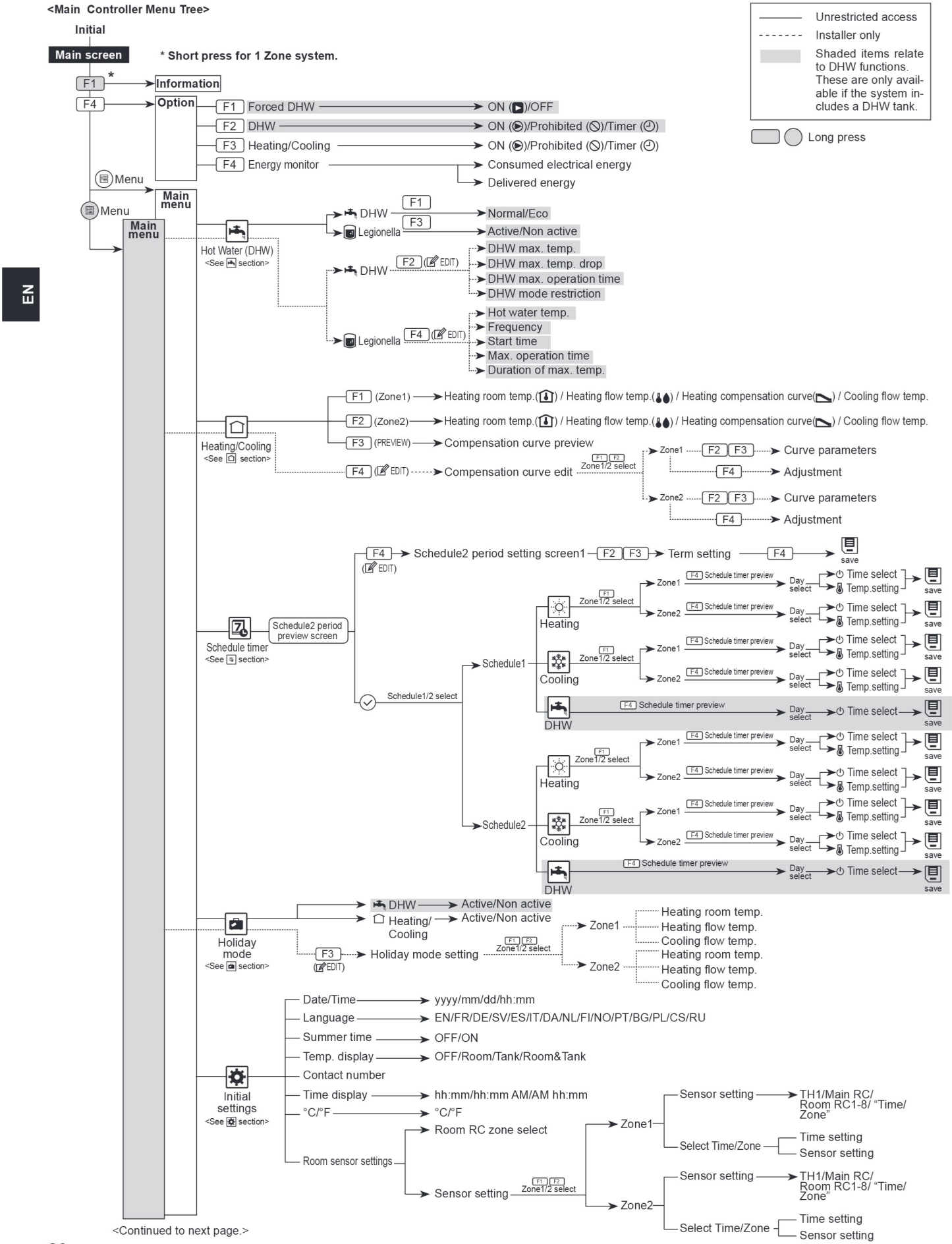
Main menu



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General Operation

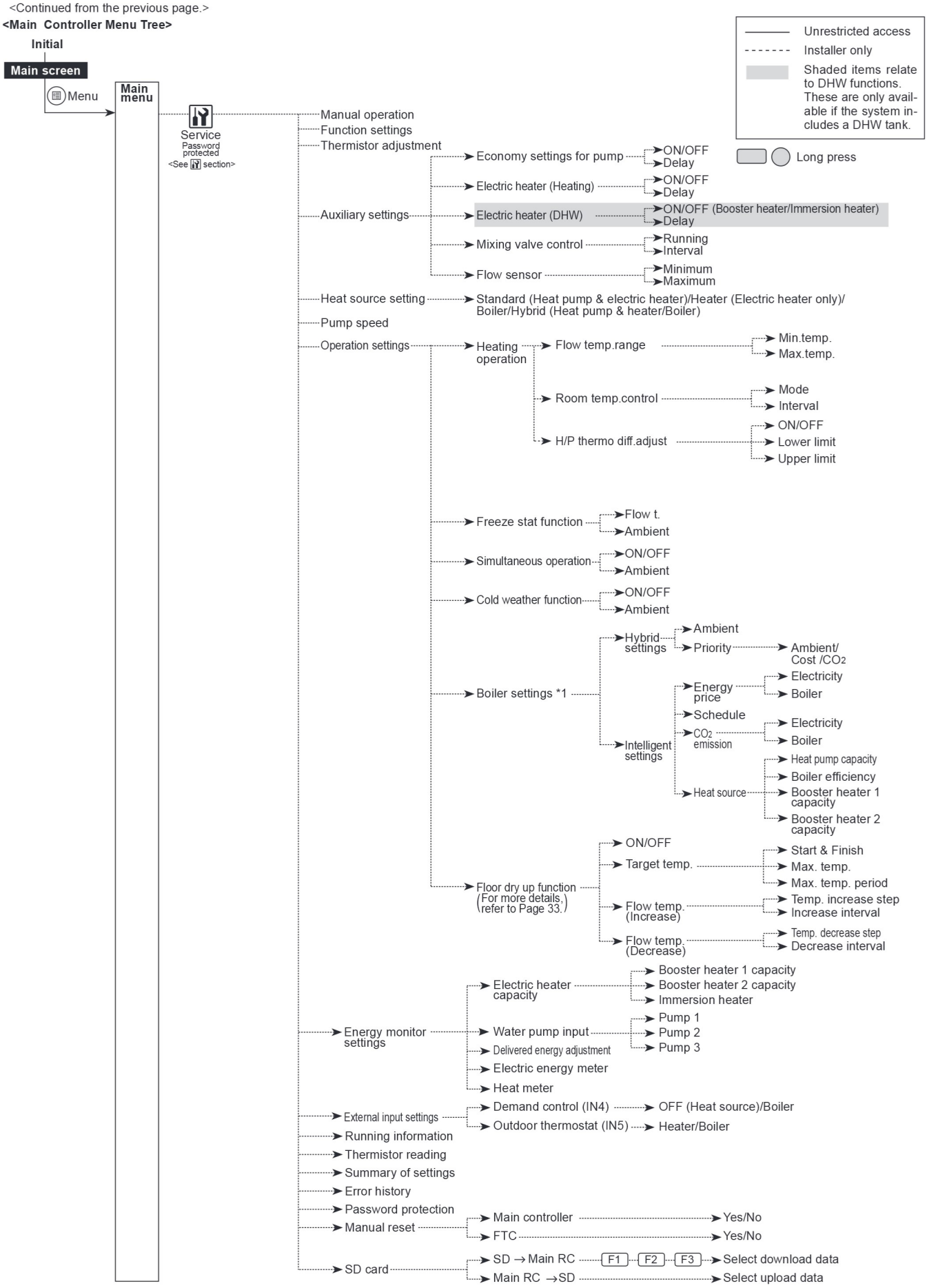
- To find the icon that you wish to set, use the F2 and F3 buttons to move between the icons.
- The highlighted icon will appear as a larger version of the center of the screen.
- Press CONFIRM to select and edit the highlighted mode.
- Follow the <Main remote controller Menu Tree> for further setting, using ◄► buttons for scrolling or F1 to F4 for selecting.


<Main Controller Menu Tree>
Initial
Main screen
* Short press for 1 Zone system.
Unrestricted access
Installer only
Shaded items relate to DHW functions. These are only available if the system includes a DHW tank.
Long press
F1 * Information
F4 Option
F1 Forced DHW → ON (▶)/OFF
F2 DHW → ON (▶)/Prohibited (⊘)/Timer (◴)
F3 Heating/Cooling → ON (▶)/Prohibited (⊘)/Timer (◴)
F4 Energy monitor → Consumed electrical energy
Delivered energy
Menu
Main menu
Hot Water (DHW) <See ▶ section>
DHW F1 → Normal/Eco
Legionella F3 → Active/Non active
DHW F2 (EDIT) → DHW max. temp.
DHW max. temp. drop
DHW max. operation time
DHW mode restriction
Legionella F4 (EDIT) → Hot water temp.
Frequency
Start time
Max. operation time
Duration of max. temp.
Heating/Cooling <See ▶ section>
F1 (Zone1) → Heating room temp. / Heating flow temp. / Heating compensation curve / Cooling flow temp.
F2 (Zone2) → Heating room temp. / Heating flow temp. / Heating compensation curve / Cooling flow temp.
F3 (PREVIEW) → Compensation curve preview
F4 (EDIT) → Compensation curve edit
F1 F2 Zone1/2 select
Zone1 F2 F3 → Curve parameters
F4 → Adjustment
Zone2 F2 F3 → Curve parameters
F4 → Adjustment
Schedule timer <See ▶ section>
Schedule2 period preview screen
F4 (EDIT) → Schedule2 period setting screen1 F2 F3 → Term setting F4 → save
Schedule1/2 select
Schedule1
Schedule2
Heating
Cooling
DHW
F1 Zone1/2 select
Zone1
Zone2
F4 Schedule timer preview
Day select
Time select
Temp.setting
save
Holiday mode <See ▶ section>
DHW → Active/Non active
Heating/ Cooling → Active/Non active
F3 (EDIT) → Holiday mode setting
F1 F2 Zone1/2 select
Zone1
Zone2
Heating room temp.
Heating flow temp.
Cooling flow temp.
Initial settings <See ▶ section>
Date/Time → yyyy/mm/dd/hh:mm
Language → EN/FR/DE/SV/ES/IT/DA/NL/FI/NO/PT/BG/PL/CS/RU
Summer time → OFF/ON
Temp. display → OFF/Room/Tank/Room&Tank
Contact number
Time display → hh:mm/hh:mm AM/AM hh:mm
°C/°F → °C/°F
Room sensor settings
Room RC zone select
Sensor setting
F1 F2 Zone1/2 select
Zone1
Zone2
Sensor setting → TH1/Main RC/ Room RC1-8/ "Time/ Zone"
Select Time/Zone
Time setting
Sensor setting
<Continued to next page.>

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<Continued from the previous page.>

<Main Controller Menu Tree>



*1 For more details, refer to the installation manual of PAC-TH011HT-E.

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Domestic Hot Water (DHW)/Legionella Prevention

►For further detail about operation, refer to Operation manual.

Please note that LP mode uses the assistance of electric heaters (if present) to supplement the energy input of the heat pump. Heating water for long periods of time is not efficient and will increase running costs. The installer should give careful consideration to the necessity of legionella prevention treatment whilst not wasting energy by heating the stored water for excessive time periods. The end user should understand the importance of this feature.
ALWAYS COMPLY WITH LOCAL AND NATIONAL GUIDANCE FOR YOUR COUNTRY REGARDING LEGIONELLA PREVENTION.

Heating/Cooling

►For further detail about operation, refer to Operation manual.

Schedule timer

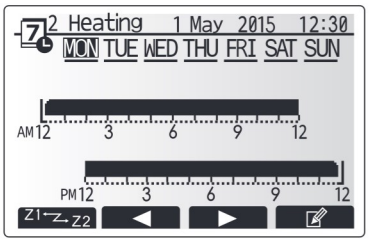
EN

Scheduled timer can be set in two ways, for example; one for summer and the other for winter. (Refer to as "Schedule 1" and "Schedule 2" respectively.) Once the term (months) for the Schedule 1 is specified, rest of the term will be specified as Schedule 2. In each Schedule, an operational pattern of modes (Heating / DHW) can be set. If no operational pattern is set for Schedule2, only the pattern for Schedule 1 will be valid. If Schedule 2 is set to full-year (i.e. March to Feb.), only the operational pattern for Schedule 2 will be valid.

Follow the procedure described in General Operation (Page 28) for the set up operation.

Setting the schedule timer
The preview screen allows you to view the current settings. In 2-zone heating operation, press F1 to switch between Zone1 and Zone2. Days of the week are displayed across the top of the screen. Where day appears underlined the settings are the same for all those days underlined.
Hours of the day and night are represented as a bar across the main part of the screen. Where the bar is solid black, space heating/cooling and DHW (whichever is selected) is allowed.

When scheduling heating, button F1 changes the scheduled variable between time and temperature. This enables a lower temperature to be set for a number of hours e.g. a lower temperature may be required at night when the occupants are sleeping.



Preview screen

•The schedule timer for space heating/cooling and DHW are set in the same way. However for DHW only time can be used as scheduling variable.
•A small rubbish bin character is also displayed choosing this icon will delete the last unsaved action.
•It is necessary to use the SAVE function F4 button to save settings. CONFIRM does not act as SAVE for this menu.

Holiday mode

►For further detail about operation, refer to Operation manual.

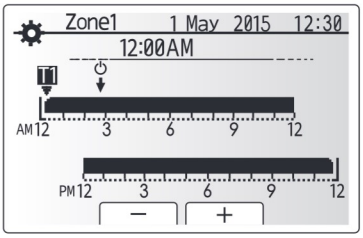
Initial Settings

From the Initial settings menu the installer can set the following.

- Date/Time *Be sure to set it to the local standard time.
- Language
- Summer time
- Temp. display
- Contact number
- Time display
- ºC/ºF
- Room sensor settings

Follow the procedure described in General Operation for the set up operation.

<Room sensor settings>
For room sensor settings it is important to choose the correct room sensor depending on the heating mode the system will operate in.



Time/Zone schedule setting screen

Menu subtitle	Description
Room RC zone select	When 2-zone temperature control is active and wireless remote controllers are available, from Room RC zone select screen, select zone no. to assign to each remote controller.
Sensor setting	From sensor setting screen, select a room sensor to be used for monitoring the room temperature from Zone1 and Zone2 separately.

Control option (pages 24 - 25)	Corresponding initial settings room sensor	
	Zone 1	Zone 2
A	Room RC 1-8 (one each for Zone1 and Zone2)	*1
B	TH1	*1
C	Main remote controller	*1
D	*1	*1
When different room sensors are used according to the time schedule	Time/ Zone*2	*1

*1. Not specified (if a locally-supplied room thermostat is used) Room RC 1-8 (one each for Zone1 and Zone2) (if a wireless remote controller is used as a room thermostat)
*2. From sensor setting screen, select Time/Zone to make it possible to use different room sensors according to the time schedule set in the Select Time/ Zone menu. The room sensors can be switched up to 4 times within 24 hours.

Service Menu

The service menu provides functions for use by installer or service engineer. It is NOT intended the home owner alters settings within this menu. It is for this reason password protection is required to prevent unauthorised access to the service settings.

The factory default password is "0000".
Follow the procedure described in General Operation for the set up operation.

The service menu is navigated using the F1 and F2 buttons to scroll through the functions. The menu is split across two screens and is comprised of the following functions;

1. Manual operation
2. Function settings
3. Thermistor adjustment
4. Auxiliary settings
5. Heat source setting
6. Pump speed
7. Operation settings
8. Energy monitor settings
9. External input settings
10. Running information
11. Thermistor reading
12. Summary of settings
13. Error history
14. Password protection
15. Manual reset
16. SD card

In this Installation Manual, instructions will be given only for the following functions;

1. Manual operation
2. Auxiliary settings
3. Heat source setting
4. Pump speed
5. Operation settings
6. Energy monitor settings
7. External input settings
8. Password protection
9. Manual reset
10. SD card

Information on the other functions can be found by consulting the service manual.

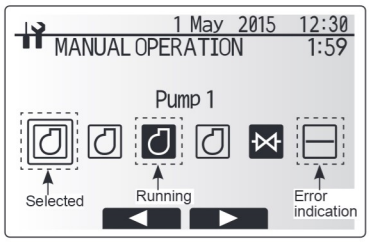
EN

Many functions can not be set whilst the indoor unit is running. The installer should turn off the unit before trying to set these functions. If the installer attempts to change the settings whilst the unit is running the main remote controller will display a reminder message prompting the installer to stop operation before continuing. By selecting “Yes” the unit will cease operation.

<Manual operation>

During the filling of the system the water circulation pump and 3-way valve can be manually overridden using manual operation mode.
When manual operation is selected a small timer icon appears in the screen. The function selected will only remain in manual operation for a maximum of 2 hours. This is to prevent accidental permanent override of the FTC.

►Example
Pressing F3 button will switch manual operation mode ON for the main 3-way valve. When filling of the DHW tank is complete the installer should access this menu again and press F3 to deactivate manual operation of the part. Alternatively after 2 hours manual operation mode will no longer be active and FTC will resume control of the part.



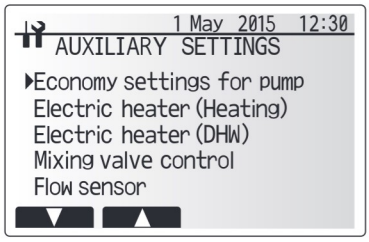
Manual operation menu screen

Manual operation and heat source setting can not be selected if the system is running. A screen will be displayed asking the installer to stop the system before these modes can be activated.
The system automatically stops 2 hours after last operation.

<Auxiliary settings>

This function is used to set the parameters for any auxiliary parts used in the system

Menu subtitle		Function/ Description
Economy settings for pump		Water pump stops automatically in certain period of time from when operation is finished.
	Delay	Time before pump switched off*1
Electric heater (Heating)		To select “WITH booster heater (ON)” or “WITHOUT booster heater (OFF)” in Heating mode.
	Delay	The minimum time required for the booster heater to turn ON from after Heating mode has started.
Electric heater (DHW)		To select "WITH (ON)" or "WITHOUT (OFF)" booster heater or immersion heater individually in DHW mode.
	Delay	The minimum time required for the booster heater or immersion heater to turn ON from after DHW mode has started. (This setting is applied for both booster and immersion heater.)
Mixing valve control *2	Running	Period from valve fully open (at a hot water mixing ratio of 100%) to valve fully closed (at a cold water mixing ratio of 100%)
	Interval	Interval (min) to control the Mixing valve.
Flow sensor *3	Minimum	The minimum flow rate to be detected at Flow sensor.
	Maximum	The maximum flow rate to be detected at Flow sensor.



Auxiliary settings menu screen

*1. Decreasing "time before pump switched off" may increase the duration of stand-by in Heating/Cooling mode.
*2. Set the Running time according to the specifications of the actuator of each mixing valve. It is recommended to set the interval to 2 minutes that is a default value. With the interval set longer, it could take longer to warm up a room.
*3. Do not change the setting since it is set according to the specification of Flow sensor attached to the hydrobox.

<Heat source setting>

The default heat source setting is heat pump and all electric heaters present in the system to be operational.
This is referred to as Standard operation on the menu.

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<Operation settings>

Heating operation

This function allows operational setting of flow temperature range from the Ecodan and also the time interval at which the FTC collects and processes data for the auto adaptation mode.

Menu subtitle		Function	Range	Unit	Default
Flow temp. range	Minimum temp.	To minimize the loss by frequent ON and OFF in mild outdoor ambient temperature seasons.	25 - 45	ºC	30
	Maximum temp.	To set max. possible flow temperature according to the type of heat emitters.	35 - 60	ºC	50
Room temp. control	Mode	Setting for Room temp. control At Fast mode, target outlet water temperature is set higher than the one set at normal mode. This reduces the time to reach the target room temperature when the room temperature is relatively low.*3	Normal/ Fast	--	Normal
	Interval	Selectable according to the heat emitter type and the materials of floor (i.e. radiators, floor heating-thick, -thin concrete, wood, etc.)	10 ~ 60	mins.	10
Heat pump thermo diff.adjust	On/Off	To minimize the loss by frequent ON and OFF in mild outdoor ambient temperature seasons.	On/Off	—	On
	Lower limit	Prohibits heat pump operation until the flow temperature drops below the target flow temperature plus lower limit value.	−9 - −1	ºC	−5
	Upper limit	Allows heat pump operation until the flow temperature rises above the target flow temperature plus upper limit value.	+3 - +5	ºC	+5

<Table 5.6.1> Heating operation (Room temp. control table)

Note:

1. The minimum flow temperature that prohibits heat pump operation is 20ºC.
2. The maximum flow temperature that allows heat pump operation equals to the maximum temperature set in the Flow temp. range menu.

* Fast mode is not efficient and will increase running cost when compared to normal mode.

Freeze stat function

Menu subtitle		Function/ Description
Freeze stat function		An operational function to prevent the water circuit from freezing when outdoor ambient temperature drops.
	Flow t.	The target outlet water temperature at water circuit when operating in Freeze stat function. *2
	Outdoor ambient temp.	Minimum outdoor ambient temperature which freeze stat function will begin to operate, (3 - 20ºC) or choose**. If asterisk (**) is chosen freeze stat function is deactivated. (i.e. primary water freeze risk)"

*1. When the system is turned off, freeze stat function is not enabled.
*2. Flow t. is fixed to 20°C and unchangeable.

Simultaneous Operation

For periods of very low outside temperature this mode can be used. Simultaneous operation allows both DHW and space heating to run together by using the heat pump and/or booster heater to provide space heating whilst only the immersion heater provides heating for DHW. This operation is only available if BOTH a DHW tank AND immersion heater are present on the system.

- Range of outdoor ambient temperature at which simultaneous operation starts is −30°C to 10°C (default −15°C).
- System shall automatically return to routine operation. This will happen when the outdoor ambient temperature rises above the selected temperature for this specific mode of operation.

<Cold weather function>

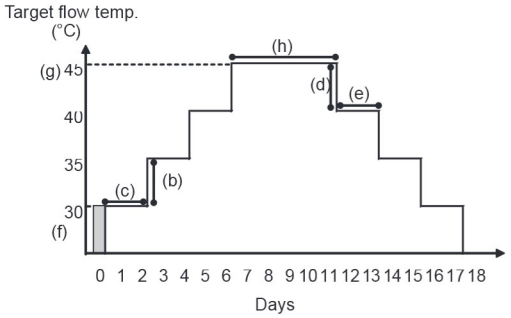
For extremely low outdoor ambient temperature conditions when the heat pump's capacity is restricted the heating or DHW is provided only by the electric booster heater (and immersion if present). This function is intended for use during extreme cold periods only. Extensive use of direct electrical heaters ONLY will result in higher power consumption and may reduce working life of heaters and related parts.

- Range of outdoor ambient temperature at which cold weather function starts is −30°C to −10°C (default −15°C).
- System shall automatically return to routine operation. This will happen when the outdoor ambient temperature rises above the selected temp for this specific mode of operation.

Floor dry up function

The Floor dry up function automatically changes the target hot water temperature in stages to gradually dry concrete when this particular type of underfloor heating system is installed.

Upon completion of the operation the system stops all the operations except the Freeze stat. operation.
For Floor dry up function, the target flow temp. of Zone1 is the same as that of Zone2.



- This function is not available when a PUHZ-FRP outdoor unit is connected.
- Disconnect wiring to external inputs of room thermostat, demand control, and outdoor thermostat, or the target flow temperature may not be maintained.

Functions		Symbol	Description	Option/Range	Unit	Default
Floor dry up function		a	Set the function to ON and power on the system using the main remote controller, and the dry up heating operation will start.	On/Off	—	Off
Flow temp. (increase)	Flow temp. increase step	b	Sets the increase step of the target flow temperature.	+1 - +10	ºC	+5
	Increase interval	c	Sets the period for which the same target flow temperature is maintained.	1 - 7	day	2
Flow temp. (decrease)	Flow temp. decrease step	d	Sets the decrease step of the target flow temperature.	−1 - −10	ºC	−5
	Decrease interval	e	Sets the period for which the same target flow temperature is maintained.	1 - 7	day	2
Target temperature	Start & Finish	f	Sets the target flow temperature at the start and the finish of the operation.	25 - 60	ºC	30
	Max. target temp.	g	Sets the maximum target flow temperature.	25 - 60	ºC	45
	Max. temp. period	h	Sets the period for which the maximum target flow temperature is maintained.	1 - 20	day	5

<Energy monitor settings>

In this menu, all parameters required to record the consumed electrical energy and the delivered heat energy which is displayed on the main remote controller can be set. The parameters are an electric heater capacity, supply power of water pump and heat meter pulse.

Follow the procedure described in General Operation for the set up operation.

For Pump 1, *** can be also set besides this setting.
In the case *** is selected, the system acknowledges "factory fitted pump" is selected.
Refer to the section [Energy Monitor] in "3. Technical Information"

<External input settings>

Demand control(IN4)

The selection of “OFF”, whilst a signal is being sent to IN4, forcefully stops all the heat source operations and the selection of “Boiler” stops operations of heat pump and electric heater and performs boiler operation.

Outdoor thermostat (IN5)

The selection of “Heater”, whilst a signal is being sent to IN5, performs electric-heater-only operation and the selection of “Boiler” performs boiler operation.

<Password protection>

Password protection is available to prevent unauthorised access to the service menu by untrained persons.

Resetting the password

If you forget the password you entered, or have to service a unit somebody else installed, you can reset the password to the factory default of **0000**.

1. From the main settings menu scroll down the functions until Service Menu is highlighted.
2. Press CONFIRM.
3. You will be prompted to enter a password.
4. Hold down buttons F3 and F4 together for 3 secs
5. You will be asked if you wish to continue and reset the password to default setting.
6. To reset press button F3.
7. The password is now reset to **0000**.

<Manual reset>

Should you wish to restore the factory settings at any time you should use the manual reset function. Please note this will reset ALL functions to the factory default settings.

<SD card>

The use of an SD memory card simplifies the main remote controller settings in the field.
*Ecodan service tool (for use with PC tool) is necessary for the setting.



Password input screen



Password verify screen

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6 Service and Maintenance

The indoor hydrobox must be serviced **once a year** by a qualified individual. Servicing and maintenance of the outdoor unit should only be done by a Mitsubishi Electric trained technician with relevant qualifications and experience. Any electrical work should be done by a tradesperson with the appropriate electrical qualifications. Any maintenance or 'DIY' fixes done by a non-accredited person could invalidate the Warranty and/or result in damage to the hydrobox and injury to the person.

■ Basic Troubleshooting for Hydrobox

The following table is to be used as a guide to possible problems. It is not exhaustive and all problems should be investigated by the installer or another competent person. Users should not attempt to repair the system themselves.
At no time should the system be operating with the safety devices by-passed or plugged.

Fault symptom	Possible cause	Solution
Cold water at taps (systems with DHW tank)	Scheduled control off period	Check schedule settings and change if necessary.
	All hot water from DHW tank used	Ensure DHW mode is operating and wait for DHW tank to re-heat.
	Heat pump or electric heaters not working	Contact installer.
Heating system does not get up to set temperature.	Prohibit, schedule or holiday mode selected	Check settings and change as appropriate.
	Incorrectly sized radiators	Contact installer.
	The room in which the temperature sensor is located is at a different temperature to the rest of the house.	Reposition the temperature sensor to a more suitable room.
	Battery problem *wireless control only	Check the battery power and replace if flat.
The cooling system does not cool down to the set temperature. (ONLY for ERSE models)	When the water in the circulation circuit is unduly hot, Cooling mode starts with a delay for the protection of the outdoor unit.	Normal operation
	When the outdoor ambient temperature is significantly low, Cooling mode does not start running to avoid freezing of the water pipes.	If the freeze stat. function is not necessary, contact installer to change the settings.
Heating emitter is hot in the DHW mode. (The room temperature rises.)	The 3-way valve may have foreign objects in it, or hot water may flow to the heating side due to malfunctions.	Contact installer.
Schedule function inhibits the system from operating but the outdoor unit operates.	Freeze stat. function is active.	Normal operation no action necessary.
Pump runs without reason for short time.	Pump jam prevention mechanism to inhibit the build up of scale.	Normal operation no action necessary.
Mechanical noise heard coming from hydrobox	Heaters switching on/off	Normal operation no action required.
Noisy pipework	Air trapped in the system	Try bleeding radiators (if present) If the symptoms persist contact installer.
	Loose pipework	Contact installer.
Water discharges from one of the relief valves	The system has overheated or overpressurised	Switch off power to the heat pump and any immersion heaters then contact installer.
Small amounts of water drip from one of the relief valves.	Dirt may be preventing a tight seal in the valve	Twist the valve cap in the direction indicted until a click is heard. This will release a small amount of water flushing dirt from the valve. Be very careful the water released will be hot. Should the valve continue to drip contact installer as the rubber seal may be damaged and need replacing.
An error code appears in the main remote controller display.	The indoor or outdoor unit is reporting an abnormal condition	Make a note of the error code number and contact installer.

<Power failure>
All setting will be saved for 1 week with no power, after 1 week Date/Time ONLY will be saved.

For more details, refer to the service manual.

<Draining the hydrobox>
WARNING: DRAINED WATER MAY BE VERY HOT

1. Before attempting to drain the hydrobox islolate from the electrical supply to prevent booster heater burning out.
2. Isolate hydrobox from primary water circuit and drain water from hydrobox. Use a suitable heat resistant hose to assist in these operations.
3. Drain any remaining water from booster heater using fitted drain cock and hose to safely drain the unit.
4. After the hydrobox is drained, water remains in the following component parts. Drain water completely by checking the inside of the parts.
   - Strainer (Remove the strainer cover.)
   - Pressure relief valve (Operate the valve.)

■ Error Codes

Code	Error	Action
L3	Circulation water temperature overheat protection	Flow rate may be reduced check for; • Water leakage • Strainer blockage • Water circulation pump function (Error code may display during filling of primary circuit, complete filling and reset error code.)
L4	DHW tank water temperature overheat protection	Check the immersion heater and it's contactor.
L5	Indoor unit temperature thermistor (THW1, THW2, THW5, THW6, THW7, THW8, THW9) failure	Check resistance across the thermistor.
L6	Circulation water freeze protection	See Action for L3.
L8	Heating operation error	Re-attach any thermistors that have become dislodged.
L9	Low primary circuit flow rate detected by flow sensor or flow switch (flow switches 1, 2, 3)	See Action for L3. If the flow sensor or flow switch itself does not work, replace it. **Caution: The pump valves may be hot, please take care.**
LC	Boiler circulation water temperature overheat protection	Check if the setting temperature of the Boiler for heating exceeds the restriction. (See the manual of the thermistors "PAC-TH011HT-E") Flow rate of the heating circuit from the boiler may be reduced. Check for • water leakage • strainer blockage • water circulation pump function
LD	Boiler temperature thermistor (THWB1, THWB2) failure	Check resistance across the thermistor.
LE	Boiler operation error	See Action for L8. Check the status of the boiler.
LF	Flow sensor failure	Check flow sensor cable for damage or loose connections.
LH	Boiler circulation water freeze protection	Flow rate of the heating circuit from the boiler may be reduced. Check for • water leakage • strainer blockage • water circulation pump function
LJ	DHW operation error (type of external plate HEX)	• Check for disconnection of DHW tank water temp. thermistor (THW5). • Flow rate of the sanitary circuit may be reduced. • Check for water circulation pump function.
LL	Setting errors of DIP switches on FTC control board	For boiler operation, check that DIP SW1-1 is set to ON (With Boiler) and DIP SW2-6 is set to ON (With Mixing Tank). For 2-zone temperature control, check DIP SW2-7 is set to ON (2-zone) and DIP SW2-6 is set to ON (With Mixing Tank).
J0	Communication failure between FTC and wireless receiver	Check connection cable for damage or loose connections.
P1	Thermistor (Room temp.) (TH1) failure	Check resistance across the thermistor.
P2	Thermistor (Ref. liquid temp.) (TH2) failure	Check resistance across the thermistor.
P6	Anti-freeze protection of plate heat exchanger	See Action for L3. Check for correct amount of refrigerant.
J1 - J8	Communication failure between wireless receiver and wireless remote controller	Check wireless remote controller's battery is not flat. Check the pairing between wireless receiver to wireless remote controller. Test the wireless communication. (See the manual of wireless system)
E0 - E5	Communication failure between main remote controller and FTC	Check connection cable for damage or loose connections.
E6 - EF	Communication failure between FTC and outdoor unit	Check that the outdoor unit has not been turned off. Check connection cable for damage or loose connections. Refer to outdoor unit service manual.
E9	Outdoor unit receives no signal from indoor unit.	Check both units are switched on. Check connection cable for damage or loose connections. Refer to outdoor unit service manual.
U*, F*	Outdoor unit failure	Refer to outdoor unit service manual.

Note: To cancel error codes please switch system off (Press button E, on main remote controller, for 3 secs).

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■ Annual Maintenance

It is essential that the hydrobox is serviced at least once a year by a qualified individual any spare parts required MUST be purchased from Mitsubishi Electric (safety matter). **NEVER** bypass safety devices or operate the unit without them being fully operational.

Note:

- **Within the first couple of months of installation, remove and clean the hydrobox's strainer plus any that are fitted external to the hydrobox. This is especially important when installing on an existing system.**
- **Check valves open completely after servicing and maintenance.**

In addition to annual servicing it is necessary to replace or inspect some parts after a certain period of system operation. Please see tables below for detailed instructions. Replacement and inspection of parts should always be done by a competent person with relevant training and qualifications.

Parts which require regular replacement

Parts	Replace every	Possible failures
Pressure relief valve (PRV) Air vent (Auto/Manual) Drain cock (Primary circuit) Manometer	6 years	Water leakage

Parts which require regular inspection

Parts	Check every	Possible failures
Water circulation pump	20,000 hrs (3 years)	Water circulation pump failure

Parts which must NOT be reused when servicing

* O-ring
* Gasket

Note:
Always replace the gasket for pump with a new one at each regular maintenance (every 20,000 hours of use or every 3 years).

■ Engineers Forms

Should settings be changed from default, please enter and record new setting in 'Field Setting' column. This will ease resetting in the future should the system use change or the circuit board need to be replaced.

Commissioning/Field settings record sheet

Main remote controller screen					Parameters		Default setting	Field setting	Notes
Main			Zone1 heating room temp.		10°C - 30°C		20°C		
			Zone2 heating room temp. *14		10°C - 30°C		20°C		
			Zone1 heating flow temp.		25°C - 60°C		45°C		
			Zone2 heating flow temp. *1		25°C - 60°C		35°C		
			Zone1 cooling flow temp. *12		5°C - 25°C		15°C		
			Zone2 cooling flow temp. *12		5°C - 25°C		20°C		
			Zone1 heating compensation curve		−9°C - + 9°C		0°C		
			Zone2 heating compensation curve *1		−9°C - + 9°C		0°C		
			Holiday mode		Active/Non active/Set time		—		
Option			Forced DHW operation		On/Off		—		
			DHW		On/Off/Timer		On		
			Heating/Cooling		On/Off/Timer		On		
			Energy monitor		Consumed electrical energy/Delivered energy		—		
Setting	DHW *13		Operation mode		Normal/Eco		Normal		
			DHW max. temp.		40°C - 60°C *2		50°C		
			DHW temp. drop		5°C - 30°C		10°C		
			DHW max. operation time		30 - 120 mins		60 mins		
			DHW mode restriction		30 - 120 mins		30 mins		
	Legionella prevention *13		Active		Yes/No		Yes		
			Hot water temp.		60°C - 70°C *2		65°C		
			Frequency		1 - 30 days		15 days		
			Start time		00.00 - 23.00		03.00		
			Max. operation time		1 - 5 hours		3 hours		
			Duration of maximum temp.		1 - 120 mins		30 min		
	Heating/ Cooling *12		Zone1 operation mode		Heating room temp/ Heating flow temp/ Heating compensation curve/ Cooling flow temp		Room temp		
			Zone2 operation mode *1		Heating room temp/ Heating flow temp/ Heating compensation curve/ Cooling flow temp		Compensation curve		
	Compensation curve	Hi flow temp. set point	Zone1 outdoor ambient temp.		−30°C - +33°C *3		−15°C		
			Zone1 flow temp.		25°C – 60°C		50°C		
			Zone2 outdoor ambient temp. *1		−30°C - +33°C *3		−15°C		
			Zone2 flow temp. *1		25°C - 60°C		40°C		
		Lo flow temp. set point	Zone1 outdoor ambient temp.		−28°C - +35°C *4		35°C		
			Zone1 flow temp.		25°C - 60°C		25°C		
			Zone2 outdoor ambient temp. *1		−28°C - +35°C *4		35°C		
			Zone2 flow temp.		25°C - 60°C		25°C		
		Adjust	Zone1 outdoor ambient temp.		−29°C - +34°C *5		—		
			Zone1 flow temp.		25°C - 60°C		—		
			Zone2 outdoor ambient temp. *1		−29°C - +34°C *5		—		
			Zone2 flow temp. *1		25°C - 60°C		—		
	Holiday		DHW *13		Active/Non active		Non active		
			Heating/ Cooling *12		Active/Non active		Active		
			Zone1 heating room temp.		10°C - 30°C		15°C		
			Zone2 heating room temp. *14		10°C - 30°C		15°C		
			Zone1 heating flow temp.		25°C - 60°C		35°C		
			Zone2 heating flow temp. *1		25°C - 60°C		25°C		
			Zone1 cooling flow temp. *12		5°C - 25°C		25°C		
			Zone2 cooling flow temp. *12		5°C - 25°C		25°C		
	Initial settings		Language		EN/FR/DE/SV/ES/IT/DA/NL/FI/NO/PT/BG/PL/CS/RU		EN		
			°C/°F		°C/°F		°C		
			Summer time		On/Off		Off		
			Temp. display		Room/DHW tank/Room&DHW tank /Off		Off		
			Time display		hh:mm/hh:mm AM/AM hh:mm		hh:mm		
			Room sensor settings for Zone1		TH1/Main RC/Room RC1-8/"Time/Zone"		TH1		
			Room sensor settings for Zone2 *1		TH1/Main RC/Room RC1-8/"Time/Zone"		TH1		
			Room RC zone select *1		Zone1/Zone2		Zone1		
	Service menu		Thermistor adjustment	THW1	−10°C - +10°C		0°C		
				THW2	−10°C - +10°C		0°C		
				THW5	−10°C - +10°C		0°C		
				THW6	−10°C - +10°C		0°C		
				THW7	−10°C - +10°C		0°C		
				THW8	−10°C - +10°C		0°C		
				THW9	−10°C - +10°C		0°C		
				THWB1	−10°C - +10°C		0°C		
				THWB2	−10°C - +10°C		0°C		
			Auxiliary settings	Economy settings for pump.	On/Off *6		On		
					Delay		10 mins		
				Electric heater (Heating)	Space heating: On (used)/Off (not used)		On		
					Electric heater delay timer (5 - 180 mins)		30 mins		
				Electric heater (DHW) *13	Booster heater	DHW: On (used)/Off (not used)	On		
					Immersion heater	DHW: On (used)/Off (not used)	On		
					Electric heater delay timer (15 - 30 mins)		15 mins		
				Mixing valve control	Running (10 - 240 secs)		120 secs		
					Interval (1 - 30 mins)		2 mins		
				Flow sensor	Minimum(0 - 100L/min.)		5 L/min.		
					Maximum(0 - 100L/min.)		100 L/min.		

*1 The settings related to Zone2 can be switched only when 2 Zone temperature control is enabled (when DIP SW2-6 and SW 2-7 are ON).
*2 For the model without both booster and immersion heater, it may not reach the set temperature depending on the outside ambient temperature.
*3 The lower limit is -15°C depending on the connected outdoor unit.
*4 The lower limit is -13°C depending on the connected outdoor unit.
*5 The lower limit is -14°C depending on the connected outdoor unit.

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■ Engineers Forms

Commissioning/Field settings record sheet (continued from the previous page)

Main remote controller screen					Parameters			Default setting	Field setting	Notes
	Service menu	Pump speed			Pump speed(1 - 5)			5		
		Heat source setting			Standard/Heater/Boiler/Hybrid *7			Standard		
		Operation settings	Heating operation *8	Flow temp.range *10	Min.temp.(25 - 45°C)			30°C		
					Max.temp.(35 - 60°C)			50°C		
				Room temp.control	Mode(Normal/Fast)			Normal		
					Interval(10 - 60min.)			10min.		
				Heat pump thermo diff.adjust	On/Off *6			On		
					Lower limit(-9 - −1°C)			-5°C		
					Upper limit(+3 - +5°C)			5°C		
			Freeze stat function *11		Outdoor ambient temp. (3 - 20°C) / **			5°C		
			Simultaneous operation (DHW/Heating)		On/Off *6			Off		
					Outdoor ambient temp. (−30 - +10°C) *4			−15°C		
			Cold weather function		On/Off *6			Off		
					Outdoor ambient temp. (−30 - −10°C) *4			−15°C		
			Boiler operation		Hybrid settings	Outdoor ambient temp. (−30 - +10°C) *4		−15°C		
						Priority mode (Ambient/ Cost/CO_2)		Ambient		
					Intelligent settings	Energy price *9	Electricity (0.001 - 999 */kWh)	0.5 */kWh		
							Boiler (0.001 - 999 */kWh)	0.5 */kWh		
						CO_2 emission	Electricity (0.001 - 999 kg -CO2/kWh)	0.5 kg -CO2/kWh		
							Boiler (0.001 - 999 kg -CO2/kWh)	0.5 kg -CO2/kWh		
						Heat source	Heat pump capacity (1 - 40 kW)	11.2 kW		
							Boiler efficiency (25 - 150%)	80%		
							Booster heater 1 capacity (0 - 30 kW)	2 kW		
							Booster heater 2 capacity (0 - 30 kW)	4 kW		
			Floor dry up function		On/Off *6			Off		
					Target temp.	Start&Finish (25 - 60°C)		30°C		
						Max. temp. (25 - 60°C)		45°C		
						Max. temp. period (1 - 20 days)		5 days		
					Flow temp. (Increase)	Temp. increase step (+1 - +10°C)		+5°C		
						Increase interval (1 - 7 days)		2 days		
					Flow temp. (Decrease)	Temp. decrease step (−1 - −10°C)		−5°C		
						Decrease interval (1 - 7 days)		2 days		
		Energy monitor settings	Electric heater capacity	Booster heater 1 capacity	0 - 30kW			3kW		
				Booster heater 2 capacity	0 - 30kW			6kW		
				Immersion heater capacity	0 - 30kW			0kW		
			Delivered energy adjustment		−50 - +50%			0%		
			Water pump input	Pump 1	0 - 200W			*** *15		
				Pump 2	0 - 200W			0W		
				Pump 3	0 - 200W			0W		
			Electric energy meter		0.1/1/10/100/1000 pulse/kWh			1 pulse/kWh		
			Heat meter		0.1/1/10/100/1000 pulse/kWh			1 pulse/kWh		
		External input settings	Demand control (IN4)		Heat source OFF/Boiler operation			Boiler operation		
			Outdoor thermostat (IN5)		Heater operation/Boiler operation			Boiler operation		

*6 On: the function is active; Off: the function is inactive.
*7 When DIP SW1-1 is set to OFF “WITHOUT Boiler” or SW2-6 is set to OFF “WITHOUT Mixing tank”, neither Boiler nor Hybrid can be selected.
*8 Valid only when operating in Room temp. control mode.
9 “” of “*/kwh” represents currency unit (e.g. € or £ or the like)
*10 Valid only when operating in Heating room temperature.
*11 If asterisk (**) is chosen freeze stat function is deactived. (i.e. primary water freeze risk)
*12 Cooling mode settings are available for ERS * model only.
*13 Only availavle if DHW tank present in system.
*14 The settings related to Zone2 can be switched only when 2-zone temperature control or 2-zone valve ON/OFF control is active.
*15 Please change setting according to <Table 3.7>.