

# Hydrobox

Гидромодуль без накопительного бака ГBC

**EHSC series**

**EHSD series**

**EHSE series**

**EHPXseries**

**ERSCseries**

**ERSD 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

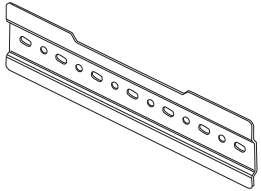
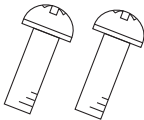
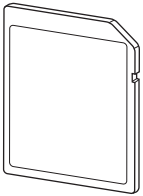
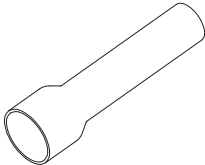
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<http://www.mitsubishielectric.com/ldg/ibim/>

If you want more information that is not written in this manual, go to the above website to download manuals, select model name, then choose language.

en

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

\* Only E\*SE series

**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	Packaged model	Plate heat exchanger (Refrigerant - Water) in the outdoor heat pump unit
13	PRV	Pressure relief valve
14	Return temperature	Temperature at which water is delivered from the primary circuit
15	Split model	Plate heat exchanger (Refrigerant - Water) in the indoor unit
16	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:**  
Precautions that must be observed to prevent injuries or death.

**⚠ CAUTION:**  
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 containers 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 2°C below the maximum allowable temperature of all the heat emitters. For Zone2, set the target flow temperature to a minimum of 5°C below the maximum allowable flow temperature of all the heat emitters in Zone2 circuit.
- Do not install the unit where combustible gases may leak, be produced, flow, or accumulate. If combustible gas accumulates around the unit, fire or explosion may result.

## ⚠ 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.

## Product specification

Model name	EHSD-MED	EHSD-VM2D	EHSD-VM6D	EHSD-VM9D	EHSD-VM9ED	EHSD-TM9D	ERSD-MED	ERSD-VM2D	ERSD-VM6D	ERSD-VM9D	ERSD-VM9ED	EHSC-TM9D	EHSC-VM2D	EHSC-VM6D	EHSC-VM9D	EHSC-VM9ED	ERSC-MED	ERSC-VM2D	ERSC-VM6D	ERSC-VM9D	ERSC-VM9ED	ERSE-MED
Overall unit dimensions (Height x Width x Depth)	800 x 530 x 360 mm																					
Weight (empty)	36 kg	43 kg	44 kg	44 kg	40 kg	44 kg	38 kg	44 kg	48 kg	48 kg	43 kg	48 kg	47 kg	48 kg	48 kg	43 kg	41 kg	48 kg	48 kg	48 kg	64 kg	62 kg
Weight (full)	38 kg	48 kg	49 kg	49 kg	45 kg	49 kg	39 kg	50 kg	54 kg	54 kg	50 kg	54 kg	53 kg	54 kg	54 kg	50 kg	44 kg	54 kg	54 kg	74 kg	72 kg	
Water volume of heating circuit in the unit *1	1.7 kg	5.2 kg	5.2 kg	5.2 kg	5.2 kg	5.2 kg	1.7 kg	5.2 kg	6.1 kg	6.1 kg	6.1 kg	6.1 kg	6.1 kg	6.1 kg	6.1 kg	6.1 kg	2.6 kg	6.1 kg	6.1 kg	10.0 kg	10.0 kg	
Plate heat exchanger (MWA1)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Plate heat exchanger (MWA2-38PA-4)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Plate heat exchanger (MWA2-72PA)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unvented expansion vessel (Primary heating)	—	—	10 L	—	—	10 L	—	10 L	—	—	—	—	—	10 L	—	—	—	—	—	—	—	—
Charge pressure	—	1 bar	1 bar	1 bar	—	1 bar	—	1 bar	—	—	—	—	—	1 bar	—	—	—	—	—	—	—	—
Control thermostat	1 - 80°C																					
Pressure relief valve	0.3 MPa (3bar)																					
Flow sensor	Min. flow 5.0 L/min																					
Manual reset thermostat	90°C																					
Thermal Cut-out (for dry run prevention)	90°C																					
Primary circuit circulating Pump	Grundfos UPM3 15-75 130																					
Water (primary circuit)	G1-A																					
Refrigerant (R410A)	Liquid																					
Gas	6.35 mm																					
Heating	12.7 mm																					
Cooling	—																					
Flow temperature	20 - 60°C																					
Cooling	—																					
Room temperature	10 - 30 °C																					
Cooling	—																					
Ambient *2	0 - 35°C (≤ 80 %RH)																					
Guaranteed operating range	See outdoor unit spec table.																					
Heating	—																					
Cooling	—																					
Power supply (Phase, voltage, frequency)	~N, 230 V, 50 Hz																					
Breaker (*when powered from independent source)	10A																					
Control board (including 4 pumps)	—																					
Booster heater	—																					
Power supply (Phase, voltage, frequency)	—	~N, 230 V, 50 Hz	3~ 400 V, 50 Hz	3~ 230 V, 50 Hz	—	~N, 230V, 50 Hz	—	~N, 230V, 50 Hz	~N, 230V, 50 Hz	~N, 230V, 50 Hz	3~ 400 V, 50 Hz	3~ 230 V, 50 Hz	—	~N, 230 V, 50 Hz	~N, 230 V, 50 Hz	3~ 400 V, 50 Hz	—	—	—	—	—	—
Capacity	—	2kW	3kW +6kW	3kW +6kW	—	2kW	—	2kW +4kW	2kW +6kW	2kW +6kW	3kW +6kW	3kW +6kW	—	2kW +4kW	2kW +6kW	3kW +6kW	—	—	—	—	—	—
Current	—	9 A	26 A	23 A	—	9 A	—	9 A	26 A	26 A	13 A	23 A	—	9 A	26 A	23 A	—	—	—	—	—	—
Breaker	—	16 A	32 A	32 A	—	16 A	—	16 A	32 A	32 A	16 A	32 A	—	16 A	32 A	32 A	—	—	—	—	—	—
Sound pressure level	41 dB(A)																					
Sound power level	40 dB(A)																					

<Table 3.1>

\*1 Piping to Expansion vessel is not included in this value.

\*2 The environment must be frost-free.

\*3 Cooling mode is not available in low outdoor temperature.

If you use our system in cooling mode at the low ambient temperature (10°C or below), there are some risks of plate heat exchanger breaking by frozen water.

### 3 Technical Information

Model name			EHSE-YM9ED	EHSE-MED	EHPX-MED	EHPX-VM2D	EHPX-VM6D	EHPX-YM9D	EHPX-YM9ED	
Overall unit dimensions (Height × Width × Depth)			950 × 600 × 360 mm			800 × 530 × 360 mm				
Weight (empty)			63 kg	61 kg	28 kg	35 kg	37 kg	37 kg	32 kg	
Weight (full)			73 kg	71 kg	29 kg	40 kg	41 kg	41 kg	37 kg	
Water volume of heating circuit in the unit *1			10.0 kg	10.0 kg	1.0 kg	4.5 kg	4.5 kg	4.5 kg	4.5 kg	
Plate heat exchanger (MWA1)			—	—	—	—	—	—	—	
Plate heat exchanger (MWA2-38PA-4)			—	—	—	—	—	—	—	
Plate heat exchanger (MWA2-72PA)			✓	✓	—	—	—	—	—	
Unvented expansion vessel(Primary heating)			Nominal volume		—		10 L		—	
			Charge pressure		—		1 bar		—	
Safety device	Water circuit (Primary)	Control thermistor		1 - 80°C						
		Pressure relief valve		0.3 MPa (3bar)						
		Flow sensor		Min. flow 5.0 L/min						
	Booster heater	Manual reset thermostat		90°C	—	—	90°C			
Thermal Cut-out (for dry run prevention)		121°C	—	—	121°C					
Primary circuit circulating Pump			Grundfos UPMXL 25-125 180			Grundfos UPM3 15-75 130				
Connections	Water (primary circuit)		G1-1/2-B			G1- A				
	Refrigerant (R410A)	Liquid	9.52 mm			—	—	—	—	
		Gas	25.4 mm (Brazing)			—	—	—	—	
Target temperature range	Flow temperature	Heating	20 - 60°C							
		Cooling	—							
	Room temperature	Heating	10 - 30 °C							
		Cooling	—							
Guaranteed operating range	Ambient *2		0 - 35°C (≤ 80 %RH)							
	Outdoor temperature	Heating	See outdoor unit spec table							
		Cooling	—							
Electrical data	Control board (Including 4 pumps)	Power supply (Phase, voltage, frequency)		~N, 230 V, 50 Hz						
		Breaker (*when powered from independent source)		10A						
	Booster heater	Power supply (Phase, voltage, frequency)		3~, 400 V, 50 Hz	—	—	~N, 230 V, 50 Hz	~N, 230 V, 50 Hz	3~, 400 V, 50 Hz	3~, 400 V, 50 Hz
		Capacity		3kW +6kW	—	—	2kW	2kW +4kW	3kW +6kW	3kW +6kW
		Current		13A	—	—	9 A	26 A	13A	13A
		Breaker		16A	—	—	16 A	32 A	16A	16A
Sound power level			45 dB(A)			40 dB(A)				

<Table 3.2>

\*1 Piping to Expansion vessel is not included in this value.

\*2 The environment must be frost-free.

\*3 Cooling mode is not available in low outdoor temperature.

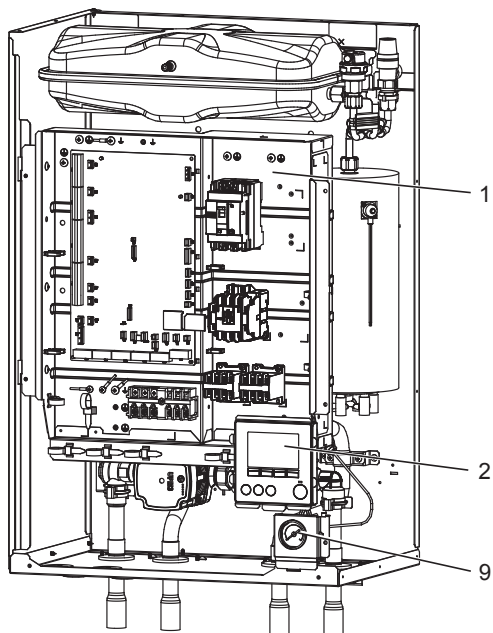
If you use our system in cooling mode at the low ambient temperature (10°C or below), there are some risks of plate heat exchanger breaking by frozen water.

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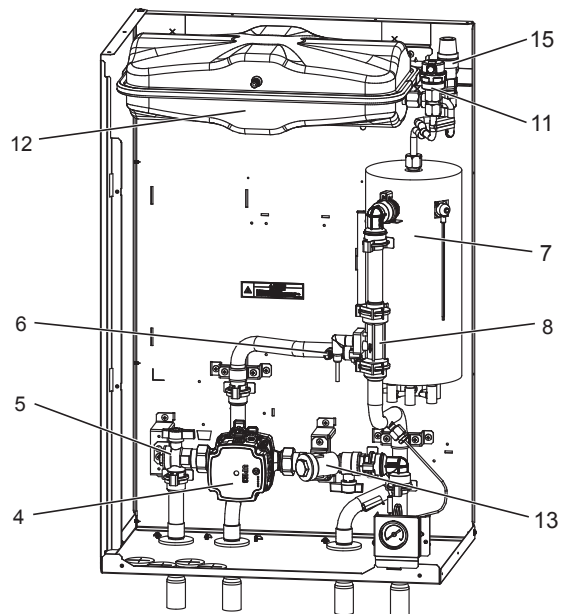
### 3 Technical Information

#### ■ Component Parts

##### <EHPX-\*M\*D> (Packaged model system)

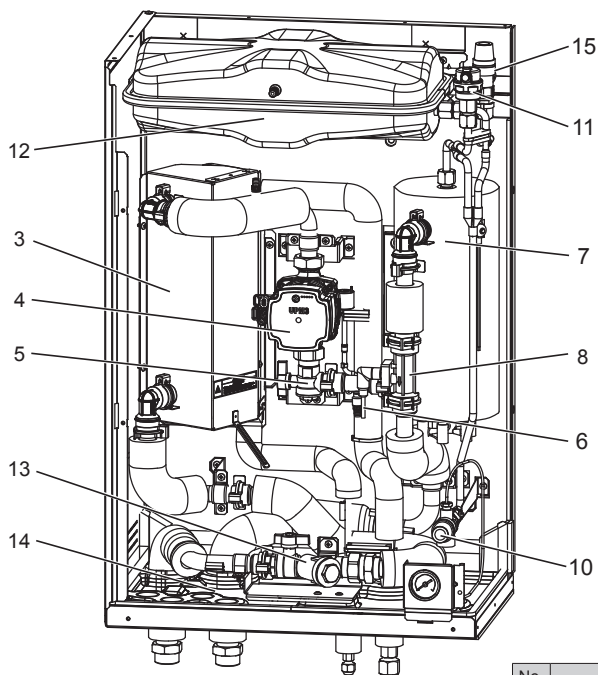


<Figure 3.1>



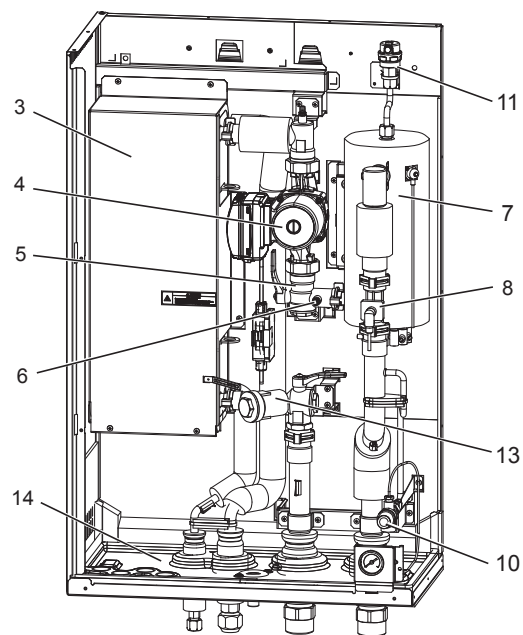
<Figure 3.2>

##### <E\*S\*-\*M\*\*D> (Split model system)



<Figure 3.3>

##### <E\*SE-\*M\*ED>



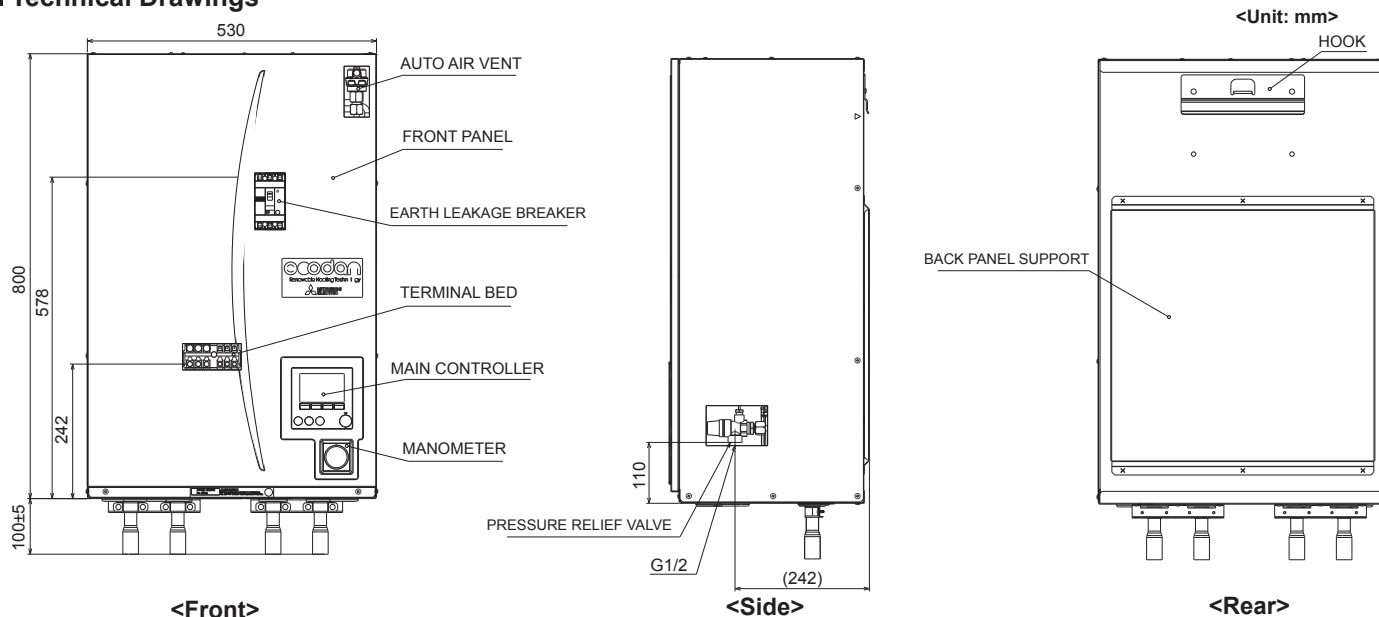
<Figure 3.4>

No.	Part name	EHPX-*M*D	EHS*-MED	EHS*-*M*D	EHS*-*M*ED	ERS*-VM2D	ERSC-MED
1	Control and electrical box	✓	✓	✓	✓	✓	✓
2	Main remote controller	✓				✓	✓
3	Plate heat exchanger (Refrigerant - Water)	-	✓	✓	✓	✓	✓
4	Water circulation pump 1	✓	✓	✓	✓	✓	✓
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	Expansion vessel	✓	-	✓	-	✓	-
13	Strainer valve	✓	✓	✓	✓	✓	✓
14	Drain pan	-	-	-	-	✓	✓
15	Pressure relief valve (5bar)	✓	-	✓	-	✓	-

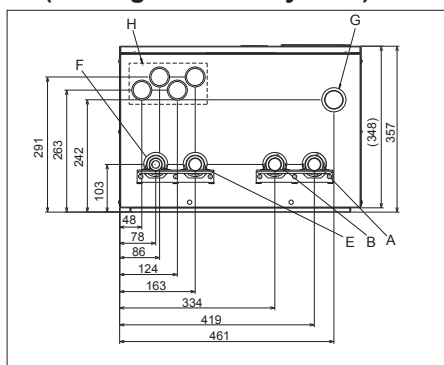
<Table 3.3>

### 3 Technical Information

#### ■ Technical Drawings



#### <EHPX> (Packaged model system)

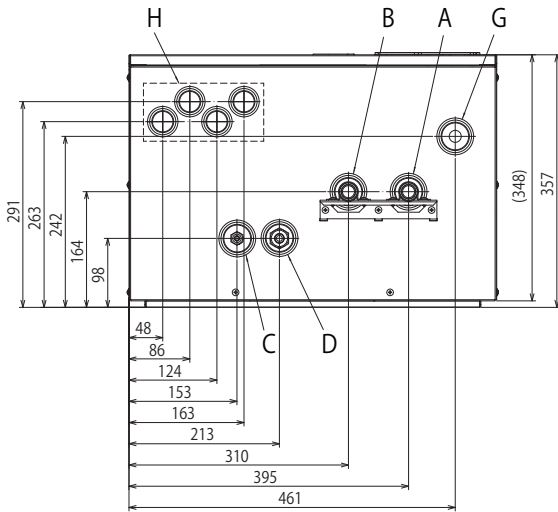


Letter	Pipe description	Connection size/type
A	Space heating/Indirect DHW tank (primary) RETURN connection	28mm/Compression (EHSC/D-* and EHPX-*) G1 nut (ERS*-* )
B	Space heating/Indirect DHW tank (primary) FLOW connection	28mm/Compression (EHSC/D-* and EHPX-*) G1 nut (ERS*-* )
C	Refrigerant (Liquid)	6.35 mm/Flare (E*SD-*) 9.52 mm/Flare (E*SC-*)
D	Refrigerant (Gas)	12.7 mm/Flare (E*SD-*) 15.88 mm/Flare (E*SC-*)
E	Flow connection FROM heat pump	28 mm/Compression (EHPX-*)
F	Return connection TO heat pump	28 mm/Compression (EHPX-*)
G	Discharge pipe (by installer) from pressure relief valve	G1/2" female (valve port within hydrobox casing)
H	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.
I	Drain socket	O.D. ø20

<Table 3.4>

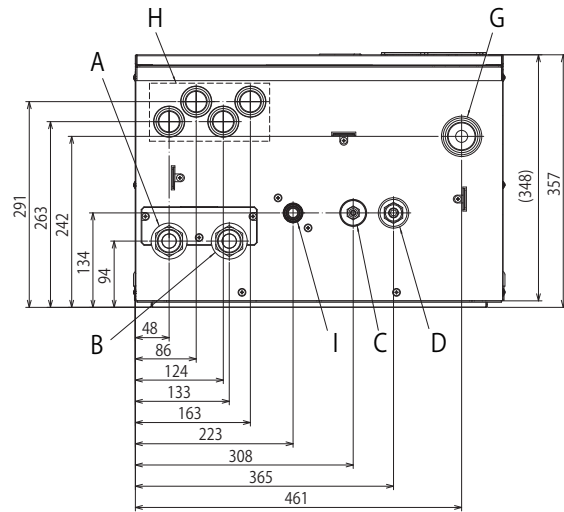
### 3 Technical Information

#### <EHS\*> (Split model system)



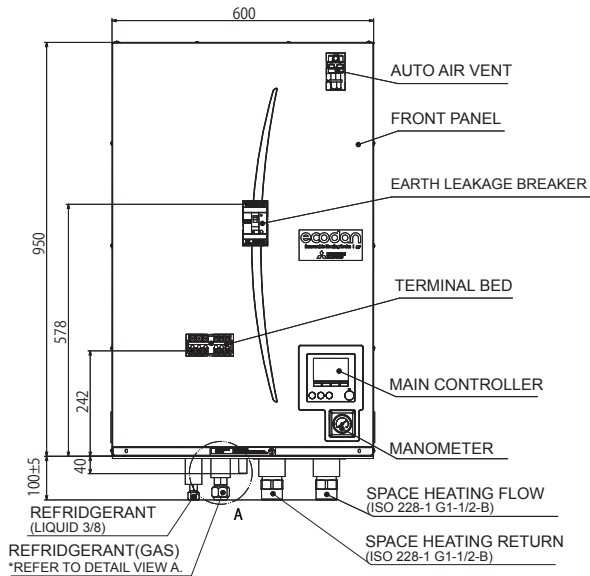
<View from below>

#### <ERS\*> (Split model system for heating and cooling)

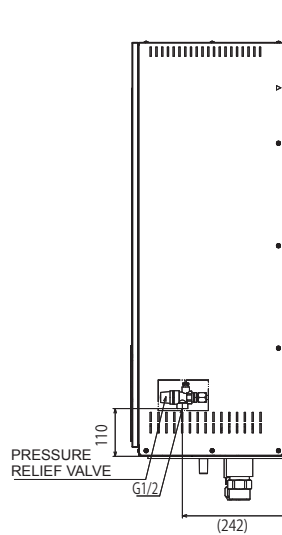


<View from below>

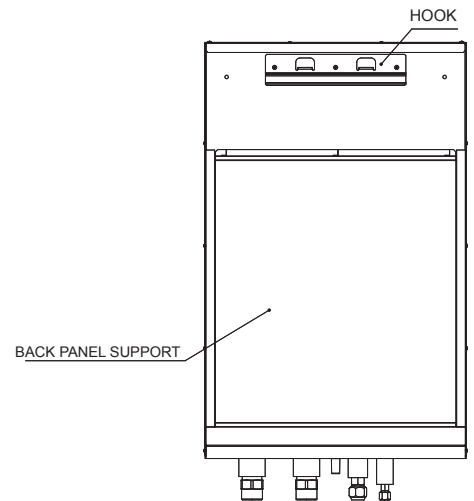
#### <E\*SE> (Heating/Heating and cooling system)



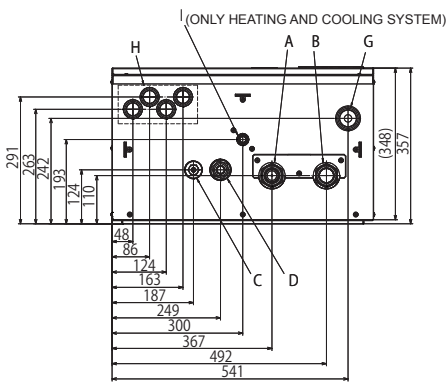
<Front>



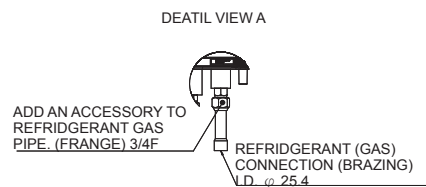
<Side>



<Rear>



<View from below>

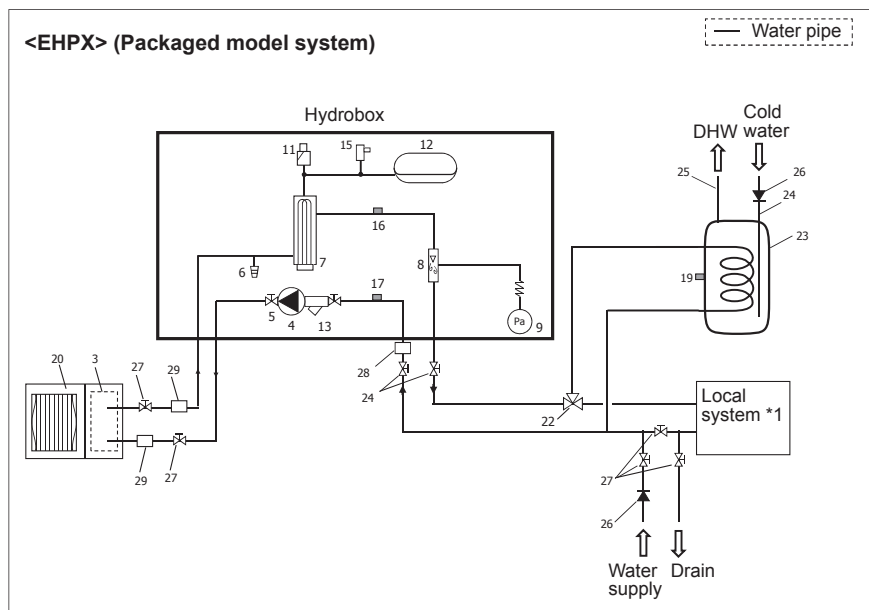




### 3 Technical Information

#### Water circuit diagram

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



<Figure 3.5>

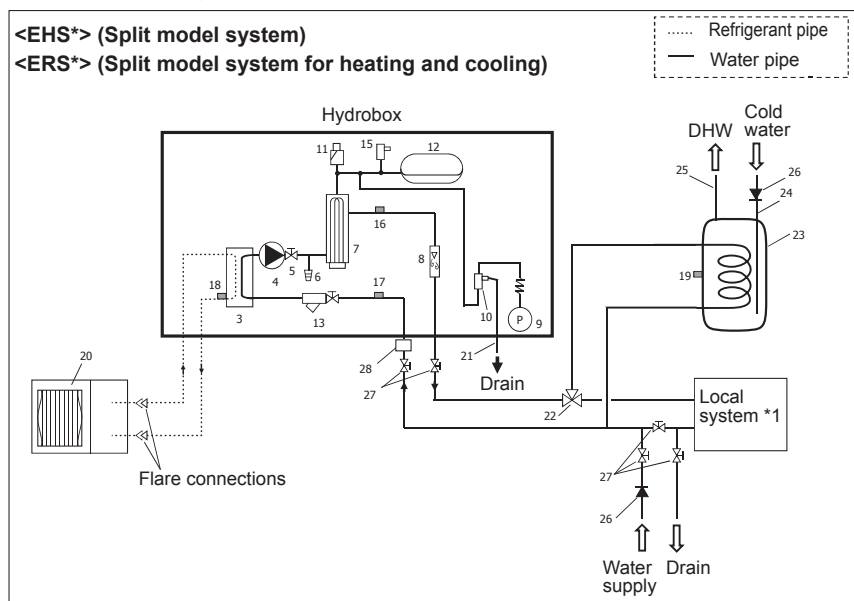
No.	Part name	EHPX- *M*D	EHS- MED	EHS- *M*D	EHSC- *M*ED	ERS- VM2D	ERSC- MED
1	Control and electrical box	✓	✓	✓	✓	✓	✓
2	Main remote controller	✓	✓	✓	✓	✓	✓
3	Plate heat exchanger (Refrigerant - Water)	-	✓	✓	✓	✓	✓
4	Water circulation pump 1	✓	✓	✓	✓	✓	✓
5	Pump valve	✓	✓	✓	✓	✓	✓
6	Drain cock (Primary circuit)	✓	✓	✓	✓	✓	✓
7	Booster heater 1, 2	✓	-	✓	✓	✓	-
8	Flow sensor	✓	✓	✓	✓	✓	✓
9	Manometer	✓	✓	✓	✓	✓	✓
10	Pressure relief valve (3 bar)	✓	✓	✓	✓	✓	✓
11	Automatic air vent	✓	✓	✓	✓	✓	✓
12	Expansion vessel	✓	-	✓	-	✓	-
13	Strainer valve	✓	✓	✓	✓	✓	✓
14	Drain pan	-	-	-	-	✓	✓
15	Pressure relief valve (5 bar)	✓	-	✓	-	✓	-
16	THW1	✓	✓	✓	✓	✓	✓
17	THW2	✓	✓	✓	✓	✓	✓
18	TH2	-	✓	✓	✓	✓	✓
19	THW5B (Optional part PAC-TH011TK2-E or PAC-TH011TKL2-E)	-	-	-	-	-	-
20	Outdoor unit	-	-	-	-	-	-
21	Drain pipe (Local supply)	-	-	-	-	-	-
22	3-way valve (Local supply)	-	-	-	-	-	-
23	DHW indirect unvented tank (Local supply)	-	-	-	-	-	-
24	Cold water inlet pipe (Local supply)	-	-	-	-	-	-
25	DHW outlet pipe (Local supply)	-	-	-	-	-	-
26	Back flow prevention device (Local supply)	-	-	-	-	-	-
27	Isolating valve (Local supply)	-	-	-	-	-	-
28	Magnetic filter (Local supply) (Recommended)	-	-	-	-	-	-
29	Strainer (Local supply)	-	-	-	-	-	-

<Table 3.5>

#### 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.

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

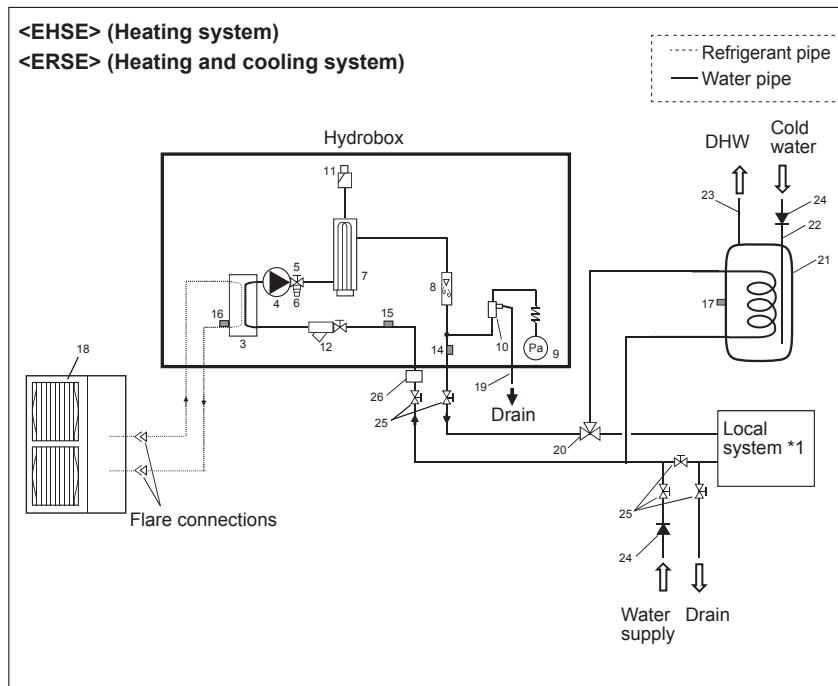


<Figure 3.6>

en

### 3 Technical Information

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

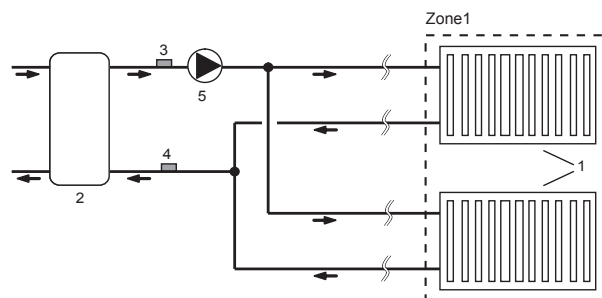
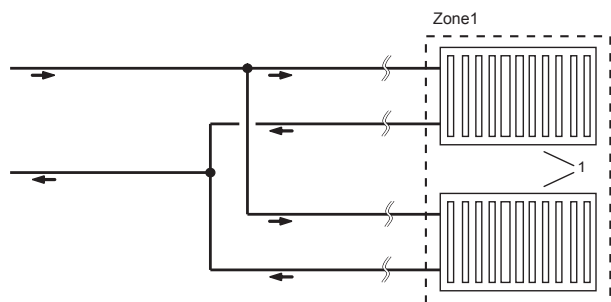


<Figure 3.7>

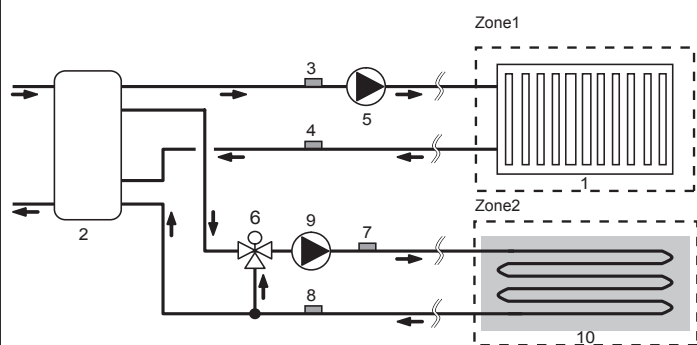
### 3 Technical Information

#### Local system

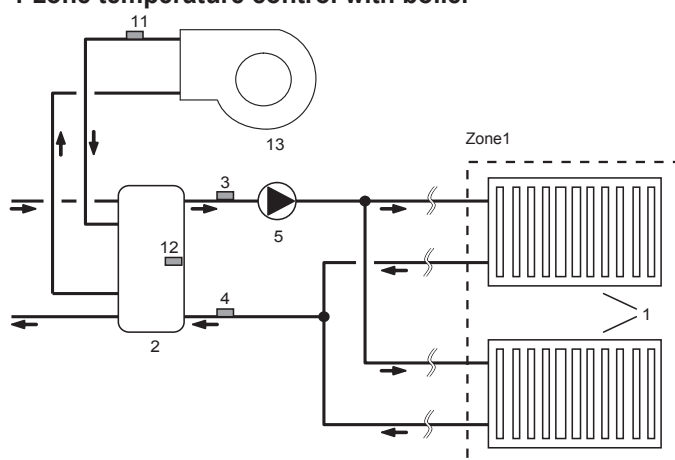
##### 1-zone temperature control



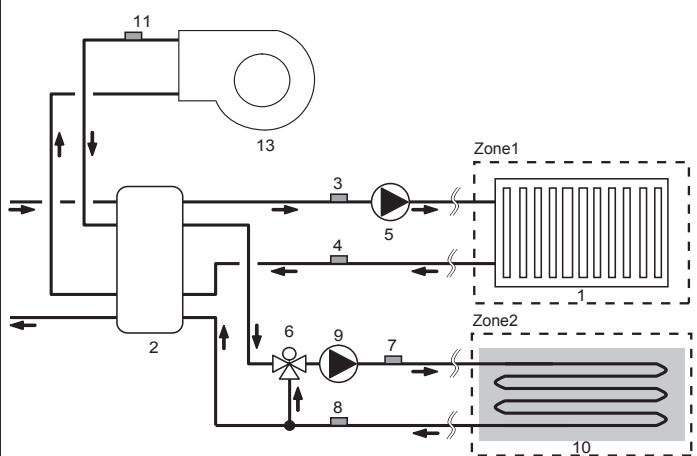
##### 2-zone temperature control



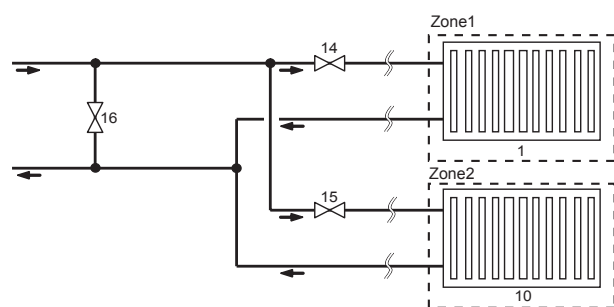
##### 1-zone temperature control with boiler



##### 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. Motorized mixing valve (local supply)
7. Zone2 flow water temp. thermistor (THW8)
8. Zone2 return water temp. thermistor (THW9) } Optional part : PAC-TH011-E
9. Zone2 water circulation pump (local supply)

10. Zone2 heat emitters (e.g. underfloor heating) (local supply)
11. Boiler flow water temp. thermistor (THWB1) } Optional part : PAC-TH012HT-E
12. Mixing tank thermistor (THW10)
13. Boiler (local supply)
14. Zone1 2-way valve (local supply)
15. Zone2 2-way valve (local supply)
16. Bypass valve (local supply)

en

## 4 Installation

### <Preparation before the installation and service>

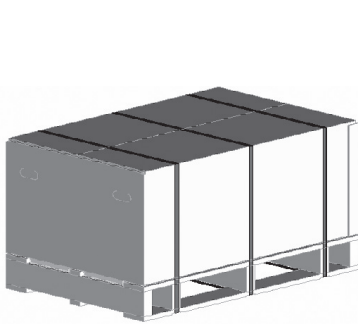
- Prepare the proper tools.
- Prepare the proper protection.
- Allow parts to cool before attempting any maintenance.
- Provide adequate ventilation.
- After stopping the operation of the system, turn off the power-supply breaker and remove the power plug.
- Discharge the capacitor before commencing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

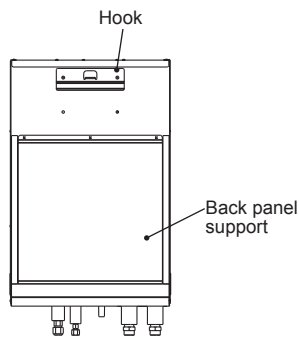
## 4.1 Location

### ■ Transportation and Handling



<Figure 4.1.1>

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



<Figure 4.1.2>

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 or lifting the hydrobox.

### ■ Suitable Location

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

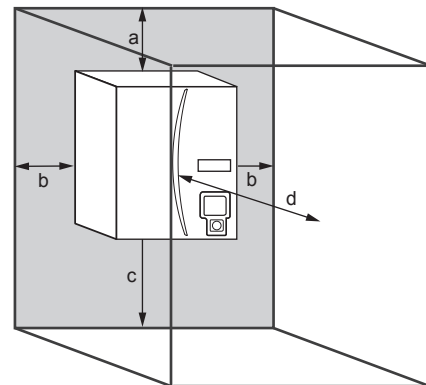
- The hydrobox should be installed indoors in a frost free weather proof location.
- Install the hydrobox where it is not exposed to water/excessive moisture.
- The hydrobox should be positioned on a level wall capable of supporting it's filled weight.
- To find out the weight, refer to "3. Technical 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>

### ■ 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.

### ■ Repositioning hydrobox

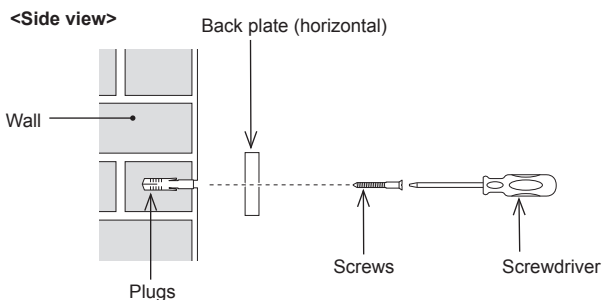
If you need to move the hydrobox to a new position FULLY DRAIN it before moving to avoid damage to the unit.

**Note: Do NOT hold piping when moving or lifting the hydrobox.**

# 4 Installation

## ■ Mounting procedure

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

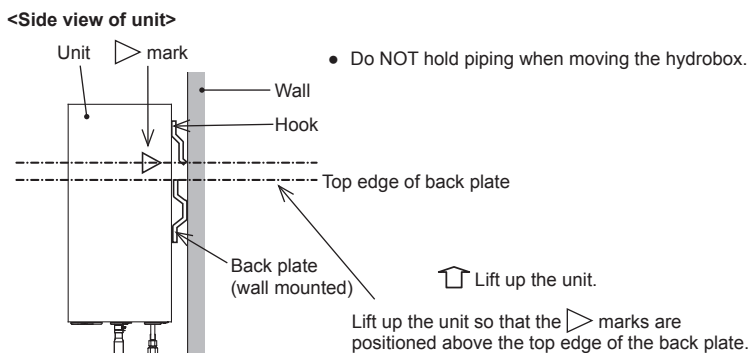


<Figure 4.1.4>

- Fit the back plate correctly with its horizontal notch profile positioned at the TOP. 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.

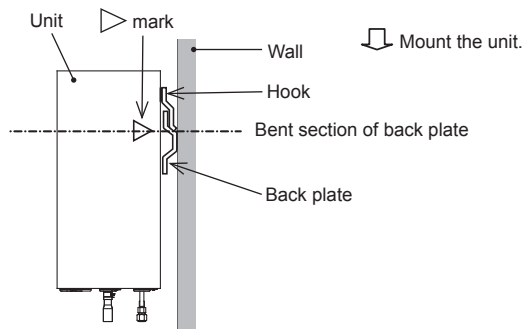
2. Insert the hook on the back of the hydrobox behind the notch of the back plate.  
\*The lifting up of the hydrobox is facilitated by first tilting the unit forward using the included packaging cushioning.

- 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.

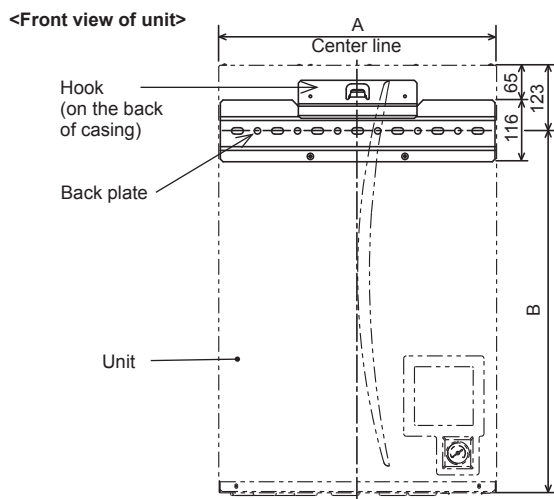


<Figure 4.1.5>

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



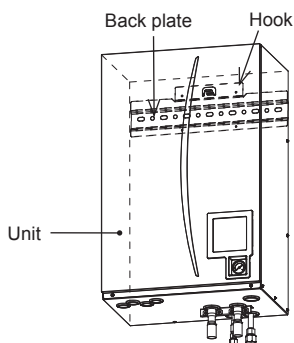
<Figure 4.1.6>



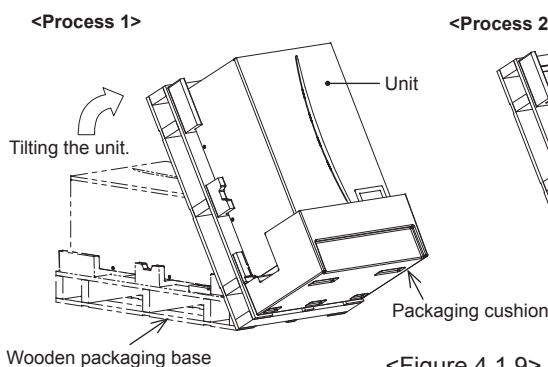
<Figure 4.1.7>

- Figure 4.1.7 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.

Dimensions (mm)	A	B
Hydro box		
E*SC/E*SD	530	677
EHPX		
E*SE	600	827



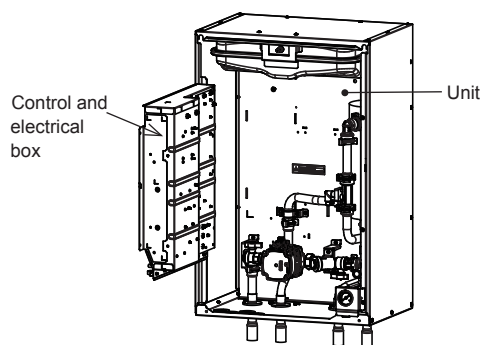
<Figure 4.1.8>



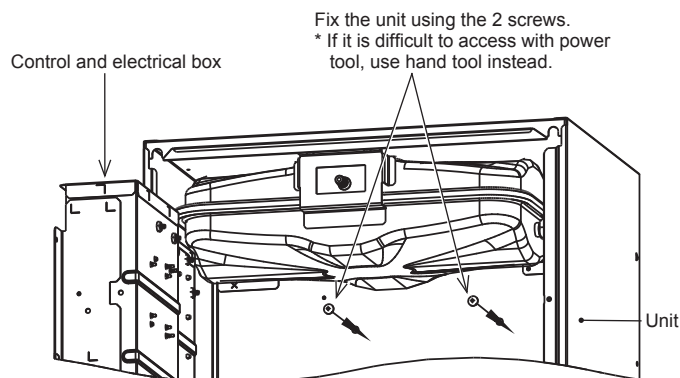
<Figure 4.1.9>

## 4 Installation

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

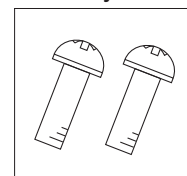


<Figure 4.1.10>

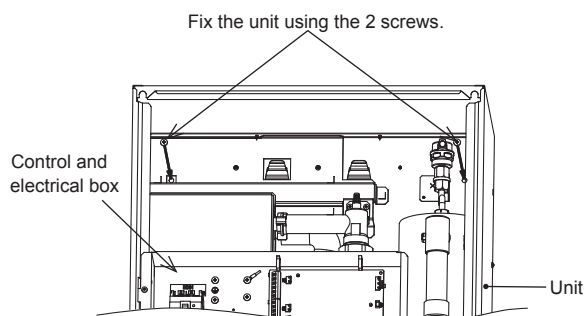


<Figure 4.1.11>

<Accessory>



Screw M5x8



<Figure 4.1.12>

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 values;
  - Calcium: 100mg/L, Ca hardness: 250mg/L
  - Chlorine: 100mg/L, Copper: 0.3mg/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 should 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 should 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 should 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.
- For all packaged model systems, and the split model or PUMY system without booster heater, add a combined inhibitor and anti-freeze solution to prevent damage to the pipework and system components.
- For split model systems the responsible installer should decide if anti-freeze solution is necessary for each site's conditions. Corrosion inhibitor however should ALWAYS be used.

#### ■ 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.
- For all packaged model systems add a combined inhibitor and anti-freeze solution to prevent damage to the pipework and system components.
- For split model systems 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]
Packaged model	PUHZ-WM85	
	PUHZ-WM112	
Split model	SUZ-SWM40	
	SUZ-SWM60	
	SUZ-SWM80	
	PUHZ-SW50	
	PUHZ-FRP71	
	PUHZ-SW75	
	PUHZ-SW100	
	PUHZ-SW120	
	PUHZ-SHW80	
	PUHZ-SHW112	
PUHZ-SHW140		
	PUMY-P112	
	PUMY-P125	
	PUMY-P140	

<Table 4.2.1>

**Note:**

For 2-zone temperature control system, the value in the table above excludes the amount of stored water in zone2.

## 4 Installation

### 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 enter the pipe.

#### Safety Device Connections

The hydrobox contains a pressure relief valve. (see <Figure 4.3.1>) The connection size is G1/2" female. The installer **MUST** responsibly 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).

#### Hydraulic Filter Work (ONLY EHPX series)

Install a hydraulic filter or strainer (local supply) at the water intake ("Pipe E" in Table 3.3, also see associated schematic Fig. 3.5)

#### 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 4.3.2>).

#### 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.

When the necessary expansion vessel volume exceeds the volume of an built-in expansion vessel, install an additional expansion vessel so that the sum of the volumes of the expansion vessels exceeds the necessary expansion vessel volume.

\* For installation of an E\*S\*-M\*EC model, provide and install an expansion vessel in the field as the model does not come fitted with an expansion vessel.

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

Where;

- V : Necessary expansion vessel volume [L]
- $\varepsilon$  : 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

$\varepsilon$  : at 70 °C = 0.0229

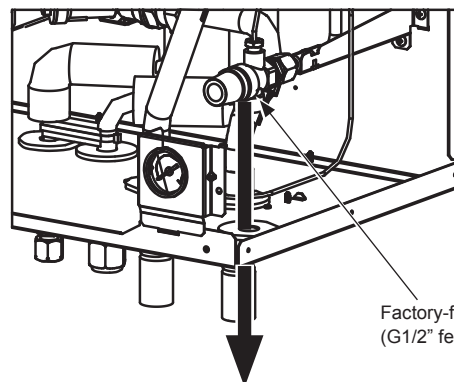
$P_1$  : 0.1 MPa

$P_2$  : 0.3 MPa

\*A 30% safety margin has been added.

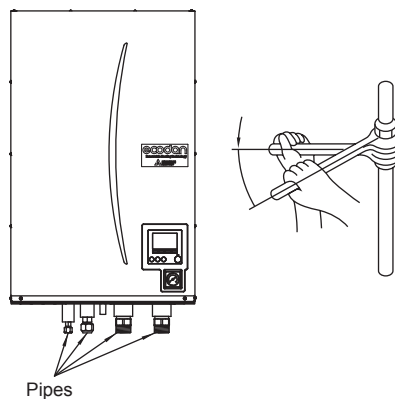
#### Insulation of Pipework

- 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  $\leq 0.04$  W/m.K.



Discharge to drain  
(pipe **MUST** responsibly be fitted by installer).

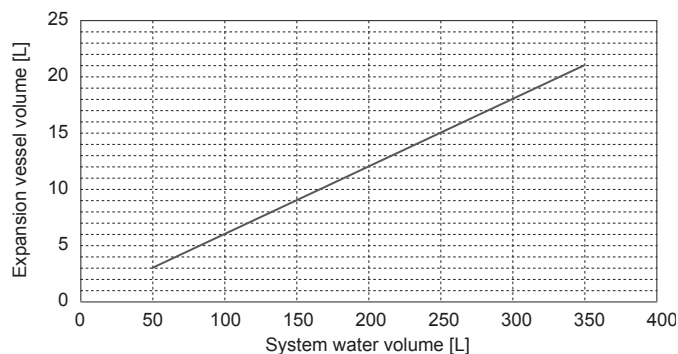
<Figure 4.3.1>



Pipes

<Figure 4.3.2>

#### Expansion vessel sizing



<Figure 4.3.3>

# 4 Installation

## Water Circulation Pump Characteristics

Pump speed can be selected by main remote controller setting (see <Figure 4.3.4 to 4.3.9>).

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.

For outdoor unit model not listed in the <Table 4.3.1>, refer to Water flow rate range in the specification table of outdoor unit Data Book. In such case, make sure that the flow rate is greater than 5.0 L/min and less than 36.9 L/min.

<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.**

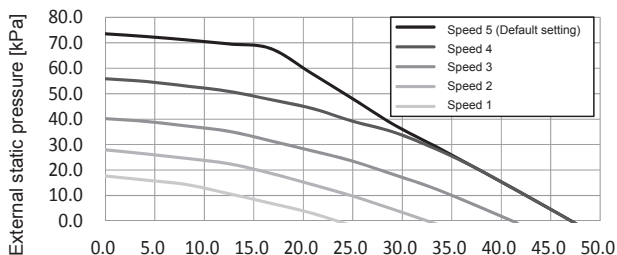
Outdoor heat pump unit		Water flow rate range [L/min]
Packaged model	PUHZ-WM85	10.0 - 25.8
	PUHZ-WM112	14.4 - 32.1
Split model	SUZ-SWM40	6.5 - 11.4
	SUZ-SWM60	7.2 - 17.2
	SUZ-SWM80	7.8 - 21.5
	PUHZ-SW50	7.1 - 17.2
	PUHZ-FRP71	11.5 - 22.9
	PUHZ-SW75	10.2 - 22.9
	PUHZ-SW100	14.4 - 32.1
	PUHZ-SW120	20.1 - 36.9
	PUHZ-SHW80	10.2 - 22.9
	PUHZ-SHW112	14.4 - 32.1
	PUHZ-SHW140	17.9 - 36.9
PUMY-P112	17.9 - 35.8	
PUMY-P125	17.9 - 35.8	
PUMY-P140	17.9 - 35.8	

<Table 4.3.1>

\* If the water flow rate is less than the minimum flow rate setting of the flow sensor (default 5.0L/min), the flow rate error will be activated. If the water flow rate exceeds 36.9 L/min, the flow speed will be greater than 2.0 m/s, which could erode the pipes.

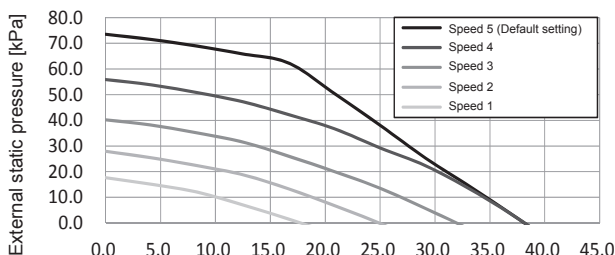
## Water Circulation Pump Characteristics

EHPX series



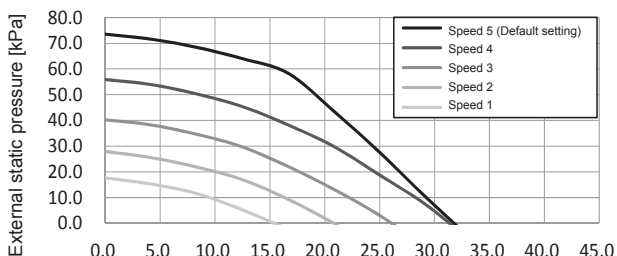
<Figure 4.3.4>

ERSC series



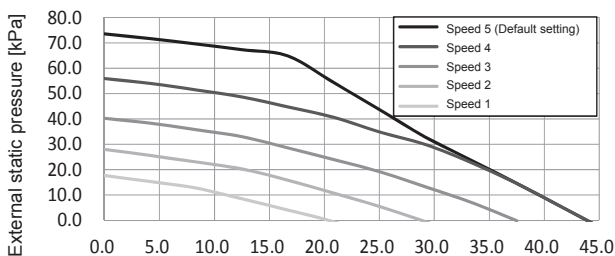
<Figure 4.3.5>

ERSD series



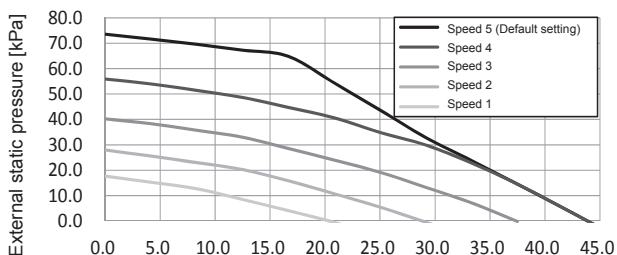
<Figure 4.3.6>

EHSC series



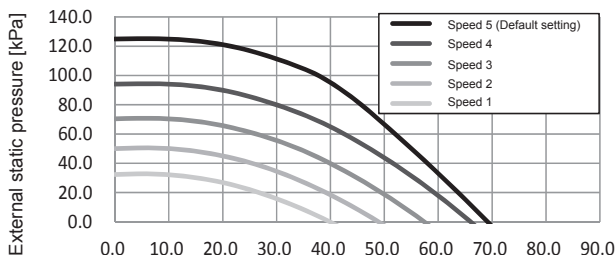
<Figure 4.3.7>

EHSD series



<Figure 4.3.8>

E\*SE series



<Figure 4.3.9>

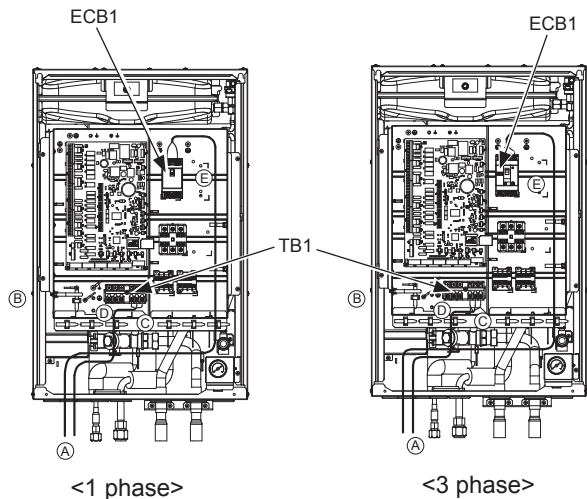


## 4 Installation

### 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>

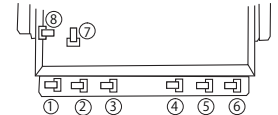
The hydrobox can be powered in two ways.

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 fixed with the cable straps as below.
  - ② Output wires
  - ③ Indoor-Outdoor wire
  - ⑥ Power line (B.H.)
  - 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.

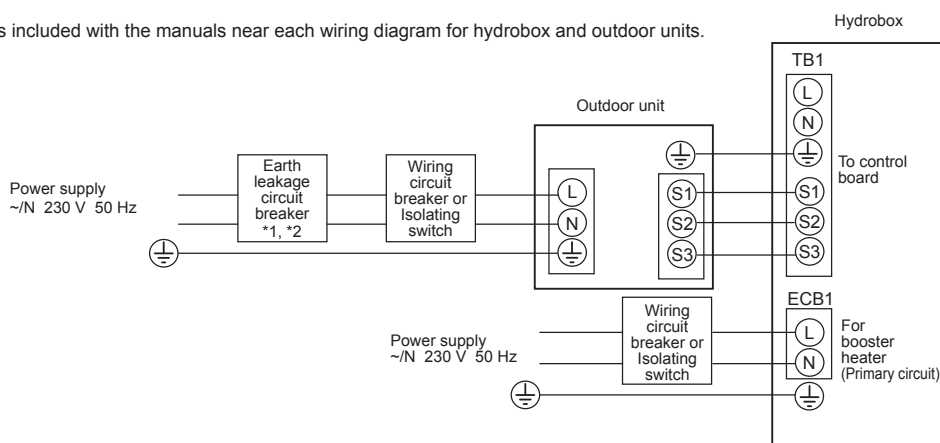
## 4 Installation

### Hydrobox powered via outdoor unit

(If you want to use independent source, go to the Mitsubishi website.)

#### <1 phase>

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



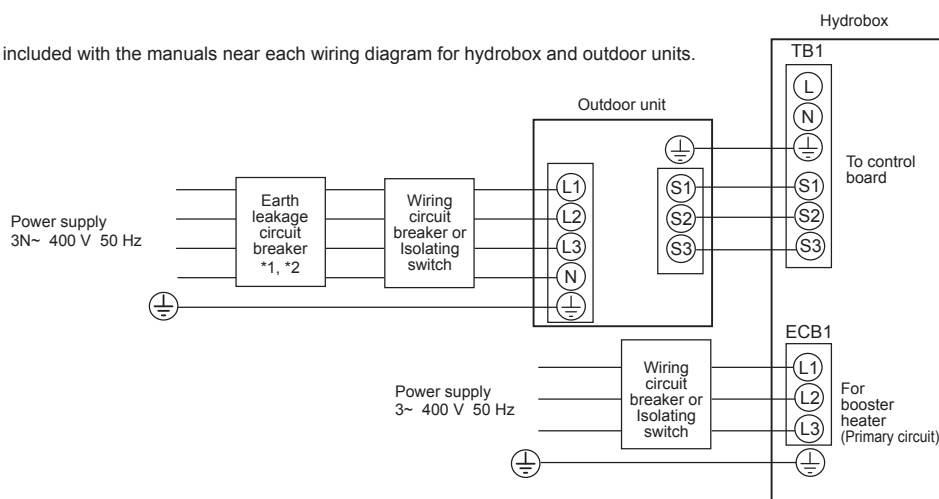
\*1 If the installed earth leakage circuit breaker does not have an over-current protection function, install a breaker with that function along the same power line.

<Figure 4.4.2>  
Electrical connections 1 phase

Description	Power supply	Capacity	Breaker	Wiring
Booster heater (Primary circuit)	~N 230 V 50 Hz	2 kW	16 A *2	2.5 mm <sup>2</sup>
		6 kW	32 A *2	6.0 mm <sup>2</sup>

#### <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.

<Figure 4.4.3>  
Electrical connections 3 phase

Description	Power supply	Capacity	Breaker	Wiring
Booster heater (Primary circuit)	3~ 400 V 50 Hz	9 kW	16 A *2	2.5 mm <sup>2</sup>

Wiring No. x size (mm <sup>2</sup> )	Description	Quantity	Wiring size (mm <sup>2</sup> )
Wiring No. x size (mm <sup>2</sup> )	Hydrobox - Outdoor unit	*3	3 × 1.5 (polar)
	Hydrobox - Outdoor unit earth	*3	1 × Min. 1.5
Circuit rating	Hydrobox - Outdoor unit S1 - S2	*4	230 V AC
	Hydrobox - Outdoor unit S2 - S3	*4	24 V DC

\*2. 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.

\*3. Max. 45 m

If 2.5 mm<sup>2</sup> used, Max. 50 m

If 2.5 mm<sup>2</sup> used and S3 separated, Max. 80 m

\*4. 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 System Set Up

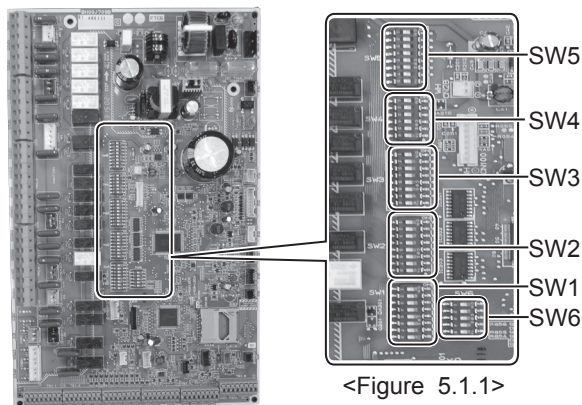
### 5.1 DIP Switch Functions

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.

Only an authorised installer can change DIP switch setting under one's own responsibility according to the installation condition.

Make sure to turn off both indoor unit and outdoor unit power supplies before changing the switch settings.



<Figure 5.1.1>

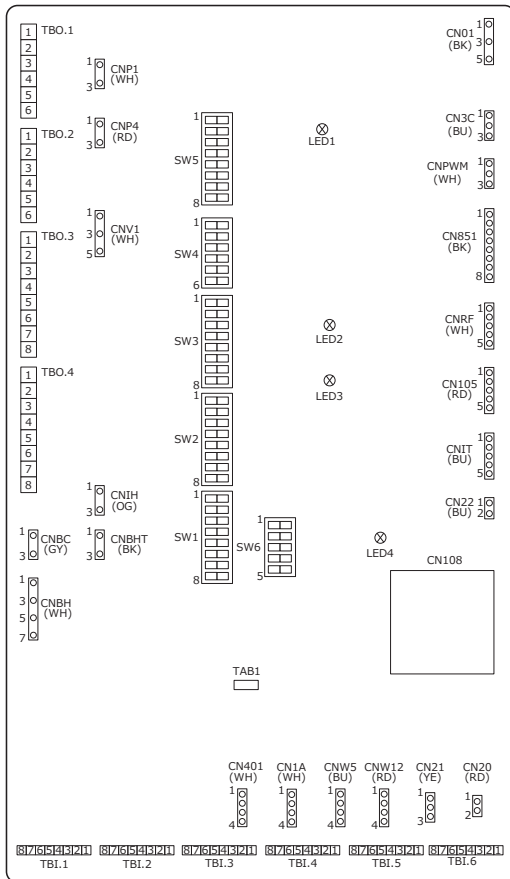
DIP switch	Function	OFF	ON	Default settings: Indoor unit model			
SW1	SW1-1 Boiler	WITHOUT Boiler	WITH Boiler	OFF			
	SW1-2 Heat pump maximum outlet water temperature	55°C	60°C	ON *1			
	SW1-3 DHW tank	WITHOUT DHW tank	WITH DHW tank	OFF			
	SW1-4 Immersion heater	WITHOUT Immersion heater	WITH Immersion heater	OFF			
	SW1-5 Booster heater	WITHOUT Booster heater	WITH Booster heater	OFF: E***-M*D ON : E***-M2/6/9D			
	SW1-6 Booster heater function	For heating only	For heating and DHW	OFF: E***-M*D ON : E***-M2/6/9D			
	SW1-7 Outdoor unit type	Split type	Packaged type	ON			
	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: Except E***-VM2*D ON : E***-VM2*D			
	SW2-4	—	—	OFF			
	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 logic change	Zone2 operation stop at thermostat short	Zone2 operation stop at thermostat open	OFF			
	SW3-2 Flow switch 2 and 3 input logic change	Failure detection at short	Failure detection at open	OFF			
	SW3-3	—	—	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 Advanced auto adaptation	Inactive	Active	ON			
	SW5-3	Capacity code					
	SW5-4		SW5-3	SW5-4	SW5-5	SW5-6	SW5-7
	SW5-5	E*SC-*M**D	ON	ON	ON	ON	OFF
	SW5-6	E*SD-*M**D	ON	OFF	OFF	ON	OFF
	SW5-7	E*SE-*M*ED	OFF	ON	ON	OFF	ON
	SW5-8	EHPX-*M**D	OFF	OFF	OFF	OFF	OFF
SW6	SW6-1	—	—	OFF			
	SW6-2	—	—	OFF			
	SW6-3	—	—	OFF			
	SW6-4 Analog output signal (0-10V)	Inactive	Active	OFF			
	SW6-5	—	—	OFF			

<Table 5.1.1>

- Note:**
- \*1. When the hydrobox is connected with a PUMY-P/SUHZ-SW outdoor unit of which maximum outlet water temperature is 55°C, 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 "5.4 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 System Set Up

## 5.2 Connecting inputs/outputs



<Figure 5.2.1>

### Signal inputs

Name	Terminal block	Connector	Item	OFF (Open)	ON (Short)
IN1	TBI.1 7-8	—	Room thermostat 1 input *1	Refer to SW2-1 in <5.1 DIP Switch Functions>.	
IN2	TBI.1 5-6	—	Flow switch 1 input	Refer to SW2-2 in <5.1 DIP Switch Functions>.	
IN3	TBI.1 3-4	—	Flow switch 2 input (Zone1)	Refer to SW3-2 in <5.1 DIP Switch Functions>.	
IN4	TBI.1 1-2	—	Demand control input	Normal	Heat source OFF/ Boiler operation *3
IN5	TBI.2 7-8	—	Outdoor thermostat input *2	Standard operation	Heater operation/ Boiler operation *3
IN6	TBI.2 5-6	—	Room thermostat 2 input *1	Refer to SW3-1 in <5.1 DIP Switch Functions>.	
IN7	TBI.2 3-4	—	Flow switch 3 input (Zone2)	Refer to SW3-3 in <5.1 DIP Switch Functions>.	
IN8	TBI.3 7-8	—	Electric energy meter 1	*4	
IN9	TBI.3 5-6	—	Electric energy meter 2		
IN10	TBI.2 1-2	—	Heat meter		
IN11	TBI.3 3-4	—	Smart grid ready input	*5	
IN12	TBI.3 1-2	—			
INA1	TBI.4 1-3	CN1A	Flow sensor	—	—

\*1. Set the ON/OFF cycle time of the room thermostat for 10 minutes or more; otherwise the compressor may be damaged.

\*2. If using outdoor thermostat for controlling operation of heaters, the lifetime of the heaters and related parts may be reduced.

\*3. To turn on the boiler operation, use the main remote controller to select "Boiler" in "External input setting" screen in the service menu.

\*4. Connectable electric energy meter and heat meter

- Pulse type Voltage free contact for 12V DC detection by FTC (TBI.2 1 pin, TBI.3 5 and 7 pins 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 " Main remote controller".)

\*5. As for the smart grid ready, refer to "5.5 Smart grid ready".

### 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 mm <sup>2</sup> to 0.52 mm <sup>2</sup> Solid wire: ø0.4 mm to ø0.8 mm
	Switch	Non-voltage "a" contact signals Remote switch: minimum applicable load 12V DC, 1mA

Note:

Stranded wire should be processed with insulation-covered bar terminal (DIN46228-4 standard compatible type).

## 5 System Set Up

### 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.)	—
THW5B	—	CNW5 3-4	Thermistor (DHW tank water temp.) (Option) *1	—
THW6	TBI.5 7-8	—	Thermistor (Zone1 flow water temp.) (Option) *1	PAC-TH011-E
THW7	TBI.5 5-6	—	Thermistor (Zone1 return water temp.) (Option) *1	
THW8	TBI.5 3-4	—	Thermistor (Zone2 flow water temp.) (Option) *1	PAC-TH011-E
THW9	TBI.5 1-2	—	Thermistor (Zone2 return water temp.) (Option) *1	
THWB1	TBI.6 7-8	—	Thermistor (Boiler flow water temp.) (Option) *1	PAC-TH012HT-E
THW10	TBI.6 5-6	—	Thermistor (Mixing tank water temp.) (Option1) *1	

Ensure to wire thermistor wirings away from the power line and/or OUT1 to 16 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.

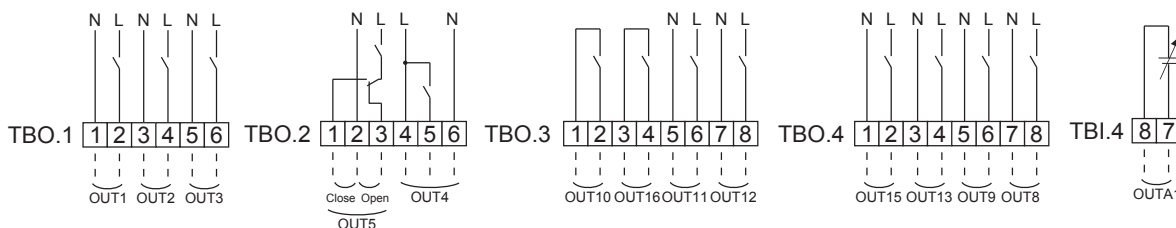
### Outputs

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. (Inrush current 40A 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. (Inrush current 40A Max.)	
OUT3	TBO.1 5-6	—	Water circulation pump 3 output (Space heating/cooling for Zone2) *1 2-way valve 2b output *2	OFF	ON	230V AC 1.0A Max. (Inrush current 40A Max.)	
OUT14	—	CNP4	Water circulation pump 4 output (DHW)	OFF	ON	230V AC 1.0A Max. (Inrush current 40A Max.)	
OUT4	TBO.2 4-6	CNV1	3-way valve (2-way valve 1) output	Heating	DHW	230V AC 0.1A Max.	3.0A (b)
	—	CN851	3-way valve output				
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 7-8	—	Cooling signal output	OFF	ON	230V AC 0.5A Max.	
OUT9	TBO.4 5-6	CNIH	Immersion heater output	OFF	ON	230V AC 0.5A Max. (Relay)	
OUT11	TBO.3 5-6	—	Error output	Normal	Error	230V AC 0.5A Max.	
OUT12	TBO.3 7-8	—	Defrost output	Normal	Defrost	230V AC 0.5A Max.	
OUT13	TBO.4 3-4	—	2-way valve 2a output *2	OFF	ON	230V AC 0.1A Max.	
OUT15	TBO.4 1-2	—	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	—
OUT16	TBO.3 3-4	—	Heating/Cooling thermo ON signal	OFF	ON		—
OUTA1	TBI.4 7-8	—	Analog output	—	—	0-10V DC 5mA max.	—

Do not connect to the terminals that are indicated as “—” in the “Terminal block” field.

\*1 For 2-zone temperature control.

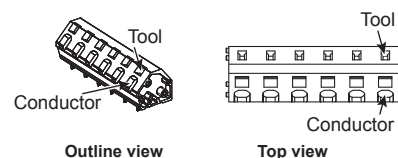
\*2 For 2-zone valve ON/OFF control.



#### How to use TBO.1 to 4

#### 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 mm <sup>2</sup> to 1.5 mm <sup>2</sup> Solid wire: 0.25 mm <sup>2</sup> to 1.5 mm <sup>2</sup>



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).
  6. Use the same thing as the Signal input wire for OUTA1 wiring.

## 5 System Set Up

### 5.3 Wiring for 2-zone temperature control

Connect the pipe work and locally supplied parts according to the relevant circuit diagram shown "Local system" in Section 3, of this manual.

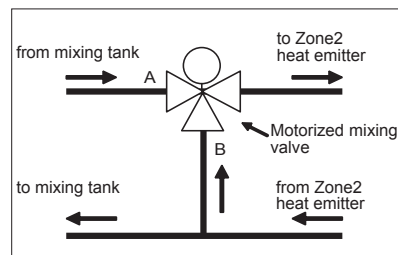
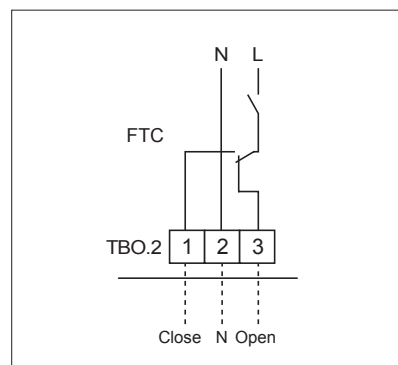
#### <Mixing valve>

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).

#### <Thermistor>

- Do not install the thermistors on the mixing tank.
- Install the Zone2 flow temp. thermistor (THW8) near the mixing valve.
- 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.



### 5.4 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 \*2

- Turn OFF the indoor unit power supply.
- Turn DIP switch 4-4 and 4-5 OFF.

\*2 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 System Set Up

### 5.5 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

\*1 To edit main remote controller settings or to check operating data, an Ecodan service tool (for use with PC) is required.

#### <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 55°C.
- (3) When the SD memory card is a miniSD, miniSDHC, microSD, or microSDHC 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	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
SanDisk	SDSDUN-008G-G46	Oct. 2016
Verbatim	#43961	Oct. 2016
Verbatim	#44018	Oct. 2016

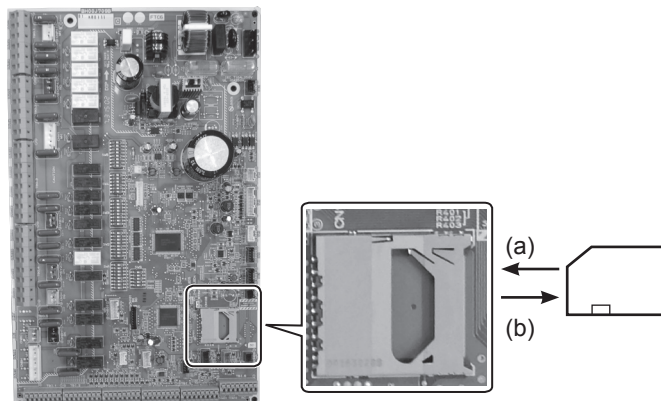
Before using a new SD memory card (including the card that comes with the unit), always check that the SD memory card can be safely read and written to by the FTC controller.

#### <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.

- (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.**



#### 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.

\*2 A 2-GB SD memory card stores up to 30 days of operation logs.

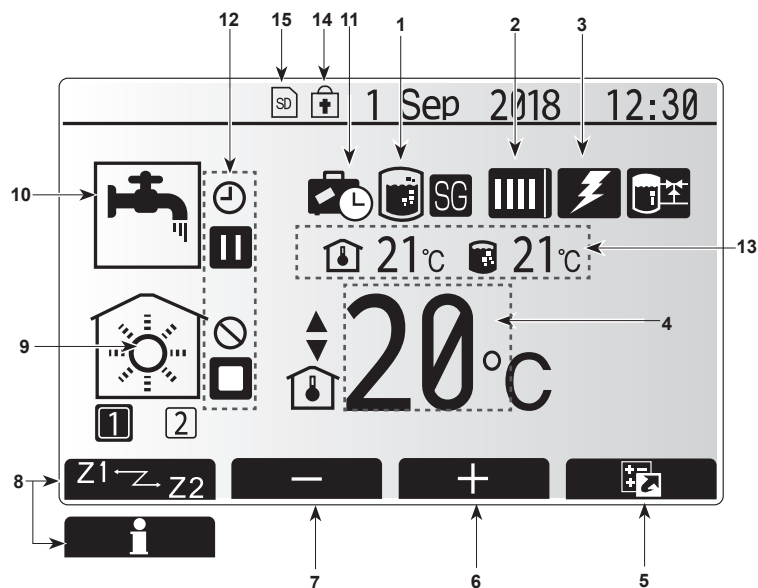
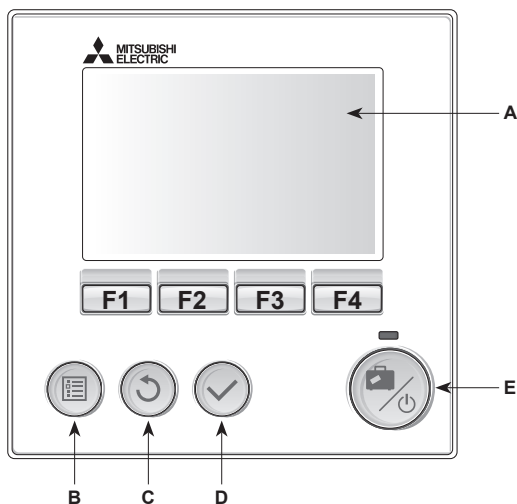
# 5 System Set Up

## 5.6 Main remote controller

### ■ Main remote controller

To change the settings of your heating/cooling system please use the main remote controller located on the front panel of the cylinder unit or hydrobox. The following is a guide to viewing the main settings. Should you require more information please contact your installer or local Mitsubishi Electric dealer.

Cooling mode is available for ERS series only. However, Cooling mode is not available when the indoor unit is connected to PUHZ-FRP.



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 indoor unit protection functions (e.g. freeze stat. function) will NOT operate. Please beware that without these safety functions enabled the indoor unit may potentially become exposed to damage.

### <Main screen icons>

	Icon	Description
1	Legionella prevention icon	When this icon is displayed 'Legionella prevention mode' is active.
2	Heat pump icon	'Heat pump' is running.
	Defrosting icon	Defrosting
	Emergency heating icon	Emergency heating
3	Electric heater icon	When this icon is displayed the 'Electric heaters' (booster or immersion heater) are in use.
4	Target flow temperature icon	Target flow temperature
	Target room temperature icon	Target room temperature
	Compensation curve icon	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 icon	Pressing the function button below this icon switches between Zone1 and Zone2.
	Information icon	Pressing the function button below this icon displays the information screen.
9	Space heating (cooling) mode icon	Heating mode Zone1 or Zone2
		Cooling mode Zone1 or Zone2
10	DHW mode icon	Normal or ECO mode
11	Holiday mode icon	When this icon is displayed 'Holiday mode' activated.
12	Timer icon	Timer
	Prohibited icon	Prohibited
	Server control icon	Server control
	Stand-by icon	Stand-by
	Stand-by (*2) icon	Stand-by (*2)
	Stop icon	Stop
13	Operating icon	Operating
	Current temperature icon	Current room temperature Current water temperature of DHW tank
14	Menu lock icon	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 icon	SD memory card (NOT for the user) is inserted.

\*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.



## 5 System Set Up

### ■ Initial setting wizard

When the main remote controller is switched on for the first time, the screen automatically goes to Language setting screen , Date/Time setting screen and Main settings menu screen in order. Enter the desired number using the function keys and press CONFIRM.

**Note:**

<HEATER CAPACITY RESTRICTION>

This setting restricts the booster heater capacity. It is NOT possible to change the setting after starting up.

If you do not have any special requirements (such as building regulations) in your country, skip this setting (select "No").

### ■ 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.

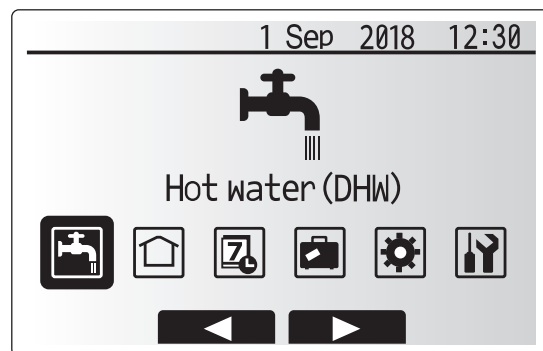
**Installer Level – Long press**

If the MENU button is pressed down for 3 seconds the main settings will be displayed with all functionality available.

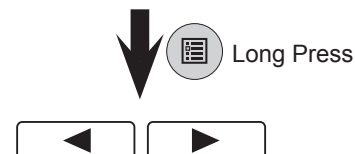
The color of ◀▶ buttons is inverted, as per figure on right. <Fig. 5.5.1>.

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)



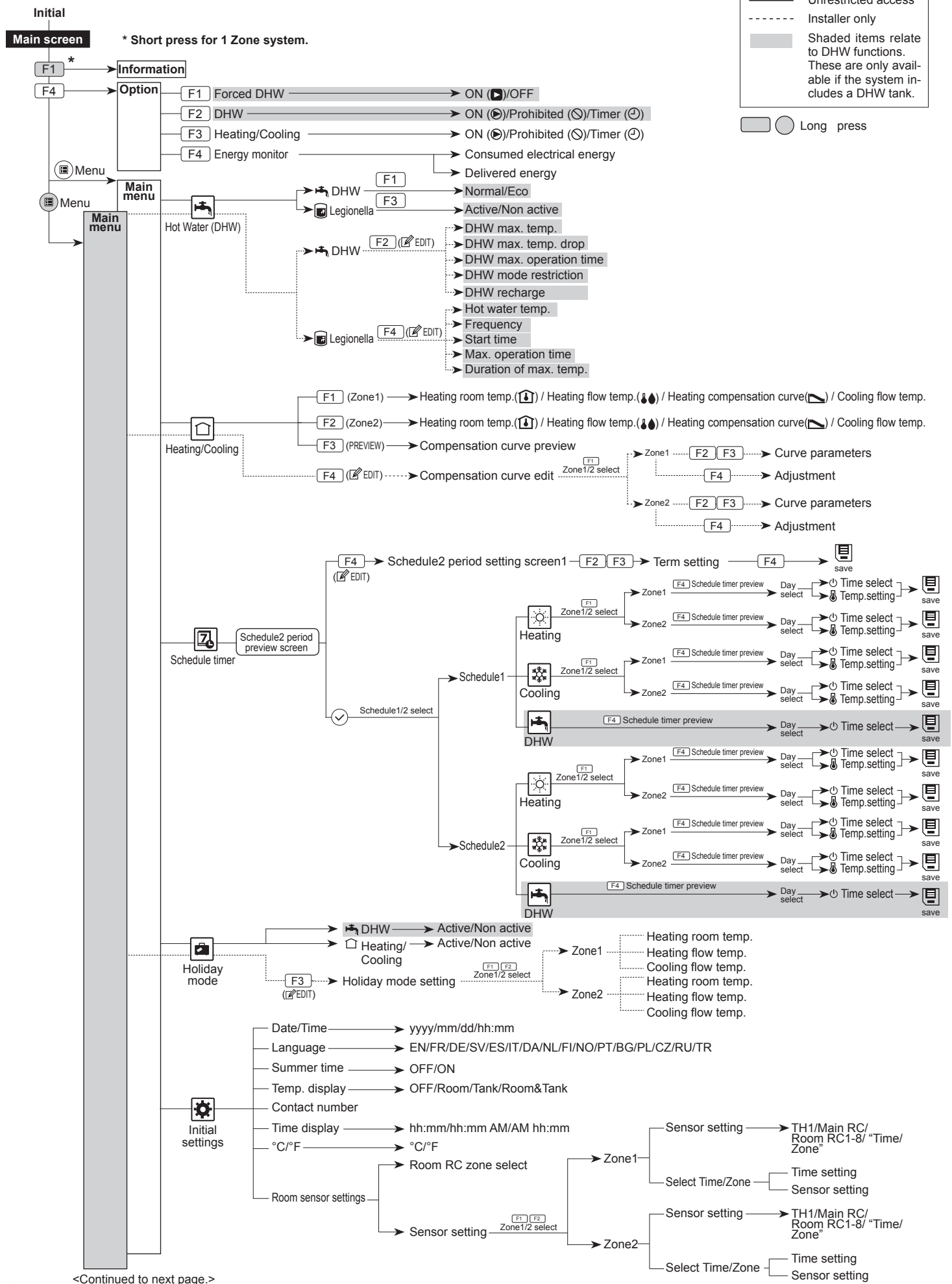
Main menu



<Fig. 5.5.1>

# 5 System Set Up

## <Main Controller Menu Tree>



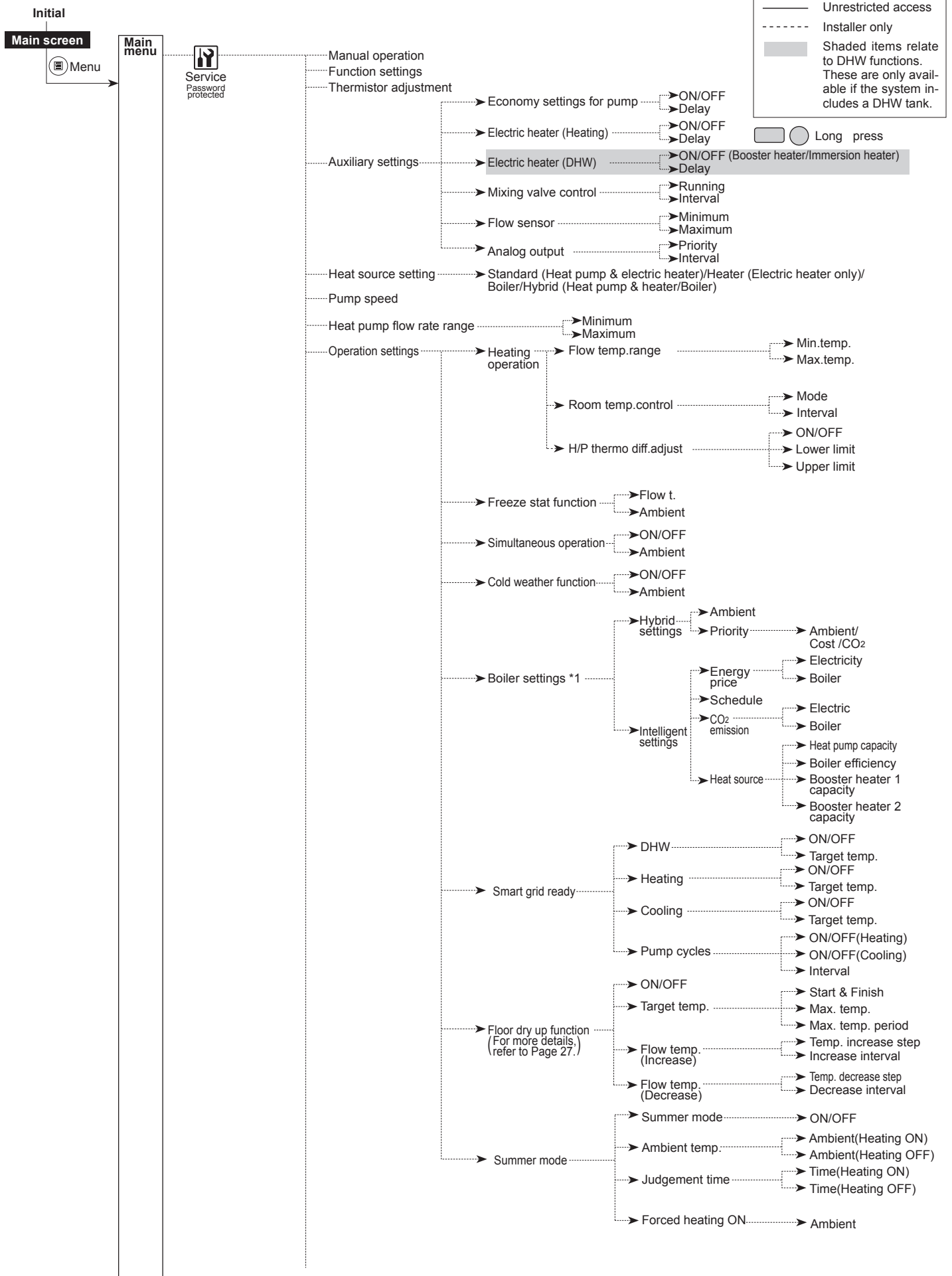
- Unrestricted access
- - - - - Installer only
- Shaded items relate to DHW functions. These are only available if the system includes a DHW tank.
- Long press

en

# 5 System Set Up

<Continued from the previous page.>

## <Main Controller Menu Tree>



— Unrestricted access  
 - - - - - Installer only  
 Shaded items relate to DHW functions. These are only available if the system includes a DHW tank.

□ ○ Long press

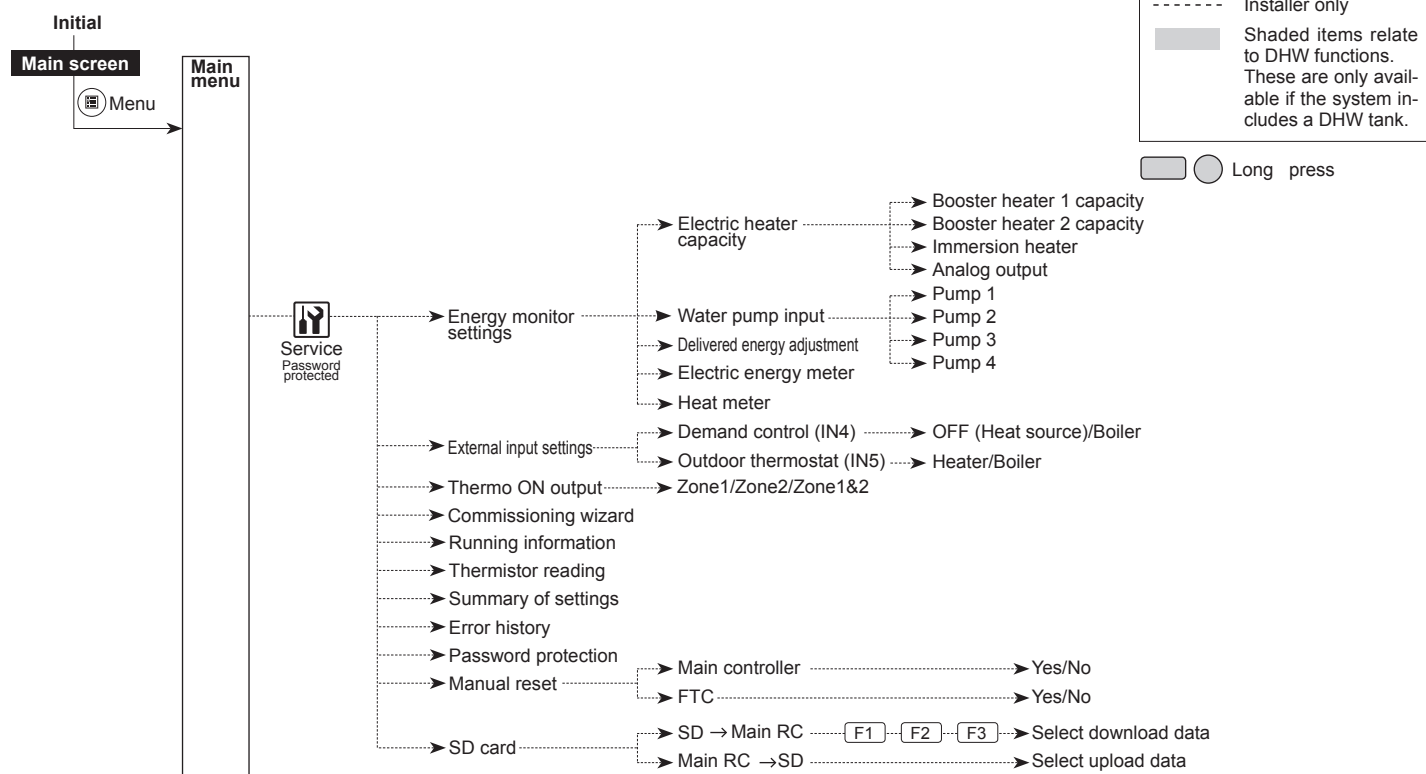
en

\*1 For more details, refer to the installation manual of PAC-TH012HT-E.

# 5 System Set Up

<Continued from the previous page.>

## <Main Controller Menu Tree>

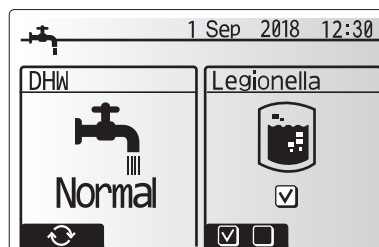


## Domestic Hot Water (DHW)/Legionella Prevention

The domestic hot water and legionella prevention menus control the operation of DHW tank heat ups.

### <DHW mode settings>

1. Highlight the hot water icon and press CONFIRM.
2. Use button F1 to switch between Normal and ECO heating modes.
3. To edit the mode, press down the MENU button for 3 seconds, then select "hot water".
4. Press F2 key to display the HOTWATER (DHW) SETTING menu.
5. Use F2 and F3 keys to scroll through the menu selecting each component in turn by pressing CONFIRM. See the table below for description of each setting.
6. Enter the desired number using the function keys and press CONFIRM.



Menu subtitle	Function	Range	Unit	Default value
DHW max. temp.	Desired temperature of stored hot water	40 - 60	°C	50
DHW max. temp. drop	Difference in temperature between DHW max. temp. and the temperature at which DHW mode restarts	5 - 30	°C	10
DHW max. operation time	Max. time allowed for stored water heating DHW mode	30 - 120	min	60
DHW mode restriction	The time period after DHW mode when space heating has priority over DHW mode temporarily preventing further stored water heating (Only when DHW max. operation time has passed.)	30 - 120	min	30

### <Eco mode>

DHW mode can run in either 'Normal' or 'Eco' mode. Normal mode will heat the water in the DHW tank more quickly using the full power of the heat pump. Eco mode takes a little longer to heat the water in the DHW tank but the energy used is reduced. This is because heat pump operation is restricted using signals from the FTC based on measured DHW tank temperature.

**Note: The actual energy saved in Eco mode will vary according to outdoor ambient temperature.**

### <DHW recharge>

Select the amount of DHW tank. If you need much hot water, select LARGE.

Return to the DHW/legionella prevention menu.

## 5 System Set Up

### Legionella Prevention Mode settings (LP mode)

1. Use button F3 to choose legionella mode active YES/NO.
2. To edit the legionella function, press down the MENU button for 3 seconds and select "hot water", then press F4 key.
3. Use F1 and F2 keys to scroll through the menu selecting each subtitle in turn by pressing CONFIRM. See the table below for description of each setting.
4. Enter the desired number using the function keys and press CONFIRM.

During Legionella Prevention Mode the temperature of the stored water is increased above 60°C to inhibit legionella bacterium growth. It is strongly recommended that this is done at regular intervals. Please check local regulations for the recommended frequency of heat ups.

**Note: When failures occur on the hydrobox, the LP mode may not function normally.**

Menu subtitle	Function	Range	Unit	Default value
Hot water temp.	Desired temp. of stored hot water	60–70	°C	65
Frequency	Time between LP mode DHW tank heat up	1–30	day	15
Start time	Time when LP mode will begin	0:00–23:00	-	03:00
Max. operation time	Maximum time allowed for LP mode DHW tank heat	1–5	hour	3
Duration of max. temp.	The time period after LP mode desired water temp. has been reached	1–120	min	30

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.**

### Initial Settings

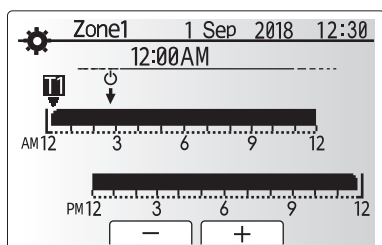
From the Initial settings menu the installer can set the following.

- Date/Time \*Be sure to set it to the local standard time.
- Language
- Summer time
- Temp. display
- Contact number
- Time display
- °C/°F
- 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 main 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. <table border="1" data-bbox="970 1003 1508 1272"> <thead> <tr> <th rowspan="2">Control option (pages 26 - 27)</th> <th colspan="2">Corresponding initial settings room sensor</th> </tr> <tr> <th>Zone1</th> <th>Zone2</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Room RC 1-8 (one each for Zone1 and Zone2)</td> <td>*1</td> </tr> <tr> <td>B</td> <td>TH1</td> <td>*1</td> </tr> <tr> <td>C</td> <td>Main remote controller</td> <td>*1</td> </tr> <tr> <td>D</td> <td>*1</td> <td>*1</td> </tr> <tr> <td>When different room sensors are used according to the time schedule</td> <td>Time/ Zone*2</td> <td>*1</td> </tr> </tbody> </table>	Control option (pages 26 - 27)	Corresponding initial settings room sensor		Zone1	Zone2	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
Control option (pages 26 - 27)	Corresponding initial settings room sensor																				
	Zone1	Zone2																			
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																			
<p>*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)</p> <p>*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.</p>																					

## 5 System Set Up

### 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.

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.

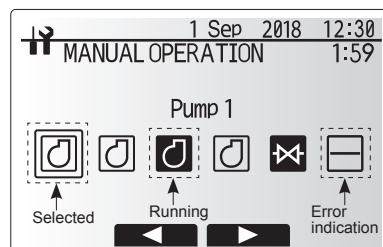
#### <Manual operation>

During the filling of the system the primary circuit 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. When selected, this function will only remain in manual operation for a maximum of 2 hours. This is to prevent accidental permanent override of the FTC.

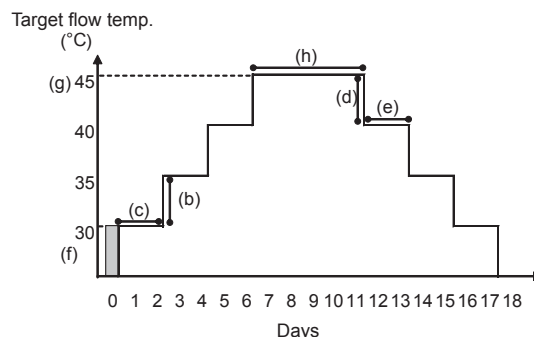
#### ► Example

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 can resume control of the hydrobox.



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.



- This function is not available when a PUAZ-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.

#### <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.

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)	b	Flow temp. increase step	+1 - +10	°C	+5
	c	Increase interval	1 - 7	day	2
Flow temp. (decrease)	d	Flow temp. decrease step	-1 - -10	°C	-5
	e	Decrease interval	1 - 7	day	2
Target temperature	f	Start & Finish	20 - 60	°C	30
	g	Max. target temp.	20 - 60	°C	45
	h	Max. temp. period	1 - 20	day	5

#### <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 seconds.
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.



Password input screen



Password verify screen

## 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 quali-

fications. 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.

### ■ Error Codes

Code	Error	Action
L3	Circulation water temperature overheat protection	Flow rate may be reduced. Check for; <ul style="list-style-type: none"> <li>• Water leakage</li> <li>• Strainer blockage</li> <li>• Water circulation pump function (Error code may display during filling of primary circuit, complete filling and reset error code.)</li> </ul>
L4	DHW tank water temperature overheat protection	Check the immersion heater and it's contactor.
L5	Indoor unit temperature thermistor (THW1, THW2, THW5B, THW6, THW7, THW8, THW9) failure	Check resistance across the thermistor.
L6	Circulation water freeze protection	See Action for L3.
L8	Heating operation error	Check and re-attach any thermistors that may 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. <b>Caution: The pump valves may be hot, please take care.</b>
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-TH012HT-E") Flow rate of the heating circuit from the boiler may be reduced. Check for <ul style="list-style-type: none"> <li>• water leakage</li> <li>• strainer blockage</li> <li>• water circulation pump function</li> </ul>
LD	Boiler temperature thermistor (THWB1) 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 <ul style="list-style-type: none"> <li>• water leakage</li> <li>• strainer blockage</li> <li>• water circulation pump function</li> </ul>
LJ	DHW operation error (type of external plate HEX)	Check for disconnection of DHW tank water temp. thermistor (THW5B). Flow rate of the sanitary circuit may be reduced. Check for water circulation pump function. (primary / sanitary)
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).
LP	Out of water flow rate range for outdoor heat pump unit	Check the installation Table 4.3.1 Check remote controller settings (Service menu / heat pump flow rate range) See Action for L3.
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.
A*	M-NET communication error	Refer to outdoor unit service manual.

**Note: To cancel error codes please switch system off (Press button F4(RESET) on main remote controller).**

en

## 6 Service and Maintenance

### Annual Maintenance

It is essential that the hydrobox is serviced at least once a year by a qualified individual. Any required parts **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 additional filter items that are fitted external to the hydrobox. This is especially important when installing on an old/existing pipe work system.
- The PRV valve (No. 10 on Figure 3.3) should be checked annually by turning the knob manually so that the medium is discharged, thus cleaning the seal seat.

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) Manometer	6 years	Water leakage

#### Parts which require regular inspection

Parts	Check every	Possible failures
Immersion heater	2 years	Earth leakage causing circuit breaker to activate (Heater is always OFF)
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.	20°C - 60°C	45°C			
	Zone2 heating flow temp. *1	20°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 *16	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 min	60 min		
		DHW mode restriction	30 - 120 min	30 min		
		DHW recharge	Large/Standard	Large *19		
		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 min	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.	20°C - 60°C	50°C	
			Zone2 outdoor ambient temp. *1	-30°C - +33°C *3	-15°C	
			Zone2 flow temp. *1	20°C - 60°C	40°C	
		Lo flow temp. set point	Zone1 outdoor ambient temp.	-28°C - +35°C *4	35°C	
			Zone1 flow temp.	20°C - 60°C	25°C	
Zone2 outdoor ambient temp. *1			-28°C - +35°C *4	35°C		
Zone2 flow temp. *1			20°C - 60°C	25°C		
Adjust		Zone1 outdoor ambient temp.	-29°C - +34°C *5	---		
		Zone1 flow temp.	20°C - 60°C	---		
Holiday	DHW *13	Active/Non active	Non active			
		Active/Non active	Active			
	Heating/ Cooling *12	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.	20°C - 60°C	35°C		
		Zone2 heating flow temp. *1	20°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		

(Continued to next page.)



# 6 Service and Maintenance

## Engineers Forms

### Commissioning/Field settings record sheet

Main remote controller screen			Parameters		Default setting	Field setting	Notes		
Setting	Initial settings	Language	EN/FR/DE/SV/ES/IT/DA/NL/FI/NO/PT/BG/PL/CZ/RU/TR		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				
		THW5B	-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				
		THW10	-10°C - +10°C		0°C				
		THWB1	-10°C - +10°C		0°C				
	Auxiliary settings	Economy settings for pump.	Economy settings	On/Off *6		On			
			Delay (3 - 60 min)			10 min			
		Electric heater (Heating)	Space heating: On (used)/Off (not used)			On			
			Electric heater delay timer (5 - 180 min)			30 min			
		Electric heater (DHW) *13	Booster heater	DHW: On (used)/Off (not used)		On			
			Immersion heater	DHW: On (used)/Off (not used)		On			
		Mixing valve control	Running (10 - 240 sec)			120 sec			
			Interval (1 - 30 min)			2 min			
		Flow sensor *18	Minimum(0 - 100L/min)			5 L/min			
			Maximum(0 - 100L/min)			100 L/min			
	Analog output	Interval (1 - 30 min)			5 min				
		Priority(Normal/High)			Normal				
	Pump speed	DHW	Pump speed(1 - 5)		5				
		Heating/Cooling	Pump speed(1 - 5)		5				
	Heat source setting	Standard/Heater/Boiler/Hybrid *7		Standard					
	Heat pump flow rate range	Minimum(0 - 100L/min)			5 L/min				
		Maximum(0 - 100L/min)			100 L/min				
	Operation settings	Heating operation *8	Flow temp.range *10	Min.temp.(20 - 45°C)		30°C			
			Room temp. control *15	Mode(Normal/Fast)		Normal			
Heat pump thermo diff.adjust			Interval(10 - 60min)		10min				
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) *3				-15°C		
Cold weather function		On/Off *6				Off			
		Outdoor ambient temp. (-30 - -10°C) *3				-15°C			
Boiler operation		Hybrid settings	Outdoor ambient temp. (-30 - +10°C) *3				-15°C		
			Priority mode (Ambient/Cost/CO <sub>2</sub> ) *17				Ambient		
			Outdoor ambient temp. rise (+1 - +5 °C)				+3 °C		
		Intelligent settings	Energy price *9	Electricity (0.001 - 999 */kWh)			0.5 */kWh		
	Boiler (0.001 - 999 */kWh)					0.5 */kWh			
	CO <sub>2</sub> emission		Electricity (0.001 - 999 kg -CO <sub>2</sub> /kWh)			0.5 kg -CO <sub>2</sub> /kWh			
Boiler (0.001 - 999 kg -CO <sub>2</sub> /kWh)				0.5 kg -CO <sub>2</sub> /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			

(Continued to next page.)

# 6 Service and Maintenance

## Engineers Forms

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

Main remote controller screen				Parameters	Default setting	Field setting	Notes	
Service menu	Operation settings	Smart grid ready	DHW	On/Off	Off			
				Target temp(+1- +20°C) / -- (Non active)		--		
			Heating	On/Off	Off			
				Target temp.	Switch-on recommendation(20 - 60°C)	50°C		
					Switch-on command(20 - 60°C)	55°C		
			Cooling	On/Off	Off			
				Target temp.	Switch-on recommendation(5 - 25°C)	15°C		
					Switch-on command(5 - 25°C)	10°C		
			Pump cycles	Heating (On/Off)		On		
				Cooling (On/Off)		On		
				Interval(10-120 min)		10 min		
				On/Off *6		Off		
			Floor dry up function	Target temp.	Start&Finish (20 - 60°C)	30°C		
					Max. temp. (20 - 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			
		Summer mode		On/Off		Off		
				Outdoor ambient temp.	Heating ON (4-19°C)	10°C		
					Heating OFF (5-20°C)	15°C		
			Judgement time	Heating ON (1-48 hours)	6 hours			
				Heating OFF (1-48 hours)	6 hours			
		Forced heating ON (-30 - 10°C)		5 °C				
		Energy monitor settings	Electric heater capacity	Booster heater 1 capacity	0 - 30kW	2kW		
				Booster heater 2 capacity	0 - 30kW	4kW		
				Immersion heater capacity	0 - 30kW	0kW		
				Analog output	0 - 30kW	0kW		
			Delivered energy adjustment		-50 - +50%	0%		
			Water pump input	Pump 1	0 - 200W or ***(factory fitted pump)	***		
				Pump 2	0 - 200W	0W		
				Pump 3	0 - 200W	0W		
				Pump 4	0 - 200W	72W		
			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	
			Thermo ON output		Zone1/Zone2/Zone1&2	Zone1&2		

\*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.

\*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 deactivated. (i.e. primary water freeze risk)

\*12 Cooling mode settings are available for ERS\* model only.

\*13 Only available 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 When DIP SW5-2 is set to OFF, the function is active.

\*16 When the hydrobox is connected with a PUMY-P outdoor unit, the mode is fixed to "Normal".

\*17 When the hydrobox is connected with a PUMY-P outdoor unit, the mode is fixed to "Ambient".

\*18 Do not change the setting since it is set according to the specification of flow sensor attached to the hydrobox.

\*19 This setting is valid for only cylinder units.

EC DECLARATION OF CONFORMITY  
EG-KONFORMITÄTSEKTLÄRUNG  
DECLARATION DE CONFORMITÉ CE  
EG-CONFORMITEITSEVERKLARING

DECLARACIÓN DE CONFORMIDAD CE  
DICHIARAZIONE DI CONFORMITÀ CE  
DECLARAÇÃO DE CONFORMIDADE CE  
EU-ÖVERENSSTÄMMELSESEKTLÄRUNG

EG-DEKLARATION OM ÖVERENSSTÄMMELSE  
CE-ERKLÄRUNG OM SAMSVAR  
CE-VAATIMUSTENMUKAISUUSVAKUUTUS  
ДЕКЛАРАЦИЯ СООТВЕТСТВИЯ НОРМАМ ЕС

ES PROHLÁŠENÍ O SHODĚ  
DEKLARACJA ZGODNOŚCI WE  
EO ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСТВИЕ

**mitsubishi electric air conditioning systems europe ltd.**  
**nettlehill road, houstoun industrial estate, livingston, eh54 5eq, scotland, united kingdom**

hereby declares under its sole responsibility that the heating system components described below for use in residential, commercial and light-industrial environments:  
erklärt hiermit auf seine alleinige Verantwortung, dass die unten beschriebenen Zubehörteile für das Heizungs-System zur Benutzung im häuslichen, kommerziellen und leicht-industriellen Umfeld:  
déclare par la présente et sous son entière responsabilité que les composants du système de chauffage décrits ci-dessous pour l'utilisation dans des environnements résidentiels, commerciaux et d'industrie légère :  
verklaart hierbij als enige verantwoordelijke dat de componenten van het verwarmingssteeem die hieronder worden beschreven, bedoeld zijn voor gebruik in woonomgevingen en in commerciële en licht industriële omgevingen:  
declara por la presente bajo su responsabilidad exclusiva que los componentes del sistema de calefacción descritos a continuación para su uso en zonas residenciales, comerciales y para la industria ligera:  
con la presente dichiara, sotto la sua esclusiva responsabilità, che i componenti dell'impianto di riscaldamento descritto di seguito, destinato all'uso in ambienti residenziali, commerciali e industriali:  
através da presente declara sob sua única responsabilidade que os componentes do sistema de aquecimento abaixo descritos para uso residencial, comercial e de indústria ligeira:  
erklærer hermed under eeneansvar, at de herunder beskrevne komponenter til opvarmning til brug i privat boligbyggeri, erhvervsområder og inden for let industri:  
intyggar härmed att uppvärmningssystemkomponenterna som beskrivs nedan är för användning i bostäder, kommersiella miljöer och lätt industri:  
erklærer hermed som sitt ansvar, ene og alene, at komponentene i varmesystemet som beskrives nedenfor og som er beregnet for bruk i bolig-, forretnings- og lettindustriemiljøer:  
vakuuttaa täten asiasta yksin vastuussa, että alla kuvattu lämmitysjärjestelmä osat, jotka on tarkoitettu käytettäväksi asuin-, toimisto- ja kevyen teollisuuden ympäristöissä:  
настоящим заявляет и берет на себя исключительную ответственность за то, что кондиционеры и тепловые насосы, описанные ниже и предназначенные для эксплуатации в жилых помещениях, торговых залах и на предприятиях легкой промышленности:  
tímto na vlastní odpovědnost prohlašuje, že níže popsané klimatizační jednotky a tepelná čerpadla pro použití v obytných prostředích, komerčních prostředích a prostředích lehkého průmyslu:  
niniejszym oświadczam na swoją wyłączną odpowiedzialność, że klimatyzatory i pompy ciepła opisane poniżej, są przeznaczone do zastosowań w środowisku mieszkalnym, handlowym i lekkim przemysłowym:  
с настоящето декларира на своя отговорност, че описаните по-долу компоненти за отоплителна система са годни за експлоатация в жилищна, търговска и лекопромишлена среда:

**MITSUBISHI ELECTRIC, EHSD-MED, EHSD-VM2D, EHSD-VM6D, EHSD-YM9D, EHSD-YN9ED, EHSD-TM9D, ERSD-MED, ERSD-VM2D, EHSC-MED, EHSC-VM2D, EHSC-VM6D, EHSC-YM9D, EHSC-YN9ED, EHSC-TM9D, ERSC-MED, ERSC-VM2D, ERSE-YM9ED, ERSE-MED, EHSE-YM9ED, EHSE-MED, EHPX-MED, EHPX-VM2D, EHPX-VM6D, EHPX-YM9D, EHPX-YN9ED**

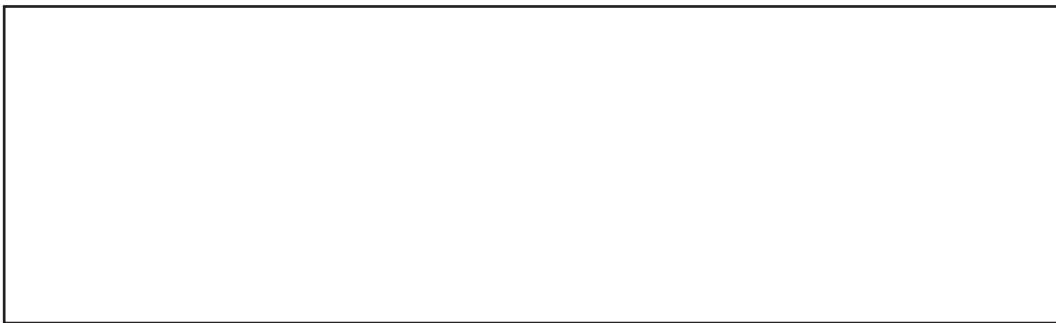
Note: Its serial number is on the nameplate of the product.  
Hinweis: Die Seriennummer befindet sich auf dem Kennschild des Produkts.  
Remarque : Le numéro de série de l'appareil se trouve sur la plaque du produit.  
Opmerking: het serienummer staat op het naamplaatje van het product.  
Nota: El número de serie se encuentra en la placa que contiene el nombre del producto.  
Nota: o número di serie si trova sulla targhetta del prodotto.  
Nota: o número de série encontra-se na placa que contém o nome do produto.  
Bemærk: Seriennummeret står på produktets fabriksskilt.

Obs: Serienumret finns på produktens namnplåt.  
Merk: Serienummeret befinnet seg på navneplaten til produktet.  
Huomautus: Sen sarjanumero on tuotteen nimikilvessä.  
Примечание: серийный номер указан на паспортной табличке изделия.  
Poznámka: Příslušné sériové číslo se nachází na štítku produktu.  
Uwaga: Numer seryjny znajduje się na tabliczce znamionowej produktu.  
Забележка: Серийният номер се намира на табелката с данни за продукта

Directives	Direktiv
Richtlinien	Direktiver
Directives	Direktiivit
Richtlijnen	Директиви
Directivas	Směrnice
Direttive	Dyrektuvy
Directivas	Директиви
Direktiver	

2014/35/EU: Low Voltage  
2006/42/EC: Machinery  
2014/30/EU: Electromagnetic Compatibility  
2009/125/EC: Energy-related Products  
2011/65/EU: RoHS

Please be sure to put the contact address/telephone number on this manual before handing it to the customer.



**mitsubishi** **ELECTRIC CORPORATION**

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