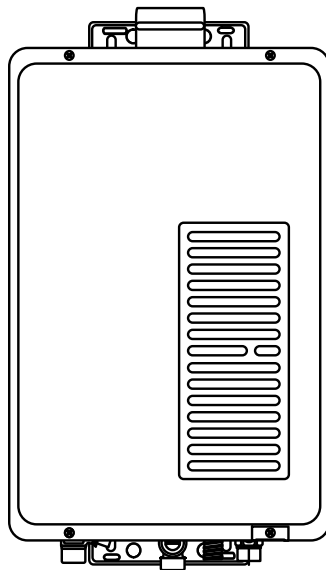


# Rinnai

---

**REU-V1616WF  
INFINITY 16 FE Internal**

## **SERVICE MANUAL**



**Rinnai High Capacity Continuous Flow Gas Hot Water System**



The Australian  
Gas Association

All Rinnai products are certified by the Australian Gas Association as compliant to relevant Australian Standards.



**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

Rinnai Australia Head Office is certified as complying with ISO 9001 by SAI Global.



**Quality  
Endorsed  
Company**

ISO 9001 Reg 415

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

**Certified  
Product**



**WaterMark**

AS3498 Lic W208  
SAI Global

All Rinnai products are Certified to WaterMark by SAI Global. WaterMark certification is awarded to products and fittings complying with safety and water contamination standards.

© Copyright Rinnai Australia Pty Ltd ACN 005 138 769 ABN 74 005 138 769  
All rights reserved  
Produced by Technical Services Department

September 2003 - Issue 1.

*No portion or part of this manual may be copied without prior permission from Rinnai Australia. Rinnai Australia takes no responsibility for the accuracy or otherwise of information contained in this manual, and reserves the right to make modifications and change specifications without notice.*



# **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. 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 supply improved appliances as well as information, and specifications may be subject to alteration at any time.

SM REU-V1616WF  
Issue N<sup>o</sup>1

# Table of Contents

---

Glossary of Terms and Symbols .....	v
1. Introduction .....	1
2. Specifications .....	2
3. Water Flow Rates and Pressures .....	4
4. Dimensions .....	7
5. Installation .....	8
6. Remote Controls .....	11
7. Cutaway Diagram .....	14
8. Operational Flow Chart .....	15
9. Operation Principles .....	16
10. Main Components .....	17
11. Time Charts .....	19
12. Wiring Diagram .....	20
13. Dip Switch Settings .....	21
14. Fault Finding .....	22
15. Component Circuit Value Table .....	24
16. Component and Circuit Checks .....	25
17. Maintenance Monitor / Error History .....	31
18. Gas Pressure / Gas Conversion Procedure .....	33
19. Dismantling for Service .....	34
20. Exploded Diagram .....	42
21. Parts List .....	46
SERVICE CONTACT POINTS .....	50

# 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 <sub>2</sub> O	-	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
∅	-	diameter
Δ °C	-	temperature rise above ambient
POV	-	modulating valve
TE	-	thermal efficiency
TH	-	thermistor
T <sub>IN</sub>	-	temperature of incoming water
T <sub>OUT</sub>	-	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 16 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. 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.
- ‘Standard’ Remote Controllers are available as an optional extra. Depending on the models chosen, these offer - Localised temperature control for up to one kitchen and two bathroom controllers
- 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	Direct Vent – Forced Flue
Rinnai model number	<b>REU–V 1 6 1 6 WF–A (Infinity 16 Internal FE)</b>
Installation	Internally mounted (Indoor Only)
Dimensions	Width – 350mm Height – 538mm Depth – 170mm
Weight	16 kilograms
Noise Level Range	49 dB (A)
Gas Consumption (Max. / Min.)	Natural gas : 125~20MJ/h Propane gas : 125~20MJ/h
Output (Max. / Min.)	27.4 / 4.3 (kW)
Connections	Gas connection – R3/4 (20A) Cold water connection – R1/2 (15A) Hot water connection – R1/2 (15A)
Ignition system	Direct electronic ignition
Electrical consumption	Normal – 65W standby – 6W ( WITH 1 Remote control ) Anti-frost protection – 74W (Optional)
Hot water capacity ( Raised 25°C )	2.4 to 16 L/min
Thermal efficiency	81%
NOXaf	70 ppm
Temperature range (with remote)	Kitchen controller : 37~55°C Bathroom controller : 37~50°C
Default temperature control (without remote)	40°C, 43°C, 50°C, 55°C (factory setting), 65°C, 75°C ( Set by combination of Dip switches on PCB )
Water Temperature control	Simulation feedforward and feedback
Water flow control	Water flow sensor, Electronic water flow control device.
Minimum operating water pressure	10kPa
Nominal operating water pressure	100kPa~830kPa
Minimum operating water flow	2.4 L/min
Maximum operating water flow	16 L/min
Power supply	Appliance – AC 240 Volts 50Hz Remote control – DC 12 Volts ( Digital )
Safety device	Flame failure – Flame rod
	Boil dry – Water flow sensor
	Remaining flame ( OHS ) – 97°C bi-metal switch
	Over temperature – 95°C lockout thermistor
	Fusible link – 129°C Thermal Fuse
	Pressure relief valve – Opens 2060kPa, closes 1470kPa
	Combustion fan rpm check – Integrated circuit system
Remote control ( optional )	Over current – Glass fuse ( 3 Amp. )
	Kitchen control –MC-91-1A
	Bathroom control –MC-91-1A
Cable ( optional )	Second bathroom control –MC-91-1A
	Non-polarized two core cable

*Note 1:* The default factory setting is 55°C for REU-V1616WF. 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.

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.

## Sensors and Safety Devices

- 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 2060 kPa, closes at 1470 kPa.
- 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)	Test Point (kPa) * *		Gas Input (MJ/hr)	
		Low	High	Low	High
Natural	ø 1.7	0.21	0.74	20	125
Propane	ø 1.25	0.22	0.92	20	125

\* \* 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).



### 3. Water Flow Rates and Pressures

---

#### Water Flows

Table 1 shows unmixed 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. Higher mixed water flow rates may be available at low temperature rises by mixing hot water from the outlet of the water heater with cold water from the mains supply as illustrated below:

Water Flows can also be calculated by the following formula :

Q = Heat energy available in kW = 28 kW for the REU-V1616WF

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?

$$\Delta T = 20 - 10 = 10^{\circ}\text{C}$$

$$Q = 28$$

$$C = 4.2$$

$M = 60 \times ( 28 / (4.2 \times 10) ) = 40 \text{ l/min}$ . Since 40 is greater than 16 this flow rate is mixed.

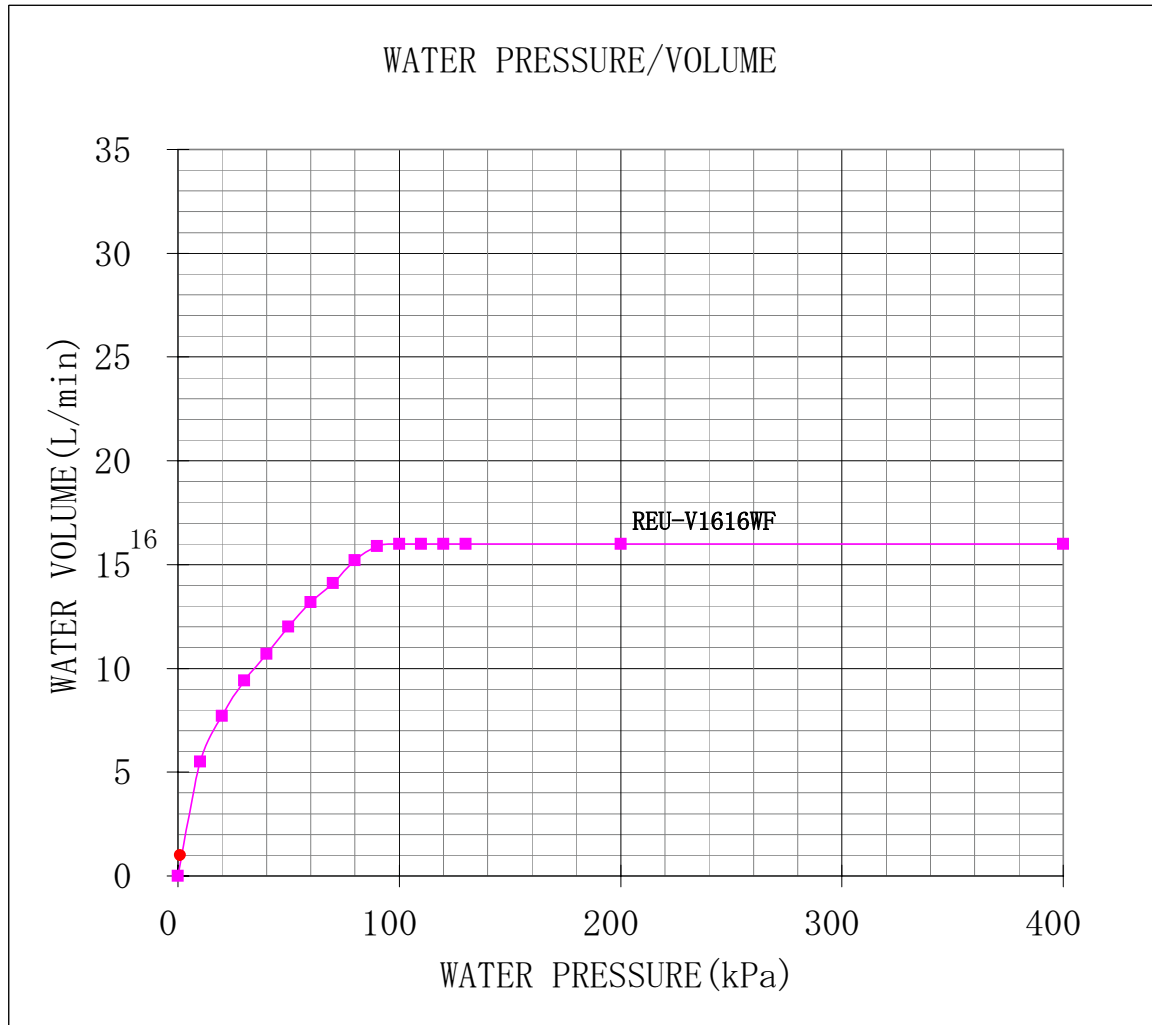
**Table 1: Approximate Water Flows and Gas Usage Table - REU-V1616WF**

Models (All Pre-set Temperatures)	Temp Rise (°C) ↑				5				10				15				20				
	Approx. Min / Max Gas Input (MJ/hour)	* L/sec	L/min	L/hr	Min Water Pressure (kPa)	Approx Gas Cons. (MJ/h)	* L/sec	L/min	L/hr	Min Water Pressure (kPa)	Approx Gas Cons. (MJ/h)	* L/sec	L/min	L/hr	Min Water Pressure (kPa)	Approx Gas Cons. (MJ/h)	* L/sec	L/min	L/hr	Min Water Pressure (kPa)	Approx Gas Cons. (MJ/h)
REU-V1616WF - Internal	18-125 20-125	0.27	16	960	72	25	0.27	16	960	72	50	0.27	16	960	72	75	0.27	16	960	72	100
			25					30					35					40			
Models (All Pre-set Temperatures)	Approx. Min / Max Gas Input (MJ/hour)	* L/sec	L/min	L/hr	Min Water Pressure (kPa)	Approx Gas Cons. (MJ/h)	* L/sec	L/min	L/hr	Min Water Pressure (kPa)	Approx Gas Cons. (MJ/h)	* L/sec	L/min	L/hr	Min Water Pressure (kPa)	Approx Gas Cons. (MJ/h)	* L/sec	L/min	L/hr	Min Water Pressure (kPa)	Approx Gas Cons. (MJ/h)
REU-V1616WF - Internal	18-125 20-125	0.27	16	960	72	125	0.22	13.2	792	60	125	0.19	11.4	684	44	125	0.17	10.2	612	35	125
			45					50					55					60			
Models (All Pre-set Temperatures)	Approx. Min / Max Gas Input (MJ/hour)	* L/sec	L/min	L/hr	Min Water Pressure (kPa)	Approx Gas Cons. (MJ/h)	* L/sec	L/min	L/hr	Min Water Pressure (kPa)	Approx Gas Cons. (MJ/h)	* L/sec	L/min	L/hr	Min Water Pressure (kPa)	Approx Gas Cons. (MJ/h)	* L/sec	L/min	L/hr	Min Water Pressure (kPa)	Approx Gas Cons. (MJ/h)
REU-V1616WF - Internal	18-125 20-125	0.15	9	540	29	125	0.13	8	480	24	125	0.12	7.2	434	21	125	0.11	6.6	396	20	125

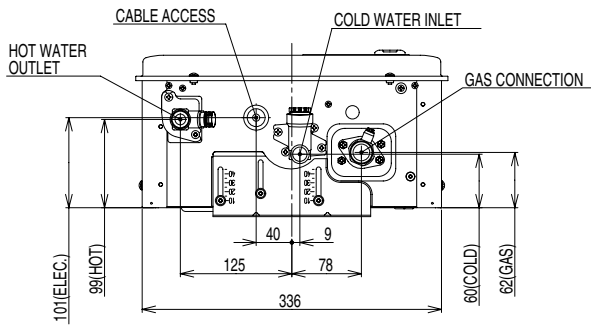
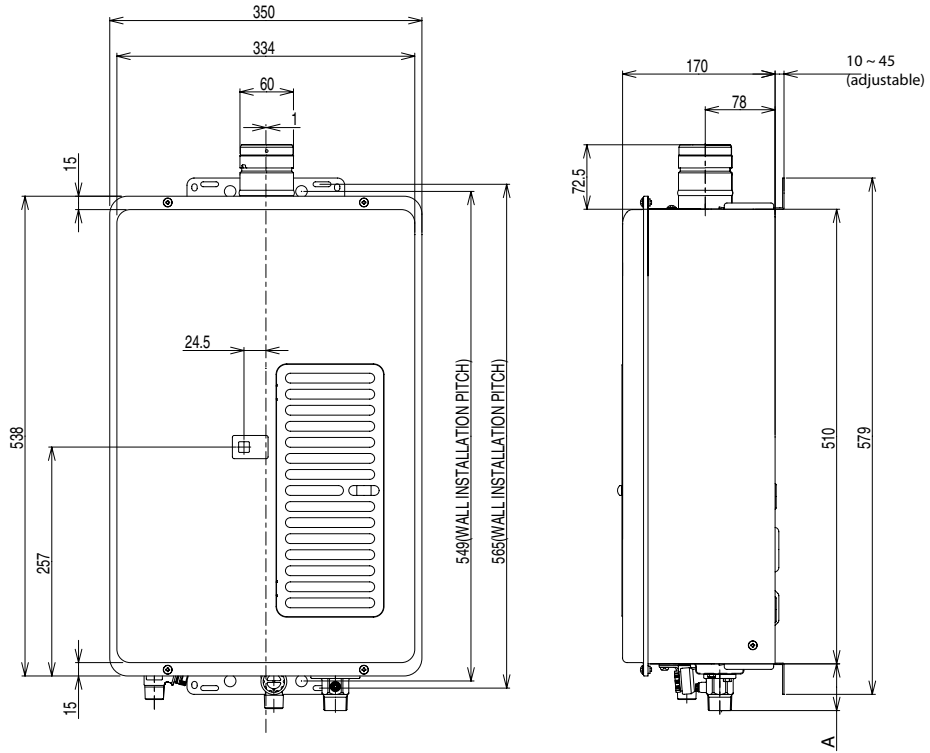
**\* Flows (L/Sec) are unmixed, at the outlet of the water heater.**

## Water Pressure

As seen in the table below a minimum supply pressure of 90 kPa is required to operate at the rated flow of 16 L/min. In an actual installation, pressure losses in the plumbing system also need to be considered to determine the minimum supply pressure.



# 4. Dimensions



	A DIMENSION (mm)	CONNECTION
GAS	52	R <sup>3/4</sup> (20mm)
COLD	50	R <sup>1/2</sup> (15mm)
HOT	42	R <sup>1/2</sup> (15mm)
CABLE ACCESS	3	—

## 5. Installation

---

### Ventilation

The REU-V1616WF is not a room sealed appliance, therefore adequate fixed ventilation must be provided as per AS5601/AG601/ 2002 Clause 5.4 to 5.4.5.

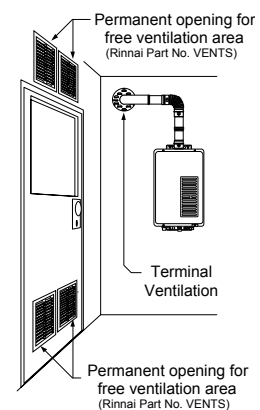
Air for combustion must be replaced, preferably from outside atmosphere. Ensure that the area in which the appliance is installed has adequate fixed ventilation. (See table below).

When calculating the ventilation requirements, care should be taken to allow for obstructions in the vent material / design used. The use of Rinnai Vents (Rinnai Part No. 'VENTS') will provide correct ventilation. See installation instructions provided with the water heater for full details.

Note: Incorrect ventilation can cause the appliance to operate in an unsatisfactory manner and can lead to a dangerous situation.

### Flueing

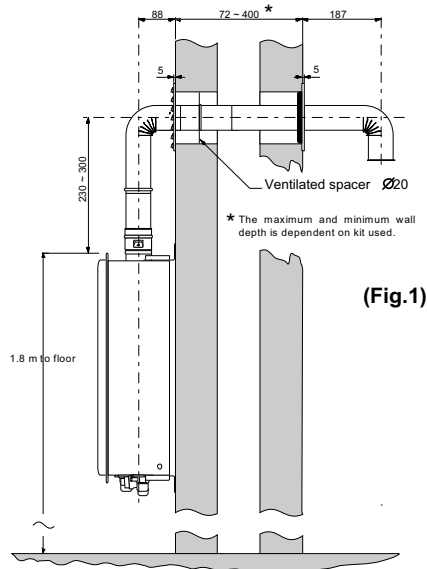
Install the Rinnai Infinity WF (FE) Flueing system in accordance with the instructions supplied with the flue terminal. The Rinnai REU-V1616WF can only be installed with the Rinnai approved WF Flue system. Non Rinnai Flueing systems must not be used.



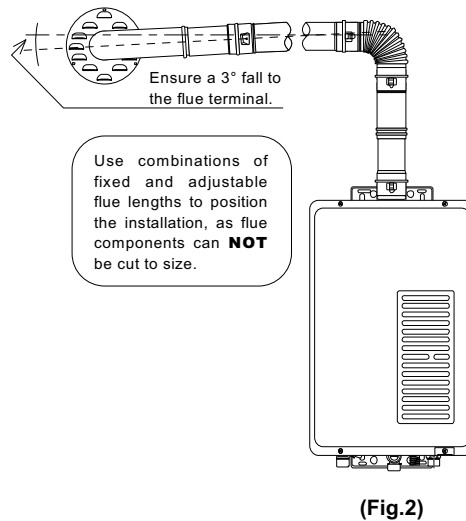
# Flueing Options

## Flueing Options

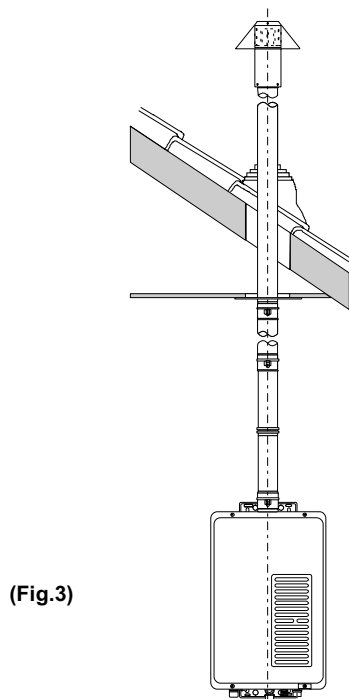
a) Direct Flueing with Wall Terminal: (Fig.1)



b) Extended Direct Flueing with Wall Terminal: (Fig.2)



c) Vertical Flueing with Roof Terminal (Fig.3)



### Important Installation Notes:

The components of this flueing system **CAN NOT BE CUT** use telescopic components to achieve the required length.

The flue system **MUST** be installed to comply with AS5601/AG601 Clause 5.13.

Ensure that positioning of the flue terminal complies with the requirements of AG5601/AG601. **Warning:** The flue products can reach temperatures above 200°C. The flue terminal is to terminate in a location, not to cause a nuisance.

The Rinnai REU V1616WF is a fan-assisted appliance; use the fan-assisted clearances in AS5601/AG601 Clause 5.13.6.5

All Flue **MUST** be supported and be independent of the appliance in accordance with AS5601/AG601 Clause 5.13.4.2 and 5.13.4.3.

Ensure the appliance can be removed without causing movement or displacement of the flue, as per AS5601/AG601 clause 5.13.4.1. Telescopic components extended to a minimum of 55mm can be used as a slip socket.

**Caution:** The "O" Rings in all components are pre-greased; ensure they are not damaged when joining.

When preparing the wall and ceiling penetrations, cover the flue spigot to prevent debris from entering the appliance.

The mounting brackets on the appliance can be adjusted from 15mm to 50mm to allow for irregularities in the walls and length of the flue components.

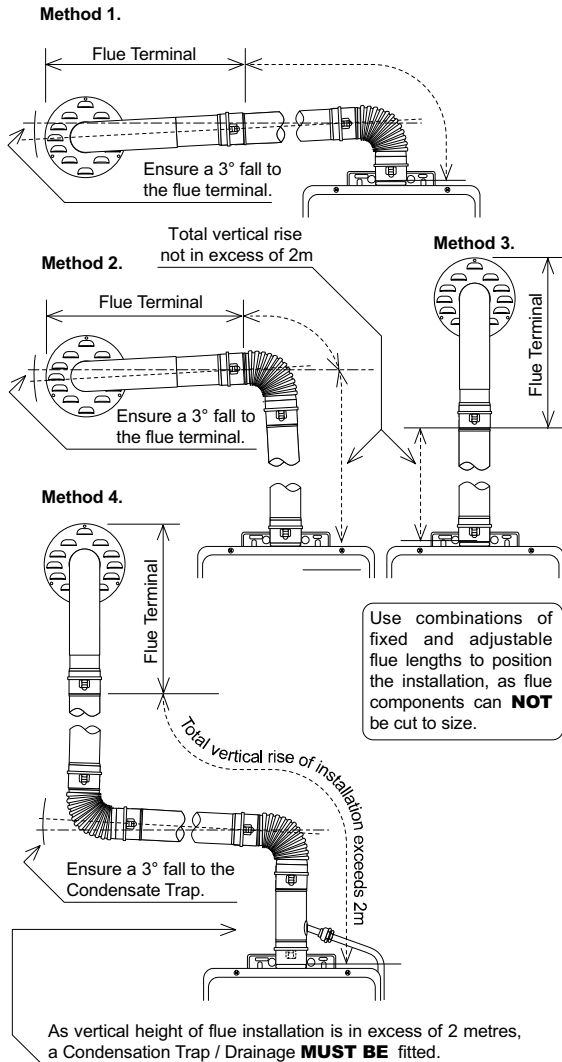
## Extended and Direct Flueing with Wall and Room Terminals

The Direct flueing wall terminal can be extended using the methods as shown in (Fig.5)

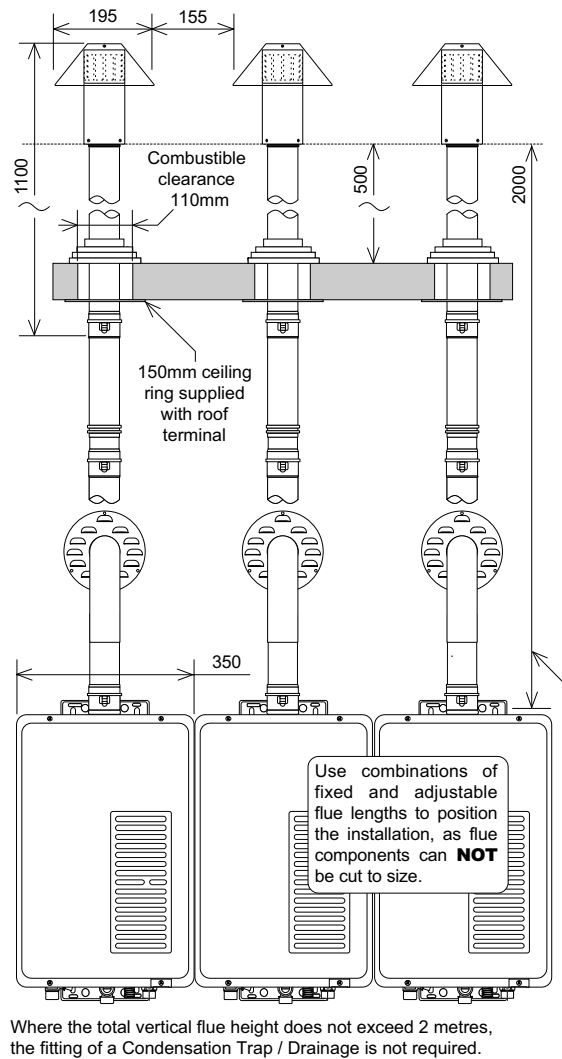
The total flue length should not exceed 9m and the number of 90° bends should not exceed 3.

When total vertical rise of flue exceeds 2 m a Condensation Trap / Drainage **MUST BE** fitted (Fig.5, Method 4.).

Note: The through wall terminal is equivalent to a 1m length and counts as one 90° bend, these factors must be taken into account when sizing a through wall installation.



(Fig.4)



(Fig.5)

The terminal clearances in AS5601 / AG601 do not apply to the Infinity REU V1616WF Water Heaters installed side by side. The appliances are AGA certified to be installed side by side as shown in (Fig.6), allowing for a horizontal distance of 155mm between flues.

The minimum distance of 500mm between the underside of the cowl and the nearest part of the roof must still be met.

## Condensate Drain

The condensate trap will collect condensate from the flue system. This condensate must be drained to the outside of the building via a condensate drain pipe. In accordance with the installation instructions supplied with the flue terminal.

## 6. Remote Controls

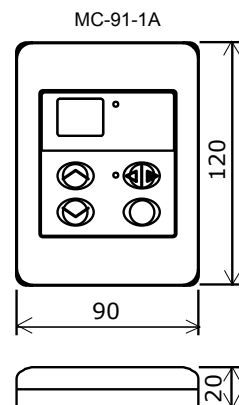
---

### Remote Controls

Remote Controllers are an optional extra. 'Standard' controllers can be fitted. Standard controllers allow temperature selection only. 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 3 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.



### 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 1500mm). Controllers are water resistant, however, durability is improved when positioned outside the shower recess or at least 400mm 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 mm<sup>2</sup> 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

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

**"THIS APPLIANCE DELIVERS WATER  
NOT EXCEEDING 50°C IN ACCORDANCE WITH AS 3498"**

:

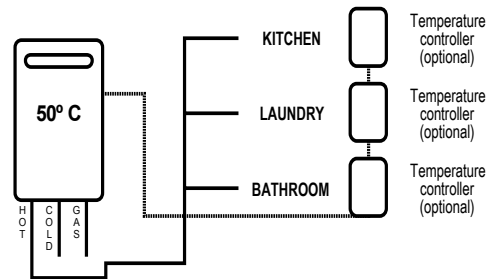


Diagram 1. 50° C Appliance

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

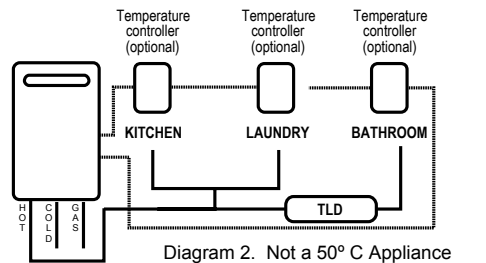


Diagram 2. Not a 50° C Appliance  
Note: TLD = Temperature Limiting Device.

**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 50° 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) as shown in fig. 1.
3. Thread the cable(s) through the cable access hole at the base of the appliance.
4. **Ensure the position of the terminals for controls** shown on the printed circuit board **COVER**. Connect the spade connectors to the terminals on the P.C.B. (Fig. 2). Polarity is not important. Either wire colour can be connected to either terminal. Connect cord anchorage clip to controller wire.
5. Replace cover of the appliance, ensuring that the screw with the star washer is placed at the bottom right hand corner for earthing purposes.

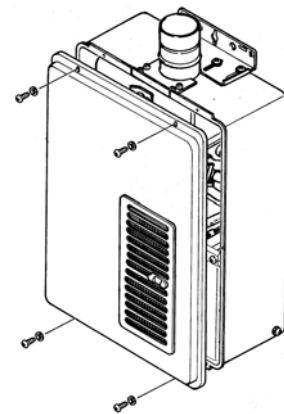


fig.1.

## Connecting Three Controllers

1. Isolate the power supply.
2. Remove the front cover from the Appliance (4 screws) as shown in fig.1.
3. 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.
4. Thread the 3 cables through the cable access hole at the base of the appliance.

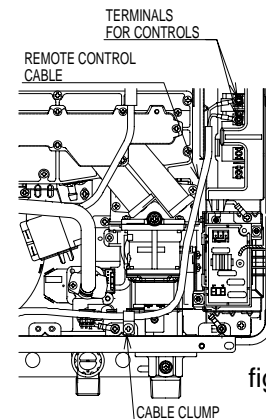


fig. 2

5. **Ensure the position of the terminals for controls** shown on the Printed Circuit Board **COVER**. Connect the 4 spade connectors to the terminals on the P.C.B. (fig 2). Polarity is not important. Either wire colour can be connected to either terminal. Connect cable clamp around controller wiring to provide cord anchorage.

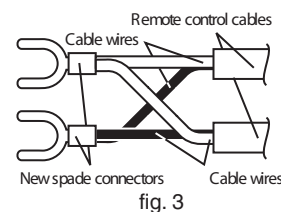


fig. 3

6. Replace cover of the appliance, ensuring that the screw with the star washer is placed at the bottom right hand corner for earthing purposes.

## If the front cover of the appliance contains the following text, "THIS APPLIANCE DELIVERS WATER NOT EXCEEDING 50° C IN ACCORDANCE WITH AS 3498"

IF YES: No further action required.

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

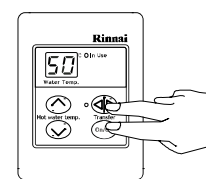


fig.1

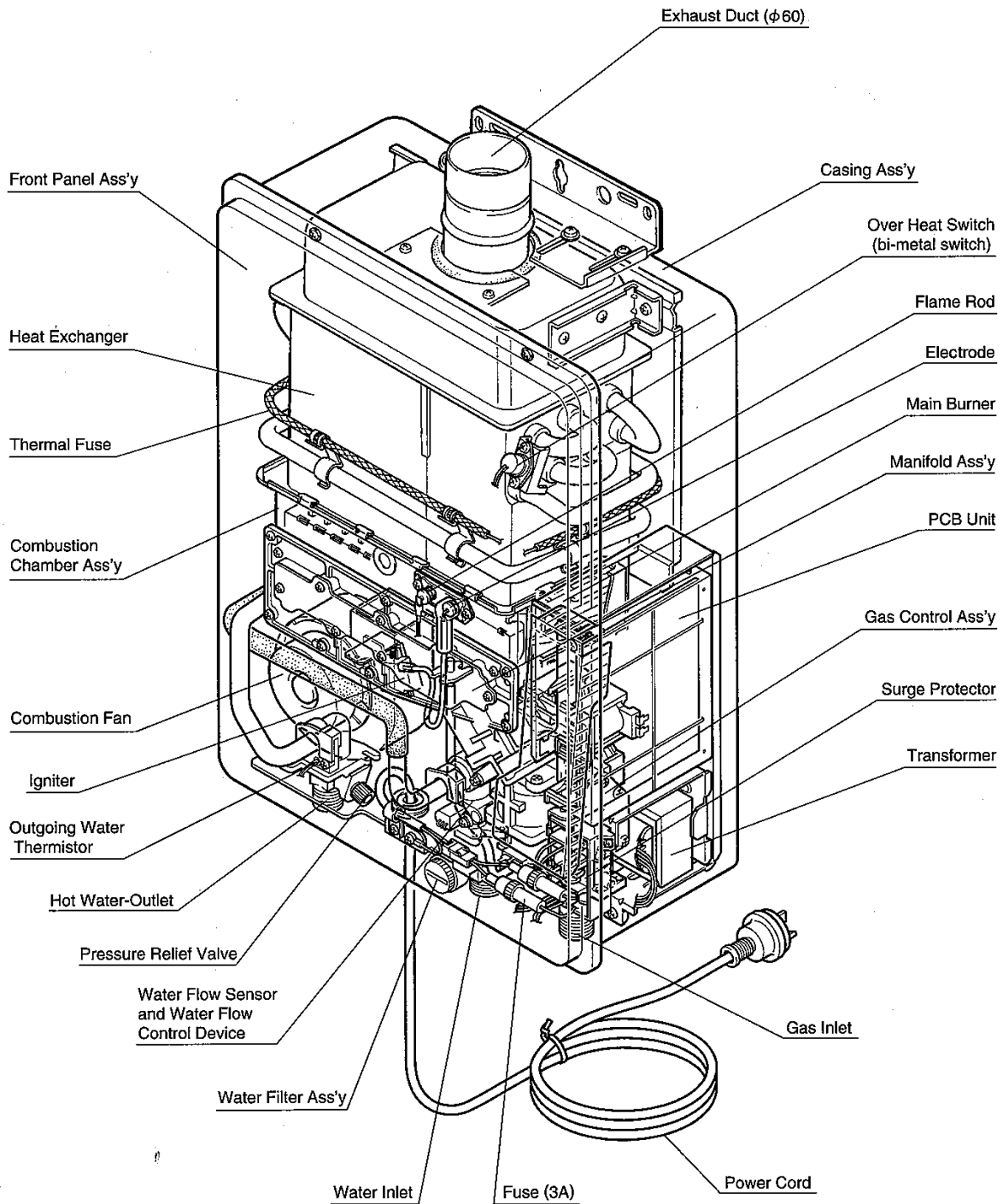
### STEP 2:

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

### Note:

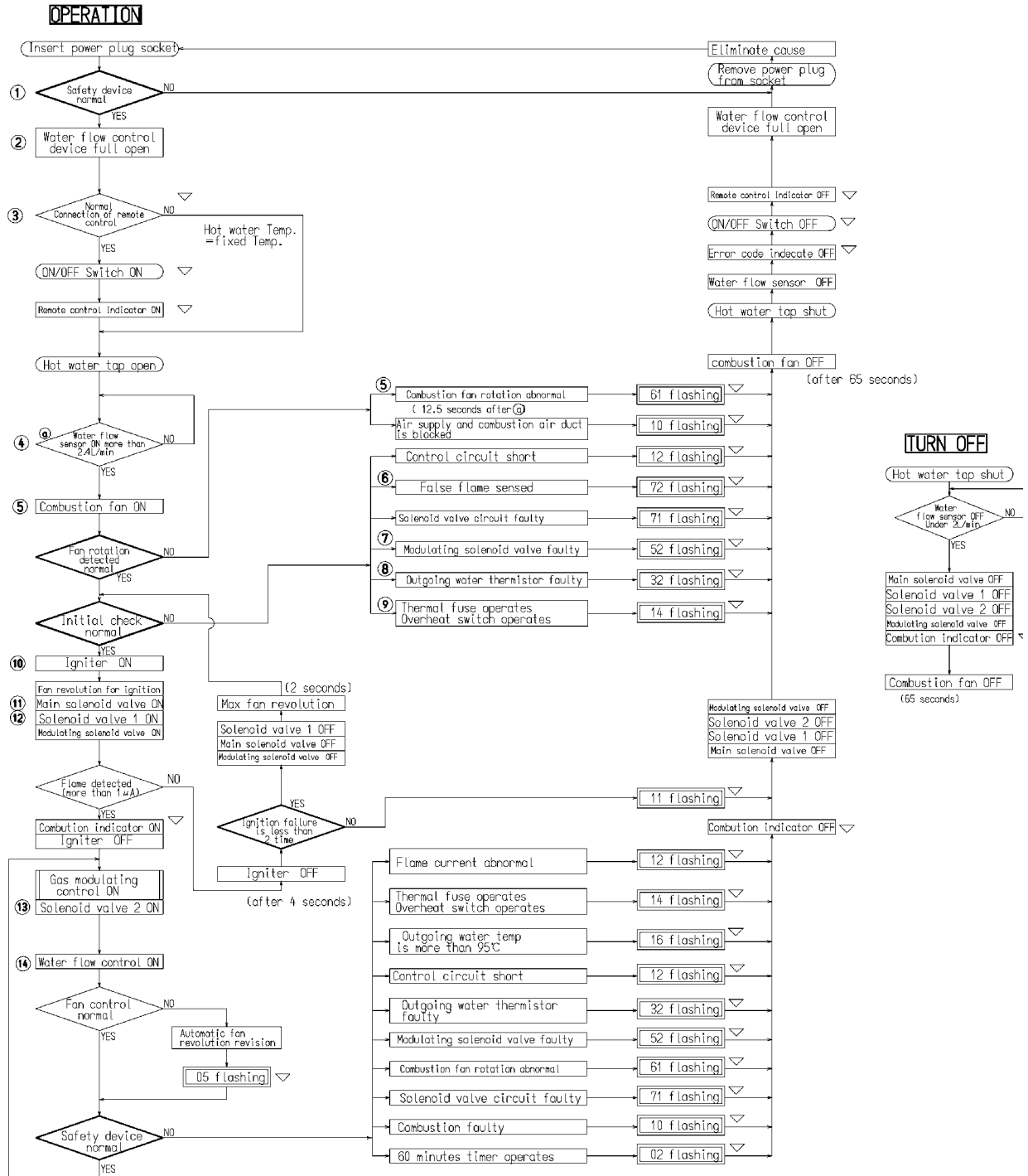
- If the kitchen controller is replaced, repeat STEP 1 above for the replacement controller
- If the kitchen controller is swapped with another controller (for example, the controller fitted in a bathroom), repeat STEP 1 for the controller moved from the kitchen to the bathroom. Then perform STEP 1 for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

# 7. Cutaway Diagram



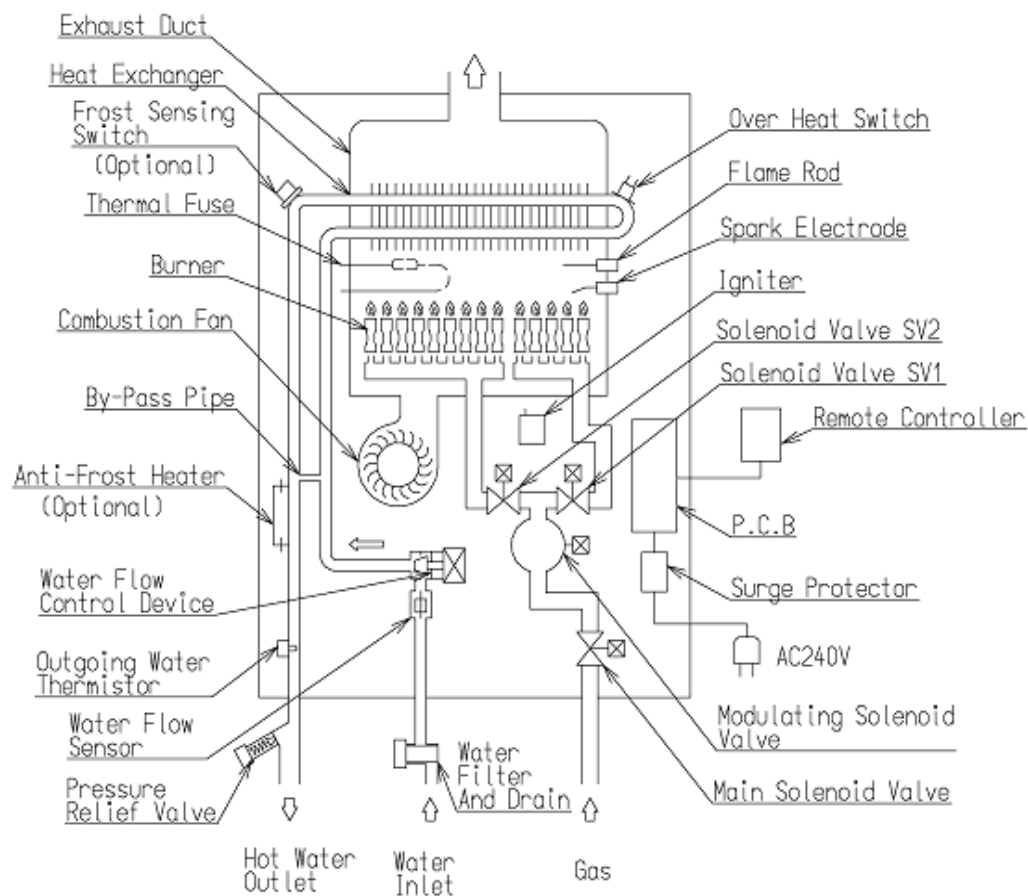
# 8. Operational Flow Chart

MODEL:REU-V1616WF



▽ : Only applicable when remote control is connected

## 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.

#### 3. Shut Down

- 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) Printed 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, 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 two burner banks independently. Any one or two or both of the solenoid valves may be open during operation.
- Gas flow is modulated between 20 and 125 MJ/hr for REU-V1616WF 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. A minimum flow rate of 2.4 l/min. is required for the burner to ignite.
- Water flow control is achieved through the use of servo driven water flow control valve and fixed bypass. Servo motor is 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. During normal operation, cold water from the inlet valve is mixed with hot water from the heat exchanger outlet via the fixed bypass.

## 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:

- Aluminium alloy manifold with multiple integral injectors. Gas flow to each chamber is controlled by an electronic solenoid valve (refer 'Gas Flow Control' above).
- A burner assembly comprising multiple 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 single injector.
- A combustion chamber. Integrated into the combustion chamber front panel are the flame rod and ignition electrode.

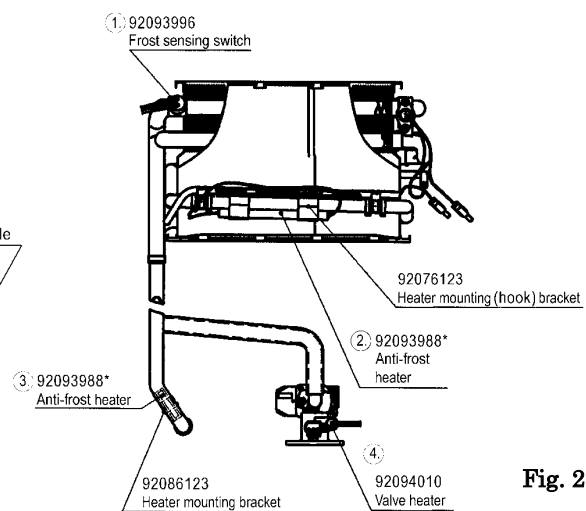
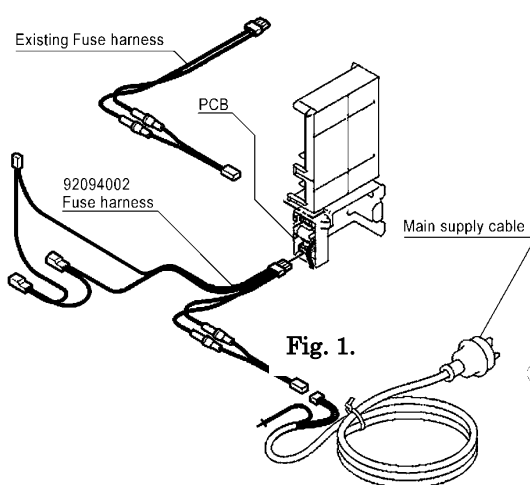
## 6) Anti Frost

### Fitting method

1. Turn off and disconnect the 240V power supply.
2. Turn off the water supply and relieve the water pressure in the water heater.
3. Remove front cover.
4. Disconnect and remove the existing Fuse harness and replace with the Fuse harness (92094002) supplied in the anti-frost kit, ensuring to re-connect the polarized plugs to PCB and the mains supply. (See Fig. 1.)
5. Fit the Frost sensing switch (92093996). This is the black sensor with the built in brackets and clips vertically on the water tube at the top left hand side of the heat exchanger. (See note ①, Fig. 2.).
6. Fit the long white round Anti-frost heater (92093988\*) with two hook brackets (92076123) to the tube on the front of the heat exchanger. (See note ②, Fig. 2.).
7. Using the clip bracket (92086123) fit the square Anti-frost heater (92093988\*), to the rear of the hot water outlet tube. This is located on the lower left hand side of the heat exchanger and can be easily accessed without removing any components. (See note ③, Fig. 2.)
8. On the cold water inlet servo valve located in the lower center of the unit, remove the retaining screw and insert the Valve heating element (92094010), refit the retaining screw. (See note ④, Fig. 2.)
9. Connect the polarized plugs for the Frost sensing switch (92093996), Valve heating element (92094010) and the Anti-frost wiring loom (92093988\*) to the corresponding polarized plugs of the Fuse harness (92094002).
10. Ensure the assembled wiring loom and component leads are supported in existing anchor ties.
11. Turn on water supply.
12. Refit the front cover.
13. Restore the power supply.

Part	RA Part Number	Drawing Number	Qty.
Fuse harness	92094002	U250-1612-2	1
Frost sensing switch	92093996	U242-511-2	1
Anti-frost loom/heaters*	92093988	U245-1177	1
Valve heater	92094010	U250-1552	1
Heater mounting bracket	92086123	AU100-721	1
Heater mounting bracket	92076123	AU195-675	2

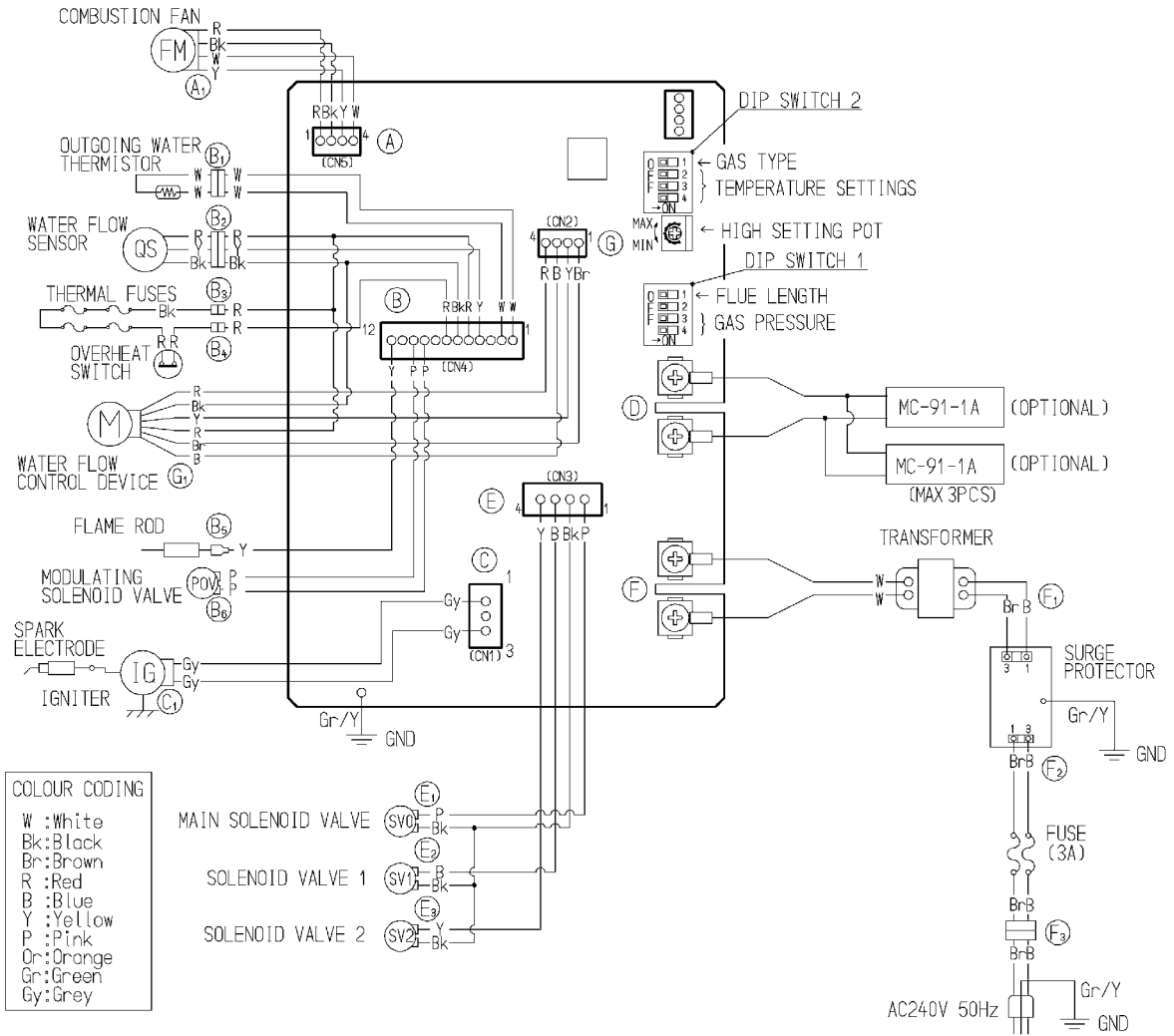
\*Note: Anti-frost wiring loom is supplied with two factory fitted heating elements.





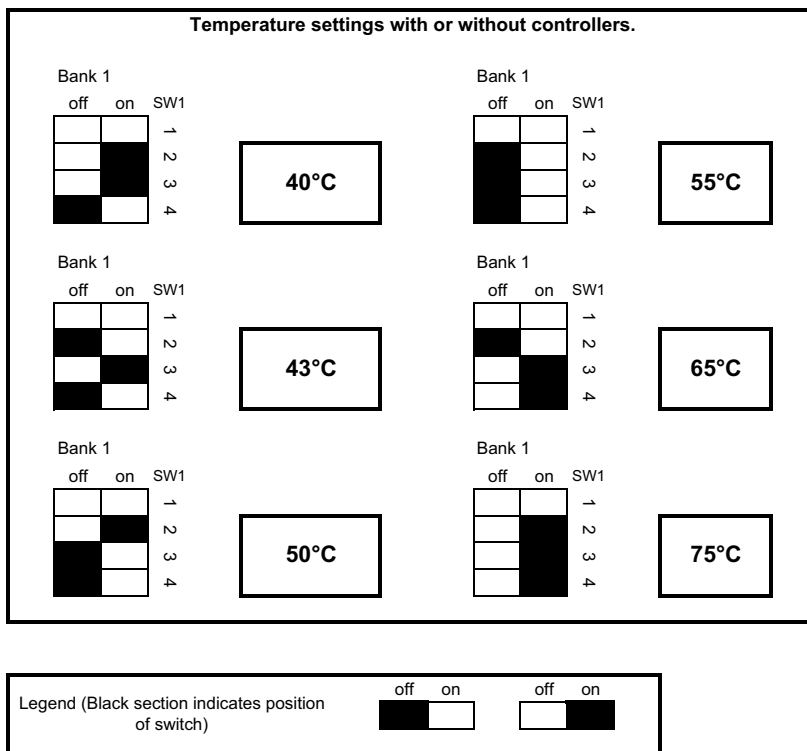
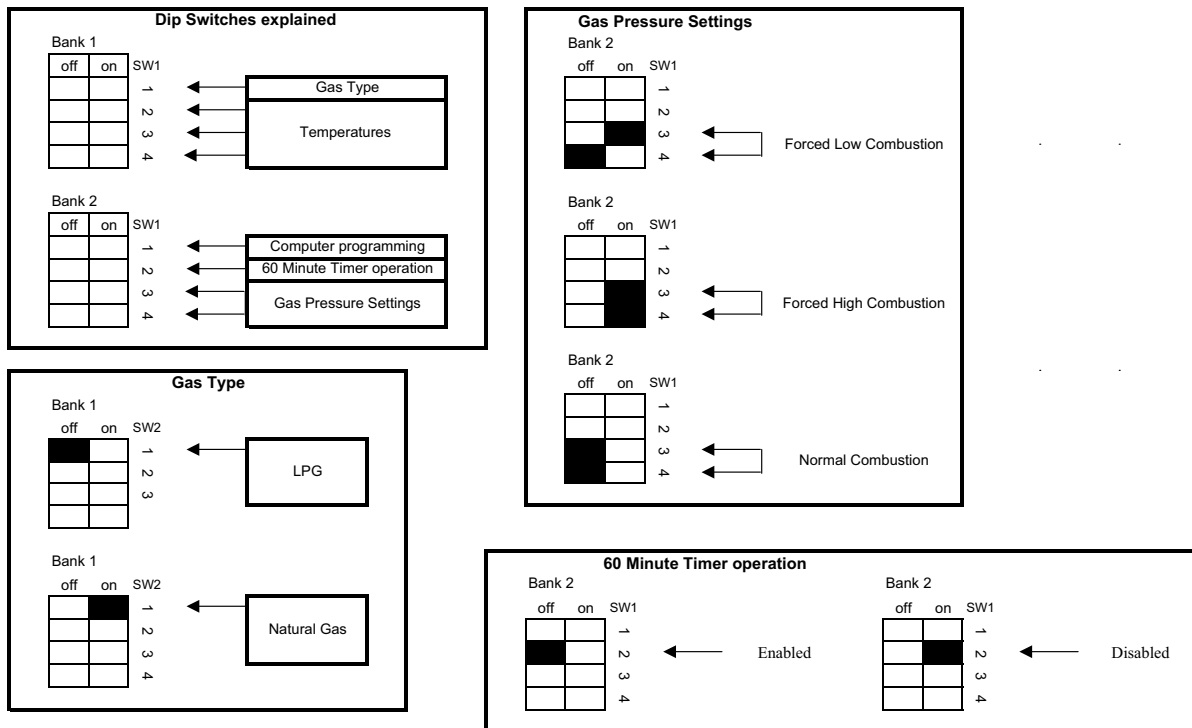


# 12. Wiring Diagram



# 13. Dip Switch Settings

Dip Switch Settings REU-V1616WF

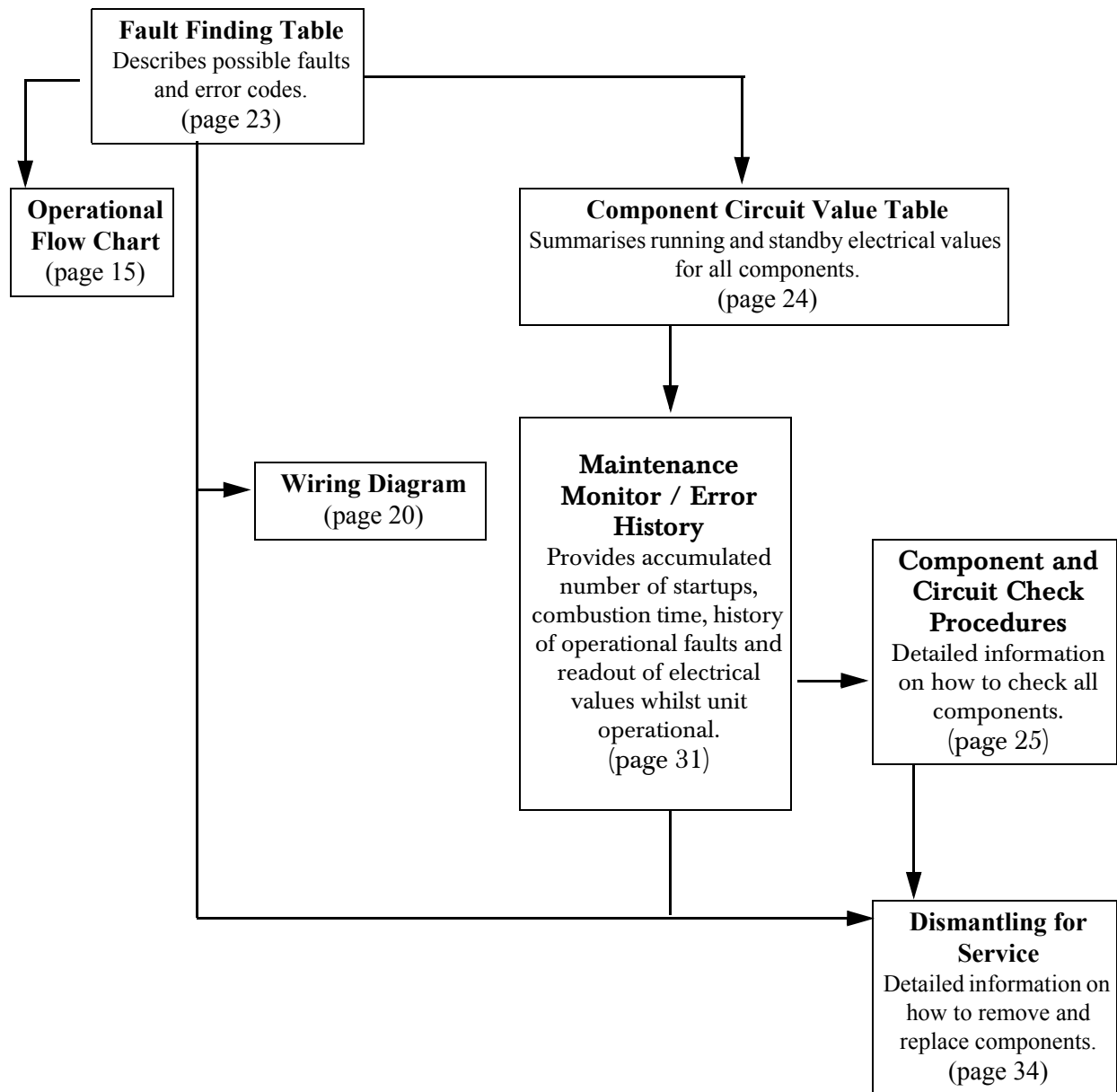


# 14. Fault Finding



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	Action
02	Combustion time out (activated after 60 minutes of continuous use to ensure that the room does not run out of oxygen).	Reset the appliance by turning the water heater off at the power point, leave the unit off for 10 seconds and then turn the power back on.
03	Power interruption during Bathfill. Water will not flow when power restored.	1. Turn off all hot water taps. 2. Press the ON/OFF button on a controller twice.
10	Combustion fan current too high. Unit operates, then stops.	1. Check blockage of air intake/flue outlet. 2. Check combustion fan.
11	No ignition. Unit stops without flame igniting	1. Check gas supply 2. Check sparker unit 3. Check gas valves
12	Flame Failure / Earth Leakage	1. Check gas supply 2. Check flame rod 3. Check earth wire lead 4. Check remote control
14	Thermal fuse and/or overheat switch activated. Unit operates, then stops.	1. Check thermal fuse 2. Check overheat switch IMPORTANT- If thermal fuse or overheat switch were faulty : a. Check heater for damage b. Confirm "Gas Type" and "Combustion" dip switch settings (page 21). c. Confirm test point pressures (page 24).
16	Over temperature warning. Unit operates, then stops.	1. Confirm "Gas Type" and "Combustion" dip switch settings (page 21) 2. Confirm test point pressure (page 24) 3. Check gas valves 4. Check water flow sensor 5. Check water flow servo 6. Check heat exchanger outlet temperature thermistor 7. Check hot water outlet temperature thermistor
32	Outlet water thermistor flow	Check hot water outlet thermistor
52	Modulating solenoid valve fault. Unit stops without flame ignition.	Check modulating solenoid valve
61	Combustion fan rotation error	Check combustion fan
71	Solenoid valve circuit error. Unit does not operate.	Check gas valves
72	Flame rod circuit error. Unit does not operate.	Check flame rod
-	Appliance does not operate at all. No display on the remote controllers (if fitted).	1. Check power cord plugged in and supply turned on. 2. Check power supply voltage. 3. Check electrical fuse. 4. Check transformer. 5. Check gas valves 6. Check sparker unit. 7. Check earth leads and connections. 8. Check for short circuits. 9. Check remote controller(s) - if fitted.
-	No combustion despite remote control indicating that combustion is occurring - if remote controller(s) fitted)	1. Check water flow sensor. 2. Check flame rod. 3. Check heat exchanger outlet thermistor. 4. Check hot water outlet thermistor. 5. Check combustion fan. 6. Check the sparker unit. 7. Check gas valves. 8. Check thermal fuse. 9. Check overheat switch. 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 3. Check earth leads and connections.
-	Cannot adjust the hot water temperature via the controller(s) - only if controller(s) fitted.	1. Check hot water outlet thermistor. 2. Check heat exchanger outlet thermistor. 3. Check gas valves 4. Check water flow servo.
-	Anti-frost heater does not operate.	1. Check anti-frost heater components 2. Check frost sensing switch

# 15. Component Circuit Value Table

Component	Measurement Point		Normal Value	Notes
	CN	Wire Colour		
Surge Protection	F <sub>1</sub>	B-Br	AC207~264V	
Water Flow Control Device	G <sub>1</sub>	R(CN2-NO.4)-B	DC11~13V (Only When Operating)	Operate Electricity
		R(CN4-NO.5)-Bk	DC11~13V	Control Electricity
		Bk-Y	Below DC1V (Limiter On)	Full Open Position
			DC4~6V (Limiter Off)	
		Bk-Br	Below DC1V (Limiter On)	Full Close Position
			DC4~6V (Limiter Off)	
Remote Control	D	(TERMINAL)	DC11~13V	
Water Flow Sensor	B <sub>2</sub>	R-Bk	DC11~13V	On 2.4L/min (33Hz) Over 1980 PULSE/min Off 1.7L/min (23Hz) Below 1380 PULSE/min
		Y-Bk GND	DC4~7V (Pulse 20~320Hz)	
Combustion Fan	A <sub>1</sub>	R-Bk	DC15~46V	
		Y-Bk	DC11~13V	
		W-Bk GND	DC2~10V (20~420Hz)	
Flame Rod	B <sub>5</sub>	Y-FLAME ROD	Over DC1μA	Flame Condition
Modulating Valve	B <sub>6</sub>	P-P	DC2~15V 65~85Ω	
Outgoing Thermistor	B <sub>1</sub>	W-W	15° C... 11.4 ~ 14.0kΩ 30° C... 6.4 ~ 7.8kΩ 45° C... 3.6 ~ 4.5kΩ 60° C... 2.2 ~ 2.7kΩ 100° C... 0.6 ~ 0.8kΩ	
Thermal Fuse / Over Heat Switch	B <sub>3</sub>	R-R	Below 1Ω	
	B <sub>4</sub>	R-Bk		
Igniter	C <sub>1</sub>	Gy-Gy	AC90~110V	
Main Solenoid Valve	E <sub>1</sub>	P-Bk	DC80~100V 1.3~1.6kΩ	
Solenoid Valve 1	E <sub>2</sub>	B-Bk	DC80~100V 1.7~2.1kΩ	
Solenoid Valve 2	E <sub>3</sub>	Y-Bk	DC80~100V 1.7~2.1kΩ	
Transformer	F	W-W	AC90~110V 11~13kΩ	
	F <sub>3</sub>	B-Br	31~36kΩ	

# 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 (A<sub>1</sub>).

*Normal:* DC15~46V (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 (A<sub>1</sub>).

*Normal:* DC11~13V

If normal proceed to b.).

**Faulty:** Replace PCB.

b.) Measure voltages between Black and White of connector (A<sub>1</sub>).

*Normal:* DC2~10V

If normal proceed to Sparker Circuit 2.

**Faulty:** Replace Combustion Fan.

## 2. Sparker Circuit

a.) Measure voltages between Grey and Grey of connector (C<sub>1</sub>).

*Normal:* AC90~110V

If Normal proceed to b.).

**Faulty:** Replace PCB.

b.) Disconnect connector (J<sub>6</sub>) and measure resistance between both terminals of the sparker.

*Normal:* 1MΩ

If not sparking, adjust or replace ignition plug.

**Faulty:** Replace Sparker.

### 3. Main Solenoid Valve (SV<sub>0</sub>) Circuit

Check the main solenoid if error indicator “11” is displayed.

- a.) Disconnect Main Solenoid connector (E<sub>1</sub>) and measure resistance between Pink and Black

*Normal:* 1.3 ~1.6kΩ

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<sub>1</sub>

**Faulty:** Replace PCB.

### 4. Solenoid Valve 1 (SV<sub>1</sub>) Circuit

Check Solenoid 1 if error indicator “11” is displayed.

- a.) Disconnect Solenoid 1 connector (E<sub>2</sub>) and measure resistance between Blue and Black.

*Normal:* 1.7 ~2.1kΩ

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<sub>2</sub>) Circuit

**Faulty:** Replace PCB.

### 5. Solenoid Valve 2 (SV<sub>2</sub>) Circuit

- a.) Disconnect Solenoid Valve 2 connector (E<sub>3</sub>) and measure resistance between Yellow and Black.

*Normal:* 1.7 ~2.1kΩ

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.

## 6. Valve Circuit

a.) Disconnect Modulating Valve fasten terminals (B<sub>6</sub>) and measure resistance between terminals.

*Normal:* 65~85Ω

If normal, proceed to b.).

**Faulty:** Replace Modulating Valve.

b.) Measure voltage between Pink and Pink of Modulating Valve fasten terminal.

*Normal:* DC2.0~15V

If normal, proceed to c.).

**Faulty:** Replace PCB.

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

*Normal:* If secondary pressure changes, go to Water Flow Servo Circuit.

**Faulty:** Replace Modulating Valve.

## 7. Flame Rod Circuit

Check flame rod.

Disconnect flame rod terminal (B<sub>5</sub>), 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 (B<sub>5</sub>) and appliance earth.

*Normal:* >1MΩ

If normal, replace PCB.

**Faulty:** Replace flame rod.

a.) Remove the Flame Rod terminal (B<sub>5</sub>) 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 (B<sub>5</sub>).

*Normal:* Voltage AC100~160V

If normal, replaced 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



## 8. 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.

## 9. Thermal Fuse Circuit

Check the Thermal Fuse.

Disconnect relay connector (B<sub>3</sub>) and (B<sub>4</sub>) 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.

## 10. Overheat Switch Circuit

Measure resistance between Overheat Switch terminals.

*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.

## 11. Water Flow Sensor

- a.) Measure voltage between Red - Black of relay connector (B<sub>2</sub>).

*Normal*: DC 11~13V

If normal, proceed to b.

**Faulty**: Replace PCB.

- b.) Measure voltage between Yellow - Black of relay connector (B<sub>2</sub>).

*Normal*: DC 4~7V

**Faulty**: Replace water flow sensor.

*Note*: For controller readout of water flow whilst operational refer maintenance monitor.

## 12. Water Flow Servo Circuit

- a.) Disconnect relay connector (G<sub>1</sub>), and measure voltage between Red (+) and Black (-) on PCB unit side.

*Normal:* DC11~13V

If normal: proceed to c.

**Faulty:** Replace PCB unit.

- b.) Measure voltage between Black and Yellow with relay connector (G<sub>1</sub>) connected (with no water flowing, water flow servo fully open).

*Normal:* DC4~6V

**Faulty:** Replace Water Flow Servo with Water Flow Servo.

- c.) Measure voltage between Black and Brown with relay connector (G<sub>1</sub>) connected (with no water flowing, water flow servo fully open).

*Normal:* < DC4~6V

**Faulty:** Replace Water Flow Servo and Water Flow Sensor.

## 13. Hot Water Outlet Thermistor Circuit

Check Hot Water Thermistor if error code 32 is displayed.

Disconnect relay connector (B<sub>1</sub>) and measure resistance White -White.

*When disconnected:* resistance >1MΩ

*When short circuit:* resistance > 1 Ω

*Normal:* Check Heat exchanger outlet thermistor

**Faulty:** Replace hot water outlet thermistor.

*Normal*

Temp.	15°C	30°C	45°C	60°C
Resistance	11.4~14 kΩ	6.4~7.8 kΩ	3.6~4.5 kΩ	2.2~2.7 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 (B<sub>1</sub>) and measure resistance White -White.

## 14. Surge Protector

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:*  $<1\Omega$

If normal go to step Electrical Fuse 14.

**Faulty:** Replace fuse/s (3Ax2). Check for a short next time it's turned off.

## 15. Electrical Fuse

- a.) Measure voltage between blue and brown on the connector (F<sub>2</sub>)

*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 (F<sub>1</sub>).

*Normal:* AC207~264V.

**Faulty:** replace surge protector unit.

## 16. Transformer

Check for the transformer

- a.) Measure the voltage between white and white on the transmission connector (F).

*Normal:* AC90~110V (11~13  $\Omega$ )

## 17. Remote Control

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

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

*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. Maintenance Monitor / Error History

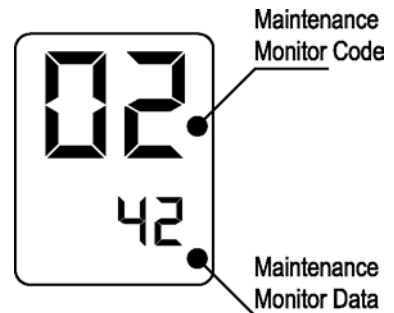
\* REU-V1616WF INFINITY 16 FE

A deluxe controller (MC70-2A) should only be fitted to the above water heater models, for the purpose of enabling service personnel to locate the error history and fault find operational appliances.

NB. Use only one controller, when accessing the maintenance information, error history, as two or more remote controls may cause incorrect operation.

## To display Maintenance Information

1. 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.
2. The maintenance number will be shown in the Water Temperature display.
3. Data will be shown in the Clock display.
4. To select the required maintenance number, press the Water Temperature "UP" and "DOWN" buttons.



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) x 15

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

**\*Note 2 Remote Control Connections**

Bathroom Remote		Kitchen remote	
Additional 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 (Not applicable)		

**To return to normal operation**

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

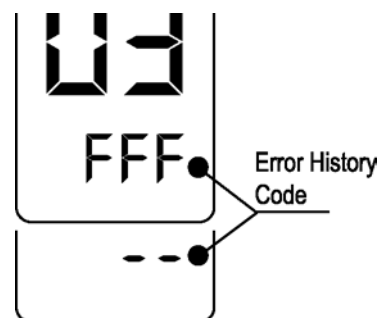
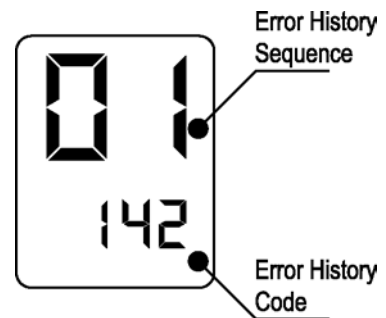
**Error History**

**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 minutes.

# 18. Gas Pressure / Gas Conversion Procedure



## Gas Pressure Setting

1. Turn 'OFF' the gas supply
2. Turn 'OFF' 240V power supply.
3. Remove the front cover from the appliance.
4. Remove and replace burner Manifold and Damper.
5. Set gas type switches (fig. 1) to the correct position (dipswitch 1 of SW2 'OFF' = Propane. 'ON' = Natural Gas).

**Note: 'ON' towards front, 'OFF' towards rear.**

5. Attach pressure gauge to burner test point, located on the gas control. (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 the maximum 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. Low Setting

- a. To set the appliance to 'Forced Low' combustion, switch No. 3 dipswitch of (SW1) to 'ON'. (fig. 3)
- b. Check the burner test point pressure.
- c. Remove rubber access plug and adjust the regulator screw on the modulating valve (fig. 4) refer to correct gas type setting. (Table 1.), replace rubber access plug.

## 10. High Setting

- a. To set the appliance to 'Forced High' combustion, switch both No. 3 and No. 4 dipswitches of (SW1) to 'ON'. (fig. 5). Ensure maximum water flow.
- b. Check the burner test point pressure.
- c. Adjust the high pressure Potentiometer (POT) (fig.1), on the Printed Circuit Board (PCB) refer to correct gas type setting. (Table 2.)

11. **IMPORTANT:** Re-set dipswitches No's 3 & 4 of (SW2) to 'OFF' to return the appliance to 'Normal' combustion. (fig. 6)

12. Close hot water tap
13. Turn OFF the gas supply and 240V power supply.
14. Remove pressure gauge, and replace sealing screw.
15. Restore the plastic PCB cover.
16. Check for leaks from gas control (assy), manifold connection and pressure test point.

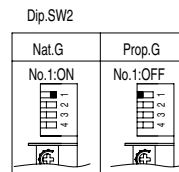
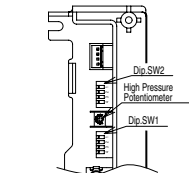


fig. 1

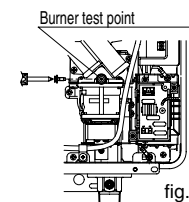


fig. 2

Dip.SW1	Pressure Setting Low (kPa)	
	Nat.G	Prop.G
REU-V1616WF	0.21	0.22

Table 1.

fig. 3

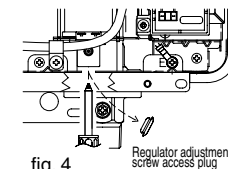


fig. 4

Dip.SW1	Pressure Setting High (kPa)	
	Nat.G	Prop.G
REU-V1616WF	0.74	0.92

Table 2.

fig. 5



fig. 6

## REU-V1616WF GAS CONVERSION

	RJ Drawing No.	RA Part No.
Manifold A (Prop.):	U243-200-A	92093897
Manifold G (NG):	U243-200-G	92093905
Damper A (Prop.):	U243-314-A	92095462
Damper E (NG):	U243-314-E	92095470

## 19. Dismantling for Service

---



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

<i>Item</i>	<i>Page</i>
1. “Removal of the Front Panel” .....	35
2. “Removal of PCB Unit” .....	35
3. “Removal of EMC sub board” .....	35
4. “Remove of Transformer” .....	36
5. “Removal of the Igniter”.....	36
6. “Removal of the manifold & burner unit.”.....	36
7. “Removal of the Gas Control” .....	37
8. “Removal of the flame rod and ignition plug” .....	38
9. “Removal of the outgoing heater thermistor” .....	38
10. “Removal of the Water Flow Servo” .....	39
11. “Removal of the fan motor” .....	39
12. “Removal of the Heat Exchanger”.....	40
13. “Removal of the Thermal Fuse”.....	41

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

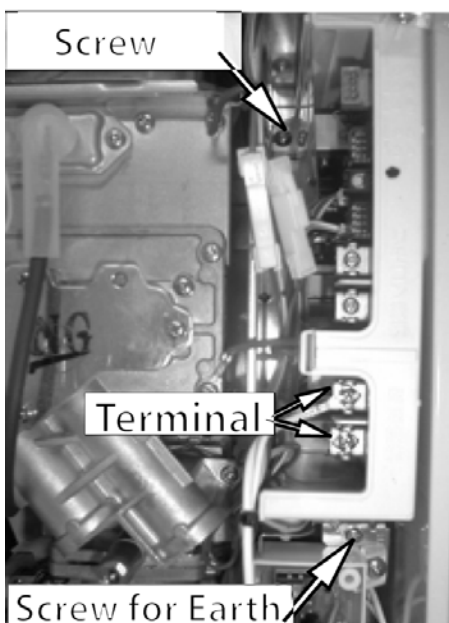
#### 1) Removal of the Front Panel

- a. Remove four (4) screws.



#### 2) Removal of PCB Unit

- a. Disconnect earth (1 screw).
- b. Disconnect harness from the terminal (2 screws).
- c. Dislodge hook and remove the PCB unit 1 screw).

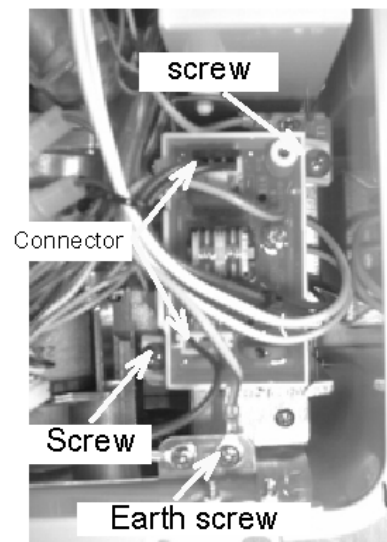


- d. Remove protection cover,
  - e. Disconnect five (5) connectors from PCB.
- PCB

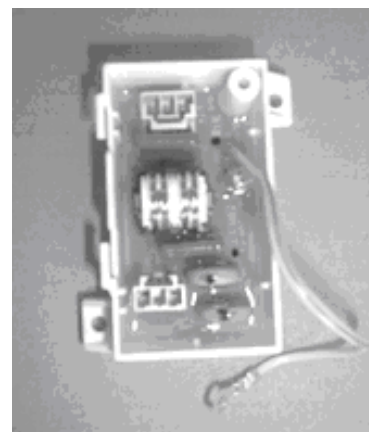


#### 3) Removal of EMC Sub Board

- a. Remove earth. (1 screw).
- b. Disconnect 2 connectors.
- c. Remove the sub board (2 screws).



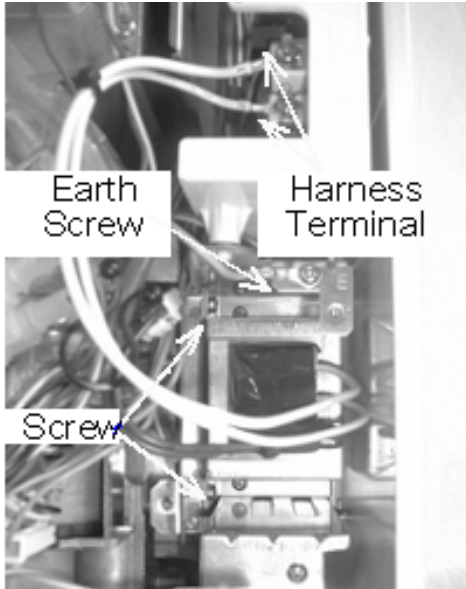
- EMC sub board



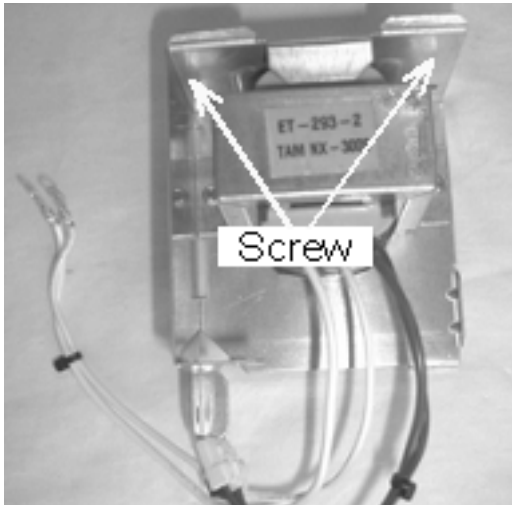


**4) Remove of Transformer**

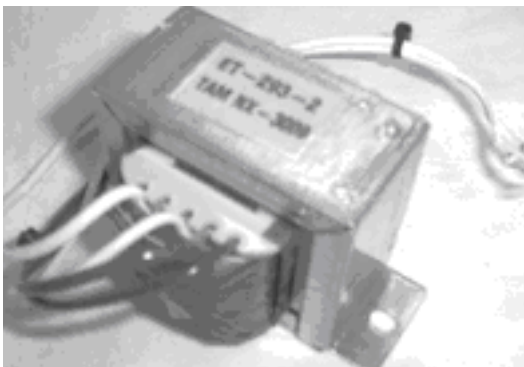
- a. Remove the EMC sub board. (Refer 3)
- b. Disconnect earth wire from the PCB (1 screw).
- c. Disconnect harness from the terminal. (2 screws).
- d. Remove the transformer (2 screws).



- e. Remove the transformer from bracket (2 screws)

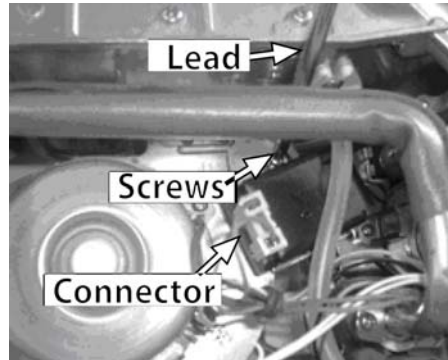


- Transformer



**5) Removal of the Igniter**

- a. Remove the igniter (1 screw)
- b. Remove the 3 pin connector. (Grey-grey)
- c. Remove the high tension lead.

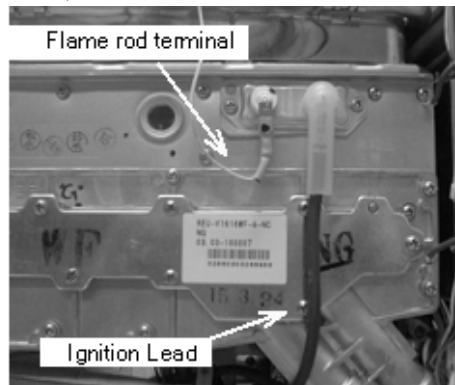


- Igniter

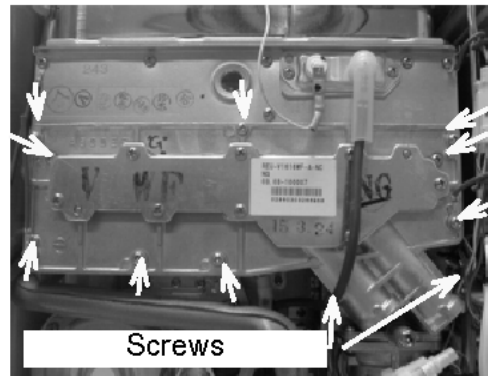


**6) Removal of the Manifold & Burner unit.**

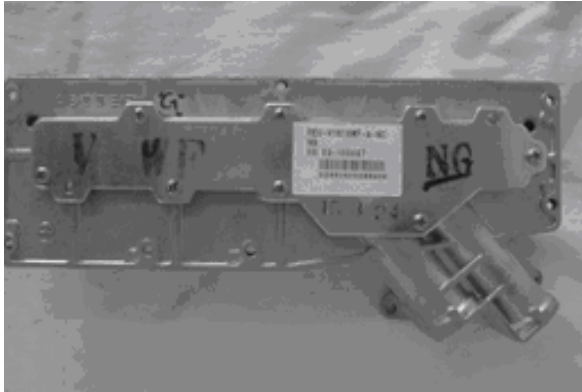
- a. Remove ignition lead (black) and flame rod (Yellow).



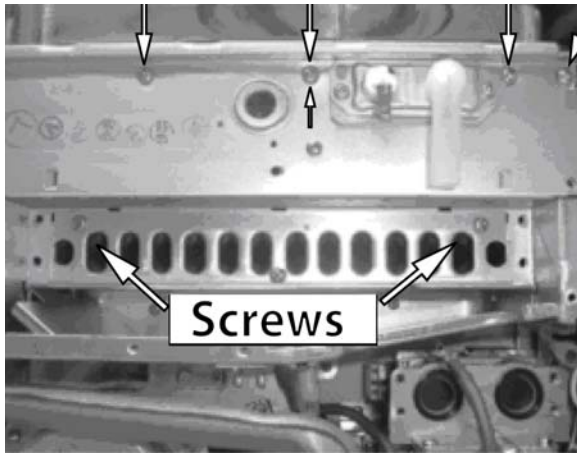
- b. Remove the manifold (9 screws + 2 ignition leads).



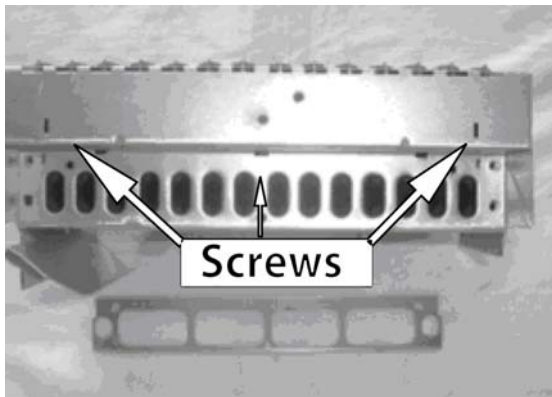
• Manifold (Assembly)



- c. Remove the combustion chamber Front panel (6 screws).
- d. Remove screws from the burner unit (2 screws)

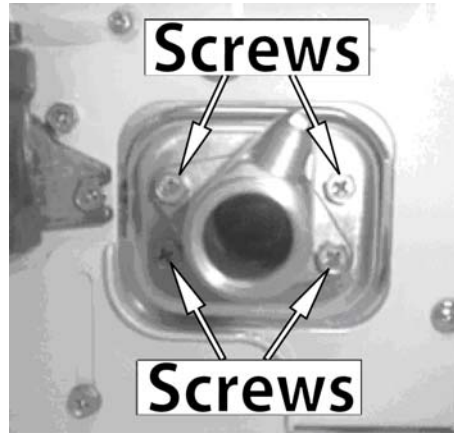


- e. Take out the burner unit.
- f. Remove the damper. (3 screws).

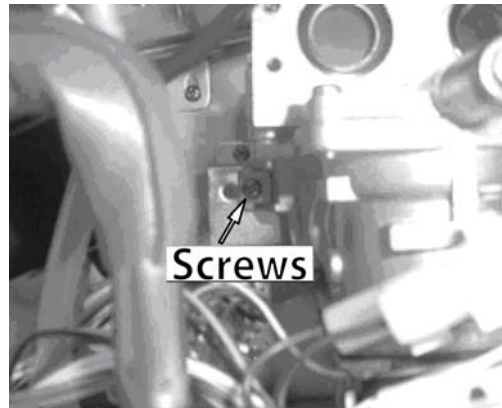


7) **Removal of the Gas Control**

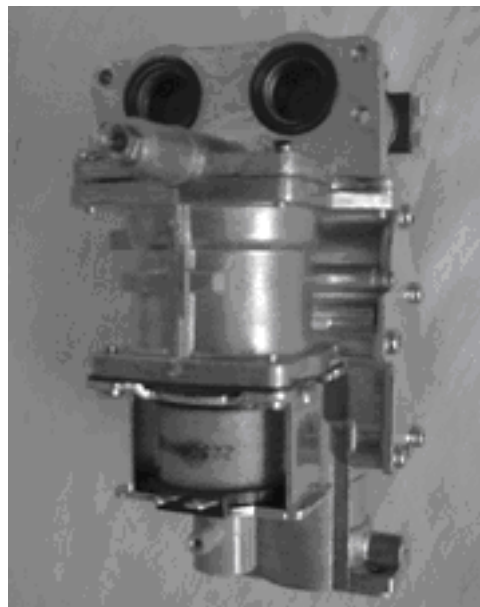
- a. Remove the manifold. Refer 6.
- b. Take out the back pressure tube.
- c. Remove gas connection and gas control screws. (4 screws).



- d. Remove the gas control (1 screw).

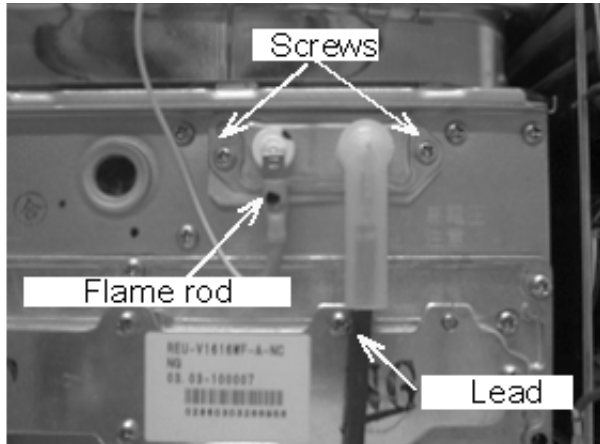


- e. Take out the gas control from body and remove connector of modulation valve, (Pink-Pink).
- Main valve (Pink-Blk).
- Solenoid valve 1 (Blue-Blk) and solenoid valve 2 (Ylw-Blk).
- Gas Control (Assy).

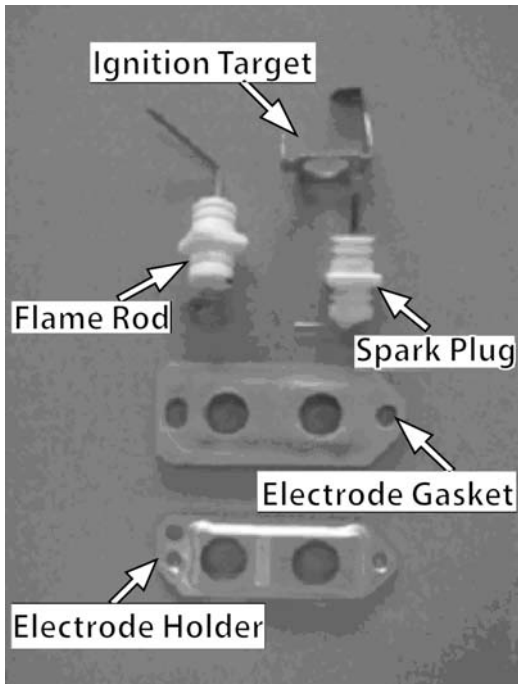


**8) Removal of Flame Rod and Ignition Plug**

- a. Pull off the flame rod terminal and high tension lead.
- b. Remove the flame rod and ignition plug (2 screws).

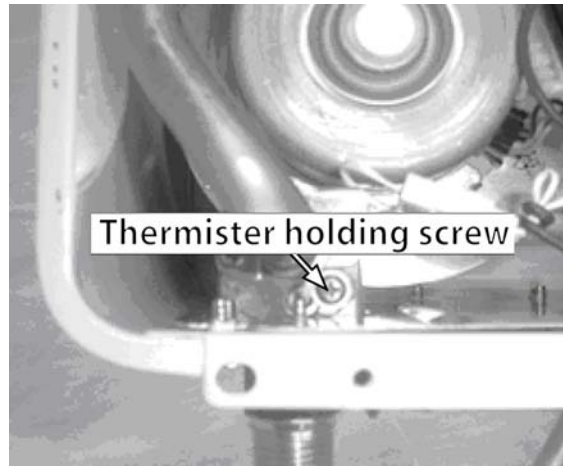


- Flame rod
- Electronic gasket
- Electrode holder
- Ignition lead
- Ignition target



**9) Removal of Outgoing Heater Thermistor**

- a. Remove thermistor screws (1 screw).
- b. Disconnect and remove the connector. (White-White).

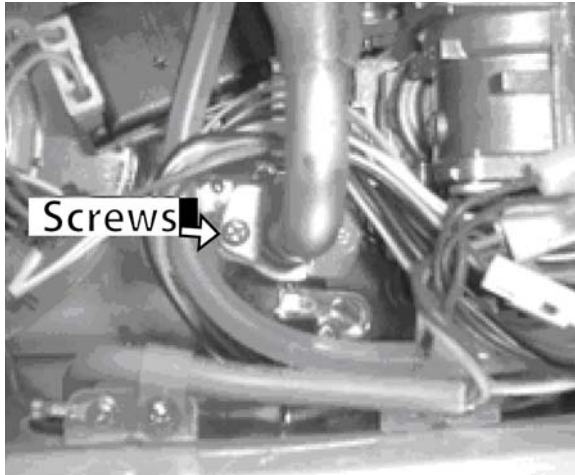


- Outgoing water thermistor.

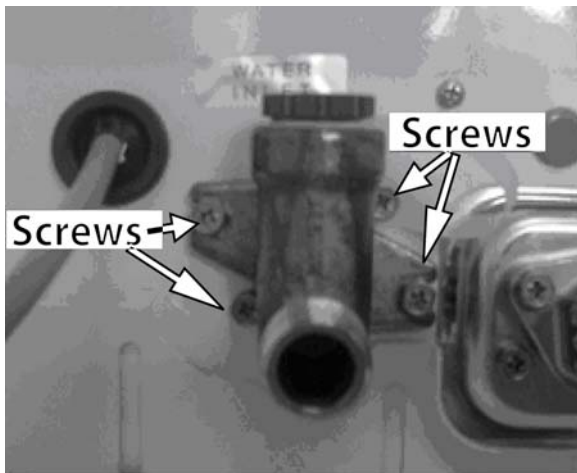


### 10) Removal of the Water Flow Servo

- Pull off the water flow sensor connector. (Black, Yellow, Red).
  - Remove screw to fit the inlet water tube with heat exchanger (1 screw).
- Unlock mounting bracket and pull off inlet water tube (Take care with O ring).



- Remove screws of inlet water connection and water flow servo (4 screws).

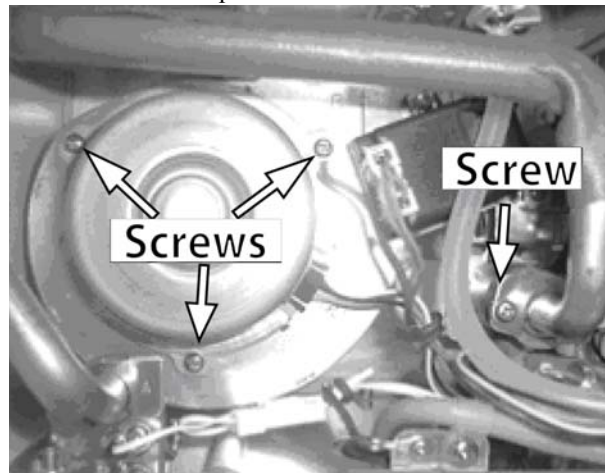


- Pull off 6 pin connector of the water flow servo. (Red, Black, Yellow, Brown, Blue).
  - Take out water flow servo with sensor.
- Water Flow servo with flow sensor.



### 11) Removal of the Fan Motor

- Remove inlet water tube. (1 screw).
- Remove combustion fan mounting screws and pull off. (3 screws).
- Remove the 4 pin connector.

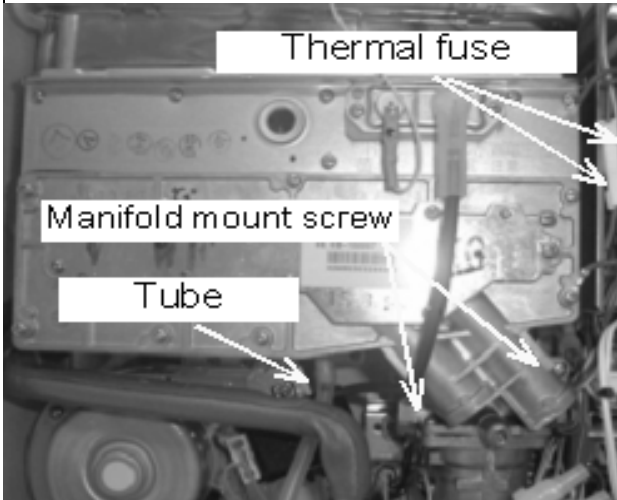


- Fan and Fan motor.

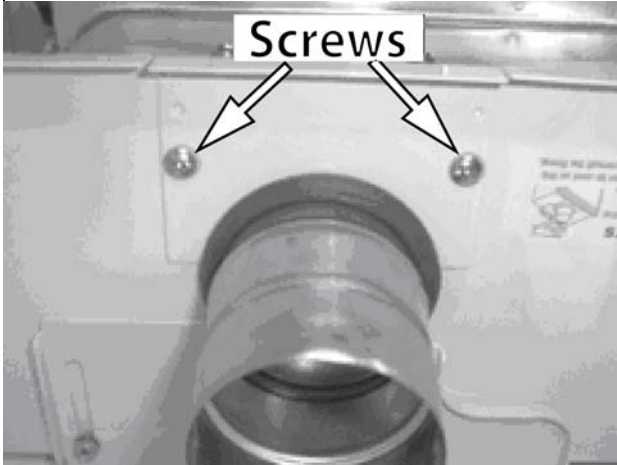


## 12) Removal of the Heat Exchanger

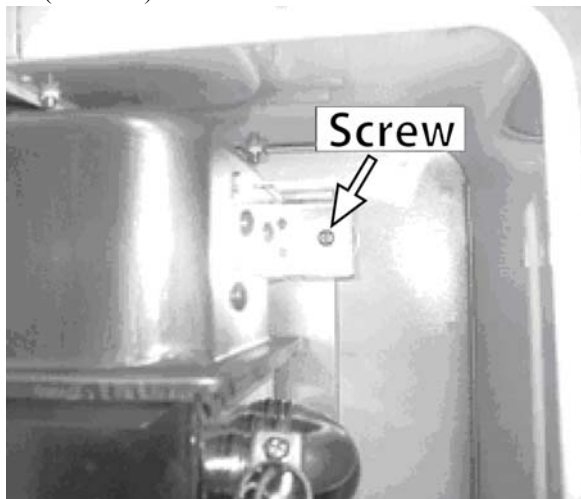
- a. Remove two (2) of the thermal fuse connectors. (Red).
- b. Pull off high tension lead and flame rod terminal. (Yellow). Refer 5.
- c. Remove 3 pin connector for igniter (White) and 4 pin connector for fan motor. (Black).
- d. Pull off back pressure tube.
- e. Remove mounting screws for manifold and gas control. (2 screws). Refer 6.



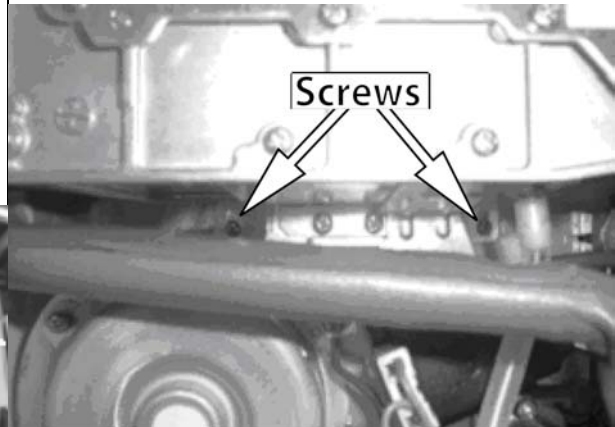
- a. Remove top panel sealing plate (2 screws).



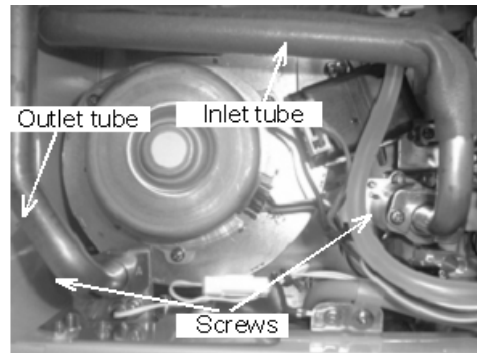
- b. Remove heat exchanger mounting screws. (2 screws).



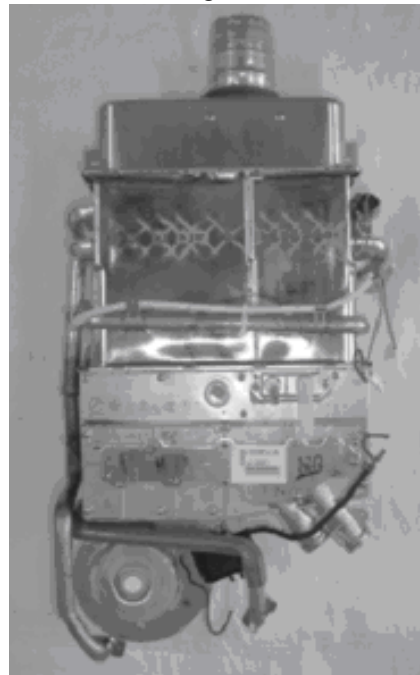
- a. Remove heat exchanger mounting screws. (2 screws).



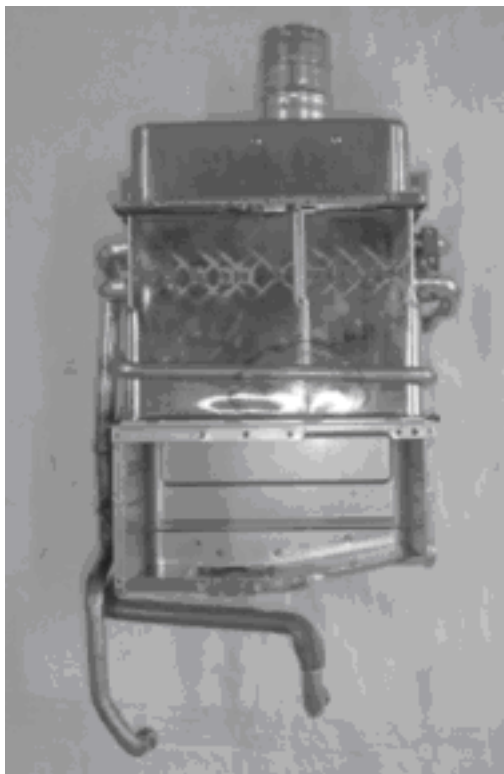
- b. Remove inlet water connection tube (1 screw).
- c. Remove outgoing water connection tube. (1 screw).



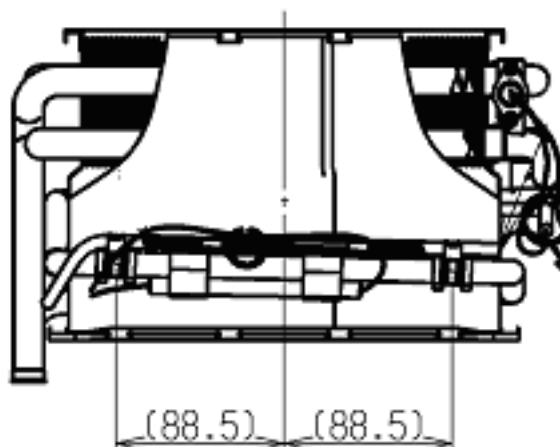
- d. Take out heat exchanger.



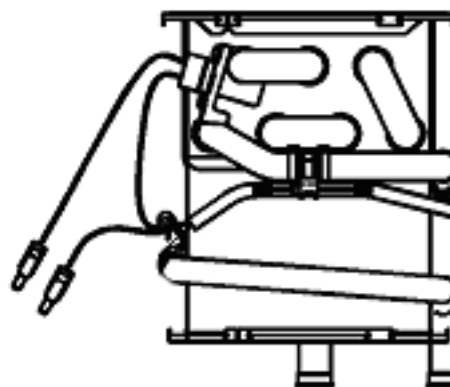
- e. Remove the manifold and burner unit. [Refer to point 6].
- f. Remove the fan motor. (3 screws)
- g. Remove thermal fuse, overheating switch, igniter, back pressure joint and Heat exchanger (Assy).



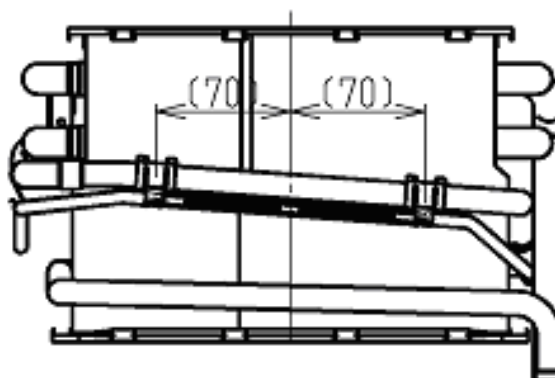
### Heat Exchanger Front



### Heat Exchanger Back



### Heat Exchanger Centre



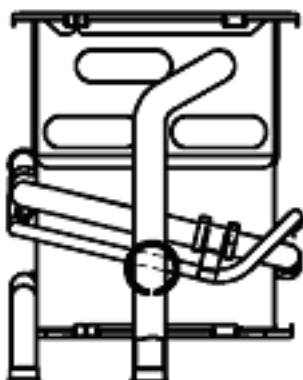
### 13) Removal of the Thermal Fuse

- a. Remove the heat exchanger [Refer 12].
- b. Remove the thermal fuse.

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

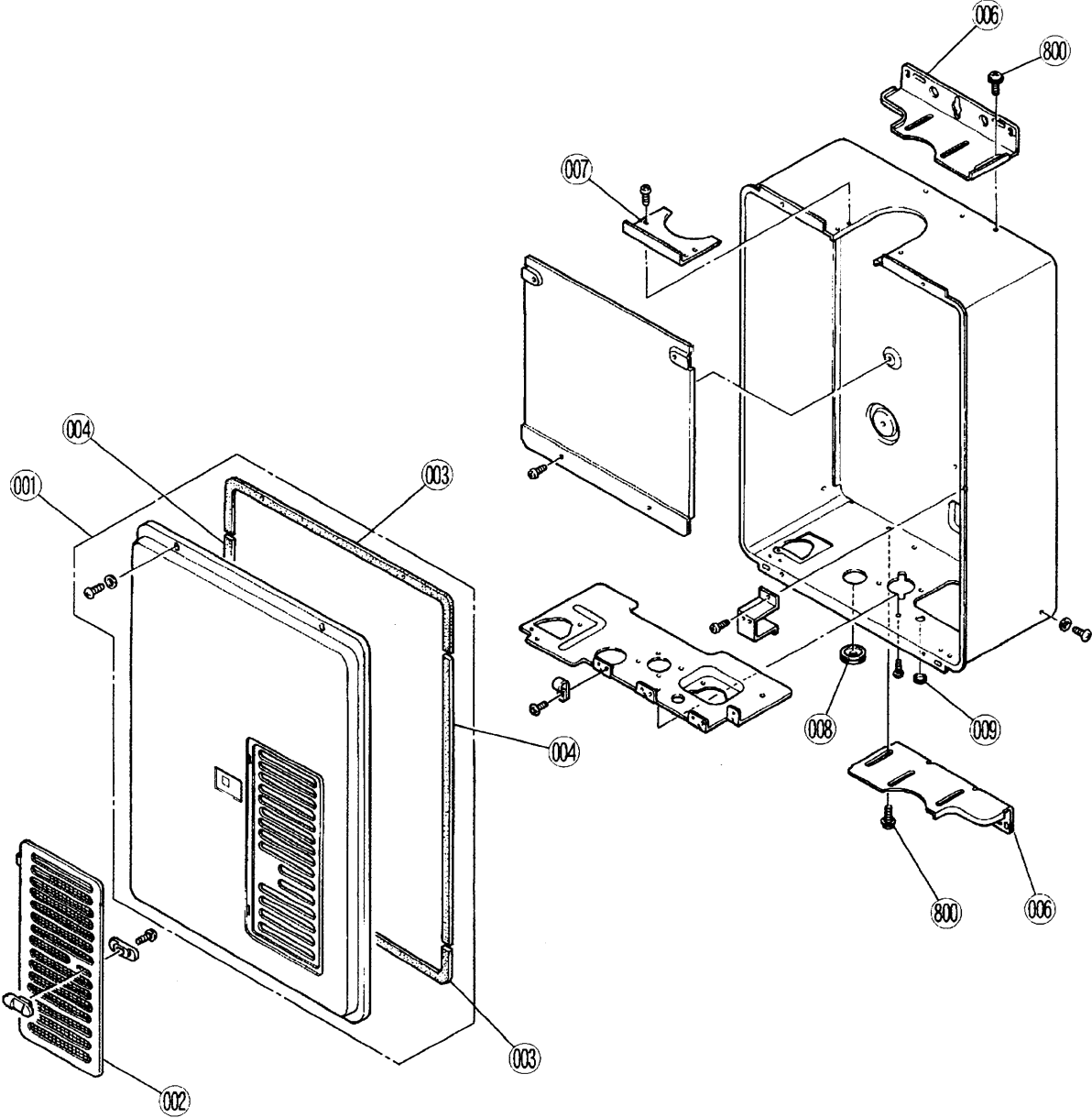
### Heat Exchanger Right

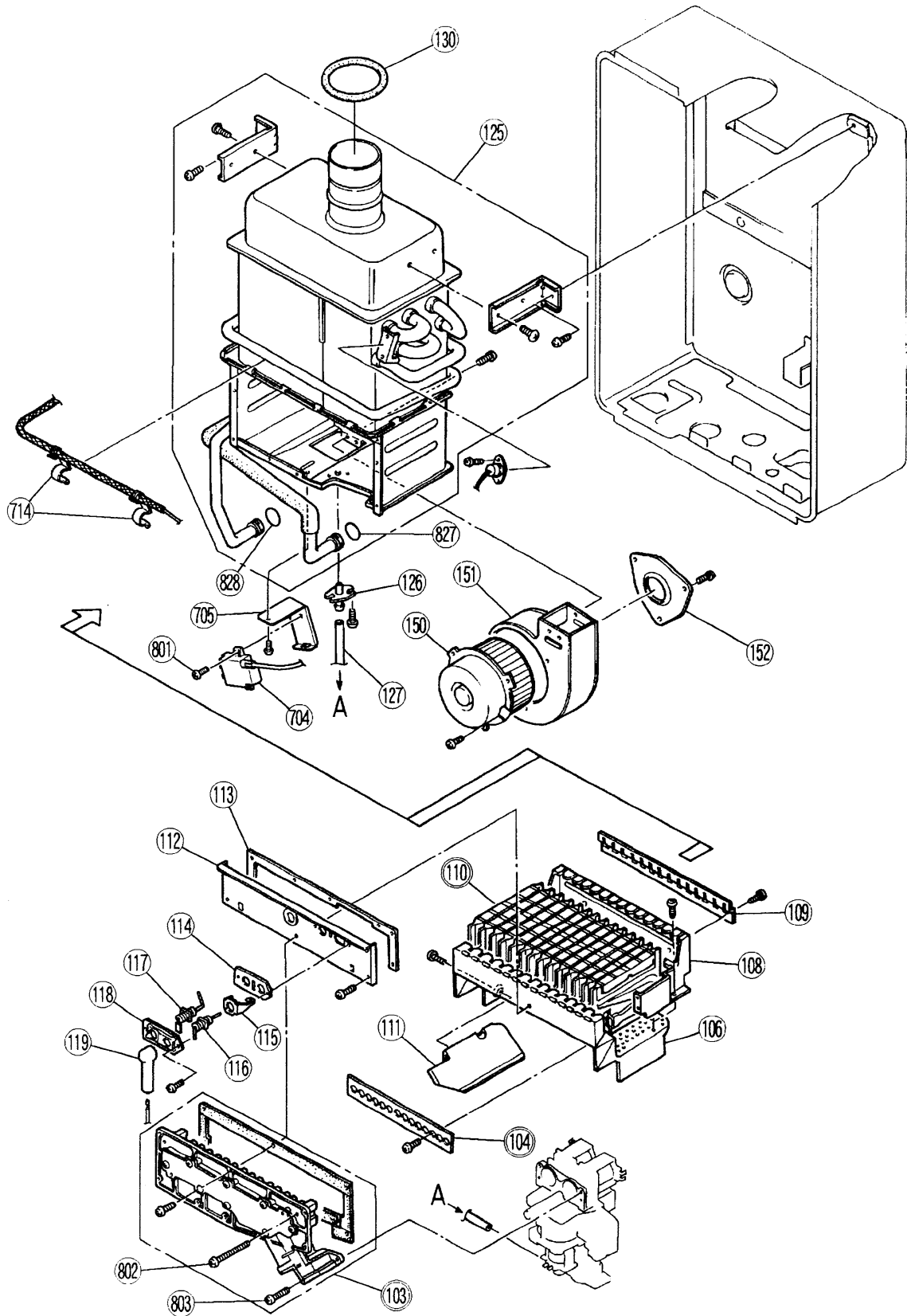
- c. Remove one (1) screw of the bi-metal overheating switch.



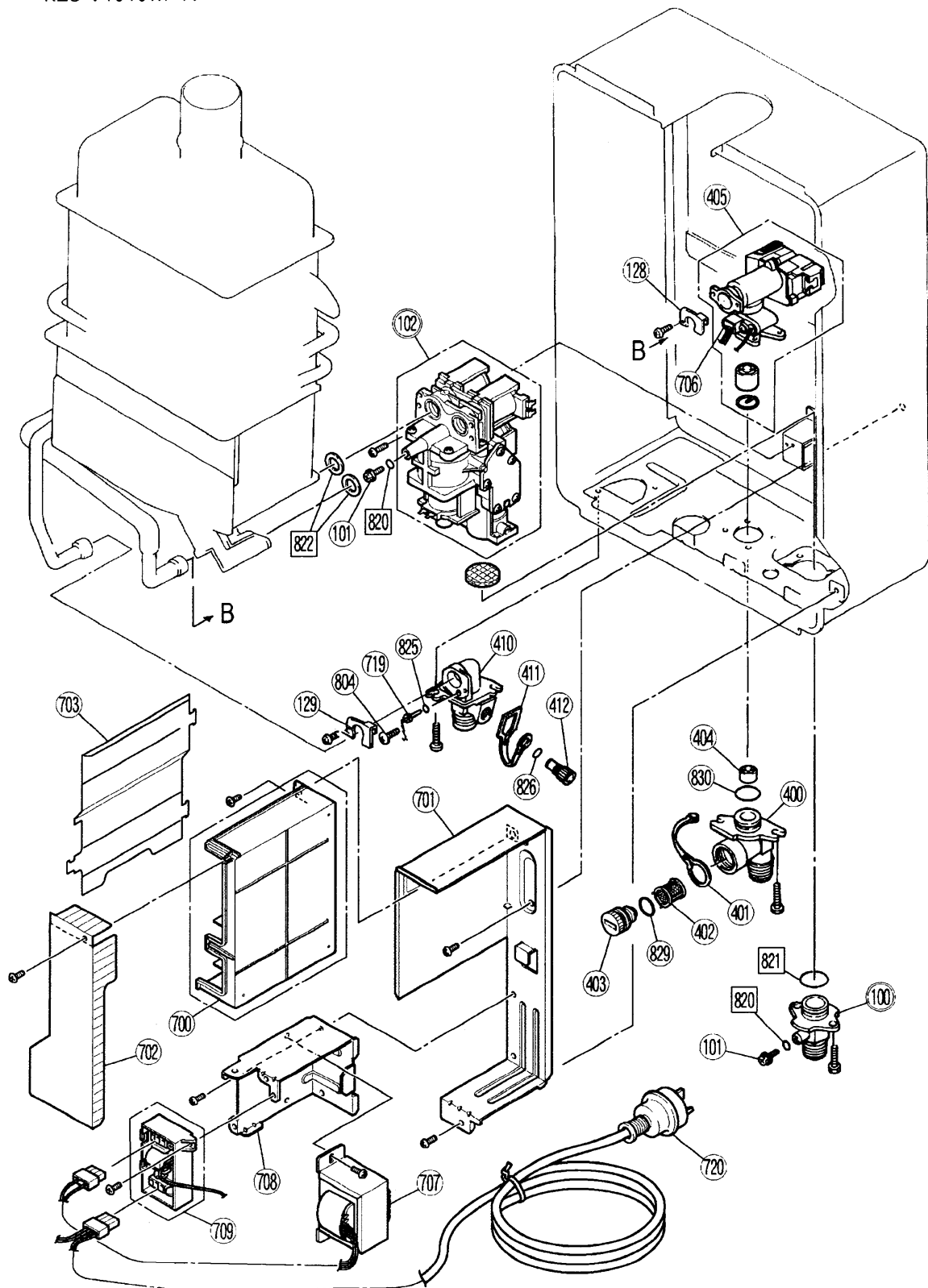
# 20. Exploded Diagram

REU-V1616WF-A

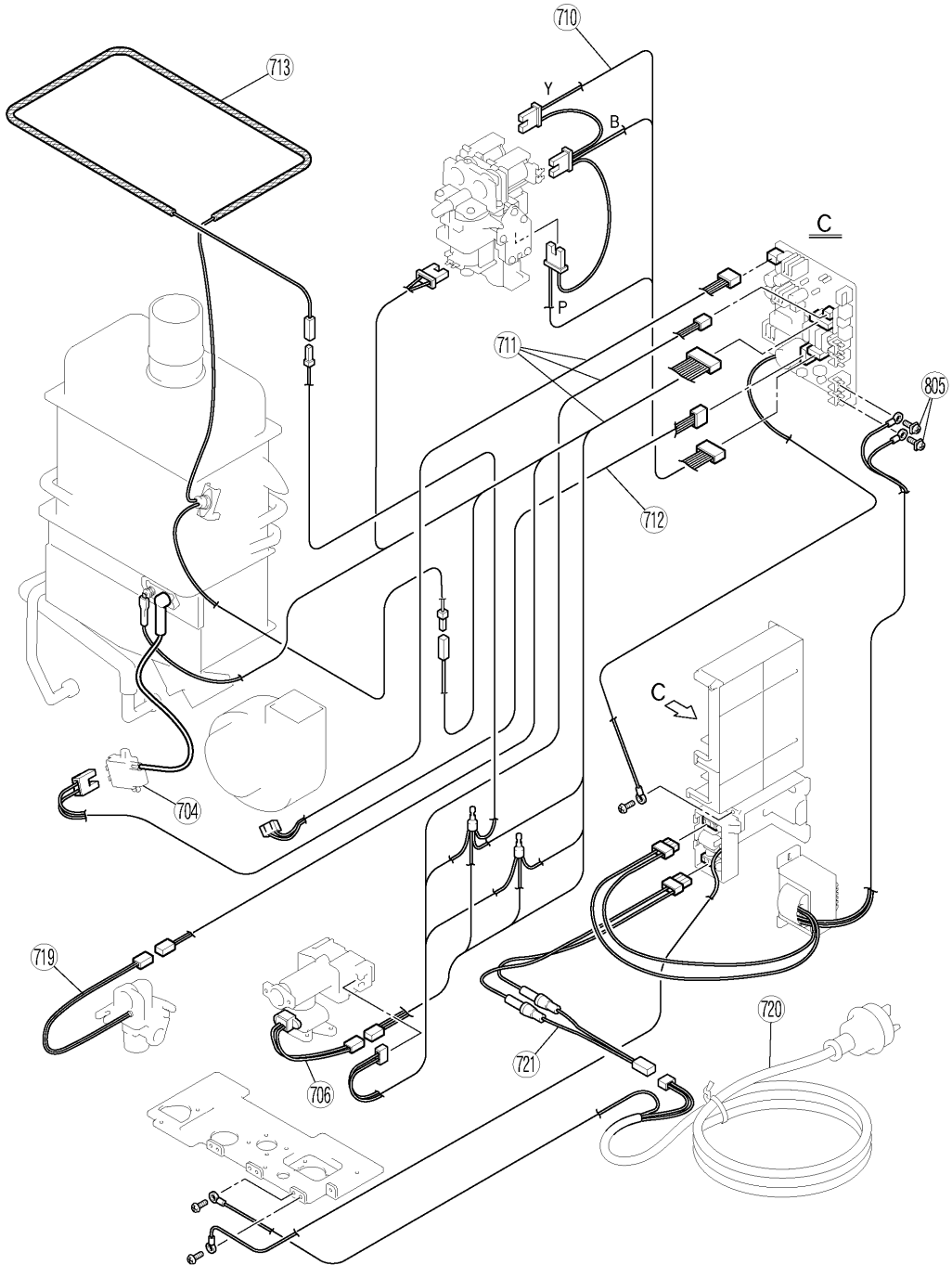








REU-V1616WF-A



## 21. Parts List

Effective Date : 06/04/04

Supercedes: 05/04/04

### REU-V1616WF

No.	PART NAME	RJ DRAWING No.	RA PART No.	11 DIGIT CODE	QTY
001	PANEL, Front	DU196-130-3-AU	92093863	019-1981000	1
002	FILTER, Air Intake	BU173-062-4		017-0039000	1
003	SEALING, Fr Panel	BU195-167	92086909	580-453-000	2
004	SEALING, Body Side	AU115-163	92063361	510-990-000	2
006	BRACKET, A	U243-111-4		537-0160000	2
007	PLATE, Top Panel Seal.	U243-113-3		526-211-000	1
008	GROMMET	ACF10-120-2		194-143-000	1
009	PLUG	AU105-113		510-893-000	1
100	CONNECTION 3/4 Gas	BCF2-417	92075092	106-158-000	1
101	SCREW, Pres Pt. Seal	C10D-5	90195157	501-275-000	2
102	CONTROL, Gas	C36E-37A-S	92093889	120-922-000	1
103	MANIFOLD, A (LP)	U243-200-A	92093897	101-496-000	1
103	MANIFOLD, G (NG)	U243-200-G	92093905	101-604-000	1
104	DAMPER, A (LP)	U243-314-A	92095462	140-659-000	1
104	DAMPER, E (NG)	U243-314-E	92095470	140-701-000	1
106	CASE, Brn Fr	U243-311		098-0182000	1
108	CASE, Brn Rr	CH46-219		098-434-000	1
109	PLATE, Comb Rect.	BU196-243		146-072-000	1
110	BURNER	B3A1-4	92073451	157-060-LPG	14
111	DISTRIBUTOR	U243-316		043-044-000	1
112	PLATE, Comb . Cmbr - Fr	U243-305		019-1060000	1
113	GASKET, Comb. Cmbr - Up	U243-307		580-884-000	1
114	GASKET, Electrode	AU195-312	92095629	580-375-000	1
115	TARGET, Ignition	AU168-325	92073469	202-128-000	1
116	ELECTRODE	AU168-321	92072917	202-129-000	1
117	ELECTRODE, Fr	U243-216	92093913	230-056-000	1
118	HOLDER, Electrode	AH43-262		506-153-000	1
119	SLEEVE, Electrode	AU206-218	92087030	518-035-000	1
125	HEAT EXCHANGER, Assy	U243-903-S	92093921	314-469-000	1

Effective Date : 06/04/04  
 Supercedes: 05/04/04

## REU-V1616WF

No.	PART NAME	RJ DRAWING No.	RA PART No.	11 DIGIT CODE	QTY
126	JOINT, Back Pressure	U242-312		197-951-000	1
127	TUBE, Wind Pressure - F	AU161-665-F		513-847-000	1
128	BRACKET, B	AU195-322		537-501-000	1
129	BRACKET, A	AU195-321		537-502-000	1
130	SEALING, D	BH29-486-D		580-494-000	1
150	FAN COMB. Assy	H78-622	92093939	222-426-000	1
151	CASING, Fan	H78-565		035-952-000	1
152	BELL MOUTH	AU155-631		036-142-000	1
400	CONNECTION, 1/2 In. Water	H73-500	92093947	333-300-000	1
401	STRAP, Plug	H73-512		553-087-000	1
402	FILTER, Inlet Water	H73-511	92083773	017-268-000	1
403	PLUG, Filter 2	H73-510-2	92089036	196-037-000	1
404	RECTIFIER	M8D1-15		330-107-000	1
405	SERVO, Water Flow	M8E-4-3-A	92085414	301-082-000	1
410	CONNECTION, Hot Water	U217-441		333-303-000	1
411	STRAP, Hot Water Plug	AU129-526		553-043-000	1
412	DRAIN	BU129-520-C	92081751	337-048-000	1
700	PCB	U243-1170	92093954	210-607-000	1
701	PROTECTOR, Surge	U243-1165		537-0161000	1
702	COVER, EC	U243-1172		098-0785000	1
703	COVER, PCB	U250-507		098-0627000	1
704	IGNITOR	BU169-510	92093962	211-108-000	1
705	LEAD, High Tension	U243-1167		537-0163000	1
706	SENSOR, MR	M8D1-10-4	92092279	243-072-000	1
707	TRANSFORMER, Assy	ET-293-2	92093970	224-333-000	1
708	BRACKET, Transformer	U243-1166		537-0162000	1
709	EMC BOARD, Assy	U250-1602	92093699	210-605-000	1
710	HARNESS, Solenoid Valve	U243-604		290-0213000	1

( ) = Optional

Effective Date : 06/04/04  
 Supercedes: 05/04/04

## REU-V1616WF

No.	PART NAME	RJ DRAWING No.	RA PART No.	11 DIGIT CODE	QTY
711	HARNESS, Sensor	U243-1175		290-0649000	1
712	HARNESS, Sparker	U250-1610		290-0644000	1
713	HARNESS, Thermal Fuse	U243-610		290-0216000	1
714	BRACKET, Fuse Thermal	U217-676		537-505-000	6
715	HARNESS, A/Frost	U243-1177	92093988	235-319-000	(1)
716	BRACKET, Heater	AU195-675	92086123	537-433-000	(2)
717	CLIP, Heater	AU100-721	92076123	537-174-000	(1)
718	SWITCH, Lr Temp Sensor 2	U242-511-2	92093996	234-541-000	(1)
719	THERMISTOR	BH45-650	92073675	233-108-000	1
720	POWER CORD	CP-90491T	92089051	206-226-000	1
721	HARNESS, Fuse	U250-1612		290-0645000	1
721	HARNESS-2, Fuse	U250-1612-2	92094002	290-0646000	(1)
722	HEATER, Antifrost	U250-1552	92094010	235-318-000	(1)
800	BOLT	ZIHD0510UK		501-577-000	6
801	SCREW, Tapping Earth	CP-80452		501-737-000	1
802	SCREW, FT	ZFAB0445SZ		501-891-000	2
803	SCREW, Cup	CP-21478-412		501-400-000	2
804	SCREW, Thermistor	U217-449		501-295-000	1
805	SCREW	U217-510		501-296-000	2
820	O-RING	M10B-13-4	90195165	520-300-010	2
821	O-RING	M10B-1-24	92072859	520-043-010	1
822	WASHER	C36E1-6		580-180-000	1
825	O-RING	M10B-2-4	92062249	520-209-010	1
826	O-RING	M10B-2-7	92062348	520-281-010	1
827	O-RING	M10B-2-12.5	92072800	520-255-010	1
828	O-RING	M10B-2-14	92062207	520-193-010	1
829	O-RING	M10B-2-16	92062199	520-048-010	1
830	O-RING	M10B-2-18	92071182	520-049-010	1
888	CUSTOMER INST.	U243-1190		623-915-600	1
889	INSTALLATION INST.	U243-1185		K23-915-600	1

( ) = Optional

# Notes

# SERVICE CONTACT POINTS

---

**Rinnai**  
AUSTRALIA PTY. LTD

ACN 005 138 769 ABN 74 005 138 769

Internet: [www.rinnai.com.au](http://www.rinnai.com.au)  
E-mail: [enquiry@rinnai.com.au](mailto:enquiry@rinnai.com.au)

**Head Office, Australia**

10-11 Walker Street, Braeside, VIC 3195  
Tel: (03) 9271 6625  
Fax: (03) 9271 6622

**Help Line: Sales & Service**

Tel: 1300 555 545  
Fax: 1300 555 655

**Hot Water Service Line**

Tel: 1800 000 340

**Help Line: Spare Parts & Technical Info**

Tel: 1300 366 388  
Fax: 1300 300 141

**Rinnai**  
NEW ZEALAND LTD.

Internet: [www.rinnai.co.nz](http://www.rinnai.co.nz)  
E-mail: [sales@rinnai.co.nz](mailto:sales@rinnai.co.nz)

**Head Office, New Zealand**

691 Mt. Albert Road, Royal Oak,  
Auckland  
P O Box 24-068

Tel: (09) 625 4285  
Fax: (09) 624 3018

24 hr Service  
Tel: 0800 746624 (0800 Rinnai)