A. Troubleshooting

If the error code is displayed on the built-in controller and/or the remote controller, refer to Section B.

If there is a water temperature drop between the inlet and outlet of the water heater, the temperature sensor inside the water heater is abnormal. This is mainly for the case where the water flow is small and water temperature is low.

The time it takes to deliver hot water from the water heater to your fixtures depends on the length of piping between the water heater and the fixtures. The longer the piping, the longer it will take to get hot water.

If you would like to conserve hot water to your fixtures more quickly, you may want to consider a hot water recirculation system.

The water is not hot enough or turns cool and stays cool >>

Compare the water temperature in the hot water heater with the “hot water temperature chart” in the Instruction manual.

Check the water temperature in the water heater between cold water lines and hot water lines.

Check if the gas supply valve is open fully, the gas line is sized properly, and the gas supply pressure is specified correctly. If necessary, consult the “Gas supply and gas pipe sizing” in the Instruction manual.

Check the set temperature on the water heater (the remote controller, if it is installed) or the DIP switch setting. Refer to Section D.

<Refer to the “water circuit” in this section.>

The thermostat is not low enough when a fixture is opened >>

<Refer to the “Power supply circuit” and “Water circuit” in this section.>

<Check if the gas supply valve is open fully, the gas line is sized properly, and the gas supply pressure is within specified limits.>

<Check if the water inlet temperature is too high. If it is too close to the water heater, the water heater won’t activate>

<Refer to the “Water circuit” in this section.>

<Check if there is dust and lint in the heat exchanger.>  
If so, consult the manufacturer.

<If a remote controller has stopped, the built-in controller is in an inoperable condition without the display function.>

B. Error codes

031: Incorrect DIP switch setting

<Check the DIP switch settings on the PCB.>  
Refer to Section D.

101: Warning for the “999” error code

<Check the gas type of the house (and/or the building).>  
This model comes from the factory set for natural gas. This model can be converted to propane by a qualified agent with the LP Conversion Kit (Part #311).

<Check for and remove any blockage in the concentric venting system.>  
Refer to the “Venting instructions” of the Installation manual.  
Refer to Appendix D (For error code 741 and 751)

103: Air-fuel ratio out of control

<Check for correct connection/breakage of wires (Part #413, 708, 709), and check the resistance between white wire and light blue wire (#3).>

<Check if a condensate collector and trap (100266140 & 100266139) are installed on the vent (Part #311).>

<Check if the voltage on the remote controller and/or built-in controller is within the specified range.>

131: Disconnected/short-circuited thermistor*  
<Check for connection/breakage of wires and/or delamination on the thermistor (Part #407, 408).>

<Check the thermistor resistance.>  
Refer to “Appendix D” in Section C.

310:551: Abnormal main gas solenoid valve and gas solenoid valve

<Check for correct connection/breakage of wires (Part #708) and/or soot on the flame rod (Part #108).>

611: Fan motor fault*

<Check for connection/breakage of wires, dust buildup in the fan motor (Part #103) and/or soot on the computer board (Part #708).>

<Refer to “Appendix C” in Section C.>

701: Computer board fault*

<Check for connection/breakage of wires (Part #708) and/or soot on the flame rod (Part #108).>

<Refer to “Appendix E” in Section C.>

711: Communication between water heater and remote controller

<Check if a condensate collector and trap (100266140 & 100266139) are installed on the vent (Part #311).>

<Check the voltage between the flame rod and the fan motor (Part #103).>

713: Miscommunication between water heater and built-in controller

<Check if the voltage on the remote controller and/or built-in controller is within the specified range.>

<If this error code appears only on the remote controller, check the voltage on the remote controller terminal on the PCB. Refer to the “Value circuit” in this section.>

991: Imperfection in combustion  
<Refer to the “101” error code in this section.>

These error codes will be cleared when water flow stops.

Appendix A (For error code 111)

Check the following points during ignition stage.

# 1. Refer to check point “B” on the wiring diagram above.

<Check if the fan motor is spinning after operation has stopped.*>

<This is normal if the fan motor keeps running from 15 to 70 seconds in order to re-ignite quickly, as well as purge all the exhaust gas out of the flue.>

<Abnormal supply circuit>

<Check if the fan motor is spinning after operation has stopped.*>

<An abnormal sound from the water heater is caused by insufficient air supply or incorrect installation.>

<Check the water heater needs more combustion air. Refer to the “101” error code in the section B.>

<Power supply circuit>

<Check if the power switch inside the water heater (the remote controller, if it is installed) is working.>

<Check if the built-in controller has a breakage. Consult the manufacturer.>

<Press the “ON/OFF” button on the built-in controller (the remote controller, if it is installed)>

<Core make sure that the STAND BY LED on the controller is lit.>

<Is the power switch inside water heater turned on? (Part #706)>

<Check if the green LED on the PCB (Part #701) is lit. If so, the power supply circuit of the water heater is under normal condition.>

<Next, refer to the “Water circuit” in this section.>

<Check if there is a condensate collector and trap (Part #100) and a brown spot, need to replace it.>

<If the green LED on the PCB (Part #701) isn’t lit, some electrical parts can be broken. Consult the manufacturer.>

<Water circuit>

<Check the voltage between purple wires during the ignition process.>

<Check if the motor drive of the flow adjustment valve (Part #402) is locked due to scale buildup, and/or water leakage. If so, consult the manufacturer.>

<If a remote controller has stopped, the built-in controller is in an inoperable condition without the display function.>

Appendix B (For error code 112)

Refer to check point “F” on the wiring diagram above.

<Check the voltage between the flame rod and the remote controller.>

<If this error code appears only on the remote controller, check the voltage on the remote controller terminal on the PCB. Refer to the “Value circuit” in this section.>

<If this error code appears only on the built-in controller, replace the PCB (Part #701).>

<If this error code appears on both the PCB (Part #701) and the built-in controller, replace the built-in controller.>

Appendix C (For error code 510 and 553)

<Check to point “C” in the diagram on the left and the following.>  
Check the voltage on the each valve on the gas valve assembly.

<Between blue wire and light blue wire (Normal: 93 to 120 VDC)>

<Between blue wire and orange wire (Normal: 93 to 120 VDC)>

<Between blue and white wire (Normal: 5 to 12 VDC)>

<Check if there is dust and lint in the heat exchanger.>

<If the water heater has been installed in a contaminated area.>

<Check the voltage between white wire and red wire. (Normal: 1 to 5 VDC)>

<Are all of the check points normal?>

<Yes >> Replace the gas valve assembly (Part #102).

<No >> Replace the PCB (Part #701).

Appendix D (For error code 311 and 321)

<Outlet thermostat>  
(Find the Mark of No.113 on the connector)  
Check the voltage on the wiring diagram.

<Remote controller>  
(Find the Mark of No.120 on the connector)  
Check the voltage on the wiring diagram.  
Check the resistance between black wire and white wire.

Appendix E (For error code 741 and 751)

Error code 741: Refer to check point “F” on the wiring diagram above.  
Check the voltage on the remote controller and/or built-in controller on the PCB.  
Check the voltage on the black wire and white wire. (Normal: 1.2 to 3.0 VDC)  
Is this check point normal?

<Yes >> No >> Replace the remote controller and/or built-in controller.  
No >> Replace the PCB (Part #701).

D. DIP switch settings on the computer board of the water heater

Locate the bank of DIP switches at the bottom left of the computer board of the unit.

Change the DIP switch settings when the power supply is turned off.  
The dark squares indicate the correct DIP switch positions. DEFAULT is the factory setting.