



PARTS NAME : HIGH TEMP. THERMISTOR

PARTS No. : PAC-TH011HT-E <G>

SALES MODEL CODE : 7H1THR2G

MITSUBISHI ELECTRIC CORPORATION

# INSTALLATION MANUAL



- Before starting installation, read the following description together with the installation manual included with the unit.
- Please read carefully and observe fully the following safety precautions.

**WARNING** Precautions that must be observed to prevent injuries or death.

- After installation carry out a test run to ensure correct operation, then explain operation method and safety precautions to the end user.
- Tell your customers to keep this installation manual together with the operation manual, and when they give or sell this machine to any other person include this installation manual and operation manual with it.

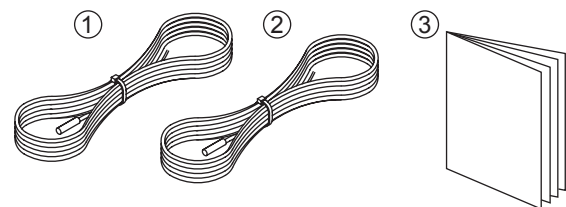
## WARNING

- Before installing any accessories on the unit ensure the unit is isolated from the power supply.
- Connections must be made securely and without tension on the terminals.
- All electrical work should be performed by a qualified technician according to local regulations and the instructions given in this manual.
- The flow temperature from boiler MUST NOT exceed 70 °C (\*1).
- Before running Floor Dry-up function, disconnect IN4 and IN5 wirings. (\*2)

\*1 When the temperature sensed by flow temp. thermistor or return temp. thermistor exceeds 80°C, FTC4 will detect it as overheat error.  
 \*2 High-temperature water produced by boiler operation could flow in and this could cause a big damage to the floor.

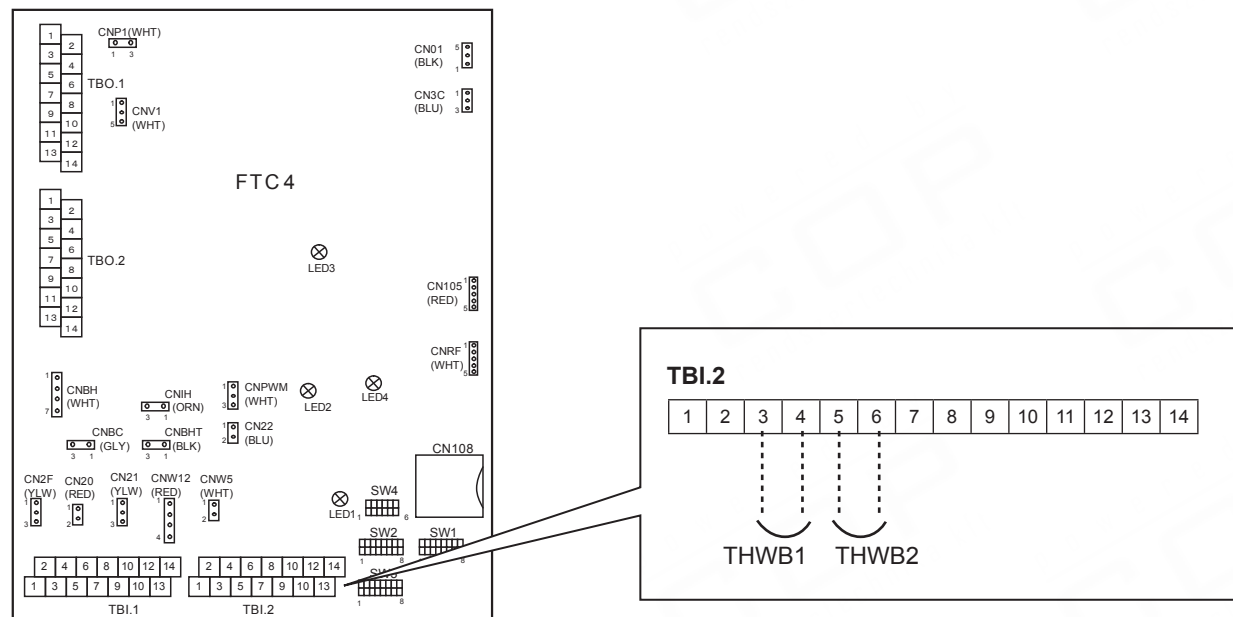
- Make sure to install the boiler that has overheat protection and output flow temperature control.

<Included items>



Item	Piece
① Boiler flow temp. thermistor (THWB1) 5 m, color: gray	1
② Boiler return temp. thermistor (THWB2) 5 m, color: black	1
③ Installation manual	1

<Connecting boiler thermistor>



## 1. System

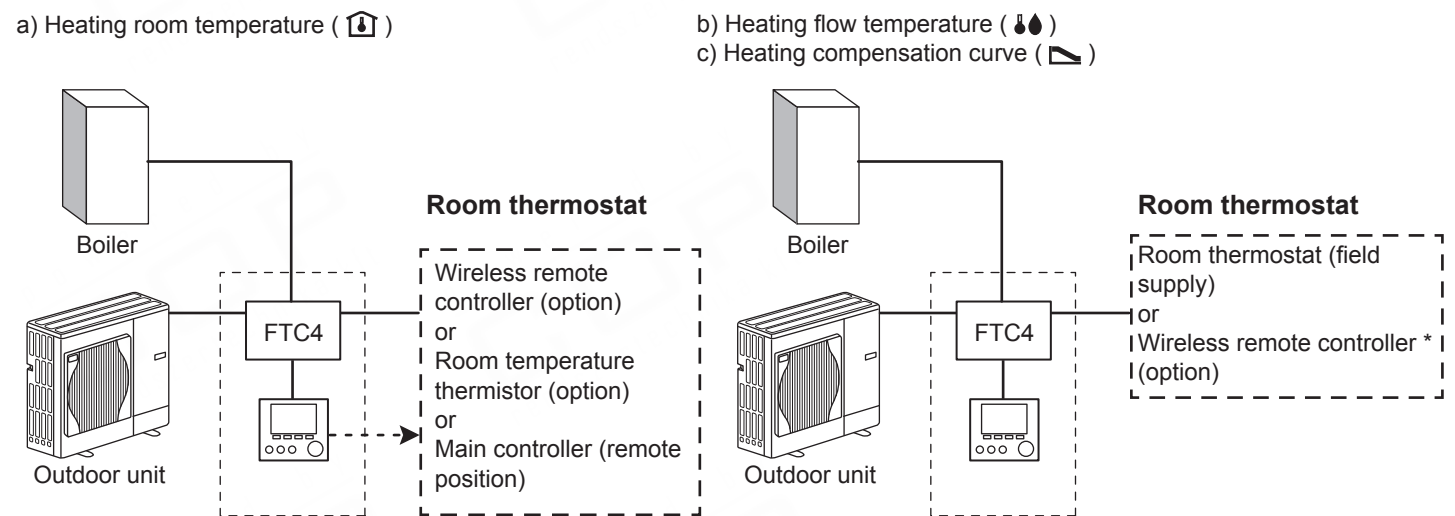
- 1) Heat source can be switched between heat pump and boiler by external input from power supplier or outdoor temperature thermistor.
- 2) Heat source can be switched according to running cost, CO<sub>2</sub> emission, or outdoor temp.
- 3) In case of outdoor unit failure, backup operation is possible with boiler. \*1

\*1 When Hybrid is selected as heat source.  
 When Dip SW2-5 (Automatic switch to backup heat source operation) is set to ON.  
**Note:** FTC4 can control boiler only in space heating mode.

Heat source	Heating	DHW
Heat pump	✓	✓
Boiler	✓	—

### 1.1 Room thermostat connection

**IMPORTANT NOTE**  
 Be sure to connect room thermostat to FTC4.  
 When boiler is running, the heating operation is regulated by the room thermostat connected to FTC4.

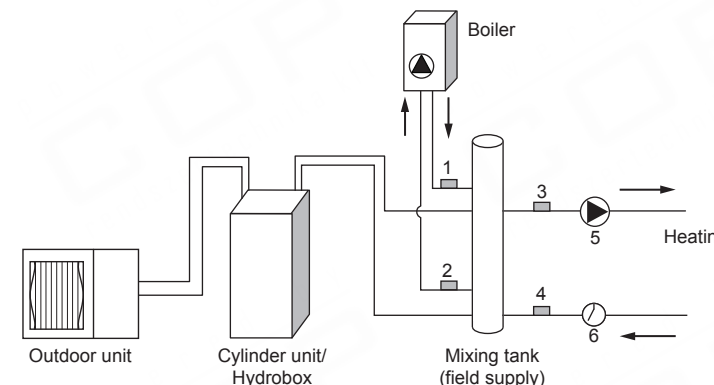


\* Wireless remote controller can be changed to room thermostat.

### 1.2 Pipe work

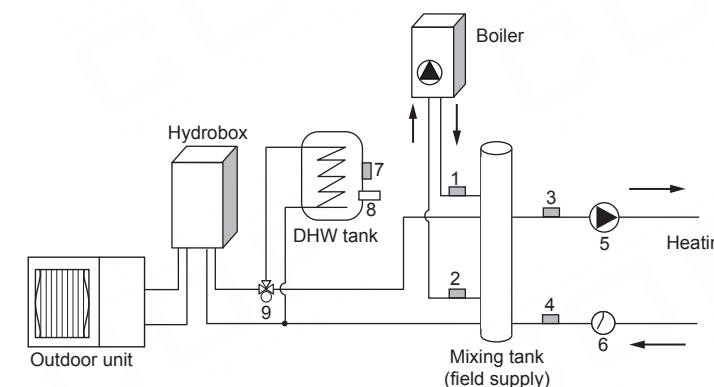
- Boiler and heat pump are connected in parallel.
- Install a mixing tank (field supply).
- Put 2 thermistors in boiler circuit. (THWB1: Flow temp., THWB2: Return temp.)

\* It is recommended to protect the thermistors with heat insulating materials so as not to be affected by ambient temperature.  
 Note: These lead wires of the thermistors must avoid being in contact with pipe surfaces.



Number	Component
1	Boiler flow temp. thermistor (THWB1)
2	Boiler return temp. thermistor (THWB2)
3	Flow temp. thermistor (THW6) (option)
4	Return temp. thermistor (THW7) (option)
5	Circulation pump (field supply)
6	Flow switch (field supply) *1

\*1 For safety protection, it is recommended to install a flow switch.



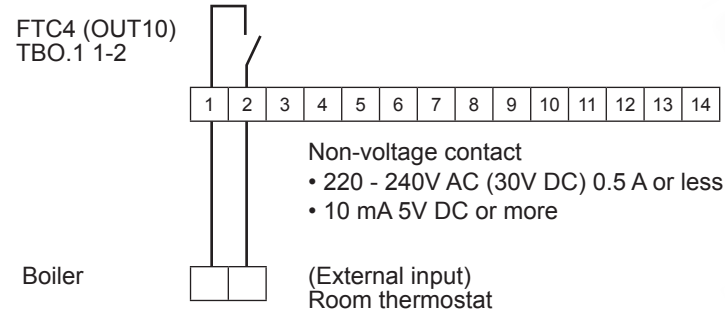
Number	Component
1	Boiler flow temp. thermistor (THWB1)
2	Boiler return temp. thermistor (THWB2)
3	Flow temp. thermistor (THW6) (option)
4	Return temp. thermistor (THW7) (option)
5	Circulation pump (field supply)
6	Flow switch (field supply) *1
7	Tank water temp. (THW5)
8	Immersion heater (field supply)
9	3-way valve (field supply) *2

\*1 For safety protection, it is recommended to install a flow switch.

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

### 1.3 Wiring for boiler control

Connect OUT10 to boiler external input (room thermostat).



### 1.4 Dip switch functions

Set Dip SW1-1 and SW2-6 to ON .

Dip switch	Function	OFF	ON
SW1-1	Boiler	WITHOUT Boiler	WITH Boiler
SW2-5	Automatic switch to backup heater only operation	Inactive	Active
SW2-6	Mixing tank	WITHOUT Mixing tank	WITH Mixing tank

<Signal inputs>

When connecting room thermostat (field supply), wire the cable to IN1.

Name	Terminal block	Item	OFF (Open)	ON (Short)
IN1	TBI.1 1-2	Room thermostat 1 input	Refer to SW2-1.	
IN4	TBI.1 7-8	Demand control input	Normal	Heat source OFF/Boiler operation
IN5	TBI.1 9-10	Outdoor thermostat input	Standard operation	Heat operation/Boiler operation

<Thermistor inputs>

For details on where to install the thermistors, refer to chapter "1.2 Pipe work" in this manual.

Name	Terminal block	Item	Optional part model
THW6	TBI.2 7-8	Zone 1 flow water temp. thermistor (Option)	PAC-TH011-E
THW7	TBI.2 9-10	Zone 1 return water temp. thermistor (Option)	
THWB1	TBI.2 3-4	Boiler flow water temp. thermistor	—
THWB2	TBI.2 5-6	Boiler return water temp. thermistor	

<Outputs>

Connect OUT10 to boiler external input (Room thermostat).

Name	Terminal block	Item	OFF	ON	Signal/Max current
OUT10	TBO.1 1-2	Boiler output	OFF	ON	non-voltage contact • 220 - 240V AC (30V DC) 0.5 A or less • 10 mA 5V DC or more

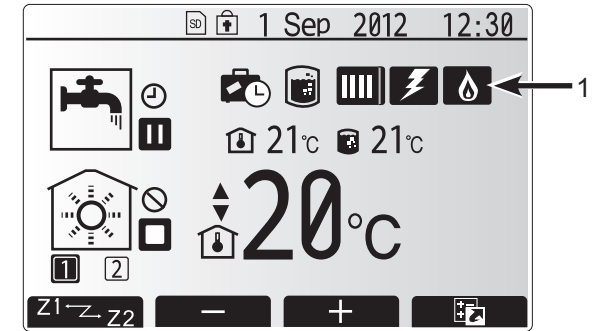
Note:

- OUT10 is separated by basic insulation from other external output signals in FTC4.
- Connect the surge absorber according to the load at site.
- When the wires are wired to adjacent terminals , use ring terminals and insulate the wires.
- Do not splice the wiring to extend or shorten it, or this could affect correct monitoring of each temperature. If the wiring is too long, bundle it with a strap to adjust the length.

### 2. Setting the Main Controller

<Main screen icons>

When boiler is running, icon 1 is displayed.



<Service menu>

(1) Heat source setting

Select heat sources to run.

[Standard] \*1

• Heat pump and Electric heater

[Heater] \*1

• Electric heater only

[Boiler]

• Boiler only (for emergency operation)

**Note: DHW mode is NOT available in this setting.**

[Hybrid]\*1

• Standard (Heat pump and Electric heater) and Boiler

• Switch between heat sources dependent on energy saving calculation (running cost/CO<sub>2</sub> emission) or outdoor ambient temperature. \*2

\*1 FTC4 can switch heat source to Boiler by external signal when Boiler is selected in "External input settings".

\*2 Make detailed settings in "Boiler settings" of "Operation settings".

(2) Operation settings → Boiler settings

• Select prioritised items in energy saving calculation.

[Hybrid settings]

(a) **Outdoor ambient temperature**

Set the ambient temperature to switch to Boiler operation.

(b) **Priority mode**

Ambient: Heat source is switched based on outdoor ambient temperature.

Cost: Heat source is switched based on running cost or outdoor ambient temperature.

CO<sub>2</sub>: Heat source is switched based on CO<sub>2</sub> emission or outdoor ambient temperature.

[Intelligent settings]

Set parameters for energy saving calculation.

The following settings will be applied when "Cost" or "CO<sub>2</sub>" is selected in Priority mode.

(c) **Energy price**

Enter unit prices of electricity, and gas or oil (depending on boiler type) per 1 kWh.

(d) **CO<sub>2</sub> emission**

Enter CO<sub>2</sub> emission amount from electricity or boiler (gas or oil).

(e) **Heat source**

Enter outdoor unit capacity, electric heater capacity, and boiler efficiency.

(3) External input settings

• Select which heat source to run when IN4 or IN5 external input signal is received.

• If Boiler is selected, boiler will start running by receiving external input signals.

External input settings	
Demand control (IN4)	Boiler
	Heat source OFF
Outdoor thermostat (IN5)	Boiler
	Heater

### 3. Error codes

Code	Error	Action
LC	Boiler circulation water temperature overheat protection	Check if the setting temperature of the Boiler for heating exceeds the restriction. Flow rate of the heating circuit from the boiler may be reduced. Check for •water leakage •strainer blockage •water circulation pump function
LD	Boiler temperature thermistor (THWB1, THWB2) failure	Re-attach any thermistors that have become dislodged. Check resistance across the thermistor.
LE	Boiler operation error	Re-attach any thermistors that have become dislodged. Check the status of the boiler.
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
LL	Setting errors of Dip switches on FTC4 control board	For boiler operation, check that Dip SW1-1 is set to ON (With Boiler) and Dip SW2-6 is set to ON (With Mixing Tank). For 2-zone temperature control, check Dip SW2-7 is set to ON (2-zone) and Dip SW2-6 is set to ON (With Mixing Tank).