

Hydrobox

ERSF-NM6E

Website manual

INSTALLATION MANUAL

MANUEL D'INSTALLATION

MANUAL DE INSTALACIÓN

FOR INSTALLER

POUR L'INSTALLATEUR

PARA EL INSTALADOR

English

Français

Español

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1 Technical Information

■ Energy monitor

End user can monitor accumulated*1 consumption and production energy in each operation mode*2 on the main remote controller.

*1 Monthly and Year to date

*2 - DHW operation

- Space heating
- Space cooling

Refer to "6. Remote controller" on the paper-based manual for how to check the energy, and "5.1 DIP switch functions" on the paper-based manual for the details on DIP-SW setting. Either one of the following two methods is used for monitoring.

Note: Method 1 should be used as a guide. If a certain accuracy is required, the 2nd method should be used.

	Booster heater 1	Booster heater 2	Pump 1 *3	Pump 2	Pump 3
ERSF-NM6E	2 kW	4 kW	*** W	"When additional pumps supplied locally are connected as Pump 2/3, change setting according to specs of the pumps."	

<Table 1.1>

Method 1. Calculation internally

Electricity consumption is calculated internally based on the energy consumption of outdoor unit, electric heater, water pump(s) and other auxiliaries. (*3)

Delivered heat is calculated internally by multiplying delta T (flow and return temperature) and flow rate measured by the factory fitted sensors.

Set the electric heater capacity and water pump(s) input according to indoor unit model and specs of additional pump(s) supplied locally. (Refer to the menu tree in "6. Remote controller" on the paper-based manual)

*3 "****" displayed in the energy monitor setting mode means the factory fitted pump is connected as Pump 1 so that the input is automatically calculated.

When anti-freeze solution (propylene glycol) is used for primary water circuit, set the delivered energy adjustment if necessary.

Should you need more details, refer to "6. Remote controller" on the paper-based manual.

Method 2. Actual measurement by external meter (locally supplied)

FTC has external input terminals for 2 'Electric energy meters' and a 'Heat meter'.

If two 'Electric energy meters' are connected, the 2 recorded values will be combined at the FTC and shown on the main remote controller.

(e.g. Meter 1 for H/P power line, Meter 2 for heater power line)

Refer to the "Signal inputs" section in "5.2 Connecting inputs/outputs" on the paper-based manual for more information on connectable electric energy meter and heat meter.

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2 Installation

■ How to access Internal Components and Control and Electrical Box

<A> Opening the front panel

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

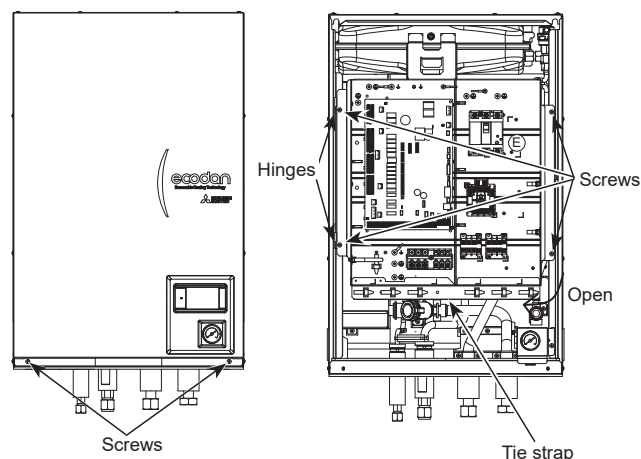
 Accessing the back of the control and electrical box

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

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

Notes:

1. **Before accessing back of the control and electrical box, release cables from the tie strap attached to the cross-support.**
2. **After servicing, re-secure all cables using straps provided. Reconnect main remote controller cable to its relay connector. Replace the front panel and re-secure the screws at base.**



<Figure 2.1>

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■ Room Thermostat

If a room thermostat is fitted for the system:

- Position it out of direct sunlight and draughts
- Position it away from internal heat sources
- Position it in a room without a thermostatic radiator valve on the radiator/heat emitter
- Position it on an internal wall

Note: Do not position the thermostat close to an external wall. The thermostat may detect the temperature of the wall, which could impact the accurate control of the room temperature.

- Position it approx. 4.9 ft (1.5 m) above floor level

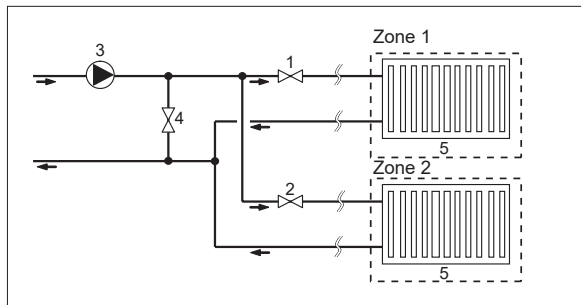
3 System Set Up

3.1 Simple 2-zone System

■ 2-zone valve ON/OFF control

Opening/closing 2-way valve provides a simple 2-zone control.
Flow temperature is common for Zone 1 and 2.

1. Pipe work



1. Zone 1 2-way valve 2a (local supply)
2. Zone 2 2-way valve 2b (local supply)
3. Water circulation pump 2 (local supply) *1
4. Bypass valve (local supply) *2
5. Heat emitter (e.g. radiator, fan coil unit) (local supply)

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

2. DIP switch

Turn DIP switch 3-6 ON.

3. 2-way valve 2a (for Zone 1) / 2-way valve 2b (for Zone 2)

Electrically wire 2-way valve 2a and 2b to the appropriate external output terminals. (Refer to "Outputs" in 5.2 on the paper-based manual.)

4. Room thermostat connection

Heating operation mode	Zone 1	Zone 2
Room temperature control (Auto Adaptation) *3	• Room temperature thermistor (option) • Main remote controller (remote position)	
Weather compensation curve or flow temperature control	• Room temperature thermostat (local supply)	• Room temperature thermostat (local supply)

*1 Install according to system in the field.

*2 For safety protection, it is recommended to install a by-pass valve.

*3 Ensure to install the room thermostat for Zone 1 in main room since the room temperature control for Zone 1 is prioritized.

3.2 Remote Controller Options

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

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

Refer to heating section of this manual for instructions on how to set the weather compensation curve, flow temperature or room temperature (Auto Adaptation). For instructions on how to set the thermistor input for the FTC, please refer to Setting section in 6. Remote Controller in the installation manual.

Note: Auto Adaptation is not available in cooling mode.

1-zone temperature control

Control option A This option features the main remote controller and the Mitsubishi Electric thermistor wired to FTC. The thermistor is used to monitor room temperature but can not make any changes in control operation. Any changes to DHW *1 must be made using the main remote controller mounted on the indoor unit. Wire the thermistor to the TH1 connector on FTC. The number of room temperature thermistors that can be connected to FTC is always one.	Factory supplied standard Outdoor unit Indoor unit FTC (Main) Main remote controller
Control option B This option features the main remote controller being removed from the indoor unit and situated in a different room. A thermistor built in the main remote controller can be used for monitoring the room temperature for Auto Adaptation function whilst keeping all its features of the main remote controller available. The main remote controller and FTC are connected by a 2-core, 0.3 mm², non-polar cable (local supply) with a maximum length of 492 ft (150 m). To use the sensor in the main remote controller, the main remote controller should come off from the indoor unit. Otherwise it will detect the temperature of the indoor unit instead of room temperature. This will affect the output of the space heating. Note: Wiring for main remote controller cable shall be (5 cm or more) apart from power source wiring so that it is not influenced by electrical noise from power source wiring. (Do not insert main remote controller cable and power source wiring in the same conduit.)	Outdoor unit Indoor unit FTC (Main) Main remote controller Room temperature thermistor (option) Room
Control option C (Flow temperature or weather compensation curve only) This option features the main remote controller and a locally supplied thermostat wired to FTC. The thermostat is used to set the maximum temperature for heating room or the minimum temperature for cooling room. Any changes to DHW *1 must be made using main remote controller mounted on the indoor unit. The thermostat is wired to IN1 in TBI.1 on FTC. The number of thermostats that can be connected to FTC is one for one zone.	Outdoor unit Indoor unit FTC (Main) Main remote controller Room temperature thermostat (local supply) Room

*1 If applicable

3 System Set Up

2-zone temperature control

Control option A

This option features the main remote controller, the Mitsubishi Electric thermistor and a locally supplied thermostat that are wired to FTC.

The thermistor is used to monitor the Zone 1 room temperature and the thermostat is used to control the Zone 2 room temperature.

The thermostat can be also allocated to Zone 1 and the thermistor to Zone 2.

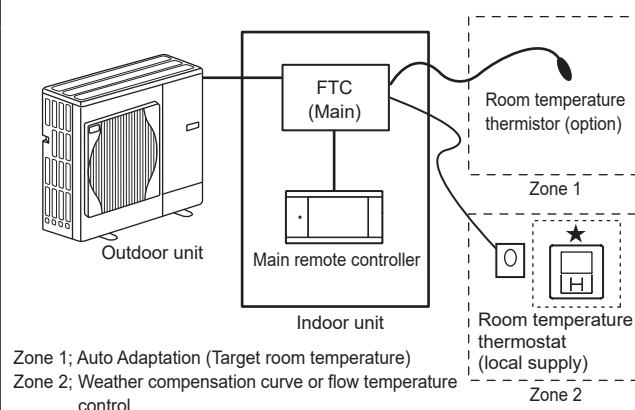
The thermistor can not make any changes in control operation. Any changes to DHW *1 must be made using the main remote controller mounted on the indoor unit.

Wire the thermistor to the TH1 connector on FTC.

The number of room temperature thermistors that can be connected to FTC is always one.

The thermostat is used to set the maximum temperature for heating Zone 2 room.

The thermostat is wired to IN6 on FTC. (If the thermostat is allocated to Zone 1, wire it to IN1 on TBI.1.) (Refer to 5.2. on the paper-based manual.)



Control option B

This option features the main remote controller (with in-built thermistor) that is removed from the indoor unit to monitor the Zone 1 room temperature and a locally supplied thermostat to monitor the Zone 2 room temperature.

The thermostat can be also allocated to Zone 1 and the thermistor to Zone 2.

A thermistor built into the main remote controller can be used for monitoring the room temperature for Auto Adaptation function whilst keeping all its features of the main remote controller available.

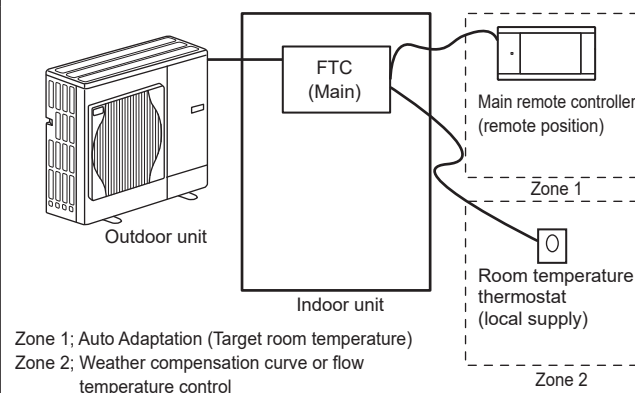
The main remote controller and FTC are connected by a 2-core, 0.3 mm², non-polar cable (local supply) with a maximum length of 492 ft (150 m).

To use the sensor in the main remote controller, the main remote controller should be detached from the indoor unit. Otherwise it will detect the temperature of the indoor unit instead of room temperature. This will affect the output of the space heating.

The thermostat is used to set the maximum temperature for heating Zone 2 room.

The thermostat is wired to IN6 on FTC. (If the thermostat is allocated to Zone 1, wire it to IN1 on TBI.1.) (Refer to 5.2. on the paper-based manual.)

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

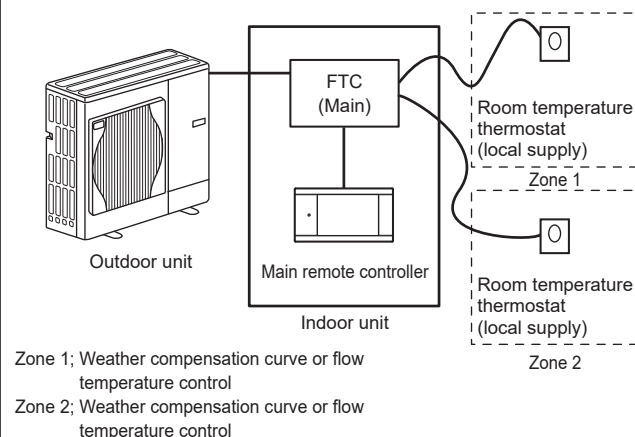


Control option C

This option features the locally supplied thermostats wired to FTC. The thermostats are individually allocated to Zone 1 and Zone 2. The thermostats are used to set each maximum temperature for heating Zone 1 and Zone 2 rooms or the minimum temperature for cooling Zone 1 and Zone 2. Any changes to DHW *1 must be made using the main remote controller mounted on the indoor unit.

The thermostat for Zone 1 is wired to IN1 in TBI.1 on FTC.

The thermostat for Zone 2 is wired to IN6 in TBI.1 on FTC.



*1 If applicable

*2 For the options above, the sensor types can be exchanged between Zone 1 and Zone 2. (e.g. Wireless remote controller in Zone 1 and room temperature thermostat in Zone 2 can be changed to room temperature thermostat and wireless remote controller, respectively)

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3 System Set Up

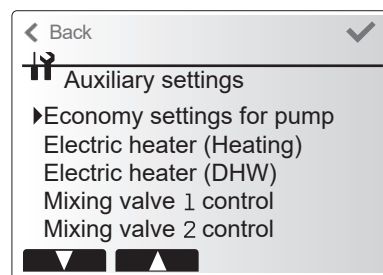
3.3 Service Menu (Special setting)

■ Main remote controller

[Auxiliary settings]

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

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



[Auxiliary settings]

*1. Decreasing "time before pump switched off" may increase the duration of stand-by in heating/cooling mode.

*2. Set the running time according to the specifications of the actuator of each mixing valve. It is recommended to set the interval to 2 minutes that is a default value. With the interval set longer, it could take longer to warm up a room.

*3. Do not change the setting since it is set according to the specification of flow sensor attached to the indoor unit.

[Operation settings]

[Heating operation]

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

Menu subtitle	Function	Range	Unit	Default
[Flow temperature range]	[Minimum temp.] To minimize the loss by frequent ON and OFF in mild outdoor ambient temperature seasons.	68 to 113 (20 to 45)	°F (°C)	87 (30)
	[Maximum temp.] To set maximum possible flow temperature according to the type of heat emitters.	95 to 158 (35 to 70)	°F (°C)	122 (50)
[Room temperature control]	[Mode] Setting for room temperature control At Quick mode, target outlet water temperature is set higher than the one set at normal mode.	Auto/Quick/ Normal/ Slow	—	Auto
	[Interval] Selectable according to the heat emitter type and the materials of floor (i.e. radiators, floor heating-thick, -thin concrete, wood, etc.)	10 to 60	min.	10
[Heat pump thermo diff.]	On/Off To minimize the loss by frequent ON and OFF in mild outdoor ambient temperature seasons.	On/Off	—	On
	[Lower] Prohibits heat pump operation until the flow temperature drops below the target flow temperature plus lower limit value.	-16 to -2 (-9 to -1)	°F (°C)	-9 (-5)
	[Upper] Allows heat pump operation until the flow temperature rises above the target flow temperature plus upper limit value.	+5 to +9 (+3 to +5)	°F (°C)	9 (+5)

Notes:

1. The minimum flow temperature that prohibits heat pump operation is 68°F (20°C).
2. The maximum flow temperature that allows heat pump operation equals to the maximum temperature set in the [Flow temperature range] menu.

[Water flow control]

Adjust the water flow rate of pump 1 to achieve the flow temperature difference (delta T) set by the remote controller.

Menu subtitle	Range	Unit	Default
[Water flow control]	On/Off	-	Off
	Water temperature difference Heating	+5 to +36 (+3 to +20)	°F (°C)
	Cooling	+5 to +18 (+3 to +10)	°F (°C)
[Heat pump settings]	[Heat pump flow rate range] Minimum	0.0 to 26.4 GPM (0 to 100 L/min)	GPM

Notes:

- The minimum flow rate is 2.2 GPM (8L/min) or the setting value of the heat pump flow rate range. Make sure the minimum flow rate range is correct.
- When the DIP SW2-6 is ON (with mixing tank), the water flow control is invalid.
- Water flow control is not available during multiple outdoor unit control.
- The default setting for the WUZ series outdoor unit is "High temperature control".
- To enable this function in the outdoor unit of WUZ series, switch the [Mode 7] in [Function settings] to "2". ([Menu] → [Service] → [Function settings], [Ref.add: 0], [Unit: 1] → [Mode 7], 1-High temperature control (default) / 2-Water temperature difference control)

3 System Set Up

[Freeze stat function]

Menu subtitle	Function/ Description
[Freeze stat function] *4	An operational function to prevent the water circuit from freezing when outdoor ambient temperature drops.
[Flow temp.]	The target outlet water temperature at water circuit when operating in freeze stat function. *5
[Ambient temp.]	Minimum outdoor ambient temperature which freeze stat function will begin to operate, (37 to 68°F [3 to 20°C]) or choose**. If asterisk (**) is chosen, freeze stat function is deactivated. (i.e. primary water freeze risk)

*4. When the system is turned off, freeze stat function is not enabled.

*5. Flow temperature is fixed to 68°F (20°C) and unchangeable.

- Range of outdoor ambient temperature at which simultaneous operation starts is -22 to 50°F (-30 to 10°C) (default 5°F [-15°C]).
- System shall automatically return to routine operation. This will happen when the outdoor ambient temperature rises above the selected temperature for this specific mode of operation.

[Simultaneous Operation]

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

[Cold weather function]

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

- Range of outdoor ambient temperature at which cold weather function starts is -22 to 14°F (-30 to -10°C) (default 5°F [-15°C]).
- System shall automatically return to routine operation. This will happen when the outdoor ambient temperature rises above the selected temp for this specific mode of operation.

[Energy monitor settings]

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

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

[External input settings]

[Demand control (IN4)]

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

[Outdoor thermostat (IN5)]

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

[Cooling limit temp. (IN15)]

Dew point thermostat can be connected to IN15. (To avoid condensation) When the input signal (IN15) is ON, the cooling target flow temperature is limited by remote controller.

Note: For outdoor unit protection, this target temperature is kept for 60 minutes after changing IN15 input.

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4 Supplementary information

■ Refrigerant collecting (pumpdown)

Refer to "Refrigerant collection" in the outdoor unit installation manual or service manual.

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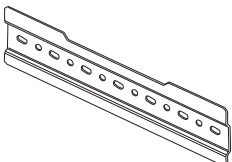
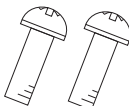
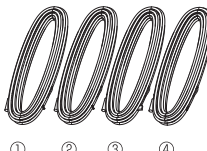
<https://www.l2.mitsubishielectric.com/>

Should you need more information, please access above website to download detailed manuals, select your region, select model name, then choose your language.

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Accessories (included)

Back plate	Screw M5×8	Thermistors ①THW6/②THW7/③THW5B/④THWB1
		
1	2	1 pc. each

Abbreviations and glossary

No.	Abbreviations/Word	Description
1	Weather compensation curve mode	Space heating incorporating outdoor ambient temperature compensation
2	Cooling mode	Space cooling through fan-coils or underfloor cooling
3	DHW mode	Domestic Hot Water heating mode for showers, sinks, etc
4	Flow temperature	Temperature at which water is delivered to the primary circuit
5	Freeze stat. function	Heating control routine to prevent water pipes freezing
6	FTC	Flow Temperature Controller, the circuit board in charge of controlling the system
7	Heating mode	Space heating through radiators or underfloor heating
8	Hydrobox	Indoor unit housing the component plumbing parts (NO DHW tank)
9	Legionella	Bacteria potentially found in plumbing, showers and water tanks that may cause Legionnaires disease
10	LP mode	Legionella prevention mode – a function on systems with water tanks to prevent the growth of legionella bacteria
11	Packaged model	Plate heat exchanger (Refrigerant - Water) in the outdoor heat pump unit
12	PRV	Pressure Relief Valve
13	Return water temperature	Temperature at which water is delivered from the primary circuit
14	Split model	Plate heat exchanger (Refrigerant - Water) in the indoor unit
15	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 operation 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.

MEANINGS OF SYMBOLS DISPLAYED ON THE UNIT

 	WARNING (Risk of fire)	This mark is for R32 refrigerant only. Refrigerant type is written on nameplate of outdoor unit. In case that refrigerant type is R32, this unit uses a flammable refrigerant. If refrigerant leaks and comes in contact with fire or heating part, it will create harmful gas and there is risk of fire.
	Read the OPERATION MANUAL carefully before operation.	
	Service personnel are required to carefully read the OPERATION MANUAL and INSTALLATION MANUAL before operation.	
	Further information is available in the OPERATION MANUAL, INSTALLATION MANUAL, and the likes.	

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, 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 or above 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.
This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- 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 heat pump's specified refrigerant 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 36°F (2°C) below the maximum allowable temperature of all the heat emitters. For Zone 2, set the target flow temperature to a minimum of 41°F (5°C) below the maximum allowable flow temperature of all the heat emitters.
- Do not install the unit where combustible gas may leak, be produced, flow, or accumulate. If combustible gas accumulates around the unit, fire or explosion may result.
- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odor.
- Pipe-work including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ASHRAE 15, ASHRAE 15.2, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA 852.
- Do not remove the red label near the pipe connection part.
- The installation of pipe-work shall be kept to a minimum.
All field joints shall be accessible for inspection prior to being covered or enclosed.
- Compliance with national gas regulations shall be observed.

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1 Safety Notices

WARNING

- Keep any required ventilation openings clear of obstruction.
- Do not use low temperature solder alloy in case of brazing the refrigerant pipes.
- Refrigerant leakage may cause suffocation. Provide ventilation in accordance with local code.
- Be sure to wrap insulation around the piping. Direct contact with the bare piping may result in burns or frostbite.
- When disposal of equipment using flammable refrigerants, see national regulations. Notification of refrigerant discharge shall be provided in accordance with the International Fire Code.

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.
- Never put batteries in your mouth for any reason to avoid accidental ingestion.
- Battery ingestion may cause choking and/or poisoning.
- If power to the hydrobox is to be turned off (or system switched off) for a long time, the water of DHW tank should be drained.
- Do not drain the water in the primary circuit and do not turn off the power.
- 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.
- 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.
- This appliance incorporates an earth connection for functional purposes only.

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.

3 Technical Information

■ Product specification

Model name				ERSF-NM6E	
Unit dimensions [Height × Width × Depth]			in. (mm)	31 1/2 × 20+55/64 × 14 11/64 (800 × 530 × 360)	
Water volume of heating circuit in the unit *1			gal (L)	1.4 (5.3)	
Unvented expansion vessel (Primary heating)	Nominal volume		gal (L)	3.2 (12)	
	Charge pressure		psi (MPa)	14.5 (0.1) [1 bar]	
Safety device	Primary circuit	Control thermistor	°F (°C)	34 - 176 (1 - 80)	
		Pressure relief valve *9	psi (MPa)	43.5 (0.3) [3 bar]	
		Flow sensor	GPM (L/min)	Min. flow 1.4 (5.0), See table 4.3.1 about water flow rate range.	
	Booster heater	BH manual reset thermostat	°F (°C)	194 (90)	
		BH thermal cut-out	°F (°C)	250 (121)	
Connections	Water	Primary circuit		NPT1 nut	
	Refrigerant	Liquid	in. (mm)	ø1/4 (ø6.35)	
		Gas	in. (mm)	ø5/8 (ø15.88)	
Operating range	Heating	Room temperature	°F (°C)	50 - 87 (10 - 30)	
		Flow temperature *4, *5	°F (°C)	68 - 158 (20 - 70)	
	Cooling	Room temperature	°F (°C)	-	
		Flow temperature	°F (°C)	41 - 77 (5 - 25)	
Guaranteed operating range *2	Ambient	Temperature	°F (°C)	32 - 95 (0 - 35)	
		Humidity	%RH	≤ 78%RH at 81°F (27°C) *6	
	Outdoor temperature	Heating	°F (°C)	See outdoor unit spec table.	
		Cooling	°F (°C)	*3	
Electrical data	Control board	Power supply (Phase, voltage, frequency)		~, 208/230 V, 60 Hz	
		Input	kW	0.30	
		Current	A	1.76 (208 V) / 1.95 (230 V)	
		Breaker	A	15 *8	
	Booster heater	Power supply (Phase, voltage, frequency)		~, 208/230 V, 60 Hz	
		Capacity	kW	4.9 (208 V) / 6.0 (230 V)	
		Current	A	23.5 (208 V) / 26.0 (230 V)	
		Breaker	A	35	
Sound power level (PWL) *7			dB(A)	48	
Sound pressure level (SPL) (3.3 ft [1 m])			dB(A)	34	

<Table 3.1>

*1 Excluding the expansion vessel and piping to expansion vessel.

*2 The environment must be frost-free.

*3 See outdoor unit spec table. Minimum temperature is 50°F (10°C).

Cooling mode is not available in low outdoor temperature.

If you use our system in cooling mode at the low ambient temperature of 50°F (10°C) or below, there are some risks of plate heat exchanger damages by frozen water.

*4 Maximum temperature of ERSF model depending on the connected outdoor unit. WUZ: 158°F (70°C).

*5 For more details, refer to the installation manual of outdoor unit.

*6 When the unit is operated in the condition with the humidity exceeding 78%, dew condensation may be produced from the indoor unit.

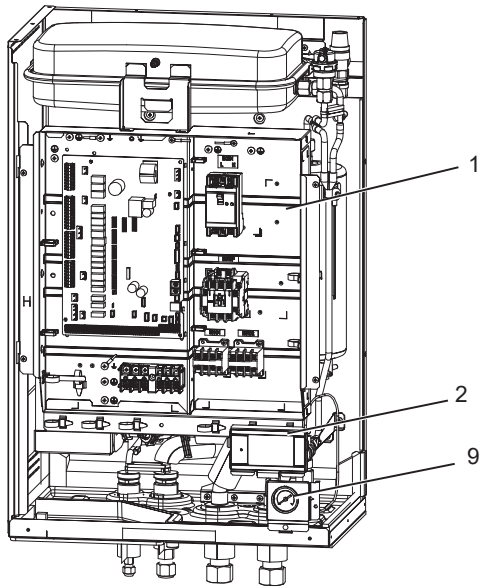
*7 The sound power level is measured in accordance with ISO 3744.

*8 The breaker for the control board is required only during the indoor unit only operation (without the outdoor unit operation.) Refer to "5.5 Indoor Unit Only Operation" for the detailed installation instruction.

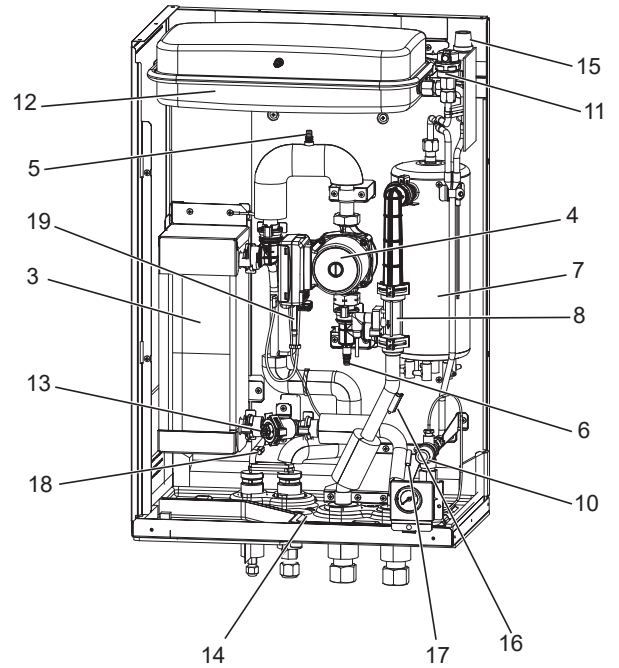
*9 The maximum water or brine operating pressure of the primary circuit is equal to the set pressure of the pressure relief valve.

3 Technical Information

■ Component Parts



<Figure 3.1>



<Figure 3.2>

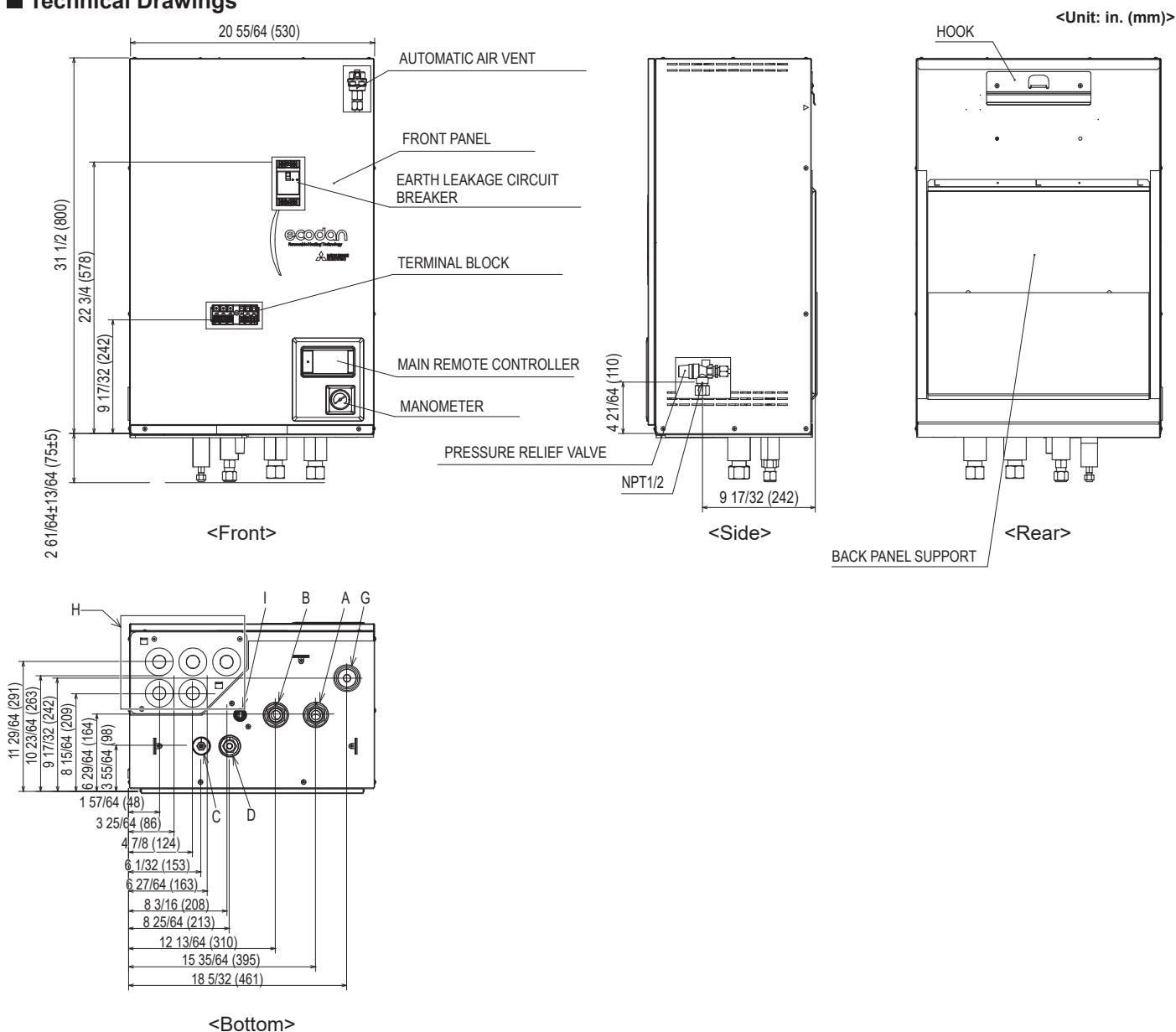
No.	Part name
1	Control and electrical box
2	Main remote controller
3	Plate heat exchanger (Refrigerant - Water)
4	Water circulation pump 1
5	Air vent (manual)
6	Drain cock (Primary circuit)
7	Booster heater
8	Flow sensor
9	Manometer
10	Pressure relief valve 43.5 psi (3 bar)
11	Automatic air vent
12	Expansion vessel
13	Magnetic filter
14	Drain pan
15	Pressure relief valve 72.5 psi (5 bar)
16	THW1 (Flow water temp.)
17	THW2 (Return water temp.)
18	TH1 (Ref. liquid temp.)
19	Pressure sensor

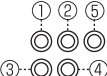
<Table 3.2>

For installation, make sure to install a suitably sized primary-side expansion vessel. (See figure 4.3.5 for further guidance)

3 Technical Information

■ Technical Drawings

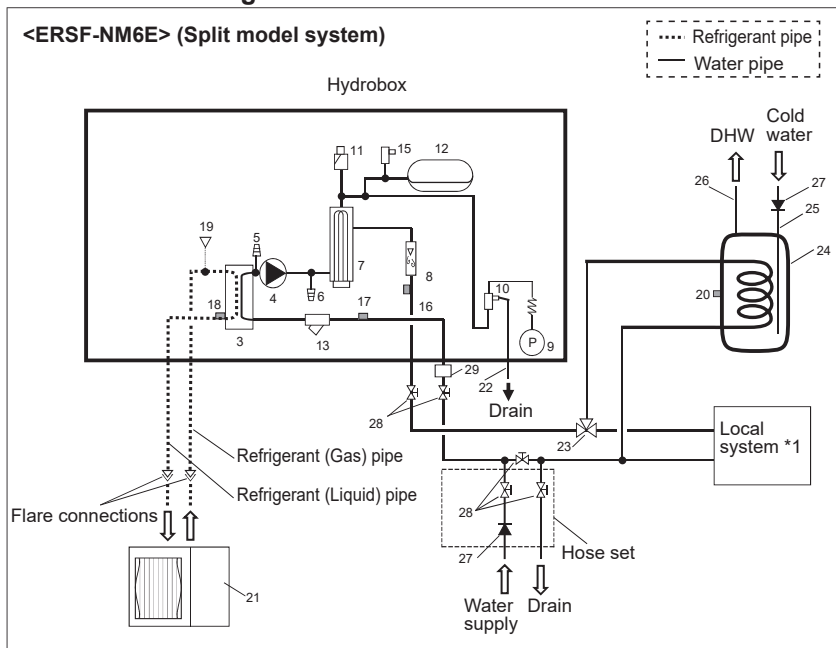


Letter	Pipe description	Connection size/type	
A	Space heating/Indirect DHW tank (primary) RETURN connection	NPT1	
B	Space heating/Indirect DHW tank (primary) FLOW connection	NPT1	
C	Refrigerant (Liquid)	1/4 in. (6.35 mm)/Flare	 Warning • Refrigerant pipes connection shall be accessible for maintenance purposes. • In case of reconnecting the refrigerant pipes after detaching, make the flared part of pipe re-fabricated.
D	Refrigerant (Gas)	5/8 in. (15.88 mm)/Flare	
G	Discharge pipe (by installer) from pressure relief valve	NPT1/2 (valve port within hydrobox casing)	
H	Electrical cable inlets 	For inlets ①, ②, and ③ run high-voltage wires including power cable, indoor-outdoor cable and external output wires. For inlet ④, run low-voltage wires including external input wires and thermistor wires.	
I	Drain socket	Outside diameter: 25/32 in. (20 mm)	

<Table 3.3>

3 Technical Information

Water circuit diagram



<Figure 3.3>

Notes

- Be sure to follow 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.
- Do not always connect the hose set to the system. Connect it only when supplying or draining water.
- Be sure to install a strainer on the inlet pipe work to the hydrobox.
- Suitable drain pipework should be attached to the relief valves instructed to be connected to it in Figure 3.3 in accordance with country's regulations.
- According to local code, install a back flow prevention device on water supply pipework for preventing from back siphonage.
- If using a vacuum relief valve to prevent siphoning of system, the vacuum relief valve shall comply with ANSI Z21.22.
- 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.
- DHW tank temperature by legionella prevention mode may be greater than 140°F (60°C), therefore a master thermostatic mixing valve complying with ASSE 1017 shall be provided to limit the water supplied to the potable hot water distribution system to a temperature of 140°F (60°C) or less.

*1 Refer to the following section "Local system".

No.	Part name	ERSF-NM6E
1	Control and electrical box	✓
2	Main remote controller	✓
3	Plate heat exchanger (Refrigerant - Water)	✓
4	Water circulation pump 1	✓
5	Air vent (manual)	✓
6	Drain cock (Primary circuit)	✓
7	Booster heater	✓
8	Flow sensor	✓
9	Manometer	✓
10	Pressure relief valve 43.5 psi (3 bar)	✓
11	Automatic air vent	✓
12	Expansion vessel	✓
13	Magnetic filter	✓
14	Drain pan	✓
15	Pressure relief valve 72.5 psi (5 bar)	✓
16	THW1 (Flow water temp.)	✓
17	THW2 (Return water temp.)	✓
18	TH2 (Ref. liquid temp.)	✓
19	Pressure sensor	✓
20	THW5B	✓
21	Outdoor unit	—
22	Drain pipe (Local supply)	—
23	3-way valve (Local supply)	—
24	DHW indirect unvented tank (Local supply)	—
25	Cold water inlet pipe (Local supply)	—
26	DHW outlet pipe (Local supply)	—
27	Back flow prevention device (Local supply)	—
28	Isolating valve (Local supply)	—
29	Strainer (Local supply)	—

<Table 3.4>

✓ is marked for the parts installed to the indoor unit.

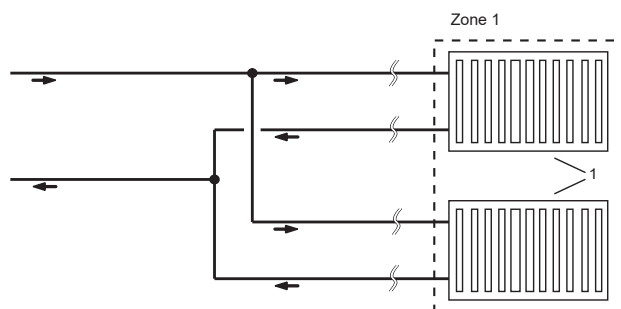
3 Technical Information

Local system

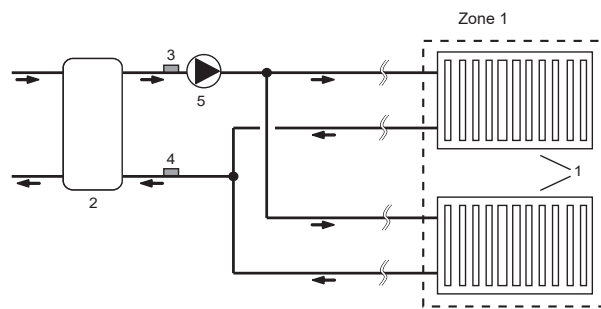
The following diagrams show various patterns of the parts of the local system indicated in the previous page.

Note: When the mixing tank is installed and the return temperature to the indoor unit is 131°F (55°C) or higher, the outdoor unit operation is stopped to prevent the product mechanical damage.

1-zone temperature control

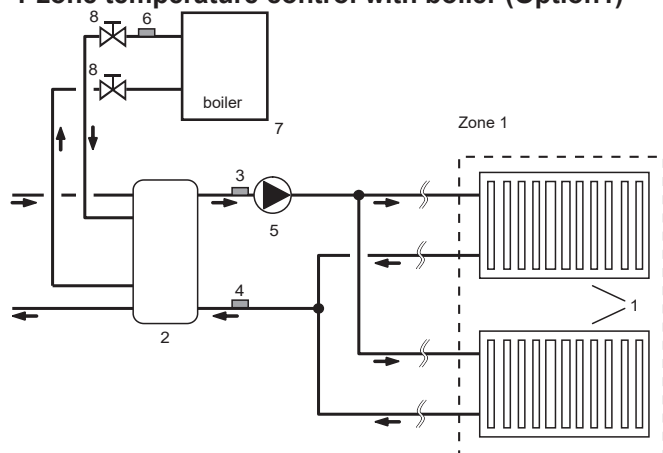


1-zone temperature control & buffer tank (mixing tank)



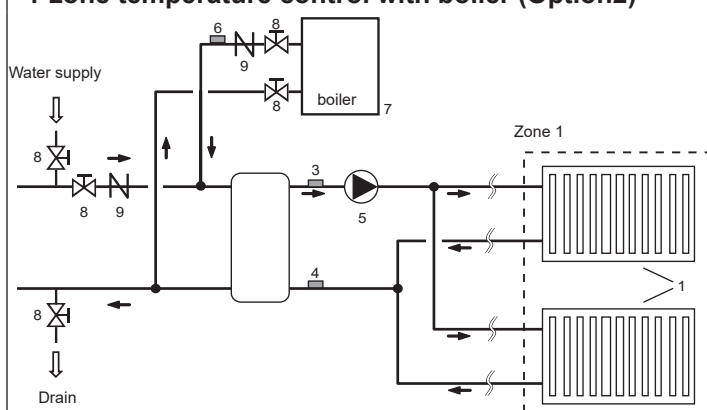
Note:
When installing a pump other than the 230 VAC pump as the water circulation pump (No.5), the terminal block (TBO. 1 3-4) for signal output (OUT2) on the P.C.B. cannot be used. Instead, follow the procedure below.
• Connect the room thermostat input to the terminal block (TBI. 1 7-8) (IN1) on the P.C.B.
• When performing the mixing tank control, set DIP SW 2-6 to ON.

1-zone temperature control with boiler (Option1)



Note:
When installing a pump other than the 230 VAC pump as the water circulation pump (No.5), the terminal block (TBO. 1 3-4) for signal output (OUT2) on the P.C.B. cannot be used. Install and set up the system according to "5.4 Back-up Operation of Boiler"

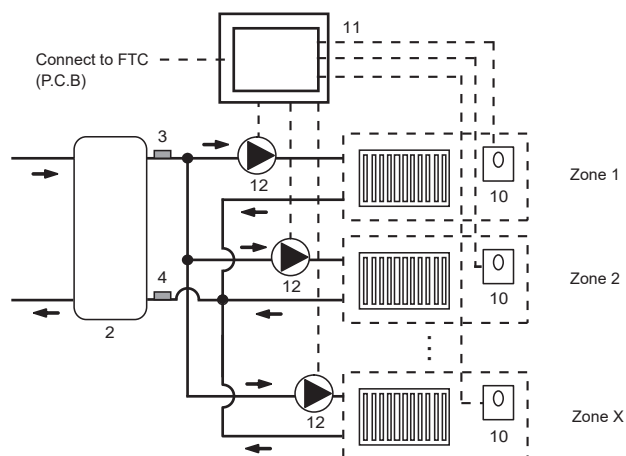
1-zone temperature control with boiler (Option2)



If the number of connection port on the buffer tank (mixing tank) is insufficient, merge the ATW indoor unit outlet and the boiler outlet and let the water flow into the mixing tank. The water flowing back from the mixing tank shall be branched to the ATW indoor unit inlet and the boiler inlet. In this case, make sure to follow the precautions stated below.

Note:
• If the boiler outlet water flows into the indoor unit, it may cause the equipment breakdown. Therefore, install 2 pcs. of reversing valve as shown in the diagram.
• It is difficult to fill the water with the non return valve installed; therefore, install the isolating valve as shown in the diagram.

Multiple Zone Control using External Controller



Note: When applying this system, the external controller is required. Each zone will be controlled by the external controller, not by the indoor unit P.C.B. Follow the precautions stated below.

• Connect each pump to the external controller, not to the indoor unit P.C.B.
• Install the room thermostat to each zone and connect each room thermostat to the external controller.
• The room thermostat input signal to the indoor unit P.C.B. from the external controller shall be connected to the terminal block (TBI.1 7-8)(IN1) on the P.C.B.
• Connecting to the boiler is possible with this system; however, note that the outdoor unit operation will stop when the return temperature to the indoor unit reaches 131°F (55°C) or higher.

1. Zone 1 heat emitters (e.g. radiator, fan coil unit) (local supply)
2. Mixing tank (local supply)
3. Thermistor (Zone 1 flow water temp.) (THW6)
4. Thermistor (Zone 1 return water temp.) (THW7)
5. Zone 1 water circulation pump (local supply)
6. Thermistor (Boiler flow water temp.) (THWB1)

7. Boiler (local supply)
8. Isolating valve (local supply)
9. Non return valve (Check valve for backflow prevention) (local supply)
10. Room thermostat (local supply)
11. External controller (local supply)
12. Water circulation pump (local supply) connected with external controller

en

4 Installation

<Preparation before the installation and service>

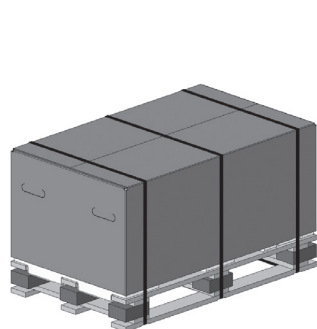
- Prepare the proper tools.
- Prepare the proper protection.
- Allow parts to cool before attempting any maintenance.
- Provide adequate ventilation.
- After stopping the operation of the system, turn off the power-supply breaker and remove the power plug.
- Discharge the capacitor before commencing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

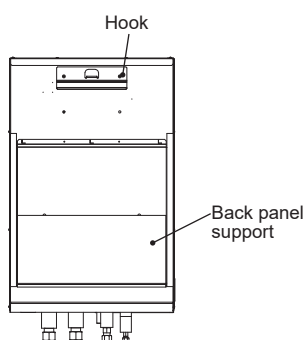
4.1 Location

■ 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.

Notes:

- 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.

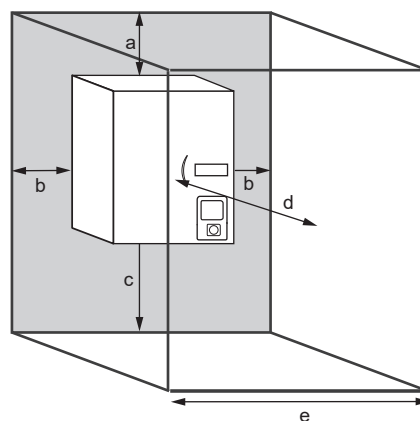
- The hydrobox should be installed indoors in a frost free weather proof location.
- Install the hydrobox where it is not exposed to water/excessive moisture.
- The hydrobox should be positioned on a level wall capable of supporting it's filled weight.
- To find out the weight, refer to "3. Technical 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. <Figure 4.1.2>

■ Service access diagrams

Service access	
Parameter	Dimension [in. (mm)]
a	7 7/8 (200) or more
b	5 29/32 (150) or more
c	39 3/8 (1000) or more
d	30 (762) or more
e	30 (762) or more

<Table 4.1.1>

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



<Figure 4.1.3>

Service access

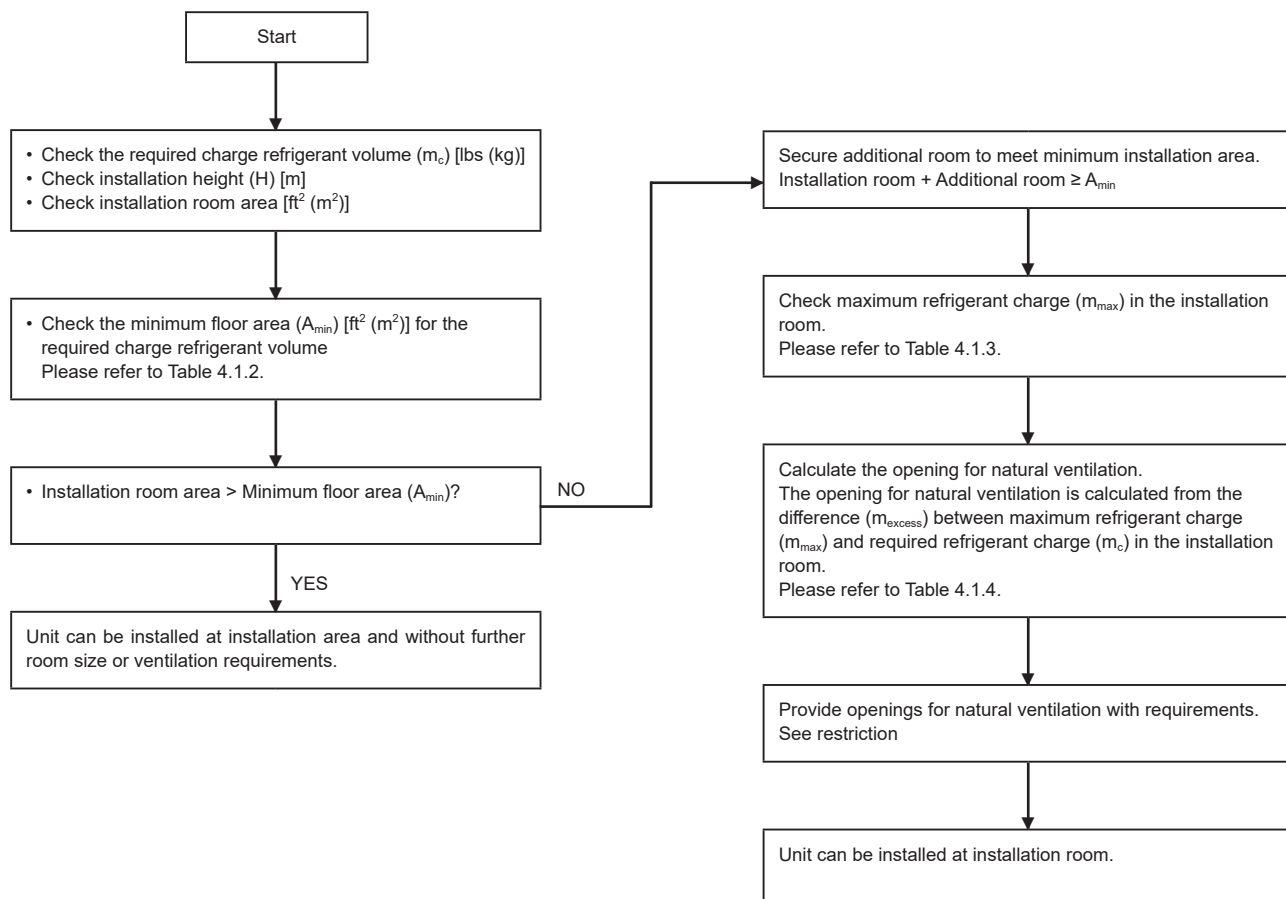
The hydrobox must be located indoors and in a frost-free environment, for example in a utility room.

4 Installation

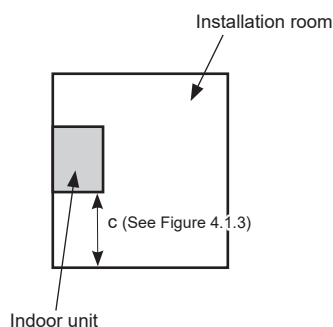
Indoor unit installation requirements for R32 refrigerant

- Minimum floor area requirements are complied according to the below flow chart.
- Charges above 5.29 lbs (2.4 kg) are not allowed in the unit.
- When installing an indoor unit in a mechanical room, install a refrigerant detector, alarm, and mechanical ventilation system in accordance with ANSI/ASHRAE Standard 15 or CSA B52.

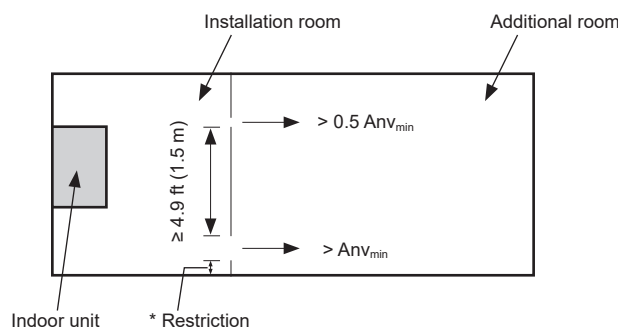
Flow chart for indoor unit installation



Hydrobox:



Hydrobox:
In case of natural ventilation



* Restriction for ventilation

When the openings for connected rooms and natural ventilation are required, the following conditions shall be applied.

- The area of any openings above 11 13/16 in. (300 mm) from the floor shall not be considered in determining compliance with minimum opening for natural ventilation ($\text{Anv}_{\min}$).
- At least 50% of the required opening area $\text{Anv}_{\min}$ shall be below 7+7/8 in. (200 mm) from the floor.
- The bottom of the lowest openings shall not be higher than the point of release when the unit is installed and not more than 3 15/16 in. (100 mm) from the floor.
- Openings are permanent openings which cannot be closed.
- For openings extending to the floor the height shall not be less than 25/32 in. (20 mm) above the surface of the floor covering.
- A second higher opening shall be provided. The total size of second opening shall not be less than 50% of minimum opening area for $\text{Anv}_{\min}$ and shall be at least 4.9 ft (1.5 m) above the floor.
- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.
- The location where the mechanical ventilation air extracted from the space is discharged shall be separated by a sufficient distance, but not less than 9.8 ft (3 m), from the mechanical ventilation air intake openings, to prevent recirculation to the space.

4 Installation

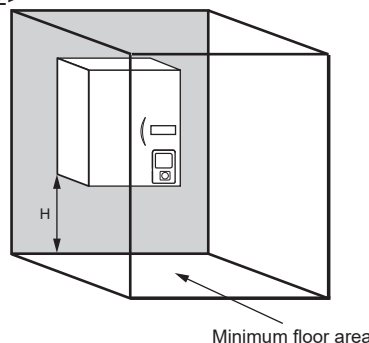
■ Indoor unit installation requirements for R32 refrigerant

Minimum floor area: Hydrobox

m _c [lbs (kg)]	Minimum floor area (A _{min}) ft ² [m ²]							
	H = 3.28 ft (1 m)	H = 3.61 ft (1.1 m)	H = 3.94 ft (1.2 m)	H = 4.27 ft (1.3 m)	H = 4.59 ft (1.4 m)	H = 4.92 ft (1.5 m)	H = 5.25 ft (1.6 m)	H = 5.58 ft (1.7 m)
< 3.75 (1.7)	74.3 (6.9)	64.6 (6.0)	57.1 (5.3)	51.7 (4.8)	46.3 (4.3)	43.1 (4.0)	38.8 (3.6)	36.6 (3.4)
3.97 (1.8)	78.6 (7.3)	68.9 (6.4)	60.3 (5.6)	53.9 (5.0)	49.6 (4.6)	45.3 (4.2)	42.0 (3.9)	38.8 (3.6)
4.19 (1.9)	134.6 (12.5)	121.7 (11.3)	112.0 (10.4)	103.4 (9.6)	95.8 (8.9)	89.4 (8.3)	84.0 (7.8)	79.7 (7.4)
4.41 (2.0)	141.1 (13.1)	128.1 (11.9)	117.4 (10.9)	108.8 (10.1)	101.2 (9.4)	94.8 (8.8)	88.3 (8.2)	82.9 (7.7)
4.63 (2.1)	148.6 (13.8)	134.6 (12.5)	123.8 (11.5)	114.1 (10.6)	106.6 (9.9)	99.1 (9.2)	92.6 (8.6)	87.2 (8.1)
4.85 (2.2)	161.5 (15.0)	141.1 (13.1)	129.2 (12.0)	119.5 (11.1)	110.9 (10.3)	103.4 (9.6)	96.9 (9.0)	91.5 (8.5)
5.07 (2.3)	176.6 (16.4)	147.5 (13.7)	135.7 (12.6)	124.9 (11.6)	116.3 (10.8)	108.8 (10.1)	101.2 (9.4)	95.8 (8.9)
5.29 (2.4)	191.6 (17.8)	159.4 (14.8)	141.1 (13.1)	130.3 (12.1)	121.7 (11.3)	113.1 (10.5)	106.6 (9.9)	100.2 (9.3)

<Table 4.1.2>

- H = Height measured from the bottom of the casing to the floor.
- Charges above 5.29 lbs (2.4 kg) are not allowed in the unit.
- For intermediate refrigerant charges, use the row with the higher value.
Example: If the refrigerant charge is 4.50 lbs (2.04 kg), use the row of 4.63 lbs (2.1 kg).
- The value of installation height (H) is considered above value to comply to UL 60335-2-40.
- The maximum installation height of the Hydrobox is 5.6 ft (1.7 m).



Maximum refrigerant charge allowed in the room: Hydrobox

Installation room ft ² (m ²)	Maximum refrigerant charge in a room (m _{max}) [lbs (kg)]							
	H = 3.28 ft (1 m)	H = 3.61 ft (1.1 m)	H = 3.94 ft (1.2 m)	H = 4.27 ft (1.3 m)	H = 4.59 ft (1.4 m)	H = 4.92 ft (1.5 m)	H = 5.25 ft (1.6 m)	H = 5.58 ft (1.7 m)
11 (1)	NO	NO	NO	NO	NO	NO	NO	NO
22 (2)	NO	NO	NO	NO	NO	NO	NO	NO
32 (3)	NO	NO	NO	NO	NO	NO	NO	NO
43 (4)	NO	NO	NO	NO	NO	3.86 (1.75)	4.03 (1.83)	4.03 (1.83)
54 (5)	NO	NO	NO	3.99 (1.81)	4.03 (1.83)	4.03 (1.83)	4.03 (1.83)	4.03 (1.83)
65 (6)	NO	3.77 (1.71)	4.03 (1.83)	4.03 (1.83)	4.03 (1.83)	4.03 (1.83)	4.03 (1.83)	4.03 (1.83)
75 (7)	3.81 (1.73)	4.03 (1.83)	4.03 (1.83)	4.03 (1.83)	4.03 (1.83)	4.03 (1.83)	4.03 (1.83)	4.03 (1.83)
86 (8)	4.03 (1.83)	4.03 (1.83)	4.03 (1.83)	4.03 (1.83)	4.03 (1.83)	4.06 (1.84)	4.32 (1.96)	4.61 (2.09)
97 (9)	4.03 (1.83)	4.03 (1.83)	4.03 (1.83)	4.03 (1.83)	4.25 (1.93)	4.56 (2.07)	4.87 (2.21)	5.18 (2.35)
108 (10)	4.03 (1.83)	4.03 (1.83)	4.06 (1.84)	4.39 (1.99)	4.74 (2.15)	5.07 (2.3)	5.29 (2.4)	5.29 (2.4)
118 (11)	4.03 (1.83)	4.10 (1.86)	4.45 (2.02)	4.83 (2.19)	5.20 (2.36)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)
129 (12)	4.06 (1.84)	4.45 (2.02)	4.87 (2.21)	5.27 (2.39)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)
140 (13)	4.39 (1.99)	4.83 (2.19)	5.27 (2.39)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)
151 (14)	4.70 (2.13)	5.18 (2.35)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)
161 (15)	4.87 (2.21)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)
172 (16)	5.03 (2.28)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)
183 (17)	5.18 (2.35)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)
194 (18)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)	5.29 (2.4)

<Table 4.1.3>

- Note:
- Units cannot be installed in the conditions indicated with NO.
 - For intermediate floor areas, use the row with the lower value. Example: If the floor area is 58 ft² (5.4 m²), use the row of 54 ft² (5 m²).
 - The value of installation height (H) is considered above value to comply to UL 60335-2-40.

Minimum venting opening area for natural ventilation: Hydrobox

m _c [lbs (kg)]	m _{max} [lbs (kg)]	m _{excess} [lbs (kg)] = m _c - m _{max}	Minimum opening for natural ventilation (Anv _{min}) [ft ² (cm ²)]							
			H = 3.28 ft (1 m)	H = 3.61 ft (1.1 m)	H = 3.94 ft (1.2 m)	H = 4.27 ft (1.3 m)	H = 4.59 ft (1.4 m)	H = 4.92 ft (1.5 m)	H = 5.25 ft (1.6 m)	H = 5.58 ft (1.7 m)
5.29 (2.4)	3.75 (1.7)	1.54 (0.7)	0.23 (213)	0.21 (199)	0.20 (187)	0.19 (178)	0.18 (168)	0.17 (162)	0.17 (154)	0.16 (150)
5.29 (2.4)	3.97 (1.8)	1.32 (0.6)	0.20 (183)	0.18 (171)	0.17 (160)	0.16 (151)	0.16 (145)	0.15 (139)	0.14 (134)	0.14 (128)
5.29 (2.4)	4.19 (1.9)	1.10 (0.5)	0.21 (194)	0.20 (184)	0.19 (177)	0.18 (170)	0.18 (164)	0.17 (158)	0.16 (153)	0.16 (149)
5.29 (2.4)	4.41 (2.0)	0.88 (0.4)	0.17 (155)	0.16 (148)	0.15 (141)	0.15 (136)	0.14 (131)	0.14 (127)	0.13 (123)	0.13 (119)
5.29 (2.4)	4.63 (2.1)	0.66 (0.3)	0.12 (116)	0.12 (111)	0.11 (106)	0.11 (102)	0.11 (99)	0.10 (95)	0.10 (92)	0.10 (89)
5.29 (2.4)	4.85 (2.2)	0.44 (0.2)	0.09 (79)	0.08 (74)	0.08 (71)	0.07 (68)	0.07 (66)	0.07 (64)	0.07 (62)	0.06 (60)
5.29 (2.4)	5.07 (2.3)	0.22 (0.1)	0.04 (41)	0.04 (37)	0.04 (36)	0.04 (34)	0.04 (33)	0.03 (32)	0.03 (31)	0.03 (30)

<Table 4.1.4>

- For intermediate m_{excess} values, the value that corresponds to the higher m_{excess} value from the table is considered.
Example:
m_{excess} = 0.97 lb (0.44 kg), the value that corresponds to m_{excess} = 1.10 lbs (0.5 kg) is considered.
- The value of installation height (H) is considered above value to comply to UL 60335-2-40.

■ 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

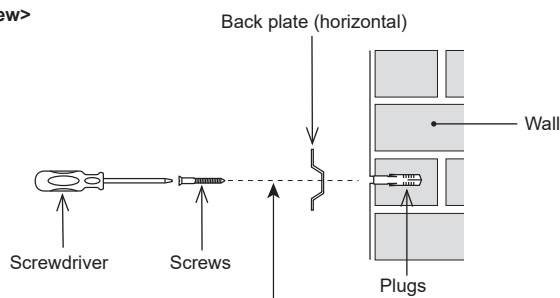
■ Mounting procedure

1. Install the included back plate accessory.

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

- 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.

<Side view>



The height from the floor = H determined in the previous page + 26 21/32 inch (677 mm)

<Figure 4.1.4>

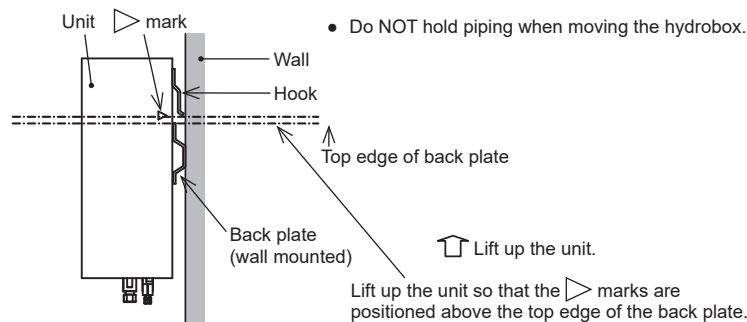
2. Insert the hook on the back of the hydrobox behind the notch of the back plate.

*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.

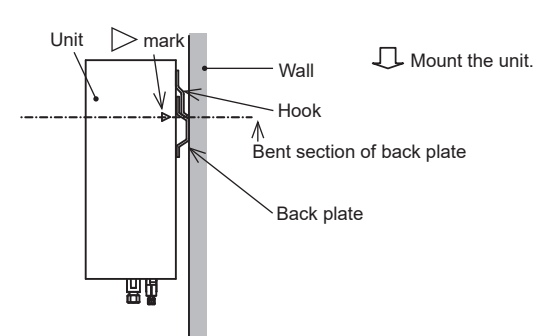
<Side view of unit>



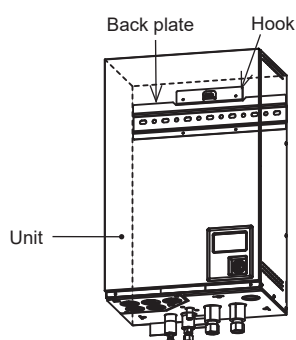
<Figure 4.1.6>

ii) Check and ensure that the ▷ marks are positioned and properly engaged at the bent section level on the back plate as shown below.

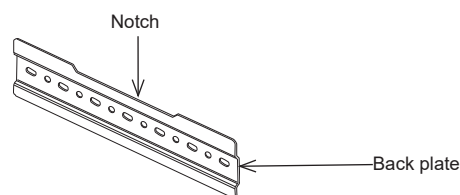
<Side view of unit>



<Figure 4.1.7>

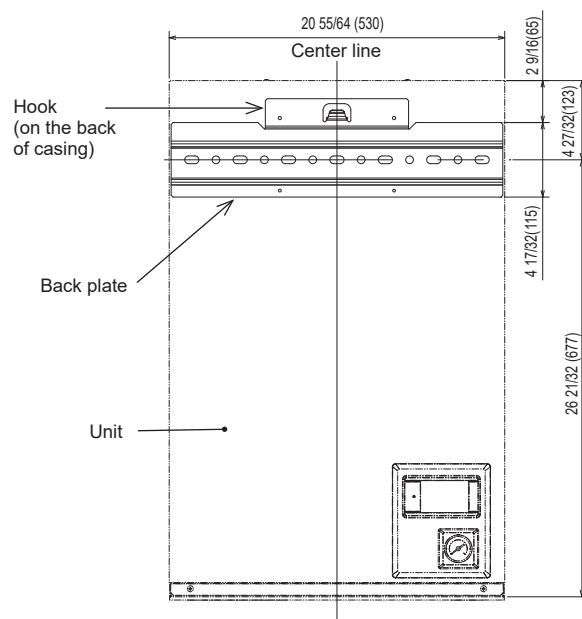


<Figure 4.1.9>



<Figure 4.1.5>

<Front view of unit>



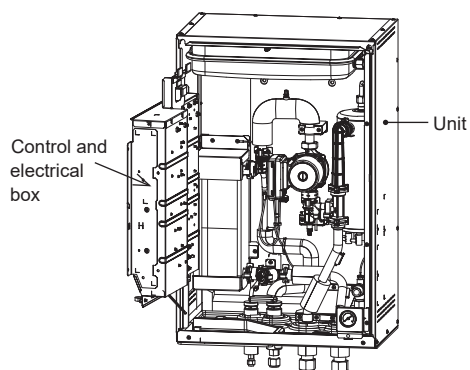
<Figure 4.1.8>

- Figure 4.1.8 shows the relative positions between the unit and the wall secured back plate. Referring to <Figure 4.1.3> Service access, install the back plate.

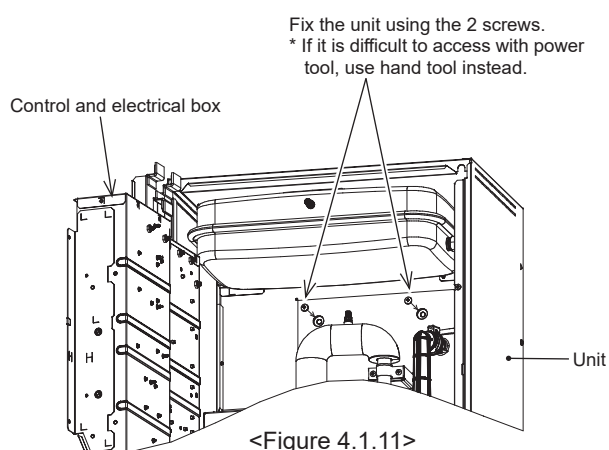
en

4 Installation

3. Fix the unit to the back plate using the included 2 screws (accessory items).

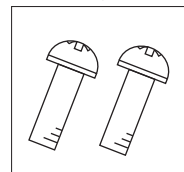


<Figure 4.1.10>



<Figure 4.1.11>

<Accessory>



Screw M5×8

en

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.

Note: If using seismic supports, the supports shall be designed and installed for the seismic forces in accordance with the International Building Code and local codes.

4 Installation

4.2 Water Quality and System Preparation

The water quality must comply with national and local codes.

■ Water quality in primary circuit

- The water in primary circuit should observe local national standards
- The water in primary circuit should be clean and with a pH value of pH6.5-10.0.

■ Water quality in sanitary circuit

- The sanitary water circuit should be clean and with a pH value of pH6.5-8.0
- The following are maximum values of water in sanitary circuit;
Calcium: 100 mg/L, Hardness: 250 mg/L (Ca Hardness)
Chloride: 100 mg/L, Copper: 0.3 mg/L
- Other constituents of water in sanitary circuit should be compliant with national and local codes.
- In known hard water areas, to prevent/minimise scaling, it is beneficial to restrict the routine stored water temperature (DHW maximum temperature) to 131°F (55°C), and/or to add an appropriate water treatment (i.e: softener).

■ 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.

Notes:

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 the primary water circuit, 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		Indoor unit containing water amount [gal (L)]	Additional required water amount [gal (L)]*1	
			Average / Warmer climate	Colder climate
Split model	WUZ-SA24NMZ	1.3 (5)	1.6 (6)	7.7 (29)
WUZ series	WUZ-SA36NMZ		2.4 (9)	10.0 (38)
	WUZ-SA48NMZ		4.0 (15)	14.5 (55)

<Table 4.2.1>

*1 Water amount: If there is a bypass circuit, above table means minimum water amount in case of bypass.

Case 1. No division between primary and secondary circuit

- Please ensure the required water amount according to Table 4.2.1 by water pipe and radiator or underfloor heating.

Case 2. Separate primary and secondary circuit

- If the interlock operation of primary and secondary pump is not available, please ensure required additional water in only primary circuit according to Table 4.2.1.
- If the interlock operation of primary and secondary pump is available, please ensure total water amount of primary and secondary circuit according to Table 4.2.1.

In case of the shortage of required water amount, please install buffer tank.

en

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 NPT1/2. 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.

The discharge piping serving a pressure relief valve shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air gap located in the same room as the water heater.
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air gap.
4. Serve a single relief device and shall not connect to piping serving any other relief device or equipment.
5. Discharge to the floor, to the pan serving the water heater or storage tank, to a waste receptor or to the outdoors.
6. Discharge in a manner that does not cause personal injury or structural damage.
7. Discharge to a termination point that is readily observable by the building occupants.
8. Not be trapped.
9. Be installed so as to flow by gravity.
10. Terminate not more than 6 inches (152 mm) above and not less than two times the discharge pipe diameter above the floor or flood level rim of the waste receptor.
11. Not have a threaded connection at the end of such piping.
12. Not have valves or tee fittings.
13. Be constructed of those materials listed in Section 605.4 in international plumbing code or Section P2906.5 in international residential code or materials tested, rated and approved for such use in accordance with ASME A112.4.1.
14. Be one nominal size larger than the size of the relief valve outlet, where the relief valve discharge piping is installed with insert fittings. The outlet end of such tubing shall be fastened in place.

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).

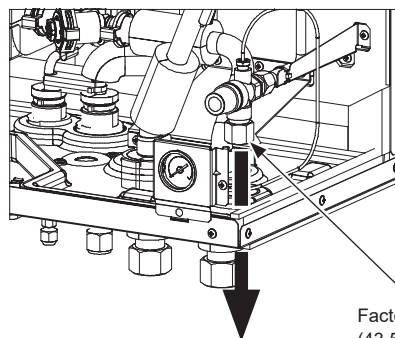
■ Pipework Connections

Connections to the hydrobox should be made using the NPT-Screw connection as appropriate. (The hydrobox has NPT1 thread connections.)

Do not over-tighten compression fittings as this will lead to deformation of the ferrule ring and potential leaks.

■ Insulation of Pipework

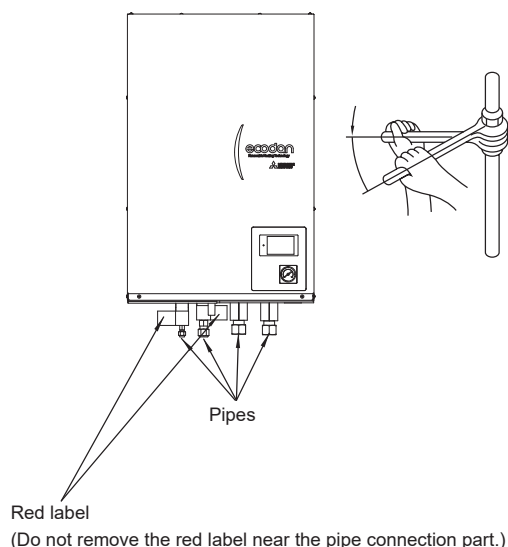
- All exposed water pipework should be insulated to prevent unnecessary heat loss and condensation. To prevent condensate entering the hydrobox, the pipework and connections at the top of the hydrobox should be carefully insulated.
- Cold and hot water pipework should not be run close together where possible, to avoid unwanted heat transfer.
- When installing drain piping via the pressure relief valve, be careful not to break the root of the manometer.
- Pipework between outdoor heat pump unit and hydrobox should be insulated with suitable pipe insulation material with a thermal conductivity of $\leq 0.04 \text{ W/m}\cdot\text{K}$ [$0.023 \text{ BTU/hr}\cdot\text{ft}\cdot^\circ\text{F}$].
- Water discharge connections shall be made in accordance with International Mechanical Code and the International Plumbing Code.



Factory-fitted pressure relief valve
(43.5 psi (3 bar)) (NPT1/2 connection)

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

<Figure 4.3.1>



<Figure 4.3.2>

4 Installation

■ Drain Pipework

The drain pipe should be installed to drain condensing water in cooling mode.

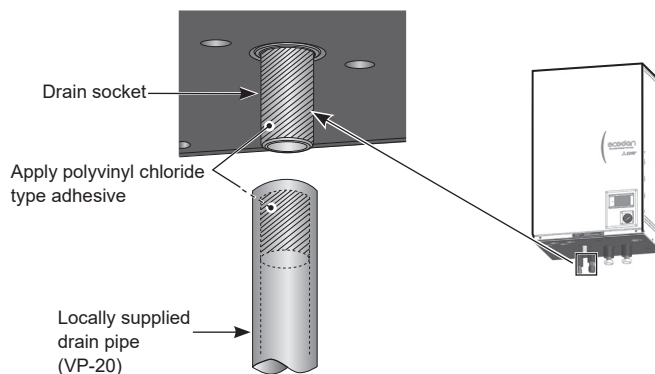
- Securely install the drain pipe to prevent leakage from the connection.
- Securely insulate the drain pipe to prevent water dripping from the locally supplied drain pipe.
- Install the drain pipe at a down slope of 1/100 or more.
- Do not place the drain pipe in drain channel where sulphuric gas exists.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

<Installation>

1. Apply polyvinyl chloride type adhesive over the shaded surfaces inside of the drain pipe and on the exterior of the drain socket as shown.
2. Insert the drain socket deeply into the drain pipe <Figure 4.3.3>.

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

To prevent dirty water from draining directly onto the floor next to hydrobox, please connect appropriate discharge pipework from the hydrobox.



<Figure 4.3.3>

■ Water Circulation Pump Characteristics

Pump speed can be selected by main remote controller setting (see Figure 4.3.4). Adjust the pump speed setting so that the flow rate in the primary circuit is appropriate for the installed outdoor unit (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 Table 4.3.1, refer to water flow rate range in the specification table of outdoor unit Data Book.

<Second pump>

If a second pump is required for the installation, please read the following carefully. The second pump can be positioned in 2 ways.

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/cooling 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 from the hydrobox's in-built pump.

Outdoor heat pump unit		Water flow range		Recommend flow *1	
		L/min	gallon/min	L/min	gallon/min
Split model WUZ series	WUZ-SA24NMZ	7.2 - 22.9	1.9 - 6.1	14.3	3.8
	WUZ-SA36NMZ	7.2 - 28.7	1.9 - 7.6	17.9	4.7
	WUZ-SA48NMZ	10.0 - 34.4 *3	2.6 - 9.1	25.1 *2	6.6

<Table 4.3.1>

Notes:

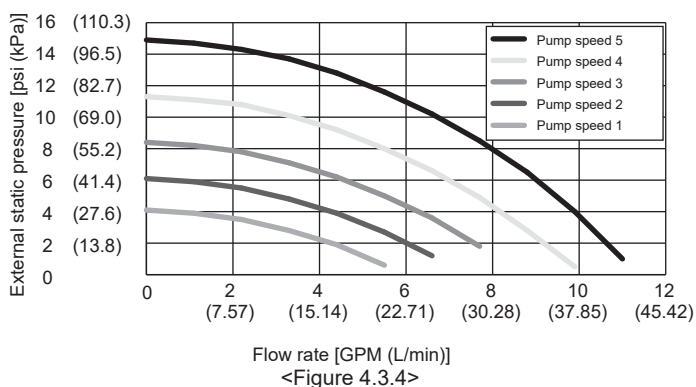
1. If the water flow rate is less than the minimum flow rate setting of the flow sensor (default 1.4 GPM [5.0 L/min]), the flow rate error will be activated.
2. If the water flow rate exceeds 9.7 GPM (36.9 L/min), the flow speed will be greater than 6.6 ft/s (2.0 m/s), which could erode the pipes.

*1 Flow rate recommended for installation

*2 With buffer tank

*3 If you want to secure the maximum flow rate, please install an additional pump.

Water Circulation Pump Characteristics



<Figure 4.3.4>

4 Installation

■ 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.

$$V_i = \frac{(0.00041T - 0.0466) V_s}{\left(\frac{P_s}{P_i}\right) - \left(\frac{P_s}{P_o}\right)}$$

V_i = Minimum volume of expansion vessel (gal)

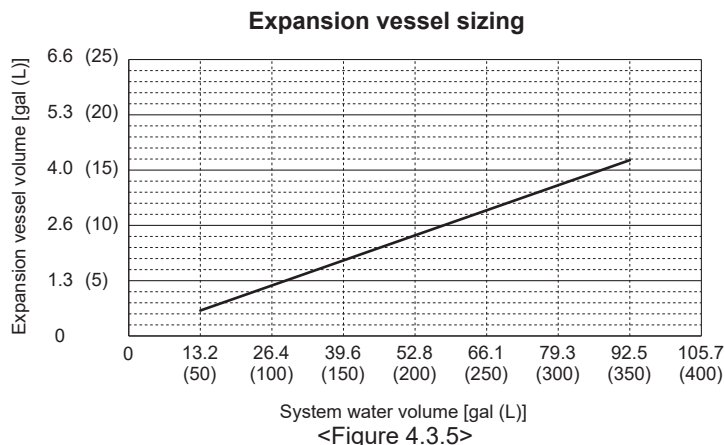
V_s = Volume of system, not including expansion vessel (gal)

T = Average operating temperature of water circuit system (°F)

P_s = Atmospheric pressure (psi)

P_i = Fill pressure (psi)

P_o = Maximum operating pressure (psi)



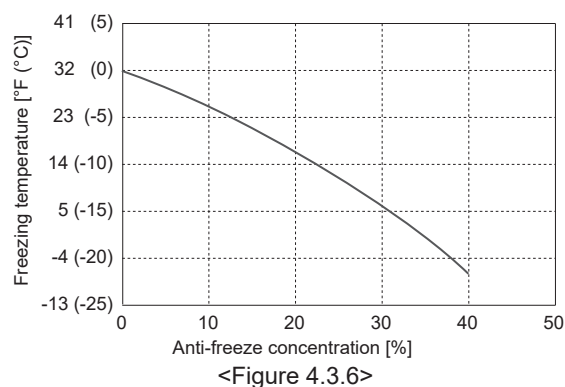
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■ Filling the System (Primary Circuit)

1. Check and charge expansion vessel.
2. Check all connections including factory fitted ones are tight.
3. Insulate pipework between hydrobox and outdoor unit.
4. Thoroughly clean and flush all debris from the system.
(See section 4.2 for instruction.)
5. Fill hydrobox with potable water. Fill primary heating circuit with water and suitable anti-freeze and inhibitor as necessary. **Always use a filling loop with double check valve when filling the primary circuit to avoid back flow contamination and back siphonage of water supply.**
6. Check for leakages. If leakage is found, retighten the screws onto the connections.

- Anti-freeze should always be used for packaged model systems (see section 4.2 for instruction). It is the responsibility of the installer to decide if anti-freeze solution should be used in split model systems depending on each site's conditions. Corrosion inhibitor should be used in both split model and packaged model systems.
Figure 4.3.6 shows freezing temperature against anti-freeze concentration. This figure is an example for FERNOX ALPHI-11. For other anti-freeze, please refer to relevant manual.
- When connecting metal pipes of different materials, insulate the joints to prevent a corrosive reaction taking place which will damage the pipework.

7. Pressurise system to 14.5 psi (1 bar) (Min. water or brine operating pressure).
8. Release all trapped air using air vents during and following heating period.
9. Top up with water as necessary. (If pressure is below 14.5 psi (1 bar)).
10. After removing the air, automatic air vent **MUST** be closed.



4 Installation

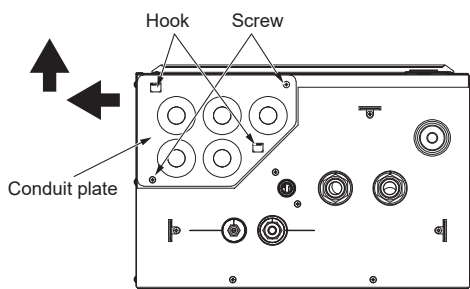
4.4 How to Install Conduit Piping

Conduit piping shall be installed on the unit in accordance with National Electrical Code.

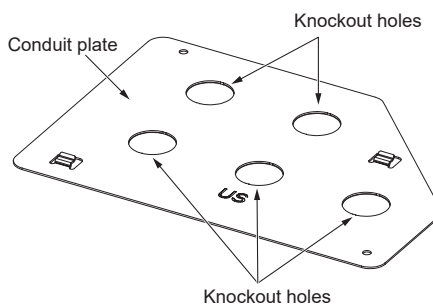
1. The conduit plate is fixed with 2 screws and 2 hooks. Remove the screws, and then slide the conduit plate to the direction of the arrow as shown in the figure to remove it. (Figure 4.4.1.)
2. Make knockout holes and deburr as necessary. (Figure 4.4.2)
3. Set conduit pipes and materials procured on site in the knockout holes (conduit size: 3/4 in.), and then fix them with the conduit plate. (Figure 4.4.3) To pass wires through appropriate knockout holes, follow Table 3.3 for details of knockout holes.
4. Return the conduit plate to the original position by an inverse procedure of No. 1.

Note:

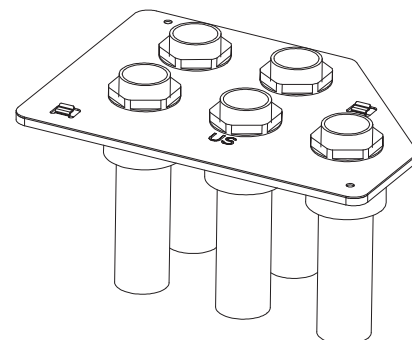
Conduit pipes and materials are attached to all knowout holes on Figure 4.4.3, however, use only necessary holes in accordance with Table 3.3. After making knockout holes, be sure to attach conduit parts and materials or seal them.



Under view of unit
<Figure 4.4.1>



Conduit plate
<Figure 4.4.2>



Connected conduit pipes
<Figure 4.4.3>

4.5 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.

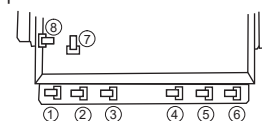
The hydrobox can be powered in two ways.

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 should be connected independently from one another to dedicated power supplies.

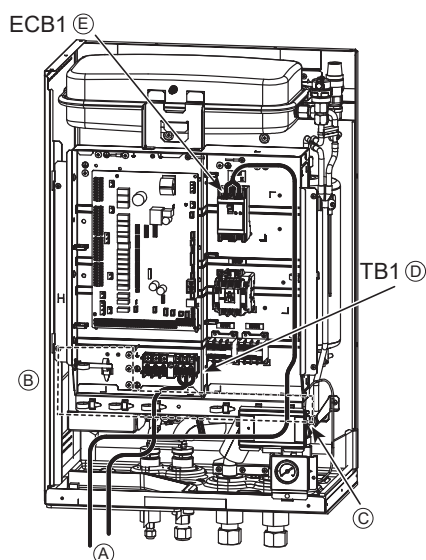
- Ⓐ Locally supplied wiring should be inserted through the inlets situated on the base of the hydrobox. (Refer to Table 3.3.)
- Ⓑ Wiring should be fed down the left hand side of the control and electrical box and clamped in place using clips provided.
- Ⓒ The wires should be fixed with the cable straps as below.
 - ② Output wires
 - ③ Indoor-Outdoor wire
 - ⑥ Power line (B.H.)
 - ⑦ Signal input wires



- Ⓓ 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.

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



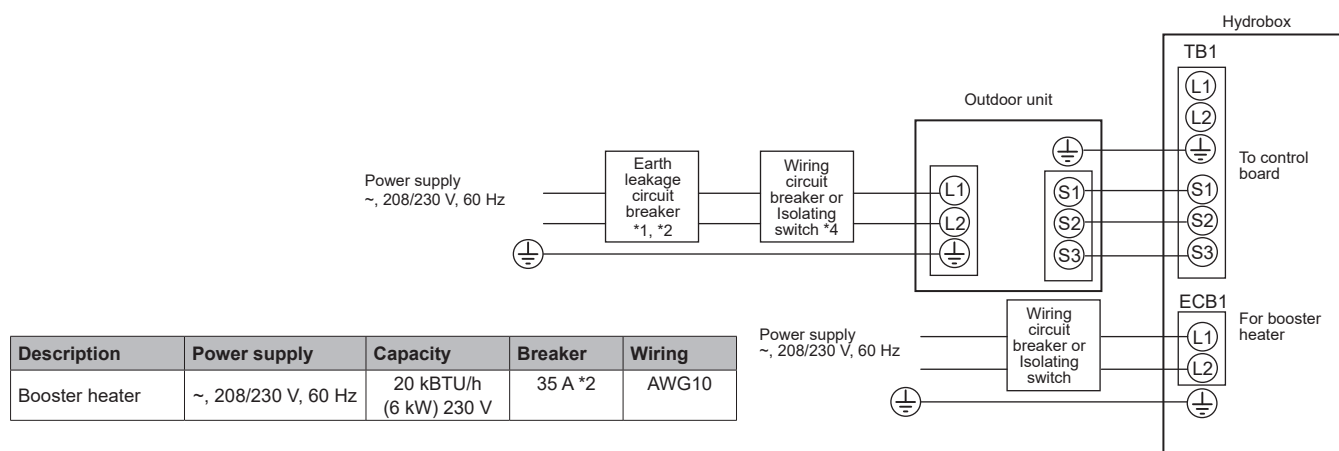
<Figure 4.5.1>

4 Installation

Hydrobox powered via outdoor unit

<1 phase>

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



<Figure 4.5.2>
Electrical connections 1 phase

Wiring No. × size	Hydrobox - Outdoor unit	3 × AWG16 (pollar) *3
	Hydrobox - Outdoor unit earth	1 × AWG16 *3
Circuit rating	Hydrobox - Outdoor unit S1 - S2 *5	208/230 VAC
	Hydrobox - Outdoor unit S2 - S3 *5	24 VDC

- *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.
- *2. A breaker with at least 1/8 in. (3.0 mm) contact separation in each pole shall be provided. Use earth leakage circuit breaker (NV).
The breaker shall be provided to ensure disconnection of all active phase conductors of the supply.
- *3. If AWG16 used, Max. 148 ft (45 m).
If AWG13 used, Max. 164 ft (50 m)
If AWG13 used and S3 separated, Max. 262 ft (80 m)
- *4. Method for disconnecting an electric hot water supply system from its energy supply (e.g. isolating switch) shall be provided in accordance with National Electrical Code.
- *5. The values given in the table above are not always measured against the ground value.

Notes:

1. Field-installed wiring size, length, and installation comply with the applicable local and National Electrical Code.
Field-installed power supply cables (including a grounding conductor as specified by the National Electrical Code) shall extend at least 6 in. (152 mm) beyond the end of the flexible conduit.
2. Install an earth longer than other cables.
3. Please keep enough output capacity of power supply for each heater. Insufficient power supply capacity might cause chattering.
4. Use copper supply wire.

5 System Set Up

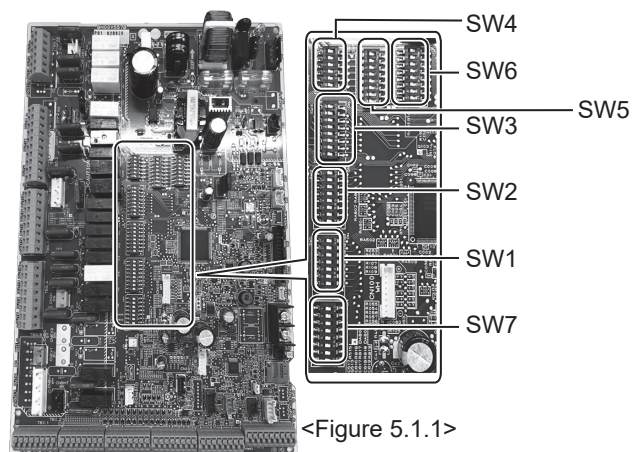
5.1 DIP Switch Functions

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:
SW1	SW1-1 Boiler	WITHOUT Boiler	WITH Boiler	OFF
	SW1-2 —	—	—	ON
	SW1-3 DHW tank	WITHOUT DHW tank	WITH DHW tank	OFF
	SW1-4 —	—	—	OFF
	SW1-5 Booster heater	WITHOUT Booster heater	WITH Booster heater	ON
	SW1-6 Booster heater function	For heating only	For heating and DHW	ON
	SW1-7 Outdoor unit type	Split type	Packaged type	OFF
	SW1-8 —	—	—	OFF
SW2	SW2-1 Room thermostat1 input (IN1) logic change	Zone 1 operation stop at thermostat short	Zone 1 operation stop at thermostat open	OFF
	SW2-2 Flow switch1 input (IN2) logic change	Failure detection at short	Failure detection at open	OFF
	SW2-3 Booster heater capacity restriction	Inactive	Active	OFF
	SW2-4 Cooling mode function	Inactive	Active	ON
	SW2-5 Automatic switch to backup heat source operation (When outdoor unit stops by error)	Inactive	Active *1	OFF
	SW2-6 Mixing tank	WITHOUT Mixing tank	WITH Mixing tank	OFF
	SW2-7 2-zone temperature control	Inactive	Active *2	OFF
	SW2-8 Flow sensor	WITHOUT Flow sensor	WITH Flow sensor	ON
SW3	SW3-1 Room thermostat 2 (IN6) input logic change	Zone 2 operation stop at thermostat short	Zone 2 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 —	—	—	ON
	SW3-6 2-zone valve ON/OFF control	Inactive	Active	OFF
	SW3-7 —	—	—	OFF
	SW3-8 Heat meter	WITHOUT Heat meter	WITH Heat meter	OFF
SW4	SW4-1 —	—	—	OFF
	SW4-2 —	—	—	OFF
	SW4-3 —	—	—	OFF
	SW4-4 Indoor unit only operation (during installation work) *3	Inactive	Active	OFF
	SW4-5 Emergency mode (Heater only operation)	Normal	Emergency mode (Heater only operation)	OFF *4
	SW4-6 Emergency mode (Boiler operation)	Normal	Emergency mode (Boiler operation)	OFF *4
SW5	SW5-1 —	—	—	OFF
	SW5-2 Advanced auto adaptation	Inactive	Active	ON
	SW5-3 —	—	—	OFF
	SW5-4 —	—	—	OFF
	SW5-5 —	—	—	ON
	SW5-6 —	—	—	ON
	SW5-7 —	—	—	OFF
	SW5-8 —	—	—	OFF
SW6	SW6-1 —	—	—	OFF
	SW6-2 —	—	—	OFF
	SW6-3 Pressure sensor	Inactive	Active	ON
	SW6-4 Analog output	Inactive	Active	OFF
	SW6-5 —	—	—	OFF
	SW6-6 —	—	—	OFF
	SW6-7 —	—	—	OFF
	SW6-8 —	—	—	ON

<Table 5.1.1>

<Continued on next page.>

5 System Set Up

DIP switch		Function	OFF	ON	Default settings: Indoor unit model
SW7	SW7-1	Mixing valve setting	Only Zone 2	Zone 1 and Zone 2	OFF
	SW7-2	Forced cooling mode input (IN13) logic change	Active at short	Active at open	OFF
	SW7-3	Cooling limit temp. input (IN15) logic change	Active at short	Active at open	OFF
	SW7-4	—	—	—	OFF
	SW7-5	—	—	—	OFF
	SW7-6	—	—	—	OFF
	SW7-7	—	—	—	OFF
	SW7-8	—	—	—	OFF

<Table 5.1.1>

Notes: *1. 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.)
*2. Active only when SW3-6 is set to OFF.
*3. Space heating and DHW can be operated only in indoor unit, like an electric heater. (Refer to "5.5 Indoor Unit Only Operation".)
*4. If emergency mode is no longer required, return the switch to OFF position.

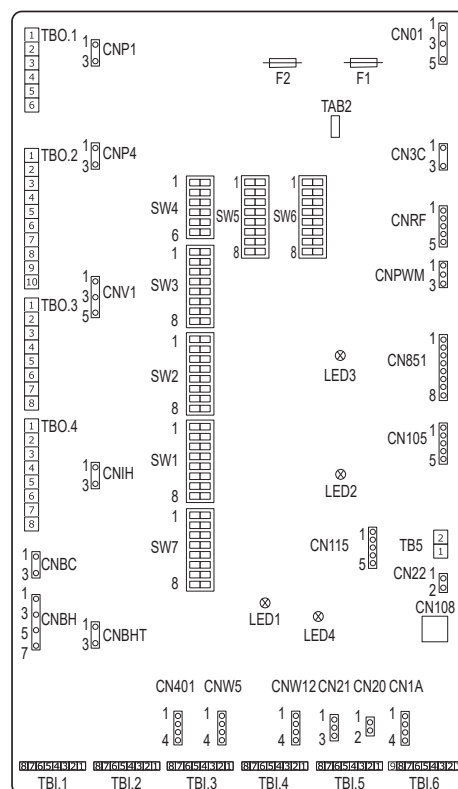
5.2 Connecting Inputs/Outputs

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. 98 ft (30 m) Wire type: CV, CVS or equivalent Wire size: AWG24 - AWG20
	Switch	Non-voltage "a" contact signals Remote switch: minimum applicable load 12 VDC, 1 mA

Note:

Stranded wire should be processed with insulation-covered bar terminal



<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 (Zone 1)	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 (Zone 2)	Refer to SW3-2 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	—	—	—	
IN12	TBI.3 1-2	—	—	—	
IN13	TBI.4 3-4	—	Forced cooling mode	Refer to SW7-2 in <5.1 DIP Switch Functions and 5.6 Forced cooling mode input (IN13)>.	
IN15	TBI.4 1-2	—	Cooling limit temp.	Refer to SW7-3 in <5.1 DIP Switch Functions>.	
INA1	TBI.6 3-5	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 settings] in [Operation settings] from [Service].

*4. Connectable electric energy meter and heat meter

- Pulse type: Voltage free contact for 12 VDC detection by FTC (TBI.2 1 pin, TBI.3 5 and 7 pins have a positive voltage.)
- Pulse duration: Minimum ON time: 40 ms
Minimum OFF time: 100 ms
- 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 System Set Up

■ Thermistor inputs

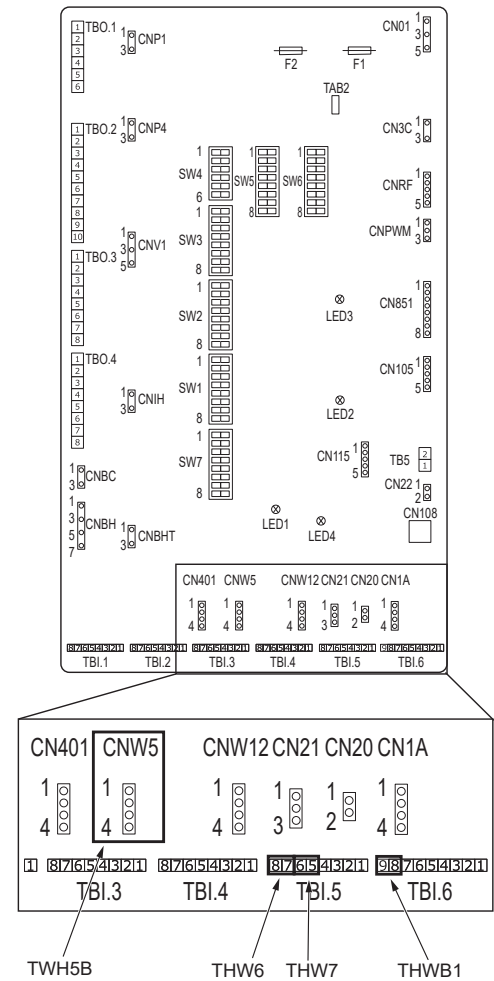
Name	Terminal block	Connector	Item
TH1	—	CN20	Thermistor (Room temp.)
TH2	—	CN21	Thermistor (Ref. liquid temp.)
THW1	—	CNW12 1-2	Thermistor (Flow water temp.)
THW2	—	CNW12 3-4	Thermistor (Return water temp.)
THW5B	—	CNW5 3-4	Thermistor (DHW tank lower water temp.) *1
THW6	TBI.5 7-8	—	Thermistor (Zone 1 flow water temp.)
THW7	TBI.5 5-6	—	Thermistor (Zone 1 return water temp.)
THWB1	TBI.6 8-9	—	Thermistor (Boiler flow water temp.) *1

Ensure to wire thermistor wirings away from the power line and/or OUT1 to OUT18 wirings.

*1. The length of the thermistor wire supplied with the unit is 16 ft (5 m). If you need a longer one, use an optional thermistor with a wire of 98 ft (30 m).

Note: 4 thermistors listed in the table below are included in the product. Check names written on the thermistors. Refer to "Terminal block" or "Connector" columns in the above table for connecting them.

Name	Color of thermistor wire	Diameter [in. (mm)]	length [ft (m)]
THW5B	Gray	ø0.24 (6)	16 (5)
THW6	Yellow	ø0.24 (6)	16 (5)
THW7	Blue	ø0.24 (6)	16 (5)
THWB1	Black	ø0.31 (8)	16 (5)



<Figure 5.2.2>

■ Outputs

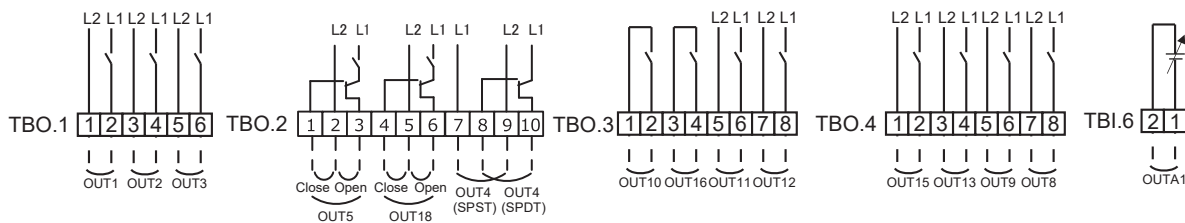
Name	Terminal block	Connector	Item	OFF	ON	Signal/Max. current	Max. total current
OUT1	TBO.1 1-2	CNP1	—	OFF	ON	—	4.0 A (a)
OUT2	TBO.1 3-4	—	Water circulation pump 2 output (Space heating/cooling for Zone 1)	OFF	ON	230 VAC 1.0 A Max. (Inrush current 40 A Max.)	
OUT3	TBO.1 5-6	—	Water circulation pump 3 output (Space heating/cooling for Zone 2) *1	OFF	ON	230 VAC 1.0 A Max. (Inrush current 40 A Max.)	
OUT14	—	CNP4	—	OFF	ON	—	
OUT4	TBO.2 7-9	—	3-way valve SPST (2-way valve 1) output	Heating	DHW	230 VAC 0.1 A Max.	3.0 A (b)
	TBO.2 8-10	CNV1	3-way valve SPDT output				
	—	CN851	3-way valve output				
OUT5	TBO.2 1-2	—	Zone 2 mixing valve output *1	Stop	Close Open	230 VAC 0.1 A Max.	
OUT6	—	CNBH 1-3	Booster heater 1 output	OFF	ON	230 VAC 0.5 A Max. (Relay)	
OUT7	—	CNBH 5-7	Booster heater 2 output	OFF	ON	230 VAC 0.5 A Max. (Relay)	
OUT8	TBO.4 7-8	—	Cooling signal output	OFF	ON	230 VAC 0.5 A Max.	
OUT9	TBO.4 5-6	CNIH	—	OFF	ON	—	3.0 A (b)
OUT10	TBO.3 1-2	—	Boiler output	OFF	ON	non-voltage contact · 220 - 240 VAC (30 VDC) 0.5 A or less · 10 mA 5 VDC or more	
OUT11	TBO.3 5-6	—	Error output	Normal	Error	230 VAC 0.5 A Max.	
OUT12	TBO.3 7-8	—	Defrost output	Normal	Defrost	230 VAC 0.5 A Max.	
OUT13	TBO.4 3-4	—	2-way valve 2a output *2	OFF	ON	230 VAC 0.1 A Max.	
OUT15	TBO.4 1-2	—	Comp ON signal	OFF	ON	230 VAC 0.5 A Max.	3.0 A (b)
OUT16	TBO.3 3-4	—	Heating/Cooling thermostat ON signal	OFF	ON	non-voltage contact · 220 - 240 VAC (30 VDC) 0.5 A or less · 10 mA 5 VDC or more	
OUT18	TBO.2 4-5	—	Zone 1 mixing valve output *1	Stop	Close Open	230 VAC 0.1 A Max.	
OUTA1	TBI.6 1-2	—	Analog output	0 V - 10 V		0 - 10 VDC 5 mA 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.

5 System Set Up



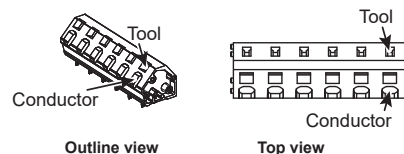
Wiring specification and local supply parts

Item	Name	Model and specifications
External output function	Outputs wire	Use sheathed vinyl coated cord or cable. Max. 98 ft (30 m) Wire type: CV, CVS or equivalent Wire size: AWG26-14

Note:

- When the hydrobox is powered via outdoor unit, the maximum grand total current of (a)+(b) is 3.0 A.
- Do not connect multiple water circulation pumps directly to each output (OUT1, OUT2, and OUT3). In such a case, connect them via each relay.
- Do not connect water circulation pumps to both TBO.1 1-2 and CNP1 at the same time.
- Connect an appropriate surge absorber to OUT10 (TBO.3 1-2) depending on the load at site.
- Use the same thing as the Signal input wire for OUTA1 wiring.

How to use TBO.1 to 4



Connect them using either way as shown above.

<Figure 5.2.3>

5.3 DHW Tank for Hydrobox

■ Connecting procedure for DHW tank

Notes:

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

- To enable switching of the water circulation circuit between the DHW mode and the heating mode, install a 3-way valve (local supply).

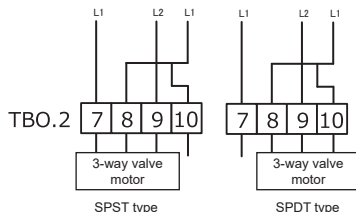
The use of two 2-way valves can perform the same function as a 3-way valve.

- Install the thermistor THW5B on the DHW tank.

It is recommended to position the thermistor at the mid point of the DHW tank capacity. Insulate thermistor from ambient air. Especially for double (insulated) tank, thermistor should be attached to the inner side (to detect the water temperature).

- Connect the thermistor lead to the CNW5 connector on the FTC. If the thermistor lead is too long, bundle it with a strap to adjust the length.

- The output terminals for the 3-way valve (SPST) is TBO.2 7-9 (OUT4). The output terminals for the 3-way valve (SPDT) is TBO.2 8-10 (OUT4).



When the rated current of the 3-way valve exceeds 0.1 A, be sure to use a relay with maximum voltage and current ratings of 230 VAC / 0.1 A when connecting to the FTC. Do not directly connect the 3-way valve cable to the FTC. Connect the relay cable to the TBO.2 8-9 terminals.

For systems using 2-way valves instead of a 3-way valve please read the following;

	Installation position	Electrical connection terminal block	Output signal		
			Heating	DHW	System
2-way valve1	DHW	TBO.2 8-9	OFF (closed)	ON (open)	OFF (closed)
2-way valve2	Heating	TBO.4 3-4	ON (open)	OFF (closed)	OFF (closed)

Notes:

Should the 2-way valve become blocked, the water circulation will stop. A bypass valve or circuit should be installed between pump and 2-way valve for safety. The TBO.4 3-4 terminals on the FTC are shown in the wiring diagram.

The 2-way valve (local supply) should be installed according to the instructions supplied with it. Follow 2-way valve's manufacturer's instructions as to whether to connect an earth cable or not.

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

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

Specification of 2-way valve (local supply)

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

⚠ WARNING: When connecting DHW tank

- Attach the thermistor THW5B.
- Connect a pressure relief valve on the sanitary water side.
- It is essential that no check valve or isolating valve is fitted between the hydrobox and the pressure relief valve.

5 System Set Up

Recommended DHW system

Where system involves a DHW tank:

DHW tank	Booster heater	BH function	System diagram	Thermistor
Present	Present	For space heating/cooling and DHW		THW1: Flow water temp. THW2: Return water temp. THW5B: DHW tank lower water temp.

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

5.4 Back-up Operation of Boiler

Heating operation is backed up by boiler. When connecting boiler devices, prepare in accordance with the figures in "Local systems" in "3. Technical Information".

<Installation & System set up>

- Set DIP-SW 1-1 to ON "With boiler" and SW2-6 to ON "With Mixing tank".
- Install the thermistor (Boiler flow water temp. thermistor) (THWB1) on the boiler circuit. Install the thermistors for mixing tank (THW6 and THW7) at the inlet and outlet of the mixing tank.
- Connect the output wire (OUT10: Boiler operation) to the signal input (room thermostat input) on the boiler. *1
- Install one of the following room temperature thermostats. *2
 - Room temperature thermostat (local supply)
 - Main remote controller (remote position)

<Main remote controller settings>

- Go to [Service] menu, then [Heat source setting], and choose [Boiler] or [Hybrid]. *3
- Go to [Service] menu, and choose [Operation settings], then [Boiler settings] to make detailed settings for [Hybrid settings].

*1 OUT10 has no voltage across it.

*2 Boiler heating is controlled on/off by the room temp. thermostat.

*3 [Hybrid] automatically switches heat sources between heat pump (and electric heater) and boiler.

Note:

- When you want to store 131°F (55°C) or hotter water in the mixing tank, notify that the outdoor unit does not start heating until the water temperature drops to below 131°F (55°C).
- Install a check valve so that the water does not flow back to the indoor unit from the boiler.
- Set the boiler temperature to 158°F (70°C) or lower, otherwise the indoor unit may break down.

5.5 Indoor Unit Only Operation (during installation work)

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

- To start operation

Carry out the wiring for the power supply as shown below.

Note: The power supply for the P.C.B. shall be connected to S1/S2 instead of L1/L2 on the terminal block (TB1).

- 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.

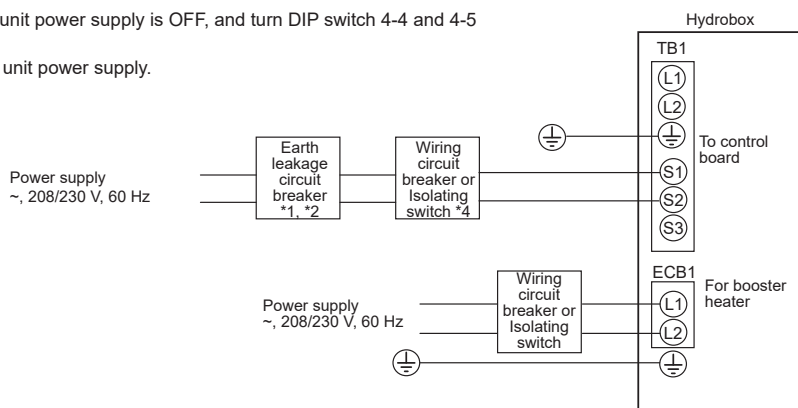
- To end operation *1

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

*1 When the indoor unit only operation is ended, ensure to check over the settings after outdoor unit is connected.

Note:

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



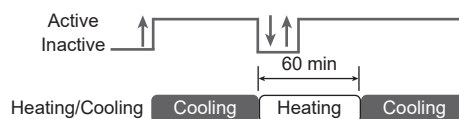
<Figure 5.3.1>

5 System Set Up

5.6 Forced Cooling Mode Input (IN13)

- When IN13 is active, the mode (heating/cooling) is fixed to cooling.
- SW7-2 changes the logic of IN13.

Name	Terminal block	DIP SW7-2	
		OFF	ON
IN13	TBI.4 3-4	Active at short (Default setting)	Active at open



Notes:

Use non-voltage contact signals for the switch of IN13.

The mode (heating/cooling) does not switch under the condition such as

- within 60 minutes since the mode switched last time,
- during DHW mode or legionella prevention mode,
- during outdoor unit protection control,
- during emergency operation, floor dry up operation, or abnormality.

Check the mode with the main remote controller or the cooling signal output (OUT8 ON: cooling, OFF: heating).

en

5.7 Using MicroSD Memory Card

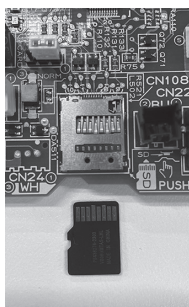
The indoor unit is equipped with a microSD memory card interface in FTC.

Using a microSD 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 a microSD memory card that complies with the SD standards. Check that the microSD memory card has a logo on it of those shown to the right.
- (2) SD memory cards to the SD standards include microSD and microSDHC memory cards. The capacities are available up to 32 GB.
- (3) Insert the microSD memory card into the FTC control board in the direction shown below.



- (4) Before inserting or ejecting a microSD memory card, make sure to power off the system. If a microSD memory card is inserted or ejected with the system powered on, the stored data could be corrupted or the microSD memory card be damaged.

*A microSD 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.

- (5) The read and write operations have been verified using the following microSD memory cards, however, these operations are not always guaranteed as the specifications of these microSD memory cards could change.

Manufacturer	Model	Tested in
Vantastek	Vantastek 8GB microSDHC	Sep. 2022
Longsys	NC5MC 2008G-52A39	Sep. 2022
Kingston	SDCS2/32GBSP	Sep. 2022

Before using a new microSD memory card (including the card that comes with the unit), always check that the microSD 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 "4.5 Electrical Connection".
(Do not power on the system at this point.)
- b) Insert a microSD 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 microSD memory card cannot be read or written to by the FTC controller.

- (6) Make sure to follow the instruction and the requirement of the microSD memory card's manufacturer.
- (7) Format the microSD memory card if determined unreadable in step (5). This could make it readable.
Download an SD card formatter from the following site.
SD Association homepage: <https://www.sdcard.org/home/>
- (8) FTC supports FAT12/FAT16/FAT32 file system but not NTFS/exFAT file system.
- (9) Mitsubishi Electric is not liable for any damages, in whole or in part, including failure of writing to a microSD memory card, and corruption and loss of the saved data, or the like. Back up saved data as necessary.
- (10) Do not touch any electronic parts on the FTC control board when inserting or ejecting a microSD memory card, or else the control board could fail.

Logos



Capacities

2 GB to 32 GB *2

SD speed classes

All

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

*2 A 2GB microSD memory card stores up to 30 days of operation logs.

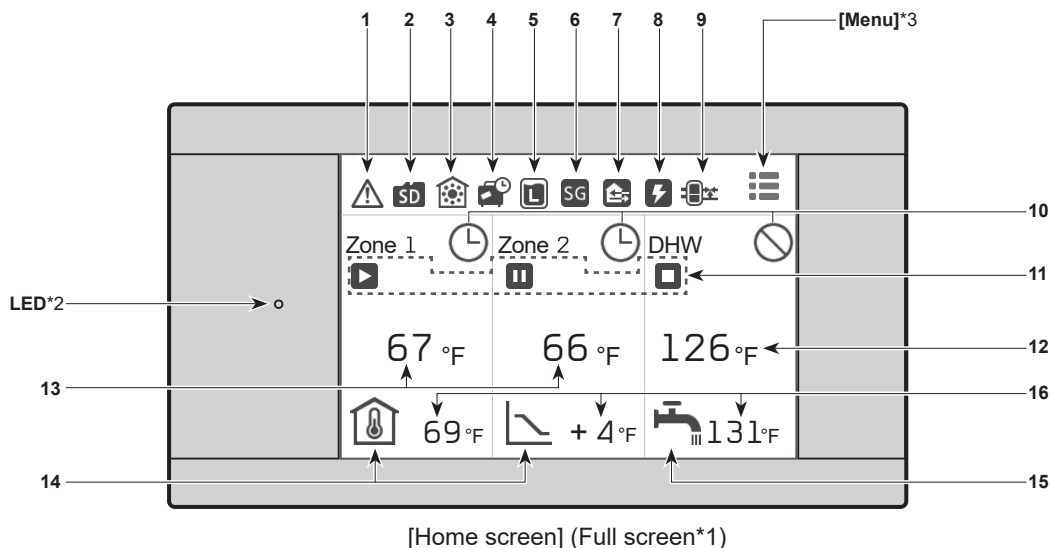
6 Remote Controller

1. Main remote controller

■ Main remote controller

To change the settings of your heating/cooling system, please use the main remote controller located on the wall or the front panel of the hydrobox. The following is a guide to viewing the main settings. Should you require more information, please contact your installer. Some functions are not available depending on the system configuration. These functions are grayed out or not shown.

Note: The terms displayed on the main remote controller are enclosed in square brackets.



Home screen icons

No.	Icons	Description
1		Alert (for multiple outdoor units control) Touching the menu icon displays error codes.
	J1	Alert Error codes are displayed.
2		SD card is inserted. Normal operation
		SD card is inserted. Abnormal operation
3		Heating mode
		Cooling mode
4		Vacation schedule is activated.
5		Legionella prevention mode is running.
6		Smart grid ready is running. (Europe only)
7		Compressor is running.
		Compressor is running and defrosting.
		Compressor is running and in quiet mode. The sound level is shown at left side of the icon.
		Emergency heating
8		Electric heater is running.

No.	Icons	Description
9		Boiler is running.
		Buffer tank control is running.
10		Schedule
		Prohibited
		Cloud control
11		Operation
		Standby
		This unit is in standby whilst other indoor unit(s) is in operation by priority.
		Stop
12		Current DHW tank temperature
13		Current flow temperature If the unit is connected to the room temperature thermistor (option) and choose Room temp. mode, the screen shows current room temperature.

No.	Icons	Description
14		Weather compensation curve When the operation stops: Black During heating operation: Orange During cooling operation: Blue
		Auto Adaptation (Target room temperature) When the operation stops: Black During heating operation: Orange
		Flow temperature (Target flow temperature) When the operation stops: Black During heating operation: Orange During cooling operation: Blue
15		DHW icon is displayed when DHW is enabled. When the operation stops: Black During operation: Orange
16		Target temperature The settable temperature differs depending on the control logic.

- The screen will turn off when the main remote controller is not operated for a while. Touching any part of the screen turns it on again.
- From [Touch screen] in [Setting], the brightness can be adjusted.
- By selecting [Always on] for [Backlight time] from [Touch screen] in [Setting], the backlight stays lit for 30 seconds and after it dims down.

*1 From [Setting], the screen can be switched to the full screen or the base screen.

The base screen does not display the operation icons and the target temperature.

*2 From [Display] in [Setting], the LED lamp can be turned on/off.

*3 Pressing and holding the menu icon for 3 seconds switches the lock menu to on/off.

Some functions cannot be edited when the lock menu is on.

(The icon changes to when the lock menu is on.)

*4 Auto Adaptation cannot be selected during the cooling mode.

6 Remote Controller

■ Quick start

When the main remote controller is switched on for the first time, the screen automatically goes to the [Language], [Date/Time], [System configuration], and quick start setting screen in order. On the quick start setting screen, the following items can be set.

Note:

[Electric booster heater use]

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

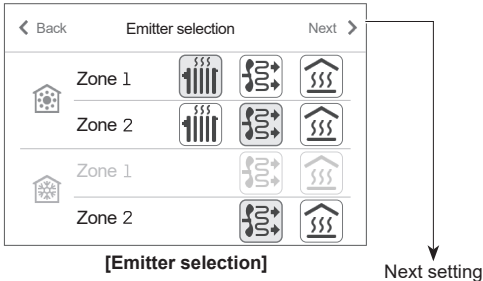
If you do not have any special requirements (such as building regulations) in your country, skip this setting (select [Next]).

Quick start

- [Zone sensor selection]
- [Emitter selection]
- [Control logic]
- [Outdoor design temperature]
- [Zone sensor selection]*1
- [DHW]
- [Flow rate & pump speed]
- [Electric booster heater use]*2

*1 Selection of room sensors for monitoring the room temperature

*2 It cannot be reset, so be careful when you set it.



■ Lock menu

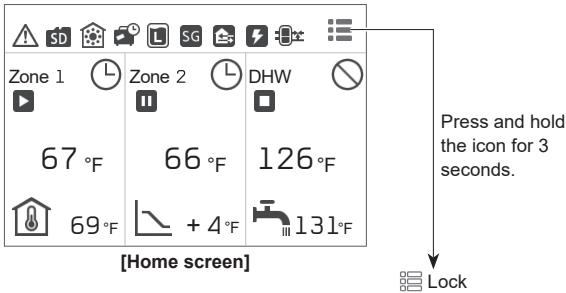
Pressing and holding the menu icon for 3 seconds switches the lock menu to on.

(The icon changes to when the lock menu is on.)

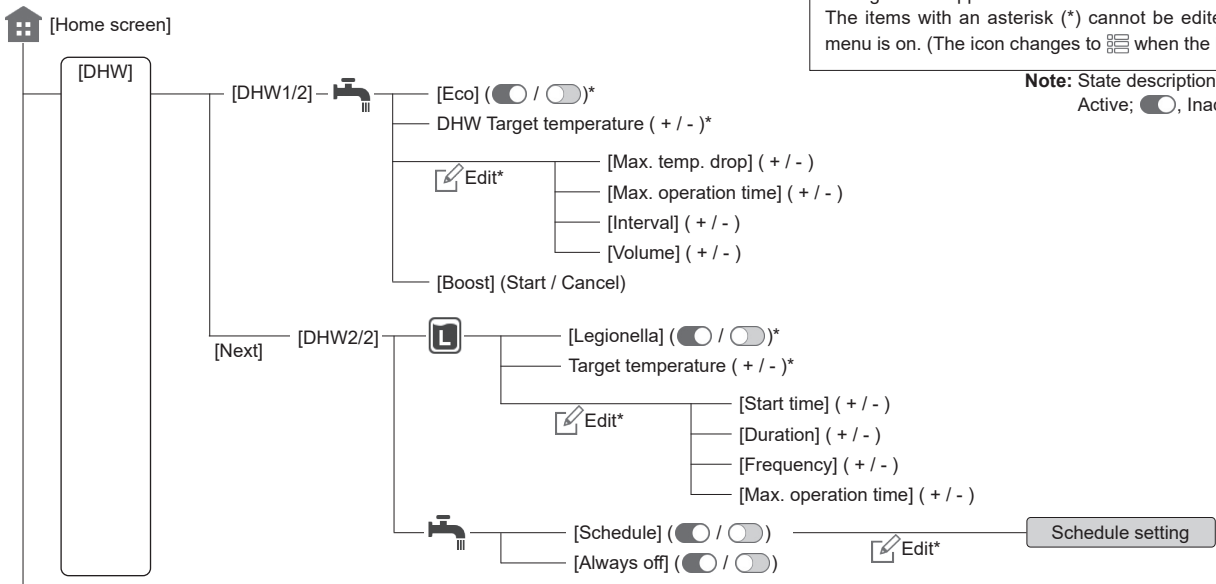
Some functions cannot be edited in this state.

Note: You need a password to edit [Service] even when the lock menu is off.

Refer to the main remote controller menu tree for details of the items which cannot be edited when the lock menu is on.



<Main remote controller menu tree>



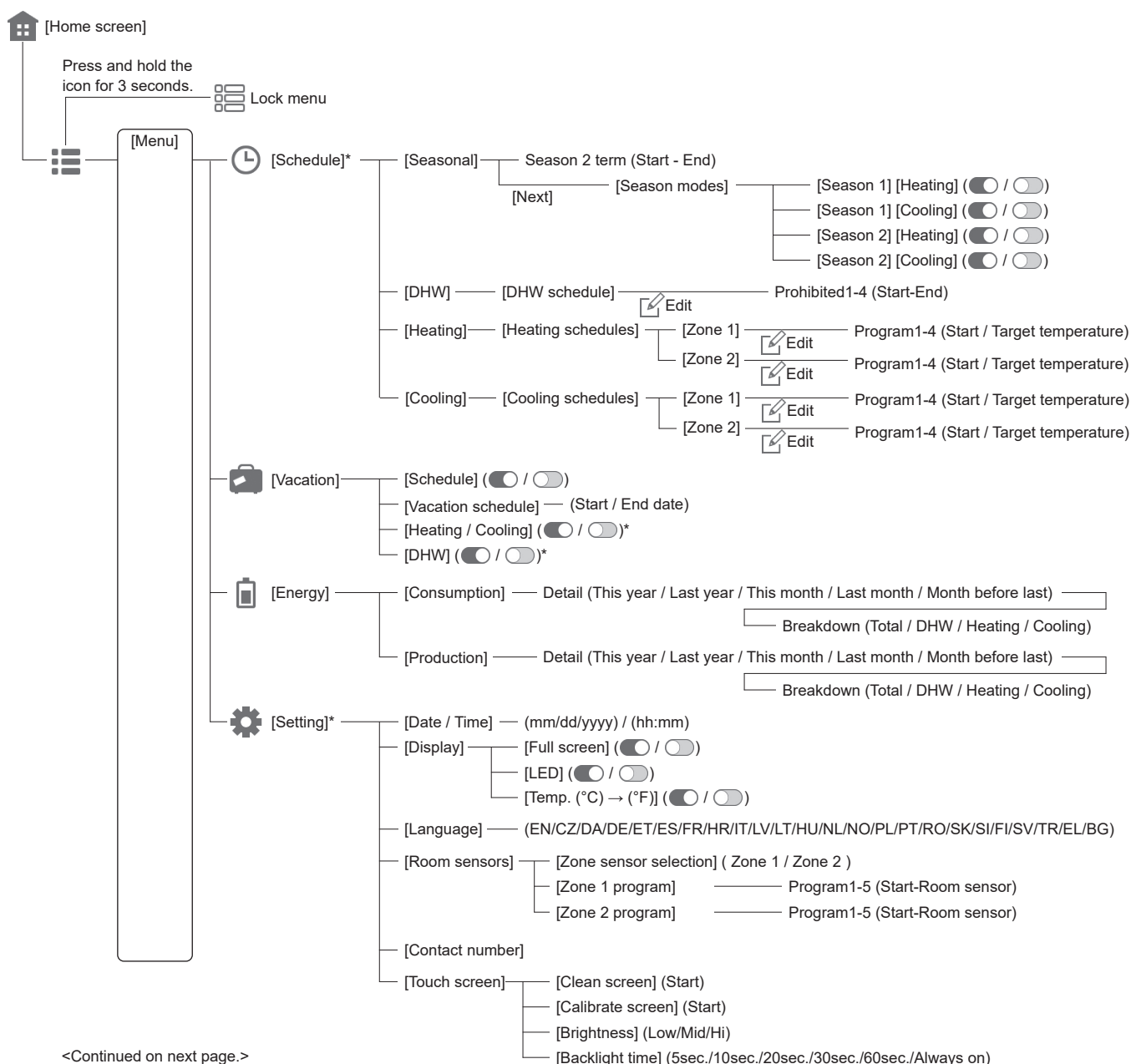
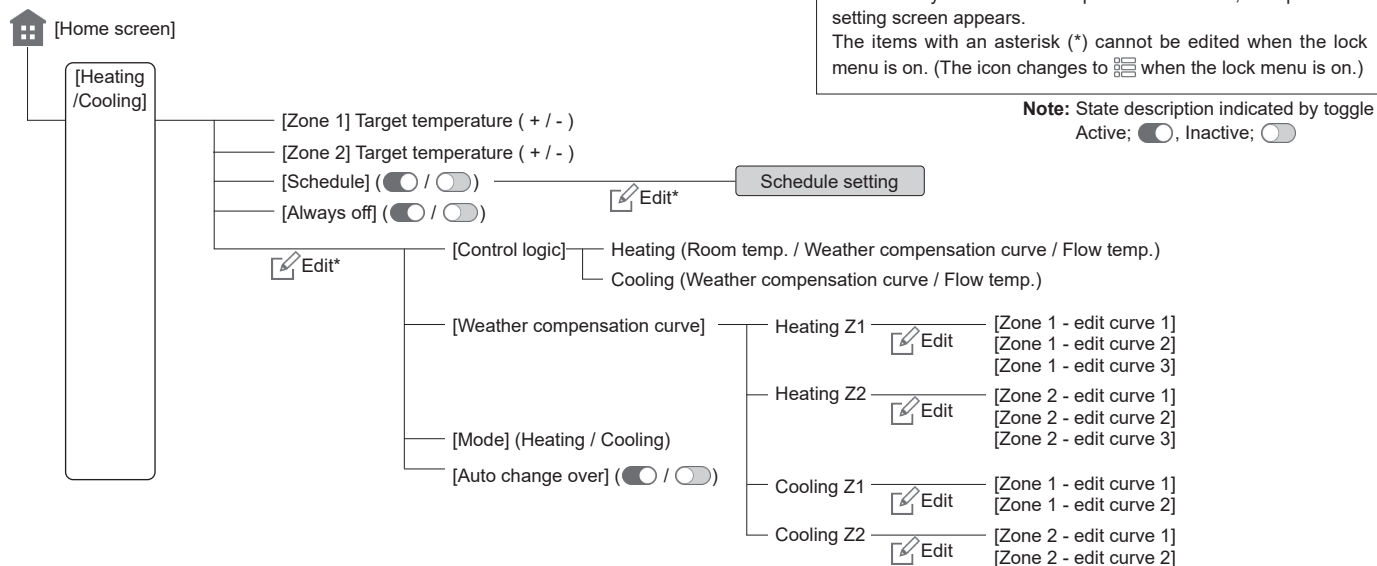
When the system is started up for the first time, the quick start setting screen appears.
The items with an asterisk (*) cannot be edited when the lock menu is on. (The icon changes to when the lock menu is on.)

Note: State description indicated by toggle
Active: , Inactive:

6 Remote Controller

Continued from the previous page.

<Main remote controller menu tree>



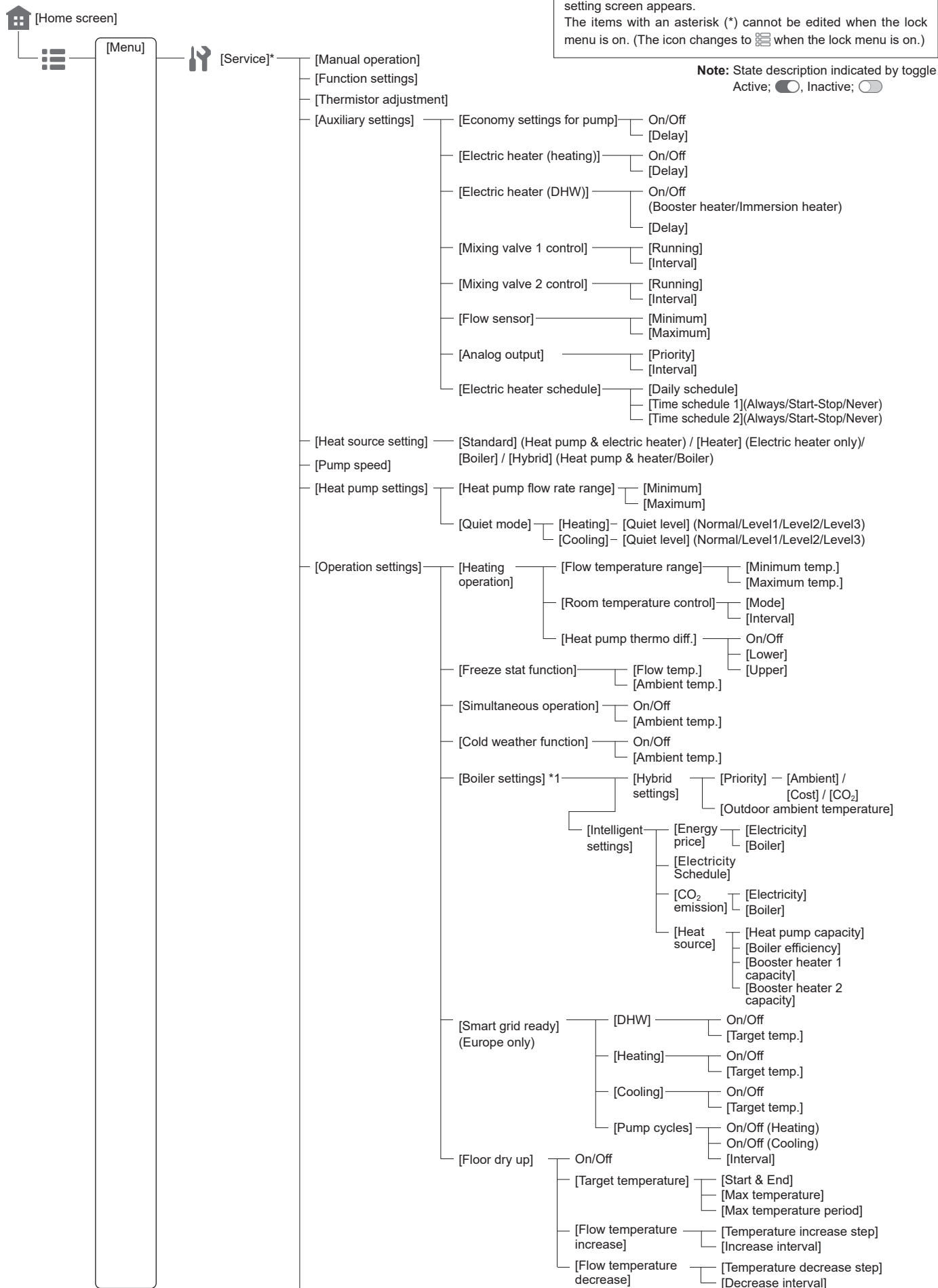
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6 Remote Controller

Continued from the previous page.

<Main remote controller menu tree>



<Continued on next page.>

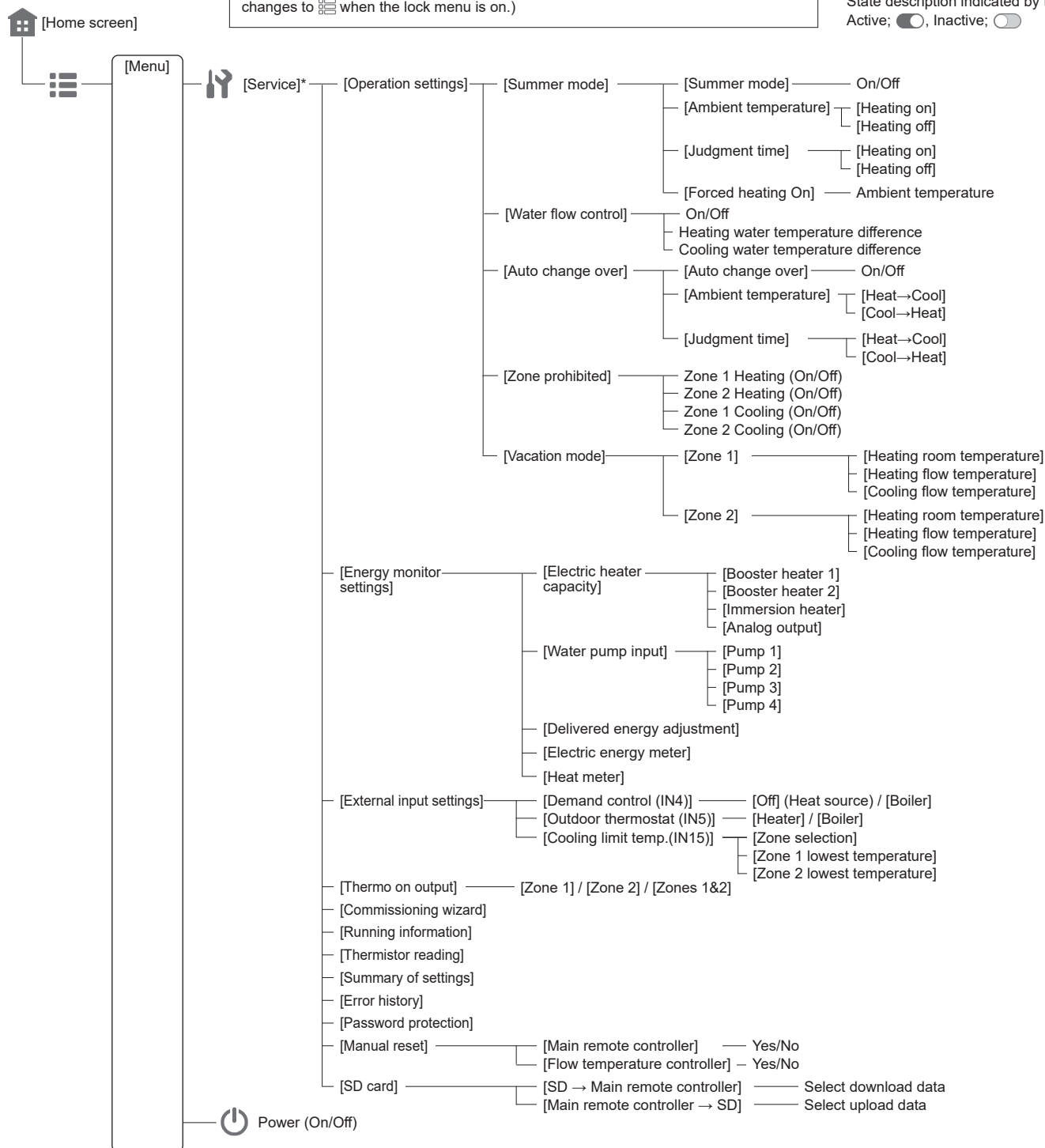
6 Remote Controller

Continued from the previous page.

<Main remote controller menu tree>

When the system is started up for the first time, the quick start setting screen appears. The items with an asterisk (*) cannot be edited when the lock menu is on. (The icon changes to  when the lock menu is on.)

- Note:
State description indicated by toggle
Active; , Inactive; 

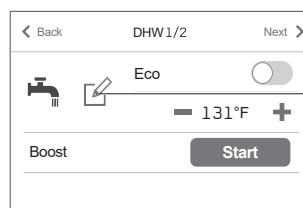


DHW (Domestic Hot Water) / Legionella Prevention

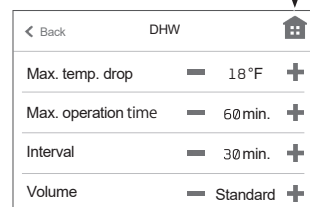
The DHW and legionella prevention menus control the operation of DHW tank heat ups.

DHW mode settings

- [DHW]: The Eco mode can be activated/deactivated by the toggle.
The target temperature can be adjusted by +/-.
From the edit icon , [Max. temp. drop], [Max. operation time], [Interval], and [Volume] can be set.



[DHW]



[DHW]

6 Remote Controller

Menu subtitle	Function	Range	Unit	Default value
DHW target temp.	Desired temperature of stored hot water	104 - 158 (40 - 70)	°F (°C)	122 (50)
[Max. temp. drop]	Difference in temperature between the DHW maximum temperature and the temperature at which DHW mode restarts	9 - 72 (5 - 40)*1	°F (°C)	18 (10)
[Max. operation time]	Maximum time allowed for stored water heating DHW mode	30 - 120	min.	60
[Interval]	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

*1 When the DHW maximum temperature is set over 131°F (55°C), the temperature at which DHW mode restarts must be less than 122°F (50°C) to protect the device.

[Eco]

DHW mode can run in either normal or Eco mode. Normal mode will heat the water in the DHW tank fast 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.

[Volume]

Select the amount of DHW tank. If you need much hot water, select [Large].

Return to the DHW/legionella prevention menu.

Legionella prevention mode settings (LP mode)

- [Legionella]: It can be activated/deactivated by the toggle.
The target temperature can be changed by +/-.
From the edit icon , [Start time], [Duration], [Frequency], and [Max. operation time] can be set.
- [Schedule]: It can be activated/deactivated by the toggle.
- [Always off]: It can be activated/deactivated by the toggle.

During LP mode, the temperature of the stored water is increased above 140°F (60°C) to inhibit legionella bacteria growth. It is strongly recommended that this is done at regular intervals. Please check local regulations for the recommended frequency of heat ups.

Note 1: When failures occur on the hydrobox, the LP mode may not function normally.

Note 2: Even when DHW operation is prohibited, LP mode will operate.

Please note that LP mode uses the assistance of electric heaters 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 REGION REGARDING LEGIONELLA PREVENTION, such as ASHRAE GUIDELINE 12.

Menu subtitle	Function	Range	Unit	Default value
Hot water temp.	Desired temperature of stored hot water	140 - 158 (60 - 70)	°F (°C)	149 (65)
[Start time]	Time when LP mode will begin	AM12:00 - PM11:00	-	AM03:00
[Duration]	The time period after LP mode desired water temperature has been reached	1 - 120	min.	30
[Frequency]	Time between LP mode DHW tank heat up	1 - 30	day	15
[Max. operation time]	Maximum time allowed for LP mode DHW tank heat	1 - 5	h	3

⚙ [Setting]

From the menu icon , access [Setting].

The following items can be edited in [Setting].

- [Date / time]
- [Display] (From [Setting], the screen can be switched to the full screen or the base screen.)
- [Language]
- [Room sensors]
- [Contact number]
- [Touch screen] ([Calibrate screen]*1, [Clean screen]*2, [Brightness], and [Backlight time])

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

*1 Touching the 9 dots displayed on the screen starts calibration.

To properly calibrate the touch panel, use a pointy but not sharp object to touch the dots.

Note: A sharp object may damage or scratch the touch screen.

*2 You can wipe the screen while touch operations are invalid for 30 seconds.

Wipe with a soft dry cloth, a cloth soaked in water with mild detergent, or a cloth dampened with ethanol.

Do not use acidic, alkaline, or organic solvents.

[Room sensors]

For [Room sensors], it is important to choose the correct room sensor depending on the heating and cooling mode the system will operate in.

 Back
 Zone 1 program
 

Program 1 AM 12:00 - MainRC >

Program 2 PM 12:00 - MainRC >

Program 3 PM 03:00 - MainRC >

Program 4 PM 07:00 - MainRC >



[Zone 1 program]

6 Remote Controller

Menu subtitle	Description		
[Zone 1 program] [Zone 2 program]	Control option *	Corresponding initial settings room sensor	
		[Zone 1]	[Zone 2]
	A Zone 1 ; Auto Adaptation (Target room temperature) Zone 2 ; Weather compensation curve or flow temperature control	TH1 (Room temperature thermistor (option))	*1
	B Zone 1 ; Auto Adaptation (Target room temperature) Zone 2 ; Weather compensation curve or flow temperature control	[MainRC] (Main remote controller)	*1
	C Zone 1 ; Weather compensation curve or flow temperature control Zone 2 ; Weather compensation curve or flow temperature control	*1	*1
*1. Not specified (if a locally-supplied room thermostat is used)			
* Refer to the website manual for details.			

[Service]

The service menu provides functions to be used by installer or service engineer. It is NOT intended for the home owner to alter 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 [Password protection] 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, 3-way valve and mixing 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.

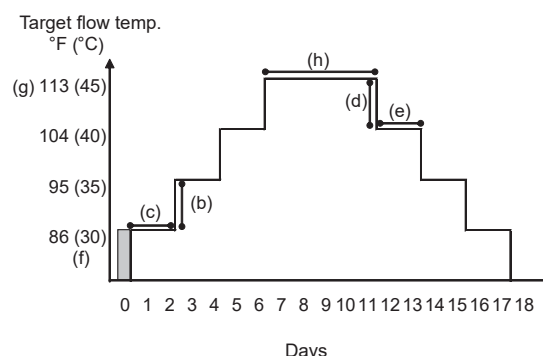
Manual operation and heat source setting can not be selected if the system is running. A screen will be displayed asking the installer to stop the system before these modes can be activated.
The system automatically stops 2 hours after last operation.

[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 temperature of Zone 1 is the same as that of Zone 2.



• Disconnect wiring to external inputs of room thermostat, demand control, and outdoor thermostat, or the target flow temperature may not be maintained.

Functions	Symbol	Description	Option/Range	Unit	Default
[Floor dry up function]	a	Set the function to on and power on the system using the main remote controller, and the dry up heating operation will start.	on/off	—	off
[Flow temperature increase]	b	It sets the increase step of the target flow temperature.	+2 to +54 (+1 to +30)	°F (°C)	+9 (+5)
	c	It sets the period for which the same target flow temperature is maintained.	1 to 7	day	2
[Flow temperature decrease]	d	It sets the decrease step of the target flow temperature.	-2 to -54 (-1 to -30)	°F (°C)	-10 (-5)
	e	It sets the period for which the same target flow temperature is maintained.	1 to 7	day	2
[Target temperature]	f	It sets the target flow temperature at the start and the finish of the operation.	68 to 167 (20 to 75)*	°F (°C)	87 (30)
	g	It sets the maximum target flow temperature.	68 to 167 (20 to 75)*	°F (°C)	113 (45)
	h	It sets the period for which the maximum target flow temperature is maintained.	1 to 20	day	5

* The maximum temperature differs depending on the connected outdoor unit.

en

6 Remote Controller

[Password protection]

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

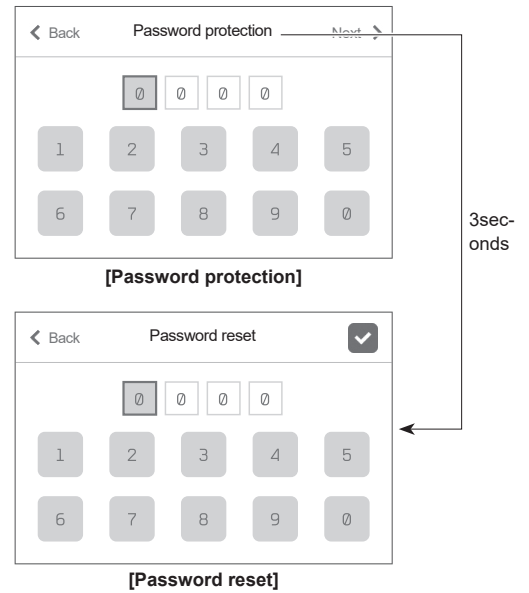
[Password reset]

If you forget the password you entered, or have to service a unit somebody else installed, you can reset and change the password.

1. From [Service] in [Menu], access the [Password protection] screen.
2. Press and hold the title section for 3 seconds to access the [Password reset] screen.
3. Enter a new password.
4. Touching [Back] or the confirm icon  saves the password.

[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.



7 Commissioning

■ Pre-commissioning exercises- potable/DHW circuit

Initial fill procedure:

Ensure all pipe joints and fittings are tight and secure.

Open the most distant DHW tap/outlet.

Slowly/gradually open the main water supply to begin filling unit and DHW pipework.

Allow most distant tap to run free and release/purge residual air from installation.

Close tap/outlet to retain fully charged system.

Note: When an immersion heater is fitted, do NOT energise the heater until the DHW tank is full of water. Also do NOT energise any immersion heater if any sterilisation chemicals remain in the DHW tank as this will cause premature failure of the heater.

Initial flush procedure:

Energise system to heat-up indoor unit contents to a temperature of approx. 87 to 104°F (30 to 40°C).

Flush/drain the water contents to remove any residue/impurities resulting from the installation works. Use the cylinder unit drain cock to safely discharge the warmed water to drain via a suitable hose.

On completion, close drain cock, re-fill system and resume system commissioning.

8 Service and Maintenance

The indoor unit must be serviced once a year by a qualified individual. Service 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 personnel with the appropriate electrical qualifications. Any maintenance or 'DIY' fixes done by a non-accredited person could invalidate the Warranty and/or result in damage to the hydrobox unit and injury to the person.

■ Error Codes

Code	Error	Action
L3	Circulation water temperature overheat protection	Flow rate may be reduced. Check for; • Water leakage • Magnetic filter / Strainer blockage • Water circulation pump function (Error code may display during filling of primary circuit, complete filling and reset error code.)
L4	DHW tank water temperature overheat protection	Check the immersion heater and it's contactor.
L5	Indoor unit temperature thermistor (THW1, THW2, THW5B, THW6, THW7) 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. Caution: The pump valves may be hot, please take care.
LA	Pressure sensor failure	Check pressure sensor cable for damage or loose connections.
LB	High pressure protection	• Flow rate of the heating circuit may be reduced. Check water circuit. • Plate heat exchanger may be clogged. Check the plate heat exchanger. • Outdoor unit failure. Check refrigerant volume, valve, LEV coil and pipe crushing of outdoor unit.
LC	Boiler circulation water temperature overheat protection	Check if the setting temperature of the Boiler for heating exceeds the restriction. Flow rate of the heating circuit from the boiler may be reduced. Check for • Water leakage • Magnetic filter / Strainer blockage • Water circulation pump function.
LD	Thermistor (Boiler flow water temp.) (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 • Water leakage • Magnetic filter / Strainer blockage • Water circulation pump function.
LJ	DHW operation error (type of external plate HEX)	• Check for disconnection of the thermistor (DHW tank lower water temp.) (THW5B). • Flow rate 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 the water flow rate range (Table 4.3.1). Check remote controller settings ([Service] → [Heat pump settings] → [Heat pump flow rate range]) See Action for L3.
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.
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.
EE	Combination error between FTC and outdoor unit	Check combination of FTC and outdoor unit.
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 (Touch [Reset] on main remote controller).

en

8 Service and Maintenance

■ Annual Maintenance

It is essential that the indoor unit is serviced at least once a year by a qualified individual. Any required parts should be purchased from Mitsubishi Electric. NEVER bypass safety devices or operate the unit without them being fully operational. For more details, refer to service handbook.

Notes

- Within the first couple of months of installation, remove and clean the indoor unit's strainer plus any additional filter items that are fitted external to the indoor unit. This is especially important when installing on an old/existing pipe work system.
- The pressure relief valve and T&P valve 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) Manometer	6 years	Water leakage

Parts which require regular inspection

Parts	Check every	Possible failures
Pressure relief valve 43.5 psi (3bar)	1 year (turning the knob manually)	It could seize and risk burst of expansion vessel
Water circulation pump (Primary circuit)	20,000 hrs (3 years)	Water circulation pump failure
Magnetic filter	3 years	Flow rate decrease due to clogging

Parts which must NOT be re-used when servicing

- * O-ring
- * Gasket

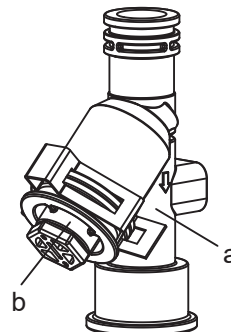
Note:

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

<Draining particles from the magnetic filter>

Note: DRAINED WATER MAY BE VERY HOT

1. Turn OFF the unit via the user interface.
2. Turn OFF the circuit breaker.
3. Check if body of the magnet filter is still fitted tight (a).
4. Close the isolating valves.
5. Put a suitable bottle below the magnetic filter.
6. Remove fastener and open the cap of the filter (b).
7. Collect the water and particles in the bottle.
8. Wash the inside mesh and magnet and remove particles from them.
9. Put the inside mesh and magnet back into the filter.
10. Fit the cap with fastener.
11. Open the isolating valves.
12. Check the pressure of the water circuit.



- a. body
- b. cap

Engineers Forms

Should settings be changed from default, please enter and record new setting in 'Commissioning/Field settings record sheet' below. 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			
DHW	DHW *3	Eco	On/Off	Off					
		Boost	On/Off	—					
		DHW max. temp.	104 to 158°F (40 to 70°C) *4	122°F (50°C)					
		Max. temp. drop	9 to 72°F (5 to 40°C)	18°F (10°C)					
		Max. operation time	30 to 120 min.	60 min.					
		Interval	30 to 120 min.	30 min.					
		Volume	Large / Standard	Standard					
		Schedule	On/Off	Off					
	Legionella prevention *3	Always off	On/Off	Off					
		Legionella	On/Off	On					
		Hot water temp.	140 to 158°F (60 to 70°C) *4	149°F (65°C)					
		Start time	AM12:00 - PM11:00	AM03:00					
		Duration	1 to 120 min.	30 min.					
		Frequency	1 to 30 days	15 days					
Heating / Cooling *3	Heating / Cooling	Max. operation time	1 to 5 h	3 h					
		Zone 1 heating room temp.	50 to 87°F (10 to 30°C)	68°F (20°C)					
		Zone 2 heating room temp. *1	50 to 87°F (10 to 30°C)	68°F (20°C)					
		Zone 1 heating flow temp.	68 to 158°F (20 to 70°C)	113°F (45°C)					
		Zone 2 heating flow temp. *2	68 to 158°F (20 to 70°C)	95°F (35°C)					
		Zone 1 cooling flow temp.	41 to 77°F (5 to 25°C)	59°F (15°C)					
		Zone 2 cooling flow temp.	41 to 77°F (5 to 25°C)	68°F (20°C)					
		Zone 1 heating weather compensation curve	-16 to +16°F (-9 to +9°C)	+0°F (0°C)					
		Zone 2 heating weather compensation curve *2	-16 to +16°F (-9 to +9°C)	+0°F (0°C)					
		Zone 1 cooling weather compensation curve	-16 to +16°F (-9 to +9°C)	+0°F (0°C)					
		Zone 2 cooling weather compensation curve *2	-16 to +16°F (-9 to +9°C)	+0°F (0°C)					
		Schedule	On/Off	Off					
		Always off	On/Off	Off					
		Heating / Cooling	Heating / Cooling	Heating					
		Zone 1 control logic	Heating room temp./ Heating flow temp./ Heating weather compensation curve / Cooling flow temp./ Cooling weather compensation curve	Heating weather compensation curve					
		Zone 2 control logic *2	Heating room temp./ Heating flow temp./ Heating weather compensation curve / Cooling flow temp./ Cooling weather compensation curve	Heating weather compensation curve					
		Auto change over	On/Off	Off					
		Weather compensation curve (Heating)	Hi flow temp. set point	Zone 1 outdoor ambient temp.	-22 to +91°F (-30 to +33°C) *5	5°F (-15°C)			
	Zone 1 flow temp.			68 to 158°F (20 to 70°C)	122°F (50°C)				
	Zone 2 outdoor ambient temp. *2			-22 to +91°F (-30 to +33°C) *5	5°F (-15°C)				
	Zone 2 flow temp. *2			68 to 158°F (20 to 70°C)	104°F (40°C)				
	Lo flow temp. set point			Zone 1 outdoor ambient temp.	-18 to +95°F (-28 to +35°C) *6	68°F (20°C)			
				Zone 1 flow temp.	68 to 158°F (20 to 70°C)	77°F (25°C)			
			Zone 2 outdoor ambient temp. *2	-18 to +95°F (-28 to +35°C) *6	68°F (20°C)				
			Zone 2 flow temp. *2	68 to 158°F (20 to 70°C)	77°F (25°C)				
			Adjust	Zone 1 outdoor ambient temp.	-20 to +93°F (-29 to +34°C) *7	—			
				Zone 1 flow temp.	68 to 158°F (20 to 70°C)	—			
	Zone 2 outdoor ambient temp. *2			-20 to +93°F (-29 to +34°C) *7	—				
	Zone 2 flow temp. *2			68 to 158°F (20 to 70°C)	—				
	Weather compensation curve (Cooling)			Hi flow temp. set point	Zone 1 outdoor ambient temp.	50 to 115°F (10 to 46°C)	95°F (35°C)		
					Zone 1 flow temp.	41 to 77°F (5 to 25°C)	59°F (15°C)		
			Zone 2 outdoor ambient temp. *2		50 to 115°F (10 to 46°C)	95°F (35°C)			
			Zone 2 flow temp. *2		41 to 77°F (5 to 25°C)	68°F (20°C)			
			Lo flow temp. set point	Zone 1 outdoor ambient temp.	50 to 115°F (10 to 46°C)	77°F (25°C)			
				Zone 1 flow temp.	41 to 77°F (5 to 25°C)	77°F (25°C)			
	Zone 2 outdoor ambient temp. *2	50 to 115°F (10 to 46°C)		77°F (25°C)					
Zone 2 flow temp. *2	41 to 77°F (5 to 25°C)	77°F (25°C)							
Menu	Energy		Energy monitor	Consumed electrical energy/Delivered energy	—				
	Vacation		Schedule	On/Off/Set time	—				
			DHW *3	On/Off	Off				
			Heating / Cooling	On/Off	On				
	Setting	Language	EN/CZ/DA/DE/ET/ES/FR/HR/IT/LV/LT/HU/NL/NO/PL/PT/RO/SK/SI/FI/SV/TR/EL/BG		EN				
		Room sensors	Zone sensor selection *2	Zone 1/Zone 2	Zone 1				
			Zone 1 program	TH1/Main RC/"Time/Zone"		TH1			
			Zone 2 program *2	TH1/Main RC/"Time/Zone"		TH1			
		Display	Temp. (°C) → (°F)	On/Off	Off				
		Touch screen	Clean screen	On/Off	Off				
			Calibrate screen	On/Off	Off				
			Brightness	Low / Mid / Hi	Mid				
	Backlight time		5sec./10sec./20sec./30sec./60sec./Always on	30sec.					

en

Continued to next page.

Engineers Forms

Commissioning/Field settings record sheet

Main remote controller screen			Parameters		Default setting	Field setting	Notes
Menu	Service	Thermistor adjustment	THW1	-18 to +18°F (-10 to +10°C)	+0°F (0°C)		
			THW2	-18 to +18°F (-10 to +10°C)	+0°F (0°C)		
			THW5B	-18 to +18°F (-10 to +10°C)	+0°F (0°C)		
			THW6	-18 to +18°F (-10 to +10°C)	+0°F (0°C)		
			THW7	-18 to +18°F (-10 to +10°C)	+0°F (0°C)		
			THW8	-18 to +18°F (-10 to +10°C)	+0°F (0°C)		
			THW9	-18 to +18°F (-10 to +10°C)	+0°F (0°C)		
			THW10	-18 to +18°F (-10 to +10°C)	+0°F (0°C)		
			THWB1	-18 to +18°F (-10 to +10°C)	+0°F (0°C)		
		Auxiliary settings	Economy settings for pump.	On/Off *8 Delay (3 to 60 min.)	On 10 min.		
			Electric heater (heating)	Space heating: On (used)/Off (not used) Electric heater delay timer (5 to 180 min.)	On 30 min.		
			Electric heater (DHW) *3	Booster heater	DHW: On (used)/Off (not used) On		
				Immersion heater	DHW: On (used)/Off (not used) On		
				Electric heater delay timer (15 to 30 min.)	15 min.		
			Mixing valve 1 control	Running (10 to 240 sec.) Interval (1 to 30 min.)	120 sec. 2 min.		
			Mixing valve 2 control	Running (10 to 240 sec.) Interval (1 to 30 min.)	120 sec. 2 min.		
			Flow sensor *9	0 to 26.4 GPM	1.4 GPM		
				0 to 26.4 GPM	26.4 GPM		
			Analog output	Interval (1 to 30 min.)	5 min.		
				Priority (Normal / High)	Normal		
			Electric heater schedule *15	Daily schedule (Schedule 1/Schedule 2)	Schedule 1		
				Time schedule 1 (Always/Start-Stop/Never)	Always		
				Time schedule 2 (Always/Start-Stop/Never)	Always		
		Pump speed	DHW	Pump speed (1 to 5)	5		
			Heating / Cooling	Pump speed (1 to 5)	5		
		Heat source setting		Standard / Heater / Boiler / Hybrid *10	Standard		
		Heat pump settings	Heat pump flow rate range	Minimum (0 to 26.4 GPM [0 to 100 L/min])	1.4 GPM		
				Maximum (0 to 26.4 GPM [0 to 100 L/min])	26.4 GPM		
			Quiet mode	Heating	Day (Mon to Sun)	—	
				Time	AM12:00 to PM11:45		
				Quiet level (Normal/ Level1/ Level2/ Level3)	Normal		
			Cooling	Day (Mon to Sun)	—		
				Time	AM12:00 to PM11:45		
				Quiet level (Normal/ Level1/ Level2/ Level3)	Normal		
		Operation settings	Heating operation	Flow temperature range *11	Minimum temp. (68 to 113°F [20 to 45°C]) Maximum temp. (95 to 158°F [35 to 70°C])	87°F (30°C) 122°F (50°C)	
				Room temperature control *11	Mode (Auto/Quick/Normal/Slow) Interval (10 to 60 min.) *12	Auto 10 min.	
			Heat pump thermo diff.	On/Off *8	On		
				Lower (-16 to -2°F [-9 to -1°C])	-9°F (-5°C)		
				Upper (+5 to +9°F [+3 to +5°C])	+9°F (+5°C)		
			Freeze stat function *13	Ambient temp. (37 to 68°F [3 to 20°C]) / **	41°F (5°C)		
			Simultaneous operation (DHW/ Heating)	On/Off *8	Off		
			Cold weather function	Ambient temp. (-22 to 50°F [-30 to 10°C]) *5	5°F (-15°C)		
				On/Off *8	Off		
			Boiler settings	Hybrid settings	Ambient temp. (-22 to 14°F [-30 to -10°C]) *5	5°F (-15°C)	
					Outdoor ambient temp. (-22 to 50°F [-30 to 10°C]) *5	5°F (-15°C)	
					Priority mode (Ambient/Cost/CO ₂)	Ambient	
					Outdoor ambient temp. rise (+2 to +9°F [+1 to +5°C])	+5°F (+3°C)	
				Intelligent settings	Energy price *14	Electricity (0.001 to 999 */kWh)	0.5 */kWh
						Boiler (0.001 to 999 */kWh)	0.5 */kWh
					CO ₂ emission	Electricity	1.10 lb•CO ₂ /kWh (0.5 kg•CO ₂ /kWh)
						Boiler	0.5 kg -CO ₂ /kWh
					Heat source	Heat pump capacity (4.0 to 68.0 (1 to 19.9 kW))	38.2 kBTU/h
						Boiler efficiency (25 to 150%)	80%
						Booster heater 1 capacity (0 to 30 kW)	2 kW
						Booster heater 2 capacity (0 to 30 kW)	4 kW

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Engineers Forms

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

Main remote controller screen				Parameters		Default setting	Field setting	Notes
Menu	Service	Operation settings	Smart grid ready (Europe only)	DHW	On/Off		Off	
					Target temp. (+2 to +54°F [+1 to +30°C]) / -- (Non active)		--	
				Heating	On/Off		Off	
					Target temp.	Switch-on recommendation (68 to 158°F [20 to 70°C])	122°F (50°C)	
						Switch-on command (68 to 158°F [20 to 70°C])	131°F (55°C)	
				Cooling	On/Off		Off	
					Target temp.	Switch-on recommendation (41 to 77°F [5 to 25°C])	59°F (15°C)	
						Switch-on command (41 to 77°F [5 to 25°C])	50°F (10°C)	
				Pump cycles	Heating (On/Off)		On	
					Cooling (On/Off)		On	
					Interval (10 to 120 min.)		10 min.	
			Floor dry up	On/Off *8		Off		
				Target temperature	Start & End (68 to 158°F [20 to 70°C])		87°F (30°C)	
					Max temperature (68 to 158°F [20 to 70°C])		113°F (45°C)	
					Max temperature period (1 to 20 days)		5 days	
				Flow temperature increase	Temperature increase step (+2 to +54°F [+1 to +30°C])		+9°F (+5°C)	
					Increase interval (1 to 7 days)		2 days	
				Flow temperature decrease	Temperature decrease step (-54 to -2°F [-30 to -1°C])		-9°F (-5°C)	
					Decrease interval (1 to 7 days)		2 days	
			Summer mode	On/Off		Off		
				Ambient temperature	Heating on (39 to 67°F [4 to 19°C])		50°F (10°C)	
					Heating off (41 to 68°F [5 to 20°C])		59°F (15°C)	
				Judgment time	Heating on (1 to 48 h)		6 h	
					Heating off (1 to 48 h)		6 h	
			Auto change over	On/Off		Off		
				Ambient temperature	Heat→Cool (50 to 104°F [10 to 40°C])		83°F (28°C)	
					Cool→Heat (41 to 68°F [5 to 20°C])		59°F (15°C)	
				Judgment time	Heat→Cool (1 to 48 h)		6 h	
					Cool→Heat (1 to 48 h)		6 h	
			Water flow control	On/Off		Off		
				Water temperature difference *16	Heating (+6 to +40°F [+3 to +20°C])		+10°F (+5°C)	
					Cooling (+6 to +20°F [+3 to +10°C])		+10°F (+5°C)	
			Vacation mode	Zone 1 heating room temp.		50 to 86°F (10 to 30°C)	59°F (15°C)	
				Zone 2 heating room temp. *1		50 to 86°F (10 to 30°C)	59°F (15°C)	
				Zone 1 heating flow temp.		68 to 158°F (20 to 70°C)	95°F (35°C)	
				Zone 2 heating flow temp. *2		68 to 158°F (20 to 70°C)	77°F (25°C)	
				Zone 1 cooling flow temp.		41 to 77°F (5 to 25°C)	77°F (25°C)	
				Zone 2 cooling flow temp.		41 to 77°F (5 to 25°C)	77°F (25°C)	
			Zone prohibited	Heating (Zone 1)		Permitted/Prohibited	Permitted	
				Heating (Zone 2)		Permitted/Prohibited	Permitted	
				Cooling (Zone 1)		Permitted/Prohibited	Permitted	
				Cooling (Zone 2)		Permitted/Prohibited	Permitted	

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8 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	
Menu	Service	Energy monitor settings	Electric heater capacity	Booster heater 1	0 to 30 kW	2 kW			
				Booster heater 2	0 to 30 kW	4 kW			
				Immersion heater	0 to 30 kW	0 kW			
				Analog output	0 to 30 kW	0 kW			
			Delivered energy adjustment		-50 to +50%	0%			
			Water pump input	Pump 1	0 to 200 W or *** (factory fitted pump)	***			
				Pump 2	0 to 200 W	0 W			
				Pump 3	0 to 200 W	0 W			
				Pump 4	0 to 200 W	72 W			
			Electric energy meter		0.1/1/10/100/1000 pulse/kWh	1000 pulse/kWh			
		Heat meter		0.1/1/10/100/1000 pulse/kWh	1000 pulse/kWh				
		External input settings	Demand control (IN4)		Heat source OFF/Boiler operation		Boiler operation		
			Outdoor thermostat (IN5)		Heater operation/Boiler operation		Boiler operation		
			Cooling limit temp. (IN15)	Zone selection		Zone 1/Zone 2/Zone 1&2	Zone 1		
				Zone 1 lowest temperature		41 to 77°F (5 to 25°C)	65°F (18°C)		
				Zone 2 lowest temperature		41 to 77°F (5 to 25°C)	65°F (18°C)		
		Thermo on output			Zone 1/Zone 2/Zone 1&2		Zone 1&2		

*1 The settings related to Zone 2 can be switched only when 2-zone temperature control or 2-zone valve ON/OFF control is active.

*2 The settings related to Zone 2 can be switched only when 2-zone temperature control is enabled (when DIP SW 2-6 and SW 2-7 are ON).

*3 Only available if DHW tank is present in system.

*4 For the model without both booster, it may not reach the set temperature depending on the outside ambient temperature.

*5 The lower limit is 5°F (-15°C) depending on the connected outdoor unit.

*6 The lower limit is 9°F (-13°C) depending on the connected outdoor unit.

*7 The lower limit is 7°F (-14°C) depending on the connected outdoor unit.

*8 On: the function is active; Off: the function is inactive.

*9 Do not change the setting since it is set according to the specification of flow sensor attached to the indoor unit.

*10 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.

*11 Valid only when operating in Heating room temperature.

*12 When DIP SW5-2 is set to OFF, the function is active.

*13 If asterisk (**) is chosen freeze stat function is deactivated. (i.e. primary water freeze risk)

*14 ** of **/kWh represents currency unit (e.g. €, £, or the like)

*15 Valid only during heating mode

*16 To enable this function in the outdoor unit of WUZ-SHWM, switch the [Mode 7] in [Function settings] to "2".

([Menu] → [Service] → [Function settings], [Ref. add: 0], [Unit: 1] → [Mode 7], 1-High temperature control (default) / 2-Water temperature difference control)

This product is designed and intended for use in the residential, commercial and light-industrial environment.

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

mitsubishi **ELECTRIC CORPORATION**

HEAD OFFICE: TOKYO BUILDING, 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN