Maintenance sheet ³¹⁰_{62V101-5}

A. Troubleshooting

water heater (and/or the remote controller), refer to Section B.

<< It takes a 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 more quickly, 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" in the Installation manual
- Check cross plumbing 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 within specified limits. Refer to the "Gas supply and gas pipe sizing" in the Installation manual
- · Check the set temperature, and change the set temperature with 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 water is too hot>>

Check the set temperature and lower

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

• Refer to the "Power supply circuit" and "Water circuit" in this section. · Check if the gas supply valve is fully open, the gas line is sized properly, and the gas supply pressure is within specified limits.

<<Fluctuation in hot water temperature>>

- Check if the filter on the cold water inlet is cleaned (Part #406).
- · Check if the gas line is sized properly and the supply gas pressure is within specified limits. Check for cross connection between cold water lines and hot water lines.
- Refer to the "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 check if the
- set temperature will be displayed on the screen.
- Check if the filter on the cold water inlet is cleaned (Part #406)

B. Error codes

The numbers in parentheses below are the numbers of blinking of the Red LED on the PCB to indicate the error codes.

03 (One flash): Incorrect DIP switch setting*

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

10 (Five flashes): Warning for the "99" error code

- Check the gas type of the house (and/or the building). If it's an incorrect gas type model, replace 39 (Two flashes): Air-fuel ratio rod failure* the water heater to the correct one
- Check for and remove any blockage in the vent system. Refer to "Venting instructions" in 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" in the Installation manual
- Verify the total equivalent vent length hasn't exceeded 50 ft (15.2 m) with no more than 5 elbows deducting 5 ft (1.5 m) for each elbow used in the venting system. Refer to "Venting 61 (Four flashes): Fan motor fault* instructions" in the Installation manual
- Check the altitude/elevation of area of where the water heater is installed. Refer to the "Highaltitude function" of Section D. And change the DIP switch 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 the heat exchanger.
- Check the manifold pressure of the water heater. Refer to the rating plate of the water heter.

11 (Three flashes): Ignition failure*

- Check the gas supply and inlet gas pressure.
- Check if the Hi-limit switch (Part #412) is functioning properly.
- 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 the O.H.C.F (Part #413) has a 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 if no sparking and/or clunk sound) Check the voltage on each wire to gas valve assembly (Part #102) and/or the igniter (Part #711). Refer to "Appendix A" in Section C.

*No sparking sound >>>>> Refer to #1 at "Appendix A" in Section C.

- *No clunk sound >>>>> Refer to #2 at "Appendix A" in Section C. Check if there is leaking from the heat exchanger (Part #401).
- Check if there is dust and lint in nozzles of the manifold (Part #102).
- Check the current on the flame rod (Part #108). Refer to #3 at "Appendix A" in Section C.
- 12 (Three flashes): Loss of flame*

- Check the gas supply and inlet gas pressure.
- Check if the Hi-limit switch (Part #412) is functioning properly.
- 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 the O.H.C.F (Part #413) has a breakage, consult the manufacturer.
- Check if there is leaking from the heat exchanger (Part #401).
- Check if there is dust and lint in nozzles of the manifold (Part #102).
- Check the current on the flame rod (Part #108). Refer to #3 at "Appendix A" in Section C.

<< The fan motor is 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.

- An abnormal sound from the water heaters is caused by not enough air supply or incorrect installations. The water heater needs more combustion air. Refer to the "10" error code in the section B

<<Power supply circuit>>

- If the remote controller is installed, press the "ON/OFF" button of the remote controller, and make sure that the set temperature is displayed on the remote controller. Restart the water heater.
- Is the power switch inside water heater turned on? (Part #706)
- Check if the Red LED on the PCB (Part #701) of the water heater is lit for a few seconds right after the power is supplied. 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 Red LED on the PCB (Part #701) isn't lit, some electrical parts can be broken. Consult the manufacturer.

<<Water circuit>>

- If you use the remote controller, turn the power button on and then check if the set temperature will be displayed on the screen
- Open all hot water faucets, and make sure that there is enough water flow. This water heater needs at least 0.5 GPM (1.9 L/m) water flow (at the default set temperature) to operate
- Check for reverse connection and cross connection.
- · Check if the filter on the cold water inlet is 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 the
- Installation manual to protect your water heater from freezing.
- Check if the inlet water pressure is higher than 40 psi. If it's lower than 40 psi, 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. If so, consult the manufacturer.

31,32 (Two flashes): Disconnected/short-circuited thermistor*

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

 Check for connection/breakage of wires (Part #709) and/or soot on the flame rod (Part #108). 51,55 (Six flashes): Abnormal gas solenoid valve and main 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 the voltage of each valve on the gas valve assembly (Part #102). Refer to "Appendix C" in

- 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 to see if the fan motor connectors are frozen or corroded (Part #103).
- · Check the voltage between blue wire and each wire of the fan motor (Part #103), and check resistance between white wire and red wire. Refer to "Appendix B" in Section C.

70 (One flash): Computer board fault*

· Check for connection/breakage of wires (Part #714) and/or burn marks on the computerboard (Part #701)

72 (Six flashes): False flame detection*

· Clean the flame rod (Part #108).

remote controller.

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

74: Miscommunication between water heater and remote controller

- Check the model type of the remote controller. Model No. 100112183 (TK-RE02) is the correct
- one.
- · Inspect the connections between the water heater and remote controller. Refer to the "Temperature Remote controller" in the Installation manual.
- Check the power supply of the water heater.

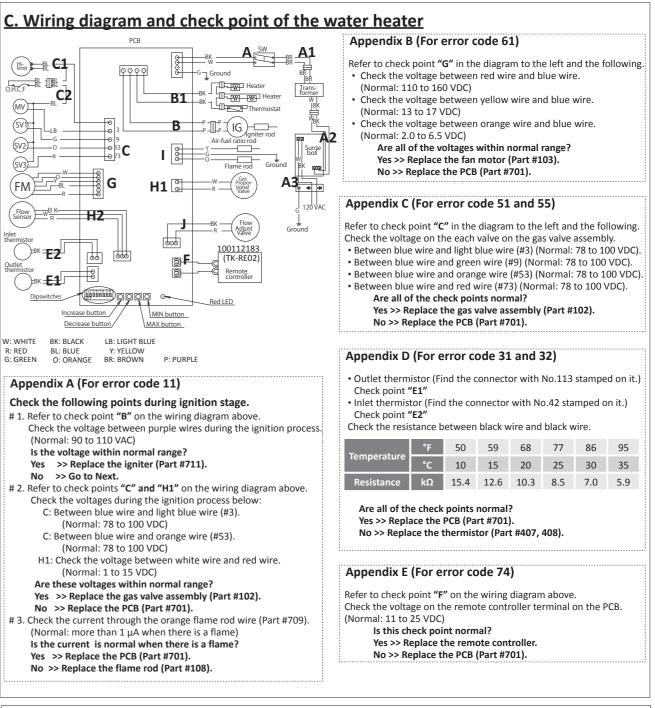
99 (Five flashes): Imperfect combustion*

*These error codes will be cleared when water flow stops.

Refer to the "10" error code in this section

• If this error code appears only on the Red LED in the PCB (Part #701), check the voltage on the remote controller terminal on the PCB. Refer to "Appendix E" in Section C. • If this error code appears only on the remote controller, replace the PCB (Part #701).

• If this error code appears on both the PCB (Part #701) and the remote controller, replace the



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

Change the DIP switch settings when the power supply is turned off.

PCB

0000

● ⁵³ ● ⁷³

G

H2

66 000

Increase button

Decrease button

Appendix A (For error code 11)

(Normal: 90 to 110 VAC)

No >> Go to Next.

Is the voltage within normal range?

Yes >> Replace the igniter (Part #711).

(Normal: 78 to 100 VDC)

(Normal: 78 to 100 VDC)

Are these voltages within normal range?

(Normal: 1 to 15 VDC)

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

Yes >> Replace the PCB (Part #701) No >> Replace the flame rod (Part #108).

They have settings for four functions, shown below.

Propane

DEFAULT

0 to 2,000 ft

(0 to 610 m)

FM+

2,001 to 4,000 ft (611 to 1,219 m)

FM++

4,001 to 6,000 ft

(1,200 to 1,829 m)

FM speed is increased automatically.

ON 1 2 3 4 5 6 7 8

de function

ON 12345678

OFF

ON 12345678

ON 12345678

Gas type

Natural gas

BL: BLUE O: ORANGE

H1 😭

600

DF

Ð

P: PURPLE

MIN button

MAX button

LB: LIGHT BLUE

Check the following points during ignition stage.

1. Refer to check point "B" on the wiring diagram above.

Check the voltages during the ignition process below:

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

(Normal: more than $1 \mu A$ when there is a flame)

Is the current is normal when there is a flame?

C: Between blue wire and light blue wire (#3).

C: Between blue wire and orange wire (#53)

Y: YELLOW BR: BROWN

Heater

II:(IG)-□-

Gas Propor-tional Valve

Flow Adjust Valve

100112183

(TK-RE02)

Remote

Red LED

℠℩⅃ℿℯ

Air-fuel

(liiiit) **C1**

C2

₩ 2.H.C.F

(MV)

(SV1)

(sv2)

(SV3)

FM

)^{∋⊮}**=E2**[∐]

)-bk **-E1**∫

W: WHITE BK: BLACK

G: GREEN

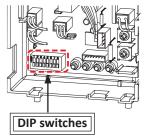
The dark squares indicate the correct DIP switch positions. DEFAULT is the factory setting. The DIP switches have certain special functions and generally should not need adjustment.



The Gas type DIP switch should already be properly preset from the factory.

Model type			
310 Indoor	ON 12345678		
310 Outdoor	ON 1 2 3 4 5 6 7 8		
The Model type DIP switch should alread			

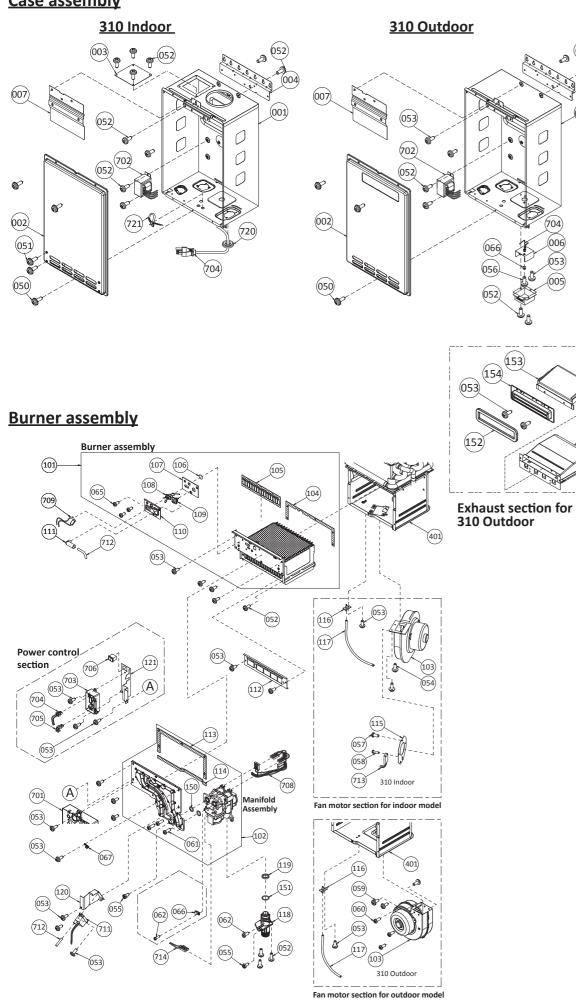
be properly preset from the factory.



Temperature set		
113 °F (45 °C)	ON 1 2 3 4 5 6 7 8	
122 °F (50 °C) Default	ON 12345678	
131 °F (55 °C)	ON 12345678	
140 °F (60 °C)	ON 12345678 OFF	

E. Components diagram / Parts list

Case assembly



Item	Part	#	
#	310 model	T-K4 model	Description
001	100074335 100074395	EK402 EKK41	Case assembly for 310 Indoor for 310 Outdoor
002	100074336	EK403	Front coverfor 310 Indoor
003	100074554 100074602	EK409 EK401	for 310 Outdoor Air blockage plate for 310 Indoor
004	100074368	EKJ09	Bracket
005	100074199	EKJ64	Junction box
006	100074313	EKJ66	Junction box inner plate
007 050	100074405 100074210		Back guard panel for 310 Truss screw M4×12 (W/Washer) SUS410
050	100074210		Truss screw M4×12 (W/Washer) 505410
052	100074211		Truss screw M4×10 (Coated) SUS3
053	100074245	EW003	Truss screw M4x10 SUS
054	100074510		Hex head screw M4×12 (W/Washer) SUS3
055	100074248		Hex head screw M4x8 FEZN
056 057	100074555 100074514	EX014 EW00B	Truss screw M4x10 Screw M3x6 SUS3
057	100074514		Pan head screw M3x10 SUS
059	100074246		Pan screw M4x12 (W/Washer)
060	100074516	EW024	Pan screw M4x10 FEZN
061	100074385	EKK31	Tap tight screw M4x12 FEZN
062 063	100074247		Pan screw M4x10 Pan head screw M3x6 SUS3
063	100074272 100074512		Truss head screw M4x6 SUS3
065	100074244		Pan screw M4x8 MFZN
066	100074328	EC00X	Nylon clamp
067	100074233	EM167	Wire clamp 60
			B 405 458 405 458 407 064 Water inlet section
Part #			water met section
Item	310	Т-К4	Description
#	model	mode	
101	100074215	EKH5\	N Burner assembly for 310
102	100074231	EKH6	
102	100074551	EKK5I	K Manifold with gas valve assembly NA for 310
103		FILLA	
	100074228	EKK2	5 Fan motor for 310 Indoor
104	100074401	EKK54	5 Fan motor for 310 Indoor4 Fan motor for 310 Outdoor
104 105			5 Fan motor for 310 Indoor 4 Fan motor for 310 Outdoor 5 Burner holder gasket for 310
	100074401 100074217	EKK54 EKK00	 5 Fan motor for 310 Indoor 4 Fan motor for 310 Outdoor 6 Burner holder gasket for 310 K Burner gasket
105 106 107	100074401 100074217 100074216 100074218 100074219	EKK54 EKK00 EKK20 EKK20 EKK20	 5 Fan motor for 310 Indoor 4 Fan motor for 310 Outdoor 6 Burner holder gasket for 310 7 Burner gasket 7 Burner window 7 Rod holder gasket
105 106 107 108	100074401 100074217 100074216 100074218 100074219 100074220	EKK54 EKK00 EKK20 EKK20 EKK20 EKK20	 5 Fan motor for 310 Indoor 4 Fan motor for 310 Outdoor 5 Burner holder gasket for 310 K Burner gasket 7 Burner window V Rod holder gasket E Flame rod for 310
105 106 107 108 109	100074401 100074217 100074216 100074218 100074219 100074220 100074222	EKK54 EKK00 EKK22 EKK2V EKK2V EKK00 EKK00	 5 Fan motor for 310 Indoor 4 Fan motor for 310 Outdoor 6 Burner holder gasket for 310 7 Burner gasket 7 Burner window 7 Rod holder gasket 8 Flame rod for 310 8 Igniter rod for 310
105 106 107 108	100074401 100074217 100074216 100074218 100074219 100074220	EKK54 EKK00 EKK20 EKK20 EKK20 EKK20	 5 Fan motor for 310 Indoor 4 Fan motor for 310 Outdoor 5 Burner holder gasket for 310 K Burner gasket V Burner window V Rod holder gasket E Flame rod for 310 F Igniter rod for 310 2 Rod holder for 310
105 106 107 108 109 110	100074401 100074217 100074216 100074218 100074219 100074220 100074222 100074221	EKK54 EKK00 EKK22 EKK24 EKK20 EKK00 EKK00 EKK00 EKK32	 5 Fan motor for 310 Indoor 4 Fan motor for 310 Outdoor 6 Burner holder gasket for 310 8 Burner gasket 9 Burner window 9 Rod holder gasket 9 Flame rod for 310 9 Flamiter rod for 310 1 Rod cap 1 Burner damper for 310 Indoor
105 106 107 108 109 110 111 112	100074401 100074217 100074216 100074218 100074219 100074220 100074222 100074221 100074223 100191104	EKK54 EKK22 EKK22 EKK24 EKK01 EKK01 EKK01 EKK01 EKK01 EKK01 EKK01 EK2A EK492	 5 Fan motor for 310 Indoor 4 Fan motor for 310 Outdoor 5 Burner holder gasket for 310 K Burner gasket ✓ Burner window ✓ Rod holder gasket E Flame rod for 310 F Igniter rod for 310 2 Rod holder for 310 1 Rod cap J Burner damper for 310 Outdoor 2 Burner damper for 310 Outdoor
105 106 107 108 109 110 111 112 113	100074401 100074217 100074216 100074218 100074219 100074220 100074222 100074221 100074223 100191104 100191106	EKK54 EKK00 EKK21 EKK21 EKK00 EKK00 EKK00 EKK32 EKN60 EK2A EK2492 EKK21	 5 Fan motor for 310 Indoor 4 Fan motor for 310 Outdoor 5 Burner holder gasket for 310 K Burner gasket ✓ Burner window ✓ Rod holder gasket E Flame rod for 310 F Igniter rod for 310 2 Rod holder for 310 1 Rod cap J Burner damper for 310 Outdoor Y Manifold gasket A
105 106 107 108 109 110 111 112 113 114	100074401 100074217 100074216 100074218 100074219 100074220 100074222 100074221 100074223 100191104 100191106 100074229 100074230	EKK54 EKK00 EKK22 EKK24 EKK01 EKK01 EKK01 EKK32 EKN6 EK24 EK492 EKK24	 5 Fan motor for 310 Indoor 4 Fan motor for 310 Outdoor 5 Burner holder gasket for 310 K Burner gasket K Burner window V Rod holder gasket F Flame rod for 310 F Igniter rod for 310 2 Rod holder for 310 1 Rod cap J Burner damper for 310 Outdoor 2 Burner damper for 310 Outdoor Y Manifold gasket A K Manifold gasket B
105 106 107 108 109 110 111 112 113	100074401 100074217 100074216 100074218 100074219 100074220 100074222 100074221 100074223 100191104 100191106	EKK54 EKK00 EKK21 EKK21 EKK00 EKK00 EKK00 EKK32 EKN60 EK2A EK2492 EKK21	 5 Fan motor for 310 Indoor 4 Fan motor for 310 Outdoor 5 Burner holder gasket for 310 6 Burner window 7 Rod holder gasket 8 Flame rod for 310 9 Flame rod for 310 9 Rod holder for 310 1 Rod cap 1 Burner damper for 310 Outdoor 9 Burner damper for 310 Outdoor 9 Manifold gasket A 1 Manifold gasket B 1 Fan damper for 310 Indoor

401

117

119

150

151

152

153

100074226

100074528

100074234

100074242

100074390

100074400

118 100074235

120 100074236

EKK2N

EX019

EKK1B

121 100074397 EKK4H Surge box plate for 310

154 100074403 EKK56 Exhaust port

EKK1E Gas inlet

100074533 EZP18 O-ring P18 NBR (Black)

EKK2Z Gas inlet ring

Igniter plate

EK042 O-ring P20 NBR (Black)

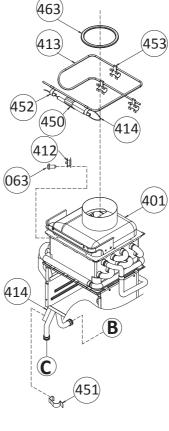
EKK3G Silicon ring for 310 Outdoor

for 310 Outdoor

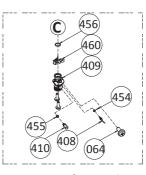
Combustion chamber tube for 310 Indoor

EKK53 Rain protection plate in Exhaust chamber

Combustion chamber tube for 310 Outdoor



Water way assembly



Water outlet section



Itom	Part #		
Item	310	T-K4	Description
#	model	model	
401	100074337	EK406	Heat exchanger assembly for 310 Indoor
	100074341	EK413	for 310 Outdoor
402	100074351	EK427	Flow adjustment valve/Flow sensor for 310
404	100074377	EKK1U	Water inlet
405	100074381	EKK2B	Inlet drain plug
406	100074382	EKK2C	Inlet water filter
407	100074398	EKK4J	Inlet thermistor for 310
408	100074402	EKK55	Outlet thermistor for 310
409	100074378	EKK1V	Water outlet
410	100074383	EKK2E	Outlet drain plug
412	100074412	EM212	Hi-Limit switch for 310
413	100074334	EK333	Overheat-cut-off fuse
414	100074384	EKK2R	Heater
415	100074263	EKK2P	Inlet heater
450	100074273	EKK27	Pipe heater fixing plate
451	100074310	EK031	Heater fixing plate 16
452	100074251	EKK26	Fuse fixing plate 18
453	100074331	EK029	Fuse fixing plate 14
454	100076303	EZM04	O-ring P4 FKM
455	100076305	EZM06	O-ring P6 FKM
456	100076306	EZM14	O-ring P14 FKM
457	100076307	EZM15	O-ring P15 FKM
458	100076308	EZM16	O-ring P16 FKM
460	100074290	EKK24	Fastener "14-22"
461	100074410	EM192	Fastener "16A"
463	100074250	EKN50	Silicon ring for 310 Indoor

ltom	Part #		
Item	310	T-K4	Description
#	model	model	
701	100074342	EK414	Computer board for 310 model
702	100074366	EKH09	Transformer
703 704	100074352 100074601 100074323	EK428 EK146 EKK3C	Surge box AC120V wire for 310 Indoor AC 120 V wire for 310 Outdoor
705	100074364	EK440	Transformer wire for 310
706	100074326	EKK4V	AC120V Power ON-OFF switch
707	100074365	EK441	Switch wire for 310
708	100074391	EKK3K	Gas valve wire for 310 model
709	100074392	EKK3L	Flame rod wire for 310 model
710	100074393 100074394	EKK3R EKK40	EH-IG wire for 310 Indoor EH-IG wire with freeze protection thermostat for 310 Outdoor
711	100074237	EKN74	Igniter
712	100074224	EKK2M	High voltage igniter cable
713	100074369	EKJ59	Freeze protection thermostat for 310 Indoor
714	100074404	EKK58	Proportional gas valve wire for 310
719	100074396	EKK49	Computer board cover for 310 model
720	N/A	EK148	Rubber grommet for Indoor model
721	N/A	EW022	Cable strap for Indoor model
722	100112183	TK-RE02	Temperature remote controller for 310

Computer board assembly

