

March 2010

FASTflo WHC56

Service Manual



Working towards
a cleaner future



WHC56

Service Manual

- This manual must be read by Service personnel repairing the above appliance models.
- Take this manual with you when attending Service study meetings.
- The specifications and contents of this manual may change at any time without prior notification.

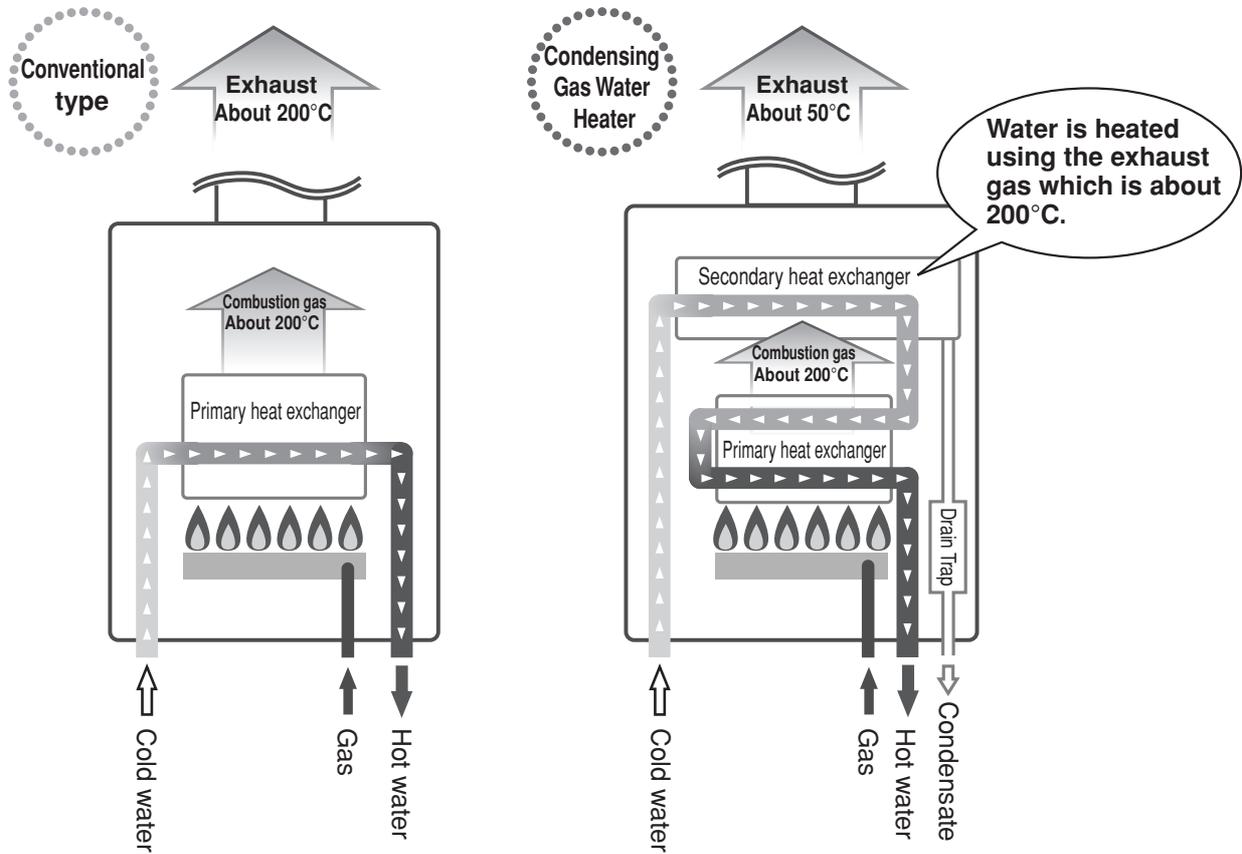
Never short-circuit any safety devices

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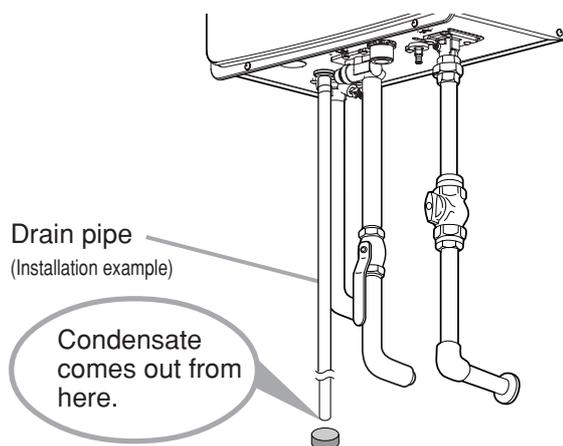
Overview of Condensing Gas Water Heater

This water heater is a high efficiency, fully condensing appliance. Unlike a traditional water heater, a condensing type captures heat from the exhaust gas and uses it to preheat the incoming cold water as it passes through the secondary heat exchanger as illustrated below.



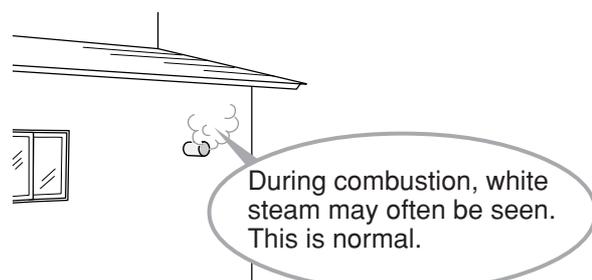
The condensing gas water heater discharges condensate.

When heat from the exhaust gas is collected within the secondary heat exchanger, condensation occurs from moisture in the exhaust gas and the resulting water is discharged from the drain pipe (approx. 100cc/min maximum). It is not a water leak. Do not plug or block the drain line as it must always be allowed to freely flow.



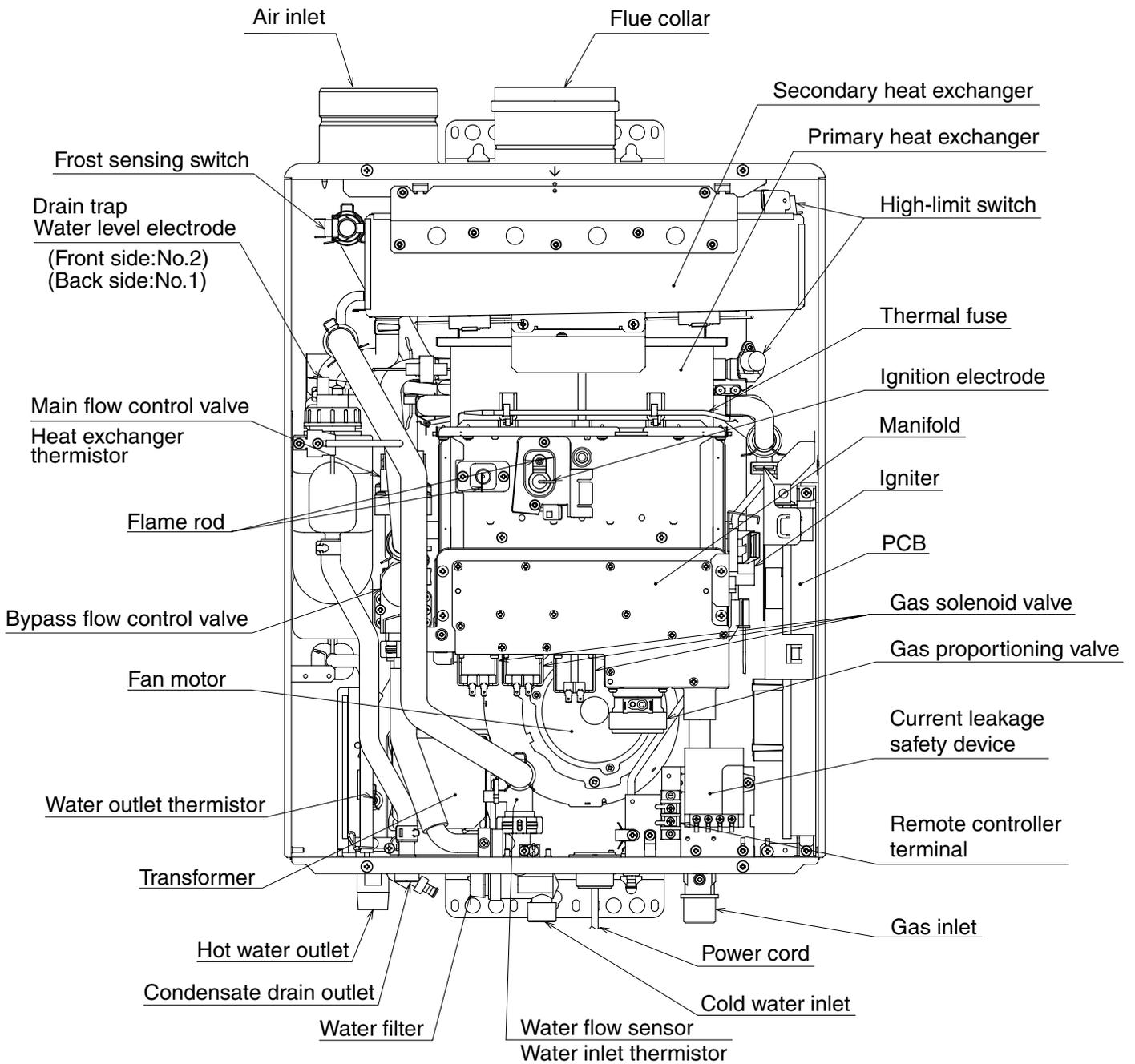
The condensing gas water heater tends to show white steam.

After the exhaust gas passes through the secondary heat exchanger, it becomes low in temperature and moisture rich which tends to produce steam at the vent discharge terminal. This is a normal occurrence.

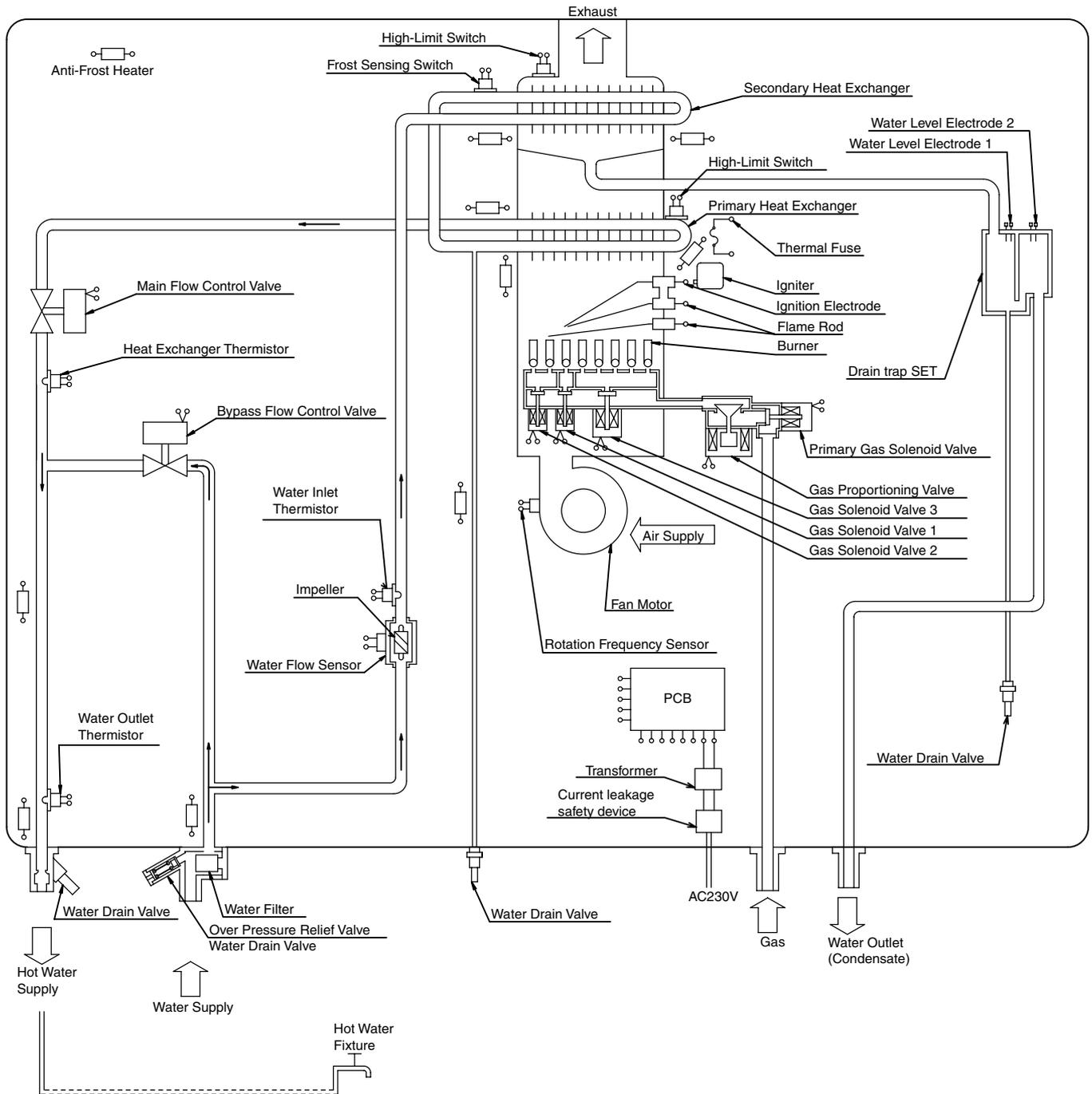


Structural Cross-section of Operation Unit

< WHC56, LWHC56 >



Principle of Operation



■ Explanation of operation

1. Using hot water

- (1) Turn the ON/OFF button on the remote controller to ON. (The ON/OFF button will turn on the light.)
- (2) Open the hot water valve to be used. If the water flow sensor detects a water flow above the minimum operation water flow volume, pre-purge (purging gas remaining in the combustion chamber before ignition) will be carried out for a fixed duration of time. After this the gas solenoid valve will open, the ignition device will activate, and ignition will take place in the burner. (The bypass flow control valve is always waiting in the normally "open" position.)
- (3) When the flame rod (flame sensor) detects a flame, the ignition device will stop sparking.
- (4) The hot water temperature will automatically be adjusted to the temperature selected with the temp. button.
- (5) Close the hot water valve that was used.
- (6) When the water flow sensor detects a water flow below the minimum operation water flow, the gas solenoid valve will close and the flame will go out. Post-purge (purging gas remaining in the combustion chamber after the flame goes out) will be carried out for a fixed duration of time, and then the unit will stop.
- (7) After using, the ON/OFF button on the remote controller should be turned OFF. (The ON/OFF button will turn off the light.)

2. Error Codes

If by any chance the flame rod does not detect a flame or the high limit switch activates, the gas solenoid valve will close and extinguish the flame.

The display will show an error message to inform you of safe operation.

The safe operation reset procedure is to press the ON/OFF button so it turns OFF, and then press it again to turn it ON.

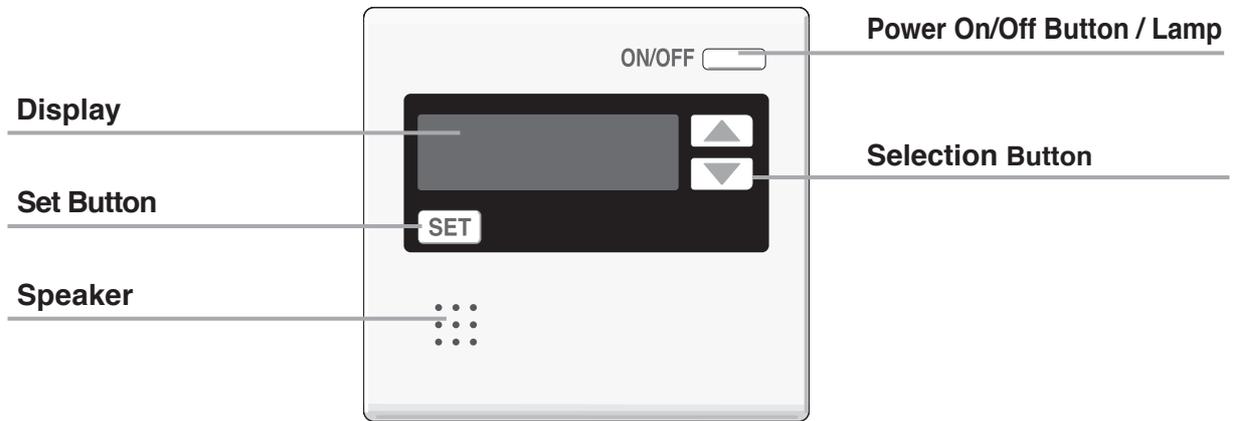
3. Miscellaneous

Before going to bed or at other times when the unit will not be used for a prolonged period of time, be sure to press the ON/OFF button on the remote controllers, make sure that the display has gone off, and then close the primary gas solenoid valve.

Operation Panel, Remote control

Main Remote Controller (RC-7508M)

Part number B285



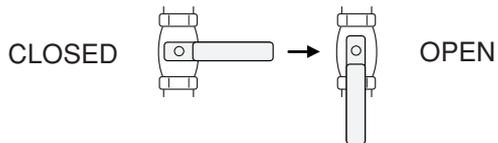
PLEASE NOTE THAT ONE REMOTE CONTROLLER IS REQUIRED PER INSTALLATION

Initial Operation

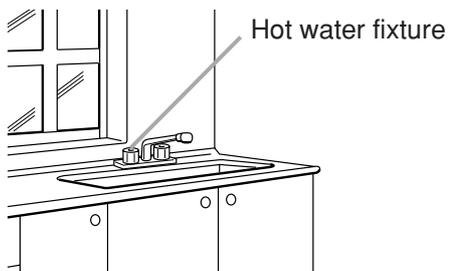
Before the first use of your water heater, make the following preparations.

Follow steps **1 through 4.**

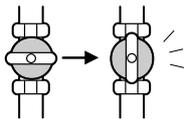
1 Open the water supply valve.



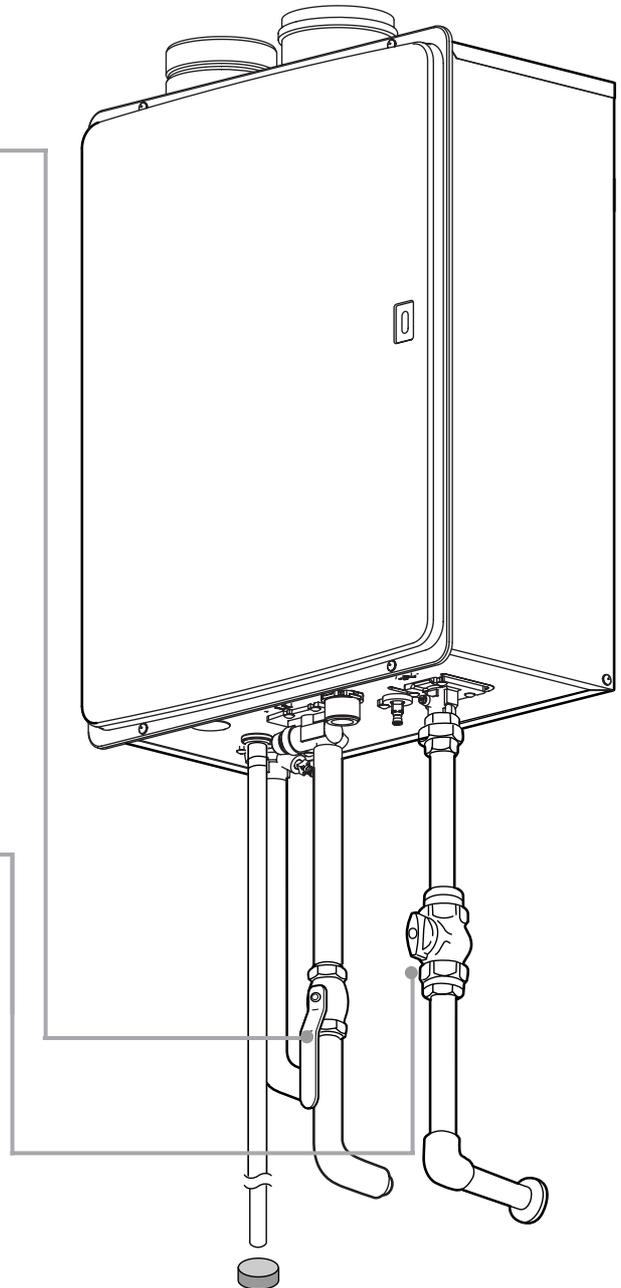
2 Open a hot water fixture to confirm that water is available, and then close the fixture again.



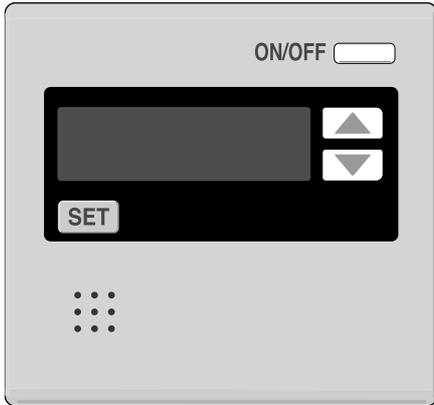
3 Open the gas supply valve.

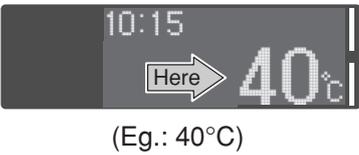


4 Turn on the power.



Setting Hot Water Temperature



On this Display	Operation	Description
1 	Press the ON/OFF  button to turn it "On".	* The ON/OFF  is lit.
2 	Use the   buttons to adjust the temperature.	

WARNING



While the shower is being used, no one other than the user should change the temperature, the power switch must not be turned "off".

This is to prevent scalding if the temperature rises. Conversely, if the temperature drops or the power switch is turned "off", the user may be upset when the water suddenly becomes much colder.

● Approximate hot water conditions ●

																(°C)		
37	38	39	40	41	42	43	44	45	46	47	48	50	55	60	65	70	75	80
Washing dishes, etc.		Shower, hot water supply, etc.				Hot water supply, etc.						High temperature						

- Hot water temperatures are approximations, and may differ from actual temperatures depending on external factors, such as the season and length of piping involved.
- When low temperatures are set (for washing dishes, etc.), if the ambient water temperature is already quite high, it may be difficult to ensure the resultant water temperature is as per the setting.
- When the hot water temperature is adjusted using thermostat-controlled water mixing valves, set the temperature on the remote controller to about 10°C higher than that required to ensure the appropriate temperature.

● When setting high temperatures (60 - 80°C) ●

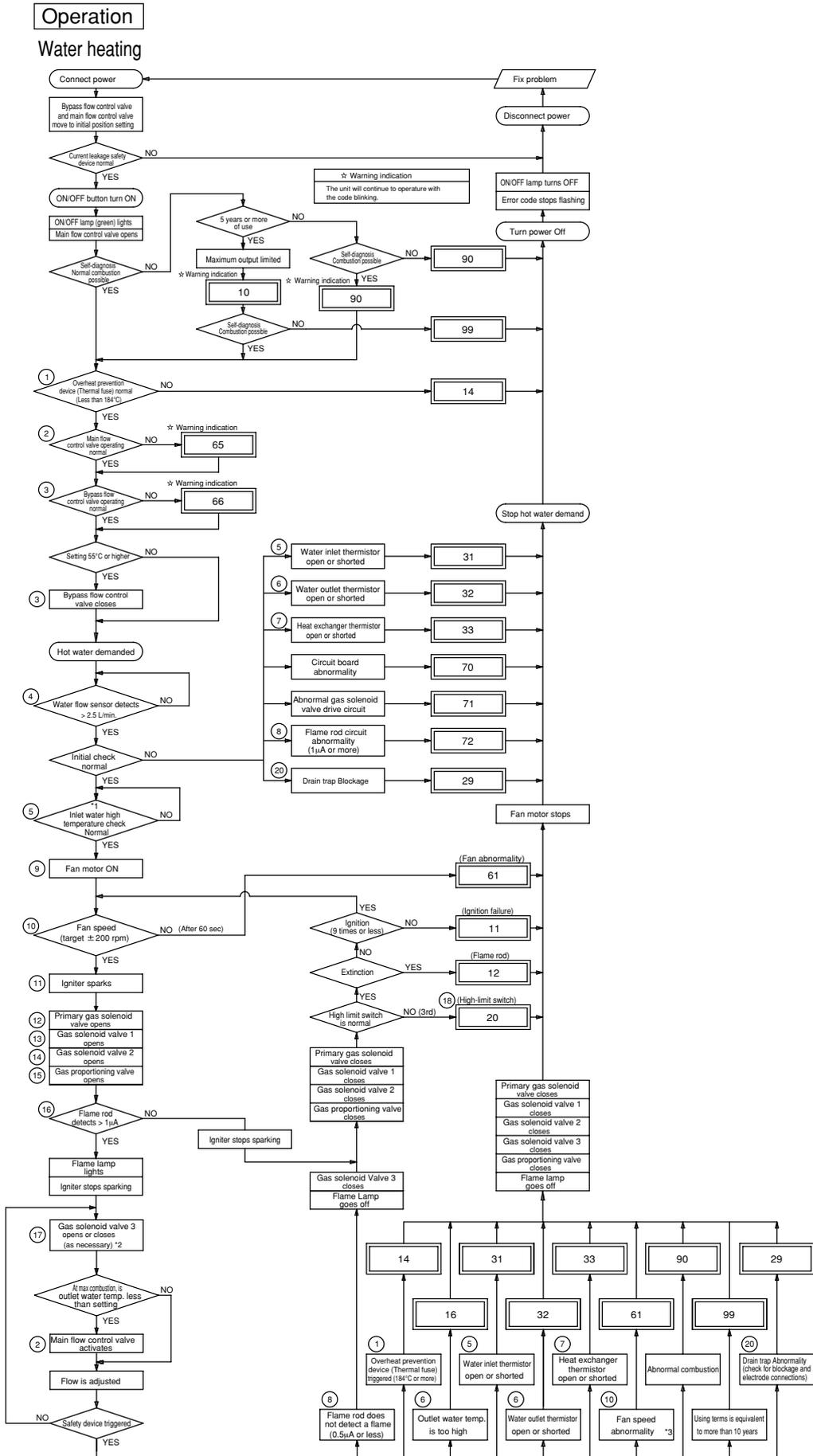
- When a high temperature is set, the readout on the right is shown.
- Please check the temperature displayed before using any hot water.
Be especially careful using any hot water after any previous setting of between 60 - 80°C.



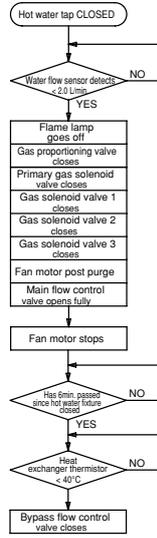
(Eg.: 60°C)

Temperature display flashes for about 10 seconds to indicate high temperature.

Sequence



Shutdown procedure



*1 If the inlet temp is less than 50°C or if the following statements about K are true, the inlet temperature will be normal (YES).

$$K > \frac{\text{Approx. } 1.6 \times 25}{\text{Total water flow (L/min)}} + \text{water inlet temperature (°C)}$$

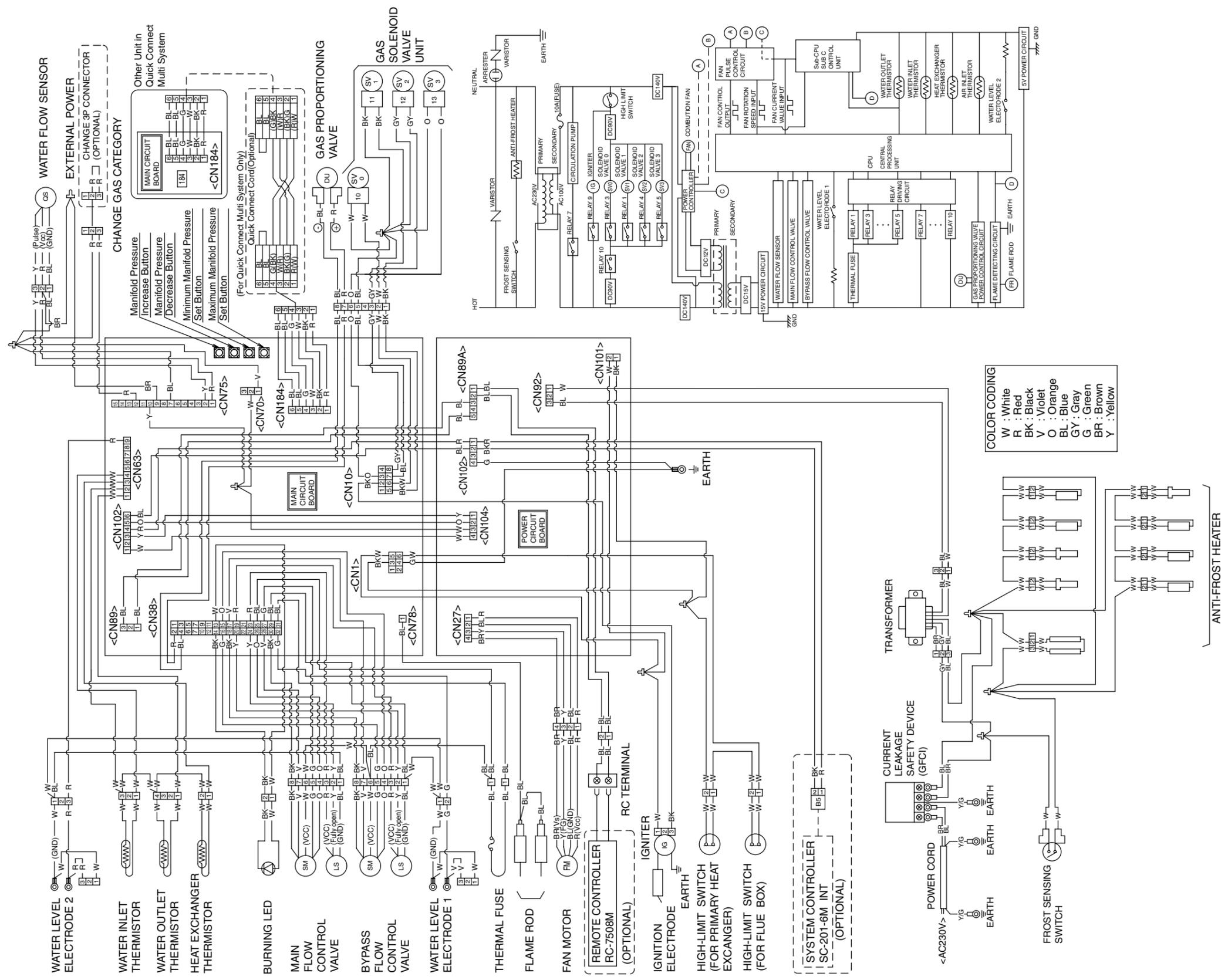
Set temperature	Less than 53°C	53°C or more
K	58°C	Set temp + 10°C

*2

Out put	Over 33.3 kWh	Over 18.1 kWh	Over 11.7 kWh	Over 6.3 kWh	Over 2.8 kWh
Gas solenoid valve 1	ON	ON	ON	/	ON
Gas solenoid valve 2	ON	/	ON	ON	/
Gas solenoid valve 3	ON	ON	/	/	/

*3 When the present fan speed is 500rpm more or less than target speed.

Wiring Diagram and Inspection Flowchart



Checkpoints and Measures if a Breakdown Occurs

■ Error Codes and Checkpoints

Display	Description	Diagnosis Point (Trouble Point)	Remarks
(F) 10	Combustion Abnormality (Joule Drop) (Unit Continues Working)	Check for abnormal combustion. Check flue for blockage or obstruction.	To reset this error code, the power needs to be disconnected and then reconnected.
(F) 11	Ignition Failure (Initial Flame Fault detection)	Check gas supply piping and pressure. Check for igniter spark. Check gas solenoid valves. Check flame rod. Check ground, paying special attention to the ground connection to the circuit board.	
(F) 12	Flame Rod Does Not Detect Flame (Secondary Flame Fault Detection)	Check for accidental extinction of the flame. Check for abnormal combustion, check gas solenoid valves, check flame rod. Check ground, especially on circuit board.	
(F) 14	Overheat Cutoff Fuse (Thermal Fuse) Triggered	Check for melting or damage to the overheat cutoff fuse. Check for improper connection of overheat cutoff fuse.	
(F) 16	Abnormally High Output Temperature	Measure the resistance through the water outlet thermistor. Check for gas proportioning valve trouble. Check gas manifold pressure.	
(F) 20	High Limit Switch Triggered	Check if high limit switch is triggered. Check for improper connection of high limit switch.	To reset this error code, the power needs to be disconnected and then reconnected.
(F) 29	Drain trap Water Level Electrode Abnormality	Check for Drain trap blockage. Check for drain pipe blockage. Check for proper connection of drain trap water level electrode.	Note 2) This model has two pieces of water level electrodes. The front one is "No.2" and the back one is "No.1".
(F) 31	Water Inlet Thermistor Abnormality	Measure the resistance through the water inlet thermistor. Check for an open or short circuit. Check for improper connection of the water inlet thermistor.	
(F) 32	Water Outlet Thermistor Abnormality	Measure the resistance through the water outlet thermistor. Check for an open or short circuit. Check for improper connection of the water outlet thermistor.	
(F) 33	Heat Exchanger Thermistor Abnormality	Measure the resistance through the heat exchanger thermistor. Check for an open or short circuit. Check for improper connection of the heat exchanger thermistor.	
(F) 56	Multi-System CCP Valve Abnormality	Check for an obstruction in the CCP valve. Check for improper connection of multi-system wiring. Check the inlet filter for an obstruction. Check that the main flow control valve is functioning. Check for the failure of the water flow sensor.	This error code is not mentioned in the flowchart.
(F) 59	Heat exchanger flow abnormality	Check for scale build-up in heat exchanger. Check for abnormal combustion. Check flue for blockage or obstruction. Check that flame ignites all across the burner.	This error code is not mentioned in the flowchart.
(F) 61	Fan Motor Abnormality	Check that the fan is rotating. Check for improper connection of the fan. Check the pulse frequency from the fan rotational frequency sensor. Check voltage from circuit board.	
63	Circulation Pump Abnormality	Check for a damage of Circulation Pump. Check for improper connection of the circulation pump. Check for improper Circulation pipe. Check for pump control unit.	Note 1)
(F) 65	Main flow Control Valve Abnormality	Check that the main flow control valve is functioning. Check for improper connection of the valve.	To reset this error code, the power needs to be disconnected and then reconnected.
(F) 66	Bypass flow Control Valve Abnormality	Check that the bypass flow control valve is functioning. Check for improper connection of the valve.	To reset this error code, the power needs to be disconnected and then reconnected.
(F) 70	Circuit Board Abnormality	Circuit board failure.	
(F) 71	Gas Solenoid Valve Drive Circuit Abnormality	Check for damage to the gas solenoid valve drive circuit on the circuit board.	
(F) 72	Flame Rod Circuit Abnormality (Detection of Flame when no flame is present)	Measure the current from the flame rod when there is no flame. Check for a ground fault.	
730	Multi-System Controller Board Error	Malfunction of system controller electrical component board.	During multi-system controller connection only.
(F) 73	Improper Circuit Board Setting (Dip Switch etc.)	Check for proper setting of maintenance writers on circuit board. Check circuit board for damage, check wiring connections to circuit board.	This code is not mentioned in the flowchart. To reset this error code, the power needs to be disconnected and then reconnected.
760	Remote Controller Transmission Abnormality	Check connection from remote controller to circuit board. Check remote controller and circuit board for damage.	This code is not mentioned in the flowchart.
76	Multi-System Controller Communication Error	Check connection from remote controller to circuit board. Check remote controller and circuit board for damage.	Note 1)
	Number of the unit decrease	Check connection from multi-system controller to the unit. SCU failure. Check for the circuit board of each unit.	Note 1)
F 76	Connection Error of Quick Connect Cord	Check for proper connection of quick connect cord. Check for the circuit board of each unit.	This error code is not mentioned in the flowchart.
(F) 90	Combustion Abnormality (Output Drop)	Visually check flame. Check flue for blockage. Check that flame ignites all across the burner.	To reset this error code, the power needs to be disconnected and then reconnected.
(F) 99	Combustion Abnormality (Unit Shuts Off)	Check for abnormal combustion. Check flue for blockage or obstruction.	To reset this error code, the power needs to be disconnected and then reconnected.

*In a Quick Connect (2-unit) Multi-System, "F##" (except F76) indicates an error code from the secondary unit (unit without a remote). F76 refers to the connection error of quick connect cord.

Note 1) System controller connection only.

Note 2) The ON/OFF condition of both water level electrodes can be checked using the maintenance monitors.

When maintenance monitor number 19 reads "000", the conditions of both electrodes are normal. When this monitor reads "011", the conditions of both electrodes are abnormal. When this monitor reads "001", the condition of the only electrode "No. 1" is abnormal. When this monitor reads "010", the condition of the only electrode "No. 2" is abnormal.

■ Error Descriptions and How to Reset

<After Pressing the Power On/Off Button on the Remote Controller>

1. If the Power On/Off lamp does not come on:

Error Code	Possible Causes	Checkpoint	Connector No.	Pin No. & Color Code	Normal Value	How to Fix Problem and Reset Unit
No Error Code	A Fuse is Blown	Check whether the 10A fuse on the circuit board is open.			Closed circuit	Remove the cause of excess current, then replace the 10A fuse.
	Circuit Board Abnormality	Check the 15V output line from the circuit board.	CN-102	2 BK/BL-R	DC14 – 16V	If there is AC 100V supplied to the circuit board, but there is not DC 15V out of it, the circuit board needs to be replaced.
	Connection line Abnormality	Check the 15V output line from the circuit board.	CN-102	6 BL-R	DC14 – 16V	Check for improper or damaged connections between the two boards, and for an open circuit on the circuit board.
	Circuit Board Abnormality	Check the 15V output line from the circuit board.	CN-89	1 BL-BL	DC13 – 16V	If voltage is abnormal, replace the circuit board.
	Remote Control Terminal Block Voltage Abnormality	Check voltage supply from circuit board to remote controller.	CN-89A	1 BL-BL	DC14 – 16V	If voltage is abnormal, replace the circuit board.
Remote Controller Cord Abnormality	Check for open or short circuit.			Closed circuit (not open or shorted)	If there is an open or short circuit, or a ground fault is detected, replace the cord.	

2. The Power On/Off lamp lights, but an error code appears soon after:

Error Code	Possible Causes	Checkpoint	Connector No.	Pin No. & Color Code	Normal Value	How to Fix Problem and Reset Unit
10	Combustion Abnormality (Unit continues burning with error code flashing and drop in heat output)	Check for abnormal combustion. Check flue for blockage or obstruction.				A blinking 10 indicates there has been a loss of gas input, but combustion will continue. In order to reset the unit, the power must be disconnected and then reconnected.
14	Overheat Prevention Device (Thermal Fuse)	Check for melting or improper connection of the overheat prevention device (Thermal fuse).	CN-38	25 BL-BL	2Ω or less	If the overheat prevention device (Thermal fuse) has fused, it has been exposed to temperatures in excess of 184°C. First fix the cause of the high temperature exposure (hole in heat exchanger, etc.) and then replace the overheat prevention device (Thermal fuse).
760	Remote Controller Transmission Abnormality	Check remote controller and circuit board. Check connection of remote control cord and cord to circuit board. Check remote control cord for a short or open circuit, or for a ground fault.	CN-89A	1 BL-BL	DC14 – 16V	If there is a voltage abnormality, replace the circuit board.
90	Combustion Abnormality (Output fail)	Check for abnormal combustion. Check flue for blockage or obstruction. Check the cause of output fail.			Closed circuit (no open or short)	If an open or short circuit or a ground fault exists, replace Remote Control cord. If output fail is detected, the error code will flash and combustion stops. This error code can be reset by turning the water heater OFF on the operation panel. Remove the cause of the abnormal combustion.
99	Combustion Abnormality (Warning Indication) (Unit Shuts Off)	Check for abnormal combustion. Check flue for blockage or obstruction.				Check maintenance monitor No.48. If the fan has increased its speed by 101 % (3P : 104 %), the error code will flash but combustion continues. If the fan has increased its speed by 102 % (3P : 105 %), the error code will flash and combustion stops.
99	Combustion Abnormality (Unit Shuts Off)	Check for abnormal combustion. Check flue for blockage or obstruction.				If this error code is displayed and the water heater has been in use for 5 years, the unit has reached the end of its life cycle and should be replaced.

<During Regular Operation>

1. Fan does not begin rotating when hot water is being demanded:

Error Code	Possible Causes	Checkpoint	Connector No.	Pin No. & Code Color	Normal Value	How to Fix Problem and Reset Unit
No Error	Water Flow Sensor Abnormality	Check maintenance monitor no. 14	CN-63	4 W-W	2.5 L/min.	If the flow monitor indicates higher than the minimum, the circuit board will need to be replaced. OK if $K > 1.6 \times 25 \text{Flow Rate (L/min.)} + \text{inlet water temp. (}^\circ\text{C)}$, where $K = 58^\circ\text{C}$ for 53°C or lower temperature setting, $K = \text{Set Temp (}^\circ\text{C)} + 10^\circ\text{C}$ for 53°C or more setting. Also check thermistor temperature characteristics.
	Inlet Water Temperature is too High	Check inlet water temperature				
20	High Limit Switch Triggered	Check if high limit switch is triggered or improperly connected.	CN-1	3 BK-W	1Ω or less	Make Sure there is no flame left over in the burner. Check for short or open circuit. Reset unit by turning power off and on. Replace high limit if code remains.
29	Drain Trap Water Level Electrode abnormality	Check maintenance monitor no. 19			Both Electrodes OFF [000]	If no.19 is [001] : Only Electrode No.1 is ON, [010] : Only Electrode No.2 is ON, [011] : Both Electrodes are ON, check the following : Check for Drain Trap blockage. Check for drain pipe blockage. Check for proper connection of Drain Trap water level electrode. Check for short circuit of Drain Trap water level electrode cord. If normal value, replace the circuit board.
31	Water Inlet Thermistor Abnormality	Check the resistance through the thermistor. Check for open or short circuit or improper connection.	CN-63	4 W-W	2	Compare to temperature characteristic list on pgs. 16. Check for open or short circuit or for an improper connection.
32	Water Outlet Thermistor Abnormality	Check the resistance through the thermistor. Check for open or short circuit or improper connection.	CN-63	1 W-W	2	Compare to temperature characteristic list on pgs. 16. Check for open or short circuit or for an improper connection.
33	Heat Exchanger Thermistor Abnormality	Check the resistance through the thermistor. Check for open or short circuit or improper connection.	CN-63	3 W-W	2	Compare to temperature characteristic list on pgs. 16. Check for open or short circuit or for an improper connection.
70	Circuit board Abnormality	Detection of circuit board abnormality.				Disconnect the electrical power, then reconnect electrical power to the water heater to reset the system. If the circuit board abnormality is continuous, replace the circuit board.
71	Gas Solenoid Valve Drive Circuit Abnormality	Check for damage to the gas solenoid valve drive circuit on the circuit board.				Disconnect the electrical power, then reconnect electrical power to the water heater to reset the system. If the error code "71" is continuous, replace the circuit board.
72	Flame Rod Abnormality (Flame detected when no flame present)	Measure the current from the flame rod when there is no flame. Check for a ground fault.	CN-78	1 BL-Burner case	GND	10kHz – 100kHz
				1 BL-Electrode	F-rod	DC0.5μA or less

2. Fan rotates normally, but no flame ignites on the burner:

Error Code	Possible Causes	Checkpoint	Connector No.	Pin No. & Code Color	Normal Value	How to Fix Problem and Reset Unit
11	Ignition Failure	Igniter failure	CN-1(W), 10(BK)	5 W-BK	2 AC90V – 110V	Replace Igniter
		Check primary gas solenoid valve	CN-10	6 W-BL	7 DC80V – 100V	Gas Solenoid Valve typical resistance: 1075Ω to 1440Ω.
		Check gas solenoid valve 1		5 BK-BL	7 DC80V – 100V	Gas Solenoid Valve typical resistance: 1235Ω to 1660Ω.
		Check gas proportioning valve	CN-38	2 R-BL	4 DC0.3V – 15V	Current value changes depending on the load. Proportioning valve resistance: 55Ω – 75Ω.

3. A flame ignites on the burner, but it goes out immediately:

Error Code	Possible Causes	Checkpoint	Connector No.	Pin No. & Code Color	Normal Value	How to Fix Problem and Reset Unit
11	Flame Detecting Circuit abnormality (Initial flame fault detection)	Check the flame rod	CN-78	1 BL-Burner case	GND	10kHz – 100kHz
		Check the current from the flame rod		1 BL-Electrode	F-rod	DC1μA or more
		Check for a disconnected ground from the circuit board				
11	Gas Supply Pressure or Manifold Pressure Abnormality	Check gas supply and manifold pressures				See pg.24
		Check gas proportioning valve	CN-38	2 R-BL	4 DC0.3 – 15V	Current value changes depending on the load. Proportioning valve resistance: 55Ω – 75Ω.

4. Flame goes out while hot water is being supplied:

Error Code	Possible Causes	Checkpoint	Connector No.	Pin No. & Code Color	Normal Value	How to Fix Problem and Reset Unit
12	Flame Rod Triggered (Doesn't sense flame during operation)	Check the flame rod	CN-78	1 BL-Burner case GND	10kHz – 100kHz	Visually confirm that a flame ignites, check wiring connections to the flame rod, and check wiring connections to gas proportioning and gas solenoid valves. Check for a bad contact or a bad connection between the flame rod and circuit board. Check for a ground fault in the unit, especially the circuit board ground. Check for damage or improper connection of the ground wire between the circuit board and the metal case of the unit.
		Check the current from the flame rod		1 BL-Electrode rod	DC1µA or more	
12	Gas Supply Pressure or Manifold Pressure Abnormality	Check for a disconnected ground from the circuit board	CN-38		See pg. 24	Check that the input is proper for the load. Current value changes depending on the load. Proportioning valve resistance: 55Ω – 75Ω.
		Check gas supply and manifold pressures				
		Check gas proportioning valve		2 R-BL	DC0.3 – 15V	

5. Fan does not begin rotating, or the fan rotation is abnormal when hot water is being demanded:

Error Code	Possible Causes	Checkpoint	Connector No.	Pin No. & Code Color	Normal Value	How to Fix Problem and Reset Unit	
61	Fan Motor abnormality	Check that the fan is rotating and check the pulse frequency from the fan rotational frequency sensor. Check for improper connection of the fan. Check voltage from circuit board.	CN-27	4 BR-BL	2	DC7V – 48V	Confirm the measured fan speed by Maintenance Monitor (No.10). If the fan motor does not rotate, but voltage is normal, then the fan motor should be replaced. If the voltage is abnormal, replace the circuit board. If the fan motor is rotating and if the voltage is normal, but there is a "61" error code, then the fan motor should be replaced.
				1 R-BL	2	DC10V – 14V	
				3 Y-BL	2	150Hz – 400Hz (4 pulse/rev.)	

<During Regular Operation>

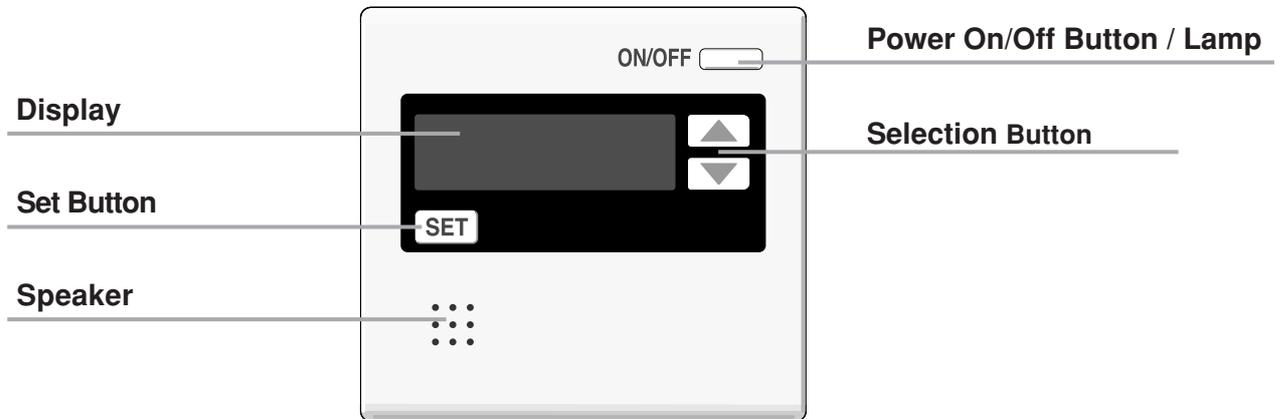
6. Temperature control problem:

Error Code	Possible Causes	Checkpoint	Connector No.	Pin No. & Code Color	Normal Value	How to Fix Problem and Reset Unit	
No Indication	Gas supply pressure or manifold pressure abnormality	Check gas supply and manifold pressures.			See pg. 24		
				25 BL-O	26		DC1 – 16V
65	Main Flow Control Valve Abnormality	Check main flow control valve. Check for improper connection of the valve.	CN-38	25 BL-G	27	DC1 – 16V	During Operation.
				25 BL-V	28	DC1 – 16V	During Operation.
				25 BL-BK	30	DC1 – 16V	During Operation.
				24 Y-BL	29	DC1V or less	When valve is fully open.
66	Bypass Flow Control Valve Abnormality	Check that the bypass flow control valve is functioning. Check for improper connection of the valve.	CN-38	25 BL-O	15	DC1 – 16V	During Operation.
				25 BL-G	16	DC1 – 16V	During Operation.
				25 BL-V	17	DC1 – 16V	During Operation.
				25 BL-BK	18	DC1 – 16V	During Operation.
				20 Y-BL	29	DC1V or less	When valve is fully open.
				16	Abnormally High Output (temperature is too hot)	Check the resistance of the water outlet thermistor.	CN-63
		Check gas proportioning valve.	CN-38	2 R-BL	4	DC0.3 – 15V	Check for short or open circuit or improper connection of wiring to valve.

Water Inlet / Water Outlet / Heat Exchanger Thermistor Temperature Characteristics

Temperature (°C)	0	10	20	30	40	50	60	70	80
Resistance (kΩ)	23.7	15.5	10.3	7.0	4.9	3.5	2.5	1.9	1.4

■ Main Remote Control
●(RC-7508M)



■ Displaying the Maintenance Monitor

The Power On/Off Button can be set to either "ON" or "OFF" - unit operation will not be affected by this setting. However, be sure to set the Power On/Off Button to "ON" after turning on the power.

<Display procedure>

1. Press and hold both the up [▲] and down [▼] selection buttons simultaneously for more than five seconds.
2. "Maintenance Monitor" display will appear along with the data no. and data.
3. Displaying data and switching data no.
 - (1) Press the up [▲] selection button to switch display to the next item no. Press the down [▼] set button to switch display to the previous data no.
 - (2) Press the selection button to change to the ten's digit. Use the selection buttons [▲] and [▼] in the same manner as (1) to make changes.

* If more than one Quick connect Multi System is installed, the mode shifts to the mode for switching the device No. by pressing the selection buttons.
If the device No. is switched by pressing selection buttons [▲] and [▼], the data of each device is displayed.

device No.	data
00	Master (device to which the remote controller is connected)
01	Slave (device to which the remote controller is not connected)

The temperature of hot water etc. cannot be changed while Maintenance Monitors are displayed.

<Returning to Normal Mode>

1. To return to normal mode, press and hold both up [▲] and down [▼] of selection buttons simultaneously more than two seconds. The unit will also return to normal mode if no buttons are pressed for 10 minutes.

<Displaying the Error code history>

1. After switching to the maintenance monitor mode, press the [▼] selection button to switch to error code history 1.
2. Up to eight error histories are stored in memory from error code history 1 (most recent) to error code history 8.
3. If there is no error history, "000" will appear in the data.
4. To clear the error code history from memory, exit maintenance monitor mode, push the Power On/Off Button to "OFF", and press and hold the [▼] select button for more than 5 seconds (tone will sound). Error code history will not be cleared by turning off the power.

■ Maintenance Monitor List

Data No.	Item	Data (Display Reading x Multiplier)		Minimum Value for Indication	Remarks
		Multiplier	Unit		
02	2E ⁺ gas judgement result	[ab : cd]			Under judgement [000] 2L[1100],2H[1300] 2L(Dip switch)[1109], 2H(Dip switch)[1309]
03	Total Plug-in Time	X 100	hour	100 hours	Disp. Range [000] – [1300]
04	Total Combustion Time	X 1	hour	1 hour	Disp. Range [000] – [999]
05	Total Combustion Time	X 1000	hour	1000 hours	Disp. Range [000] – [1999]
07	Number of Ignition Times	X 10	time	10 times	Disp. Range [000] – [999]
08	Number of Ignition Times	X 10000	time	10000 times	Disp. Range [000] – [1999]
10	Fan Rotational Frequency	X 10	rpm	25 rpm	
14	Total Flow Rate	X 0.1	L/min.	0.1 L/min.	
*2 15	Heat Exchanger Flow Rate	X 0.1	L/min.	0.1 L/min.	
18	Output (%)	X 1	%	1 %	
19	Drain Trap Water Level Electrode	[x : xx]			<ul style="list-style-type: none"> • Both electrodes : OFF [000] • Electrode No.1 only : ON [001] • Electrode No.2 only : ON [010] • Both electrodes : ON [011]
*1 20	Calculated Fan Speed	X 10	rpm	25 rpm	
30	Water Inlet Thermistor Temperature Reading	X 0.1	°C	0.5°C	
31	Water Outlet Thermistor Temperature Reading	X 0.1	°C	0.5°C	
32	Heat Exchanger Thermistor Temperature Reading	X 0.1	°C	0.5°C	
47	Simple Self-diagnosis Counter	[0 : xx]	Decimal		[000] – [036]
48	Initial Fan Speed Correction	X 1	%	1 %	2H/2E ⁺ [000] – [105], 3P[000] – [102]
49	Final Fan Speed Correction	X 1	%	1 %	2H/2E ⁺ [000] – [105], 3P[000] – [102]
50	FF No.	X 0.1		0.1	
51	FF+FB No.	X 0.1		0.1	
52	Output	X 0.1		0.1	
60	Position of Main Flow Control valve	X 2	step		[000] (Open) – [1350](Closed) step
61	Position of Main Flow Control valve limiter	—			Open [000], Unlimited [AAA], Fully closed [315], Error [EEE]
62	Position of Bypass Flow Control Valve	X 2	step		[000] (Open) – [1350](Closed) step
63	Position of Bypass Flow Control Valve limiter	—			Open [000], Unlimited [AAA], Fully closed [315], Error [EEE]
87	Circuit Board ID1: Product 1	[1 : xy]			A=101,B=102,C=103,...Z=126
88	Circuit Board ID2: Product 2	[2 : xy]			A=201,B=202,C=203,...Z=226
89	Circuit Board ID3:Version	[3 : xy]			A=301,B=302,C=303,...Z=326
90	Proportioning valve output capacity	X 1			[000] – [1000]
91	Error Code History 1	Most Recent Error Code		— — —	<p>If the same error code is repeated, it will appear in the history list twice.</p> <p>If it is repeated more than twice, it will only appear twice.</p>
92	Error Code History 2	Next Most Recent Error Code		— — —	
93	Error Code History 3	Next Most Recent Error Code		— — —	
94	Error Code History 4	Next Most Recent Error Code		— — —	
95	Error Code History 5	Next Most Recent Error Code		— — —	
96	Error Code History 6	Next Most Recent Error Code		— — —	
97	Error Code History 7	Next Most Recent Error Code		— — —	
98	Error Code History 8	Next Most Recent Error Code		— — —	

*1 A difference in the calculated (#20) and the measured (#10) fan speeds of ±500 or less is normal.

*2 To view the maintenance monitors of another unit in a multi-system installation, press the SET button (while in monitor mode) to switch to the desired unit.

■ Drain Trap Replacement

Replace the Drain trap following the procedures below.

1. Disconnect electrical power to the unit.
2. Drain water from the Drain trap using the drain valve located underneath the water heater (Fig.).
3. Disconnect the relay connector(2 positions), remove the fixing screw, and remove drain hose 1 and drain hose 2. (Fig.). Remove the Drain trap by lifting up on it to disengage the tabs.
Note) When removing the drain hoses, make sure that water in the hose does not come into contact with any part of your body. If it comes into contact with any part of your body, rinse it off immediately with fresh water. Do not allow water from the drain hoses or drain trap to leak into the water heater.
4. Connect the neutralizer drain hose (with pin clip) to the new Drain trap and install the one.
Reconnect drain hose 1 and drain hose 2 as well as the relay connector.(2 positions)
Note) Drain hose 1 and drain hose 2 must be oriented so that there is a downwards slope and there are no bends or kinks in the hoses.
Do not connect the wires labeled as "Connector (Factory Use Only)" as shown in Fig. .

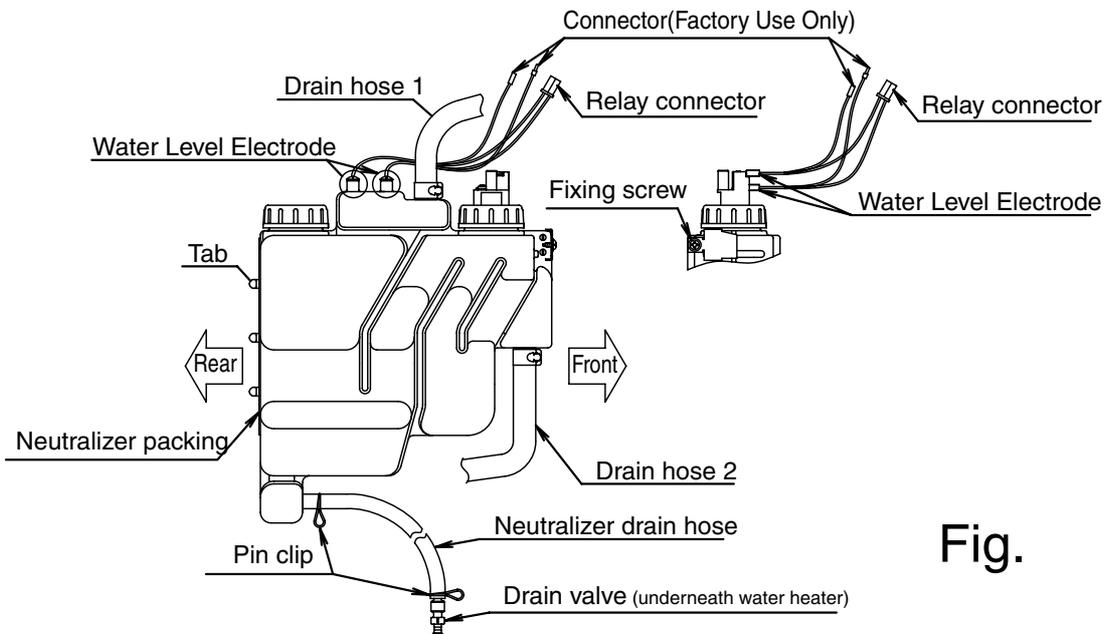


Fig.

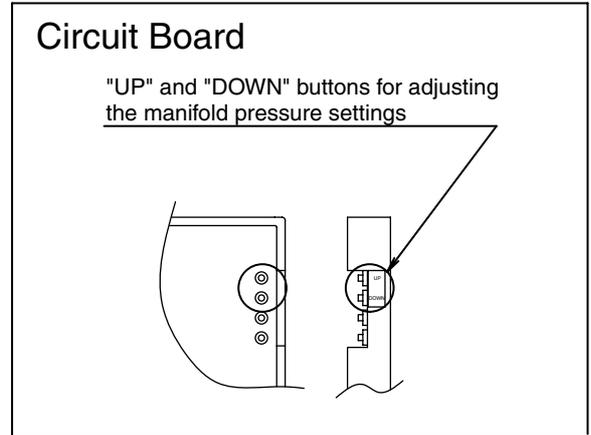
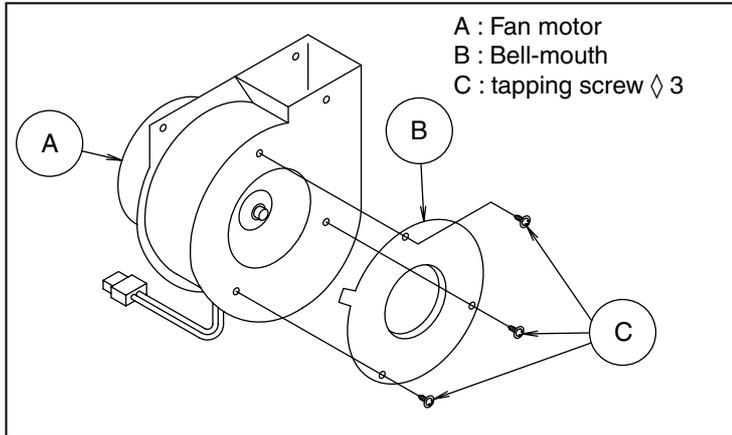
⚠ Danger

Prior to initial start up, make sure that you fill the drain trap unit with water. This is to prevent dangerous exhaust gases from entering the building. Failure to fill the drain trap unit could result in severe personal injury or death. Refer to the installation manual.

■ Fan Motor Replacement

When changing the fan motor.

When Bell-mouth(B) is installed in the old fan motor, install Bell-mouth (B) as shown in figure to maintain the proper air volume. When you change the fan motor, please remove this part from the old fan motor, and install in the new fan motor. After changing the fan motor, please follow the procedure "Circuit Board Settings". The water heater will not operate properly unless you carry out this step.



Circuit Board Settings

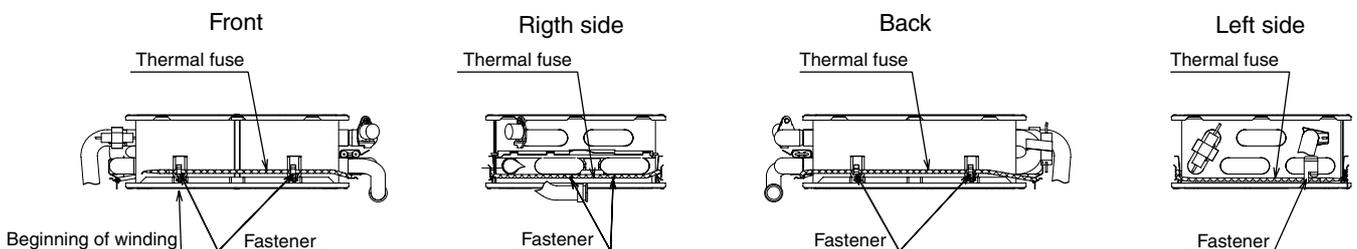
1. Check that there is no water flow.
2. Within the first ten minutes of connecting electrical power, before turning it on, press and hold both the "UP" and "DOWN" buttons on the Circuit Board as illustrated.
3. In about 10 seconds after the above mentioned setting 2., the fan motor rotation as well as the gas solenoid valve opening/closing continues simultaneously. Please release the "UP" and "DOWN" buttons after confirming it. This operation continues for about 3 minutes after the release of buttons until it ceases automatically.

Note .

Termination operation will stop in about 3 minutes.
If the fan motor does not operate, repeat Procedures 1 - 3 again.
The switches on the board will not respond while the fan is operating.

■ Thermal Fuse Replacement

How to install a thermal fuse



• Install a thermal fuse according to the following procedures.

1. Start winding the thermal fuse from the front left fastener.
2. Wind the thermal fuse according to the order shown in illustration.
In this case, be sure to attach the thermal fuse to the fastener on each surface so that it does not loosen.
Caution is also necessary on sections where the thermal fuse is passed through.

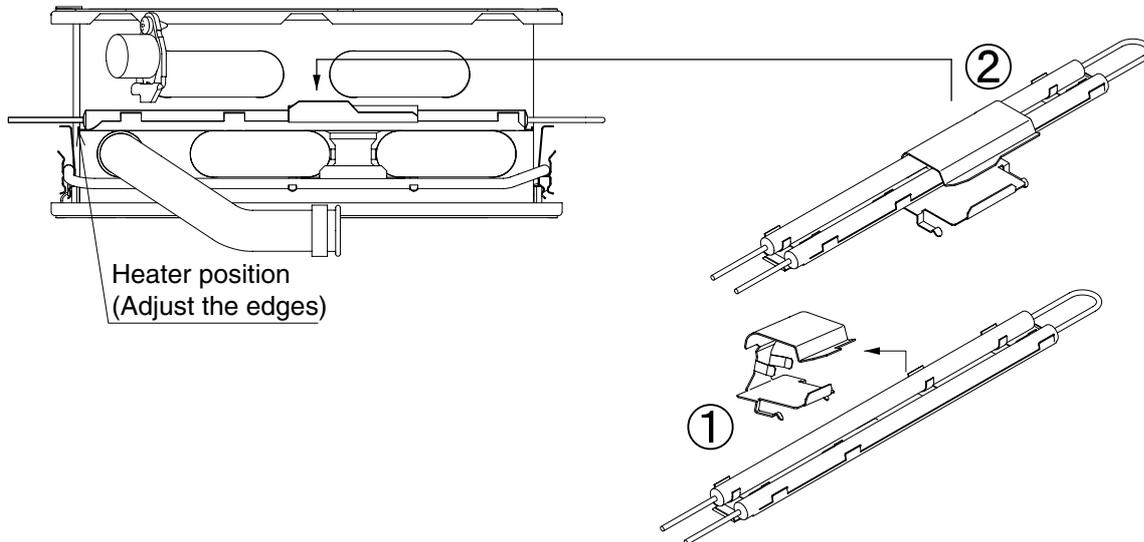
Caution

1. Thermal fuse may become broken if it is bent suddenly or twisted with strong force.
Make sure that the bending remains smaller than 30mm in radius.
2. Be sure to keep the thermal fuse from coming in direct contact with the freezing prevention heater.

■ Anti Frost Heater Replacement

Attention in after-sale service

Please check the original position and re-install to this position.
The anti-frost heater shall be installed with the method described in the diagram below.



- ① Adjust the heater and the heater fastener.
- ② Push the heater fastener all the way to the right side of the heat exchanger described in the diagram.

■ Manifold Gas Pressure Adjustment

NOTE:

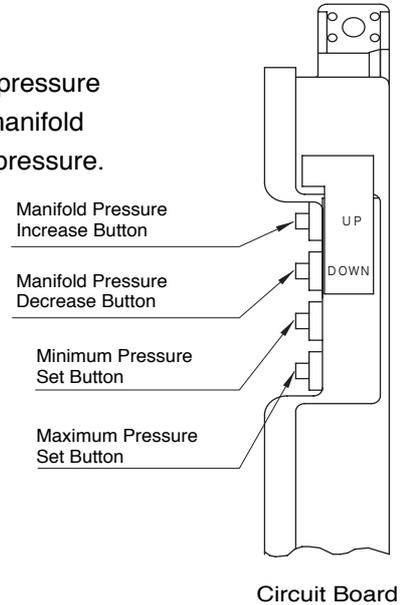
* Use the following procedure to adjust the manifold gas pressure only if it can be done with a high flow rate through the unit.

- (1) With a manometer or pressure gauge connected to the manifold pressure tap, press and hold the maximum pressure set button. Use the manifold pressure increase and decrease buttons to adjust to the correct pressure.
- (2) Press and hold the minimum pressure set button. Use the manifold pressure increase and decrease buttons to adjust to the correct pressure.
- (3) Repeat steps (1) and (2) until both are at the correct pressure.

Maximum and Minimum Burner Setting Pressure

Model Name	Category ※	Supply Pressure (mbar)	Burner Setting Pressure (mbar) (Front Cover off)	
			Max Value	Min Value
WHC56	I ₂ H	20	9.4	2.6
	I ₂ L	25	9.3	2.5
	I ₂ E ⁺	20 / 25	9.3	2.5

※ Please check the Gas Category on the Data Label, before setting.



Maintenance

(1) Troubleshooting and Repair.

A. Unit does not work at all (operation lamp does not light up).

1. Is the current leakage safety device activated?



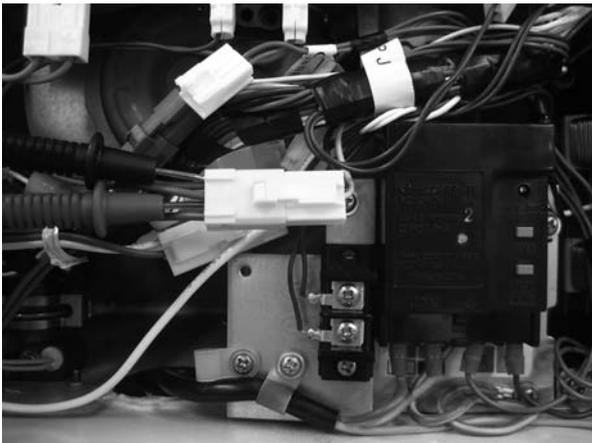
Check the operation of the current leakage safety device.

(1) When the ground-fault lamp of the current leakage safety device lights, press the reset button or disconnected power plug to cancel. If the current leakage safety device cannot be canceled, check for electric leakage around power receptacle, etc.

<Caution>

Checking electric leakage can be dangerous. Perform with caution.

2. Is the current leakage safety device normal?



Check the secondary side of the current leakage safety device.

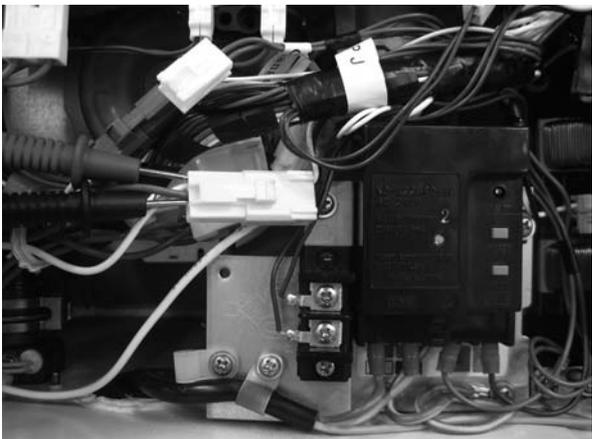
(1) Measure the voltage between Gray 2 and Blue 3 of the 3P relay connector.

Normal	AC207 - 253V
--------	--------------

Yes	Continue to "3. Is the transformer...".
-----	---

No	Replace the current leakage safety device or power cord.
----	--

3. Is the transformer normal?



Check the secondary side of the transformer.

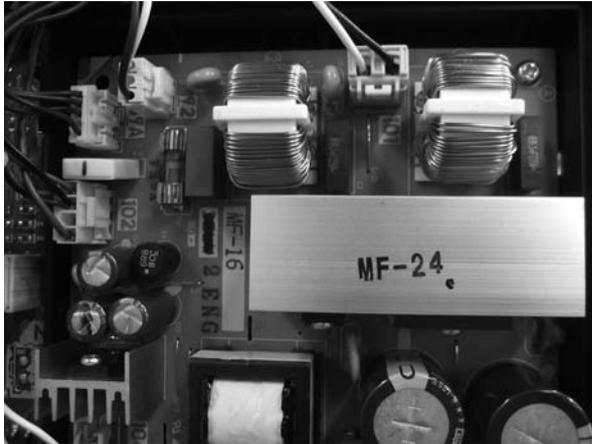
(1) Measure the voltage between White 1 and Blue 2 of the 3P relay connector.

Normal	AC90 - 110V
--------	-------------

Yes	Continue to "4. Blown Current Fuse".
-----	--------------------------------------

No	Replace the transformer, current leakage safety device or power cord.
----	---

4. Blown current fuse.



Check for blown current fuse on the circuit board.

- (1) Remove the power plug (current leakage safety device).
- (2) Visually check the current fuse (10A) on the circuit board to see if it is blown.

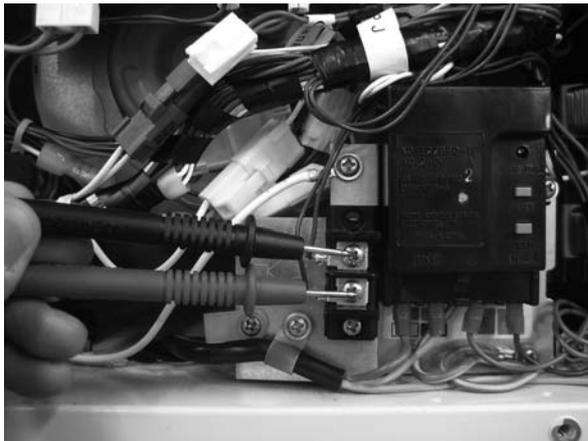
Normal	Not blown
--------	-----------

Yes	Continue to "5. Remote control error".
-----	--

No	Replace the current fuse (10A).
----	---------------------------------

If the fuse blows again, check for short circuits.

5. Remote control error.



Check the voltage of the remote control terminal block.

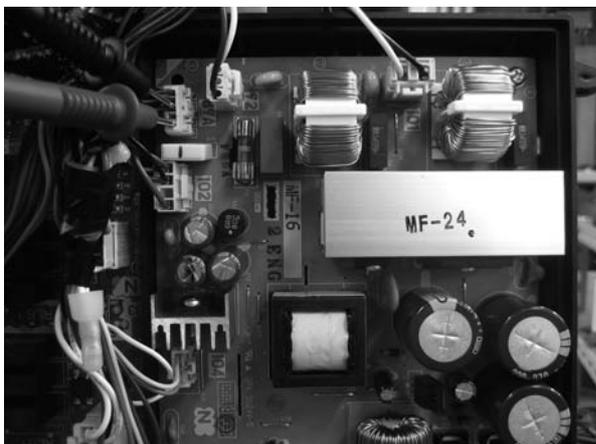
- (1) Measure the voltage of the terminal block.

Normal	DC 14 - 16V
--------	-------------

Yes	Replace the remote controller or remote control cord.
-----	---

No	Continue to "6. Circuit board error".
----	---------------------------------------

6. Circuit board error.



Check the output of circuit board.

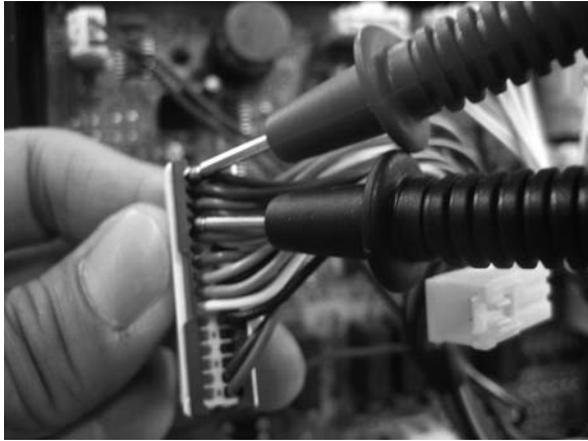
- (1) Measure the voltage between Blue 5 and Blue 3 of connector 89A on the circuit board.

Normal	DC 14 - 16V
--------	-------------

Yes	Inspect/repair the wiring and connectors up to the remote control terminal block.
-----	---

No	Continue to "7. Error display 14...".
----	---------------------------------------

7. Error display 14 immediately after turning unit ON.



Inspect overheat prevention device (thermal fuse).

(1) Remove connector 38 on the circuit board and measure the resistance between Blue 25 and Blue 31.

Normal	2Ω or less
--------	------------

Yes	Replace the circuit board.
-----	----------------------------

No	After finding cause of overheating, replace the thermal fuse.
----	---

8. Error display 90 or 99 immediately after turning unit ON.

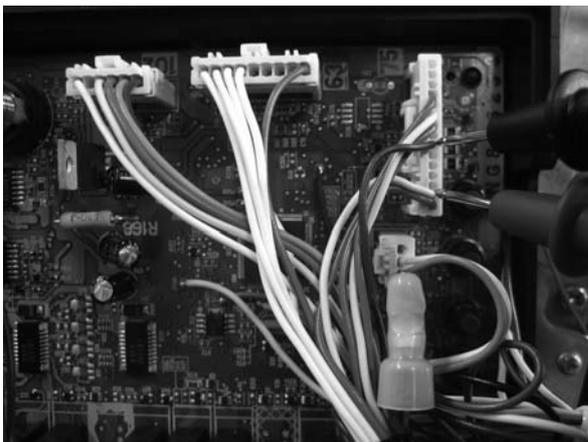
Inspect the usage status of the unit.

- If error display 99, then end of service life: replace the unit.
- If error display 90
 - Inspect burner specification (Inspect gas type, nozzle, secondary pressure)
 - Inspect vent passageways for blockage, etc.

Yes	Replace the circuit board.
-----	----------------------------

B. No hot-water supply/combustion.

1. Water flow sensor error.



Check the water flow sensor.

- Check using maintenance information monitor no. 15. Test when hot-water supply valve is fully opened and 1.7L/min or more is displayed.
- (1) Open the hot-water supply valve and measure the voltage between Yellow 2 (+) and Blue 7 (-) of connector 75 on the circuit board.

Normal	DC 0.5 - 15V
--------	--------------

Yes	Continue to "3. Water inlet...".
-----	----------------------------------

No	Continue to (2).
----	------------------



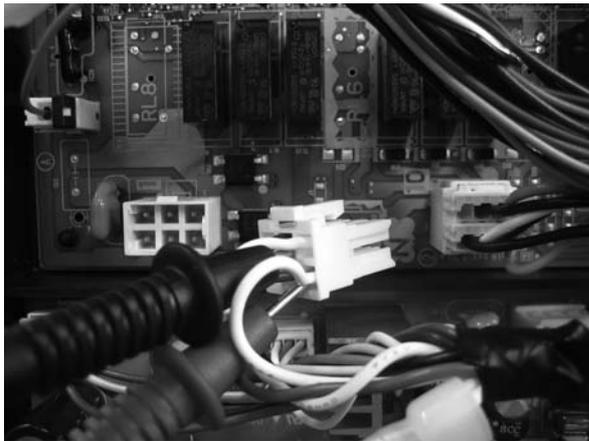
(2) Measure the voltage between Red 1 and Blue 7 of connector 75 on the circuit board.

Normal	DC 14 - 16V
--------	-------------

Yes	Replace the water flow sensor.
-----	--------------------------------

No	Replace the circuit board.
----	----------------------------

2. Error display 20 immediately after turning unit ON.



Inspect the high-limit switch.

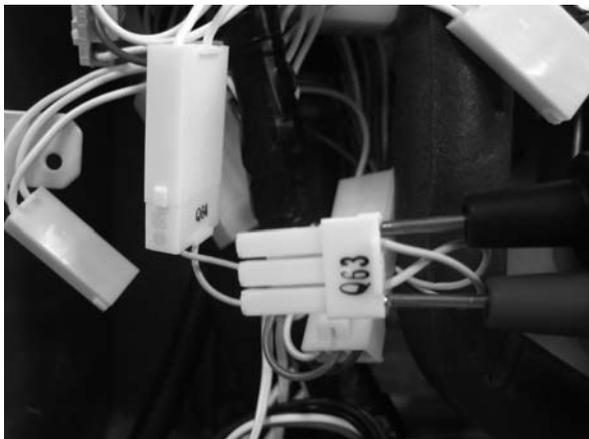
(1) Remove connector 1 and connector 92 on the circuit board and measure the resistance between Black 3 of connector 1 and White 6 of connector 1.

Normal	1Ω or less
--------	------------

Yes	Replace the circuit board.
-----	----------------------------

No	After finding the cause, restore/replace the high limit switch.
----	---

3. Water inlet thermistor error.



If error display 31 appears, then make sure the water inlet thermistor and the temperature shown in maintenance information monitor no. 30 match.

(1) Measure the resistance between White 1 and White 3 of connector Q63.

Break in wire: $\infty\Omega$

Short circuit: 1Ω or less

If wire is broken or short-circuited, replace the water inlet thermistor.

If the problem is not a broken or short-circuited wire, then inspect/repair the wirings/connectors of the water inlet thermistor.

4. Water outlet thermistor error.



If error display 32 appears, then check the water outlet thermistor.

- (1) Measure the resistance between White 1 and White 2 of connector M64.

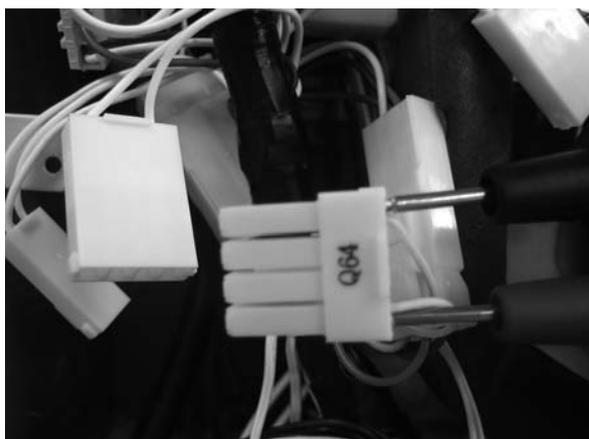
Break in wire: $\infty\Omega$

Short circuit: 1Ω or less

If wire is broken or short-circuited, replace the water outlet thermistor.

If the problem is not a broken or short-circuited wire, then inspect/repair the wirings/connectors of the water outlet thermistor.

5. Heat exchanger thermistor error.



If error display 33 appears, then check the heat exchanger thermistor.

- (1) Measure the resistance between White 1 and White 4 of connector Q64.

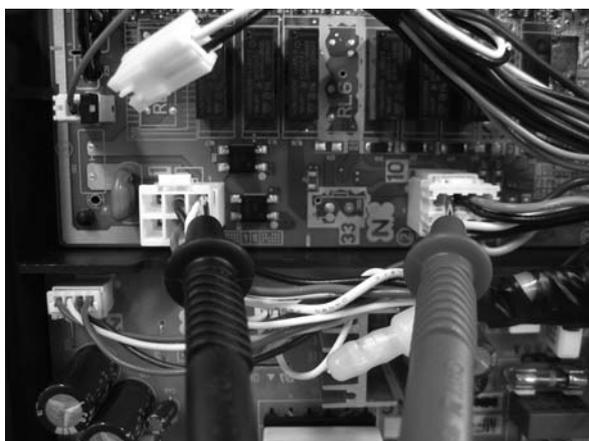
Break in wire: $\infty\Omega$

Short circuit: 1Ω or less

If wire is broken or short-circuited, replace the heat exchanger thermistor.

If the problem is not a broken or short-circuited wire, then inspect/repair the wirings/connectors of the heat exchanger thermistor.

6. Igniter error.



If error display 11 appears and there is no continuous electrical discharge, then check the igniter.

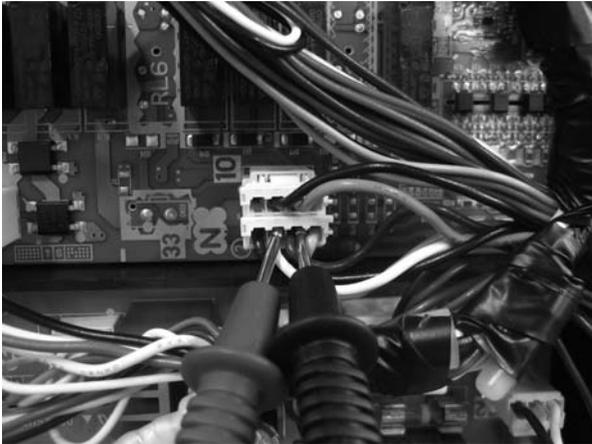
- (1) Open the hot-water supply valve and measure the voltage between White 5 of connector 1 and Black 2 of connector 10 on the circuit board.

Normal	AC 90 - 110V
--------	--------------

Yes	Replace the igniter or ignition electrode.
-----	--

No	Replace the circuit board.
----	----------------------------

7. Gas solenoid valve error.



If error display 11 appears and there is continuous electrical discharge, then check the gas solenoid valves.

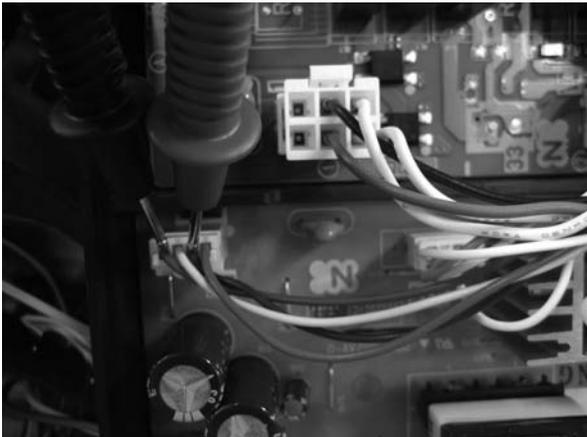
- (1) Open the hot-water supply valve and measure the voltages between:
SV0: White 6 and Blue 7 on connector 10
SV1: Black 5 and Blue 7 on connector 10.

Normal	DC 80 - 100V
--------	--------------

Yes	Replace the bad gas solenoid valve.
-----	-------------------------------------

No	Replace the circuit board.
----	----------------------------

8. Fan motor error.



If error display 61 appears, then check the fan motor.

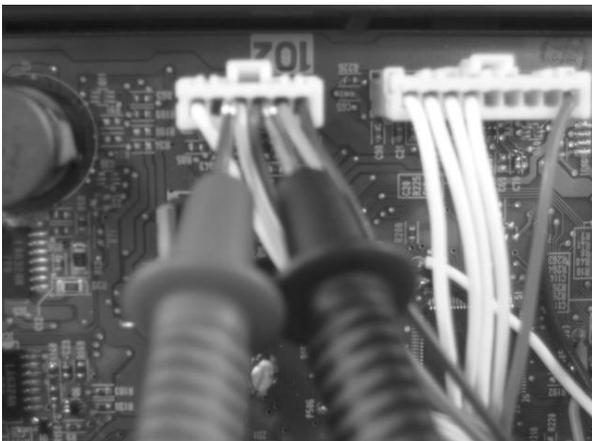
- (1) Measure the voltage between Blue 2 and Brown 4 of connector 27 on the circuit board.

Normal	DC 7 - 48V
--------	------------

Yes	Replace the fan motor.
-----	------------------------

No	Continue to "9. Combustion fan ...".
----	--------------------------------------

9. Combustion fan speed sensor error.



If error display 61 appears and the fan is rotating, then check the fan speed sensor.

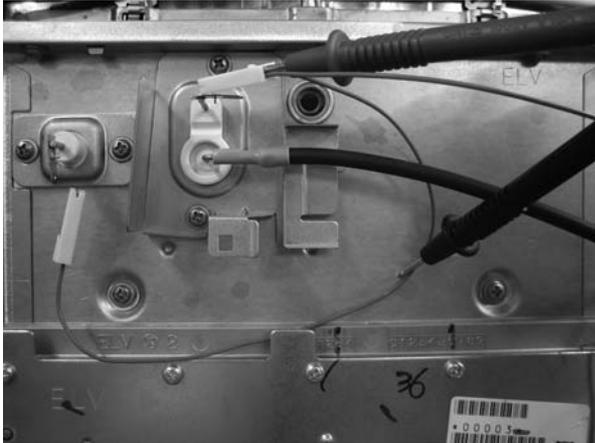
- (1) Measure the pulses between Yellow 3 and Red 4 of connector 102 on the circuit board.
- Check to see if maintenance information monitor no. 10 (fan speed) and no. 20 (set fan speed) are close when the maximum pressure or minimum pressure set button are pressed (don't press button during ignition).

Normal	150 - 400 Hz (4 pulses/rev.).
--------	-------------------------------

Yes	Replace the circuit board.
-----	----------------------------

No	Replace the combustion fan.
----	-----------------------------

10. Flame rod error.



If error display 12 or 72 appears, then check the flame rod.

- (1) Measure the frequency between the flame rod and burner case (GUD) when the remote controller is turned on.

Normal	10kHz - 100kHz
--------	----------------

Yes	Continue to (2).
-----	------------------

No	Replace the circuit board.
----	----------------------------

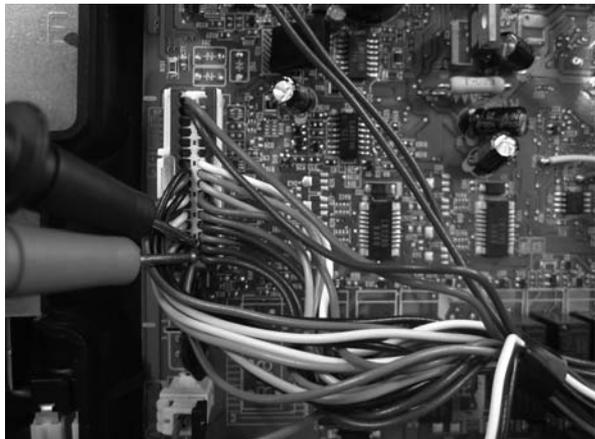
- (2) Measure the current between flame rod (or Blue 1 of connector 78) and electrode.

Normal	DC 1 μ A or higher (during flame detection)
--------	---

Yes	Check for connection failure between circuit board ground and metallic section of unit, then check the gas pressure and airflow (has the flame been blown out by excessive airflow?).
-----	---

No	Replace the flame rod.
----	------------------------

11. Drain trap water level electrode error.



If error display 29 appears, then check the drain trap water level electrode.

- (1) Measure the voltage between Blue 29 and Green 32 of connector 38 on the circuit board.

Normal	DC 4V or more
--------	---------------

Yes	Continue to (2).
-----	------------------

No	<ul style="list-style-type: none"> • Check the clogging of drain piping, drain trap and connection hose. • Replace the circuit board.
----	---



(2) Measure the voltage between Blue 29 of connector 38 and Red 9 of connector 63 on the circuit board.

Normal	DC 4V or more
--------	---------------

Yes	Replace the circuit board.
-----	----------------------------

No	<ul style="list-style-type: none"> • Check the clogging of drain piping, drain trap and connection hose. • Replace the circuit board.
----	---

C. Hot-water supply temperature cannot be adjusted.

1. Water inlet thermistor error.



Check the water inlet thermistor.

- Check to see whether the actual water temperature and displayed data of maintenance information monitor no. 30 match.

(1) Measure the resistance between White 1 and White 3 of connector Q63.

Normal	Temp.(°C)	0	10	20	30	40	50	60	70	80
	Resistance(kΩ)	23.7	15.5	10.3	7.0	4.9	3.5	2.5	1.9	1.4

Yes	Continue to “2. Water outlet...”.
-----	-----------------------------------

No	Replace the water inlet thermistor.
----	-------------------------------------

2. Water outlet thermistor error.



Check the water outlet thermistor.

- Check to see whether the actual hot-water temperature and displayed data of maintenance information monitor no. 31 match.

(1) Measure the resistance between White 1 and White 2 of connector M64.

Normal	Temp.(°C)	0	10	20	30	40	50	60	70	80
	Resistance(kΩ)	23.7	15.5	10.3	7.0	4.9	3.5	2.5	1.9	1.4

Yes	Continue to “3. Heat exchanger...”.
-----	-------------------------------------

No	Replace water outlet thermistor.
----	----------------------------------

3. Heat exchanger thermistor error.



Check the heat exchanger thermistor.

- Check to see if the displayed data of maintenance information monitor no. 32 and no. 42 match.

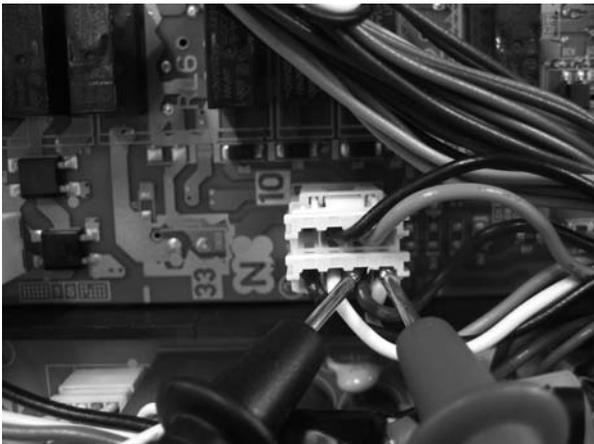
(1) Measure the resistance between White 1 and White 4 of connector Q64.

Normal	Temp.(°C)	0	10	20	30	40	50	60	70	80
	Resistance(kΩ)	23.7	15.5	10.3	7.0	4.9	3.5	2.5	1.9	1.4

Yes	Check “4. Gas solenoid...” and “6. Bypass flow control...”.
-----	---

No	Replace the heat exchanger thermistor.
----	--

4. Gas solenoid valve error.



*For SV2

Check the gas solenoid valves.

(1) Measure the voltage using connector 10 on the circuit board.

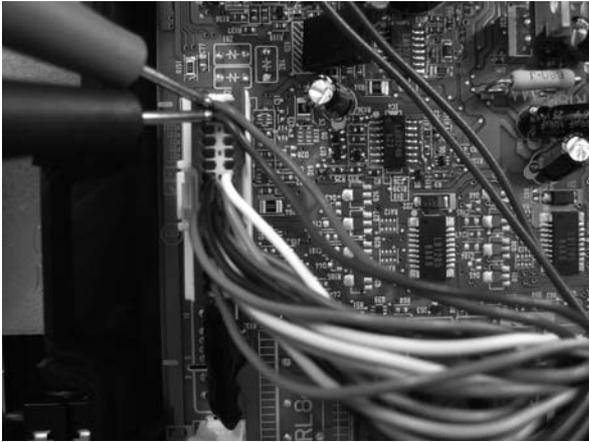
Normal
Hot water is not discharged. While pressing the maximum manifold pressure set button, SV2 Between Gray 8 - Blue 7 DC80 - 100V SV3 Between Orange 3 - Blue 7 DC80 - 100V Warm water is not discharged. Combust with lowest temperature/lowest flow rate SV2 Between Gray 8 - Blue 7 DC1V or less. SV3 Between Orange 3 - Blue 7 DC1V or less.

If combustion cannot be achieved for all burners with the above values, replace the gas solenoid valve.

(If combustion is achieved for all burners, check “5. Gas proportioning...”)

NO	Replace the circuit board.
----	----------------------------

5. Gas proportioning valve error.



Check the gas proportioning valve error.

- (1) Check to see if the flame size changes when pressing the minimum and maximum manifold pressure set button, then measure the voltage between Red 2 and Blue 4 using connector 38 on the circuit board.

Normal	DC 0.3 - 15V
--------	--------------

Yes	Continue to "6. Bypass flow...". Change the gas proportioning valve.
-----	---

No	Replace the circuit board.
----	----------------------------

6. Bypass flow control valve error.



Check the bypass flow control valve.

- (1) Measure the following voltages using connector 38 on the circuit board: between Blue 25 - Black 18, Blue 25 - Orange 15, Blue 25 - Green 16, and Blue 25 - Violet 17.

Normal	DC 1 - 16V
--------	------------

Yes	Replace the bypass flow control valve.
-----	--

No	Replace the circuit board.
----	----------------------------

7. Main flow control valve error.



Check the main flow control valve error.

- (1) Measure the following voltages using connector 38 on the circuit board : between Blue 25 - Black 30, Blue 25 - Orange 26, Blue 25 - Green 27, Blue 25 - Violet 28.

Normal	DC 1 - 16V
--------	------------

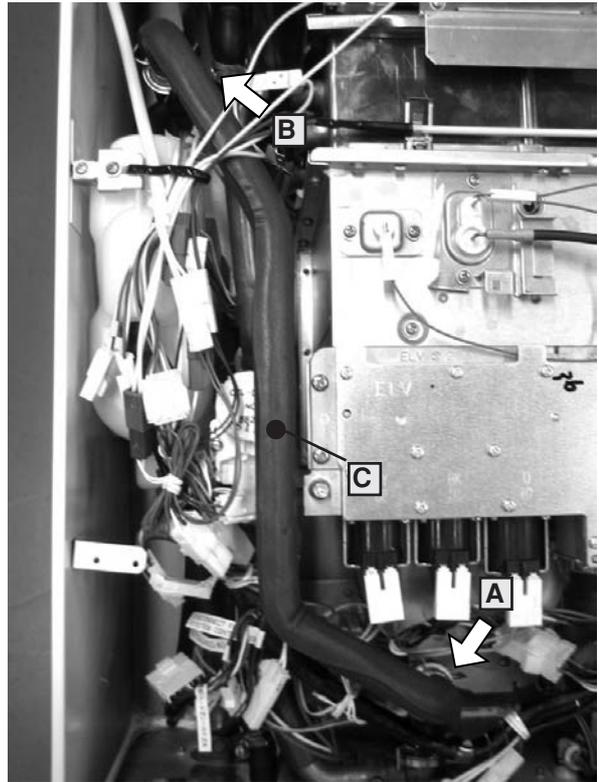
Yes	Replace the main flow control valve.
-----	--------------------------------------

No	Replace the circuit board.
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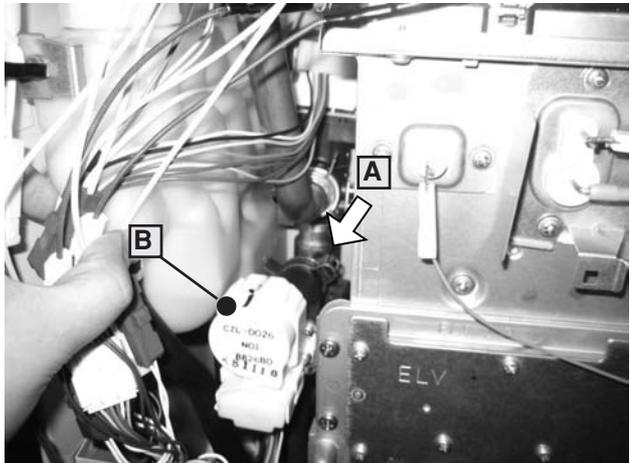
(2) Disassembly of each part

1. How to remove transformers

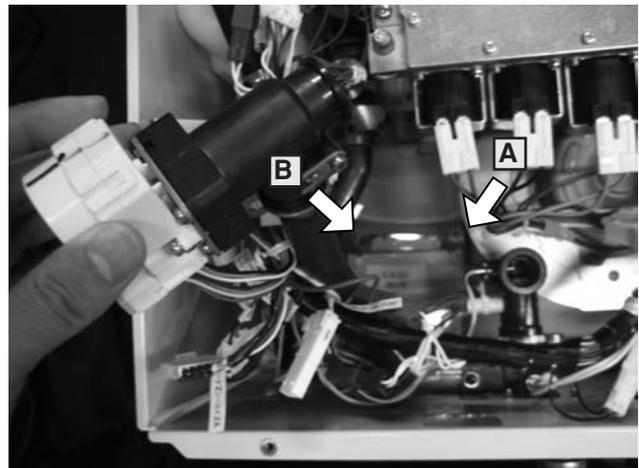
- (1) Remove two quick fasteners (A and B) in the right figure and remove the water inlet pipe (C).



- (2) Remove the quick fastener (A) in the right figure and pull the bypass servo (B).

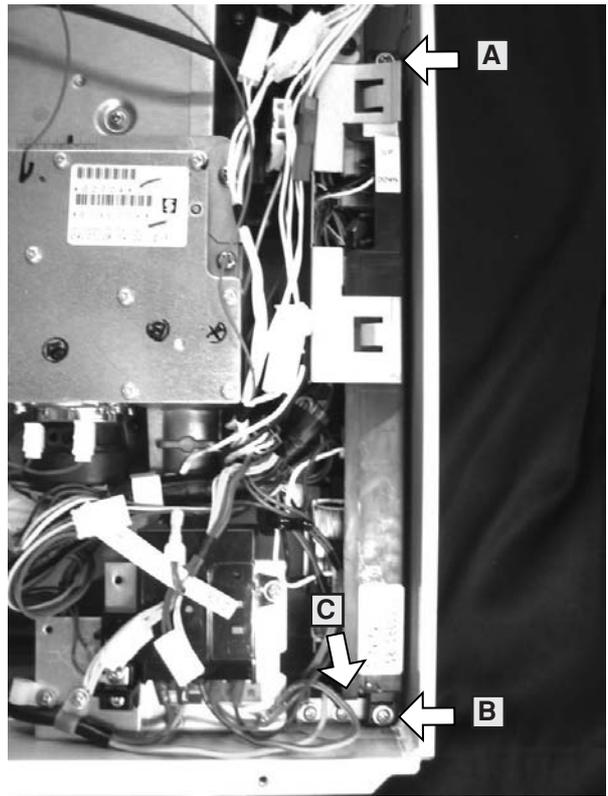


- (3) Unscrew two fixing screws (A and B) in the right figure and remove the transformers.



2. How to remove the board

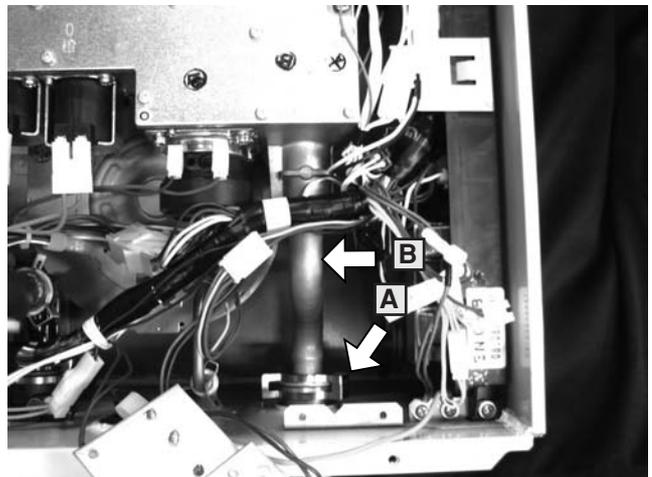
- (1) Unscrew two screws (A and B) that fix the board and the earth screw (C) and remove the board.



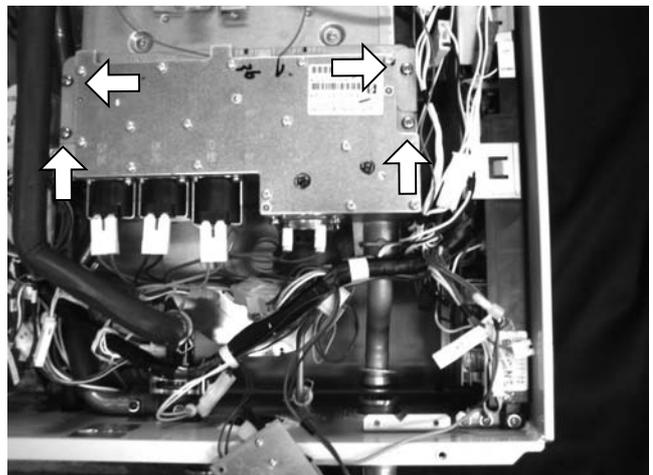
3. How to remove the manifold

- Unscrew two fixing screws of mounting plate for current leakage safety device in advance.

- (1) Remove the quick fastener (A) in the right figure and slide the gas pipe (B) upward.



- (2) Unscrew four screws that fix the manifold and pull out the manifold SET.



Installation

■ Filling the drain trap unit with water

The drain trap unit can be filled before connecting the vent pipe.

Filling the drain trap unit before vent pipe installation.



DANGER

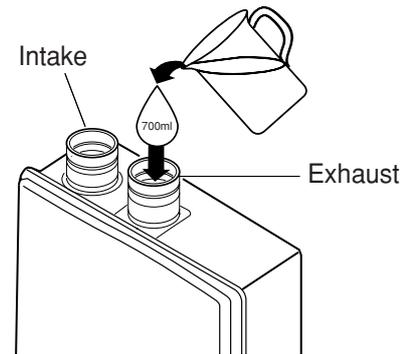
Prior to initial start up, make sure that you fill the drain trap unit with water. This is to prevent dangerous exhaust gases from entering the building. Failure to fill the drain trap unit could result in severe personal injury or death.

Please follow one of the procedures described below to ensure that the drain trap unit is filled with water.

- 1) Fill the drain trap unit by pouring approx. 700ml of water into the exhaust accessory on the top of the appliance as illustrated below.

Or, if the vent pipe has already been installed:

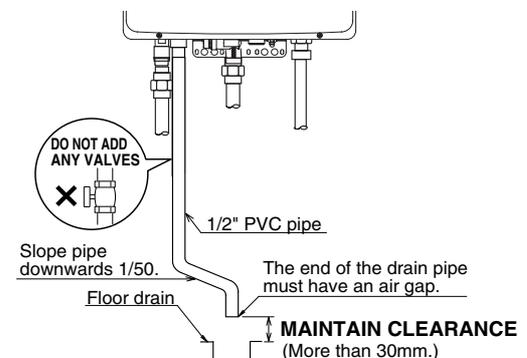
- 2) After installing the drain pipe, make sure that the area around the appliance is well ventilated; open a window or a door if necessary. Then, operate the unit and verify that condensate is coming out of the drain pipe.
(During normal use of the water heater, condensate will begin to discharge from the drain pipe within 30 minutes of use. However, depending on the season and/or installation site conditions, it may take longer.)



■ Drain pipe

- This product is a highly-efficient latent heat collection device and drain water is discharged from the drain discharge port during combustion (max discharge: about 100cc/min). Be sure to perform drain piping.
- Use indirect water discharge when connecting the drain pipe from the device to a rainwater pipe. Do not install a trap.
- Use indirect water discharge when connecting the drain pipe from the device to a sewage water pipe or other drainage pipes and be sure to install a trap to prevent foul odors. (Take caution as there may be odor when leaving the device unattended for a long period of time)
- The specified drain pipe size is R1/2". Do not narrow the diameter of the drain pipe in the middle.
- Use plastic pipe, such as PVC, for the drain line. Do not use steel, black iron, or any other material which can corrode when placed into contact with water.
- Keep the drain pipe length to a minimum. Install the pipe with a decline when horizontally pulling the pipe in the middle.
- The end of the drain pipe must be released in to the air. Be sure the pipe is not submerged in water. In addition, take measures to prevent clogging of the pipe.
- After performing piping, check to make sure drain water is properly drained. (In the case of normal hot water use, drainage starts in about 15 minutes. However, the time may vary depending on the season and other conditions.)
- Use tape or packing, etc. to the connection part of the drain pipe.
Some of the seal material may damage the resin.
- Take measures to prevent the condensate drain lines from freezing (insulation, heat tape, electric heaters, etc.).

Condensate piping to floor drain



Specifications

Item		Specification
Model Name		WHC56
Type	Installation	Internal, Wall Mounted
	Air Supply/Exhaust	Power Vented
Ignition		Direct Ignition
Minimum Pressure for Maximum flow		2.0 bar
Minimum Flow Rate		2.5 L/min.
Dimensions		61.5 cm(Height) x 46.4 cm(Width) x 24 cm(Depth)
Weight		33 kg
Water Holding Capacity		1.9 Litre
Connection Sizes	Water Inlet	R 3/4"
	Hot Water Outlet	R 3/4"
	Gas Inlet	R 3/4"
	Condensate Drain	R 1/2"
Power Supply	Supply	230V AC (50Hz)
	Consumption	140W
		Freeze Prevention
Materials	Casing	Zincified Steel Plate/Polyester Coating
	Flue Collar	Stainless Steel
	Primary Heat Exchanger	Copper Sheetting, Copper Tubing
	Secondary Heat Exchanger	Stainless Steel Sheetting, Stainless Steel Tubing
Safety Devices		Flame Rod, Thermal Fuse, Pressure Relief Valve, Lightning Protection Device (ZNR), Electric Leakage Prevention Device, Overheat Prevention Device, Freezing Prevention Device, Fan Rotation Detector
Accessories		Anchoring Screws

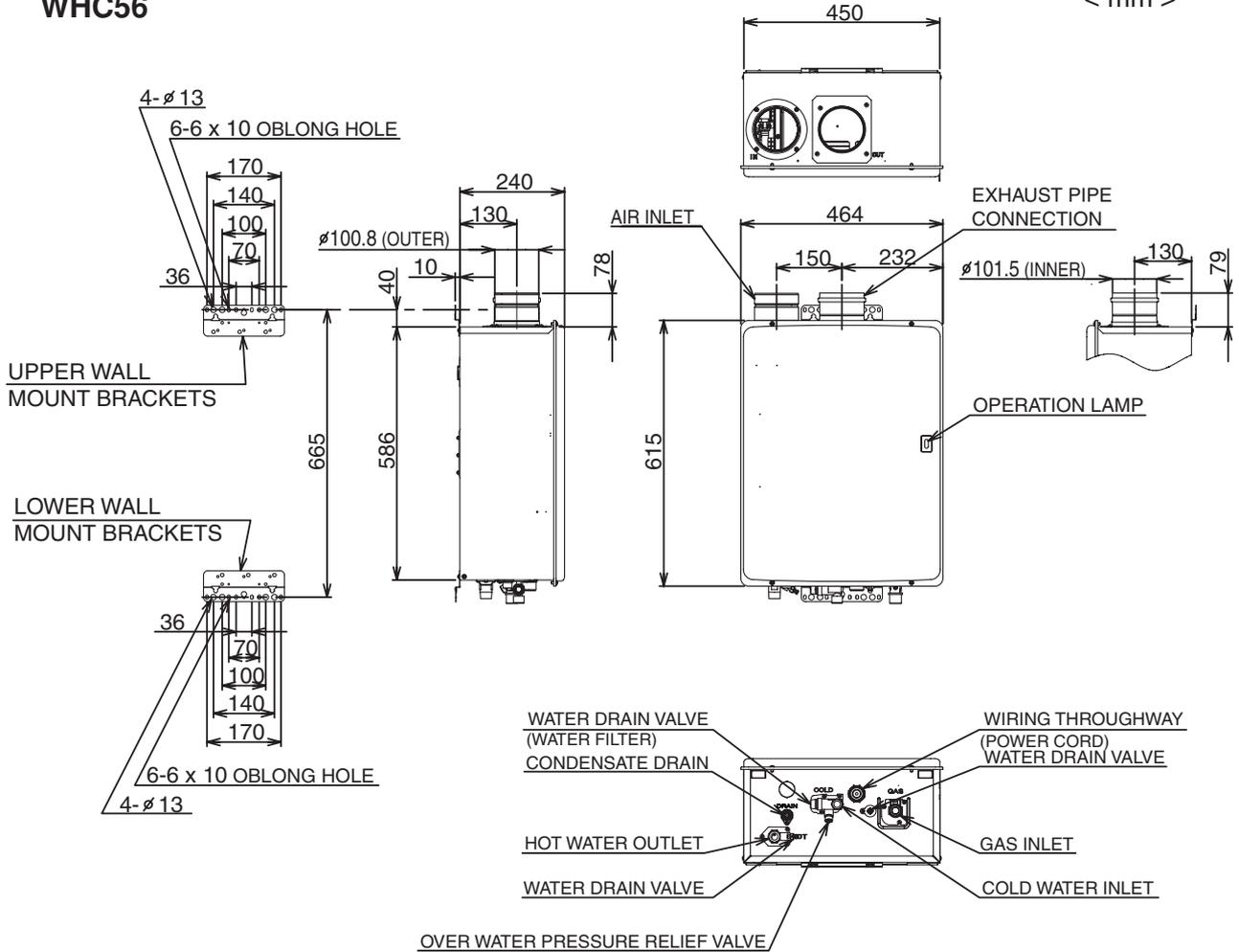
Performance

Item		Maximum Performance	Minimum Performance
Gas Consumption (NET)	I _{2H}	54.0 kW	3.2 kW
	I _{3P}	54.0 kW	3.2 kW
Hot Water Capacity	25°C Rise	32 L/min.	
	50°C Rise	16 L/min.	
Capacity Range		2.5 - 42 L/min.	
Temperature Settings		37 - 48, 50, 55, 60, 65, 70, 75, 80°C	

Dimensions

WHC56

< mm >



(VIEW FROM TOP)

HEIGHT OF EACH FITTING FROM BOTTOM OF CASE

CONDENSATE DRAIN	20
HOT WATER OUTLET	44
COLD WATER INLET	55
GAS INLET	56

