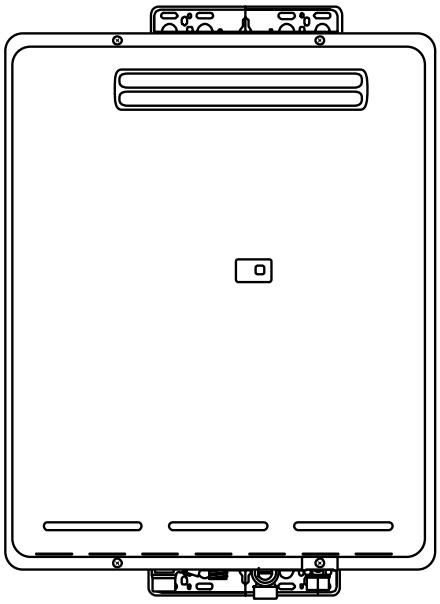
Rinnai

INFINITY REU-V3232W
HD250E REU-V3232WC

SERVICE MANUAL



Infinity High Capacity Continuous Flow Gas Hot Water System

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 9002 Lic 4983
Standards Australia

Distributed and serviced in Australia under a Quality System certified as complying with ISO 9002 by Quality Assurance Services.

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

TELARC REGISTERED SUPPLIER
Quality Endorsed Company
ISO 9001 Reg 415

Certified Product
WaterMark
AS3498 Lic W208
Standards Australia

Certified to WaterMark by Quality Assurance Services. WaterMark certification is awarded to products and fittings complying with safety and water contamination standards.

Comparative Energy Consumption tested to The Australian Gas Association requirements of Australian Gas Code AG 102.
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 MORE STARS, THE MORE ENERGY EFFICIENT
GAS ENERGY RATING
The Australian Gas Association

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 102	*Approval requirements for gas water 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 Customer Technical Services

August 2003 - Issue 1

WARNING

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

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 published by Rinnai Australia Technical Services. We welcome users of this manual to provide feedback and suggestions for improvement purposes.

REU-V3232W
REU-V3232WC
Issue Nº1

Table of Contents

Glossary of Terms and Symbols

dB(A)	-	sound pressure level in decibels, “A” range
DC	-	direct current
AC	-	alternating current
WFCD	-	water flow control device
FB	-	feedback information
FF	-	feedforward information
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	-	megajoule per hour
mm	-	millimetres
mmH_2O	-	millimetres of water (gauge pressure)
OHS	-	overheat switch
PCB	-	printed circuit board
CPU	-	central processing unit
POT	-	potentiometer
rpm	-	revolutions per minute
SV	-	solenoid valve
ø	-	diameter
$\Delta\,^{o}C$	-	temperature rise above ambient
POV	-	modulating valve
TE	-	thermal efficiency
TH	-	thermistor
T_{IN}	-	temperature of incoming water
T_{OUT}	-	temperature of outgoing water

1. Introduction

The Rinnai V-Series hot water units represents the latest technology in continuous flow, temperature controlled hot water.

Features

- The Infinity 32 NEVER RUNS OUT of hot water. Whilst electricity, water and gas supplies are connected, hot water is available whenever hot water taps are open.

- Built into the main micro-processor is the facility to LIMIT THE MAXIMUM TEMPERATURE of the hot water supplied. The water temperature may be limited to various maximum temperatures. This is particularly useful when the hot water unit is installed where young children or the infirm may be using the hot water. The Infinity is delivered with a maximum preset temperature of 55° C for REU-V3232W and 65º C for REU-V3232WC. If required, the temperature limits can be changed by a service technician. For further information, please contact Rinnai.

- The Infinity is a power flued appliance. It is COMPACT, saving both floor and wall space.

- The temperature of outgoing hot water is CONSTANTLY MONITORED by a BUILT-IN SENSOR. If the temperature of the outgoing hot water rises to more than 3° C above the selected temperature shown on the Digital Monitor (or the pre-set limit when Remote Controls are not fitted), the burner will automatically go out. The burner will ignite again once the outgoing hot water temperature falls below the temperature shown on the Digital Monitor (or the pre-set limit).

- The burner lights automatically when the hot water tap is opened, and goes out when the tap is closed. IGNITION IS ELECTRONIC, therefore there is not pilot light. When the hot water tap is off, no gas is used.

- 'Deluxe' or 'Standard' Remote Controllers are available as an optional extra. Depending on the models chosen, these offer the following additional features :

  - Bath fill function

  - Voice Prompting

  - Localised Temperature Control for up to one kitchen and two bathroom controllers

  - Clock

- Temperatures selected at the controllers are retained in the SYSTEM MEMORY.

- Operating NOISE LEVEL IS VERY LOW.

- ERROR MESSAGES ARE DISPLAYED on the Remote Controllers, assisting with service.

2. Specifications

Type of appliance	Temperature controlled continuous flow gas hot water system	
Operation	With / without remote controls, mounted in kitchen, bathroom etc.	
Exhaust system	Forced Flue	
Rinnai model number	**REU-V3232W** **REU-V3232WC**	
Installation	Externally mounted	
Dimensions	Width — 470mm Height — 600mm Depth — 220mm	
Weight	29 kilograms	
Maximum / Minimum Gas consumption	Natural gas：250～21MJ/h Propane gas：250～21MJ/h	
Connections	Gas connection — R3/4 (20A) Cold water connection — R3/4 (20A) Hot water connection — R3/4 (20A)	
Ignition system	Direct electronic ignition	
Electrical consumption	Normal — 83 W Standby — 12 W（With 1 Remote control） With Anti-frost protection — 100 W	
Hot water capacity（Raised 25℃）	32 to 2.4 L/min	
Thermal efficiency	80%	
Temperature range (with remote)	Kitchen controller（MC）：37～55℃	
	Bathroom controller (BC) ：37～50℃	
Default temperature control (without remote)	40℃、43℃、50℃、55℃、60℃、65℃、75℃、85℃ （Set by combination of Dip switches on PCB）	
Water flow control	Electronic Water flow sensor, flow control & heat exch. By-pass flow control.	
Minimum operating water pressure*(Note 2)*	180 kPa	
Nominal operating water pressure	200 kPa～1000 kPa	
Minimum operating water flow *(Note 2):*	2.4 L/min	
Maximum operating water flow	32 L/min	
Power supply	Appliance — AC 240 Volts 50Hz Remote control — DC 12 Volts （Digital）	
Noise Level	49 dB(A)	
Safety device	Flame failure	— Flame rod
	Boil dry	— Water flow sensor
	Remaining flame （OHS）	— 97℃ bi-metal switch
	Over temperature	— 95℃ lockout thermistor
	Fusible link	— 129℃ Thermal Fuse
	Pressure relief valve	— Opens 2060 kPa. Closes 1470 kPa
	Combustion fan rpm check	— Integrated circuit system
	Over current	— Glass fuse （3 Amp.）
Remote control optional	Kitchen control	—MC-91-1A or MC-70-2A
	Bathroom control	—MC-91-1A or BC-70-2A
	Second bathroom control	—MC-91-1A or BC-70-2A
Remote Controller Cable (optional)	Two core sheathed (double insulated), flex with min. cross-sectional area of 0.5m²	
Manifold Electronic Control System(optional)	MSA-S	

Note 1: The default factory setting is 55° C for REU-V3232W and 65° C for REU-V3232WC. The unit can be ordered from Rinnai to be pre-set to any of the other temperatures listed. The unit can be pre-set to any of the temperatures listed by a suitably qualified person, except 95° C. Conversion to 95° C must be performed by Rinnai.
Controllers are available with default temperatures up to 75° C. When fitted with controllers, only temperatures not exceeding the default temperatures can be selected. When fitted without controllers, the unit will deliver water at the default temperature. Controllers are not available with 85 and 95° C settings.
Note 2: Unit will operate at lower pressures but the maximum rated flow of 32L/min. will not be achieved.
Note 3: 95° C setting is not suitable for Flow and Return systems.

Sensors and Safety Devices

- Heat Exchanger Thermistor: Measures hot water temperature at heat exchanger outlet. If water temperature reaches a predetermined limit, gas supply is stopped.
- Hot Water Delivery Thermistor: Measures hot water temperature at the outlet valve (i.e. the 'mixed' temperature).
- Flame Rod: Monitors combustion characteristics inside the combustion chamber. If the flame fails, gas supply is stopped.
- Overheat Switch: Situated on the heat exchanger, gas supply is stopped when water temperature reaches 97° C for a number of seconds.
- Fusible Link: Situated on the heat exchanger, electrical power supply is stopped if the temperature exceeds 129° C.
- Water Pressure Relief Valve: Safeguards the water circuit against excessive inlet pressure. Opens at 2100kPa, closes at 1500kPa.
- Electrical Fuse: (3A glass fuse) prevents against over-current.
  Surge Protector: prevents against over-current.
- Boil Dry Prevention: If water flow sensor detects no flow, gas supply is stopped.
- Combustion Fan Speed Sensor: In case of combustion fan defect (no rotation of fan) gas supply is stopped.
- Temperature Cutout: If the delivered hot water temperature rises above the required delivery temperature for a number of seconds, the gas supply is stopped.

Combustion Specifications

Gas Type	Injector Size (mm)	Nominal TPP (kPa) * *		Gas Input (MJ/hr)	
		Low	High	Low	High
Natural	1.05	0.18	0.74	20	250
	1.65				
Propane	0.65	0.35	1.76	20	250
(NZ LPG)	0.95		(1.53) * * *		

* * The TPP is measured with the cover 'off' the appliance at the regulator test point with supply pressures of 1.13 kPa (NG) and 2.75 kPa (Propane).

* * * Value for New Zealand LPG

3. Water Flow Rates and Pressures

Table 1 shows unmixed and mixed water flow rates and approximate gas consumptions for various temperature rises. The unmixed flow rates are the flow rates available at the given temperature rise directly at the outlet of the water heater. The mixed water flow rates are available at the given temperature rise by mixing hot water from the outlet of the water heater with cold water from the mains supply.

Water Flows can also be calculated by the following formula:

$M = 60 \times (Q / C \times \Delta T)$

Where M = Water flow rate in litres/minute. If M is ≤ to 32, the water is unmixed. If M is >32, the water is mixed.
Q = Heat energy available in kW = 56kW for the REU-V3232W/WC
C = Specific heat of water = 4.2KJ/Kg ° C. C does not change for the purpose of this calculation.
Δ T = Temperature rise required (° C)

Example:
What is the flow rate available with an incoming water temperature of 10° C and a required temperature of 20° C?

$\Delta T = 20 - 10 = 10°$ C
Q = 56
C = 4.2

$M = 60 \times (56 / (4.2 \times 10)) = 80$ l/min. Since 80 is greater than 32, this flow rate is mixed. This result corresponds with the value in Table 1.

Table 1: Approximate Water Flows and Gas Usage - Rinnai Infinity REU-V3232W/WC

Temperature Rise °C	5			10			15		
	L/min	L/hr	MJ/hr	L/min	L/hr	MJ/hr	L/min	L/hr	MJ/hr
unmixed	32.0	1920.0	50.0	32.0	1920.0	100.0	32.0	1920.0	150.0
mixed	160.0	9600.0	250.0	80.0	4800.0	250.0	53.0	3200.0	250.0

Temperature Rise °C	20			25			30		
	L/min	L/hr	MJ/hr	L/min	L/hr	MJ/hr	L/min	L/hr	MJ/hr
unmixed	32.0	1920.0	200.0	32.0	1920.0	250.0	26.5	1589.0	250.0
mixed	40.0	2400.0	250.0	32.0	1920.0	250.0	26.5	1589.0	250.0

Temperature Rise °C	35			40			45		
	L/min	L/hr	MJ/hr	L/min	L/hr	MJ/hr	L/min	L/hr	MJ/hr
(unmixed and mixed)	22.7	1362.0	250.0	19.9	1191.0	250.0	17.7	1059.0	250.0

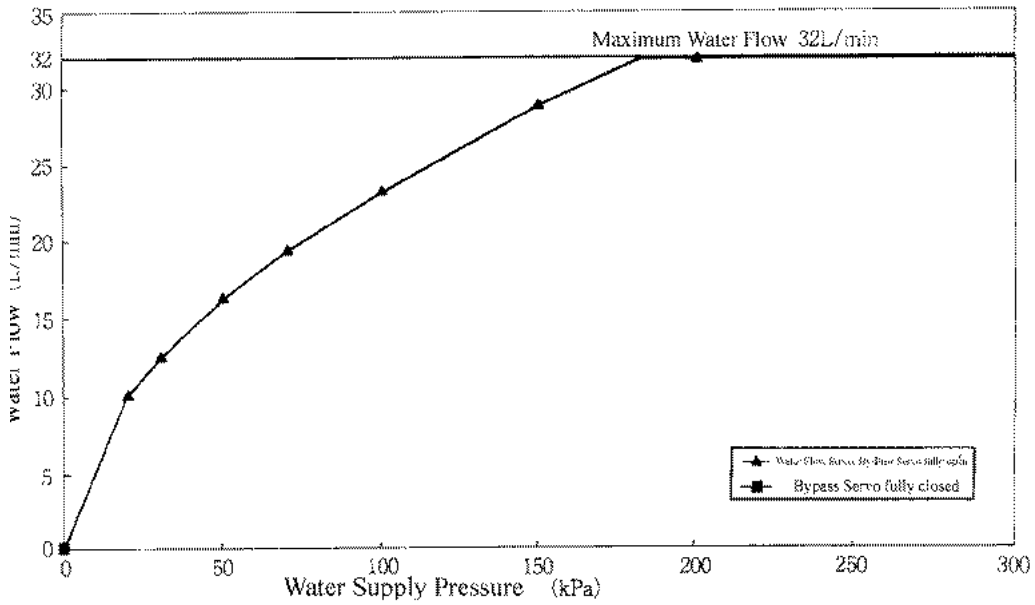
Temperature Rise °C	50			55			60		
	L/min	L/hr	MJ/hr	L/min	L/hr	MJ/hr	L/min	L/hr	MJ/hr
(unmixed and mixed)	15.9	953.0	250.0	14.4	867.0	250.0	13.2	794.0	250.0

Temperature Rise °C	65			70			75		
	L/min	L/hr	MJ/hr	L/min	L/hr	MJ/hr	L/min	L/hr	MJ/hr
(unmixed and mixed)	12.2	733.0	250.0	11.3	681.0	250.0	10.6	635.0	250.0

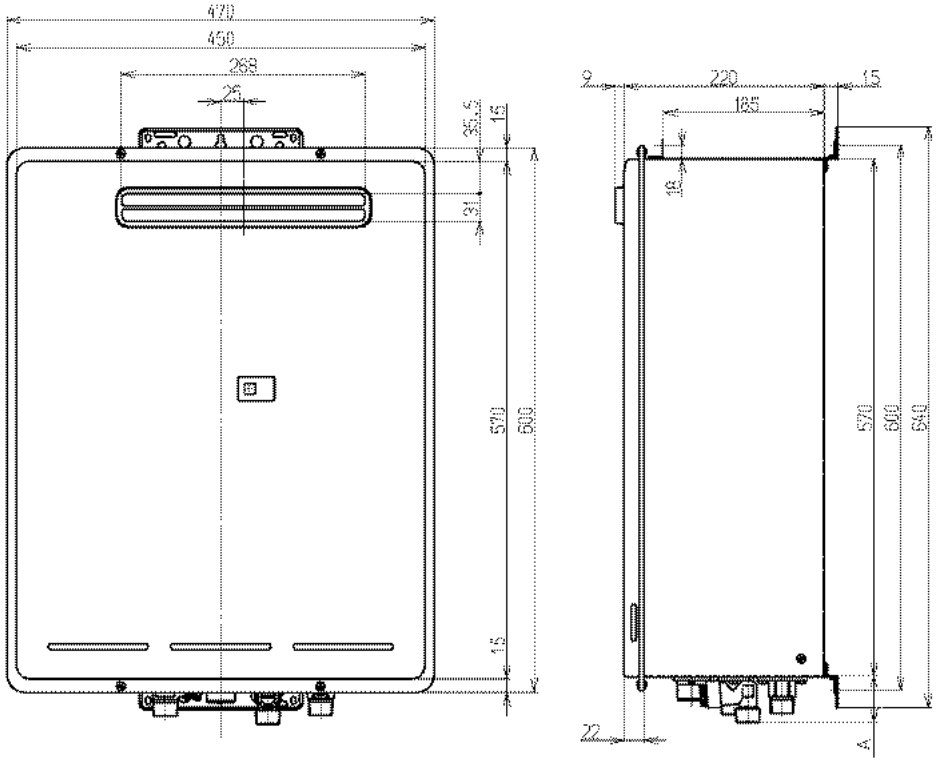
Temperature Rise °C	80			85			90		
	L/min	L/hr	MJ/hr	L/min	L/hr	MJ/hr	L/min	L/hr	MJ/hr
(unmixed and mixed)	9.9	596.0	250.0	9.3	561.0	250.0	8.8	530.0	250.0

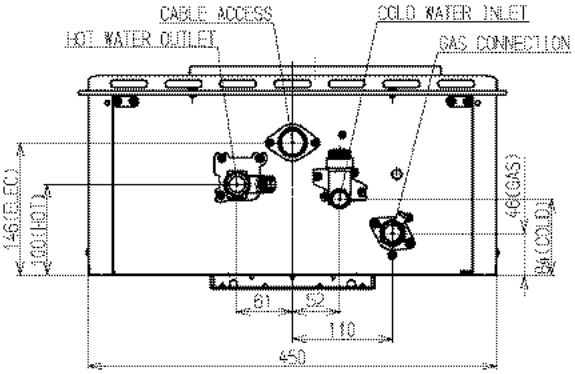
Water Pressure

As seen in the table below a minimum supply pressure of 180 kPa is required to operate at the rated flow of 32 L/min. In an actual installation, pressure losses in the plumbing system also need to be considered.



4. Dimensions



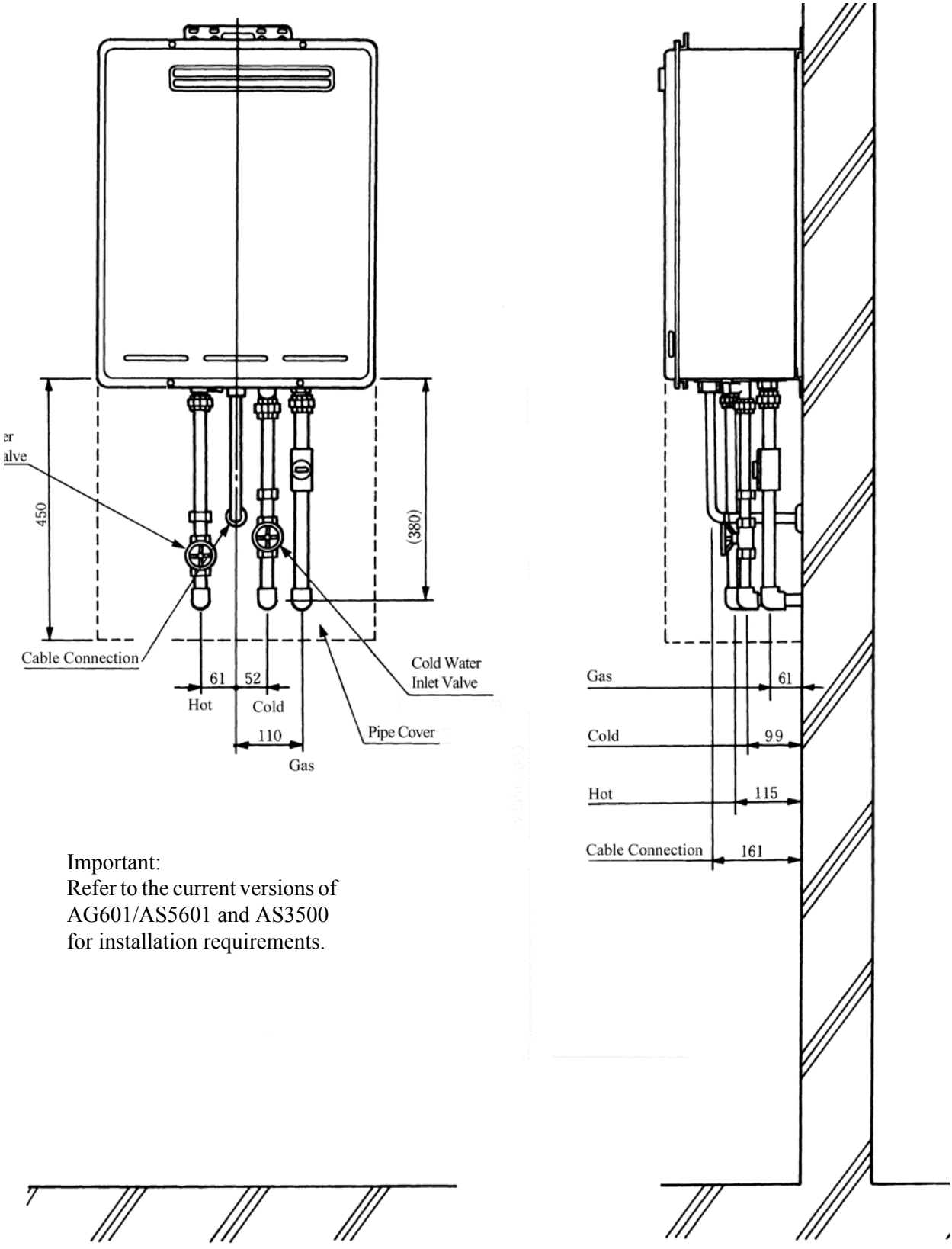


Note:All dimensions are in mm.

	A DIMENSION
GAS	41
COLD	51
HOT	42
ELEC.	27

5. Installation

External Wall Installation

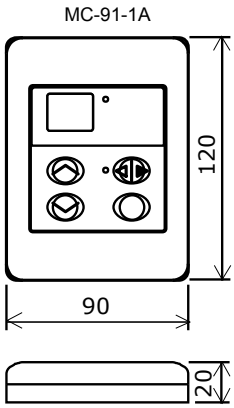


Important:
Refer to the current versions of
AG601/AS5601 and AS3500
for installation requirements.

6. Remote Controls

Remote Controls

Remote Controllers are an optional extra. 'Standard' and 'Deluxe' controllers can be fitted.
Standard controllers allow temperature selection only. Deluxe controllers have temperature selection, bath-fill and voice prompting functions. For detailed information regarding controller operation refer to the 'How to use your water heater' booklet supplied with the appliance. Other manufacturers' controllers are NOT compatible with this appliance.

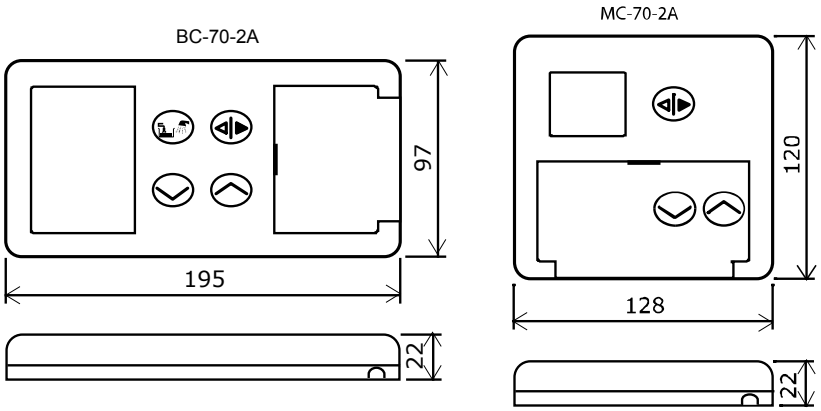


Standard Controller (Model MC-91)

Up to 4 Standard Controllers can be fitted to the appliance. They are normally installed in the areas where the majority of hot water is used, for example, the kitchen, bathroom, ensuite and laundry.

Deluxe Kitchen Remote Control (MC-70) and (BC-70A)

Deluxe controllers have 'Kitchen' (MC-70-2A) and 'Bathroom' (BC-70-2A) versions. 'Kitchen' controls are intended for the Kitchen or other convenient area where the majority of hot water is used. Bathroom Controllers are intended to be fitted in the bathroom or ensuite and allow the user to have a bath filled to the required level and temperature automatically.



Up to three ‘Deluxe’ Controllers can be connected as follows:

Kitchen	Bathroom	Ensuite
MC70-2A		
MC70-2A	BC70-2A	
MC70-2A	BC70-2A	BC70-2A

Positioning of Controllers

Controllers must be installed in shaded and clean locations. They should be fitted out of reach of children (suggested height from floor at least 1500 mm). Controllers are water resistant, however, durability is improved when positioned outside the shower recess or at least 400 mm above the highest part of a sink, basin or bath.

Do not install the Controllers

- Near a heat source, such as a cook top, stove or oven. Heat, steam smoke and hot oil may cause damage.
- In direct sunlight.
- Outdoors unless an enclosure is provided which protects the controller against sunlight and dust ingress.
- Against a metal wall unless the wall is earthed in accordance with AS/NZ3000.

Remote Controller Connection

Remote controls operate at extra low voltage (12 Volts DC) which is supplied from the appliance. Controllers are supplied with 15 m of electrical cable. The cable wires for connection to the appliance are fitted with spade terminals.

Extension cables are available from Rinnai. Alternatively, a two core sheathed (double insulated) flex with minimum cross-sectional area of 0.5 mm² can be used. Maximum cable length is 50 m.

For connection refer to the "**CONNECTING REMOTE CONTROL CABLES**" section.

Water Heater and Controller installation configurations

"THIS APPLIANCE DELIVERS WATER
NOT EXCEEDING 50ºC IN ACCORDANCE WITH AS 3498"

If the front cover of the appliance contains the following text install it in accordance with Diagram 1 below:

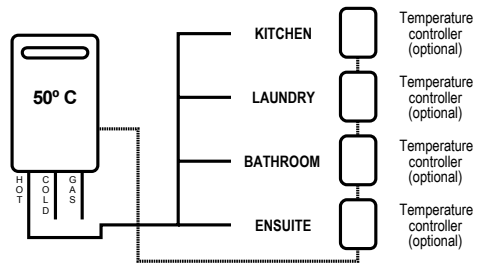


Diagram 1. 50º C Appliance

If the front cover of the appliance does NOT contain the above text install it in accordance with Diagram 2:

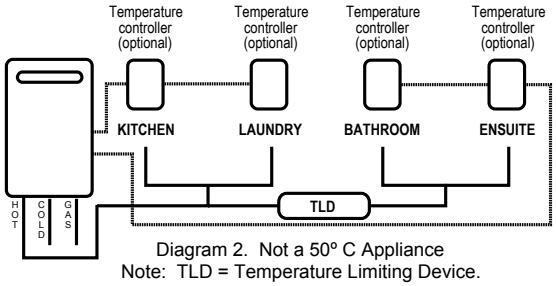


Diagram 2. Not a 50º C Appliance
Note: TLD = Temperature Limiting Device.

IMPORTANT: If the appliance is to deliver water primarily for the purposes of personal hygiene in an early childhood centre, primary or secondary school, nursing home or similar facility for young, aged, sick or disabled persons as defined in AS/NZ3500.4 a Temperature Limiting Device (TLD), such as a Tempering Valve, may be required even if the appliance is set to 50º C or less. For these types of applications contact Rinnai.

Connecting Remote Control Cables

Do not attempt to connect the remote control cable terminals to the appliance with the power on.
RISK OF ELECTRICAL SHOCK !

Connecting One or Two Controllers

1. Isolate the power supply
2. Remove the front cover from the Appliance (4 screws) fig. 1.
3. Thread the cable(s) through the cable access hole at the base of the appliance.
4. Connect the spade connectors to the terminals marked "Remote Control" on the printed circuit board (fig. 2). Polarity is not important. Either wire colour can be connected to either terminal.
5. Replace cover of the Appliance. Ensure that the screw with the star washer is placed at the bottom right hand corner for earthing purposes.

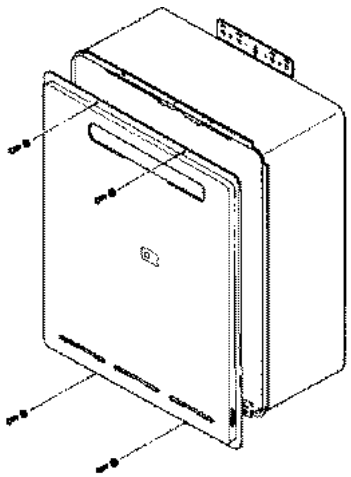


fig.1

Connecting Three Controllers

6. Isolate the power supply
7. Remove the front cover from the Appliance (4 screws) fig.1.
8. Cut the spade connectors from 2 of the controller cables to be connected to the appliance (4 spade connectors should be cut off) and discard. Connect the wires from these two cables and terminate into two new spade connectors as shown in fig.3. Spade connectors are available from your local electrical component retailer.
9. Thread the 3 cables through the cable access hole at the base of the appliance. Connect the 4 spade connectors to the terminals marked "Remote Control" on the printed circuit board (fig.2). Polarity is not important. Either wire colour can be connected to either terminal.
10. Replace cover of the Appliance. Ensure that the screw with the star washer is placed at the bottom right hand corner for earthing purposes.

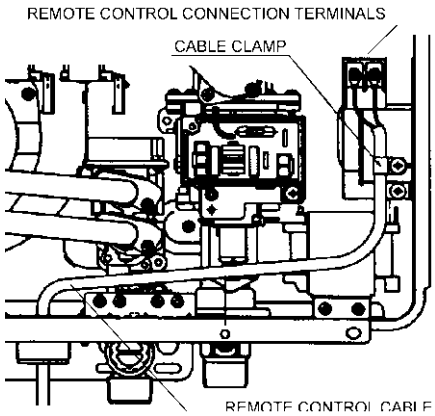


fig.2

Connecting Four Standard Controllers

11. Isolate the power supply
12. Remove the front cover from the Appliance (4 screws) fig 1.
13. Cut the spade connectors from all four controller cables to be connected to the appliance (8 spade connectors should be cut off) and discard. Connect the wires from two cables and terminate into two new spade connectors as shown in (fig. 3).

    Repeat for the remaining two cables. Spade connectors are available from your local electrical component retailer.

14. Thread the 4 cables through the cable access hole at the base of the appliance. Connect the 4 spade connectors to the terminals marked "Remote Control" on the printed circuit board (fig 2). Polarity is not important. Either wire colour can be connected to either terminal.
15. Replace cover of the Appliance. Ensure that the screw with the star washer is placed at the bottom right hand corner for earthing purposes.

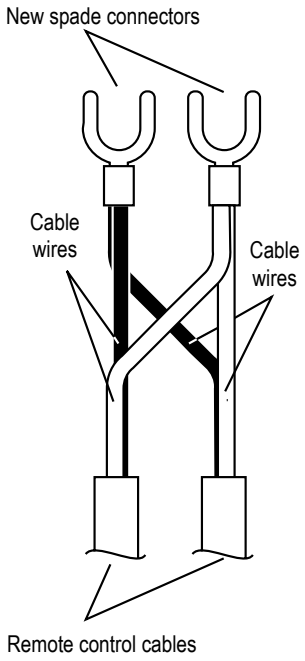


fig. 3

MC-91A Controller Programming

Question 1: Are four Controllers connected ?

IF YES: You will need to activate the fourth controller.

STEP 1:

For the Controller in the 'KITCHEN' only, press and hold the 'Transfer' and 'On/Off' buttons simultaneously (see fig. 1) until a 'beep' is heard (approximately 5 seconds).

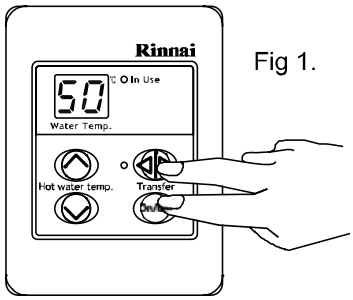


Fig 1.

STEP 2:

Check that the display on ALL FOUR controllers is lit and displaying a temperature when 'switched on'. If any ONE of the controller displays two dashes (see fig. 2) in the display repeat STEP 1.

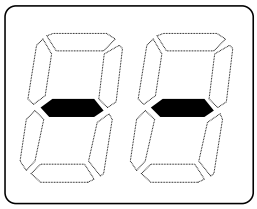


Fig 2.

This completes the activation procedure. Ignore Question 2.

IF NO: (You have three controllers or fewer), go to Question 2.

Question 2: Is your water heater labelled "THIS APPLIANCE DELIVERS WATER NOT EXCEEDING 50° C IN ACCORDANCE WITH AS 3498" on the front cover?

IF YES: No further action required.

IF NO: You will need to program the Kitchen controller to enable selection of temperatures higher than 50º C.

STEP 1:

For the controller in the KITCHEN only, press and hold the 'Transfer' and 'On/Off' buttons simultaneously (see fig 1.) until a 'beep' is heard (approximately 5 seconds).

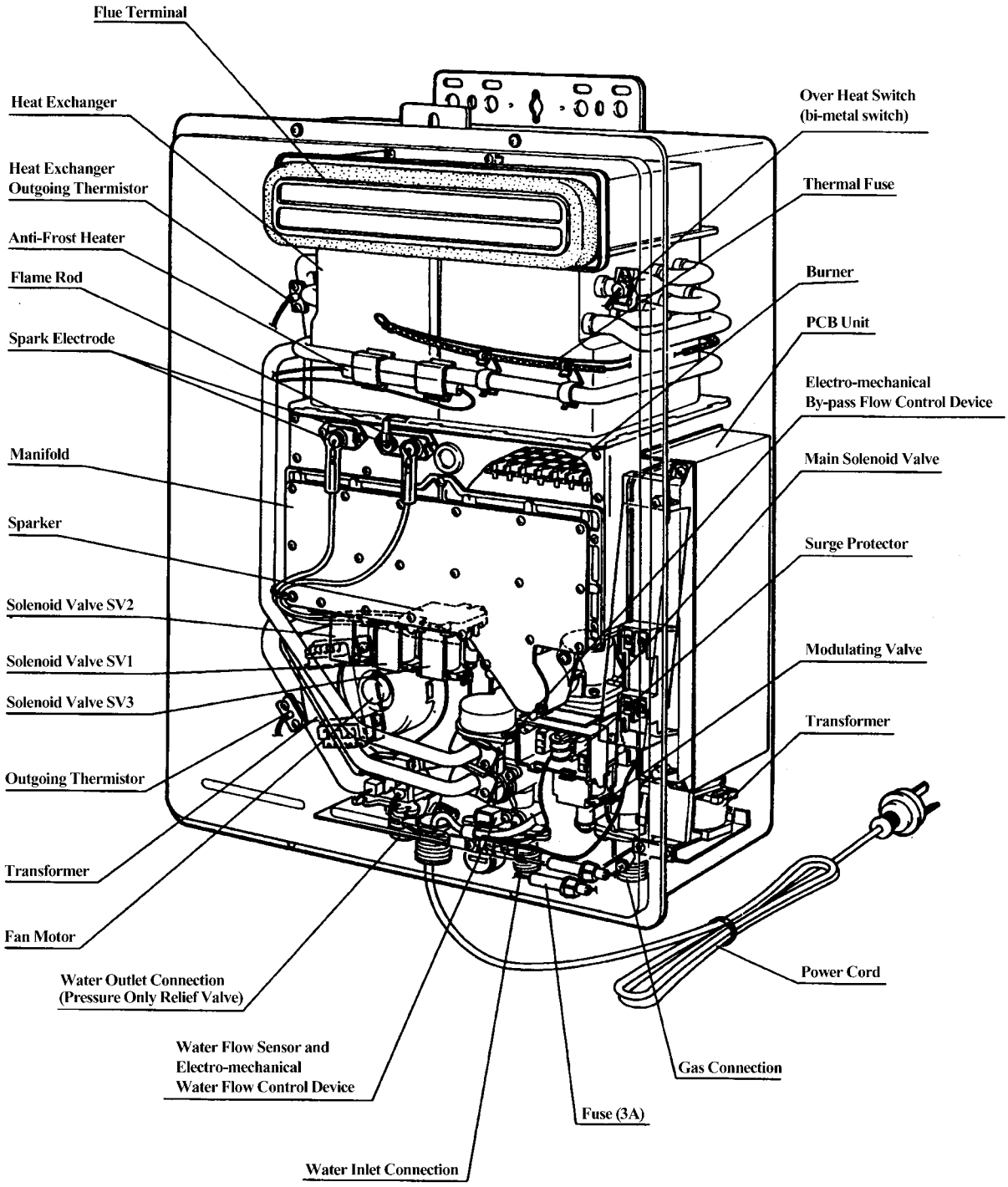
STEP 2:

When the controller fitted in the KITCHEN is switched on, it should be possible to select temperatures higher than 50º C. If not, repeat Step 1.

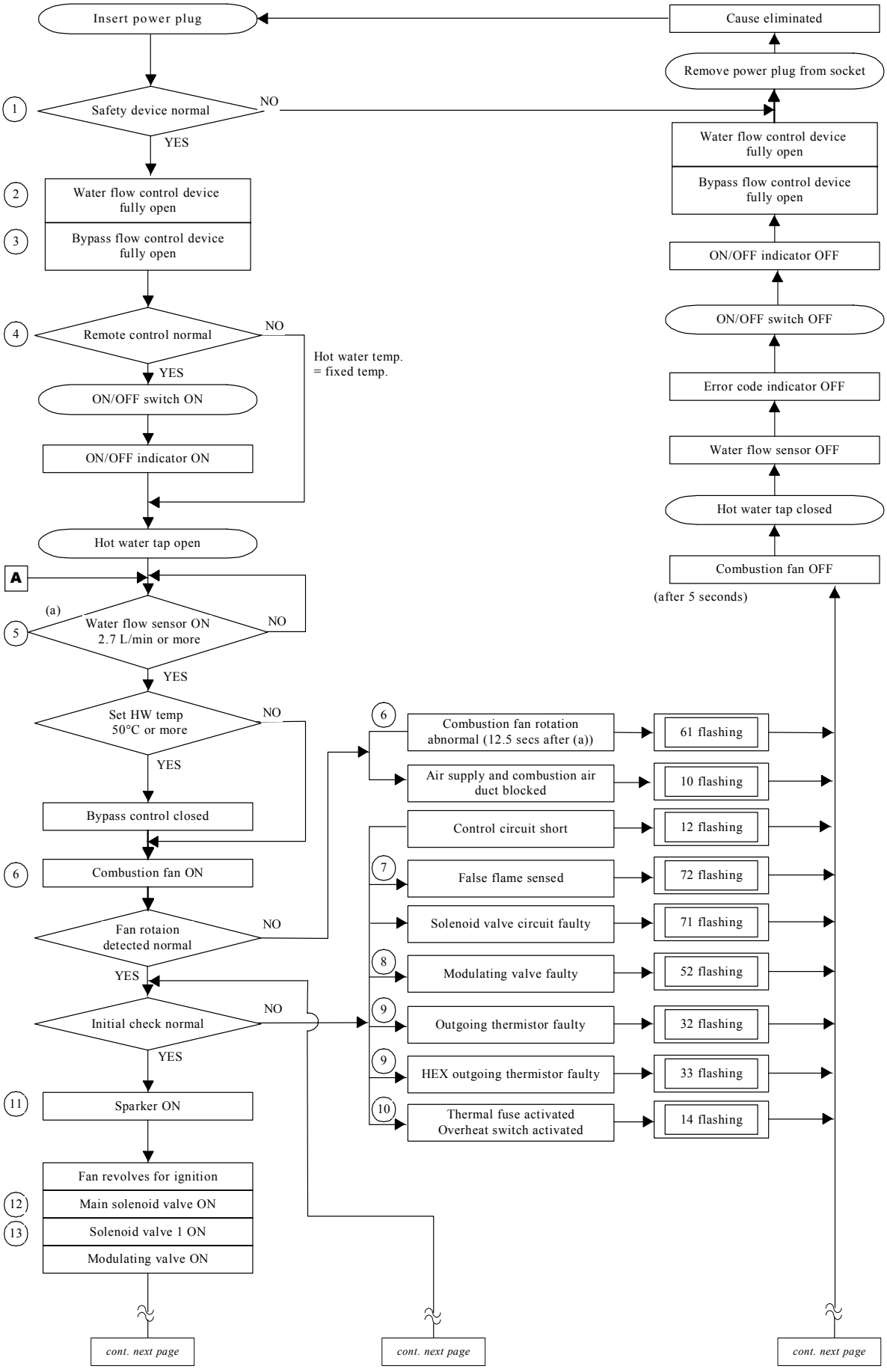
Note:

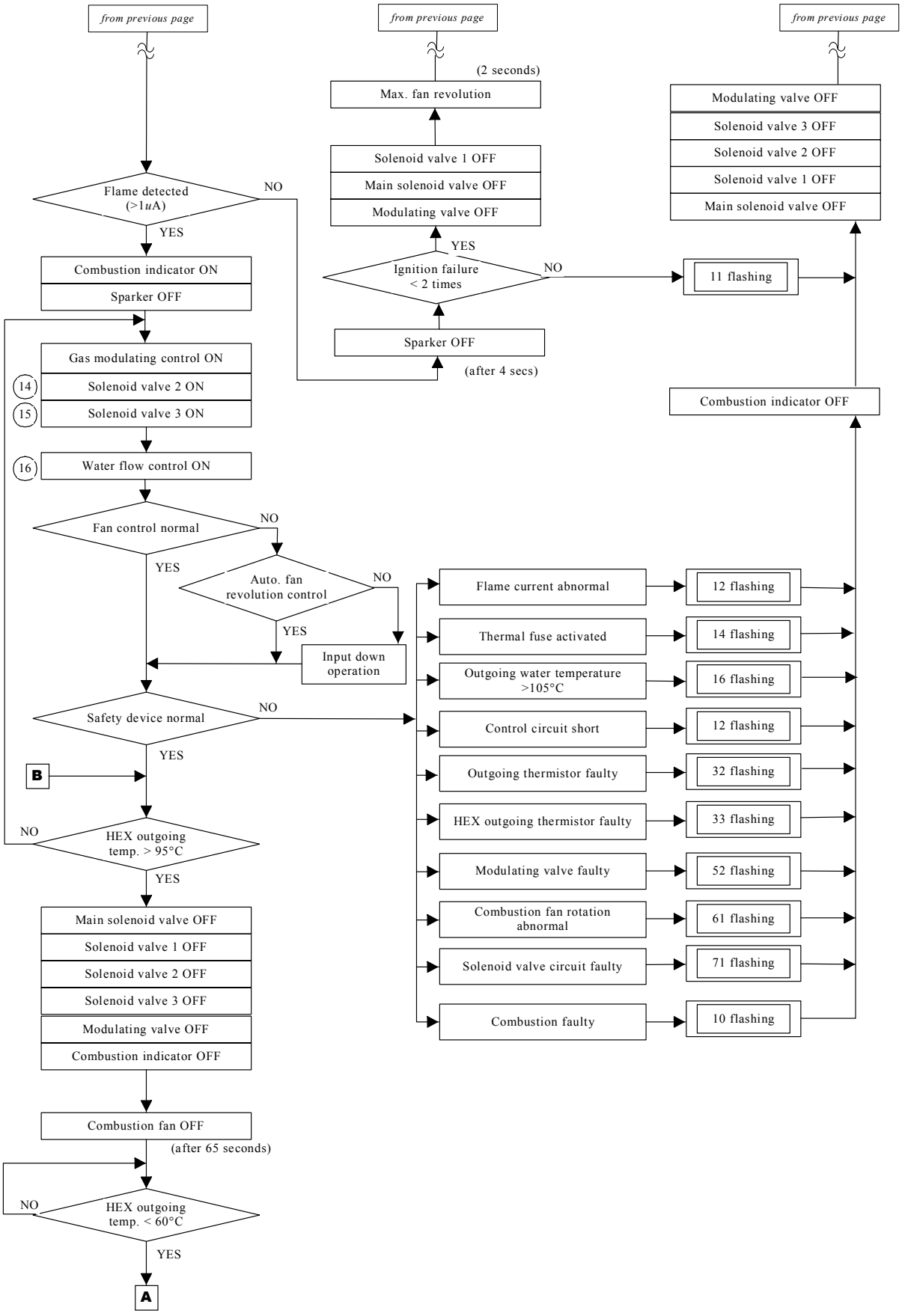
- If the kitchen controller is replaced, repeat STEP 1 above for the replacement controller.
- If the kitchen controller is swapped with another controller (for example, the controller fitted in a bathroom), repeat STEP 1 for the controller moved from the kitchen to the bathroom. Then perform STEP 1 for the controller moved from the bathroom to the kitchen.

7. Cutaway Diagram



8. Operational Flow Chart




from previous page
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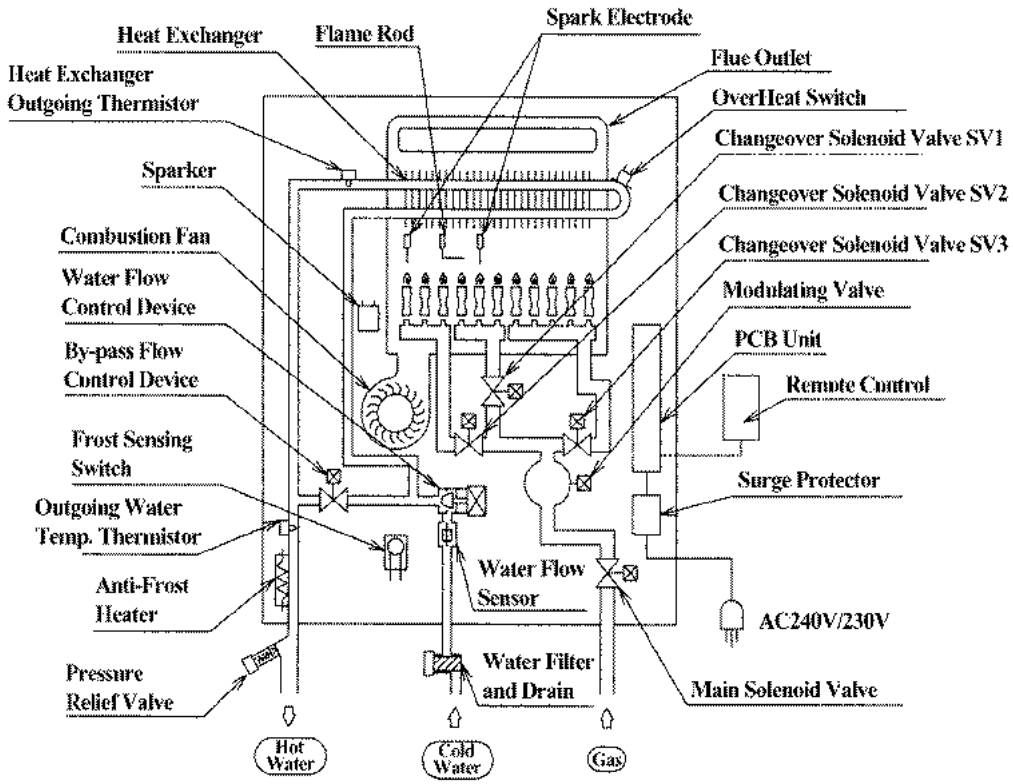
from previous page
(2 seconds)
Max. fan revolution
Modulating valve OFF
Solenoid valve 3 OFF
Solenoid valve 2 OFF
Solenoid valve 1 OFF
Main solenoid valve OFF
Solenoid valve 1 OFF
Main solenoid valve OFF
Modulating valve OFF
Flame detected (>1μA)
NO
YES
YES
Ignition failure < 2 times
NO
11 flashing
Combustion indicator ON
Sparker OFF
Sparker OFF
(after 4 secs)
Combustion indicator OFF
Gas modulating control ON
14 Solenoid valve 2 ON
15 Solenoid valve 3 ON
16 Water flow control ON
Fan control normal
NO
YES
Auto. fan revolution control
NO
YES
Input down operation
Safety device normal
NO
YES
B
NO
HEX outgoing temp. > 95°C
YES
Main solenoid valve OFF
Solenoid valve 1 OFF
Solenoid valve 2 OFF
Solenoid valve 3 OFF
Modulating valve OFF
Combustion indicator OFF
Combustion fan OFF
(after 65 seconds)
NO
HEX outgoing temp. < 60°C
YES
A
Flame current abnormal
12 flashing
Thermal fuse activated
14 flashing
Outgoing water temperature >105°C
16 flashing
Control circuit short
12 flashing
Outgoing thermistor faulty
32 flashing
HEX outgoing thermistor faulty
33 flashing
Modulating valve faulty
52 flashing
Combustion fan rotation abnormal
61 flashing
Solenoid valve circuit faulty
71 flashing
Combustion faulty
10 flashing

9. Operation Principles



Hot Water Operation

1. Ignition

- Activate controllers (if fitted) and open the hot water tap (for full details regarding operation of controllers refer to the 'How To Use Your Water Heater' booklet).
- When water flows through the unit, the water flow sensor rotates and sends an electrical 'pulse' signal to the Printed Circuit Board (PCB). This signal is proportional to the water flow rate.
- The PCB sends electrical current to the combustion fan motor causing it to turn. The fan motor sends an electrical pulse signal to the PCB. If fan rotation is OK, the main solenoid and changeover solenoid valves open as required, the spark generator activates and the spark electrode ignites the burner.

2. Water Temperature / Flow Control / Volume Control

- The PCB will automatically control operation of the internal components to achieve the programmed temperature. When a high temperature rise is required, the PCB may cause the Water Flow Servo to close partially resulting in a lower flow rate to achieve the programmed temperature. This is a necessary operational feature of the unit.
- When operating in 'Bath Fill' mode, the signal from the water flow sensor is also used by the PCB to compute the volume of water that has been passed through the unit at any instant whilst the bath is filling.

3. Shut Down

- When operating in 'Bath Fill' mode, the PCB causes the Water Flow Servo to close when the programmed Bath Fill volume has passed through the unit. Alternatively, flow is stopped when the user closes the hot water tap.
- When water flow stops, the water flow sensor stops rotating and the pulse signal to the PCB stops. The PCB then causes the main solenoid and solenoid valves to close and the burner is extinguished. The combustion fan will continue to operate for some time to purge the combustion chamber.

10. Main Components

1) Printer Circuit Board

- The Printed Circuit Board controls all operational functions including Air Supply Control, Gas Control, Water Flow Measurement, Water Flow Control, Combustion System and all sensors and safety devices.

2) Gas Flow Control

- During normal operation, the PCB keeps the main solenoid valve open whilst there is flow through the unit and the burner needs to be lit.
- Gas flow rate is controlled by the modulating valve assembly and three changeover solenoid valves to always ensure constant outlet water temperature, regardless of flow rate or incoming water temperature.
- The modulating valve is electronically controlled by the PCB using signals from the water flow sensor, water flow control device, bypass flow control device, water temperature thermistors and combustion fan speed sensor. The modulating valve directs gas to the three changeover solenoid valves.
- The three changeover solenoid valves direct gas to each of the three burner banks independantly. Any one, two or all of the solenoid valves may be open during operation.
- Gas flow is modulated between 20 and 250MJ/hr by a combination of the modulating valve and changeover solenoid positions.
- The maximum gas rate is predetermined and the appliance cannot be overloaded when correctly installed.

3) Water Flow Control

- Water flow is detected by a turbine coupled to a magnetic pulse generating device. The magnetic pulses are detected and counted by the PCB. The PCB calculates the exact water flow from the frequency of pulses generated by the turbine, as well as the volume of water that has passed through the unit at any instant during 'Bath Fill' operation. A minimum flow rate of 2.7l/min. is required for the burner to ignite.
- Water flow control is achieved through the use of servo driven water flow and bypass valves. Both servo motors are controlled by the PCB. The 'Water Flow Valve' restricts the flow of water into the heat exchanger assembly if the programmed temperature cannot be achieved. Also, when the Bath Fill function is activated, flow of water is stopped when the bath is full. During normal operation, cold water from the inlet valve is mixed with hot water from the heat exchanger outlet. The 'Bypass Valve' mixes the correct proportion of cold and hot water to ensure accurate hot water delivery temperature over the available range of flow rates. The water flow and bypass valves are a combined assembly on the cold water inlet of the appliance.

4) Air Supply Control

- Air for combustion is supplied by a centrifugal fan driven by a variable speed DC motor. The voltage to the motor is determined by the PCB based on water flow, delivered water temperature and programmed water temperature. The actual fan speed is monitored by a magnetic pulse counter. This counter emits a signal to the PCB. From the voltage supplied to the DC motor and the fan speed signal, the PCB determines whether an error condition exists with the fan.

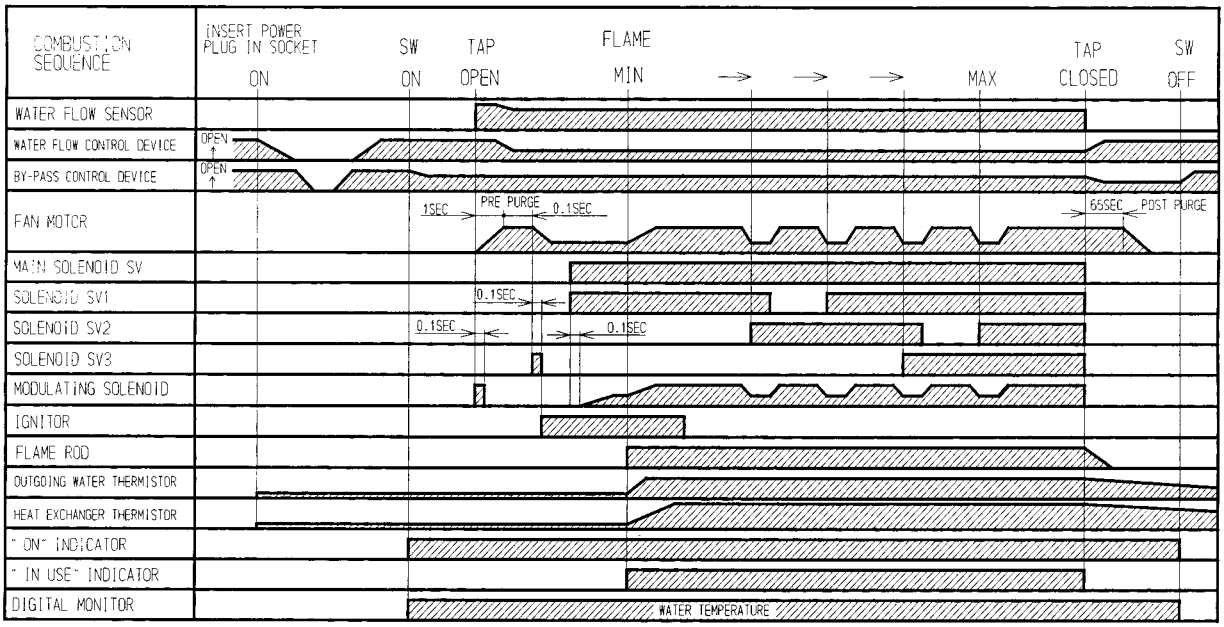
5) Combustion System

The combustion chamber is housed within the heat exchanger assembly and comprises:

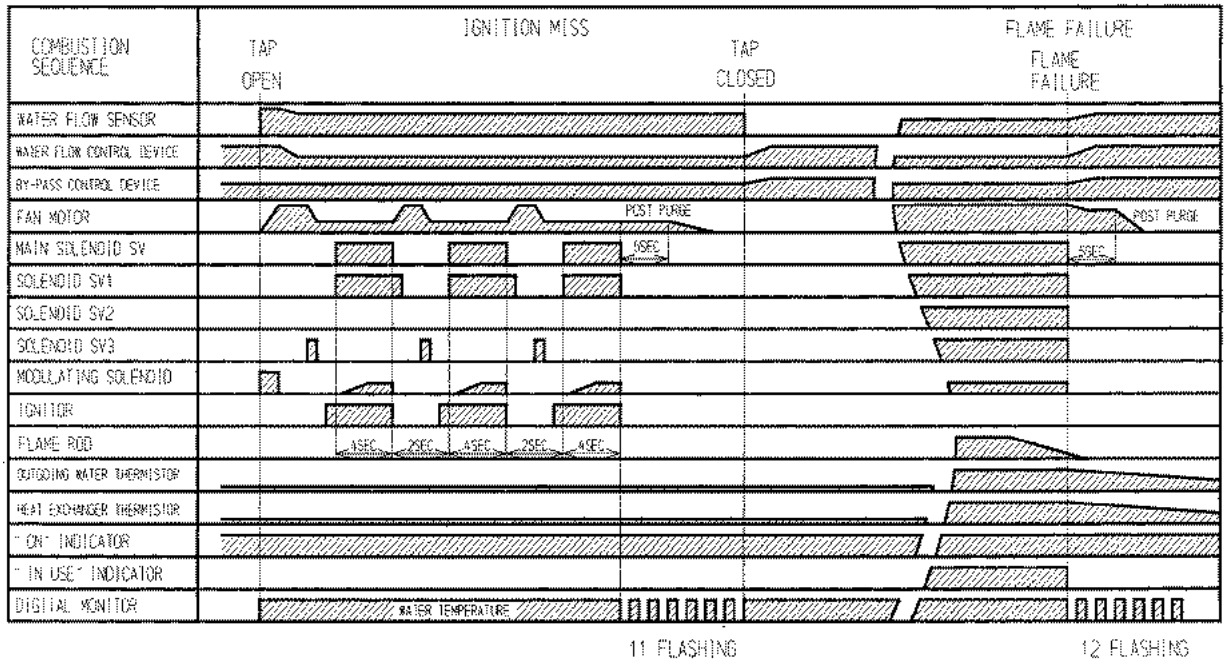
- A three chamber aluminium alloy manifold with a total of 44 integral injectors, arranged in two rows of twenty two. The middle chamber houses eight injectors, the left chamber, twelve, and the right chamber, twenty four injectors. Gas flow to each chamber is controlled by an electronic solenoid valve (refer 'Gas Flow Control' above).
- A burner assembly comprising twenty two identical modular stainless steel bunsen burners secured by an aluminised steel framework. The manifold is attached to the front of the burner module. Each bunsen burner is supplied by two injectors.
- A combustion chamber. Integrated into the combustion chamber front panel are the flame rod and two ignition electrodes.

11. Time Charts

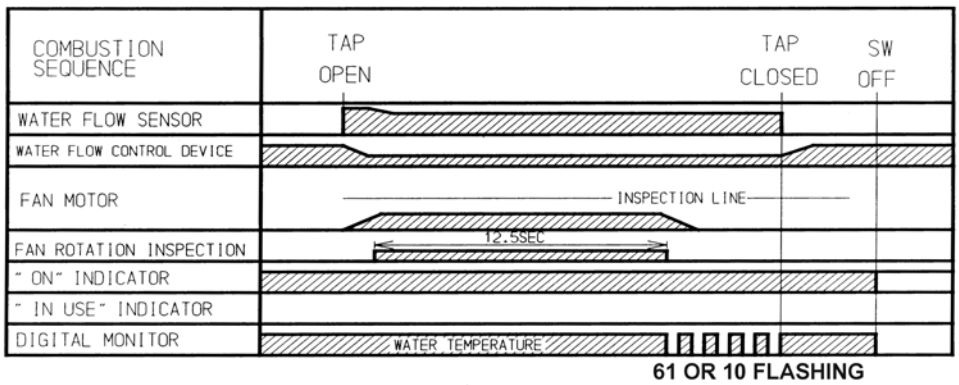
Normal Combustion



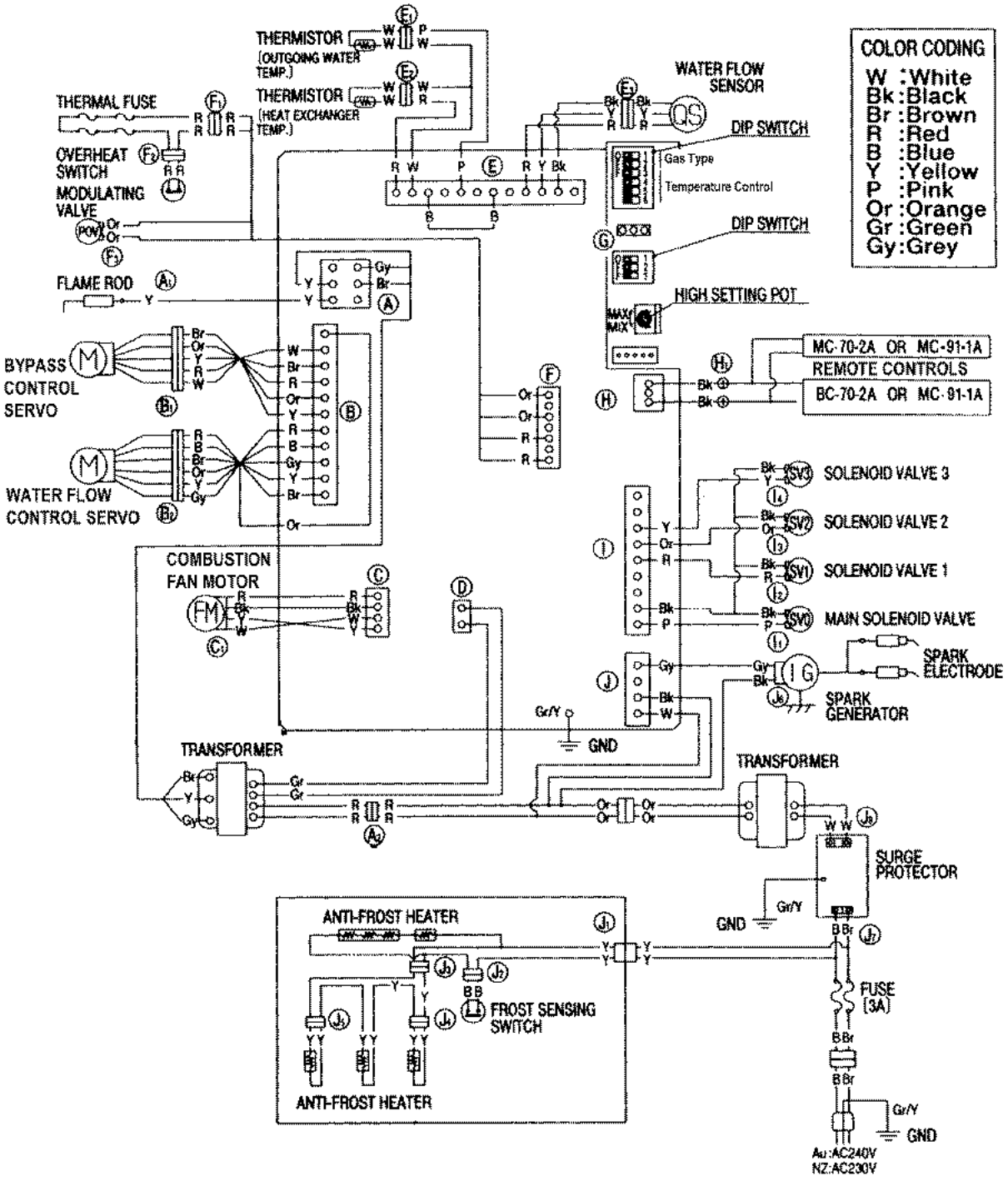
Miss-Ignition / Flame Failure



Abnormal Pre-Purge (Air Supply/Exhaust Blockage)



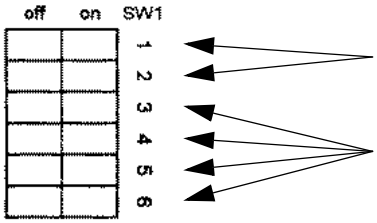
12. Wiring Diagram



13. Dip Switch Settings

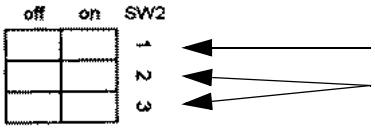
WARNING: Dip Switch settings must only be changed by an authorised person.

Dip Switches explained



Gas Type

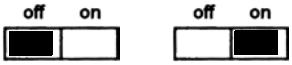
Temperature



Computer Programming

Combustion (forced high or low)

LEGEND
(black section indicates position of switch)

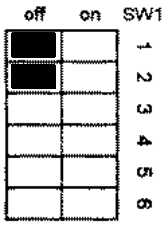


Dip Switches

Gas Type

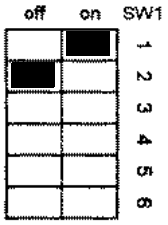
LP

1: OFF
2: OFF



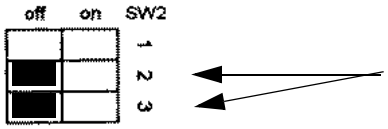
Natural

1: ON
2: OFF

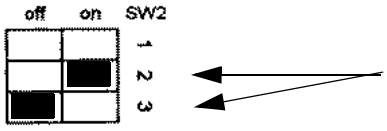


Note :
Only alter gas type positions when converting from one gas type to another. For gas conversion instructions refer to page 41.

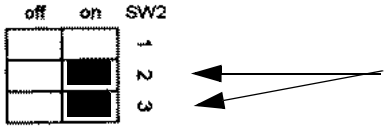
Combustion



Normal Combustion

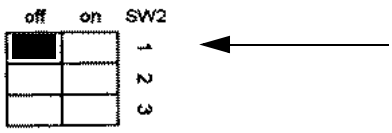


Forced ‘Low’ Combustion



Forced ‘High’ Combustion

Computer Programming



Switch is always in OFF position for REU-V3232W/WC

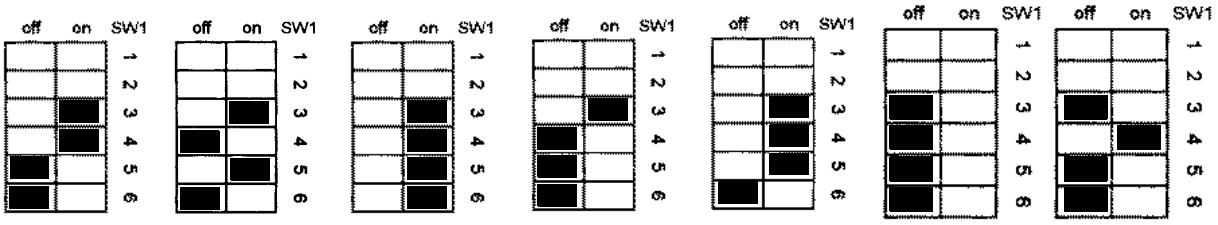
Fixed Temperatures

With or Without Remote Controllers

40°C **43°C** **50°C** **55°C** **60°C** **65°C** **75°C**

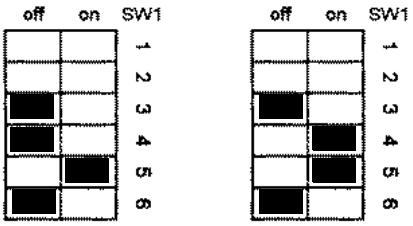
Factory preset (V3232W)

Factory preset (V3232WC)



Without Remote Controllers Only **

85°C **95°C**

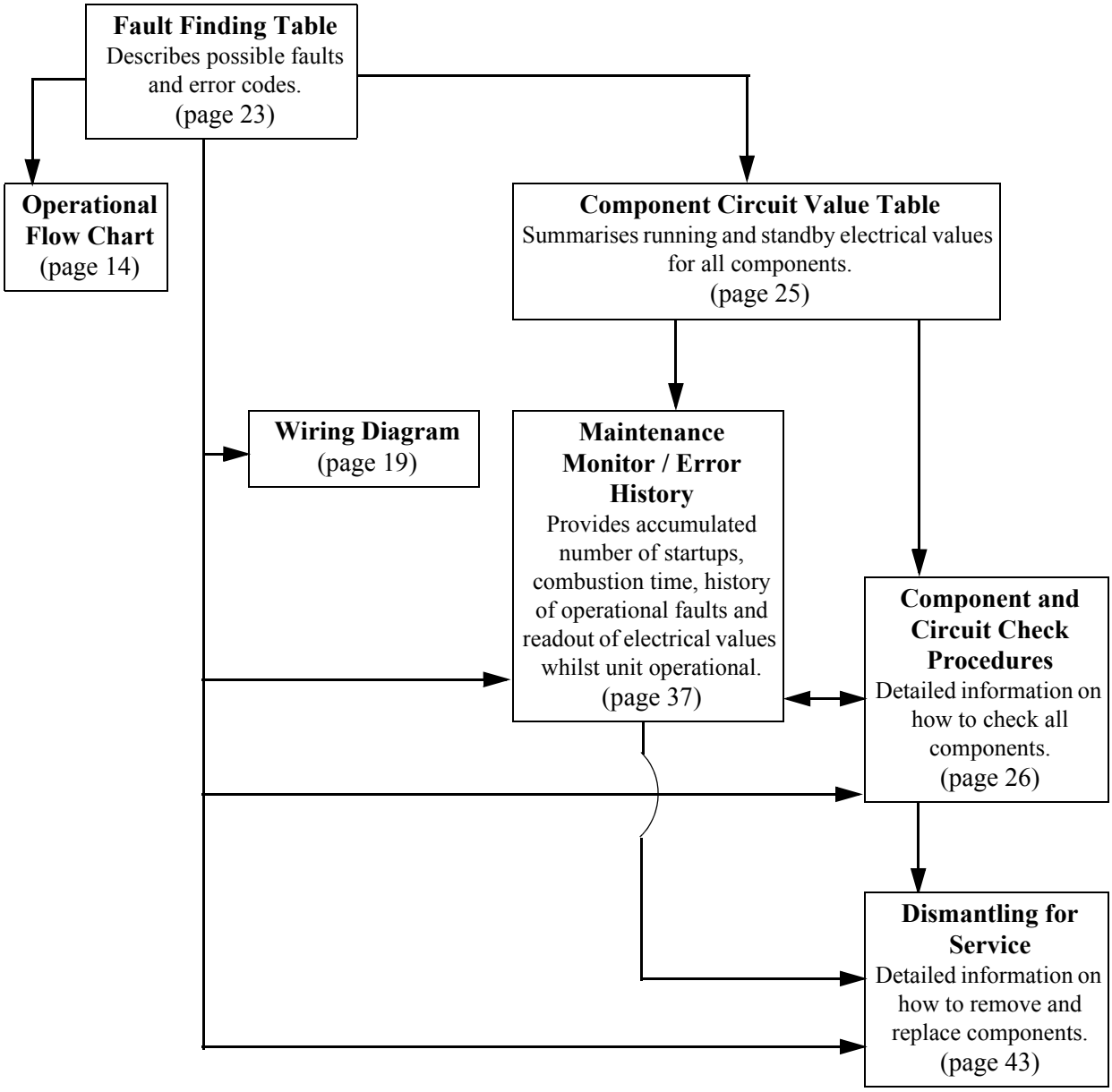


DO NOT attempt to set a temperature of 95° C unless the heater is marked as an 95° C unit.
Such markings appear near the data plate, located on the burner cover and or on the bypass servo wiring loom. A unit set to between 40° C and 85° C MUST BE returned to Rinnai and specifically modified to deliver 95° C.

14. Fault Finding

If there is a fault with the appliance, and controllers are installed, a numerical fault code may appear on the digital display controller. If controllers are not installed, one may be fitted to find out the fault code. Fault finding without controllers (and thus fault codes) is possible but more time consuming.

To diagnose and rectify faults, the **Fault Finding Table** is used as illustrated below:



Fault Finding Table

Code on Controller	Fault	Flow Chart No.	Action	'Component Check' and 'Circuit Value' Items	Dismantling Item	Wiring Diagram Item	Maintenance Monitor Item
03	Power interruption during Bathfill. Water will not flow when power restored.		1. Turn off all hot water taps.				
			1. Press the ON/OFF button on a controller twice.				
10	Combustion fan current too high. Unit operates, then stops.	6, 18	1. Check blockage of air intake/flue outlet.				
			2. Check combustion fan.	1	5	C_1	5 and 9
11	No ignition. Unit stops without flame igniting	21, 17, 19	1. Check gas supply				
			2. Check sparker unit	2	4	J_6	
			3. Check gas valves	3	8 and or 9	F_3, I_1, I_2, I_3, I_4	
12	Flame Failure / Earth Leakage	21, 18, 19	1. Check gas supply				
			2. Check flame rod	4		A_1	
			3. Check earth wire lead	5		J_7, PCB, Power Supply Lead	
			4. Check remote control	15		H_1	06
14	Thermal fuse and/or overheat switch activated. Unit operates, then stops.	19	1. Check thermal fuse	6	11	F1	
			2. Check overheat switch	7	11	F2	
			IMPORTANT- If thermal fuse or overheat switch were faulty : a. Check heater for damage b. Confirm "Gas Type" and "Combustion" dip switch settings (page 20). c. Confirm test point pressures (page 39).				
16	Over temperature warning. Unit operates, then stops.	19, 20	1. Confirm "Gas Type" and "Combustion" dip switch settings (page 20)				
			2. Confirm test point pressure (page 39)				
			3. Check gas valves	3. a) - 3. d)	8 and or 9	F_3, I_1, I_2, I_3, I_4	
			4. Check water flow sensor	8	3	E_3	01
			5. Check water flow servo	9	3	B_2	07
			6. Check heat exchanger outlet temperature thermistor	10	6	E_2	11
			7. Check hot water outlet temperature thermistor	11	6	E_1	02
32	Outlet water thermistor flow	1, 19	Check hot water outlet thermistor	11	6	E_1	02
33	Heat exchanger thermistor error	1, 19	Check heat exchanger thermistor	10	6	E_2	11
52	Modulating solenoid valve fault. Unit stops without flame ignition.	12, 19	Check modulating solenoid valve	3. e)	9	F_3	
61	Combustion fan rotation error	6, 18, 21	Check combustion fan	1	5	C_1	05 and 09
65	Water flow control device error. Water flow is not controlled. Water temperature too low.	19	Check water flow servo	9	3	B_2	07

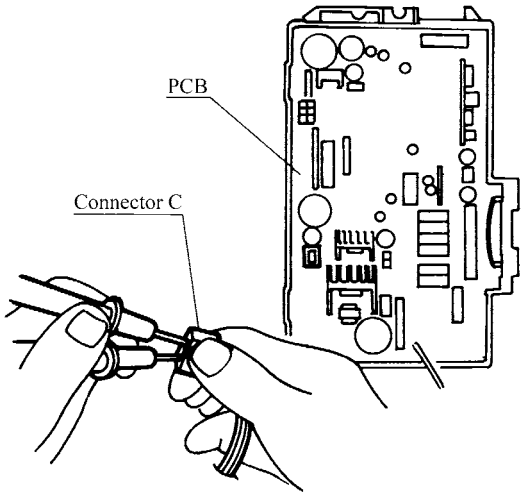
71	Solenoid valve circuit error. Unit does not operate.	19	Check gas valves	3	8 and or 9	F_3, I_1, I_2, I_3, I_4	
72	Flame rod circuit error. Unit does not operate.	19	Check flame rod	4	8	A_1	
-	Appliance does not operate at all. No display on the remote controllers (if fitted).	-	1. Check power cord plugged in and supply turned on.			J7	
			2. Check power supply voltage.	12		J7	
			3. Check electrical fuse.	13			
			4. Check transformer.	14	7	A_2, A, D	
			5. Check gas valves	3. a) - 3. d)	8 and or 9	F_3, I_1, I_2, I_3, I_4	
			6. Check sparker unit.	2	4	J_6	
			7. Check earth leads and connections.	5		J_7, PCB and power supply lead	
			8. Check for short circuits.				
			9. Check remote controller(s) - if fitted.	16		H_1	06
-	No combustion despite remote control indicating that combustion is occuring - if remote controller(s) fitted)	-	1. Check water flow sensor.	8	3	E_3	
			2. Check flame rod.	4	??	A_1	
			3. Check heat exchanger outlet thermistor.	10	6	E_2	11
			4. Check hot water outlet thermistor.	11	6	E_1	02
			5. Check combustion fan.	1	5	C_1	5 and 9
			6. Check the sparker unit.	2	4	J_6	
			7. Check gas valves.	3. a) - 3. d)	8 and or 9	F_3, I_1, I_2, I_3, I_4	
			8. Check thermal fuse.	6	11	F_1	
			9. Check overheat switch.	7	11	F_2	
			IMPORTANT - If thermal fuse or overheat switch were faulty: a) check heater for damage; b) confirm “Gas Type” and “Combustion” dip switch settings; c) confirm test point pressure.				
-	Combustion stops during operation.	-	1. Check gas supply				
			2. Check flame rod	4	8	A_1	
			3. Check earth leads and connections.	5		J_7, PCB and power supply lead	
-	Cannot adjust the hot water temperature via the controller(s) - only if controller(s) fitted.	-	1. Check hot water outlet thermistor.	11	6	E_1	02
			2. Check heat exchanger outlet thermistor.	11	6	E_1	02
			3. Check gas valves	3. a) - 3. d)	8 and or 9	F_3, I_1, I_2, I_3, I_4	
			4. Check water flow servo.	9	3	B_2	07
			5. Check bypass servo.	15	3	B_1	12
-	Anti-frost heater does not operate.	-	1. Check anti-frost heater components	16			J_1, J_3, J_4, J_5, J_8
			2. Check frost sensing switch	17			J_2

15. Component Circuit Value Table

Table Reference	Component	Measurement Point		Normal Value	A Note
		CN	Wire Colour		
13	Surge Protection	J_7	B-Br	AC207~264V	
9	Water Flow Control Device	B_2	R-B	DC11~13V	Operate Electricity
			Gy-Or	DC11~13V	Control Electricity
			Gy-Y	Below DC1V (Limiter On)	Full Open Position
				DC4~6V (Limiter Off)	
			Gy-Br	Below DC1V (Limiter On)	Full Close Position
				DC4~6V (Limiter Off)	
15	By-Pass Flow Control Device	B_1	Br-W Or-W	DC2~6V	Operate Condition
			Y-W R-W GND	15~35Ω	
16	Remote Control	H_1	Bk-Bk	DC11~13V	
8	Water Flow Sensor	E_3	R-Bk	DC11~13V	On 2.7L/min (30Hz) Over 1800 PULSE/min Off 2.0L/min (20Hz) Below 1200 PULSE/min
			Y-Bk GND	DC4~7V (Pulse 17~460Hz)	
1	Combustion Fan	C	W-Bk GND	DC2~9V	
			Check Terminal	60~360Hz	
4	Flame Rod	A_1	Y-BODY EARTH	AC100~160V	After Ignition
				Over DC1μA	Flame Condition
3e	Modulating Valve	F_3	Or-Or	AC1.0~25V 70~90Ω	
11	Outgoing Thermistor	E_1	W-W	15° C··· 11.4 ~14.0kΩ 30° C··· 6.4 ~ 7.8kΩ 45° C··· 3.6 ~ 4.5kΩ	
12	Heat Exchanger Outgoing Thermistor	E_2		60° C··· 2.2 ~ 2.7kΩ 100° C··· 0.6 ~ 0.8kΩ	
6	Thermal Fuse	F_1	R-R	Below 1Ω	
2	Igniter	J_6	Gy-Bk	AC90~110V	
3a	Main Solenoid Valve	I_1	P-Bk	DC80~100V 1.5~1.9kΩ	
3b	Solenoid Valve 1	I_2	R-Bk	DC80~100V 1.8~2.2kΩ	
3c	Solenoid Valve 2	I_3	Or-Bk	DC80~100V 1.8~2.2kΩ	
3d	Solenoid Valve 3	I_4	Y-Bk	DC80~100V 1.8~2.2kΩ	
14	Transformer	A_2	R-R	AC90~110V 12~21Ω	
		D	Gr-Gr	AC12~18V 2.4~4.3Ω	
		A	Br-Gy	AC30~50V 2.2~3.9Ω	
		A	Y-Gy	AC180~220V 300~530Ω	

16. Component and Circuit Checks

1. Combustion Fan Circuit



Check the Motor

Check the combustion fan if the error indicator displays “61”.

Measure voltages between Black and Red of the PCB connector (C).

Normal: DC7~45V (when fan ON)
DC0V (when fan OFF)
If normal proceed to check the rotation sensor
Faulty: Replace PCB

Check for the Fan Rotation Sensor

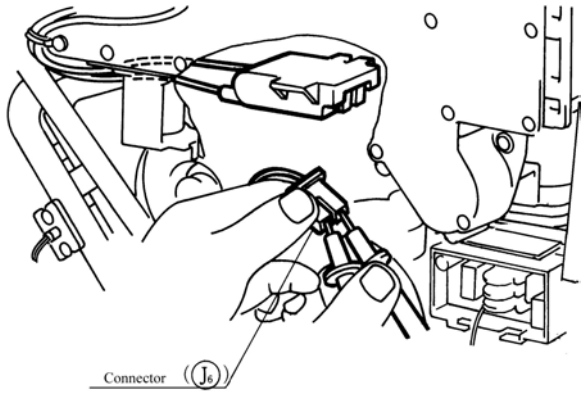
a.) Measure voltages between Black and Yellow of connector (C).

Normal: DC10~14V
If normal, proceed to b.
Faulty: Replace PCB.

b.) Measure voltages between Black and White of connector (C).

Normal: DC2~9V
If normal, proceed to Sparker Circuit 2.
Faulty: Replace Combustion Fan.

2. Sparker Circuit



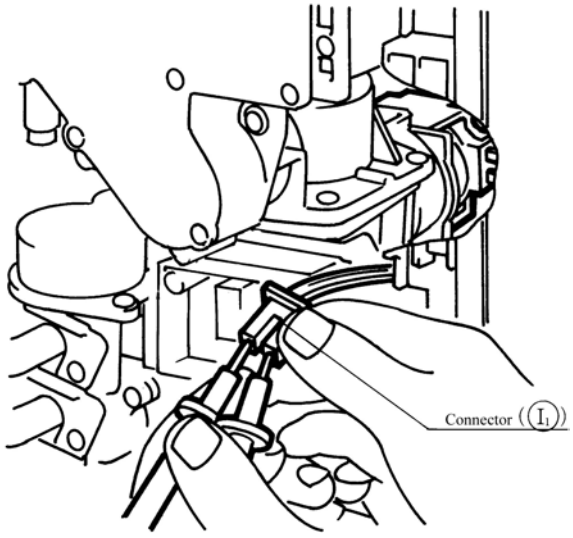
a.) Measure voltage between Grey and Black of connector (J_6).

Normal: AC90~110V
If normal, proceed to b.
Faulty: Replace PCB.

b.) Disconnect connector (J_6) and measure resistance between both terminals of the sparker.

Normal: > 1MΩ
If not sparking, adjust or replace ignition plug.
Faulty: Replace Sparker.

3a. Main Solenoid Valve (SV_0) Circuit



Check the main solenoid if error indicator "11" is displayed.

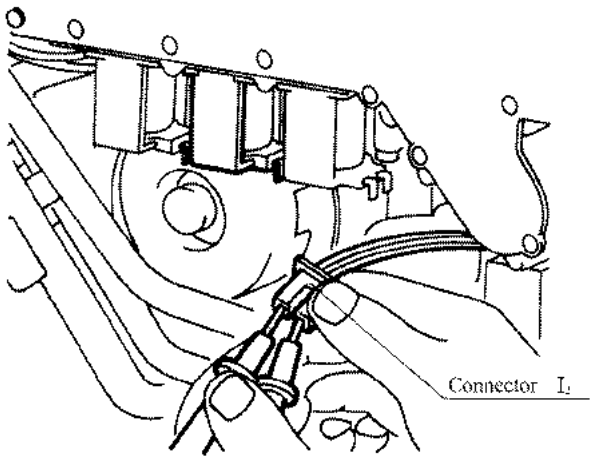
a.) Disconnect Main Solenoid connector and measure resistance between Pink and Black.

Normal: 1.5~1.9kΩ
If normal, proceed to b.
Faulty: Replace Main Solenoid.

b.) Measure voltage between Pink-Black of Main Solenoid connector.

Normal: DC80~100V
If normal, proceed to Solenoid Valve SV_1
Faulty: Replace PCB.

3b. Solenoid Valve 1 (SV_1) Circuit



Check Solenoid 1 if error indicator "11" is displayed.

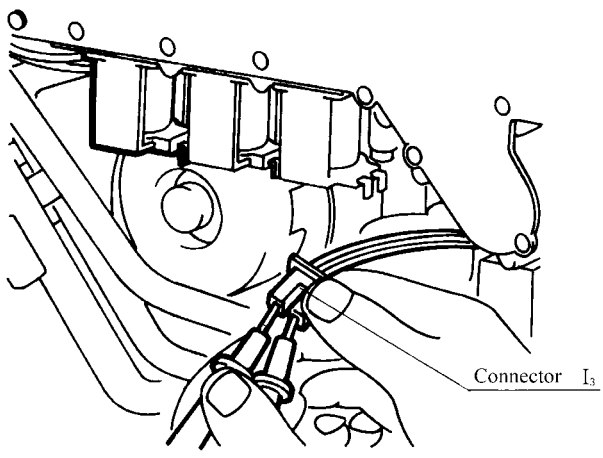
a.) Disconnect Solenoid 1 connector and measure resistance between Red and Black.

Normal: 1.8~2.2kΩ
If normal, proceed to b.
Faulty: Replace Solenoid 1.

b.) Measure voltage between Red and Black of Solenoid 1 connector.

Normal: DC80~100V
If normal, proceed to Solenoid Valve 2 (SV_2) Circuit
Faulty: Replace PCB.

3c. Solenoid Valve 2 (SV_2) Circuit



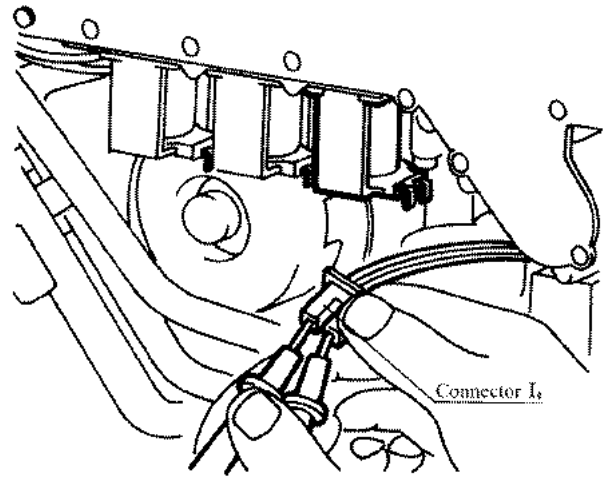
a.) Disconnect Solenoid Valve 2 connector and measure resistance between Orange and Black.

Normal: 1.8~2.2kΩ
If normal,, proceed to b.
Faulty: Replace Solenoid Valve 2.

b.) Measure voltage between Orange and Black of Solenoid Valve connector.

Normal: DC80~100V
If normal, proceed to Thermal fuse Circuit.
Faulty: Replace PCB.

3d. Valve Circuit

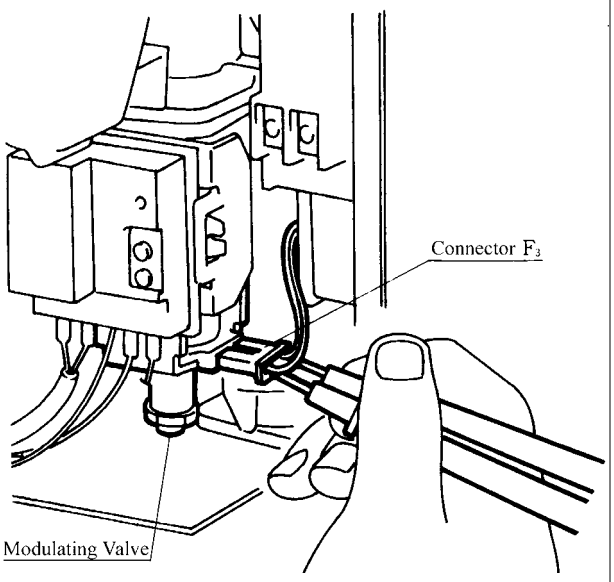


a.) Disconnect Solenoid connector, measure resistance between Yellow and Black.

Normal: 1.8~2.2kΩ
If normal, proceed to b.
Faulty: Replace Solenoid Valve 3.

b.) Measure voltage between Yellow and Black of SV_3 connector.

Normal: DC80~100V
If normal, proceed to Modulating valve circuit.
Faulty: Replace PCB.



c.) Disconnect Modulating Valve fasten terminal and measure resistance between terminals.

Normal: 70~90Ω
If normal, proceed to b.
Faulty: Replace Modulating Valve.

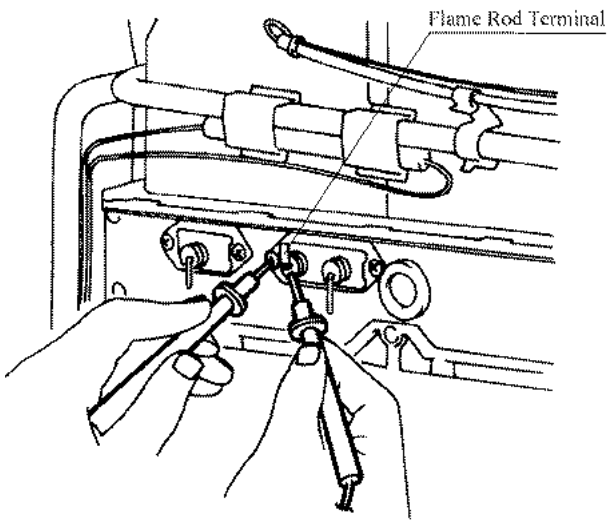
d.) Measure voltage between Orange and Orange of Modulating Valve fasten terminal.

Normal: DC1.0~25V
If normal, proceed to c.
Faulty: Replace PCB.

e.) Check the gas secondary pressure change when set temperature on the remote control changes from 37 to 55°C.

Normal: If secondary pressure changes, go to Water Flow Servo Circuit.
Faulty: Replace Modulating Valve.

4. Flame Rod Circuit



Check flame rod.

Disconnect flame rod terminal (A_1), and re-operate.

"72" indicated:- Proceed to 3.
"72" is not indicated:- check for electrical leaks from the flame rod.

Measure resistance between flame rod terminal (A_1) and appliance earth.

Normal: >1MΩ
If normal, replace PCB.
Faulty: Replace flame rod.

a.) Remove the Flame Rod terminal (A_1) repeat operation procedure, if 72 is displayed again check the Hot water outlet thermistor.
If 72 is not displayed check current leakage from the Flame Rod.

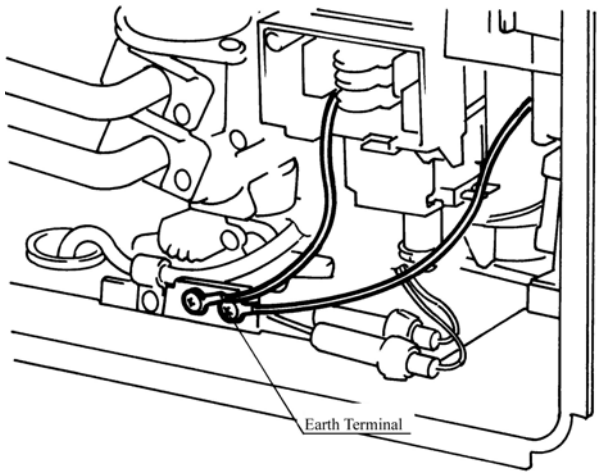
b.) Measure voltage between body earth and Flame Rod terminal (A_1).

Normal: Voltage AC100 ~160V
If normal, repalced PCB
Faulty: Replace Flame Rod.

c.) Check if the Flame Rod is securely fitted.

Normal: replace the PCB
Faulty: Adjust the fitting of the Flame Rod

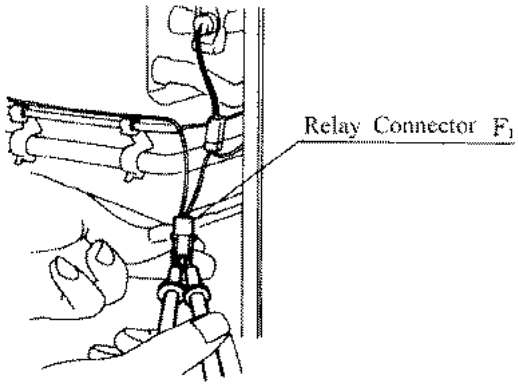
5. Earth Lead



Confirm the Earth Lead connection is secure (at round terminal), and check for broken or short circuits in the lead.

If normal, check other possible causes for flame failure (is gas valve open?, is the filter blocked? etc.).
If faulty, tighten the earth lead, PCB, power cord and surge arrester.

6. Thermal Fuse Circuit

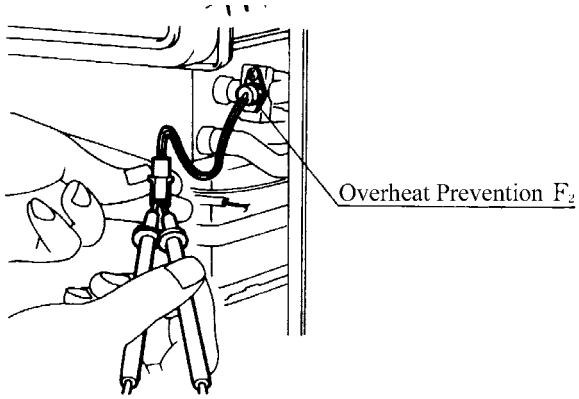


Check the Thermal Fuse.

Disconnect relay connector (F_1) and measure resistance between Red and Red.

Normal: < 1Ω
If normal, replace PCB.
Faulty: Replace Thermal Fuse if after confirming there is no damage to the appliance.

7. Overheat Switch Circuit



Measure resistance between Overheat Switch terminals (F_2).

Normal: < 1Ω
If normal, replace PCB.
Faulty: Replace Overheat Switch.

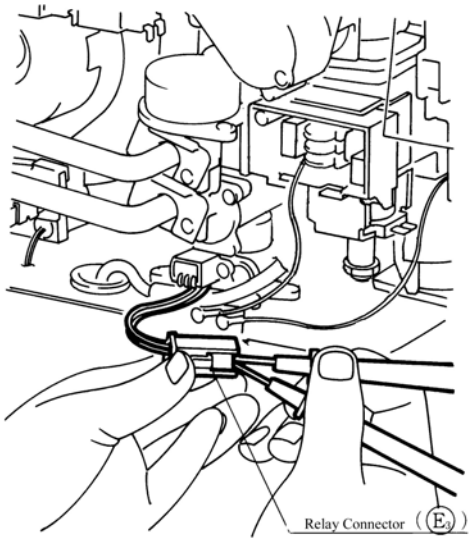
Note: If Thermal fuse or Overheat Switch were faulty.

a.) Check heater for damage

b.) Confirm gas type and combustion dipswitch settings

c.) Confirm test point pressure.

8. Water Flow Sensor



a.) Measure voltage between Red - Black of relay connector (E_3).

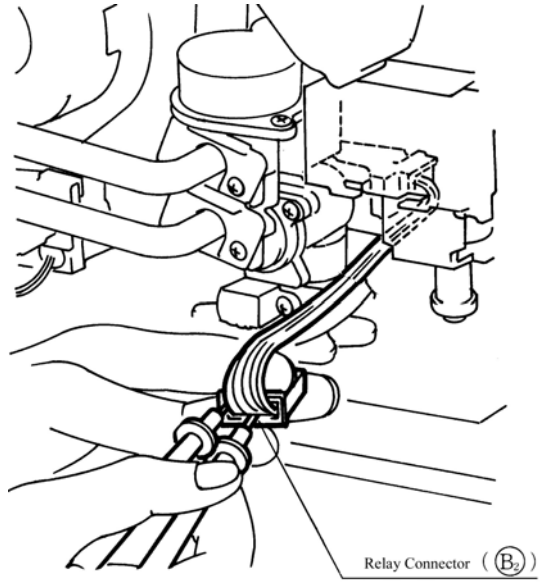
Normal: DC 11~13V
If normal, proceed to b.
Faulty: Replace PCB.

b.) Measure voltage between Yellow - Black of relay connector (E_3).

Normal: DC 4~7V
If normal, proceed to 2.
Faulty: Replace water flow sensor.

Note: For controller readout of water flow whilst operational refer maintenance monitor (chapter 17) No. 1.

9. Water Flow Servo Circuit



a.) Disconnect relay connector (B_2), and measure resistance between Red and Blue of Water Flow Servo.

Normal: 10~30Ω
If normal, proceed to b.
Faulty: Replace Water Flow Servo and Water Flow Sensor.

b.) Disconnect relay connector (B_2), and measure voltage between Orange (+) and Grey (-) on PCB unit side.

Normal: DC11~13V
If normal: proceed to c.
Faulty: Replace PCB unit.

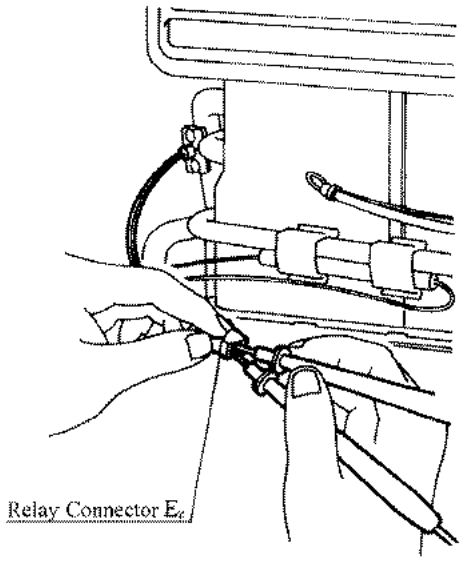
c.) Measure voltage between Brown and Grey with relay connector (B_2) connected (with no water flowing, water flow servo fully open).

Normal: DC4~6V
Faulty: Replace Water Flow Servo with Water Flow Servo.

d.) Measure voltage between Yellow and Grey with relay connector (B_2) connected (with no water flowing, water flow servo fully open).

Normal: < DC1.0V
Faulty: Replace Water Flow Servo and Water Flow Sensor.

10.Heat Exchanger Outlet Thermistor Circuit



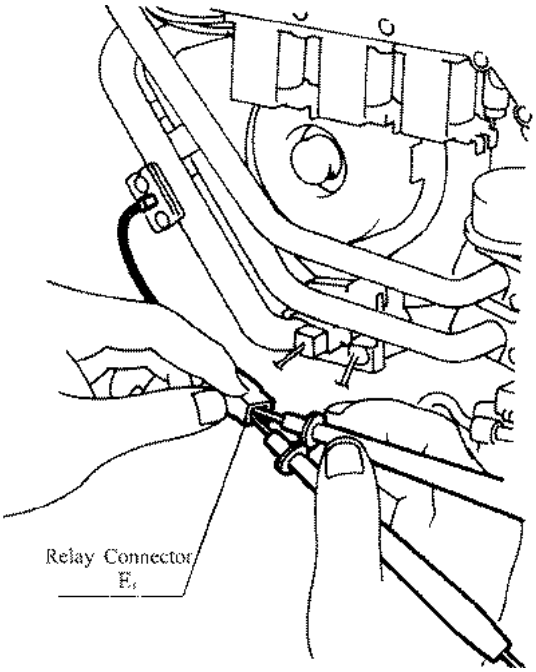
Check Heat Exchanger Outlet Thermistor if error indicator "33" is displayed.

Disconnect relay connector (E_2) and measure resistance between White and White.

Circuit Break: Resistance > 1MΩ
Short circuit: Resistance < 1Ω
If normal, proceed to Water Flow Servo Circuit
If faulty, replace Heat Exchanger Outlet Thermistor.

Note: For controller readout of thermistor temperature whilst operational refer maintenance monitor (chapter 17) No. 11.

11.Hot Water Outlet Thermistor Circuit



Check Hot Water Thermistor if error code 32 is displayed.

Disconnect relay connector (E_1) and measure resistance White -White.

When disconnected: resistance >1MΩ
When short circuit: resitance > 1 Ω
Normal: Check Heat exchanger outlet thermistor

Faulty: Replace hot water outlet thermistor.

Normal

Temp.	15°C	30°C	45°C	75°C
Resistance	12.3 kΩ	7.0 kΩ	4.1 kΩ	1.6 kΩ

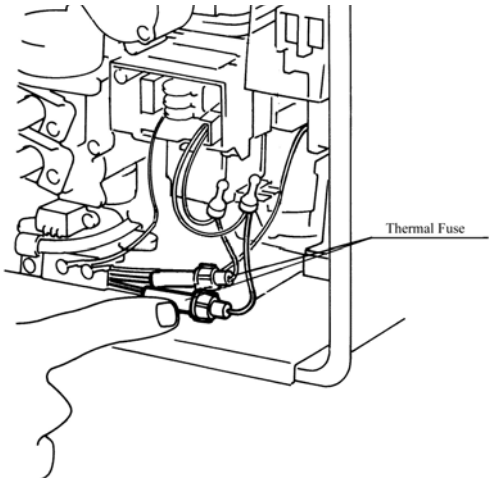
If normal proceed to Flame Rod circuit.

Faulty: Replace the Hot water Outlet Thermistor.

Note: For controller readout of thermistor temperature whilst operational refer maintenance monitor (chapter 17) No. 2.

Disconnect relay connector (E_1) and measure resistance White -White.

12.Electrical Fuse



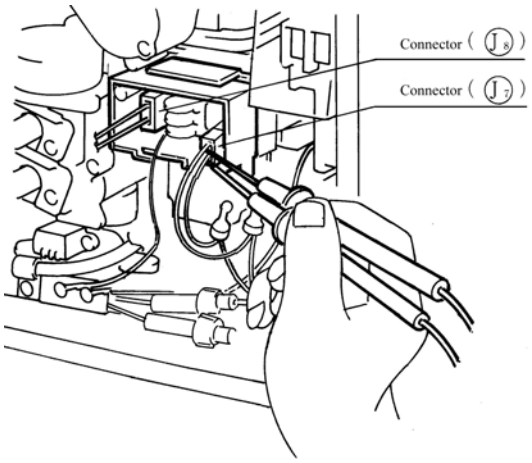
Check the fuse.

a.) Unplug the power plug.

b.) Check whether or not the fuse (3A) x 2 has blown by measuring the resistance.

Normal: <1Ω
If normal go to step Electrical Fuse 13.
Faulty: Replace fuse/s (3Ax2). Check for a short next time it's turned off.

13. Surge Protector



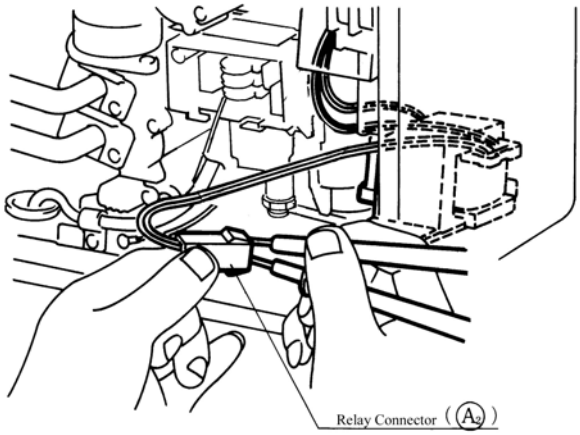
a.) Measure voltage between blue and brown on the connecter J_7

Normal :AC 207~264V
If normal proceed to b.
Faulty: Check if voltage on the fuse terminal is AC207~264V

b.) Measure voltage between white and white on the J_8.

Normal: AC207~264V.
Faulty: replace surge protecter unit.

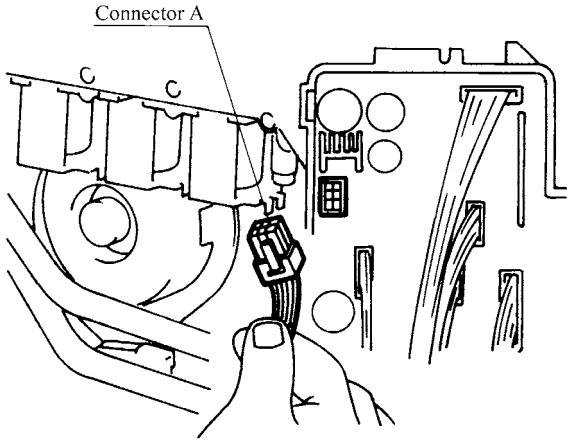
14. Transformer



Check for the transformer

a.) Measure the voltage between red and red on the transmission connector (A_2).

Normal: AC90~110V (12~21 Ω)
If normal proceed to b.
Faulty: Check if the voltage on fuse terminals is AC90~110V.



b.) Measure the voltage of the connector (A) on the PCB.

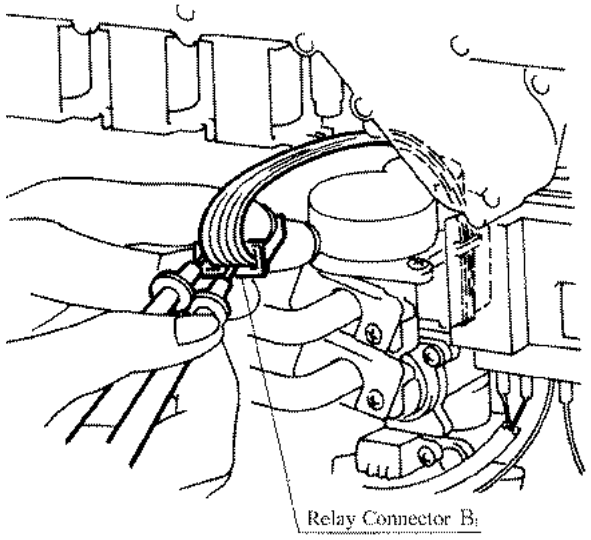
Normal: Between Brown and Grey AC 30~50V
Between Yellow and Grey AC 180~220V
If normal, proceed to c
Faulty: Replace transformer.

c.) Measure voltage between Green and Green of connector (D) on PCB.

Normal: AC 12~18V
If normal, proceed to 4.
Faulty: Replace transformer.

Note) The above transformer voltages are measured while the appliance is in standby mode - not while it is operating.

15.Bypass Servo Circuit 15.



a.) Disconnect relay connector (B_1) and measure resistance.

Normal

CN	Wire Colour	Value
B_1	Br - W O - W Y - W R - W	15~35Ω

GND

If normal, proceed to b.

Faulty: Replace PCB.

b.) Measure working voltage while relay connector (B_1) is connected.

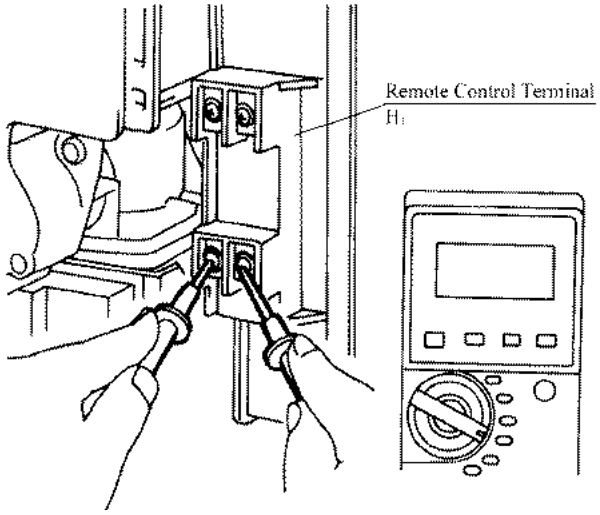
Normal

CN	Wire Colour	Value
B_1	Br - W O - W Y - W R - W	DC 2~6V

GND

Faulty: Replace Bypass Servo.

16.Remote Control



Check the voltage between the 2-core remote control cable.

Measure the voltage between terminals on the remote control terminal (H_1).

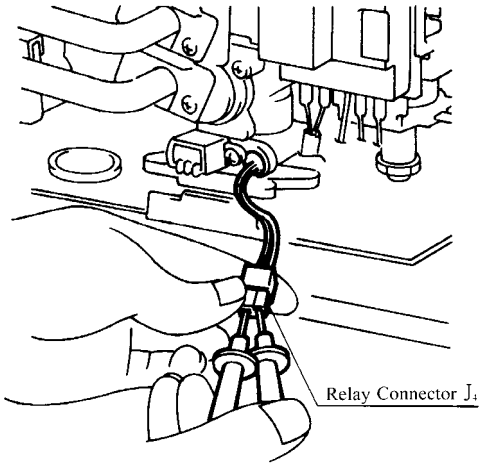
Normal: DC 11~13V

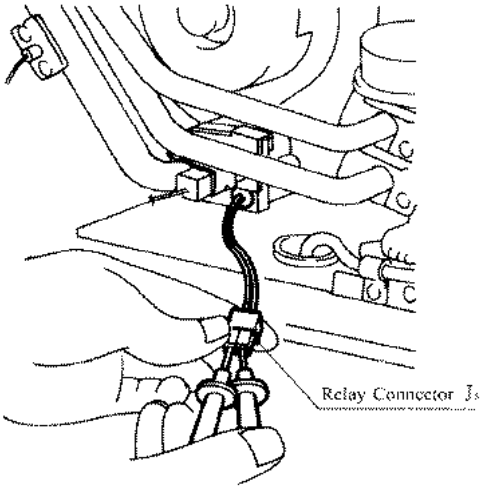
If normal, replace the remote control after confirming that the cable hasn't been damaged or shorted.

Faulty: Because normal voltage is not given due a short circuit, despite the PCB being in normal state, check Water Flow Servo circuit.

If solution is not given from the above replace PCB.

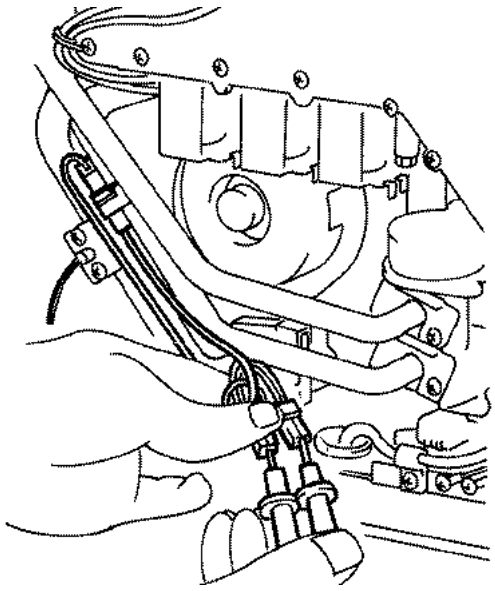
17.Anti-frost Heater Circuit





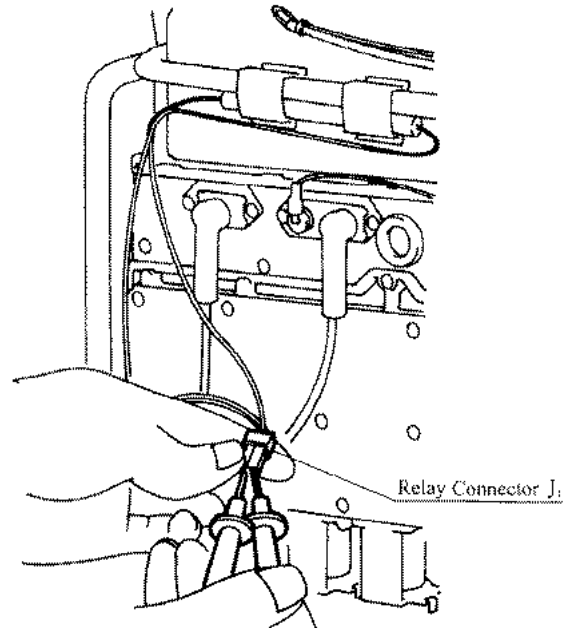
a.) Disconnect relay connectors (J_4) and (J_5) and measure resistance between White and WhiteW on heater side (water flow servo and HW connection).

Normal: 408Ω
If normal, proceed to b.
Faulty: Replace Valve Heater.



b.) Disconnect relay connector (J_4) and (J_5) and measure resistance between Yellow and Yellow on each conector on heater side.

Normal: 653Ω
If normal, proceed to c.
Faulty: Replace Anti-frost Heater B (assy).

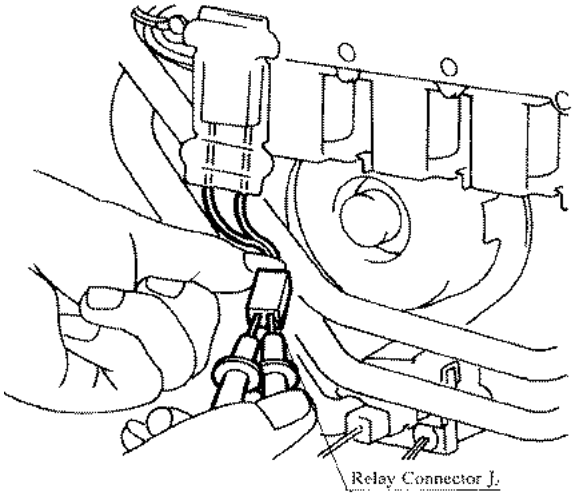


c.) Disconnect relay connector (J1) and (J3) and measure resistance between Yellow and Yellow on Heat Exchanger Heater side.

Normal: 825Ω
If normal, proceed to Frost Sensing Switch 18.
Faulty: Replace Anti-frost Heater A (assy).
[Measure when temperature is 4+/- 3°C.]

Note: If you cannot get the temperature low enough, cool the low-temperature sensing switch with ice etc.

18. Frost Sensing Switch



a.) Disconnect relay connector (J_2) and measure resistance between Blue and Blue.

Normal: < 1Ω
If normal, check wiring (AC240V circuit).
Faulty: Replace Frost Sensing Switch.

17. Maintenance Monitor / Error History

This feature is available where the appliances are connected with a deluxe controller (MC70-2A or BC70-2A). This will enable service personnel to locate the maintenance history and faulty components, with the appliance in operation.

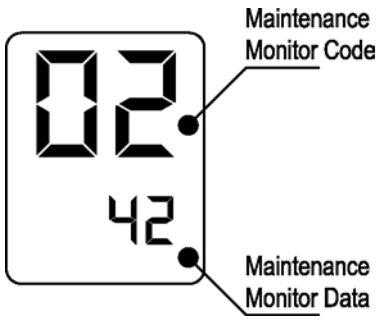
NB. When the maintenance information, error history is shown, use only one controller. If two or more remote controls are used at the same time, it may not operate correctly.

To display Maintenance Information

16. With the controller in the "OFF" position press the Water Temperature "DOWN" (Cooler) button while holding the "ON/ OFF" button to activate the maintenance monitor. Press the "ON/ OFF" button a second time to set the controller in the "ON" mode. This feature can now be used with the appliance in operation.

17. The maintenance number will be shown in the Water Temperature display.

18. Data will be shown in the Clock display.



19. To select the required maintenance number, press the Water Temperature "UP" and "DOWN" buttons.

Note: REU-V3232W/WC uses Maintenance Numbers 1-12.

Display Monitor Contents			
No.	Contents	Units	Data Range
01	Water flow sensor recognition flow (Example 123 = 12.3L/min).	0.1L/min	0~400
02	Hot water Outlet thermistor temperature (Example 20 = 20° C)	° C	0~999
03	Hot water combustion time (Example 6 = 600 hours)	100 hours	000~999
04	Hot water operation frequency (Example 6 = 600 Operations)	100	0~999
05	Hot water fan frequency	Hz pulses/sec	0~999 ***Note 1**

***Note 1** Fan Frequency rpm Conversion

(rpm) = (Hz) x15

06	Remote control connection	none	0 or 1 ***Note 2**

***Note 2** Remote Control Connections

Bathroom Remote

Additional remote Kitchen remote

"0 1 1"

Controls connected	Display
No	"0"
Yes	"1"

07	Water flow servo present recognising positioning	None	0~2 ***Note 3**

***Note 3** Water Flow Servo Positioning

Servo Position	Open	Centre	Closed
Display	**"1"**	**"0"**	**"2"**

08	Inlet water temperature (PCB recognition value) (Example 25 = 25 ° C)	° C	0~999
09	Hot water fan current flow value (Example 6 x 10 = 60 mA)	10 mA	0~999
10	Bath fill amount (this counts the litres during bath fill operation).	Litres	0~999
11	Heat exchanger exit thermistor temperature (Example 55 = 55 ° C)	° C	0~999
12	Bypass servo present recognition positioning (Example 0 = Closed 250 = Half open 500 = Open	Degrees	0~500

To return to normal operation

- Press the ON/OFF button again while holding down the Water Temperature "DOWN" (Cooler) button.

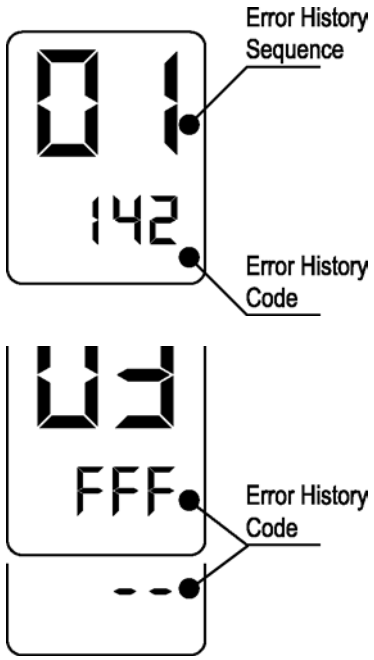
Error History

To Display Error Memory (History)
(This feature will show the last 10 faults in sequence)

1. Turn off at the ON/OFF button. (This can be done during operation)

2. Press the ON/OFF button while holding the Water Temperature "UP" (Hotter) button.

   - The Sequence will be shown in the Water Temperature display.
   - Error Code will be shown in the Clock display. (See service Manual for error codes).
   - Where there are less than a total of 9 errors, "FFF" or " - - " will be displayed in the Clock display.



To return to normal operation.

- Press the ON/OFF button again while holding the Water Temperature "UP" (Hotter) button.
- This feature will automatically shut down after 3 minuets.

18. Gas Pressure Setting Procedure

The regulator on the Infinity is electronically controlled and factory pre-set. Under normal circumstances it **does not** require adjustment during installation. Perform this procedure only if the unit is not operating correctly and **all** other possible causes for incorrect operation have been eliminated.

1) Turn 'OFF' the gas supply

2) Turn 'OFF' 240V power supply.

3) Remove the front cover from the appliance.

4) Check gas type switches (fig. 1) are in the correct position (top set or SW1 of switches).

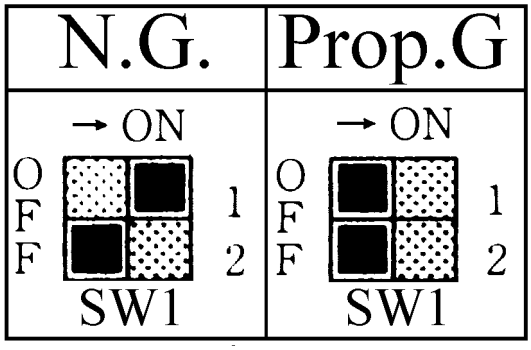
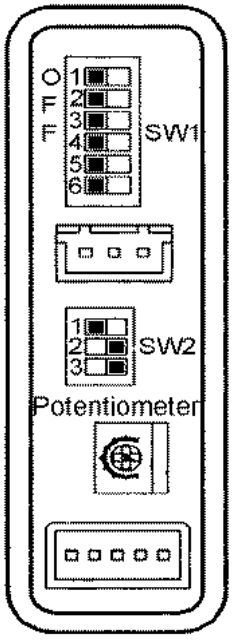


fig. 1



5) Attach pressure gauge to burner test point. (fig. 2)

6) Turn 'ON' the gas supply.

7) Turn 'ON' 240V power supply.

8) If remote controllers are fitted, turn the unit 'ON' at the kitchen controller, select a delivery temperature of 55°C and open a hot water tap fully. (**CAUTION: Ensure building occupants do not have access to hot water outlets during this procedure.**

9) Set the Infinity to 'Forced Low' combustion by setting No. 2 dipswitch of the bottom (SW2) set of dip switches to 'ON'. (fig 3)

10) Check the burner test point pressure.

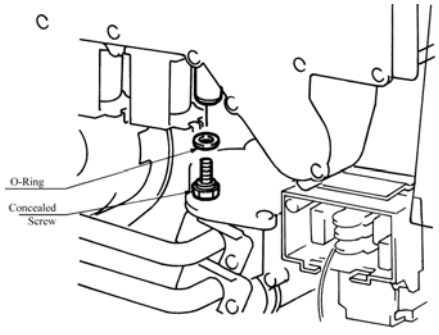


fig. 2

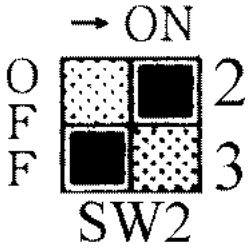


fig. 3

11) Adjust the regulator screw on the modulating valve as required to the pressure below. (fig. 4).

Pressure Setting low	
N.G.	0.18 kPa
Prop. G	0.35 kPa
LPG (NZ)	0.35 kPa

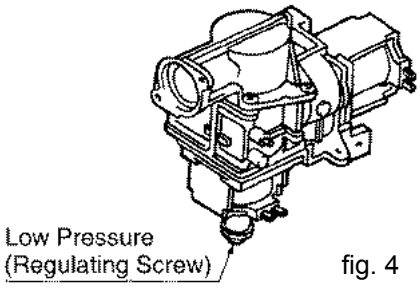


fig. 4

12) Lock the regulating screw on the modulating valve.

13) Set the Infinity to 'Forced High' combustion by setting both No. 2 and No. 3 dipswitches of the bottom (SW2) set to 'ON'. (fig.5) Ensure maximum water flow.

14) Check the burner test point pressure.

15) Adjust the high pressure Potentiometer (POT) on the Printed Circuit Board (PCB). As required to the pressure shown.

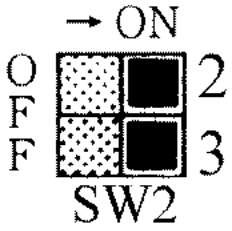
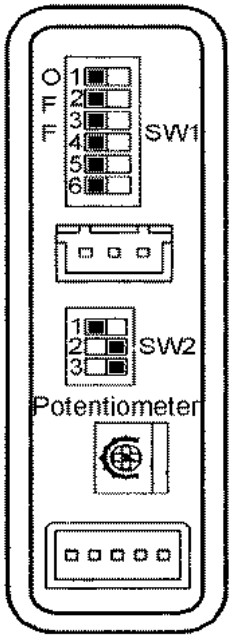


fig. 5

Pressure Setting high	
N.G.	0.74 kPa
Prop. G	1.76 kPa
LPG (NZ)	1.53 kPa



16) **IMPORTANT**: Set dip switches No's 2 and 3 on the bottom (SW2) set of switches to 'OFF' to return the appliance to 'Normal' combustion.

17) Close hot water tap.

18) Turn OFF the gas supply and 240V power supply.

19) Remove pressure gauge, and replace sealing screw.

20) Turn 'ON' the gas supply and 240V power supply.

21) Operate unit and check for gas leaks at test point.

22) Replace the front cover of the appliance.

Warning

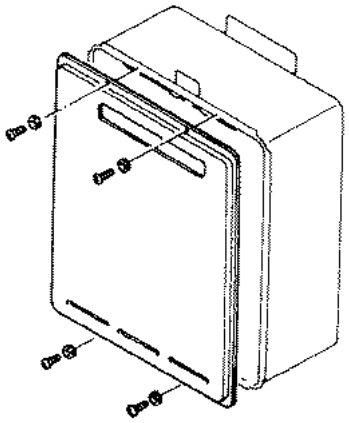
DURING PRESSURE TESTING OF THE INSTALLATION ENSURE GAS COCK SITUATED BEFORE UNIT IS SHUT OFF.

FAILURE TO DO SO MAY RESULT IN SERIOUS DAMAGE TO THE APPLIANCE AND POSSIBLE INJURY.

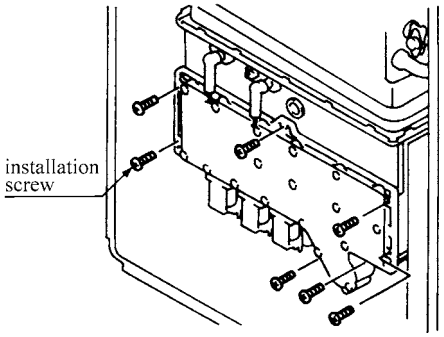
19. Gas Conversion Procedure

1) Close the main gas valve.
   Turn power OFF (disconnect the power cord).

2) Remove front cover. (4 screws)



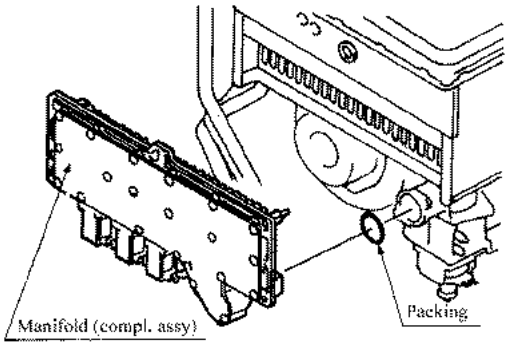
3) Remove manifold (complete assembly). (7 screws)



4) Replace the manifold (complete assembly) and the packing. (7 screws)

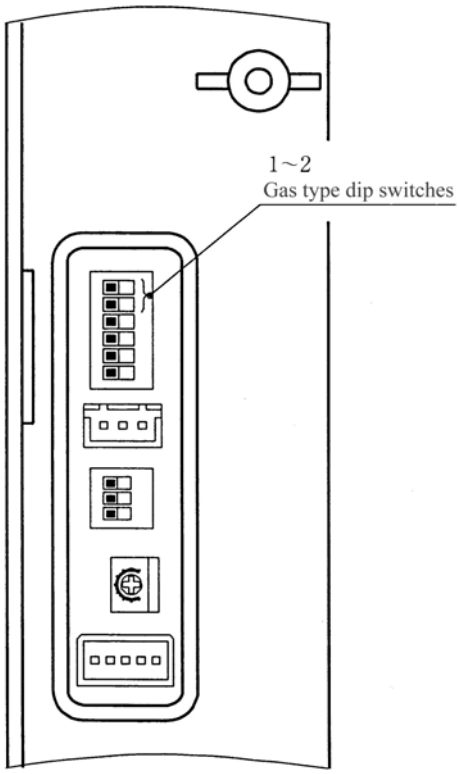
   Note: Do not loose or damage the O-ring when reassembling.

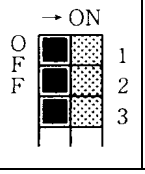
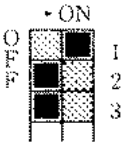
   Ensure connections for the solenoid and sparker lead are made properly.



5) Change over the gas conversion switches (1 ~ 4) on the PCB unit

6) Reset Gas pressurs as per instructions in 18. Gas Pressure Setting Procedure. (page 39)



LPG	NG
	

20. Dismantling for Service

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

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

IMPORTANT

For some areas of dismantling you may need to isolate any or all of the following:

* Isolate gas supply.
* Disconnect electrical supply from wall socket.
* Isolate water supply.
* Drain **all** water from appliance.

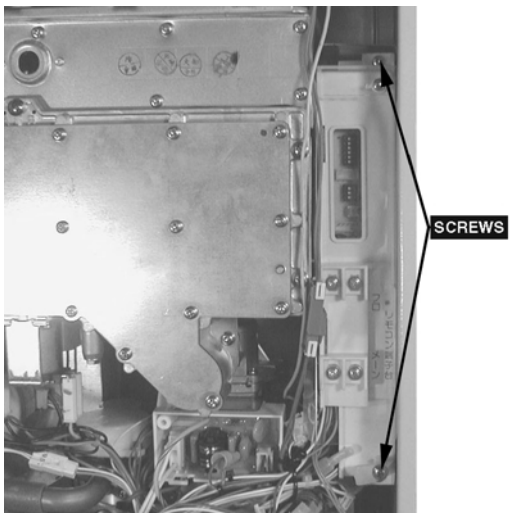
1) Removal of the Front Panel

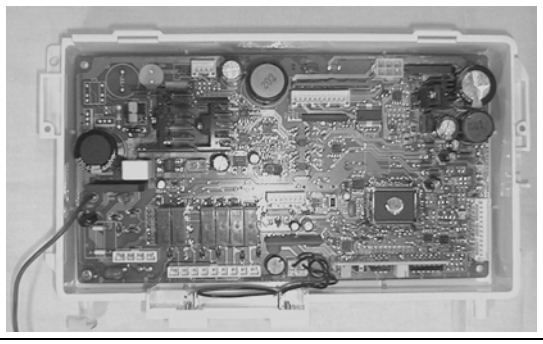
a. Remove four (4) screws.

2) Removal of the PCB Unit

a. Remove the front panel. (Refer Item 1.)

b. Remove two (2) PCB unit fixing screws and pull out forward.

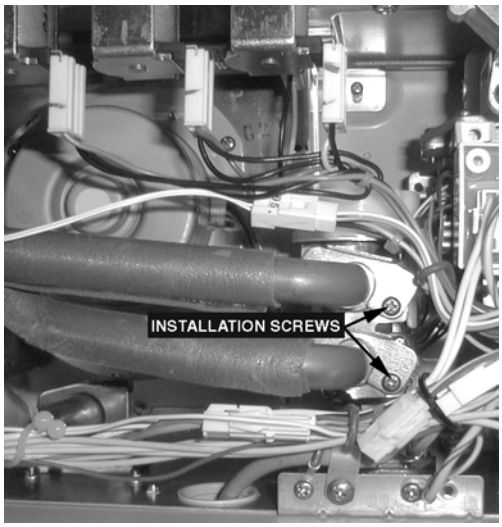




3) Removal of the **Water Flow Sensor, Servo and Bypass Servo**

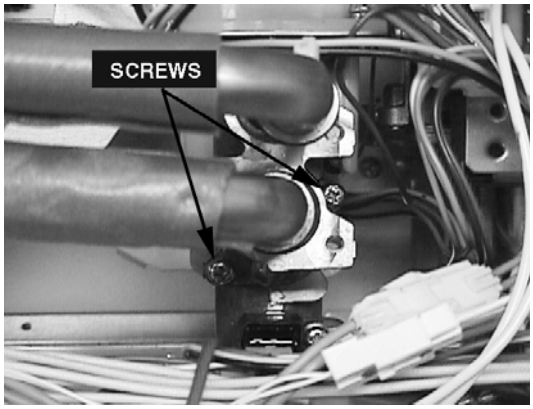
a. Remove the front panel. (Refer Item 1.)

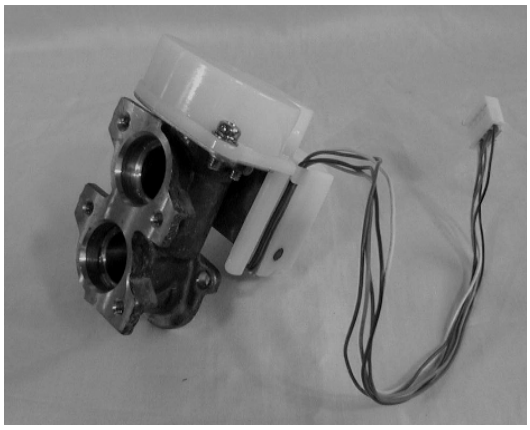
b. Remove two (2) screws and locking plates located on the water supply pipe and bypass pipe. Pull bypass pipe and water supply pipe forward to clear servo valves. Ensure O-rings are not lost or damamged.



*** Removal of the Bypass Servo**

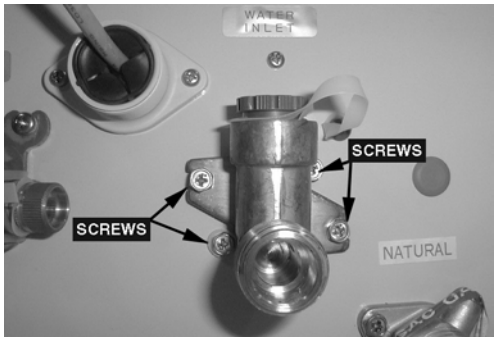
c. Remove two (2) screws from the water flow servo body, and pull the bypass servo out forwards. Ensure O-rings are not lost or damamged..

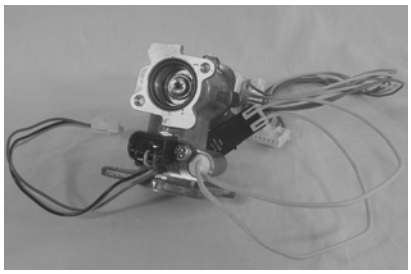




* Removal of the **Water Flow Servo with Sensor**

d. Remove four (4) screws from water supply connection body and take out the water flow servo with sensor and the water supply connection. Ensure O-rings are not lost or damamged..

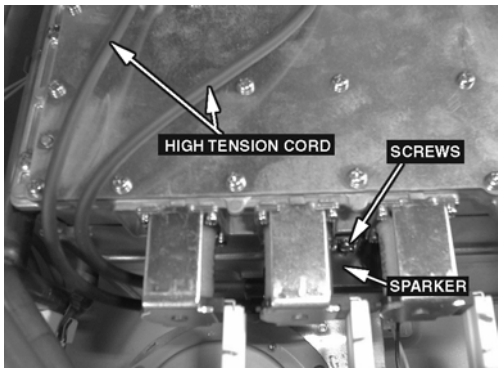




4) Removal of the **Sparkers**

a. Remove front panel. (Refer Item 1.)

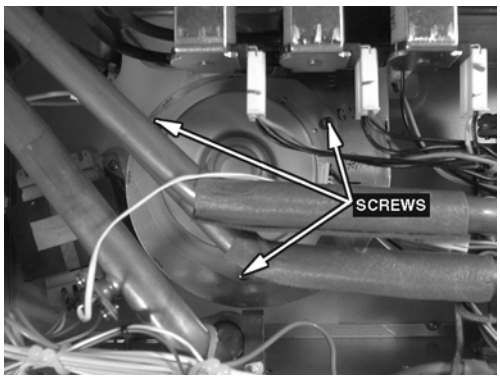
b. Remove one (1) sparker screw, unplug high tension leads from spark ignitors, and take out the sparker.



5) Removal of the **Combustion Fan**

a. Remove front panel. (Refer Item 1.)

b. Remove three (3) combustion fan screws, pull forward and slide to the side to remove fan.

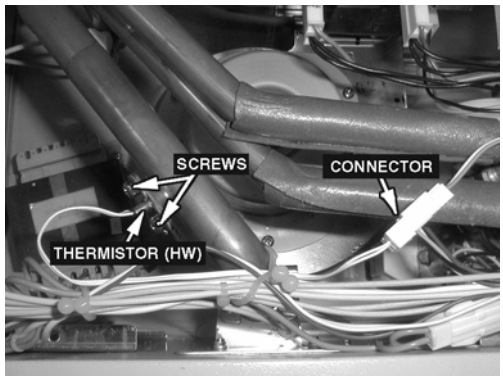


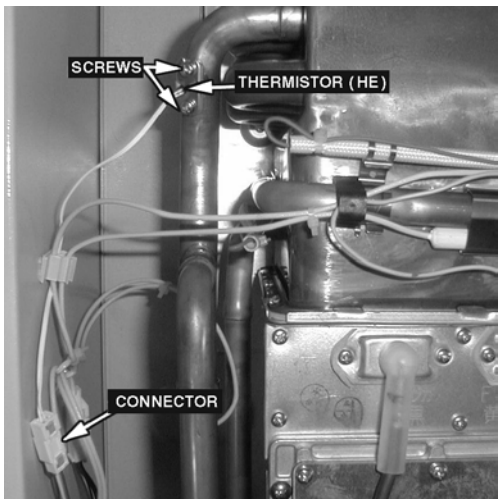
6) Removal of the **Hot Water Outlet & Heat Exchanger Outlet Thermistors**

a. Remove front panel. (refer Item 1.)

b. Remove two (2) thermistor screws and remove the Hot Water Outlet thermistor (HW), unplug.

c. Remove two (2) thermistor screws and remove the Heat Exchanger Outlet thermistor (HE), unplug.



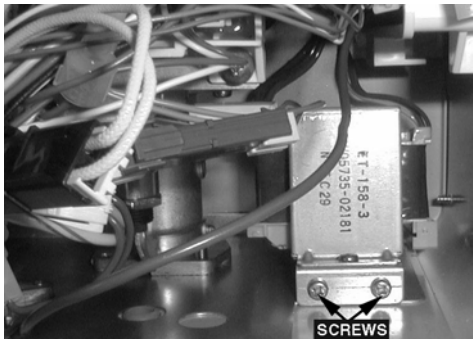


7) Removal of the **Transformers (240V / 110V)**

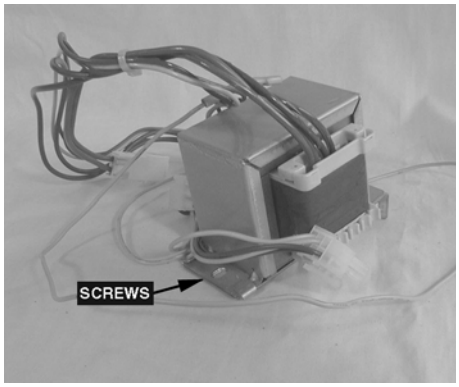
a. Remove front panel. (Refer Item 1.)

b. Remove PCB unit (assembly). (Refer Item 2.)

c. Remove two (2) transformer screws and pull out forward (2 screws).

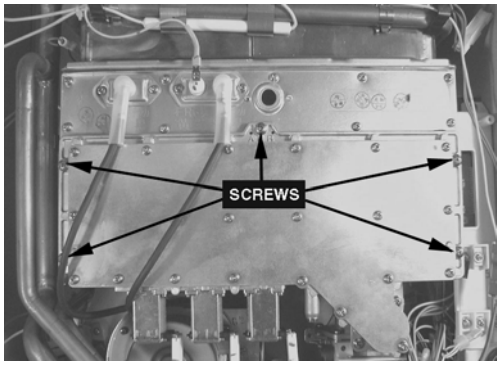


d. Remove transformer installation bracket screw.

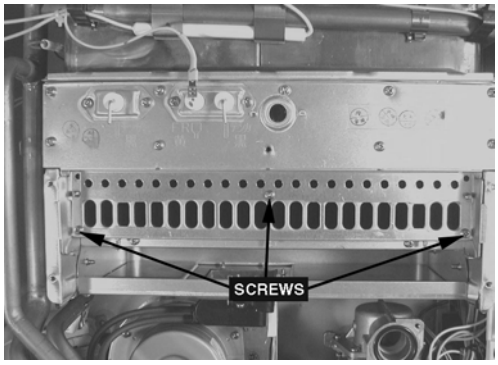


8) Removal of the **Gas Inlet, Solenoid, Flame Rod**

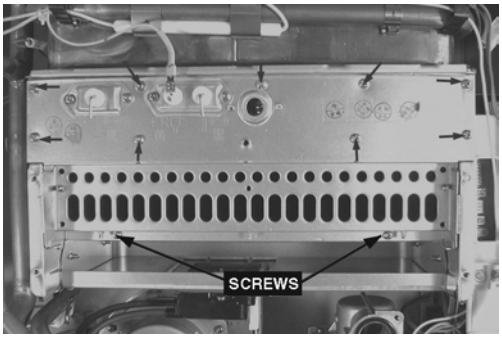
a. Remove front panel (4 screws). (Refer Item 1.)
b. Remove five (5) combustion screws located on outer edge of manifold plate.
c. Remove two high tension leads from spark ignitors. Unplug wiring from solenoid coils.
d. Remove two (2) manifold and gas control screws and take out by hand.



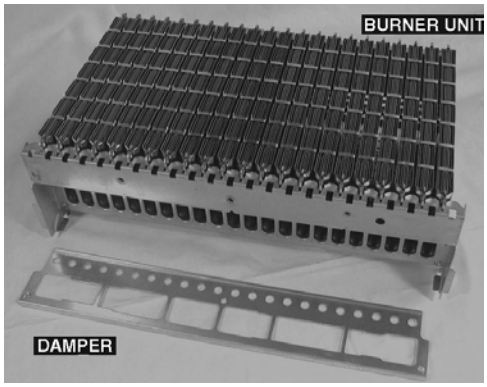
e. Remove damper (3 screws).



f. Remove two (2) burner retaining screws, then remove combustion chamber front panel (9 screws).

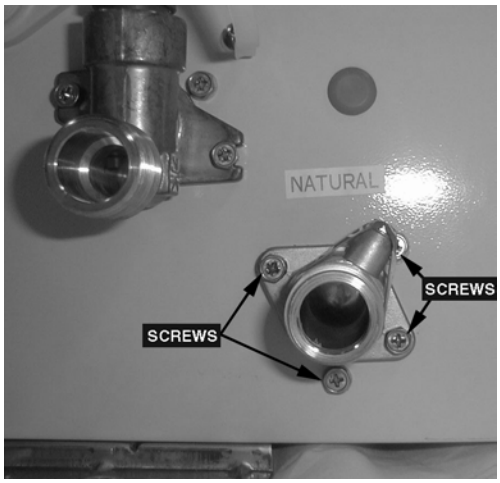


g. Take out the burner unit.

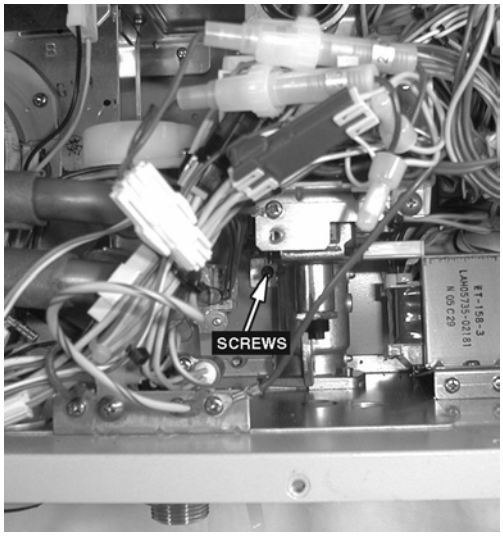


9) Removal of the **Gas Control**

a. Remove front panel (4 screws). (Refer Item 1.)
b. Remove the manifold. Refer to section 8) a. to d.
c. Remove four (4) screws on gas connection inlet and gas control (assy), and pull out the gas connection. Handle O-ring carefully.

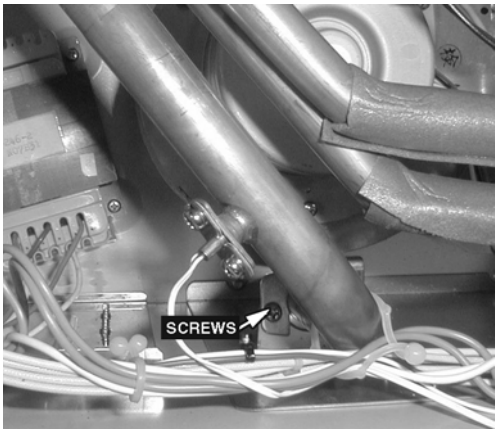


d. Remove one (1) gas control (assy) screw and pull out gas control (assy).

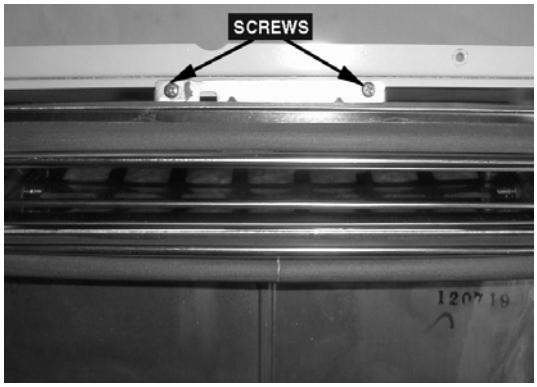


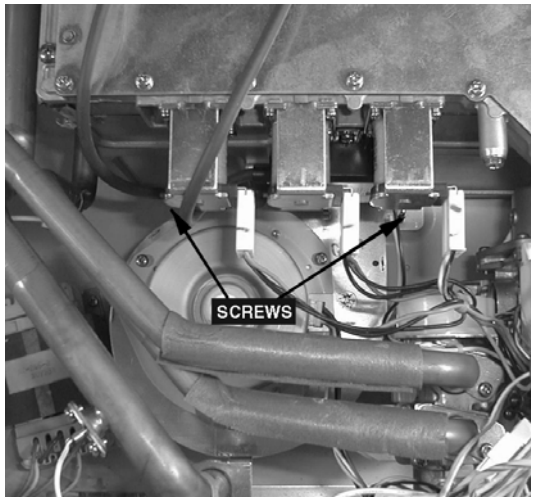
10) Removal of the **Heat Exchanger**

a. Remove front panel (4 screws). (Refer Item 1.)
b. Remove the PCB. (Refer Item 2.b.)
c. Remove heat exchanger water supply pipe and bypass pipe. Refer to 3).
d. Remove one (1) HEX HW pipe screw and pull the hot water pipe forward. Handle O-ring carefully..

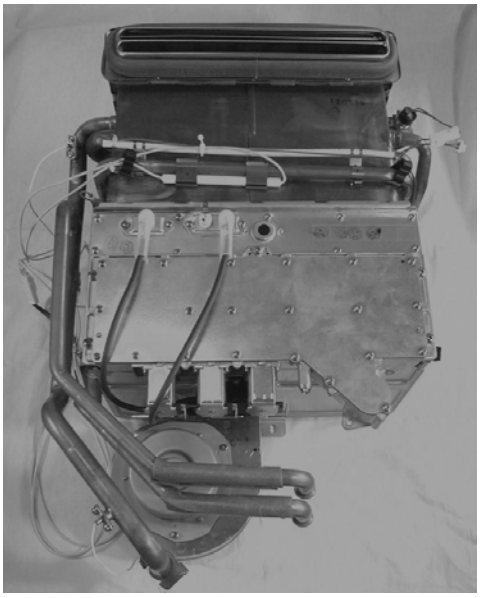


e. Remove the two (2) screws fixing the manifold and gas control.
f. Remove four (4) heat exchanger unit screws.





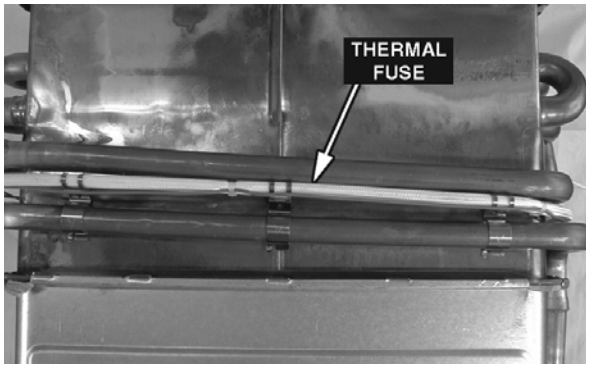
g. Remove connectors of the fan motor, thermal fuse, flame rod etc.
h. Pull the heat exchanger unit forward and out.



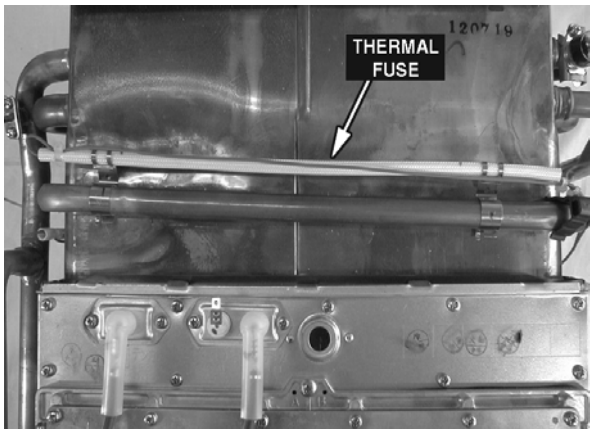
11) Removal of the **Thermal Fuse and OHS**

a. Remove front panel (4 screws).
b. Take out the heat exchanger unit. Refer to 10).
c. Remove the thermal fuse.

Note: After replacing, install the thermal fuse as in the following diagrams.



Heat Exchanger RHS

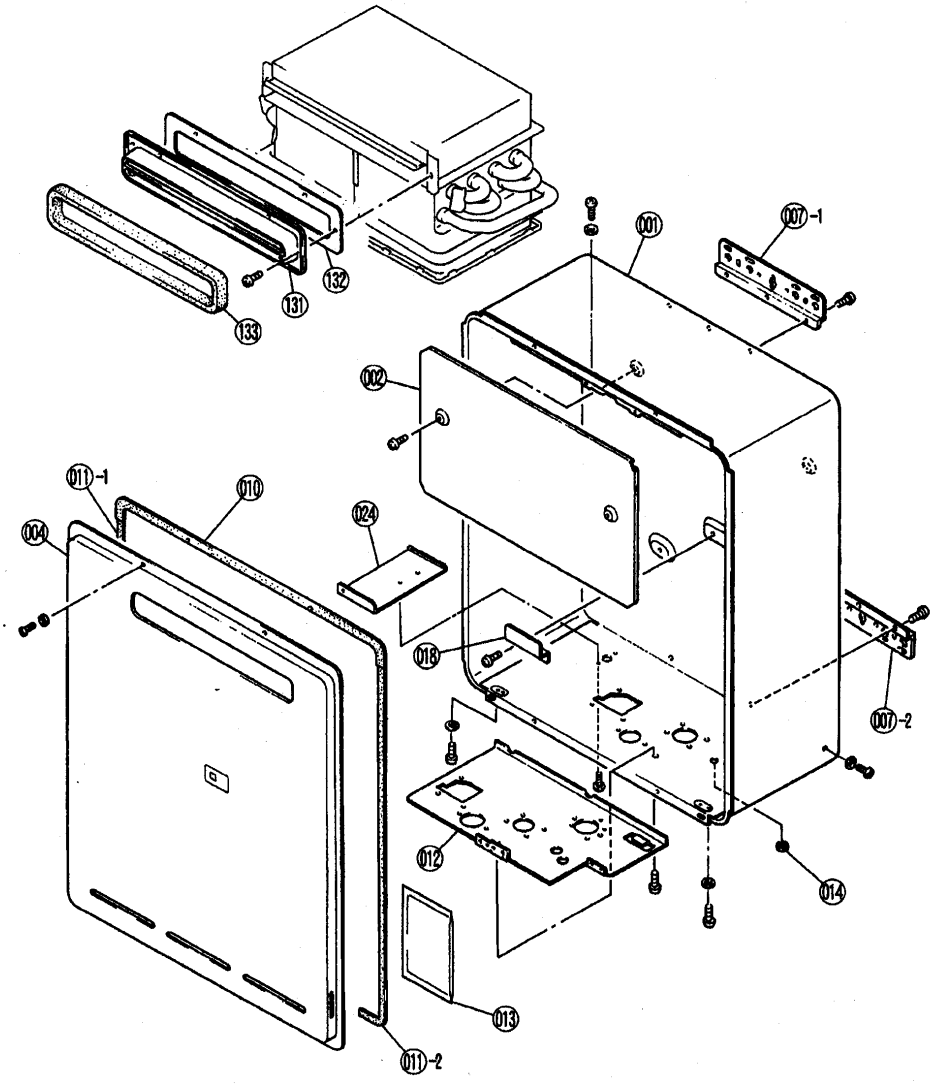


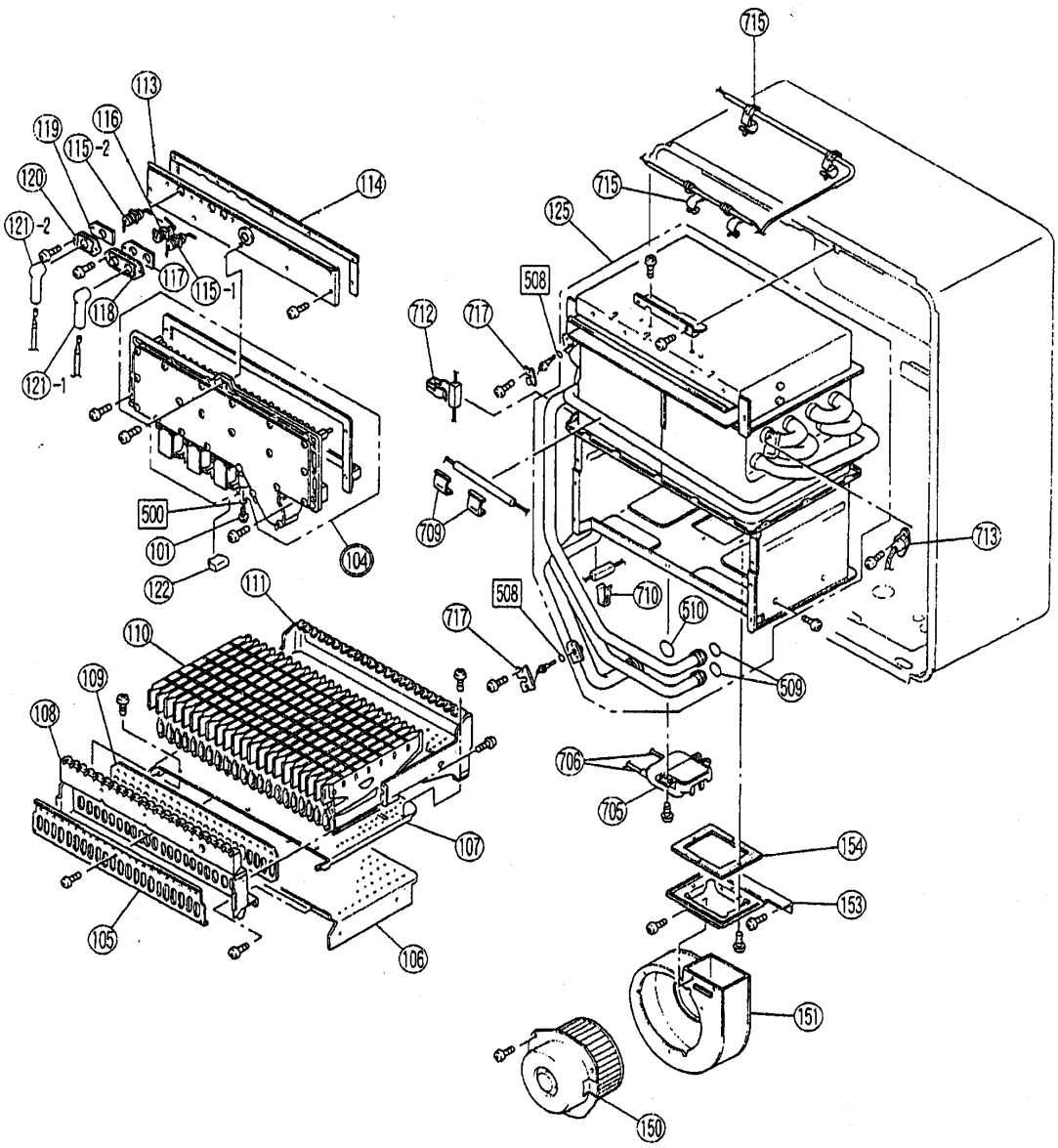
Heat Exchanger Front

Heat Exchanger Back

d. Remove one (1) screw of the bi-metal overheat switch.

21. Exploded Diagram




715
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116
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115-2
120
121-2
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125
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712
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115-1
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121-1
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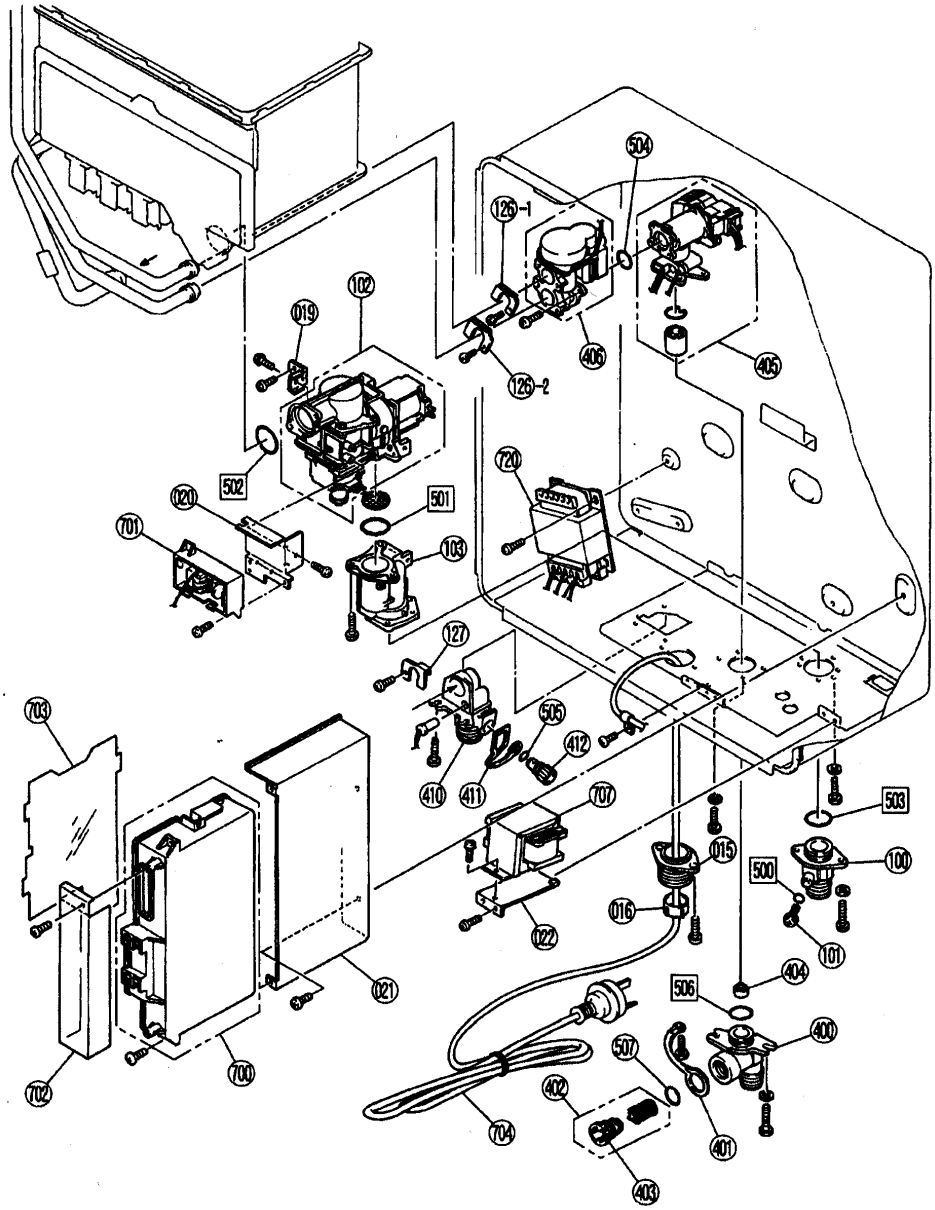
504
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019
406
126-2
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701
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127
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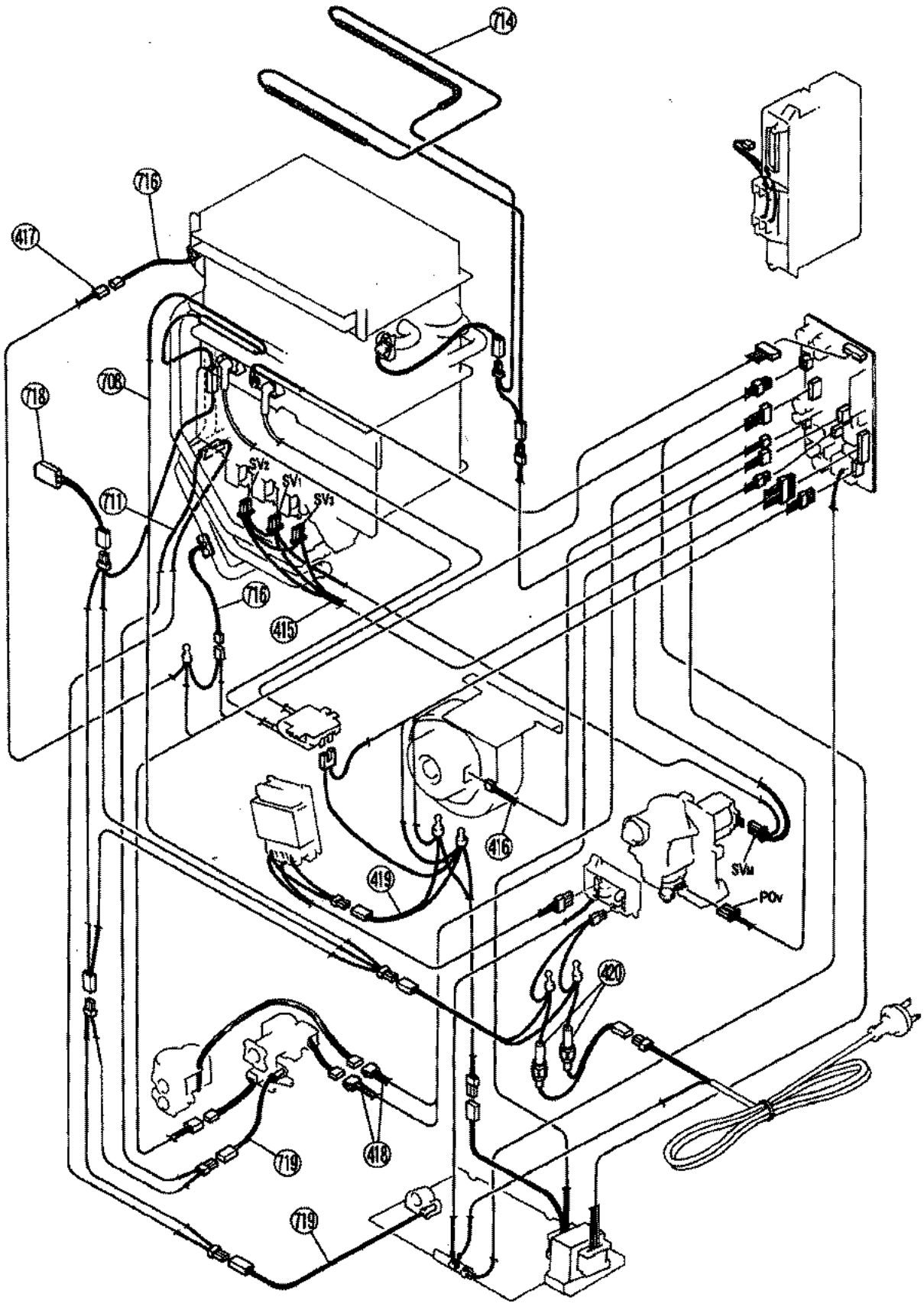
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SVz
SVi
SVi
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SVm
POv
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719

22. Parts List

				REU-V3232W-AK-NC	REU-V3232WC-AK-NC
No.	PART NAME	RJ DRAWING No.	RA PART No.	QTY	QTY
001	BODY Assy, Main - White	U211-100-3		1	
001	BODY Assy, Main - Silver	U211-100-4	92093830		1
002	SHIELD, Heat Insulation	H73-065		1	1
004	PANEL Assy, Front - White	U211-110-5-B	92093376	1	
004	PANEL Assy, Front - Silver	U211-110-6-A	92092051		1
007	BRACKET, Wall Mounting	BH59-092-2X02		2	2
010	GASKET, Front Panel	BU195-167X01	92086909	1	1
011	SIDE GASKET, Main Body	AU103-106X01	92086917	2	2
012	PANEL, Connection Reinforcement	U211-105X02		1	1
014	PLUG, Rubber	AU105-113		1	1
015	Cable Connection	BU56-602-NX06	92073352	1	1
016	SKIRT, Cable	AU169-126		1	1
100	CONNECTION, 3/4 Gas	BCF2-417X03		1	1
101	SCREW, Test Point	C10D-5		2	2
102	CONTROL, Gas Assy	C36Q-1-S	92086925	1	1
103	CONTROL, Gas Connection	U211-208	92086933	1	1
104	MANIFOLD Assy A (LPG)	U211-200-AX02	92086941	1	1
104	MANIFOLD Assy C (NG)	U211-200-C	92086958	1	1
105	DAMPER	U211-262X01	92086966	1	1
106	PLATE, Restrictor	U211-258		1	1
107	CASE, Lower Bnr	U211-260		1	1
108	CASE, Front Burner	U211-259		1	1
109	PACKING	U211-263		1	1
110	BURNER	B3A7-1X04		22	22
111	PANEL, Burner Case Back	U211-261		1	1
113	PANEL, Comb. Assy Chamber Fr Par	U211-266X01		1	1
114	PANEL, Comb. Assy Chamber Fr Par	U211-267X01		1	1
115	ELECTRODE	H73-120	92086974	2	2
116	FLAME ROD	AH41-216	92086982	1	1
117	GASKET, Electrode	AH66-398X01	92086990	1	1
118	HOLDER, Electrode	AH66-393	92087006	1	1
119	GASKET - B, Electrode	U211-279	92087014	1	1
120	HOLDER, Electrode	AU168-323	92087022	1	1
121	SLEEVE, Electrode	AU206-218	92087030	2	2
122	COVER, Magnet Valve	U211-1027		1	1
125	HEAT EXCHANGER, Complete Assy	U211-900-S	92087048	1	
126	BRACKET, Retention	AH69-310		2	2
127	BRACKET - D, Retention	U211-322		1	1
131	TERMINAL, Flue	U211-351		1	1
132	GASKET, Flue Terminal	U211-352		1	1
133	PACKING, Flue Terminal Front Seal	AH24-653-4		1	1
150	MOTOR, Assy Fan	BCF26-608	92087055	1	1
151	CASING, Fan	CH51-615X01		1	1
153	CONNECTION, Fan	U211-551		1	1
154	GASKET, Fan Connection	U211-552		1	1

				REU-V3232W-AK-NC	REU-V3232WC-AK-NC
No.	PART NAME	RJ DRAWING No.	RA PART No.	QTY	QTY
400	CONNECTION, 3/4 Water Inlet	H73-501X02	92089044	1	1
401	RETAINER, Plug	H73-512X02		1	1
402	FILTER, Assy, Water	H73-511	92083773	1	1
403	RETAINER, Plug	H73-510		1	1
404	BALANCER	M8D1-15X01		1	1
405	SERVO, Water Flow Assy	M8E-6-3-A	92087063	1	1
405	SERVO, By-pass Assy	M8E-6-4-A			
406	SERVO, By-pass Assy	M6J-1	92087071	1	1
410	R3/4 /20 Hot Water Outlet Connectior	U211-321		1	1
411	RETAINER, Plug	AU129-526		1	1
412	VALVE - C, Pressure Relief	BU129-520-CX03	92081751	1	1
415	HARNESS - Wire, Mod. Solen. Vlv	U211-601X02		1	1
416	HARNESS - Wire, Fan Motor	U211-602		1	1
417	HARNESS - Wire, Sensor	U211-603X06		1	1
418	HARNESS - Wire, Water Flow Servo	U211-604X01		1	1
419	HARNESS - Wire, Transformer	U211-1037		1	1
420	HARNESS - Wire 3 Amp Fuse	BU195-1630X03	92081900	1	1
500	O-RING	M10B-13-4		2	2
501	WASHER	C36B3-4	92072842	1	1
502	WASHER	C36F8-1	92075126	1	1
503	O-RING	M10B-1-24	92072859	1	1
504	O-RING	M10B-2-18	92071182	1	1
505	O-RING	M10B-2-7	92062348	1	1
506	O-RING	M10B-2-18		1	1
507	O-RING	M10B-2-16	92062199	1	1
508	O-RING	M10B-2-4	92062249	2	2
509	O-RING	M10B-2-14	92062207	2	2
510	O-RING	M10B-2-18		1	1
700	BOARD, PC	U211-1030-B	92092295	1	1
701	BOARD, PC EMC Assy	BU195-1643	92081801	1	1
702	PROTECTOR, Surge	BH43-755		1	1
703	COVER - Side, PCB	U211-506		1	1
704	COVER - Front, PCB	CP-90491T	92089051	1	1
705	CORD, Power	EI-145X02	92087113	1	1
706	SPARKER	BH38-710-540		1	1
707	LEAD, High Tension	ET-158-3	92087121	1	1
708	TRANSFORMER - Small	U211-1033		1	1
709	HEATER - A, Anti Frost 230V (K only)	AU195-675X01	92086123	2	2
710	CLIP, Anti-frost Heater (K only)	AU100-721X03	92076123	1	1
711	CLIP, Anti-frost Heater Clip (K only)	U211-1035		1	1
712	HEATER-B, 230V Anti-frost Heater B	AU124-618X01		1	1
713	CLIP, Anti-frost Heater (K only)	BU129-821-2		1	1
714	SWITCH, Over Heat	U211-610X01		1	1
715	WASHER	CP-80531X01		7	7
716	THERMISTOR	BH45-650X01		2	2

				REU-V3232W-AK-NC	REU-V3232WC-AK-NC
No.	PART NAME	RJ DRAWING No.	RA PART No.	QTY	QTY
717	RETAINER	CP-90172	9208638	2	2
718	CLIP, Thermistor	H73-750		1	1
719	SWITCH, A/Frost Heater (K only)	U211-1034		1	1
720	TRANSFORMER, Assy	ET-246-2	92087139	1	1
800	SCREW	ZEDB0408UK		2	2
801	WASHER	AU33-184X01		6	6
802	SCREW	ZAD0408UK		4	4
803	SCREW	CP-21478-412X01		2	2
804	SCREW	CP-80452-412		1	1
805	SCREW	ZEAB0406UK		4	4
806	SCREW	ZEDB0412SZ		2	2
807	SCREW	ZIAA0410SZ		3	3
808	SCREW	CP-21505-408		1	1
809	SCREW	ZFDB0408SZ		1	1
811	SCREW	AU48-174X01		2	2
812	SCREW	ZBA0508UK		2	2
888	CUSTOMER INSTRUCTION	U245-795		1	1
889	INSTALLATION INSTRUCTION	U211-1230		1	1

Notes

SERVICE CONTACT POINTS

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Western Australia	18 Belgravia Street, Belmont, WA 6104

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New South Wales	Tel: (02) 9609 2888 Fax: (02) 9609 5260
Queensland	Tel: (07) 3209 4622 Fax (07) 3209 4722
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HelpLine

National	Tel: 1300 366 388 Fax: (03) 9271 6611

Product Service

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Western Australia	Tel: (08) 9479 9479 Fax: (08) 9277 2531

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