Rinnai Energysaver

ENERGYSAVER
RHFE-561FT

SERVICE MANUAL

RHFE-561FT

High Efficiency Power Flued Gas Space Heater

WARNING

ALL WIRING INSIDE THIS APPLIANCE MAY BE AT 240 VOLTS POTENTIAL
ALL SERVICE WORK MUST BE CARRIED OUT BY AN AUTHORISED PERSON.
DO NOT TEST FOR GAS ESCAPES WITH AN OPEN FLAME

This manual has been compiled by Rinnai Australia Engineering & Technical Department. While many individuals have contributed to this publication, it will be successful only if you - the reader and customer - find it useful. We would like to extend an invitation to users of this manual to make contact with us, as your feedback and suggestions are valuable resources for us to include as improvements. Rinnai are constantly working toward supplying improved appliances as well as information, and specifications may be subject to alteration at any time.

SM RHFE-561FT
Issue Nº2

The Australian Gas Association	All Rinnai products are certified by the Australian Gas Association as compliant to relevant Australian Standards.
Quality System ™ Quality Endorsed Company ISO 9001 Lic 4983 SAI Global	Rinnai Australia Head Office is certified as complying with ISO 9001 by SAI Global.
TELARC SAI registered ISO 9001	Rinnai New Zealand has been certified to ISO 9001 Quality Assurance by Telarc.
The Regulatory Compliance Mark (RCM) indicates compliance with electrical safety regulations in Australia & New Zealand Rinnai Australia Supplier Code 5109	All Rinnai products carry the “C Tick” symbol. This signifies compliance with the Electromagnetic Compatibility (EMC) requirements of the Australian Communications Authority (ACA) which aim to minimise electromagnetic interference. Rinnai Australia Supplier Code 5109.

Table of Contents

Glossary of Terms and Symbols

This glossary of terms and symbols is provided to assist you in understanding some of the language used throughout this manual.

dB(A)	-	sound pressure level in decibels, “A” range
DC	-	direct current
AC	-	alternating current
Hz	-	Hertz
IC	-	integrated circuit
kcal/h	-	kilocalorie per hour
kPa	-	kilopascals
LED	-	light emitting diode
L/min	-	Litres per minute
mA	-	milliamps
MJ/h	-	megajoules per hour
mm	-	millimetres
mmH_2O	-	millimetres of water (gauge pressure)
NO_X	-	oxides of nitrogen (NO & NO_2)
OHS	-	overheat switch
PCB	-	printed circuit board
CPU	-	central processing unit
POT	-	potentiometer
rpm	-	revolutions per minute
SV	-	solenoid valve
ø	-	diameter
$\triangle\,^{o}C$	-	temperature rise above ambient
POV	-	modulating valve
TH	-	thermistor
PES	-	Programmable Electronic Systems

1. Introduction

Type

This appliance is an indoor fan forced flued gas space heater, electronically controlled console style fixed space heater. It is a room sealed forced exhaust appliance, to be used in conjunction with the Rinnai Co-Axial flue system. Gas flow is automatically controlled to deliver warmed room air until desired room temperature is reached. This appliance incorporates a PES for temperature/ gas control.

Characteristics

- Built into the main PCB is the software for connection to a central ON-OFF control.
- Gas flow modulates in 7 steps between High and Low ensuring comfortable and efficient heating.
- Includes a 24 hour digital clock and dual timer, and an economy mode function. This reduces gas consumption without affecting comfort.
- Temperature control is monitored by “fuzzy logic” technology - relevance to each other.
- All operation and temperature control is with user-friendly push buttons.
- Improvements have been made to the rear convex section for clean-cut design.
- If a problem occurs or service is required, an error coded message appears on the digital display to direct the service technician to the cause of the problem.
- Information about any previous faults is stored in the PCB and can be recalled during servicing.

About your heater

Construction

General:

Compact all-in-one-case assembly.
Accesses to internal components and ATPP through removable front cover, gas connection is made outside the appliance.
All internal components are mechanically supported via screw fasteners.

Outer Case:

Precision pressed and formed sheet steel incorporating main body, components mounting brackets and cover panels. Outer panels are press formed with large radii to be aesthetically pleasing and present 'safe' edges.

Burner Support:

The burner is fixed to combustion chamber / heat exchanger and main sheet metal body via various brackets and threaded screw fasteners - multiple points.

Combustion Air Inlet:

Combustion air is drawn into the manifold air inlet by the combustion fan through the plastic flexi tube flue adaptor. Air is drawn from outside the building, combustion by-product is discharged to outside the house/building.

Combustion Chamber:

The combustion chamber is located between the manifold, burner injector assembly and heat exchanger. It is fabricated from pressed and formed sheet metal and constitutes the central main component of the space heater combustion product path. Precision press swaged and crimped gas tight joints have been utilized to assemble, fix and seal the combustion chamber to the heat exchanger and the heat exchanger to the exhaust tube.

Flueing:

This appliance is designed and certified to use the Rinnai Co-Axial flue system only. The flue adaptor attaches is to the unit at the rear of the appliance using the connection pipe assembly for the hot gas discharge and plastic flexible tube connection for the cold air intake.
Flue dimensions: approximately 85mmØ internal x 125mmØ external. Refer to separate flue instruction manual for further details.

Mounting:

Primarily designed for placing on a stable horizontal solid surface. It is not suitable for Inbuilt installations, it is a console type installation only.
Back cover panels facilitate the protection of the exposed rear components and allow for securing the appliance to the wall or similar fixed structure.

Markings:

Operation warning label. Located on right hand side panel.
Data label. Located on right hand side panel.
240V caution label. Fixed to heat exchanger cover panel.
Gas type label fixed to rear panel in vicinity of the gas inlet connection.
Commissioning data sheet affixed to the inside of the front cover.

Gas System and Gas Control:

Refer to cut away drawing and schematic diagram for locations of all gas components.
The gas control circuit consists of the following valves:

- Combination Modulating and safety shut-off valve x 1
- Solenoid control valve x 1

Regulator:

The gas regulator is integral with the gas control valve assembly.

Pressure test point:

Burner pressure (ATPP) is measured at two positions simultaneously; one on the gas control valve and the other at the burner manifold. A dual reading manometer is required to achieve accurate pressure settings.

Noise level:

RHFE561FT High - Low = 42 - 33 dB(A).

Gas Control Valve:

(Refer to Schematic Diagram on page 6).

The Gas control valve consists of the following valves:

- Solenoid 1 - ON/OFF(5)
- Solenoid 2(6)
- Modulating gas valve(7)

The gas control valve has three main functions:

- Regulates the incoming gas pressure regardless of line pressure.
- Directs gas to the gas manifold through the gas connection tube.
- Gas flow is modulated between the minimum and maximum gas rate by the modulating valve.

Conversion details:

It is preferred that the appliance is supplied as a dedicated gas type from the factory, however, this appliance is readily convertible between gases by exchanging injectors and baffle plates and re-adjusting the gas type and pressure settings.

Main Burner:

The burner is of a forced combustion Bunsen type burner.
The burner is able to operate in seven stages.

Combustion Fan:

Air for combustion is supplied by a centrifugal fan driven by a variable speed motor. Fan speed, and thus the air flow and the gas rate is determined by the PCB, based on start up and purge sequence, ambient air temperature, and required room temperature. Fan speed is regulated by varying the voltage to the motor. Actual fan speed is measured by a magnetic pulse counter. This counter emits 2 pulses per rotation of the fan. To prove the combustion fan is operating, a magnetic revolution counter is incorporated within the fan motor housing. The PCB needs to recognize the fan in both the no-air flow and air flow proved conditions. The PCB will constantly correct the fan speed for optimum combustion.

The PCB will also calculate the degree of the opening of modulating gas valve based on the actual fan speed. The reason for controlling the modulating gas valve based on the combustion fan speed is because the gas valves react quicker to a change in control signal than the combustion fan. The degree of opening of the gas valve is thus always correctly matched to the actual fan speed.

Heat Exchanger:

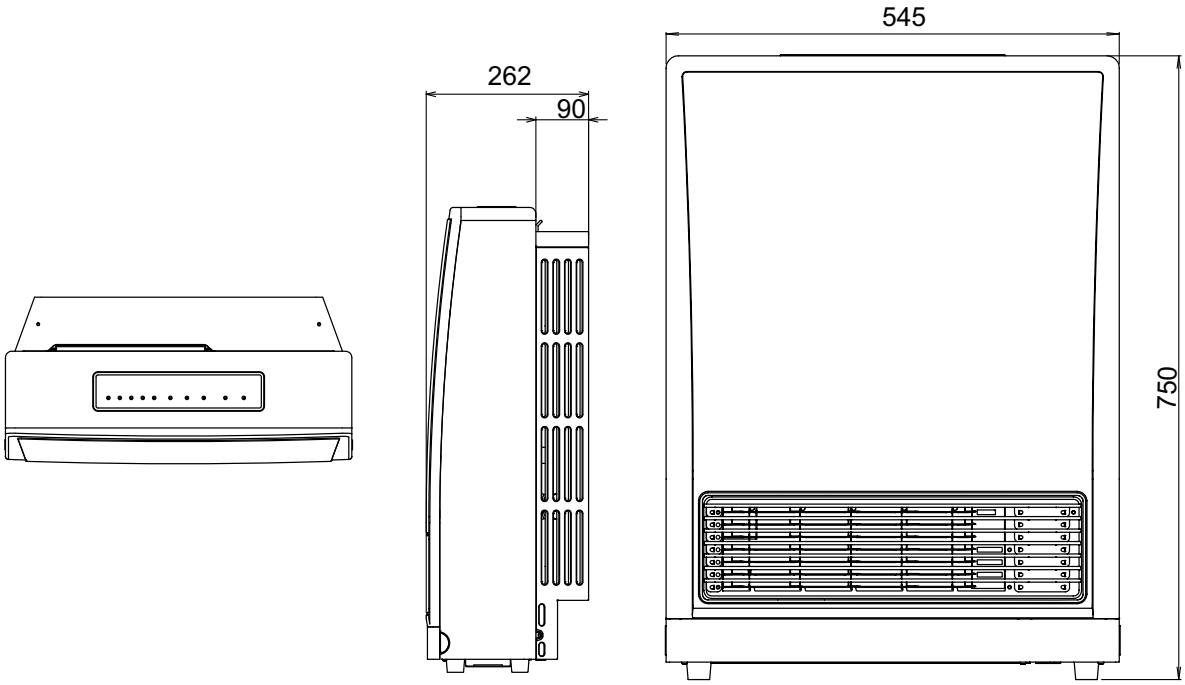
The heat exchanger is of a positive pressure type heat exchanger fabricated from aluminized steel. The heat exchanger is located after the combustion chamber.

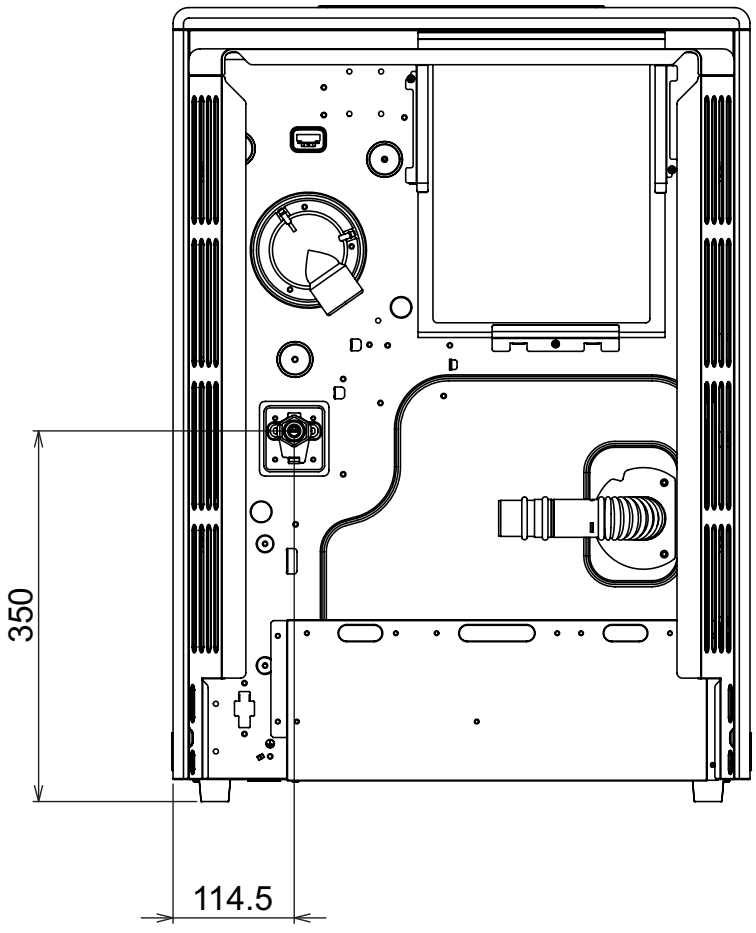
2. Specification

Refer to Operation / Installation Manual for specification details.

3. Dimensions

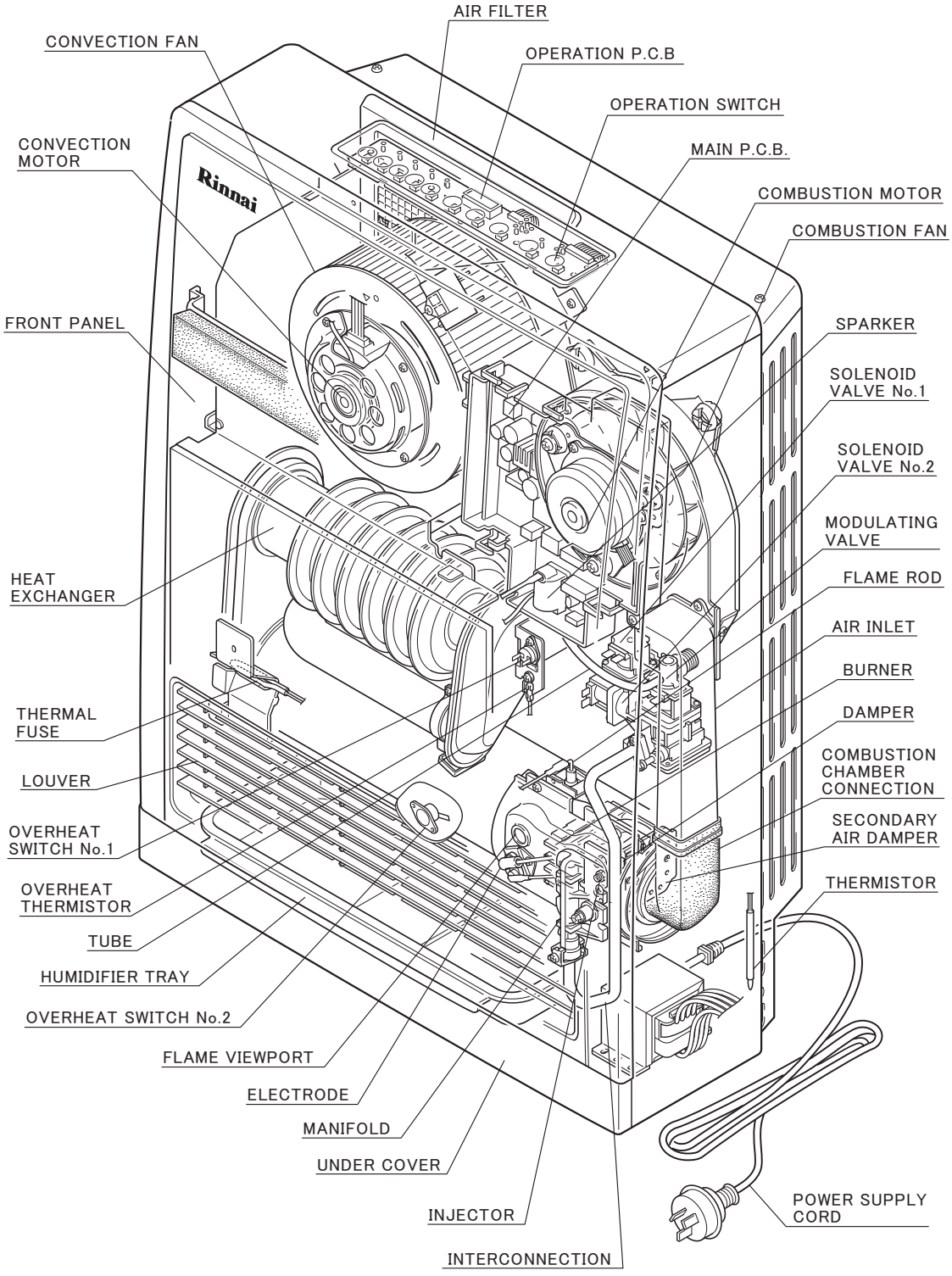
Note: All dimensions are in millimetres



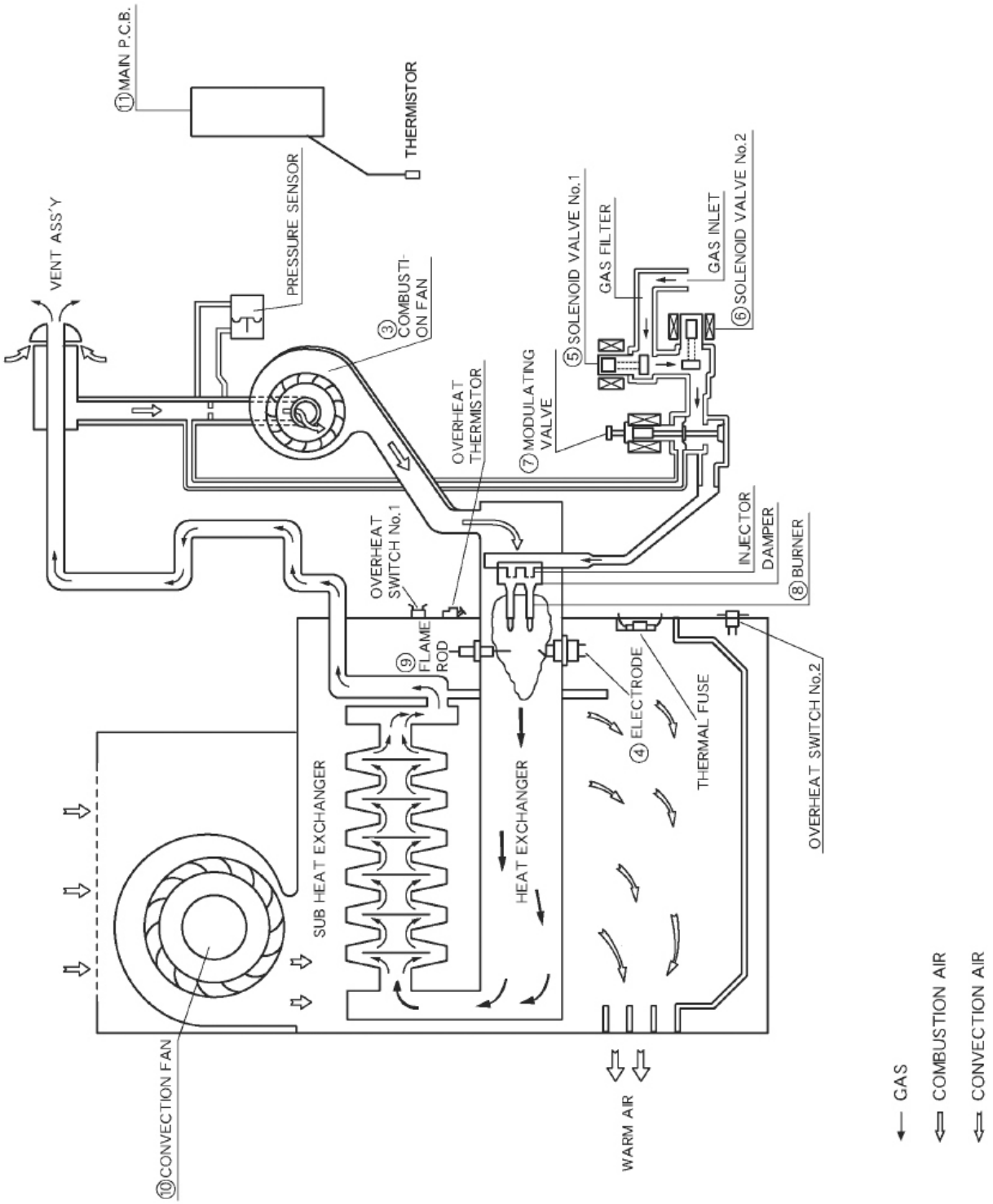


4. Cut-Away Diagram

RHFE-561FT



5. Schematic Diagram



6. Control Panel Layout

1 'ON' / 'OFF' BUTTON
Main switch for turning 'ON / OFF'.

2 SET TIMES BUTTON
Selects clock and/or Timers for adjusting or programming.

3 TIME / TEMP ADJUSTMENT BUTTON
Increases or decreases the temperature setting as well as changing hours or minutes

4 OVERRIDE BUTTON
Temporarily changes operation from ON to OFF or OFF to ON, until next programmed setting is reached.

5 ON TIMER BUTTON
Selects operating mode for Timers 1 & 2 period.

6 ECONOMY BUTTON
Selects energy saving function

7 CHILD LOCK BUTTON
Locks all controls when pressed. (EXCEPT OFF)

8 FILTER INDICATOR
Indicates that the filter needs cleaning.

9 POWER ON /COMBUSTION INDICATOR
Indicates that the appliance is turned ON and whether the burner is alight.

10 CLOCK ADJUSTMENT & TIMER INDICATORS
Indicates that clock or dual timer programme is being set.

11 TIME / TEMP DISPLAY
Shows either the time of day, temperatures, or coded error message

12 OVERRIDE INDICATOR
Indicates that the override function is activated.

13 TIMER INDICATOR
Indicates that Timer 1 or Timer 2 has been selected to operate.

14 ECONOMY INDICATOR
Indicates that the Economy mode is in operation.

15 CHILD LOCK INDICATOR
Indicates Child lock is activated.

7. Safety Devices

Room Temperature Overheat Protection Switches

Operate to shut off the solenoid valves and cut off gas supply in the event the heater exceeds a predetermined temperature:

i) Bimetal Overheat Switches

This is normally caused by an obstruction in front of the louvers, or a blocked fan filter. If the overheat switch operates, turn the unit "OFF", remove the obstruction (clean filters) and allow the unit to cool off for 10-15 minutes before re-operating.

a) Bimetal OHS1	b) Bimetal OHS2
Operates at 130 ± 5ºC	Operates at 95 ± 5ºC
Recovery at 115 ± 7ºC	Recovery at 85 ± 7ºC

ii) Fusible Link

The fusible link activates under conditions of severe overheating (216 ± 2ºC). A service call will be required to repair this appliance.

iii) Thermistor

Operates at a temperature range of 90 ºC ~ 110 ºC (High ~ Low) depending on gas input.

Fan delay

The convection fan starts after a short delay to avoid cold draughts, and keeps running after burner extinction to allow the unit to cool down (controlled via PCB).

- ON at 10 seconds after ignition commences
- OFF at 120-210 seconds after combustion ceases

Power failure circuit

Shuts off the solenoid valves if a power failure occurs. The unit will re-light after the power is restored, and the clock time will be slow by the amount of time the power was off.

Spark sensing circuit

Senses the location of spark and opens the solenoid valves only when the spark location is confirmed as correct.

Flame rod sensor

Senses main burner ignition and shuts off the solenoid valves when the flame current drops below 0.1 µA.

- Ignition sensing current: under 0.4 µA.
- Extinction sensing current: above 0.1 µA.

Pre-purge circuit

- Purges heat exchanger and flue prior to spark commencing.

Combustion fan rpm sensing circuit

- Senses the operation of the combustion fan and maintains a pre-determined rotation speed.

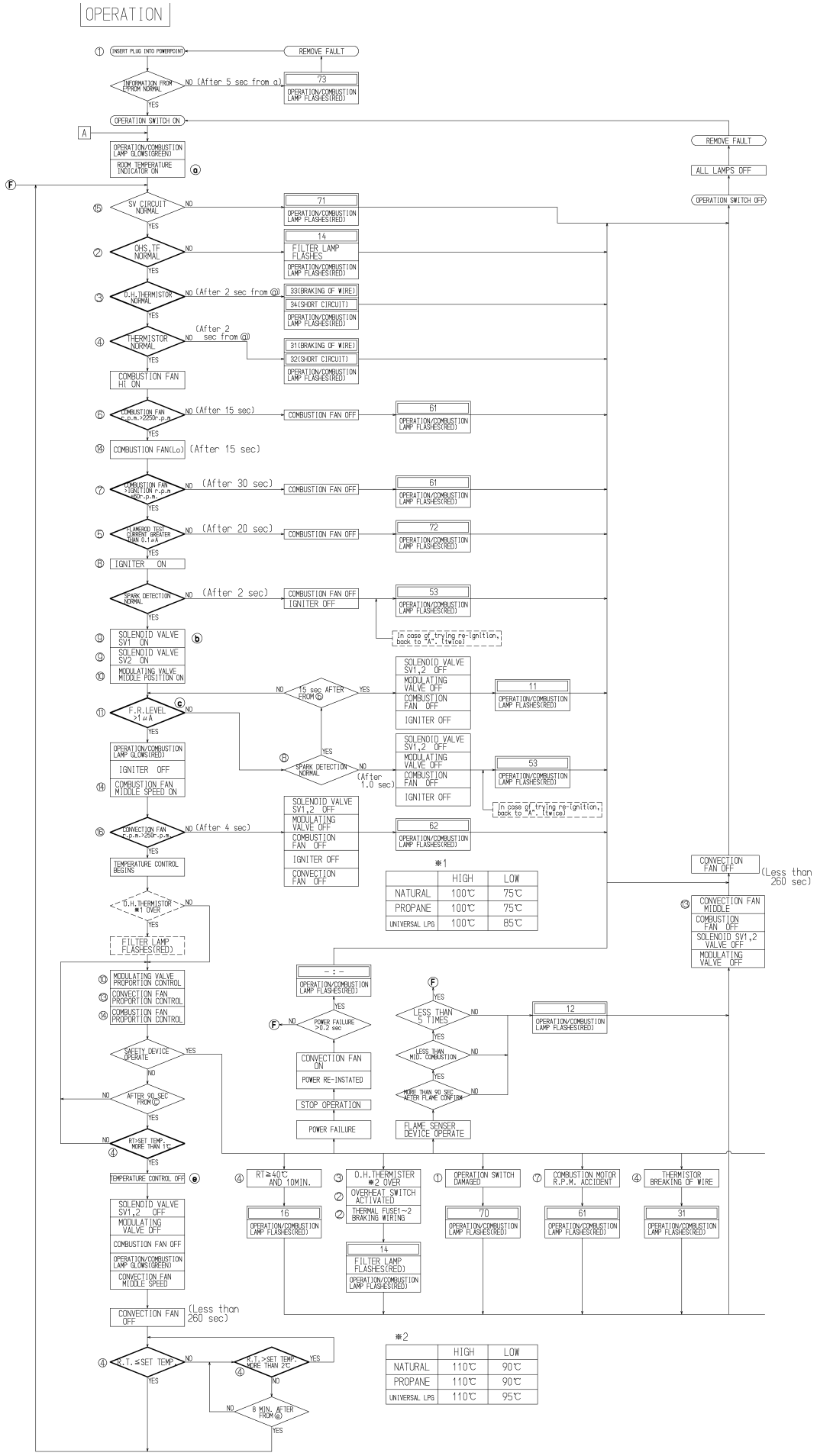
Flame Failure Device

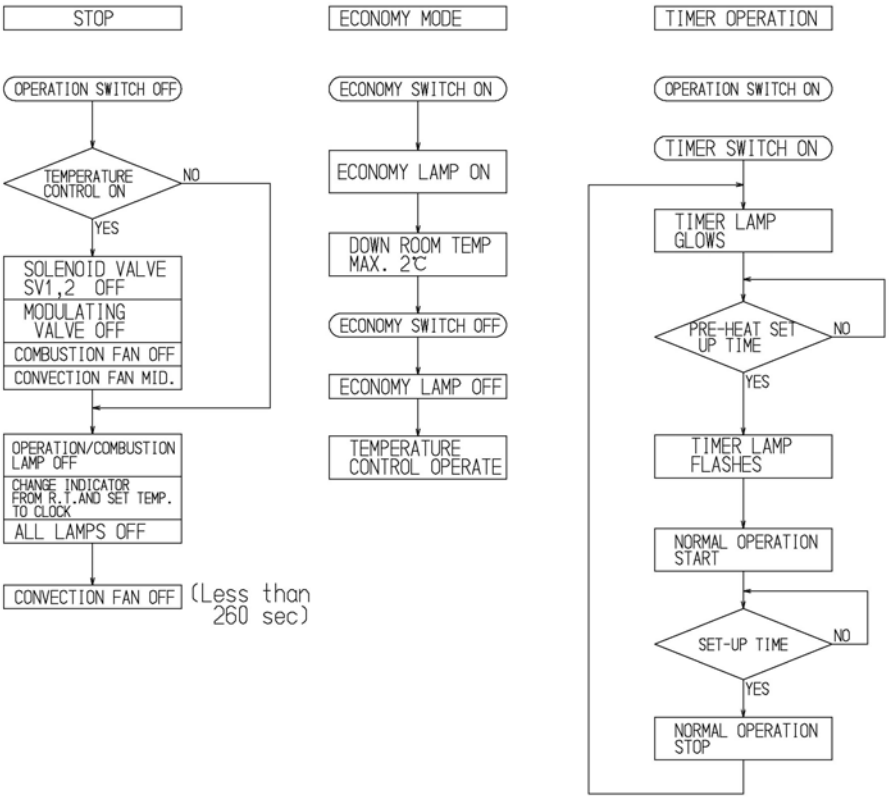
If the flame goes out during operation this device shuts off gas to the burner. To reset, turn the unit "OFF", then "ON" again. If this happens repeatedly a service call is required.

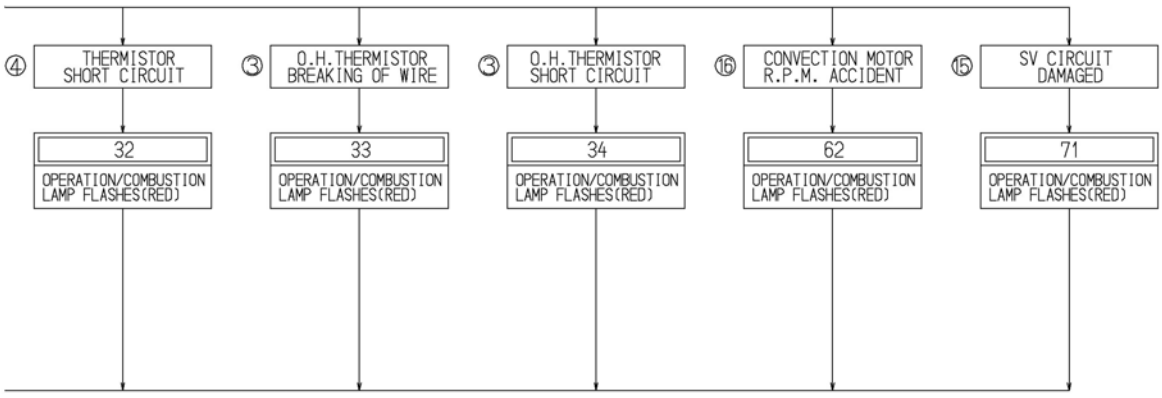
Electrical Fuse

The electrical circuits are protected by an electric fuse. When the fuse blows, the heater will not operate. The fuse must be replaced by an authorised person.

8. Operation Flow Chart

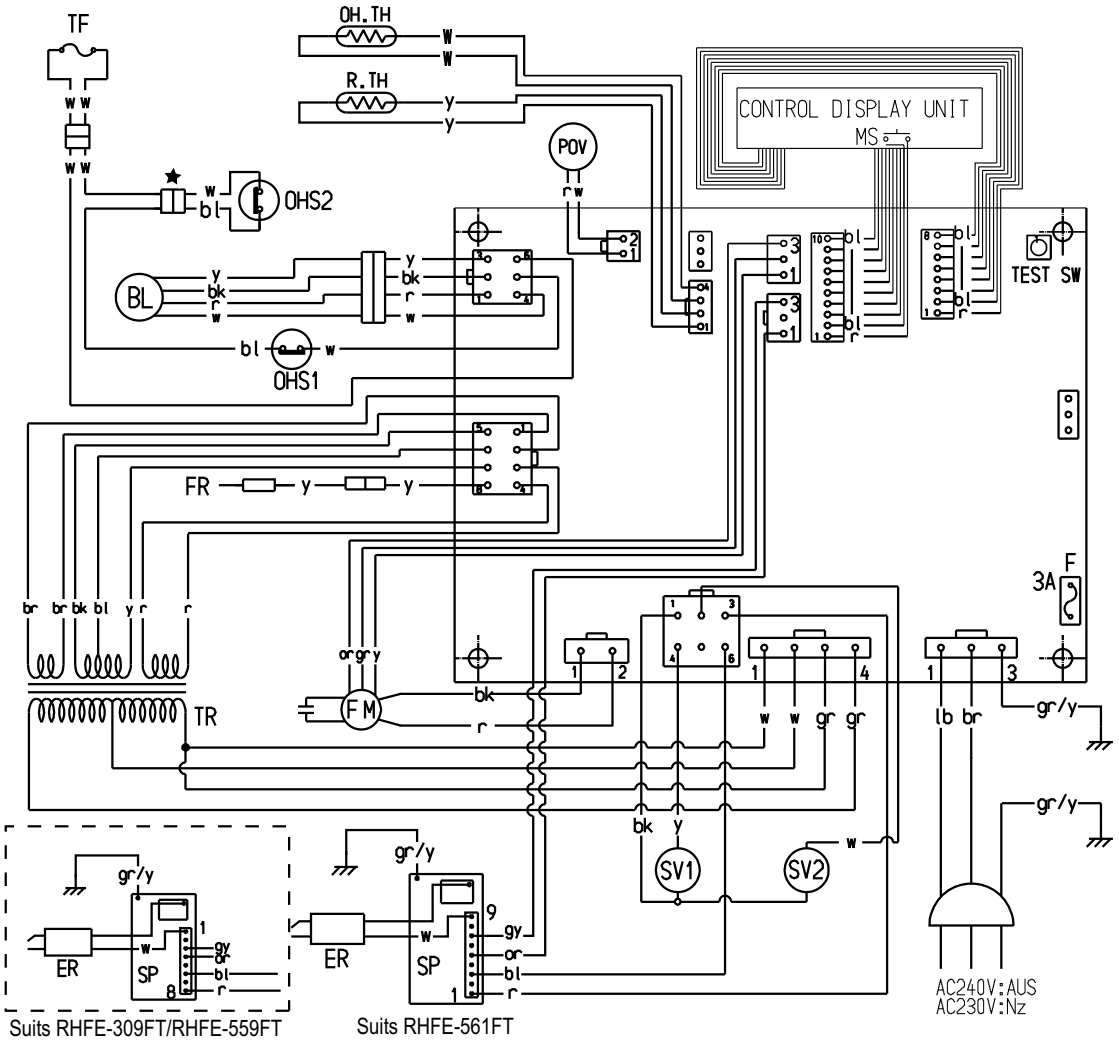



STOP
OPERATION SWITCH OFF
TEMPERATURE CONTROL ON
NO
YES
SOLENOID VALVE SV1,2 OFF
MODULATING VALVE OFF
COMBUSTION FAN OFF
CONVECTION FAN MID.
OPERATION/COMBUSTION LAMP OFF
CHANGE INDICATOR FROM R.T.AND SET TEMP. TO CLOCK
ALL LAMPS OFF
CONVECTION FAN OFF
(Less than 260 sec)
ECONOMY MODE
ECONOMY SWITCH ON
ECONOMY LAMP ON
DOWN ROOM TEMP MAX. 2℃
ECONOMY SWITCH OFF
ECONOMY LAMP OFF
TEMPERATURE CONTROL OPERATE
TIMER OPERATION
OPERATION SWITCH ON
TIMER SWITCH ON
TIMER LAMP GLOWS
PRE-HEAT SET UP TIME
NO
YES
TIMER LAMP FLASHES
NORMAL OPERATION START
SET-UP TIME
NO
YES
NORMAL OPERATION STOP


④ THERMISTOR SHORT CIRCUIT
32
OPERATION/COMBUSTION LAMP FLASHES(RED)
③ O.H.THERMISTOR BREAKING OF WIRE
33
OPERATION/COMBUSTION LAMP FLASHES(RED)
③ O.H.THERMISTOR SHORT CIRCUIT
34
OPERATION/COMBUSTION LAMP FLASHES(RED)
⑯ CONVECTION MOTOR R.P.M. ACCIDENT
62
OPERATION/COMBUSTION LAMP FLASHES(RED)
⑮ SV CIRCUIT DAMAGED
71
OPERATION/COMBUSTION LAMP FLASHES(RED)

9. Wiring Diagram

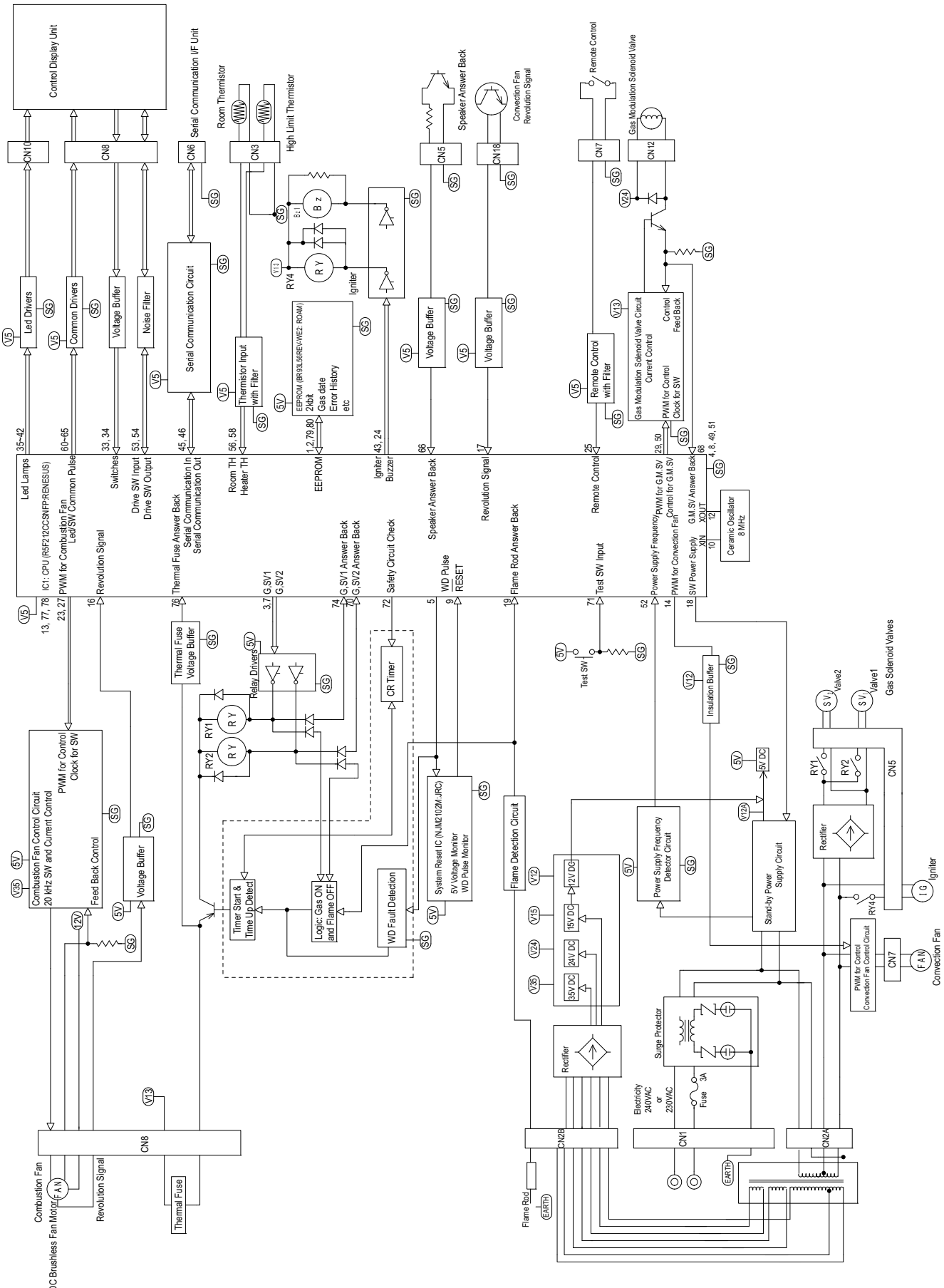
WIRING DIAGRAM



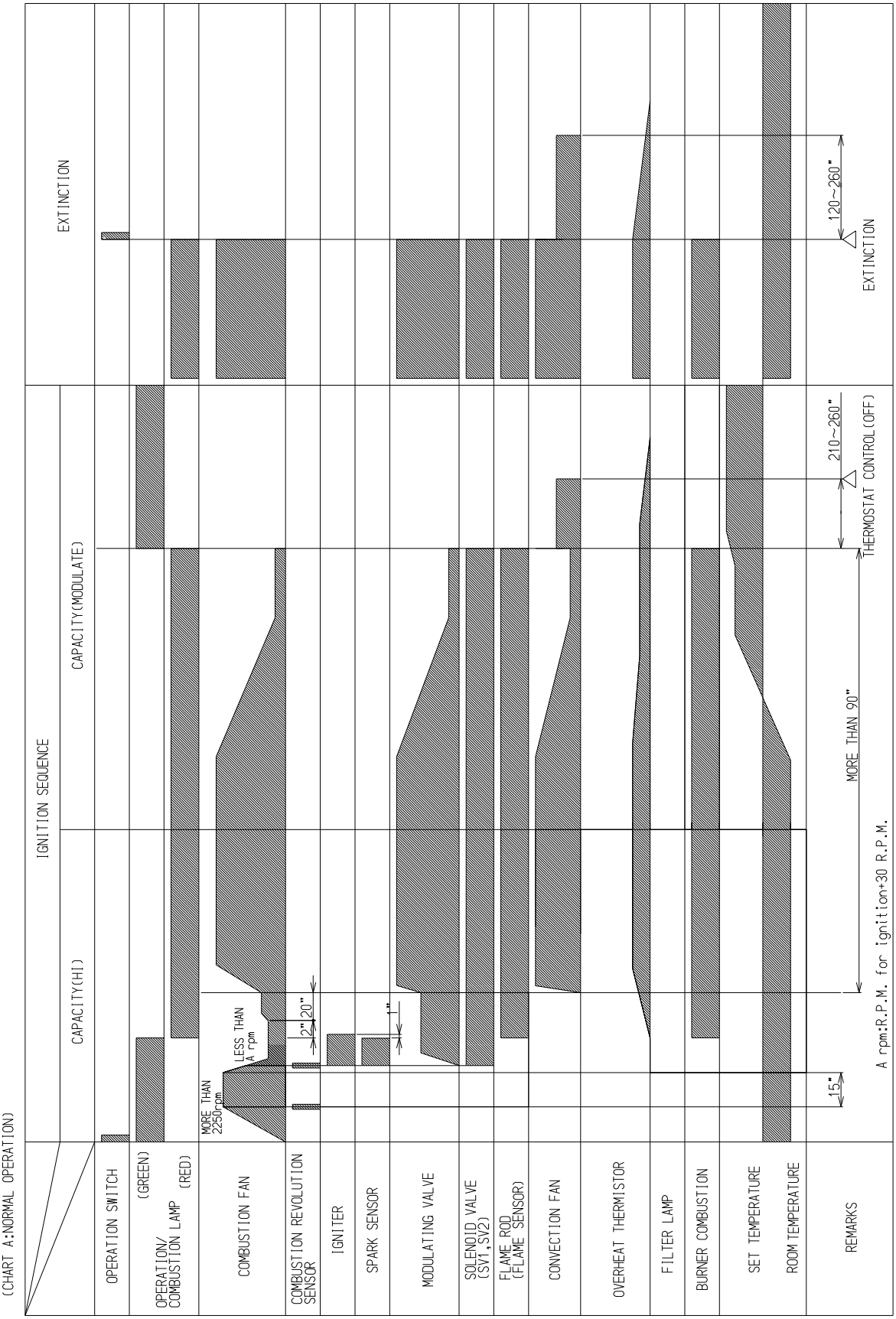
CODE	COLOR	CODE	COLOR
bk	black	w	white
bl	blue	y	yellow
lb	light blue	gy	gray
gr/y	green/yellow	or	orange
r	red	br	brown
pk	pink	gr	green

MARK	PARTS NAME	MARK	PARTS NAME
MS	MAIN SWITCH	OH.TH	OVER HEAT THERMISTOR
R.TH	THERMISTOR	OHS1,2	OVER HEAT SWITCH1,2
TF	THERMAL FUSE	FM	CONVECTION FAN MOTOR
F	FUSE	SP	SPARKER
ER	ELECTRODE	SV1,2	MAIN SOLENOID VALVE 1,2
POV	MODULATING SOLENOID VALVE	BL	COMBUSTION FAN MOTOR
TR	TRANSFORMER	FR	FLAME ROD

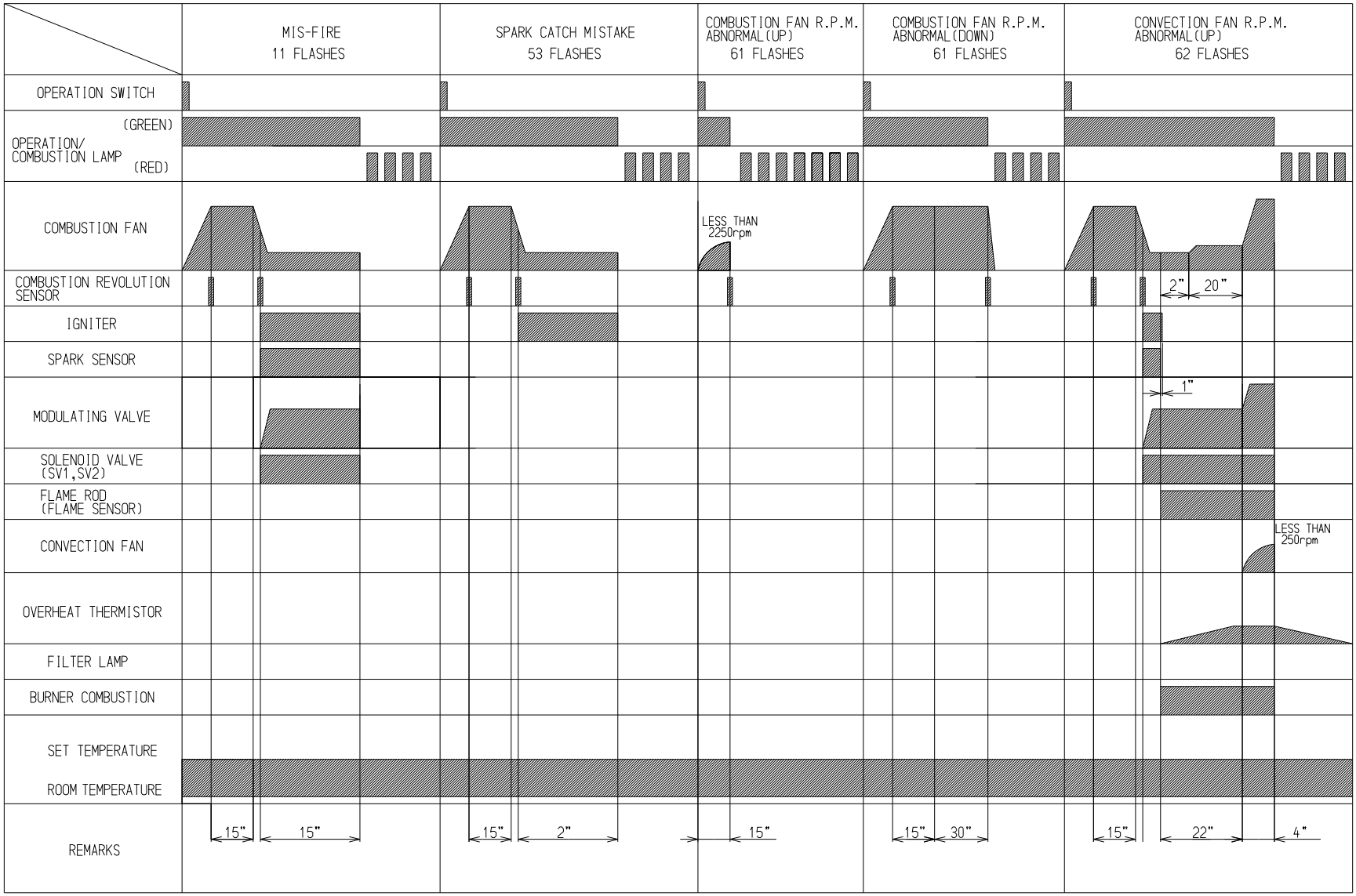
10. Block Diagram



11. Time Charts

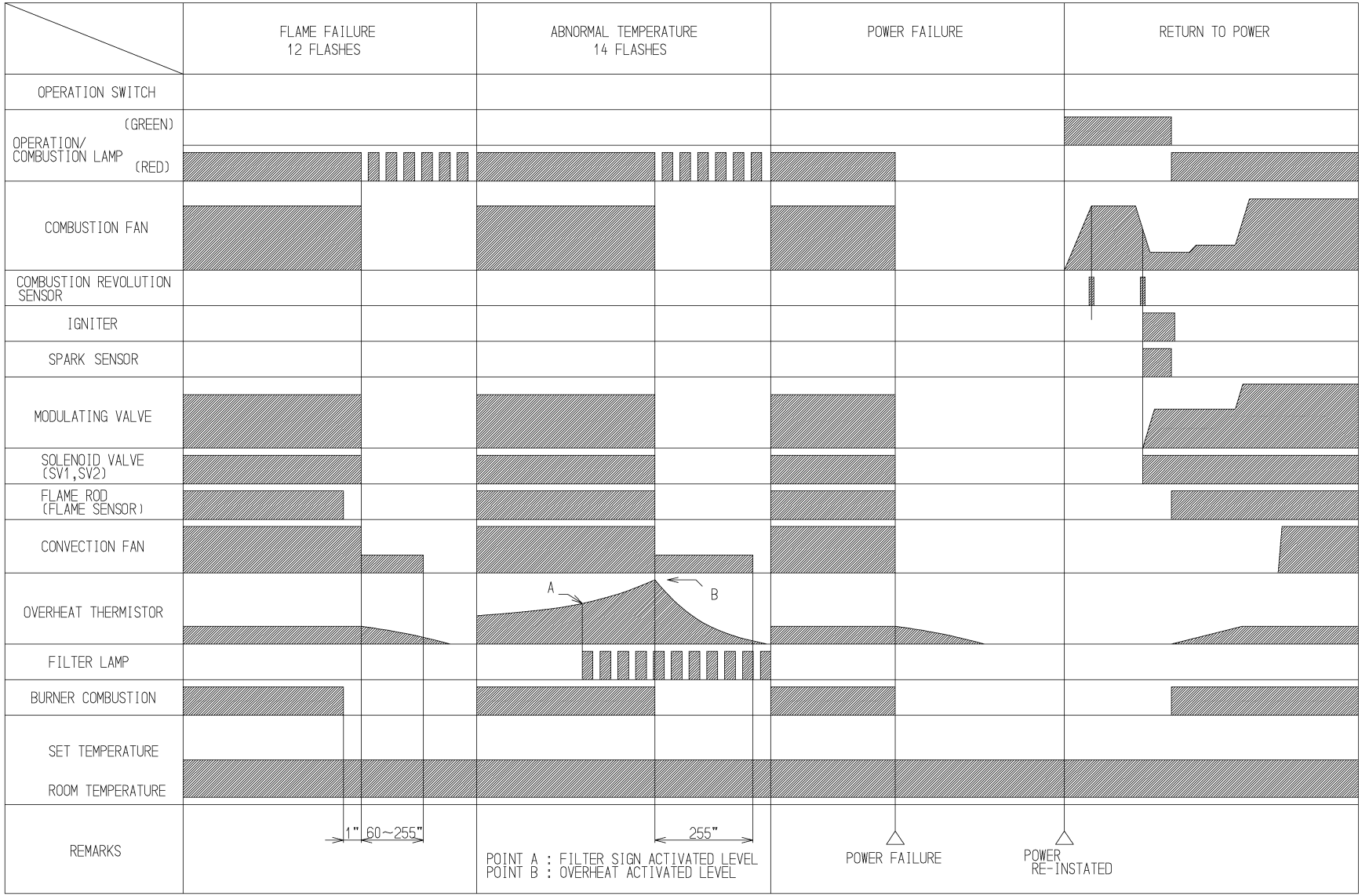


(CHART B:ABNORMAL OPERATION)



A rpm: R.P.M. for ignition+30 R.P.M.

(CHART C:ABNORMAL OPERATION)



12. Fault Finding

Trouble Shooting Check List

Please check this list before asking for Service

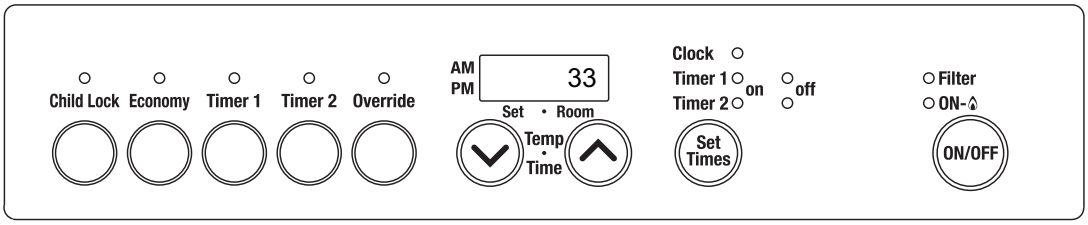
Cause \ Fault	No Power ON/Combustion Indicator	Burner doesn't ignite	Unusual Combustion	Combustion stops during operation	Smell of Gas	Noisy Ignition	Remedy
Not plugged in	●	●					Plug in power cord and press the control panel 'ON'/ 'OFF' button.
Power Cut	●	●		●			Re-ignite manually after power is restored.
(Initial Installation) Air in gas pipe		●					Purge air (Installer).
Gas Filter Blocked		●	●				Service Call (Contact Rinnai).
Mis-Ignition	●	●					Check customer instructions.
Flue Terminal obstructed			●	●		●	Clear obstruction.
Flue manifold not connected					●	●	Service Call (Contact Rinnai).
Louvre obstructed				●			Clear obstruction.
Air Filter Blocked				●			Clean filter (weekly).
Gas Escape					●		Service Call (Contact Rinnai).
'ON' Timer is set		●					Cancel 'ON' Timer or press the override button.
Gas turned 'OFF' at meter		●					Turn Gas 'ON'.
Function / Child Lock Set		●					Cancel Function / Child Lock.

If you are unsure about the way the unit is operating, contact Rinnai or your Agent.

Before asking for a service call please check the following.
These symptoms are part of the normal operation of the unit and do not indicate a fault.

Symptom		Explanation
At Ignition:		
Warm air does not start when the burner lights.	→	The fan is started automatically after a short delay. This is to allow the heat exchanger to warm up, helping to avoid cold draughts.
Smoke or strange smells are produced on the first trial light up after installation.	→	This is caused by grease or oil from the manufacturing process on the heat exchanger and dust, and will stop after a short time.
Sharp clicking noises at ignition, or when the unit cuts down on the thermostat, or goes out.	→	This is simply expansion noise from the metal heat exchanger.
During combustion:		
Clunking noise when the thermostat operates.	→	This is the sound of the solenoid gas valves opening and closing.
When the unit is turned 'OFF':		
Convection fan continues to run after turning 'OFF'	→	This is to remove the residual heat from the heat exchanger. The fan will stop when the unit cools down.
Other points:		
Steam is discharged from the flue terminal.	→	High efficiency appliances tend to discharge water vapour on cold days. This is normal.
Heater does not start even when 'ON' button is pushed and thermostat is on HIGH.	→	Check timer. Timer must be in the "OFF" position for manual operation. Room temperature is hotter than 'High' setting.
Timers:		
Timers do not operate at set time.	→	Timers may either be inactivated or incorrectly programmed. Repeat programming.
Timer operates for 30 seconds then cuts out.	→	Room temperature may be higher than set temperature. Adjust temperature upwards if desired.

13. Error Messages



The Energysaver® Range of heaters has the ability to monitor its own operation continuously. If a fault occurs, an Error Message will flash on the Digital Display ⑪ on the control panel, refer to page 7. This assists with diagnosing the fault, and may enable you to overcome a problem without a service call. Please quote the code displayed when inquiring about service.

Code Displayed	Probable Cause	Comments	Remedy
11	Ignition failure	Flame current does not reach 0.1Amp within the given time, after solenoid valve opens.	Check gas supply is turned 'ON' Turn Heater 'OFF' then 'ON' again Service call if repeated
12	Flame failure	Flame rod current remains below 0.1Amp for 1 second during initial combustion.	Check gas is turned 'ON'
14	Overheat Safety Device	High-limit temperature thermistor or thermal fuse has activated.	Clean filter Service call if repeated
16	Room Overheat Temperature cut off	Room temperature is sensed as being above 40°C for longer than 10 minutes.	Lower room temperature to less than 40°C
31 32	Room temperature thermistor disconnection	Room temperature thermistor open circuit	Service call
33 34	High-limit thermistor disconnection or short circuit	High limit thermistor open circuit for over 2 seconds High limit thermistor short for over 2 seconds	Service call
53	Abnormal spark sensed	Sparker not OFF within 20 seconds at time of ignition. 1st spark sensed not within 2 seconds. 2nd spark sensed spark not continuous for 1 second after solenoid valve opens.	Service call
61 62	Abnormal Combustion fan motor rpm	Speed is not achieved within time or goes over speed level. Speed goes below the given rpm.	Service call
70	'ON'/'OFF' Switch failure	ON/OFF switch on continuously for more than 15 seconds	Service call
71	Solenoid valve check	Solenoid valve(s) (SV1, SV2) signal and response signal are different.	Service call
72	Flame Rod failure	Flame rod current should not go below 0.1Amp within 20 seconds of starting.	Service call
73	Communication failure	Data transfer between CPU and E2PROM fails.	Service call

* To reset error codes, press the ON switch while the error code is showing. If the Error Message still remains or returns on the next operation, contact Rinnai or your nearest service agent and arrange for a service call.

NOTE

Service calls for general cleaning, maintenance and wear and tear are not necessarily covered under the warranty. Service calls of this nature may be chargeable.
Faults caused by insufficient gas supply, gas quality, installation errors or operation errors are not covered by the Rinnai warranty. Refer to separate Warranty booklet for details.

14. Diagnostic Points

Part	Wire		Measurement Value
Control Panel	Red – Blue		DC0–5V (Pulsed voltage) The resistance is infinity but the current flow when the switch is pushed.
	Blue – Blue		
Hi-Limit SW etc.	White – White		Below DC 1V, Below 2Ω
	Blue – White (OHS1)		
	White – White (TF)		
	Blue – White (OHS2)		
Hi-Limit TH	White – White		0.87–482kΩ (<0.87kΩ:Short, >482kΩ:Open)
	Temperature		0℃:214kΩ, 20℃:78kΩ, 50℃:21kΩ 80℃:7.3kΩ, 100℃:3.6kΩ, 135℃:1.5kΩ
	White – White (Filter sign)	High	NG: Flashes below 6.19kΩ LP: Flashes below 6.19kΩ
		Low	NG: Flashes below 6.19kΩ LP: Flashes below 6.19kΩ
	White – White (The TH operate)	High	NG: Operates below 3.90kΩ LP: Operates below 3.90kΩ
		Low	NG: Operates below 3.90kΩ LP: Operates below 3.90kΩ
RT TH	Yellow – Yellow		1.82–707kΩ (<1.82kΩ:Short, >707kΩ:Open)
	Temperature		0℃:113kΩ, 20℃:39kΩ, 30℃:24kΩ, 40℃:15kΩ
FR	Yellow – Yellow		Below 0.1μA (During Stop)
Combustion Fan (In case of short vent.)	White – Black		Below ignition revolution +2Hz
	Ignition revolution	Initial	LP: 52Hz, NG: 62Hz
		Re-attempt	LP: 52Hz, NG: 62Hz
	Normal revolution	High	LP: 113Hz, NG: 110Hz
		Low	LP: 55Hz, NG: 55Hz
Combustion Fan (In case of long vent.)	White – Black		Below ignition revolution +2Hz
	Ignition revolution	Initial	LP: 55Hz, NG: 65Hz
		Re-attempt	LP: 55Hz, NG: 65Hz
	Normal revolution	High	LP: 113Hz, NG: 112Hz
		Low	LP: 57Hz, NG: 57Hz
Convection Fan	Black – Red Black – White Gray – Yellow Gray – Orange		35–45Ω (20℃) 80–90Ω (20℃) 5–15kΩ 10–20kΩ
SV	Black – White		80–100V 1.5–2.5kΩ
	Black – Yellow		
POV	Red – White		DC2–15V(Low–High) 60–90Ω
Transformer	Gray – Gray		AC216–264V, 30–60Ω
	White – White		AC85–125V, 20–50Ω
	Red – Red		DC25–52V, 0.5–2.0Ω
	Brown – Brown		DC15–35V, 1–5Ω
	Blue – Yellow		AC180–235V, 150–350Ω
	Black – Blue		DC14–26V, 1–3Ω

15. Gas Pressure Setting Procedure

Refer to a separate Rinnai document behind front cover of appliance.

16. Function and Control

Thermistor calibration (Room temperature correction)

The EnergySaver models have the ability to adjust or calibrate the thermistor.
In most installations, this function will not need to be used. This function can be useful when the installation affects the reading of the thermistor. For example, if there is a source of draught (gaps around windows, hole in floor) near the thermistor location, the true room temperature may be higher or lower than that displayed on the PCB, resulting in the appliance running for longer or shorter time period, which will cause erratic temperature control.

Procedure for adjusting the thermistor

1. With the unit OFF, press the SW test button (on the PCB) twice. A number between -12 and 12 will be displayed on the PCB (0 is the factory setting).
2. Press the "∧" or "∨" buttons to increase or decrease the value, respectively. Each increment is equal to 0.33ºC. Use the chart below to adjust to the required value.
3. Press the SW test button (on the PCB) once. The new setting will be recorded in the PCB. Adjustment is now complete.

Display	- 12	- 11	- 10	- 9	- 8
Room Temperature	+ 4°C	+ 3.66°C	+ 3.33°C	+ 3°C	+ 2.66°C
Display	- 7	- 6	- 5	- 4	- 3
Room Temperature	+ 2.33°C	+ 2°C	+ 1.67°C	+ 1.33°C	+ 1°C
Display	- 2	- 1	0	1	2
Room Temperature	+ 0.66°C	+ 0.33°C	± 0°C	- 0.33°C	+ 0.66°C
Display	3	4	5	6	7
Room Temperature	- 1°C	- 1.33°C	- 1.67°C	- 2°C	- 2.33°C
Display	8	9	10	11	12
Room Temperature	- 2.66°C	- 3°C	- 3.33°C	- 3.66°C	- 4°C

Eg: Room temperature on the display would be one degree lower than actual room temperature when 3 was set. The room temperature would be one degree higher than the temperature on the display.

17. Dismantling for Service

NOTE: Before proceeding with dismantling, be sure to follow the CAUTION Instructions before each explanation

240 volt potential inside appliance

Disconnect electrical supply

ONLY AUTHORISED PERSON TO CARRY OUT REPAIRS TO THIS APPLIANCE

DISMANTLING FOR RHFE-561FT

Unless otherwise stated, re-assembly is in the reverse of dismantling

NOTE

When servicing this unit, please make sure that flue integrity is checked, i.e. check for any corrosion of transition box and clear any deposit.

Also check for any burn marks around the burner cover plate.

Check that the drip catcher is fitted.

CAUTION

240 volt potential inside appliance

Disconnect electrical supply

Note: Please ensure that proper screws are used at proper location in re-assembly

To secure metallic panel	**Front/Side panel, louvre**	**Gas connecting tube**	**Earthing lead**
8g Pan Head - self taper	8g Pan Head - self taper with captive star washer	Pan Head M4 with captive spring washer	Pan Head M4 with captive star washer
			

To secure plastics, exhaust pipe	**To secure air intake tube**
Flat Head 8g - self taper	Flat Head M4
	

CAUTION

240 volt potential inside appliance

Disconnect electrical supply

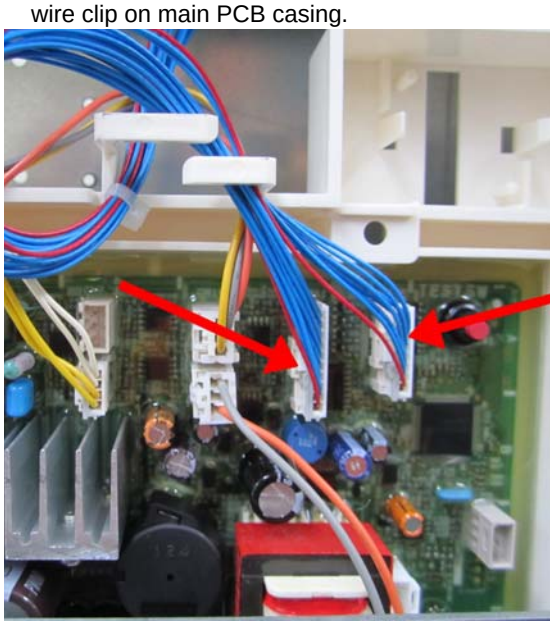
1) Removal of Front Panel

a. Grip sides of skirt and pull forward to remove.

b. Remove five (5) screws to release louvre & front panel.
c. Remove the louvre.
d. Grip bottom left and right corners of front panel, lift up and pull forward to release.

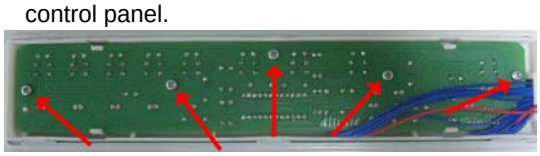
2) Removal of Top Panel, Control Panel and Control Panel PCB

a. Remove front panel assembly, see section 1.
b. Remove three (3) screws from top panel.
c. Release two (2) multi-pin connectors from main PCB, releasing the control panel PCB harness from wire clip on main PCB casing.



d. Pull the control panel forward and lift both sides to remove.

e. Unscrew five (5) screws to remove control PCB from control panel.



CAUTION - 240 volt potential inside appliance. Disconnect electrical supply.

3) Removal of Convection Fan Motor

a. Remove front panel assembly, see section 1.
b. Loosen allen screw securing fan blade to fan motor shaft using a 3mm allen key (from back of unit).

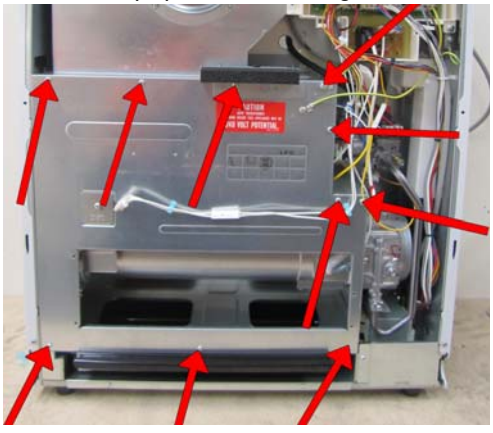
c. Remove securing bracket, two (2) screws.
d. Remove four (4) screws securing the motor to the casing and remove fan motor cover.

e. Release two (2) multi-pin connectors and wire harness from clips of PCB casing and two (2) leads connected to capacitor.

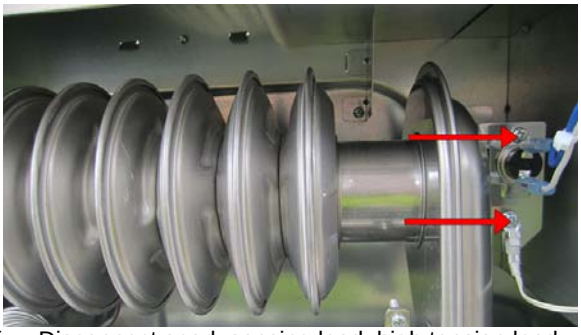
4) Removal of Heat Exchanger

Attention: Combustion tube gasket must be replaced (refer to part number 90199865) whenever burner tube cover plate has been removed. Need to clean off old gasket before fitting replacement gasket.

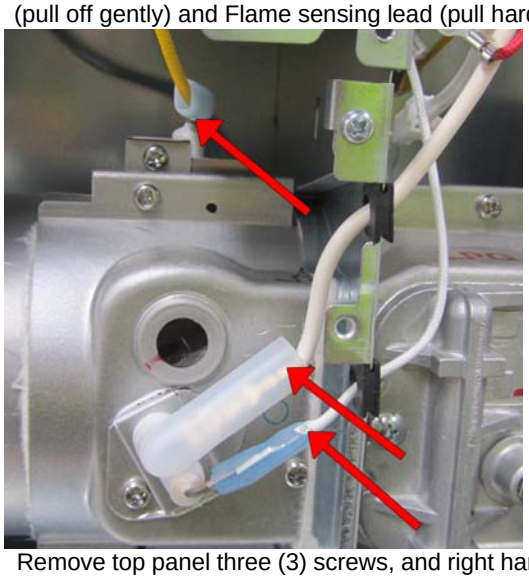
a. Remove front panel assembly, see section 1.
b. Remove one (1) earth connection on front heat shield.
c. Release fusible link.
d. Release ten (10) screws securing heat shield.



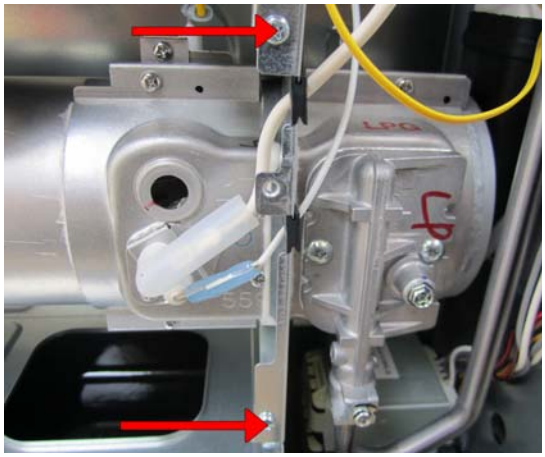
e. Disconnect O/H switch & thermistor, two (2) screws



f. Disconnect spark sensing lead, high tension lead (pull off gently) and Flame sensing lead (pull hard).

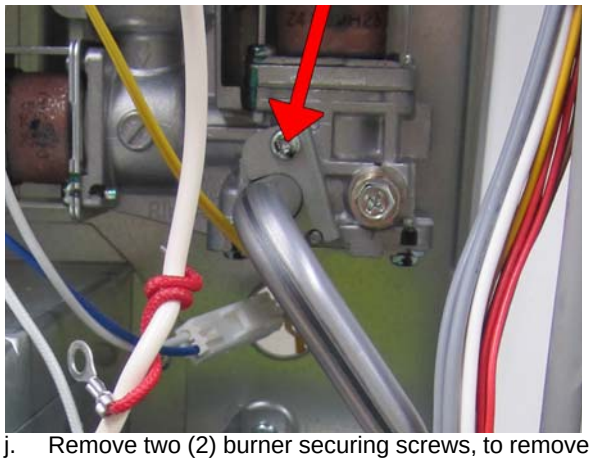


g. Remove top panel three (3) screws, and right hand side panel three (3) screws.
h. Remove blanking panel, two (2) screws.

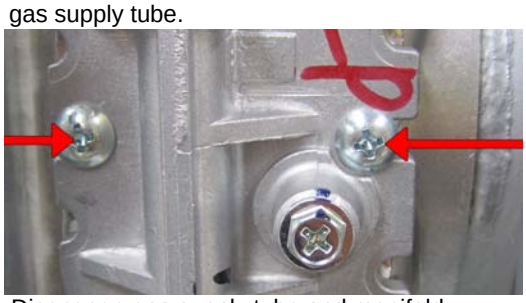


CAUTION: 240 volt potential inside appliance. Disconnect electrical supply.

i. Remove one (1) gas supply tube securing screw (gas control side) and two (2) air intake tube securing screws.

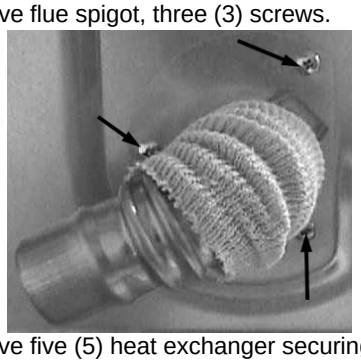


j. Remove two (2) burner securing screws, to remove gas supply tube.

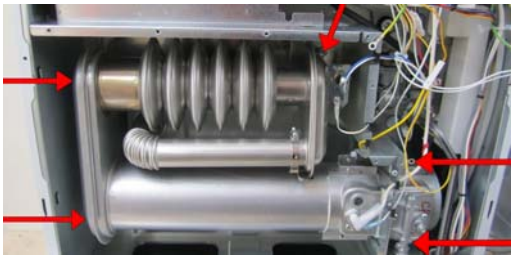


k. Disengage gas supply tube and manifold.

l. Remove flue spigot, three (3) screws.



m. Remove five (5) heat exchanger securing screws. Grip heat exchanger and pull forward to remove.

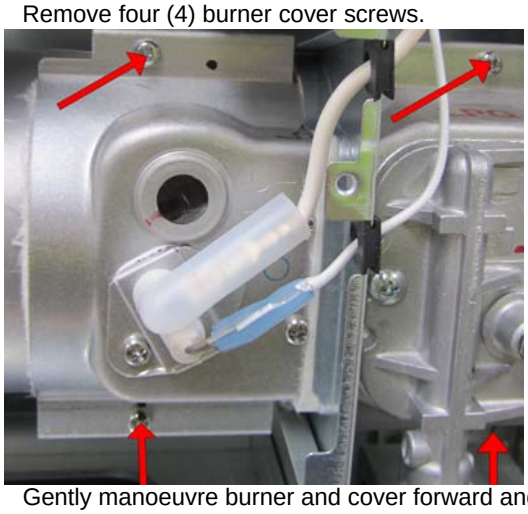


Note: Refer section 5 f)~g) to disconnect burner from heat exchanger complete assembly.

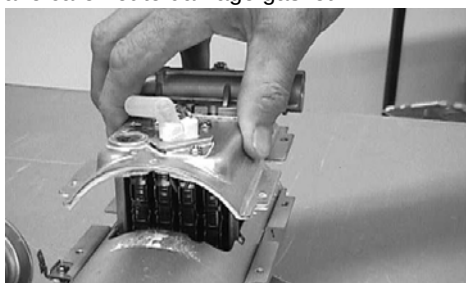
5) Removal of Burner

Attention: Combustion tube gasket must be replaced (refer to part number) whenever burner tube cover plate has been removed. Need to clean off old gasket before fitting replacement gasket.

a. Remove front panel assembly, see section 1.
b. Remove front heat shield, see section 4 b) ~ d).
c. Remove blanking panel, two (2) screws.
d. Remove spark sensing lead, and high tension lead (pull off gently).
e. Remove two (2) gas supply tube securing screws.
f. Disengage gas supply tube.
g. Remove four (4) burner cover screws.



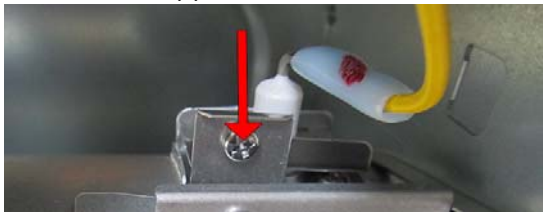
h. Gently manoeuvre burner and cover forward and out of burner chamber by pulling on manifold. Take care not to damage gasket.



Note: to reassemble the burner, replace gland to secure airtightness of burner chamber.

6) Removal of Flame Rod

a. Remove front panel assembly, see section 1.
b. Remove front heat shield, see section 4b)~d).
c. Remove one (1) screw.

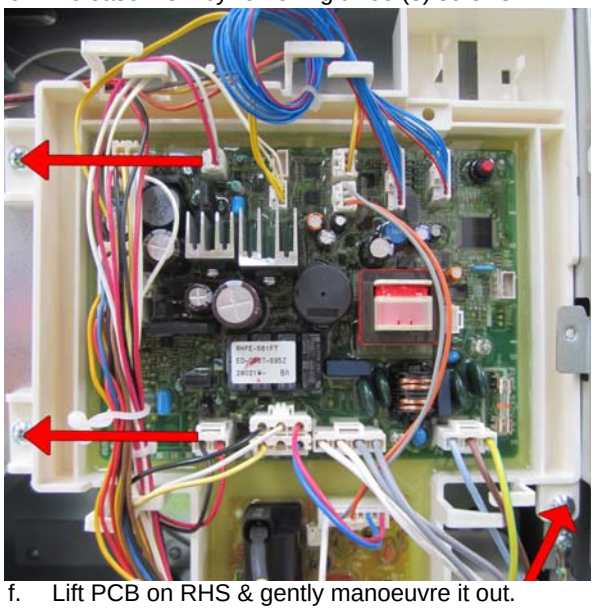


CAUTION

240 volt potential inside appliance. Disconnect Electrical Supply.

7) Removal of Main PCB

a. Remove front panel assembly, see section 1.
b. Remove securing bracket, two (2) screws.
c. Disconnect all multi-pin connectors, and wire harness from clips of PCB casing.
d. Remove one (1) earth connection on front heat shield.
e. Release PCB by removing three (3) screws.



f. Lift PCB on RHS & gently manoeuvre it out.

8) Removal of Combustion Fan Motor

g. Disconnect electrical supply.
h. Remove front panel assembly, see section 1.
i. Remove main PCB, see section 7 b)~f).
j. Remove four (4) combustion fan securing screws on mounting plate.

k. Grip fan motor plate and pull forward to remove fan from casing.
l. Remove connector from fan motor.

Note: Arrow should be aligned when fan assembly is replaced.

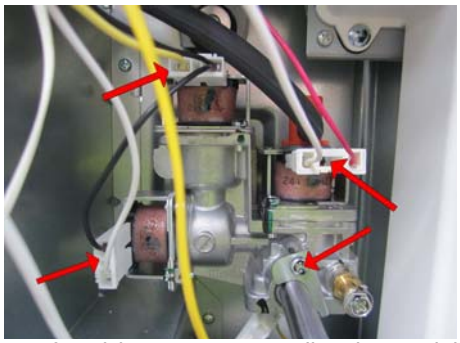
9) Removal of Main Transformer

a. Disconnect electrical supply.
b. Remove front panel assembly, see section 1.
c. Remove gas supply tube, see section 5 e)~f).
d. Remove blanking panel in front of transformer one (1) screw.
e. Release two(2)multi-pin connectors from main PCB.
f. Remove one (1) securing screw from transformer mounting bracket.

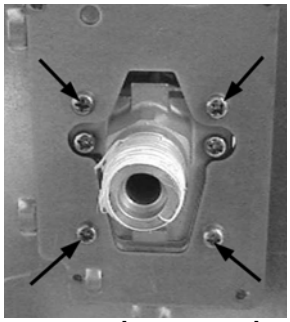
g. Pull forward.

10) Removal of Gas Control

a. Turn off gas supply at the meter and disconnect appliance from installation.
b. Remove front panel assembly, see section 1.
c. Release three (3) solenoid connectors and one (1) gas supply tube securing screw, release gas supply tube. Take care with O-ring.



d. Remove four (4) screws surrounding the gas inlet flange at back of heater.
e. Release hose clamp of air intake hose, back of heater and remove hose.
f. Pull gas control assembly forward to remove from appliance.



Note: Ensure test point screw is fitted to gas controls, if fitting new control.

CAUTION

240 volt potential inside appliance

Disconnect electrical supply

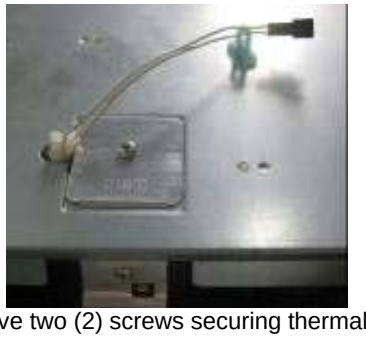
11) Removal of Room Thermistor

Note: Room temperature thermistor and heat exchanger overheat thermistor are connected together as one harness.

a. Remove front panel assembly; see section 1.
b. From rear of appliance, unclip thermistor from purse locks.
c. Remove one (1) earth connection on front of heat shield.
d. Release fusible link.
e. Remove ten (10) screws securing heat shield and lift heat shield off; see section 4- c)~d).
f. Remove overheat thermistor, see section4-e).

12) Removal of Thermal Fuse

a. Turn off gas at meter and disconnect appliance from installation.
b. Remove front panel assembly; see section 1.
c. Remove one (1) earth connection on front of heat shield.
d. Release fusible link.
e. Release ten (10) screws securing heat shield.
f. Disconnect wire connector along harness to release completely from appliance.



g. Remove two (2) screws securing thermal fuse.

h. Release thermal fuse from appliance.

18. Parts List

Effective: 11/12/12
Issue 1

ENERGYSAVER RHFE-561 FT (10-2825)

No	Part Name	RA CODE	11 DIGIT CODE
001	Rear Panel Assy		004-975-000
002	Frame R		047-5538000
003	Frame L		047-5539000
004	Frame Center		047-5540000
005	Bottom Plate Support		517-544-000
006	Humidifier Tray Fixing Plate		538-0676000
007	Humidifier Tray Fixing Plate		515-370-000
008	BRKT FILTER SIDE 556 557 309	90102161	538-059-000
009	BRKT FILTER BOTTOM 308 557FTR	90102179	538-064-000
010	Top Plate Supporter		044-224-000
012	PANEL TOP 561FT	90197101	001-0997000
013	PANEL CONTROL 561FT	90197103	063-0081000
014	BRACKET FRONT SUPPORT 561FT	90197105	044-225-000
015	PACKING FRONT SUPPORT 561FT	90197107	580-0856000
016	PANEL SIDE R 561FT	90197109	003-0056000
017	PANEL SIDE L 561FT	90197111	003-0057000
018	FILTER ASSY 1 557	90131749	017-986-000
019	FOOT FRONT 309 556 557 559	90165663	015-140-000
020	FOOT REAR 309 556 557 559	90165655	015-141-000
021	Floor Fixing Bracket		537-677-000
022	HEAT EXCH GASKET 556 557 559	90175563	580-640-000
023	LOUVRE ASSY 561FT	90197113	095-270-000
024	PANEL FRONT 561FT	90197115	019-4809000
025	Heat Shield Panel		030-0159000
026	SPACER TOP 561FT	90197119	034-0089000
027	SPACER R 561FT	90197121	034-0090000
028	SPACER L 561FT	90197123	034-0091000
029	Warm Air Seal Panel		512-420-000
030	Cord Packing B		580-149-000
031	Cord Packing A		580-148-000
032	Transformer Bracket		537-1122000
033	Under Cover Packing	90197127	
034	Lock A	90197127	
035	PANEL KICK 561FT	90197127	098-3489000
036	Guard		039-186-000

ENERGYSAVER RHFE-561 FT (10-2825)

No	Part Name	RA CODE	11 DIGIT CODE
037	Front Panel Bracket		517-512-000
038	CLIP WALL SPACER	90147471	504-018-000
039	DECAL RINNAI 309	90196518	602-0817000
040	Lock Bracket		517-513-000
041	Rear Panel Rectifier		146-137-000
100	Heat Exchanger Assy		314-897-000
101	Fixing Plate		537-735-000
102	Combustion Chamber Fixer		537-673-000
103	OHS Fixer		537-422-000
104	Burner Box		527-217-000
105	Flange Board		190-199-000
106	Seal Plate B		538-653-000
107	Flame Rod Retainer		538-277-000
108	FLAME ROD 308 557 556 1001/4	90142803	230-017-000
109	Flame Rod Bracket		537-849-000
110	Flame Rod Packing		580-458-000
111	BURNER ASSY 309 556 557 559	90170630	157-063-LPG
112	Seal Plate Packing		580-0615000
113	Burner Box Supporter Assy		538-276-000
114	GASKET BURNER BOX 309 556 559	90175662	580-641-000
115	Burner Box Fitting Plate Asyy		537-1094000
116	DAMPER 431 556	90178559	140-543-G00
117	DAMPER SECONDARY NG 557 559	90178740	140-564-100
117	DAMPER SECONDARY LP 557 559	90178112	140-564-200
118	PACKING BURNER BOX 561FT	90197129	580-0616000
119	Manifold D		101-808-000
120	INJECTOR NG 309 559	90196584	130-329-125
120	INJECTOR LP 559	90196582	130-329-082
121	PACKING MANIFOLD 561FT	90197131	580-392-000
122	Electrode Mounting Plate		506-179-000
123	ELECTRODE 561FT	90197133	202-246-000
124	PACKING ELECTRODE 561FT	90197135	580-0812000
125	GAS CONTROL 309 559	90196588	120-0083000
126	Inter Connection Assy		109-943-000
127	ORING 561FT	90197137	520-027-010

ENERGYSAVER RHFE-561 FT (10-2825)

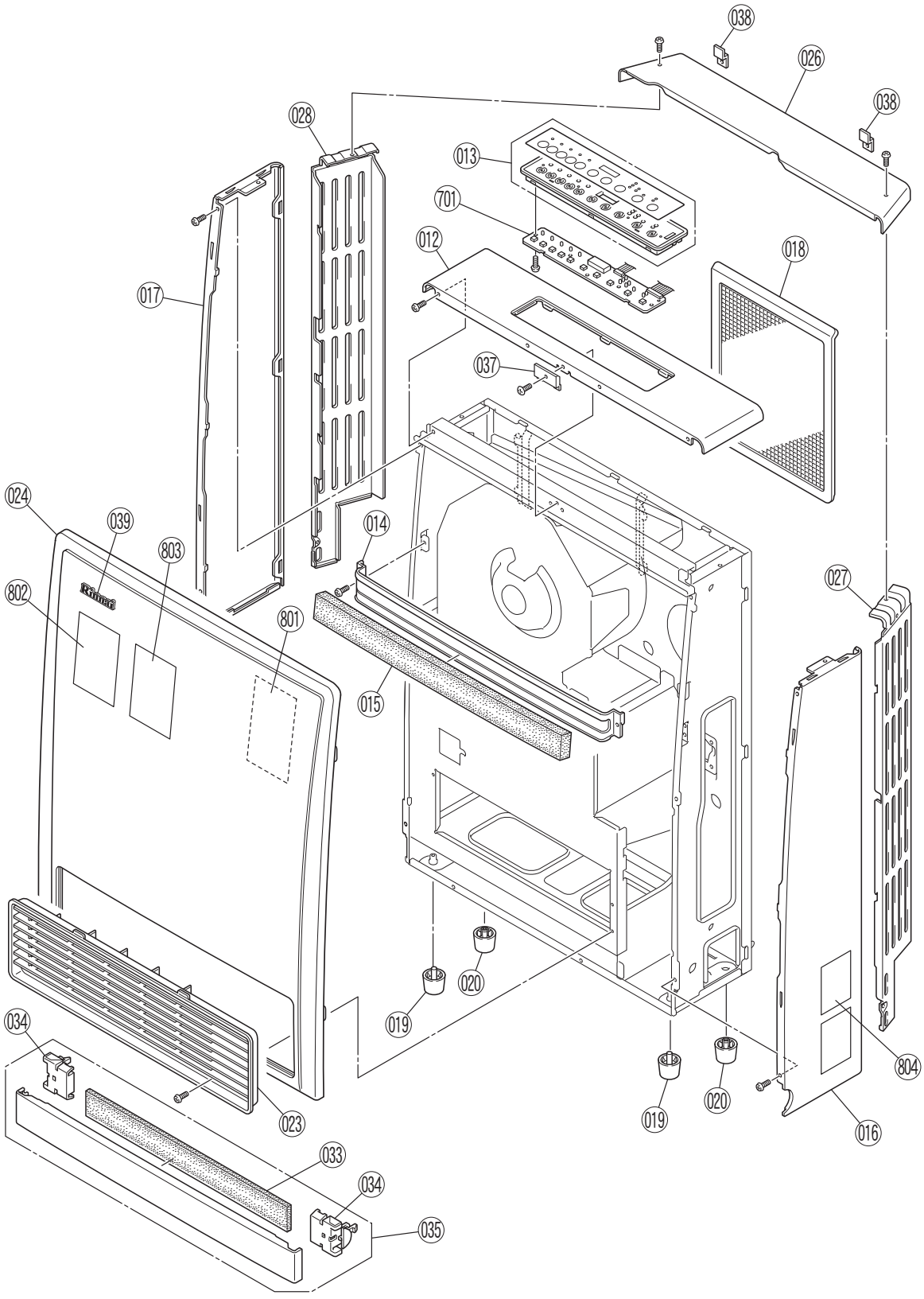
No	Part Name	RA CODE	11 DIGIT CODE
129	Pressure Point		501-193-000
130	GASKET 151 252 329 506 516 311	90176637	510-519-000
131	FILTER GAS 329 1004 RD4/6 311	90182692	017-0108000
132	FLANGE GAS INLET 556 557 559	90165515	106-301-000
133	Connecting Tube Retainer		538-0674000
134	Drain Collector		517-533-000
135	INLET AIR 559	90196590	094-026-000
136	SEAL INLET HOUSING 556 557 559	90123050	510-506-000
137	HOSE AIR INLET 556 557 309	90122961	513-126-000
138	ELBOW AIR INLET RUBBER 557 559	90122953	191-051-000
139	Combustion Chamber Communication Pipe		109-944-000
140	Air Supply Pipe		055-0111000
141	Connecting Tube Fixer		538-0606000
142	PACKING AIR GUIDE 561FT	90197139	580-0858000
143	Combustion Fan Casing Assy B		034-0092000
147	Screw		501-0319000
148	S Tight Screw		501-303-000
149	CUSHION 460 560 1004 30FT 311	90183195	540-051-000
150	Exhaust Slide Pipe All Assy		554-228-000
151	ORING EXHAUST 309 559	90196528	520-160-000
152	COVER OUTLET FLUE 403 556 557	90165382	034-457-000
153	CLIP INSTALLATION 556 557 559	90165374	552-075-000
156	SCREW TEST POINT	90195157	501-275-005
157	O RING (S4) TEST POINT 371TR	90195165	520-300-010
158	FAN COMB ASSY 561FT	90197141	040-419-000
159	FLUE LOCK CLAMP 431 553 556	90165358	512-327-000
160	ELEC CORD BKT 516 570 670 559	90177114	538-180-000
161	TUBE GAS CONTROL 561FT	90197143	513-212-000
162	*NLA*CLIP HOSE 556 USE90170341	90178146	538-065-000
400	FAN CONV ASSY 561FT	90197145	040-420-000
401	Capacitor		225-149-000
402	Convection Motor		222-702-000
403	Motor Fixing Plate		537-850-000
404	BLADE FAN CONV 557	90185968	040-185-000
405	Casing Assy		098-3490000

ENERGYSAVER RHFE-561 FT (10-2825)

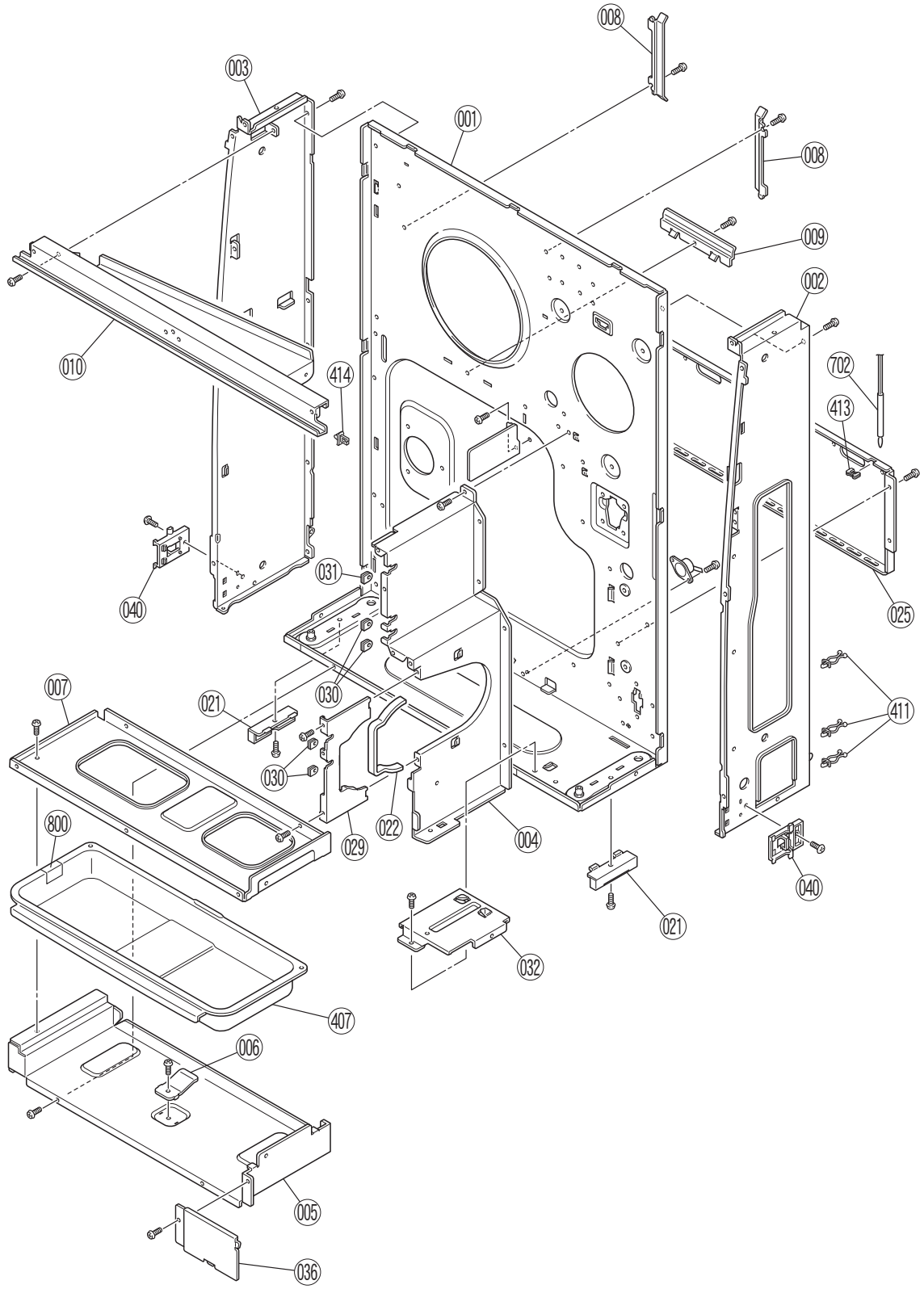
No	Part Name	RA CODE	11 DIGIT CODE
406	Front Panel Fixer		538-0677000
407	TRAY HUMIDIFIER 561FT	90197147	078-020-000
408	Heat Shield Plate		030-0351000
409	Front Panel Packing		580-0682000
410	TF Fixing Plate		537-1102000
411	Cable Clip		504-024-000
412	Wire Clip		505-122-000
413	Wiring Bracket		514-052-000
414	Wire Clip		505-142-000
700	PCB MAIN 561FT	90197149	200-2041000
701	PCB CONTROL 309 559	90196538	200-1824000
702	THERMISTOR 561FT	90197151	233-316-000
703	CORD POWER 561FT	90197153	206-323-000
704	TRANSFORMER 561FT	90197155	224-382-000
705	HARNESS SOLINOID 561FT	90197157	290-2315000
706	HARNESS FAN COMB 561FT	90197159	290-2316000
707	LEAD HIGH TENSION 561FT	90197161	203-899-000
708	HARNESS OHS 561FT	90197163	290-2320000
710	OHS 309 509	90196546	234-416-000
711	OHS 561FT	90197165	234-616-000
713	Electrode Sleeve		513-109-000
714	LEAD FLAME ROD 561FT	90197167	209-465-000
715	HARNESS THERMAL FUSE 309 559	90196552	290-1990000
800	Water Level Label B		602-654-000

19. Exploded Diagram

RHFE−561FT



RHFE-561FT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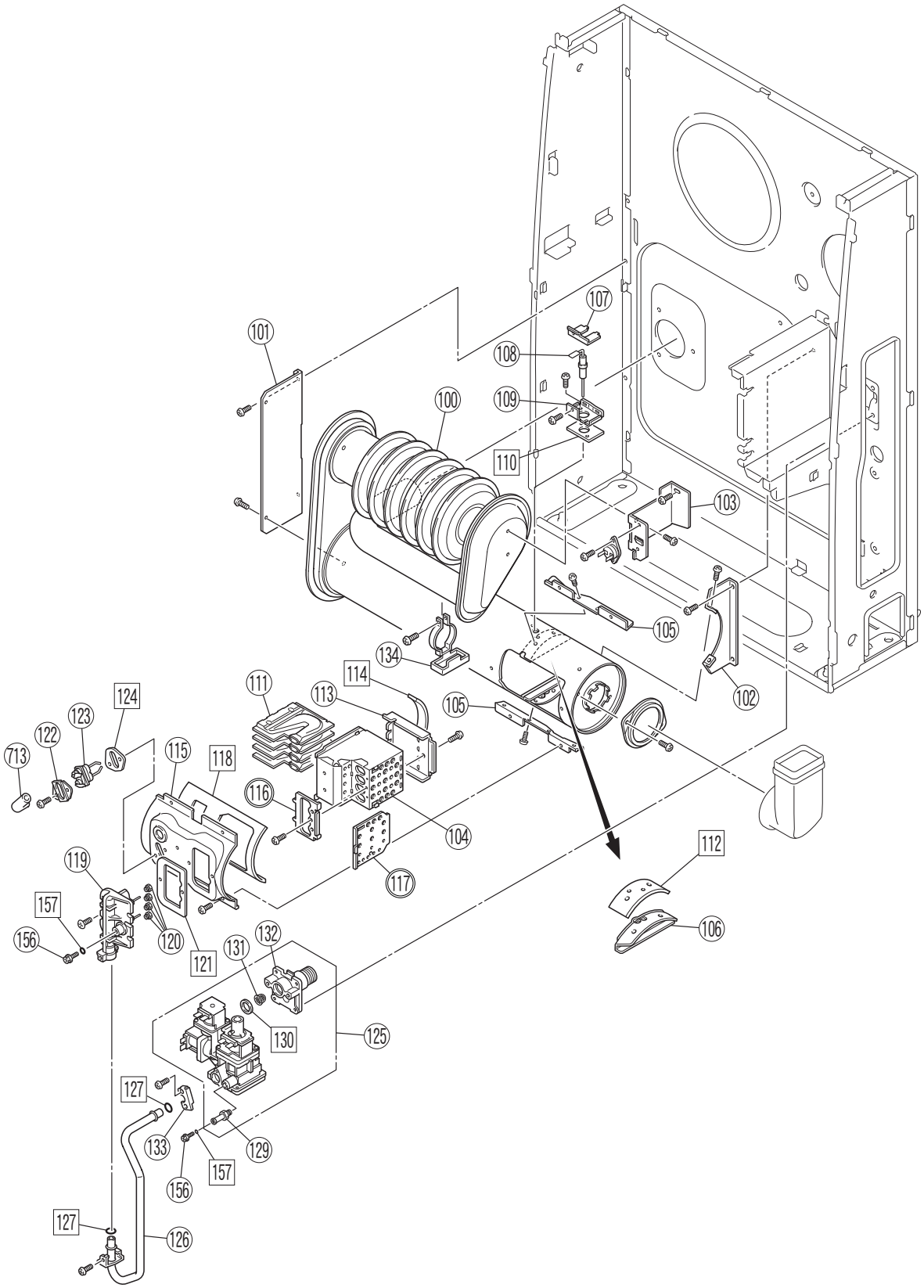
RHFE−561FT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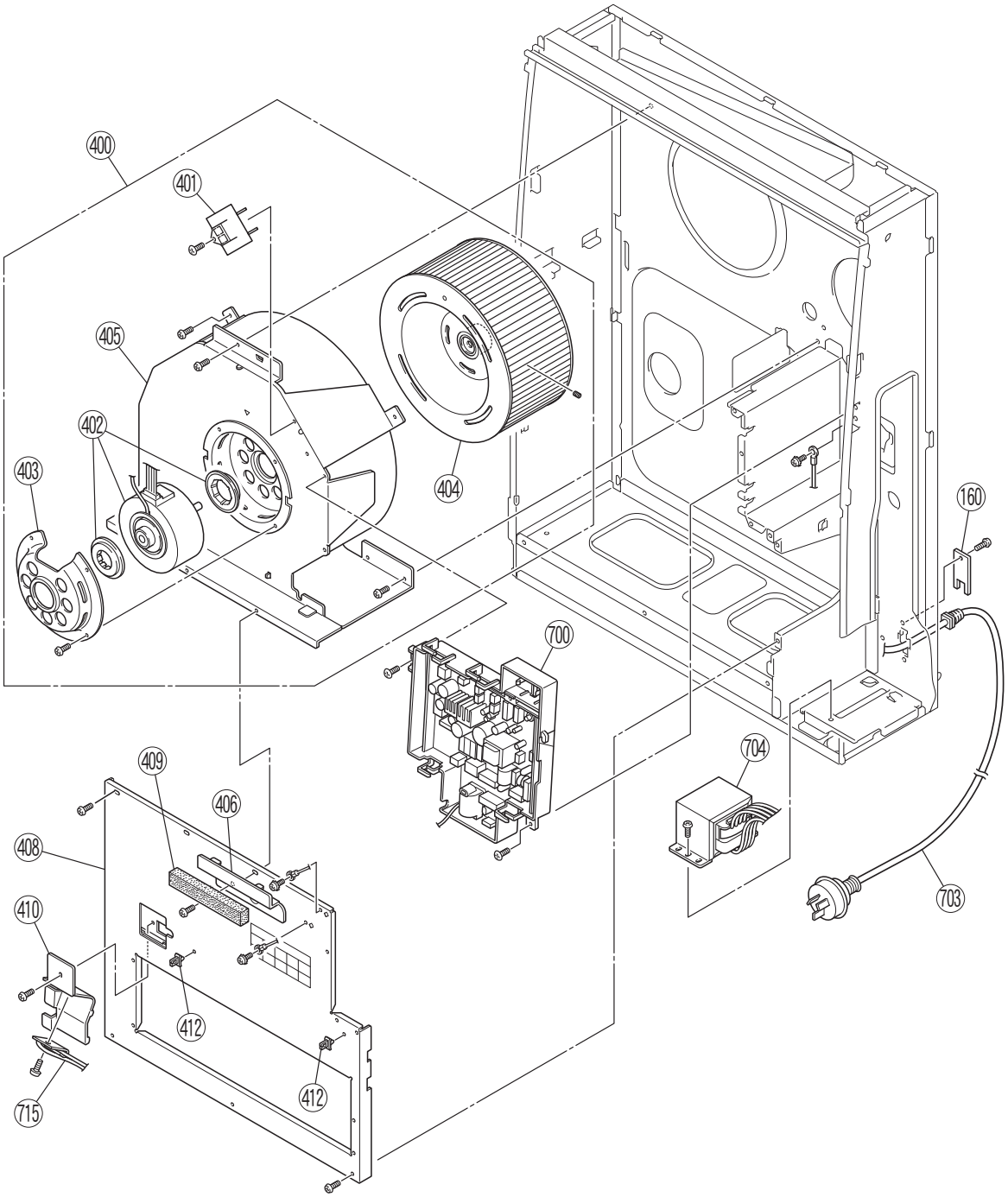
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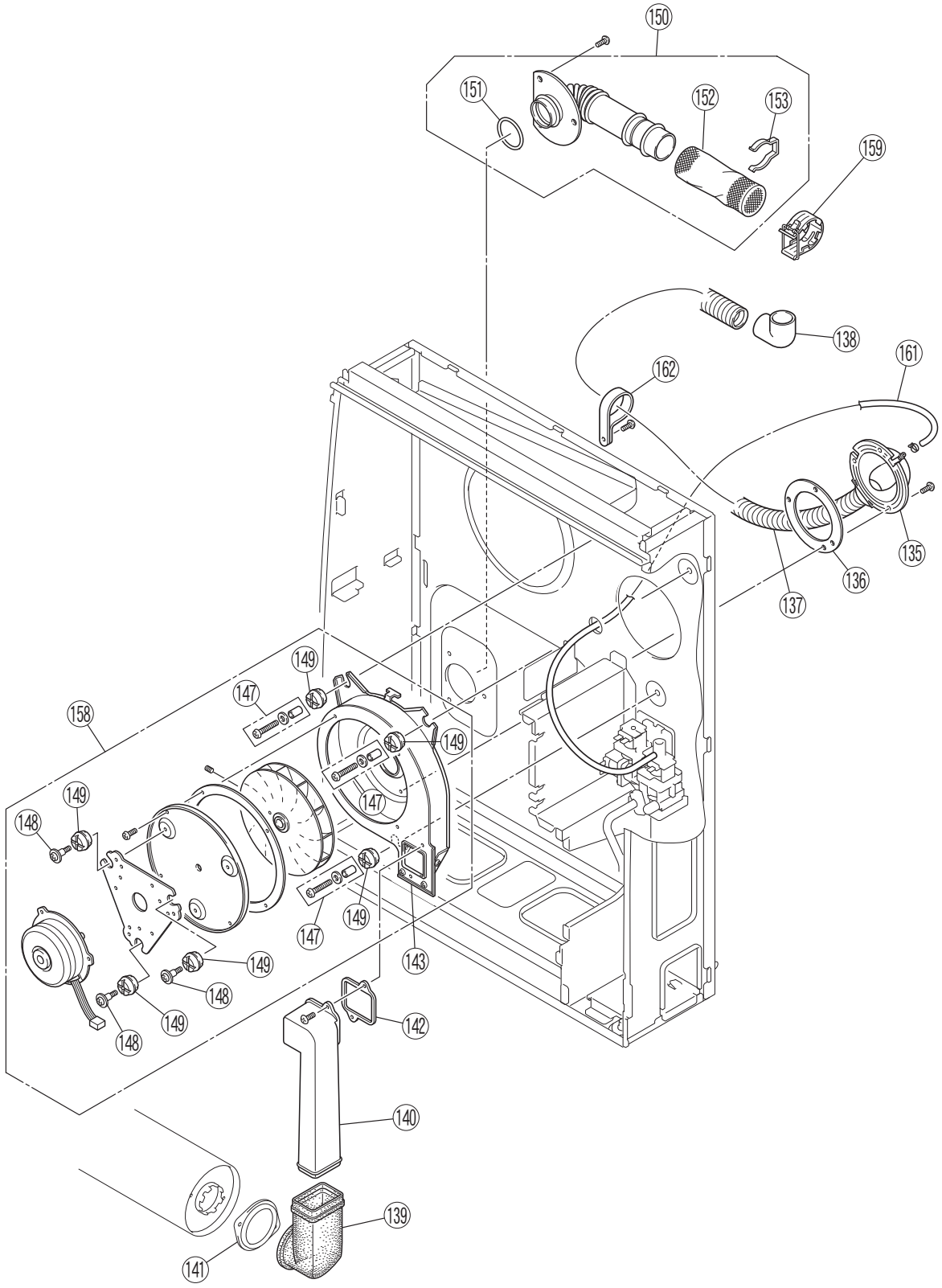
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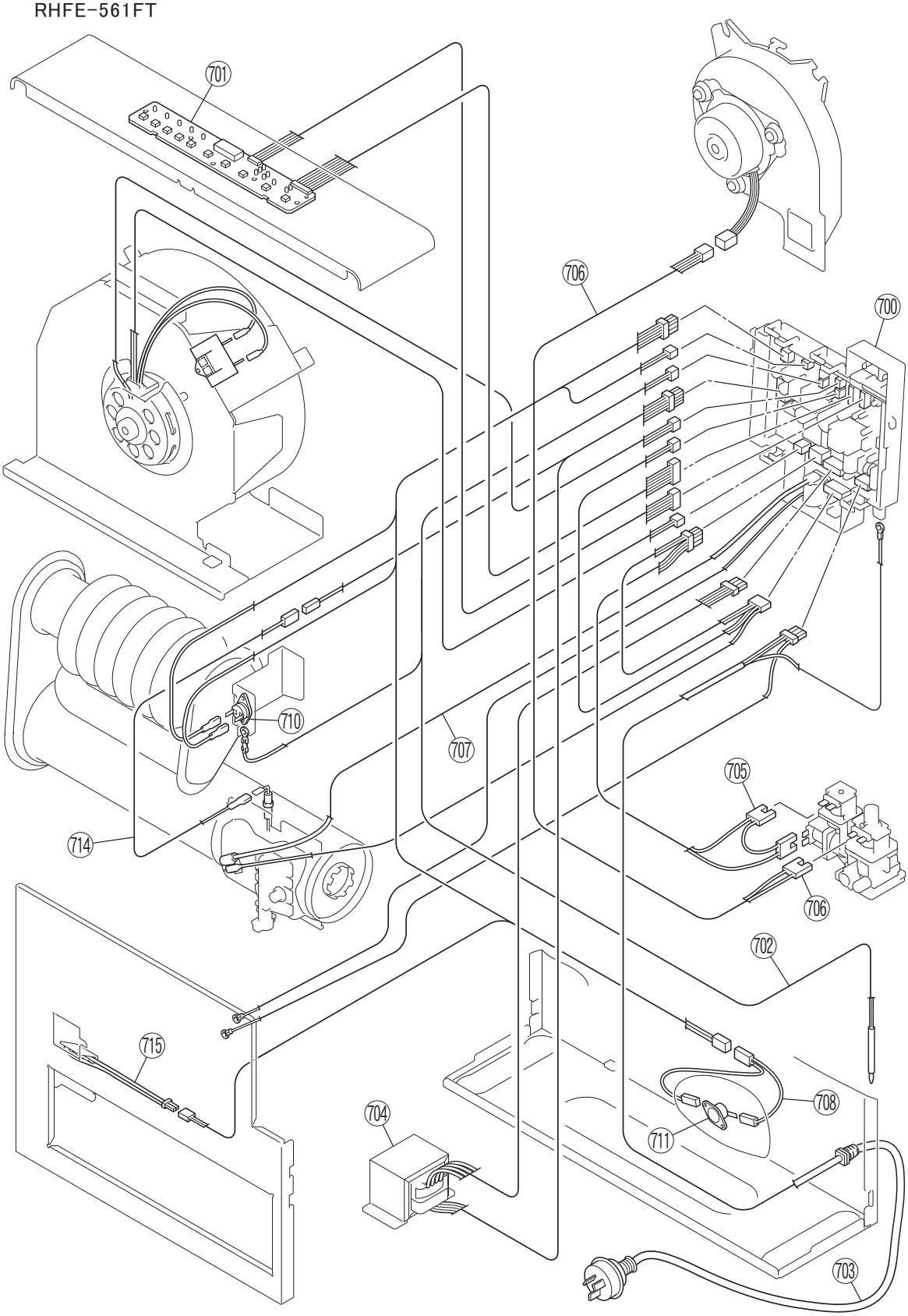
RHFE-561FT



20. Notes

Contact Points

Rinnai

Rinnai Australia Pty. Ltd. ABN 74 005 138 769

Head Office

10-11 Walker Street,
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P.O. Box 460
Tel: (03) 9271 6625
Fax: (03) 9271 6622

Internet: www.rinnai.com.au
E-mail: enquiry@rinnai.com.au

National Help Line
Tel: 1300 555 545* Fax: 1300 555 655*

Cost of a local call Higher from mobile or public phones.

Rinnai has a Service and Spare Parts network with personnel who are fully trained and equipped to give the best service on your Rinnai appliance. If your appliance requires service, please call our National Help Line. Rinnai recommends that this appliance be serviced every 2 years.

RHF561-1152(00)