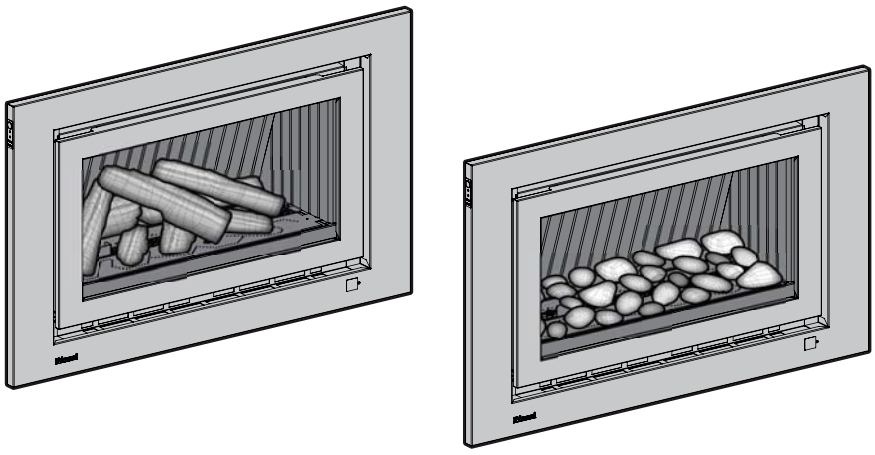
Rinnai

SERVICE MANUAL

RHFE-950ETR

RHFE-950ETR FLAME FIRE



The Australian Gas Association	All Rinnai products are certified by the Australian Gas Association as compliant to relevant Australian Standards.
TELARC REGISTERED SUPPLIER Quality Endorsed Company ISO 9001 Reg 415	Rinnai New Zealand has been certified to ISO 9001 Quality Assurance by Telarc.
N10378	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 N10378.

Produced by Technical Services Department

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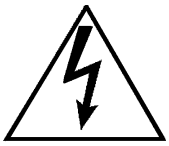
Key to Warning Symbols

Failure to comply with the following instructions may result in serious personal injury or damage to the appliance.



Be careful of possible electric shock. Wiring inside this appliance may potentially be at 240 Volts.

Read Fault Diagnosis and Wiring Diagram carefully to avoid incorrect wiring

Please follow instructions carefully to ensure safe and appropriate service. After completing the service and confirming that there no gas leaks or incorrect wiring, test operation of unit according to the Customer Operating Instructions. After confirming normal operation, explain what was serviced to the customer and operation principles if necessary.

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.

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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
mA	-	milliamps
MJ/h	-	megajoule per hour
mm	-	millimetres
OHS	-	overheat switch
PCB	-	printed circuit board
CPU	-	central processing unit
POT	-	potentiometer
rpm	-	revolutions per minute
SV	-	solenoid valve
ø	-	diameter
$\Delta^\circ C$	-	temperature rise above ambient
POV	-	modulating valve
TH	-	thermistor

Introduction

The Rinnai RHFE-950ETR Power Flued Gas Space Heater consists of a glass fronted combustion chamber with a single modulating burner and spark ignition. This Flame Fire is fitted with combustion and convection fans and includes over heat protection, and flame supervision for safety. The unit also consists of a modulating gas valve and electronic temperature control.

For all installations, the Rinnai RHFE-950ETR Flue system MUST BE used.

The appliance MUST NOT be flued into 'natural draft' flue pipes or via a chimney.

Features are:

- Set 'n' forget digital dual timers which allow you to program the appliance to come on and off for two set periods each day as desired.
- Pre-heat mode ensure the room is at your desired temperature by the time programmed into the timer all automatic.
- Temperature pre-set enables you to set your room temperature between 7°C to 32°C
- Extra low function allows the unit to turn to an extra low heat output setting if the room continues to rise after the set temperature is reached.
- Flame function overrides the thermostat and maintains a constant flame picture when you just want the ambience of the heater.
- 3 fan speed settings for added comfort and even temperature distribution.
- 7 heat settings provide highly refined room temperature control.
- Inbuilt zero clearance provides heat protection to surrounding structures allowing greater flexibly and reduced installation costs, as you no longer require a masonry (non-combustible) fireplace.
- Full function remote control to allow you to enjoy ambience of your flame fire without leaving the comfort of your chair.

This flame fire is available with a choice of fascias and finishes:

- Black with glass guard
- Stainless Steel with glass guard
- Black Stainless Steel inner frame
- Black inner frame

Media:

- Ceramic Logs
- Ceramic Stones

Main Componentry

CONSTRUCTION

General:

The construction of the appliance consists of a Combustion Chamber including Ceramic Glass Front Panel, Burners x2, Heat Exchangers x2 and the outer casing panels. The decorative front panel is removable and interchangeable in design however it includes the bottom convection air inlet and top warm air discharge Louvre.
The Gas Control and Spark Ignition Unit is located on the left hand side of the Combustion Chamber
The PCB, Remote Control Receiver, Power Supply and Transformer are located below the Combustion Chamber.
The Control Panel is located on the left hand side of the Front Panel.
The Convection Fan is located below and behind the Combustion Chamber and draws room air from the bottom into the fan, up the back of the combustion chamber, over the heat exchanger, across the top of the combustion chamber and out through the top front warm air discharge Louvre.
The Combustion Fan is located after the Heat Exchangers and Air for primary and secondary combustion is drawn from the Flue Terminal external to the appliance into the combustion chamber, through the heat exchangers and then out the inner section of the Flue Terminal. The Combustion Chamber and Heat Exchanger are therefore at negative pressure.

Dress guard:

2 options:
1. Consists of a decorative Tempered glass panel attached to the Front Panel. The double layer of glass with an air gap between reduces the external surface temperature below that which would require an additional primary guard.
2. Consists of a wire mesh panel attached to the Front Panel.

Secondary Air Inlet:

Air is induced into the bottom panel of the Combustion Chamber by an Ø50mm plastic hose and Ø50 mm inlet pipe.

Combustion Chamber:

The Combustion Chamber consists of a 5 sided box of volume 0.088m³ manufactured from aluminium coated steel thickness 0.8mm with a Ceramic Glass Front Panel. The joint sealing of the chamber is by mean of minimum 10mm overlapping faces continuously seam welded.
The Glass Panel is sealed against the Combustion Chamber Front face by means of fibreglass woven tadpole tape manufactured by Mid Mountain Materials Inc. USA.
The heat exchanger consists of 2 rectangular boxes manufactured from SUS 304 of thickness 0.5mm with 10mm flange joint continuously seam welded together.
Front Heat Exchanger 480mm x 330mm x 25mm
Rear Heat Exchanger 480mm x 220mm x 15mm
Secondary Heat Exchanger consists of a 1 meter length Ø50mm SS304 Corrugated semi rigid pipe.

GAS CONTROL AND BURNER

Gas Inlet Connection:

The gas connection is situated in the bottom left hand corner of the appliance below the gas control.
It consists of a Brass ½" BSPT to Ø 3/8" SAE flared fitting attached to an Ø10mm x 200mm. This hose is directly connected to the Gas control by a Ø3/8" SAE flare fitting.

Regulator:

A separate pressure regulator is provided for Pilot Burner only.
Type Maxitrol model RV12 LM 1/8".
Rated 100mbar CE-0085 AP 0665
A different spring is required for Natural and Propane gas type.

Main Burner pressure is regulated by Rinnai POV Modulating Valve

Piping:

The Main Burners are supplied gas through individual pipes of aluminium 8mm x 1.0mm wall thickness from the gas control solenoids to injector blocks attached to the burners.
The Ignition gas is supplied by a pipe of aluminium 6.0mm x 1.0mm directly from the Gas Control via a Bypass adaptor.

Gas Control:

The gas control consists of x4 DC90V solenoids in series.
The first x2 solenoids must be open to supply gas to the pilot assembly.
When the pilot flame rod senses that the pilot has lit the third solenoid then opens which supplies gas to the front burner only. When the front burner flame rod senses that the front burner has lit the fourth solenoid then opens which supplies gas to the rear burners. There is a POV modulating valve situated between the third and fourth solenoids which modulate the x3 main burners through x7 stages from high to low gas rate.
The PCB also monitors by means of OH thermistors, fan stoppage and a thermal fuse in the event of appliance overheating.

Burner:

The combustion system consists of 1 Burner.
Manufactured by Rinnai NZ Ltd
The Burner consists of a Ribbon Type Burner 580 x 40 x 30mm of material Stainless Steel SUS 430 thickness 0.8mm consisting of 11 x Slotted Ports 10mm x 1.5 and 88 x Round Ports Ø 1.8mm.
The Burner Top Panel is secured and sealed by lock seam joint spot welded and TIG welded at each end.

Electronic Ignition:

Electronic spark ignition is provided to the burner assembly via a two pronged spark electrode. Spark must prove it has jumped across the gap between the two electrodes otherwise the ignition sequence will not continue.

Pressure Test Point:

1. There are x4 Pressure Test Points.
2. Supply Pressure Test Point is located on the gas inlet connection just before the first solenoid.
3. Ignition pressure point located on the outlet elbow of the Ignition Regulator.
4. Gas Control Test Point located after the POV and before the 4th solenoid.
5. Combustion Chamber pressure Test Point measured in conjunction with 3 to give true pressure differential.

All of these test points consist of an Ø9mm Nipple with an Ø0.7mm hole and sealed with a removable M4 screw and fibre gasket.

Heating System:

Fan forced convection. Fan forced air blown across combustion chamber, heat exchanger and through bottom warm air discharge louvre.
Radiant heat from glow of ceramic panels and yellow flame.

Burner Media:

Glass Beads and Quartz Stones are placed in front of the burner for decoration but are not in contact with the flames.

Warm Air Outlet:

Warm Air Discharge is through the Front Panel Louvre located below the Combustion Chamber.

Electricals:

Power cord, Length 1.5,m Rating 10 A, 3 wire, 3 pin earthed plug.

Ignition

240V 50Hz High voltage electronic spark generation unit activated by PCB from ON/OFF button on the control panel or remote control.

Combustion Fan

Double Ø160mm x 180mm - 3 speed - Centrifugal Activated by PCB and speeds are synchronised with gas rate.

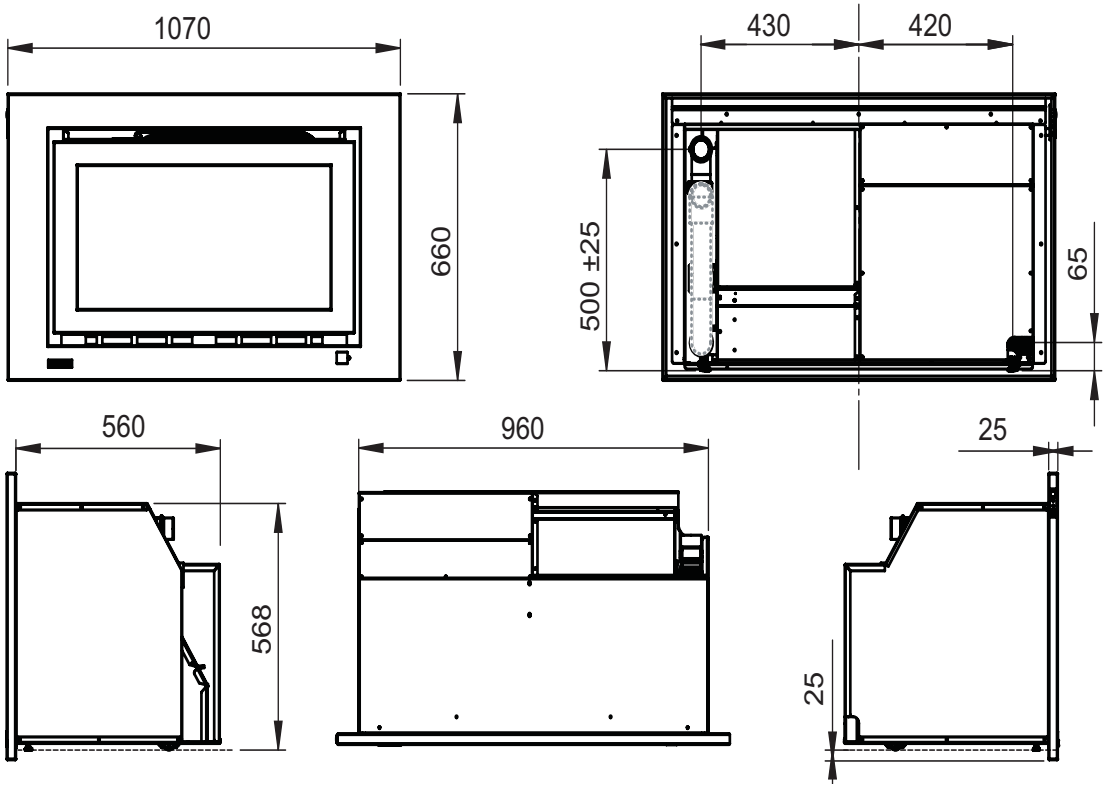
General Installation

PRODUCT SPECIFICATIONS

Model:	RHFE-950ETR		
General description:	Inbuilt, Fan Exhaust Balanced Flued Convection Flame Fire with Electronic Temperature Control, Timer and Remote.		
Gas input rate (MJ/hr):		Natural Gas	Propane
	Low	10	10
	High, Extended flue / Direct flue	31/34	31/34
Output (kW):		9.2	9.2
Heat-up area (m2)	125m2 (cool areas)		
Gas control:	Manual On/Off, 3 Heat Settings (Electrical touch control). Remote (RF)		
Burner:	Ribbon Burner		
Gas Supply Pressure (kPa):		1.13 - 3.5	2.5 - 3.5
Gas Connection:	1/2" BSPT x 5/8" SAE Male flare		
Guard:	Triple-glazed glass TBC - no need for dress guard? Cool to touch glass		
Flue System:	Fan assisted, twin chamber coaxial flue system, provides air for combustion to the appliance and allows expulsion of combustion products to atmosphere. Results in 'room sealed' appliance.		
Convection Fan:	Double 160 mm x 180 mm (diameter) 3 Speed - Centrifugal		
Combustion system	Naturally aspirated burner		
Burner Media:	Ceramic Logs or Ceramic Stones		
Ignition system:	Continuous spark electronic ignition		
Thermostat	Thermostat in remote, wireless remote		
Operation:	Push button electronic / Remote control		
Safety devices:	Overheat thermistor Flame failure sensing system Thermal fuse	Overcurrent fuse Spark detector Air temperature thermistor	
Colour:	Black engine, black and silver fascia options		
Installation type:	Inbuilt Masonry		
Weight:	60 Kg.		

The manufacturer reserves the right to change or modify specifications without notice.

APPLIANCE DIMENSIONS

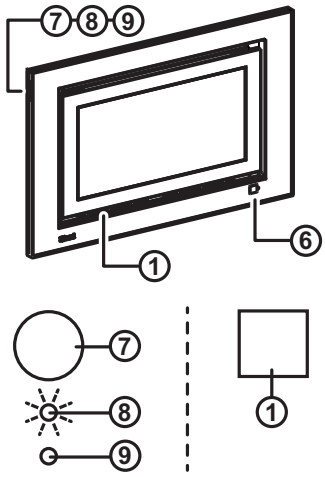


Operation Principles

GENERAL NOTES ABOUT IGNITION

This appliance has a sealed combustion chamber that requires purging before gas is allowed to flow and the ignition sequence begins. As a result the combustion fan starts several seconds before there are any signs of ignition. The normal ignition sequence is as follows:

1. When the On/Off ⑦ button is pressed the Operation Indicator ⑧ LED will glow blue and Combustion fan will rotate to purge the system.
2. Pilot sparker operates.
3. As soon as a spark is sensed, gas will flow to the main burner.
4. When burner has established the heater will automatically modulate between burner settings to achieve and maintain the default set temperature of 22°C.



NOTE

When using the heater for the first time or after long periods of non use, ignition may not occur the first time it is operated due to air in the gas pipes. If ignition does not occur after approximately 60 seconds the unit will cease operation automatically. Try operating the heater again if this occurs.

The heater may make noises after ignition or extinction. This is due to expansion and contraction of the internal components and is normal.

The heater will not ignite if the ON/OFF button is pressed straight after extinction. After approximately 20 seconds has passed the unit will automatically go into ignition mode.

Notes about the remote control:

The remote control holds all of the clock, timer and variable temperature settings for the heater so it is important that you read these instructions and take care note to damage or loose the remote control. If the remote control is lost or the batteries go flat, the heater will still operate using the on/off button on the top of the heater using an automatic room temperature setting of 22°C, but the clock and timer settings will be lost until the remote control connection is re-established.

The remote control operates using an infra-red (IR) signal and must be aimed towards the receiver unit (on the bottom right of the heater below the air inlet) for proper transmission. The range of the remote control may vary depending on the style of heater installed and the strength of the remote control batteries. The normal operating range is within 5 metres and at angle of less than 30° to the heater. If the remote does not operate correctly within this range, the batteries may need replacing. Use only alkaline type batteries.

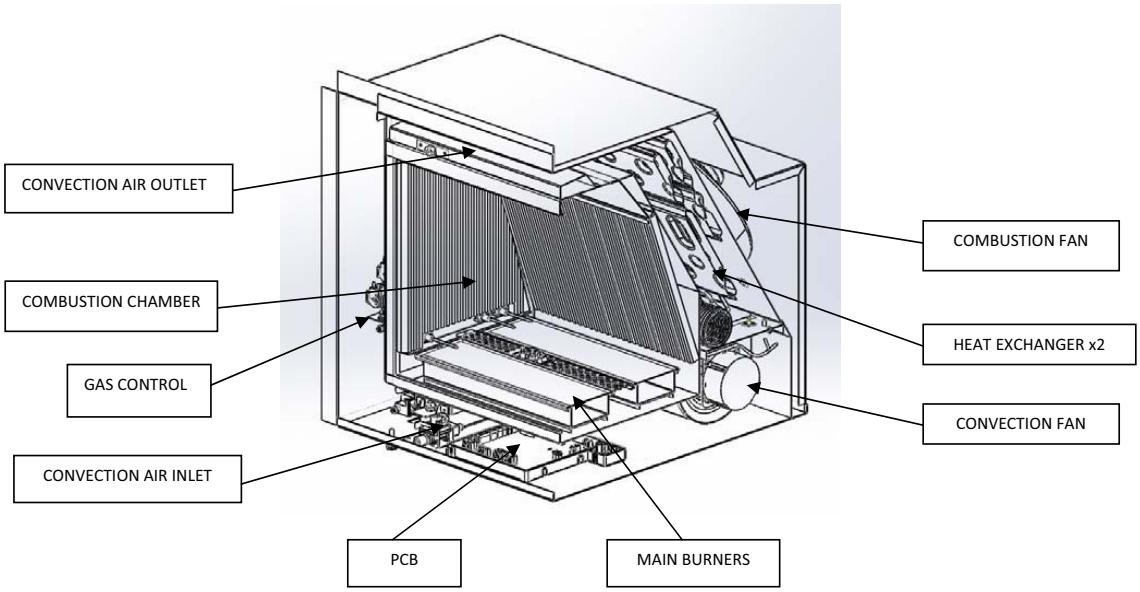
The remote control sends information to the heater every time a button is pressed with the following exceptions:

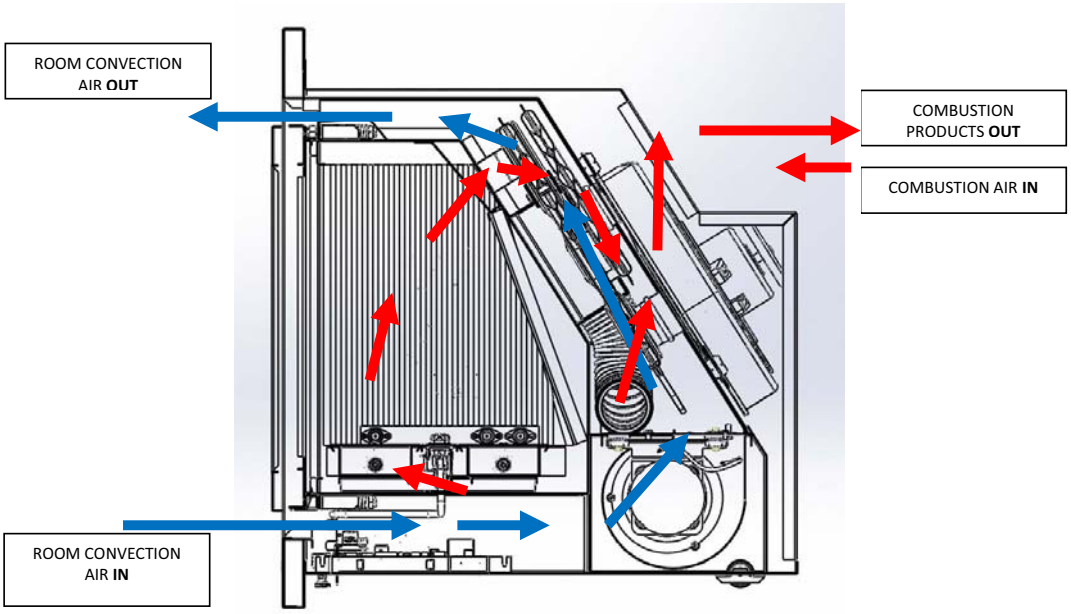
1. When the display has turned off, any button will restore power to the display.
2. When setting the clock and timers, the information is only sent each time the Time Set button is pressed.
3. When the lock function is activated.

Transmission is indicated on the remote display with a flashing symbol and the receiver light on the heater will flash briefly and a beep will sound.

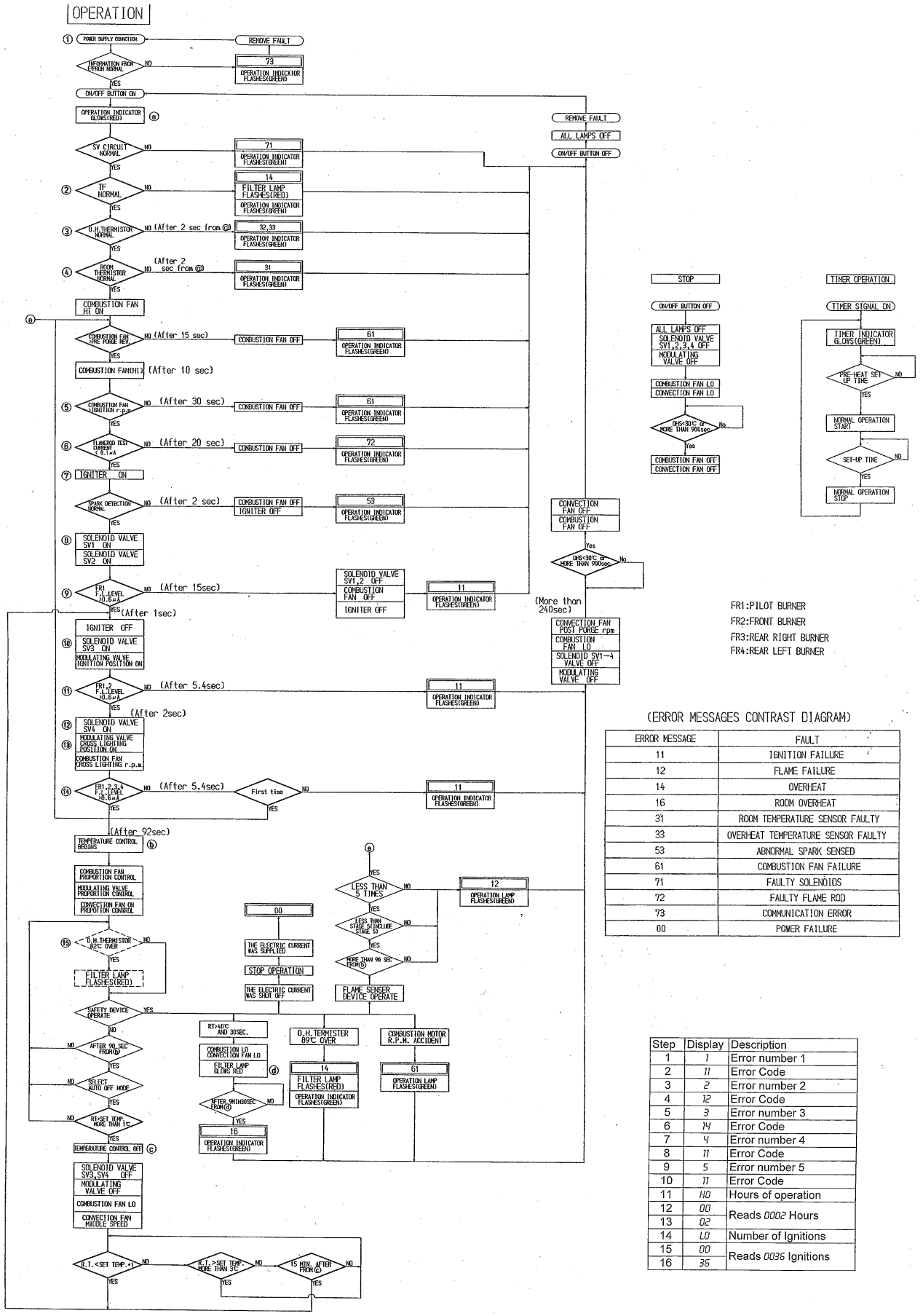
To save battery life the remote control display will turn off automatically after 1 minute of inactivity. When the display is reactivated by pressing any button on the display, the last used settings will be displayed.

Cut - Away Diagram





Operational Flow Chart



FR1:PILOT BURNER
FR2:FRONT BURNER
FR3:REAR RIGHT BURNER
FR4:REAR LEFT BURNER

(ERROR MESSAGES CONTRAST DIAGRAM)

ERROR MESSAGE	FAULT
11	IGNITION FAILURE
12	FLAME FAILURE
14	OVERHEAT
16	ROOM OVERHEAT
31	ROOM TEMPERATURE SENSOR FAULTY
33	OVERHEAT TEMPERATURE SENSOR FAULTY
53	ABNORMAL SPARK SENSED
61	COMBUSTION FAN FAILURE
71	FAULTY SOLENOIDS
72	FAULTY FLAME ROD
73	COMMUNICATION ERROR
00	POWER FAILURE

Step	Display	Description
1	1	Error number 1
2	11	Error Code
3	2	Error number 2
4	12	Error Code
5	3	Error number 3
6	14	Error Code
7	4	Error number 4
8	11	Error Code
9	5	Error number 5
10	11	Error Code
11	H0	Hours of operation
12	00	Reads 0002 Hours
13	02	
14	L0	Number of Ignitions
15	00	Reads 0036 Ignitions
16	36	

Fault Analysis

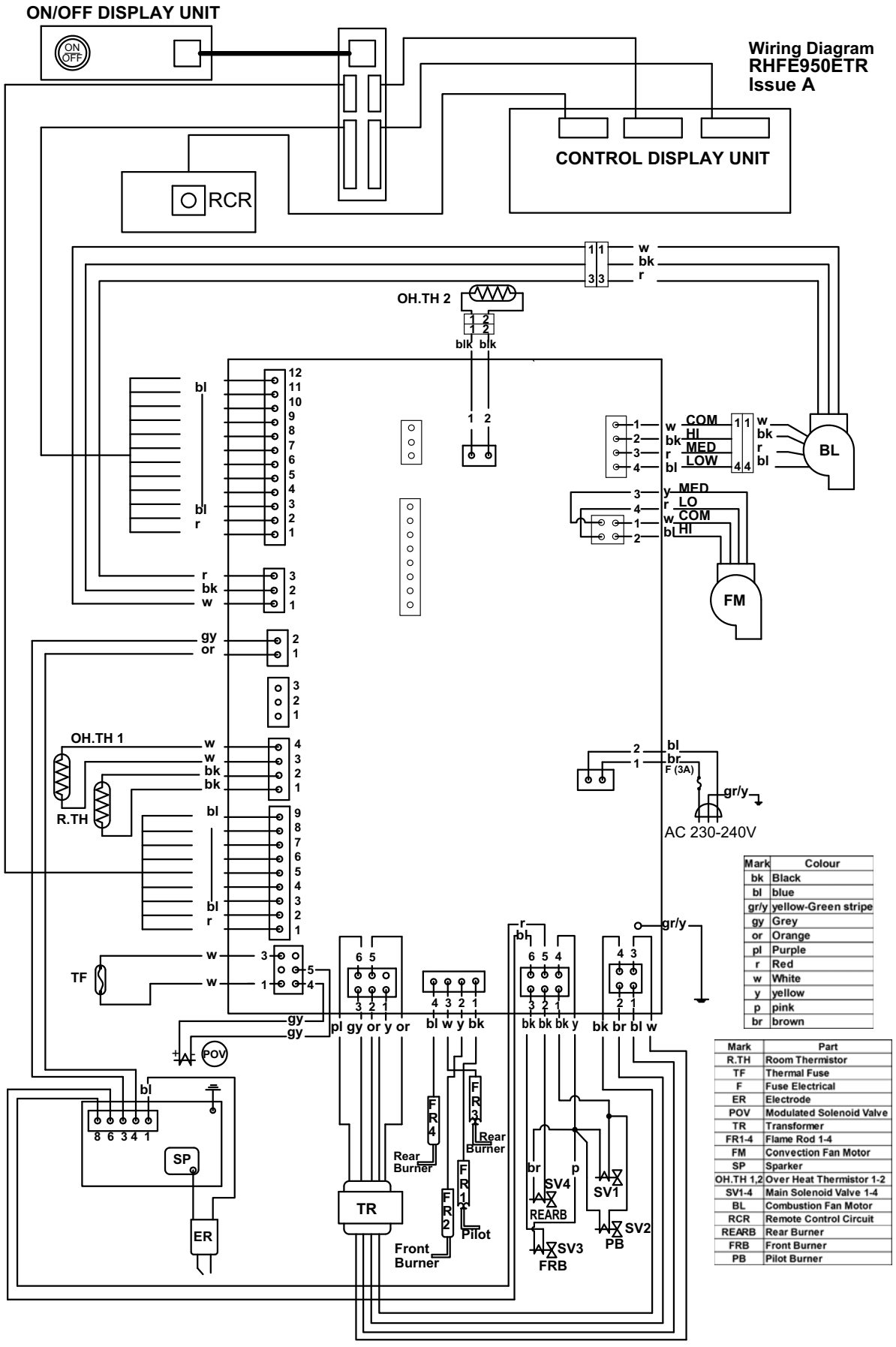
CAUTION! - The electricity supply must be disconnected prior to attempting any service or repairs to the heater. All repair work must be undertaken by an authorised person only.

	Nature of fault	Fault code	Examination point	Diagnostic point	Values	Y/N	Action
1	Power failure	-:-- or 00	power available to the power point?	Check power point	AC 216-264VAC	Yes	Go to (2)
						No	Check and restore power supply
			Is there power to the appliance	Check Power point and Lead	AC 216-264 VAC	Yes	Go to (2)
						No	Check and repair / replace faulty plug or lead. Check 3A fuse replace if necessary. See trouble shooting table above.
2	Combustion fan does not operate	61	Visual	Flue outlet		Yes	Go to (3)
						No	Check power to combustion fan
	Is power available to combustion fan	No error code Power Out	Check power at connector to combustion fan at rear of heater	Connector	240V	Yes	Check resistance across combustion fan motor windings Black – White 218.8Ω, Black – Red 249.1Ω,White – Red 31Ω
					240V	No	Check connector on PC and wiring from PCB to combustion fan connector at rear of heater. If no power faulty PCB.
	No damage to plug and wiring from PCB to fan		Visual	Plug and wiring from PCB to fan plug		Yes	Faulty PCB. Replace
						No	Rectify damage. Restore power to Combustion fan
3	No spark ignition	11	Check igniter probe/ lead disconnected /damaged	Visual		Yes	Go to (4)
						No	Check igniter lead and probe for damage and replace if necessary
	Spark occurs but burner does not ignite	53		Visual		Yes	Check gas supply. Check power to Solenoids, if ok check resistance across Solenoids 1 & 2 is 8.95kΩ, Resistance across modulating valve solenoid is 74Ω. Replace if necessary.
						No	Go to (4)
4	Burner ignites but goes off after a while.	12	Main burner	Visual		Yes	Uneven Interupted Spark
						No	Go to (5)
5	Does Convection fan operate	14		Visual		Yes	Ok. Lighting up Sequence complete.
						No	Check resistance across OH sensor ~117kΩ Check power to fan. Check capacitor. Replace if faulty. Check fan motor windings. 0.935kΩ across windings. Red & White wires. Replace fan if no resistance Check fusible link, if overheated one shot fusible link will shut gas supply to heater.

Diagnostic Points

PCB	Component		PCB Term	PCB Output/Input	Wire Colour	Component Value
A	Combustion Fan	Hi	1~2	AC 105~135V	White~black	40~ 80 Ω
		Med	1~3	AC 105~135V	White~red	50~ 90 Ω
		Low	1~4	AC 105~135V	White~blue	60~100 Ω
B	Convection Fan	Hi	1~2	AC 105~135V	White~blue	180~ 220 Ω
		Med	1~3	AC 105~135V	White~yellow	200~ 240 Ω
		Lo	1~4	AC 105~135V	White~red	270~310 Ω
C	Power Cord	Supply	1~2	AC 216-264 V	Brown~blue	AC 216-264 V
		Fuse			Brown~Brown	< 1 Ω
D	Transformer		2~1	AC 216~264 V	Brown~Blue	2~ 12 Ω
			4~3	AC 216~264 V	Black~White	5~ 10 Ω
E	Gas Valve Control	SV1 & 2	1~4	DC 85~110 V	Black1~Yellow	1.1~1.7 kΩ
		SV3	3~4	DC 85~110 V	Black3~Yellow	2.6~3.2 kΩ
E	Sparker Control		5~6	AC 100~140 V	Red~Blue	
F	Flame Rods			PCB Term		
		Left Left Centre Right Centre Right	1~FR 2~FR 3~FR 4~FR	4 2 1 3	Blue~FR Yellow~FR Black~FR White~FR	
		Pre-Ignition				<DC 0.1μA
		Normal				≈DC 2.0μA
		Minimum				≈DC 0.7μA
G	Transformer		2~5	AC 18~28 V	Orange~Orange	0.1~3.0 Ω
			1~3	AC 185~225 V	Yellow~Grey	25~35 Ω
			3~6	AC 10~20 V	Grey~Purple	0.1~3.0 Ω
H	POV		4~5	DC 1~17 V	Grey~Grey	75~95 Ω
H	Thermal Fuse		1~3	< DC 1 V	White~White	<1 Ω
J	Room Thermistor	10 °C	1~2		Black~Black	62~72 kΩ
		20 °C	1~2		Black~Black	33~43 kΩ
J	Overheat Thermistor 1	10 °C	3~4		White~White	119~136 kΩ
		20 °C	3~4		White~White	74~82 kΩ
M	Combustion Fan Speed Sensor	Voltage Supply	1~2	DC 12 V	White~Black	
		Hi Speed	2~3		Black~Red	89~104 Hz
		Med Speed	2~3		Black~Red	72~87 Hz
		Lo Speed	2~3		Black~Red	45~60 Hz
O	Overheat Thermistor 2	10 °C	3~4		Black~Black	119~136 kΩ
		20 °C	3~4		Black~Black	74~82 kΩ

Wiring Diagram



Mark	Colour
bk	Black
bl	blue
gr/y	yellow-Green stripe
gy	Grey
or	Orange
pl	Purple
r	Red
w	White
y	yellow
p	pink
br	brown

Mark	Part
R.TH	Room Thermistor
TF	Thermal Fuse
F	Fuse Electrical
ER	Electrode
POV	Modulated Solenoid Valve
TR	Transformer
FR1-4	Flame Rod 1-4
FM	Convection Fan Motor
SP	Sparker
OH.TH 1,2	Over Heat Thermistor 1-2
SV1-4	Main Solenoid Valve 1-4
BL	Combustion Fan Motor
RCR	Remote Control Circuit
REARB	Rear Burner
FRB	Front Burner
PB	Pilot Burner

If the supply cord is damaged or requires replacing, it must be replaced by the manufacturer or the manufacturer's agent or similarly qualified person in order to avoid a hazard. The supply cord must only be replaced with a genuine Rinnai spare part.

Error Code Messages

FAULT FINDING PROCEDURE

Use the following chart to help determine whether a service call is required, however if you are unsure about the way your heater is operating, contact Rinnai Australia, or your local agent.

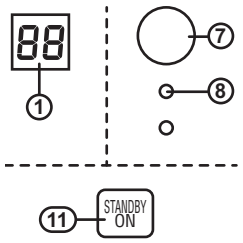
Fault Condition / Probable Cause ↓	No Display on remote	No ignition or control panel indicators	Burners fail to ignite	Combustion stops during operation	Smell of gas	Remote control doesn't work	Possible Remedy ↓
Not plugged in or turned on		●				●	Plug in power cord or press On/Off (7) button.
Mains power failure		●		●			Use power failure reset procedure
(Initial Installation) Air in gas pipe			●				Installer to purge air from gas supply.
Filter obstructed				●			Remove the obstruction from the louvres.
Gas escape					●		Contact Rinnai for service, (contact numbers page 36).
On Time Set						●	Use the Override.
Lock Set						●	Cancel lock
Gas supply turned off			●	●			Turn gas supply on at meter or cylinder
Flat batteries	●						Replace the remote control batteries 2 x 1.5v (AAA).
Remote Control lock-up due to miss operations such as the remote signal being out of range, incorrectly aimed or obstructed.						●	Press the STANDBY/ON (11) button.

ERROR CODES

Your Flame Fire Heater is also fitted with self diagnostic electronics that monitor the appliance during start-up and operation.

Should a fault occur the heater will shut down, the fault that has caused the shut down will be indicated by a pair of flashing digits in the Error Display (10) window and a 'Green' flashing Operation Indicator (8).

Refer to the table below for probable cause and the suggested remedy.



Code	Probable Cause	Suggested Remedy
00	Power failure while is on	Switch heater to STANDBY and then ON again.
11	Ignition failure	Check gas supply is turned on, switch the heater to Standby and then On again. If ignition failure continues to occur a Service call will be required.
12	Incomplete combustion	Contact Rinnai.
14	Overheat	Contact Rinnai.
16	Room overheat	Lower room temp to below 40°C.
31	Room temperature sensor faulty	Contact Rinnai.
32	Overheat temperature sensor faulty	Contact Rinnai.
53	Spark sensor faulty	Contact Rinnai.
61	Fan motor faulty	Contact Rinnai.
71	Solenoids faulty	Contact Rinnai.
72	Flame detection circuit fault	Contact Rinnai.
73	Communication error	Contact Rinnai.

CLEANING

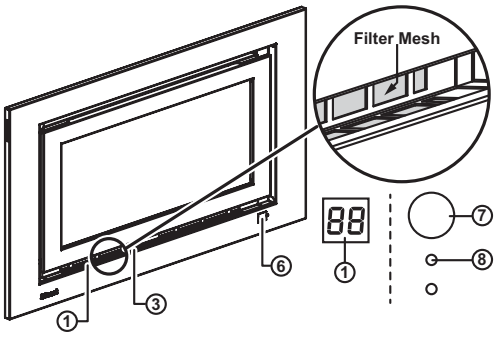
Your heater needs very little maintenance, however the following information will help you keep it looking good and working efficiently.

NOTE

- **Unplug electrical cord before cleaning.**
- **DO NOT USE SOLVENTS. All parts of the heater and remote control can be cleaned using a soft, damp cloth and a mild detergent.**
- **DO NOT attempt to clean the heater while the appliance is hot or operating.**

FILTERS

The filter meshing for this appliance is fixed to the inlets of the room air return ③.



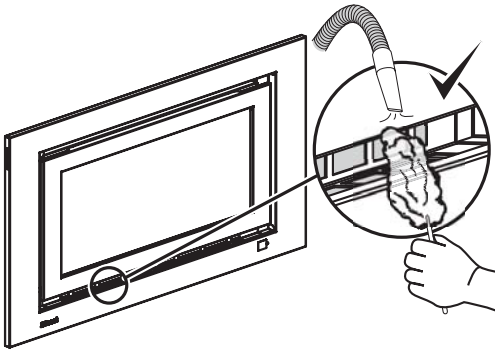
The build up of dust or other particles on these filter strips reduces the air flow through to the heater which in turn reduces heater's efficiency and can lead to the appliance shutting down.

Filter Care

Filters require cleaning regularly during the heating season to prevent these unnecessary cut-outs.

Cleaning filter strips:

Clean any dust and other debris from both faces of the filters with either a vacuum cleaner, a soft dry cloth or a soft brush. **NEVER** attempt to clean filters with water.



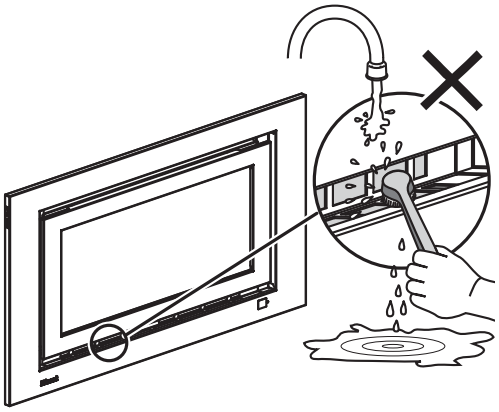
Heater shut down due to filter blockages

DO NOT wait for the Filter Blockage Indicator to come on before cleaning filters.

DO NOT continue to use the heater once this Indicator is flashing.

When an obstructive build up is detected the Blockage Indicator LED which is located above the Receiver Window ⑥ will begin to flash RED to let you know that there is a problem.

Once the Indicator is flashing if no action is taken the heater will eventually shut down to avoid overheating and a fault code of 14 will be displayed in the Error Display ⑩ window.



Returning the appliance to normal operation after a shut down

To restore to normal operation after a filter blockage shut down do the following:

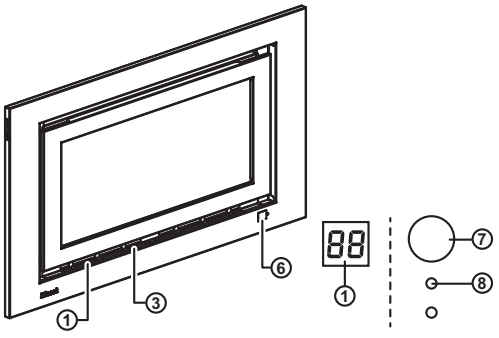
1. Press the On/Off ⑦ button once to turn off the heater.
2. Remove obstruction (see “Filter Care” on page 15).
3. Press the On/Off ⑦ button once to turn the heater back on.
4. Use the remote control to resume normal heater operation.

WARM AIR VENT

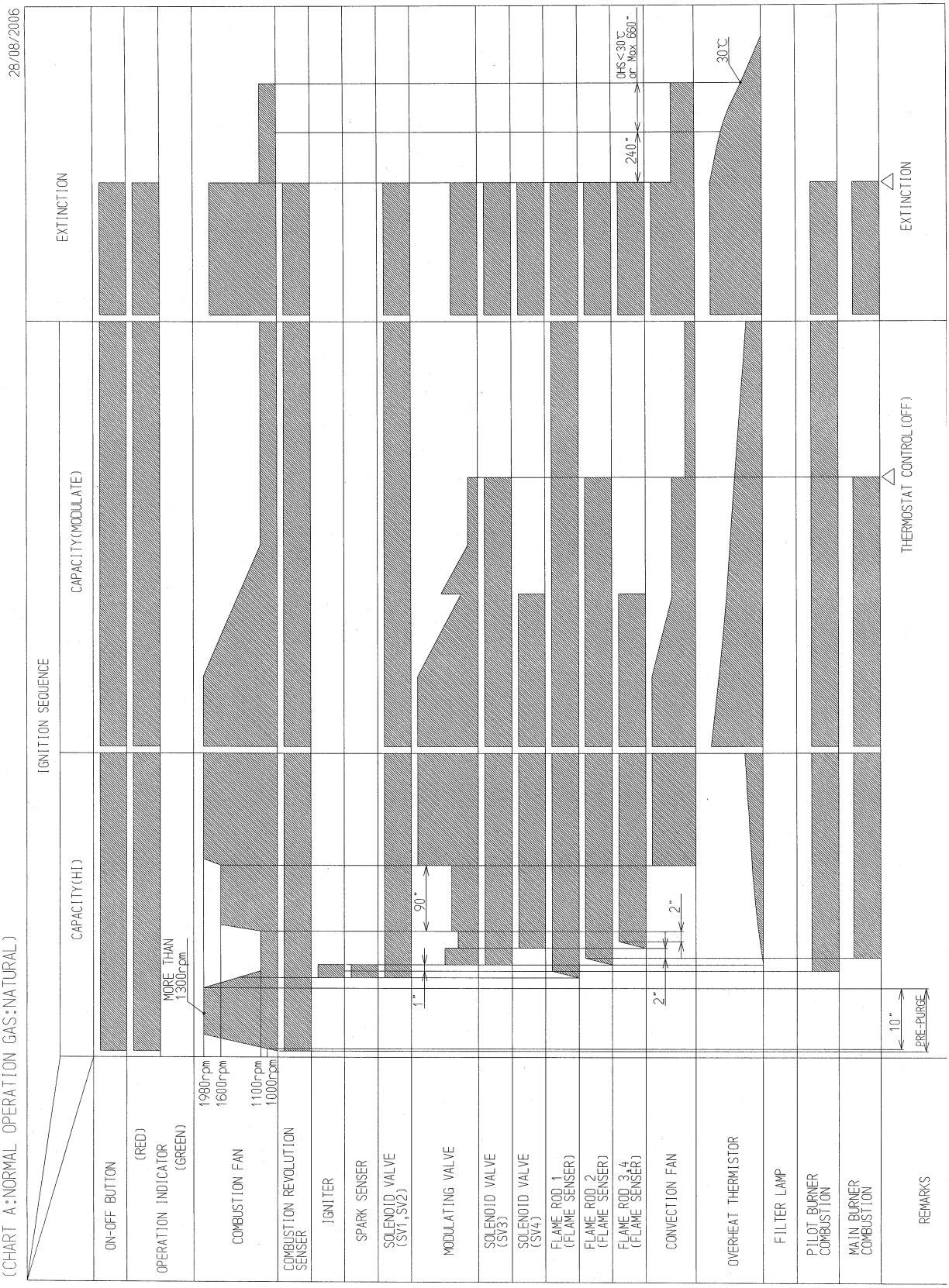
It is important that the Warm Air Discharge Vent ⑤ be kept clear of any obstructions as this will cause your heater to operate less efficiently.

When an obstruction is detected the Blockage Indicator LED which is located next to the Receiver Window ⑥ will illuminate RED and the combustion state reduces to front burner, low operation only.

To restore normal operation remove the obstruction and use the remote control to resume normal heater operation.

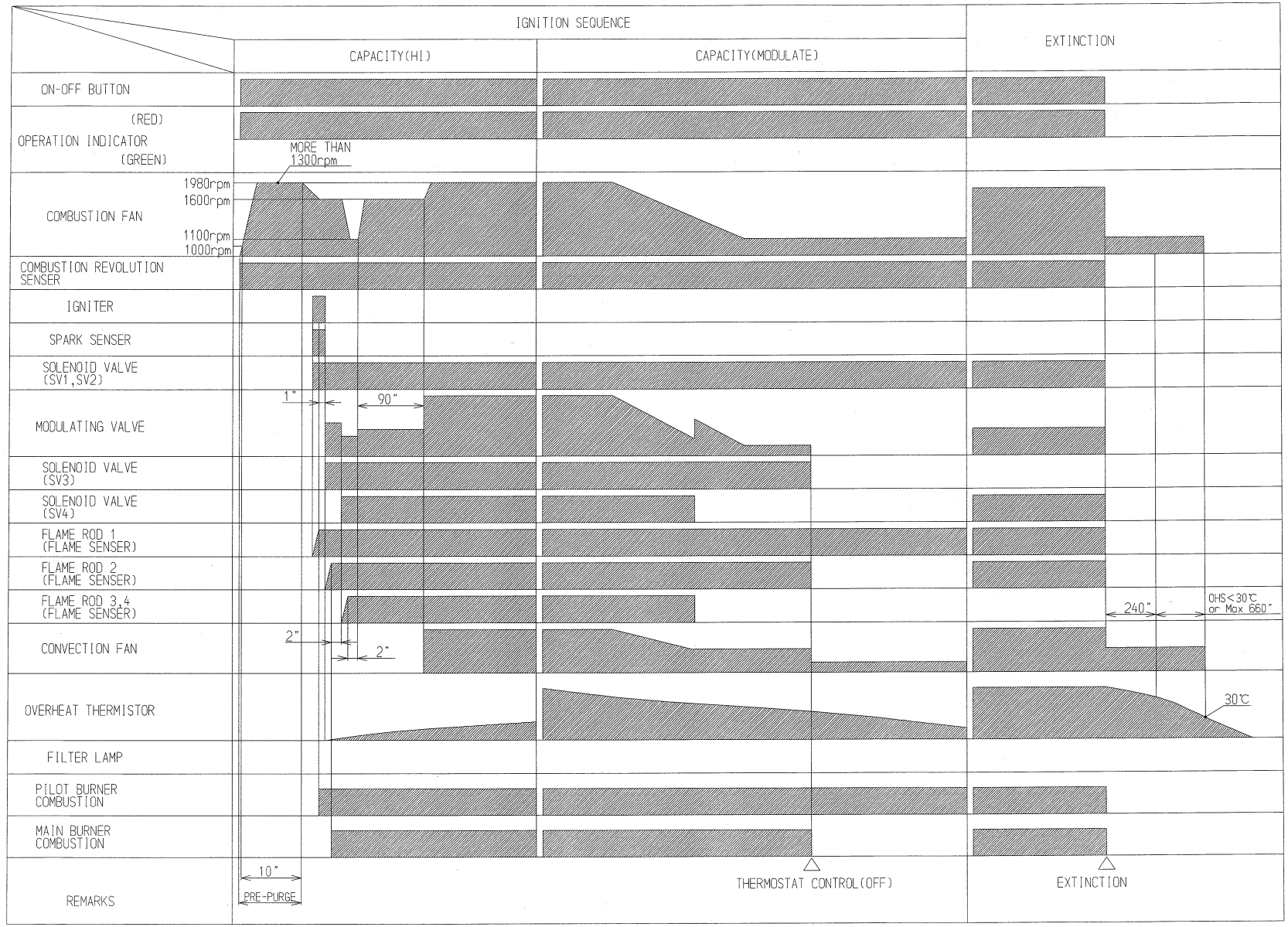


Time Charts

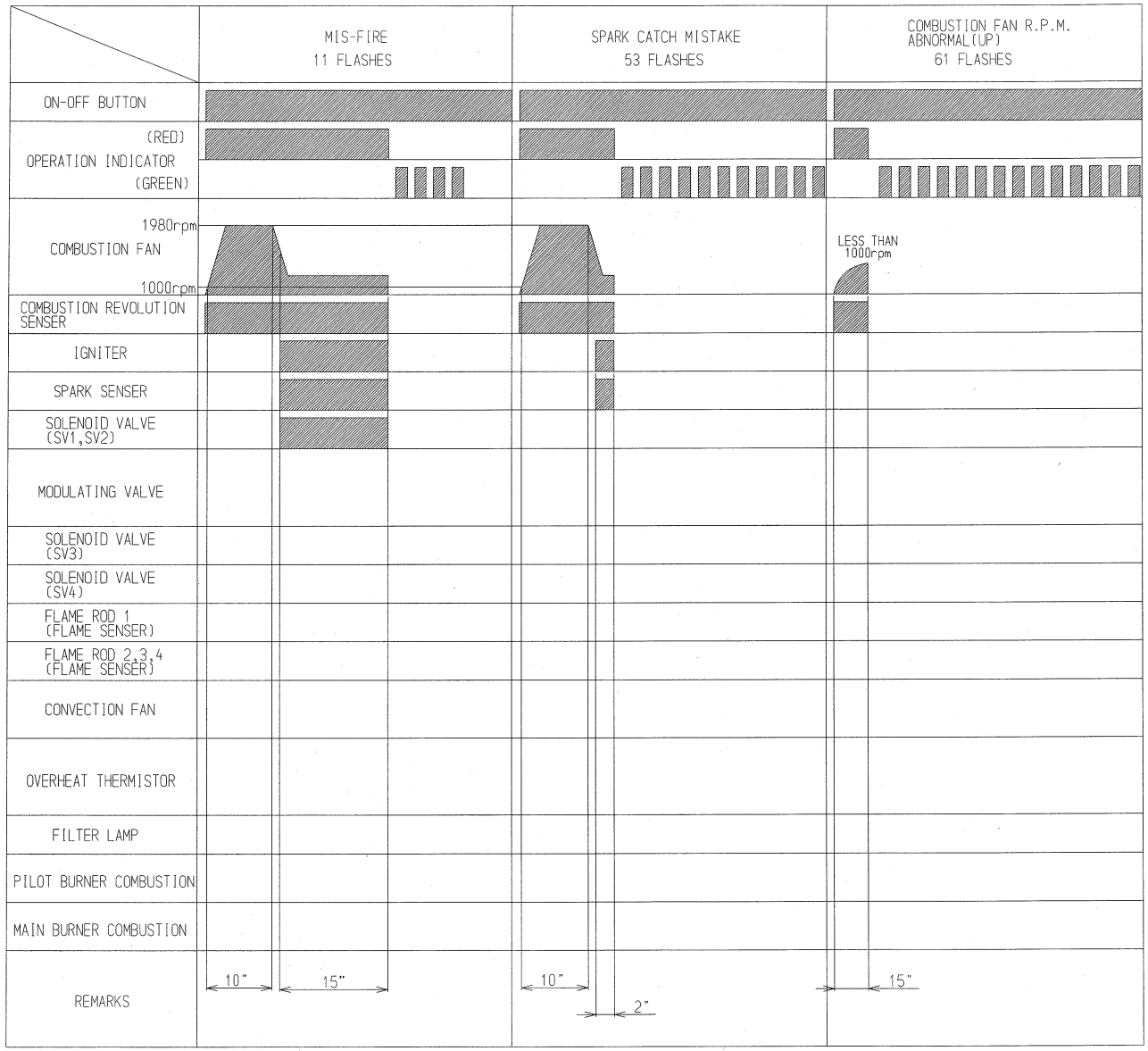

28/08/2006
(CHART A:NORMAL OPERATION GAS:NATURAL)
IGNITION SEQUENCE
CAPACITY(HI)
CAPACITY(MODULATE)
EXTINCTION
ON-OFF BUTTON
OPERATION INDICATOR (RED)
(GREEN)
COMBUSTION FAN
MORE THAN 1300rpm
1980rpm
1600rpm
1100rpm
1000rpm
COMBUSTION REVOLUTION SENSER
IGNITER
SPARK SENSER
SOLENOID VALVE (SV1,SV2)
MODULATING VALVE
SOLENOID VALVE (SV3)
SOLENOID VALVE (SV4)
FLAME ROD 1 (FLAME SENSER)
FLAME ROD 2 (FLAME SENSER)
FLAME ROD 3,4 (FLAME SENSER)
CONVECTION FAN
OVERHEAT THERMISTOR
FILTER LAMP
PILOT BURNER COMBUSTION
MAIN BURNER COMBUSTION
REMARKS
1"
90"
2"
2"
240"
OHS<30℃ or Max 660"
30℃
10"
PRE-PURGE
THERMOSTAT CONTROL(OFF)
EXTINCTION

(CHART B:NORMAL OPERATION GAS:LPG)

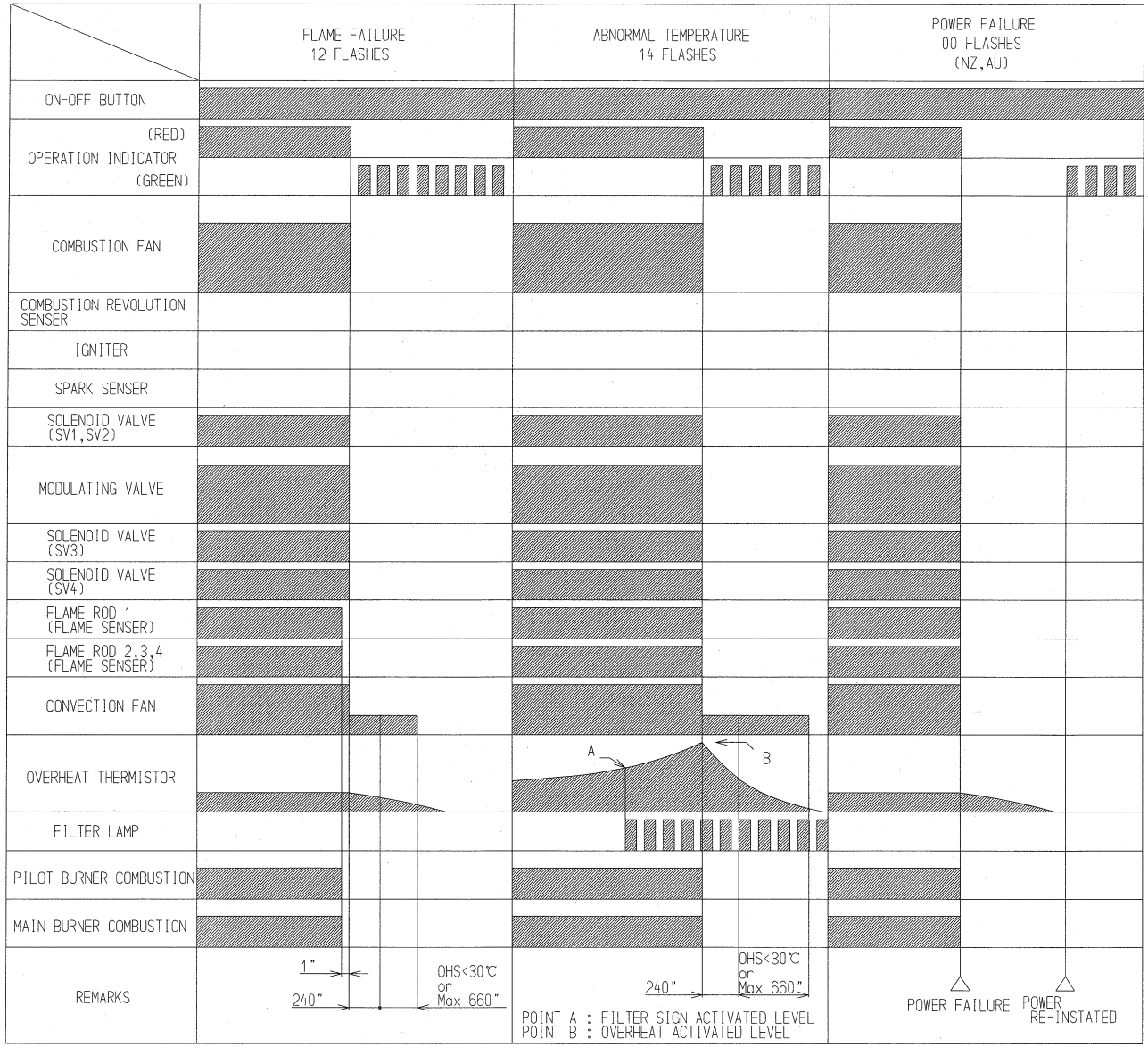
28/08/2006



(CHART C:ABNORMAL OPERATION)



(CHART D:ABNORMAL OPERATION)



RHFE-950ETR COMMISSIONING INSTRUCTIONS

240 VOLTS RISK OF ELECTRICAL SHOCK!

When commissioning this appliance electrical power will need to be connected.

Exercise CAUTION, there is potential for electric shock from exposed wiring / circuitry.

DO NOT leave appliance unattended when power is connected and panels are removed.

The gas pressures for the appliance are factory pre-set. For 'extended' flue installations refer to the important note below for a definition of an 'EXTENDED' flue installation. This applies to both Natural and Propane gas versions.

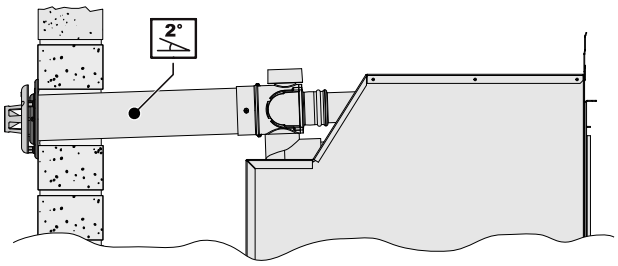
Adjustments are to be made only:

- **When a 'DIRECT' flue installation is used, refer to the important note below for a definition of a 'DIRECT' flue installation.**
- **If the appliance is not operating correctly and all other possible causes have been eliminated.**
- **After the replacement of any component(s) or re-assembly after service.**

'EXTENDED' OR 'DIRECT' FLUE

A 'DIRECT' flue installation applies when the flue system uses the 'ASPDFK - Direct Flue Kit' ONLY (as illustrated right).

If any additional Rinnai ASP/ES flue components are required to extend the flue system it is then considered an 'EXTENDED' flue installation.

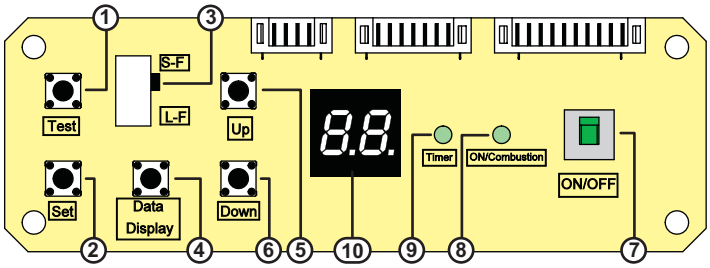


CHECKING FOR CORRECT SETTINGS

It is important to ensure that the heater is correctly set up for local conditions.

The heaters settings are shown on the LED display (10) of the Control PCB.

If any of the following settings are not correct, check the appliance data plate to confirm the model type.



PRESSURE SETTINGS

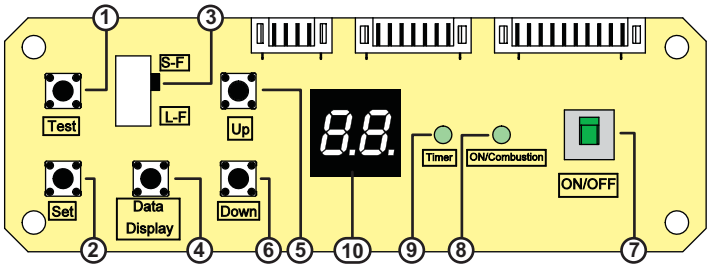
The pressures given in the table below are correct at the time of printing, however they should always be checked against those printed on the data plate of the appliance. In case of a discrepancy, the pressures on the data plate must be used.

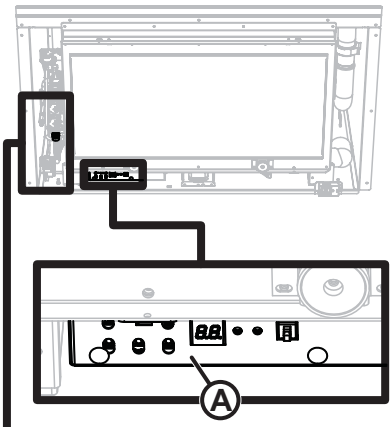
	Gas Type	Natural		Propane	
	Flue Length	Extended	Direct	Extended	Direct
Test Point Pressures (kPa):	Pilot	0.98	0.98	2.35	2.35
	PL (Stage 1)	0.18	0.18	0.52	0.52
	PF (Stage 3)	0.67	0.67	2.00	2.00
	PA (Stage 4)	0.30	0.30	0.84	0.84
	PH (Stage 7)	0.62	0.78	1.70	2.00
Mains Supply Gas Pressure (kPa):		1.13		2.50	
Maximum Supply Gas Pressure (kPa):		3.50		3.00	

GAS PRESSURE SETTING

240 VOLTS RISK OF ELECTRICAL SHOCK!

When commissioning this appliance electrical power will need to be connected.
Exercise CAUTION, there is potential for electric shock from exposed wiring / circuitry.
DO NOT leave appliance unattended when power is connected and panels are removed.





CHECKING INLET PRESSURE

1. With the fascia removed locate and identify both the Control PCB housing Ⓐ and the Inlet test point screw Ⓑ.
2. Remove the Inlet test point screw Ⓑ and connect the manometer hose.
3. Press the heater "ON/OFF" button ⑦ to start the ignition sequence.
   Ensure the correct flowing pressure is available with all other appliances operating on high.
4. Press the heater "ON/OFF" button ⑦ to stop the heater operation.
5. Disconnect the manometer hose and replace the Inlet test point screw Ⓑ.

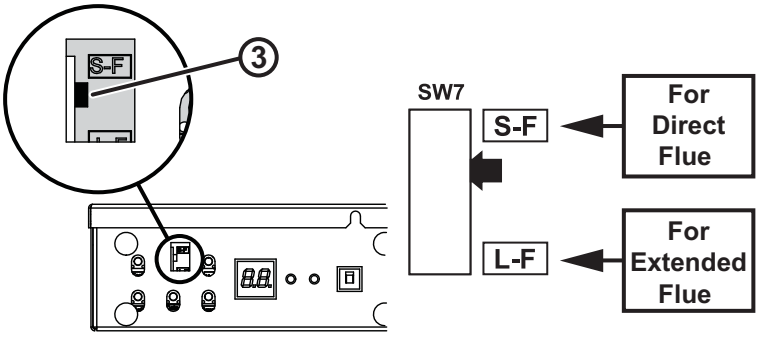
IMPORTANT

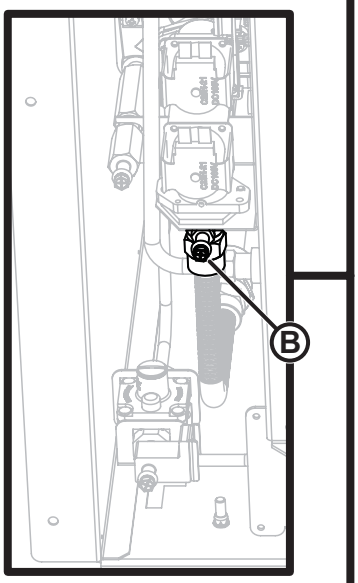
Check the flueing section of the Operation/Installation Manual to see if down rating is required.

Before commencing with the setting of the burner pressures, the correct flue length must be set.

The appliance is factory set for 'extended' flue installations with the dip switch (SW7) ③ set to L-F (Long Flue).

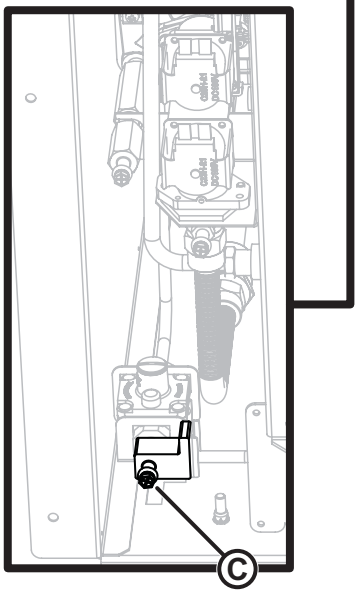
For a 'Direct' flue installation (see 'Direct' Flue Installation definition on page 3) set dip switch (SW7) ③ to S-F (Short Flue).





SETTING PILOT PRESSURE

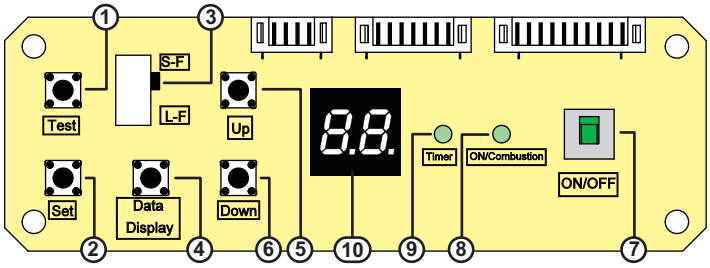
1. With the fascia removed locate and identify both the Control PCB housing Ⓐ and the Pilot test point screw Ⓒ.
2. Remove the Pilot test point screw Ⓒ and connect the manometer hose.
3. Press the heater "ON/OFF" ⑦ button to start the heater.
4. Press the test button ① twice, the heater will light to the main burner on its lowest setting (stage 1) and the display ⑩ will show PL.
5. Adjust the ignition pressure as required by manually adjusting the ignition regulator.
6. Press the heater "ON/OFF" ⑦ button to stop the heater operation.
7. Disconnect the manometer hose and replace the Pilot test point screw Ⓒ.

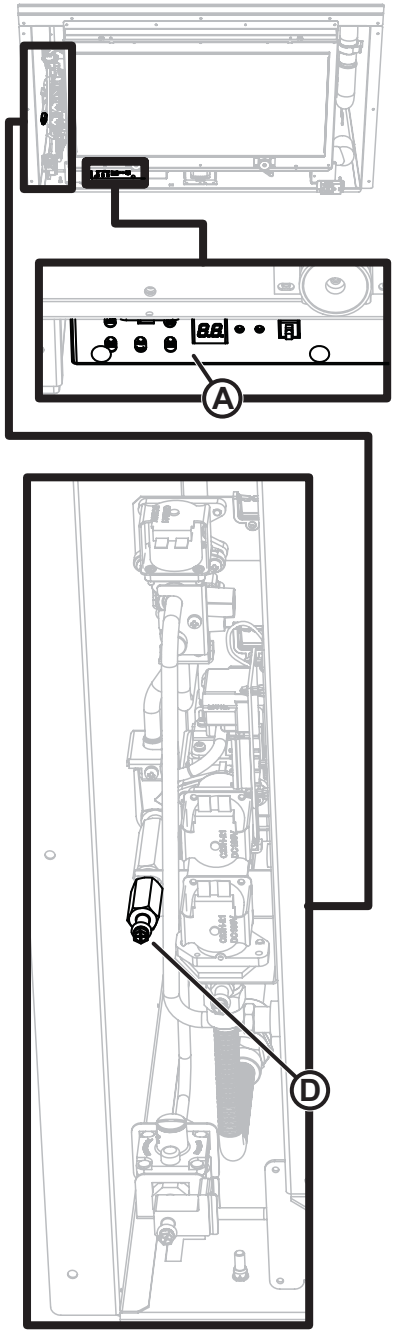


GAS PRESSURE SETTING

240 VOLTS RISK OF ELECTRICAL SHOCK!

When commissioning this appliance electrical power will need to be connected.
Exercise CAUTION, there is potential for electric shock from exposed wiring / circuitry.
DO NOT leave appliance unattended when power is connected and panels are removed.





SETTING MAIN BURNER PRESSURE

1. With the fascia removed locate and identify both the Control PCB housing Ⓐ and the Main burner test point screw Ⓓ.
2. Remove Main burner test point screw Ⓓ and connect the positive manometer hose Ⓘ.
3. Press the heater "ON/OFF" ⑦ button to start the heater.
4. Press the test button ① twice, the heater will light to the main burner on its lowest setting (stage 1) and the display ⑩ will show PL.
5. Press the Up ⑤ or Down ⑥ buttons to set the gas pressure value for the appropriate gas type in accordance with the “Test Point Pressures” table page 20. Press the Set ② button once to save setting.
6. The display ⑩ will now show PF (main burner stage 3). Press the Up ⑤ or Down ⑥ buttons to set the gas pressure value for the appropriate gas type in accordance with the “Test Point Pressures” table page 20. Press the Set ② button once to save setting.
7. The display ⑩ will now show PA (main burner stage 4). Press the Up ⑤ or Down ⑥ buttons to set the gas pressure value for the appropriate gas type in accordance with the “Test Point Pressures” table page 20. Press the Set ② button once to save setting.
8. The display ⑩ will now show PH (main burner stage 7). Press the Up ⑤ or Down ⑥ buttons to set the gas pressure value for the appropriate gas type in accordance with the “Test Point Pressures” table page 20. Press the Set ② button once to save setting.
9. The display ⑩ will now show 70. If the display does not change to 70 then there was an error in the commissioning and it should be carried out again.
10. Press the heater "ON/OFF" ⑦ button to stop the heater operation.
11. Commissioning is now complete, remove the positive manometer hose and replace the Main burner test point screw Ⓓ.
12. Check operation of the appliance.
13. Return the commissioning instruction sheet to its plastic pouch.

Dismantling for Servicing

NOTE: Before proceeding with dismantling, be sure to follow the CAUTION instructions before each explanation.
e.g. - Isolate gas supply
- Disconnect electrical supply from wall socket

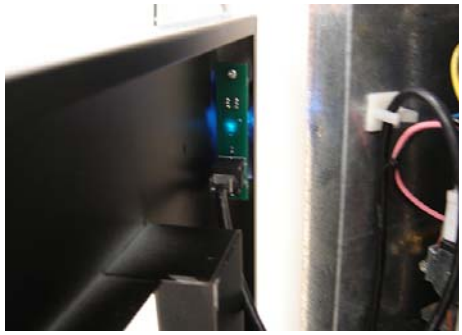
Unless otherwise stated, re-assembly is the reverse of dismantling.

CAUTION

240 Volt exposure. Isolate the electrical supply to the appliance and reconfirm with the neon screwdriver or multimeter.

1) Removal of Front Panel

- Remove the Inner Frame.
- Remove 2 x screws on the Front Panel located at the bottom left and right hand above the Air Inlet Filter Mesh.
- Lift the Front Panel out at the bottom then up to unhook from the top.
- Disconnect the Cat 5 Cable from the Control Panel switch..

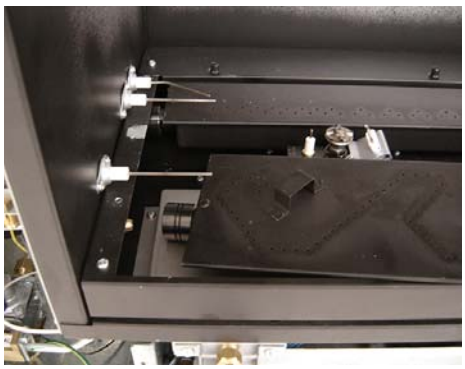


2) Removal of Combustion Chamber Glass

- Remove front panel (as above).
- Remove 4 x screws holding Glass Frame Assembly to the Combustion Chamber.
- Lift Glass Assembly off and place somewhere carefully.
- When replacing the Combustion Chamber Glass, sit the assembly on the 2 bottom supports while lining up the holes.
- Replace the 4 x screws.
- The Glass Assembly is spring loaded for safety in the event of a delayed ignite therefore tighten the 4 x screws complete up and then loosen off by a quarter of a turn.

3) Removal of Burner

- Remove front panel (as above).
- Remove combustion chamber glass (as above).
- Remove ceramic panel right hand by sliding up and then forward. Be careful while handling as they are fragile.
- Remove the screw x 1 from right hand end of each of the front and rear burners.
- Slide the burners to the right and lift up and out ensuring not to move the Flame Rod positioning.
- Note that some burners have Primary Aeration Sleeves on the burner inlet. Ensure that they stay on and are not mixed up.



CAUTION

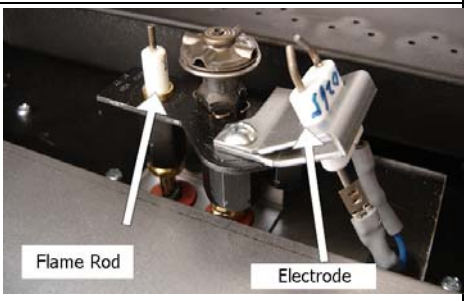
240 Volt exposure. Isolate the electrical supply to the appliance and reconfirm with the neon screwdriver or multimeter.

4) Removal of Pilot Flame Rod

- Remove Ceramic Panel left hand and right hand only by sliding up and then forward. Be careful while handling as they are fragile.
- Remove the Front Burner and Panel Burner surround centre.
- Remove 2 x screws in Air Diverter and remove.
- Unscrew Flame Rod Nut and Pilot Tube Nut.
- Remove 2 x screws from Pilot Bracket and swing forward.
- The Flame Rod can now be removed and replaced.

5) Removal of Spark Ignitor Electrode

- Remove HT Lead and the Return Sparker Lead from the bottom of the Electrode.
- Remove 1 x screw from the Pilot Bracket Cover.
- The Electrode can now be removed and replaced.

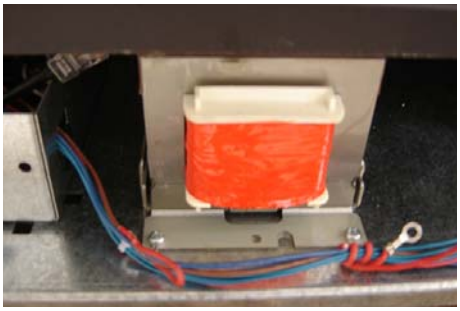


6) Removal of Main Burner Flame Rods

- There are 3 x Flame Rods. The Front Burner has 1 and the rear burner has 2 Flame Rods.
- Remove the Ceramic Panel left hand by sliding up and then forward. Be careful while handling as they are fragile.
- Remove the 2 x screws attaching the Flame Rod Cover Panel and remove.
- Remove the Flame Rods by removing the 2 x screws in each.
- Carefully pull the Flame Rod out into the Combustion Chamber until the Flame Rod Wires are just exposed.
- Carefully pull the wires off the Flame Rods.
- Replacement of the Flame Rod Wires in their correct colours is critical for the lighting sequence.

7) Removal of Transformer

- Pull the PCB box out from underneath the Combustion Chamber.
- Remove the lid from the PCB Box and unplug the Transformer Connector from the PCB.
- Remove the 2 x screws holding the Transformer in place and slide forward.

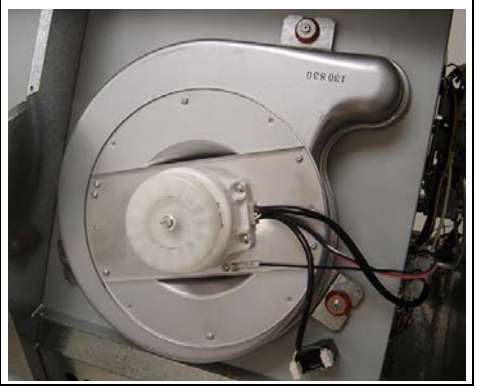


CAUTION

240 Volt exposure. Isolate the electrical supply to the appliance and reconfirm with the neon screwdriver or multimeter.

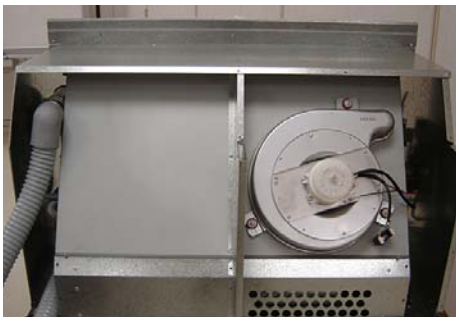
8) Removal of Combustion Fan

- To access the Combustion Fan the unit needs to be removed from the wall cavity.
- Remove the 15 x screws from the Combustion Fan Cover and remove.
- Access is now available to the 3 sets of wire harnesses from the Main Harness and Combustion Fan Capacitor.
- To remove the Combustion Fan disconnect the wires from the Harness and Capacitor.
- Remove the 3 x screws from the Combustion Fan and pull off the 2 tubes connected to the Heat Exchanger.



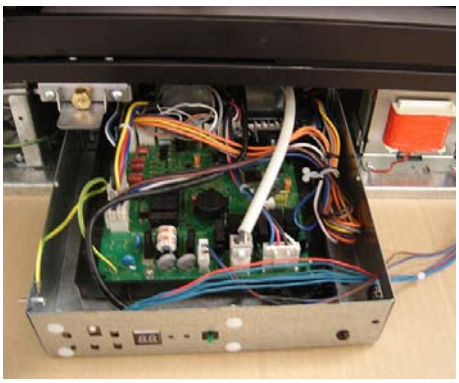
9) Removal of Convection Fan

- To access the Convection Fan the unit needs to be removed from the wall cavity.
- Pull the PCB Box out from under the Combustion Chamber and remove the Cover. Disconnect the Convection Fan wire connector to the PCB.
- From the rear of the appliance remove the Combustion Fan Cover and Combustion Fan side cover.
- Remove the 5 x screws holding the Convection fan to the body of the heater.
- Pull the Convection Fan out and disconnect the Condensate Tray Harness from the Combustion Fan.
- Remove the Convection Fan Assembly.
- Remove 2 x screws from the Convection Fan Assembly and remove the Convection Fan.

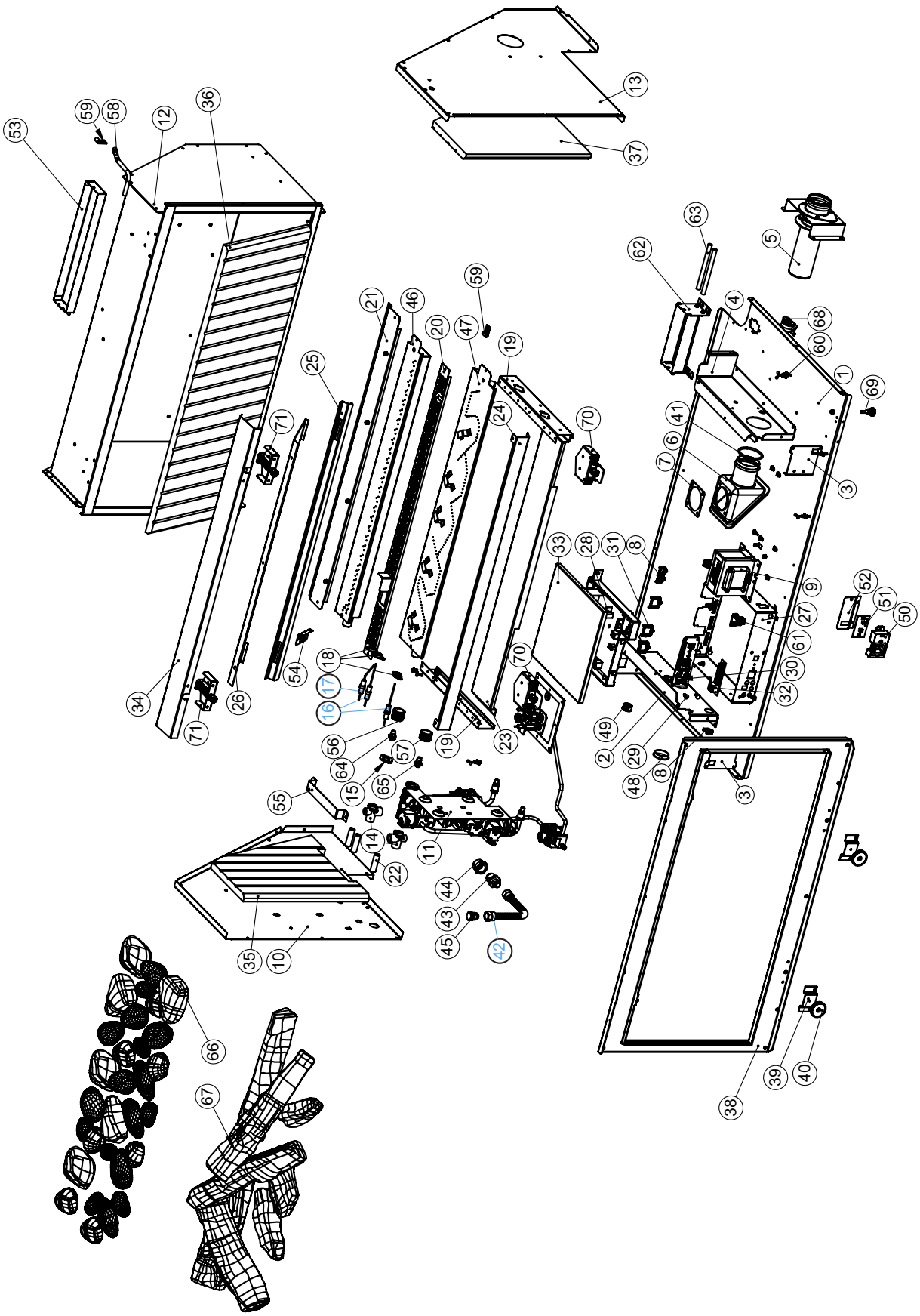


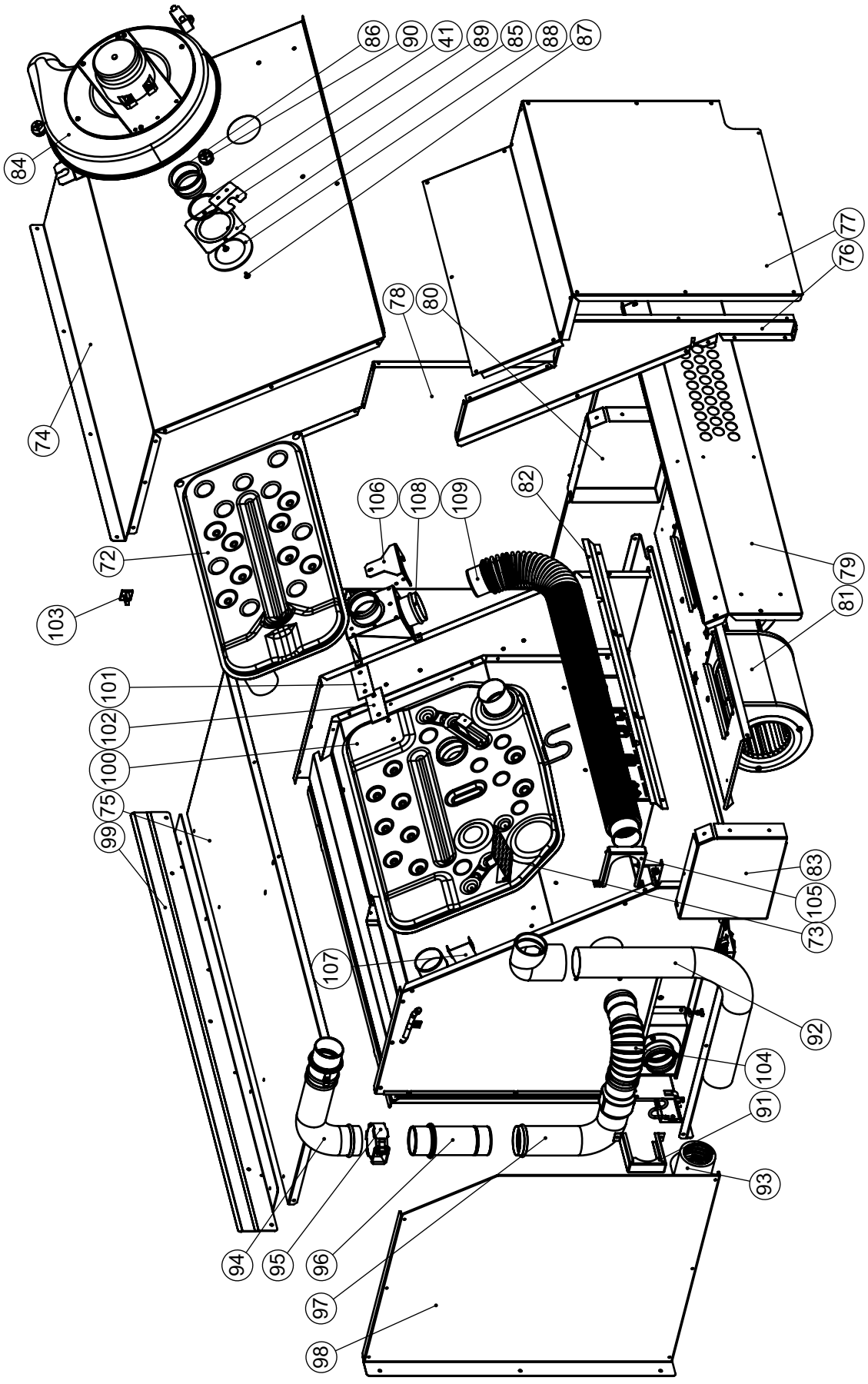
10) Removal of PCB

- The PCB is located under the Combustion Chamber and is attached by velcro.
- Lift the PCB Box out and remove the Cover Panel.
- Access is now available to the PCB, Commissioning Control Panel and the wiring harness from most electrical components.
- Remove the PCB by disconnecting all of the electrical connectors, then turning the Box cover remove the 4 x screws in the bottom of the PCB.
- It is a good idea to count how many connectors have been disconnected so that all connectors are returned on replacement.



Exploded Diagrams

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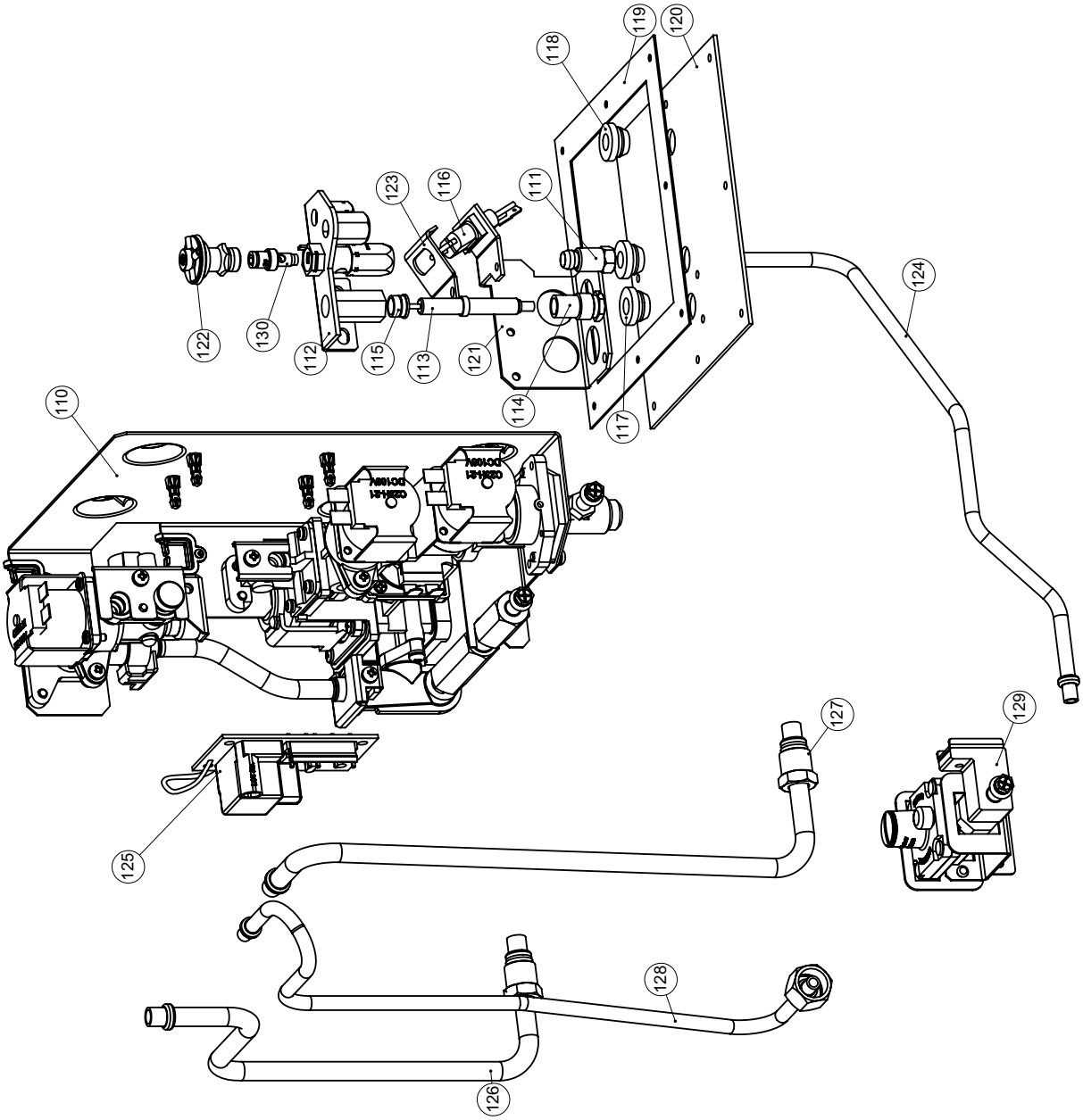
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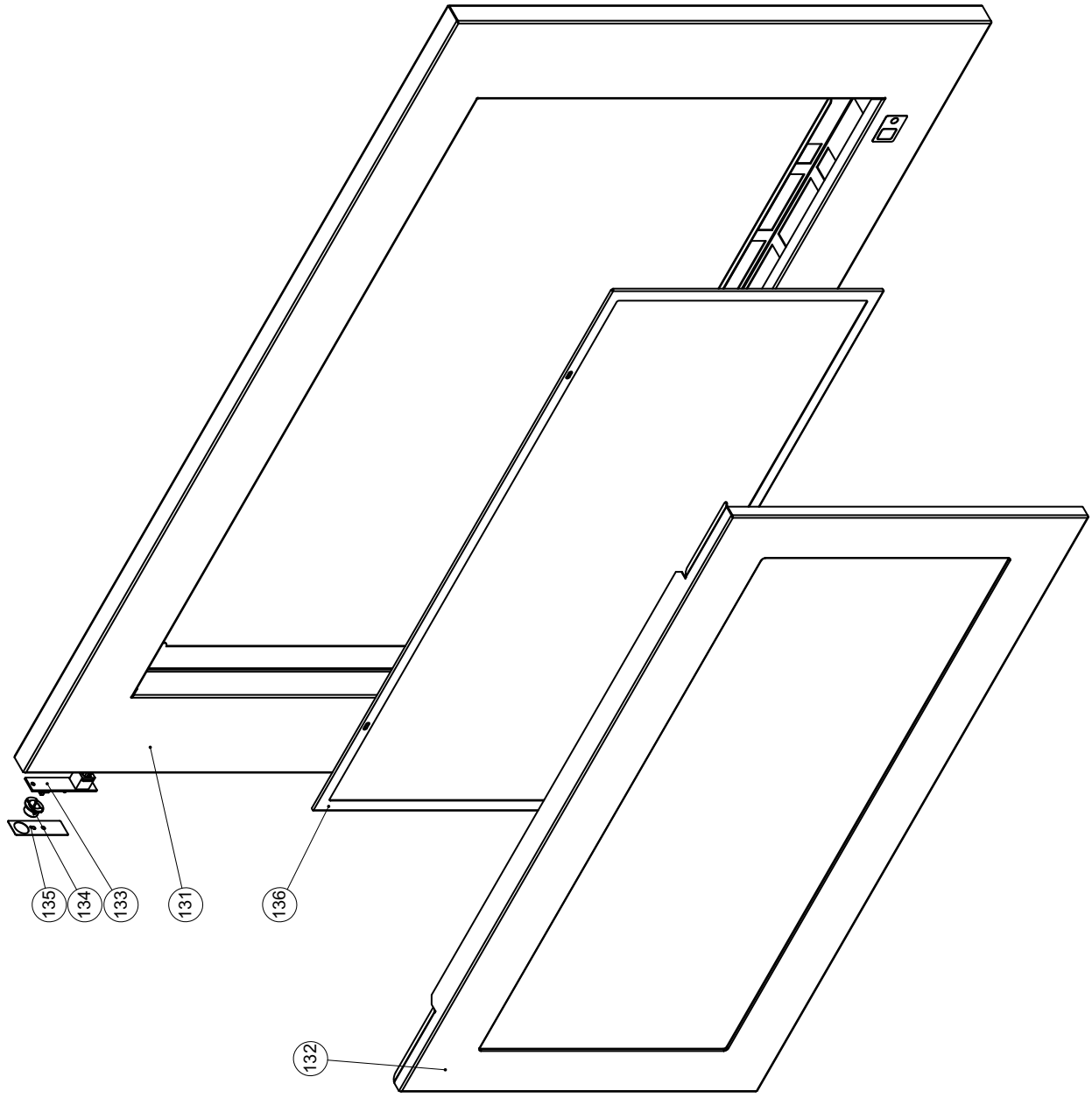
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Parts List

Waiting on Parts List from Leon Kaiser

Contact Information

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