



FLOW TEMP. CONTROLLER 3 (Cased) PAC-IF041B-E

SUPPLEMENTARY VERSION (FOR COOLING)

This manual is a supplementary version of the main manual – INSTALLATION MANUAL and OPERATION MANUAL of FTC3 (cased) – that comes with the unit. For further information not included in this manual, refer to the main manual.

INSTALLATION MANUAL

For safe and correct use, read this manual thoroughly before installing the FTC3 unit.

FOR INSTALLER

OPERATION MANUAL

For safe and correct use, please read this operation manual thoroughly before operating the FTC3 unit.

FOR USER

English

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"FTC3" is the abbreviation of "Flow Temperature Controller 3", which is described as "FTC3" in this manual.

Mitsubishi Electric is not responsible for the failure of locally supplied parts.

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1. Additional precautions and requirements

Before installing the FTC3 unit, make sure to read all the "Additional precautions and requirements" in this supplemental manual and also the "Safety precautions" in the main manual – INSTALLATION MANUAL and OPERATION MANUAL of FTC3 (cased) – that comes with the unit.

1. To make Cooling mode available, turn Dip SW2-4 to ON. (Refer to "2. Dip switch setting" in this manual.)
2. The auto-adaptation function is disabled in Cooling mode. Only flow temperature control is available.
3. To prevent condensation forming on the emitters, adjust the flow temperature appropriately and set the lower limit of the flow temperature on site.

4. When the outdoor temperature is lower than the preset temperature below which the freeze stat. function is activated, Cooling operation is disabled. To enable Cooling operation overriding the freeze stat. function, adjust the preset temperature. (Refer to Page 36 in the main manual – INSTALLATION MANUAL and OPERATION MANUAL of FTC3 (cased) – that comes with the unit.)

Abbreviations and glossary

Abbreviations/Word	Description
Ambient temperature	The outdoor temperature
Freeze stat. function	Heating to prevent water pipes freezing
DHW mode	Domestic hot water heating mode for showers, sinks, etc
Flow rate	Speed at which water circulates around the primary circuit
Flow temperature	Temperature at which water is delivered to the primary circuit
FTC3	Flow temperature controller, the circuit board in charge of controlling the system
Compensation curve mode	Space heating incorporating outdoor temperature compensation
Heating mode	Space heating through radiators or UFH
Cooling mode	Space cooling through radiators or UFC
Legionella	Bacteria potentially found in plumbing, showers and water tanks that may cause Legionnaires disease
LP mode	Legionella prevention mode – a function on systems with tanks to prevent the growth of legionella bacterium
Refrigerant	A compound used within the heat cycle that goes through a phase change from gas to liquid
UFH	Under floor heating – a system of water carrying pipes under the floor, that warms the floor surface
UFC	Under floor cooling - a system of water that carries pipes under the floor, which cools the floor surface

2. Dip switch setting

■ Operation setting

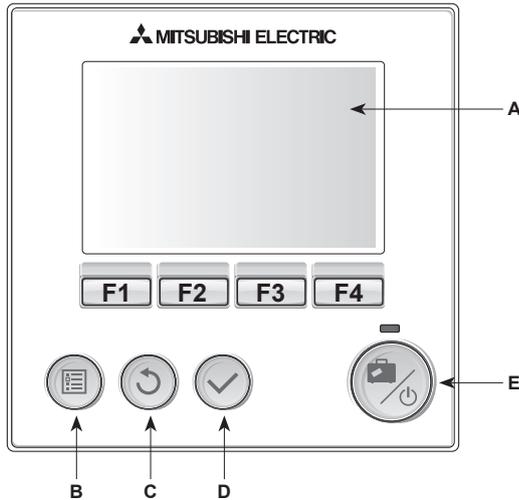
Set Dip SW2-4 to activate or deactivate Cooling mode.

Dip switch 2-4	Setting
OFF	Inactive
ON	Active

When Dip SW2-4 is OFF, Cooling mode is NOT available.

3. Main controller operation

3.1 Main Controller



<Main controller parts>

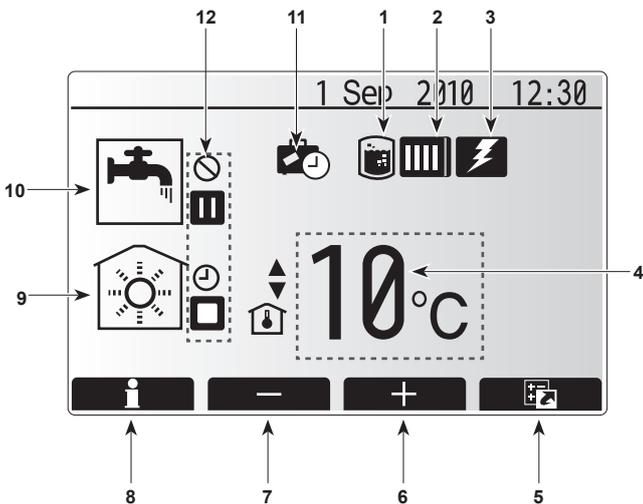
Letter	Name	Function
A	Screen	Screen in which all information is displayed
B	Menu	Access to system settings for initial set up and modifications.
C	Back	Return to previous menu.
D	Confirm	Used to select or save. (Enter key)
E	Power/Holiday	If system is switched off pressing once will turn system on.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

*1

When the system is switched off or the power supply is disconnected, the water circuit protection functions (e.g. freeze stat. function) will NOT operate. Please beware that without these safety functions in operation the water circuit may be damaged.

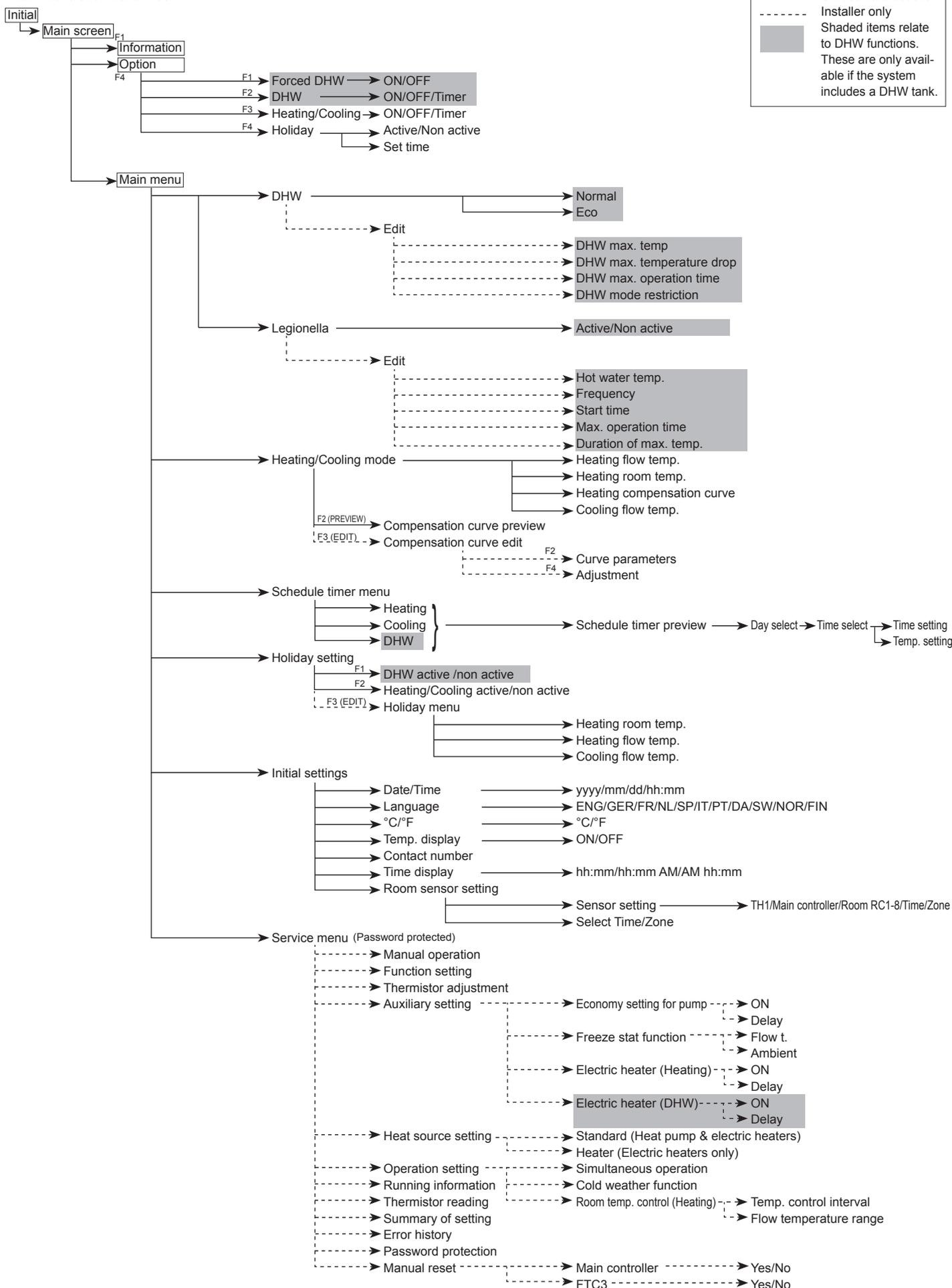
<Main screen icons>

	Icon	Description
1	Legionella prevention	When this icon is displayed 'Legionella Prevention mode' is active (if DHW tank in system).
2	Heat pump	When this icon is displayed the 'Heat pump' is in use.
3	Electric heater	When this icon is displayed the 'Electric heaters' are in use.
4	Target temperature	Target flow temperature
		Target room temperature (only Heating)
		Compensation curve (only Heating)
5	OPTION	Pressing the function button below this icon will display the quick view menu.
6	+	Increase desired temperature.
7	-	Decrease desired temperature.
8	Information	Pressing the function button below this icon displays the information screen.
9	Space heating (cooling) mode	Heating mode
		Cooling mode
10	DHW mode	Normal or ECO mode displayed (if DHW tank in system)
11	Holiday mode	When this icon is displayed 'Holiday mode' time is set.
12	Timer	
	Prohibited	
	Stand-by	
	Stop	
	Operating	



3. Main controller operation

<Main Controller Menu Tree>



3. Main controller operation

■ Setting the Main Controller

After the power has been connected to the outdoor and FTC3 units (see “4.1 Electrical connection” in the main manual – INSTALLATION MANUAL and OPERATION MANUAL of FTC3 (cased) – that comes with the unit) the initial system settings can be entered via the main controller.

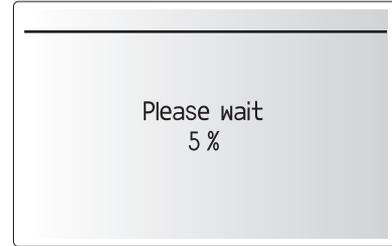
1. Power supply

- i. Check all breakers and other safety devices are correctly installed and turn on power to the system.
- ii. Main controller will automatically start up.
Wait approximately 6 mins whilst the control menus load.

2. Controller settings

When the controller is ready a blank screen with a line running across the top will be displayed.

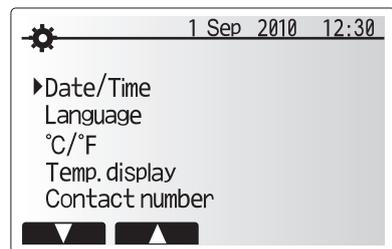
- i. Press button E (Power)
If this is the first time the controller has been switched on you will automatically be directed to the Initial settings menu.
- * When the system is off, freeze stat. function is not performed.



■ Initial Settings

From the initial settings menu the installer can set the language, date/time, temperature unit (°C/°F), emergency contact number, room sensor setting, and display options.

1. Use buttons F1 and F2 to move scroll through the menu list. When the title is highlighted press CONFIRM to edit.
2. Use function buttons appropriate to edit each setting then press CONFIRM to save the setting.
3. For room sensor setting it is important to choose the correct room sensor depending on the heating mode the system will operate in.



Control option (p11)	Corresponding initial settings room sensor
A	Room RC1-8 (only 1 can be selected)
B	TH1
C	Main controller
D	N/A (Option D uses a thermostat with off/on signal only, actual room/space temperature is not detected by FTC3)

NOTE

If you wish to operate in time/zone mode please select this from the room sensor setting menu then edit the schedule under ‘Select Time/Zone’ to reflect which room sensor you want operational for the given time period.

Once the controller initial settings are complete, settings for the main modes can be entered. To return to the main settings menu screen from the initial settings screen, press the BACK button.

■ Main Settings Menu

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

User Level – Short press

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

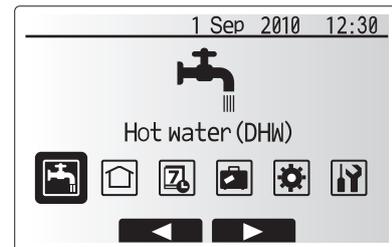
Installer Level – Long press

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

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

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

Use the F2 and F3 buttons to move between the icons. The highlighted icon will appear as a larger version in the centre of the screen. Press CONFIRM to select and edit the highlighted mode.



Icon	Description
	Hot water (DHW)
	Heating/Cooling
	Schedule timer
	Holiday mode
	Initial setting
	Service

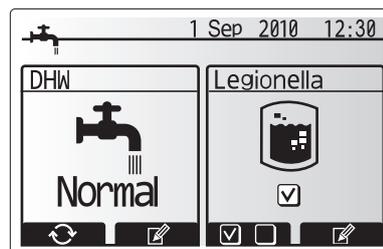
3. Main controller operation

■ Mode 1 - Domestic Hot Water (DHW)/Legionella Prevention

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

<DHW mode settings>

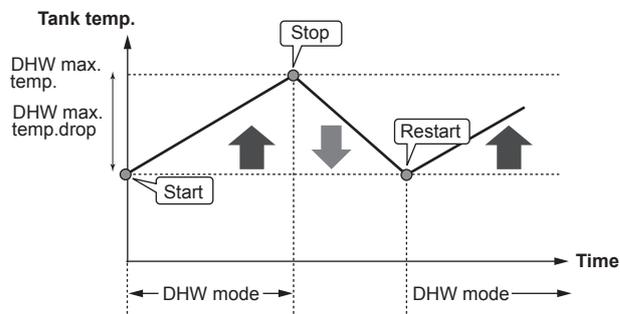
1. Highlight the hot water icon and press CONFIRM.
2. Use button F1 to switch between Normal and ECO heating modes.
3. To edit the mode press F2 to display the HOT WATER (DHW) SETTING menu.
4. Use F2 and F3 keys to scroll through the menu selecting each component in turn by pressing CONFIRM. See the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



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

<Explanation of DHW operation>

- When the tank temperature drops from “DHW max. temp” by more than the “DHW max. temperature drop” (set by installer), DHW mode operates and the flow from the primary heating circuit is diverted to heat the water in the storage tank.
- When the temperature of the stored water reaches the ‘DHW max. temp.’ set by the installer or if the ‘DHW max. operation time’ set by the installer is exceeded DHW mode ceases to operate.
- Whilst DHW mode is in operation hot water is not directed to the space heating/cooling circuit.
- Directly after DHW max. operation time ‘DHW mode restriction’ will operate. The duration of this feature is set by the installer and during its operation DHW mode can not be reactivated, allowing time for the system to deliver hot water to the space heating/cooling if required.
- After the ‘DHW mode restriction’ operation the DHW mode can operate again and tank heating will continue according to system demand.



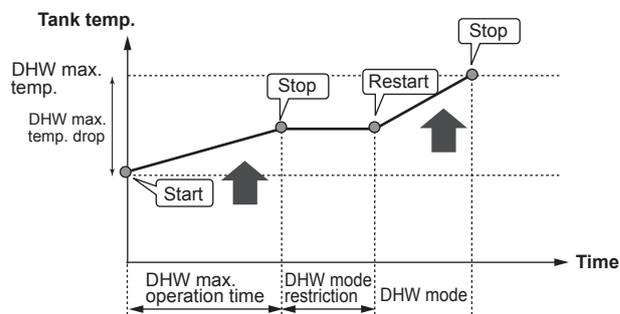
<Eco mode>

DHW mode can run in either ‘Normal’ or ‘Eco’ mode. Normal mode will heat the water circuit quickly using the full power of the heat pump. Eco mode takes a little longer to heat the water circuit but the energy used is reduced. This is because heat pump operation is restricted using signals from the FTC3 based on measured water circuit temperature.

Note:

The actual energy saved in Eco mode will vary according to outdoor temperature.

Return to the DHW/legionella prevention menu.

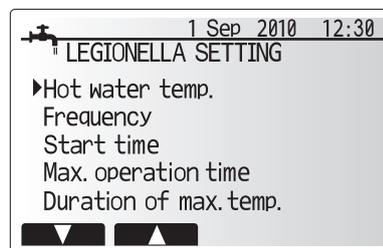


Legionella Prevention Mode settings (LP mode)

1. Use button F3 to chose legionella mode active YES/NO.
2. Use button F4 to edit the legionella function.
3. Use F2 and F3 keys to scroll through the menu selecting each subtitle in turn by pressing CONFIRM. See the table below for description of each setting.
4. Enter the desired number using the function keys and press CONFIRM.

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

Note: System without neither booster heater or immersion heater, ‘Legionella Prevention Mode’ is NOT available.

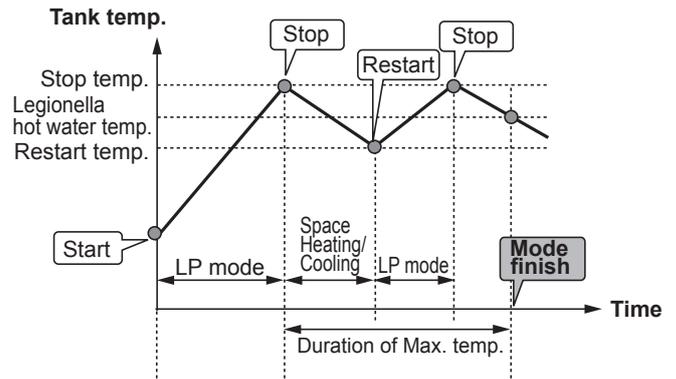


Menu subtitle	Function	Range	Unit	Default value
Legionella hot water temp.	Desired temp of stored hot water	60–70	°C	65
Frequency	Time between LP mode tank heat ups	1–30	day	15
Start time	Time when LP mode will begin	0:00–23:00	-	03:00
Max. operation time	Maximum time allowed for LP mode tank heat	1–5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

3. Main controller operation

<Explanation of Legionella Prevention Mode operation>

- At the time entered by the installer 'Start time' flow of useful heat from the system is diverted to heat the water in the storage tank.
- When the temperature of the stored water exceeds the 'Hot Water temp.' set by the installer (above 65°C) water is no longer diverted to the tank.
- Whilst LP mode is in operation, hot water is not directed to the space heating/cooling circuit.
- Directly after LP mode operation 'Duration of max. temp' will operate. The duration of this feature is set by the installer and during its operation stored water temperature will be monitored.
- If stored water temperature should drop to LP restart temp, LP mode will restart and water flow from the plate heat exchanger will be directed to the tank to boost the temperature. Once the set time for Duration of Max. temp has passed LP mode will not recur for the set interval (set by installer).
- It is the responsibility of the installer to ensure the settings for legionella prevention are compliant with local and national guidelines.



(LP mode : Legionella Prevention Mode)

Please note that LP mode uses the assistance of electric heaters to supplement the energy input of the heat pump. Place an electric heater on the DHW circuit. Heating water for long periods of time is not efficient and will increase running costs. The installer should give careful consideration to the necessity of legionella prevention treatment whilst not wasting energy by heating the stored water for excessive time periods. The end user should understand the importance of this feature.

ALWAYS COMPLY WITH LOCAL AND NATIONAL GUIDANCE FOR YOUR COUNTRY REGARDING LEGIONELLA PREVENTION.

Forced DHW

The forced DHW function is used to force the system to operate in DHW mode. In normal operation the water in the DHW tank will be heated either to the set temperature or for the maximum DHW time, whichever occurs first. However should there be a high demand for hot water 'Forced DHW' function can be used to prevent the system switching to space heating/(cooling) and continue to provide DHW tank heating.

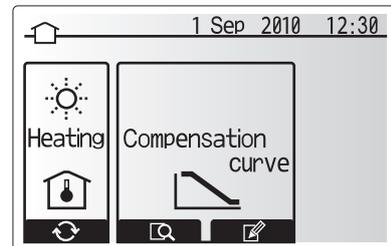
Forced DHW mode is activated by pressing button F1 when the 'Option Screen' is displayed. Following operation the system will automatically return to normal operation.

■ Mode 2 - Heating/Cooling

The heating and cooling menus deal with space heating and cooling using either a radiator or under-floor system depending on the installation.

From the main settings menu

1. Use F1 and F2 buttons to highlight heating/cooling icon then press CONFIRM.
2. The heating and cooling menus will be displayed.
3. To select the sub-menu press the function button below the icon required.
E.g. for MODE change press F1



Heating/Cooling

1. Under this sub-menu the mode of heating or cooling is selected.
2. For Heating, choose between
 - Flow temperature (🔥)
 - Room temperature (🏠)
 - Compensation curve (📈)
3. When Cooling mode is selected, the following operation mode is automatically selected:
 - Flow temperature (🔥)

If using an underfloor system in Cooling mode, do not set the flow temperature too low to avoid formation of condensation.
4. To choose between the different modes for heating and cooling highlight the mode preferred and press select.
5. Press the BACK button to return to the heating and cooling menu.

If compensation curve mode was selected as the heating mode please read the following instructions.

3. Main controller operation

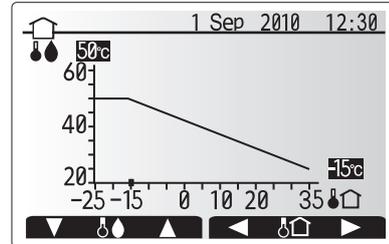
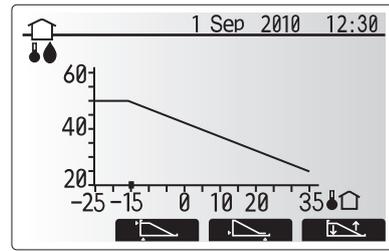
<Compensation curve setting (space heating)>

1. From the heating menu select edit using the F3 function button.
2. The compensation curve setting screen will be displayed.
3. Press F2 to alter the Hi parameter (when flow temp is maximum and outdoor temp is minimum).
4. Press F3 to alter the Lo parameter (when flow temp is minimum and outdoor temp is maximum).
5. Press F4 to add an extra point (adjust).

Pressing F2-4 will cause the relevant edit screen to be displayed. Editing Lo and Hi parameters is done in the same way; please see the following for more detailed explanation of parameter editing.

In the parameter (Lo/Hi) edit screen the flow temperature and outdoor temperature for the compensation curve graph can be set and altered for the 2 extremes of Hi and Lo.

1. Press F1 and F2 to change the flow temperature (y-axis of compensation curve).
2. Pressing F1 will raise the desired flow temperature for the set outdoor temperature.
3. Pressing F2 will lower the desired flow temperature for the set outdoor temperature.
4. Press F3 and F4 to change the outdoor temperature (x-axis of compensation curve).
5. Pressing F3 will lower the outdoor temperature for the set flow temperature.
6. Pressing F4 will raise the outdoor temperature for the set flow temperature.



<Explanation of compensation curve >

During late spring and summer usually the demand for space heating is reduced. To prevent the heat pump from producing excessive flow temperatures for the primary circuit the compensation curve mode can be used to maximise efficiency and reduce running costs.

The compensation curve is used to restrict the flow temperature of the primary space heating circuit dependent on the outdoor temperature. The FTC3 uses information from both an outdoor temperature sensor and a temperature sensor on the primary circuit supply to ensure the heat pump is not producing excessive flow temperatures if the weather conditions do not require it.

<Holiday mode>

Holiday mode can be activated in 2 ways. Both methods will result in the holiday mode activation screen being shown.

Option 1.

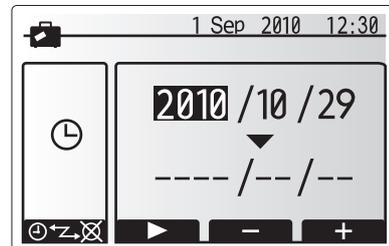
From the main menu screen button E should be pressed. Be careful not to hold down button E for too long as this will turn off the controller and system.

Option 2.

From the main menu screen press button F4. The current settings screen will be displayed. Press button F4 again to access the holiday mode activation screen.

Once the holiday mode activation screen is displayed you can activate/deactivate and select the duration that you would like holiday mode to run for.

- Press button F1 to activate or deactivate holiday mode.
- Use buttons F2, F3 and F4 to input the date which you would like holiday mode to activate or deactivate for space heating (cooling).

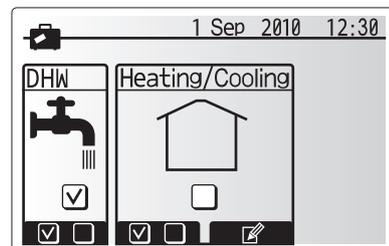


Holiday Mode activation screen

<Editing holiday mode>

To change the holiday mode settings e.g. the flow temp, you must access the holiday mode menu from the main settings menu.

1. From main menu screen press button B.
2. Use buttons F2 and F3 to scroll through menu until Holiday Mode is highlighted.
3. Press CONFIRM button.
4. The holiday mode status screen is displayed.
5. To change the flow temperature or room temperatures on heating mode press button F3.
6. A list of variables will be displayed. Choose the one you wish to modify using buttons F1/F2 then press CONFIRM.
7. Adjust the temperature using buttons F3 and F2 and press CONFIRM button to save changes.



Holiday Mode status screen

3. Main controller operation

■ Mode 3 - Schedule timer

The schedule timer mode allows daily and weekly space heating/cooling and DHW patterns to be entered.

1. From the main settings menu use F2 and F3 to highlight the schedule timer icon then press CONFIRM.
2. The schedule timer sub menu will be displayed. The icons show the following modes;
 - Heating
 - Cooling
 - DHW
3. Use F2 and F3 buttons to move between mode icons press CONFIRM to be shown the PREVIEW screen for each mode.

The PREVIEW screen allows you to view the current settings. Days of the week are displayed across the top of the screen. Where day appears underlined the settings are the same for all those days underlined.

Hours of the day and night are represented as a bar across the main part of the screen. Where the bar is solid black, space heating/cooling/DHW (whichever is selected) is allowed.

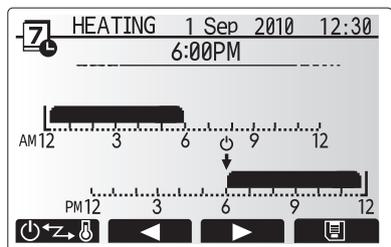
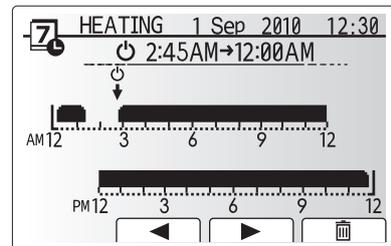
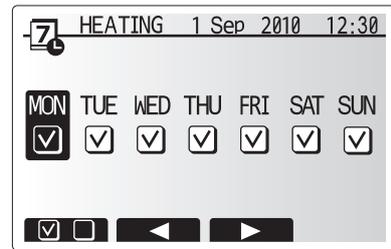
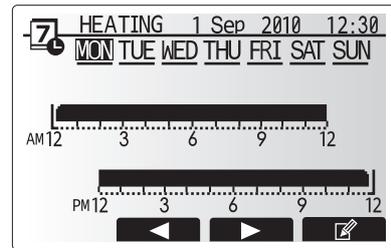
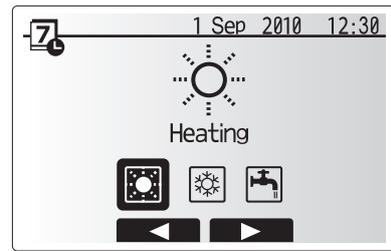
<Setting the schedule timer>

1. In the PREVIEW menu screen press F4 button.
2. First select the days of the week you wish to schedule.
3. Press F2/F3 buttons to move between days and F1 to check or uncheck the box.
4. When you have selected the days press CONFIRM.
5. The time bar edit screen will be displayed.
6. Use buttons F2/F3 to move to the point at which you do not want the selected mode to be active press CONFIRM to start.
7. Use F3 button to set the required time of inactivity then press CONFIRM.
8. You can add up to 4 periods of inactivity within a 24 hour interval.
9. Press F4 to save settings.

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

Notes:

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



3. Main controller operation

Should settings be changed from default please enter 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

			Parameters	Default setting	Field setting	Notes
Main	Option	Forced DHW operation *2	On/Off	Off		
		DHW *2	On/Off/Timer	On		
		Heating/Cooling *5	On/Off/Timer	On		
		Holiday mode	Active/Non active/Set time	Non active		
Setting	DHW	Operation mode	Normal/Eco	Normal		
		DHW max. temp	40°C – 60°C *3	50°C		
		DHW temperature drop	5°C – 30°C	10°C		
		DHW max. operation time	30 – 120 mins	60 mins		
		DHW mode restriction	30 – 120 mins	30 mins		
	Legionella prevention	Active	Yes/No	Yes		
		Hot water temp	60°C – 70°C *4	65°C *4		
		Frequency	1 – 30 days	15 days		
		Start time	00.00 – 23.00	03.00		
		Max. operation time	1 – 5 hours	3 hours		
		Duration of maximum temperature	1 – 120 mins	30 min		
	Heating/Cooling	Operation mode	Heating	Flow temp/Compensation curve/Room temp	Room temp	
			Cooling *5	Flow temp		
		Heating room temp	10°C – 30°C	20°C		
		Heating flow temp	25°C – 60°C	45°C		
		Cooling flow temp *5	5°C – 25°C	15°C		
	Compensation curve	Lo set point	Outdoor ambient temp	-15°C – 35°C	35°C	
			Flow temp	25°C – 60°C	25°C	
		Hi set point	Outdoor ambient temp	-15°C – 35°C	-15°C	
			Flow Temp	25°C – 60°C	50°C	
		Adjust	Outdoor Ambient Temp	-14°C – 34°C	—	
			Flow temp	25°C – 60°C	—	
	Schedule timer	Active	Yes/No	No		
	Holiday	DHW *2	Active/Non active	Non active		
		Heating/Cooling *5	Active/Non active	Active		
		Heating room temp	10°C – 30°C	15°C		
		Heating flow temp	25°C – 60°C	35°C		
		Cooling flow temp *5	5°C – 25°C	25°C		
	Initial settings	Language	ENG/PT/NOR/FIN/NL/DA/IT/SP/SW/GER/FR	ENG		
		°C/°F	°C/°F	°C		
		Temp display	On/Off	Off		
Time display		hh:mm/hh:mm AM/AM hh:mm	—			
Room sensor setting		TH1/Main RC/Room RC1-8/(Time/Zone)	TH1			
Service menu	Manual operation		Supplementary pump or 3 way valve On/Off	Off		
	Thermistor adjustment		-10°C — +10°C	0°C		
	Auxiliary setting	Economy setting for pump	Active/Not active	Active		
		Freeze stat function	Outdoor ambient temperature (3 – 20°C)*1	10 mins		
		Electric heater (Heating)	Space heating: Used/Not Used	Used		
			Electric heater delay timer (5 – 180 mins)	30 mins		
		Electric heater (DHW)	DHW: Used/Not Used	Used		
	Electric heater delay timer (15 – 30 mins)		15 mins			
	Heat source setting		Standard/Heater	Standard		
	Operation setting	Simultaneous operation	Active/Inactive	Inactive		
			Outdoor ambient temperature (-15 – 10°C)	-15°C		
		Cold weather function	Active/Inactive	Inactive		
			Outdoor ambient temperature (-15 – -10°C)	-15°C		
		Room temp control (Heating)	Temperature control interval (10 – 60 mins)	10 mins		
			Flow temperature range (Maximum temp.) (35 – 60°C)	50°C		
Flow temperature range (Minimum temp.) (25 – 40°C)	30°C					

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

*2. Only if the DHW tank is available (Dip-SW 1-3 ON).

*3. The upper limit of the maximum set temperature will decrease to 55°C depending on the settings of Dip switches (SW1-2, 1-4, 1-5, 1-6).

*4. The upper limit of the maximum set temperature will decrease to 60°C or 'Legionella Prevention Mode' will be disabled depending on the settings of Dip switches (SW1-2, 1-4, 1-5, 1-6).

*5. Only if Cooling operation is active (Dip-SW 2-4 ON).

4. Troubleshooting

<Troubleshooting by inferior phenomena>

No.	Fault symptom	Possible cause	Explanation - Solution
1	Cooling mode is NOT available.	Dip SW 2-4 is OFF.	Turn Dip SW2-4 to ON. (Refer to "2. Dip switch setting" in this manual.)
2	The cooling system does not cool down to the set temperature.	<ol style="list-style-type: none"> When the water in the circulation circuit is unduly hot, Cooling mode starts with a delay for the protection of the outdoor unit. When the outdoor temperature is lower than the preset temperature below which the freeze stat. function is activated, Cooling mode does not start running. 	<ol style="list-style-type: none"> Normal operation. To run Cooling mode overriding the freeze stat. function, adjust the preset temperature below which the freeze stat. function is activated. (Refer to "<Frost prevention>" on Page 36 in the main manual – INSTALLATION MANUAL and OPERATION MANUAL of FTC3 (cased) – that comes with the unit.)
3.	The electric heaters are activated shortly after DHW or LP mode starts running after Cooling mode.	The setting time period of Heat-pump Only operation is short.	Adjust the setting time period of Heat-pump Only operation. (Refer to "<Electric heater (DHW)>" on Page 36 in the main manual – INSTALLATION MANUAL and OPERATION MANUAL of FTC3 (cased) – that comes with the unit.)
4	During DHW or LP mode following the cooling mode, error L6 (circulation water freeze protection) occurs and operation stops frequently.	If the preset temperature below which the freeze stat. function is activated is low, error L6 is more likely to occur interrupting operation before the freeze stat. function is activated.	Adjust the preset temperature below which the freeze stat. function is activated. (Refer to "<Frost prevention>" on Page 36 of the main manual – INSTALLATION MANUAL and OPERATION MANUAL of FTC3 (cased) – that comes with the unit.)

5. Supplementary information

Local application factors

- * This FTC3 is designed to connect Mr.Slim/Ecodan inverter outdoor unit of MITSUBISHI ELECTRIC to local systems. Please check the following when designing the local system.
- * MITSUBISHI ELECTRIC does not take any responsibility for the local system design.

Heat exchanger

(1) Withstanding pressure

Designed pressure of outdoor unit is 4.15 MPa. Following must be satisfied for burst pressure of connecting application.
Burst pressure: More than 12.45 MPa (3 times more than designed pressure)

(2) Performance

Secure the heat exchanger capacity which meets the following conditions. If the conditions are not met, it may result in malfunction caused by the protection operation or the outdoor unit may be turned off due to the operation of protection system.

- The evaporation temperature is more than 4°C in max. frequency operation under the cooling rated conditions (*1).
- In case of hot water supply, condense temperature is less than 58°C in max. frequency operation with the outside temperature 7 °C D.B./6 °C W.B.
*1 Outdoor temperature: 35°C D.B./24°C W.B.

(3) Heat exchanger internal capacity

Heat exchanger internal capacity must be within the capacity range shown below. If the heat exchanger below the minimum capacity is connected, it may result in the back flow of liquid or the failure of the compressor.

If the heat exchanger above the maximum capacity is connected, it may result in the deficiency in performance due to lack of refrigerant or overheating of the compressor.

Minimum capacity: $10 \times \text{Model capacity [cm}^3\text{]}$ / Maximum capacity: $30 \times \text{Model capacity [cm}^3\text{]}$

e.g. When connecting to PUAZ-HRP100 VHA
 Minimum capacity : $10 \times 100 = 1000 \text{ cm}^3$
 Maximum capacity : $30 \times 100 = 3000 \text{ cm}^3$

Model capacity	35	50	60	71	100	125	140	200	250
Maximum capacity [cm ³]	1050	1500	1800	2130	3000	3750	4200	6000	7500
Minimum capacity [cm ³]	350	500	600	710	1000	1250	1400	2000	2500

(4) Contamination maintenance

- Wash the inside of heat exchanger to keep it clean. Be sure to RINSE not to leave flux. Do not use chlorine detergent when washing.
- Be sure that the amount of contamination per unit cubic content of heat transfer pipe is less than the following amount.

Example) In case of $\phi 9.52 \text{ mm}$

Residual water: 0.6 mg/m, Residual oil: 0.5 mg/m, Solid foreign object: 1.8 mg/m

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

MITSUBISHI ELECTRIC CORPORATION

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

Authorized representative in EU: MITSUBISHI ELECTRIC EUROPE B.V.

HARMAN HOUSE, 1 GEORGE STREET, UXBRIDGE, MIDDLESEX UB8 1QQ, U.K.

This product is made by Mitsubishi Air Conditioning Systems Europe Ltd.: NETTLEHILL Rd, HOUSTOUN IND ESTATE, LIVINGSTON, EH54 5EQ, UK