

Maintenance sheet

ATD2
62S101

A. Troubleshooting

If the error code is indicated on the 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 it takes to deliver hot water from the water heater to your fixtures depends on the length of piping between the two. The longer the distance or the bigger the pipes, the longer it will take 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 installation manual.
- Check cross plumbing between cold water lines and hot water lines.
- Check if the gas supply valve fully open, the gas line sized properly and the gas supplies pressure enough. Refer to the "Gas supply and gas pipe sizing" of the installation manual.
- Check the set temperature, and change the dipswitch setting. Refer to Section D.
- Refer to "Water circuit" in this section.

<<The water is too hot>>

- Check the set temperature, lower setting temperature.

<<The hot water is not available when a fixture is opened>>

- Refer to the "Power supply circuit" and "Water circuit" in this section.

<<Fluctuation in hot water temperature>>

- Check if the filter on the cold water inlet cleaned. (Part #406)
- Check if the gas line sized properly and the supply gas pressure sufficient.
- Check for cross connection between cold water lines and hot water lines.
- Refer to "Water circuit" in this section.

<<Unit does not ignite when water goes through the water heater>>

- Refer to the "Power supply circuit" and "Water circuit" in this section.
- If you use the remote controller, turn the power button on and then the green LED will light up.
- Check if the filter on the cold water inlet cleaned. (Part #406)
- Refer to "Water circuit" in this section.

B. Error codes

031: Incorrect dipswitch setting

- Check the dipswitch settings on the PCB. Refer to Section D.

101: Warning for the "991" error code

- Check the gas type of the water heater. If it's wrong gas type model, replace the water heater to correct one.
- Check if there is any blockage (For example, Damper sticking, Vent Flaps installed on the terminator, Snow build up around terminator, Installed in a closet (No ventilation or lack of combustion air)) in the intake air and/or exhaust. Refer to the "Vent termination clearances" of the installation manual.
- If the water heater is installed as a direct-vent system, check whether there is enough distance between the intake air terminal and the exhaust terminal. Refer to the "Vent termination clearances" of the installation manual.
- Check if the total vent length doesn't exceed 50 ft and the # of elbows is less than 5Ea.
- Check the altitude/elevation of area of where the water heater installed. Refer to the "High-altitude function" of the Section D. And change the dipswitch settings.
- Check if there is grease and/or dirt in the burner (Part #101) and the fan motor (Part #103), especially if the water heater has been installed in a contaminated area.
- Check if there is dust and lint in heat exchanger.
- Check the manifold pressure of the water heater. Refer to installation manual.

111: Ignition failure

- Check gas supply and inlet gas pressure.
- Check if the Hi-limit switch (Part #412) is properly functioning.
- Check for connection/breakage of wires (Part #413, 708, 709, 712), burn marks on the computer board (Part #701), and/or soot on the flame rod (Part #108). And then if O.H.C.F (Part #413) is breakage, **Consult the manufacturer.**
- Check if there is a buzzing spark ignition sound coming from the burner (Part #101) when water heater prepares for combustion.
- Listen for the double "clunk" sound coming from the gas valve assembly (Part #102) when water heater goes into combustion.
- (Only no sparking and/or kick sound) Check voltage on each wire to gas valves assembly (Part #102) and/or the igniter (Part #711). Refer to the "Appendix A" in Section C.
 - *No sparking sound >>>> Refer to the #1 at "Appendix A" in Section C.
 - *No kick sound >>>> Refer to the #2 at "Appendix A" in Section C.
- Check if there is leaking from heat exchanger (Part #401)
- Check if there is dust and lint in nozzles of the manifold (Part #102).
- Check current on the flame rod (Part #108). Refer to the #3 at "Appendix A" in Section C.

121: Loss of flame

- Check gas supply and inlet gas pressure.
- Check if the Hi-limit switch (Part #412) is properly functioning.
- Check for connection/breakage of wires (Part #413, 708, 709, 712), burn marks on the computer board (Part #701), and/or soot on the flame rod (Part #108). And then if O.H.C.F (Part #413) is breakage, **Consult the manufacturer.**
- Check if there is leakage from heat exchanger (Part #401).
- Check if there is dust and lint in nozzles of the manifold (Part #102).
- Check current on the flame rod (Part #108). Refer to the #3 at "Appendix A" in Section C.

<<The fan motor still spinning after operation has stopped>>

- This is normal. After operation has stopped, 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 sound from water heater>>

- An abnormal sound from the water heaters is caused by not enough air supply or wrong installations. The water heater needs more combustion air. Refer to the "101" error code in the section B.

<<Power supply circuit>>

- If the remote controller installed, press the "ON/OFF" button of the remote controller, and make sure that the green LED on the "ON/OFF" button of the remote controller is lit. Restart the water heater.
- Check if that the 7-Seg LED on the PCB (Part #701) of the water heater 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 the fuse on the surge box (Part #703), and if it has a brown spot, need to replace it.
- Check the power supply, and make sure that the water heater has 120 VAC.
- If the 7-Seg LED on the PCB (Part #701) isn't lit, some electrical parts can be broken. **Consult the manufacturer.**

<<Water circuit>>

- If you set the remote controller, turn the power button on and then the green LED will light up.
- Open all hot water faucets, and make sure that there is enough water flow. This water heater needs at least 0.75 GPM water flow to operate.
- Check for reverse connection and cross connection.
- Check if the filter on the cold water inlet cleaned. (Part #406)
- Check if there is no debris or obstruction on the fixtures.
- Check if water ways in the water heater are frozen. If so, unfreeze them. And refer to installation manual to protect your water heater from freeze.
- Check if the inlet water pressure is higher than 40 psi. And if it's lower than 40 psi, need to increase the pressure.
- Check for connections and breakage of wires (Part #402).
- Check if the motor drive of the flow adjustment valve (Part #402) is locked due to scale buildup, and/or water leakage. **Consult the manufacturer.**

311,321,331: Disconnected/short-circuited thermistor

- Check for connection/breakage of wires and/or debris on thermistor (Part #407, 408, 411, 716).
- Check thermistor resistance. Refer to the "Appendix D" in Section C.

391: Air-fuel Ratio Rod failure

- Check for connection/breakage of wires (Part #709) and/or soot on the AFR rod. (Part #108).

441: Flow Sensor failure (Only Easy-Link system)

- Check for connection/breakage of wires and/or debris on the flow sensor impeller (Part #402,717).

510: Abnormal Main and Solenoid Gas Valve

- Check for connection/breakage of wires (Part #708) and/or burn marks on the computer board (Part #701).
- Reset power supply of the water heater.
- Check voltage on the each valve on the gas valves assembly (Part #102). Refer to the "Appendix C" in Section C.

611: Fan motor fault

- Check for connection/breakage of wires, dust buildup in the fan motor (Part #103) and/or burn marks on the computer board (Part #701).
- Check for frozen/corrosion of connectors of the fan motor (Part #103).
- Check voltage between blue wire and each wire of the fan motor (Part #103), and check resistance between white wire and red wire. Refer to the "Appendix B" in Section C.

651: Flow adjustment valve fault (Only Easy-Link system)

- Inspect the flow adjustment valve (Part #402), for connection/breakage of wires (Part #718), locked motor drive due to scale buildup, and/or water leakage.
- Check voltage between black wire and red wire. Refer to the "Appendix F" in Section C.

701: Computer board fault

- Check for connection/breakage of wires (Part #714) and/or burn marks on the computer board (Part #701).

721: False flame detection

- Clean the flame rod (Part #108).
- For indoor models, check if condensate drain is installed on the vent collar of the water heater.
- Check if there is leaking from heat exchanger (Part #401).

741: Miscommunication between water heater and remote controller

- Check the model type of the remote controller. Model No. 9007603005 is the correct one.
- Inspect the connections between the water heater and remote controller. Refer to the "Remote controller connections" of the Installation manual.
- Check the power supply of the water heater.
- If this error code appears only the 7-Seg LED on the PCB (Part #701), check the voltage on the remote controller terminal on the PCB. Refer to the "Appendix E" in Section C.
- If this error code appears only remote controller, replace the PCB (Part #701).
- If this error code appears both the PCB (Part #701) and the remote controller, replace the remote controller.

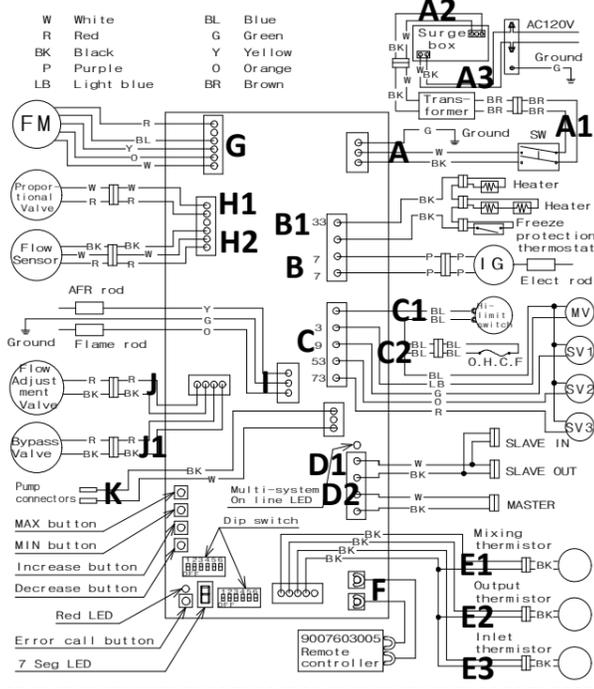
761: Miscommunication between Parent unit and Child units for Easy-link system

- Check if the connections between the parent unit and the child units are correct. Refer to "Easy-Link system" section in the Installation manual.

991: Imperfect combustion

- Refer to the "101" error code in this section.

C. Wiring Diagram and check point of the Water heater



Appendix A (For error code 111)

Check these points during ignition stage.

- Refer to check point "B" on the wiring diagram above. Check voltage between purple wires. (Normal: AC 90 to 110 V)
 - This Check point is normal?**
 - Yes >> Replace the igniter (Part #711)
 - No >> Go to Next
- Refer to check point "C" and "H1" on the wiring diagram above. Check the voltage belows.
 - C: Between blue wire and light blue wire (#3). (Normal: DC78 to 100 V)
 - C: Between blue wire and orange wire (#53). (Normal: DC78 to 100 V)
 - H1: Check the voltage between white wire and red wire. (Normal: DC 1 to 15 V)
 - These check points are normal?**
 - Yes >> Replace the gas valves assembly. (Part #102)
 - No >> Replace the PCB. (Part #701)
- Check current thought the orange flame rod wire (Part #709). (Normal: more than 1μA)
 - This check point is normal during operation?**
 - Yes >> Replace the PCB. (Part #701)
 - No >> Replace the flame rod. (Part #108)

Appendix B (For error code 611)

Refer to check point "G" in the diagram to the left and followings.

- Check voltage between red wire and blue wire. (Normal: DC 110 to 160 V)
- Check voltage between yellow wire and blue wire. (Normal: DC 13 to 17 V)
- Check voltage between orange wire and blue wire (Normal: DC 2.0 to 6.5 V)

All check points are normal?

- Yes >> Replace the fan motor. (Part #103)
- No >> Replace the PCB. (Part #701)

Appendix C (For error code 510)

Refer to check point "C" in the diagram to the left and followings. Check voltage on the each valve on the gas valves assembly.

- Between blue wire and light blue wire (#3). (Normal: DC 78 to 100 V)
- Between blue wire and green wire. (#9). (Normal: DC 78 to 100 V)
- Between blue wire and orange wire (#53). (Normal: DC 78 to 100 V)
- Between blue wire and red wire (#73). (Normal: DC 78 to 100 V)

All check points are normal?

- Yes >> Replace the gas valves assembly. (Part #102)
- No >> Replace the PCB. (Part #701)

Appendix D (For error code 311, 321 and 331)

- Mixing thermistor (Find the marking of No.113 on the connector) Check point "E1"
- Output thermistor (Find the marking of No.12 on the connector) Check point "E2"
- Inlet thermistor (Find the marking of No.42 on the connector) Check point "E3"

Check resistance between black wire and black wire.

Temperature	°F	50	59	68	77	86	95
	°C	10	15	20	25	30	35
Resistance	kΩ	15.4	12.6	10.3	8.5	7.0	5.9

All check points are normal?

- Yes >> Replace the PCB. (Part #701)
- No >> Replace the wrong thermistor. (Part #407, 408, 411)

Appendix E (For error code 741)

Refer to check point "F" on the wiring diagram above. Check voltage on the remote controller terminal on the PCB. (Normal: DC 11 to 15 V)

This check point is normal?

- Yes >> Replace the remote controller.
- No >> Replace the PCB. (Part #701)

Appendix F (For error code 651)

Refer to check point "J" on the wiring diagram above. Check voltage between black wire and red wire. (Normal: DC 7 to 16 V)

This check point is normal?

- Yes >> Replace the Flow adjustment valve. (Part #402)
- No >> Replace the PCB. (Part #701)

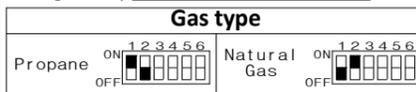
D. Dipswitch Settings on the computer board of the water heater

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

DEFAULT is the factory setting.

<Left bank of dipswitches>

The left bank has certain special functions and generally should not need adjustment.



The Gas Type dipswitch should already be properly preset from the factory.

High-altitude function

DEFAULT (0 to 2,000 ft) ON (1,2,3,4,5,6), OFF (dark square at 1)

FM+ (2,000 to 4,000 ft) ON (1,2,3,4,5,6), OFF (dark square at 1)

FM++ (4,000 to 6,000 ft) ON (1,2,3,4,5,6), OFF (dark square at 1)

Over 6,000 ft: Consult the manufacturer.

FM speed is increased automatically.

<Right bank of dipswitches>

The right bank has settings for three functions, shown below.

Easy-Link system

Parent Unit ON (1,2,3,4,5,6), OFF (dark square at 1)

Child Unit ON (1,2,3,4,5,6), OFF (dark square at 1)

DEFAULT

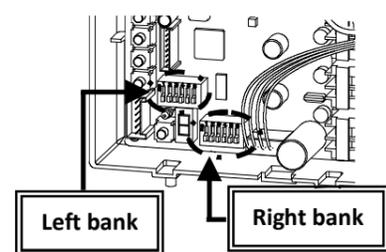
Single unit is the same as the child unit.

Model type

510 Indoor ON (1,2,3,4,5,6), OFF (dark square at 1)

510 Outdoor ON (1,2,3,4,5,6), OFF (dark square at 1)

The Model Type dipswitch should already be properly preset from the factory.



Left bank

Right bank

Temperature set

104°F (40°C) ON (1,2,3,4,5,6), OFF (dark square at 1)

122°F (50°C) ON (1,2,3,4,5,6), OFF (dark square at 1)

140°F (60°C) ON (1,2,3,4,5,6), OFF (dark square at 1)

176°F (80°C) ON (1,2,3,4,5,6), OFF (dark square at 1)

113°F (45°C) ON (1,2,3,4,5,6), OFF (dark square at 1)

131°F (55°C) ON (1,2,3,4,5,6), OFF (dark square at 1)

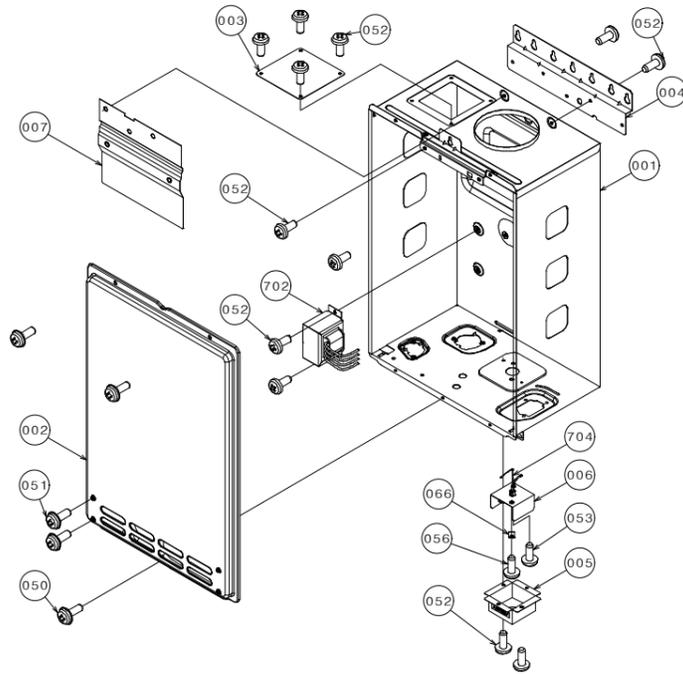
158°F (70°C) ON (1,2,3,4,5,6), OFF (dark square at 1)

185°F (85°C) ON (1,2,3,4,5,6), OFF (dark square at 1)

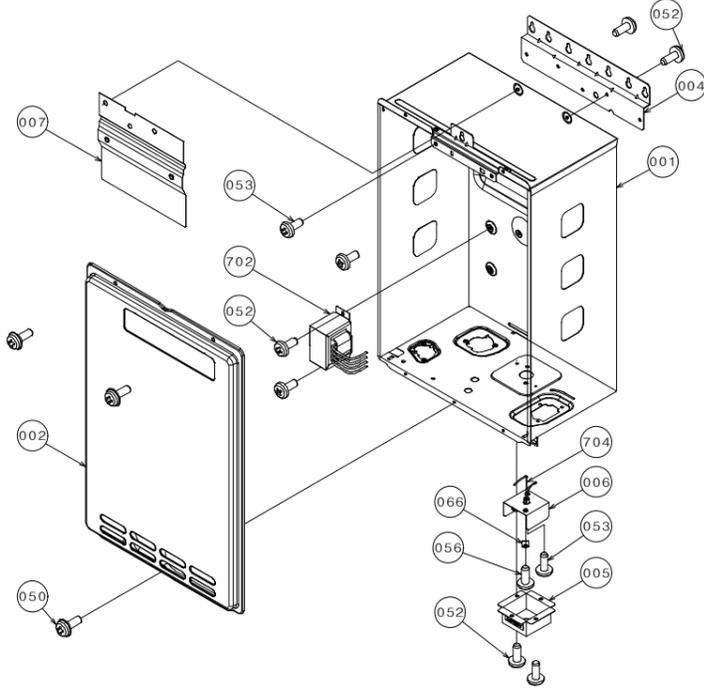
E. Components Diagram / Parts List

Case assembly

510 Indoor

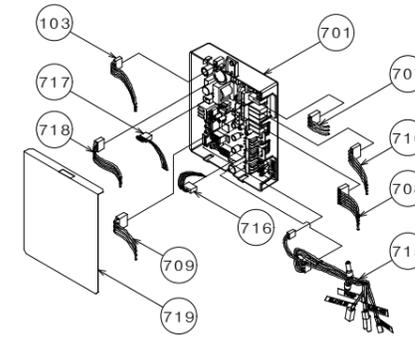


510 Outdoor



Item#	Part#	Description
001	319143-151	Case assembly for 510 Indoor
	319143-211	Case assembly for 510 Outdoor
002	319143-174	Front cover for 510 Indoor
	319143-175	Front cover for 510 Outdoor
003	319143-150	Air blockage plate (Only 510 Indoor)
004	319143-184	Bracket
005	319143-014	Junction box
006	319143-128	Junction box inner plate
007	319143-221	Back guard panel
050	319143-025	Screw M4x12 (W/Washer)
051	319143-325	Screw M4x10 (W/Washer)
052	319143-026	Screw M4x10 (Coated)
053	319143-060	Screw M4x10
054	319143-326	Hex head screw M4x12 (W/Washer)
055	319143-063	Hex head screw M4x8
056	319143-372	Screw M4x10
057	319143-330	Screw M3x6 SUS3
058	319143-327	Screw M3x10
059	319143-061	Pan screw M4x12 (W/Washer)
060	319143-332	Pan screw M4x10 FEZN
061	319143-201	Tap tight screw M4x12 FEZN
062	319143-062	Pan screw M4x10
063	319143-087	Screw M3x6
064	319143-328	Screw M4x6
065	319143-059	Pan screw M4x8
066	319143-143	Nylon clamp
067	319143-048	Wire clamp 60

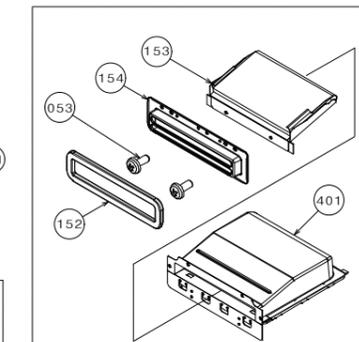
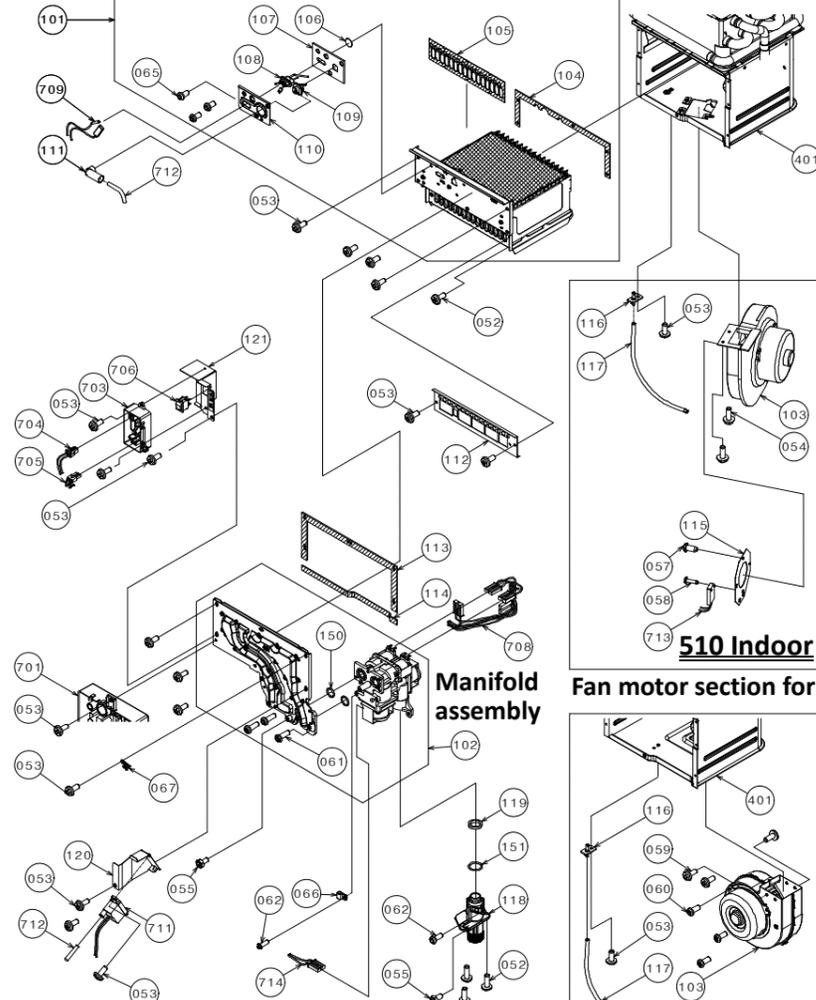
Computer board assembly



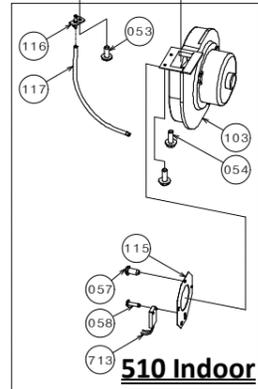
Item#	Part#	Description
701	319143-179	Computer board
702	319143-182	Transformer
703	319143-168	Surge box
704	319143-138	AC120V wire
705	319143-180	Transformer wire
706	319143-141	AC120V Power ON-OFF switch
707	319143-181	Switch wire
708	319143-188	Gas valve wire
709	319143-189	Flame rod wire
710	319143-187	EH-IG wire for 510 Indoor
	319143-210	EH-IG wire with freeze protection thermostat for 510 Outdoor
711	319143-052	Igniter
712	319143-039	High voltage igniter wire
713	319143-185	Freeze protection thermostat (Only 510 Indoor)
714	319143-133	Proportional gas valve wire
715	319143-204	Pump and multi cable
716	319143-195	Thermistors wire
717	319143-203	RS-VG wire
718	319143-202	Water valves wire
719	319143-191	Computer board cover

Burner assembly

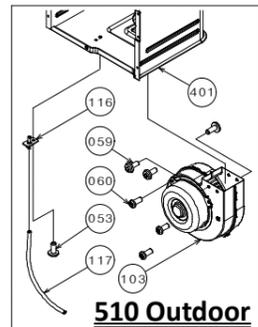
Burner assembly



Exhaust section for 510 Outdoor



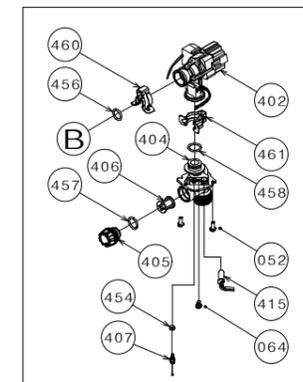
Fan motor section for 510 Indoor



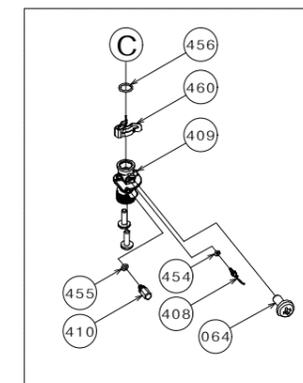
Fan motor section for 510 Outdoor

Item#	Part#	Description
101	319143-030	Burner assembly
102	319143-046	Manifold assembly with gas valve assembly LP
	319143-368	Manifold assembly with gas valve assembly NA
103	319143-043	Fan motor for 510 Indoor
	319143-217	Fan motor for 510 Outdoor
104	319143-032	Burner holder gasket
105	319143-031	Burner gasket
106	319143-033	Burner window
107	319143-034	Rod holder gasket
108	319143-035	Flame rod
109	319143-037	Igniter rod
110	319143-036	Rod holder
111	319143-038	Rod cap
112	319143-156	Burner damper
113	319143-044	Manifold gasket A
114	319143-045	Manifold gasket B
115	319143-367	Fan damper (Only 510 Indoor)
116	319143-042	Pressure port
117	319143-041	Combustion chamber tube for 510 Indoor
	319143-344	Combustion chamber tube for 510 Outdoor
118	319143-050	Gas inlet
119	319143-049	Gas inlet ring
120	319143-051	Igniter plate
121	319143-176	Surge box plate
150	319143-350	O-ring P18 NBR (Black)
151	319143-057	O-ring P20 NBR (Black)
152	319143-206	Silicon ring (Only 510 Outdoor)
153	319143-216	Rain protection plate in exhaust chamber (Only 510 Outdoor)
154	319143-219	Exhaust port (Only 510 Outdoor)

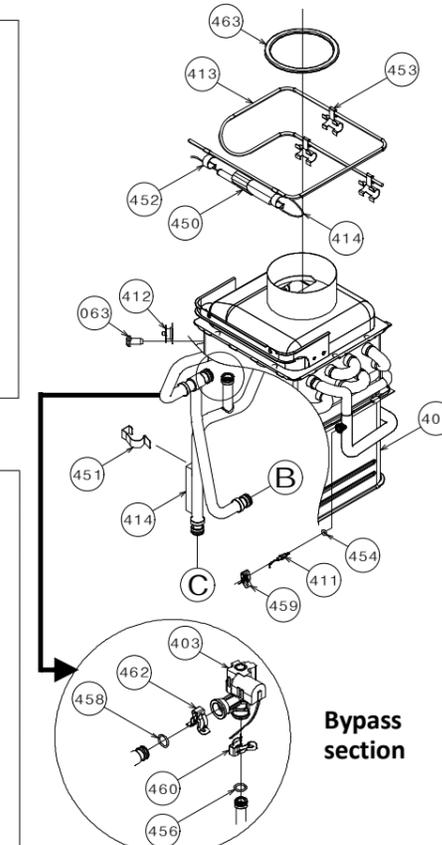
Water way assembly



Water inlet section



Water outlet section



Bypass section

Item#	Part#	Description
401	319143-369	Heat exchanger assembly for 510 Indoor
	319143-177	Heat exchanger assembly for 510 Outdoor
402	319143-178	Flow adjustment valve/ Flow sensor
403	319143-186	Bypass valve
404	319143-193	Water inlet
405	319143-197	Inlet drain plug
406	319143-198	Inlet water filter
407	319143-085	Inlet thermistor
408	319143-190	Mixing thermistor
409	319143-194	Water outlet
410	319143-199	Outlet drain plug
411	319143-096	Output thermistor
412	319143-095	Hi-Limit switch
413	319143-149	Overheat cut-off-fuse
414	319143-200	Heater
415	319143-078	Inlet heater
450	319143-088	Pipe heater fixing plate
451	319143-125	Heater fixing plate 16
452	319143-066	Fuse fixing plate 18
453	319143-146	Fuse fixing plate 14
454	319143-082	O-ring P4 FKM
455	319143-080	O-ring P6 FKM
456	319143-100	O-ring P14 FKM
457	319143-091	O-ring P15 FKM
458	319143-083	O-ring P16 FKM
459	319143-097	Fastener "4-11"
460	319143-105	Fastener "14-22"
461	319143-226	Fastener "16A"
462	319143-205	Fastener "16-25A"
463	319143-065	Silicon ring (Only 510 Indoor)