ecodan®

Renewable Heating Technology

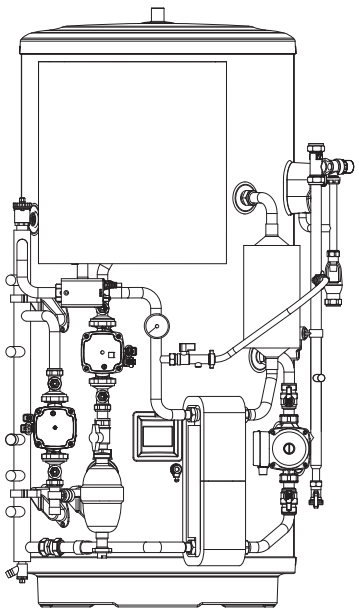
PRE-PLUMBED UNVENTED MAINS PRESSURE
WATER HEATER WITH FTC6 CONTROL SYSTEM.
FOR USE WITH ECODAN PUZ-(H)WM
AIR SOURCE HEAT PUMP RANGE.

January 2022

Doc. No. 607483

SERVICE MANUAL

EHPT15X-UKHLDW1S
EHPT17X-UKHLDW1S
EHPT15X-UKHDW1S
EHPT17X-UKHDW1S
EHPT21X-UKHDW1S
EHPT21X-UKHDW1L
EHPT25X-UKHDW1L
EHPT30X-UKHDW1L



IMPORTANT: PLEASE READ AND UNDERSTAND THESE INSTRUCTIONS BEFORE PERFORMING ANY MAINTENANCE.

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REFERENCE MANUAL

OUTDOOR UNIT'S SERVICE MANUAL

Service Ref.		Service Manual No.
Packaged model	PUZ-WM50VHA(-BS).UK PUZ-WM60VAA(-BS).UK PUZ-WM85VAA(-BS).UK PUZ-WM85YAA(-BS).UK PUZ-WM112VAA(-BS).UK PUZ-WM112YAA(-BS).UK	OCH727 OCB727
	PUZ-HWM140VHA(-BS) PUZ-HWM140YHA(-BS)	OCH748 OCB748

SAFETY PRECAUTION

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.

- **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 like.	

⚠⚠ WARNING
Mechanical
The cylinder unit and outdoor unit must not be installed, disassembled, relocated, altered or repaired by the user. Ask an authorised installer or technician. If the unit is installed improperly or modified after installation by the user, water leakage, electric shock or fire may result.
The outdoor unit should be securely fixed to a hard level surface capable of bearing its weight.
The cylinder unit should be positioned on a hard level surface capable of supporting its filled weight to prevent excessive sound or vibration.
Do not position furniture or electrical appliances below the outdoor unit or cylinder unit.
The discharge pipework from the emergency devices of the cylinder unit 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.
Discharge the condenser before the work involving the electric parts.
General
Keep children and pets away from both the cylinder unit and outdoor units.
Do not use the hot water produced by the heat pump directly for drinking or cooking. This could cause illness to the user.
Do not stand on the units.
Do not touch switches with wet hands.
Annual maintenance checks on both the cylinder unit and the outdoor unit should be conducted by a qualified person.
Do not place containers with liquids on top of the cylinder unit. If they leak or spill onto the cylinder unit, damage to the unit and/or fire could occur.
Do not place any heavy items on top of the cylinder unit.
When installing, relocating, or servicing the cylinder unit, 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 2ºC below the maximum allowable temperature of all the heat emitters. For Zone2, set the target flow temperature to a minimum of 5ºC below the maximum allowable flow temperature of all the heat emitters in Zone2 circuit.
Do not install the unit where combustible gases may leak, be produced, flow, or accumulate. If combustible gas accumulates around the unit, fire or explosion may result.
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 odour.
Pipe-work shall be protected from physical damage.
The installation of pipe-work shall be kept to a minimum.
Compliance with national gas regulations shall be observed.
Keep any required ventilation openings clear of obstruction.
Do not use low temperature solder alloy in the case of brazing the refrigerant pipes.

⚠ 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 cylinder unit 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 the primary and DHW circuits.
Refrigerant leakage may cause suffocation. Provide ventilation in accordance with EN378-1.
Be sure to wrap insulation around the piping. Direct contact with the bare piping may result in burns or frostbite.
Never put batteries in your mouth for any reason to avoid accidental ingestion.
Battery ingestion may cause choking and/or poisoning.
Install the unit on a rigid structure to prevent excessive sound or vibration during operation.
Do not transport the cylinder unit with water inside the DHW tank. This could cause damage to the unit.
If power to the cylinder unit is to be turned off (or system switched off) for a long time, the water should be drained.
If unused for a long period, before operation is resumed, DHW tank should be flushed through with potable water.
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.

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

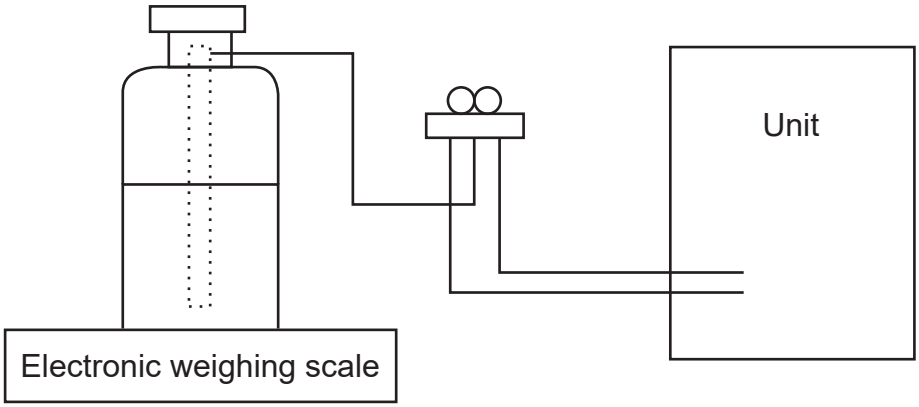
[1] Cautions for service

(1) Perform service after recovering the refrigerant left in unit completely.
(2) Do not release refrigerant in the air.
(3) After completing service, charge the cycle with specified amount of refrigerant.
(4) If moisture or foreign matter might have entered the refrigerant piping during service, ensure to remove them.

[2] Additional refrigerant charge

When charging directly from refrigerant cylinder

(1) Check that cylinder for R410A or R32 on the market is syphon type.
(2) Charging should be performed with the cylinder of syphon stood vertically. (Refrigerant is charged from liquid phase.)



[3] Service tools

Use the service tools below as exclusive tools for R410A or R32 refrigerant.

No.	Tool name	Specifications
1	Gauge manifold	· R410A or R32
		· Use the existing fitting specifications. (UNF1/2)
		· Use high-tension side pressure of 5.3 MPa·G or over.
2	Charge hose	· R410A or R32
		· Use pressure performance of 5.09 MPa·G or over.
3	Electronic weighing scale	—
4	Gas leak detector	· Use the detector for R134a, R407C, R410A or R32
5	Adaptor for reverse flow check	· Attach on vacuum pump.
6	Refrigerant charge base	—
7	Refrigerant cylinder	· R410A or R32 · Top of cylinder (Pink) · Cylinder with syphon
8	Refrigerant recovery equipment	—

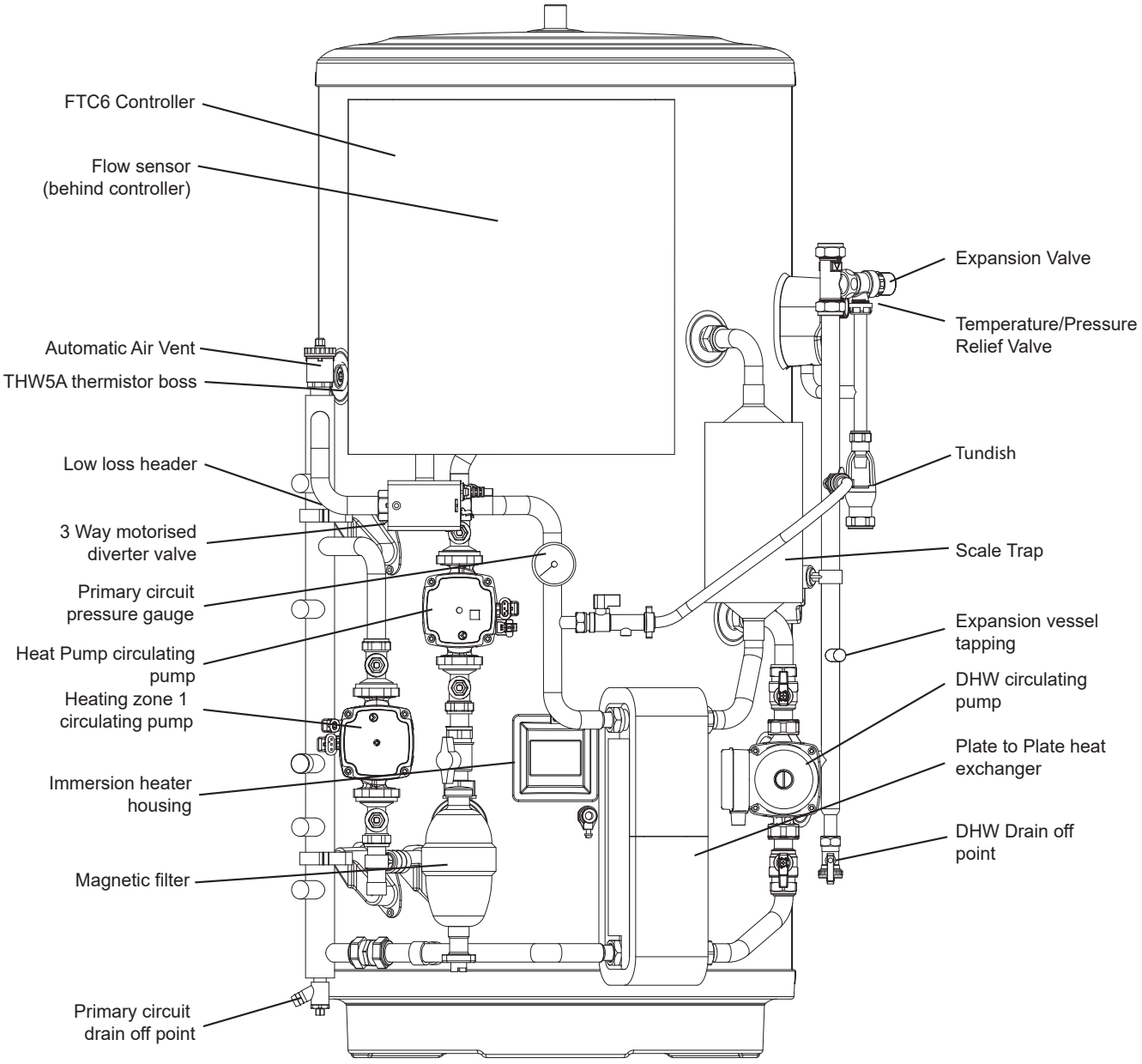
UNIT			STANDARD					
Nominal hot water capacity (litres)			150	170	210 (Small)	210 (Large)	250	300
Water		Primary flow rate (H) WM 50/60/85/112/140	14/17/24/32/40 l/min					
		Pump	Heat Pump - Grundfos UPM3L 25-75 130AZA Heating - Grundfos UPM3 AUTO 25-70 130 DHW - Grundfos UPSO 15-60 CIL2					
		Connection size Heating/DHW (mm)	22/22			28/22		
		DHW Expansion vessel (litres)	12	18	18	18	24	24
		Charge pressure (MPa (bar))	0.35 (3.5)					
Safety devices	Primary circuit	Control thermistor (°C)	80					
		Pressue Relief Valve (MPa (bar))	0.3 (3.0) Contained within outdoor unit					
	DHW circuit	Control thermistor (°C)	75					
		Over-temperature cut-out (°C)	80 +/- 5					
		Temp/Pressure Relief Valve (°C/MPa (bar))	90 / 1.0 (10.0)					
		Expansion valve (MPa (bar))	0.8 (8.0)					
Dimensions (mm)		Width	730	730	730	748	748	748
		Depth	756	756	756	755	755	755
		Height	1131	1257	1509	1509	1761	2075
Weight empty/full (kg)			55/205	58/228	64/274	68/278	74/324	82/382
Materials	Vessel		Duplex stainless steel					
	Insulation	Type	Expanded polyurethane (PU)					
		Nominal thickness (mm)	60					
		Standing heat loss (kWh/24h)	1.15	1.23	1.53	1.53	1.80	2.09
		Ozone Depletion Potential	zero					
		Global Warming Potential	3.1					
Electrical data	Control Board (optionally powered by outdoor unit)	Electrical supply	220 - 240 V ~ , 50Hz					
		Phase	single					
		Fuse rating - MCB Size (A)	16					
	Immersion heater	Electrical supply	220 - 240 V ~ , 50Hz					
		Phase	single					
		Rating (kW at 240V)	3					
		Max current (A)	13					
		Fuse rating - MCB Size (A)	16					
Mechanical zones			DHW and 1 heating zone *					
Optional wireles room thermostat and wireless receiver			PAR-WT50-E controller & PAR-WR51-E receiver					

* Optional 2-zone accessory pack available

UNIT			SLIMLINE	
Nominal hot water capacity (litres)			150	170
Water		Primary flow rate (H)WM50/60/85	14/17/24 l/min	
		Pump	Heat Pump - Grundfos UPM3L 25-75 130AZA Heating - Grundfos UPM3 AUTO 25-70 130 DHW - Grundfos UPSO 15-60 CIL2	
		Connection size Heating/DHW (mm)	22/22	
		DHW Expansion vessel (litres)	12	18
		Charge pressure (MPa (bar))	0.35 (3.5)	
Safety devices	Primary circuit	Control thermistor (°C)	80	
		Pressue Relief Valve (MPa (bar))	0.3 (3.0) Contained within outdoor unit	
	DHW circuit	Control thermistor (°C)	75	
		Over-temperature cut-out (°C)	80 +/- 5	
		Temp/Pressure Relief Valve (°C/MPa (bar))	90 / 1.0 (10.0)	
		Expansion valve (MPa (bar))	0.8 (8.0)	
Dimensions (mm)		Width	676	676
		Depth	654	654
		Height	1516	1690
Weight empty/full (kg)			59/209	63/233
Materials	Vessel		Duplex stainless steel	
	Insulation	Type	Expanded polyurethane (PU)	
		Nominal thickness (mm)	50	
		Standing heat loss (kWh/24h)	1.40	1.59
		Ozone Depletion Potential	zero	
		Global Warming Potential	3.1	
Electrical data	Control Board (optional	Electrical supply	220 - 240 V ~ , 50Hz	
		Phase	single	
		Fuse rating - MCB Size (A)	16	
	Immersion heater	Electrical supply	220 - 240 V ~ , 50Hz	
		Phase	single	
		Rating (kW at 240V)	3	
		Max current (A)	13	
		Fuse rating - MCB Size (A)	16	
Mechanical zones			DHW and 1 heating zone*	
Optional wireles room thermostat and wireless receiver			PAR-WT50-E controller & PAR-WR51-E receiver	

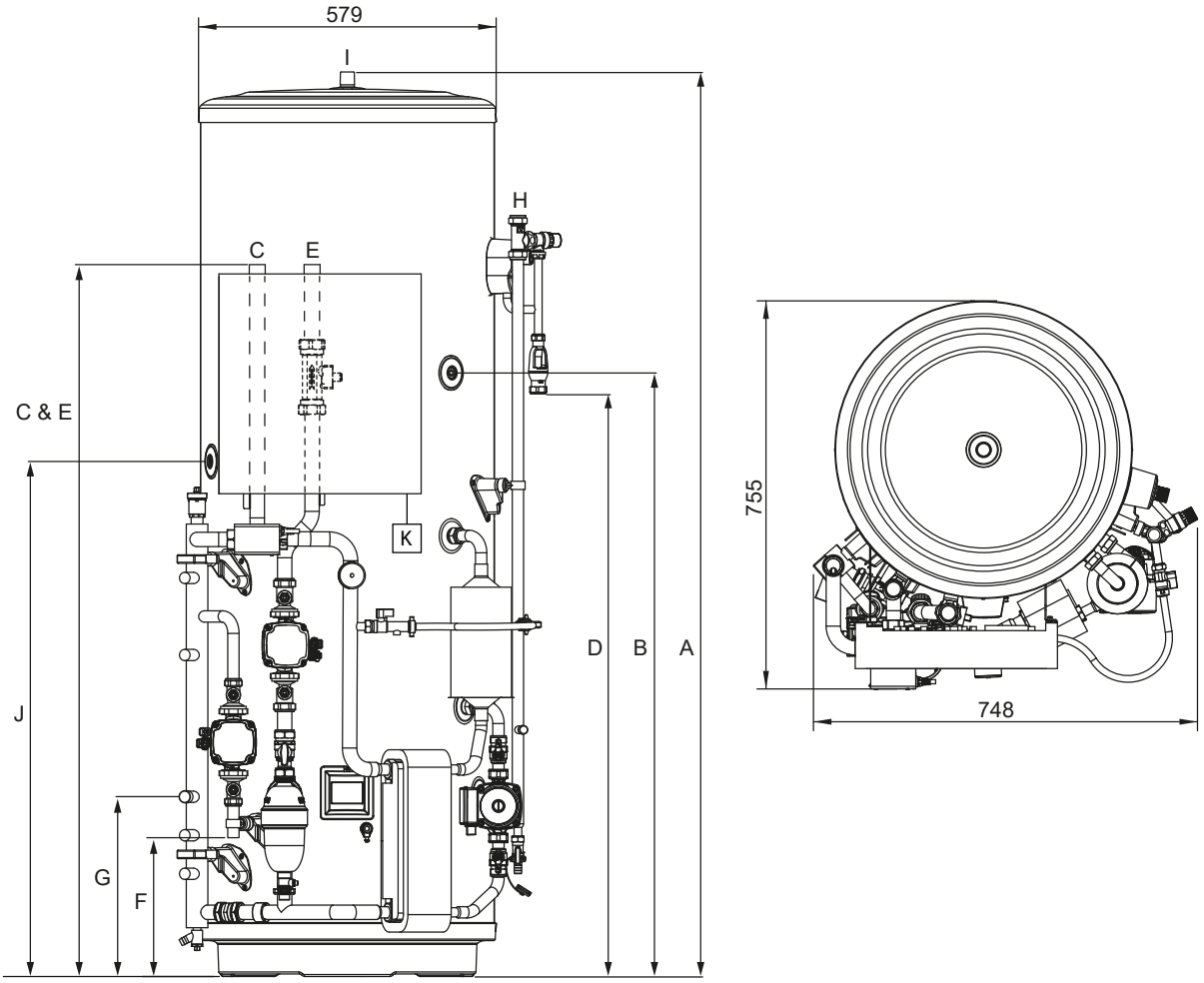
*Optional 2-zone accessory pack available

PART NAMES AND FUNCTIONS



OUTLINES AND DIMENSIONS

Dimensions - 28mm Standard Models

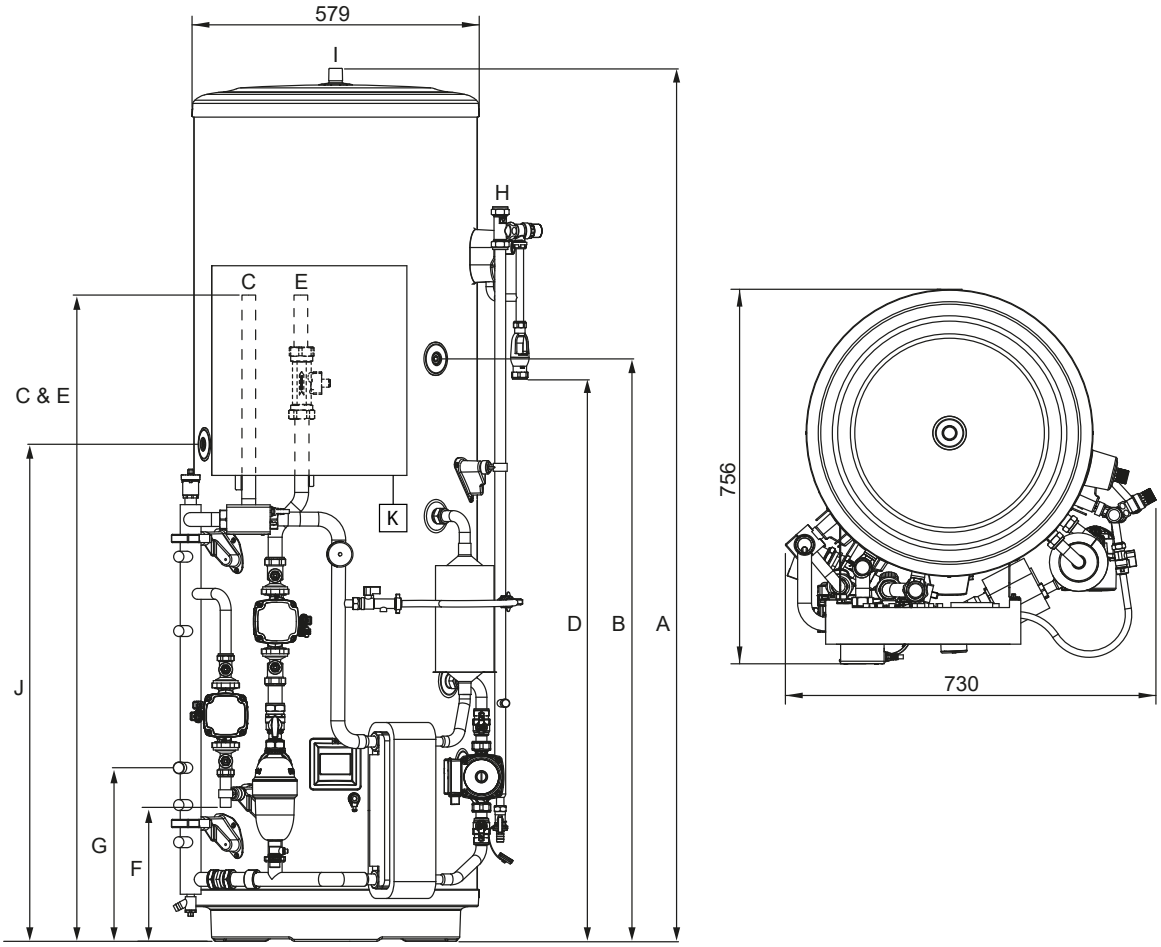


KEY

A	OVERALL HEIGHT
B	SECONDARY RETURN TAPPING
C	HEAT PUMP FLOW CONNECTION (28mm O/D COPPER)
D	TUNDISH OUTLET CONNECTION (22mm COMPRESSION)
E	HEAT PUMP RETURN CONNECTION (28mm O/D COPPER)
F	HEATING ZONE 1 CIRCUIT FLOW CONNECTION (22mm O/D COPPER)
G	HEATING ZONE 1 CIRCUIT RETURN CONNECTION (22mm O/D COPPER)
H	COLD WATER INLET CONNECTION (22mm COMPRESSION)
I	HOT WATER OUTLET CONNECTION (22mm COMPRESSION / 3/4” BSP M)
J	THW5A SENSOR POCKET
K	WI-FI ADAPTOR (INCLUDED, INSTALLER TO LOCATE AND MOUNT)

CAPACITY	210	250	300
A	1509	1761	2075
B	1050	1175	1385
C	1370	1370	1370
D	880	1136	1450
E	1370	1370	1370
F	270	270	270
G	350	350	350
J	925	1005	1193
K	Installer to locate and mount		

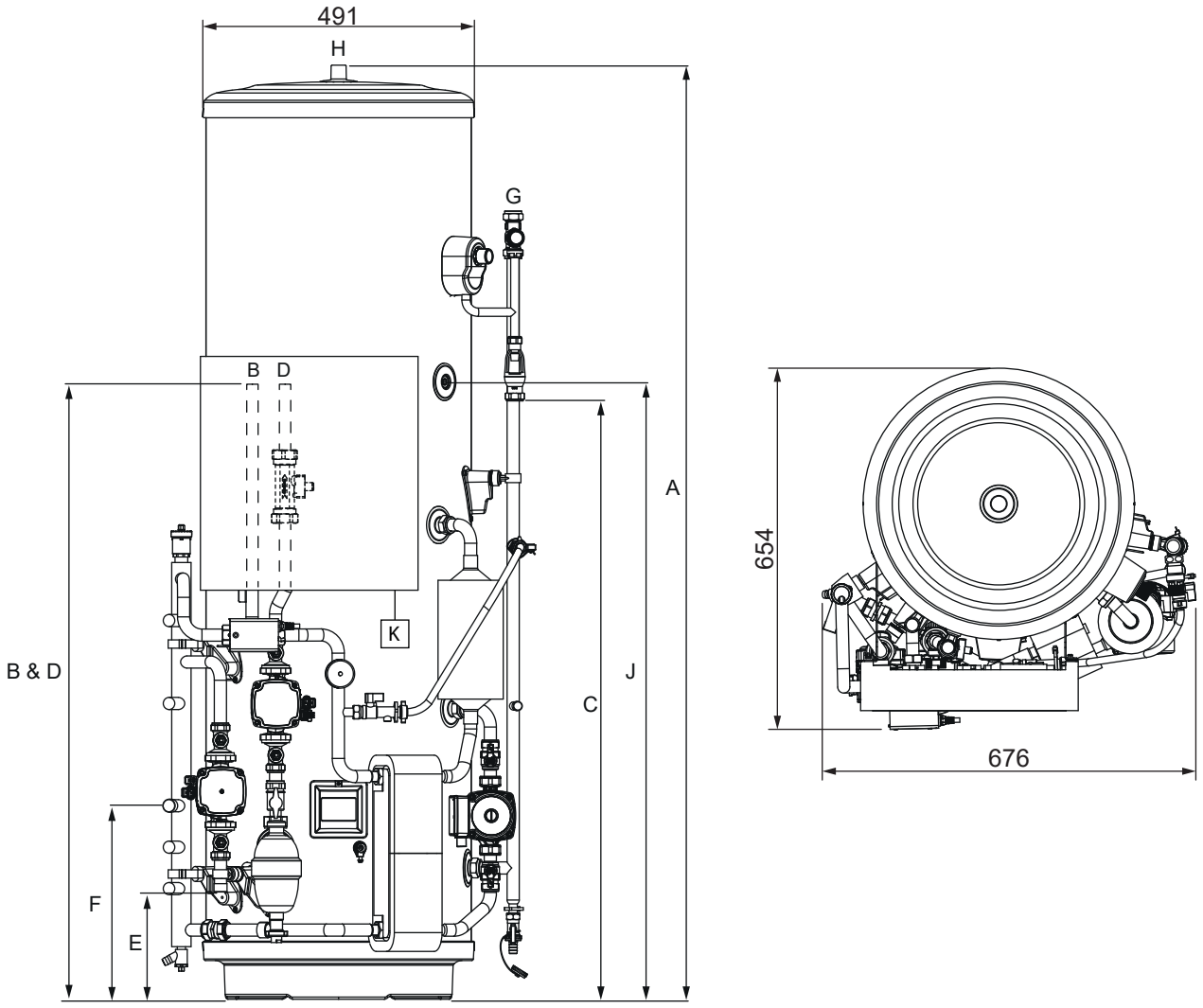
Dimensions - 22mm Standard Models



KEY

A OVERALL HEIGHT
B SECONDARY RETURN TAPPING (NOT FITTED TO EHPT15X-UKHDW1S/ EHPT17X-UKHDW1S)
C HEAT PUMP FLOW CONNECTION (22mm O/D COPPER)
D TUNDISH OUTLET CONNECTION (22mm COMPRESSION)
E HEAT PUMP RETURN CONNECTION (22mm O/D COPPER)
F HEATING ZONE 1 CIRCUIT FLOW CONNECTION (22mm O/D COPPER)
G HEATING ZONE 1 CIRCUIT RETURN CONNECTION (22mm O/D COPPER)
H COLD WATER INLET CONNECTION (22mm COMPRESSION)
I HOT WATER OUTLET CONNECTION (22mm COMPRESSION / 3/4” BSP M)
J THW5A SENSOR POCKET
K WI-FI ADAPTOR (INCLUDED, INSTALLER TO LOCATE AND MOUNT)

CAPACITY	150	170	210
A	1131	1257	1509
B	Not fitted	Not fitted	1050
C	1122	1122	1122
D	505	630	880
E	1122	1122	1122
F	194	194	194
G	350	350	350
J	675	815	925
K	Installer to locate and mount		



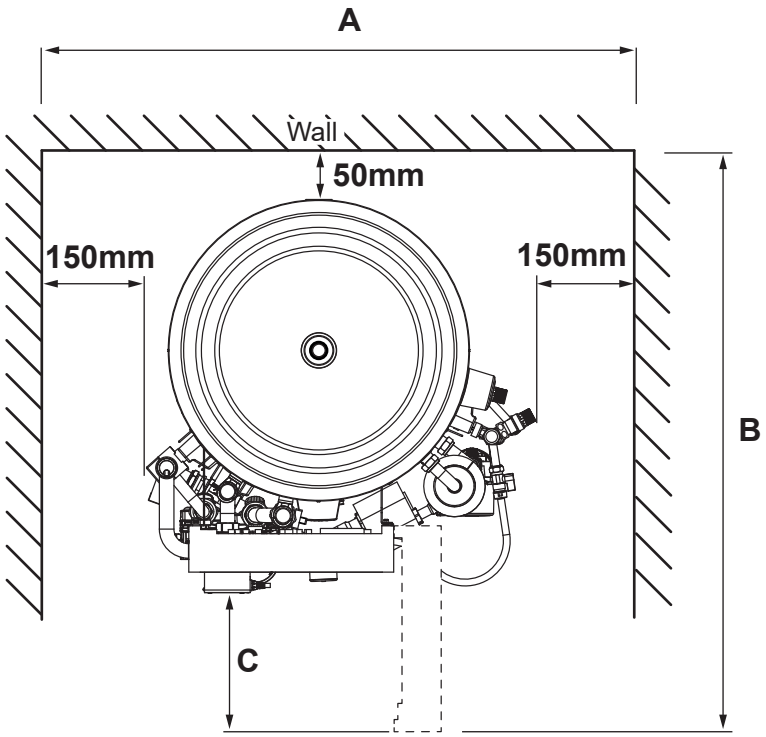
KEY

A	OVERALL HEIGHT
B	HEAT PUMP FLOW CONNECTION (22mm O/D COPPER)
C	TUNDISH OUTLET CONNECTION (22mm COMPRESSION)
D	HEAT PUMP RETURN CONNECTION (22mm O/D COPPER)
E	HEATING ZONE 1 CIRCUIT FLOW CONNECTION (22mm O/D COPPER)
F	HEATING ZONE 1 CIRCUIT RETURN CONNECTION (22mm O/D COPPER)
G	COLD WATER INLET CONNECTION (22mm COMPRESSION)
H	HOT WATER OUTLET CONNECTION (22mm COMPRESSION / 3/4” BSP M)
J	THW5A SENSOR POCKET
K	WI-FI ADAPTOR (INCLUDED, INSTALLER TO LOCATE AND MOUNT)

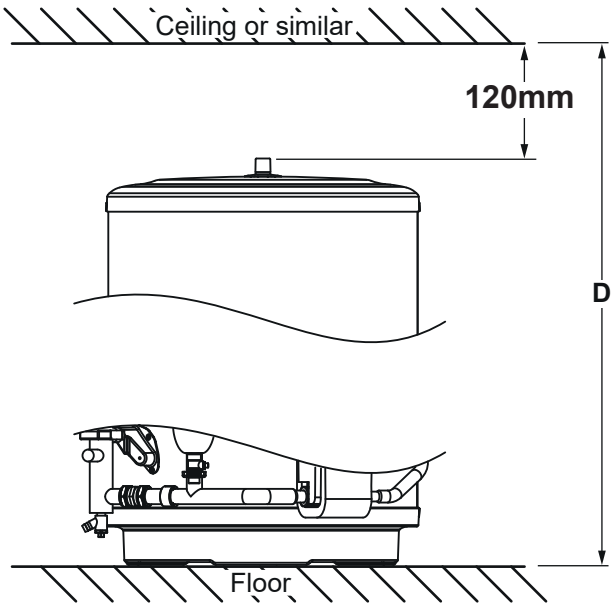
CAPACITY	150	170
A	1516	1690
B	1127	1127
C	909	1083
D	1127	1127
E	350	350
F	194	194
J	943	1117
K	Installer to locate and mount	

Service Access Diagram

Clearances - Side, Front & Rear



Clearances - Above



The cylinder must be located indoors and in a frost free environment, for example in a utility room, to minimise heat loss from the stored water. Please allow sufficient clearance at the front to close a door where fitted.
Sufficient space MUST be left for the provision of discharge pipework as detailed in National and Local Building Regulations.

Dimensions of A, B & C in above diagram

	Dimension		
Model	**A**	**B**	**C**
EHPT15X-UKHLDW1S EHPT17X-UKHLDW1S	976mm	972mm	268mm
EHPT15X-UKHDW1S EHPT17X-UKHDW1S EHPT21X-UKHDW1S	1030mm	1066mm	260mm
EHPT21X-UKHDW1L EHPT25X-UKHDW1L EHPT30X-UKHDW1L	1048mm	1066mm	260mm

Dimension of D in above diagram

Model	Dimension D
EHPT15X-UKHLDW1S	1636mm
EHPT17X-UKHLDW1S	1810mm
EHPT15X-UKHDW1S	1251mm
EHPT17X-UKHDW1S	1377mm
EHPT21X-UKHDW1S	1629mm
EHPT21X-UKHDW1L	1629mm
EHPT25X-UKHDW1L	1881mm
EHPT30X-UKHDW1L	2195mm

FTC WIRING DIAGRAM <PAC-IF07*B-E>

Table 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 <Table 3 DIP Switch Functions>.	
IN2	TBI.1 5-6	—	Flow switch 1 input	Refer to SW2-2 in <Table 3 DIP Switch Functions>.	
IN3	TBI.1 3-4	—	Flow switch 2 input (Zone1)	Refer to SW3-2 in <Table 3 DIP Switch Functions>.	
IN4	TBI.1 1-2	—	Demand control input	Normal	Heat source OFF/ Boiler operation *3
IN5	TBI.2 7-8	—	Outdoor thermo-stat input *2	Standard opera-tion	Heater operation/ Boiler operation *3
IN6	TBI.2 5-6	—	Room thermostat 2 input *1	Refer to SW3-1 in <Table 3 DIP Switch Functions>.	
IN7	TBI.2 3-4	—	Flow switch 3 input (Zone2)	Refer to SW3-2 in <Table 3 DIP Switch Functions>.	
IN8	TBI.3 7-8	—	Electric energy meter 1	Refer to installation manual.	
IN9	TBI.3 5-6	—	Electric energy meter 2		
IN10	TBI.2 1-2	—	Heat meter		
IN11	TBI.3 3-4	—	Smart grid ready		
IN12	TBI.3 1-2	—	input		
INA1	TBI.4 1-3	CN1A	Flow sensor		

*1. Set the ON/OFF cycle time of the room thermostat for 10 minutes or more; otherwise the compressor may be damaged.
*2. If using outdoor thermostat for controlling operation of heaters, the lifetime of the heaters and related parts may be reduced.
*3. To turn on the boiler operation, use the main remote controller to select "Boiler" in "External input setting" screen in the service menu.

Table 2 Outputs

Name	Terminal block	Connector	Item	OFF	ON
OUT1	TBO.1 1-2	CNP1	Water circulation pump 1 output (Space heating/cooling & DHW)	OFF	ON
OUT2	TBO.1 3-4	—	Water circulation pump 2 output (Space heating/cooling for Zone1)	OFF	ON
OUT3	TBO.1 5-6	—	Water circulation pump 3 output (Space heating/cooling for Zone2) *1	OFF	ON
			2-way valve 2b output *2		
OUT4	TBO.2 4-6	CNV1	3-way valve (2-way valve) output	Heating	DHW
OUT5	TBO.2 1-2	—	Mixing valve output *1	Stop	Close
	TBO.2 2-3				Open
OUT6	TBO.5 5-6	—	Booster heater 1 output	OFF	ON
OUT7	TBO.5 7-8	—	Booster heater 2 output	OFF	ON
OUT8	TBO.4 7-8	—	Cooling signal output	OFF	ON
OUT9	TBO.4 5-6	CNIH	Immersion heater output	OFF	ON
OUT10	TBO.3 1-2	—	Boiler output	OFF	ON
OUT11	TBO.3 5-6	—	Error output	Normal	Error
OUT12	TBO.3 7-8	—	Defrost output	Normal	Defrost
OUT13	TBO.4 3-4	—	2-way valve 2a output *2	OFF	ON
OUT14	—	CNP4	Water circulation pump 4 output (DHW)	OFF	ON
OUT15	TBO.4 1-2	—	Comp. ON signal	OFF	ON
OUT16	TBO.3 3-4	—	Thermo ON signal	OFF	ON
OUTA1	TBI.4 7-8	—	Analog output	0V-10V	
BC	TBO.5 3-4	—	Booster heater protection output	OFF(BHT Open)	ON(BHT Short)
BHT	TBO.5 1-2	CNBHT	Thermostat for booster heater	Thermostat normal: Short	High temp. open

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.

Table 3 DIP switch functions

DIP switch		Function	OFF	ON	Default settings: Indoor unit model
SW1	SW1-1	Boiler	WITHOUT Boiler	WITH Boiler	OFF
	SW1-2	Heat pump maxi-mum outlet water temperature	55ºC	60ºC	ON
	SW1-3	DHW tank	WITHOUT DHW tank	WITH DHW tank	OFF : PAC-IF071B-E ON : Except PAC-IF071B-E
	SW1-4	Immersion heater	WITHOUT Im-mersion heater	WITH Immer-sion heater	OFF : PAC-IF071B-E ON : Except PAC-IF071B-E
	SW1-5	Booster heater	WITHOUT Booster heater	WITH Booster heater	OFF
	SW1-6	Booster heater function	For heating only	For heating and DHW	OFF
	SW1-7	Outdoor unit type	Split type	Packaged type	OFF : PAC-IF071B-E ON : Except PAC-IF071B-E
	SW1-8	Wireless remote controller	WITHOUT Wireless re-mote controller	WITH Wireless remote control-ler	OFF
SW2	SW2-1	Room thermostat 1 input (IN1) logic change	Zone1 opera-tion stop at ther-mostat short	Zone1 opera-tion stop at ther-mostat open	OFF
	SW2-2	Flow switch 1 input (IN2) logic change	Failure detec-tion at short	Failure detec-tion at open	OFF
	SW2-3	Booster heater capacity restriction	Inactive	Active	OFF
	SW2-4	Cooling mode func-tion	Inactive	Active	OFF
	SW2-5	Automatic switch to backup heat source operation (When outdoor unit stops by error)	Inactive	Active *1	OFF
	SW2-6	Mixing tank	WITHOUT Mix-ing tank	WITH Mixing tank	OFF
	SW2-7	2-zone temperature control	Inactive	Active *5	OFF
	SW2-8	Flow sensor	WITHOUT Flow sensor	WITH Flow sensor	OFF

DIP switch		Function	OFF	ON	Default settings: Indoor unit model
SW3	SW3-1	Room thermostat 2 input (IN6) logic change	Zone2 opera-tion stop at ther-mostat short	Zone2 opera-tion stop at ther-mostat open	OFF
	SW3-2	Flow switch 2 and 3 input logic change	Failure detec-tion at short	Failure detec-tion at open	OFF
	SW3-3	—	—	—	OFF
	SW3-4	Electric energy meter	WITHOUT Electric energy meter	WITH Electric energy meter	OFF
	SW3-5	Heating mode function *2	Inactive	Active	ON
	SW3-6	2-zone valve ON/ OFF control	Inactive	Active	OFF
	SW3-7	Heat exchanger for DHW	Coil in tank	External plate HEX	OFF
	SW3-8	Heat meter	WITHOUT Heat meter	WITH Heat meter	OFF
SW4	SW4-1	Multiple outdoor control	Inactive	Active	OFF
	SW4-2	Position of multiple outdoor units control *6	Slave	Master	OFF
	SW4-3	—	—	—	OFF
	SW4-4	Indoor unit only operation (during installation work) *3	Inactive	Active	OFF
	SW4-5	Emergency mode (Heater only opera-tion)	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				
	SW5-4				
	SW5-5				
	SW5-6				
	SW5-7				
	SW5-8	—	—	—	OFF
SW6	SW6-1	—	—	—	OFF : PAC-IF071/072B-E ON : PAC-IF073B-E
	SW6-3	Pressure sensor	Inactive	Active	OFF
	SW6-4	Analog output	Inactive	Active	OFF

Capacity code

	SW5-3	SW5-4	SW5-5	SW5-6	SW5-7
PAC-IF07*B-E	OFF	OFF	OFF	OFF	OFF

*1. External output (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. This switch functions only when the FTC unit is connected with a PUHZ-FRP outdoor unit. When another type of outdoor unit is connected, the heating mode function is active regardless of the fact that this switch is ON or OFF.
*3. Space heating and DHW can be operated only in indoor unit, like an electric heater.
*4. If emergency mode is no longer required, return the switch to OFF position.
*5. Active only when SW3-6 is set to OFF.
*6. Active only when SW4-1 is set to ON.

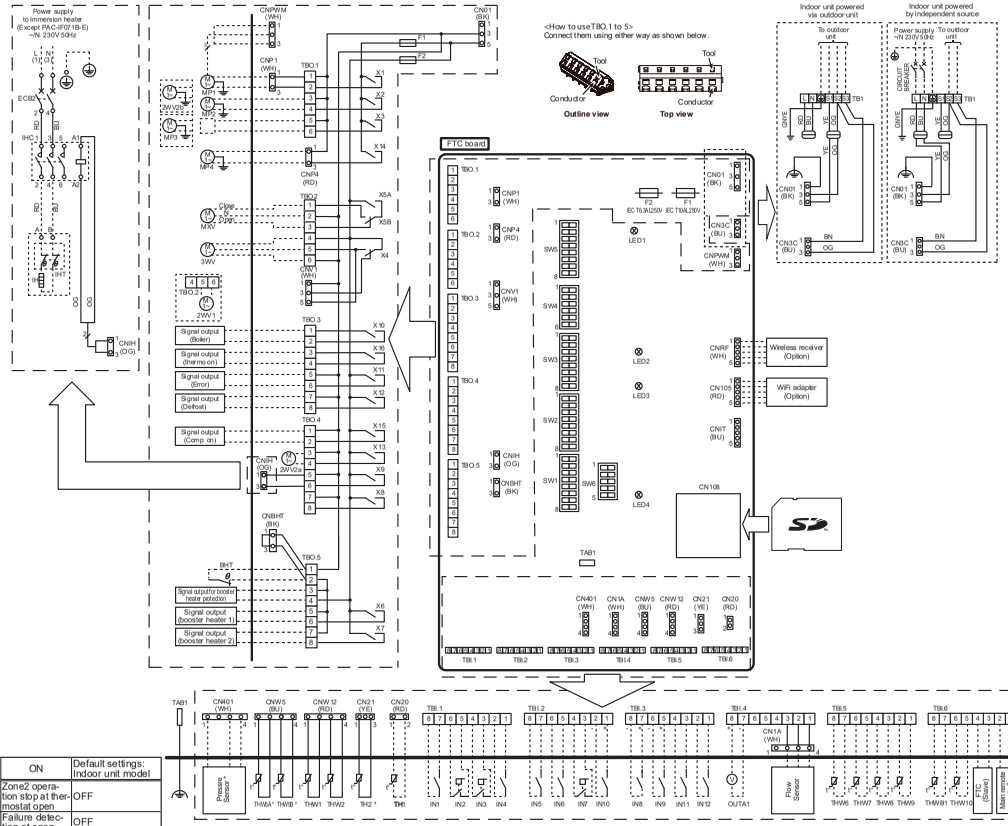


Table 4 Error Codes

Code	Error
L3	Circulation water temperature overheat protection
L4	DHW tank water temperature overheat protection
L5	Indoor unit temperature thermistor (THW1, THW2, THW5B, THW6, THW7, THW8, THW9) failure
L6	Circulation water freeze protection
L8	Heating operation error
L9	Low primary circuit flow rate detected by flow sensor or flow switch (flow switches 1, 2, 3)
LA	Pressure sensor failure
LB	High pressure protection
LC	Boiler circulation water temperature overheat protection
LD	Boiler temperature thermistor (THWB1) failure
LE	Boiler operation error
LF	Flow sensor failure
LH	Boiler circulation water freeze protection
LJ	DHW operation error (type of external plate HEX)
LL	Setting errors of DIP switches on FTC control board
LP	Out of water flow rate range for outdoor heat pump unit
P1	Thermistor (Room temp.) (TH1) failure
P2	Thermistor (Ref. liquid temp.) (TH2) failure
P6	Anti-freeze protection of plate heat exchanger
J0	Communication failure between FTC and wireless receiver
J1 - J8	Communication failure between wireless receiver and wireless remote controller
J9	Communication failure between FTC (Master) and FTC (Slave)
E0 - E5	Communication failure between main remote controller and FTC
E6 - EF	Communication failure between FTC and outdoor unit
E9	Outdoor unit receives no signal from indoor unit.
EE	Outdoor unit incorrect connection
U*, F*, A*	Outdoor unit failure

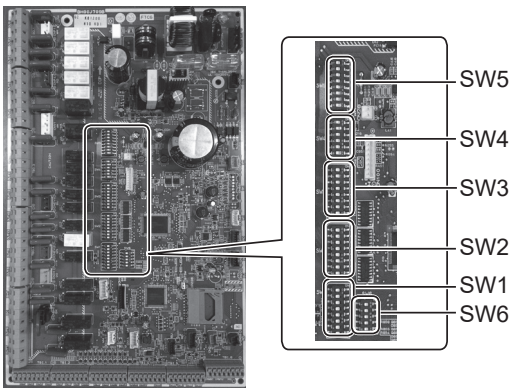
1. Symbols used in wiring diagram are, ▭: connector, ▭▭: terminal block. Function with asterisk (*) may not be available depending on model types.
2. Indoor unit and outdoor unit connecting wires have polarities, make sure to match terminal numbers (S1, S2, S3) for correct wirings.
3. Since the outdoor unit side electric wiring may change, be sure to check the outdoor unit electric wiring diagram for service.
4. When connecting a booster heater, the wiring method is different according to the type of built-in thermostat. Please refer to the installation manual for details.

Symbol	Name
TB1	Terminal block <Power supply, Outdoor unit>
ECB2	Earth leakage circuit breaker for immersion heater (Except PAC-IF071B-E)
MP1	Water circulation pump 1(Space heating & DHW)
MP2	Water circulation pump 2 (Space heating for Zone1)(Local supply)
MP3	Water circulation pump 3 (Space heating for Zone2)(Local supply)
MP4	Water circulation pump 4 (DHW)(Local supply)
3WV (2WV1)	3-way valve (2-way valve 1)(Local supply)
2WV2a	2-way valve (For Zone 1)(Local supply)
2WV2b	2-way valve (For Zone 2)(Local supply)
MXV	Mixing valve (Local supply)
IHT	Thermostat (fixed temp.) for immersion heater(Except PAC-IF071B-E)
IH	Immersion heater(Except PAC-IF071B-E)
IHC	Contactor for immersion heater (Except PAC-IF071B-E)
TH1	Thermistor (Room temp.)(Option)
TH2	Thermistor (Ref. liquid temp.) (Included in PAC-IF071B-E)
THW1	Thermistor (Flow water temp.)
THW2	Thermistor (Return water temp.)
THW5A	Thermistor (DHW tank upper water temp.) (Included in PAC-IF073B-E)
THW5B	Thermistor (DHW tank lower water temp.) (Included in PAC-IF073B-E) (Option for PAC-IF071/072B-E)
THW6	Thermistor (Zone1 flow temp.)(Option)
THW7	Thermistor (Zone1 return temp.)(Option)
THW8	Thermistor (Zone2 flow temp.)(Option)
THW9	Thermistor (Zone2 return temp.)(Option)
THW10	Thermistor (Mixing tank temp.)(Option)
THWB1	Thermistor (Boiler flow temp.)(Option)
IN1	Room thermostat 1 (Local supply)
IN2	Flow switch 1 (Local supply)
IN3	Flow switch 2 (Local supply)
IN4	Demand control (Local supply)
IN5	Outdoor thermostat (Local supply)
IN6	Room thermostat 2 (Local supply)
IN7	Flow switch 3 (Local supply)
IN8	Electric energy meter 1 (Local supply)
IN9	Electric energy meter 2 (Local supply)
IN10	Heat meter (Local supply)
IN11	Smart grid ready input (Local supply)
IN12	
INA1	Flow sensor (Option)
FLOW TEMP. CONTROLLER (FTC)	
TBO.1-5	Terminal block <Outputs>
TBI.1-6	Terminal block <Signal Inputs, Thermistor>
F1	Fuse (IEC T10AL250V)
F2	Fuse (IEC T6.3AL250V)
SW1-6	DIP switch *See Table 3
X1-16	Relay
LED1	Power supply (FTC)
LED2	Power supply (Main remote controller)
LED3	Communication (FTC-Outdoor unit)
LED4	Reading or writing data to SD card
CNPWM	Pump speed control signal for MP1
CN108	SD card connector

DIP Switch Functions

Located on the FTC printed circuit board are 6 sets of small white switches known as DIP switches. The DIP switch number is printed on the circuit board next to the relevant switches. The word ON is printed on the circuit board and on the DIP switch block itself. To move the switch you will need to use a pin or the corner of a thin metal ruler or similar.

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.



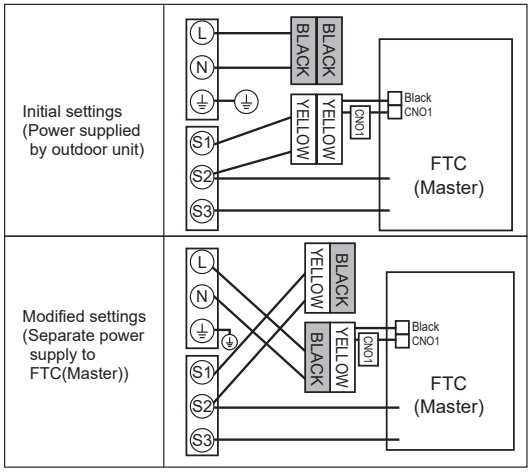
DIP switch		Function	OFF	ON	Default settings: Indoor unit model
SW1	SW1-1	Boiler	WITHOUT Boiler	WITH Boiler	OFF
	SW1-2	Heat pump maximum outlet water temperature	55ºC	60ºC	ON
	SW1-3	DHW tank	WITHOUT DHW tank	WITH DHW tank	ON
	SW1-4	Immersion heater	WITHOUT Immersion heater	WITH Immersion heater	ON
	SW1-5	Booster heater	WITHOUT Booster heater	WITH Booster heater	OFF
	SW1-6	Booster heater function	For heating only	For heating and DHW	OFF
	SW1-7	Outdoor unit type	Split type	Packaged type	ON
	SW1-8	Wireless remote controller	WITHOUT Wireless remote controller	WITH Wireless remote controller	OFF
SW2	SW2-1	Room thermostat1 input (IN1) logic change	Zone1 operation stop at thermostat short	Zone1 operation stop at thermostat open	ON
	SW2-2	Flow switch1 input (IN2) logic change	Failure detection at short	Failure detection at open	OFF
	SW2-3	Booster heater capacity restriction	Inactive	Active	OFF
	SW2-4	Cooling mode function	Inactive	Active	OFF
	SW2-5	Automatic switch to backup heat source operation (When outdoor unit stops by error)	Inactive	Active	OFF
	SW2-6	Mixing tank	WITHOUT Mixing tank	WITH Mixing tank	OFF
	SW2-7	2-zone temperature control	Inactive	Active	OFF
	SW2-8	Flow sensor	WITHOUT Flow sensor	WITH Flow sensor	ON
SW3	SW3-1	Room thermostat 2 input (IN6) logic change	Zone2 operation stop at thermostat short	Zone2 operation stop at thermostat open	ON
	SW3-2	Flow switch 2 and 3 input logic change	Failure detection at short	Failure detection at open	OFF
	SW3-3	—	—	—	OFF
	SW3-4	Electric energy meter	WITHOUT Electric energy meter	WITH Electric energy meter	OFF
	SW3-5	Heating mode function	Inactive	Active	ON
	SW3-6	2-zone valve ON/OFF control	Inactive	Active	OFF
	SW3-7	Heat exchanger for DHW	Coil in tank	External plate HEX	ON
	SW3-8	Heat meter	WITHOUT Heat meter	WITH Heat meter	OFF
SW4	SW4-1	Multiple outdoor unit control	Inactive	Active	OFF
	SW4-2	Position of multiple outdoor unit control	Sub	Main	OFF
	SW4-3	—	—	—	OFF
	SW4-4	Indoor unit only operation (during installation work)	Inactive	Active	OFF
	SW4-5	Emergency mode (Heater only operation)	Normal	Emergency mode (Heater only operation)	OFF
	SW4-6	Emergency mode (Boiler operation)	Normal	Emergency mode (Boiler operation)	OFF
SW5	SW5-1	—	—	—	OFF
	SW5-2	Advanced auto adaptation	Inactive	Active	ON
	SW5-3	—	—	—	OFF
	SW5-4	—	—	—	OFF
	SW5-5	—	—	—	OFF
	SW5-6	—	—	—	OFF
	SW5-7	—	—	—	OFF
	SW5-8	—	—	—	OFF
SW6	SW6-1	—	—	—	OFF
	SW6-2	—	—	—	OFF
	SW6-3	Pressure sensor	Inactive	Active	OFF
	SW6-4	Analog output signal (0-10V)	Inactive	Active	OFF
	SW6-5	—	—	—	OFF

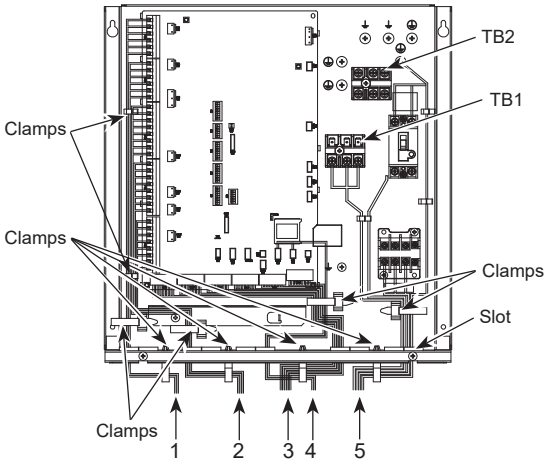
FIELD WIRING

FTC (Master) powered by independent source

If FTC (Master) and outdoor units have separate power supplies, the following requirements MUST be carried out:

- **FTC (Master) unit electrical box connector connections changed.**
- **Outdoor unit DIP switch settings changed to SW8-3 ON.**
- **Turn on the outdoor unit before the FTC (Master).**
- **Power by independent source is not available for particular models of outdoor unit model.**
  For more detail, refer to the connecting outdoor unit installation manual.



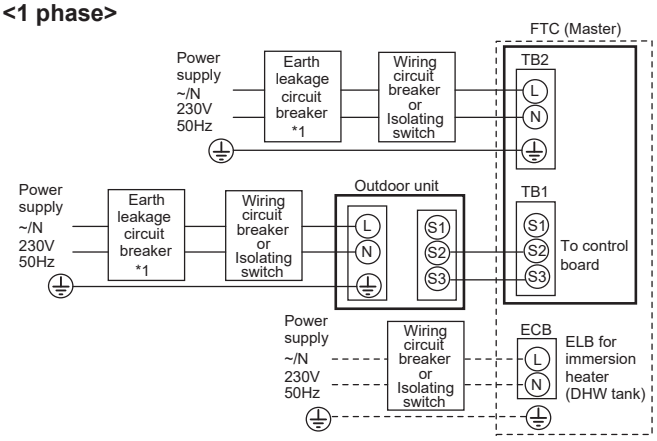


1 High voltage cables (OUTPUT)
2 High voltage cables (OUTPUT)
3 Low voltage cables (INPUT) and wireless receiver's cable
4 Thermistor cables
5 Power cables

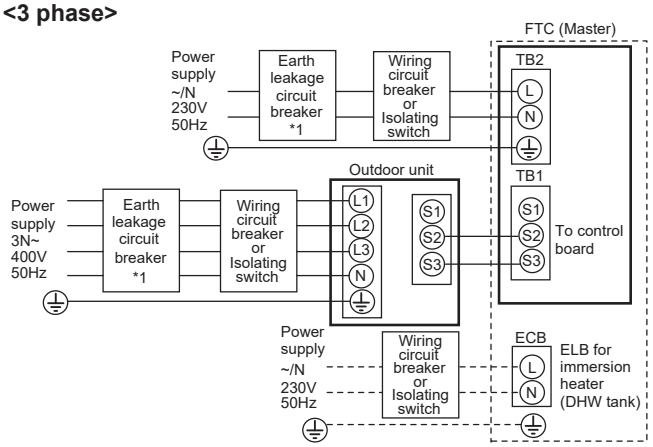
Wiring for PAC-IF07*B-E

Notes: 1. Do not run the low voltage cables through a slot that the high voltage cables go through.
2. Do not run other cables except low voltage cables through a slot that the wireless receiver's cable goes through.
3. Do not bundle power cables together with other cables.
4. Bundle cables as figure above by using clamps.

<1 phase>



<3 phase>



: PAC-IF071B-E
: PAC-IF072/073B-E

Description	Power supply	Capacity	Breaker	Wiring
Immersion heater (DHW tank)	~/N 230 V 50 Hz	3 kW	16 A*1	2.5 mm²

Electrical connections 1 phase/3 phase

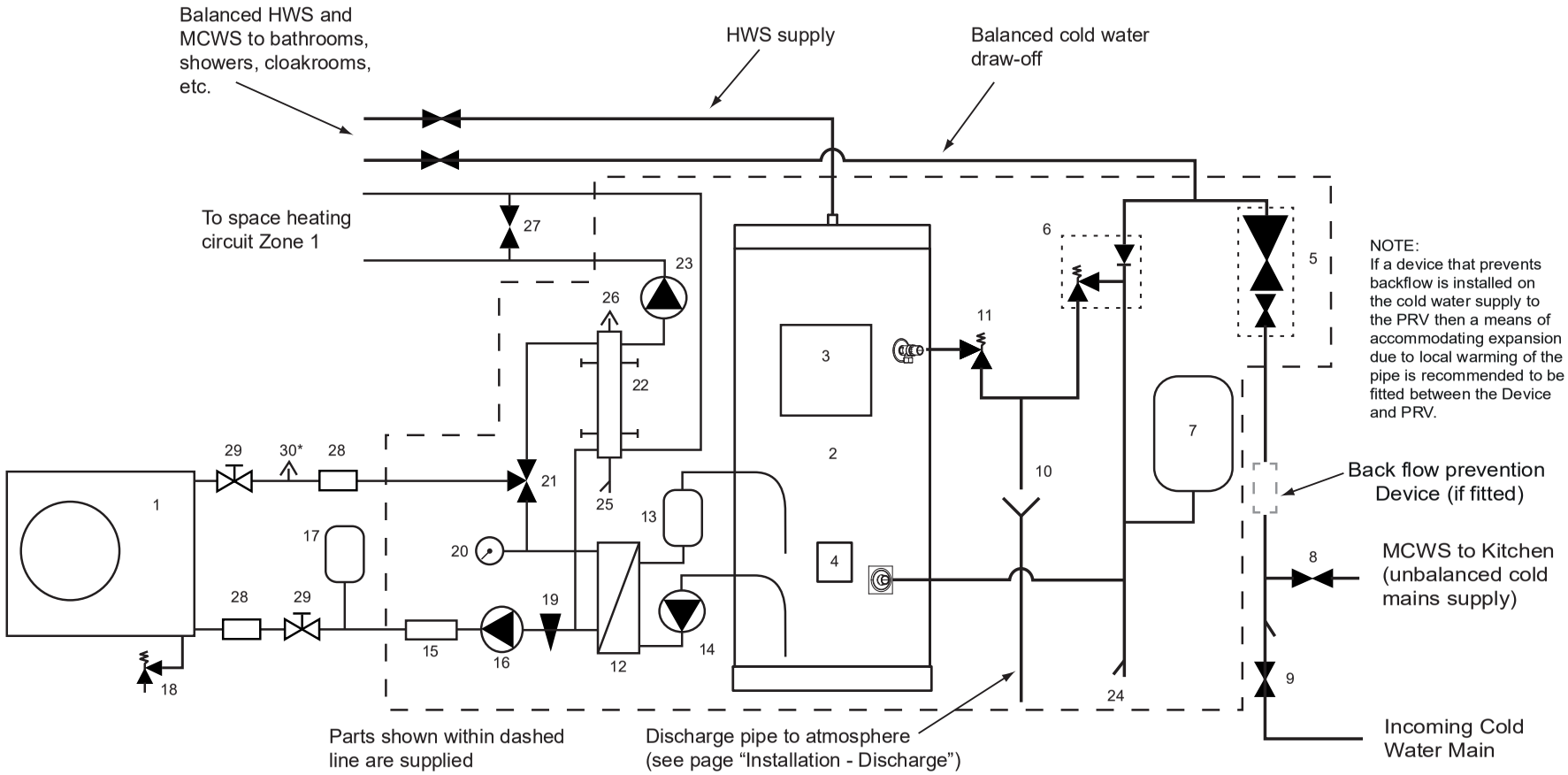
*1. If the installed earth leakage circuit breaker does not have an over-current protection function, install a breaker with that function along the same power line.
A breaker with at least 3.0 mm contact separation in each pole shall be provided. Use earth leakage breaker (NV).
The breaker shall be provided to ensure disconnection of all active phase conductors of the supply.

Note: In accordance with IEE regulations the circuit breaker/isolating switch located on the outdoor unit should be installed with lockable devices (health and safety).

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

*2. Max. 120 m
*3. The values given in the table above are not always measured against the ground value.

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

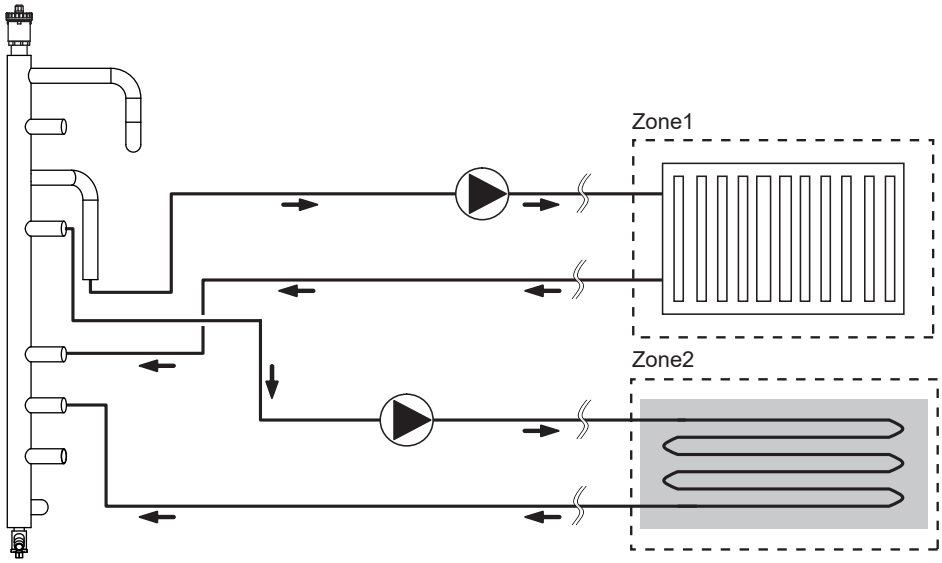


NOTE:
A backflow prevention Device may include check valves, a water meter or an additional PRV

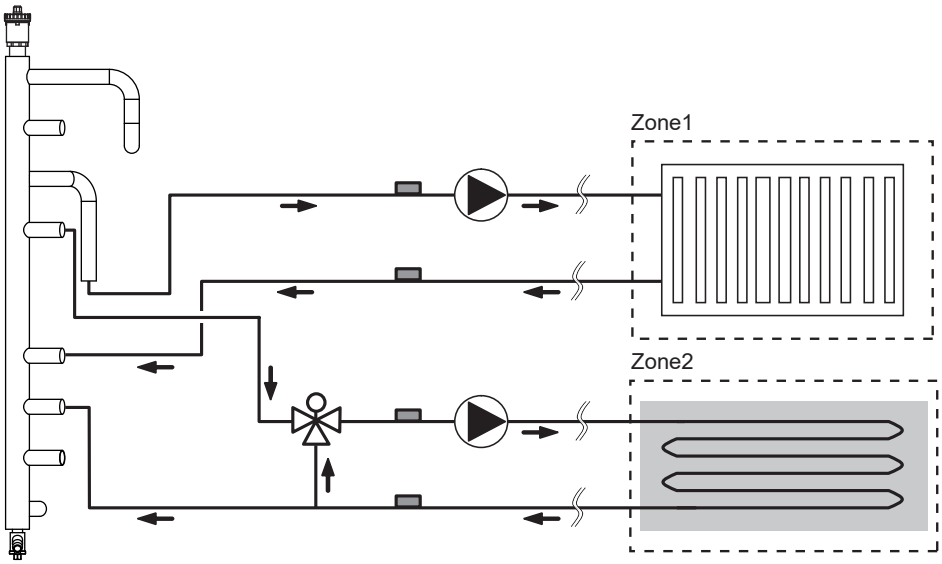
KEY

1 Heat Pump
2 Cylinder
3 FTC6 Controller
4 Immersion heater
5 3.5 bar Pressure reducing Valve incorporating Strainer and Check Valve (supplied loose)
6 8 bar Expansion Valve and Check Valve
7 DHW Expansion Vessel (supplied loose)
8 Stop Cock
9 Mains Stop Cock
10 Tundish
11 Temperature/Pressure relief Valve
12 Plate to Plate Heat Exchanger
13 Scale Trap
14 DHW Circulating Pump
15 Flow Sensor
16 Primary Pump
17 Primary Expansion Vessel
18 Primary Pressure Relief valve
19 Magnetic Filter
20 Primary System Pressure Gauge
21 3 Way Motorised Diverter Valve
22 Low Loss Header incorporating ports for 2nd heating zone and alternative heat source
23 Heating Pump
24 DHW Drainoff point
25 Primary circuit draw off point
26 Automatic Air Vent
27 Differential Pressure Bypass Valve
28 Strainer
29 Isolating Valve
30 Air Vent* - if the outdoor unit is higher than the indoor unit or if there is a location where aire gets trapped in the upper part of the water pipe consider adding this part

Optional 2 zone control pack - plumbing schematic



Optional 2 zone twin temperature control pack - plumbing schematic



Filling The Cylinder

CYLINDER UNIT - INITIAL FILL PROCEDURE

- BEFORE FILLING CHECK AND TIGHTEN ALL MECHANICAL JOINTS AND CONNECTIONS IN CASE THESE HAVE LOOSENED DURING TRANSIT.
- Check expansion vessel pre-charge pressure. The vessel is supplied pre-charged to 3.5 bar to match the control pressure of the pressure reducing valve. The pre-charge pressure is checked using a car tyre gauge by unscrewing the plastic cap opposite the water connection.
- Check all connections for tightness including the immersion heater(s). An immersion heater key spanner is supplied for this purpose.
- Ensure the drain cock is CLOSED.
- Open a hot tap furthest from the cylinder.
- Open the cylinder isolating valve to fill the unit. When water flows from the tap, allow to run for a few minutes to thoroughly flush through any residue, dirt or swarf, then close the tap.
- Open successive hot taps to purge the system of air.
- Ensure all hot taps are closed to retain system charge.

CYLINDER UNIT - SYSTEM CHECKS

- Check all water connections for leaks and rectify as necessary.
- Turn off water supply to the cylinder.
- Remove the Pressure Reducing Valve head work to access the strainer mesh, clean and re-fit.
- Manually open, for a few seconds, each relief valve in turn, checking that water is discharged and runs freely through the tundish and out at the discharge point.
- Ensure that the valve(s) re-seat satisfactorily and reinstate the cylinder water supply.

CYLINDER UNIT - INITIAL FLUSH PROCEDURE

- Energise system to heat-up cylinder unit contents to a temperature of approx. 30 - 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.

PRIMARY CIRCUIT - FILLING THE SYSTEM

- Check and charge expansion vessel.
- Check all connections including factory fitted ones are tight.
- Insulate pipework between cylinder and outdoor unit.
- Thoroughly clean and flush, system of all debris. (see page 24 for instruction.)
- Fill cylinder unit with potable water. Fill primary heating circuit with water and suitable anti-freeze and inhibitor as necessary. **Always use a filling loop with double check valve when filling the primary circuit to avoid back flow contamination of water supply.**
- Check for leakages. If leakage is found, retighten the screws onto the connections.
- Pressurise system to 1 bar.
- Release all trapped air using air vents during and following heating period.
- Top up with water as necessary. (If pressure is below 1 bar)
- After removing the air, automatic air vent **MUST** be closed.

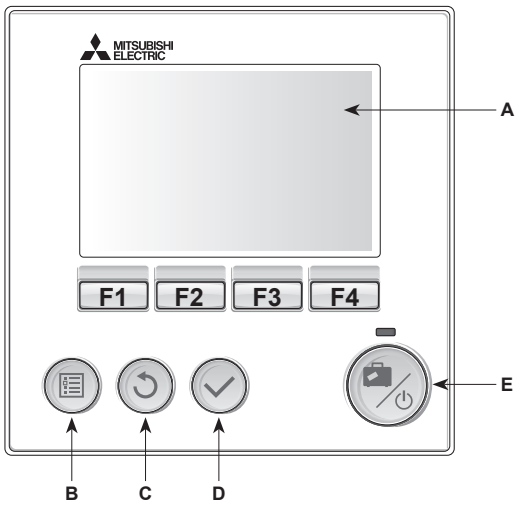
Fernox HP5-c frost protection levels:
10% Concentration provides frost protection to -4°C
20% Concentration provides frost protection to -9°C
30% Concentration provides frost protection to -14°C

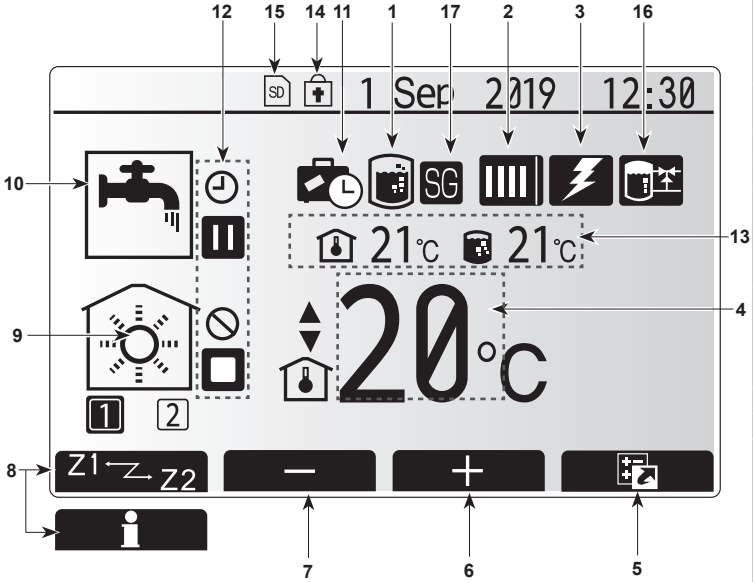
DRAINING THE CYLINDER UNIT - WARNING: DRAINED WATER MAY BE VERY HOT

- Before attempting to drain the cylinder unit, isolate from the electrical supply to prevent the immersion heater burning out.
- Isolate cold water feed to DHW tank.
- Attach a hose to the DHW tank drain off point. The hose should be able to withstand heat as the draining water could be very hot. The hose should drain to a place lower than the DHW tank bottom to encourage siphoning.Open a hot water tap to start draining without a vacuum.
- When the DHW tank is drained, close drain cock and hot tap.
- Attach hose to primary circuit drain off point. The hose should be able to withstand heat as the draining water could be very hot. The hose should drain to a place lower than the primary circuit drain off point to encourage siphoning. Open the pump valve.

Main remote controller

To change the settings of your heating/cooling system please use the main remote controller located on the front panel of the cylinder unit or hydrobox. The following is a guide to viewing the main settings. Should you require more information please contact your installer or local Mitsubishi Electric dealer.
Cooling mode is available for ERS series only. However, Cooling mode is not available when the indoor unit is connected to PUHZ-FRP.





Main screen

<Main remote controller parts>

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

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

<Main screen icons>

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

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

Setting the Main remote controller

After the power has been connected to the outdoor and cylinder units (See "7. FIELD WIRING"), the initial system settings can be entered via the main remote controller.

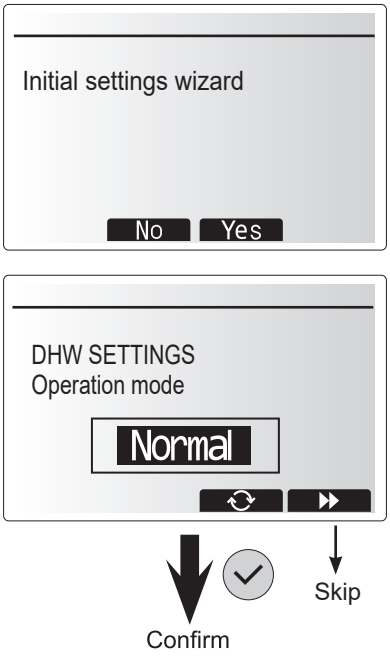
1. Check all breakers and other safety devices are correctly installed and turn on power to the system.
2. When the main remote controller is switched on for the first time, the screen automatically goes to Initial settings menu, Language setting screen and Date/Time setting screen in order.
3. Main remote controller will automatically start up. Wait approximately 6 minutes whilst the control menus load.
4. When the controller is ready, a blank screen with a line running across the top will be displayed.
5. Press button E (Power) (refer to page 29) to turn on the system. Before turning on the system, perform initial settings as instructed below.

Initial setting wizard

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

Note:
<HEATER CAPACITY RESTRICTION>
This setting restricts the booster heater capacity. It is NOT possible to change the setting after starting up.
If you do not have any special requirements (such as building regulations) in your country,
skip this setting (select "No").

- Hot water (DHW/Legionella)
- Heating/Cooling
- Operation (ON/Prohibited/Timer)
- Pump speed
- Heat pump flow rate range
- Mixing valve control
- HEATER CAPACITY RESTRICTION



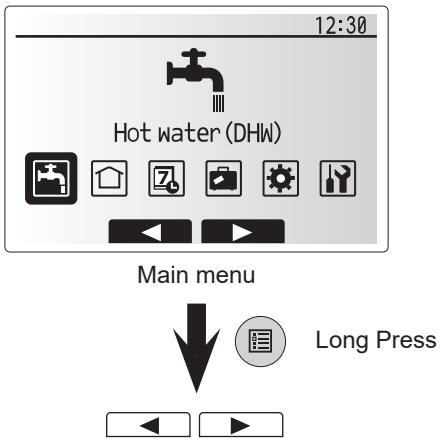
Main Settings Menu

The main settings menu can be accessed by pressing the MENU button. To reduce the risk of untrained end users altering the settings accidentally, there are 2 access levels to the main settings; and the service section menu is password protected.

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

Installer Level – Long press
If the MENU button is pressed down for 3 seconds the main settings will be displayed with all functionality available.
The colour of ◄► buttons is inverted as per right figure.

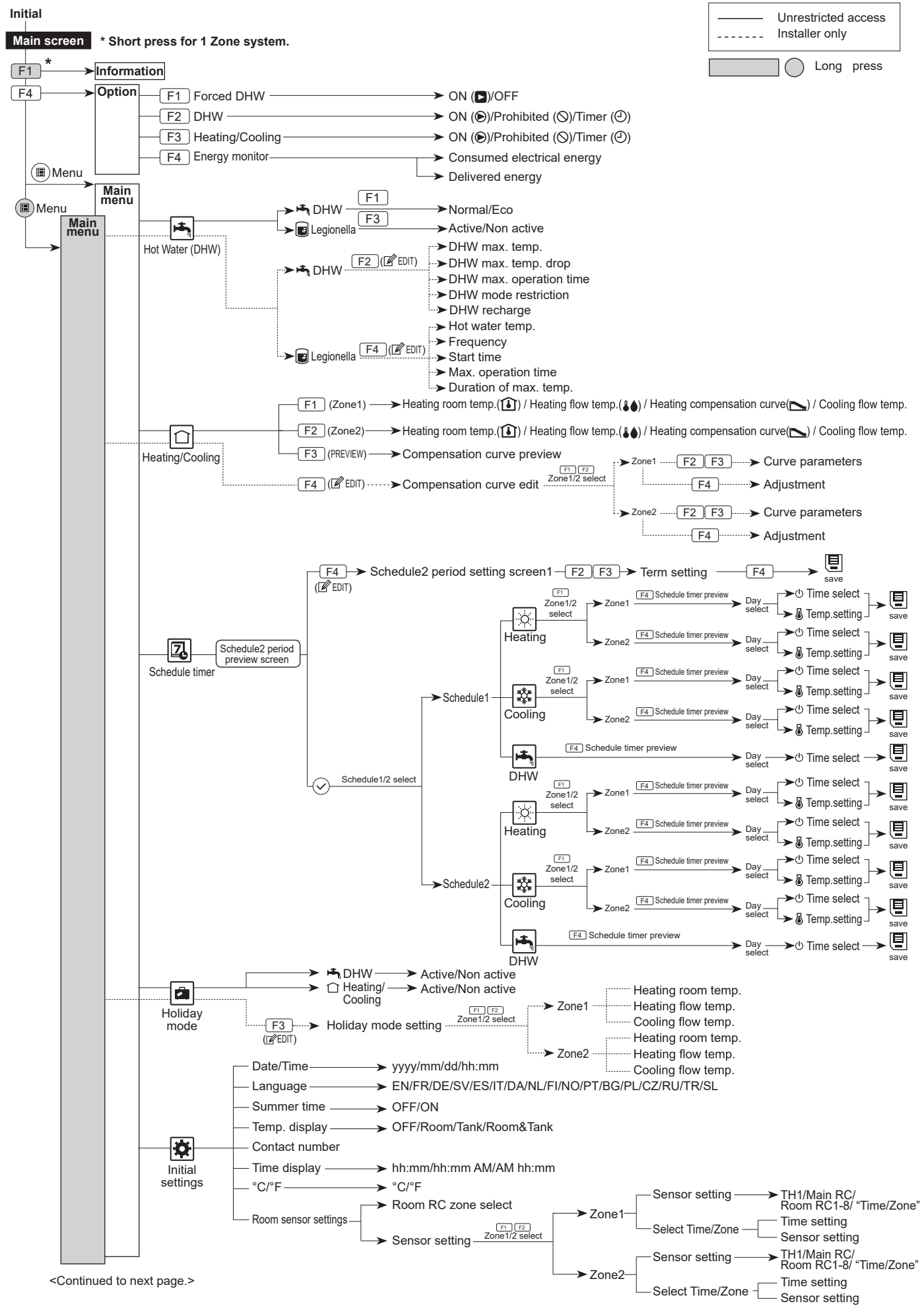
The following items can be viewed and/or edited (dependent on access level).
- Domestic Hot water (DHW)
- Heating/Cooling
- Schedule timer
- Holiday mode
- Initial settings
- Service (Password protected)



General Operation

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

<Main Remote Controller Menu Tree>



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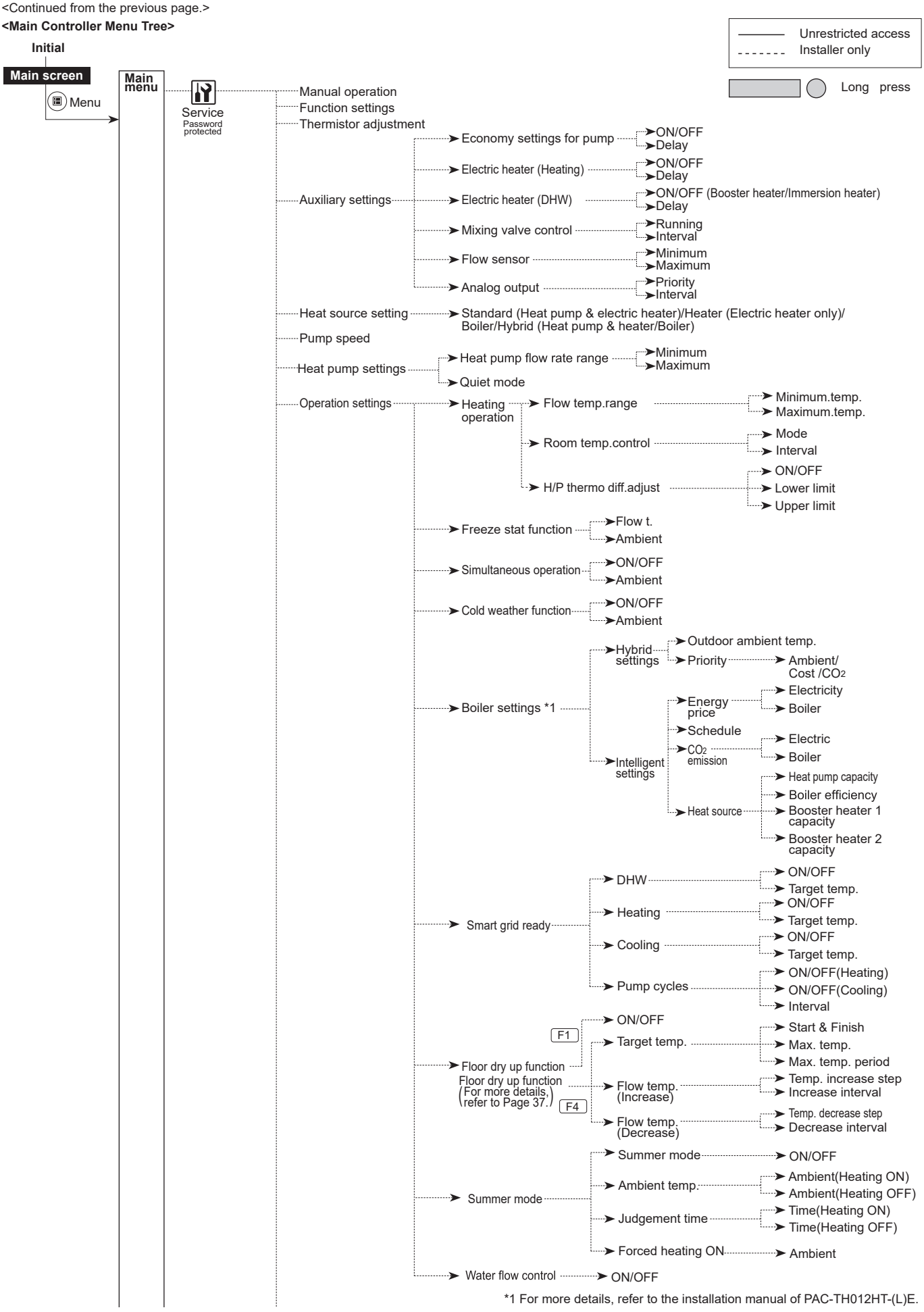
<Main Controller Menu Tree>



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

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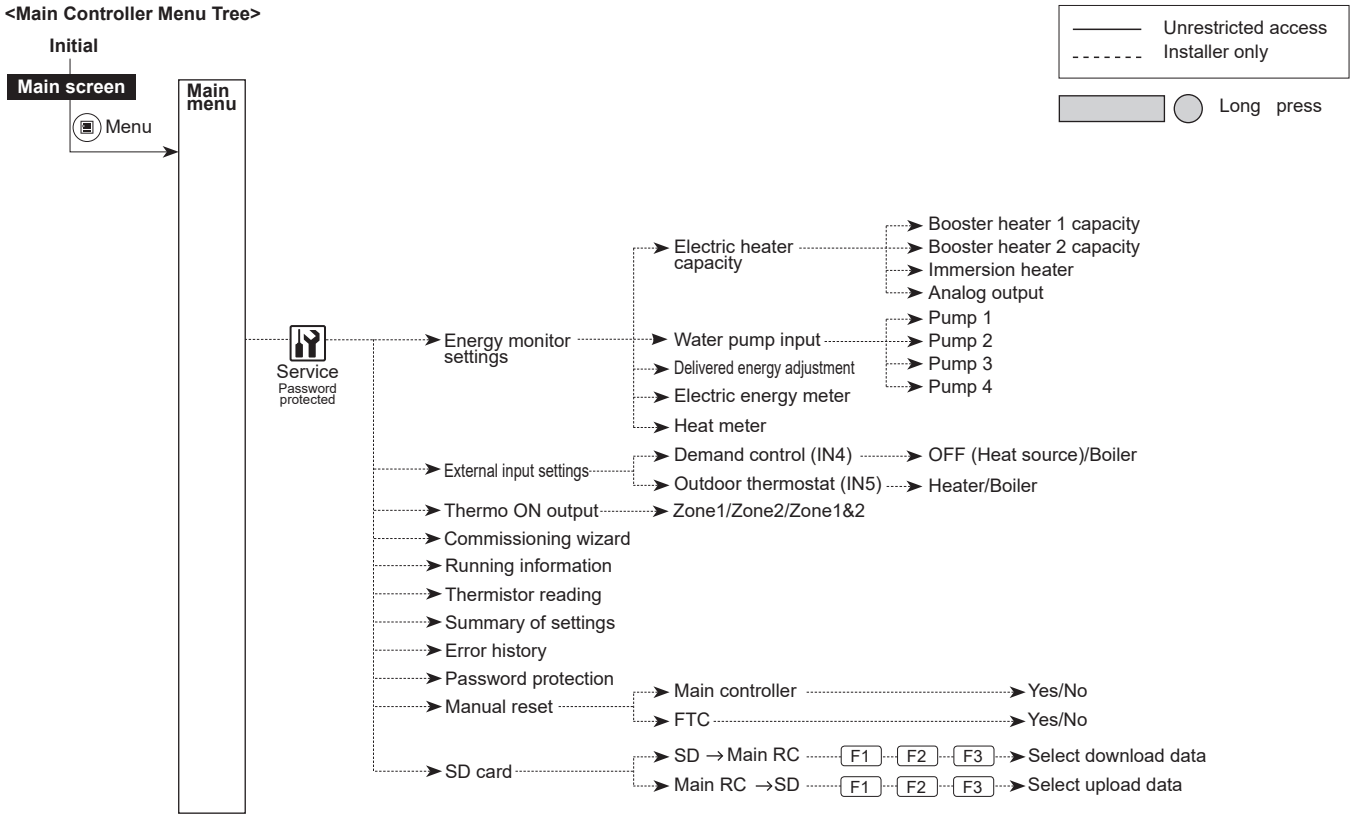
<Main Controller Menu Tree>



Service Menu

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

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

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

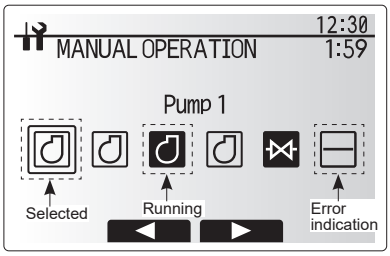
1. Manual operation
2. Function settings
3. Thermistor adjustment
4. Auxiliary settings
5. Heat source setting
6. Pump speed
7. Heat pump settings
8. Operation settings
9. Energy monitor settings
10. External input settings
11. Thermo ON output
12. Commissioning wizard
13. Running information
14. Thermistor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

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

<Manual operation>

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

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



Manual operation menu screen

Manual operation and heat source setting cannot 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 the last operation.

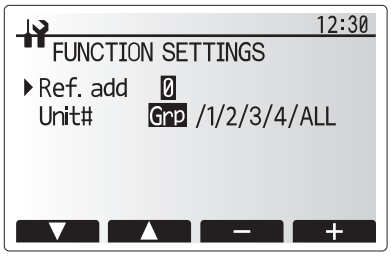
<Function settings>

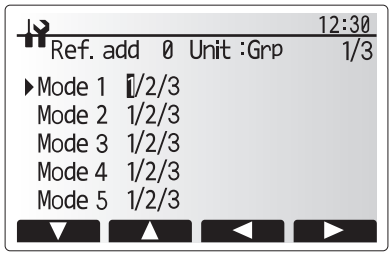
Function Setting allows the setting of auto recovery after power failure.

1. From the service menu use F1 and F2 to highlight Function Setting.
2. Press CONFIRM.
3. Ensure the Ref address and unit number are displayed to the right.
4. Press CONFIRM.
5. Use F3 and F4 to highlight either 1/2/3 (see below).
6. Press CONFIRM.

Setting	Unit	Mode	Number
Auto recovery after power failure	Grp	Mode1	1 - Inactive 2 - Active *1 3 - NO FUNCTION

*1 Approx. 4-minute delay after power is restored.

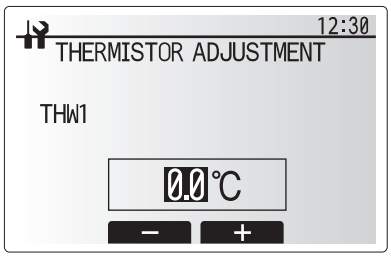




<Thermistor adjustment>

This function allows adjustments to be made to the thermistor readings from −10 to 10°C in 0.5°C intervals.

THW1: Thermistor (Flow water temp.)
THW2: Thermistor (Return water temp.)
THW5: Thermistor (DHW tank water temp.)
THW6: Thermistor (Zone1 flow temp.)(Option)
THW7: Thermistor (Zone1 return temp.)(Option)
THW8: Thermistor (Zone2 flow temp.)(Option)
THW9: Thermistor (Zone2 return temp.)(Option)
THW10: Thermistor (Mixing tank temp.)(Option)
THWB1: Thermistor (Boiler flow temp.)(Option)



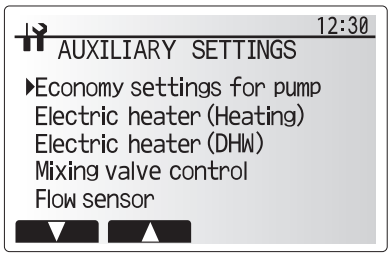
<Auxiliary settings>

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

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

*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 EHPT(15-21)X-UKH(L)DW1S Minimum: 5L/min
EHPT(15-21)X-UKH(L)DW1S Maximum: 100L/min

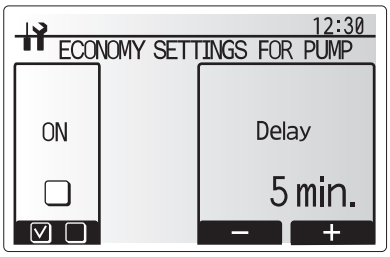
EHPT(21-30)X-UKHDW1L Minimum: 7L/min
EHPT(21-30)X-UKHDW1L Maximum: 100L/min



Auxiliary settings menu screen

Economy settings for pump

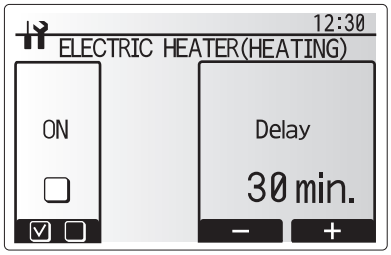
1. From the Auxiliary settings menu highlight Economy Settings for water circulation pump.
2. Press CONFIRM.
3. The economy settings for water circulation pump screen is displayed.
4. Use button F1 to switch the economy settings ON/OFF.
5. Use buttons F3 and F4 to adjust the time the water circulation pump will run. (3 to 60 minutes)



Economy settings for pump screen

Electric heater (Heating)

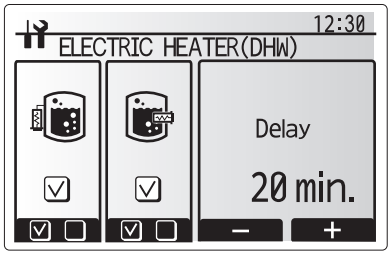
1. From the Auxiliary settings menu highlight Electric heater (Heating).
2. Press CONFIRM.
3. The Electric heater (Heating) screen is displayed.
4. Press F1 button to switch the function ON/OFF.
5. Use F3 and F4 buttons to adjust the time period of heat pump only operation before the booster heater will assist in space heating. (5 to 180 minutes)



Electric heater (Heating) screen

Electric heater (DHW)

1. From the Auxiliary settings menu highlight Electric heater (DHW).
2. Press CONFIRM.
3. The Electric heater (DHW) screen is displayed.
4. Press F1 and F2 buttons to switch the function ON/OFF. (F1: booster heater, F2: immersion heater)
5. Use F3 and F4 buttons to adjust the time period of heat pump only operation before the booster heater and the immersion heater (if present) will assist in DHW heating. (15 to 30 minutes)



Electric heater (DHW) screen

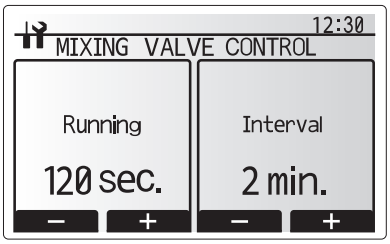
Mixing valve control

1. From the Auxiliary settings menu highlight Mixing valve control.
2. Press CONFIRM.
3. The Mixing valve control screen is displayed.
4. Use F1 and F2 buttons to set Running time between 10 to 240 seconds. The Running time equals to a period from full open of the valve (at a hot water mixing ratio of 100%) to full close (at a cold water mixing ratio of 100%).

Note: Set the Running time according to the specifications of the actuator of each mixing valve.

1. From the Auxiliary settings menu highlight Mixing valve control.
2. Press CONFIRM.
3. The Mixing valve control screen is displayed.
4. Press F3 and F4 buttons to set the interval between 2-zone temperature controls of the mixing valve between 1 to 30 minutes.

Note: 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.



Mixing valve control setting screen

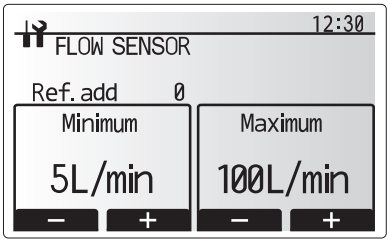
Flow sensor

1. From the Auxiliary settings menu highlight Flow sensor.
2. Press CONFIRM.
3. Press F3 or F4 buttons to select a refrigerant address of which you wish to configure or check the settings, and press CONFIRM. *1
4. The Flow sensor screen is displayed.
5. Use F1 and F2 buttons to set the minimum flow rate of flow sensor between 0 to maximum L/min.
6. Use F3 and F4 buttons to set the maximum flow rate of flow sensor between minimum to 100L/min.

*1 For multiple outdoor units control system only.

EHPT(15-21)X-UKH(L)DW1S Minimum: 5L/min
EHPT(15-21)X-UKH(L)DW1S Maximum: 100L/min

EHPT(21-30)X-UKHDW1L Minimum: 7L/min
EHPT(21-30)X-UKHDW1L Maximum: 100L/min



Flow sensor setting screen

<Heat source setting>

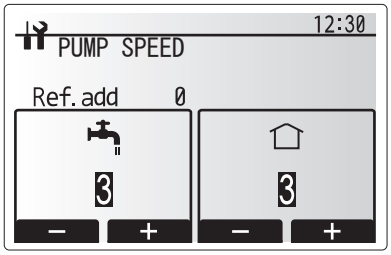
The default heat source setting is heat pump and all electric heaters present in the system to be operational. This is referred to as Standard operation on the menu.

Heat source setting screen

<Pump speed>

1. From the Service menu, highlight Pump speed.
2. Press CONFIRM.
3. Press F3 and F4 buttons to select a refrigerant address of which you wish to configure or check the settings, and press CONFIRM. *1
4. The Pump speed screen is displayed.
5. Use F1 and F2 buttons to set the pump speed (1 to 5) of DHW operation.
6. Use F3 and F4 buttons to set the pump speed (1 to 5) of space heating(cooling) operation.

*1 For multiple outdoor units control system only.



Pump speed setting screen

<Operation settings>

Heating operation

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

Menu subtitle		Function	Range	Unit	Default
Flow temp. range	Minimum temp.	To minimize the loss by frequent ON and OFF in mild outdoor ambient temperature seasons.	20 to 45	ºC	30
	Maximum temp.	To set max. possible flow temperature according to the type of heat emitters.	35 to 60	ºC	50
Room temp. control	Mode	Setting for Room temp. control At Fast mode, target outlet water temperature is set higher than the one set at normal mode. This reduces the time to reach the target room temperature when the room temperature is relatively low.*	Normal/ Fast	—	Normal
	Interval	Selectable according to the heat emitter type and the materials of floor (i.e. radiators, floor heating-thick, -thin concrete, wood, etc.)	10 to 60	min	10
Heat pump thermo diff.adjust	ON/OFF	To minimize the loss by frequent ON and OFF in mild outdoor ambient temperature seasons.	ON/OFF	—	ON
	Lower limit	Prohibits heat pump operation until the flow temperature drops below the target flow temperature plus lower limit value.	−9 to −1	ºC	−5
	Upper limit	Allows heat pump operation until the flow temperature rises above the target flow temperature plus upper limit value.	+3 to +5	ºC	+5

< Heating operation (Room temp. control table) >

Notes:

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

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

Freeze stat function

Menu subtitle		Function/ Description
Freeze stat function *1		An operational function to prevent the water circuit from freezing when outdoor ambient temperature drops.
	Flow t.	The target outlet water temperature at water circuit when operating in Freeze stat function. *2
	Outdoor ambient temp.	Minimum outdoor ambient temperature which freeze stat function will begin to operate, (3–20ºC) or choose**. If asterisk (**) is chosen freeze stat function is deactivated. (i.e. primary water freeze risk)"

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

*2. Flow t. is fixed to 20°C and unchangeable.

Simultaneous Operation

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

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

Cold weather function

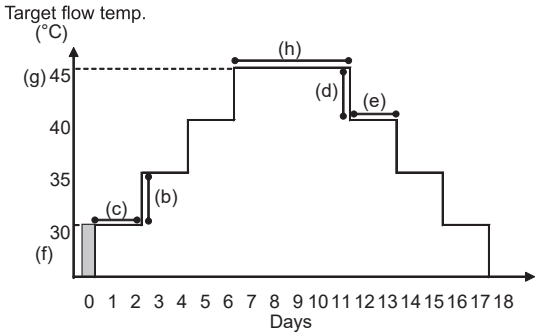
For extremely low outdoor ambient temperature conditions when the heat pump's capacity is restricted, the heating or DHW is provided only by the electric booster heater (and immersion if present). This function is intended for use during extreme cold periods only. Extensive use of direct electrical heaters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

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

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.
For Floor dry up function, the target flow temp. of Zone1 is the same as that of Zone2.



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

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

<Energy monitor settings>

1. General description

End user can monitor accumulated(*1) 'Consumed electrical energy' and 'Delivered heat energy' in each operation mode(*2) on the main remote controller.

*1 Monthly and Year to date

*2 - DHW operation
- Space heating
- Space cooling

Refer to the menu tree in "Main Settings Menu" for how to check the energy, and "DIP switch functions" for the details on DIP-SW setting.
Either one of the following 2 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.

(1) Calculation internally

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

When additional pumps supplied locally are connected change setting according to specs of the pumps.
When anti-freeze solution is used for primary water circuit, set the delivered energy adjustment if necessary
For further detail of above, refer to "Main remote controller".

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

FTC has external input terminals for 2 'Electric energy meters' and a 'Heat meter'.
If two 'Electric energy meters' are connected, the 2 recorded values will be combined at the FTC and shown on the main remote controller.
(e.g. Meter 1 for H/P power line, Meter 2 for heater power line)
Refer to the [Signal inputs] in section "6. WIRING DIAGRAM" for more information on connectable electric energy meter and heat meter.

● Connectable electric energy meter and heat meter

▪ Pulse meter type	Voltage free contact for 12VDC detection by FTC (TBI.3 1, 3 and 5 pin have a positive voltage.)
▪ Pulse duration	Minimum ON time: 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

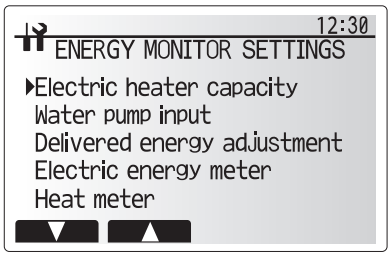
Those values can be set by the main remote controller. (Refer to the menu tree in "Main Settings Menu".)

2. Settings using the main remote controller

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.



Energy monitor settings menu screen

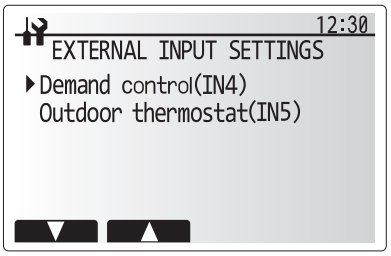
<External input settings>

Demand control (IN4)

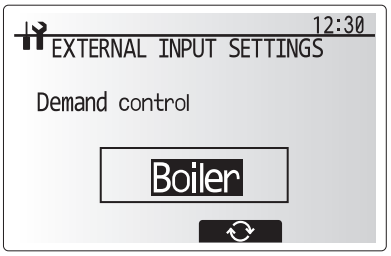
The selection of “OFF”, whilst a signal is being sent to IN4, forcefully stops all the heat source operations and the selection of “Boiler” stops operations of heat pump and electric heater and performs boiler operation.

Outdoor thermostat (IN5)

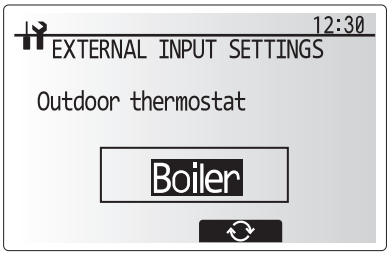
The selection of “Heater”, whilst a signal is being sent to IN5, performs only electric heater operation and the selection of “Boiler” performs boiler operation.



External input settings menu screen



Demand control screen



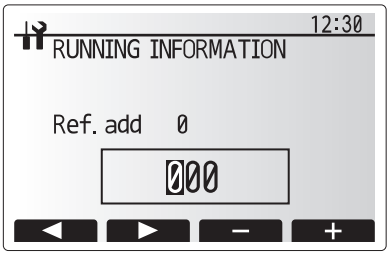
Outdoor thermostat setting screen

<Running information>

This function shows current temperature and other data of main component parts of both the indoor and outdoor units.

1. From the Service menu highlight Running information.
2. Press CONFIRM.
3. Press F3 and F4 buttons to set the Ref. address. *1
4. Use the function buttons to enter index code for the component to be viewed. (See the Table 9.5.1 for component index codes.)
5. Press CONFIRM.

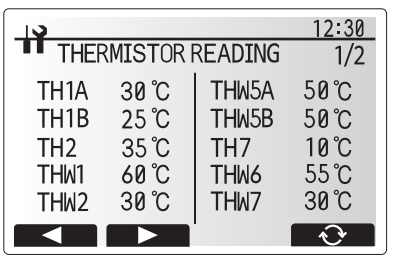
*1 For multiple outdoor units control system only.



<Thermistor reading>

This function shows the current readings of thermistors located on the water and refrigerant circuit

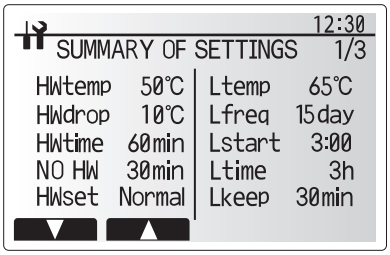
Thermistor	Description	Thermistor	Description
TH1A	Zone1 room temperature	TH7	Ambient (outdoor) temperature
TH1B	Zone2 room temperature	THW6	Zone1 flow temperature
TH2	Refrigerant return temperature	THW7	Zone1 return temperature
THW1	Flow water temperature	THW8	Zone2 flow temperature
THW2	Return water temperature	THW9	Zone2 return temperature
THW5A	DHW tank upper water temperature	THW10	Mixing tank temperature
THW5B	DHW tank lower water temperature	THWB1	Boiler flow temperature



<Summary of settings>

This function shows the current installer/user entered settings.

Abbreviation	Explanation	Abbreviation	Explanation
HWtemp	DHW max. temperature	**Z2 mode**	Operation mode
HWdrop	DHW temperature drop		- HER (Heating room temperature)
HWtime	DHW max. operation time		- HE (Heating flow temperature)
NO HW	DHW mode restriction		- HCC (Heating compensation curve)
HWset	DHW operation mode (Normal/Eco)		- COR (—)
Ltemp	Legionella hot water temperature		- CO (Cooling flow temperature)
Lfreq	Legionella operation Frequency	**Hroom 1**	Heating target room temperature
Lstart	Legionella mode start time	**Hroom 2**	Heating target room temperature
Ltime	Legionella max. operation time	**Hflow 1**	Heating target flow temperature
Lkeep	Duration of max. (Legionella) hot water temperature	**Hflow 2**	Heating target flow temperature
Z1 mode	Operation mode	**Croom 1**	Cooling target room temperature
	- HER (Heating room temperature)	**Croom 2**	Cooling target room temperature
	- HE (Heating flow temperature)	**Cflow 1**	Cooling target flow temperature
	- HCC (Heating compensation curve)	**Cflow 2**	Cooling target flow temperature
	- COR (—)	**FSflow**	Freeze stat function flow temperature
	- CO (Cooling flow temperature)	**FSout**	Freeze stat function ambient temperature



<Error history>

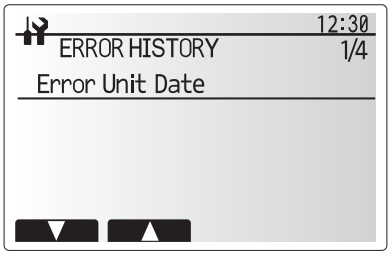
Error history allows the service engineer to view previous check codes, the unit address and the date on which they occurred. Up to 16 check codes can be stored in the history the most recent Error event is displayed at the top of the list.

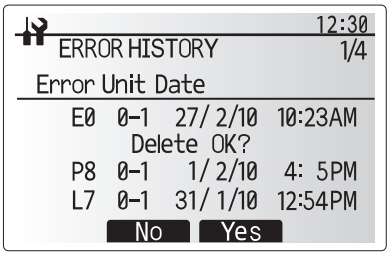
1. From the service menu select Error history
2. Press CONFIRM.

Please see "10-4. Self-diagnosis and action" for check code diagnosis and actions.

To delete an Error history item;

1. From Error history screen press F4 button (Rubbish bin icon)
2. Then press F3 button (Yes).





<Password protection>

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

Resetting the password

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

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

<Manual reset>

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

Password input screen

Password verify screen

Resetting the password

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

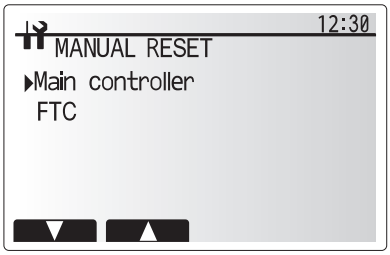
1. From the main settings menu scroll down the functions until Service Menu is highlighted.
2. Press CONFIRM.
3. You will be prompted to enter a password.
4. Hold down buttons F3 and F4 together for 3 seconds.
5. You will be asked if you wish to continue and reset the password to default setting.
6.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

Completion screen

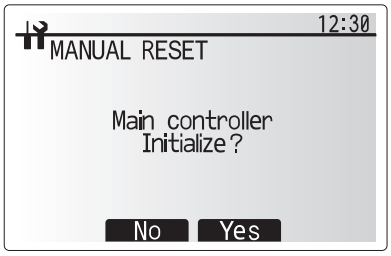
<Manual reset>

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

1. From the service menu use F1 and F2 buttons to scroll through list until Manual Reset is highlighted.
2. Press CONFIRM.
3. The Manual reset screen is displayed.
4. Choose either Manual Reset for FTC or Main remote controller.

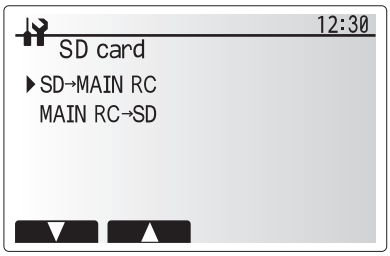


5. Press F3 button to confirm manual reset of chosen device.



<SD card>

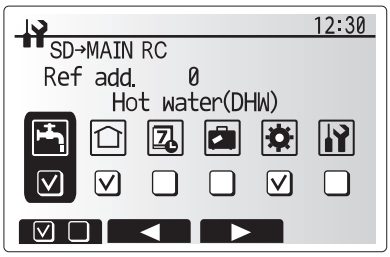
The use of an SD memory card simplifies the main remote controller settings in the field.
*Ecodan service tool (for use with PC tool) is necessary for the setting.



SD → Main RC

1. From the SD card setting use F1 and F2 buttons to scroll through list until "SD → Main RC" is highlighted.
2. Press CONFIRM.
3. Press F3 and F4 buttons to set the Ref. address. *1
4. Use F1, F2 and F3 buttons to select a menu to write to the main remote controller.
5. Press CONFIRM to start downloading.
6. Wait for a few minutes until "Complete!" appears.

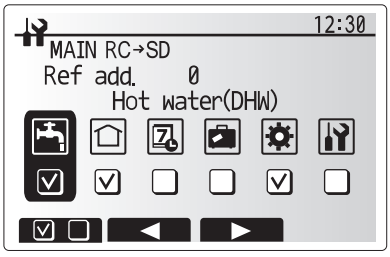
*1 For multiple outdoor units control system only.



Main RC → SD

1. From the SD card setting use F1 and F2 buttons to scroll through list until Main RC → SD is highlighted.
2. Press CONFIRM.
3. Press F3 and F4 buttons to set the Ref. address. *1
4. Use F1, F2 and F3 buttons to select a menu to write to the SD memory card.
5. Press CONFIRM to start uploading.
6. Wait for a few minutes until "Complete!" appears.

*1 For multiple outdoor units control system only.



Request code	Request content	Range	Unit
103	Error history 1 (latest)	Displays error history. ("– –" is displays if no history is present.)	Code
104	Error history 2 (second to last)	Displays error history. ("– –" is displays if no history is present.)	—
105	Error history 3 (third to last)	Displays error history. ("– –" is displays if no history is present.)	—
154	Water circulation pump 1 - Accumulated operating time (after reset)	0 to 9999	10 hours
156	Water circulation pump 2 - Accumulated operating time (after reset)	0 to 9999	10 hours
157	Water circulation pump 3 - Accumulated operating time (after reset)	0 to 9999	10 hours
158	Water circulation pump 4 - Accumulated operating time (after reset)	0 to 9999	10 hours
162	Indoor unit - DIP SW1 setting information	Refer to detail contents described hereinafter.	—
163	Indoor unit - DIP SW2 setting information	Refer to detail contents described hereinafter.	—
164	Indoor unit - DIP SW3 setting information	Refer to detail contents described hereinafter.	—
165	Indoor unit - DIP SW4 setting information	Refer to detail contents described hereinafter.	—
166	Indoor unit - DIP SW5 setting information	Refer to detail contents described hereinafter.	—
175	Indoor unit - Output signal information	Refer to detail contents described hereinafter.	—
176	Indoor unit - Input signal information	Refer to detail contents described hereinafter.	—
177	Mixing valve opening step	0 to 10	Step
190	Indoor unit - Software version 1st 4 digits	Refer to Note below.	—
191	Indoor unit - Software version last 4 digits	Refer to Note below.	—
200	Initialisation of Function Setting	—	—
340	Water circulation pump 1 - Accumulated operating time reset	—	—
342	Water circulation pump 2 - Accumulated operating time reset	—	—
343	Water circulation pump 3 - Accumulated operating time reset	—	—
344	Water circulation pump 4 - Accumulated operating time reset	—	—
504	Indoor unit - Zone1 room temp. (TH1A)	−39 to 88	°C
505	Indoor unit - Ref. liquid temp. (TH2)	−39 to 88	°C
506	Indoor unit - Return water temp. (THW2)	−39 to 88	°C
507	Indoor unit - Zone2 room temp. (TH1B)	−39 to 88	°C
508	Indoor unit - DHW tank lower water temp. (THW5B)	−39 to 88	°C
509	Indoor unit - Zone1 flow water temp. (THW6)	−39 to 88	°C
510	Indoor unit - Outside air temp. (TH7)	−39 to 88	°C
511	Indoor unit - Flow water temp. (THW1)	−39 to 88	°C
512	Indoor unit - Zone1 return water temp. (THW7)	−39 to 88	°C
513	Indoor unit - Zone2 flow water temp. (THW8)	−39 to 88	°C
514	Indoor unit - Zone2 return water temp. (THW9)	−39 to 88	°C
515	Indoor unit - Boiler flow water temp. (THWB1)	−40 to 140	°C
534	Indoor unit - DHW tank upper water temp. (THW5A)	−39 to 88	°C
535	Indoor unit - Mixing tank water temp. (THW10)	−40 to 140	°C
540	Flow rate of the primary circuit	0 to 100	L/min
550	Indoor unit - Error postponement history 1 (latest)	Displays postponement code. ("– –" is displays if no postponement code is present.)	—
551	Indoor unit - Operation control at time of error	0 Standard, 1 Heater, 2 Boiler	—
552	Indoor unit - Operation mode at time of error	0: OFF, 1: DHW, 2: Heating, 3: Cooling, 4: Legionella prevention, 5: Freeze protection, 6: Operation stop, 7: Defrost	—
553	Indoor unit - Output signal information at time of error	Refer to detail contents described hereinafter.	—
554	Indoor unit - Input signal information at time of error	Refer to detail contents described hereinafter.	—
555	Indoor unit - Zone1 room temp. (TH1A) at time of error	−39 to 88	°C
556	Indoor unit - Zone2 room temp. (TH1B) at time of error	−39 to 88	°C
557	Indoor unit - Ref. liquid temp. (TH2) at time of error	−39 to 88	°C
558	Indoor unit - Flow water temp. (THW1) at time of error	−39 to 88	°C
559	Indoor unit - Return water temp. (THW2) at time of error	−39 to 88	°C
560	Indoor unit - DHW tank water temp. (THW5) at time of error	−39 to 88	°C
561	Indoor unit - Zone1 flow water temp. (THW6) at time of error	−39 to 88	°C
562	Indoor unit - Zone1 return water temp. (THW7) at time of error	−39 to 88	°C
563	Indoor unit - Zone2 flow water temp. (THW8) at time of error	−39 to 88	°C
564	Indoor unit - Zone2 return water temp. (THW9) at time of error	−39 to 88	°C
565	Indoor unit - Boiler flow water temp. (THWB1) at time of error	−40 to 140	°C
567	Indoor unit - Failure (P1/P2/L5/L8/Ld) thermistor	0: Failure thermistor is none, 1: TH1A, 2: TH2, 3: THW1, 4: THW2, 5: THWB1, 6: THW5B, 8: TH1B, A: THW6, B: THW7, C: THW8, D: THW9	—
568	Mixing valve opening step at time of error	0 to 10	Step
569	Operated Flow switch at time of failure (L9)	0: No operated flow switch, 1: Flow switch 1, 2: Flow switch 2, 3: Flow switch 3	—
571	Flow rate at time of error	0 to 100	L/min

Note:
Refer to outdoor unit service manual for request code 0 to 102, 106 to 149.
Request codes 103 to 105 indicate error histories of both indoor and outdoor units.
As only 4 digits can be displayed at one time, the software version number is displayed in two halves.
Enter code 190 to see the first 4 digits and code 191 to see the last 4 digits.
For example software version No. 5.01 A000, when code 190 is entered 0501 is displayed, when code 191 is entered A000 is displayed.
Request code 200 resets all Function Setting to the factory default settings.

Indoor unit switch setting display (Request code: 162 to 166)

0: OFF 1: ON

SW1, SW2, SW3, SW4, SW5								Display
1	2	3	4	5	6	7	8	
0	0	0	0	0	0	0	0	00 00
1	0	0	0	0	0	0	0	00 01
0	1	0	0	0	0	0	0	00 02
1	1	0	0	0	0	0	0	00 03
0	0	1	0	0	0	0	0	00 04
1	0	1	0	0	0	0	0	00 05
0	1	1	0	0	0	0	0	00 06
1	1	1	0	0	0	0	0	00 07
0	0	0	1	0	0	0	0	00 08
1	0	0	1	0	0	0	0	00 09
0	1	0	1	0	0	0	0	00 0A
1	1	0	1	0	0	0	0	00 0B
0	0	1	1	0	0	0	0	00 0C
1	0	1	1	0	0	0	0	00 0D
0	1	1	1	0	0	0	0	00 0E
1	1	1	1	0	0	0	0	00 0F
0	0	0	0	1	0	0	0	00 10
1	0	0	0	1	0	0	0	00 11
0	1	0	0	1	0	0	0	00 12
1	1	0	0	1	0	0	0	00 13
0	0	1	0	1	0	0	0	00 14
1	0	1	0	1	0	0	0	00 15
0	1	1	0	1	0	0	0	00 16
1	1	1	0	1	0	0	0	00 17
0	0	0	1	1	0	0	0	00 18
1	0	0	1	1	0	0	0	00 19
0	1	0	1	1	0	0	0	00 1A
1	1	0	1	1	0	0	0	00 1B
0	0	1	1	1	0	0	0	00 1C
1	0	1	1	1	0	0	0	00 1D
0	1	1	1	1	0	0	0	00 1E
1	1	1	1	1	0	0	0	00 1F
0	0	0	0	0	1	0	0	00 20
1	0	0	0	0	1	0	0	00 21
0	1	0	0	0	1	0	0	00 22
1	1	0	0	0	1	0	0	00 23
0	0	1	0	0	1	0	0	00 24
1	0	1	0	0	1	0	0	00 25
0	1	1	0	0	1	0	0	00 26
1	1	1	0	0	1	0	0	00 27
0	0	0	1	0	1	0	0	00 28
1	0	0	1	0	1	0	0	00 29
0	1	0	1	0	1	0	0	00 2A
1	1	0	1	0	1	0	0	00 2B
0	0	1	1	0	1	0	0	00 2C
1	0	1	1	0	1	0	0	00 2D
0	1	1	1	0	1	0	0	00 2E
1	1	1	1	0	1	0	0	00 2F
0	0	0	0	1	1	0	0	00 30
1	0	0	0	1	1	0	0	00 31
0	1	0	0	1	1	0	0	00 32
1	1	0	0	1	1	0	0	00 33
0	0	1	0	1	1	0	0	00 34
1	0	1	0	1	1	0	0	00 35
0	1	1	0	1	1	0	0	00 36
1	1	1	0	1	1	0	0	00 37
0	0	0	1	1	1	0	0	00 38
1	0	0	1	1	1	0	0	00 39
0	1	0	1	1	1	0	0	00 3A
1	1	0	1	1	1	0	0	00 3B
0	0	1	1	1	1	0	0	00 3C
1	0	1	1	1	1	0	0	00 3D
0	1	1	1	1	1	0	0	00 3E
1	1	1	1	1	1	0	0	00 3F

0: OFF 1: ON

SW1, SW2, SW3, SW4, SW5								Display
1	2	3	4	5	6	7	8	
0	0	0	0	0	0	1	0	00 40
1	0	0	0	0	0	1	0	00 41
0	1	0	0	0	0	1	0	00 42
1	1	0	0	0	0	1	0	00 43
0	0	1	0	0	0	1	0	00 44
1	0	1	0	0	0	1	0	00 45
0	1	1	0	0	0	1	0	00 46
1	1	1	0	0	0	1	0	00 47
0	0	0	1	0	0	1	0	00 48
1	0	0	1	0	0	1	0	00 49
0	1	0	1	0	0	1	0	00 4A
1	1	0	1	0	0	1	0	00 4B
0	0	1	1	0	0	1	0	00 4C
1	0	1	1	0	0	1	0	00 4D
0	1	1	1	0	0	1	0	00 4E
1	1	1	1	0	0	1	0	00 4F
0	0	0	0	1	0	1	0	00 50
1	0	0	0	1	0	1	0	00 51
0	1	0	0	1	0	1	0	00 52
1	1	0	0	1	0	1	0	00 53
0	0	1	0	1	0	1	0	00 54
1	0	1	0	1	0	1	0	00 55
0	1	1	0	1	0	1	0	00 56
1	1	1	0	1	0	1	0	00 57
0	0	0	1	1	0	1	0	00 58
1	0	0	1	1	0	1	0	00 59
0	1	0	1	1	0	1	0	00 5A
1	1	0	1	1	0	1	0	00 5B
0	0	1	1	1	0	1	0	00 5C
1	0	1	1	1	0	1	0	00 5D
0	1	1	1	1	0	1	0	00 5E
1	1	1	1	1	0	1	0	00 5F
0	0	0	0	0	1	1	0	00 60
1	0	0	0	0	1	1	0	00 61
0	1	0	0	0	1	1	0	00 62
1	1	0	0	0	1	1	0	00 63
0	0	1	0	0	1	1	0	00 64
1	0	1	0	0	1	1	0	00 65
0	1	1	0	0	1	1	0	00 66
1	1	1	0	0	1	1	0	00 67
0	0	0	1	0	1	1	0	00 68
1	0	0	1	0	1	1	0	00 69
0	1	0	1	0	1	1	0	00 6A
1	1	0	1	0	1	1	0	00 6B
0	0	1	1	0	1	1	0	00 6C
1	0	1	1	0	1	1	0	00 6D
0	1	1	1	0	1	1	0	00 6E
1	1	1	1	0	1	1	0	00 6F
0	0	0	0	1	1	1	0	00 70
1	0	0	0	1	1	1	0	00 71
0	1	0	0	1	1	1	0	00 72
1	1	0	0	1	1	1	0	00 73
0	0	1	0	1	1	1	0	00 74
1	0	1	0	1	1	1	0	00 75
0	1	1	0	1	1	1	0	00 76
1	1	1	0	1	1	1	0	00 77
0	0	0	1	1	1	1	0	00 78
1	0	0	1	1	1	1	0	00 79
0	1	0	1	1	1	1	0	00 7A
1	1	0	1	1	1	1	0	00 7B
0	0	1	1	1	1	1	0	00 7C
1	0	1	1	1	1	1	0	00 7D
0	1	1	1	1	1	1	0	00 7E
1	1	1	1	1	1	1	0	00 7F

Indoor unit switch setting display (Request code: 162 to 166)

0: OFF 1: ON

SW1, SW2, SW3, SW4, SW5								Display
1	2	3	4	5	6	7	8	
0	0	0	0	0	0	0	1	00 80
1	0	0	0	0	0	0	1	00 81
0	1	0	0	0	0	0	1	00 82
1	1	0	0	0	0	0	1	00 83
0	0	1	0	0	0	0	1	00 84
1	0	1	0	0	0	0	1	00 85
0	1	1	0	0	0	0	1	00 86
1	1	1	0	0	0	0	1	00 87
0	0	0	1	0	0	0	1	00 88
1	0	0	1	0	0	0	1	00 89
0	1	0	1	0	0	0	1	00 8A
1	1	0	1	0	0	0	1	00 8B
0	0	1	1	0	0	0	1	00 8C
1	0	1	1	0	0	0	1	00 8D
0	1	1	1	0	0	0	1	00 8E
1	1	1	1	0	0	0	1	00 8F
0	0	0	0	1	0	0	1	00 90
1	0	0	0	1	0	0	1	00 91
0	1	0	0	1	0	0	1	00 92
1	1	0	0	1	0	0	1	00 93
0	0	1	0	1	0	0	1	00 94
1	0	1	0	1	0	0	1	00 95
0	1	1	0	1	0	0	1	00 96
1	1	1	0	1	0	0	1	00 97
0	0	0	1	1	0	0	1	00 98
1	0	0	1	1	0	0	1	00 99
0	1	0	1	1	0	0	1	00 9A
1	1	0	1	1	0	0	1	00 9B
0	0	1	1	1	0	0	1	00 9C
1	0	1	1	1	0	0	1	00 9D
0	1	1	1	1	0	0	1	00 9E
1	1	1	1	1	0	0	1	00 9F
0	0	0	0	0	1	0	1	00 A0
1	0	0	0	0	1	0	1	00 A1
0	1	0	0	0	1	0	1	00 A2
1	1	0	0	0	1	0	1	00 A3
0	0	1	0	0	1	0	1	00 A4
1	0	1	0	0	1	0	1	00 A5
0	1	1	0	0	1	0	1	00 A6
1	1	1	0	0	1	0	1	00 A7
0	0	0	1	0	1	0	1	00 A8
1	0	0	1	0	1	0	1	00 A9
0	1	0	1	0	1	0	1	00 AA
1	1	0	1	0	1	0	1	00 AB
0	0	1	1	0	1	0	1	00 AC
1	0	1	1	0	1	0	1	00 AD
0	1	1	1	0	1	0	1	00 AE
1	1	1	1	0	1	0	1	00 AF
0	0	0	0	1	1	0	1	00 B0
1	0	0	0	1	1	0	1	00 B1
0	1	0	0	1	1	0	1	00 B2
1	1	0	0	1	1	0	1	00 B3
0	0	1	0	1	1	0	1	00 B4
1	0	1	0	1	1	0	1	00 B5
0	1	1	0	1	1	0	1	00 B6
1	1	1	0	1	1	0	1	00 B7
0	0	0	1	1	1	0	1	00 B8
1	0	0	1	1	1	0	1	00 B9
0	1	0	1	1	1	0	1	00 BA
1	1	0	1	1	1	0	1	00 BB
0	0	1	1	1	1	0	1	00 BC
1	0	1	1	1	1	0	1	00 BD
0	1	1	1	1	1	0	1	00 BE
1	1	1	1	1	1	0	1	00 BF

0: OFF 1: ON

SW1, SW2, SW3, SW4, SW5								Display
1	2	3	4	5	6	7	8	
0	0	0	0	0	0	1	1	00 C0
1	0	0	0	0	0	1	1	00 C1
0	1	0	0	0	0	1	1	00 C2
1	1	0	0	0	0	1	1	00 C3
0	0	1	0	0	0	1	1	00 C4
1	0	1	0	0	0	1	1	00 C5
0	1	1	0	0	0	1	1	00 C6
1	1	1	0	0	0	1	1	00 C7
0	0	0	1	0	0	1	1	00 C8
1	0	0	1	0	0	1	1	00 C9
0	1	0	1	0	0	1	1	00 CA
1	1	0	1	0	0	1	1	00 CB
0	0	1	1	0	0	1	1	00 CC
1	0	1	1	0	0	1	1	00 CD
0	1	1	1	0	0	1	1	00 CE
1	1	1	1	0	0	1	1	00 CF
0	0	0	0	1	0	1	1	00 D0
1	0	0	0	1	0	1	1	00 D1
0	1	0	0	1	0	1	1	00 D2
1	1	0	0	1	0	1	1	00 D3
0	0	1	0	1	0	1	1	00 D4
1	0	1	0	1	0	1	1	00 D5
0	1	1	0	1	0	1	1	00 D6
1	1	1	0	1	0	1	1	00 D7
0	0	0	1	1	0	1	1	00 D8
1	0	0	1	1	0	1	1	00 D9
0	1	0	1	1	0	1	1	00 DA
1	1	0	1	1	0	1	1	00 DB
0	0	1	1	1	0	1	1	00 DC
1	0	1	1	1	0	1	1	00 DD
0	1	1	1	1	0	1	1	00 DE
1	1	1	1	1	0	1	1	00 DF
0	0	0	0	0	1	1	1	00 E0
1	0	0	0	0	1	1	1	00 E1
0	1	0	0	0	1	1	1	00 E2
1	1	0	0	0	1	1	1	00 E3
0	0	1	0	0	1	1	1	00 E4
1	0	1	0	0	1	1	1	00 E5
0	1	1	0	0	1	1	1	00 E6
1	1	1	0	0	1	1	1	00 E7
0	0	0	1	0	1	1	1	00 E8
1	0	0	1	0	1	1	1	00 E9
0	1	0	1	0	1	1	1	00 EA
1	1	0	1	0	1	1	1	00 EB
0	0	1	1	0	1	1	1	00 EC
1	0	1	1	0	1	1	1	00 ED
0	1	1	1	0	1	1	1	00 EE
1	1	1	1	0	1	1	1	00 EF
0	0	0	0	1	1	1	1	00 F0
1	0	0	0	1	1	1	1	00 F1
0	1	0	0	1	1	1	1	00 F2
1	1	0	0	1	1	1	1	00 F3
0	0	1	0	1	1	1	1	00 F4
1	0	1	0	1	1	1	1	00 F5
0	1	1	0	1	1	1	1	00 F6
1	1	1	0	1	1	1	1	00 F7
0	0	0	1	1	1	1	1	00 F8
1	0	0	1	1	1	1	1	00 F9
0	1	0	1	1	1	1	1	00 FA
1	1	0	1	1	1	1	1	00 FB
0	0	1	1	1	1	1	1	00 FC
1	0	1	1	1	1	1	1	00 FD
0	1	1	1	1	1	1	1	00 FE
1	1	1	1	1	1	1	1	00 FF

Output signal display (Request code: 175/553)

Please refer to Table 2 on relevant wiring diagram whilst using the following.

0: OFF 1: ON

OUT								Display
1	2	3	4	5A	5B	6	7	
0	0	0	0	0	0	0	0	xx 00
1	0	0	0	0	0	0	0	xx 01
0	1	0	0	0	0	0	0	xx 02
1	1	0	0	0	0	0	0	xx 03
0	0	1	0	0	0	0	0	xx 04
1	0	1	0	0	0	0	0	xx 05
0	1	1	0	0	0	0	0	xx 06
1	1	1	0	0	0	0	0	xx 07
0	0	0	1	0	0	0	0	xx 08
1	0	0	1	0	0	0	0	xx 09
0	1	0	1	0	0	0	0	xx 0A
1	1	0	1	0	0	0	0	xx 0B
0	0	1	1	0	0	0	0	xx 0C
1	0	1	1	0	0	0	0	xx 0D
0	1	1	1	0	0	0	0	xx 0E
1	1	1	1	0	0	0	0	xx 0F
0	0	0	0	1	0	0	0	xx 10
1	0	0	0	1	0	0	0	xx 11
0	1	0	0	1	0	0	0	xx 12
1	1	0	0	1	0	0	0	xx 13
0	0	1	0	1	0	0	0	xx 14
1	0	1	0	1	0	0	0	xx 15
0	1	1	0	1	0	0	0	xx 16
1	1	1	0	1	0	0	0	xx 17
0	0	0	1	1	0	0	0	xx 18
1	0	0	1	1	0	0	0	xx 19
0	1	0	1	1	0	0	0	xx 1A
1	1	0	1	1	0	0	0	xx 1B
0	0	1	1	1	0	0	0	xx 1C
1	0	1	1	1	0	0	0	xx 1D
0	1	1	1	1	0	0	0	xx 1E
1	1	1	1	1	0	0	0	xx 1F
0	0	0	0	0	1	0	0	xx 20
1	0	0	0	0	1	0	0	xx 21
0	1	0	0	0	1	0	0	xx 22
1	1	0	0	0	1	0	0	xx 23
0	0	1	0	0	1	0	0	xx 24
1	0	1	0	0	1	0	0	xx 25
0	1	1	0	0	1	0	0	xx 26
1	1	1	0	0	1	0	0	xx 27
0	0	0	1	0	1	0	0	xx 28
1	0	0	1	0	1	0	0	xx 29
0	1	0	1	0	1	0	0	xx 2A
1	1	0	1	0	1	0	0	xx 2B
0	0	1	1	0	1	0	0	xx 2C
1	0	1	1	0	1	0	0	xx 2D
0	1	1	1	0	1	0	0	xx 2E
1	1	1	1	0	1	0	0	xx 2F
0	0	0	0	1	1	0	0	xx 30
1	0	0	0	1	1	0	0	xx 31
0	1	0	0	1	1	0	0	xx 32
1	1	0	0	1	1	0	0	xx 33
0	0	1	0	1	1	0	0	xx 34
1	0	1	0	1	1	0	0	xx 35
0	1	1	0	1	1	0	0	xx 36
1	1	1	0	1	1	0	0	xx 37
0	0	0	1	1	1	0	0	xx 38
1	0	0	1	1	1	0	0	xx 39
0	1	0	1	1	1	0	0	xx 3A
1	1	0	1	1	1	0	0	xx 3B
0	0	1	1	1	1	0	0	xx 3C
1	0	1	1	1	1	0	0	xx 3D
0	1	1	1	1	1	0	0	xx 3E
1	1	1	1	1	1	0	0	xx 3F

0: OFF 1: ON

OUT								Display
1	2	3	4	5A	5B	6	7	
0	0	0	0	0	0	1	0	xx 40
1	0	0	0	0	0	1	0	xx 41
0	1	0	0	0	0	1	0	xx 42
1	1	0	0	0	0	1	0	xx 43
0	0	1	0	0	0	1	0	xx 44
1	0	1	0	0	0	1	0	xx 45
0	1	1	0	0	0	1	0	xx 46
1	1	1	0	0	0	1	0	xx 47
0	0	0	1	0	0	1	0	xx 48
1	0	0	1	0	0	1	0	xx 49
0	1	0	1	0	0	1	0	xx 4A
1	1	0	1	0	0	1	0	xx 4B
0	0	1	1	0	0	1	0	xx 4C
1	0	1	1	0	0	1	0	xx 4D
0	1	1	1	0	0	1	0	xx 4E
1	1	1	1	0	0	1	0	xx 4F
0	0	0	0	1	0	1	0	xx 50
1	0	0	0	1	0	1	0	xx 51
0	1	0	0	1	0	1	0	xx 52
1	1	0	0	1	0	1	0	xx 53
0	0	1	0	1	0	1	0	xx 54
1	0	1	0	1	0	1	0	xx 55
0	1	1	0	1	0	1	0	xx 56
1	1	1	0	1	0	1	0	xx 57
0	0	0	1	1	0	1	0	xx 58
1	0	0	1	1	0	1	0	xx 59
0	1	0	1	1	0	1	0	xx 5A
1	1	0	1	1	0	1	0	xx 5B
0	0	1	1	1	0	1	0	xx 5C
1	0	1	1	1	0	1	0	xx 5D
0	1	1	1	1	0	1	0	xx 5E
1	1	1	1	1	0	1	0	xx 5F
0	0	0	0	0	1	1	0	xx 60
1	0	0	0	0	1	1	0	xx 61
0	1	0	0	0	1	1	0	xx 62
1	1	0	0	0	1	1	0	xx 63
0	0	1	0	0	1	1	0	xx 64
1	0	1	0	0	1	1	0	xx 65
0	1	1	0	0	1	1	0	xx 66
1	1	1	0	0	1	1	0	xx 67
0	0	0	1	0	1	1	0	xx 68
1	0	0	1	0	1	1	0	xx 69
0	1	0	1	0	1	1	0	xx 6A
1	1	0	1	0	1	1	0	xx 6B
0	0	1	1	0	1	1	0	xx 6C
1	0	1	1	0	1	1	0	xx 6D
0	1	1	1	0	1	1	0	xx 6E
1	1	1	1	0	1	1	0	xx 6F
0	0	0	0	1	1	1	0	xx 70
1	0	0	0	1	1	1	0	xx 71
0	1	0	0	1	1	1	0	xx 72
1	1	0	0	1	1	1	0	xx 73
0	0	1	0	1	1	1	0	xx 74
1	0	1	0	1	1	1	0	xx 75
0	1	1	0	1	1	1	0	xx 76
1	1	1	0	1	1	1	0	xx 77
0	0	0	1	1	1	1	0	xx 78
1	0	0	1	1	1	1	0	xx 79
0	1	0	1	1	1	1	0	xx 7A
1	1	0	1	1	1	1	0	xx 7B
0	0	1	1	1	1	1	0	xx 7C
1	0	1	1	1	1	1	0	xx 7D
0	1	1	1	1	1	1	0	xx 7E
1	1	1	1	1	1	1	0	xx 7F

Output signal display (Request code: 175/553)

Please refer to Table 2 on relevant wiring diagram whilst using the following.

0: OFF 1: ON

OUT								Display
1	2	3	4	5A	5B	6	7	
0	0	0	0	0	0	0	1	xx 80
1	0	0	0	0	0	0	1	xx 81
0	1	0	0	0	0	0	1	xx 82
1	1	0	0	0	0	0	1	xx 83
0	0	1	0	0	0	0	1	xx 84
1	0	1	0	0	0	0	1	xx 85
0	1	1	0	0	0	0	1	xx 86
1	1	1	0	0	0	0	1	xx 87
0	0	0	1	0	0	0	1	xx 88
1	0	0	1	0	0	0	1	xx 89
0	1	0	1	0	0	0	1	xx 8A
1	1	0	1	0	0	0	1	xx 8B
0	0	1	1	0	0	0	1	xx 8C
1	0	1	1	0	0	0	1	xx 8D
0	1	1	1	0	0	0	1	xx 8E
1	1	1	1	0	0	0	1	xx 8F
0	0	0	0	1	0	0	1	xx 90
1	0	0	0	1	0	0	1	xx 91
0	1	0	0	1	0	0	1	xx 92
1	1	0	0	1	0	0	1	xx 93
0	0	1	0	1	0	0	1	xx 94
1	0	1	0	1	0	0	1	xx 95
0	1	1	0	1	0	0	1	xx 96
1	1	1	0	1	0	0	1	xx 97
0	0	0	1	1	0	0	1	xx 98
1	0	0	1	1	0	0	1	xx 99
0	1	0	1	1	0	0	1	xx 9A
1	1	0	1	1	0	0	1	xx 9B
0	0	1	1	1	0	0	1	xx 9C
1	0	1	1	1	0	0	1	xx 9D
0	1	1	1	1	0	0	1	xx 9E
1	1	1	1	1	0	0	1	xx 9F
0	0	0	0	0	1	0	1	xx A0
1	0	0	0	0	1	0	1	xx A1
0	1	0	0	0	1	0	1	xx A2
1	1	0	0	0	1	0	1	xx A3
0	0	1	0	0	1	0	1	xx A4
1	0	1	0	0	1	0	1	xx A5
0	1	1	0	0	1	0	1	xx A6
1	1	1	0	0	1	0	1	xx A7
0	0	0	1	0	1	0	1	xx A8
1	0	0	1	0	1	0	1	xx A9
0	1	0	1	0	1	0	1	xx AA
1	1	0	1	0	1	0	1	xx AB
0	0	1	1	0	1	0	1	xx AC
1	0	1	1	0	1	0	1	xx AD
0	1	1	1	0	1	0	1	xx AE
1	1	1	1	0	1	0	1	xx AF
0	0	0	0	1	1	0	1	xx B0
1	0	0	0	1	1	0	1	xx B1
0	1	0	0	1	1	0	1	xx B2
1	1	0	0	1	1	0	1	xx B3
0	0	1	0	1	1	0	1	xx B4
1	0	1	0	1	1	0	1	xx B5
0	1	1	0	1	1	0	1	xx B6
1	1	1	0	1	1	0	1	xx B7
0	0	0	1	1	1	0	1	xx B8
1	0	0	1	1	1	0	1	xx B9
0	1	0	1	1	1	0	1	xx BA
1	1	0	1	1	1	0	1	xx BB
0	0	1	1	1	1	0	1	xx BC
1	0	1	1	1	1	0	1	xx BD
0	1	1	1	1	1	0	1	xx BE
1	1	1	1	1	1	0	1	xx BF

0: OFF 1: ON

OUT								Display
1	2	3	4	5A	5B	6	7	
0	0	0	0	0	0	1	1	xx C0
1	0	0	0	0	0	1	1	xx C1
0	1	0	0	0	0	1	1	xx C2
1	1	0	0	0	0	1	1	xx C3
0	0	1	0	0	0	1	1	xx C4
1	0	1	0	0	0	1	1	xx C5
0	1	1	0	0	0	1	1	xx C6
1	1	1	0	0	0	1	1	xx C7
0	0	0	1	0	0	1	1	xx C8
1	0	0	1	0	0	1	1	xx C9
0	1	0	1	0	0	1	1	xx CA
1	1	0	1	0	0	1	1	xx CB
0	0	1	1	0	0	1	1	xx CC
1	0	1	1	0	0	1	1	xx CD
0	1	1	1	0	0	1	1	xx CE
1	1	1	1	0	0	1	1	xx CF
0	0	0	0	1	0	1	1	xx D0
1	0	0	0	1	0	1	1	xx D1
0	1	0	0	1	0	1	1	xx D2
1	1	0	0	1	0	1	1	xx D3
0	0	1	0	1	0	1	1	xx D4
1	0	1	0	1	0	1	1	xx D5
0	1	1	0	1	0	1	1	xx D6
1	1	1	0	1	0	1	1	xx D7
0	0	0	1	1	0	1	1	xx D8
1	0	0	1	1	0	1	1	xx D9
0	1	0	1	1	0	1	1	xx DA
1	1	0	1	1	0	1	1	xx DB
0	0	1	1	1	0	1	1	xx DC
1	0	1	1	1	0	1	1	xx DD
0	1	1	1	1	0	1	1	xx DE
1	1	1	1	1	0	1	1	xx DF
0	0	0	0	0	1	1	1	xx E0
1	0	0	0	0	1	1	1	xx E1
0	1	0	0	0	1	1	1	xx E2
1	1	0	0	0	1	1	1	xx E3
0	0	1	0	0	1	1	1	xx E4
1	0	1	0	0	1	1	1	xx E5
0	1	1	0	0	1	1	1	xx E6
1	1	1	0	0	1	1	1	xx E7
0	0	0	1	0	1	1	1	xx E8
1	0	0	1	0	1	1	1	xx E9
0	1	0	1	0	1	1	1	xx EA
1	1	0	1	0	1	1	1	xx EB
0	0	1	1	0	1	1	1	xx EC
1	0	1	1	0	1	1	1	xx ED
0	1	1	1	0	1	1	1	xx EE
1	1	1	1	0	1	1	1	xx EF
0	0	0	0	1	1	1	1	xx F0
1	0	0	0	1	1	1	1	xx F1
0	1	0	0	1	1	1	1	xx F2
1	1	0	0	1	1	1	1	xx F3
0	0	1	0	1	1	1	1	xx F4
1	0	1	0	1	1	1	1	xx F5
0	1	1	0	1	1	1	1	xx F6
1	1	1	0	1	1	1	1	xx F7
0	0	0	1	1	1	1	1	xx F8
1	0	0	1	1	1	1	1	xx F9
0	1	0	1	1	1	1	1	xx FA
1	1	0	1	1	1	1	1	xx FB
0	0	1	1	1	1	1	1	xx FC
1	0	1	1	1	1	1	1	xx FD
0	1	1	1	1	1	1	1	xx FE
1	1	1	1	1	1	1	1	xx FF

Output signal display (Request code: 175/553)

Please refer to Table 2 on relevant wiring diagram whilst using the following.

0: OFF 1: ON

OUT								Display
8 *	9	10	11	12	13	14	15	
0	0	0	0	0	0	0	0	00 xx
1	0	0	0	0	0	0	0	01 xx
0	1	0	0	0	0	0	0	02 xx
1	1	0	0	0	0	0	0	03 xx
0	0	1	0	0	0	0	0	04 xx
1	0	1	0	0	0	0	0	05 xx
0	1	1	0	0	0	0	0	06 xx
1	1	1	0	0	0	0	0	07 xx
0	0	0	1	0	0	0	0	08 xx
1	0	0	1	0	0	0	0	09 xx
0	1	0	1	0	0	0	0	0A xx
1	1	0	1	0	0	0	0	0B xx
0	0	1	1	0	0	0	0	0C xx
1	0	1	1	0	0	0	0	0D xx
0	1	1	1	0	0	0	0	0E xx
1	1	1	1	0	0	0	0	0F xx
0	0	0	0	1	0	0	0	10 xx
1	0	0	0	1	0	0	0	11 xx
0	1	0	0	1	0	0	0	12 xx
1	1	0	0	1	0	0	0	13 xx
0	0	1	0	1	0	0	0	14 xx
1	0	1	0	1	0	0	0	15 xx
0	1	1	0	1	0	0	0	16 xx
1	1	1	0	1	0	0	0	17 xx
0	0	0	1	1	0	0	0	18 xx
1	0	0	1	1	0	0	0	19 xx
0	1	0	1	1	0	0	0	1A xx
1	1	0	1	1	0	0	0	1B xx
0	0	1	1	1	0	0	0	1C xx
1	0	1	1	1	0	0	0	1D xx
0	1	1	1	1	0	0	0	1E xx
1	1	1	1	1	0	0	0	1F xx
0	0	0	0	0	1	0	0	20 xx
1	0	0	0	0	1	0	0	21 xx
0	1	0	0	0	1	0	0	22 xx
1	1	0	0	0	1	0	0	23 xx
0	0	1	0	0	1	0	0	24 xx
1	0	1	0	0	1	0	0	25 xx
0	1	1	0	0	1	0	0	26 xx
1	1	1	0	0	1	0	0	27 xx
0	0	0	1	0	1	0	0	28 xx
1	0	0	1	0	1	0	0	29 xx
0	1	0	1	0	1	0	0	2A xx
1	1	0	1	0	1	0	0	2B xx
0	0	1	1	0	1	0	0	2C xx
1	0	1	1	0	1	0	0	2D xx
0	1	1	1	0	1	0	0	2E xx
1	1	1	1	0	1	0	0	2F xx
0	0	0	0	1	1	0	0	30 xx
1	0	0	0	1	1	0	0	31 xx
0	1	0	0	1	1	0	0	32 xx
1	1	0	0	1	1	0	0	33 xx
0	0	1	0	1	1	0	0	34 xx
1	0	1	0	1	1	0	0	35 xx
0	1	1	0	1	1	0	0	36 xx
1	1	1	0	1	1	0	0	37 xx
0	0	0	1	1	1	0	0	38 xx
1	0	0	1	1	1	0	0	39 xx
0	1	0	1	1	1	0	0	3A xx
1	1	0	1	1	1	0	0	3B xx
0	0	1	1	1	1	0	0	3C xx
1	0	1	1	1	1	0	0	3D xx
0	1	1	1	1	1	0	0	3E xx
1	1	1	1	1	1	0	0	3F xx

* Displayed only when the request code is 553.

0: OFF 1: ON

OUT								Display
8	9	10	11	12	13	14	15	
0	0	0	0	0	0	1	0	40 xx
1	0	0	0	0	0	1	0	41 xx
0	1	0	0	0	0	1	0	42 xx
1	1	0	0	0	0	1	0	43 xx
0	0	1	0	0	0	1	0	44 xx
1	0	1	0	0	0	1	0	45 xx
0	1	1	0	0	0	1	0	46 xx
1	1	1	0	0	0	1	0	47 xx
0	0	0	1	0	0	1	0	48 xx
1	0	0	1	0	0	1	0	49 xx
0	1	0	1	0	0	1	0	4A xx
1	1	0	1	0	0	1	0	4B xx
0	0	1	1	0	0	1	0	4C xx
1	0	1	1	0	0	1	0	4D xx
0	1	1	1	0	0	1	0	4E xx
1	1	1	1	0	0	1	0	4F xx
0	0	0	0	1	0	1	0	50 xx
1	0	0	0	1	0	1	0	51 xx
0	1	0	0	1	0	1	0	52 xx
1	1	0	0	1	0	1	0	53 xx
0	0	1	0	1	0	1	0	54 xx
1	0	1	0	1	0	1	0	55 xx
0	1	1	0	1	0	1	0	56 xx
1	1	1	0	1	0	1	0	57 xx
0	0	0	1	1	0	1	0	58 xx
1	0	0	1	1	0	1	0	59 xx
0	1	0	1	1	0	1	0	5A xx
1	1	0	1	1	0	1	0	5B xx
0	0	1	1	1	0	1	0	5C xx
1	0	1	1	1	0	1	0	5D xx
0	1	1	1	1	0	1	0	5E xx
1	1	1	1	1	0	1	0	5F xx
0	0	0	0	0	1	1	0	60 xx
1	0	0	0	0	1	1	0	61 xx
0	1	0	0	0	1	1	0	62 xx
1	1	0	0	0	1	1	0	63 xx
0	0	1	0	0	1	1	0	64 xx
1	0	1	0	0	1	1	0	65 xx
0	1	1	0	0	1	1	0	66 xx
1	1	1	0	0	1	1	0	67 xx
0	0	0	1	0	1	1	0	68 xx
1	0	0	1	0	1	1	0	69 xx
0	1	0	1	0	1	1	0	6A xx
1	1	0	1	0	1	1	0	6B xx
0	0	1	1	0	1	1	0	6C xx
1	0	1	1	0	1	1	0	6D xx
0	1	1	1	0	1	1	0	6E xx
1	1	1	1	0	1	1	0	6F xx
0	0	0	0	1	1	1	0	70 xx
1	0	0	0	1	1	1	0	71 xx
0	1	0	0	1	1	1	0	72 xx
1	1	0	0	1	1	1	0	73 xx
0	0	1	0	1	1	1	0	74 xx
1	0	1	0	1	1	1	0	75 xx
0	1	1	0	1	1	1	0	76 xx
1	1	1	0	1	1	1	0	77 xx
0	0	0	1	1	1	1	0	78 xx
1	0	0	1	1	1	1	0	79 xx
0	1	0	1	1	1	1	0	7A xx
1	1	0	1	1	1	1	0	7B xx
0	0	1	1	1	1	1	0	7C xx
1	0	1	1	1	1	1	0	7D xx
0	1	1	1	1	1	1	0	7E xx
1	1	1	1	1	1	1	0	7F xx

Mixing valve state

OUT		Mixing valve state
5A	5B	
0	0	Stop
0	1	Stop
1	0	Open
1	1	Close

Input signal display (Request code: 176/554)

Please refer to Table 1 on relevant wiring diagram whilst using the following.

0: OFF (open) 1: ON (short)

IN								Display
1	2	3	4	5	6	7	8	
0	0	0	0	0	0	0	0	00 00
1	0	0	0	0	0	0	0	00 01
0	1	0	0	0	0	0	0	00 02
1	1	0	0	0	0	0	0	00 03
0	0	1	0	0	0	0	0	00 04
1	0	1	0	0	0	0	0	00 05
0	1	1	0	0	0	0	0	00 06
1	1	1	0	0	0	0	0	00 07
0	0	0	1	0	0	0	0	00 08
1	0	0	1	0	0	0	0	00 09
0	1	0	1	0	0	0	0	00 0A
1	1	0	1	0	0	0	0	00 0B
0	0	1	1	0	0	0	0	00 0C
1	0	1	1	0	0	0	0	00 0D
0	1	1	1	0	0	0	0	00 0E
1	1	1	1	0	0	0	0	00 0F
0	0	0	0	1	0	0	0	00 10
1	0	0	0	1	0	0	0	00 11
0	1	0	0	1	0	0	0	00 12
1	1	0	0	1	0	0	0	00 13
0	0	1	0	1	0	0	0	00 14
1	0	1	0	1	0	0	0	00 15
0	1	1	0	1	0	0	0	00 16
1	1	1	0	1	0	0	0	00 17
0	0	0	1	1	0	0	0	00 18
1	0	0	1	1	0	0	0	00 19
0	1	0	1	1	0	0	0	00 1A
1	1	0	1	1	0	0	0	00 1B
0	0	1	1	1	0	0	0	00 1C
1	0	1	1	1	0	0	0	00 1D
0	1	1	1	1	0	0	0	00 1E
1	1	1	1	1	0	0	0	00 1F
0	0	0	0	0	1	0	0	00 20
1	0	0	0	0	1	0	0	00 21
0	1	0	0	0	1	0	0	00 22
1	1	0	0	0	1	0	0	00 23
0	0	1	0	0	1	0	0	00 24
1	0	1	0	0	1	0	0	00 25
0	1	1	0	0	1	0	0	00 26
1	1	1	0	0	1	0	0	00 27
0	0	0	1	0	1	0	0	00 28
1	0	0	1	0	1	0	0	00 29
0	1	0	1	0	1	0	0	00 2A
1	1	0	1	0	1	0	0	00 2B
0	0	1	1	0	1	0	0	00 2C
1	0	1	1	0	1	0	0	00 2D
0	1	1	1	0	1	0	0	00 2E
1	1	1	1	0	1	0	0	00 2F
0	0	0	0	1	1	0	0	00 30
1	0	0	0	1	1	0	0	00 31
0	1	0	0	1	1	0	0	00 32
1	1	0	0	1	1	0	0	00 33
0	0	1	0	1	1	0	0	00 34
1	0	1	0	1	1	0	0	00 35
0	1	1	0	1	1	0	0	00 36
1	1	1	0	1	1	0	0	00 37
0	0	0	1	1	1	0	0	00 38
1	0	0	1	1	1	0	0	00 39
0	1	0	1	1	1	0	0	00 3A
1	1	0	1	1	1	0	0	00 3B
0	0	1	1	1	1	0	0	00 3C
1	0	1	1	1	1	0	0	00 3D
0	1	1	1	1	1	0	0	00 3E
1	1	1	1	1	1	0	0	00 3F

0: OFF (open) 1: ON (short)

IN								Display
1	2	3	4	5	6	7	8	
0	0	0	0	0	0	1	0	00 40
1	0	0	0	0	0	1	0	00 41
0	1	0	0	0	0	1	0	00 42
1	1	0	0	0	0	1	0	00 43
0	0	1	0	0	0	1	0	00 44
1	0	1	0	0	0	1	0	00 45
0	1	1	0	0	0	1	0	00 46
1	1	1	0	0	0	1	0	00 47
0	0	0	1	0	0	1	0	00 48
1	0	0	1	0	0	1	0	00 49
0	1	0	1	0	0	1	0	00 4A
1	1	0	1	0	0	1	0	00 4B
0	0	1	1	0	0	1	0	00 4C
1	0	1	1	0	0	1	0	00 4D
0	1	1	1	0	0	1	0	00 4E
1	1	1	1	0	0	1	0	00 4F
0	0	0	0	1	0	1	0	00 50
1	0	0	0	1	0	1	0	00 51
0	1	0	0	1	0	1	0	00 52
1	1	0	0	1	0	1	0	00 53
0	0	1	0	1	0	1	0	00 54
1	0	1	0	1	0	1	0	00 55
0	1	1	0	1	0	1	0	00 56
1	1	1	0	1	0	1	0	00 57
0	0	0	1	1	0	1	0	00 58
1	0	0	1	1	0	1	0	00 59
0	1	0	1	1	0	1	0	00 5A
1	1	0	1	1	0	1	0	00 5B
0	0	1	1	1	0	1	0	00 5C
1	0	1	1	1	0	1	0	00 5D
0	1	1	1	1	0	1	0	00 5E
1	1	1	1	1	0	1	0	00 5F
0	0	0	0	0	1	1	0	00 60
1	0	0	0	0	1	1	0	00 61
0	1	0	0	0	1	1	0	00 62
1	1	0	0	0	1	1	0	00 63
0	0	1	0	0	1	1	0	00 64
1	0	1	0	0	1	1	0	00 65
0	1	1	0	0	1	1	0	00 66
1	1	1	0	0	1	1	0	00 67
0	0	0	1	0	1	1	0	00 68
1	0	0	1	0	1	1	0	00 69
0	1	0	1	0	1	1	0	00 6A
1	1	0	1	0	1	1	0	00 6B
0	0	1	1	0	1	1	0	00 6C
1	0	1	1	0	1	1	0	00 6D
0	1	1	1	0	1	1	0	00 6E
1	1	1	1	0	1	1	0	00 6F
0	0	0	0	1	1	1	0	00 70
1	0	0	0	1	1	1	0	00 71
0	1	0	0	1	1	1	0	00 72
1	1	0	0	1	1	1	0	00 73
0	0	1	0	1	1	1	0	00 74
1	0	1	0	1	1	1	0	00 75
0	1	1	0	1	1	1	0	00 76
1	1	1	0	1	1	1	0	00 77
0	0	0	1	1	1	1	0	00 78
1	0	0	1	1	1	1	0	00 79
0	1	0	1	1	1	1	0	00 7A
1	1	0	1	1	1	1	0	00 7B
0	0	1	1	1	1	1	0	00 7C
1	0	1	1	1	1	1	0	00 7D
0	1	1	1	1	1	1	0	00 7E
1	1	1	1	1	1	1	0	00 7F

■ Indoor unit only operation

In indoor unit only operation, an operation without connecting outdoor unit is possible.
When in Indoor unit only operation, the main control has control functions.

	Indoor unit only operation
Indoor unit	Necessary
Heat pump	Not necessary
Main remote controller	Necessary
DIP switch setting	Electric heater SW4-4 ON, SW4-5 ON
	Boiler SW4-4 ON, SW4-6 ON
Setting range for flow temp.	20 to 60°C Selectable
Setting range for tank temp.	40 to 60°C Selectable

<Heater>

Heating for DHW and space heating is provided by the heater.
• Activating indoor unit only operation mode
To activate indoor unit only operation see the following:
1. Switch OFF the breaker for the outdoor unit (or both breakers if cylinder powered independently).
2. Change DIP switch SW4-4 and SW4-5 to ON.
3. Switch ON the breaker(s).
4. Indoor unit only operation is now activated.

• Deactivating indoor unit only operation mode
To deactivate indoor unit only operation see the following:
1. Switch OFF the breaker for the outdoor unit (or both breakers if cylinder powered independently).
2. Change DIP switch SW4-4 and SW4-5 to OFF.
3. Switch ON the breaker(s).
4. Indoor unit only operation is now deactivated.

<Boiler>

Heating for space heating is provided by the boiler.
• Activating indoor unit only operation mode
To activate indoor unit only operation see the following:
1. Switch OFF the breaker for the outdoor unit (or both breakers if cylinder powered independently).
2. Change DIP switch SW4-4 and SW4-6 to ON.
3. Switch ON the breaker(s).
4. Indoor unit only operation is now activated.

• Deactivating indoor unit only operation mode
To deactivate indoor unit only operation see the following:
1. Switch OFF the breaker for the outdoor unit (or both breakers if cylinder powered independently).
2. Change DIP switch SW4-4 and SW4-6 to OFF.
3. Switch ON the breaker(s).
4. Indoor unit only operation is now deactivated.

■ Emergency operation

In emergency operation, an operation without connecting outdoor unit and main remote controller is possible.
When in Emergency operation, the main control has NO control functions.
Space heating flow temp. is restarted 40°C and DHW tank temp. is restricted 50°C. *1

	Emergency operation
Indoor unit	Necessary
Heat pump	Not necessary
Main remote controller	Not necessary
DIP switch setting	Electric heater SW4-5 ON
	Boiler SW4-6 ON
Setting range for flow temp.	Fixed at 40°C
Setting range for tank temp.	Fixed at 50°C *1

*1 Default setting is 50°C. Once system has started running, emergency operation runs at the latest set temp.

<Heater>

Heating for DHW and space heating is provided by the heater.
• Activating emergency operation mode
To activate emergency operation see the following:
1. Switch OFF the breaker for the outdoor unit (or both breakers if cylinder powered independently).
2. Change DIP switch SW4-5 to ON.
3. Switch ON the breaker(s).
4. Emergency operation is now activated.

• Deactivating emergency operation mode
To deactivate emergency operation see the following:
1. Switch OFF the breaker for the outdoor unit (or both breakers if cylinder powered independently).
2. Change DIP switch SW4-5 to OFF.
3. Switch ON the breaker(s).
4. Emergency operation is now deactivated.

<Boiler>

Heating for space heating is provided by the boiler.
• Activating emergency operation mode
To activate emergency operation see the following:
1. Switch OFF the breaker for the outdoor unit (or both breakers if cylinder powered independently).
2. Change DIP switch SW4-6 to ON.
3. Switch ON the breaker(s).
4. Emergency operation is now activated.

• Deactivating emergency operation mode
To deactivate emergency operation see the following:
1. Switch OFF the breaker for the outdoor unit (or both breakers if cylinder powered independently).
2. Change DIP switch SW4-6 to OFF.
3. Switch ON the breaker(s).
4. Emergency operation is now deactivated.

⚠ WARNING
Do not attempt to change the DIP switches whilst the breaker(s) are ON as this could result in electric shock.

TROUBLESHOOTING

Troubleshooting

<Summary of self-diagnosis based on Check codes and Service Procedures>

Present and past Check codes are logged, and they can be displayed on the main remote controller or control board of the outdoor unit.
Please refer to the table below and subsequent explanations to diagnose and remedy typical problems that may occur in the field.

Unit Condition	Check code	Action
Reoccurring problem	Displayed	Use table "Self-diagnosis and action" to identify fault and correct.
	Not Displayed	Use table "Troubleshooting by inferior phenomena" to identify fault and correct.
Non reoccurring problem	Logged	1. Check temporary causes of defects such as the operation of safety devices on the refrigerant/water circuit including compressor, poor wiring, electrical noise, etc. Re-check the symptom and the installation environment, refrigerant amount (Split systems only), weather conditions at time of fault, etc. 2. Reset Check code logs, Service the unit and restart system.
	Not Logged	1. Recheck the abnormal symptom.
		2. Identify cause of problem and take corrective action according to Table "10-5. Troubleshooting by inferior phenomena".
		3. If no obvious problem can be found, continue to operate the unit.

Note:
Electrical components should only be replaced as a final option. Please follow instructions in "Self-diagnosis and action" and "Troubleshooting by inferior phenomena" fully before resorting to replacing parts.

Test Run

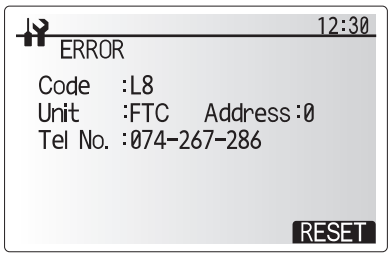
Before a test run

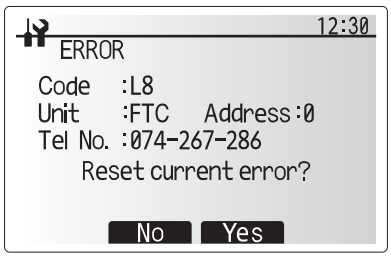
- After installation of outdoor unit, pipework and electrical wiring, recheck that there is no water leakage, loosened connections or miswiring.
- Measure impedance between the ground and the power supply terminal block (L,N) on the outdoor and indoor units with suitable (500V) ohmmeter. Resistance should be ≥ 1.0MΩ .
- Read the Installation and Operation Manuals fully especially the safety requirements before carrying out any test runs.

Malfunction diagnosis method by main remote controller

If during start up or operation a malfunction occurs, the check code screen may be displayed on the main remote controller.
The check code screen shows the following; code, unit, ref. address, and telephone number of installer (only if previously entered by the installer)
Please note in the case of some malfunctions an check code is not generated please refer to table "Troubleshooting by inferior phenomena" for more details.

To reset
1. To reset the main remote controller press F4 button (Reset).
2. Then press F3 (Yes) to confirm.





Self-diagnosis and action

Check if DIP SW is set correctly. (Refer to "DIP switch functions".)

Check code	Title and display conditions	Possible Cause	Diagnosis and action
L3	**Circulation water temperature overheat protection** <DHW/Heating/Cooling/LP/FS/OS> Check code displayed when THW1 detects a temp. ≥ 80ºC for 10 consecutive seconds or THW2 detects a temp. ≥ 80ºC for 10 consecutive seconds. DHW: Domestic hot water mode Heating: Heating mode Cooling: Cooling mode LP: Legionella prevention mode FS: Freeze stat OS: Operation stop TH1A/B: Room temp. thermistor TH2: Liquid refrigerant temp. thermistor THW1: Flow water temp. thermistor THW2: Return water temp. thermistor THW5B: DHW tank lower water temp. thermistor THW6: Zone1 flow water temperature thermistor THW7: Zone1 return water temperature thermistor THW8: Zone2 flow water temperature thermistor THW9: Zone2 return water temperature thermistor THWB1: Boiler flow water temperature thermistor	1. Insufficient system head 2. Reduced flow in primary water circuit Due to 1 or more of the following; Faulty pump, insufficient air purge, blocked strainer, leak in water circuit. 3. Valve operation fault 4. 2-way valve (local supply) actuator fault 5. 3-way valve actuator fault 6. Booster heater relay (BHC1, BHC2, BHCP) operating fault 7. Power supply voltage increase 8. THW1 or THW5 has become detached from its holder. 9. THW1 or THW2 fault 10. FTC board failure	1 Refer to table in "Checking Component Parts' Function" to determine if system pump meets requirements. If more head required either add a pump of the same size or replace existing pump with capacity model. See "DISASSEMBLY PROCEDURE" for how to replace pump. 2. Check circulation pump (See "Checking Component Parts' Function" for how to check). Open purge valve to remove trapped air. Check the strainer for blockages. Check the primary water circuit for leaks. Check that the flow amount is within the recommended range. 3. Check valves on primary water circuit are installed level. 4. Electrically test to determine fault 5. 1) Electrically test to determine fault. 2) Operate 3-way valve manually using the main remote controller. (Refer to <Manual operation> in "9-5. Service menu".) 3) Replace 3-way valve coil. 4) Replace 3-way valve. (Refer to Procedure 6 in “11. DISASSEMBLY PROCEDURE.” 6. Electrically test the relays (BHC1, BHC2, BHCP) to determine fault. See "Checking Component Parts' Function" for how to check. 7. Check the supply voltage. 8. Visually inspect location and reattach as necessary. 9. Check resistance of thermistor against table in "Checking Component Parts' Function” Compare FTC detected temperature to hand held detector. 10. Replace board.
L4	**Tank water temperature overheat protection** <DHW/Heating/Cooling/LP/FS/OS> Check code display when THW5B detects a temp. ≥ 75ºC for 10 consecutive seconds.	1. 3-way valve actuator fault 2. Immersion heater relay (IHC) operating fault 3. THW5B fault 4. FTC board failure	1. 1) Electrically test to determine fault. 2) Operate 3-way valve manually using the main remote controller. (Refer to <Manual operation> in "Service menu".) 3) Replace 3-way valve coil. 4) Replace 3-way valve. (Refer to Procedure 6 in “DISASSEMBLY PROCEDURE.” 2. Check immersion heater relay (IHC). 3. Check resistance of thermistor against table in "Checking Component Parts' Function” Compare FTC detected temperature to hand held detector. 4. Replace board.

<table>
<tr><th>Check code</th><th>Title and display conditions</th><th>Possible Cause</th><th>Diagnosis and action</th></tr>
<tr><td>P1/P2/L5/LD</td><td>Indoor unit temperature thermistor failure
Note: The thermistors subject to failure can be checked in “Request code: 567” in “Running information.

<DHW/Heating/Cooling/LP/FS/OS>
Check code displayed when thermistor is at open or short (see table).

<u>Exceptions</u>
Check code will not be displayed for TH2; During defrost and for 10 minutes after defrost operation.</td><td>1. Connector/terminal wire has become detached or loose wiring.
2. Thermistor fault
3. FTC board failure
4. The thermistor on the wireless remote controller or the main remote controller may be defective. (when Room temp. is chosen for the Heating operation and when Main remote controller or Room RC 1-8 is chosen for the Room Sensor setting in the Initial setting)
5. Incorrect setting of the DIP switch(es)</td><td>1. Visually check the terminals and connections and reattaches appropriate.
2. Check resistance of thermistor against table in "Checking Component Parts' Function".
Compare FTC detected temperature to hand held detector.
3. Replace board.
4. Replace wireless remote controller or main remote controller.
5. Check the DIP switch setting(s).</td></tr>
<tr><td colspan="4">
<table>
<tr><th rowspan="2">Check code</th><th colspan="2">Thermistor</th><th rowspan="2">Open detection</th><th rowspan="2">Short detection</th></tr>
<tr><th>Symbol</th><th>Name</th></tr>
<tr><td>P1</td><td>TH1A/TH1B</td><td>Room temperature thermistor</td><td>−39ºC or below</td><td>88.5ºC or above</td></tr>
<tr><td>P2</td><td>TH2</td><td>Liquid temperature thermistor</td><td>−39ºC or below</td><td>88.5ºC or above</td></tr>
<tr><td rowspan="8">L5</td><td>THW1</td><td>Flow water temperature thermistor</td><td>−39ºC or below</td><td>88.5ºC or above</td></tr>
<tr><td>THW2</td><td>Return water temperature thermistor</td><td>−39ºC or below</td><td>88.5ºC or above</td></tr>
<tr><td>THW5B</td><td>DHW tank water temperature thermistor</td><td>−39ºC or below</td><td>88.5ºC or above</td></tr>
<tr><td>THW6</td><td>Zone1 flow water temperature thermistor</td><td>−39ºC or below</td><td>88.5ºC or above</td></tr>
<tr><td>THW7</td><td>Zone1 return water temperature thermistor</td><td>−39ºC or below</td><td>88.5ºC or above</td></tr>
<tr><td>THW8</td><td>Zone2 flow water temperature thermistor</td><td>−39ºC or below</td><td>88.5ºC or above</td></tr>
<tr><td>THW9</td><td>Zone2 return water temperature thermistor</td><td>−39ºC or below</td><td>88.5ºC or above</td></tr>
<tr><td>LD</td><td>THWB1</td><td>Boiler flow water temperature thermistor</td><td>−40ºC or below</td><td>140ºC or above</td></tr>
</table>
</td></tr>
<tr><td>L6</td><td>Circulation water freeze protection
<DHW/Heating/Cooling/LP/FS/OS>
Check code displayed when THW1 detects a temp. ≤ 1ºC for 10 consecutive seconds or THW2 detects a temp. ≤ 3ºC for 10 consecutive seconds.

<u>Exception</u>
Check code will not be displayed if;
FS function is disabled,
For 10 minutes after water circulation pump1 is switched on.</td><td>1. Insufficient system head
2. Reduced flow in primary water circuit Due to 1 or more of the following; Faulty pump, insufficient air purge, blocked strainer, leak in water circuit
3. Valve operation fault
4. 2-way valve (local supply) actuator fault
5. 3-way valve actuator fault
6. THW1 has become detached from its holder.
7. THW1 or THW2 fault
8. FTC board failure</td><td>1. Refer to table in "Checking Component Parts' Function" to determine if system pump meets requirements.
If more head required either add a pump of the same size or replace existing pump with capacity model.
See "DISASSEMBLY PROCEDURE" for how to replace pump.
2. Check circulation pump (See "Checking Component Parts' Function" for how to check).
Open purge valve to remove trapped air.
Check the strainer for blockages.
Check the primary water circuit for leaks.
Check that the flow amount is within the recommended range.
3. Check valves on primary water circuit are installed level.
4. Electrically test to determine fault.
5. 1) Electrically test to determine fault.
2) Operate 3-way valve manually using the main remote controller. (Refer to <Manual operation> in "Service menu”.)
3) Replace 3-way valve coil.
4) Replace 3-way valve. (Refer to Procedure 6 in “DISASSEMBLY PROCEDURE”.)
6. Visually inspect location and reattach as necessary.
7. Check resistance of thermistor against table in "Checking Component Parts' Function".
Compare FTC detected temperature to hand held detector.
8. Replace board.</td></tr>
</table>

Check code	Title and display conditions	Possible Cause	Diagnosis and action
L8	**Heating operation error** Note: “3” is displayed in “Request code: 567” in “Running information”. <Heating/FS> If a), b) and c) occur, L8 is displayed; a) No change on THW1 and THW5B (under 1°C for 20 minutes from unit starts operation) b) No change on THW1 (under 1°C for 10 minutes from booster heater starts operation) c) THW1−THW2 < −5°C (for 10 minutes continuously)	1. THW1 has become detached from its holder. 2. Booster heater fault 3. THW1 or THW2 or THW5B fault 4. FTC board failure	1. Visually inspect location and reattach as necessary. 2. Electrically test to determine fault. See "Checking Component Parts' Function" 3. Check resistance of thermistor against table in "Checking Component Parts' Function". Compare FTC detected temperature to hand held detector. 4. Replace board.
	Heating operation error Note: “A” is displayed in “Request code: 567” in “Running information”.	1. THW6 has become detached from its holder. 2. THW6 or THW7 fault 3. FTC board failure	1. Visually inspect location and reattach as necessary. 2. Check resistance of thermistor against table in "Checking Component Parts' Function". Compare FTC detected temperature to hand held detector. 3. Replace board.
	Heating operation error Note: “C” is displayed in “Request code: 567” in “Running information”.	1. THW8 has become detached from its holder. 2. THW8 or THW9 fault 3. FTC board failure	1. Visually inspect location and reattach as necessary. 2. Check resistance of thermistor against table in "Checking Component Parts' Function". Compare FTC detected temperature to hand held detector. 3. Replace board.
L9	**Low primary circuit (Heat source side) flow rate detected by flow sensor** Note: “1” is displayed in “Request code: 569” in “Running information”. <DHW/Heating/LP/FS> Check code displayed when flow sensor detects low flow rate for 10 seconds. <u>Exception</u> For 1 minute after water circulation pump1 is switched on.	1. Insufficient system head 2. Reduced flow in primary water circuit Due to 1 or more of the following; Faulty pump, insufficient air purge, blocked strainer, leak in water circuit. 3. Valve operation fault 4. 2-way valve (local supply) actuator fault 5. Connector/terminal wire has become detached or loose wiring. 6. Flow sensor fault 7. Incorrect setting of the SW2-2 8. FTC board failure	1. Refer to table in "Checking Component Parts Function" to determine if system pump meets requirements. If more head required either add a pump of the same size or replace existing pump with capacity model. See "DISASSEMBLY PROCEDURE" for how to replace pump. 2. Check circulation pump (See "Checking Component Parts Function" for how to check). Open purge valve to remove trapped air. Check the strainer for blockages. Check the primary water circuit for leaks. Check that the flow amount is within the recommended range. 3. Check valves on primary water circuit are installed level. 4. Electrically test to determine fault. 5. Visually check the CN1A connector and IN2 terminal and reattach if necessary. 6. Electrically test to determine fault. See "Checking Component Parts Function" for how to check. 7. Check the SW2-2 setting. 8. Replace board.
	Low primary circuit (Zone1 side) flow rate detected by flow switch Note: “2” is displayed in “Request code: 569” in “Running information”.	1. Insufficient system head 2. Reduced flow in primary water circuit Due to 1 or more of the following; Faulty pump, insufficient air purge, blocked strainer, leak in water circuit. 3. Terminal wire has become detached or loose wiring. 4. Flow switch fault 5. Incorrect setting of the SW3-2 6. FTC board failure	1. If more head required either add a pump of the same size or replace existing pump . 2. Check circulation pump (See "Checking Component Parts Function" for how to check). Open purge valve to remove trapped air. Check the strainer for blockages. Check the primary water circuit for leaks. Check that the flow amount is within the recommended range. 3. Visually check the IN3 terminal and reattach if necessary. 4. Electrically test to determine fault 5. Check the SW3-2 setting. 6. Replace board.

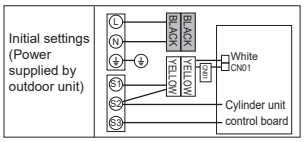
Check code	Title and display conditions	Possible Cause	Diagnosis and action
L9	**Low primary circuit (Zone2 side) flow rate detected by flow switch** Note: "3" is displayed in "Request code: 569" in "Running information".	1. Insufficient system head 2. Reduced flow in primary water circuit Due to 1 or more of the following; Faulty pump, insufficient air purge, blocked strainer, leak in water circuit 3. Terminal wire has become detached or loose wiring. 4. Flow switch fault 5. Incorrect setting of the SW3-3 6. FTC board failure	1. If more head required either add a pump of the same size or replace existing pump. 2. Check circulation pump (See "Checking Component Parts' Function" for how to check). Open purge valve to remove trapped air. Check the strainer for blockages. Check the primary water circuit for leaks. Check that the flow amount is within the recommended range. 3. Visually check the IN7 terminal and reattach if necessary. 4. Electrically test to determine fault. 5. Check the SW3-3 setting. 6. Replace board.
LA	Pressure sensor failure	1. Connector/terminal wire has become detached or loose wiring. 2. Pressure sensor fault 3. FTC board failure	1. Check pressure sensor cable for damage or loose connections. 2. Electrically test to determine fault. See "Checking Component Parts' Function" for how to check. 3. Replace board.
LB	High pressure protection	1. Flow rate of the heating circuit may be reduced. 2. Plate heat exchanger may be clogged. 3. Outdoor unit failure.	1. Check water circuit. 2. Check the plate heat exchanger. 3. Refer to outdoor unit service manual.
LC	Boiler circulation water temperature overheat protection <DHW/Heating/LP/FS/OS> Check code displayed when THWB1 detects a temp. ≥80ºC for 10 consecutive seconds or THWB2 detects a temp. ≥80ºC for 10 consecutive seconds	1. The set temperature for Boiler is too high. 2. Flow rate of the heating circuit from the boiler may be reduced.	1. Check if the set temperature for Boiler for heating exceeds the restriction. (See the manual for the thermistors "PAC-TH011HT-E") 2. Check for • water leakage • strainer blockage • water circulation pump function.
LD	Boiler temperature thermistor (THWB1, THWB2) failure	Refer to check codes (P1/P2/L5/LD).	
LE	Boiler operation error <Heating> Boiler is running and THW6 detects a temperature <30ºC for consecutive 60 minutes.	1. THW6 has become detached from its holder. 2. Incorrect wiring between FTC (OUT10) and the boiler. 3. Boiler fuel has run out or the system is OFF. 4. Boiler failure 5. FTC board failure	1. Visually inspect location and reattach as necessary. 2. See the manual of the thermistors "PAC-TH011HT-E". 3. Check the status of the boiler. 4. Check the status of the boiler. 5. Replace board.
LF	Flow sensor failure	Disconnection or loose connection of flow sensor	Check flow sensor cable for damage or loose connections.
LH	Boiler circulation water freeze protection	Flow rate of the heating circuit from the boiler may be reduced.	Check for • water leakage • strainer blockage • water circulation pump function.
LJ	DHW operation error (type of external plate HEX)	1. DHW tank water temp. thermistor (THW5B) has become detached from its holder. 2. Flow rate of the sanitary circuit may be reduced.	1. Check for disconnection of DHW tank water temp. thermistor (THW5B). 2. Check for water circulation pump function.
LL	Setting errors of DIP switches on FTC control board	Incorrect setting of DIP switches 1. Boiler operation 2. 2-zone temperature control	1. 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). 2. 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).
P1	Indoor unit temperature thermistor (TH1) failure	Refer to check codes (P1/P2/L5/LD).	
P2	Indoor unit temperature thermistor (TH2) failure	Refer to check codes (P1/P2/L5/LD).	
P6	Anti-freeze protection of plate heat exchanger <Cooling> The check code displayed when Ref. liquid temp. (TH2) stays at −5ºC or lower for 10 seconds after compressor operates for 6 minutes.	<Cooling> 1. Reduced water flow • Clogged filter • Leakage of water 2. Low temperature • Low load • Inlet water is too cold. 3. Defective water pump 4. Defective outdoor fan control. 5. Overcharge of refrigerant 6. Defective refrigerant circuit (clogs) 7. Malfunction of linear expansion valve	1., 2. Check water piping. 3. Check water pump. 4. Check outdoor fan motor. 5., 6. Check operating condition of refrigerant circuit. 7. Check linear expansion valve.

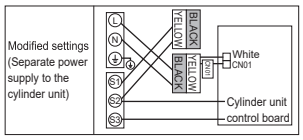
Check code	Title and display conditions	Possible Cause	Diagnosis and action
P6	<Defrosting> THW2 detects a temperature ≤15ºC and TH2 detects a temperature ≤−16ºC for consecutive 10 seconds.	<Defrosting> 1. Reduced water flow • Clogged filter • Leakage of water 2. Low temperature • Low load • Inlet water is cold. 3. Defective water pump 4. Leakage or shortage of refrigerant 5. Malfunction of linear expansion valve	 1., 2.Check water piping. 3. Check water pump. 4. Correct to proper amount of refrigerant. 5. Check linear expansion valve.
E0/E4	**Main remote controller communication failure (Reception error)** Check code E0 is displayed if main remote controller does not receive any signal from the indoor unit for ref. address "0" for 3 minutes. Check code E4 is displayed if indoor unit does not receive any data from the main remote controller for 3 minutes or indoor unit does not receive any signal from the main remote controller for 2 minutes.	1. Contact failure with transmission cable 2. Wiring procedure not observed. (Cable length/cable diameter/number of indoor units/number of main remote controllers) 3. Fault on the indoor unit FTC board section controlling Ref. address "0" 4. Fault with the main remote controller circuit board 5. Electrical noise causes interference with transmission/reception of data for main remote controller.	1. Check connection cable for damage or loose connections at the FTC and main remote controller terminals. 2. Check main remote controller and FTC common wiring max cable length 500 m. Only use 2-core cable. Only connect 1 main remote controller to 1 FTC indoor unit board. 3. to 5. If the problem is not solved by the above measures then: Turn the power to the indoor unit OFF and then ON. Power to both the indoor unit and outdoor units should be switched OFF then ON. (This may require switching 1 or 2 breakers depending if the unit is powered independently from the outdoor unit). If the E4 code is still displayed the FTC and/or the main remote controller circuit board should be replaced.
E3/E5	**Main remote controller communication failure (Transmission error)** Check code E3 is displayed if the main remote controller cannot find an empty transmission path and thus fails to transmit for 6 seconds or the data received by the main remote controller is different to what was sent (by the main remote controller) 30 consecutive times. Check code E5 is displayed if the FTC cannot find an empty transmission path for 3 minutes and thus cannot transmit or the data sent by the FTC is different to what was expected 30 consecutive times.	1. 2 or more main remote controllers have been connected to the FTC. 2. Fault with main remote controller transmission/receiving circuit board 3. Fault with the main remote controller circuit board 4. Electrical noise causes interference with transmission/reception of data for main remote controller.	1. Only connect 1 main remote controller to 1 FTC indoor unit board. 2. to 4. Turn the power to the indoor unit OFF and then ON. Power to both the indoor unit and outdoor units should be switched OFF then ON. (This may require switching 1 or 2 breakers depending if the unit is powered independently from the outdoor unit). If the E3/E5 code is still displayed the FTC and/or the main remote controller circuit board should be replaced.
E6	**Indoor/outdoor communication failure (Reception error)** Check code E6 is displayed if after the power is switched ON to the indoor unit, the FTC board does not receive any signal or the signal received is not complete for 6 minutes, or after a period of operation the FTC board does not receive any signal or the signal received is not complete for 3 minutes.	 1. Contact failure/short circuit/miswiring 2. Fault with outdoor unit transmission/receiving circuit board 3. Fault with FTC transmission/receiving circuit board 4. Electrical noise causes interference with FTC-Outdoor unit transmission cable.	* Check the LED display on the outdoor unit circuit board. (Connect the A-control service tool, PAC-SK52ST to test.) Refer to the outdoor unit service manual for explanation of EA-EC codes. 1. Check the connections on the indoor and outdoor units have not become loose and that the connecting cable is not damaged. 2. to 4. Turn the power to the indoor unit OFF and then ON. Power to both the indoor unit and outdoor units should be switched OFF then ON. (This may require switching 1 or 2 breakers depending if the unit is powered independently from the outdoor unit). If the E6 code is still displayed the FTC and/or the outdoor unit circuit board should be replaced.
E7	**Indoor/outdoor communication failure (Transmission error)** Check code E7 is displayed if despite the FTC board sending signal "0", signal "1" is received 30 consecutive times.	1. Fault with FTC transmission/receiving circuit board 2. Electrical noise causes interference with power supply. 3. Electrical noise causes interference with FTC-outdoor unit transmission cable.	1. to 3. Turn the power to the indoor unit OFF and then ON. Power to both the indoor unit and outdoor units should be switched OFF then ON. (This may require switching 1 or 2 breakers depending if the unit is powered independently from the outdoor unit). If the E7 code is still displayed the FTC circuit board should be replaced.

Check code	Title and display conditions	Possible Cause	Diagnosis and action
E1/E2	**Main remote controller control board failure** Check code E1 displayed if main remote controller cannot access it is non volatile (non power dependent) memory. Check code E2 is displayed when there is a fault with the main remote controller's internal clock.	1. Fault with the main remote controller circuit board	1. Replace main remote controller circuit board.
J0	**Indoor unit/wireless receiver communication failure** Check code J0 is displayed when the FTC cannot receive data from the wireless receiver for 1 minute.	1. Connection fault with wireless receiver-FTC connection 2. Fault with FTC receiving circuit board 3. Fault with wireless receiver's transmission circuit board 4. Electrical noise causes interference with wireless receiver communication cable.	1. Check the connections to the wireless receiver and FTC have not become loose and that the connecting cable is not damaged. 2. to 4. Turn the power to the indoor unit OFF and then ON. Power to both the indoor unit and outdoor units should be switched OFF then ON. (This may require switching 1 or 2 breakers depending if the unit is powered independently from the outdoor unit). If the J0 code is still displayed the FTC and/or the wireless receiver circuit board should be replaced.
J1 to J8	**Wireless remote controller/wireless receiver communication failure (Reception error)** Check code displayed if wireless receiver receives no/incomplete data from the wireless remote controller for 15 consecutive minutes. The digit after the J refers to the address of the wireless remote controller that has the error. E.g. Check code "J3" refers to a communication fault between the wireless receiver and wireless remote control with address 3.	1. Battery on wireless remote control may be flat. 2. The wireless remote controller is out of range of the wireless receiver. 3. Fault with wireless remote controller transmission circuit board 4. Fault with wireless receiver's reception circuit board	1 Check and replace the battery if necessary the wireless remote controller battery. 2. to 4. Reposition the wireless remote control closer to the receiver and perform a communication test. For procedure refer to wireless remote controller installation manual. If "OK" is displayed then the cause of the J1 to J8 error was the controller was out of range of the receiver. The wireless remote controller should be installed within range of the receiver. If "Err" is displayed replace wireless remote controller with a new controller and perform the pairing procedure. If after this procedure the "Err" code is still displayed the fault is with the receiver unit (attached to the indoor unit). The receiver unit should be replaced with a new part and the original remote control can be reconnected. If "OK" is displayed then the fault is with the remote control and this should be replaced.
EE	Combination error between FTC and outdoor unit	R410A outdoor unit is combined incorrectly.	Check combination of FTC and outdoor unit.
U*, F*, A*	Outdoor unit failure	Outdoor unit failure	Refer to outdoor unit service manual.

Note: To cancel check codes, please switch system off (press button F4 (RESET) on main remote controller).

Troubleshooting by inferior phenomena

No.	Fault symptom	Possible cause	Explanation - Solution
1	Main remote controller display is blank.	1. There is no power supply to main remote controller.	1. Check LED2 on FTC. (See "WIRING DIAGRAM".) (i) When LED2 is lit. Check for damage or contact failure of the main remote controller wiring. (ii) When LED2 is blinking. Refer to No. 5 below. (iii) When LED2 is not lit. Refer to No. 4 below.
		2. Power is supplied to main remote controller, however, the display on the main remote controller does not appear.	2. Check the following: • Disconnection between the main remote controller cable and the FTC control board • Failure of the main remote controller if “Please Wait” is not displayed. • Refer to No. 2 below if “Please Wait” is displayed.
2	“Please Wait” remains displayed on the main remote controller.	1. "Please Wait" is displayed for up to 6 minutes. 2. Communication failure between the main remote controller and FTC 3. Communication failure between FTC and outdoor unit	1. Normal operation 2, 3. Main remote controller start up checks/procedure. (i) If “0%” or “50 to 99%” is displayed below "Please Wait" there is a communication error between the main remote controller and the FTC control board. • Check wiring connections on the main remote controller. • Replace the main remote controller or the FTC control board. (ii) If “1 to 49%” is displayed there is a communication error between the outdoor unit's and FTC's control boards. • Check the wiring connections on the outdoor unit control board and the FTC control board. (Ensure S1 and S2 are not cross-wired and S3 is securely wired with no damage. (See "FIELD WIRING".) • Replace the outdoor unit's and/or the FTC's control boards.
3	The main screen appears with a press of the “ON” button, but disappears in a second.	The main remote controller operations do not work for a while after the settings are changed in the service menu. This is because the system takes time to apply the changes.	Normal operation The indoor unit is applying updated settings made in the service menu. Normal operation will start shortly.
4	LED2 on FTC is off. (See "WIRING DIAGRAM".)	When LED1 on FTC is also off. (See "WIRING DIAGRAM".) <FTC powered via outdoor unit.>	
		1. The outdoor unit is not supplied at the rated voltage.	1. Check the voltage across the terminals L and N or L3 and N on the outdoor power board. (See "FIELD WIRING".) • When the voltage is not 220 to 240 VAC, check wiring of the outdoor unit and of the breaker. • When the voltage is at 220 to 240 VAC, go to “2.” below.
		2. Defective outdoor controller circuit board	2. Check the voltage across the outdoor unit terminals S1 and S2. (See "FIELD WIRING".) • When the voltage is not 220 to 240 VAC, check the fuse on the outdoor control board and check for faulty wiring. • When the voltage is 220 to 240 VAC, go to “3.” below.
		3. FTC is not supplied with 220 to 240 VAC.	3. Check the voltage across the indoor unit terminals S1 and S2. (See "FIELD WIRING".) • When the voltage is not 220 to 240 VAC, check FTC-outdoor unit wiring for faults. • When the voltage is 220 to 240 VAC, go to “4.” below.
		4. FTC failure	4. Check the FTC control board. • Check the fuse on FTC control board. • Check for faulty wiring. • If no problem found with the wiring, the FTC control board is faulty.
		5. Faulty connector wiring	5. Check the connector wiring. • When the connectors are wired incorrectly, re-wire the connectors referring to below. (See "FIELD WIRING".) 

No.	Fault symptom	Possible cause	Explanation - Solution
4	LED2 on FTC is off. (See "WIRING DIAGRAM".)	<FTC powered on independent source>	
		1. FTC is not supplied with 220 to 240 VAC.	1. Check the voltage across the L and N terminals on the indoor power supply terminal block. (See "FIELD WIRING".) • When the voltage is not 220 to 240 VAC, check for faulty wiring to power supply. • When the voltage is 220 to 240 VAC, go to 2. below.
		2. There are problems in the method of connecting the connectors.	2. Check for faulty wiring between the connectors. • When the connectors are wired incorrectly re-wire them correctly referring to below. (See "FIELD WIRING" and a wiring diagram on the control and electrical box cover.)  • If no problem found with the wiring, go to 3. below.
		3. FTC failure	3. Check the FTC control board. • Check the fuse on FTC control board. • Check for faulty wiring. • If no problem found with the wiring, the FTC control board is faulty.
		When LED1 on FTC is lit. Incorrect setting of refrigerant address for outdoor unit (None of the refrigerant address is set to "0".)	Recheck the refrigerant address setting on the outdoor unit. Set the refrigerant address to “0”. (Set refrigerant address using SW1(3-6) on outdoor controller circuit board.)
5	LED2 on FTC is blinking. (See "WIRING DIAGRAM".)	When LED1 is also blinking on FTC . Faulty wiring between FTC and outdoor unit	Check for faulty wiring between FTC and outdoor unit.
		When LED1 on FTC is lit.	
		1. Faulty wiring in main remote controller Multiple indoor units have been wired to a single outdoor unit.	1. Check for faulty wiring in main remote controller. The number of indoor units that can be wired to a single outdoor unit is one. Additional indoor units must be wired individually to a single outdoor unit.
		2. Short-circuited wiring in main remote controller	2.,3. Remove main remote controller wires and check LED2 on FTC. (See "WIRING DIAGRAM".) • If LED2 is blinking check for short circuits in the main remote controller wiring. • If LED2 is lit, wire the main remote controller again and: - if LED2 is blinking, the main remote controller is faulty; - if LED2 is lit, faulty wiring of the main remote controller has been corrected.
		3. Main remote controller failure	
6	LED4 on FTC is off. (See "WIRING DIAGRAM".)	1. SD memory card is NOT inserted into the memory card slot with correct orientation.	1. Correctly insert SD memory card in place until a click is heard.
		2. Not an SD standards compliant memory card.	2. Use an SD standards compliant memory card. (Refer to installation manual, "5.8 Using SD memory card".)
	LED4 on FTC is blinking. (See "WIRING DIAGRAM".)	1. Full of data.	1. Move or delete data, or replace SD memory card with a new one.
		2. Write-protected.	2. Release the write-protect switch.
		3. NOT formatted.	3. Refer to installation manual, "Using SD memory card".
		4. Formatted in NTFS file system.	4. FTC is Not compatible with NTFS file system. Use an SD memory card formatted in FAT file system.
7	No water at hot tap.	1. Cold main off	1. Check and open stop cock.
		2. Strainer (local supply) blocked.	2. Isolate water supply and clean strainer.
8	Cold water at tap.	1. Hot water run out.	1. Ensure DHW mode is operating and wait for DHW tank to re-heat.
		2. Prohibit, schedule timer or holiday mode selected or demand control input (IN4) or smart grid ready (switch-off command).	2. Check settings and change as appropriate.
		3. Heat pump not working.	3. Check heat pump – consult outdoor unit service manual.
		4. Booster heater cut-out tripped.	4. Check booster heater thermostat and press reset button if safe. Reset button is located on the side of booster heater, covered with white rubber cap. See "PART NAMES AND FUNCTIONS" to find out its position.
		5. The earth leakage circuit breaker for booster heater breaker (ECB1) tripped.	5. Check the cause and reset if safe.
		6. The booster heater thermal cut-out has tripped and cannot be reset using the manual reset button.	6. Check resistance across the thermal cut-out, if open then the connection is broken and the booster heater will have to be replaced. Contact your Mitsubishi Electric dealer.
		7. Immersion heater cut-out tripped.	7. Check immersion heater thermostat and press reset button, located on immersion heater boss, if safe. If the heater has been operated with no water inside it may have failed, so please replace it with a new one.
		8. Immersion heater breaker (ECB2) tripped.	8. Check the cause and reset if safe.
		9. 3-way valve fault	9. Check plumbing/wiring to 3-way valve. (i) Manually override 3-way valve using the main remote controller. (Refer to <Manual operation> in "Service menu") If the valve does not still function, go to (ii) below. (ii) Replace 3-way valve coil. If the valve does not still function, go to (iii) below. (iii) Replace 3-way valve. (Refer to "DISASSEMBLY PROCEDURE".)

No.	Fault symptom	Possible cause	Explanation - Solution
9	Water heating takes longer.	1. Heat pump not working. 2. Booster heater cut-out tripped. 3. Booster heater breaker (ECB1) tripped. 4. The booster heater thermal cut-out has tripped and cannot be reset using the manual reset button. 5. Immersion heater cut-out has been triggered. 6. Immersion heater breaker (ECB2) tripped. 7. Flow rate of the sanitary circuit may be reduced.	1. Check heat pump – consult outdoor unit service manual. 2. Check booster heater thermostat and press reset button if safe. Reset button is located on the side of booster heater, covered with white rubber cap. See "PART NAMES AND FUNCTIONS" to find out its position. 3. Check the cause and reset if safe. 4. Check resistance across the thermal cut-out, if open then connection is broken and the booster heater will have to be replaced. Contact your Mitsubishi Electric dealer. 5. Check immersion heater thermostat and press reset button located on immersion heater boss, if safe. If the heater kept running with no water inside, this may have resulted in failure, so replace it with a new one. 6. Check the cause and reset if safe. 7. Check the following items • Check for trapped air in water pump (sanitary circuit). • Check if the speed of water pump (sanitary circuit) is set to 2. • Check water pump (sanitary circuit) for malfunction. (Refer to "Checking Component Parts' Function".) • Replace plate heat exchanger (water - water) or scale trap, if there are a blockage which blocks the sanitary circuit.
10	Temperature of DHW tank water dropped.	When DHW operation is not running, the DHW tank emits heat and the water temperature decreases to a certain level. If water in the DHW tank is reheated frequently because of a significant drop in water temperature, check for the following. 1. Water leakage in the pipes that connect to the DHW tank 2. Insulation material coming loose or off. 3. 3-way valve failure 4. Water pump (sanitary circuit) speed setting failure	1. Take the following measures. • Retighten the nuts holding the pipes onto the DHW tank. • Replace seal materials. • Replace the pipes. 2. Fix insulation. 3. Check plumbing/wiring to 3-way valve. (i) Manually override 3-way valve using the main remote controller. (Refer to <Manual operation> in "Service menu".) If the valve does not still function, go to (ii) below. (ii) Replace 3-way valve motor. If the valve does not still function, go to (iii) below. (iii) Replace 3-way valve. (Refer to "DISASSEMBLY PROCEDURE".) 4. Water pump (sanitary circuit) MUST be set to speed 2. When it set to speed 1, hot water would be mixed with cold water due to circulation.
11	Hot or warm water from cold tap.	Heat of hot water pipe is transferred to cold water pipe.	Insulate/re-route pipework.
12	Water leakage	1. Poorly sealed connections of water circuit components 2. Water circuit components reaching the end of life	1. Tighten connections as required. 2. Refer to PARTS CATALOG for expected part lifetimes and replace them as necessary.
13	Heating system does not reach the set temperature.	1. Prohibit, schedule timer or holiday mode selected or demand control input (IN4) or smart grid ready (switch-off command). 2. Check settings and change as appropriate. 3. The temperature sensor is located in a room that has a different temperature relative to that of the rest of the house. 4. Heat pump not working. 5. Booster heater cut-out tripped. 6. Booster heater breaker (ECB1) tripped. 7. The booster heater thermal cut-out tripped and cannot be reset using the manual reset button. 8. Incorrectly sized heat emitter 9. 3-way valve failure 10. Battery problem (wireless control only) 11. If a mixing tank is installed, the flow rate between the mixing tank and the cylinder unit is less than that between the mixing tank and the local system.	1. Check settings and change as appropriate. 2. Check the battery power and replace if flat. 3. Relocate the temperature sensor to a more suitable room. 4. Check heat pump – consult outdoor unit service manual. 5. Check booster heater thermostat and press reset button if safe. Reset button is located on the side of booster heater, covered with white rubber cap. (See "PART NAMES AND FUNCTIONS" for position.) 6. Check the cause of the trip and reset if safe. 7. Check resistance across the thermal cut-out, if open then the connection is broken and the booster heater will have to be replaced. Contact your Mitsubishi Electric dealer. 8. Check the heat emitter surface area is adequate Increase size if necessary. 9. Check plumbing/wiring to 3-way valve. (i) Manually override 3-way valve using the main remote controller. (Refer to <Manual operation> in "Service menu".) If the 3-way valve does not function go to (ii) below. (ii) Replace 3-way valve motor. If the 3-way valve coil is replaced but the 3-way valve does not function go to (iii) below. (iii) Replace 3-way valve. (Refer to "DISASSEMBLY PROCEDURE".) 10. Check the battery power and replace if flat. 11. Increase the flow rate between the mixing tank and the cylinder unit decrease that between the mixing tank and the local system.

No.	Fault symptom	Possible cause	Explanation - Solution
14	Heating system does not reach the set lower temperature.	Heating system operates depending on the heating load to prevent low-load heating system from the frequent switching (ON/OFF) of the compressor.	Normal operation, no action necessary.
15	In 2-zone temperature control, only Zone2 does not reach the set temperature.	1. When Zone1 and Zone2 are both in heating mode, the hot water temperature in Zone2 does not exceed that in Zone1. 2. Faulty wiring of motorized mixing valve 3. Faulty installation of motorized mixing valve 4. Incorrect setting of Running time 5. Motorized mixing valve failure	1. Normal action no action necessary. 2. Refer to installation manual, "Wiring for 2-zone temperature control". 3. Check for correct installation. (Refer to the manual included with each motorized mixing valve.) 4. Check for correct setting of Running time. 5. Inspect the mixing valve. (Refer to the manual included with each motorized mixing valve.)
16	When a PUHZ-FRP outdoor unit is connected, DHW or Heating operation cannot run.	The outdoor unit is set to have operation of the indoor unit of air conditioner take precedence over that of the cylinder unit, and in the main remote controller settings "Electric heater (Heating)" or "Electric heater (DHW)" is turned off.	Turn ON Electric heater (Heating) or Electric heater (DHW) using the main remote controller.
17	When a PUHZ-FRP outdoor unit is connected and is in heat recovery operation, the set temperature is not reached.	When the outdoor unit is set to have cooling operation of the indoor unit of air conditioner take precedence over that of the cylinder unit, the outdoor unit controls the frequency of the compressor according to the load of air conditioner. The DHW and heating run according to that frequency.	Normal operation no action necessary. If Air-to-Water system is given priority in operation, comp Hz can be regulated depending on the load of DHW or Heating. For more details, refer to the PUHZ-FRP installation manual.
18	After DHW operation room temperature rises slightly.	At the end of the DHW mode operation the 3-way valve diverts hot water away from the DHW circuit into space heating circuit. This is done to prevent the cylinder unit components from overheating. The amount of hot water directed into the space heating circuit varies according to the type of the system and of the pipe run between the plate heat exchanger and the cylinder unit.	Normal operation no action necessary.
19	The room temperature rises during DHW operation.	3-way valve failure	Check the 3-way valve. (i) Manually override 3-way valve using the main remote controller. (Refer to <Manual operation> in "Service menu".) If the 3-way valve does not function, go to (ii) below. (ii) Replace 3-way valve coil. If the 3-way valve coil is replaced but the 3-way valve does not function go to (iii) below. (iii) Replace 3-way valve. (Refer to "DISASSEMBLY PROCEDURE".)
20	Water discharges from pressure relief valve. (Primary circuit)	1. If continual – pressure relief valve could bite foreign objects and the valve seat may be damaged. 2. If intermittent – expansion vessel charge may have reduced/bladder perished.	1. Turn the handle on the pressure relief valve several turns. If leakage persists, replace the pressure relief valve with a new one. 2. Check pressure in expansion vessel. Recharge to 1 bar if necessary. If bladder perished replace expansion vessel with a new one.
21	Water discharges from pressure relief valve. (Sanitary circuit)	1. If continual – field supplied pressure reducing valve not working. 2. If continual – pressure relief valve could bite foreign objects and the valve seat may be damaged. 3. If intermittent – expansion vessel charge may have reduced/bladder perished. 4. DHW tank may have subjected to backflow.	1. Check function of pressure reducing valve and replace if necessary. 2. Turn the handle on the pressure relief valve several turns. If leakage persists, replace the pressure relief valve with a new one. 3. Check gas-side pressure in expansion vessel. Recharge to correct precharge pressure if necessary. If bladder perished replace expansion vessel with a new one with appropriate pre-charge. 4. Check the pressure in DHW tank. If pressure in DHW tank is similar to that in the incoming mains, cold water supply that merges with incoming mains water supply could flow back to DHW tank. Investigate source of back-feed and rectify error in pipework/fitting configuration. Adjust pressure in cold supply.
22	Water discharges from temperature and pressure relief valve (EHPT20X-MHEDW only) (Sanitary circuit)	1. If continual – field supplied pressure reducing valve not working. 2. If continual – temperature and pressure relief valve could bite foreign objects and the valve seat may be damaged. 3. If intermittent – expansion vessel charge may have reduced/bladder perished. 4. DHW tank may have subjected to backflow. 5. Unit has overheated – thermal controls have failed.	1. Check function of pressure reducing valve and replace if necessary. 2. Turn the handle on the temperature and pressure relief valve several turns. If leakage persists, replace the temperature and pressure relief valve with a new one. 3. Check gas-side pressure in expansion vessel. Recharge to correct precharge pressure if necessary. If bladder perished replace expansion vessel with a new one with appropriate pre-charge. 4. Check pressure in DHW tank. If pressure in DHW tank is similar to that in the incoming mains, cold water supply that merges with incoming mains water supply could flow back to DHW tank. Investigate source of back-feed and rectify error in pipework/fitting configuration. Adjust pressure in cold supply. 5. Switch off power to the heat pump and immersion heaters. Leave water running. Wait until discharge stops. Isolate water supply and replace if faulty.

<table>
<tr><th>No.</th><th>Fault symptom</th><th>Possible cause</th><th>Explanation - Solution</th></tr>
<tr><td>23</td><td>Water discharges from expansion relief valve - part of Inlet Control Group (EHPT20X-MHEDW only) (sanitary circuit)</td><td>1. If continual – field supplied pressure reducing valve not working.
2. If continual – expansion relief valve may be damaged.
3. If intermittent – expansion vessel charge may have reduced/bladder perished.
4. DHW tank may have subjected to backflow.
5. Unit has overheated – thermal controls have failed.</td><td>1. Check function of pressure reducing valve and replace if necessary.
2. Turn the handle on the expansion relief valve to check for foreign objects inside. If the problem is not still solved, replace the expansion relief valve with a new one.
3. Check gas-side pressure in expansion vessel.
Recharge to correct precharge pressure if necessary.
If bladder perished replace expansion vessel with a new one with appropriate precharge.
4. Check pressure in DHW tank. If pressure in DHW tank is similar to that in the incoming mains, cold water supply that merges with incoming mains water supply could flow back to DHW tank. Investigate source of back-feed and rectify error in pipework/fitting configuration. Adjust pressure in cold supply.
5. Switch off power to the heat pump and immersion heaters. Leave water running. Wait until discharge stops. Isolate water supply and replace if faulty.</td></tr>
<tr><td>24</td><td>Noisy water circulation pump</td><td>Air in water circulation pump</td><td>Use manual and automatic air vents to remove air from system.
Top up water if necessary to achieve 1 bar on primary circuit.</td></tr>
<tr><td>25</td><td>Noise during hot water draw off typically worse in the morning.</td><td>1. Loose airing cupboard pipework
2. Heaters switching on/off</td><td>1. Install extra pipe fastening clips.
2. Normal operation no action necessary.</td></tr>
<tr><td>26</td><td>Mechanical noise heard coming from the cylinder unit.</td><td>1. Heaters switching on/off
2. 3-way valve changing position between DHW and heating mode</td><td>Normal operation no action necessary.</td></tr>
<tr><td>27</td><td>Water circulation pump runs for a short time unexpectedly.</td><td>Water circulation pump jam prevention mechanism (routine) to inhibit the build-up of scale</td><td>Normal operation no action necessary.</td></tr>
<tr><td>28</td><td>Milky/Cloudy water (Sanitary circuit)</td><td>Oxygenated water</td><td>Water from any pressurised system will release oxygen bubbles when water is running. The bubbles will settle out.</td></tr>
<tr><td>29</td><td>Heating mode has been on standby for a long time (does not start operation smoothly.)</td><td>The time of “Delay” set in “Economy settings for pump” is too short. (Go to “Service menu” → “Auxiliary settings” → “Economy settings for pump”).</td><td>Increase the time of “Delay” in “Economy settings for pump” .</td></tr>
<tr><td>30</td><td>The cylinder unit that was running in the heating mode before power failure is running in the DHW mode after power recovery.</td><td>The cylinder unit is designed to run in an operation mode with a higher priority (i.e. DHW mode in this case) at power recovery.</td><td>• Normal operation
• After the DHW max. operation time has elapsed or the DHW max. temperature has been reached, the DHW mode switches to the other mode (ex. Heating mode).</td></tr>
<tr><td>31</td><td>Cooling mode is NOT available.</td><td>DIP SW2-4 is OFF.</td><td>Turn DIP SW2-4 to ON. (Refer to “DIP switch functions”.)</td></tr>
<tr><td>32</td><td>The cooling system does not cool down to the set temperature.</td><td>1. When the water in the circulation circuit is unduly hot, Cooling mode starts with a delay for the protection of the outdoor unit.
2. When the outdoor ambient temperature is lower than the preset temperature that activates the freeze stat function, Cooling mode does not start running.</td><td>1. Normal operation
2. To run Cooling mode overriding the freeze stat function, adjust the preset temperature that activates the freeze stat function.
(Refer to "<Freeze stat function>")</td></tr>
<tr><td>33</td><td>The electric heaters are activated shortly after DHW or LP mode starts running after Cooling mode.</td><td>The setting time period of Heat-pump-only operation is short.</td><td>Adjust the setting time period of Heat-pump only operation. (Refer to “<Electric heater (DHW)>)</td></tr>
<tr><td>34</td><td>During DHW or LP mode following the cooling mode, error L6 (circulation water freeze protection error) occurs and the system stops all the operations.</td><td>The unit runs in Cooling mode when the outdoor ambient temperature is lower than 10ºC (outside of the guaranteed operating range).
(When defrosting operation is running at such a low outdoor ambient temperature after Cooling mode is switched to DHW or LP mode, the water temperature in the cooling circuit drops too low, which could result in L6 error to stop all the operations.</td><td>Do not run Cooling operation when the outdoor ambient temperature is lower than 10ºC.
To automatically stop or recover only Cooling operation and keep other operations running, the freeze stat function can be used. Set the preset temperature that activates the freeze stat function to adjust the outdoor ambient temperature as follows. (Refer to "<Freeze stat function>")
<table><tr><th>Outdoor ambient temperature</th><th>Cooling operation</th></tr><tr><td>3ºC higher than the preset temperature</td><td>Stop</td></tr><tr><td>5ºC higher than the preset temperature</td><td>Recover</td></tr></table></td></tr>
</table>

<table>
<tr><th>No.</th><th>Fault symptom</th><th>Possible cause</th><th>Explanation - Solution</th></tr>
<tr><td>35</td><td>The energy monitor value seems not correct.

Note:
There could be some discrepancies between the actual and the calculated values.
If you seek for accuracy, please make sure to connect power meter(s) and heat meter to FTC board. Both should be locally supplied.</td><td>1. Incorrect setting of the energy monitor

2. Non-connectable type of external meter (local supply) is connected.
3. External meter (local supply) failure

4. FTC board failure</td><td>1. Check the setting by following the procedure below.
(1) Check if the DIP switch is set as the table below.
Consumed electric energy
<table><tr><td>SW3-4</td><td>Electric energy meter (Local supply)</td></tr><tr><td>OFF</td><td>Without</td></tr><tr><td>ON</td><td>With</td></tr></table>Delivered heat energy
<table><tr><td>SW3-8</td><td>Heat meter (Local supply)</td></tr><tr><td>OFF</td><td>Without</td></tr><tr><td>ON</td><td>With</td></tr></table>(2) In the case external electric energy meter and/or heat meter is not used, check if the setting for electric heater and water pump(s) input is correct by referring to <Energy monitor setting> in "Service menu".
(3) In the case external electric energy meter and/or heat meter is used, check if the unit of output pulse on external meter matches with the one set at the main remote controller by referring to <Energy monitor setting> in "9-5. Service menu".
2. Check if the external meter (local supply) is connectable type by referring to <Energy monitor setting>" in "Service menu".
3. Check if signal is sent to IN8 to IN10 properly. (Refer to section WIRING DIAGRAM)
Replace the external heat meter if defective.
4. Check the FTC control board.
• Check for faulty wiring.
• If no problem found with the wiring, the FTC control board is faulty. Replace the board.</td></tr>
<tr><td>36</td><td>Heat pump is forced to turn ON and OFF.</td><td>Smart grid ready input (IN11 and IN12) is used, and switch-on and off commands are input.</td><td>Normal operation no action necessary.</td></tr>
</table>

Annual Maintenance

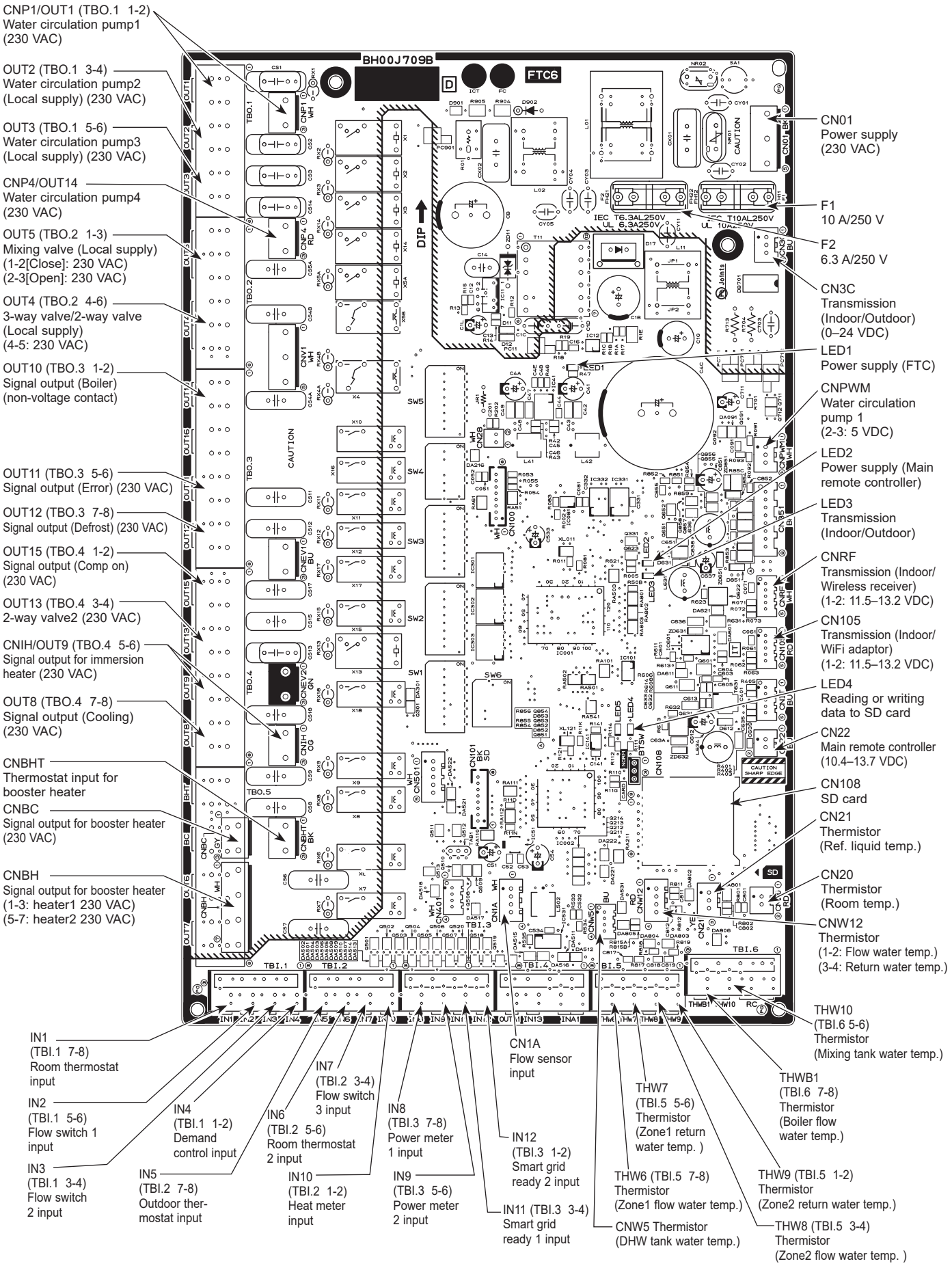
It is essential that the cylinder unit is serviced at least once a year by a qualified individual. Any spare parts required should be purchased from Mitsubishi Electric. NEVER bypass safety devices or operate the unit without them being fully operational.

<Annual maintenance points>

Use the Annual Maintenance Log Book as a guide to carrying out the necessary checks on the cylinder unit and outdoor unit.

Test point diagram

FTC (Controller board)



FAULT FINDING

IMPORTANT

- Any required parts should be purchased from Mitsubishi Electric parts.
- Disconnect the electrical supply before removing any electrical equipment covers.
- NEVER bypass any thermal controls or operate system without the necessary safety valves.
- Water contained in the Air Source Heat Pump pre-plumbed cylinder may be very hot, especially following a thermal control failure. Caution must be taken when drawing water from the unit.

Fault Finding Table

FAULT	POSSIBLE CAUSE	REMEDY
No hot water flow	1. Mains supply off.	1. Check and open stock cock.
	2. Strainer blocked.	2. Turn off water supply. Remove strainer and clean (see maintanance section).
	3. Cold water combination valve incorrectly fitted.	3. Check and refit as required.
Water from hot taps is cold	1. BACK UP immersion heater not switched on.	1. Check and switch on.
	2. BACK UP immersion heater thermal cut-out has operated.	2. Check. Reset by pushing button.
	3. Programmer set to Central Heating only.	3. Check. Set to Domestic Hot Water programme.
	4. Air Source Heat Pump not working.	4. Check heat pump operation. If fault is suspected, consult heat pump instructions.
	5. Thermal cut-out has operated.	5. Check. Reset by pushing button on cut-out. Check operation of DHW thermal sensor.
	6. DHW circulating pump not connected correctly.	6. Check wiring and/or plumbing connections to DHW circulating pump. Check isolating valves are open.
Water discharges from Expansion Valve	1. INTERMITTENTLY Expansion vessel charge pressure has reduced below 3.5bar.	1. See Maintance section for re-charging procedure.
	2. CONTINUALLY a. Cold water combination valve pressure reducer not working correctly. b. Expansion valve seat damaged.	2a. Check pressure from cold water combination valve. If greater than 3.6 bar, replace pressure reducer cartridge. 2b. Remove expansion valve cartridge. Check condition of seat. If necessary, fit new expansion valve cartridge.
Water discharges from T&P Relief Valve	1. Thermal control failure. NOTE water will be very hot.	1. Switch off power to immersion heater(s) and /or shut down Heat Pump. DO NOT turn off water supply. When discharge stops check all thermal controls, replace if faulty.
Milky water	1. Oxygenated water.	1. Water from a pressurised system releases oxygen bubbles when flowing. The milkiness will disappear after a short while.

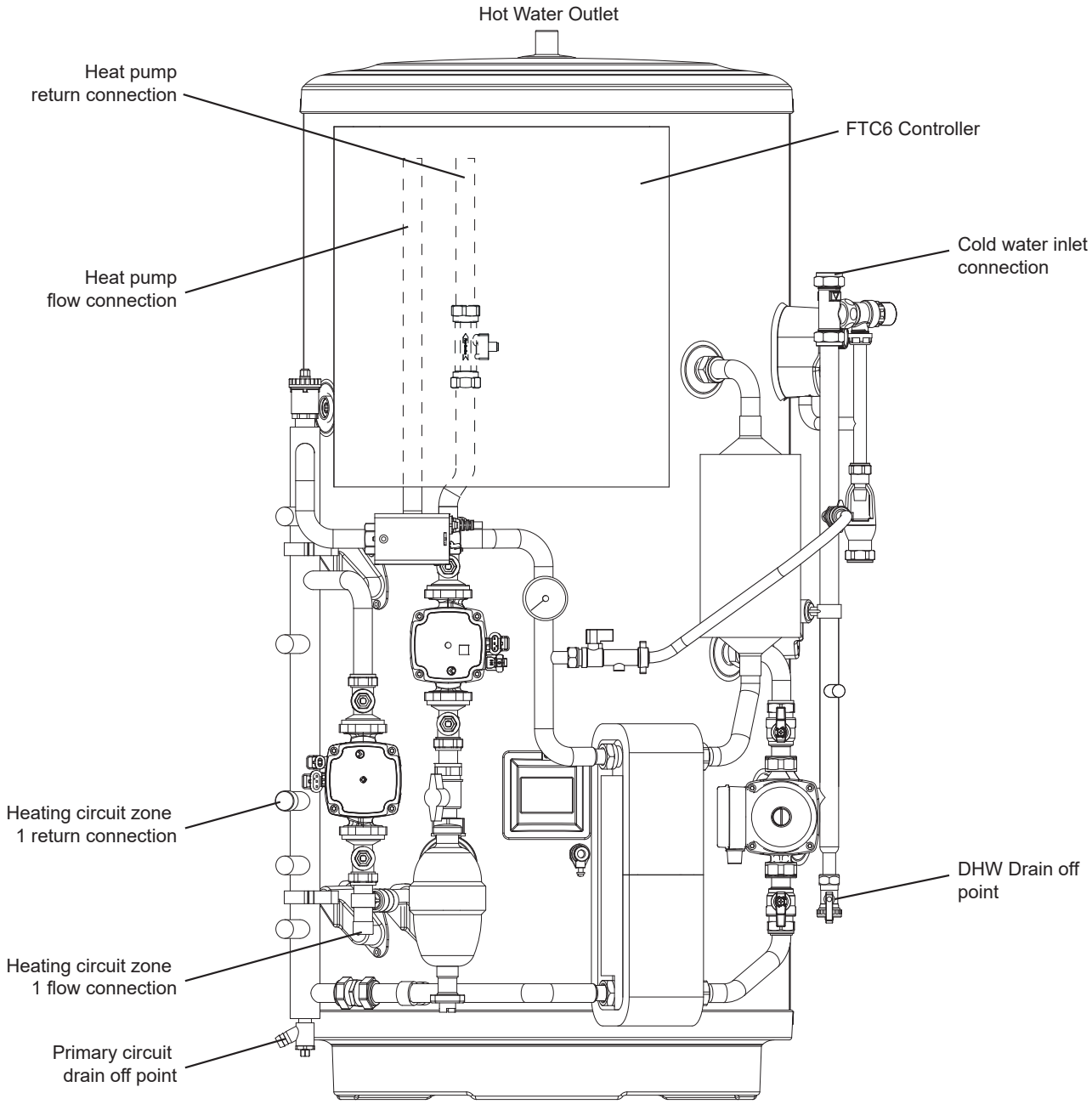
The fault finding table (above) will enable operational faults to be identified and their possible causes rectified. Any work carried out on this unvented water heater and its associated controls MUST be carried out by a competent installer for unvented water heating systems. In case of doubt contact Technical Support (see contact details on back page).

WARNING
DO NOT TAMPER WITH ANY OF THE SAFETY VALVES OR CONTROLS SUPPLIED WITH THE PRE-PLUMBED CYLINDER AS THIS WILL INVALIDATE ANY GUARANTEE.

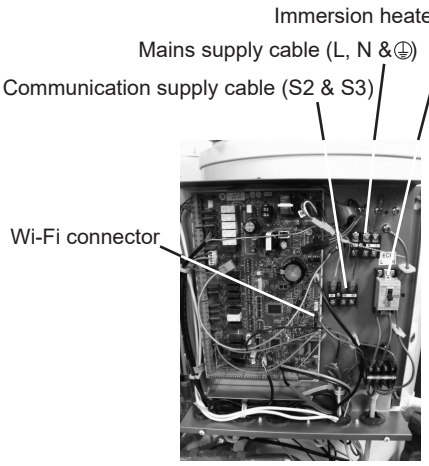
DISASSEMBLY PROCEDURE

PREPARATION FOR DISASSEMBLY

- Prepare the proper tools.
- Prepare the proper protectors.
- Provide adequate ventilation.
- After stopping the operation of the cylinder and outdoor unit, turn off all the power-supply breakers.
- Allow parts to cool.
- Do not expose the electric parts to water.
- When replacing or servicing water circuit parts, drain system first.



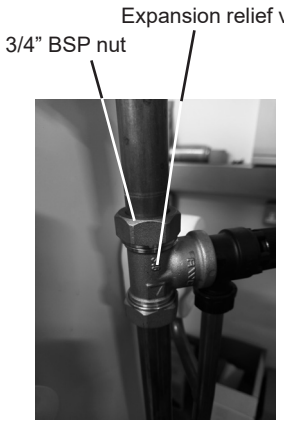
Isolate all electrical power connections to the installation and disconnect all wiring to the FTC6 controller. To remove the cylinder it is necessary to isolate the feed to the cold water inlet. The primary circuit & DHW can then be drained from the points shown in the diagram above.
Disconnect the pipework from the hot water outlet, heat pump flow & return, heating circuit flow & return and expansion relief valve pipework.
The cylinder can then be removed.
See next page for step-by-step procedure and images.



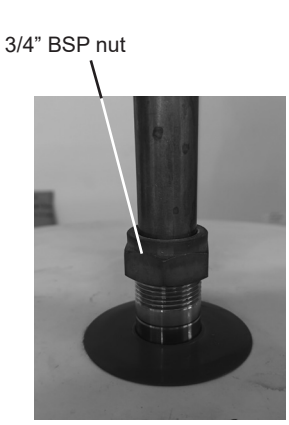
1. Turn off electrical supplies to both Cylinder and Heat Pump. Disconnect cables to main control panel.

2. Turn off cold water supply to Heat Pump Cylinder. Drain down cylinder making sure Hot water outlet is isolated, connect hose to tail and secure. Run hose to drain.

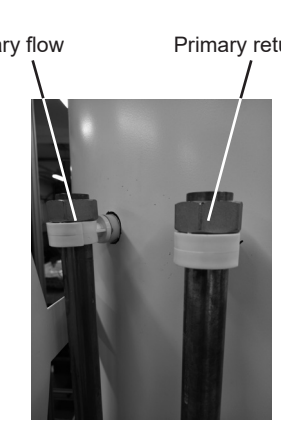
3. Drain down Heat Pump Primary fluid, ensuring it is disposed of in accordance with national evironmental regulations.



4. Disconnect cold water supply to cylinder. Disconnect expansion relief valve pipework.



5. Disconnect hot water supply from cylinder.



6. Disconnect primary flow & return from heat pump. Disconnect the heating circuit flow & return.

The cylinder can now be removed - care must be taken as the cylinder will be heavy.

SUPPLEMENTARY INFORMATION

■ Back-up operation of boiler

Heating operation is backed up by boiler.
For more details, refer to the installation manual of PAC-TH012HT(L)-E.

<Installation & System set up>

1. Set DIP-SW1-1 to ON "With boiler" and SW2-6 to ON “With Mixing tank”.
2. Install the thermistors THWB1 (Flow temp.) *1 on the boiler circuit.
3. Connect the output wire (OUT10: Boiler operation) to the input (room thermostat input) on the boiler. *2
4. Install one of the following room temperature thermostats. *3

- Wireless remote controller (option)
- Room temp. thermostat (local supply)
- Main remote controller (remote position)

*1 The boiler temperature thermistor is an optional part.
*2 OUT10 has no voltage across it.
*3 Boiler heating is controlled on/off by the Room temp. thermostat.

<Remote controller settings>

1. Go to Service menu > Heat source setting and choose “Boiler” or “Hybrid”. *4
2. Go to Service menu > Operation settings > Boiler settings to make detailed settings for “Hybrid” above.

*4 The “Hybrid” automatically switches heat sources between Heat pump (and Electric heater) and boiler.

SERVICE AND MAINTENANCE

Engineers Forms

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

Commissioning/Field settings record sheet

Main remote controller screen					Parameters	Default setting	Field setting	Notes
Main			Zone1 heating room temp.		10°C to 30°C	20°C		
			Zone2 heating room temp. *1		10°C to 30°C	20°C		
			Zone1 heating flow temp.		20°C to 60°C	45°C		
			Zone2 heating flow temp. *2		20°C to 60°C	35°C		
			Zone1 cooling flow temp. *3		5°C to 25°C	15°C		
			Zone2 cooling flow temp. *3		5°C to 25°C	20°C		
			Zone1 heating compensation curve		−9°C to + 9°C	0°C		
			Zone2 heating compensation curve *2		−9°C to + 9°C	0°C		
			Holiday mode		Active/Non active/Set time	—		
Option			Forced DHW operation		On/Off	—		
			DHW		On/Off/Timer	On		
			Heating/Cooling *3		On/Off/Timer	On		
			Energy monitor		Consumed electrical energy/Delivered energy	—		
Setting	DHW		Operation mode		Normal/Eco *4	Normal		
			DHW max. temp.		40°C to 60°C *5	50°C		
			DHW temp. drop		5°C to 30°C	10°C		
			DHW max. operation time		30 to 120 min	60 min		
			DHW mode restriction		30 to 120 min	30 min		
			DHW recharge		Large/Standard	Standard		
	Legionella prevention		Active		Yes/No	Yes		
			Hot water temp.		60°C to 70°C *5	65°C		
			Frequency		1 to 30 days	15 days		
			Start time		00.00 to 23.00	03.00		
			Max. operation time		1 to 5 hours	3 hours		
			Duration of maximum temp.		1 to 120 min	30 min		
	Heating/Cooling *3		Zone1 operation mode		Heating room temp./ Heating flow temp./ Heating compensation curve/ Cooling flow temp.	Room temp.		
			Zone2 operation mode *2		Heating room temp./ Heating flow temp./ Heating compensation curve/ Cooling flow temp.	Compensation curve		
	Compensation curve	Hi flow temp. set point	Zone1 outdoor ambient temp.		−30°C to +33°C *6	−15°C		
			Zone1 flow temp.		20°C to 60°C	50°C		
			Zone2 outdoor ambient temp. *2		−30°C to +33°C *6	−15°C		
			Zone2 flow temp. *2		20°C to 60°C	40°C		
		Lo flow temp. set point	Zone1 outdoor ambient temp.		−28°C to +35°C *7	35°C		
			Zone1 flow temp.		20°C to 60°C	25°C		
			Zone2 outdoor ambient temp. *2		−28°C to +35°C *7	35°C		
			Zone2 flow temp.*2		20°C to 60°C	25°C		
		Adjust	Zone1 outdoor ambient temp.		−29°C to +34°C *8	—		
			Zone1 flow temp.		20°C to 60°C	—		
			Zone2 outdoor ambient temp. *2		−29°C to +34°C *8	—		
			Zone2 flow temp. *2		20°C to 60°C	—		
	Holiday		DHW		Active/Non active	Non active		
			Heating/Cooling *3		Active/Non active	Active		
			Zone1 heating room temp.		10°C to 30°C	15°C		
			Zone2 heating room temp. *1		10°C to 30°C	15°C		
			Zone1 heating flow temp.		20°C to 60°C	35°C		
			Zone2 heating flow temp. *2		20°C to 60°C	25°C		
			Zone1 cooling flow temp. *3		5°C to 25°C	25°C		
			Zone2 cooling flow temp. *3		5°C to 25°C	25°C		
	Initial settings		Language		EN/FR/DE/SV/ES/IT/DA/NL/FI/NO/PT/BG/PL/CZ/RU/TR/SL	EN		
			°C/°F		°C/°F	°C		
			Summer time		On/Off	Off		
			Temp. display		Room/DHW tank/Room&DHW tank /Off	Off		
			Time display		hh:mm/hh:mm AM/AM hh:mm	hh:mm		
			Room sensor settings for Zone1		TH1/Main RC/Room RC1 to 8/"Time/Zone"	TH1		
			Room sensor settings for Zone2 *2		TH1/Main RC/Room RC1 to 8/"Time/Zone"	TH1		
			Room RC zone select *2		Zone1/Zone2	Zone1		
	Service menu		Thermistor adjustment	THW1	−10°C to +10°C	0°C		
				THW2	−10°C to +10°C	0°C		
				THW5A	−10°C to +10°C	0°C		
				THW5B	−10°C to +10°C	0°C		
				THW6	−10°C to +10°C	0°C		
				THW7	−10°C to +10°C	0°C		
				THW8	−10°C to +10°C	0°C		
				THW9	−10°C to +10°C	0°C		
				THW10	−10°C to +10°C	0°C		
				THWB1	−10°C to +10°C	0°C		
			Auxiliary settings	Economy settings for pump.	On/Off *9	On		
					Delay (3 to 60 min)	10 min		
				Electric heater (Heating)	Space heating: On (used)/Off (not used)	On		
					Electric heater delay timer (5 to 180 min)	30 min		
				Electric heater (DHW)	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 control	Running (10 to 240 sec)	120 sec		
					Interval (1 to 30 min)	2 min		
				Flow sensor *10	Minimum (0 to 100L/min)	5 L/min		
					Maximum (0 to 100L/min)	100 L/min		
				Analog output	Interval (1 to 30 min)	5 min		
					Priority (Normal/High)	Normal		

(Continued to next page.)

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

Main remote controller screen						Parameters			Default setting	Field setting	Notes
Setting	Service menu	Pump speed		DHW		Pump speed (1 to 5)			5		
				Heating/Cooling		Pump speed (1 to 5)			5		
		Heat source setting				Standard/Heater/Boiler/Hybrid *11			Standard		
		Heat pump setting		Heat pump flow rate range		Minimum(0 to 100L/min)			5 L/min		
						Maximum(0 to 100L/min)			100 L/min		
				Quiet mode		Day (Mon to Sun)			—		
						Time			0:00 - 23:45		
						Quiet level (Normal/ Level1/ Level2)			Normal		
		Operation settings	Heating operation	Flow temp.range *12		Minimum.temp.(20 to 45°C)			30°C		
						Maximum.temp.(35 to 60°C)			50°C		
				Room temp.control *13		Mode (Normal/Fast)			Normal		
						Interval (10 to 60min)			10min		
				Heat pump thermo diff.adjust		On/Off *9			On		
						Lower limit (−9 to −1°C)			-5°C		
						Upper limit (+3 to +5°C)			5°C		
			Freeze stat function *14			Outdoor ambient temp. (3 to 20°C) / **			5°C		
			Simultaneous operation (DHW/Heating)			On/Off *9			Off		
						Outdoor ambient temp. (−30 to +10°C) *6			−15°C		
			Cold weather function			On/Off *9			Off		
						Outdoor ambient temp. (−30 to −10°C) *6			−15°C		
			Boiler operation			Hybrid settings	Outdoor ambient temp. (−30 to +10°C) *6		−15°C		
							Priority mode (Ambient/Cost/CO_2) *15		Ambient		
							Outdoor ambient temp. rise (+1 to +5 °C)		+3 °C		
						Intelligent settings	Energy price *16	Electricity (0.001 to 999 */kWh)	0.5 */kWh		
								Boiler (0.001 to 999 */kWh)	0.5 */kWh		
							CO_2 emission	Electricity (0.001 to 999 kg -CO_2/kWh)	0.5 kg -CO_2/kWh		
								Boiler (0.001 to 999 kg -CO_2/kWh)	0.5 kg -CO_2/kWh		
							Heat source	Heat pump capacity (1 to 40 kW)	11.2 kW		
								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		
			Smart grid ready	DHW		On/Off			Off		
						Target temp (+1 to +20°C) / -- (Non active)			--		
				Heating		On/Off			Off		
						Target temp.	Switch-on recommendation(20 to 60°C)		50°C		
							Switch-on command(20 to 60°C)		55°C		
				Cooling		On/Off			Off		
						Target temp.	Switch-on recommendation(5 to 25°C)		15°C		
							Switch-on command(5 to 25°C)		10°C		
				Pump cycles		Heating (On/Off)			On		
						Cooling (On/Off)			On		
						Interval(10 to 120 min)			10 min		
			Floor dry up function			On/Off *9			Off		
						Target temp.	Start&Finish (20 to 60°C)		30°C		
							Max. temp. (20 to 60°C)		45°C		
							Max. temp. period (1 to 20 days)		5 days		
						Flow temp. (Increase)	Temp. increase step (+1 to +10°C)		+5°C		
							Increase interval (1 to 7 days)		2 days		
						Flow temp. (Decrease)	Temp. decrease step (−1 to −10°C)		−5°C		
							Decrease interval (1 to 7 days)		2 days		
			Summer mode			On/Off			Off		
						Outdoor ambient temp.	Heating ON (4 to 19°C)		10°C		
							Heating OFF (5 to 20°C)		15°C		
						Judgement time	Heating ON (1 to 48 hours)		6 hours		
							Heating OFF (1 to 48 hours)		6 hours		
						Forced heating ON (-30 to 10°C)			5 °C		
			Water flow control			On/Off			Off		

(Continued to next page.)

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

Main remote controller screen					Parameters	Default setting	Field setting	Notes
	Service menu	Energy monitor settings	Electric heater capacity	Booster heater 1 capacity	0 to 30 kW	2 kW		
				Booster heater 2 capacity	0 to 30 kW	4 kW		
				Immersion heater capacity	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 *17		0.1/1/10/100/1000 pulse/kWh	1000 pulse/kWh		
			Heat meter *17		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		
		Thermo ON output			Zone1/Zone2/Zone1&2	Zone1&2		

*1 The settings related to Zone2 can be switched only when 2-zone temperature control or 2-Zone valve ON/OFF control is active.
*2 The settings related to Zone2 can be switched only when 2 zone temperature control is enabled (when DIP SW2-6 and SW2-7 are ON).
*3 Cooling mode settings are available for ER model only.
*4 When the cylinder unit is connected with a PUMY-P outdoor unit, the mode is fixed to "Normal".
*5 For the model without both booster and immersion heater, it may not reach the set temperature depending on the outside ambient temperature.
*6 The lower limit is -15°C depending on the connected outdoor unit.
*7 The lower limit is -13°C depending on the connected outdoor unit.
*8 The lower limit is -14°C depending on the connected outdoor unit.
*9 On: the function is active; Off: the function is inactive.
*10 EHPT(15-21)X-UKH(L)DW1S Minimum: 5L/min EHPT(15-21)X-UKH(L)DW1S Maximum: 100L/min
EHPT(21-30)X-UKHDW1L Minimum: 7L/min EHPT(21-30)X-UKHDW1L Maximum: 100L/min
*11 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.
*12 Valid only when operating in Heating room temperature.
*13 When DIP SW5-2 is set to OFF, the function is active.
*14 If asterisk (**) is chosen freeze stat function is deactivated. (i.e. primary water freeze risk)
*15 When the cylinder unit is connected with a PUMY-P outdoor unit, the mode is fixed to "Ambient".
16 “” of “*/kWh” represents currency unit (e.g. € or £ or the like)
*17 The default setting is 1 pulse/kWh depending on the connected indoor unit.

Annual Maintenance Log Book

Contractor name		Engineer name	
Site name		Site number	

Cylinder unit maintenance record sheet			
Warranty number		Model number	
		Serial number	

No.	Mechanical	Frequency	Notes
1	Turn OFF water supply, drain DHW tank, remove mesh from strainer clean and replace in strainer. *1		
2	Keep water supply OFF, open hot water taps and check the primary-side expansion vessel charge pressure. Top up if necessary (1 bar).		
3	Keep water supply OFF and check the potable vessel charge pressure. Top up if necessary (3.5 bar).		
4	Keep water supply OFF. In hard water areas de-scaling of the immersion heaters may be required.		
5	Drop the primary/heating system pressure to zero check and if necessary top up the expansion vessel (1 bar). Air valve of expansion vessel is TR-412.		
6	Turn water supply ON, open the pressure relief valve and then the expansion relief valve in turn. Check for unrestricted discharge to the tundish and that the valves reseat correctly. Check there are no blockages in the tundish and associated pipework.		
7	Check and if necessary top up the concentration of anti-freeze/inhibitor (if used in the system).		
8	Top up the primary/heating system using a temporary backflow prevention filling loop and re-pressurise to 1 bar.		
9	Heat system and check pressure does not rise above 3 bar and no water is released from the safety valves.		
10	Release any air from the system.		
11	To check the 3-way valve for inside leaks, confirm that the temperature of the heat emitter does not rise when running the DHW mode.		
	Refrigerant models only [except EHPT20 series]	Frequency	Notes
1	Refer to outdoor unit manual.		
	Electrical	Frequency	Notes
1	Check condition of cables.		
2	Check rating and fuse fitted on the electricity supply.		
	Controller	Frequency	Notes
1	Check field settings against factory recommendations.		
2	Check operation of motorized valves ensure they reseat correctly.		
3	Check battery power of wireless thermostat and replace if necessary.		

Outdoor heat pump unit maintenance record sheet			
Model number		Serial number	

	Mechanical	Frequency	Notes
1	Inspect grill and air inlet for trapped debris/damage.		
2	Check condensate drain provision.		
3	Check integrity of water pipework and insulation.		
4	Check all electrical connections.		
5	Check and record the operation voltage.		

* Checks should be carried out once a year.
*1 Be sure to reattach the mesh after washing.

Note: Within the first couple of months of installation, remove and clean the cylinder unit's filter plus any strainers that are fitted external to the cylinder unit. This is especially important when installing on an existing system.

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
Air vent (Auto/Manual) Drain cock (Primary/Sanitary circuit) Manometer Inlet control group (ICG)*	6 years	Water leakage

Parts which require regular inspection

Parts	Check every	Possible failures
Immersion heater	2 years	Earth leakage causing circuit breaker to activate (Heater is always OFF)
Water circulation pump	20,000 hrs (3 years)	Water circulation pump failure

Parts which must NOT be reused when servicing
* O-ring
* Gasket

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

MAINTENANCE REQUIREMENTS

Unvented hot water systems have a continuing maintenance requirement in order to ensure safe working and optimum performance. It is essential that the relief valve(s) are periodically inspected and manually opened to ensure no blockage has occurred in the valves or discharge pipe work. Similarly cleaning of the strainer element and replacement of the air in the expansion vessel will help to prevent possible operational faults.

The maintenance checks described below should be performed by a competent person on a regular basis, e.g. Annually to coincide with Heat Pump maintenance.

After any maintenance, please complete the relevant service interval record documentation for the installation.

INSPECTION

The immersion heater boss can be used as an access for inspecting the cylinder internally.

SAFETY VALVE OPERATION

Manually operate the temperature/pressure relief valve for a few seconds. Check water is discharged and that it flows freely through the tundish and discharge pipe work. Check valve re-seats correctly when released. NOTE: Water discharged may be very hot!

Repeat the above procedure for the expansion relief valve.

STRAINER

Turn off the cold water supply, Heat Pump and immersion heater. The lowest hot water tap should then be opened to depressurise the system. Remove the Pressure Reducing Cartridge to access the strainer mesh. Wash any particulate matter from the strainer under clean water. Re-assemble ensuring the seal is correctly fitted. DO NOT use any other type of sealant.

DESCALING IMMERSION HEATER

Before removing the immersion heater, the cylinder unit must be drained. Ensure the water, electrical supply and Heat Pump are OFF before draining. Attach a hosepipe to the drain cock having sufficient length to take water to a suitable discharge point below the level of the unit. Open a hot tap close to the unit and open the drain cock to drain the unit.

IMMERSION HEATER REMOVAL

Open the cover to the immersion heater housing and disconnect wiring from immersion heater over-temperature cut-out. Remove the over-temperature cutout by pulling from the terminal connections on the immersion heater. Unscrew immersion heater backnut and remove immersion heater from the unit. A key spanner is supplied with the cylinder unit for easy removal/ tightening of the backnut(s). Over time, the immersion heater gasket may become stuck to the mating surface. To break the seal, insert a round bladed screwdriver into one of the pockets on the immersion heater and gently lever up and down.

Carefully remove any scale from the surface of the element. DO NOT use a sharp implement as damage to the element surface could be caused. Ensure sealing surfaces are clean and seals are undamaged, if in doubt fit a new gasket.

Replace immersion heater ensuring the (right angled) element hangs vertically downwards towards the base of the unit. It may be helpful to support the immersion heater using a round bladed screwdriver inserted into one of the thermal control pockets whilst the backnut is tightened. Replace over-temperature cutout rod into pocket. Replace the immersion heater over-temperature cutout by carefully plugging the two male spade terminations on the underside of the thermostat head into the corresponding terminations on the element. Rewire, check, close and secure immersion heater housing cover.

EXPANSION VESSEL CHARGE PRESSURE

Remove the dust cap on top of the vessel. Check the charge pressure using a tyre pressure gauge. The pressure (with system de-pressurised) should be 0.35MPa (3.5 bar). If it is lower than the required setting it should be re-charged using a tyre pump (Schrader valve type). DO NOT OVER-CHARGE. Re-check the pressure and when correct replace the dust cap.

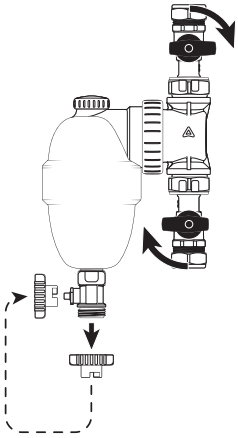
RE-COMMISSIONING

Check all electrical and plumbing connections are secure. Close the drain cock. With a hot tap open, turn on the cold water supply and allow unit to refill. DO NOT switch on the immersion heater or Heat Pump until the unit is full. When water flows from the hot tap, allow to flow for a short while to purge air and flush through any disturbed particles. Close hot tap and then open successive hot taps in the system to purge any air. When completely full and purged, check system for leaks. The heating source (immersion heater and Heat Pump) can then be switched on.

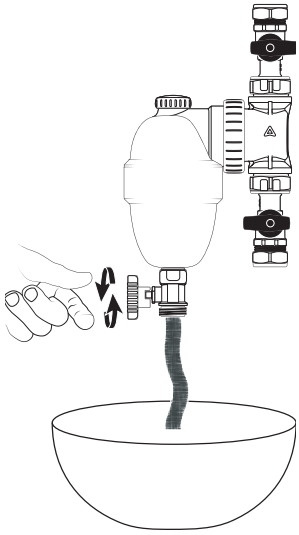
CLEANING THE FERNOX TF-1 SIGMA MAGNETIC FILTER

To clean the filter follow the procedure as described below. If necessary, once cleaning has been completed, re-pressurise the system using the filling loop fitted to the unit.

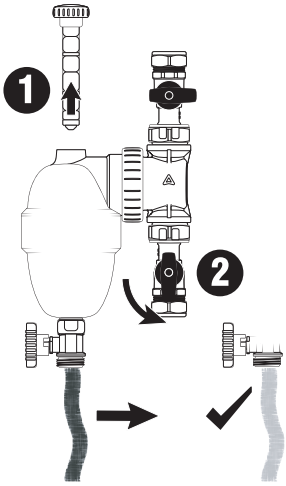
1. Ensure the installation is not operating & the primary pump is OFF



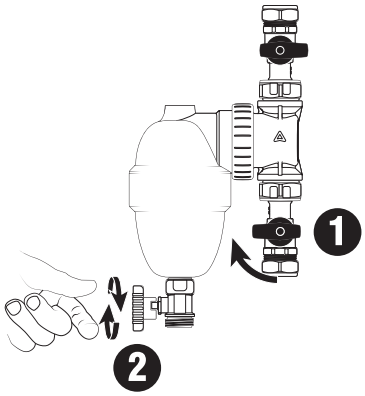
2. Close the inlet/outlet valves. Remove the drain valve cap & locate it on the drain valve.



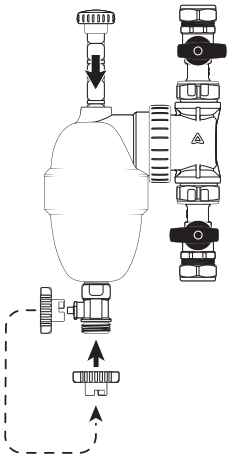
3. With a suitable receptacle in place below turn the valve cap to open the drain valve.



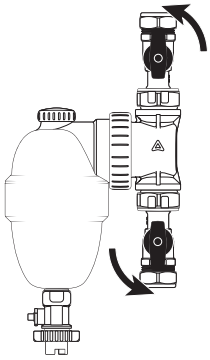
4. Remove the magnet then slowly open the inlet valve to control the flow. Flush out the filter until water runs clear.



5. Close the inlet valve. Close the drain valve.

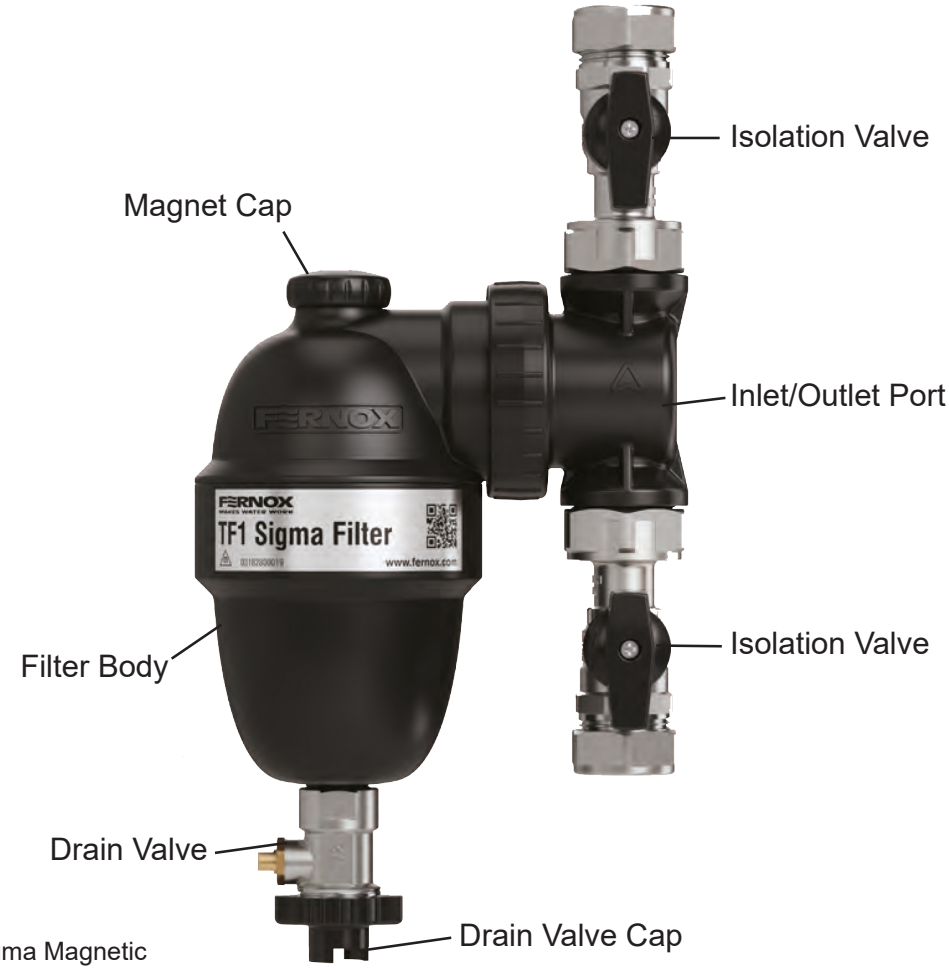


6. Replace the drain valve cap & re-insert the magnet.



7. Open the inlet/outlet valves.

8. The installation can be operated.



Fernox TF-1 Sigma Magnetic Filter assembly

ANNUAL MAINTENANCE LOG BOOK

On completion of any maintenance or service of the pre-plumbed cylinder, the Annual Maintenance Log Book should be filled in to record the actions taken and the date the work was undertaken.

Notes

Notes

Notes

ENVIRONMENTAL INFORMATION

Products are manufactured from many recyclable materials. At the end of their useful life they should be disposed of at a Local Authority Recycling Centre in order to realise the full environmental benefits.

Insulation is by means of an approved CFC/HCFC free polyurethane foam with an ozone depletion factor of zero.

WEEE Declaration

Disposal of Waste Equipment by Users in Private Household in the European Union.

This symbol on the product indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical equipment.

The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.

For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the company where this product was purchased.

TECHNICAL SUPPORT

Residential Heating & Ventilation Telephone: 01707 278666

MELSmart Customer Services & Support: 0161 866 6089

Option 1 - Air Conditioning Technical	Option 4 - Heating Technical
Option 2 - Spares	Option 5 - Returns
Option 3 - Warranty	Option 6 - Product Training & Site Services

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