A. Troubleshooting

If the error code is included on the 5-digit 7-seg LED on the PCB (Part #701) of the water heater (and/or the remote controller), refer to Section B.

* It takes long time to get hot water at the fixtures ->
  The time to get hot water at the water heater, if your conditions depend on the length of piping between the two. The longer the distance or the bigger the pipes, the longer the time to get hot water.
  If you would like to receive hot water to your fixtures quicker, you may want to consider a hot water recirculation system.

* The water is not hot enough or turns cold and stays cold ->
  * Compare the flow and temperature. Refer to the "Output temperature chart" of the water heater:
  * Check cross-plumbing between cold water lines and hot water lines.
  * Check if the water heater is not fully unloaded and the gas supplies are pressure sufficient. Refer to the "Gas supply and gas piping size" of the installation manual.
  * Check if the control, timer, and chip of the display setting. Refer to Section D.
  * Refer to "Water circuit" in this section.

* The water is too hot ->
  * Check if water temperature, lower setting temperature.

* The water is not available when a fixture is opened ->
  * Refer to the "Power supply circuit" and "Water circuit" in this section.

* Incorrect display settings ->
  * Check the display settings on the PCB. Refer to Section D.

B. Error codes

* 431: Incorrect display setting
  * Check the display settings on the PCB. Refer to Section D.

* 101: Warning for the "59°F" setting
  * Check the gas type of the water heater. If it’s wrong gas type model, replace the water heater to correct one.
  * If there is any blockage (For example, Damper sticking, Vent Flaps installed on the terminal, Snow build-up on the heat exchanger, Install in a cold environment. (No ventilation or lack of combustion air) in the intake and/or exhaust. Refer to the "Vent temperature limitations" of the installation manual.
  * If the water heater is installed as a direct-vent system, check whether there are enough distance between the combustion air inlet and the exhaust outlet. Refer to the "Vent temperature limitations" of the installation manual.
  * Check if the total vent length doesn’t exceed 50 ft and if the elbows is less than 5 ea.
  * Check if the altitude/area of the installation is insufficient.
  * Check if there is any blockage. Refer to the "High-altitude option" of the Section D. And change the display settings.
  * If there is grease and/or dirt in the burner (Part #114), install a new burner. (Part #114), especially if the water heater has been installed in a contaminated area.
  * Check if there is dust and lint in the manifold. Refer to the "111: Ignition failure" in this section.

111: Ignition failure

1. Check gas supply and inlet gas pressure.
2. Check if the HI-limit switch (Part #432) is properly functioning.
3. Check the coil of the gas solenoid valve (Part #504, 705, 710, 719) burn marks on the computer board (Part #101) and/or in the control (Part #406). And then if D.C.C.F (Part #800 and #404) is broken.
4. Check if there is a buzzing spark-ignition sound coming from the burner (Part #101) when water heating goes into combustion.
5. Listen for the double "slurk" sound coming from the gas valves assembly (Part #138) when water heater goes into combustion.
6. (Only no sparking and/or lack of ignition) Check each voltage on each wire to gas valves assembly (Part #138) and/or in the computer (Part #423). Refer to the "Appendix in C" in Section C.

* No sparking sound ->
  * Refer to the #4 at "Appendix in C" in Section C.

* No kick sound ->
  * Refer to the #2 at "Appendix in C" in Section C.

7. Check ignition from the kick button (Part #101 or #406).
8. Check if there is dust and lint in the manifold (Part #118).
9. Check the gas line to the flame rod (Part #101). Refer to the #4 at "Appendix in C" in Section C.

121: Loss of flame

1. Check gas supply and inlet gas pressure.
2. Check if the HI-limit switch (Part #432) is properly functioning.
3. Check for connection of breakage of wires (Part #101, 404, 704, 705, 710, 719) burn marks on the computer board (Part #101) and/or on the flame rod (Part #406). And then if D.C.C.F (Part #800 and #404) is broken. Check the computer board.
4. Check if there is a sparking spark-ignition sound coming from the burner (Part #101) when water heating goes into combustion.
5. Check the gas supply line to the flame rod (Part #101).

C. Wiring Diagram and check point of the Water heater

APPENDIX A (for error code 111)

Check these points during ignition stage.

1. Refer check point "B2" and "B3" on the wiring diagram above.
   ① Check voltage between purple wires.
   (Normal: 90 to 110 VAC)
   VAC No >> Go to Next
   ② Check if there is any flame on the igniter (Part #223)
   VAC No >> Go to Next
   ③ Check if there is any socket on the igniter.
   VAC No >> Go to Next

2. Refer check point "C2" and "H2" on the wiring diagram above.
   ① Check the voltage between blue and red wire (59 psi).
   (Normal: 7.9 to 13.5 VDC)
   VDC No >> Replace the igniter (Part #223)
   VDC Yes >> Go to Next
   ② Check the voltage between blue and white wire (59 psi).
   (Normal: 1.9 to 13 VDC)
   VDC No >> Replace the igniter (Part #223)
   VDC Yes >> Go to Next
   ③ Check if there is any socket on the igniter.
   VDC No >> Go to Next
   ④ Check if there is any socket on the igniter.
   VDC No >> Go to Next

D. Dipswitch Settings on the computer board of the water heater

Change the dipswitch settings when the power supply is turning on. The square direction is the dipswitch should be set.

* <Left bank of dipswitches>
  * The Gas Type and Model Type dipswitch should already be properly preset from the factory.

E. Appendix B (for error code 611 and 621)

Check point "A1" and "A2" in the diagram in the left and followings.

* Check voltage between red wire and blue wire.
  (Normal: 110 to 160 VDC)
  VDC No >> Replace the water heater.
  VDC Yes >> Go to Next
* Check voltage between red wire and blue wire.
  (Normal: 13 to 17 VDC)
  VDC No >> Replace the water heater.
  VDC Yes >> Go to Next

F. Appendix C (for error code 510 and 551)

* Check point "C1" on the diagram in the left and followings.
* Check voltage on the each valve on the gas valves assembly.
  * Between blue wire and red wire (59 psi). (Normal: 70 to 120 VDC)
  * Between blue wire and green wire (49). (Normal: 78 to 120 VDC)
  * Between blue wire and red wire (73). (Normal: 78 to 120 VDC)
  all check points are normal?
  VDC No >> Replace the water heater.
  VDC Yes >> Go to Next

G. Appendix D (for error code 311, 321, 331, 341 and 941)

Mixing thermistor (Find the marking of No.13 on the connector)

* Check point "E2" on the diagram.
* Check thermostat (Find the marking of No.42 on the connector)
  * ① Check resistance between black wire and black wire.
  * ② Check resistance between red wire and white wire.

H. Appendix E (for error code 741)

Check point "F2" on the wiring diagram above.

* Check voltage on the gas valves assembly (Normal: 110 to 25 VDC)
  this check point is normal?
  VDC No >> Replace the water heater.
  VDC Yes >> Go to Next

I. Appendix F (for error code 651 and 661)

Check point "F2" on the wiring diagram above.

* Check voltage on the gas valves assembly (Normal: 110 to 16 VDC)
  this check point is normal?
  VDC No >> Replace the water heater.
  VDC Yes >> Go to Next

<Right bank of dipswitches>

J. Diagram of the water heater

APPENDIX B (for error code 611 and 621)

APPENDIX C (for error code 510 and 551)

APPENDIX D (for error code 311, 321, 331, 341 and 941)

APPENDIX E (for error code 741)

APPENDIX F (for error code 651 and 661)