PAVILION™

PB HEAT, LLC

Condensing Gas Water Heater

Rev : March 2020

UT199DV (GQ-C3260WX-FF PB US)
PR199DV (GQ-C3260WXQ-FF PB US)

Service Manual

- Refer to this manual whenever performing service or maintenance on this appliance.
- This manual will be used for service technical training seminars.
- The specifications and descriptions in this manual may be changed without prior notice.
- For further assistance, contact Pavilion Customer Center at 1-855-443-8468.

Do not short circuit any safety device on this appliance.

Contents

Important Safety Information

To prevent damage to property and injury to the user, the icons below warn of varying levels of risk.

Warning	Ignoring this indication will cause an immediate danger of death or serious injury.
Caution	Ignoring this indication may result in death or serious injury.
	Prohibited.

1. Safety Tips for Service

• Wear the appropriate clothing and protective gear:

Caution

● In order to prevent injury or accident, wear a protective helmet, safety boots and a lifting belt whenever necessary.

• Use only the appropriate tools and parts:

Warning

● Only use replacement parts manufactured by PB HEAT for this model as listed in the Installation Manual Parts List for service on this unit. Use appropriate tools.

• Modification of the unit is prohibited:

● Do not attempt to modify or alter the unit. This will cause a fire hazard and a risk of electrical shock.

• When servicing:

Warning

● Disconnect the power supply during maintenance and repairs to reduce the risk of electric shock. If it is necessary to have the electricity connected during repairs, use extreme caution not to touch parts that may cause a shock.

• Do not short circuit any safety device on this appliance:

● If a safety device is not functioning properly, replace the part. Do not under any circumstances short circuit the part.

• Exhaust and gas leakage caution:

Warning

● Always check for leaks when installing or modifying the exhaust vent or gas piping.

2. Post-Service Checks

• Check parts for leaks:

Caution

● Confirm that there are no gas, water, or exhaust leaks regardless of whether the service performed could have caused them.

● If the unit is installed indoors, check that the flue collar and vent pipe are installed correctly and that they are in good condition. Confirm that there are no gas, water or exhaust leaks regardless of whether the service performed could have caused them.

• Check for combustibles:

Caution

● After service or maintenance is completed, check that there are no combustibles in the vicinity of the unit.

• Check insulation resistance:

Warning

● After service or maintenance is completed, measure the resistance between the electrical wires and ground. If it is less than 10MΩ, there is a risk of electrical shock.

• Properly reconnect the power supply:

Warning

● Confirm that the power supply has been reconnected properly after service or maintenance is completed. Also confirm that there is no dust or other obstacles that might cause an electric shock or a fire hazard.

1. Features

1. Multi System Capability

• Allows the simple installation of up to 2 units linked together using a Quick Connect Cord

2. Temperature Lockout Function

• The remote controller can be set to restrict the maximum allowable temperature setting for added safety. See "Changing Default Temperature Setting" section for details.

3. Maximum Remote Controller Length (Only one remote controller can be connected.)

• Remote controller (1 unit): Cord can be extended up to 300' with 18AWG wire.

* Note: In a Multi-System, only one remote controller will be installed.

4. Elevation Adjustment

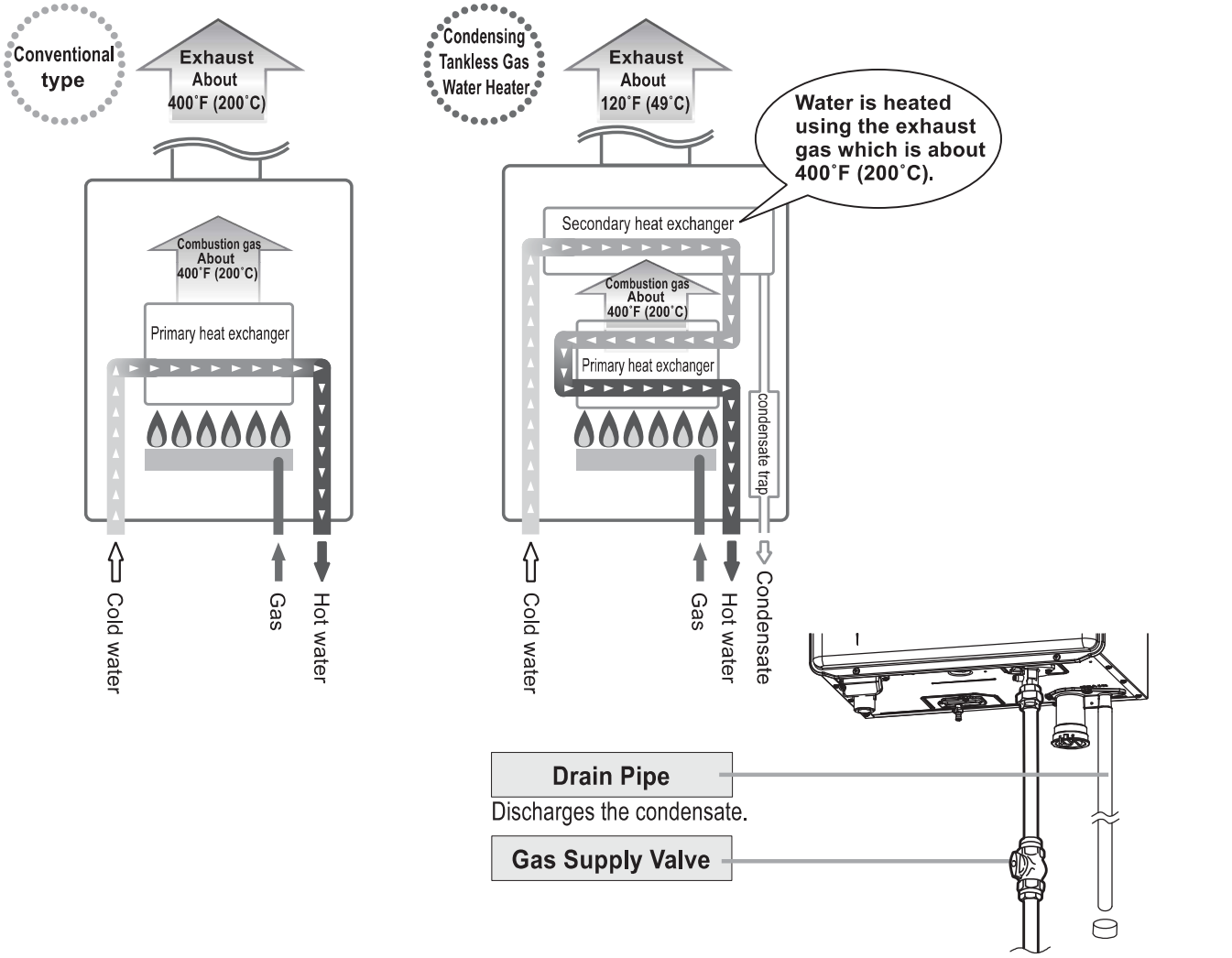
• The water heater can be quickly configured for installations above 2000' by simply adjusting dip switches inside of the unit. No additional equipment or adjustments are necessary. See the "Installation Manual" for details.

5. Built-in Circulation Pump (PR199DV only)

• The water heater heats and circulates hot water in the pipe. Hot water is available more instantly with less waste of water. Auto-Recirculation learns usage patterns and automatically configures timer to activate recirculationn during peak demand times.

Overview of Condensing Tankless Gas Water Heater

This water heater is a high efficiency, fully condensing appliance. Unlike a traditional tankless 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 above illustration shows an example of installation.**
The exact installation configuration may be slightly different.

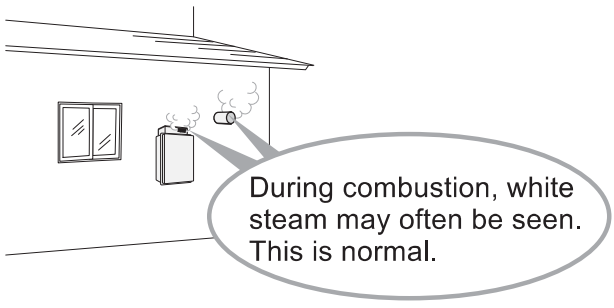
The condensing tankless gas water heater discharges condensate.

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. 2 gallons/hour (7.5 liters/hour) maximum). It is not a water leak. Do not plug or block the drain line as it must always be allowed to freely flow.

Note : The condensate discharged is acidic with a pH level of approximately 2-3.
A condensate neutralizer may be required by local code prior to disposal.

The condensing tankless gas water heater tends to show white steam.

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



2. Specifications / Performance Table

Specifications

UT199DV (GQ-C3260WX-FF PB US)

Item		Specification
Model Name		UT199DV (GQ-C3260WX-FF PB US)
Type	Installation	Indoor / Outdoor Wall mounted
	Air Supply / Exhaust	Power Vented
Ignition		Direct Ignition
Operating Pressure		15-150 psi (Recommended 50 to 80 psi for maximum performance)
Minimum Activation Flow Rate* Minimum Operating Flow Rate*		0.5 GPM (2.0 L/min) 0.29 GPM (1.1 L/min)
Dimensions (Height) × (Width) × (Depth)		27.0 in. (687 mm) × 18.5 in. (471 mm) × 14.1 in. (359 mm)
Weight		70 lbs. (32 kg)
Water Holding Capacity		0.83 Gallon (3.1 L)
Connection Sizes	Water Inlet	NPT 3/4 in.
	Hot Water Outlet	NPT 3/4 in.
	Gas Inlet	NPT 3/4 in.
	Condensate Drain	NPT 1/2 in.
Power Supply	Supply	120 VAC (60 Hz)
	Consumption	NG: 96 W LP: 80 W Freeze Prevention: 114 W
	Maximum Current	4 Amps
Materials	Casing	•Front Cover: Hot-dipped zinc-aluminum-magnesium-alloy-coated steel w/ Polyester Coating •Casing: Zincified Steel Plate / Polyester Coating
	Flue Collar	PP
	Primary Heat Exchanger	Stainless Steel Sheeting, Stainless Steel Tubing
	Secondary Heat Exchanger	Stainless Steel Sheeting, Stainless Steel Tubing
Safety Devices		Flame Rod, High Limit Switch, Lightning Protection Device (ZNR), Freezing Prevention Device, Fan Rotation Detector
Included Accessories		Remote Controller, Remote Controller Cord, Anchoring Screws, Wall Mounting Bracket

* Minimum flow rate may change by setting temperature and water temperature.

Specifications

PR199DV (GQ-C3260WXQ-FF PB US)

Item		Specification
Model Name		PR199DV (GQ-C3260WXQ-FF PB US)
Type	Installation	Indoor / Outdoor Wall mounted
	Air Supply / Exhaust	Power Vented
Ignition		Direct Ignition
Operating Pressure		15-150 psi (Recommended 50 to 80 psi for maximum performance)
Minimum Activation Flow Rate* Minimum Operating Flow Rate*		0.5 GPM (2.0 L/min) 0.29 GPM (1.1 L/min)
Dimensions (Height) × (Width) × (Depth)		27.0 in. (687 mm) × 18.5 in. (471 mm) × 14.1 in. (359 mm)
Weight		73 lbs. (33 kg)
Water Holding Capacity		0.85 Gallon (3.2 L)
Connection Sizes	Water Inlet	NPT 3/4 in.
	Hot Water Outlet	NPT 3/4 in.
	Hot Water Return	NPT 3/4 in.
	Gas Inlet	NPT 3/4 in.
	Condensate Drain	NPT 1/2 in.
Power Supply	Supply	120 VAC (60 Hz)
	Consumption	NG: 218 W LP: 202 W Freeze Prevention: 114 W
	Maximum Current	4 Amps
Materials	Casing	•Front Cover: Hot-dipped zinc-aluminum-magnesium-alloy-coated steel w/ Polyester Coating •Casing: Zincified Steel Plate / Polyester Coating
	Flue Collar	PP
	Primary Heat Exchanger	Stainless Steel Sheeting, Stainless Steel Tubing
	Secondary Heat Exchanger	Stainless Steel Sheeting, Stainless Steel Tubing
Safety Devices		Flame Rod, High Limit Switch, Lightning Protection Device (ZNR), Freezing Prevention Device, Fan Rotation Detector
Included Accessories		Remote Controller, Remote Controller Cord, Anchoring Screws, Wall Mounting Bracket

* Minimum flow rate may change by setting temperature and water temperature.

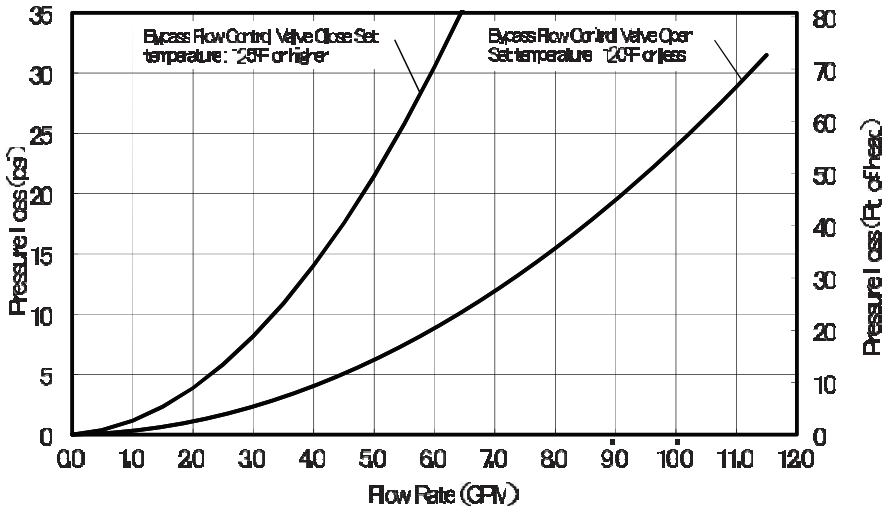
Performances

UT199DV (GQ-C3260WX-FF PB US) / PR199DV (GQ-C3260WXQ-FF PB US)

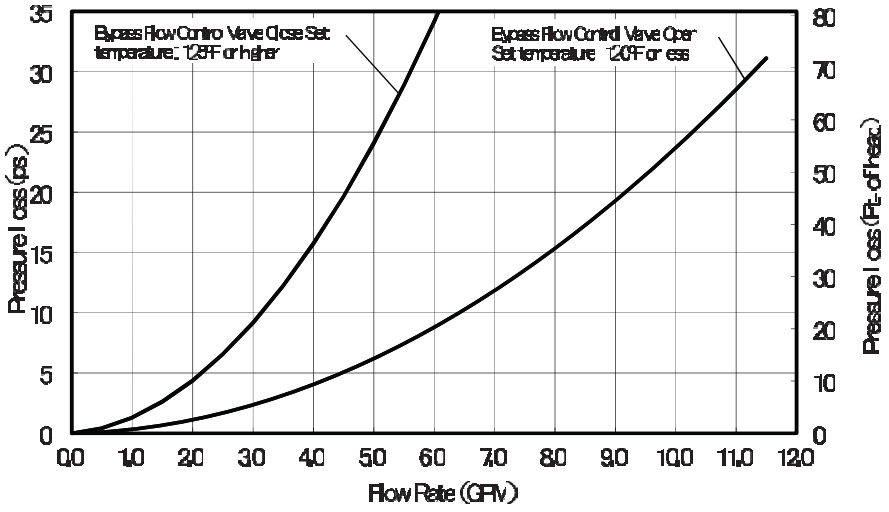
Item		Performance	
		Maximum	Minimum
Gas Consumption	NG	199,900 Btu/h	18,000 Btu/h
	LP	199,900 Btu/h	18,000 Btu/h
Maximum Hot Water Capacity (45°F (25°C) Rise)		8.7 GPM (33 L/min)	
Capacity Range		0.5-11.1 GPM (2-42 L/min)	
Temperature Settings	°F Mode	100-140°F (In 5°F intervals) (9 Options)	
	°C Mode	37-48°C (In 1°C intervals), 50-60°C (In 5°C intervals) (15 Options)	

■Pressure Loss Characteristics

UT199DV (GQ-C3260WX-FF PB US)

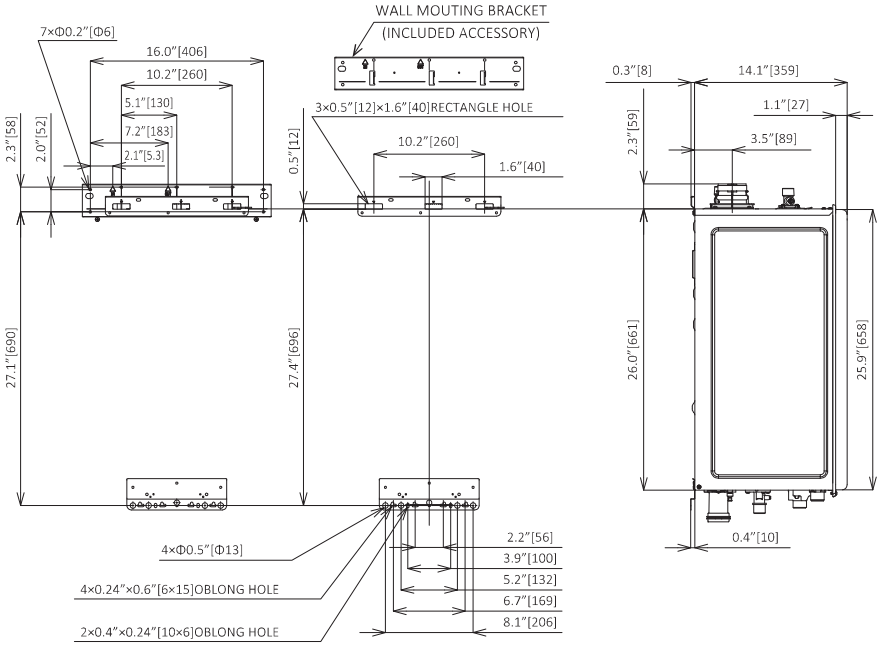


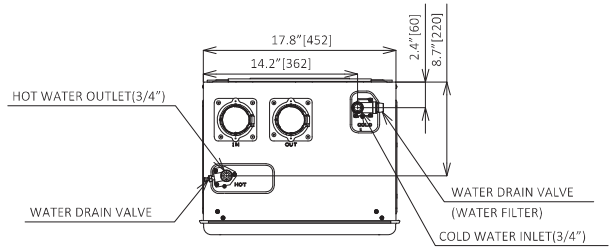
PR199DV (GQ-C3260WXQ-FF PB US)

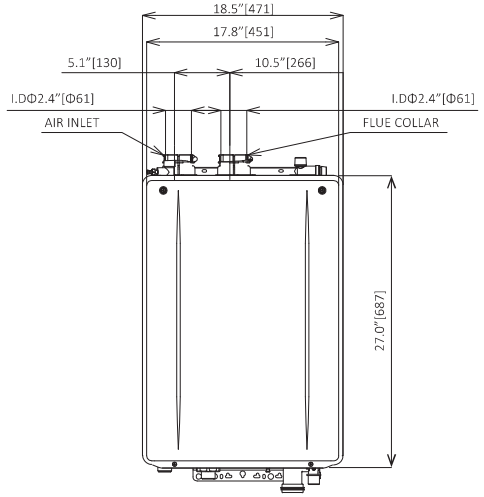


Dimensions

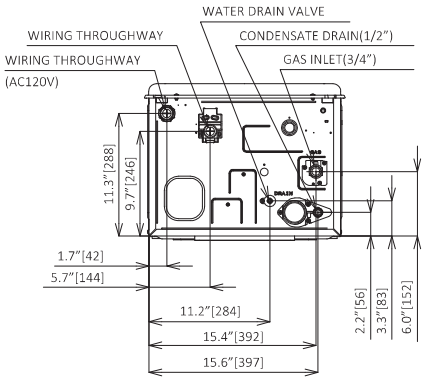
<inch [mm]>







(VIEW FROM BOTTOM)

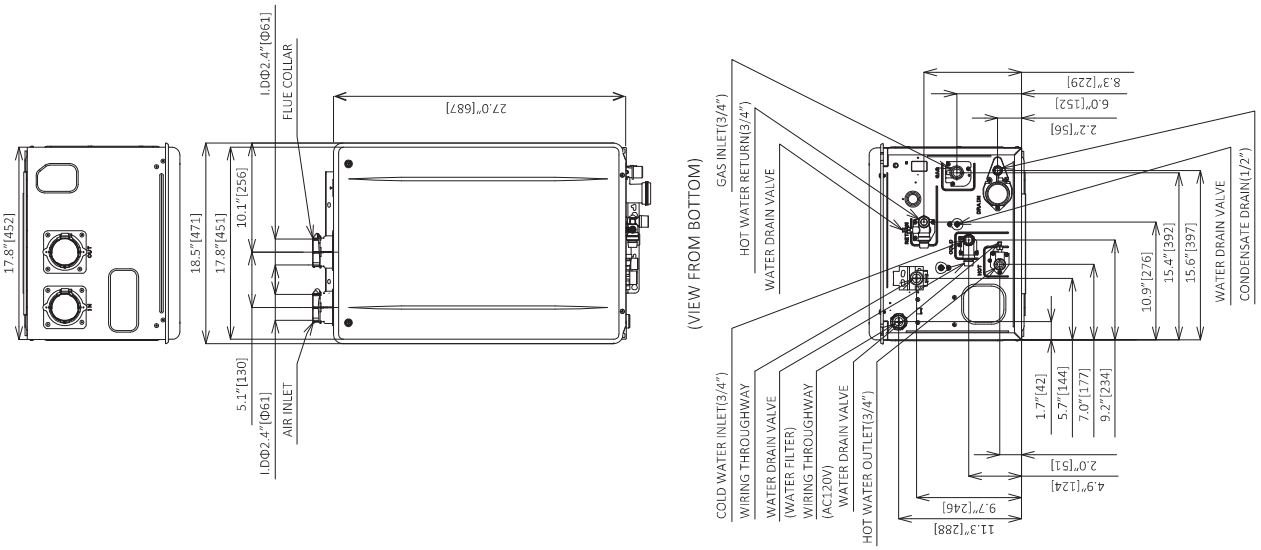


HEIGHT OF EACH FITTING FROM CASE

HOT WATER OUTLET	TOP	1.9"[49]
COLD WATER INLET	TOP	2.1"[53]
CONDENSATE DRAIN	BOTTOM	1.7"[42]
GAS INLET	BOTTOM	2.2"[56]

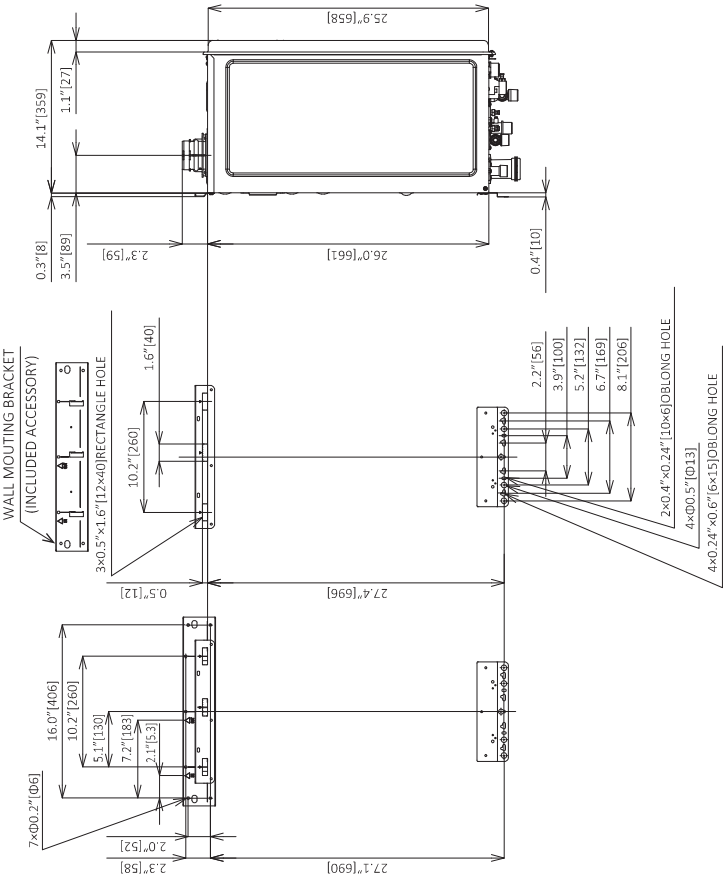
<inch [mm]>

PR199DV (GQ-C3260WXQ-FF PB US)

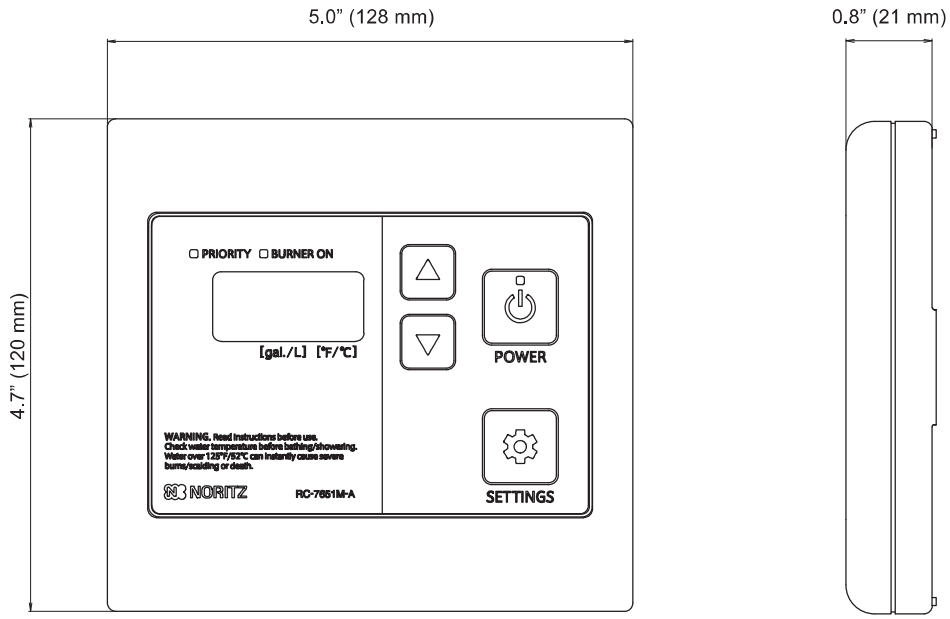


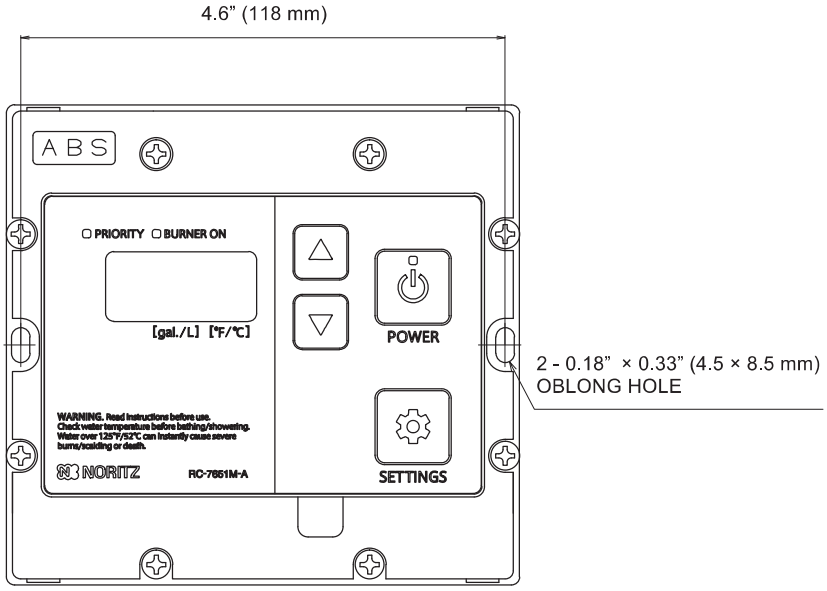
HEIGHT OF EACH FITTING FROM BOTTOM OF CASE

HOT WATER OUTLET	1.8"[45]
COLD WATER INLET	1.9"[49]
CONDENSATE DRAIN	1.7"[42]
HOT WATER RETURN	2.7"[69]
GAS INLET	2.2"[56]

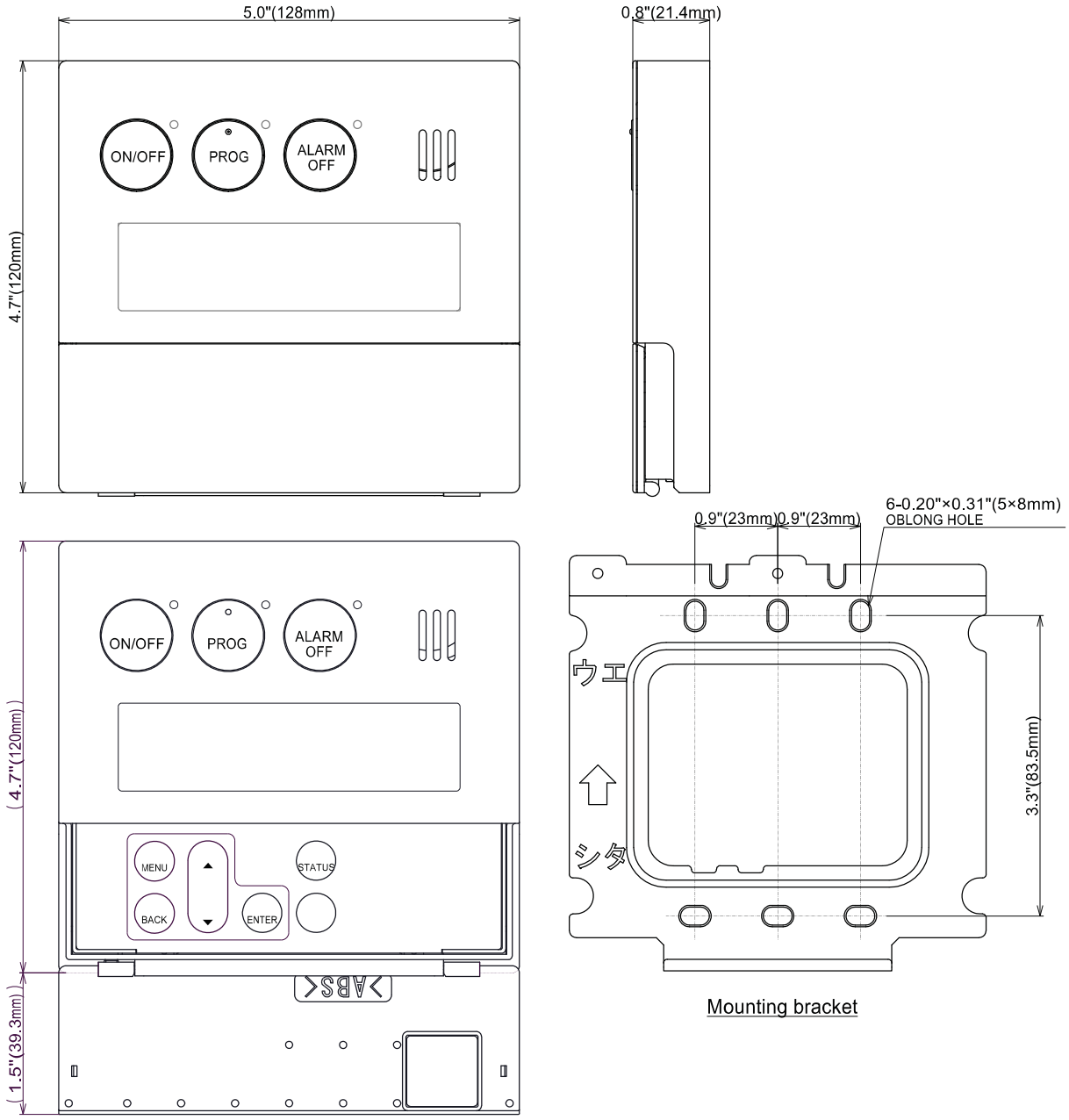


■ Dimensions RC-7651M-A NB





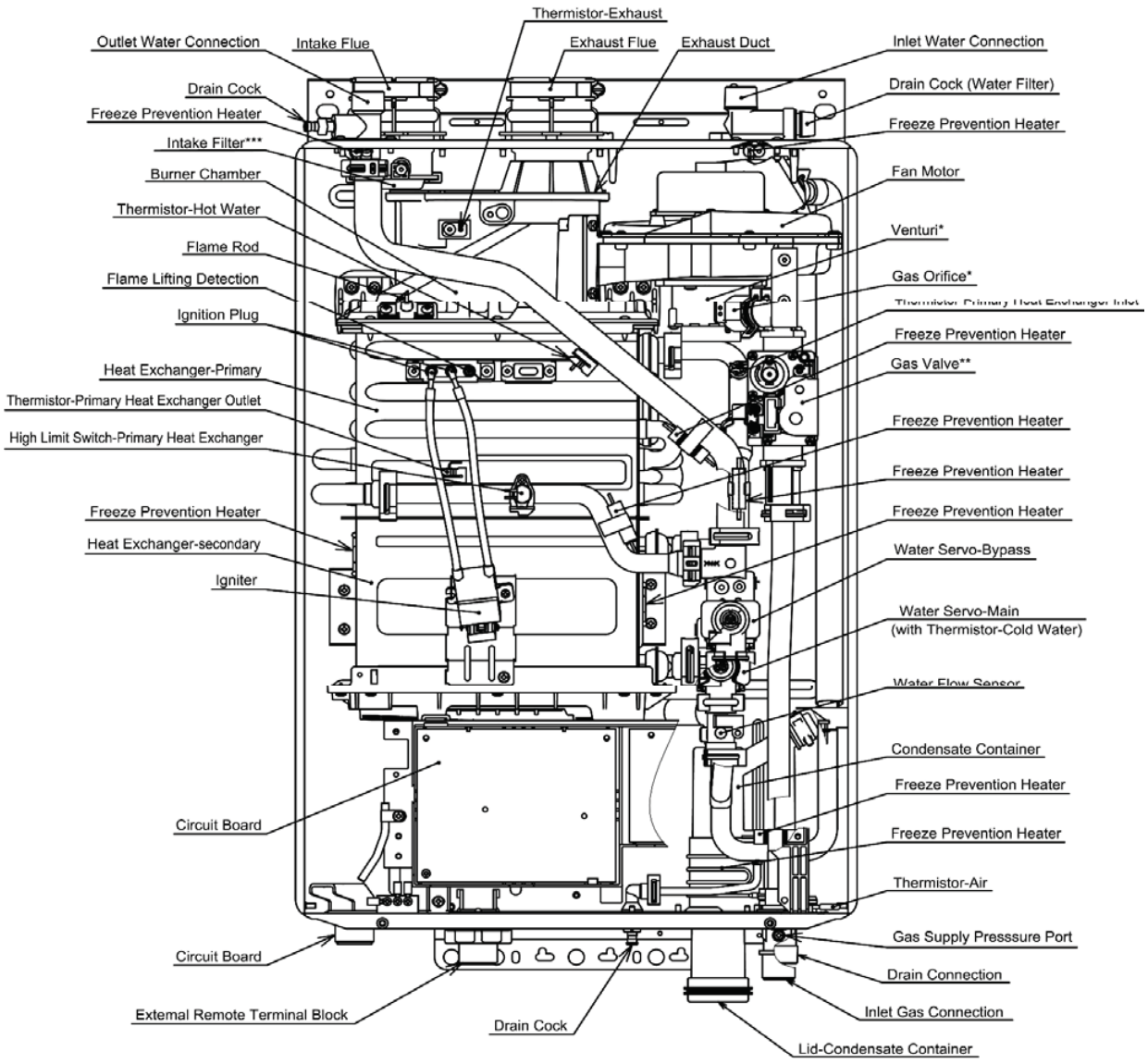
■Dimensions RC-9018M NB



Mounting bracket

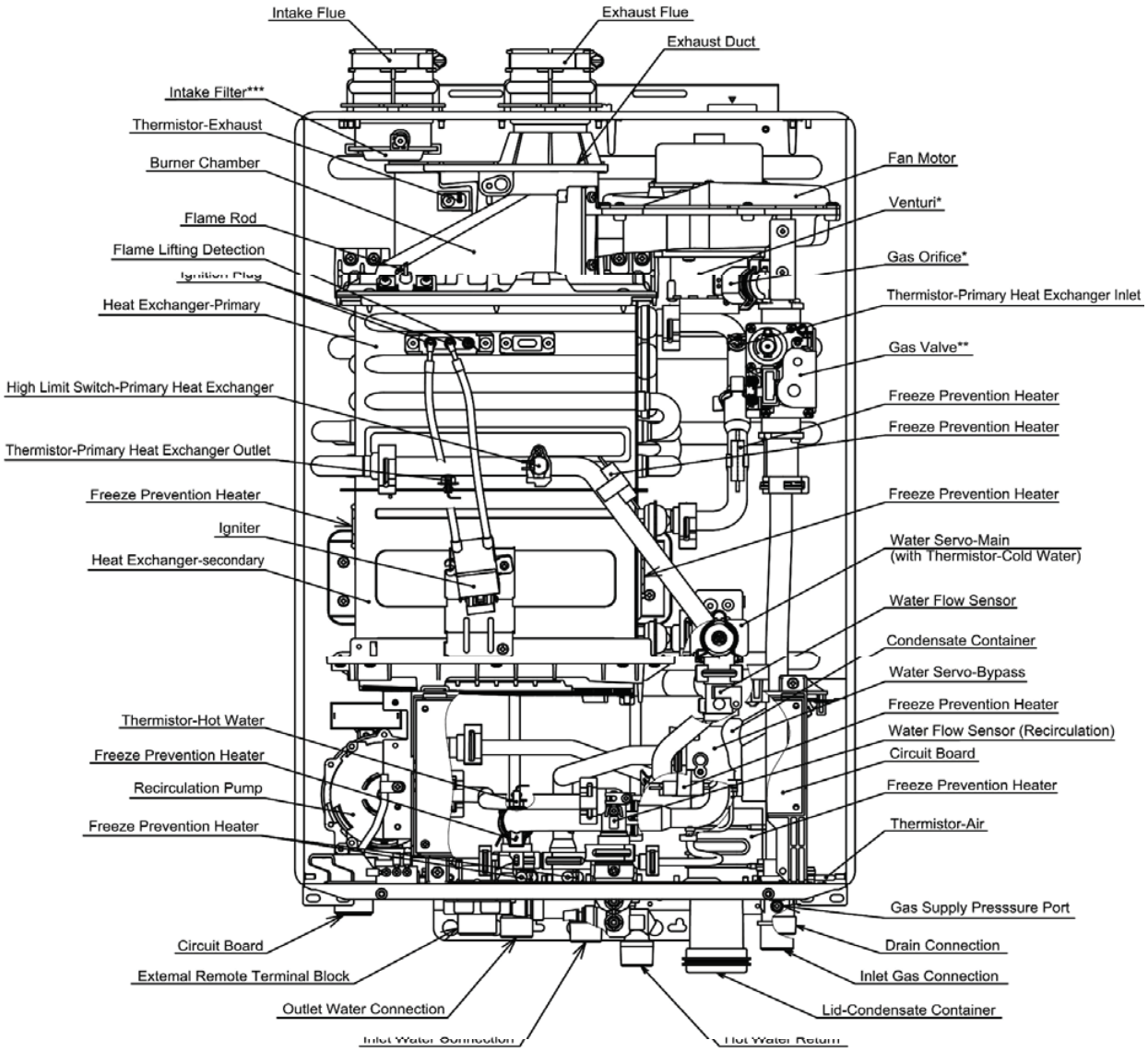
■Components

UT199DV (GQ-C3260WX-FF PB US)



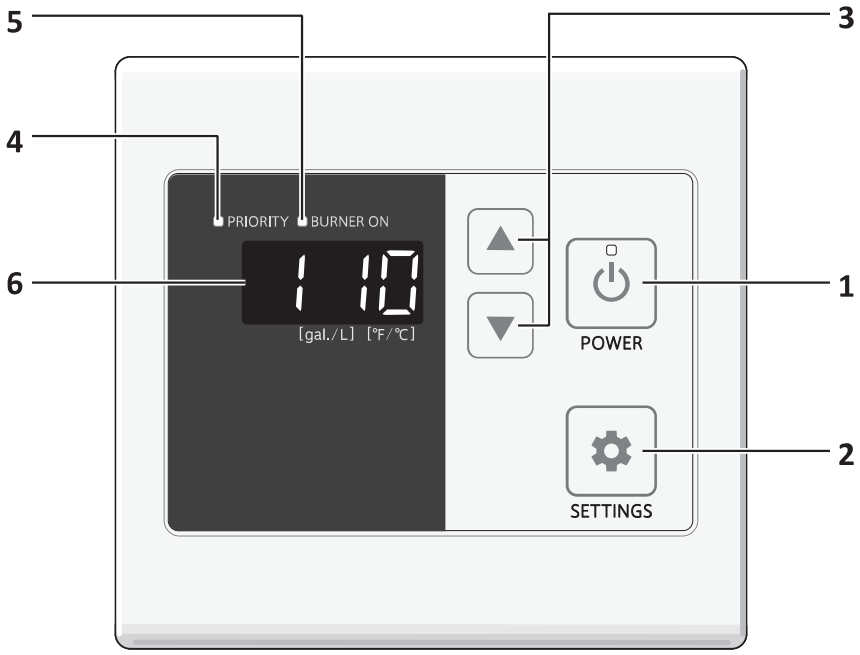
■Components

PR199DV (GQ-C3260WXQ-FF PB US)



Remote Controller (RC-7651M-A NB)

- What is actually displayed depends on how the Water Heater is set.
- Before use, remove the protective sheet from the Remote Controller surface.



1. POWER Button / Indicator
For turning the Water Heater ON/OFF.

2. SETTINGS Button
For setting the flow meter alarm, and other settings.

3. ▲ / ▼ Buttons
For setting the hot water temperature, the flow meter alarm, and other settings.

4. PRIORITY Indicator
When this indicator is displayed, the hot water temperature can be set.

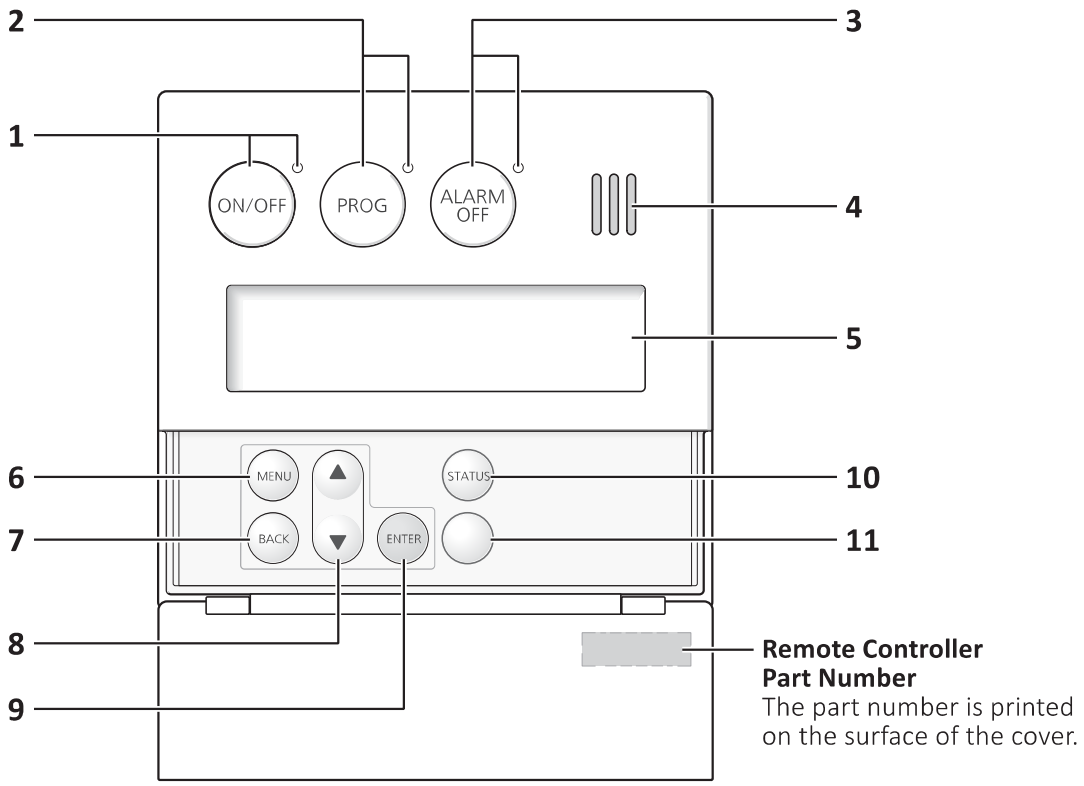
5. BURNER ON Indicator
When burning, the indicator is displayed.

6. - Temperature Setting (e.g. 110°F)
- Flow Meter Setting
- Error Code
A number will blink if a failure occurs.

NOTE As shipped from the factory, the Remote Controller is set to display in °F and gallons.
To adjust the display to °C and liters, refer to the Installation Manual.

Remote Controller (RC-9018M NB)

The Remote Controller will emit a tone when a button is pressed.



Cover shown in the open position.

1. Power Button / Indicator (Green)
For turning the Water Heater ON/OFF.

2. PROG Button / Indicator (Red)
Activate the automatic Water Heater power ON/OFF setting as determined by the user selected schedule.

3. ALARM OFF Button / Indicator (Red)
Stop the tone that is emitted when an error occurs.

4. Speaker

5. Display Screen (See next page)

6. MENU Button
Use to change system settings or to return to the home screen.
If you press the MENU button and press the ▲ / ▼ buttons, “Sys monitor” is sometimes displayed, however, do not use this mode as it meant for installation or service technician only.

7. BACK Button
Return to the previous screen while making system settings or checking status.

8. ▲ / ▼ Buttons
For setting the hot water temperature, the flow meter alarm, and other settings.

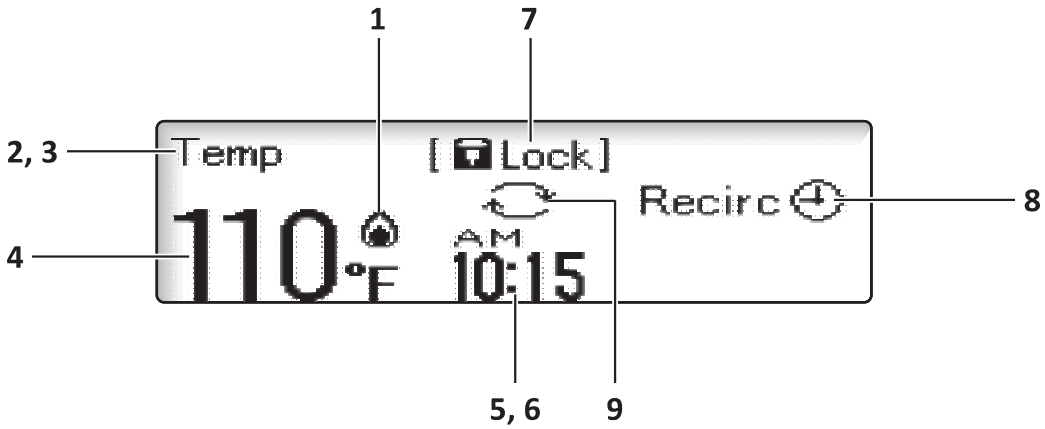
9. ENTER Button
Confirm changes made by the user.

10. STATUS Button
Check the status of the system or the number of installed the Water Heater.

11. Lock Button
Lock Remote Controller operation.

Display Screen

- The display screen shown below is for illustration purposes only.
  The actual display will vary depending on how the Water Heater is being used.
- After a button is pressed, the display will gradually become darker to prevent unnecessary power consumption by the Remote Controller.



1. Flame Indicator
The flame indicator is displayed during combustion when using hot water or recirculation functions.

2. Display for Temperature Setting
During normal operation, “Temp” is displayed.

3. Display for High Temperature “Hi temp”
Displays when the set temperature is 125°F / 55°C or higher.

4. Temperature Setting (e.g. 110°F)

5. Clock Display (e.g. 10:15 am)
Normally the clock display is not shown when the Power button is OFF.
* This setting can be changed so that the clock is displayed even when the Power button is turned OFF.

6. Error Code
A number will flash if a failure occurs.

7. Locked Display
The lock symbol is displayed when the Remote Controller is locked.

8. Recirculation Timer
The clock symbol is displayed when the recirculation timer is activated.

9. Display for Recirculation Operation
- For systems that use recirculation operation, the symbol is displayed when the Power button is turned ON.
- It is displayed during the recirculation operation.

NOTE As shipped from the factory, the Remote Controller is set to display in °F and gallons.
To adjust the display to °C and liters, refer to the Installation Manual.

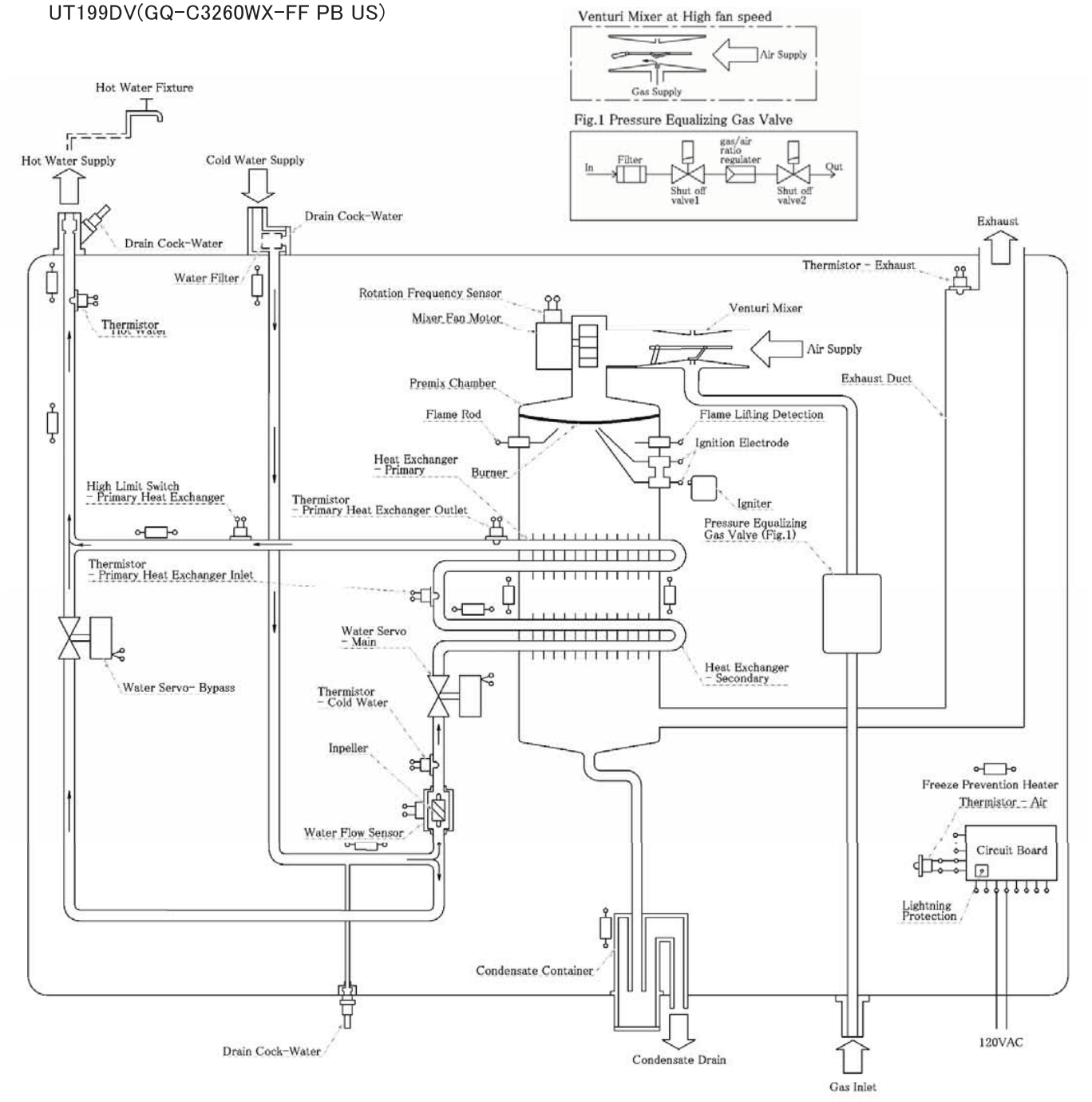
What is the home screen?

The home screen is displayed when the Power button is ON.
Normally, the hot water temperature and the clock, etc. are displayed.

(Home Screen Example)

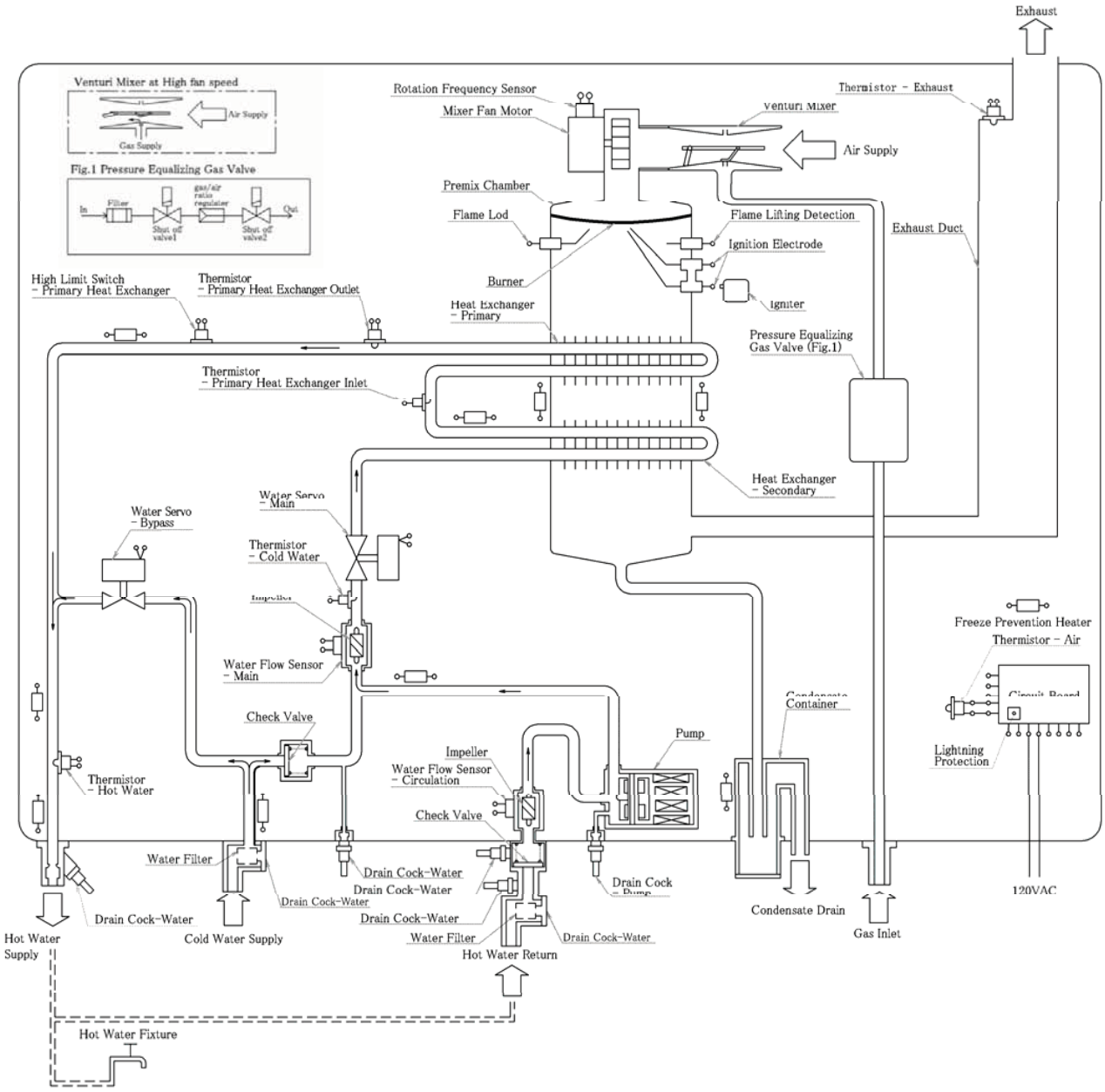
■Operating Principle

UT199DV(GQ-C3260WX-FF PB US)

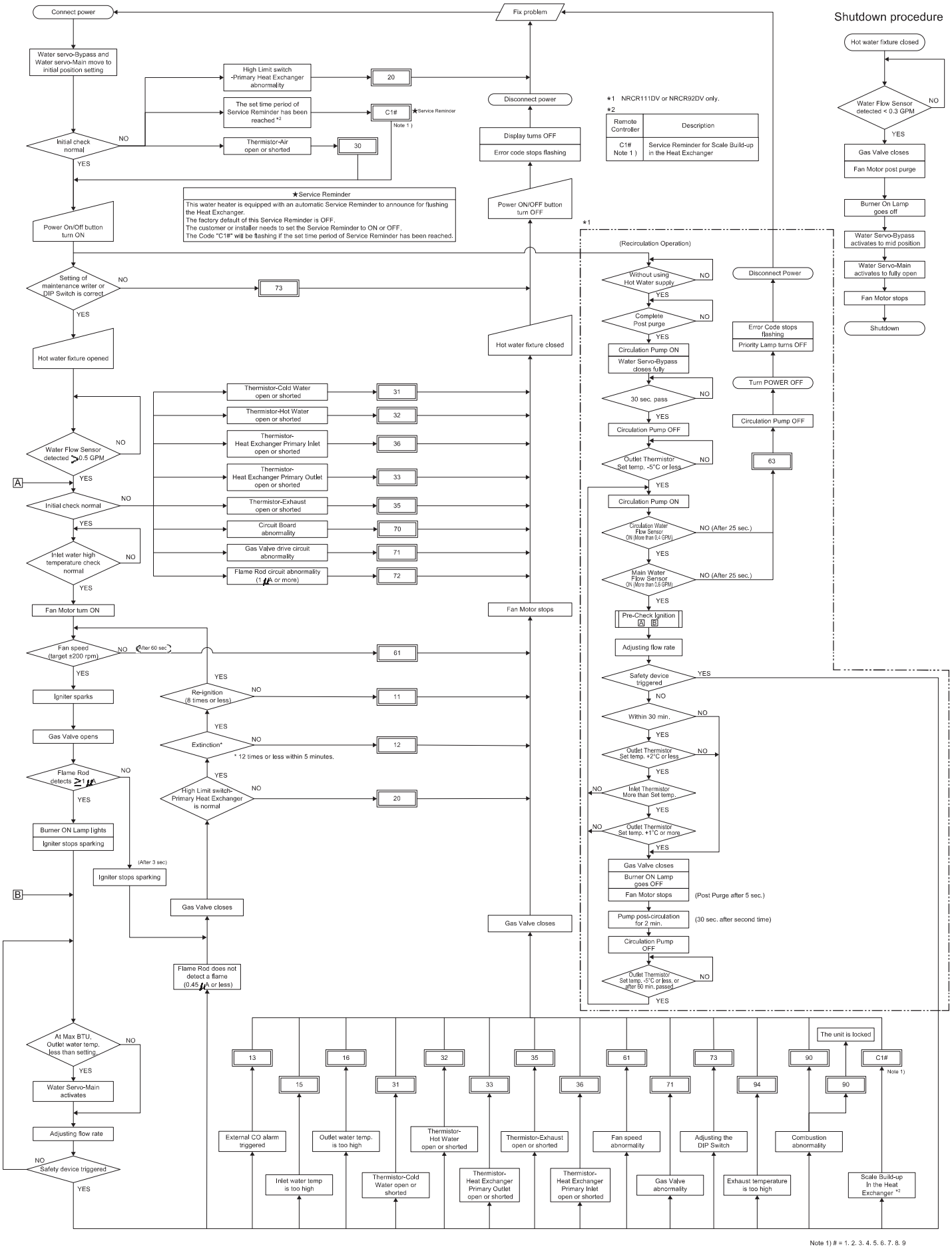


■Operating Principle

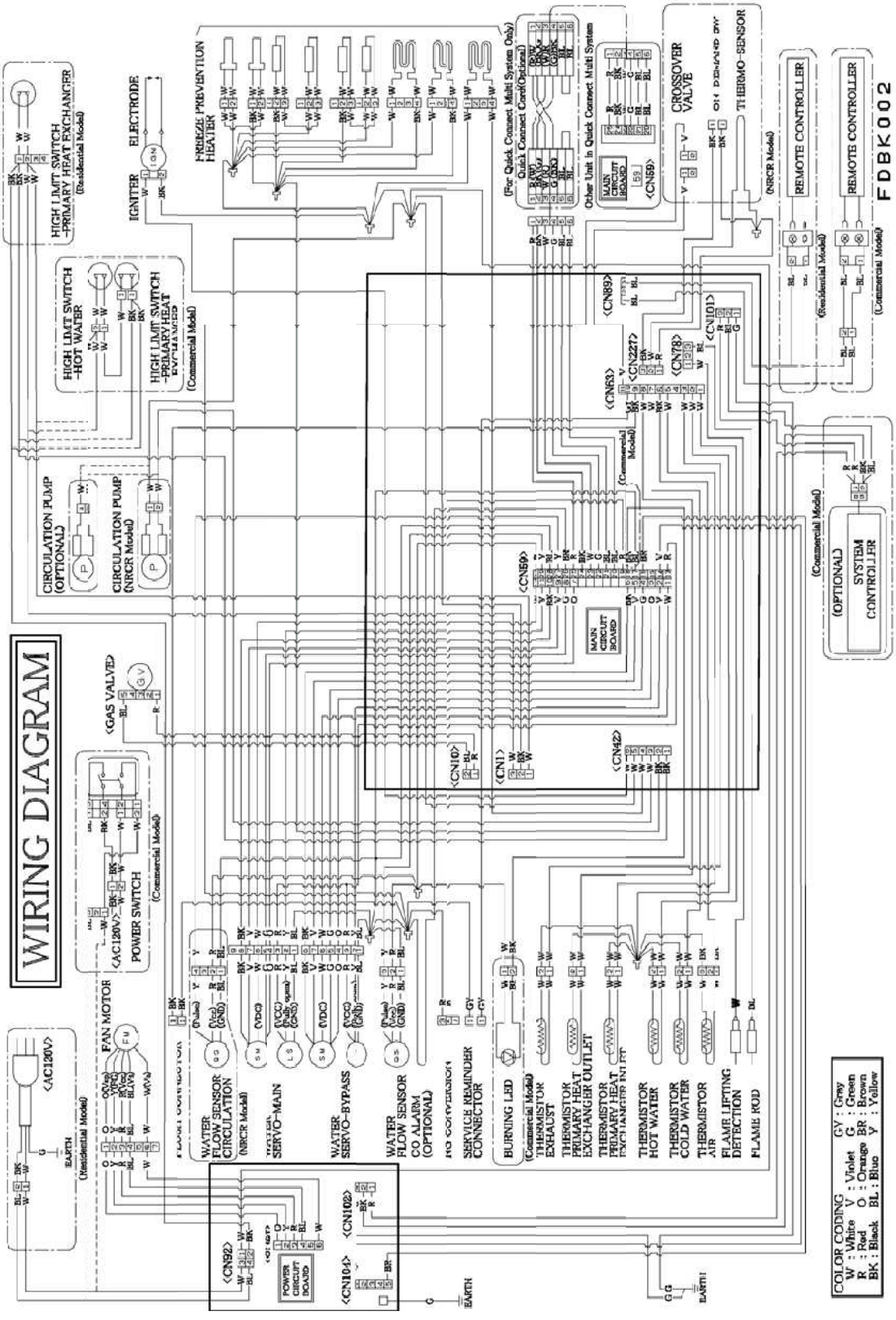
PR199DV(GQ-C3260WXQ-FF PB US)



■Operation Flow Chart



Note 1) # = 1. 2. 3. 4. 5. 6. 7. 8. 9


WIRING DIAGRAM
FDBK002
COLOR CODING
W : White V : Violet G : Green
R : Red O : Orange BR : Brown
BK : Black BL : Blue Y : Yellow
GY : Gray
HIGH LIMIT SWITCH -PRIMARY HEAT EXCHANGER (Residential Model)
HIGH LIMIT SWITCH -HOT WATER
HIGH LIMIT SWITCH -PRIMARY HEAT EXCHANGER (Commercial Model)
IGNITER
ELECTRODE
FREEZE PREVENTION HEATER
CIRCULATION PUMP (OPTIONAL)
CIRCULATION PUMP (NRCR Model)
GAS VALVE
POWER SWITCH
FAN MOTOR
WATER FLOW SENSOR CIRCULATION
WATER SERVO-MAIN
WATER SERVO-BYPASS
WATER FLOW SENSOR CO ALARM (OPTIONAL)
SERVICE REMINDER CONNECTOR
BURNING LED
THERMISTOR EXHAUST
THERMISTOR PRIMARY HEAT EXCHANGER OUTLET
THERMISTOR PRIMARY HEAT EXCHANGER INLET
THERMISTOR HOT WATER
THERMISTOR COLD WATER
THERMISTOR AIR
FLAME LIFTING DETECTION
FLAME ROD
CROSSOVER VALVE
THERMO-SENSOR
REMOTE CONTROLLER
SYSTEM CONTROLLER
MAIN CIRCUIT BOARD
POWER CIRCUIT BOARD
EARTH

■ Troubleshooting

Important Safety Information

To prevent damage to property and injury to the user, the icons below warn of varying levels of risk.

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

1. Safety Tips for Service

Wear the appropriate clothing and protective gear:

⚠ CAUTION In order to prevent injury or accident, wear a protective helmet, safety boots and a lifting belt whenever necessary.

Use only the appropriate tools and parts:

⚠ WARNING Only use replacement parts manufactured by PB HEAT for this model as listed in the Parts List Sheet for service on this unit. Use appropriate tools.

Modification of the unit is prohibited:

Do not attempt to modify or alter the unit. This will cause a fire hazard and a risk of electrical shock.

When servicing:

⚠ WARNING Disconnect the power supply during maintenance and repairs to reduce the risk of electrical shock. If it is necessary to have the electricity connected during repairs, use extreme caution not to touch parts that may cause a shock.

Do not short circuit any safety device on this appliance:

If a safety device is not functioning properly, replace the part. Do not under any circumstances short circuit the part.

Exhaust and gas leakage caution:

⚠ WARNING Always check for leaks when installing or modifying the exhaust vent or gas piping.

2. Post Service Checks

Check parts for leaks:

⚠ CAUTION
- Confirm that there are no gas, water, or exhaust leaks regardless of whether the service performed could have caused them.
- If the unit is installed indoors, check that the flue collar and vent pipe are installed correctly and that they are in good condition. Confirm that there are no gas, water or exhaust leaks regardless of whether the service performed could have caused them.

Check for combustibles:

⚠ CAUTION After service or maintenance is completed, check that there are no combustibles in the vicinity of the unit.

Check insulation resistance:

⚠ WARNING After service or maintenance is completed, measure the resistance between the electrical wires and ground. If it is less than 10MΩ, there is a risk of electrical shock.

Properly reconnect the power supply:

⚠ WARNING Confirm that the power supply has been reconnected properly after service or maintenance is completed. Also confirm that there is no dust or other obstacles that might cause an electrical shock or a fire hazard.

■ Error Codes and Checkpoints

UT199DV (GQ-C3260WX-FF PB US)

Display*	Description	Diagnosis Point (Trouble Point)	Remarks
(F) 10	Combustion abnormality (Only memorized in error code history)	Check air supply vent for blockage or obstruction. Check exhaust vent for blockage or obstruction. Have a professional check the gas supply pressure. Check if the condensate drain line is clogged or frozen. Check that the condensate drain pipe slopes down. Check the DIP switch settings on the circuit board.	
(F) 11	Ignition failure (Initial flame fault detection)	Check the gas supply piping and pressure. Check for Igniter spark (12). Check Gas Valve (13). Check Flame Rod (10) . Check ground, paying special attention to the ground connection to the Circuit Board.	
(F) 12	Flame Rod does not detect flame (Flame fault detection)	Check for accidental extinction of the flame. Check for abnormal combustion. Check Gas Valve (13). Check Flame Rod (10). Check ground, especially on Circuit Board. Check for any exhaust gas leaking in the appliance or leaking from the vent pipe.	
(F) 13	External CO alarm triggered	Check for abnormal combustion. Check all vent components are secure and fully connected. Check for any exhaust leaking from vent pipes. Check if CO alarm wire cut off.	
(F) 15	Abnormally high input temperature	Measure the resistance through the Thermistor -Primary Heat Exchanger Inlet (6). Check gas type.	
(F) 16	Abnormally high output temperature	Measure the resistance through the Thermistor-Hot Water (5). Check for the offset pressure of the gas valve. Check gas type.	
(F) 20	High Limit Switch -Primary Heat Exchanger triggered	Check if High Limit Switch-Primary Heat Exchanger is triggered (14). Check for improper connection of High Limit Switch-Primary Heat Exchanger. Check if the Scale Build-up in the Heat Exchanger. (This error code may be caused by Scale Build-up in the Heat Exchanger)	To reset this error code, the power needs to be disconnected and then reconnected.
(F) 30	Thermistor-Air abnormality	Measure the resistance through the Thermistor-Air (15). Check for an open or short circuit. Check for improper connection of Thermistor-Air.	
(F) 31	Thermistor-Cold Water abnormality	Measure the resistance through the Thermistor-Cold Water (4). Check for an open or short circuit. Check for improper connection of Thermistor-Cold Water.	
(F) 32	Thermistor-Hot Water abnormality	Measure the resistance through the Thermistor-Hot Water (5). Check for an open or short circuit. Check for improper connection of Thermistor-Hot Water.	
(F) 33	Thermistor-Primary Heat Exchanger Outlet abnormality	Measure the resistance through the Thermistor-Heat Exchanger Outlet (7). Check for an open or short circuit. Check for improper connection of Thermistor-Heat Exchanger Outlet.	

(F) 35	Thermistor-Exhaust abnormality	Measure the resistance through the Thermistor-Exhaust (8). Check for an open or short circuit. Check for improper connection of Thermistor-Exhaust.	
(F) 36	Thermistor-Primary Heat Exchanger Inlet abnormality	Measure the resistance through the Thermistor-Heat Exchanger Inlet (6).Check for an open or short circuit. Check for improper connection of Thermistor-Heat Exchanger Inlet.	
(F) 61	Fan Motor abnormality	Check that the fan is rotating and check the pulse frequency from the fan rotational frequency sensor (11). Check for improper connection of the fan. Check voltage from Circuit Board.	
(F) 65	Water Servo-Main abnormality	Check that the Water Servo-Main is functioning (1). Check for improper connection of the valve.	To reset this error code, the power needs to be disconnected and then reconnected.
(F) 66	Water Servo-Bypass abnormality	Check that the Water Servo-Bypass is functioning (2). 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.	To reset this error code, the power needs to be disconnected and then reconnected.
(F) 71	Gas Valve drive circuit abnormality	Check for damage to the Gas Valve drive circuit on the Circuit Board.	To reset this error code, the power needs to be disconnected and then reconnected. If the display continues, contact nearest agent.
(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 (9). Check for a ground fault.	
(F) 73	Circuit Board setting abnormality (Improper Maintenance Writers Settings, DIP Switch Settings, etc.)	Check for proper setting of maintenance writers on Circuit Board. Check the Circuit Board (microcomputer) for damage. Check the dip switch settings. e.g.) Exhaust type, vent length, etc.	This error is displayed when switching the dip switch with the power on. To reset this error code, the power needs to be disconnected and then reconnected.
F76	Multi-system communication error	Check for proper connection of Quick Connect Cord.	
760	Remote Controller transmission abnormality	Check connection from Remote Controller to Circuit Board. Check Remote Controller and Circuit Board for damage.	
(F) 90	Combustion abnormality (Unit shuts off)	Check air supply vent for blockage or obstruction. Check exhaust vent for blockage or obstruction. Have a professional check the gas supply pressure. Check if the condensate drain line is clogged or frozen. Check that the condensate drain pipe slopes down. Check the dip switch settings on the circuit board.	To reset this error code, the power needs to be disconnected and then reconnected. If the display continues, contact nearest agent.
(F) 94	Exhaust temperature is too high	Check for abnormal combustion (8).	To reset this error code, the power needs to be disconnected and then reconnected.
(F) C1# # = 1-9	Service Reminder (Warning Indication)	This unit is equipped with a service reminder. Excessive scale build-up may cause premature failure of the heat exchanger. Excessive dust or lint build-up in the fan and air intake may affect efficiency and combustion performance . Reach out to our customer care for additional information about recommended maintenance. Contact details are available on the rating plate of the appliance.	

*In a Quick Connect Multi-System, "F##"(except F76) indicates an error code from the secondary unit (unit without a remote controller).

■ Error Codes and Checkpoints

PR199DV (GQ-C3260WXQ-FF PB US)

Display*	Description	Diagnosis Point (Trouble Point)	Remarks
(F) 10	Combustion abnormality (Only memorized in error code history)	Check air supply vent for blockage or obstruction. Check exhaust vent for blockage or obstruction. Have a professional check the gas supply pressure. Check if the condensate drain line is clogged or frozen. Check that the condensate drain pipe slopes down. Check the DIP switch settings on the circuit board.	
(F) 11	Ignition failure (Initial flame fault detection)	Check the gas supply piping and pressure. Check for Igniter spark (12). Check Gas Valve (13). Check Flame Rod (10). Check ground, paying special attention to the ground connection to the Circuit Board.	
(F) 12	Flame Rod does not detect flame (Flame fault detection)	Check for accidental extinction of the flame. Check for abnormal combustion. Check Gas Valve (13). Check Flame Rod (10). Check ground, especially on Circuit Board. Check for any exhaust gas leaking in the appliance or leaking from the vent pipe.	
(F) 13	External CO alarm triggered	Check for abnormal combustion. Check all vent components are secure and fully connected. Check for any exhaust leaking from vent pipes. Check if CO alarm wire cut off.	
(F) 15	Abnormally high input temperature	Measure the resistance through the Thermistor -Primary Heat Exchanger Inlet (6). Check gas type.	
(F) 16	Abnormally high output temperature	Measure the resistance through the Thermistor-Hot Water (5). Check for the offset pressure of the gas valve. Check gas type.	
(F) 20	High Limit Switch -Primary Heat Exchanger triggered	Check if High Limit Switch-Primary Heat Exchanger is triggered (14). Check for improper connection of High Limit Switch-Primary Heat Exchanger. Check if the Scale Build-up in the Heat Exchanger. (This error code may be caused by Scale Build-up in the Heat Exchanger)	To reset this error code, the power needs to be disconnected and then reconnected.
(F) 30	Thermistor-Air abnormality	Measure the resistance through the Thermistor-Air (15). Check for an open or short circuit. Check for improper connection of Thermistor-Air.	
(F) 31	Thermistor-Cold Water abnormality	Measure the resistance through the Thermistor-Cold Water (4). Check for an open or short circuit. Check for improper connection of Thermistor-Cold Water.	
(F) 32	Thermistor-Hot Water abnormality	Measure the resistance through the Thermistor-Hot Water (5). Check for an open or short circuit. Check for improper connection of Thermistor-Hot Water.	
(F) 33	Thermistor-Primary Heat Exchanger Outlet abnormality	Measure the resistance through the Thermistor-Heat Exchanger Outlet (7). Check for an open or short circuit. Check for improper connection of Thermistor-Heat Exchanger Outlet.	
(F) 35	Thermistor-Exhaust abnormality	Measure the resistance through the Thermistor-Exhaust (8). Check for an open or short circuit. Check for improper connection of Thermistor-Exhaust.	

(F) 36	Thermistor-Primary Heat Exchanger Inlet abnormality	Measure the resistance through the Thermistor-Heat Exchanger Inlet (6).Check for an open or short circuit. Check for improper connection of Thermistor-Heat Exchanger Inlet.	
(F) 42	Water Flow Sensor (Recirculation) abnormality	Check voltage from Circuit Board (17).	
(F) 61	Fan Motor abnormality	Check that the fan is rotating and check the pulse frequency from the fan rotational frequency sensor (11). Check for improper connection of the fan. Check voltage from Circuit Board.	
(F) 63	Recirculation Abnormality	Check return line filter. <Dedicated mode only> Purge the air in the domestic hot water line and return line. <Crossover mode only> Check the connector marked “Crossover” is closed. Check the crossover valve's filter	
(F) 65	Water Servo-Main abnormality	Check that the Water Servo-Main is functioning (1). Check for improper connection of the valve.	To reset this error code, the power needs to be disconnected and then reconnected.
(F) 66	Water Servo-Bypass abnormality	Check that the Water Servo-Bypass is functioning (2). 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.	To reset this error code, the power needs to be disconnected and then reconnected.
(F) 71	Gas Valve drive circuit abnormality	Check for damage to the Gas Valve drive circuit on the Circuit Board.	To reset this error code, the power needs to be disconnected and then reconnected. If the display continues, contact nearest agent.
(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 (9). Check for a ground fault.	
(F) 73	Circuit Board setting abnormality (Improper Maintenance Writers Settings, DIP Switch Settings, etc.)	Check for proper setting of maintenance writers on Circuit Board. Check the Circuit Board (microcomputer) for damage. Check the dip switch settings. e.g.) Exhaust type, vent length, etc.	This error is displayed when switching the dip switch with the power on. To reset this error code, the power needs to be disconnected and then reconnected.
F76	Multi-system communication error	Check for proper connection of Quick Connect Cord.	
760	Remote Controller transmission abnormality	Check connection from Remote Controller to Circuit Board. Check Remote Controller and Circuit Board for damage.	
(F) 90	Combustion abnormality (Unit shuts off)	Check air supply vent for blockage or obstruction. Check exhaust vent for blockage or obstruction. Have a professional check the gas supply pressure. Check if the condensate drain line is clogged or frozen. Check that the condensate drain pipe slopes down. Check the dip switch settings on the circuit board.	To reset this error code, the power needs to be disconnected and then reconnected. If the display continues, contact nearest agent.
(F) 94	Exhaust temperature is too high	Check for abnormal combustion (8).	To reset this error code, the power needs to be disconnected and then reconnected.
(F) C1# # = 1-9	Service Reminder (Warning Indication)	This unit is equipped with a service reminder. Excessive scale build-up may cause premature failure of the heat exchanger. Excessive dust or lint build-up in the fan and air intake may affect efficiency and combustion performance . Contact the phone number of instruction manual for additional information about recommended maintenance.	

*In a Quick Connect Multi-System, "F##"(except F76) indicates an error code from the secondary unit (unit without a remote controller).

Circuit Board Checkpoints

UT199DV (GQ-C3260WX-FF PB US)

Ref. No.	Part	Circuit board Check points (Check the wiring diagram behind the front cover)					Normal value	Remarks
		CN & Pin	No.	Wire Color	CN & Pin	No.		
1	Water Servo-Main	CN59	12	W - O	CN59	7	DC 1 - 16 V	
			12	W - G		8	DC 1 - 16 V	
			12	W - V		9	DC 1 - 16 V	
			12	W - BK		10	DC 1 - 16 V	
			11	Y - BL		28	DC 1V or less	When valve is fully open
2	Water Servo-Bypass	CN59	1	W - O	CN59	3	DC 1 - 16 V	
			1	W - G		4	DC 1 - 16 V	
			1	W - V		5	DC 1 - 16 V	
			1	W - BK		6	DC 1 - 16 V	
			2	Y - BL		28	DC 1V or less	When valve is fully open
3	Water Flow Sensor	CN59	30	R - BL	CN59	28	DC 14 - 16 V	
			29	Y - BL		28	DC 0.5 - 15 V	
4	Thermistor-Cold Water	CN63	7	W - W	CN63	2	Note 1)	Note 1)
5	Thermistor-Hot Water	CN63	1	W - W	CN63	2	Note 1)	Note 1)
6	Thermistor-Primary Heat Exchanger Inlet	CN63	5	W - W	CN63	2	Note 1)	Note 1)
7	Thermistor-Primary Heat Exchanger Outlet	CN63	8	W - W	CN63	2	Note 1)	Note 1)
8	Thermistor-Exhaust	CN63	3	W - W	CN63	2	Note 2)	Note 2)
9	Flame Rod	CN78	3	BL - Heat exchanger	-	GND	10 kHz - 100 kHz	
			3	BL - Electrode		Flame Rod	DC 0.45μA or less	When no flame is detected
10	Flame Rod	CN78	3	BL - Heat exchanger	-	GND	10 kHz - 100 kHz	
			3	BL - Electrode		Flame Rod	DC 1μA or more	At flame detection
11	Fan Motor	CN27	6	W - BL	CN27	4	DC 140 - 187 V	
			3	R - BL		4	DC 13 - 16 V	
			1	O - BL		4	DC 1.69 - 8.25 V	When fan is rotating
			2	Y - BL		4	208 Hz - 1300 Hz	12 pulse/revolution
12	Igniter	CN42	6	W - BK	CN1	2	AC 108 - 132 V	When igniter is sparking
13	Gas Valve	CN10	1	R - BL	CN10	2	DC 90 - 120 V	When valve is open
							1.22 kΩ - 1.50 kΩ	Coil resistance Note 4)
14	High Limit Switch -Primary Heat Exchanger	CN42	1	BK - W	CN1	1	1Ω or less	Contact resistance Note 4)
15	Thermistor - Air	CN63	6	BK - W	CN63	2	Note 3)	Note 3)
-	Power Supply (Power Circuit Board)	CN92	3	W - BL	CN92	4	AC 108 - 132 V	
-	Power Supply (Power Circuit Board)	CN92	1	W - BK	CN92	2	AC 108 - 132 V	
-	Remote Controller	CN89	1	BL - BL	CN89	3	DC 14 - 16 V	

Note 1) •Cold Water / Hot water / Primary Heat Exchanger Inlet / Primary Heat Exchanger Outlet Thermistor Temperature Characteristics

Temperature (° F)	32	50	68	86	104	122	140	158	176
Temperature (° C)	0	10	20	30	40	50	60	70	80
Resistance (k Ω)	23.7	15.5	10.3	7.0	4.9	3.5	2.5	1.9	1.4
Voltage (V)	4.5	4.3	4.0	3.6	3.2	2.8	2.4	2.0	1.7

Note 2) •Thermistor - Exhaust Temperature Characteristics

Temperature (° F)	-4	14	32	50	68	86
Temperature (° C)	-20	-10	0	10	20	30
Resistance (k Ω)	487	276	162	98.3	61.4	39.5
Voltage (V)	4.6	4.3	3.9	3.4	2.8	2.3

Note 3) •Thermistor - Air Temperature Characteristics

Temperature (° F)	-4	14	32	50	68	86
Temperature (° C)	-20	-10	0	10	20	30
Resistance (k Ω)	101.7	57.7	33.8	20.4	12.6	8.0
Voltage (V)	4.4	4.0	3.5	2.9	2.3	1.7

Note 4) When measuring the resistance, disconnect the connector from circuit board and check the connector side.

■ Circuit Board Checkpoints

PR199DV (GQ-C3260WXQ-FF PB US)

Ref. No.	Part	Circuit board Check points (Check the wiring diagram behind the front cover)					Normal value	Remarks
		CN & Pin	No.	Wire Color	CN & Pin	No.		
1	Water Servo-Main	CN59	12	W - O	CN59	7	DC 1 - 16 V	
			12	W - G		8	DC 1 - 16 V	
			12	W - V		9	DC 1 - 16 V	
			12	W - BK		10	DC 1 - 16 V	
			11	Y - BL		28	DC 1V or less	When valve is fully open
2	Water Servo-Bypass	CN59	1	W - O	CN59	3	DC 1 - 16 V	
			1	W - G		4	DC 1 - 16 V	
			1	W - V		5	DC 1 - 16 V	
			1	W - BK		6	DC 1 - 16 V	
			2	Y - BL		28	DC 1V or less	When valve is fully open
3	Water Flow Sensor	CN59	30	R - BL	CN59	28	DC 14 - 16 V	
			29	Y - BL		28	DC 0.5 - 15 V	
4	Thermistor-Cold Water	CN63	7	W - W	CN63	2	Note 1)	Note 1)
5	Thermistor-Hot Water	CN63	1	W - W	CN63	2	Note 1)	Note 1)
6	Thermistor-Primary Heat Exchanger Inlet	CN63	5	W - W	CN63	2	Note 1)	Note 1)
7	Thermistor-Primary Heat Exchanger Outlet	CN63	8	W - W	CN63	2	Note 1)	Note 1)
8	Thermistor-Exhaust	CN63	3	W - W	CN63	2	Note 2)	Note 2)
9	Flame Rod	CN78	3	BL - Heat exchanger	-	GND	10 kHz - 100 kHz	
			3	BL - Electrode		Flame Rod	DC 0.45μA or less	When no flame is detected
10	Flame Rod	CN78	3	BL - Heat exchanger	-	GND	10 kHz - 100 kHz	
			3	BL - Electrode		Flame Rod	DC 1μA or more	At flame detection
11	Fan Motor	CN27	6	W - BL	CN27	4	DC 140 - 187 V	
			3	R - BL		4	DC 13 - 16 V	
			1	O - BL		4	DC 1.69 - 8.25 V	When fan is rotating
			2	Y - BL		4	208Hz - 1300 Hz	12 pulse/revolution
12	Igniter	CN42	6	W - BK	CN1	2	AC 108 - 132 V	When igniter is sparking
13	Gas Valve	CN10	1	R - BL	CN10	2	DC 90 - 120 V	When valve is open
							1.22 kΩ - 1.50 kΩ	Coil resistance Note 4)
14	High Limit Switch -Primary Heat Exchanger	CN42	1	BK - W	CN1	1	1Ω or less	Contact resistance Note 4)
15	Thermistor - Air	CN63	6	BK - W	CN63	2	Note 3)	Note 3)
16	Recirculation Pump	CN42	3	W - BK	CN1	2	AC 108 - 132 V	When Pump is working
17	Water Flow Sensor (Recirculation)	CN59	30	R - BL	CN59	28	DC 14 - 16 V	
			27	Y - BL		28	DC 0.5 - 15 V	
-	Power Supply (Power Circuit Board)	CN92	3	W - BL	CN92	4	AC 108 - 132 V	
-	Power Supply (Power Circuit Board)	CN92	1	W - BK	CN92	2	AC 108 - 132 V	
-	Remote Controller	CN89	1	BL - BL	CN89	3	DC 14 - 16 V	

Note 1) •Cold Water / Hot water / Primary Heat Exchanger Inlet / Primary Heat Exchanger Outlet Thermistor Temperature Characteristics

Temperature (° F)	32	50	68	86	104	122	140	158	176
Temperature (° C)	0	10	20	30	40	50	60	70	80
Resistance (k Ω)	23.7	15.5	10.3	7.0	4.9	3.5	2.5	1.9	1.4
Voltage (V)	4.5	4.3	4.0	3.6	3.2	2.8	2.4	2.0	1.7

Note 2) •Thermistor - Exhaust Temperature Characteristics

Temperature (° F)	-4	14	32	50	68	86
Temperature (° C)	-20	-10	0	10	20	30
Resistance (k Ω)	487	276	162	98.3	61.4	39.5
Voltage (V)	4.6	4.3	3.9	3.4	2.8	2.3

Note 3) •Thermistor - Air Temperature Characteristics

Temperature (° F)	-4	14	32	50	68	86
Temperature (° C)	-20	-10	0	10	20	30
Resistance (k Ω)	101.7	57.7	33.8	20.4	12.6	8.0
Voltage (V)	4.4	4.0	3.5	2.9	2.3	1.7

Note 4) When measuring the resistance, disconnect the connector from circuit board and check the connector side.

No Error Code

1-1	The set temperature is not displayed on Remote Controller when electrical power is connected. Operation indicator does not light when turned on.
1-2	The fan does not operate when the hot water fixture is opened.
1-3	Outlet water temperature incorrect
1-4	Recirculation doesn't start / Pump doesn't operate
1-5	Repeating pump ON and OFF frequently

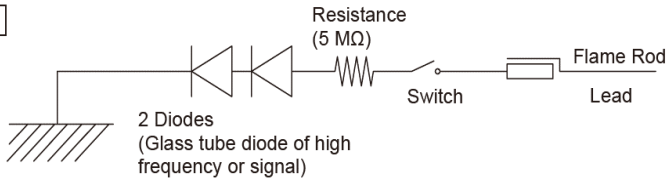
Error Code Displayed

Error Codes Remote Controller	Description
11	Ignition failure (Initial flame fault detection)
12	Flame Rod does not detect flame (Flame fault detection)
13	Optional CO alarm abnormality
15 / 16	Abnormally high input temperature / Abnormally high Output temperature
20	High Limit Switch . Primary Heat Exchanger triggered
30	Thermistor - Air abnormality
31	Thermistor - Cold Water abnormality
32	Thermistor - Hot Water abnormality
33 / 36	Thermistor - Primary Heat Exchanger Inlet/Outlet abnormality
35	Thermistor - Exhaust abnormality
42	Water Flow Sensor (Recirculation) abnormality
61	Fan Motor abnormality
63	Recirculation abnormality
65	Water Servo-Main abnormality
66	Water Servo-Bypass abnormality
70	Circuit Board abnormality
71	Gas Valve drive circuit abnormality
72	Flame Rod circuit abnormality
73	Circuit Board setting abnormality
760	Remote Controller transmission abnormality
F76	Multi system communication error
10 / 90	Air flow abnormality (Unit shuts off)
94	Air flow abnormality (Unit shuts off)
C1# Note1)	Service reminder for Scale Build-up in the Heat Exchanger

Note 1) # =1, 2, 3, 4, 5, 6, 7, 8, 9

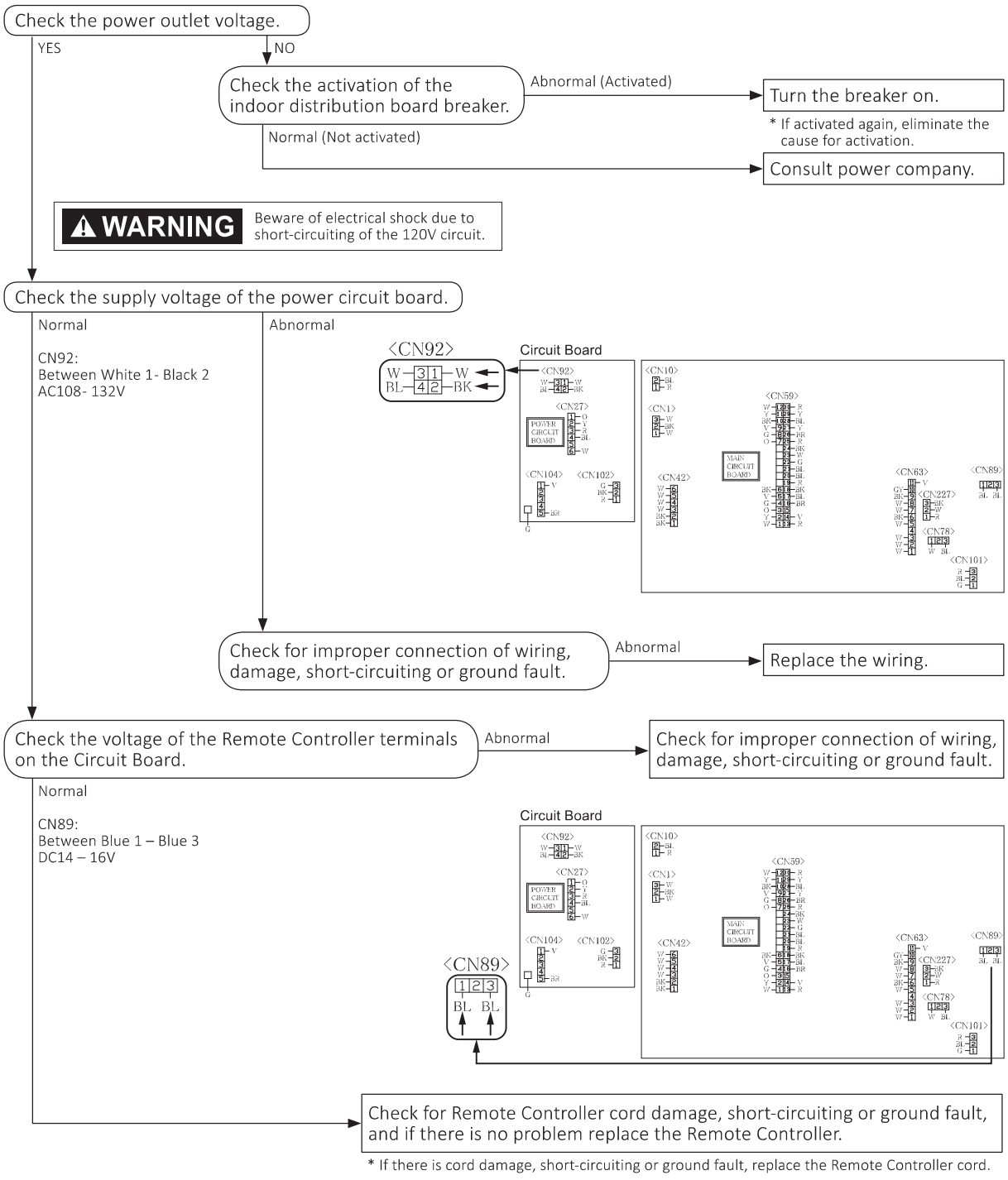
* If Error Code "21" is displayed, replace the wiring harness.

Specification of Dummy Flame



1. No Error Code

1-1. The set temperature is not displayed on Remote Controller when electrical power is connected.
Operation indicator does not light when turned on.



1-2. The fan does not operate when the hot water fixture is opened.

<NRCR only>
The cold water supply line and the hot water supply line are connected to the Water Heater reversely.

NO

YES → Correct the plumbing.

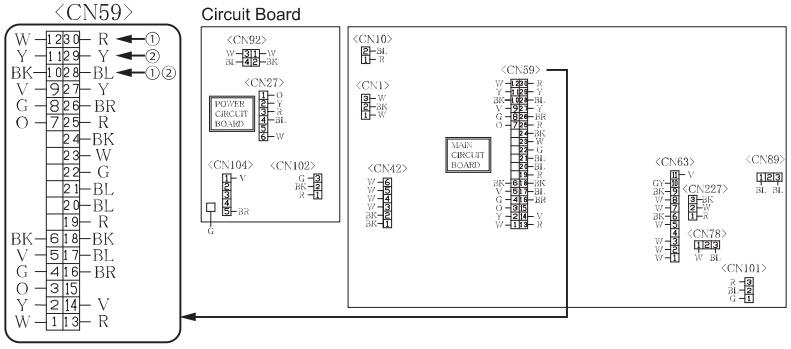
Check whether the Water Flow Sensor is normal.

Normal

Open the hot water fixture fully.
Confirm 0.5 gal/min. or more by using maintenance monitor #14.

When not using the maintenance monitor:
①CN59
Between Red 30- Blue 28
DC 14- 16V
or
②CN59
Between Yellow 29- Blue 28
DC 0.5 – 15V

Abnormal



① Check the voltage between CN59 Red 30 and Blue 28.

Abnormal → Replace the Circuit Board.

Normal

② Check the pulses between CN59 Yellow 29 and Blue 28.

Abnormal → Check for improper connection of wiring. / Replace the Water Flow Sensor.

Normal → Replace the Circuit Board.

Check whether the Thermistor-Cold Water Detection is too high. (Check the Inlet Water temperature.)*1

Normal

*1 and *2 to the right do not apply in this case.

Abnormal

*1 << How to check >>
Confirm the maintenance monitor #29 to know the cause.
[001]: Water inlet temperature is too high.
→ If possible decrease water inlet temperature.
[002]: "Predicted water outlet temperature*2" is too high.
→ If possible increase flow rate.
[004]: Inlet and Outlet temperature are reversed.
→ Check the pipes and re-install it correctly.

*2 If "Predicted water outlet temperature" is too high, the Unit will not run to prevent scalding hot water temperature.

Set Temperature (°F)	K (Predicted water temperature)
Less than 122°F	136°F
122°F or more	Set Temperature + 9°F

$$K > \frac{35.7}{\text{Total Flow Rate (gal/min)}} + \text{Thermistor- Cold Water Detection Temperature (°F)}$$

K : Predicted outlet water temperature
35.7: Coefficient for EZ111, EZ98, NCC199, NRCR111, and NRCR92

Check whether a solar water heater is directly coupled or whether the hot water fixture is not fully opened.

A

A

Check whether the Thermistor- Cold Water is normal.

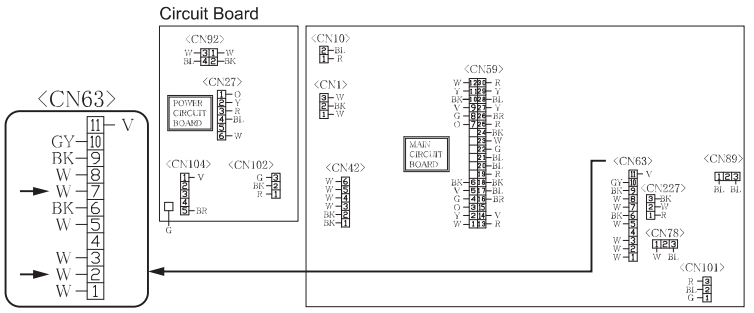
Normal

Check that actual water temperature and maintenance monitor #30 match.

When not using the maintenance monitor:
Thermistor-Cold Water converted from the resistance between CN63 White 7- White 2 (refer to the thermistor temperature characteristics below) and the actually measured water temperature should be about the same.

When measuring the resistance, disconnect the connector and check the male side.

Abnormal



Check for improper connection of wiring.

Replace the Thermistor – Cold Water.

• Cold · Hot water / Primary Heat Exchanger Thermistor Temperature Characteristics

Temperature (°F)	32	50	68	86	104	122	140	158	176
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
Voltage (V)	4.5	4.3	4.0	3.6	3.2	2.8	2.4	2.0	1.7

Replace the Circuit Board.

1-3. Outlet water temperature incorrect

Only connect and disconnect the connector after the fan has stopped rotating and then disconnect the electrical power.
(The Circuit Board and Fan Motor may be damaged otherwise.)

In this case, the actual outlet water temperature is colder than the Set Temperature.
Confirm "Thermistor-Hot Water", "Water Servo-Main", "Gas Valves" are normal.

Check whether the Thermistor-Cold Water / Hot Water / Primary Heat Exchanger (Inlet/Outlet) are normal.

Normal

1) Set Unit to "Drainage Mode". (Drainage Mode is shown in page 7)
2) Open the fixture. (Pass through the water to the Unit.)
3) Check the maintenance monitor.
   The difference between #30 and #31 and #32 and #33 data should be within ±5°F.

Abnormal

Check the thermistor resistance.

Normal

① CN63 White 7- White 2 (Cold Water)
② CN63 White 1- White 2 (Hot Water)
③ CN63 White 5- White 2 (Primary Heat Exchanger Inlet)
④ CN63 White 8- White 2 (Primary Heat Exchanger Outlet)

When measuring the resistance, disconnect the connector and check the male side.

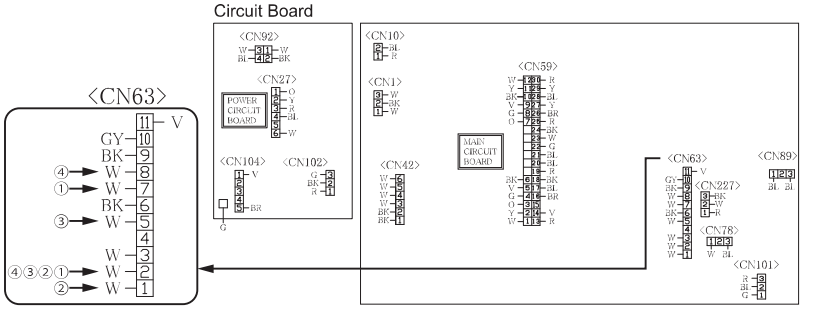
Abnormal

Check for improper connection of wiring, connectors, etc. then replace the thermistor.

Refer to the thermistor temperature characteristics below.

• Cold · Hot water / Primary Heat Exchanger Thermistor Temperature Characteristics

Temperature (°F)	32	50	68	86	104	122	140	158	176
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



Replace the Circuit Board.

Check whether the Thermistor- Cold Water is normal.

Normal

Run 2 different tests and compare the data on Maintenance monitor #31.
One test at 100°F set temperature and the second test at 140°F set temperature.
Open the hot water fixture fully, and then confirm Thermistor-Hot Water by the Maintenance monitor.
#31 data should be within ±5°F of the set temperature.

→ A

Abnormal

◎1 Check if the Water Servo-Main is normal. (Check the maintenance monitor #60.)

Normal

Maintenance monitor #60
[000]- [1700]: Normal ("1700" is displayed on the Remote Controller)
→ Check whether the maintenance monitor # 60 moves between [000] and [1700].
[EEE] : Abnormal
→ Check for improper connection of wiring, then replace the Water Servo-Main.

→ B

A

B

Check whether the primary gas pressure is normal.

Abnormal → Check the gas supply valve, etc.

Normal

* Check the primary pressure (dynamic pressure) at the time of maximum combustion.

Primary gas pressure list

Pressure \ Gas group		LP	NGA
Maximum pressure	inch H_2O	14.0	10.5
Standard pressure	inch H_2O	11.0	7.9
Minimum pressure	inch H_2O	8.0	3.5

Check whether the gas pressure is normal.

Normal

Abnormal

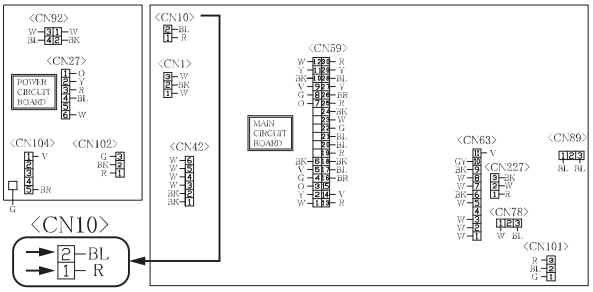
◎2 Check the voltage of Gas Valve.

Normal

Abnormal → Replace the Circuit Board.

CN10: Between
Red 1- Blue 2
DC 90- 120V

Circuit Board



Check for improper connection of wiring, then replace the Gas Valve.

Check for the Water Flow Sensor or water fixtures.

No abnormality in appliance.

• Drainage Mode Using the Remote Controller

[RC-7651M-A]

1) The ⏻ button is OFF.
2) Press and hold the ⚙ button until a sound is heard (approximately 2 seconds).
(The maximum hot water temperature will blink.)

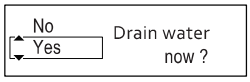
(e.g. 120°F)

3) Press the ⚙ button several times until the item number "5" is displayed.

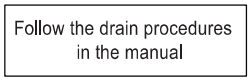
4) Press the ▲ button.
(The display will change from "oF" to "on".)

[RC-9018M]

1) Turn the power [ON/OFF] button "OFF".
2) Press the [MENU] button inside the cover, Select "Misc settings" using the [▲] or [▼] buttons.
Press the [ENTER] button.
(The "Misc settings" screen appears.)
3) Select "Drain water" using the [▲] or [▼] buttons, and then press [ENTER] button.
4) Select "Yes" using the [▲] or [▼] buttons,



press [ENTER] button.



1-4. Recirculation doesn't start / Pump doesn't operate

Check the plumbing is installed in accordance with Installation Manual.

Normal

Abnormal → Repair the plumbing.

Check the recirculation mode by using maintenance monitor #86.

Not applicable the right column.

NO	Item	Remarks		
			Dedicated Mode	Crossover Mode
86	Recirculation Mode	Auto Recirc (Default)	11	21
		Manual Timer Recirc	12	22
		Always Recirc ON	13	23
		Always Recirc OFF	14	24
		On-Demand (Title24) Mode	15	-

11 or 12: Auto recirculation will stop when not having been used hot water for 3 days. When start to use hot water, auto recirculation will operate on the next day.
12 or 22: Check the recirculation reservation time by using Remote controller (RC-9018M).
14 or 24: The recirculation function is OFF. Turn off the power button and press the SETTINGS button. Change the item "4 of" to "4 on". Details are described in Owner's Guide.
15: Press the On-demand Switch. Pump operates only when the On-demand switch is pressed. When inlet water temperature is higher than 102°F (39°C), water heater doesn't start recirculation.

Check the water temperature in the water heater.

Normal

Confirm Thermistor- Hot Water is under "Setting temperature subtract 10°F" by using maintenance monitor #31.

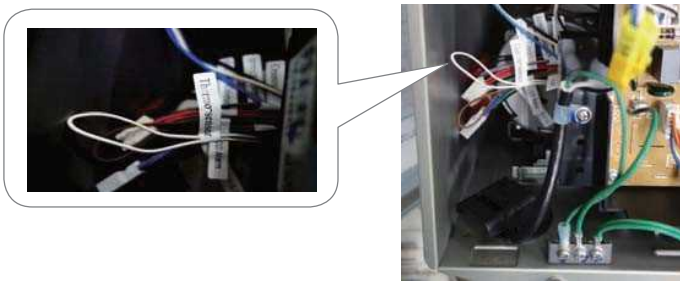
Abnormal → It's not abnormal. Wait until the water temperature cool down.

Check the state of Thermo-sensor by using maintenance monitor #45.

[1**] is shown (Circuit is shorted)

[0**] is shown (Circuit is opened) → <When installed the thermostat> Check the setting temperature of the external thermostat.

<When not installed the thermostat> Check the Thermo-sensor wiring is short-circuited.

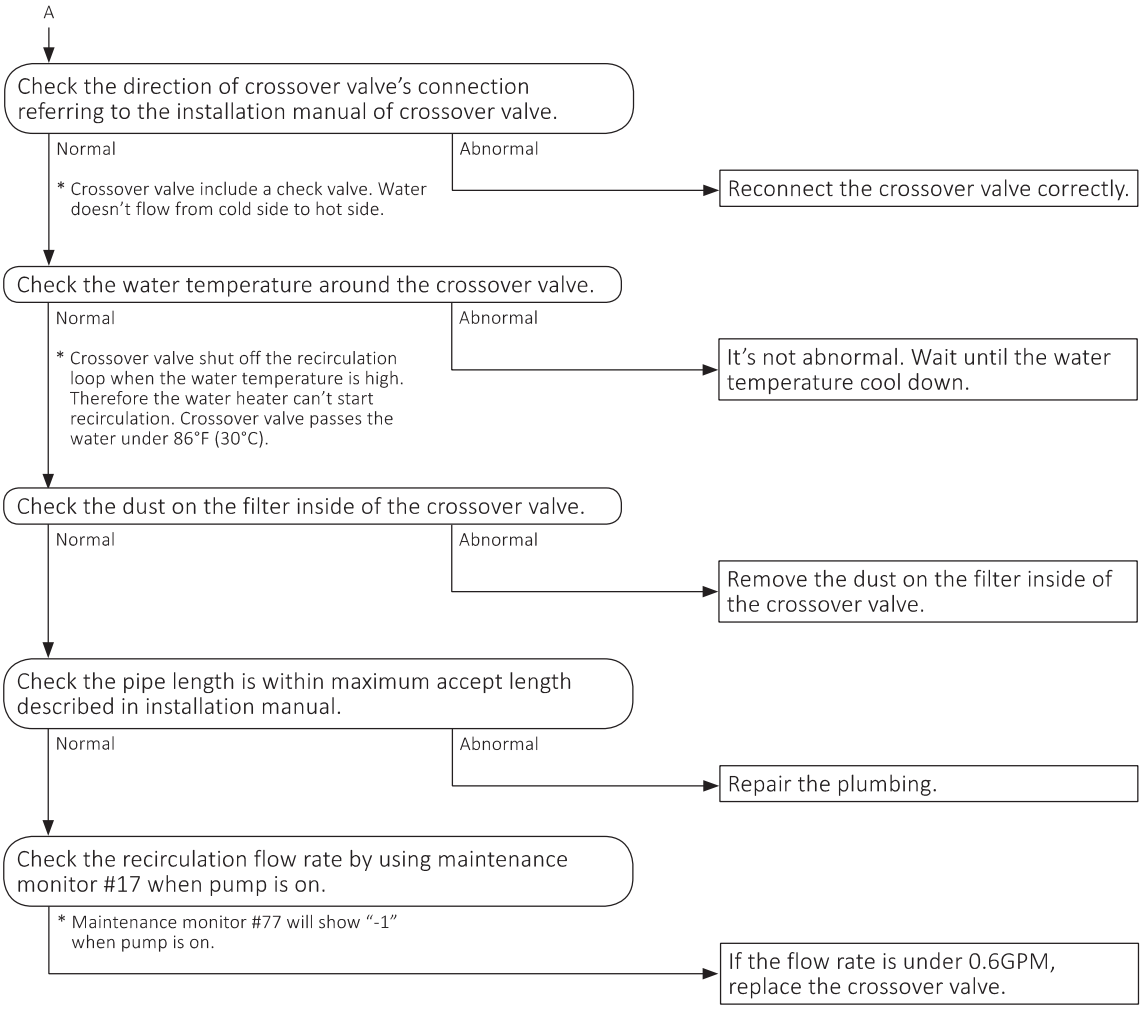


<Only crossover mode> Confirm the following points.

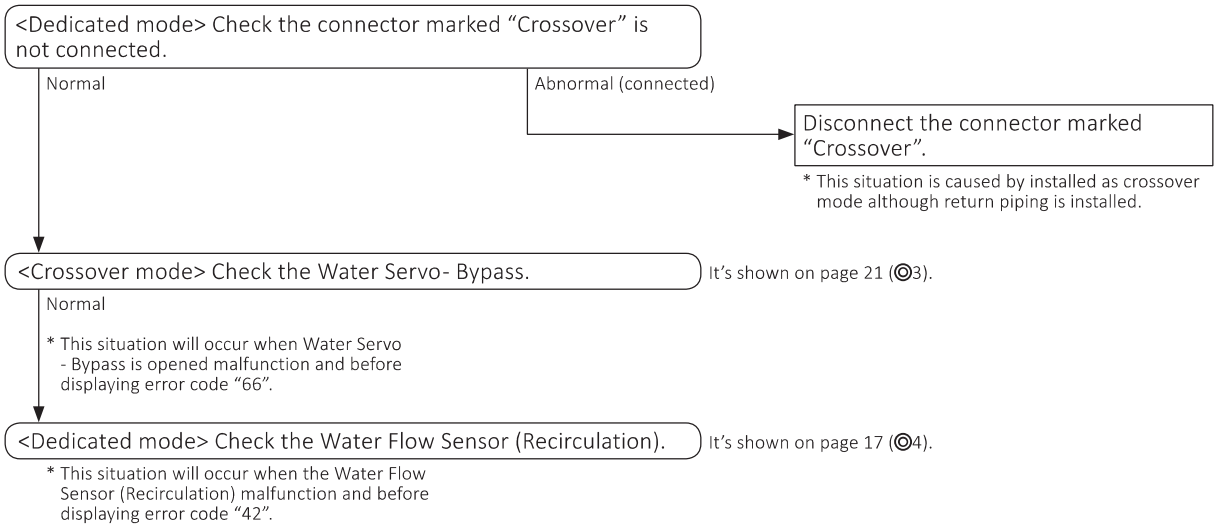
Confirm the crossover valve specified in the water heater's installation manual is installed.

Normal → A

Abnormal → Replace the crossover valve to the specified one.



1-5. Repeating pump ON and OFF frequently



2. Error Code Displayed

Error Codes Remote Controller	Description
11	Ignition failure (Initial flame fault detection)

Only connect and disconnect the connector after the fan has stopped rotating and then disconnect the electrical power.
(The Circuit Board and Fan Motor may be damaged otherwise.)

<Condition of occurrence for Error Code 11>
Displayed if flame detection was not possible at the time of initial ignition due to the causes listed below.
(Defective ignition device, leakage of ignition plug, problem in gas supply, poor connection of ground wire, defective flame rod, etc.)

Check that the flame ignites (check through the peephole of the burner).

YES

NO

Check whether the Igniter is normal.

YES

NO

Check the voltage to the Igniter (on the connector).

Normal

AC108- 132V between connector

Check for improper connection of ignition plug, then replace the Igniter.

Abnormal

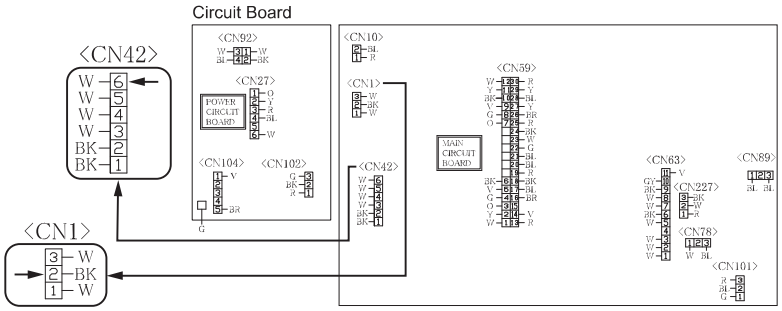
Check the voltage to the Igniter (on the Circuit Board).

Abnormal

Check High Limit Switches conduction, and if 1Ω or more (High Limit Switch), replace the Circuit Board.

Normal

Between CN42: White 6 – CN1: Black 2
AC108- 132V



Replace the Igniter or the Ignition Plug.

Check whether the primary gas pressure is normal.

Abnormal

Check the gas supply valve, etc.

Normal

* Check the primary pressure (dynamic pressure) at the time of maximum combustion.

Primary gas pressure list

Pressure \ Gas group		LP	NGA
Maximum pressure	inch H_2O	14.0	10.5
Standard pressure	inch H_2O	11.0	7.9
Minimum pressure	inch H_2O	8.0	3.5

Check whether the offset gas pressure is normal.

Normal

Abnormal

A

B

C

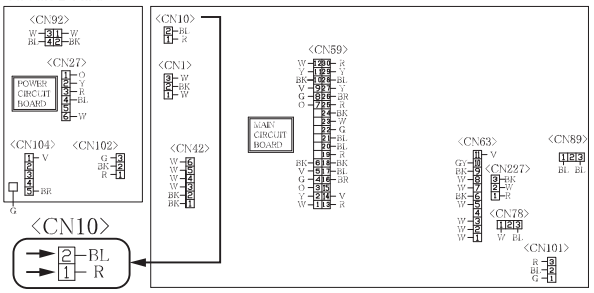
A B C

Check the voltage of Gas Valve. — Abnormal → Replace the Circuit Board.

Normal

CN10: Between Red 1- Blue 2
DC90- 120V

Circuit Board



→ Check for improper connection of wiring, then replace the Gas Valve.

→ Check for the Fan Motor clogging, etc.

Check that combustion conditions are normal. (Is the flame small?, Is there lift?, etc.)

Normal | Abnormal

Check whether the primary gas pressure is normal. — Abnormal → Check the gas supply valve, etc.

* Check the primary pressure (dynamic pressure) at the time of maximum combustion.

Normal

Check if the Fan Motor speed is normal. — Abnormal → Adjust the model type setting, etc.

Normal

→ Check for the Fan Motor, Burner, Venturi, clogging.

Primary gas pressure list

Pressure \ Gas group		LP	NGA
Maximum pressure	inch H_2O	14.0	10.5
Standard pressure	inch H_2O	11.0	7.9
Minimum pressure	inch H_2O	8.0	3.5

Check whether the Burner On Lamp is lit by the Dummy Flame*. (at the Flame Rod.)

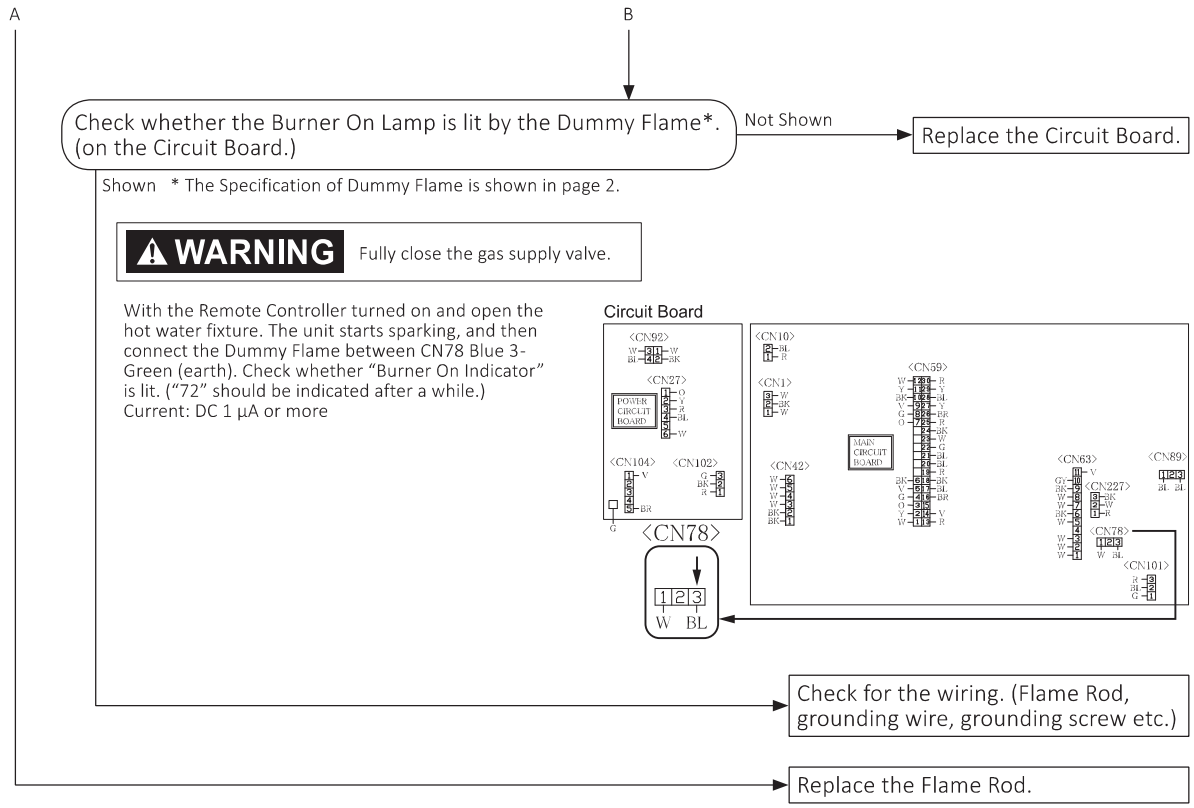
Shown * The Specification of Dummy Flame is shown in page 2.

Not Shown

⚠ WARNING Fully close the gas supply valve.

With the Remote Controller turned on and open the hot water fixture.
The unit starts sparking, and then connect the Dummy Flame Between the Flame Rod and Earth. Check whether "Burner On Lamp" is lit. ("72" should be indicated after a while.)

A B



In many cases, the Error Code 11 for ignition failure does not reappear. In some cases the error is caused by fluctuations due to environmental factors (time, humidity, etc.). If the error does not reappear, also check the items listed below.

Item	Check contents	Fluctuation factors Item and check procedure
Gas supply	Low primary pressure	Check whether the gas supply valve is half open. Check the primary pressure (dynamic pressure) at the time of maximum combustion. Check whether the error occurs when there is high gas consumption. (The primary gas pressure (dynamic pressure) may fluctuate during high usage.)
	Gas Valve	Check whether the cable was caught between the front cover and the casing or not.
Ignition device (faulty spark)	Igniter	Check for faulty insertion of wiring from Igniter to the Ignition Plug.
	Ignition Plug	Check for water on or traces of water on the Ignition Plug.
Control and settings	Faulty the gas pressure	Check whether the gas pressure can be adjusted and readjust the gas pressure.
	Flame Rod	Check whether "the grounding wire was caught between the front cover and the casing" or "the leakage occurred" or not. Check for looseness or faulty connection of grounding screw.
	Gas Valve	Press the Maximum and Minimum offset Pressure Set Button and check that the offset gas pressure switches smoothly.
Other	Wiring	Faulty connection due to looseness of connector pins or incomplete insertion of connectors. Check whether the cable was caught between the front cover and the casing.

Error Codes Remote Controller	Description
12	Flame Rod does not detect flame (Flame fault detection)

The trouble diagnosis for "Error Code 12" is same as "Error Code 11".

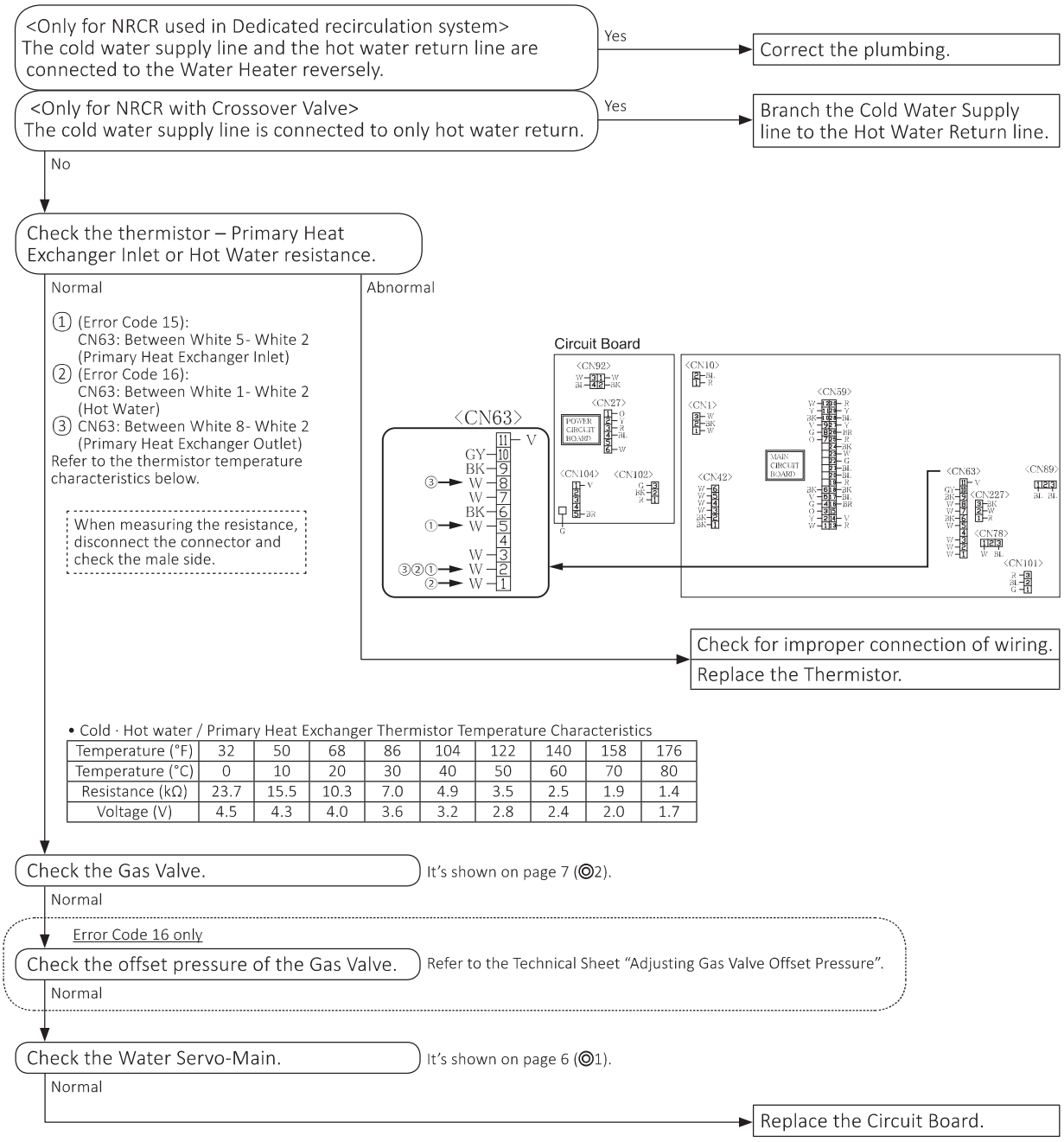
<For Remote Controller RC-9018 series>
The error code 12-4 might be displayed. This error code is indicating that the Flame Lifting Detection (See Components page) is activated caused by abnormal combustion. In this case, contact the Pavilion customer center or qualified service technician.

Error Codes Remote Controller	Description
13	Optional CO alarm abnormality

This Error Code is displayed due to failure on the optional CO alarm device. Please check the procedure below after cleaning the air of installation site.

1. Check all vent components are secure and fully connected.
2. Check for any exhaust leaking from vent pipes.
3. Check if CO alarm wire cut off.

Error Codes Remote Controller	Description
15 / 16	Abnormally high input temperature / Abnormally high Output temperature



• Cold · Hot water / Primary Heat Exchanger Thermistor Temperature Characteristics

Temperature (°F)	32	50	68	86	104	122	140	158	176
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
Voltage (V)	4.5	4.3	4.0	3.6	3.2	2.8	2.4	2.0	1.7

Error Codes Remote Controller	Description
20	High Limit Switch – Primary Heat Exchanger triggered

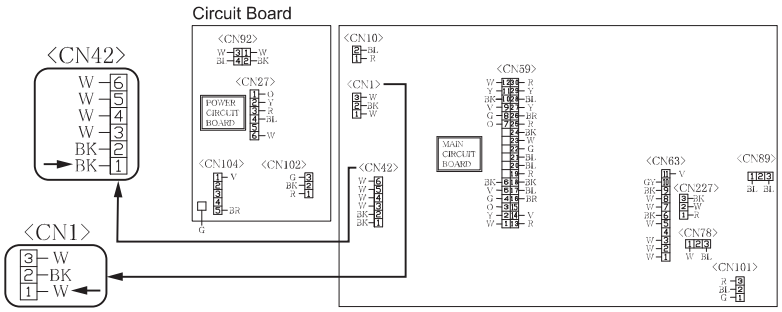
Check the thermistor – Primary Heat Exchanger Inlet or Hot Water resistance.

Normal

Between
CN1: White 1 – CN 42: Black 1
1Ω or less

When measuring the resistance, disconnect the connector and check the male side.

Abnormal



Check for improper connection of wiring.
Replace the High Limit Switch.

Check the Scale Build-up in the Heat Exchanger.

Normal

1. Open a water fixture or hot water outlet valve fully.
2. Close a water fixture or hot water outlet valve fully.
3. Check whether the Error Code 20 display again.

Abnormal

Replace the Heat Exchanger.

Replace the Circuit Board.

Error Codes Remote Controller	Description
30	Thermistor – Air abnormality

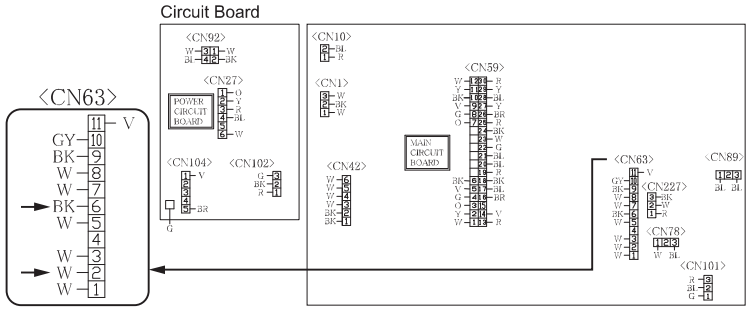
Check the Thermistor – Air open or short circuit.

Normal

CN63: Between Black 6- White 2
DC 1.7 – 4.4V
Refer to the thermistor temperature characteristics below.

When measuring the resistance, disconnect the connector and check the male side.

Abnormal



Check for improper connection of wiring.
Replace the Thermistor.

• Thermistor- Air Temperature Characteristics

Temperature (°F)	-4	14	32	50	68	86
Temperature (°C)	-20	-10	0	10	20	30
Resistance (kΩ)	106.5	59.6	34.4	20.6	12.6	8.0
Voltage (V)	4.4	4.0	3.5	2.9	2.3	1.7

Replace the Circuit Board.

Error Codes Remote Controller	Description
31	Thermistor – Cold Water abnormality

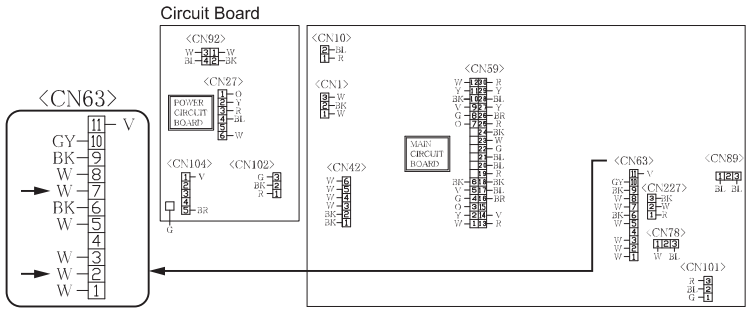
Check the Thermistor – Cold Water open or short circuit.

Normal

CN63: Between White 7- White 2
DC 1.7 – 4.5V
Refer to the thermistor temperature characteristics below..

When measuring the resistance, disconnect the connector and check the male side.

Abnormal



Check for improper connection of wiring.
Replace the Thermistor.

• Cold · Hot water / Primary Heat Exchanger Thermistor Temperature Characteristics

Temperature (°F)	32	50	68	86	104	122	140	158	176
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
Voltage (V)	4.5	4.3	4.0	3.6	3.2	2.8	2.4	2.0	1.7

Replace the Circuit Board.

Error Codes Remote Controller	Description
32	Thermistor – Hot Water abnormality

Check the Thermistor – Cold Water open or short circuit.

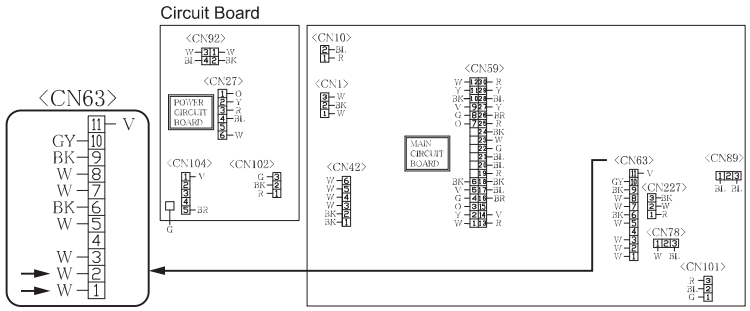
Normal

1) Set Unit to “Drainage Mode”.
(Drainage Mode is shown in page 7)
2) Open the fixture.
(pass through the water to the Unit.)
3) Check the maintenance monitor.
The difference between #30 and #31 data should be within ±5°F.

CN63: Between White 1- White 2
DC 1.7 – 4.5V
Refer to the thermistor temperature characteristics below.

When measuring the resistance, disconnect the connector and check the male side.

Abnormal



Check for improper connection of wiring.
Replace the Thermistor.

• Cold · Hot water / Primary Heat Exchanger Thermistor Temperature Characteristics

Temperature (°F)	32	50	68	86	104	122	140	158	176
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
Voltage (V)	4.5	4.3	4.0	3.6	3.2	2.8	2.4	2.0	1.7

Replace the Circuit Board.

Error Codes Remote Controller	Description
33 / 36	Thermistor – Primary Heat Exchanger Inlet / Outlet abnormality

Check the Thermistor – Primary Heat Exchanger Inlet/Outlet open or short circuit.

Normal

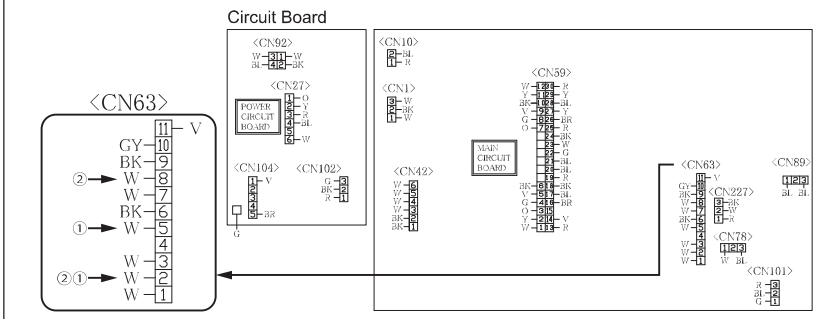
1) Set Unit to “Drainage Mode”.
   (Drainage Mode is shown in page 7)
2) Open the fixture.
   (pass through the water to the Unit.)
3) Check the maintenance monitor.
   The difference between #30, #32, and #33 data should be within ±5°F.

① (Error Code 33):
CN63: Between White 5- White 2
(Primary Heat Exchanger Inlet)
② (Error Code 36):
CN63: Between White 8- White 2
(Primary Heat Exchanger Outlet)
DC 1.7 – 4.5V

Refer to the thermistor temperature characteristics below.

When measuring the resistance, disconnect the connector and check the male side.

Abnormal



Check for improper connection of wiring.
Replace the Thermistor.

• Cold · Hot water / Primary Heat Exchanger Thermistor Temperature Characteristics

Temperature (°F)	32	50	68	86	104	122	140	158	176
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
Voltage (V)	4.5	4.3	4.0	3.6	3.2	2.8	2.4	2.0	1.7

Replace the Circuit Board.

Error Codes Remote Controller	Description
35	Thermistor – Exhaust abnormality

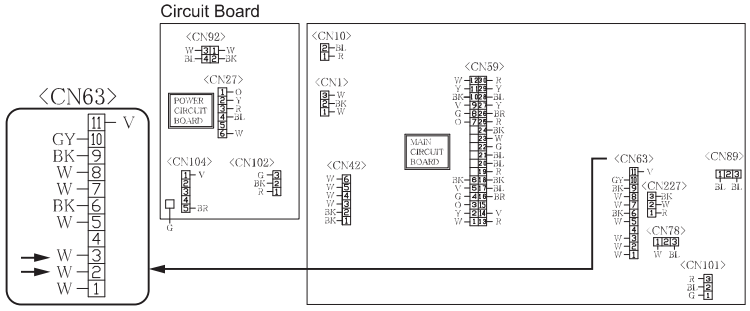
Check the Thermistor – Exhaust open or short circuit.

Normal

CN63: Between White 3- White 2
DC 2.3 – 4.6V
Refer to the thermistor temperature characteristics below.

When measuring the resistance, disconnect the connector and check the male side.

Abnormal



Check for improper connection of wiring.
Replace the Thermistor.

• Thermistor- Exhaust Temperature Characteristics

Temperature (°F)	-4	14	32	50	68	86
Temperature (°C)	-20	-10	0	10	20	30
Resistance (kΩ)	487	276	162	98.3	61.4	39.5
Voltage (V)	4.6	4.3	3.9	3.4	2.8	2.3

Replace the Circuit Board.

<Only for NRCR used in Dedicated recirculation system>

Error Codes Remote Controller	Description
42	Water Flow Sensor (Recirculation) abnormality

◎4 Check for improper connection of wiring, damage, short-circuiting or ground fault.

<Condition of occurrence for Error Code 42>
50 times detected the condition "Heat Exchanger flow rate-Recirculation flow rate ≥ 1GPM" within 8 sec after pump ON.

Normal

Abnormal

Repair the wiring.

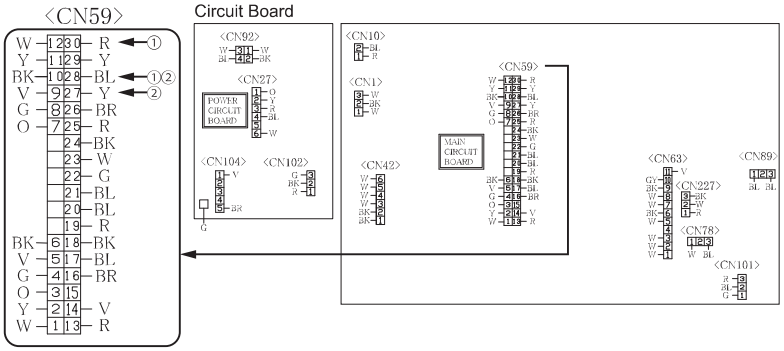
Check whether the Water Flow Sensor-Recirculation is normal.

Normal

CN59:
① Between Red 30- Blue 28
DC 14 – 16V
② Between Yellow 27- Blue 28
DC 0.5 – 15V

Abnormal

Replace the circuit board.



Replace the Water Flow (Recirculation) Sensor.

Error Codes Remote Controller	Description
61	Fan Motor abnormality

Only connect and disconnect the connector after the fan has stopped rotating and then disconnect the electrical power.
(The Circuit Board and Fan Motor may be damaged otherwise.)

<Condition of occurrence for Error Code 61>
When the Unit is in following conditions, the Error Code is displayed.
- If the fan speed is 200rpm more or less than the target speed during ignition or pre purge.
- If the fan speed is lower than 500rpm during the combustion.
- If the fan speed is 500 (200) rpm more or less than the target speed during combustion.

Fan Motor is rotating.

YES

NO

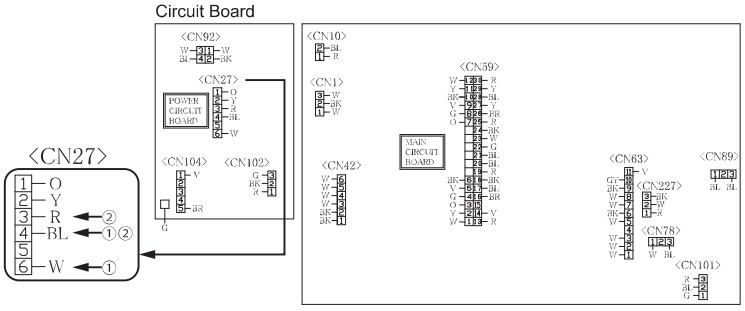
Check the Voltage to the Fan Motor.

Abnormal → Replace the Circuit Board.

Normal

CN27:
① Between White 6- Blue 4
DC 140 – 187V
② Between Red 3- Blue 4
DC 13 – 16V

Circuit Board



(because there is the possibility of fan phase interruption) → Replace the Fan Motor.

Check the Fan speed.

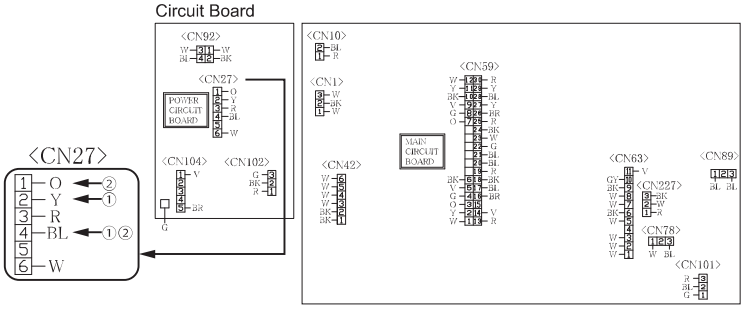
Abnormal → Replace the Fan Motor.

Normal

CN27:
① Between Yellow 2- Blue 4
208 – 1,300Hz
② Between Orange 1- Blue 4
DC 1.69 – 8.25V

Compare the data indicated on maintenance monitor #10 and #20.

Circuit Board



The problem may be due to a cause rather than the appliance.

* If the problem does not reappear and only appears on the Error Code history, it could be due to a cause rather than the unit, such as temporary blockage due to wind gusts or obstruction, a drop in the supply voltage (below AC 108V), etc.
Please explain this to the customer.

<Only for NRCR>

Error Codes Remote Controller	Description
63	Recirculation abnormality

Check the Crossover Valve is installed.

NO

YES

<Condition of occurrence for Error Code 63>
Displayed if the flow on Water Flow Sensor-Recirculation is less or none.

Connect the connector marked “Crossover”.

Check the direction of crossover valve’s connection.
Crossover Valve include a check valve.

Check whether the filter of hot water return connection is clogged by dust etc.

Normal

Abnormal (clogged)

Remove the cause of clogging.

Check for improper connection of wiring, damage, short-circuiting or ground fault.

Normal

Abnormal

Repair the wiring.

Check the pump is able to operate.

Operate
<Pump starting procedure>
Turn off the power button and turn on again. Pump will start to operate*.
* Pump will not operate when water temperature in the water heater is high. (e.g. After combustion) In that case, cool down the water heater in accordance with following procedure.
1) Set the water heater to “Drainage Mode”. (Refer to the next page)
2) Open the hot water fixture fully. Wait until cold water come out. Close the hot water fixture.
3) (Dedicated mode only) Open the drainage plugs on hot water return connection. Wait until cold water come out. Close the drainage plugs.
4) Turn on the power button.

Not to operate

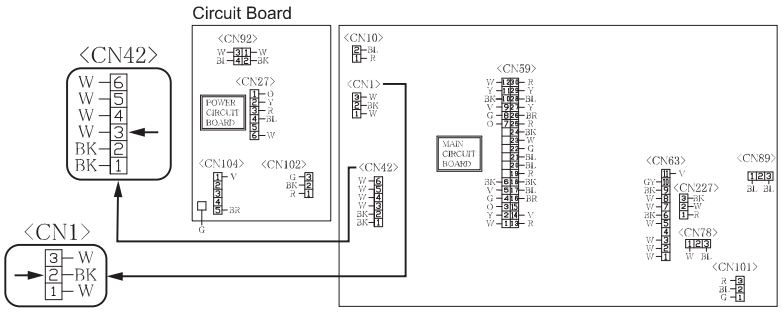
Check the supply voltage of the power circuit board.

Abnormal

Replace the circuit board.

Normal

Between CN42: White 3- CN1: Black 2
108- 132V
(When pump is operating.)
*Maintenance monitor #77 will show “-1” when pump is operating.



Replace the recirculation pump.

A

A

Check the plumbing.

Normal

Abnormal

- Purging the air in the return water line is not performed. (No water in the recirculation pump)
- Air is trapped in the hot water return line. (A gurgling sound occurs when pump is operating)
- Air separator is installed in the reverse order.
- Check for improper connection of plumbing. (Especially reverse connection of Return line and Cold line)
- <Only for NRCR with Crossover Valve>
  Crossover valve's filter is clogged by dust.
- Air separator is not installed in the hot water return line.
- <Only for NRCR with Crossover Valve>
  The cold water supply line is connected to only cold water inlet.

→ Replace the recirculation pump.

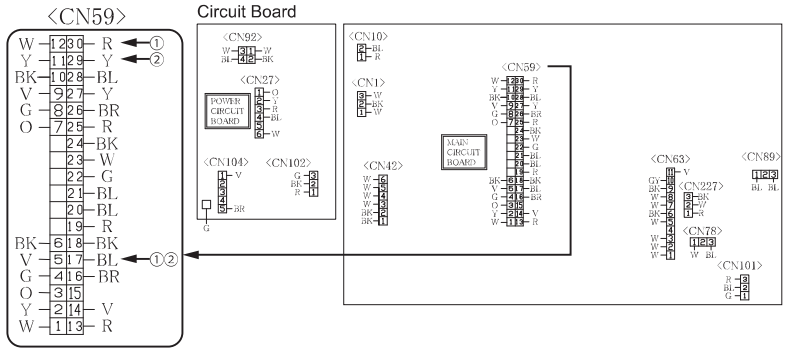
Check whether the Water Flow Sensor- Heat Exchanger is normal.

Normal

Abnormal

→ Replace the circuit board.

CN59:
① Between Red 30- Blue 17
DC 14 – 16V
② Between Yellow 29- Blue 17
DC 0.5 – 15V



Replace the Water Flow Sensor.

• Drainage Mode Using the Remote Controller

[RC-7651M-A]

1) The ⏻ button is OFF.
2) Press and hold the ⚙ button until a sound is heard (approximately 2 seconds).
(The maximum hot water temperature will blink.)

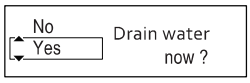
(e.g. 120°F)

3) Press the ⚙ button several times until the item number "5" is displayed.

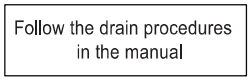
4) Press the ▲ button.
(The display will change from "oF" to "on".)

[RC-9018M]

1) Turn the power [ON/OFF] button "OFF".
2) Press the [MENU] button inside the cover, Select "Misc settings" using the [▲] or [▼] buttons.
Press the [ENTER] button.
(The "Misc settings" screen appears.)
3) Select "Drain water" using the [▲] or [▼] buttons, and then press [ENTER] button.
4) Select "Yes" using the [▲] or [▼] buttons,



press [ENTER] button.



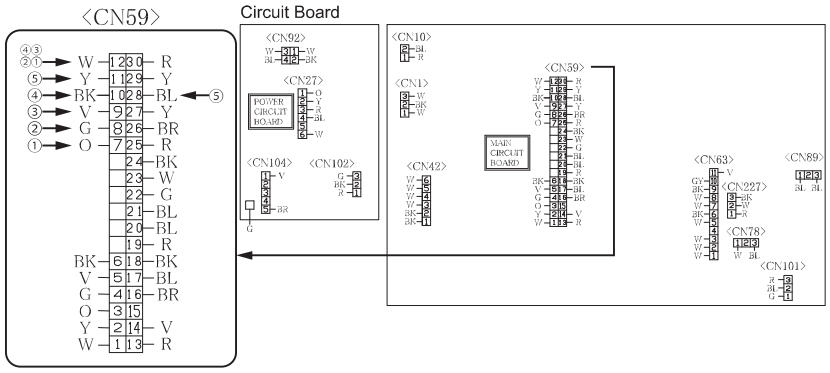
Error Codes Remote Controller	Description
65	Water Servo-Main abnormality

Check the voltage to the Water Servo-Main.

Normal

CN59:
① Between Orange 7 – White 12
DC 1 – 16V
② Between Green 8 – White 12
DC 1 – 16V
③ Between Violet 9 – White 12
DC 1 – 16V
④ Between Black 10 – White 12
DC 1 – 16V
⑤ Between Yellow 11 – Blue 28
DC 1V or less
(When valve is fully open)

Abnormal



Check for improper connection of wiring.
Replace the Circuit Board.

Check for improper connection of wiring.
Replace the Water Servo-Main.

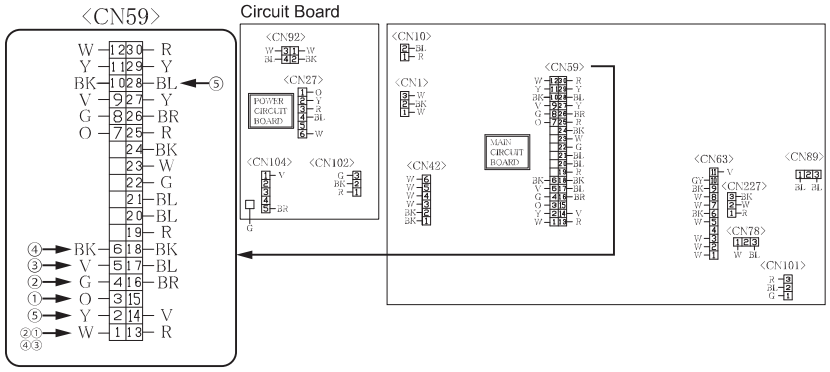
Error Codes Remote Controller	Description
66	Water Servo-Bypass abnormality

◎3 Check the voltage to the Water Servo-Bypass.

Normal

CN59:
① Between Orange 3 – White 1
DC 1 – 16V
② Between Green 4 – White 1
DC 1 – 16V
③ Between Violet 5 – White 1
DC 1 – 16V
④ Between Black 6 – White 1
DC 1 – 16V
⑤ Between Yellow 2 – Blue 28
DC 1V or less
(When valve is fully open)

Abnormal



Check for improper connection of wiring.
Replace the Circuit Board.

Check for improper connection of wiring.
Replace the Water Servo-Bypass.

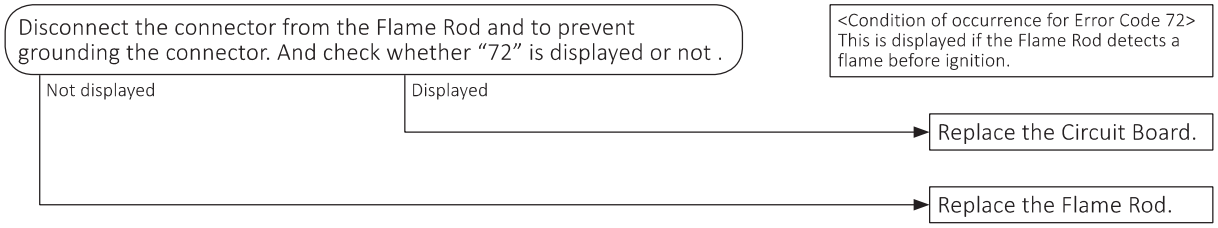
Error Codes Remote Controller	Description
70	Circuit Board abnormality

Disconnect the electrical power, then reconnect electrical power to the Unit to reset the system.
If the Circuit Board abnormality continues, replace the Circuit Board.

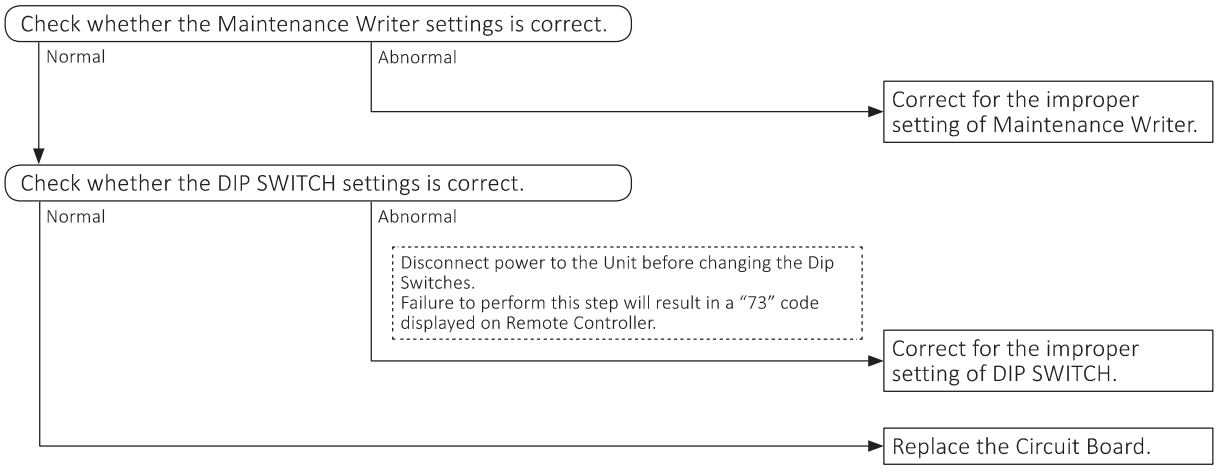
Error Codes Remote Controller	Description
71	Gas Valve drive circuit abnormality Circuit Board abnormality

This Error Code is rarely displayed due to failure on the High Limit Switch – Primary Heat Exchanger. Please check the Error Code “20” procedure. (page 14)
If the Error Code “71” display continues, it’s due to a failure of the circuit board (Gas Valve drive circuit) or in the Gas Valve drive system’s ground. The cause could be a welding issue on the Circuit Board. Basically, if this error occurs the Circuit Board should be replaced.

Error Codes Remote Controller	Description
72	Flame Rod circuit abnormality (Detection of flame when no flame is present)



Error Codes Remote Controller	Description
73	Circuit Board setting abnormality (Improper maintenance writers settings and DIP SWITCH settings) Circuit Board abnormality



Error Codes Remote Controller	Description
760	Remote Controller transmission abnormality

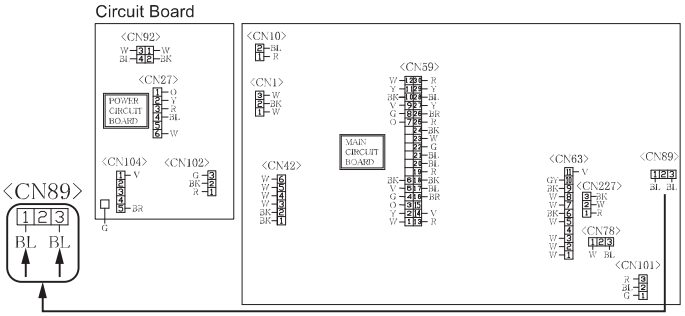
Check the voltage to the Circuit Board.

Normal

CN89:
Between Blue 1 – Blue 3
DC 14 – 16V

When measuring the voltage, remove the Remote Controller cord.

Abnormal



Check for improper connection of wiring.
Replace the Circuit Board.

Check for Remote Controller cord damage, short-circuiting or ground fault.

Error Codes Remote Controller	Description
(F)76	Multi system communication error

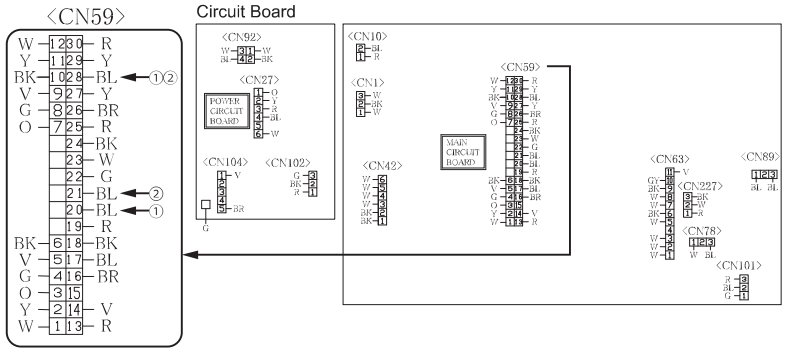
Check the voltage to the Circuit Board.

Error Code 76 : Common Vent only

Normal

CN59:
① Between Blue 20 – Blue 28
DC 14 – 16V
② Between Blue 21 – Blue 28
DC 14 – 16V

Abnormal



Check for improper connection of wiring.
Replace the Circuit Board.

Check Disconnection of Quick connect cord.

Normal

Abnormal

Replace the Quick connect cord.

Check for improper connection of wiring.
Replace the Circuit Board.

Error Codes Remote Controller	Description
10 / 90	Air flow abnormality (Unit shuts off)

<Condition of occurrence for Error Code 90>
Detected abnormal air flow when the unit starts.
- If the Unit detects "Error Code 90" 30 times, the Unit is locked for safety.

<NOTE>
In case the Heating value is too low, this error may occur.

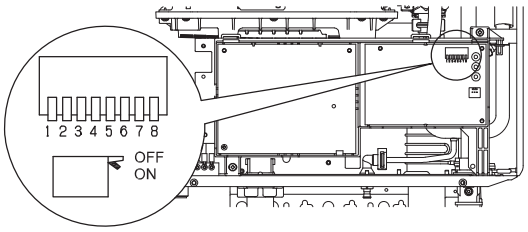
Check air inlet for blockage or obstruction.
Check the intake air filter. (inside of the unit)
Check exhaust for blockage or obstruction.
→ Abnormal → After fixing the problem, reconnect the power.
↓ Normal

Check the Condensate drain line is clogged or frozen.
Check that the Condensate drain pipe slopes down.
→ Abnormal → After fixing the problem, reconnect the power.
↓ Normal

Check the DIP Switch setting.
→ Abnormal → After fixing the problem, reconnect the power.
↓ Normal

① Common Vent setting.
② Intake Air Supply Type.
③ High Elevation Adjustment.
④ Vent Length Adjustment.
Settings: Refer to the table below.

Location of DIP Switches



• Setting list for Dip Switches

(● : ON ○ : OFF)

1		2 and 3			5 and 6			7 and 8		
Common Vent setting		Exhaust type			Elevations above 2,000ft			Vent Length Adjustment		
1	Description	2	3	Description	5	6	Description	7	8	Description
○	OFF	○	○	DV	○	○	0 – 2,000ft (0 – 610m)	○	○	2" Short Length
●	ON	●	○	OD	●	○	2,001 – 4,000ft (611 – 1,219m)	●	○	2" Long Length
		○	●	SV	○	●	4,001 – 7,000ft (1,220 – 2,134m)	○	●	3" Short Length
		●	●	EZTR	●	●	7,001 – 10,000ft (2,135 – 3,048m)	●	●	3" Long Length

Check whether the Primary gas pressure is normal.
→ Abnormal → Check the gas supply valve, etc.
↓ Normal

* Check the primary pressure (dynamic pressure) at the time of maximum combustion.
Primary gas pressure list

Pressure \ Gas group		LP	NGA
Maximum pressure	inch H_2O	14.0	10.5
Standard pressure	inch H_2O	11.0	7.9
Minimum pressure	inch H_2O	8.0	3.5

↓ A

A

Check whether the Thermistor- Primary Heat Exchanger (Inlet/Outlet) are normal.

Normal

Abnormal

Check the thermistor resistance.

Abnormal → Check for improper connection of wiring, connectors, etc. then replace the thermistor.

Normal

When measuring the resistance, disconnect the connector and check the male side.

CN63:

① Between White 5- White 2 (Primary Heat Exchanger Inlet)

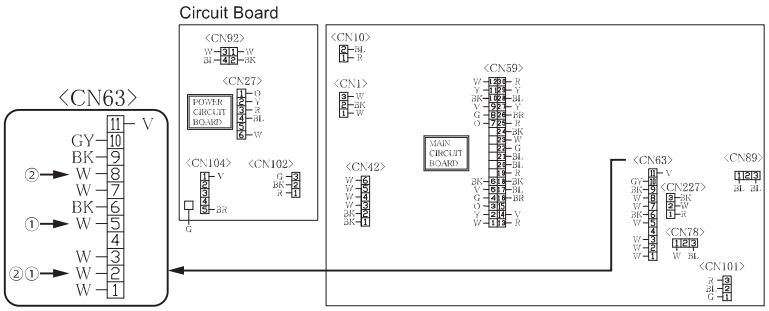
② Between White 8- White 2 (Primary Heat Exchanger Outlet)

Refer to the thermistor temperature characteristics below.

1) Set Unit to "Drainage Mode".
(Drainage Mode is shown in page 7)
2) Open the fixture.
(Pass through the water to the Unit.)
3) Check the maintenance monitor.
The difference between #30, #32, and #33 data should be within ±5°F.

• Cold · Hot water / Primary Heat Exchanger Thermistor Temperature Characteristics

Temperature (°F)	32	50	68	86	104	122	140	158	176
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



Replace the Circuit Board.

Check for clogged water fixtures, then replace the Water Flow Sensor.

Abnormal → Replace the Circuit Board.

Normal

Check if the Fan Motor is clogged.

Abnormal → Replace the Fan Motor.

Normal

Check if the Venturi is clogged.

Abnormal → Replace the Venturi.

Normal

Check if the Exhaust Duct is clogged.

Abnormal → Replace the Exhaust Duct.

Normal

Check if the Primary/Secondary Heat Exchanger is clogged.

Abnormal → Replace the Primary/Secondary Heat Exchanger.

Normal → Replace the Burner Chamber.

Error Codes Remote Controller	Description
94	Exhaust temperature is too high

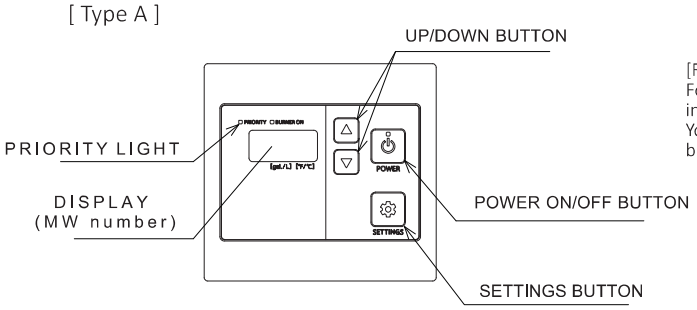
<Condition of occurrence for Error Code 94>
The Unit detects high exhaust temperature.

Check the procedure below.
1. Check air inlet for blockage or obstruction.
2. Check exhaust for blockage or obstruction.
3. Check the Fan Motor. (ex. Clogging of fan blades, etc.)
4. Check for sudden environmental changes. (ex. Hurricane, storm, etc.)

How to reset the lock of the Unit (for Error Code 90[8] and 99)

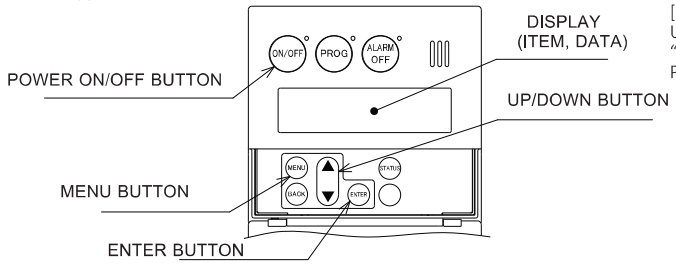
1. Make sure the Remote Controller is OFF (completely blank),
   if it is ON, turn it OFF and wait for 10 seconds.
2. Disconnect the electrical power (turn the switch OFF).
3. Wait 10 seconds and reconnect power (turn the switch ON).
   Leave the Remote Controller OFF.
4. With the Remote Controller blank, hold the up button until the display blinks “99”.
   You are now in the maintenance writer (MW) mode and can scroll through the MWs using the UP and DOWN buttons.

[Type A]



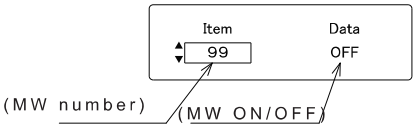
[Remote Controller Type A]
For each MW the PRIORITY light will either be on, indicating that the MW is ON, or off, indicating the MW is OFF.
You can toggle each MW to be ON or OFF using the SETTINGS button.

[Type B]



[Remote Controller Type B]
Use the UP or DOWN button to change the “Item” number or “Data” ON or OFF.
Press the ENTER button to select “Item” or “Data”.

< Display >

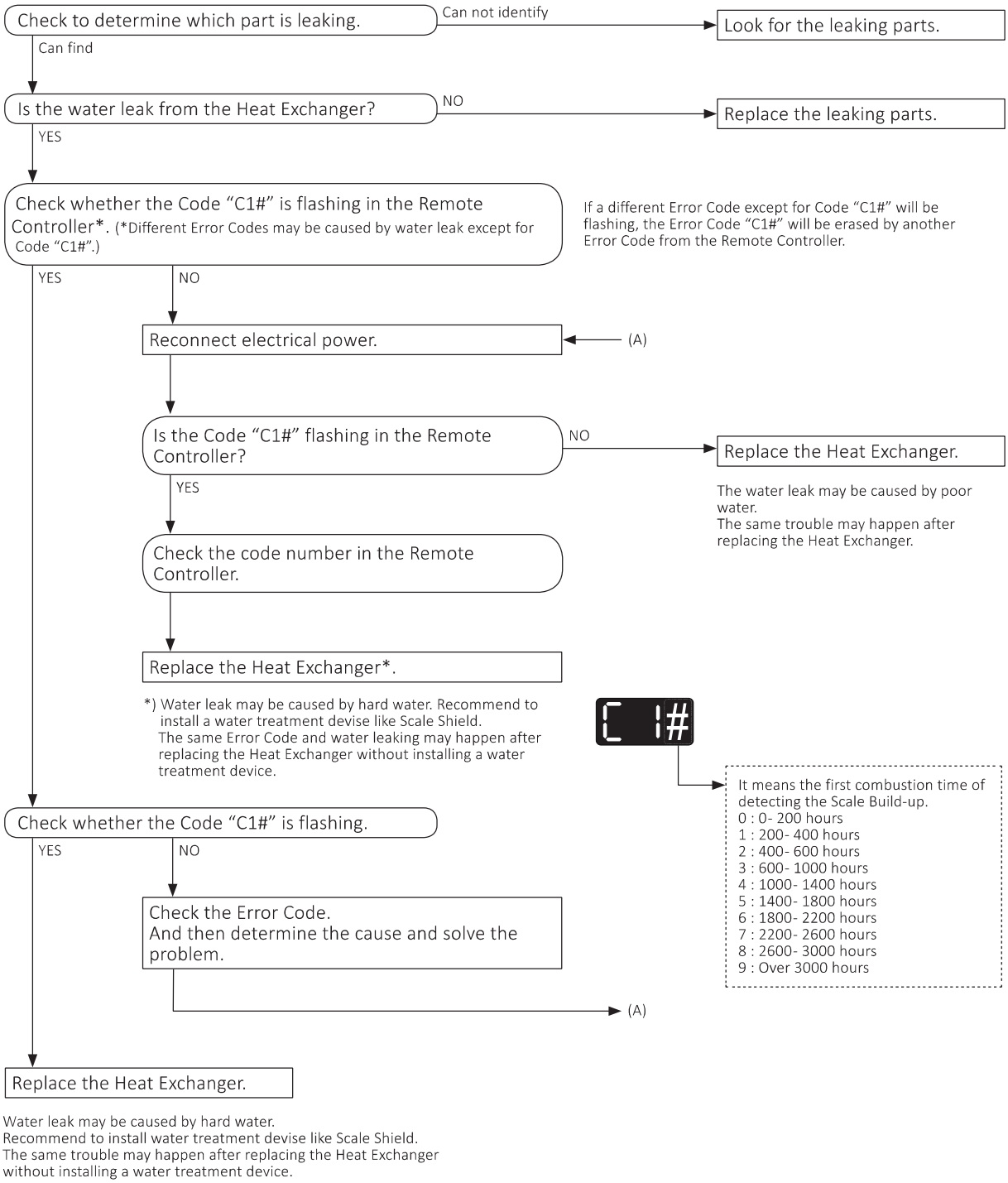


5. Turn MWs “3F” OFF.
6. Once complete, hold the UP and DOWN buttons together for 5 seconds until the Remote Controller starts beeping rapidly.
   This is the signal that the changes to the MW has been saved and the unit is ready for use.

Troubleshooting for abnormalities due to Scale Build-up

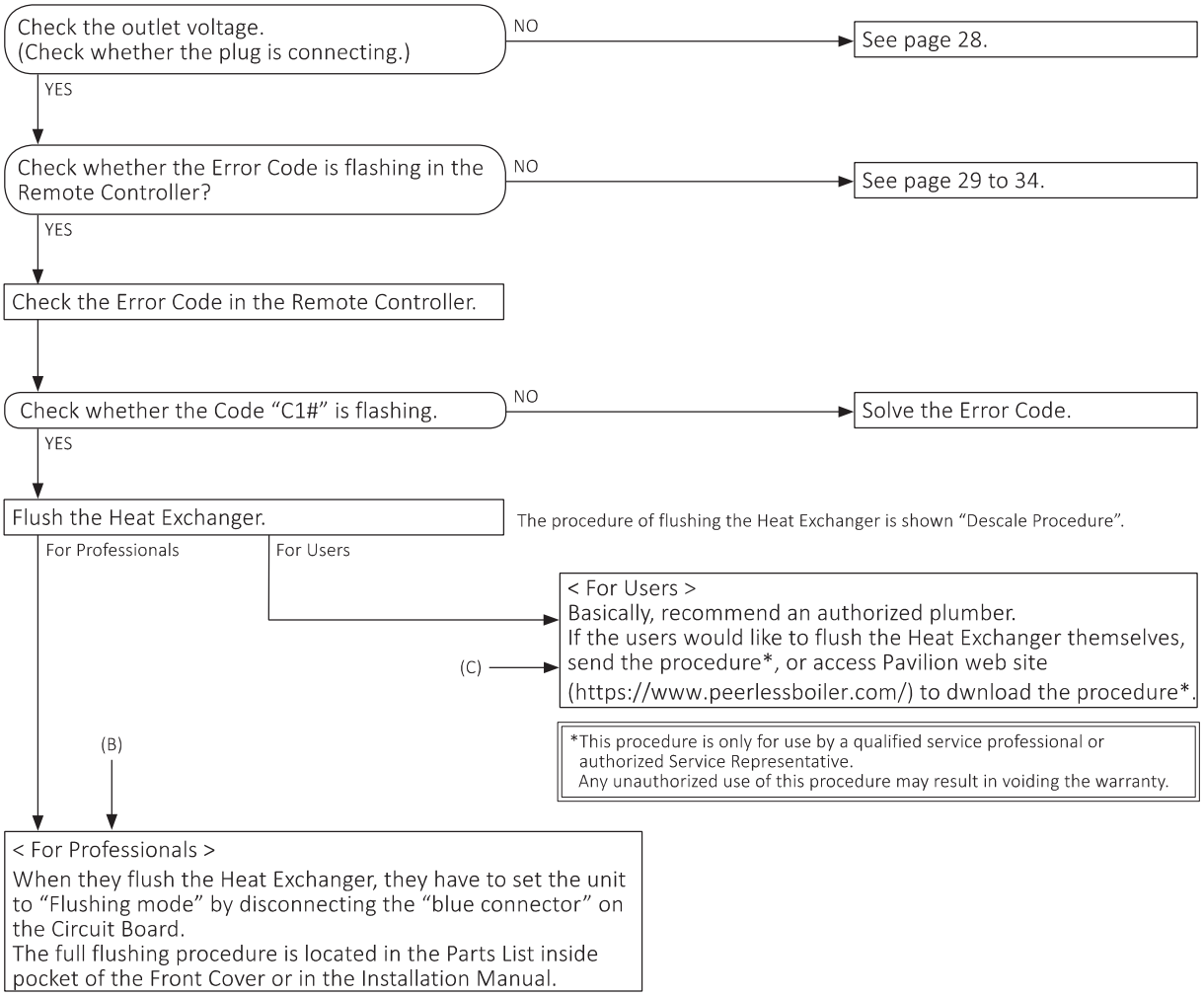
There are three cases of inquires about Scale Build-up from users and professional.
Case 1. Water Leak from the unit
Case 2. Hot water is not delivered (The user can not get hot water)
Case 3. Flush the Heat Exchanger regularly (Not displayed the code)

< Case 1. Water Leak from the unit >



Water leak may be caused by hard water.
Recommend to install water treatment devise like Scale Shield.
The same trouble may happen after replacing the Heat Exchanger without installing a water treatment device.

< Case 2. Hot water is not delivered (The user can not get hot water) >



< Case 3. Flush the Heat Exchanger regularly (Not displayed the Code "C1#") >

■ Maintenance Monitor List for Scale Build-up trouble

Data No.	Item	Data (Display Reading × Multiplier)		Minimum Value for indication	Remarks
		Multiplier	Unit		
11	Service Reminder Hours Accumulated(1)	× 1	hour	1 hour	Disp. Range [000]- [999]
12	Service Reminder Hours Accumulated(1)	× 1000	hour	1000 hours	Disp. Range [000]- [065]
21	Service Reminder Hours Accumulated(2)	× 1	hour	1 hour	Disp. Range [000]- [999]
22	Service Reminder Hours Accumulated(2)	× 1000	hour	1000 hours	Disp. Range [000]- [065]
80	Remaining Time of Scale Flushing	× 1	minute	1 minute	Disp. Range [000]- [060]
82	Number of Scale Flushing Times	× 1	time	1 time	Disp. Range [000]- [255]

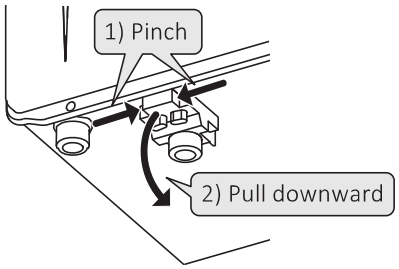
Remote Controller

- Install the remote controller according to the instructions on the Installation Manual.
- Only one the Remote Controller can be connected to the Water Heater.
  A malfunction may occur if two or more Remote Controllers are connected.
- Install according to the National Electrical Code and all applicable local codes.
- For extensions, a 26 ft (7.9 m) cord can be purchased separately (Stock Code : 1810).
- The Remote Controller Cord can be extened up to 300 ft (91 m) by splicing the cord and using 18 AWG wire to extend the cord to the appropriate length.
- Use a Y-shaped terminal with a resin sleeve. Without the sleeve, the copper wire may corrode and cause problems.

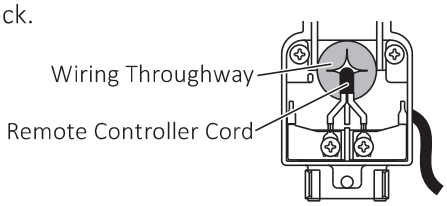
NOTE
- Do not connect the electrical power to the Water Heater until the Remote Controller installation is complete.
- Be sure to hand tighten when screwing to the terminal block. Power tools may cause damage to the terminal block.

Connecting the Remote Controller Cord

1. Check to make sure that the Remote Controller Cord has plenty of slack in order to reach the external connection terminal block.
2. Make sure the electrical power is disconnected from the Water Heater.
3. Open the external remote terminal block.



4. Pass the Remote Controller Cord through the wiring throughway.
   Connect the Y-shaped terminals at the end of the Remote Controller Cord to the terminal block.



NOTE Tie the redundant cord outside the Water Heater. Do not put the extra length inside the Water Heater.

5. Reattach the terminal block cover.

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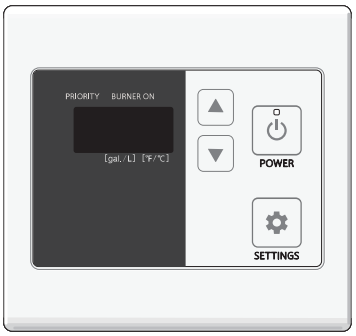

Adjusting the Temperature / Water Quantity Display

1. Turn the Water Heater off by pressing the ⏻ button on the Remote Controller.
2. Disconnect, then reconnect the electrical power to the Water Heater.

   NOTE The setting must be done within the first 10 minutes of connecting the electrical power to the Water Heater.

3. Press the ⚙ button and hold it in for 2 seconds or more.
4. Press the ⚙ button several times until the item number “12” is displayed.
5. Select “[°F/gal] ↔ [°C/L]” using the ▲ / ▼ buttons.
   - °F/gal (Fahrenheit/Gallon): default setting
   - °C/L (Celsius/Liter)
6. To confirm the setting, turn the Water Heater on by pressing the ⏻ button on the Remote Controller.

Limiting the Maximum Output Temperature

The maximum output temperature can be limited to prevent discharging hot water at too high of a temperature.
Default setting of maximum output temperature is 120°F (50°C).

⚠ DANGER
- When changing the temperature, make sure to confirm with the customer that the temperature of the Hot Water will be very high and that there is a risk of scalding.
- Hot water heater temperatures over 125°F (52°C) can cause severe burns instantly or death from scalding.

1. Turn the Water Heater off by pressing the ⏻ button on the Remote Controller.
2. Press and hold the ⚙ button until a sound is heard (approximately 2 seconds).
   [120°F/50°C] appears on the display.

3. Set the upper limit of the hot water temperature using the ▲ / ▼ buttons.
   • For Fahrenheit (°F): 125- 140°F (In 5°F intervals)
   • For Celsius (°C): 55°C, 60°C
4. Set the ⚙ button to ON when continuing to use the unit as is. Otherwise, let the unit sit for approximately 30 seconds.

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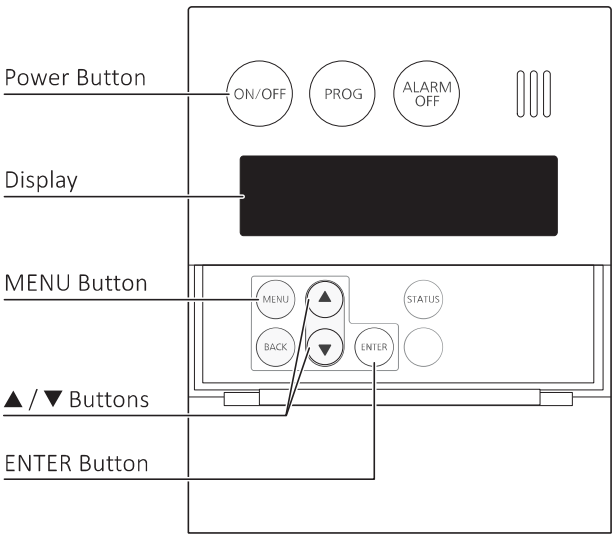


Adjusting the Temperature / Water Quantity Display

1. Turn the Water Heater off by pressing the "Power" button on the Remote Controller.
2. Disconnect, then reconnect the electrical power to the Water Heater.

   NOTE The setting must be done within the first 10 minutes of connecting the electrical power to the Water Heater.

3. Press the "MENU" button inside the cover, select "Initial settings" using the ▲ / ▼ buttons.
4. Press the "ENTER" button, the "Initial settings" screen appears on the display.
5. Select "[°F/gal] ↔ [°C/L]" using the ▲ / ▼ buttons.
   • °F/gal (Fahrenheit/Gallon): default setting
   • °C/L (Celsius/Liter)
6. Press the "ENTER" button and select either [°F/gal] or [°C/L] using the ▲ / ▼ buttons.
7. Press the "ENTER" button, "Set complete Please wait..." appears on the display for 5 seconds and then the "Initial settings" screen appears on the display.
8. To confirm the setting, turn the Water Heater on by pressing the "Power" button on the Remote Controller.

Limiting the Maximum Output Temperature

The maximum output temperature can be limited to prevent discharging hot water at too high of a temperature.
Default setting of maximum output temperature is 120°F (50°C).

⚠ DANGER

- When changing the temperature, make sure to confirm with the customer that the temperature of the Hot Water will be very high and that there is a risk of scalding.
- Hot water heater temperatures over 125°F (52°C) can cause severe burns instantly or death from scalding.

1. Turn the Water Heater off by pressing the "Power" button on the Remote Controller.
2. Press the "MENU" button inside the cover, select "Misc settings" using the ▲ / ▼ buttons.
3. Press the "ENTER" button, the "Misc settings" screen appears on the display.
4. Select "Max set Temp" using the ▲ / ▼ buttons.
5. Press the "ENTER" button, [120°F/50°C] appears on the display.
6. Set the upper limit of the hot water temperature using the ▲ / ▼ buttons.
   • For Fahrenheit (°F)]: 125- 140°F (In 5°F intervals)
   • For Celsius (°C)]: 55°C, 60°C
7. Press the "ENTER" button, "Set complete" appears on the display and then and then returns to the "Misc settings" screen.
8. To put the Water Heater back into operation, press the "Power" button. To keep the Water Heater off, either press the "MENU" button or let the Water Heater sit for 20 seconds to return to the original display.

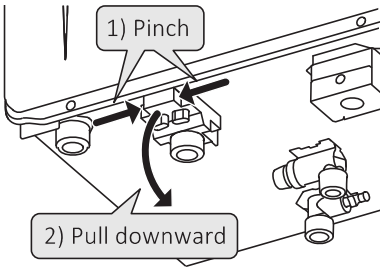
Remote Controller

- Install the Remote Controller according to the instructions on the Installation Manual.
- Only one the Remote Controller can be connected to the Water Heater.
  A malfunction may occur if two or more Remote Controllers are connected.
- Install according to the National Electrical Code and all applicable local codes.
- For extensions, a 26 ft (7.9 m) cord can be purchased separately (Stock Code : 1810).
- The Remote Controller Cord can be extened up to 300 ft (91 m) by splicing the cord and using 18 AWG wire to extend the cord to the appropriate length.
- Use a Y-shaped terminal with a resin sleeve. Without the sleeve, the copper wire may corrode and cause problems.

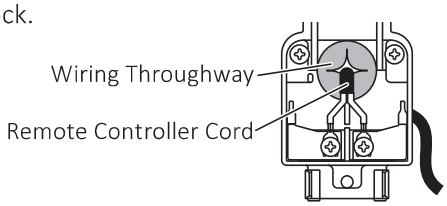
NOTE
- Do not connect the electrical power to the Water Heater until the Remote Controller installation is complete.
- Be sure to hand tighten when screwing to the terminal block. Power tools may cause damage to the terminal block.

Connecting the Remote Controller Cord

1. Check to make sure that the Remote Controller Cord has plenty of slack in order to reach the external connection terminal block.
2. Make sure the electrical power is disconnected from the Water Heater.
3. Open the external remote terminal block.



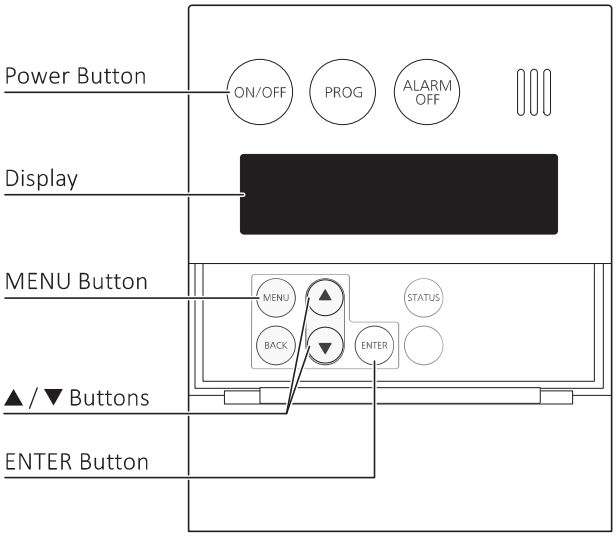
4. Pass the Remote Controller Cord through the wiring throughway.
   Connect the Y-shaped terminals at the end of the Remote Controller Cord to the terminal block.



NOTE Tie the redundant cord outside the Water Heater. Do not put the extra length inside the Water Heater.

5. Reattach the terminal block cover.

Adjusting the Temperature / Water Quantity Display



1. Turn the Water Heater off by pressing the “Power” button on the Remote Controller.
2. Disconnect, then reconnect the electrical power to the Water Heater.

   NOTE The setting must be done within the first 10 minutes of connecting the electrical power to the Water Heater.

3. Press the “MENU” button inside the cover, select “Initial settings” using the ▲ / ▼ buttons.
4. Press the “ENTER” button, the “Initial settings” screen appears on the display.
5. Select “[°F/gal] ↔ [°C/L]” using the ▲ / ▼ buttons.
   - °F/gal (Fahrenheit/Gallon): default setting
   - °C/L (Celsius/Liter)
6. Press the “ENTER” button and select either [°F/gal] or [°C/L] using the ▲ / ▼ buttons.
7. Press the “ENTER” button, “Set complete Please wait...” appears on the display for 5 seconds and then the “Initial settings” screen appears on the display.
8. To confirm the setting, turn the Water Heater on by pressing the “Power” button on the Remote Controller.

Limiting the Maximum Output Temperature

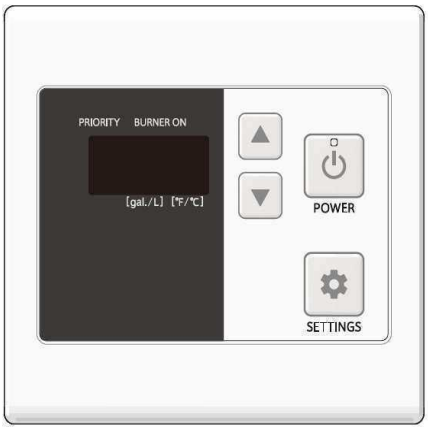
The maximum output temperature can be limited to prevent discharging hot water at too high of a temperature.
Default setting of maximum output temperature is 120°F (50°C).

⚠ DANGER

- When changing the temperature, make sure to confirm with the customer that the temperature of the Hot Water will be very high and that there is a risk of scalding.
- Hot water heater temperatures over 125°F (52°C) can cause severe burns instantly or death from scalding.

1. Turn the Water Heater off by pressing the "Power" button on the Remote Controller.
2. Press the "MENU" button inside the cover, select "Misc settings" using the ▲ / ▼ buttons.
3. Press the "ENTER" button, the "Misc settings" screen appears on the display.
4. Select "Max set Temp" using the ▲ / ▼ buttons.
5. Press the "ENTER" button, [120°F/50°C] appears on the display.
6. Set the upper limit of the hot water temperature using the ▲ / ▼ buttons.
   - For Fahrenheit (°F): 125- 150°F (In 5°F intervals), 160°F, 170°F, 185°F
   - For Celsius (°C): 55°C, 60°C
7. Press the "ENTER" button, "Set complete" appears on the display and then and then returns to the "Misc settings" screen.
8. To put the Water Heater back into operation, press the "Power" button. To keep the Water Heater off, either press the "MENU" button or let the Water Heater sit for 20 seconds to return to the original display.

Remote Controller (RC-7651M-A NB)

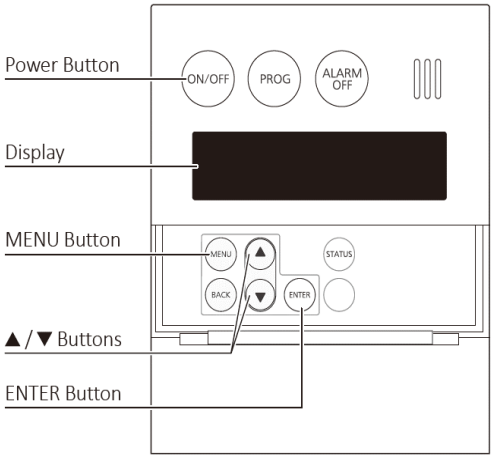


1. Turn the Water Heater off by pressing the ⏻ button on the Remote Controller.
2. Disconnect, then reconnect the electrical power to the Water Heater.

   NOTE The setting must be done within the first 10 minutes of connecting the electrical power to the Water Heater.

3. Press the ▲ button and hold it until the Remote Controller displays item number "99".
   - This will put the Water Heater into Maintenance Writer mode.
   - If pressing the ▲ button does not put the Water Heater into Maintenance Writer mode, make sure the remote controller display is blank, unplug the Water Heater for 60 seconds, and try again.
4. Change the Maintenance Writer item number display using the ▲/▼ buttons, and then press the ⚙ button for 0.5 seconds.
   - The item number setting change from "OFF" to "ON".
   - If the PRIORITY indicator turns on when an item number is displayed, this indicates an "ON" setting for that item number, and if the PRIORITY indicator is off, the item number is "OFF".
5. After setting these item number, press and hold both the ▲/▼ buttons for five seconds to confirm the new settings.
   - The Remote Controller will emit a beeping tone and the display will go blank when the settings are confirmed.
   - If this is not done, the Water Heater will not put the setting changes into effect.

Remote Controller (RC-9018M NB)



1. Turn the Water Heater off by pressing the "Power" button on the Remote Controller.
2. Disconnect, then reconnect the electrical power to the Water Heater.

   NOTE The setting must be done within the first 10 minutes of connecting the electrical power to the Water Heater.

3. Press the ▲/▼ buttons and hold them until the Remote Controller displays item number "99".
   - This will put the Water Heater into Maintenance Writer mode.
   - If pressing the ▲/▼ buttons does not put the unit into Maintenance Writer mode, make sure the remote controller display is blank, unplug the Water Heater for 60 seconds, and try again.
4. Change the item number on the column of the item using the ▲/▼ buttons, and then press the "ENTER" button.
   - "Item number" stops blinking and "Date state (OFF or ON)" will start blink.
5. Change from "OFF" to "ON" using the ▲/▼ buttons, and then press the "ENTER" button.
   - "Data state (ON)" stops blinking and "Item number" will start blink.
6. After setting these item number, press and hold both the ▲/▼ buttons until the Remote Controller will emit a beeping tone.
   - If this is not done, the Water Heater will not put the setting changes into effect.
7. Disconnect the electrical power to the Water Heater.
   Wait 10 seconds or more, and reconnect the electrical power.

■Maintenance Monitor List

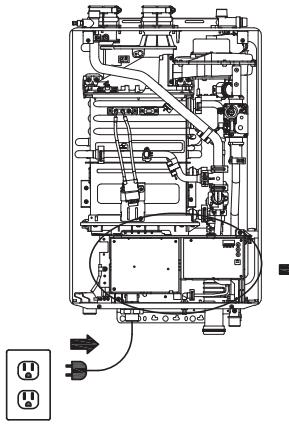
Data No.	Item	Data (Display Reading X Multiplier) Multiplier	Unit	Minimum Value for Indication	Remarks
03	Total Plug-in Time	X 100	hour	100 hour	Disp. Range [000] - [1310]
04	Total Combustion Time	X 1	hour	1 hour	Disp. Range [000] - [999]
05	Total Combustion Time	X 1000	hour	1000 hour	Disp. Range [000] - [065]
06	Total Pump operating Time	X 100	hour	100 hour	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] - [065]
10	Fan Rotational Frequency	X 10	rpm	10 rpm	
11	Service Reminder Hours Accumulated(1)	X 1	hour	1 hour	Disp. Range [000] - [999]
12	Service Reminder Hours Accumulated(1)	X 1000	hour	1000 hour	Disp. Range [000] - [065]
14	Total Flow Rate	X 0.1	gal/min	0.1 gal/min	*1
		X 0.1	L/min	0.1L/min	*2
17	Recirculation Flow Rate	X 0.1	gal/min	0.1 gal/min	*1
		X 0.1	L/min	0.1L/min	*2
18	Output (%)	X 1	%	1 %	
20	Calculated Fan Speed	X 10	rpm	10 rpm	
21	Service Reminder Hours Accumulated(2)	X 1	hour	1 hour	Disp. Range [000] - [999]
22	Service Reminder Hours Accumulated(2)	X 1000	hour	1000 hour	Disp. Range [000] - [065]
29	Reason why the unit does not run.	---	---	---	[001] : Water inlet temperature is too high → If possible decrease water inlet temperature [002] : Calculated water outlet temperature is too high → If possible increase flow rate [004] : Inlet and Outlet temperature are reversed → Check the pipes and re-install it correctly
30	Thermistor-Cold Water Detection Temperature	X 1	°F	1°F	
		X 0.1	°C	0.5°C	*1
31	Thermistor-Hot Water Detection Temperature	X 1	°F	1°F	*2
		X 0.1	°C	0.5°C	*1
32	Thermistor-Primary Heat Exchanger Outlet Detection Temperature	X 1	°F	1°F	*2
		X 0.1	°C	0.5°C	*1
33	Thermistor-Primary Heat Exchanger Inlet Detection Temperature	X 1	°F	1°F	*2
		X 1	°C	1°C	*1
36	Thermistor-Exhaust Detection Temperature	X 1	°F	1°F	*2
		X 1	°C	1°C	*1
38	Thermistor-Air Detection Temperature	X 1	°F	1°F	Disp. Range [014] - [050] *2
		X 1	°C	1°C	Disp. Range [-10] - [010] *1
50	FF No.-Primary Heat exchanger	X 0.1		0.1	*2
51	FF+FB No.-Primary Heat exchanger	X 0.1		0.1	
52	Output-Primary Heat exchanger	X 0.1		0.1	
53	Output-Total	X 0.1		0.1	
60	Position of Water Servo-Main	X 2	Step		[000](open) - [1700](closed)
62	Position of Water Servo-Bypass	X 2	Step		[000](open) - [1700](closed)
78	Flame Lifting Detection	---	---	---	OFF [0-0], ON [0-1]
80	Remaining Time of Scale Flushing	X 1	minute	1 minute	[000] - [060]
82	Number of Scale Flushing Times	X 1	time	1 times	[000] - [255] ,Z=126
86	Recirculation Mode	---	---	---	Dedicated Mode / Crossover Mode Auto Recirc (Default): 11 / 21 Manual Timer Recirc: 12 / 22 Always Recirc ON: 13 / 23 Always Recirc OFF: 14 / 24 On-Demand (Title24) Mode: 15 / 25
87	Circuit Board ID1: Product 1	[1:xy]			A=101,B=102,C=103,・・・ ,Z=226
88	Circuit Board ID2: Product 2	[2:xy]			A=201,B=202,C=203,・・・ ,Z=326
89	Circuit Board ID3: Version	[3:xy]			A=301,B=302,C=303,・・・
91	Error Code History 1	Most Recent Error Code			If the same error code is repeated, it will appear in the history list twice. If it is repeated more than twice, it will only appear twice.
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 When Remote Controller is in °F/Gallons mode. *2 When Remote Controller is in °C/Liters mode.

Circuit Board Data Transfer Procedure

When swapping in a new circuit board, the new circuit board needs to be programmed.
Failure to successfully program the circuit board will result in a 73 error code.
Typically this programming can be done with a data transfer from the old circuit board to the new circuit board.
Even a damaged circuit board can usually transfer data properly.
Always attempt the data transfer first, and if unsuccessful, retry the data transfer procedure.
Only if the data transfer is unsuccessful, then you should follow the procedure for the manual “Circuit Board Manual Program Procedure”.

1. Data Transfer Procedure

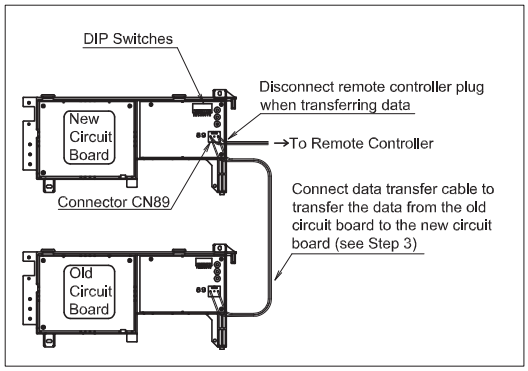


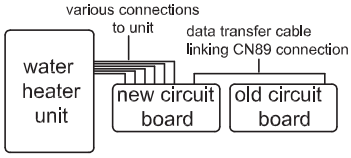
(for illustration only)

1. Make sure the remote controller is off (completely blank), If it is ON, turn it OFF and wait for 10 seconds.

2. ...then disconnect electrical power.
(turn the switch OFF)

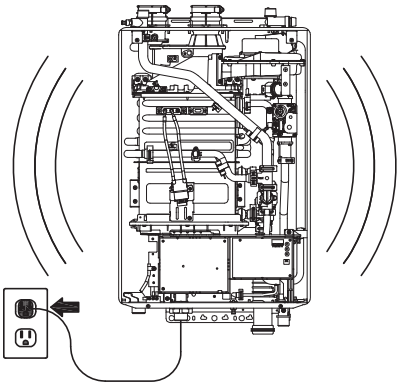
3. Remove old circuit board out of the unit.
...then transfer all electrical connections (and the power switch; GQ-C3260WZ -FF model only) to the new circuit board.
...except connector CN89 which should be left unplugged.





4. Use the blue and white data transfer cable supplied with the new circuit board to connect the CN89 connection from the old circuit board to the new one.

5. Connect power (turn the switch ON) and wait about 30 seconds to a minute.
The unit will signal a successful data transfer by spinning the fan for about 3 minutes.



If you get a successful data transfer: disconnect electrical power to the unit, disconnect the data transfer cable and reconnect the original CN89 connector.
The circuit board can now be mounted back into the unit.
Note: (If you disconnected any wires to pull out the circuit board, make sure to reconnect all wires.)

If you fail to get a successful data transfer,
refer to the manual “Circuit Board Manual Program Procedure”.

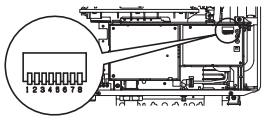
2. DIP Switch Settings

Disconnect the electrical power to the unit before adjusting the DIP Switches.
DIP Switch Settings are set to the same as the old circuit board.

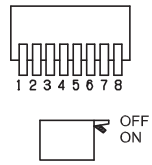
The following settings can be adjusted using the DIP Switches:
1. To set up with the common vent system, SW 1 needs to be turned on.*
2. By setting SW 2 and 3, it can adapt to the setting of the exhaust type.**
3. By setting SW 5 and 6, adjustments can be made for use at high elevation.
4. By setting SW 7 and 8, adjustments can be made for extended vent lengths.

Refer to the "Setting list for DIP Switches" table for details.

Location of DIP Switches



[DIP Switches]



Setting list for DIP Switches (● :ON ○ :OFF)

SW1	SW2	SW3	SW5	SW6	SW7	SW8
Common vent system*	Exhaust type**		Elevations above 2000ft		Vent Length Adjustment and Vent Size	

SW1	SW2	SW3		SW5	SW6	High Elevation Adjustment	SW7	SW8	
○	○	○	DV	○	○	0-2000ft (0-610m)	○	○	2" Short Length
●	●	○	OD	●	○	2001-4000ft (611-1219m)	●	○	2" Long Length
	○	●	SV	○	●	4001-7000ft (1220-2134m)	○	●	3" Short Length
	●	●	EZTR	●	●	7001-10000ft (2135-3048m)	●	●	3" Long Length

* Refer to the Installation Manual of common vent system for detail information.
** DV : Direct Vent, OD : Outdoor (using VC-6), SV : Single Vent (using SV Conversion Kit), EZTR : Flex Vent 2" (using EZ2-CK).

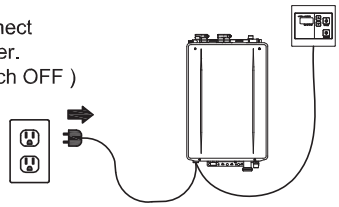
Circuit Board Manual Program Procedure

This procedure will require the remote controller.
Make sure the circuit board is completely connected including connector CN89.

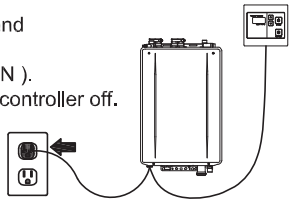
If connected in a multi unit configuration, disconnect System Controller connections or Quick Connect Cord.
After Manual Programing, make sure all connections are made before making the initial circuit board settings.

1. Make sure the remote controller is off (completely blank), If it is ON, turn it OFF and wait for 10 seconds.

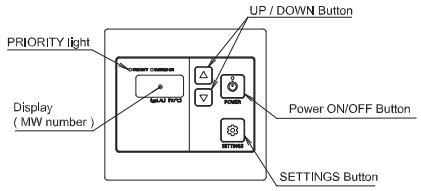
2. ...then disconnect electrical power. (turn the switch OFF)



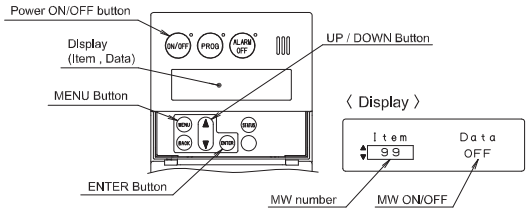
3. Wait 10 seconds and reconnect power (turn the switch ON). Leave the remote controller off.



[Type A]



[Type B]



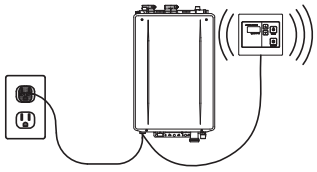
4. With the remote controller blank, hold the up button until the display blinks "99". You are now in the maintenance writer (MW) mode and can scroll through the MWs using the UP and DOWN buttons.

[Remote controller Type A]
For each MW the PRIORITY light will either be on, indicating that the MW is ON, or off, indicating the MW is OFF.
You can toggle each MW to be ON or OFF using the SETTINGS button.
[Remote controller Type B]
Use the UP or DOWN button to change the " Item " number or " Data " ON or OFF.
Press the " ENTER " button to select " Item " or " Data ".

a) Turn MWs "15", "1B" and "34" ON.
b) If the unit is GQ-C3260WZ-FF, turn MWs " 22 " and " 23 " ON.
If the unit is GQ-C3260WX-FF or GQ-C2860WX-FF, turn MW " 23 " ON.
If the unit is GQ-C3260WXQ-FF or GQ-C2660WXQ-FF, turn MWs " 28 " and " 3E " ON.
c) Turn MWs "FC" and "FE" ON and press the UP or DOWN button. (Display blinks with "A0".)
Configure the remaining MWs according to the chart below based on your unit's model and gas type.
(Type B remote only
After completing the setting, press the "ENTER" button to select "Item".)

Setting list for MW settings (Check the rating plate for model and gas type)

Model	Gas type	Circuit board MW setting (●:ON ○:OFF)																				
		A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	B0	B1	B2	BF	CC	CD	CE
UT199DV (GQ-C3260WX-FF PB US)	NG	●	○	○	○	●	●	○	○	○	●	●	○	●	●	●	●	○	○	●	●	●
	LP	○	○	○	○	●	●	○	○	○	●	●	○	●	●	●	●	○	○	●	●	●
PR199DV (GQ-C3260WXQ-FF PB US)	NG	●	○	○	○	●	●	○	○	○	●	●	○	●	●	●	●	○	●	●	●	●
	LP	○	○	○	○	●	●	○	○	○	●	●	○	●	●	●	●	○	●	●	●	●



5. Once complete, hold the UP and DOWN buttons together for 5 seconds until the remote controller starts beeping rapidly.
This is the signal that the changes to the MWs have been saved and the unit is ready for use.

6. Refer to the Manual "Circuit Board Data Transfer Procedure" title 2 "DIP Switch Settings", And adjusting the DIP Switches.

Remote Controller Settings (Remote controller Type B only)

1. After turn off the Power ON/OFF button, press the "MENU" button and select "Misc settings" by pressing the UP or DOWN button. The "Misc settings" screen appears by pressing the "ENTER" button.
2. Select "Default all settings" by pressing the UP or DOWN button, and then press the "ENTER" button.
3. "Default all settings now ?" screen appears, select "Yes" by pressing the UP or DOWN button. Confirm the settings by pressing and holding the "ENTER" button for 5 seconds.
4. To return to the home screen, press the "MENU" button or let it sit for approximately 20 seconds.
5. Within the first 10 minutes of connecting electrical power, before turning on the Power ON/OFF button, press the "MENU" button on the remote controller and select "Initial settings" by pressing the "▲" or "▼" button. If the unit does not go into "Initial settings" mode, unplug the unit and try again.
6. Change "Save backlight" from "Normal" to "On".
7. To return to the home screen, press the "MENU" button or let it sit for approximately 20 seconds.

Fan Motor Replacement Guide :

GQ-C3260 / GQ-C2860 / GQ-C2660 Series

1) Disconnect the power to unit. Detach the Wiring Harness from the Wire Clamps.
Unplug the Fan Motor connector.
(GQ-C3260WX-FF/GQ-C2860WX-FF : Unplug the Freeze Prevention Heater Connector.)

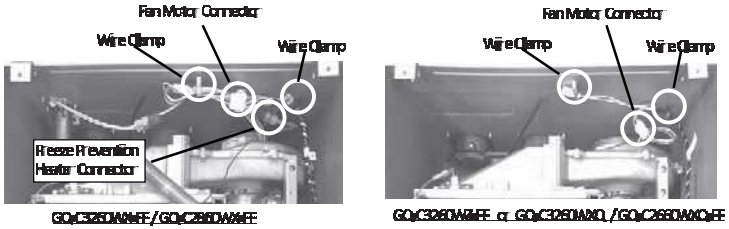


Figure 1

2) Remove the C-Clamp -16B. Then remove the screws with a Phillips screwdriver (Figure 2).
DO NOT use a power drill.

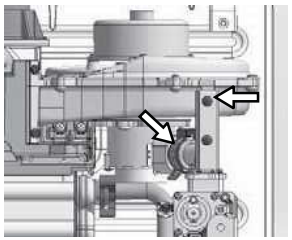


Figure 2

3) Disconnect the Gas Valve SET and push down it (Figure 3).

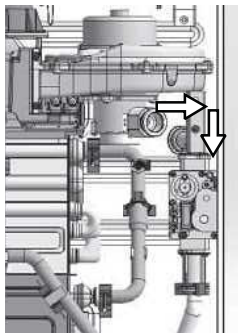


Figure 3

4) Remove 4 screws with a Phillips screwdriver (Figure 4).
DO NOT use a power drill.

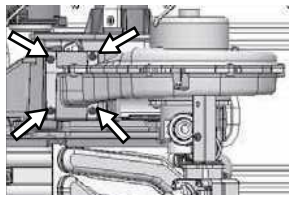


Figure 4

5) Detach Fan Motor and Venturi assembly (Figure 5).

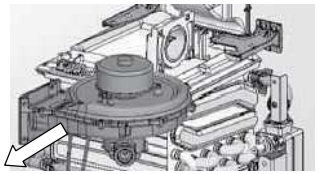


Figure 5

6) Remove 3 screws with a Phillips screwdriver (Figure 6).
Replace the O-ring –Venturi Φ60 and the Fan Motor to the new O-ring –Venturi Φ60 and the new Fan Motor.
Make sure that the O-Ring is secured properly in place (Figure 7) .

Failure to do so will cause gas leaks, possibly resulting in severe personal injury or death.

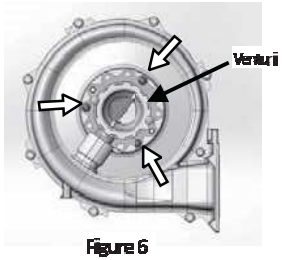


Figure 6

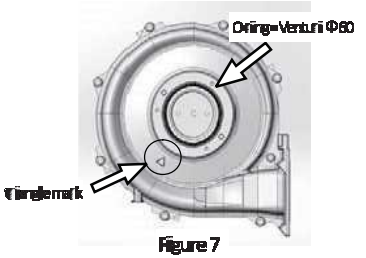


Figure 7

7) Install the Venturi so that the orifice connection in the direction of the triangle mark (Figure 7).
Secure the Venturi to the Fan Motor by using the 3 screws (Figure 6).

8) Replace the Gasket - Chamber inlet to new one. Make sure that the Gasket is secured properly in place.

Failure to do so will cause gas leaks, possibly resulting in severe personal injury or death.

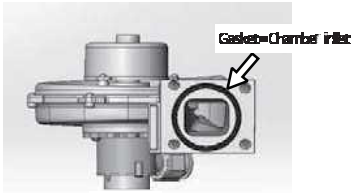


Figure 8

9) Secure the Fan Motor and Venturi assembly to the Burner Chamber by tightening the 4 screws removed in Step 4.
The screws need only to be hand tightened and should not be tightened using a power drill.
First, insert screws 1-4 in Figure 4, but do not fully tighten these screws.
Once all screws are inserted, proceed to completely tighten screws 1-4.

NOTE: When tightening the screws, be certain not to apply excess force. Excess force can strip out the original holes and screws. Keep the Fan Motor in horizontal. It makes easier to tighten the screws correctly.

10) Attach the Gas Valve SET to Venturi assembly.

11) Tighten the screws with a Phillips screwdriver.
Then attach the C-Clamp -16B at Venturi (Figure 2).

12) Connect the Fan Motor connecor. (GQ-C3260WX-FF/GQ-C2860WX-FF : Connect the Freeze Prevention Heater Connector.)
And tie the Wiring Harness by using the Wire Clamps (Figure 1).

13) Before closing the front cover, carry out trial operation and check gas leakage.

Connecting the Gas Supply

Follow the instructions from the gas supplier.

⚠ WARNING

The sizing and installation of the gas system for this Water Heater, as with any gas appliance, is the sole responsibility of the installer.
The installer must be professionally trained to do such work and must always follow all local and national codes and regulations.

Gas Type

The gas type indicated on the Water Heater's rating plate (NG or LP) must match the type of gas being supplied to the Water Heater.

Gas Conversions

- If the supplied gas does not match the gas type on the rating plate, contact your water heater supplier for a replacement Water Heater with the proper gas type.
- If a gas conversion is needed, there are conversion kits available for some models.
- The conversion kit shall be installed by a qualified service agency in accordance with the manufacturer's instructions and all applicable codes and requirements of the authority having jurisdiction. The qualified service agency is responsible for the proper installation of this kit. Improper installation of this kit will void the Pavilion Limited Warranty.
  Conversion kits will only be shipped directly to the Distributor or Agency performing the conversion.

Meter

- The gas meter must be sized properly for the Water Heater and other gas appliances to operate properly.
- Select a gas meter capable of supplying the entire Btu/h demand of all gas appliances in the building.

Regulators

⚠ WARNING

- Ensure that all gas regulators used are operating properly and providing gas pressures within the specified range of the Water Heater being installed.
- Excess gas inlet pressure may cause serious accidents.

Pressure

- Check the gas supply pressure immediately upstream at a location provided by the gas company.
- Supplied gas pressure must be within the limits shown in the specifications section with all gas appliances operating.

⚠ WARNING

The inlet gas pressure must be within the range specified.
This is for the purposes of input adjustment.
Low gas pressure may cause a loss of flame or ignition failure at other appliances in the home, which may result in unburned gas in the home. Serious accidents such as fire or explosion may result.

Pressure Test

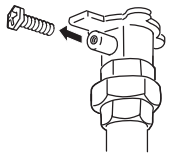
The appliance and its gas connections must be leak tested before placing the appliance in operation.

- Test at test pressures equal to or less than ½ psi (3.5 kPa).
- The appliance must be isolated from the gas supply piping system by closing its individual manual shut off valve during any pressure testing of the gas supply piping system.
- If test pressures are in excess of 1/2 psi (3.5 kPa), the appliance and its individual shut off valve must be completely disconnected from the gas supply piping system during the test process.

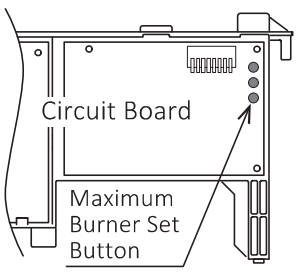
Measuring Gas Pressure

In order to check the gas supply pressure to the Water Heater, a tap is provided on the gas inlet.

1. Remove the **9/32 in. hex head /Philips screw** from the tap.



2. Connect a manometer using a silicon tube.
3. Open up at least two fixtures with hot water side fully.
4. Hold in the "Maximum Burner Set Button" on the circuit board.



Pipe Sizing

- A gas shut off valve must be installed on the supply line.
- Gas piping shall be in accordance with local utility company requirements and/or in the absence of local codes, use the latest edition of National Fuel Gas Code (NFPA54GC), ANSI Z223.1. In Canada, use the latest edition of CSA B149.1, Natural Gas and Propane installation code.
- Size the gas line according to total Btu/h demand of the building and length from the meter or regulator so that the following supply pressures are available even at maximum demand.

	Supply Pressure	
	Natural Gas	LP Gas
Min	3.5 in. W.C.	8 in. W.C.
Max	10.5 in. W.C.	14 in. W.C.

⚠ WARNING

Gas pressures below the required minimum pressure may result in ignition failure, personal injury or death.

Flexible Connectors

Flexible gas lines are not recommended unless the minimum inside diameter is ¾ in. or greater and the rated capacity of the connector is equal to or greater than the Btu/h demand of the Water Heater.

Reference Tools & Sample Calculations

NOTICE

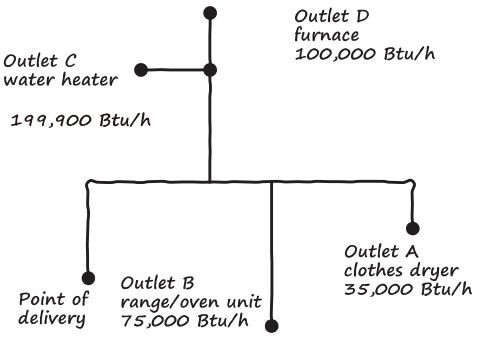
The tables and samples below are for reference only. The professional sizing and installing the gas line should always run the appropriate calculations before all installations.

[Calculation Example]

A partial set of sizing table are printed at the end of this section. In cases where these tables are not appropriate, refer to the NFPA.

1. Draw a sketch of a piping system.
   Enter the system information.

(e.g.)



2. • Determine the gas type used and supply gas Pressure, and enter it.
   • Determine the piping material and enter it to the below.
   • Select the appropriate pipe sizing table and enter it to the below.

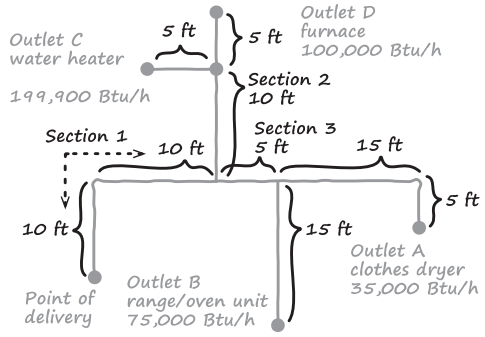
(e.g.)

Gas type: Natural
Supply gas pressure: 6 in. W.C.
Piping material: Sch 40 steel
Table used: 2
Pressure drop: 1.0 in. W.C.

Gas type: _____
Supply gas pressure: _____
Piping material: _____
Table used: _____
Pressure drop: _____

3. • On the sketch, label the section of pipe from the point of delivery (meter or regulator) to the first tee as Section 1.
   • Label the section from the first tee to the second tee as Section 2, and label the section from the first tee to the third tee as Section 3. Use similar section numbers for additional sections.

(e.g.)



4. • Enter the demand is the amount of gas flowing through a section of pipe in the table below.
   - For natural gas, use total Btu/h rating/1000 (ft^3/h).
   - For propane, use total Btu/h.
   • For each section, determine the longest piping from the point of delivery to the furthest appliance through each section. Enter this length for all pipe sections in the table below.
   • Round up to the lengths in the appropriate table. Read across until a capacity equal to or greater than the required demand for the section is found. Read up to find the size. Repeat for each section of piping. Enter this size in the table below.

(e.g.)

Section	Demand	The longest length	Size
1	409.9	45 ft	1 in.
2	299.9	35 ft	1 in.
3	110	45 ft	3/4 in.
4			
5			

Section	Demand	The longest length	Size
1			
2			
3			
4			
5			

5. • Enter the input rating for each appliance in the table below.
   - For natural gas appliances, enter the input rating in Btu/h/1000 (ft^3/h).
   - For propane appliances, enter the input rating in Btu/h.
   • Enter the outlet length from each appliance to the point of delivery in the table below.
   • Round up to the lengths in the appropriate table. Read across until a capacity equal to or greater than the required demand for the section is found. Read up to find the size. Repeat for each appliance. Enter this size in the table below.

   (e.g.)

Appliance	Demand	Outlet length	Size
Outlet A	35	45 ft	1/2 in.
Outlet B	75	40 ft	1/2 in.
Outlet C	199.9	35 ft	3/4 in.
Outlet D	100	35 ft	1/2 in.

Appliance	Demand	Outlet length	Size
Outlet A			
Outlet B			
Outlet C			
Outlet D			

Final Check

1. Turn on and operate all gas appliances including the Water Heater.
2. Check the inlet pressure at each appliance shall be such that the supply pressure at the appliance is greater than or equal to the minimum pressure required by the appliance.

   NOTE If all appliances are not receiving the minimum inlet pressure, the gas piping system may need to be changed.

[Gas pipe sizing tables]

- These tables are for reference only. Consult gas pipe manufacturer for actual pipe capacities.
- It is an example of Schedule 40 Metallic Pipe.
- (Only Table 1- 4) Values in Table are in ft³ of Gas per Hour. Contact your gas supplier for Btu/ft³ ratings. For simplification of your calculations, 1 ft³ of Gas is approximately equivalent to 1,000 Btu.

1. Maximum Natural Gas Delivery Capacity (For Less than 6 in. W.C. initial supply pressure)

0.5 in. W.C. Pressure Drop

Pipe Size	Length (including fittings)													
	10 ft	20 ft	30 ft	40 ft	50 ft	60 ft	70 ft	80 ft	90 ft	100 ft	125 ft	150 ft	175 ft	200 ft
	(3 m)	(6 m)	(9 m)	(12 m)	(15 m)	(18 m)	(21 m)	(24 m)	(27 m)	(30 m)	(38 m)	(45 m)	(53 m)	(60 m)
1/2 in.	172	118	95	81	72	65	60	56	52	50	44	40	37	34
3/4 in.	360	247	199	170	151	137	126	117	110	104	92	83	77	71
1 in.	678	466	374	320	284	257	237	220	207	195	173	157	144	134
1 1/4 in.	1,390	957	768	657	583	528	486	452	424	400	355	322	296	275
1 1/2 in.	2,090	1,430	1,150	985	873	791	728	677	635	600	532	482	443	412
2 in.	4,020	2,760	2,220	1,900	1,680	1,520	1,400	1,300	1,220	1,160	1,020	928	854	794
2 1/2 in.	6,400	4,400	3,530	3,020	2,680	2,430	2,230	2,080	1,950	1,840	1,630	1,480	1,360	1,270

2. Maximum Natural Gas Delivery Capacity (For 6 - 7 in. W.C. initial supply pressure)

1.0 in. W.C. Pressure Drop

Pipe Size	Length (including fittings)													
	10 ft	20 ft	30 ft	40 ft	50 ft	60 ft	70 ft	80 ft	90 ft	100 ft	125 ft	150 ft	175 ft	200 ft
	(3 m)	(6 m)	(9 m)	(12 m)	(15 m)	(18 m)	(21 m)	(24 m)	(27 m)	(30 m)	(38 m)	(45 m)	(53 m)	(60 m)
1/2 in.	250	172	138	118	105	95	87	81	76	72	64	58	53	50
3/4 in.	524	360	289	247	219	199	183	170	160	151	134	121	111	104
1 in.	986	678	544	466	413	374	344	320	300	284	252	228	210	195
1 1/4 in.	2,030	1,390	1,120	957	848	768	707	657	617	583	516	468	430	400
1 1/2 in.	3,030	2,090	1,680	1,430	1,270	1,150	1,060	985	924	873	774	701	645	600
2 in.	5,840	4,020	3,230	2,760	2,450	2,220	2,040	1,900	1,780	1,680	1,490	1,350	1,240	1,160
2 1/2 in.	9,310	6,400	5,140	4,400	3,900	3,530	3,250	3,020	2,840	2,680	2,380	2,150	1,980	1,840

3. Maximum Natural Gas Delivery Capacity (For 7 - 8 in. W.C. initial supply pressure)

2.0 in. W.C. Pressure Drop

Pipe Size	Length (including fittings)													
	10 ft	20 ft	30 ft	40 ft	50 ft	60 ft	70 ft	80 ft	90 ft	100 ft	125 ft	150 ft	175 ft	200 ft
	(3 m)	(6 m)	(9 m)	(12 m)	(15 m)	(18 m)	(21 m)	(24 m)	(27 m)	(30 m)	(38 m)	(45 m)	(53 m)	(60 m)
1/2 in.	364	250	201	172	153	138	127	118	111	105	93	84	77	72
3/4 in.	762	524	420	360	319	289	266	247	232	219	194	176	162	151
1 in.	1,440	986	792	678	601	544	501	466	437	413	366	332	305	284
1 1/4 in.	2,950	2,030	1,630	1,390	1,230	1,120	1,030	957	898	848	751	681	626	583
1 1/2 in.	4,420	3,030	2,440	2,090	1,850	1,680	1,540	1,430	1,350	1,270	1,130	1,020	938	873
2 in.	8,500	5,840	4,690	4,020	3,560	3,230	2,970	2,760	2,590	2,450	2,170	1,970	1,810	1,680
2 1/2 in.	13,600	9,310	7,480	6,400	5,670	5,140	4,730	4,400	4,130	3,900	3,460	3,130	2,880	2,680

4. Maximum Natural Gas Delivery Capacity (For 8 - 10.5 in. W.C. initial supply pressure)

3.0 in. W.C. Pressure Drop

Pipe Size	Length (including fittings)													
	10 ft	20 ft	30 ft	40 ft	50 ft	60 ft	70 ft	80 ft	90 ft	100 ft	125 ft	150 ft	175 ft	200 ft
	(3 m)	(6 m)	(9 m)	(12 m)	(15 m)	(18 m)	(21 m)	(24 m)	(27 m)	(30 m)	(38 m)	(45 m)	(53 m)	(60 m)
1/2 in.	454	312	250	214	190	172	158	147	138	131	116	105	96	90
3/4 in.	949	652	524	448	397	360	331	308	289	273	242	219	202	188
1 in.	1,790	1,230	986	844	748	678	624	580	544	514	456	413	380	353
1 1/4 in.	3,670	2,520	2,030	1,730	1,540	1,390	1,280	1,190	1,120	1,060	936	848	780	726
1 1/2 in.	5,500	3,780	3,030	2,600	2,300	2,090	1,920	1,790	1,680	1,580	1,400	1,270	1,170	1,090
2 in.	10,600	7,280	5,840	5,000	4,430	4,020	3,700	3,440	3,230	3,050	2,700	2,450	2,250	2,090
2 1/2 in.	16,900	11,600	9,310	7,970	7,070	6,400	5,890	5,480	5,140	4,860	4,300	3,900	3,590	3,340

5. Maximum Undiluted Propane (LP) Delivery Capacity in Thousands of Btu/h

0.5 in. W.C. Pressure Drop

Pipe Size	Length (including fittings)											
	10 ft	20 ft	30 ft	40 ft	50 ft	60 ft	80 ft	100 ft	125 ft	150 ft	175 ft	200 ft
	(3 m)	(6 m)	(9 m)	(12 m)	(15 m)	(18 m)	(24 m)	(30 m)	(38 m)	(45 m)	(53 m)	(60 m)
1/2 in.	291	200	160	137	122	110	101	94	89	84	74	67
3/4 in.	608	418	336	287	255	231	212	197	185	175	155	140
1 in.	1,150	787	632	541	480	434	400	372	349	330	292	265
1 1/4 in.	2,350	1,620	1,300	1,110	985	892	821	763	716	677	600	543
1 1/2 in.	3,520	2,420	1,940	1,660	1,480	1,340	1,230	1,140	1,070	1,010	899	814
2 in.	6,790	4,660	3,750	3,210	2,840	2,570	2,370	2,200	2,070	1,950	1,730	1,570

■ Adjusting Gas Valve Offset Pressure

Use the following procedure to adjust the gas valve offset pressure:

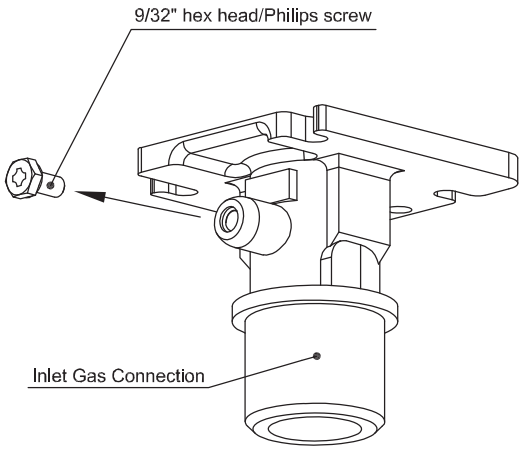
1.Shut off the main gas supply valve.
2.When the gas valve offset pressure is adjusted, remove the front cover.
Because it is not possible to adjust the gas valve offset pressure with the front cover attached.
3.Remove the 9/32" hex head/Philips screw from the Gas Supply Pressure port on the Inlet Gas Connection and connect the manometer or pressure gauge using a silicon tube.
4.Loosen the screw of Offset Pressure Port on the gas valve and connect the manometer or pressure gauge using a silicon tube.
For dual port manometer, use the positive pressure side.
5.Open the gas supply valve and operate the unit.
6.Press and hold both the "Mode" and "Minimum" buttons on the Circuit Board simultaneously for more than 3 seconds.
After releasing your fingers, the low fire condition will last 30 minutes.
7.If gas valve offset pressure adjustment needed, remove the cap of gas valve, and then adjust the gas offset pressure by turning the set screw no more than 1/8 turn.
8.After offset pressure adjustment, do not forgot to tighten the 9/32" hex head/Philips screw to the Gas Supply Pressure Port.
To return to the normal operation, press and hold the "Mode" button for more than 3 seconds.

Gas Offset Value

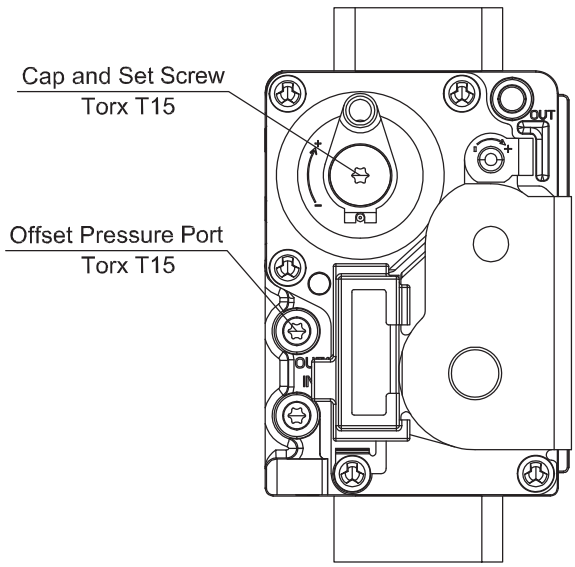
Gas Type	Supply Pressure (inch H_2O)	Offset (inch H_2O)
NG	7.9	-0.02
LP	11.0	-0.02

* Gas offset pressure values are subject to change without prior notice.
Check the latest burner specification table.

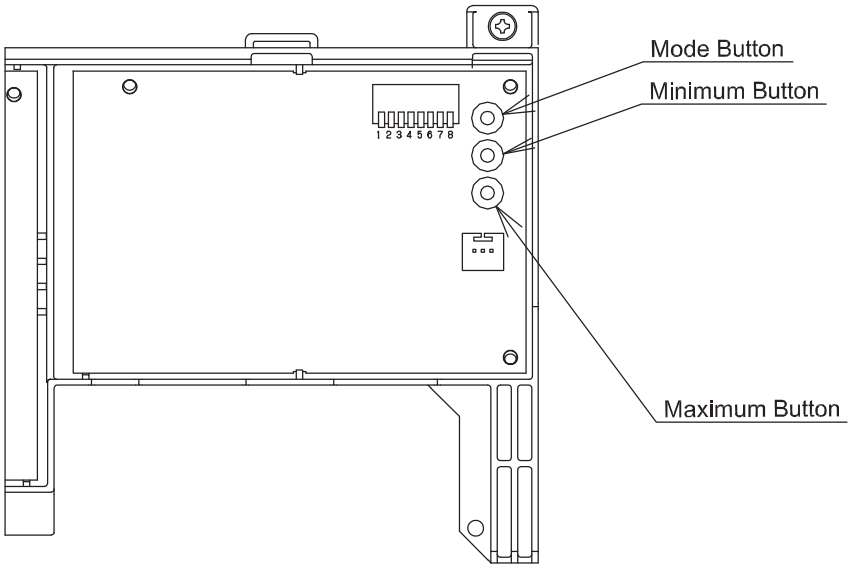
●Gas Supply Pressure Port



●Gas Valve



●Circuit Board



Periodic Inspection

Periodic check and maintenance should be performed once a year by a qualified service technician to assure that all the equipment is operating safely and efficiently.
We recommend to make necessary arrangements with a service contractor.

⚠ WARNING

To prevent burns or scalding, turn off the ⏻ button and wait until the appliance cools before performing maintenance.

Check : A
[When supplying combustion air from the indoors]
For smear or blockage with dust, oil, etc. at the air supply vent.
If blocked, remove the build-up with a vacuum cleaner or damp towel.

NOTE Do not permanently remove the Inlet Screen.

Check : B
For dust and soot in the exhaust vent or the exhaust vent terminal.

Check : C
- For abnormal sounds during operation.
- For abnormalities in external appearance, discoloration or flaws.

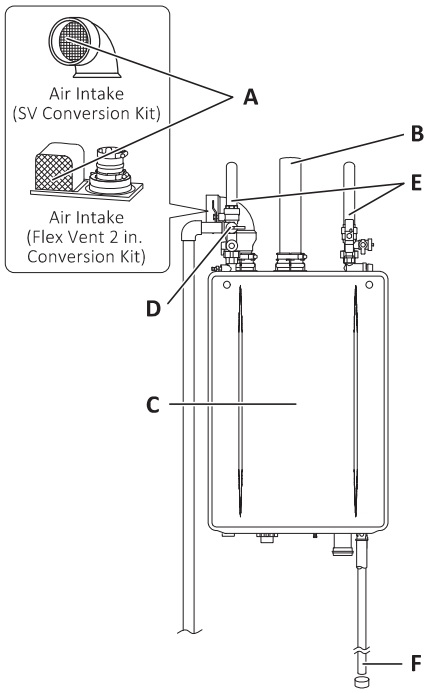
Check : D
For proper operation of pressure relief valve.

Check : E
For water leaks from the Water Heater and piping.

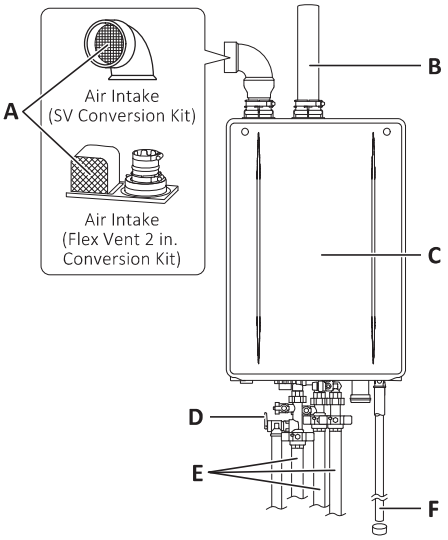
Check : F
For blockage at the condensate drain pipe discharge.

Check
For laundry, newspaper, timber, oil, spray cans and other combustible materials near the Water Heater or the exhaust vent terminal.

UT199DV (GQ-C3260WX-FF PB US)



PR199DV (GQ-C3260WXQ-FF PB US)



Periodic Maintenance

Water Heater

Wipe the outside surface with a wet cloth, then dry the surface. Use a neutral detergent to clean any stains.
If an external condensate neutralizer is installed, periodic replacement of the neutralizing agent will be required. Refer to the instructions supplied with the neutralizer for suggested replacement intervals.

Remote Controller

Wipe the surface with a wet cloth.

NOTE

- Do not use chlorine-based, acidic, alkaline detergents, organic solvents such as benzine and thinner, or Melamin Sponge to clean the Remote Controller.; discoloration, deformation, scratches or cracks may occur.
- The Remote Controller is water resistant but not water proof. Keep it as dry as possible.

Periodic Maintenance

Water Drain Valve (with Water Filter)

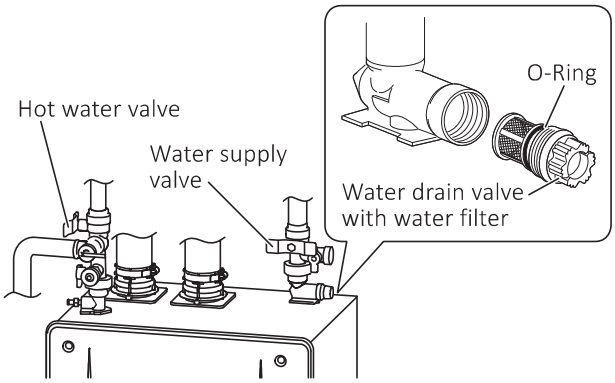
If the water drain valve (with water filter) is covered with debris, the hot water may not run smoothly, or the Water Heater may put out cold water. Check and clean the filter as explained below.

⚠ WARNING

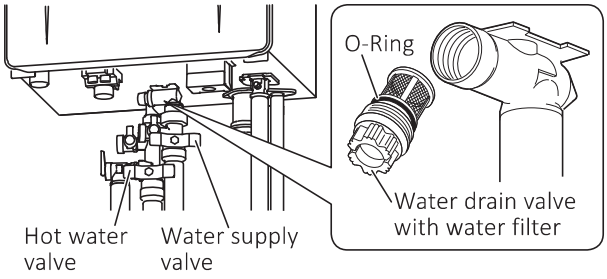
To prevent burns or scalding, turn off the ⏻ button and wait until the appliance cools before draining the water.

1. Close the hot water valve and the water supply valve.

UT199DV (GQ-C3260WX-FF PB US)



PR199DV (GQ-C3260WXQ-FF PB US)



2. With a bucket ready, remove the water drain valve.

   NOTE Approximately 0.83 gallon (3.1 L) of water will drain out.

3. Clean the water filter with a brush under running water.
4. Reattach the water drain valve (with water filter).

   NOTE Do not lose the O-Ring.

5. Open the hot water valve and the water supply valve.
   Check that water does not leak from the water drain valve.

Procedure for Flushing the Heat Exchanger

NOTE This procedure is only intended for use by a qualified service professional or authorized Service Representative. Any unauthorized use of this procedure may result in voiding the Pavilion Limited Warranty. Contact Pavilion Customer Center (1-855-443-8468) for additional support.

If the alarm code "C1#*" is flashing on the Remote Controller, it means there is Scale Build-up in the Heat Exchanger. To prevent damage to the Heat Exchanger from Scale Build-up, the Heat Exchanger needs to be flushed** to remove the Scale Build-up.
Damage to the Water Heater due to Scale Build-up is not covered by the Water Heater's warranty.
To clear the alarm code "C1#*", the Heat Exchanger must be flushed.
If the alarm code "C1#*" is displayed and flashing on the Remote Controller, contact Pavilion Customer Center (1-855-443-8468).

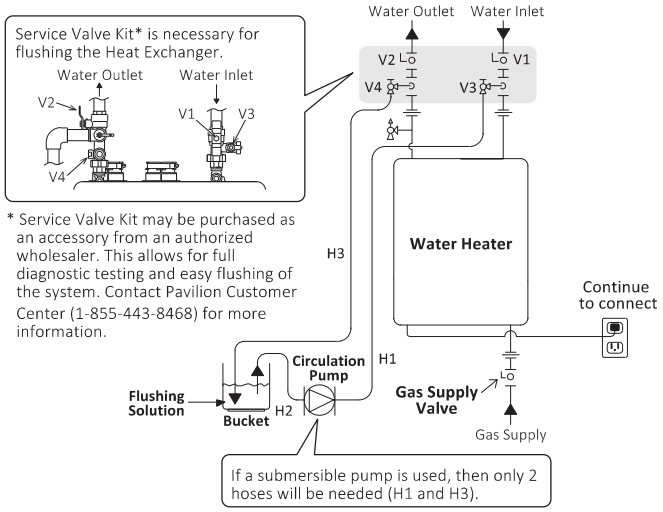
* Warning indication, # = 1-9
** Connect the blue connector marked "FLUSH" for flushing near the Circuit Board when flushing the Heat Exchanger. After connecting it, the Water Heater is set to "Flushing Mode".

NOTE The Water Heater must remain connected to the electrical power when flushing the Heat Exchanger.

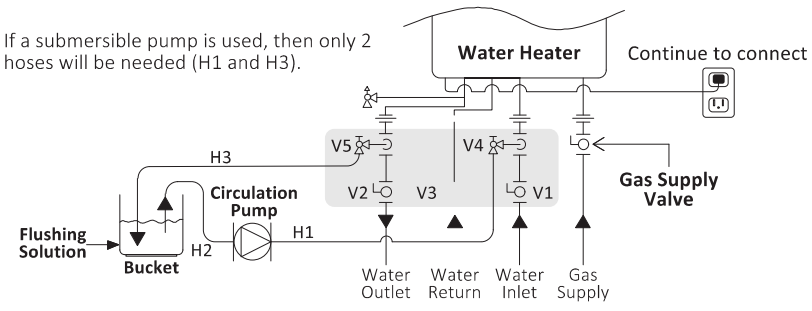
The preparation of the flushing system

1. Close the gas supply valve.
2. Close the water inlet valve (V1) and the water outlet valve (V2).
3. Connect the one drain hose (H1) to the drain valve (V3), and then the other to the circulation pump.
4. Connect the drain hose (H2) to the circulation pump.
5. Connect the drain hose (H3) to the drain valve (V4).
6. Pour 1 gallon of "Calcium, Lime and Rust Removal Product" and 1 gallon water into the bucket. Recommends "Calcium, Lime and Rust Removal Product" for flushing.
7. Place the both drain hoses (H2 and H3) into the bucket filled with the flushing solution.
8. Open the both drain valves (V3 and V4).

UT199DV (GQ-C3260WX-FF PB US)



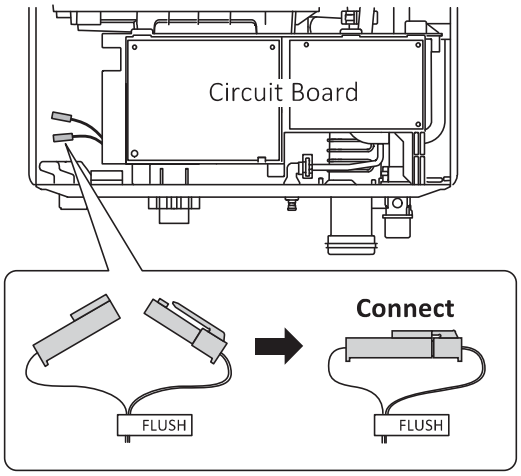
PR199DV (GQ-C3260WXQ-FF PB US)



For Single Water Heater

[Procedure 1. Flushing the Heat Exchanger]

1. Open the front cover.
2. Connect the blue connector marked "FLUSH" for flushing near the Circuit Board.



3. Then the code **CCC** is displayed on the Remote Controller.
4. Turn on the circulation pump to circulate the flushing solution through the Water Heater for 1 hour at a rate of 1.5 GPM or more.
5. **CCC** → **C60** → **C59** ⋯ **C00**

   The code "C60" is displayed on the Remote Controller when the Water Heater detects the flow of the flushing solution.

   When 1 minute passes, the code "C60" will change to "C59" on the Remote Controller.

   When 1 hour passes, the code "C00" is flashing on the Remote Controller.

   Do not disconnect the blue connector marked "FLUSH" for flushing.

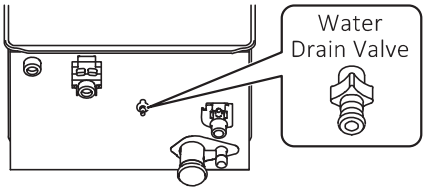
   NOTE Check whether the reverse connection of the hose (H1) and (H3) if the display number will not change. In that case, the flow rate of the flushing solution may be under 1.5 GPM.

6. Turn off the circulation pump.

[Procedure 2. Cleaning the Heat Exchanger]

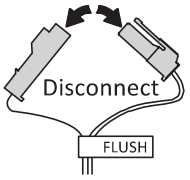
The flushing solution needs to be rinsed and cleaned out of the Water Heater.
Below is the way to rinse and clean the flushing solution.

1. Remove both drain hoses (H2 and H3) from the bucket. And then place the drain hose (H3) into the sink or outside to drain.
2. Close the drain valve (V3) and then open the water inlet valve (V1).
   Do not open the fresh water outlet valve (V2).
3. Clean the Water Heater with fresh water for 3 minutes or more.
   (Needs to have enough time to clean the Water Heater.)



NOTE The Water Heater has a "Water Drain Valve" on the bottom of the Water Heater.
Place a bucket under the Water Heater to drain water from the "Water Drain Valve".
Carefully unscrew the "Water Drain Valve" to rinse flushing solution out of the Water Heater for about 10 seconds, then close the "Water Drain Valve".

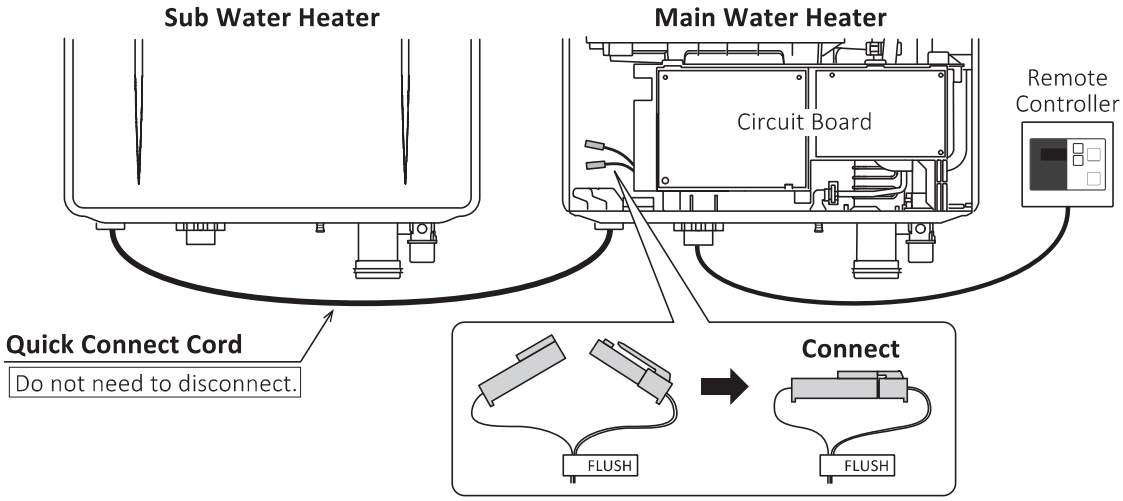
4. Close the drain valve (V4) and then remove the drain hose (H3) from the drain valve (V4).
5. Remove the drain hose (H1) from the drain valve (V3).
6. Disconnect the blue connector marked "FLUSH" for flushing.
   The code "C00" goes out on the Remote Controller.



7. Close the front cover.
8. Open the gas supply valve and water outlet valve (V2).
9. Check for correct operation of the Water Heater.

For Quick Connect Multi-System

1. Open the front covers.
2. Connect the blue connector marked "FLUSH" for Water Heater needing to be flushed.
   (The Water Heater is isolated from Quick Connect Multi-system when the blue connector marked "FLUSH" for flushing is connected. Do not need to disconnect the Quick Connect Cord.)



3. Then the code **CCC** or **FCC** is displayed on the Remote Controller.
   - "CCC" is displayed when the Blue Connector of the Main Water Heater is connected.
   - "FCC" is displayed when the Blue Connector of the Sub Water Heater is connected.
4. Turn on the circulation pump to circulate the flushing solution through the Water Heaters for 1 hour at a rate of 1.5 GPM or more.
5. **CCC** or **FCC**
   ↓
   C60 The code "C60" is displayed on the Remote Controller when the water heater detects the flow of the flushing solution.
   ↓
   C59 When 1 minute passes, the code "C60" will change to "C59" on the Remote Controller.
   ↓
   C00 When 1 hour passes, the code "C00" is flashing on the Remote Controller.

   Do not disconnect the blue connector marked "FLUSH" for flushing.

NOTE Check whether the reverse connection of the hose (H1) and (H3) if the display number will not change. In that case, the flow rate of the flushing solution may be under 1.5 GPM.

(e.g. The display when the both Water Heaters are flushed at the same time)

Connect the Blue Connector of the Main Water Heater
↓
CCC
↓
Detects the flow
↓
C50 (10 minutes pass)
↓
Connect the Blue Connector of the Sub Water Heater
↓
FCC The remaining time of flushing gives indication priority to the connector which is connected later.
↓
C60 Detects the flow
↓
C00 (1 hour passes) Flashing

6. Turn off the circulation pump.
7. Rinse and clean the flushing solution out of the Water Heaters in accordance with "For Single Water Heater [Procedure 2]".
   (See the "Procedure 2.1-2.5".)
8. Disconnect the blue connector marked "FLUSH" for flushing.
   The Code "C00" goes out on the Remote Controller.
9. Close the front covers.
10. Open the gas supply valves and water outlet valves.
11. Check for correct operation of the Water Heaters.

Preventing damage from freezing

NOTICE

- Damage can occur from frozen water within the appliance and pipes even in warm environments. Be sure to read below for appropriate measures.
- Repairs for damage caused by freezing are not covered by the warranty.

Freezing is prevented within the device automatically by the freeze prevention heater.

Freezing cannot be prevented when the power plug is unplugged. Do not remove the power plug from the wall outlet.
Freezing will be prevented regardless of whether the ⏻ button is ON or OFF.

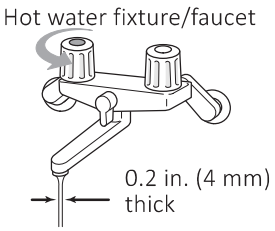
- In normal operation, freezing is prevented within the Water Heater automatically unless the outside temperature without wind is below-30°F (-35°C) when supplying combustion air from the outdoor (Direct Vent) or -4°F (-20°C) when the Water Heater is installed outdoors.
- For indoor installation, when supplying combustion air from the indoors, the room temperature must be greater than 32°F (0°C) to prevent freezing and the room inside must not have negative pressure.
- The freeze prevention heaters will not prevent the plumbing external to the Water Heater from freezing. Protect this plumbing with insulation, heat tape or electric heaters, solenoids, or pipe covers. If there remains a freezing risk, contact the nearest manufacturer's authorized agent.

Take the measures below for extremely cold temperatures*.

* Outside temperature including wind chill factor less than -30°F (-35°C) when supplying combustion air from the outdoor (Direct Vent) or -4°F (-20°C) when the Water Heater is installed outdoors.

This method can protect not only the Water Heater, but also the water supply, water piping and mixing valves.

1. Turn off the ⏻ button.
2. Close the gas supply valve.
3. Open a hot water fixture/faucet, and keep a small stream of hot water running. (0.1 gallon (400 mL)/minute or about 0.2 in. (4 mm) thick.)
   - If there is a mixing valve, set it to the highest level.
   - When linking multiple Water Heaters, discharge water equivalent to (0.1 gallon (400 mL)/ minute per Water Heater.)



4. The flow may become unstable from time to time. Check the flow 30 minutes later.
   - In general, it is not advisable to run water through the Water Heater when it is OFF, but in this case freeze prevention is more important.

NOTE

- Remember to set mixing valves and fixtures to their original levels before using the Water Heater again to prevent scalding.
- If there is still a risk that the Water Heater will freeze, drain the Water Heater as shown on the next page.

If water will not flow because it is frozen

1. Close the gas and water valves.
2. Turn off the ⏻ button.
3. Open the water supply valve from time to time to check whether water is running.
4. When the water is flowing again, check for water leaks from the Water Heater and piping before using.

NOTE If the Water Heater or the piping is frozen, do not use the Water Heater or it may get damaged.

If the Water Heater will not be used for a long period of time, drain the water.

⚠ WARNING

- To prevent burns or scalding, turn off the ⏻ button and wait until the appliance cools before performing maintenance.
- Do not touch the power cord with wet hands.

- To prevent damage from freezing, the Water Heater must be plugged into power at all times. If power is unplugged, drain the water completely from the Water Heater. Then use an air compressor to remove all water from inside the water piping of the Water Heater.
- It is recommended that Isolation Valves are installed on the Water Heater, otherwise the water connections will need to be removed to drain the Water Heater completely.
- Freeze damage due to not draining properly will not be covered under warranty.
- Drain water into a bucket to prevent water damage.

Drainage Using the Remote Controller

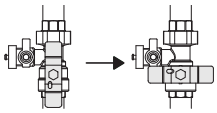
1. The ⏻ button is OFF.
2. Press and hold the ⚙ button until a sound is heard (approximately 2 seconds).
   - The maximum hot water temperature will blink.

(e.g. 120°F)

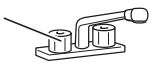
3. Press the ⚙ button several times until the item number "5" is displayed.

4. Press the ▲ button.
   - The display will change from "oF" to "on".

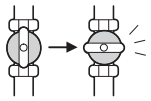
5. Close the water supply valve.



6. Fully open all hot water fixtures/faucets.



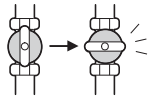
7. Open all drain plugs and drain the water out of the Water Heater.
8. When the water is completely drained, reattach all drain plugs and close the hot water fixtures/ faucets.
9. Close the gas valve and disconnect the electrical power supplied to the Water Heater.



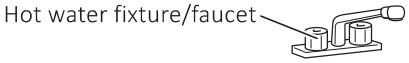
Do not touch with wet hands.

Manual Draining

1. Close the gas valve.



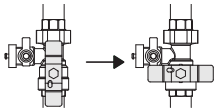
2. The ⏻ button is ON.
3. Turn and leave open the hot water fixtures/ faucets for more than 2 minutes and close.



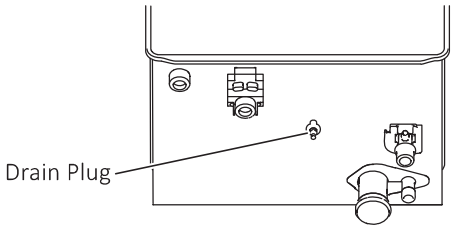
   - If multiple Water Heaters are being used, drain 2 minutes for each Water Heater.
   - An 11 Error Code may appear on the Remote Controller. This is not a malfunction of the Water Heater. Do not turn the ⏻ button OFF.

4. Close the water supply valve and disconnect the electrical power supplied to the Water Heater.

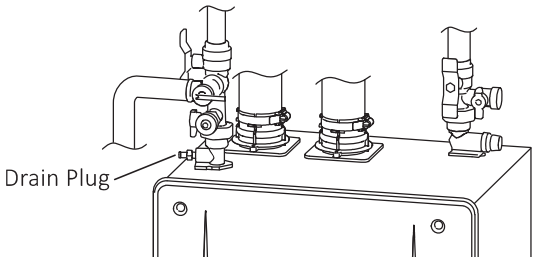
Do not touch with wet hands.



5. Fully open all hot water fixtures/faucets.
6. Open the drain plug.



7. Open the drain plug, and then drain the water out of the Water Heater.



8. When the water is completely drained, reattach all drain plugs and close the hot water fixtures/ faucets.

Turning the Water Heater Back On

⚠ DANGER

After the Water Heater has been out of use for a long time, make sure that you fill the condensate trap with water.
This is to prevent dangerous exhaust gases from entering the building.
Failure to fill the condensate trap could result in severe personal injury or death.
(By performing step 4 as described below, the condensate trap will automatically fill itself with water.)

⚠ WARNING

Do not touch the power cord with wet hands.

1. Check that all drain plugs are inserted.
2. Check that all hot water fixtures/faucets are closed.
3. Open the water supply valve.
4. Open a hot water fixtures/faucets to confirm that water is available, and then close the hot water fixtures/faucets again.
5. Open the gas supply valve.
6. Connect the electrical power.
   Do not touch with wet hands.
7. Make sure that the area around the appliance is well ventilated; open a window or a door if necessary. Then, operate the Water Heater and verify that condensate is coming out of the condensate drain pipe. (During normal use of the Water Heater, condensate will begin to discharge from the condensate drain pipe within 15 minutes of use. However, depending on the season and/or installation site conditions, it may take longer.)

   NOTE If water does not appear at the end of the drain line, a qualified service technician must clean the condensate line.

Preventing damage from freezing

NOTICE

- Damage can occur from frozen water within the appliance and pipes even in warm environments. Be sure to read below for appropriate measures.
- Repairs for damage caused by freezing are not covered by the warranty.

Freezing is prevented within the device automatically by the freeze prevention heater and pump.

Freezing cannot be prevented when the power plug is unplugged. Do not remove the power plug from the wall outlet.
Freezing will be prevented regardless of whether the ⏻ button is ON or OFF.

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- The freeze prevention heaters will not prevent the plumbing external to the Water Heater from freezing. Protect this plumbing with insulation, heat tape or electric heaters, solenoids, or pipe covers. If there remains a freezing risk, contact the nearest manufacturer's authorized agent.

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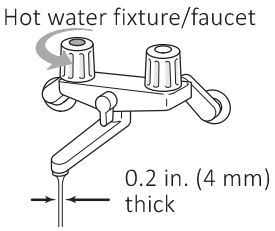
* Outside temperature including wind chill factor less than -30°F (-35°C) when supplying combustion air from the outdoor (Direct Vent) or -4°F (-20°C) when the Water Heater is installed outdoors.

This method can protect not only the Water Heater, but also the water supply, water piping and mixing valves.

1. Turn off the ⏻ button.
2. Close the gas supply valve.
3. Open a hot water fixture/faucet, and keep a small stream of hot water running. (0.1 gallon (400 mL)/minute or about 0.2 in. (4 mm) thick.)
   - If there is a mixing valve, set it to the highest level.
   - When linking multiple Water Heaters, discharge water equivalent to (0.1 gallon (400 mL)/ minute per Water Heater.)



4. The flow may become unstable from time to time. Check the flow 30 minutes later.
   - In general, it is not advisable to run water through the Water Heater when it is OFF, but in this case freeze prevention is more important.

NOTE

- Remember to set mixing valves and fixtures to their original levels before using the Water Heater again to prevent scalding.
- If there is still a risk that the Water Heater will freeze, drain the Water Heater as shown on the next page.

If water will not flow because it is frozen

1. Close the gas and water valves.
2. Turn off the ⏻ button.
3. Open the water supply valve from time to time to check whether water is running.
4. When the water is flowing again, check for water leaks from the Water Heater and piping before using.

NOTE If the Water Heater or the piping is frozen, do not use the Water Heater or it may get damaged.

If the Water Heater will not be used for a long period of time, drain the water.

⚠ WARNING

- To prevent burns or scalding, turn off the ⏻ button and wait until the appliance cools before performing maintenance.
- Do not touch the power cord with wet hands.

- To prevent damage from freezing, the Water Heater must be plugged into power at all times. If power is unplugged, drain the water completely from the Water Heater. Then use an air compressor to remove all water from inside the water piping of the Water Heater.
- It is recommended that Isolation Valves are installed on the Water Heater, otherwise the water connections will need to be removed to drain the Water Heater completely.
- Freeze damage due to not draining properly will not be covered under warranty.
- Drain water into a bucket to prevent water damage.

Drain Using the Remote Controller

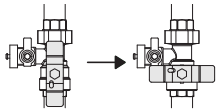
1. The ⏻ button is OFF.
2. Press and hold the ⚙ button until a sound is heard (approximately 2 seconds).
   - The maximum hot water temperature will blink.

(e.g. 120°F)

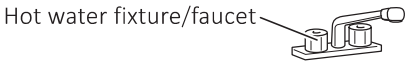
3. Press the ⚙ button several times until the item number "5" is displayed.

4. Press the ▲ button.
   - The display will change from "oF" to "on".

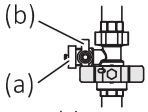
5. Close the water supply valve.



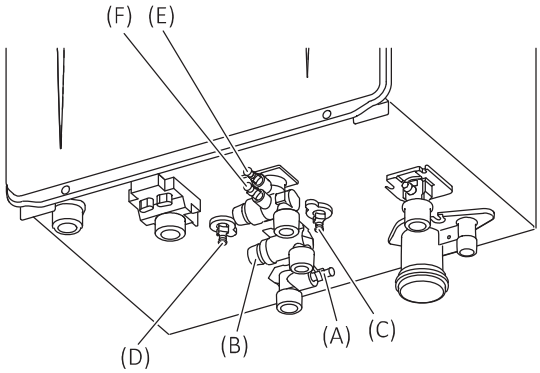
6. Fully open all hot water fixtures/faucets.



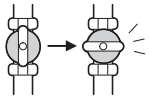
7. Open drain plug (A) on the hot water side. Or open the port (a) and small valve (b) of isolation valve on hot water side.



8. Open drain plug (with filter) (B) on the cold water side. Or open the port (a) and small valve (b) of isolation valve on cold water side.
9. Open other drain plugs (C, D, E, F) and wait until finish draining water.



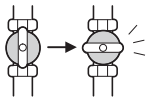
10. When the water is completely drained, reattach all drain plugs and close the hot water fixtures/faucets.
11. Close the gas valve and disconnect the electrical power supplied to the Water Heater.



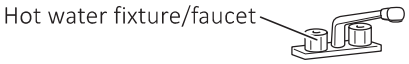
Do not touch with wet hands.

Manual Draining

1. Close the gas valve.

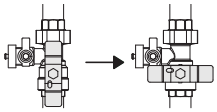


2. The ⏻ button is ON.
3. Turn and leave open the hot water fixtures/ faucets for more than 2 minutes and close.

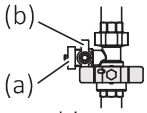


   - If multiple Water Heaters are being used, drain 2 minutes for each Water Heater.
   - An 11 Error Code may appear on the Remote Controller. This is not a malfunction of the Water Heater. Do not turn the ⏻ button OFF.

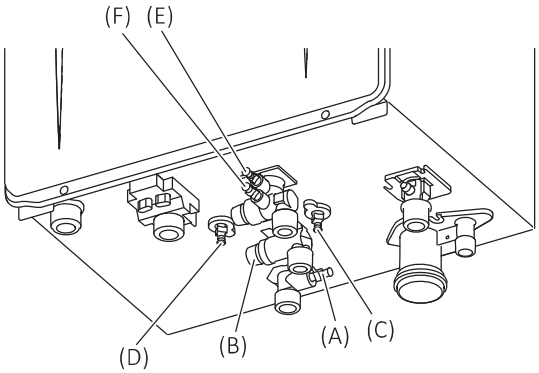
4. Close the water supply valve and disconnect the electrical power supplied to the Water Heater.
   Do not touch with wet hands.



5. Fully open all hot water fixtures/faucets.
6. Open drain plug (A) on the hot water side. Or open the port (a) and small valve (b) of isolation valve on hot water side.



7. Open drain plug (with filter) (B) on the cold water side. Or open the port (a) and small valve (b) of isolation valve on cold water side.
8. Open other drain plugs (C, D, E, F) and wait until finish draining water.



9. When the water is completely drained, reattach all drain plugs and close the hot water fixtures/ faucets.

Turning the Water Heater Back On

⚠ DANGER

After the Water Heater has been out of use for a long time, make sure that you fill the condensate trap with water.
This is to prevent dangerous exhaust gases from entering the building.
Failure to fill the condensate trap could result in severe personal injury or death.
(By performing step 4 as described below, the condensate trap will automatically fill itself with water.)

⚠ WARNING

Do not touch the power cord with wet hands.

1. Check that all drain plugs are inserted.
2. Check that all hot water fixtures/faucets are closed.
3. Open the water supply valve.
4. Open a hot water fixtures/faucets to confirm that water is available, and then close the hot water fixtures/faucets again.
5. Open the gas supply valve.
6. Connect the electrical power.
   Do not touch with wet hands.
7. Make sure that the area around the appliance is well ventilated; open a window or a door if necessary. Then, operate the Water Heater and verify that condensate is coming out of the condensate drain pipe. (During normal use of the Water Heater, condensate will begin to discharge from the condensate drain pipe within 15 minutes of use. However, depending on the season and/or installation site conditions, it may take longer.)

   NOTE If water does not appear at the end of the drain line, a qualified service technician must clean the condensate line.

Checklist After Installation

After installing the Water Heater, review the following checklist. You should be able to answer "Yes" to all of the items in the checklist. If you answer NO to any item, installation is not complete. Review the appropriate sections to complete the installation.
If you have additional questions or need assistance with installation, contact Pavilion Customer Center at 1-866-766-7489.

Choosing an Installation Location	**Yes**	**No**
Make sure that the Water Heater is not installed in the following places. • Places where gasoline, benzene and adhesives are handled • Places in which corrosive gases (ammonia, chlorine, sulfur, ethylene compounds, acids) are present in the air • Places dust or debris will accumulate		
Installation Clearances	**Yes**	**No**
Make sure that the Water Heater meets the required clearances.		
Installation of the Water Heater	**Yes**	**No**
Make sure that the condensate container is filled with water.		
Venting the Water Heater	**Yes**	**No**
Make sure that required combustion air is supplied to the Water Heater.		
Make sure using vent materials approved for use with category IV appliances.		
Make sure that there is no leakage or loose connection in the venting system.		
Make sure that the vent length is within the requirement.		
Make sure that bird screen(s) is installed on the vent termination.		
Make sure that the termination meets the clearance requirements.		
When using a horizontal section, make sure that the horizontal vent slope is 1/4 in. upwards for every 12 in. (300 mm) toward the termination.		
Make sure that the intake pipe and exhaust pipe are properly installed.		
Make sure that the vent system comforms with local codes, state codes, or national codes as ANSI/NFPA and CSA.		
Connecting the Gas Supply	**Yes**	**No**
Make sure that the gas type is compatible with the type indicated on the Water Heater's rating plate.		
Clean out any debris from the gas piping before connecting the Water Heater.		
Make sure that the gas piping size is appropriate.		
Make sure that the inlet gas pressure is within the specified range.		
Make sure that there are no leaks from the Water Heater and its gas connection.		
Connecting the Water Supply	**Yes**	**No**
Clean out metal powder, sand and dirt from the water piping before connecting the Water Heater.		
Make sure to check and test the water quality to see if water treatment is necessary.		
Make sure that the water supply pressure is 15 to 150 psi (103.4 to 1034 kPa).		
Make sure that there is no water leakage from the cold water supply pipe and the hot water supply pipe.		
Make sure that the pressure relief valve is installed.		

Make sure that the cold water supply line and the hot water supply line are properly connected to the Water Heater.		
Make sure that appropriate heat insulation measures are taken according to regional climate. (e.g. wrapping with heat insulation materials, using electric heaters)		
Connecting the Condensate Drain	**Yes**	**No**
Make sure that the condensate drain piping is connected.		
Make sure that corrosion resistant material is used for the condensate drain piping.		
Make sure that the size of the condensate drain piping is 1/2 in or larger.		
Make sure that the condensate drain piping slopes towards the inside floor drain or condensate pump.		
Make sure that the end of the condensate drain pipe is open to the atmosphere.		
Make sure that the condensate has been treated before disposal as necessary. (when required by local code or when the condensate could cause damage)		
Make sure that measures are taken to prevent the condensate drain lines from freezing. (e.g. insulation material, heat tape or electric heater)		
Connecting Electricity	**Yes**	**No**
Make sure that the electrical supply is 120 VAC at 60 Hz.		
Make sure the grounding resistance is less than 100 Ω.		
Make sure the Remote Controller Cord is correctly installed.		
[For installation with a recirculation pump] Make sure that it is installed by the following method. • When using a pump (100 W or less), connect the pump power cord to the pump control wires. • When using a large pump (greater than 100 W), a relay circuit is constructed.		
Installation of the Remote Controller	**Yes**	**No**
Make sure that the location of the Remote Controller is appropriate.		
Check the Remote Controller operation accordance with the Owner's Guide.		
Make sure that the display appears on the Remote Controller.		
Setting the DIP Switches	**Yes**	**No**
Make sure that all DIP switches are set correctly.		
Trial Operation	**Yes**	**No**
Open a hot water fixture, make sure the BURNER ON indicator or the Flame indicator is displayed on the Remote Controller and hot water is present at the fixture.		
Clean the filter in the cold water inlet after the trial operation.		
If the Water Heater will not be used immediately, do the following. • Close all gas and water shutoff valves. • Drain all the water in the Water Heater and the plumbing system. • Disconnect the electrical power to the Water Heater.		
Explain the “Important Safety Information”, “Operation Procedures” and “Follow-up Service” according to the Owner's Guide to the customer.		
Quick Connect Multi-System Installation	**Yes**	**No**
Make sure that only one Remote Controller is installed.		

PR199DV (GQ-C3260WXQ-FF PB US)

Checklist After Installation

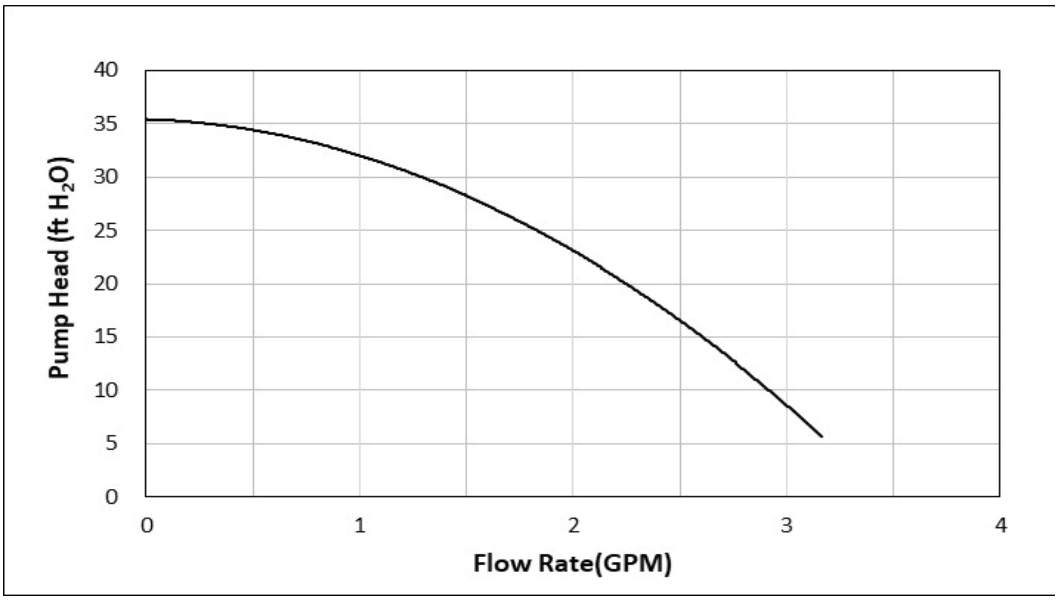
After installing the Water Heater, review the following checklist. You should be able to answer "Yes" to all of the items in the checklist. If you answer NO to any item, installation is not complete. Review the appropriate sections to complete the installation.
If you have additional questions or need assistance with installation, contact Pavilion Customer Center at 1-855-443-8468.

Choosing an Installation Location	**Yes**	**No**
Make sure that the Water Heater is not installed in the following places. • Places where gasoline, benzene and adhesives are handled • Places in which corrosive gases (ammonia, chlorine, sulfur, ethylene compounds, acids) are present in the air • Places dust or debris will accumulate		
Installation Clearances	**Yes**	**No**
Make sure that the Water Heater meets the required clearances.		
Installation of the Water Heater	**Yes**	**No**
Make sure that the condensate container is filled with water.		
Venting the Water Heater	**Yes**	**No**
Make sure that required combustion air is supplied to the Water Heater.		
Make sure using vent materials approved for use with category IV appliances.		
Make sure that there is no leakage or loose connection in the venting system.		
Make sure that the vent length is within the requirement.		
Make sure that bird screen(s) is installed on the vent termination.		
Make sure that the termination meets the clearance requirements.		
When using a horizontal section, make sure that the horizontal vent slope is 1/4 in. upwards for every 12 in. (300 mm) toward the termination.		
Make sure that the intake pipe and exhaust pipe are properly installed.		
Make sure that the vent system comforms with local codes, state codes, or national codes as ANSI/NFPA and CSA.		
Connecting the Gas Supply	**Yes**	**No**
Make sure that the gas type is compatible with the type indicated on the Water Heater's rating plate.		
Clean out any debris from the gas piping before connecting the Water Heater.		
Make sure that the gas piping size is appropriate.		
Make sure that the inlet gas pressure is within the specified range.		
Make sure that there are no leaks from the Water Heater and its gas connection.		
Connecting the Water Supply	**Yes**	**No**
Clean out metal powder, sand and dirt from the water piping before connecting the Water Heater.		
Make sure to check and test the water quality to see if water treatment is necessary.		
Make sure that the water supply pressure is 15 to 150 psi (103.4 to 1034 kPa).		
Make sure that there is no water leakage from the cold water supply pipe and the hot water supply pipe.		
Make sure that the pressure relief valve is installed.		
Make sure that the cold water supply line and the hot water supply line are properly connected to the Water Heater.		

Make sure that appropriate heat insulation measures are taken according to regional climate. (e.g. wrapping with heat insulation materials, using electric heaters)		
(Only for crossover mode) Make sure the crossover valve is installed at the furthest fixture from the Water Heater on the hot water line.		
Connecting the Condensate Drain	**Yes**	**No**
Make sure that the condensate drain piping is connected.		
Make sure that corrosion resistant material is used for the condensate drain piping.		
Make sure that the size of the condensate drain piping is 1/2 in or larger.		
Make sure that the condensate drain piping slopes towards the inside floor drain or condensate pump.		
Make sure that the end of the condensate drain pipe is open to the atmosphere.		
Make sure that the condensate has been treated before disposal as necessary. (when required by local code or when the condensate could cause damage)		
Make sure that measures are taken to prevent the condensate drain lines from freezing. (e.g. insulation material, heat tape or electric heater)		
Connecting Electricity	**Yes**	**No**
Make sure that the electrical supply is 120VAC at 60 Hz.		
Make sure the grounding resistance is less than 100 Ω.		
Make sure the Remote Controller Cord is correctly installed.		
(Only for crossover mode) Make sure the connector marked “Crossover” is connected.		
Installation of the Remote Controller	**Yes**	**No**
Make sure that the location of the Remote Controller is appropriate.		
Check the Remote Controller operation accordance with the Owner’s Guide.		
Make sure that the display appears on the Remote Controller.		
Setting the DIP Switches	**Yes**	**No**
Make sure that all DIP switches are set correctly.		
Setting for Recirculation	**Yes**	**No**
(When conforming to Title 24) Make sure that recirculation settings are set appropriately.		
Trial Operation	**Yes**	**No**
Open a hot water fixture, make sure the BURNER ON indicator or the Flame indicator is displayed on the Remote Controller and hot water is present at the fixture.		
Clean the filter in the cold water inlet after the trial operation.		
If the Water Heater will not be used immediately, do the following. • Close all gas and water shutoff valves. • Drain all the water in the Water Heater and the plumbing system. • Disconnect the electrical power to the Water Heater.		
Make sure there is no error code indication “63” on the Remote Controller after trial operation.		
Make sure there is no gurgling sound occurs when the pump operating.		
Explain the “Important Safety Information”, “Operation Procedures” and “Follow-up Service” according to the Owner's Guide to the customer.		
Quick Connect Multi-System Installation	**Yes**	**No**
Make sure that only one Remote Controller is installed.		

PR series Recirculation Settings

◆ Pump Performance Curve with internal pressure drop



◆ Special Setting for Auto Learning Faction

1. Sensitivity for hot water usage

If a customer opens a fixture and takes hot water during 3 seconds, this usage is memorized into the water heater, and then reflect this usage at tomorrow for pump activation. It's called "Learning Flag".
The time of "Learning Flag" sets to "3 seconds" for factory default.
If a customer wants to customize the time of "Learning Flag", change the time by using the following Maintenance Writers depending on situation.

Time of Learning Flag	Maintenance Writer #		Remark
	25	26	
3 sec	OFF	OFF	Factory Default
0.5 sec	ON	OFF	Very Sensitive
10 sec	OFF	ON	Mild
60 sec	ON	ON	Insensitive

2. The interval to erase "Learning Flag"

If a customer never uses hot water for 3 days, the Learning Flag for pump activation is erased from water heater internal memory.
If a customer want to change this interval from 3 days to 7 days, change the interval by using the following Maintenance Writers.

Interval to erase Learning Flag	Maintenance Writer #	Remark
	27	
3 days	OFF	Factory Default. Eco-Setting.
7 days	ON	Comfortable Setting.

2. Pre-Running (Heat up) Time for pump activation

e.g.) If the "Learning Flag" is ON during 9:00am-10:00am, the recirculation is starting from 8:45am for Pre-Running (Pre-Heat up).

A customer can customize this Pre-Running Time by using the following Maintenance Writers.

Pre-Running (Heat up) Adjustment	Maintenance Writer #		Remark
	38	39	
Before 15 min	OFF	OFF	Factory Default
No Pre-Running	ON	OFF	-
Before 30 min	OFF	ON	-
Before 60 min	ON	ON	-

◆ All Recirculation Mode Settings

Recirc Mode / Recirc Timer	Unit Itself Settings					Required Additional Item
	Crossover Connector	Maintenance Writer #				
		22	23	24	3B	
①External / Auto (Default)	OFF	OFF	OFF	OFF	OFF	Nothing
②External / On Demand (TT24)	OFF	ON	ON	OFF	ON	On Demand Switch
③External / Manual	OFF	OFF	OFF	ON	OFF	RC-9018M
④External / Always (24hrs)	OFF	OFF	ON	OFF	OFF	Nothing
⑤Cross Over / Auto	ON	OFF	OFF	OFF	OFF	Cross Over Valve
⑥Cross Over / On Demand (TT24)*	ON	ON	ON	OFF	ON	Cross Over Valve, On Demand SW
⑦Cross Over / Manual	ON	OFF	OFF	ON	OFF	Cross Over Valve, RC-9018M
⑧Cross Over / Always (24hrs)**	ON	OFF	ON	OFF	OFF	Cross Over Valve, RC-9019M
⑨No Recirculation*** (Pump Always OFF)	OFF	OFF	OFF	ON	ON	Nothing

* Possible to set this ⑥, but the unit behaves as ⑤.

** Not recommended Recirc Mode because of can't detect Recirc failure.

*** If a customer use RC-7651M (residential remote), can stop recirculation without Maintenance Writer changing. Please see the Owner's Guide on the page 13 for detail information.

◆ Assumed Failure Situation caused by water plumbing mistake

The error codes 16 and 63 will be displayed when water plumbing mistake.
Also cold water or hot water is never getting out when water plumbing mistake.
The following table shows "Assumed Failure Situation".

<External Recirculation Mode>

Case #	Unit Connection			What happened?
	Cold	Hot	Return	
1	Cold Line	Hot Line	Return Line	Fine installation and normal operation.
2	Cold Line	Return Line	Hot Line	No error code, but the direction of hot water line will be reversed. (Recirculated water is flowing reversely.)
3	Return Line	Hot Line	Cold Line	EC16 will be displayed because of can't mix cold water. (Cold water never pass the bypass line because of check valve in there.)
4	Hot Line	Cold Line	Return Line	No hot water from the fixture. (Hot water is not getting out because of check valve in there.)

e.g.) How to see the above table..

Case #3

➢Unit Cold Connection : Connected to Return Water Line
➢Unit Hot Connection : Connected to Hot Water Line
➢Unit Return Connection : Connected to Cold Water Line

➡ Eventually, EC16 will be displayed.

<Cross Over Mode>

Case #	Unit Connection			What happened?
	Cold	Hot	Return	
1	Cold Line	Hot Line	Cold Line	Fine installation and normal operation.
2	Cold Line	Cold Line	Hot Line	No hot water from the fixture' hot water line.
3	Hot Line	Cold Line	Cold Line	No hot water from the unit.
4	Cold Line	Hot Line	Not connected	EC63 will be displayed because of never work recirculating.
5	Not connected	Hot Line	Cold Line	EC16 will be displayed because of can't mix cold water. (Cold water never pass the bypass line because of check valve in there.)

e.g.) How to see the above table..

Case #4

➢Unit Cold Connection : Connected to Cold Line

➢Unit Hot Connection : Connected to Hot Water Line

➢Unit Return Connection : Never connected to any water line.

➡ Eventually, EC63 will be displayed.