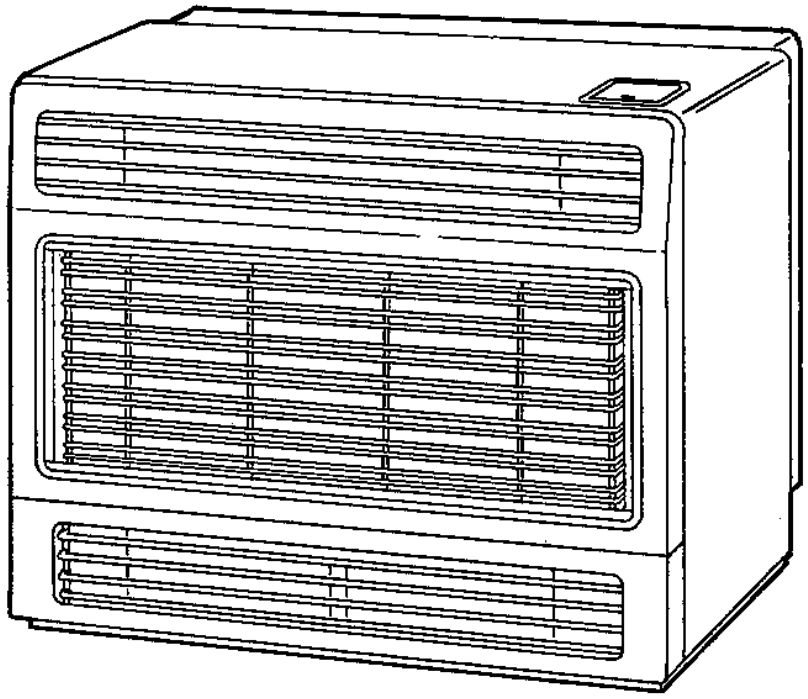
Rinnai

SERVICE MANUAL

Spectrum REH281EB/EC

FLUED HEATER



Proudly a member of The Australian Gas Association.
All of our products are AGA tested and approved.

The Australian
Gas Association

Quality System
Quality Endorsed Company
ISO 9001 Lic 4983
SAI Global
Head Office Certified

Distributed and serviced in Australia under a Quality System certified as complying with ISO 9001 by SAI Global

Distributed and serviced in Australia under a Quality System certified as complying with ISO 9001 by SAI Global.

Rinnai New Zealand has been certified to ISO 9001 Quality Assurance by Telarc.

TELARC REGISTERED SUPPLIER
Quality Endorsed Company
ISO 9001 Reg 415

THE MORE STARS, THE MORE ENERGY EFFICIENT
GAS ENERGY RATING
The Australian Gas Association

Comparative Energy Consumption tested to The Australian Gas Association requirements of Australian Gas Code AG 103. An energy rating of 5 stars refers to an efficiency of approximately 80%, that is, 80% of gas consumed is converted to useful heat.

The Regulatory Compliance Mark (RCM) indicates compliance with electrical safety regulations in Australia and New Zealand
Rinnai Australia Supplier Code 5109

ISO 9001 *Model for Quality Assurance in design/development, production, installation and servicing, aimed primarily at achieving customer satisfaction by preventing nonconformity at all stages from design through to servicing.*

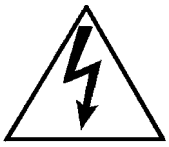
ISO 9002 *Same as ISO 9001 but excluding design.*

AG 103 *Approval requirements for gas heaters as set by The Australian Gas Association and Australian Liquefied Petroleum Gas Association Ltd, to ensure proper safety performance and quality levels are achieved.*

Produced by Technical Services Department
August 2003 - Issue 1

Key to Warning Symbols

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



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

Remove the plug from the source when carrying out any of the following activities.

Read Fault Diagnosis and Wiring Diagram carefully to avoid incorrect wiring

Do not disassemble. Parts within cannot be exchanged or diagnosed faulty.

Please follow instructions carefully to ensure safe and appropriate service.
After completing the service and confirming that there are no water or 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 Technical Services 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.

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
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

1. Introduction

Development Background

Rinnai have developed a Flued Space Heater with radiant and fan forced up flow convection with four surface combustion burners. Manually controlled, with open flue system. Available in Inbuilt and Console models.
We recommend that the heater is regularly serviced by qualified service technician.

Features

- 28 MJ/h fan assisted, radiant convection space heater.
- 3 step push button top mounted control for easy operation.
- All Rinnai safety features including overheat/flame failure protection.
- Large capacity fan to circulate warm air effectively.
- Electronic automatic ignition system.
- Fan filter to protect the fan against dust and lint.
- Glass rod and jewel plaque burner design for maximum efficiency and good looks.

2. Specifications

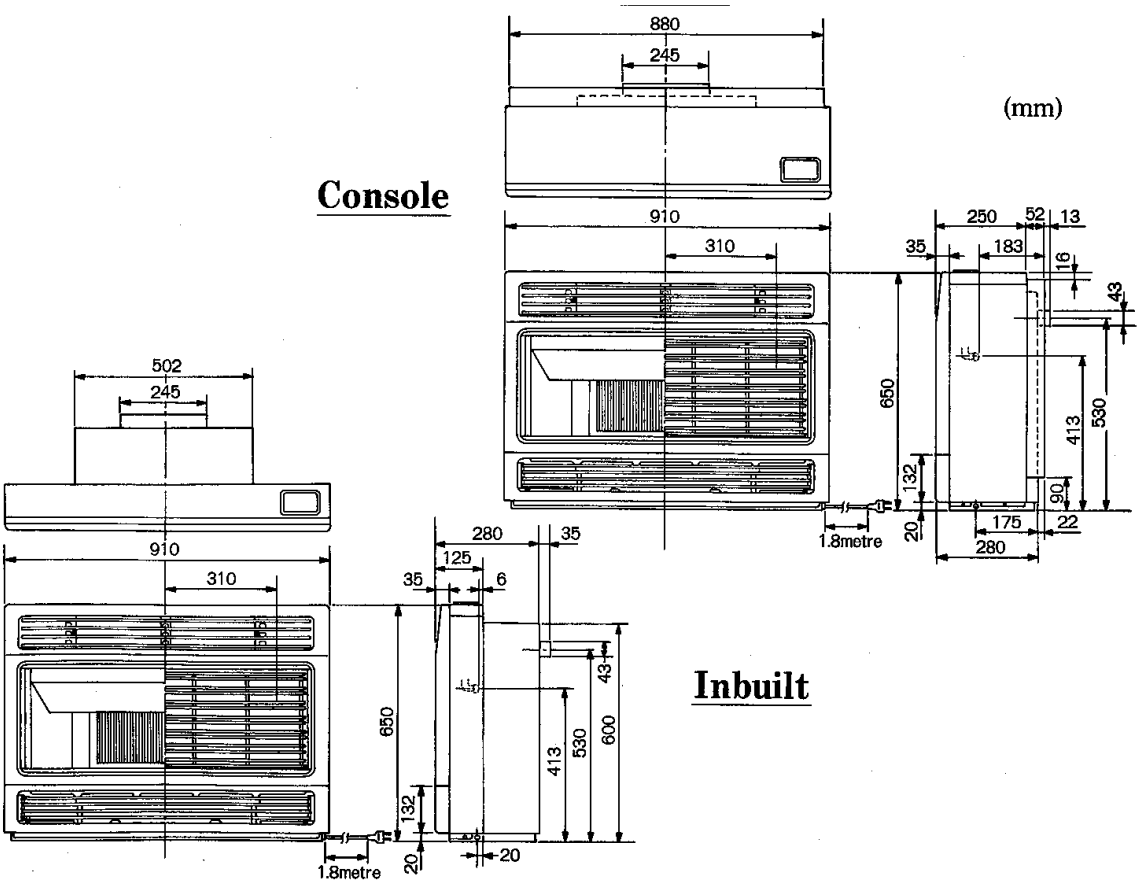
Model Number		REH-281EB	REH-281EC
Model Identification		**281EB**	**281EC**
Name of appliance		Inbuilt Flued Space Heater	Console Flued Heater
Average Efficiency Rating		70%	
Electrical Consumption (max). Watts		80 Watts	
Dimensions (mm)	Width	910	910
	Depth	190	302
	Height	650	650
	(RearCasing):Inb).	880	
Fireplace Dimensions (mm)	Height:	605 minimum 635 maximum	N/A
	Width:	510 minimum 805 maximum	N/A
	Depth:	270 minimum must be installed on sealed flat base.	
Colours:		Beige / Gunmetal	
Weight	Kg	40	42
Heating Output (kW)	Natural Gas High:	5.4	
	Natural Gas Low:	1.4	
	LP (Propane) High:	5.4	
	LP (Propane) Low:	1.4	
Gas Consumption	(MJ's)	Average - 17.5	
Clearances (mm)	Not to be installed into a mock fireplace.		
	Sideways	150	
	Infront	1000	
	Above	150	
	Behind	150	
Burner		Ceramic Plaque Burner	
Noise level range	dB (A)	High: 41	Low: 37
Gas Input (MJ/h)	High	28	28
NG	Low	7	7
LPG	High	28	28
	Low	7	7
Connections	Electrical	240 V power point	
	Gas	1/2" Copper Compression union	
Room Temperature control		Non Thermostat	
Controls		3 step push button	
Gas Control		Electronic Ignition	
Fan Switch		Automatic Fan switch ON/OFF	
Ignition System		One touch electronic	
Timer		No	
Safety devices		Automatic Fan delay switch Flame Failure Device Over-heat switch Dress guard	
Accessories		Surround:75 mm or 100 mm fireplace	
Flueing		Standard 10' x 2' flueing is supplied from plumbing outlets only (not supplied by Rinnai)	

3. Combustion Specification

Gas Type	Main Burner		Pilot Burner						Gas Valve	Pressure kPa	Gas Rating (MJ/h)		
	Ceramic Plate	Main Injector	Pilot Injector	Pilot Burner Comp. Assy	Pilot Holder	Pilot Bnr Assy	Lift Protection Panel	Pilot Damper			HI	MED	LO
Propane	LND-118	BU101-307-075 Ø 0.75	CP-60067-a Ø 0.20	REH-210-127-2	REH-210-128-2	CP-50646 Primary pres-sure opening 4.2 x 5.6 (oval shape)	REH-210-48-2 Imprint B	CP-50647D Ø 4	C28A-6-4 Breather Ø0.35 MS 2 pcs	2.45 / 2.75	28	14.9	8
Natural	LND-118	BU101-307-125 Ø 1.25	CP-60067-n Ø 0.40	REH-210-127-2	REH-210-128-2		REH-210-48-2 Imprint B	CP-50647D Ø 4		0.93 / 1.14	28	14.9	8

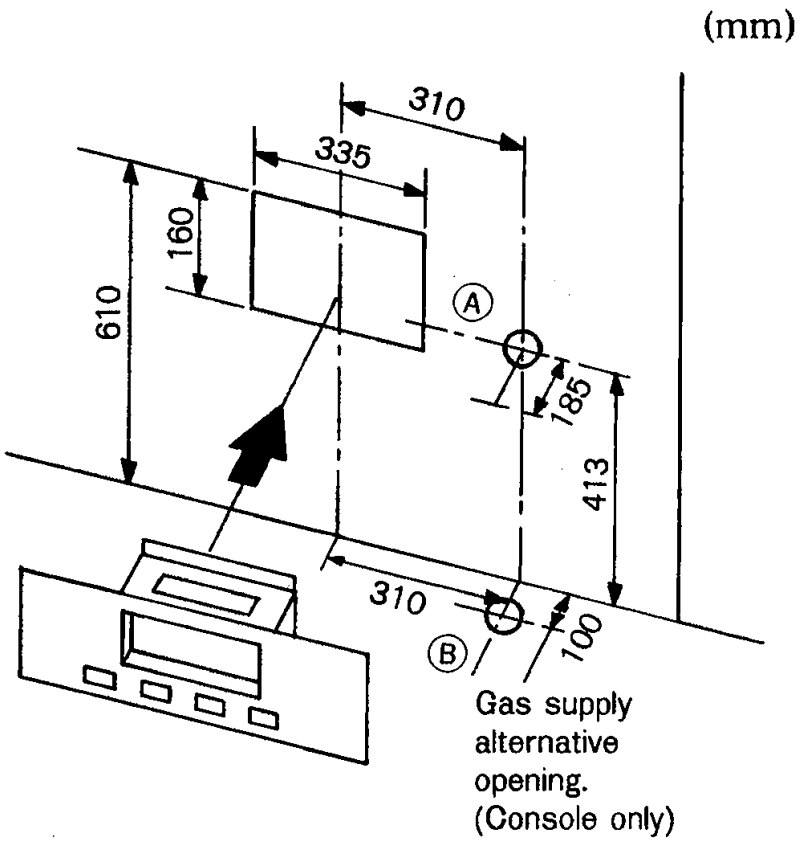
4. Dimensions

Note: All dimensions are in millimetres



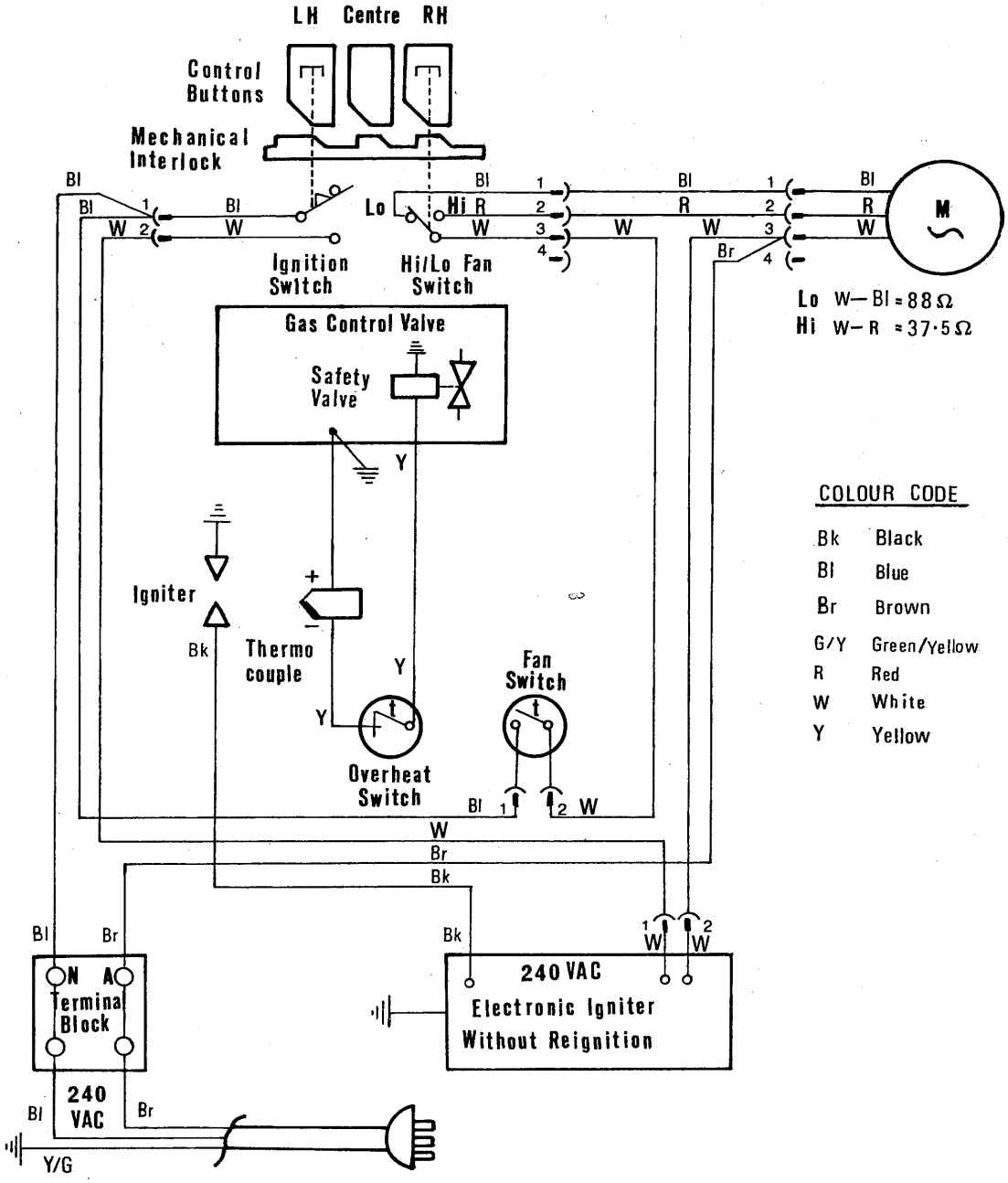
5. Installation

The following clearances are recommended for installation.

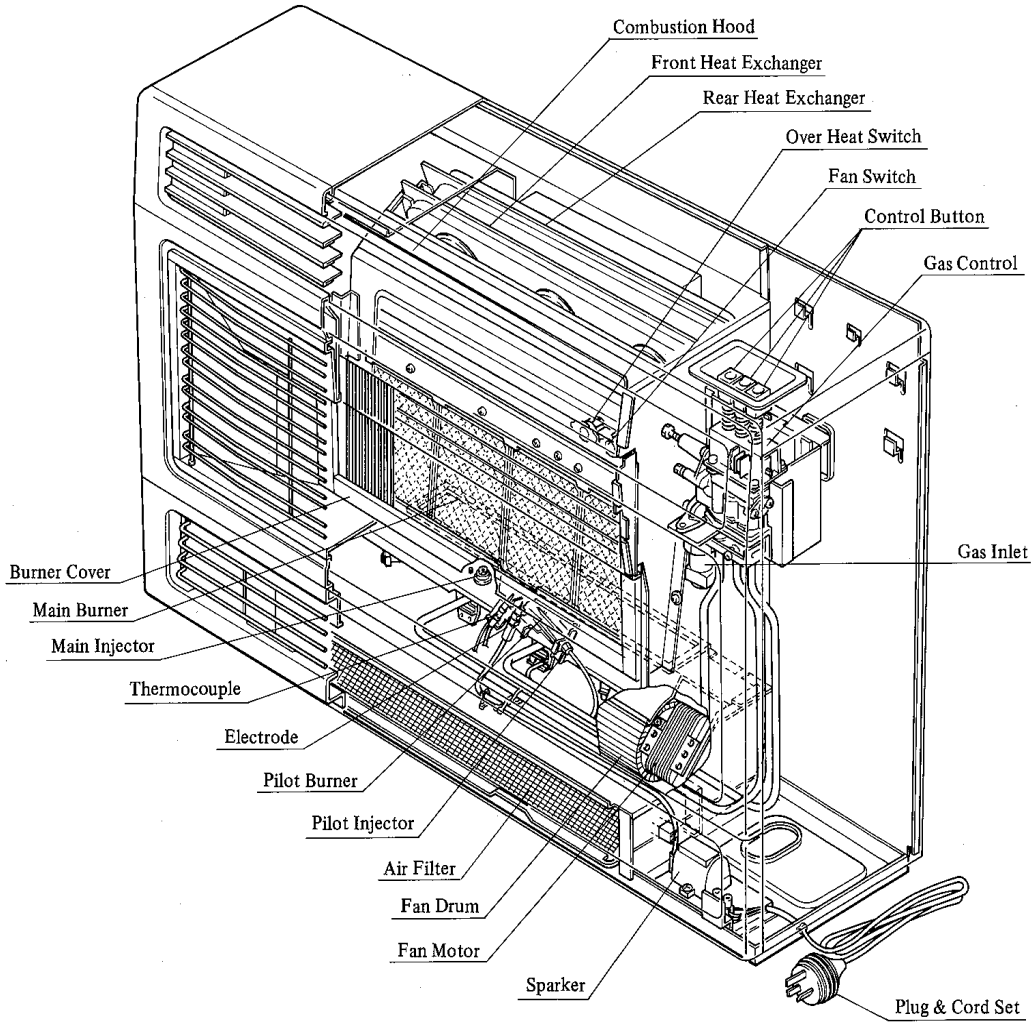


When using supply alternative Ⓑ the pipe is fed from underneath, through the opening in the base.

6. Schematic Diagram



7. Cut - Away Diagram



8. Operation Principles

Appliance Operation

When the control selector left hand push-button is depressed and held down in the ignition sequence, the normally open ignition switch is closed by the mechanical interlock lever and the gas control outlet valve to the right hand inner burner is opened. The thermo-electric flame failure safety shut-off valve is also mechanically held open by this ignition sequence operation allowing gas to flow to the right hand inner burner.
Simultaneously, the igniter will spark, the pilot and right hand inner burner will ignite.
When the pilot flame has established (approx. 15 seconds), the flame failure system circuit current will hold the thermo-electric safety shut-off valve open - provided that the overheat switch has not operated and broken the circuit.

On release of the left hand push-button the igniton switch opens, the mechanical interlock disengages the thermo-electric safety shut-off valve which remains open, held in by the flame failure circuit current.
The fan will not run until the fan temperature operated switch has closed (60°C). The fan low speed circuit is made when the left, right or centre push buttons are depressed and will run at its high speed only when all three push buttons are depressed. It will continue pt run at low speed after appliance shut down until the appliance is cooled to 48°C when the fan circuit thermal switch will open.
Pressing the centre button will cause the gas control outlet to the left hand inner burner to open and the mechanical interlock lever to lock the centre push-button in its down position. The left hand inner burner will ignite. Pressing the right hand push-button will cause the fan low / high speed change over circuit switch to change to high speed. The gas control outlet to the right hand burner (parelleled with left hand burner) will open, both left and right burners will ignite, and the mechanical internlock lever will lock the push-button in the down position. The fan may or may not run - if the fan temperature switch is closed the fan will run at high speed.
Appliance shut down is by reversing the sequence of push-button selection - the push-button control unit is mechanically interlocked so that only this preset sequence can be used - right, centre, left.
Note: when the front push-button is pressed on this shut down cycle the igniter does not spark.
The appliance is automatically shut down by the de-energisation of the gas control thermo electric safety valve when either the flame failure sensor current is too low to hold it open or when the appliance overheat switch operates and breaks this circuit.
Note that should a 240 V power failure occur during operation the appliance will automatically shut down when the overheat switch opens. Re-igntion is by manual operation only.

Ignition / Low setting

1. Check that the appliance is plugged into a 240 V power supply and is switched on.
2. Check that all push-buttons are in the up (“OFF”) position.
3. Depress the left hand control push-button and hold it down - the igniter will spark, the pilot and right hand inner burner will ignite.
4. Continue to hold the left hand push-button down for a further 15 seconds.
5. Release the push-button, check that the pilot and right hand inner burner have ignited and that they remain alight.
6. If the pilot and right hand inner burner does not remain alight, again press the left hand control push-button and release it - this will return the front push-button to the up (“OFF”) position.
7. Wait 30 seconds, then repeat the ignition procedure.

Note: All push-buttons must be in the up (“OFF”) position before attempting re-ignition.

Medium / high setting

1. To increase the heat output after ignition, depress the control push-buttons in sequence from left to right until the desire heat output is reached.
2. Medium heat setting - push centre push-button, left hand inner burner will ignite.
3. High heat setting - push in sequence, the right push-button, both left and right hand burners will ignite.
4. To decrease the heat output, again depress the control push-buttons in sequence from right to left until the desired heat output is obtained.

Turning the Heater OFF

1. Depress and release all control buttons in sequence from right to left, ensure that all burners and pilot are extinguished. The fan will stop automatically when the appliance has cooled.

Fan Operation

The fan is automatically switched ON/OFF by the temperature sensitive fan switch. Fan speed is selected by the fan low/high speed change over switch.
The fan may not run immediately the heater is lit. It will run at low speed on heater low / medium heat setting and at high speed on heater high heat setting.
The fan may continue to run at low speed after the heater is shut down until the temperature sensitive fan switch turns it off.

9. Main Componentry

Regulator

Spring loaded adjustable type, incorporated in the gas control. With gas line pressure adjusting screw. When operating on Propane Gas the regulator is still in operation and is fitted with a special lid which has a 0.30 mm breather hole.

Gas Control

A three outlet mechanically operated gas control with a thermo-electric safety valve operated by the flame failure system. Each outlet is separately controlled. Two outlets are connected via gas supply tubes to individual burner injector blocks (centre two burners). The third outlet is connected to the two outer burner injector blocks. With combination gas regulator and burner gas pressure test point.
Inlet connection 15 mm flare elbow / barrel union. Gas inlet filter fitted into the gas line between the gas control valve and inlet connection.

Push Button Control Selector Unit

Three rod selector box mounted on top of the gas control valve. Manually operated by three push-buttons which are mechanically interlocked for a preset sequenced operation - push in sequence from left to right:

- Left hand push-button - gas to right inner burner and ignition spark, fan on low speed.
- Centre push-button - gas to left inner burner, fan on low speed.
- Right hand push-button - gas to both outside burners, fan speed from low to high.
- Push buttons can only be released in reverse order sequence. With ignition micro switch and fan high / low speed change over micro switch.

Ignition

Rinnai intermittent pilot, 240 V electronic ignition unit without re-ignition. Igniter will spark while the left hand push-button is pressed fully down, thermo-electric operated safety valve is mechanically opened on the ignition sequence while the left hand push-button is depressed fully down. Electrode gap is 3.5 - 4.5 mm.

Flame Safeguard

Thermo-electric flame failure sensor mounted on the pilot burner assembly, associated main gas safety shut-off thermo-electric valve incorporated in the gas control. Thermocouple assembly includes all leads and overheat switch.

Burner

Four surface combustion burners, each fitted with a 133 mm x 93 mm ceramic diamond cut plaques with 1.15 mm dia. holes. Plaque surface is designed to prevent flame lift off. Each burner has an injector block into which is attached to the injector block by a screw and locking plate. The right hand burner injector block gas supply is also connected to the left hand burner injector block so that both the right and left hand burners operate at the same time. The right hand inner burner injector block also supplies gas to the pilot through a gas pipe connected between the injector block and the pilot nozzle. The cross lighting channel ensures positive ignition to all burners.

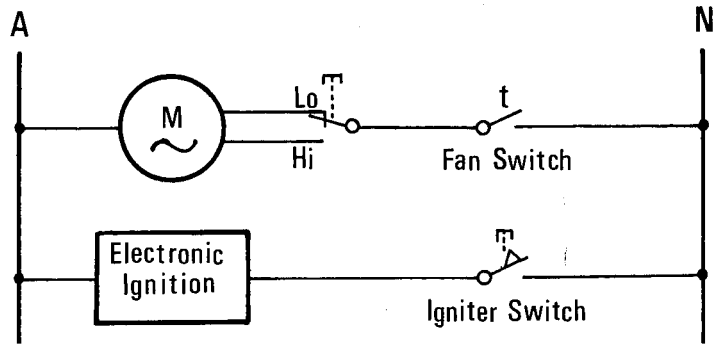
Pilot Burner Assembly

The pilot burner assembly consists of the assembly mounting plate and pilot burner. Pilot injector orifice is located in the pilot / pilot gas pipe connection. Pilot injector has an integral filter screen. Gas flows to pilot whenever the left hand control push button is in the depressed position, provided that the thermo-electric safety shut-off valve is open. Failure of the pilot flame to remain established or operation of the appliance over heat switch will cause the thermo-electric safety valve to close, shutting off the gas supply to the gas control. A 4 mm dia aeration shutter is fitted to the pilot.

Fan

Two speed tangential type blower, with induction motor complete with stainless steel blades are replaceable with removing bearing. Fan motor has electrical leads,

Lo speed winding - pins 3 and 1 - white / blue = 88 Ωs approx.
Hi speed winding - pins 3 and 2 - white / red = 37.5 Ωs approx.
Low speed is 630 ± 150 RPM. High speed is 940 ± 150 RPM.



FAN MOTOR WINDING AND START/RUN WINDING
Fig. 1

Fan Thermal Switch

Temperature operated fan control (ON/OFF) SWITCH. Fan circuit switch makes at 60°C, breaks at 48°C. Mounted on top of the burner assembly, attached by a single screw with push on spade type connector terminals. Accessed by removing the burner/tile assembly.

Over Heat Switch

Temperature operated switch, opens circuits the gas control thermo-electric safety shut-off valve on appliance over temperature condition. Breaks at 130°C, reset temperature not specified. Mounted on top of the burner assembly next to the fan switch, attached by single screw, with soldered terminal connections. In series circuit with the flame failure sensor thermostat circuit. Normally supplied as part of the thermocouple assembly.

10. Error Code Messages and Maintenance Data

SERVICE CHECK LIST AND FAULT FINDING

Please check this fault finding chart before asking for a service call you may be able to overcome the problem without a service call, or the unit may be operating normally.
Service calls to a unit which is operating normally may be chargeable, even when the unit is under warranty.
If you are unsure about the way the unit is operating, contact Rinnai or your agent.

Problem / Cause	Unit won't ignite	Unit cuts off soon after ignition	Fan keeps running after unit it turned off	Takes too long to warm room	Smell of gas	Unit goes out when ignition button is released	Unit cuts off at all settings	Remedy
Not Plugged In	●	●						Plug In
Power Cut	●	●					●	Allow unit to cool, re-ignite when power is restored.
(Initial Installation) Air in gas pipe	●							Purge air (Installer)
Gas filter blocked	●			●				Service Call (Contact Rinnai)
Mis-ignition - Not pushing ignition button firmly enough	●					●		Push button firmly
Louvre obstructed							●	Clean obstruction
Gas Escape					●			Service Call (Contact Rinnai)
Room too large				●				Service Call (Contact Rinnai)
Fan Filter blocked		●		●			●	Clean filter (weekly)
Faulty Fan		●		●			●	Service Call (Contact Rinnai)
Auto fan switch operating			●					Normal operation
Gas turned Off at meter	●							Turn gas on

Fault Finding Chart

FAULT	CAUSE	REMEDY
Unit won't ignite.	1. Power supply fault - not plugged in, blown fuse in external circuit.	Plug in power supply. Replace blown fuse. Check 240 Vac at power point.
	2. Area power cut.	Allow unit to cool, re-ignite when power is restored.
	3. Air in gas line.	Purge air from gas line.
	4. Gas line filter blocked.	Clean gas line filter.
	5. Not pushing button firmly enough.	Instruct user on correct operating procedure.
Unit cuts off after ignition.	1. Power supply fault.	Check 240 Vac at power point.
	2. Gas control thermo-magnetic safety valve not being held open by flame failure system circuit.	Check flame failure circuit, replace defective components (thermocouple assy, gas control).
	3. Overheat switch faulty (open circuit).	Test circuit continuity, replace switch if defective.
	4. Partially blocked pilot.	Clean / replace pilot injector orifice and filter assembly.
Fan continues to run after unit is shut down.	1. Unit has not cooled.	Normal operating sequence.
	2. Defective fan ON/OFF switch.	Replace defective fan switch.
Fan won't run on low, medium heat selections.	1. Fault in fan HI/LO circuit - faulty HI/LO speed switch.	Check fan circuit, check HI/LO switch for correct operation, check resistor, replace if defective.
Fan won't run on high speed.	1. Fault in fan HI/LO speed circuit or switch.	Check fan circuit, check HI/LO switch, replace if defective.
Takes too long to heat room.	1. Gas pressure / rate fault.	Clean gas line filter. Check pressure / flow rate.
	2. Room too large for heater.	User problem.
	3. Fan air intake louvre blocked.	Clear obstruction.
	4. Faulty fan circuit or fan.	Check fan circuit components, fan ON/OFF switch, fan HI/LO speed switch and fan for correct operation. Replace defective components.
Unit goes out when ignition knob is released.	1. Incorrect operating procedure - not pushing knob firmly down or holding it down long enough.	Instruct user on correct method of operation - press knob down firmly and hold for 15-seconds minimum.
Units cut out on all settings.	1. Air intake or outlet louvres obstructed.	Remove obstruction. Instruct user on minimum clear area required around the heater.
	2. Fan not coming on.	Check fan operating circuit. Repair / replace defective circuit / components.
	3. Defective flame failure circuit or overheat switch.	Check flame failure sensor circuit (thermocouple & overheat switch), replace defective components
	4. Dirty pilot injector orifice / filter.	Clean or replace pilot injector orifice / filter.
On completion of work test for gas escapes		

11. Gas Conversion

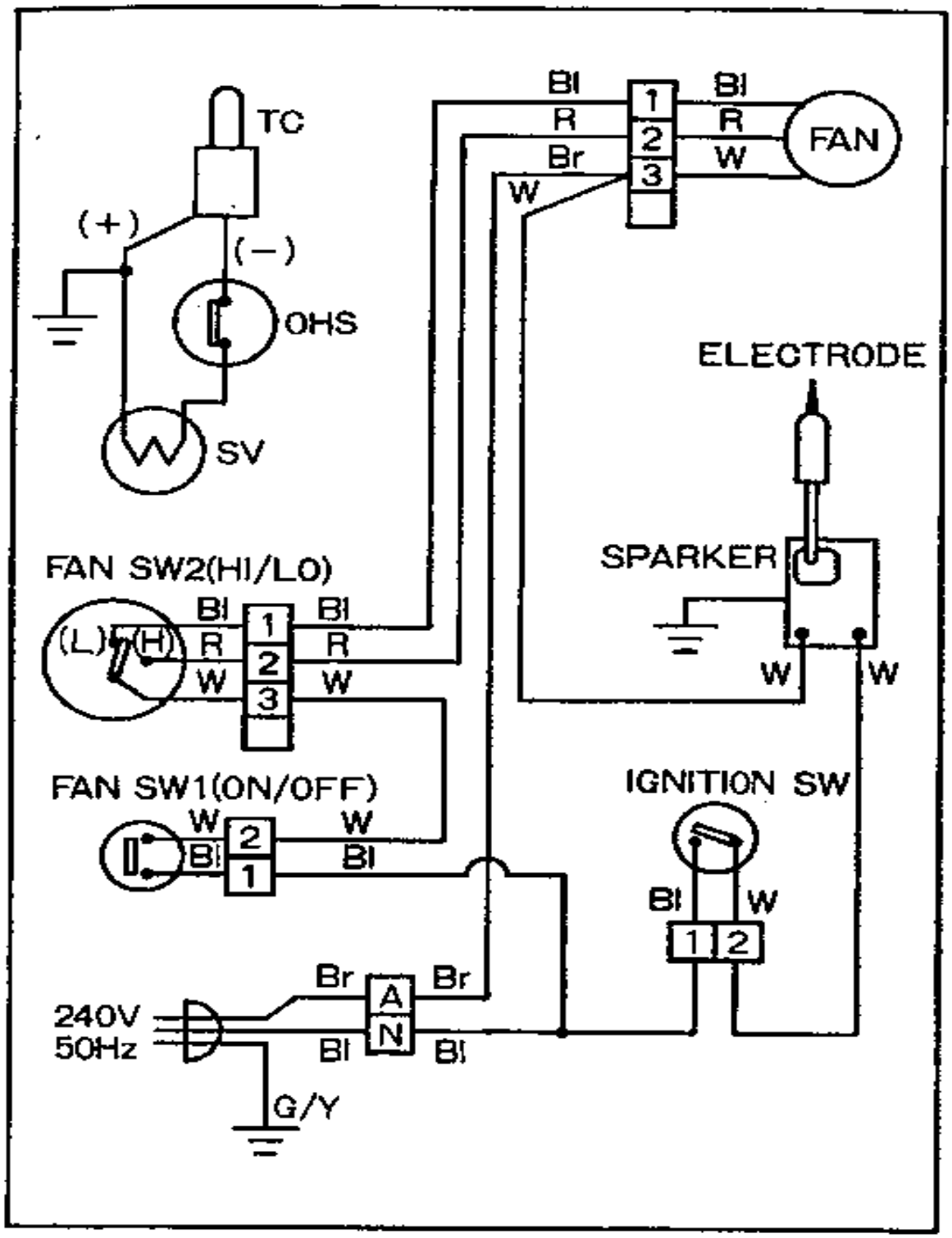
Note: All Service Work must be carried out by an Authorised Person.

Conversion Method

Warning-Ensure powercord is disconnected from power point (240V potential) and isolate gas supply

1. Remove bottom louvre, 2 screws
2. Remove front panel, 4 screws, 2 top, 2 bottom
3. Delete "Natural" from inside bottom panel. Write "Propane" in felt tip pen, OR Delete "Propane" from inside bottom panel. Write "NAT" in felt tip pen.
4. Replace small gas label on gas inlet
5. Replace large gas label on back of appliance
6. Place "Propane" very small gas label over "Natural" on Data Plate OR Place "Natural" very small gas label over "Propane" on Data Plate.
7. Remove glass rod assembly, 2 screws
8. Remove pilot injector from pilot assembly
9. Remove 3 screws from pilot assembly
10. Bend pilot assembly gently forward
11. Remove plate behind pilot assembly to allow access to the main injectors, 1 screw
12. Remove main injectors (4)
13. Fit Propane injectors
14. Refit plate behind pilot assembly, 1 screw
15. Reposition and refit pilot assembly
16. Fit Propane pilot injector
17. Refit glass rod assembly
18. Connect appliance to gas and electricity
19. Set incoming pressure to 3.25kPa
20. Remove test point screw
21. Connect pressure gauge
22. Light appliance on full (4 burners)
23. Reset test point pressure to 2.48 kPa
24. Reduce incoming pressure to 2.75 kPa, check that test point pressure remains at 2.48 kPa
25. Turn appliance off
26. Remove gauge and replace test point screw
27. Test for gas escapes
28. Disconnect appliance from services(For Workshop Use Only)
29. Replace front panel and bottom louvre

12. Wiring Diagram



* Supply lead must only be replaced with Rinnai part number 90161894.

13. Dismantling for Service

240 volt potential exposure. Isolate the appliance and reconfirm with a neon screwdriver or multimeter.

Item *Page*

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

1) Bottom Grill Removal

1. Isolate the 240 V power supply to the appliance.
2. Remove fan intake air filter by lifting it up and pulling out.
3. Remove bottom intake air louvre by removing two attaching screws, then press up (squeeze) bottom of louvre, rotate bottom out and pull top clear of locating fingers.

2) Front Cover Dress Guard

1. Isolate power supply.
2. Remove bottom grill.
3. Remove four attached screws, two in top located air louvre and one each bottom side attaching screws.
4. Rotate bottom out and lift the front cover assembly up to clear its locating fingers from the top of the cabinet.

3) Fan Removal

1. Isolate the 240 V power supply to the appliance.
2. Remove bottom grill and front cover dress guard.
3. Unhook spark electrode lead from its two locating clips on top of intake air duct panel.
4. Remove the air intake duct panel (six attached screws, two back and 2 each side).
5. Unplug the fan lead.
6. Remove the two screws attaching the fan to its mounts.
7. Ease fan forward, rotate bottom of fan outwards and pull fan forward and out.

Note: When installing the fan, ensure that the rubber cushion mounts on the fan housing exhaust air duct and the bottom of each and mounting brackets are securely struck to their metal surfaces.

4) Heat Exchanger Removal

1. Isolate the 240 V power supply to the appliance.
2. Remove bottom grill and front cover dress guard.
3. Remove the glass rod assembly (two screws each with flat stainless steel washer).
4. Remove six screws (three each side) attaching heat exchanger to inner side panels.
5. Pull heat exchanger free of cabinet.

5) Gas Control Removal

1. Isolate the 240 V power supply to the appliance.
2. Remove bottom grill and front cover dress guard.
3. Disconnect gas supply to gas control.
4. Unplug 2-pin plug, the 4-pin plug and the thermocouple lead plug from the gas control.
5. Remove the thermocouple each wire retaining screw from the gas control.
6. Remove the single screw and retaining plate holding the three gas outlet supply tubes from the gas control.
7. Gently pull each supply tube free from the gas control. Do not damage the sealing “O” ring when removing or replacing gas tubes. Use graphite grease to lubricate.
8. Remove four screws attaching the gas control to the cabinet, carefully lower gas control and pull free.

6) Burner Assembly Removal

1. Isolate the 240 V power supply to the appliance.
2. Remove bottom grill and front cover dress guard.
3. Remove the heat diffuser unit (glass rod assembly 2-screws).
4. Unclip electrical leads from around gas pipes.
5. Unclip the plastic anti vibration clamp from between the gas supply tubes.
6. Unplug the fan switch leads (2-pin plug, blue/white leads).
7. Remove each gas supply tube from the three applicable burner injector blocks (not necessary to remove the parallel tube to the left hand burner injector block). Retained by screw and locking plate.

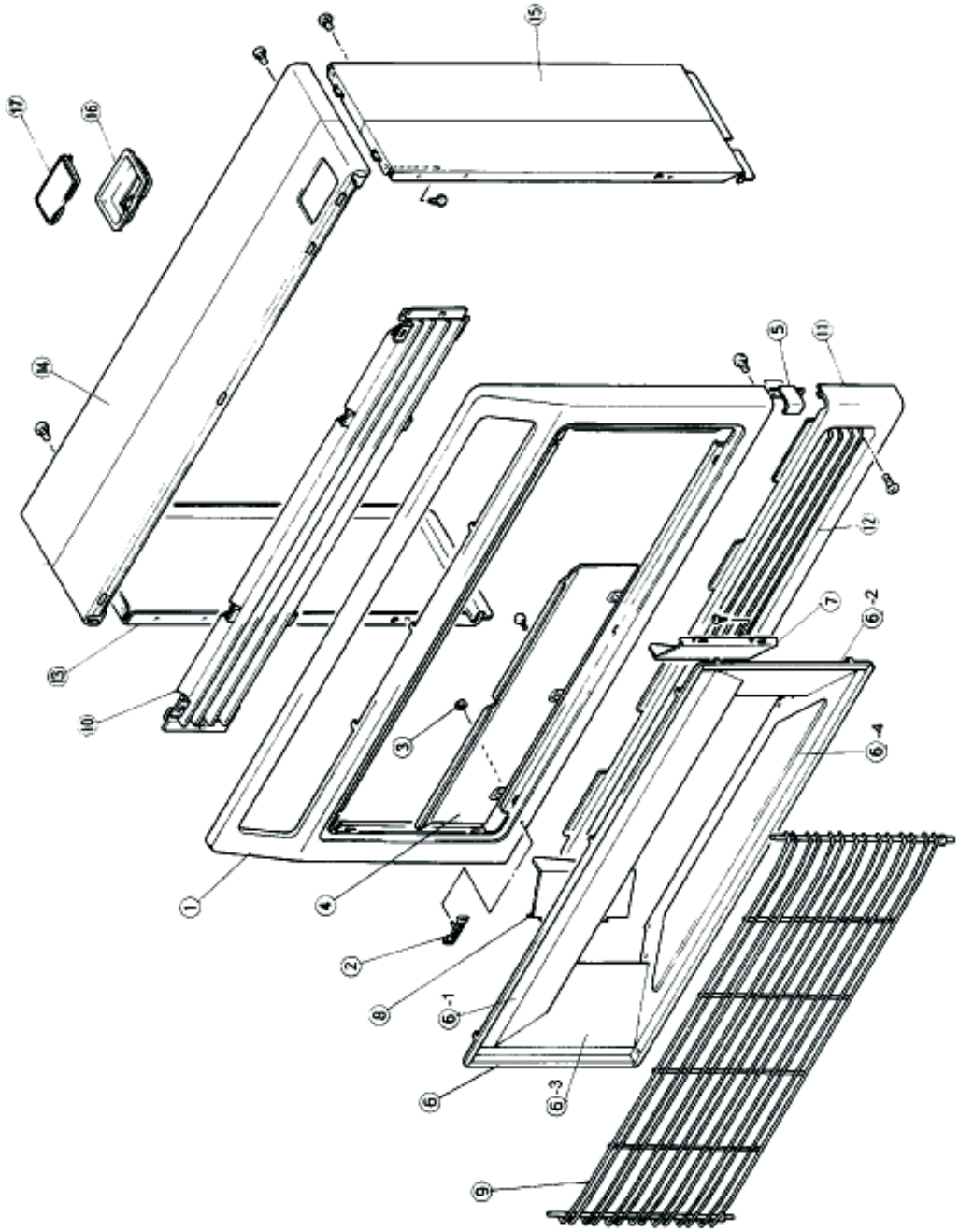
Note: Do not damage the sealing "O" rings when removing / replacing gas tubes. Use graphite grease to lubricate.

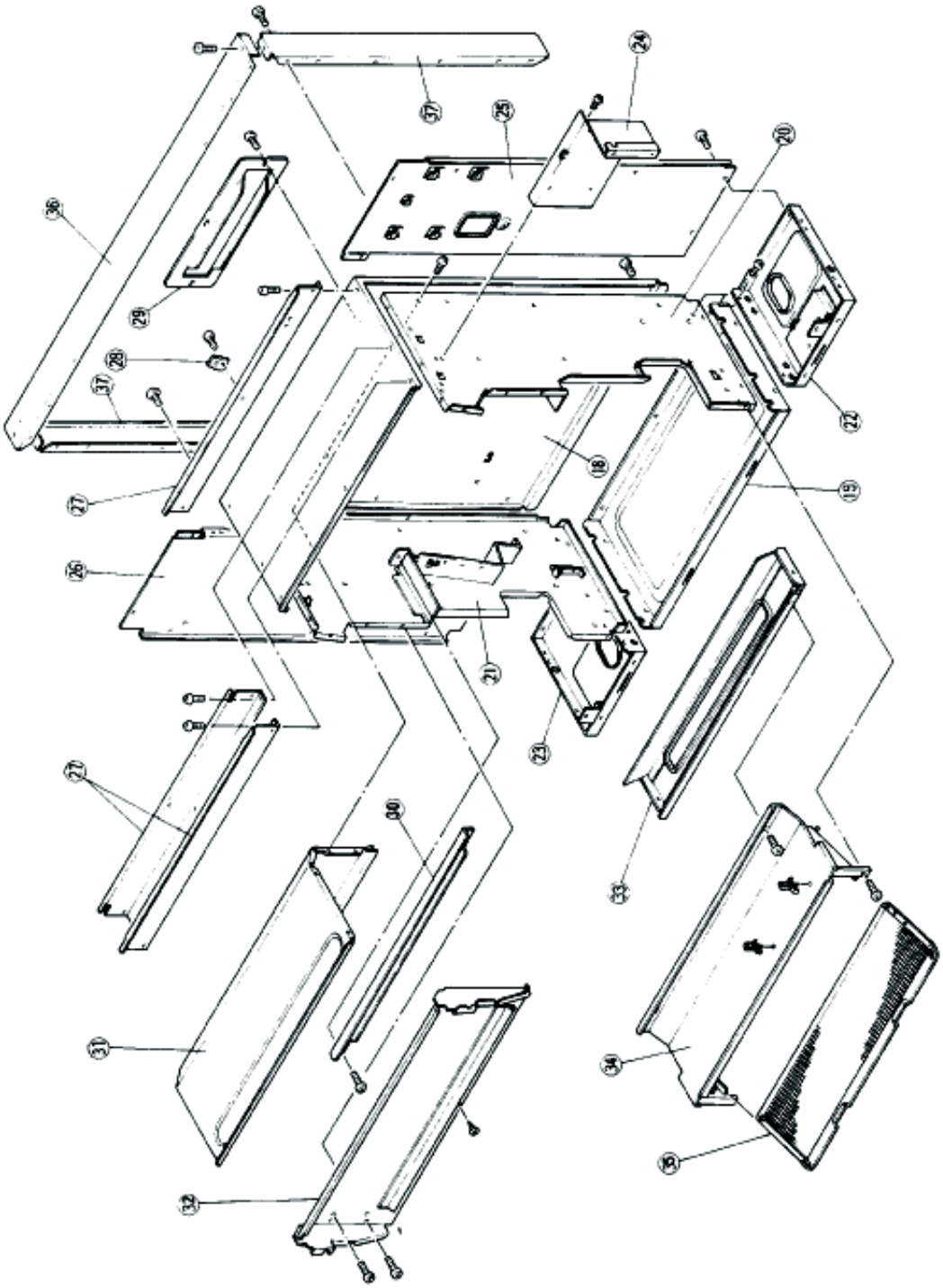
8. Disconnect the igniter electrode lead.
9. Disconnect the thermocouple leads from the gas control (single lead plug and earth wire attached by screw).
10. Remove burner assembly attaching screws (1 either side). Pull burner assembly forward and free.

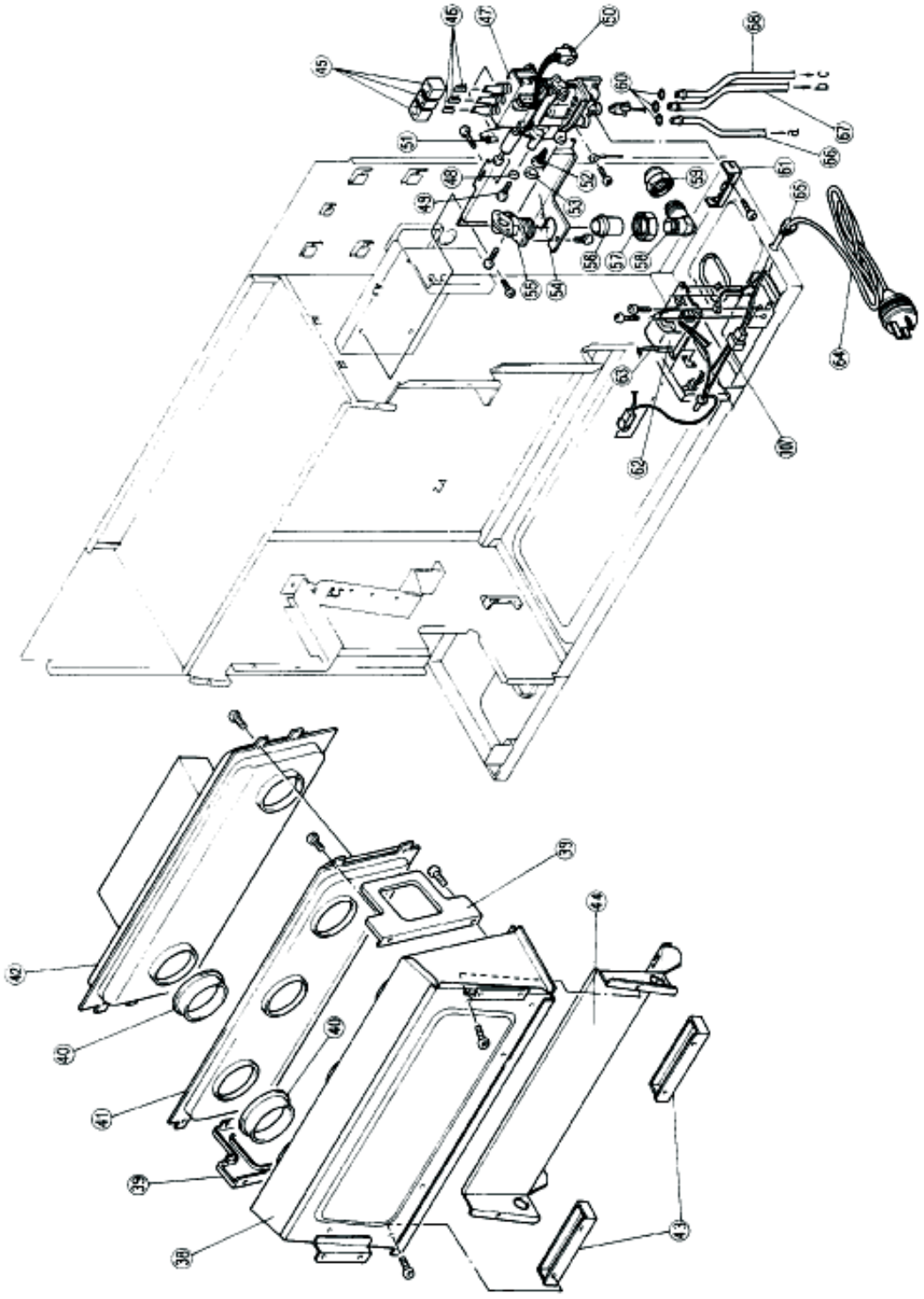
7) Filter Maintenance

1. Air intake filter should be cleaned weekly during heating season (refer to user maintenance).
2. Gas supply line filter needs to be cleaned depending on condition and cleanliness of gas supply area.
3. Pilot injector orifice filter will be cleaned at normal service.

14. Exploded Diagrams



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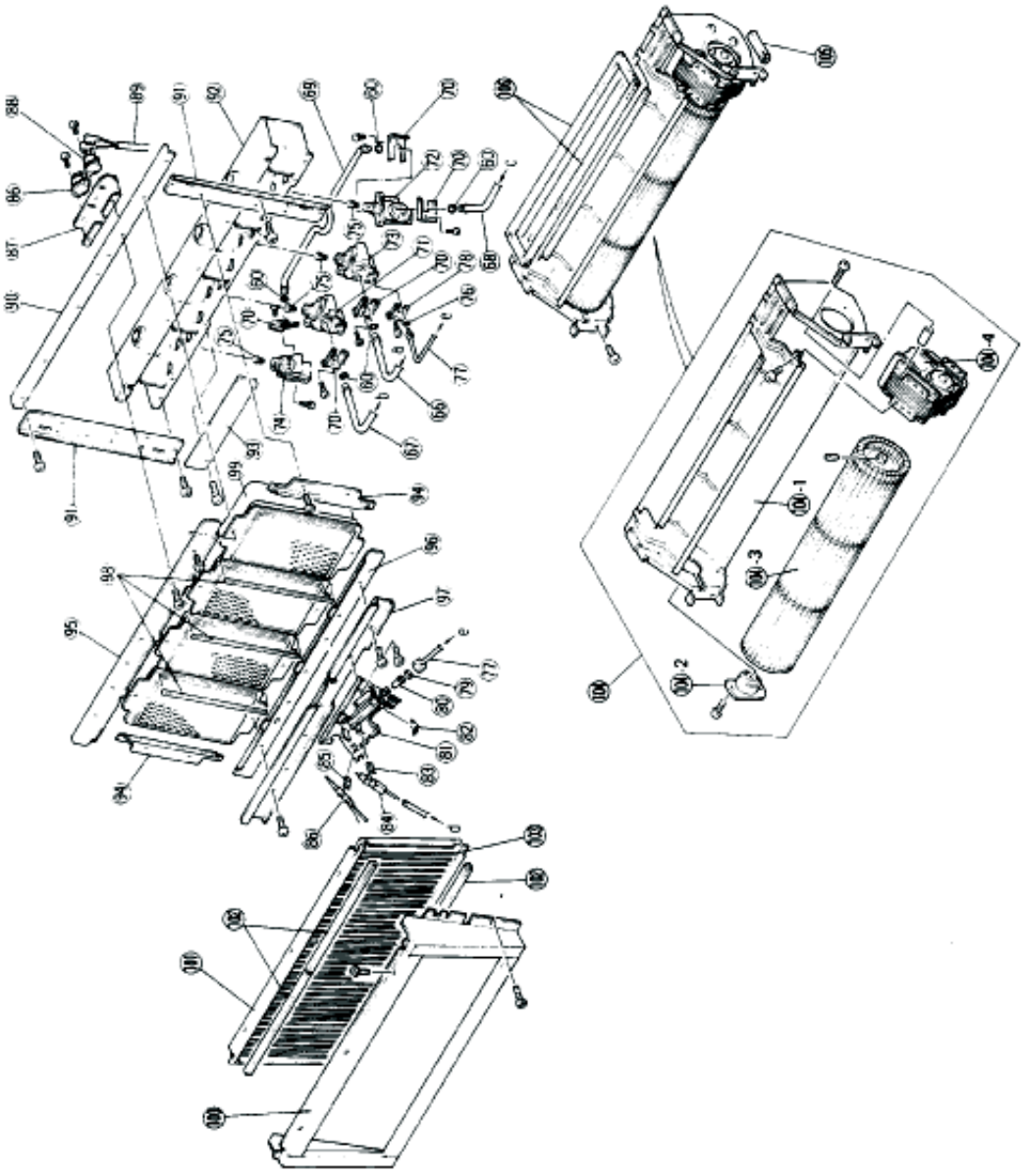

15. Parts List

Effective Date: 27/03/12
Supercedes: 15/09/2011
Version 4

REH281EB / REH281EC

No.	Part name	RA Part No.	11 Digit Code	Qty
001	Front Panel A (Beige)	90150632	019-892-000	1
001	Front Panel D (Gun Metal)	90180837		1
002	Escutcheon Panel			1
003	Electrical Cord Bush Nut			1
004	Heat Shield Assy		030-820-000	1
005	Front Panel Retainer Bracket		537-675-000	2
006-1	Upper Side Reflector(Beige)		038-158-000	1
006-1	Upper Side Reflector(Gun Metal)		038-169-000	1
	Lower Reflector		038-170-000	1
006-2	L Side Reflector (Beige)			1
006-2	R Side Reflector (Gun Metal)			1
006-3	L Side Reflector (Beige)			1
006-3	R Side Reflector (Gun Metal)			1
006-4	Bottom Side Reflector(Beige)			1
006-4	Bottom Side Reflector(Gun Metal)			1
007	Side Reflector Suppot R			1
008	Side Reflector Suppot L			1
009	Dress Guard B	90147760	056-169-000	1
010	Louvre Assy (Beige)	90147737	046-159-000	1
010	Louvre Assy (Gun Metal)			1
011	Louvre Insert (Beige)	90147893	147-028-000	1
011	Louvre Insert (Gun Metal)	90180951		1
012	Seal Gasket	90147919	580-796-000	2
012	Seal Packing	90147919	580-796-000	2
013	L/H Side Panel (EB.Beige)	90147836	003-560-000	1
013	L/H Side Panel (EB.Gun Metal)			1
013	L/H Side Panel (EC.Beige)			1
013	L/H Side Panel (EC. Gun Metal)	90180902	001-713-000	1
014	Top Panel A-a (EB.Beige)	90147778	001-713-000	1
014	Top Panel A-d (EB.Gun Metal)	90180969		1
014	Top Panel B-a (EC.Beige)	90147794		1
014	Top Panel B-d (EC.Gun Metal)	90180995		1
015	R/H Side Panel (EB.Beige)	90147810	003-564-000	1
015	R/H Side Panel (EB.Gun Metal)	90180977		1
015	R/H Side Panel (EC.Beige)	90147851		1
015	R/H Side Panel (EC. Gun Metal)	90181009		1
016	Control Case C			1
017	Control Lid C	90147364	035-742-000	1
018	Rear Panel Assembly			1
019	Bottom Panel			1
020	R/H Inside Side Panel			1

No.	Part name	RA Part No.	11 Digit Code	Qty
021	L/H Inside Side Panel			1
022	R/H Bottom Side Panel (EB)	90149634		1
022	R/H Bottom Side Panel (EC)	90149659		1
023	L/H Bottom Side Panel (EB)	90149642		1
023	L/H Bottom Side Panel (EC)	90149667		1
024	Gas Control Support Bracket			1
025	R/H Main Bracket			1
026	L/H Main Bracket			1
027	Top Main Bracket (EB)			2
027	Top Main Bracket (EC)			3
028	Clip (EC only)	90147471	504-018-000	2
029	Seal Bracket			1
030	Rear Combustion Chamber Bracket			1
031	Guide			1
032	Combustion Chamber Divider			1
033	Top Louvre Divider			1
034	Under Louvre Divider			1
035	Air Filter Assembly	90147331	017-292-000	1
036	Back Spacer(TOP) (EC.Beige)	90149741	550-138-000	1
036	Back Spacer(TOP) (EC.Gun Metal)			1
037	Back Spacer(Side) (EC.Beige)	90147653	550-153-000	2
037	Back Spacer (Side)(EC.Gun Metal)		550-153-000	2
038	Combustion Chamber Assy	90170499		1
039	Heat Exchanger Bracket			2
040	Transfer Tube			5
041	Heat Exchanger B-A Assy	90147497	314-372-000	1
042	Heat Exchanger Rear Assy	90170507	314-430-000	1
043	Combustion Hood Air Guide B			2
044	Combustion Hood Air Guide A			1
045	Control Button	90193442		3
046	Spring Bushing	90142019	194-081-000	3
047	SV Valve (NG/LPG)	90147638		1
048	Pressure Point Packing			1
049	Pressure Point Brind Packing	92068907	501-060-010	1
050	Lead Cord (Exchange Switch)	90150590	209-335-000	1
051	Lead Cord (Spaker Switch)	90150608	209-336-000	1
052	Filter		017-969-000	1
053	Packing	90149873	510-519-000	1
053	Gasket	90170374	510-519-000	1
054	P.C.B. Bracket	90147976	537-791-000	1
055	Union Elbow		191-243-000	1
056	Union	90104092	191-242-000	1
056	Barrel Union	90104092	191-242-000	1

No.	Part name	RA Part No.	11 Digit Code	Qty
056	Inlet Elbow Assy	90144973	191-242-000	1
056	Barrel Union Nut	90104084	502-292-000	1
057	Valve Union Nut		502-292-000	1
058	Gas inlet Elbow	90104191	196-032-000	1
058	Inlet Elbow Assy	90104191	196-032-000	1
059	Nut		502-296-000	1
060	O Ring	90170788	520-001-010	8
061	Front Panel Support Bracket		508-964-000	1
062	Original Sparker Part 90146952 is NLA will have to adapt 90169384			1
063	High Tension Lead B	90149733	203-805-000	1
064	Electrical Cord Assembly	90192303	206-181-000	1
065	Cord Bushing	90146952	194-098-000	1
066	Main Gas Suply Tube A	90148859		1
067	Main Gas Suply Tube B	90149717	109-179-000	1
068	Main Gas Supply Tube C	90149113	109-180-000	1
069	Main Gas Supply Tube D	90199115	109-181-000	1
070	Gas Suply Tube Retainer Bracket	90148628	537-386-000	5
071	Injector Holder A	90147950	195-081-000	1
072	Injector Holder B	90148115	195-082-000	1
073	Injector Holder C	90147505	195-083-000	1
074	Injector Holder D	90148123	195-084-000	1
075	Main Injector (N.G.)	90148644	130-295-125	4
075	Main Injector(Prop.G.)	90148651	130-295-075	4
076	O Ring	90170853	520-020-010	1
077	Pilot Tube		109-182-000	1
078	Pilot Tube Bracket	90189796	537-052-000	1
079	Secondary Pilot Injector Filter	90177932	017-055-000	1
080	Pilot Injector N.G.	90148669	131-271-040	1
080	Pilot Injector Prop.G.	90131293	131-266-020	1
081	Pilot Holder Assembly B (NG/LPG)	90147521	152-539-000	1
082	Pilot Damper D	90149832	141-087-000	1
083	Plug Holder	90179524		1
084	Electrode	90147554	202-011-000	1
085	Plug Holder		506-071-000	1
086	Thermocouple Assy B	90147570	121-346-000	1
087	Switch Bracket		537-792-000	1
087	Burner Cover	90157355	537-792-000	1
088	Fan Switch (60ºC ON, 43ºC OFF)	90143058	248-012-000	1
089	FS Lead	90148735	290-0179000	1
090	Burner Flame Top A		047-583-000	1
091	Burner Flame Side		047-454-000	2
092	Burner Flame Bottom		047-584-000	1
093	Restrictor		142-106-000	1

No.	Part name	RA Part No.	11 Digit Code	Qty
093	Restrictor		142-106-000	1
094	Burner Bracket Side		508-963-000	2
095	Burner Bracket Top	90149063	538-210-000	1
095	Radiant Retainer Top	90149063	538-210-000	1
096	Burner Bracket Bottom	90149105	538-211-000	1
097	Draught Protection Panel		039-152-000	1
098	Burner Divider		515-079-000	3
099	Burner Box Only	90118407		4
099-1	Plaques Ceramic	90179326	172-064-000	4
099-2	Wool Ceramic (Seal)	90170762	531-001-031	4
100	Glass Frame Assy	90195918	047-585-000	1
101	Glass Tube Support Bracket		517-300-000	1
102	Glass Packing		580-797-000	4
103	Glass Tube (Quartz Rods)	90103359	051-085-000	54
104	Convection Fan Complete Assembly	90147661	040-254-000	1
104-2	Bearing LS		067-013-000	1
105	Rubber Packing	90181012	540-079-000	2
106	Louvre Packing		580-957-000	2
107	Wiring Harness			1
108	Sealing Strip	90150301	580-663-000	1
888	Operation Manual		610-694-700	1

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