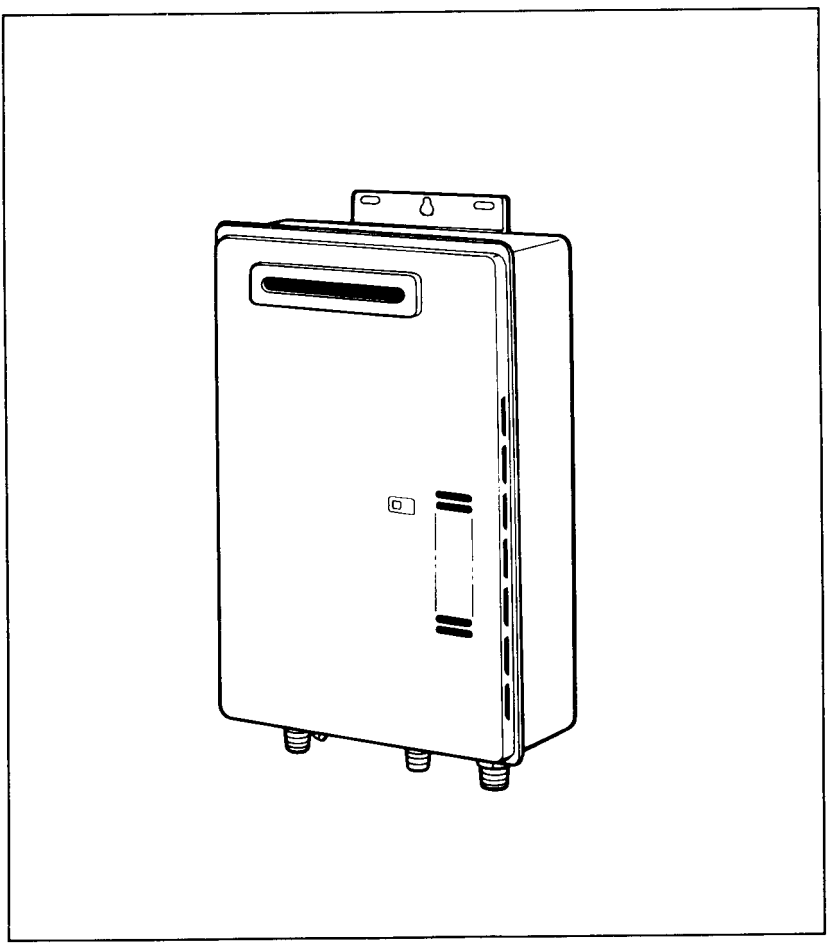
Rinnai

INFINITY 20

RUXQ – 2010 W – A



SERVICE MANUAL

CONTENTS

DEVELOPMENT BACKGROUND

In recent years high efficiency compact hot water supply units have become popular. Given that, the Infinity 20 litre **continuous hot water** unit not only corresponds to the variety and quality of the needs in the market place by way of technical advancement, but also allows for easy installation together with high efficiency and low noise characteristics.

CHARACTERISTICS

LOW NOISE

Incorporation of the 49dB low noise design in the Infinity 20 allows for installation in crowded or high density residential areas.

CONVENIENCE

Wide proportional temperature control of the hot water capacity from 2.2 to 20.5 litres, ensures that hot water at a suitable temperature throughout all seasons is selectable. Control of the water temperature while on the rise to a particular set temperature with the feedforward and feedback control system prevents overheated water being supplied when the water heater is turned ON and OFF repeatedly.

Even in the summertime the Infinity 20 can be utilised to the full scope of its ability utilising the newly developed electronic water flow control device.

The water temperature can be selected in 16 steps from 35°C to 75°C. The temperatures are 35-37-38-39-40-41-42-43-44-45-46-48-50-55-60-75°C. As a result of the adoption of the electronic water flow control device the unit can be utilised in areas with low water pressure.

INSTALLATION

The light weight, slim, compact form allows improved installation. The main unit and controls are connected by 2 non-polar cables eliminating problems of misconnection. Cable installation is simple.

SAFETY

In the event of a malfunction, one or more of the various safety devices will operate. Depending on the fault, the Infinity 20 will be shut down by the P.C.B. or directly by the safety devices. In winter, the automatically operated frost protection heaters ensure that the unit does not freeze up.

ECONOMY

Direct ignition to the main burners eliminates wasteful pilot gas consumption. The air gas ratio is always controlled to the most suitable level by the P.C.B, and as the water flow and gas consumption changes, combustion conditions are controlled maintaining continual high efficiency.

Conventional water heaters supply water at high temperatures. This means that the pipework in the house is also very hot. Hot pipes loose more heat than cooler pipes. With the Infinity 20, the water in the house pipes can be kept much cooler, reducing heat loss and thus effectively saving energy.

The front cover of the appliance is formed from 0.6 mm powder coated steel, secured to the main box assembly by 4 (four) screws. Seals around the front cover and flue outlet prevent water from entering the appliance.

Air inlets are situated in the front panel, base and sides of the main box. The general layout of components is shown on the cut-away diagram on page 6. All components are supported within a box formed from 1.0 mm powder coated steel.

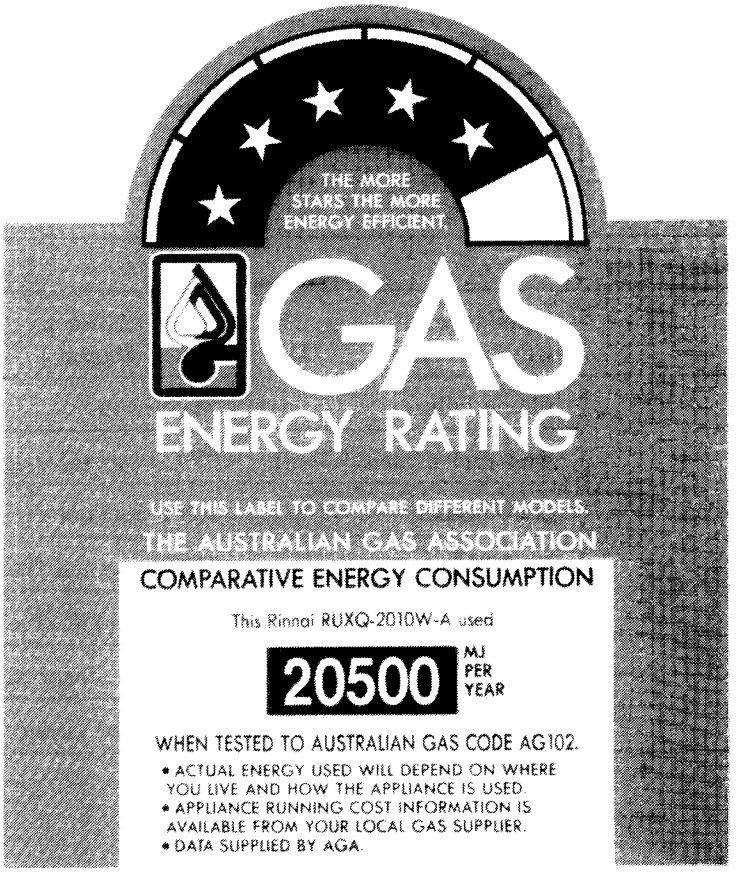
The heat exchanger occupies the top section of the box, and the burner is situated in a chamber formed from 0.6 mm aluminized steel attached to the bottom of the heat exchanger.

The air for combustion is supplied by a fan which is connected to the burner box by a duct at the left hand side of the appliance.

Gas and water controls are situated at the bottom right of the appliance, directly under the manifold. The products of combustion are expelled from the appliance via a stainless steel nozzle situated at the top of the unit on the front.

The burner assembly is made up of 14 (fourteen) identical stainless steel bunsen burners, secured by an aluminised steel framework. A 2 (two) chamber aluminium manifold with 14 (fourteen) injectors supplies gas to the burners.

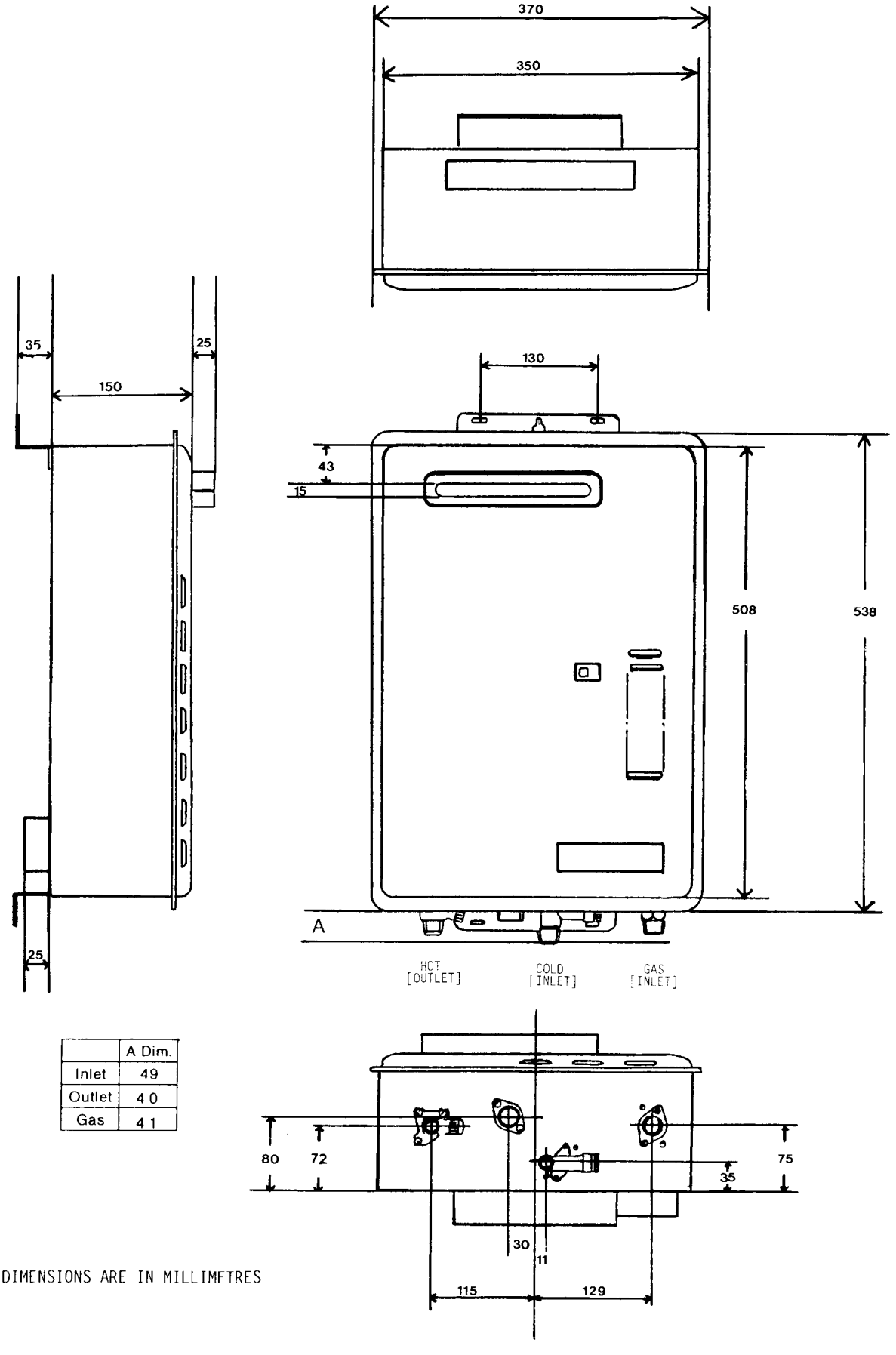
There are 2 (two) thermistors, 1 (one) fitted in the electronic water flow control device checking the incoming water temperature - part of the feedforward information, and another fitted to the outlet of the heat exchanger checking the outgoing water temperature - referred to as feedback information. See page 9.



SPECIFICATION

Type of appliance	Temperature controlled continuous gas hot water system.
Exhaust system	Forced combustion.
Rinnai Australia model No	RUXQ - 2010 W - A
Installation	Externally mounted.
Operation	Remote control, mounted in kitchen and/or bathroom.
Dimensions	Width - 370 mm. Height - 538 mm. Depth - 210 mm. [With bracket and flue extension].
Weight	17 kilograms.
Connections	Gas supply - R ¾ / 20A. Cold water supply - R ½ / 15A. Hot water supply - R ½ / 15A.
Ignition system	Direct electronic ignition.
Gas consumption	Natural gas - 160 MJ/h HI, 17 MJ/h LOW. Propane/L.P.G. - 150 MJ/h HI, 17 MJ/h LOW.
Electrical consumption	Normal - 55 Watts. Standby - 8 Watts. Automatic frost protection - 80 Watts.
Hot water capacity	2.2 to 20.5 l/min. [Raised at 25°C].
Temperature range	35°C to 75°C in 16 steps.
Water flow control	Electronic water flow control device.
Minimum operating pressure	15 kPa.
Normal operating pressure	70 to 830 kPa.
Minimum operating water flow	2.5 l/min.
Power supply	Appliance - 230/240 Volts [50Hz]. Remote control - DC 12 Volts [Digital].
Safety devices	Flame failure - Flame rod.
	Remaining flame [OHS] - 97°C bi-metal strip.
	Over boiling - 105°C lockout thermistor.
	Fusible link - 152°C thermal fuse.
	Pressure relief valve - Opens - 1400 kPa, closes - 1000 kPa.
	Automatic frost protection - Bi-metal sensor & anti-frost heaters.
	Combustion fan rpm check - Integrated circuit system.

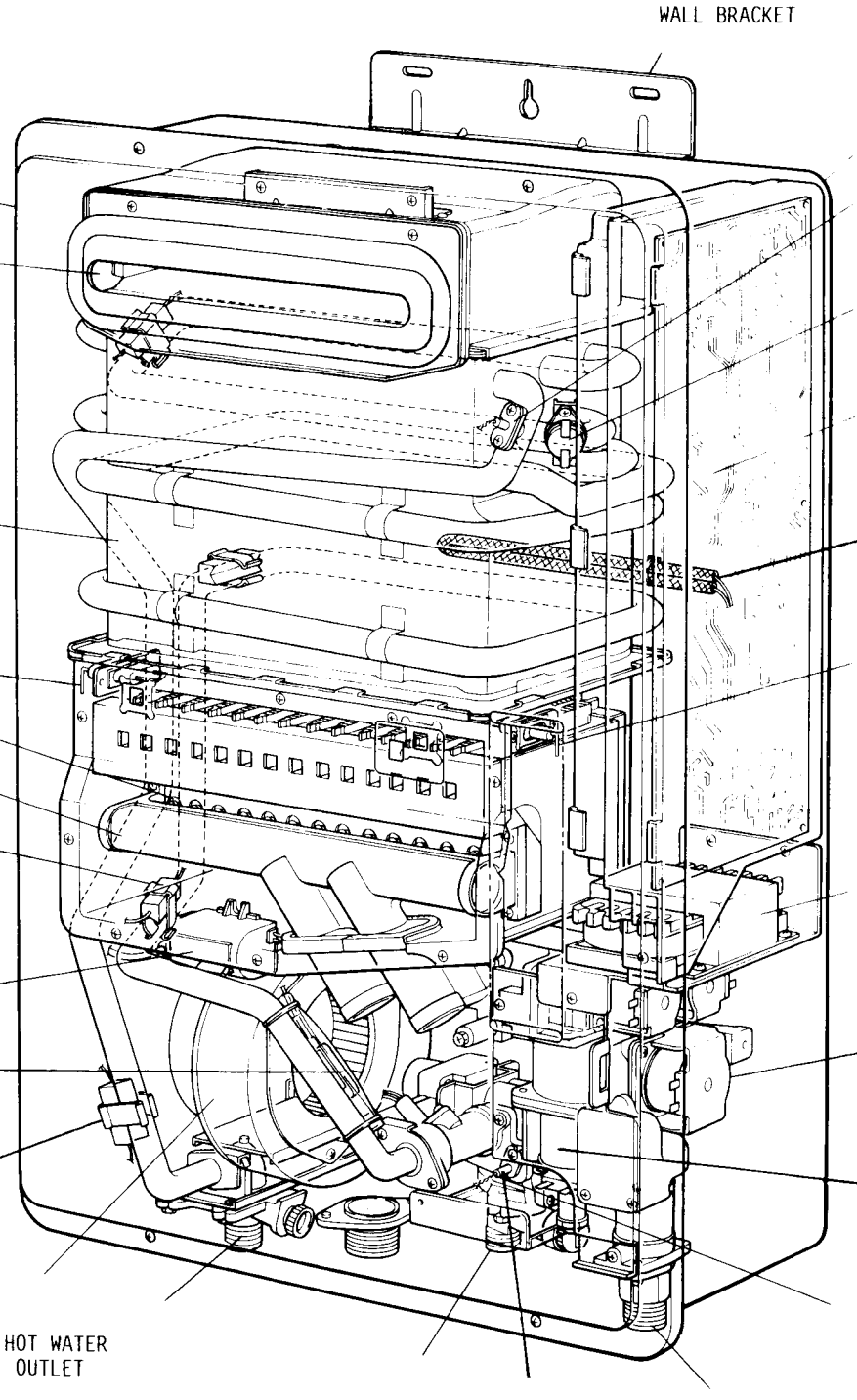
DIMENSIONS



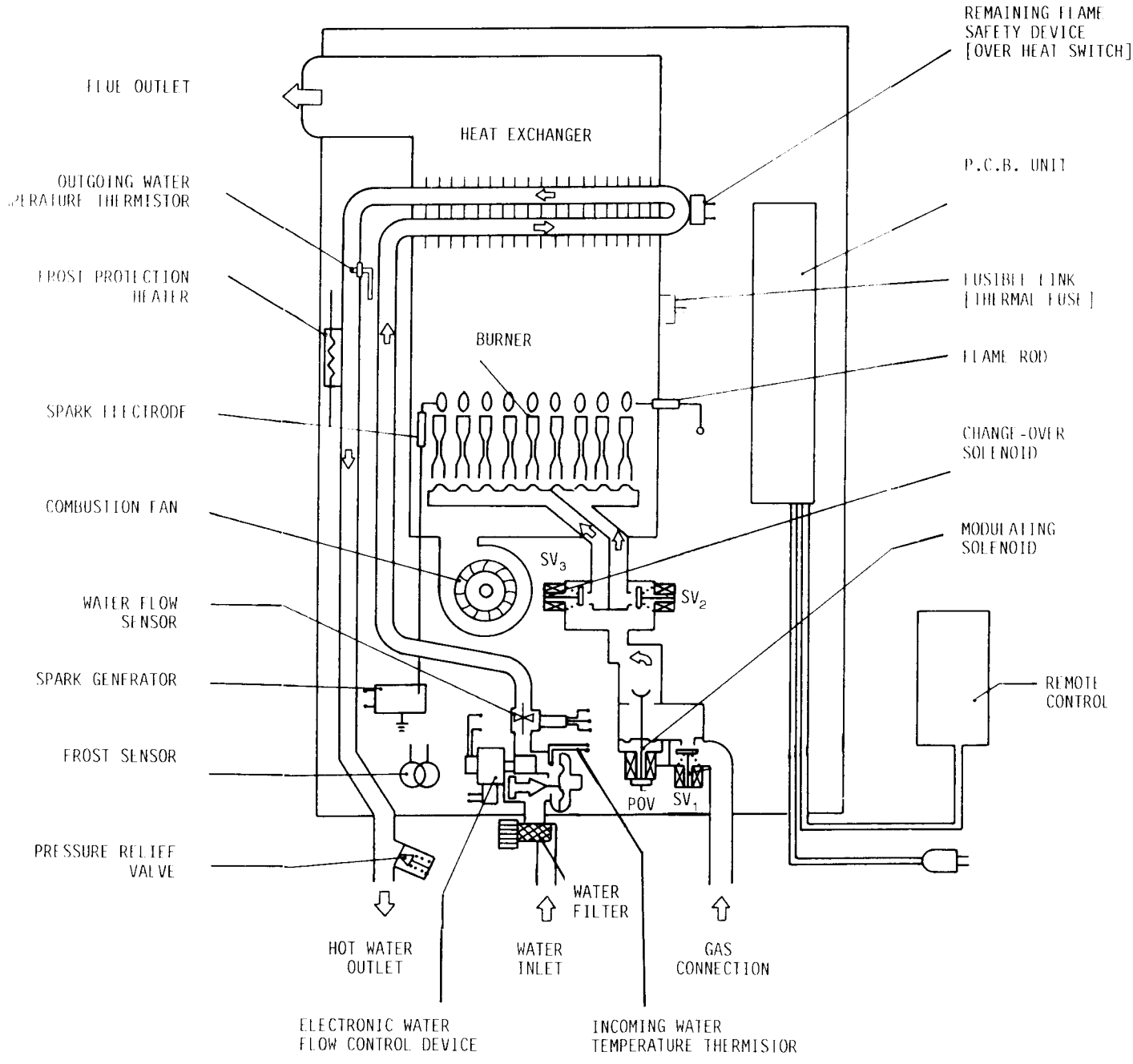
	A Dim.
Inlet	49
Outlet	40
Gas	41

ALL DIMENSIONS ARE IN MILLIMETRES

CUT – AWAY DIAGRAM



SCHEMATIC DIAGRAM



SAFETY DEVICES

FLAME FAILURE

Situated on the right hand side of the burner, the flame rod monitors normal combustion, and also prevents the discharge of gas to the burner when there is no flame, by sending a signal to the P.C.B. which in turn isolates the gas.

REMAINING FLAME SAFETY DEVICE

If the flame remains on the burner after the water tap has been turned off, and the temperature of the water inside the heat exchanger reaches 97°C, a DC 90 volt Bi-metal cut-off switch shuts off the solenoids, isolating the gas.

OVER BOILING

The outgoing water temperature thermistor, continually monitors the temperature of the water flowing from the heat exchanger. Should the temperature of the water at this point reach 105°C then a signal will be sent to the P.C.B. to shut off the solenoids and isolate the gas.

NO WATER

Should the water flow coming in become restricted or stop, then the water flow sensor will cease to send a magnetic pulse signal to the P.C.B., in turn isolating the flow of gas to the burner.

FUSIBLE LINK

This device is located on the rear of the heat exchanger. If the heat exchanger burns out, or the temperature inside it reaches 152°C, then this device will isolate the gas to the burner, and shut down the unit completely.

PRESSURE RELIEF VALVE

If the water pressure inside the heat exchanger reaches 1400 kPa, this spring and valve seating type valve will release the built up pressure until 1000 kPa is maintained, and then close. It is located on the hot water outlet.

COMBUSTION FAN REVOLUTION CHECK

The combustion fan rpm are continually monitored by a magnetic pulse counter connected to the P.C.B. If the fan revolutions deviate from the speed required for complete combustion, a signal is sent to the P.C.B. and the revolutions will be adjusted accordingly.

AUTOMATIC FROST PROTECTION

When the outdoor temperature drops below 3.5°C, the frost sensing device will be activated, and the anti-frost heaters will prevent the water in the pipework of the Infinity 20 from freezing. These anti-frost heaters will remain ON until the outdoor temperature rises to 11.5°C. There are 5 (five) anti-frost heaters located at various points along the pipework. The anti-frost protection device will prevent freezing down to -20°C in a no wind situation, and -15°C in a cold wind situation.

FEEDFORWARD INFORMATION

This is the information which the water heater uses to calculate the required parameters to give the temperature selected on the remote control.

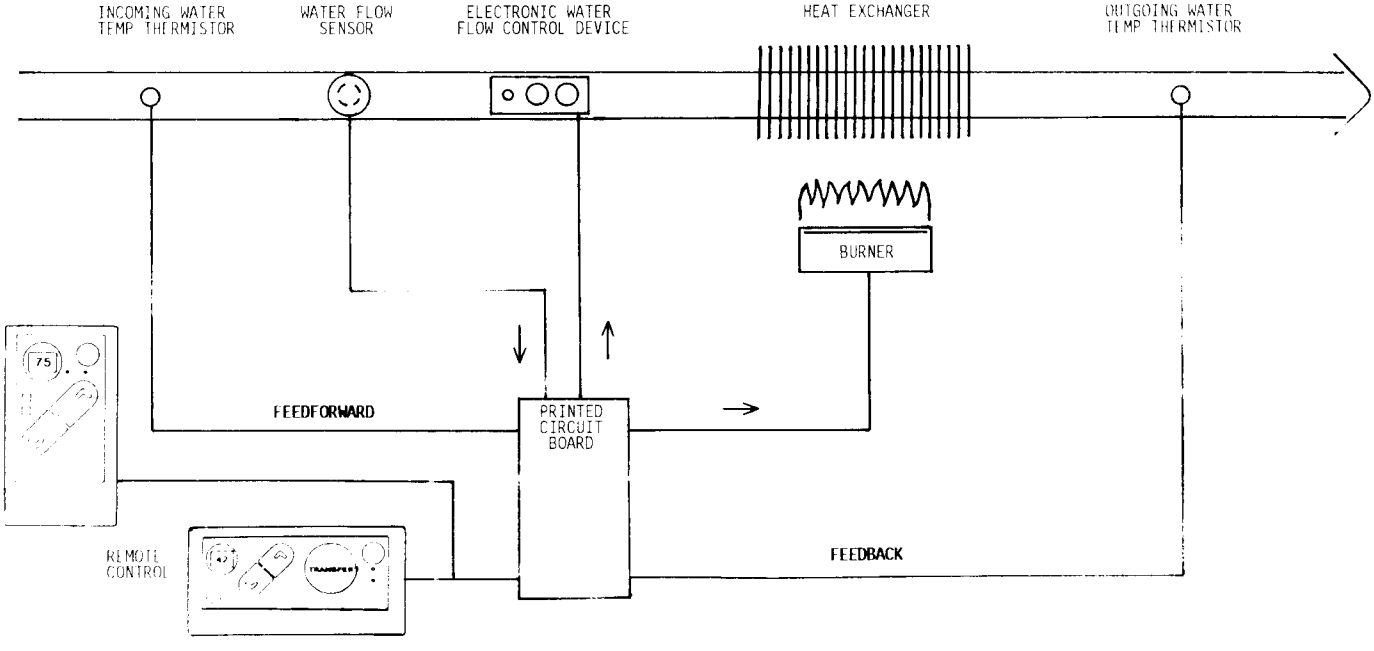
The data used is
a). Incoming water temperature.
b). Water flow.
c). Selected temperature at the remote control.

This data is continually monitored by the P.C.B. and any adjustments are made accordingly to maintain the selected temperature of the remote control.

FEEDBACK INFORMATION

This information is provided by the outgoing water temperature thermistor. The P.C.B checks the selected temperature of the remote control against the temperature indicated by the outgoing water temperature thermistor, and makes any necessary adjustments to the gas rate or water flow as required in order to maintain the selected temperature at the remote control.

The schematic diagram below indicates those components which are incorporated into the feedforward and feedback system.

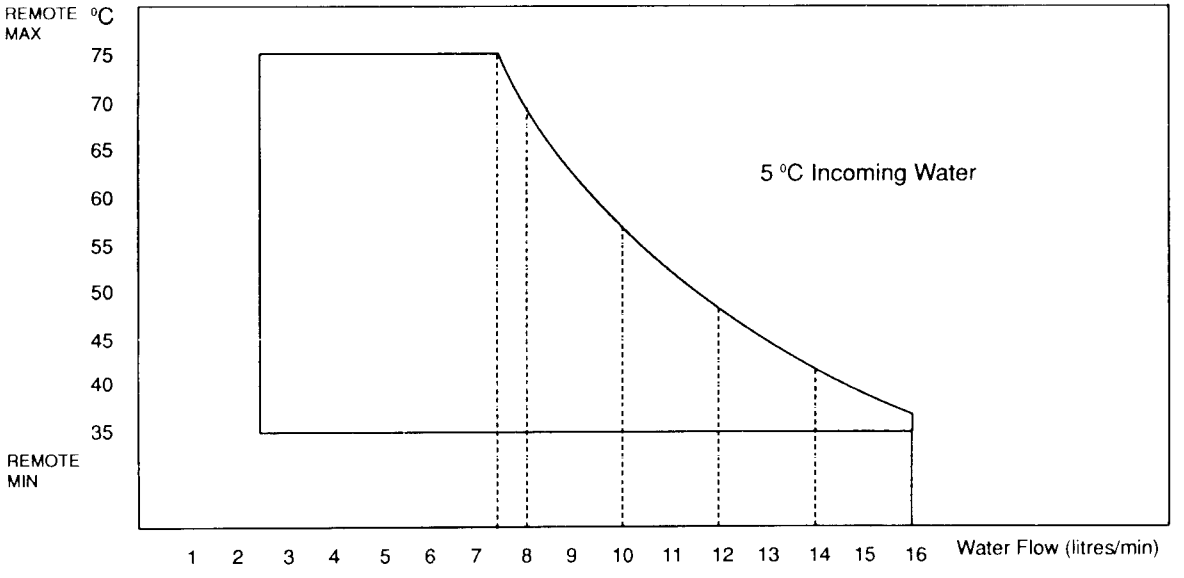


WATER FLOW RATE

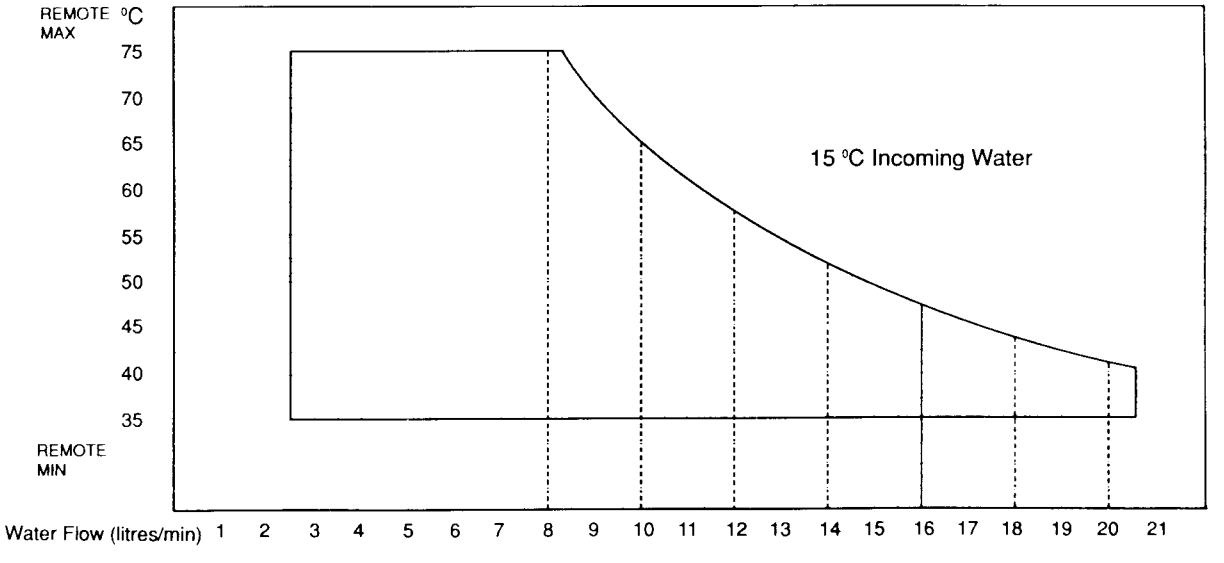
With the Infinity 20, the maximum water flow possible without mixing at the tap is 16 litres a minute. A simple calculation of the water flow rate in litres per minute can be made using the following charts. The charts indicate the water flow from the Infinity 20 at various combinations of incoming water temperatures, and the selected temperature at the remote control.

The vertical plane indicates the selected temperature at the remote, and the horizontal plane indicates the flow of water in litres per minute. Remote control range is between 35°C and 75°C, therefore the water flow charts only show the temperatures in that range. The temperature rise is the difference between the temperature of the incoming water and the selected temperature at the remote controls.

Select the appropriate chart depending on the incoming water temperature. Draw a horizontal line across the graph from the selected temperature at the remote until it intersects the curve. At this point draw the line in the vertical direction. The water flow is indicated where the line intersects the bottom of the chart. The chart below indicates that the water flow rate of the Infinity 20 will, at a preset temperature of 39°C and an incoming water temperature of 5°C, be 15 litres a minute.



However, the following chart indicates that by mixing at the tap, 20.5 litres a minute is obtainable, where the preset temperature is 40°C and the incoming water temperature is 15°C.



CALCULATING THE WATER FLOW:

The following information is an outline of the formula required to measure accurately the flow rate in litres per minute, as well as being the base for the charts. The most useful way in which this formula can be utilised, is to calculate the water flow rate where there is maximum gas input of 160MJ/h.

FORMULA: IN x TE = (Tout - Tin) x 60 x Q

Where:

Tin	=	Incoming water temperature.
Tout	=	Outgoing water temperature as selected at the remote.
In	=	Gas input#.
TE	=	Thermal efficiency*.
Q	=	Water flow in litres per minute.

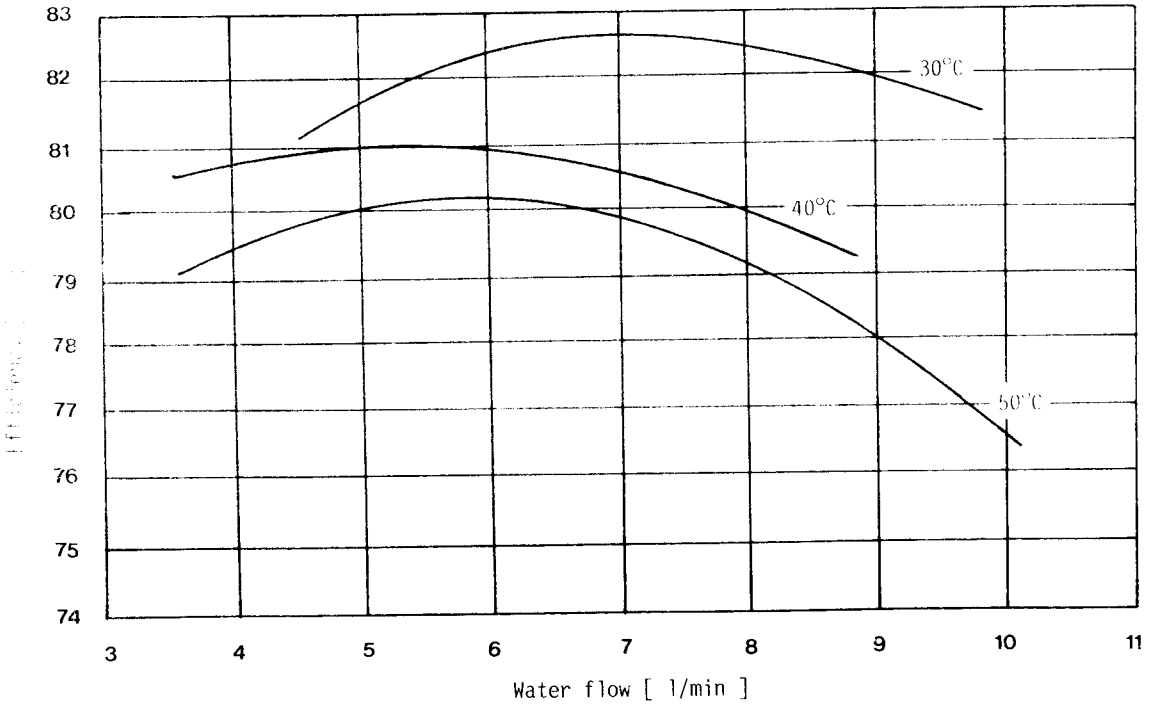
This is the maximum gas input converted from MJ/h into K/cal. As 1 K/cal raises the temperature of 1 litre of water by 1 centigrade, the method of calculation is to multiply the input in MJ/h by 239.

* Thermal efficiency may be in the range of 78% to 90%, depending on the temperature rise and water flow. For the purpose of the following calculation we have assumed an efficiency of 80%.

Example			Calculation
Tin	=	15°C	38000 x 0.8 = (60 - 15) x 60 x Q
Tout	=	60°C	30400 = 45 x 60 x Q
IN	=	38000 Kcal/h	$\frac{30400}{45}$ = 60 x Q
TE	=	80%	675 = 60 x Q l/hr
Q	=	Water flow in litres per minute	$\frac{675}{60}$ Q l/min
			11.25 l/min

EFFICIENCY

The Infinity 20 is a very high efficiency appliance. The following chart indicates efficiences at various temperatures and water flows. It can be seen from the chart that efficiences are always high, but do vary slightly at different combinations of water flow and temperature.



GAS RATE

The most common unit used to calculate the energy required to heat water is the kilocalorie.

If the full gas rate is not required to provide the required water temperature rise, [ie - when the temperature selected at the remote controls is lower, or the incoming water temperature is higher]; the amount of gas that the water heater is going to use to carry out a specific heating task will change proportionally to these variables. The actual gas rate is based upon the following calculation.

CALCULATING THE GAS INPUT:

Formula: $\dfrac{(Tout - Tin) \times Q \times 60}{239 \times TE} = IN \ MJ/h$

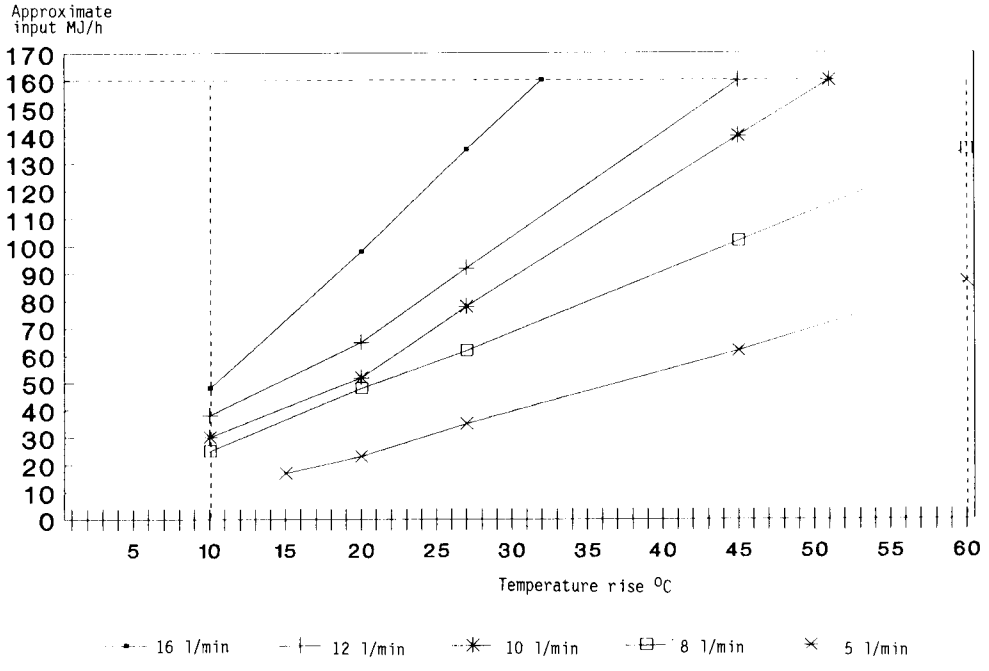
See the previous page for an explanation of Tin, Tout, IN, TE and Q.

Example			Calculation
Tin	=	15°C	$\dfrac{(60 - 15) \times 10 \times 60}{239 \times 0.8} = IN \ MJ/h$
Tout	=	60°C	
IN	=	Gas input in MJ/h	$\dfrac{45 \times 10 \times 60}{239 \times 0.8} = IN \ MJ/h$
TE	=	80%	$\dfrac{27000 \ (Kcal/h)}{191.2} = IN \ MJ/h$
Q	=	10 l/min	141 MJ/h = IN

The Infinity 20 is able to modulate both the water and gas flows. The gas input varies depending on the water flow and incoming and outgoing water temperatures. The chart on the following page is an approximate guide to the gas input according to the various temperature rises and water flows.

To calculate the approximate gas input, first select the appropriate curve representing the water flow in litres/minute [l/min]. From the base line draw a vertical line at the point where the required temperature rise in °C is indicated. This can be calculated by subtracting the incoming water temperature from the selected temperature on the remote control. Draw a horizontal line from the point where the vertical line intersects the curve. The point where the horizontal line intersects the left hand vertical line (Gas Input), shows the approximate gas input in MJ/h.

This chart is an approximate guide to the gas input according to various temperature rises and water flows. See previous page last paragraph for the explanation on how to calculate approximate gas consumption in MJ/h.

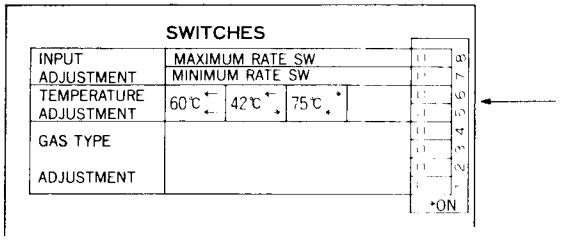


DEFAULT TEMPERATURE SETTING

On the P.C.B. there is a set of two switches [see diagram] which locks the water temperature to a default setting in instances where the remote controls become disconnected or no remote controls are required. The default water temperature settings are: 42°C, 60°C and 75°C.

REMOTE CONTROL DISCONNECTION

If the remote controls become disconnected, the water heater may still operate when a hot water tap is opened. The temperature of the water will be maintained to the default water temperature setting. The default setting at the time of manufacture is 60°C.



NO REMOTE CONTROL

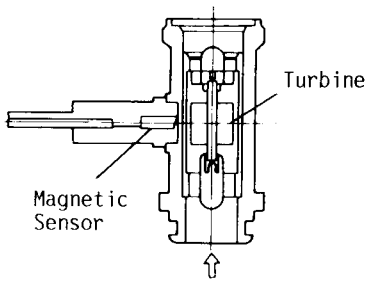
In some applications remote controls may not be required. In such cases the outgoing water temperature will be governed by the default water temperature set on the P.C.B. This provides a means to enable the water temperatures to become tamper-proof.

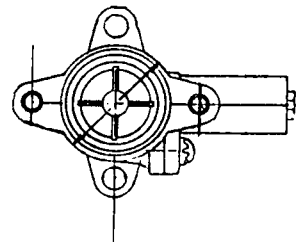
SETTING THE DEFAULT WATER TEMPERATURE SETTING

The positioning of switches 5 & 6 at the top of the P.C.B. determine the default water temperature setting. For a default setting of 42°C, position switch No.6 to the left and switch No.5 to the right. Similarly for a default setting of 75°C, position switch No.6 to the right and switch No.5 to the left. Finally for a default setting of 60°C, position switch No.6 to the left and switch No.5 to the left also.

WATER FLOW SENSOR

Water flow is detected by a turbine/magnetic pulse generating device. Water flows through the turbine and the magnetic sensor providing information to the P.C.B. (Printed circuit board) by generating a pre-determined number of pulses in proportion to the water flow. See page 31, section 3 for pulses according to water flow in l/min. These pulses are counted by the P.C.B. - no pulse indicates no water flow. The frequency of the magnetic pulses increases as the water flow increases, this enables the P.C.B. to calculate the exact water flow, and determine what the water flow is in litres/minute.

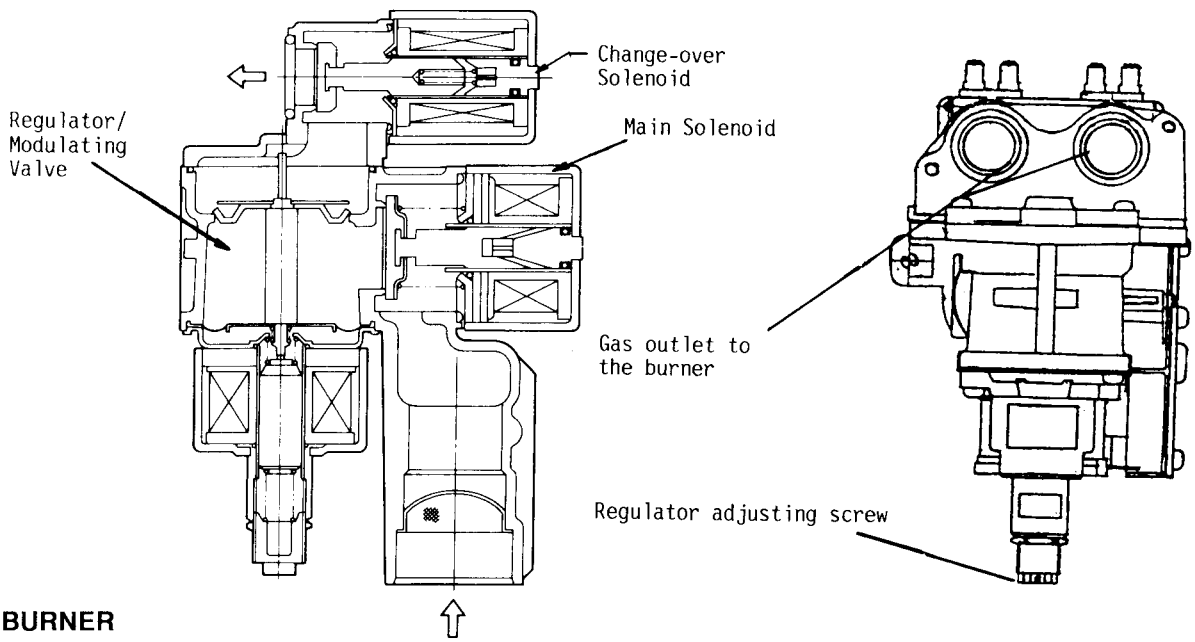




As soon as the required water flow is detected, the P.C.B. activates the combustion fan. The combustion fan speed is monitored by a magnetic pulse sensor. The output from this sensor is processed by the P.C.B. which opens the gas modulating valve to a degree proportional to the fan speed. See also page 15 for further details on the combustion fan.

CHANGEOVER SOLENOID VALVE

The changeover solenoid increases the flexibility of the regulator/modulating valve by supplying gas to the right-hand side of the burner only, [10 - 40% input] or both sides of the burner [10 - 40% input] + [40 - 100% input] through the tandem manifold.



BURNER

The burner assembly comprises 14 (fourteen) identical modular stainless steel bunsen burners, secured by an aluminised steel framework. A 2 (two) chamber aluminium manifold, with 14 (fourteen) brass injectors attached supplies gas to the burners. This manifold is attached to the front of the burner module.

ELECTRONIC REGULATOR/MODULATING VALVE

Gas is controlled by a composite regulator/modulating valve double block safety and changeover valve. This modulating solenoid is electronically controlled depending on the incoming water temperature, water flow and outgoing water temperature.

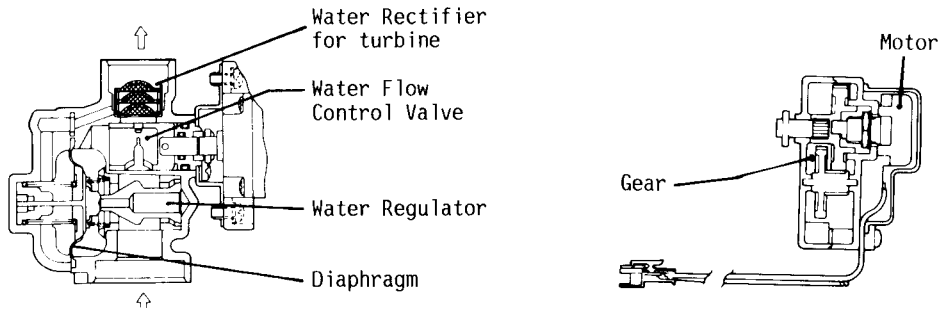
Supposing that the water flow and/or selected water temperature change, then the system will adjust the gas flow to the burner automatically in proportion to the water flow, between 17 and 160 MJ/h, ensuring that the outgoing water temperature remains at the temperature selected at the remote controls. A schematic diagram on page 7 shows the basic layout of the gas piping system. Maximum gas rate is pre-determined, and the appliance cannot be overloaded.

In summary the three (3) main functions of the electronic regulator/modulating valve are:

a. To regulate incoming gas pressure.
b. To direct gas to the right hand side of the burner only or both sides.
c. To modulate gas flow from 17 to 160 MJ/h by the combination of change-over and modulating valve positions.

ELECTRONIC WATER FLOW CONTROL DEVICE

Water pressure to the appliance is controlled by a mechanical diaphragm, spring and valve system. The water flow control consists of a plug and barrel valve which is rotated by a motor to increase or decrease the volume of water passing through the heat exchanger.



The water flow through the heat exchanger is dependant on the incoming and outgoing water temperatures, the P.C.B. controls the settings of the water flow control valve to provide the correct flow for the conditions at any given time.

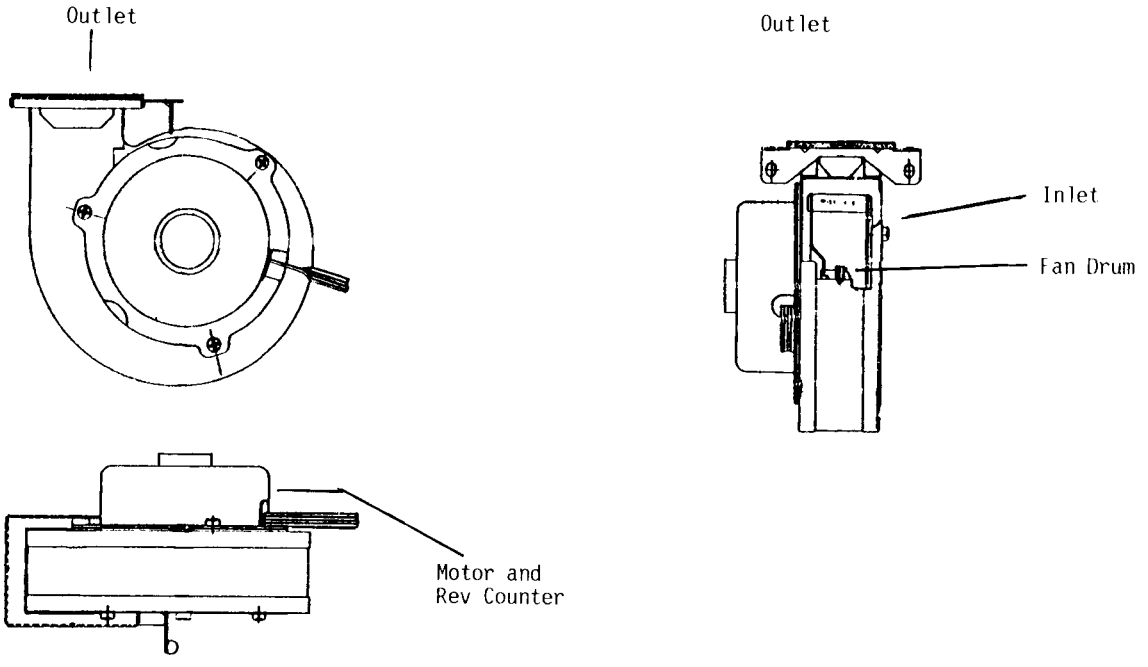
COMBUSTION FAN

The air for combustion is supplied by a centrifugal fan driven by a 37 V DC motor. After a pre-purge period the fan speed is controlled by the P.C.B. to provide the correct volume of air for combustion. The calculation for the fan speed is based upon incoming water temperature, water flow and the selected temperature at the remote controls.

The actual speed of the motor is continuously monitored by a magnetic pulse sensor. This sensor emits 4 pulses per rotation of the fan. This is the fan feedback or confirmation data processed by the P.C.B. and used for 2 (two) operations.

a. The fan speed is constantly corrected to provide optimum combustion conditions.
b. Determine the opening degree of the gas valves, so that the gas rate always matches the volume of air for combustion, as well as the input required to heat the water.

The reason for controlling the opening degree of the gas valves based upon data from the combustion fan is that the gas valves are able to react much more quickly to a change in control signal than the combustion fan. Controlling the gas valves based upon data from the combustion fan means that combustion remains satisfactory, even if there are sudden changes in input conditions.

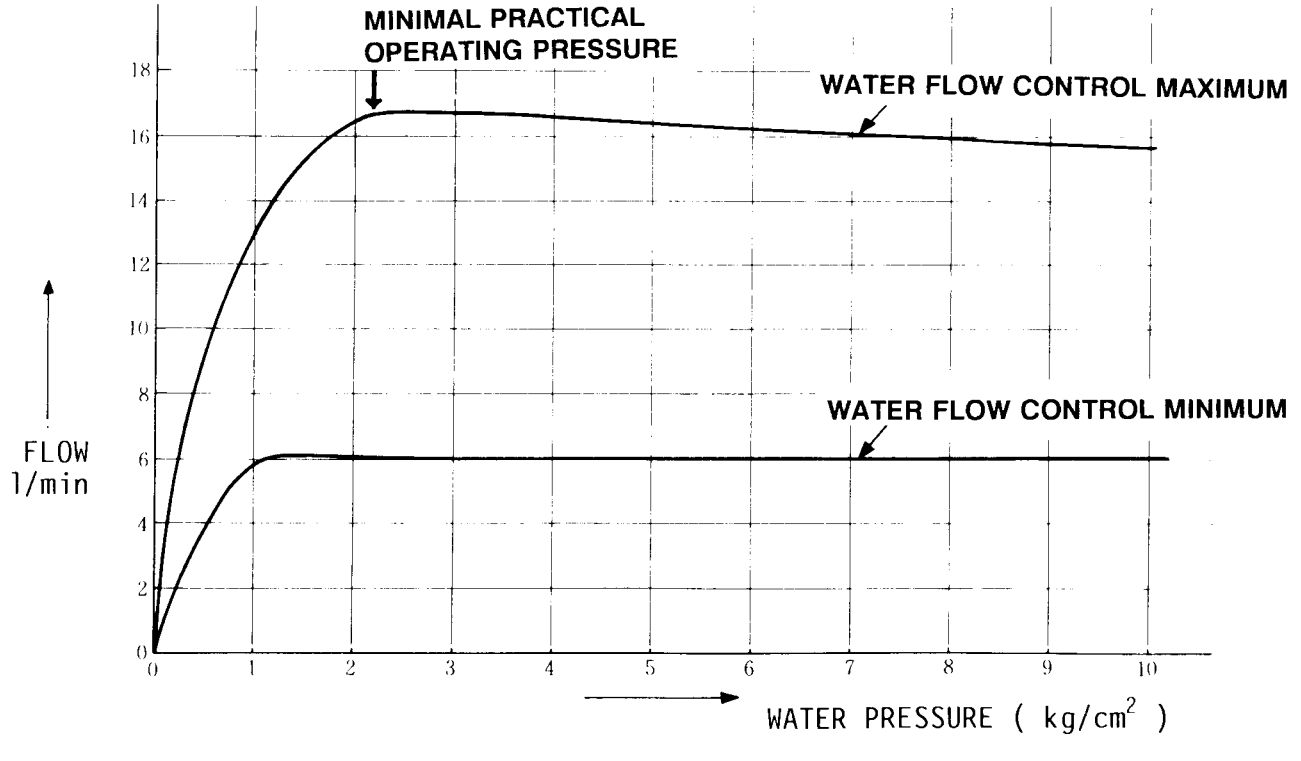


The combustion fan has a post purge period of 5 minutes, in other words, it runs on for 5 minutes after the hot water tap is closed. The purpose of this feature is to provide instant ignition when the hot water tap is turned ON and OFF repeatedly. This reduces the time taken to provide hot water; as well as enabling the Infinity 20 to respond very quickly to repeated ON/OFF operations. During the 'post purge', the burner can light immediately the water tap is turned opened, without a pre-purge period.

MECHANICAL WATER REGULATOR

This graph shows the performance of the water regulator. The top line shows the performance when the electronic water flow control is open, the lower line is when it is closed. The bottom line shows that with the electronic water flow control device closed, the maximum flow is 6 l/min. The maximum flow is reached at 100kPa inlet pressure. The top line shows that with the electronic water flow control device open, the maximum flow is approximately 16 l/min. The maximum flow is reached at 200kPa.

NOTE: Although the Infinity 20 will operate at very low water pressures, maximum performance is not reached unless the incoming pressure is 200kPa or more.



OPERATION

The preset temperature is selected at one of the remote controls [where fitted]. Where no remote control is fitted, the temperature can be preset on the P.C.B. see page 13 - default temperature setting.

When a hot water tap is opened, water begins to flow through the appliance. The turbine in the water flow sensor begins to revolve. The revolution speed is proportional to the water flow. A sensor located inside the device relays information in the form of magnetic pulses to the P.C.B. This enables the P.C.B. to determine whether or not water is actually flowing, and also the volume of water flowing.

Incoming water pressure is regulated by a mechanical water regulator at all times. The incoming water temperature is measured by the incoming water temperature thermistor. When the predetermined water flow is sensed, the ignition sequence begins.

The combustion fan pre-purges the combustion chamber. A rev counter on the combustion fan indicates the fan's rpm to the P.C.B. Once the pre-purge cycle is completed, the P.C.B. controls the fan rpm by varying the DC voltage to the fan motor to maintain the correct air/gas ratio throughout the time the water heater is in use to ensure good combustion.

The burner is ignited by direct electronic spark and the flame is sensed by the flame rod. The opening degree of the modulating valve and change over valve is determined by the combustion fan speed, see page 15 - combustion fan. The changeover valve directs gas to one side or both sides of the burner. This increases the flexibility of the modulating valve.

At the point where the changeover valve opens or closes the modulating valve is instantly re-adjusted by the P.C.B. to compensate for the change in the number of burners in use. From the information provided by the water flow sensor and the incoming water temperature thermistor, the P.C.B. determines how much gas is required to heat the water to the temperature selected on the remote control. This calculation of temperature rise and water flow is called 'feedforward' information.

The P.C.B is programmed to provide the maximum volume of water possible at a given temperature rise. As the water flow from the tap is increased, the P.C.B. increases the gas and air flow to the burner.

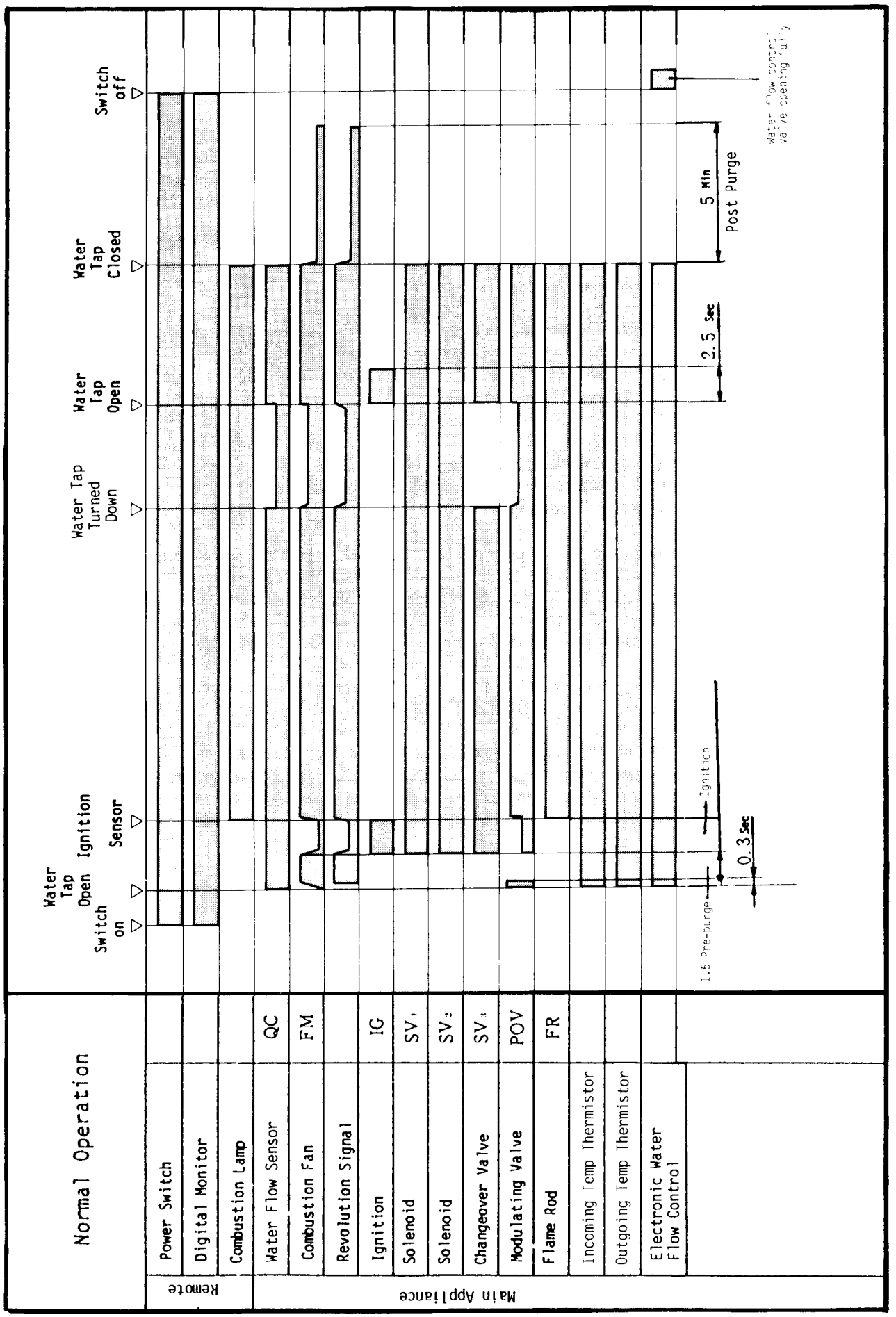
Once the maximum gas rate is reached the P.C.B. begins to control the water flow through the appliance in order to maintain the preset temperature. This is achieved by the P.C.B. turning the valve within the water flow control device by means of a geared motor. Attached to the water flow control device is a potentiometer which relays the position of the valve to the P.C.B. When the valve is in the correct position, the motor stops.

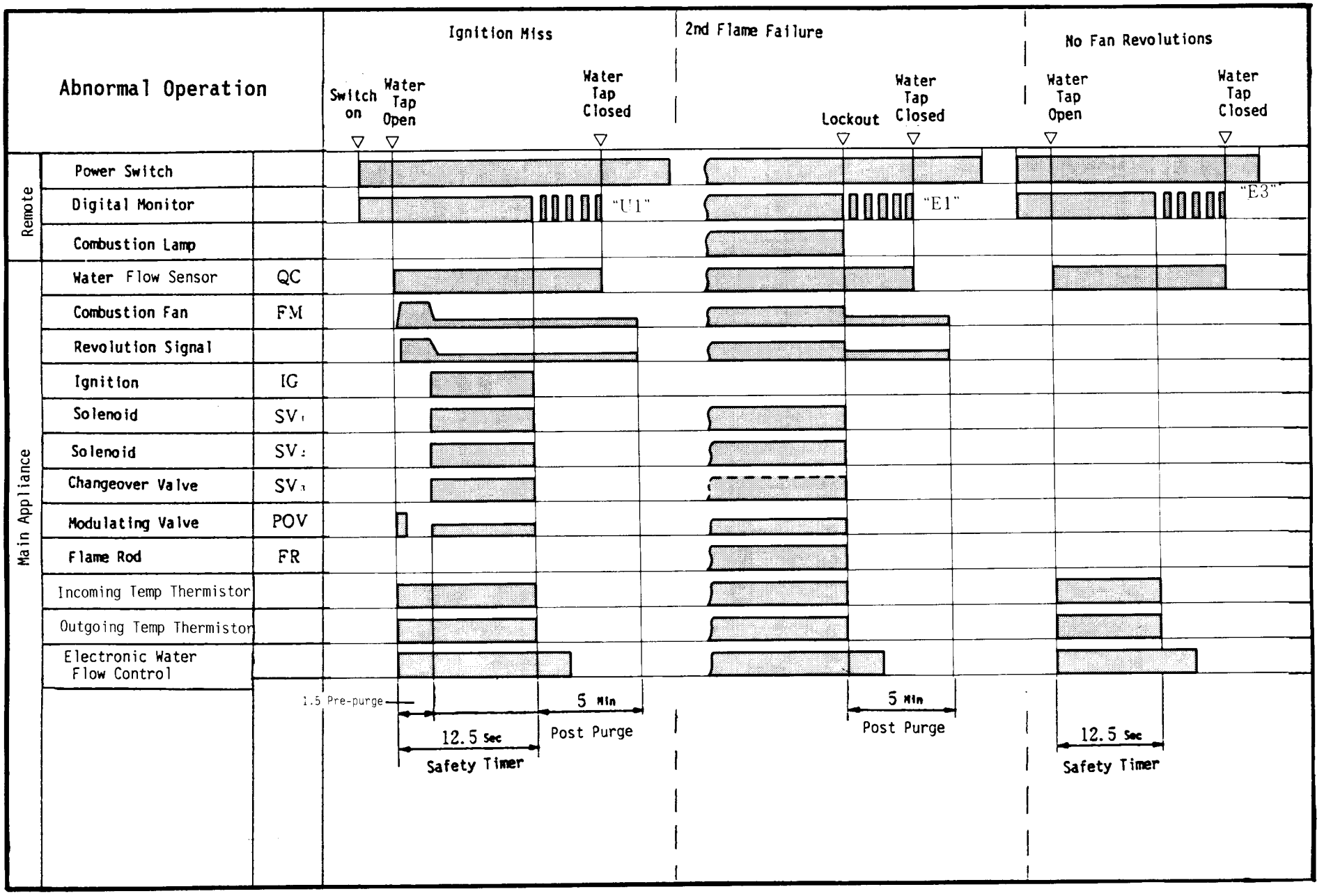
The water flow control device operates at high water flows and/or high temperature rises. When the temperature rise is low, or the water flow is restricted by the hot water tap, then the device may not be required to operate. [See section on gas and water controls, page 14, for clarification].

The P.C.B. continually makes adjustments in order to maintain a constant temperature; [adjusting both the gas input and water flow where necessary.] It also continually monitors the combustion fan rpm adjusting the gas rate to match.

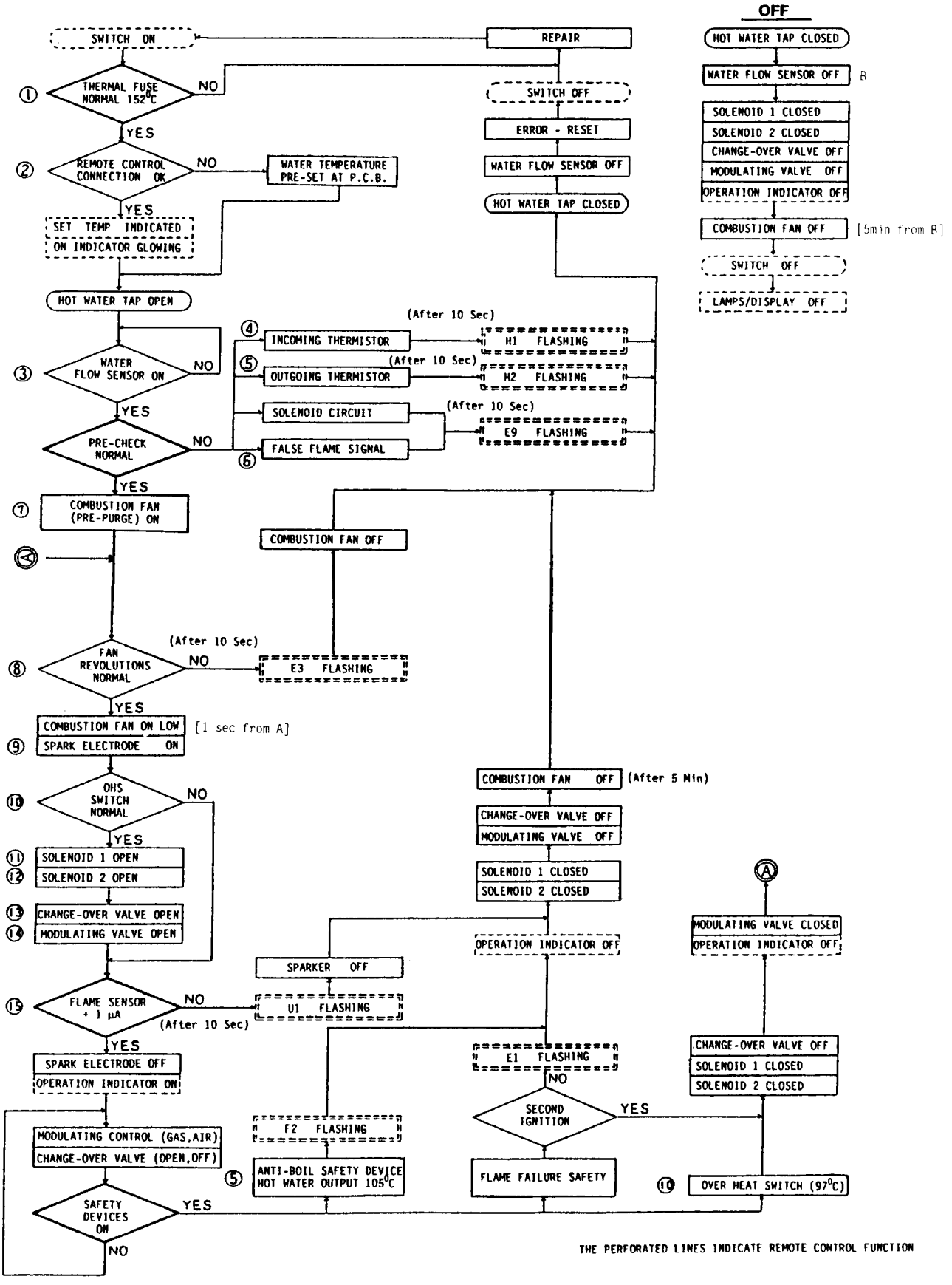
When the hot water tap is turned off the water flow sensor stops revolving, and the magnetic pulse ceases, indicating to the P.C.B. that there is no water flowing, in turn the P.C.B closes the gas valves. The combustion fan continues to operate for 5 minutes. This is to provide quicker ignition when the tap is turned on and off in rapid succession, as it removes the need for a pre-purge cycle, and allows the burner to re-light immediately a hot water tap is opened again.

TIME CHARTS


Normal Operation
Remote
Power Switch
Digital Monitor
Combustion Lamp
Main Appliance
Water Flow Sensor
QC
Combustion Fan
FM
Revolution Signal
Ignition
IG
Solenoid
SV1
Solenoid
SV2
Changeover Valve
SV3
Modulating Valve
POV
Flame Rod
FR
Incoming Temp Thermistor
Outgoing Temp Thermistor
Electronic Water Flow Control
Water Tap Open Switch on
Ignition Sensor
Water Tap Turned Down
Water Tap Open
Water Tap Closed
Switch off
1.5 Pre-purge
Ignition
0.3 Sec
2.5 Sec
5 Min
Post Purge


Abnormal Operation
Ignition Miss
2nd Flame Failure
No Fan Revolutions
Switch on
Water Tap Open
Water Tap Closed
Lockout
Water Tap Closed
Water Tap Open
Water Tap Closed
Remote
Power Switch
Digital Monitor
"U1"
"E1"
"E3"
Combustion Lamp
Main Appliance
Water Flow Sensor
QC
Combustion Fan
FM
Revolution Signal
Ignition
IG
Solenoid
SV1
Solenoid
SV2
Changeover Valve
SV3
Modulating Valve
POV
Flame Rod
FR
Incoming Temp Thermistor
Outgoing Temp Thermistor
Electronic Water Flow Control
1.5 Pre-purge
12.5 Sec
Safety Timer
5 Min
Post Purge
5 Min
Post Purge
12.5 Sec
Safety Timer

FLOW CHART


OFF
HOT WATER TAP CLOSED
WATER FLOW SENSOR OFF
B
SOLENOID 1 CLOSED
SOLENOID 2 CLOSED
CHANGE-OVER VALVE OFF
MODULATING VALVE OFF
OPERATION INDICATOR OFF
COMBUSTION FAN OFF
[5min from B]
SWITCH OFF
LAMPS/DISPLAY OFF
SWITCH ON
REPAIR
① THERMAL FUSE NORMAL 152°C
NO
YES
SWITCH OFF
ERROR - RESET
② REMOTE CONTROL CONNECTION OK
NO
WATER TEMPERATURE PRE-SET AT P.C.B.
WATER FLOW SENSOR OFF
HOT WATER TAP CLOSED
YES
SET TEMP INDICATED
ON INDICATOR GLOWING
HOT WATER TAP OPEN
(After 10 Sec)
④ INCOMING THERMISTOR
H1 FLASHING
③ WATER FLOW SENSOR ON
NO
(After 10 Sec)
⑤ OUTGOING THERMISTOR
H2 FLASHING
YES
SOLENOID CIRCUIT
(After 10 Sec)
E9 FLASHING
PRE-CHECK NORMAL
NO
⑥ FALSE FLAME SIGNAL
YES
⑦ COMBUSTION FAN (PRE-PURGE) ON
COMBUSTION FAN OFF
A
(After 10 Sec)
⑧ FAN REVOLUTIONS NORMAL
NO
E3 FLASHING
YES
COMBUSTION FAN ON LOW
[1 sec from A]
⑨ SPARK ELECTRODE ON
COMBUSTION FAN OFF
(After 5 Min)
⑩ OHS SWITCH NORMAL
NO
CHANGE-OVER VALVE OFF
MODULATING VALVE OFF
YES
⑪ SOLENOID 1 OPEN
⑫ SOLENOID 2 OPEN
SOLENOID 1 CLOSED
SOLENOID 2 CLOSED
⑬ CHANGE-OVER VALVE OPEN
⑭ MODULATING VALVE OPEN
A
MODULATING VALVE CLOSED
OPERATION INDICATOR OFF
OPERATION INDICATOR OFF
SPARKER OFF
⑮ FLAME SENSOR + 1 μA
NO
U1 FLASHING
(After 10 Sec)
YES
SPARK ELECTRODE OFF
OPERATION INDICATOR ON
E1 FLASHING
NO
CHANGE-OVER VALVE OFF
SOLENOID 1 CLOSED
SOLENOID 2 CLOSED
SECOND IGNITION
YES
MODULATING CONTROL (GAS,AIR)
CHANGE-OVER VALVE (OPEN,OFF)
F2 FLASHING
⑤ ANTI-BOIL SAFETY DEVICE HOT WATER OUTPUT 105°C
FLAME FAILURE SAFETY
⑩ OVER HEAT SWITCH (97°C)
SAFETY DEVICES ON
YES
NO
THE PERFORATED LINES INDICATE REMOTE CONTROL FUNCTION

DIAGNOSTIC POINTS

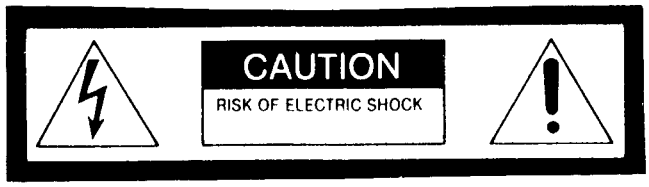
Note: FC - refers to the numbers in circles on the flow chart at the left of the sequence. [page 20]
WD - refers to the position of the connections on the wiring diagram.[page 34]

FC	POINT OF MEASURE		VALUES
	WD	WIRE COLOUR	
1	H	Br - Gy	Below AC 1 v Above 1 Ω
2	K	Remote cable	DC 11 ~ 13 v
3	B_1	Bk - R	DC 11 ~ 13 v
		Bk - Y	DC 11 ~ 13 v
4	B_2	Bl - Bl	15°C - 11.8 ~ 13.3kΩ 30°C - 6.7 ~ 7.4kΩ 45°C - 3.9 ~ 4.3kΩ
5	A	W - W	
6	F_1	Y - FR	Above 1 μA
7	E	R - Bk	DC 10 ~ 25 v
8	E	Bk - Y	DC 11 ~ 13 v
		Bk - W	DC 4 ~ 8 v

FC	POINT OF MEASURE		VALUES
	WD	WIRE COLOUR	
9	G	Bk - Bk	AC 90 ~ 110 v
10	F_2	R - R	Below DC 1 v Above 1 Ω
11	F	W - R	DC 80 ~ 100 v 860 ~ 1570 Ω
12	F	Y - R	DC 80 ~ 100 v 1100 ~ 2000 Ω
13	F	Y - R	DC 80 ~ 100 v 1100 ~ 2000 Ω
14	D	P - Or	MIN - 1.2 ~ 2.2 v MAX - 8.3 ~ 15.5 v 60 ~ 112 Ω
15	F	Y - Earth	AC 90 ~ 160 v
	F_1	Y - FR	Above 1 μA

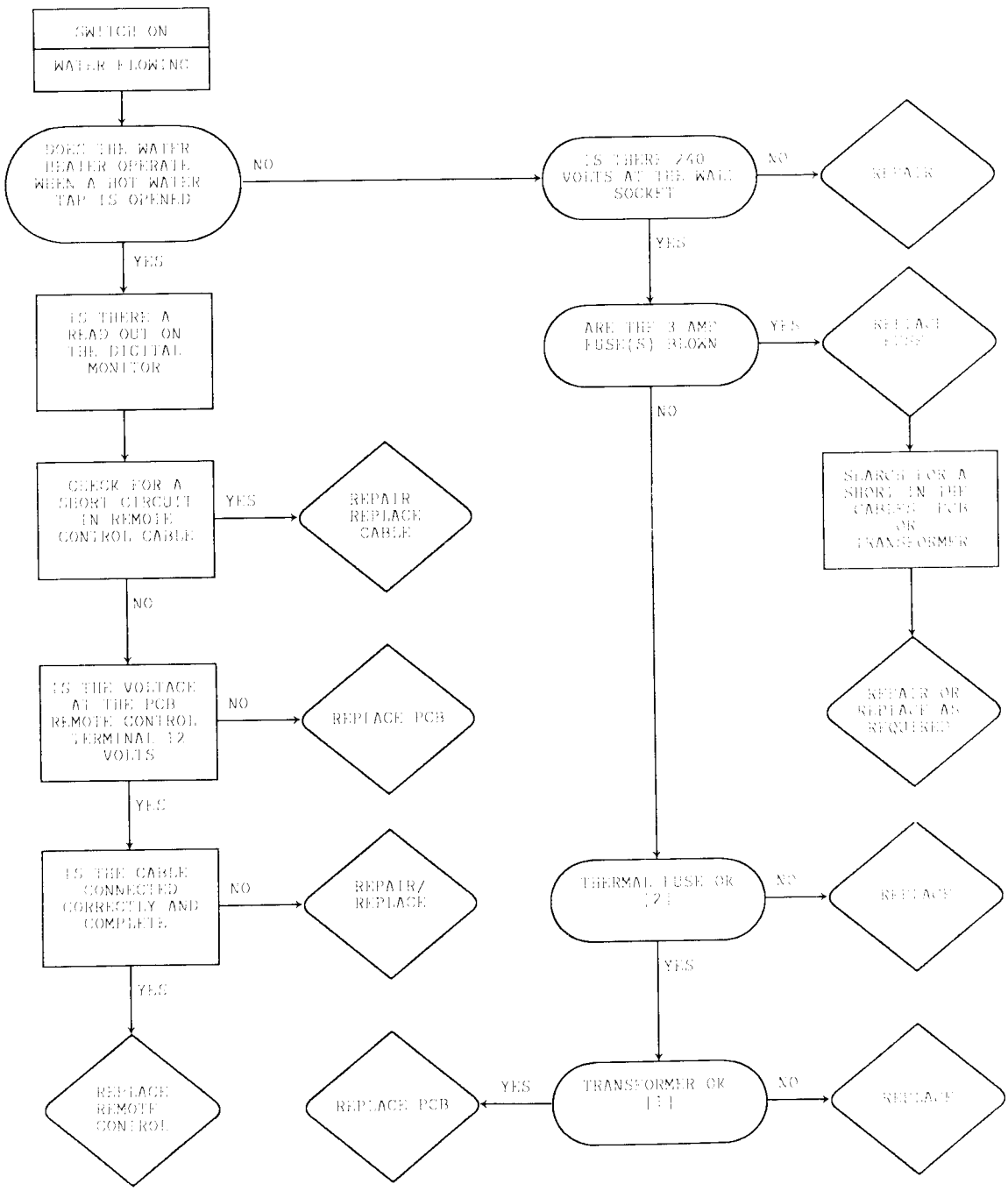
ERROR CODED MESSAGES

CODE	FAULT	REMEDY
U1	No ignition.	Go to page 23
E1	Flame failure.	Go to page 25
E3	Combustion fan failure.	Go to page 25
E9	Self check circuit failure.	Go to page 26
H1	Incoming water temperature thermistor.	Go to page 26
H2	Outgoing water temperature thermistor.	Go to page 27
F2	Outgoing water temperature thermistor.	Go to page 27



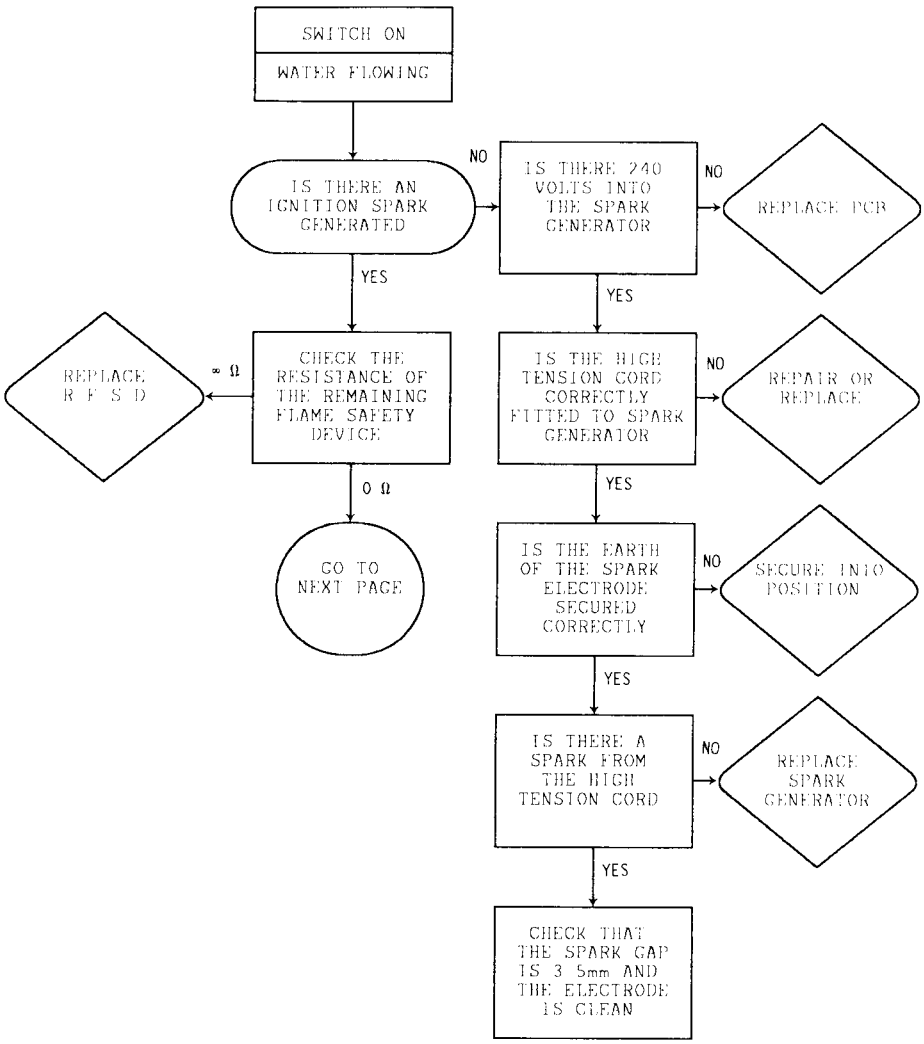
The number inside this [ ] shown in some boxes refers to the respective components in the following section - component analysis.

A. The digital monitor does not show a display after having pressed the 'ON/OFF' switch.

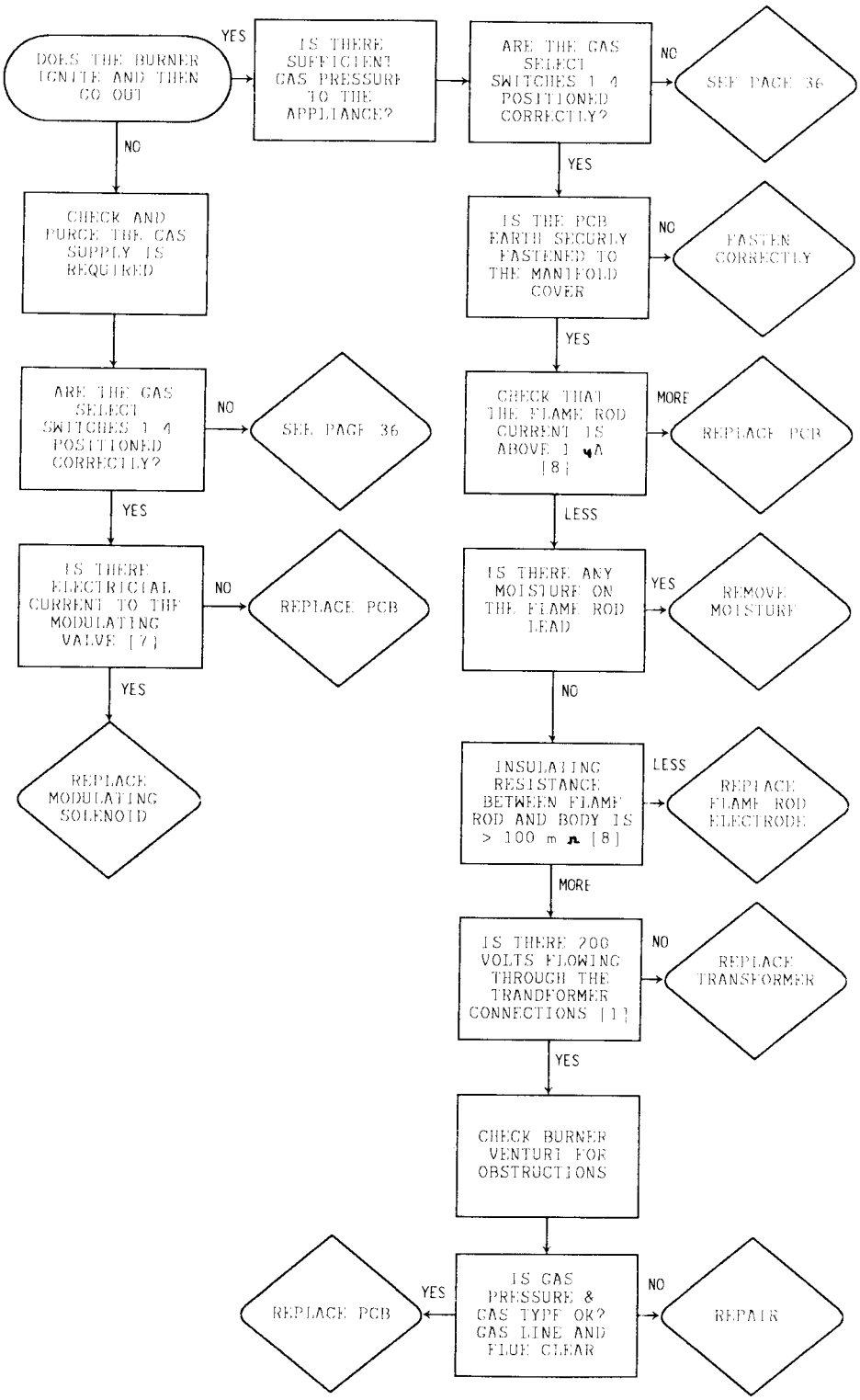


B. An 'ERROR CODE' is displayed flashing on the digital monitor.

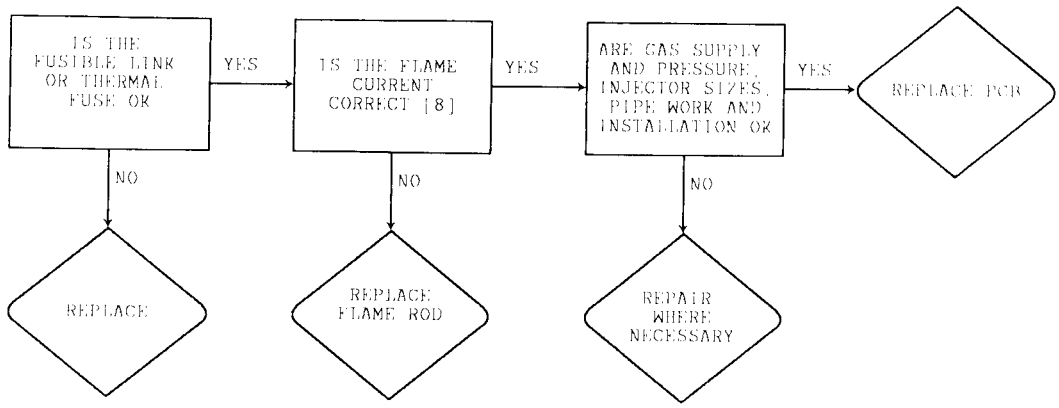
U 1 **flashing. (No Ignition)**



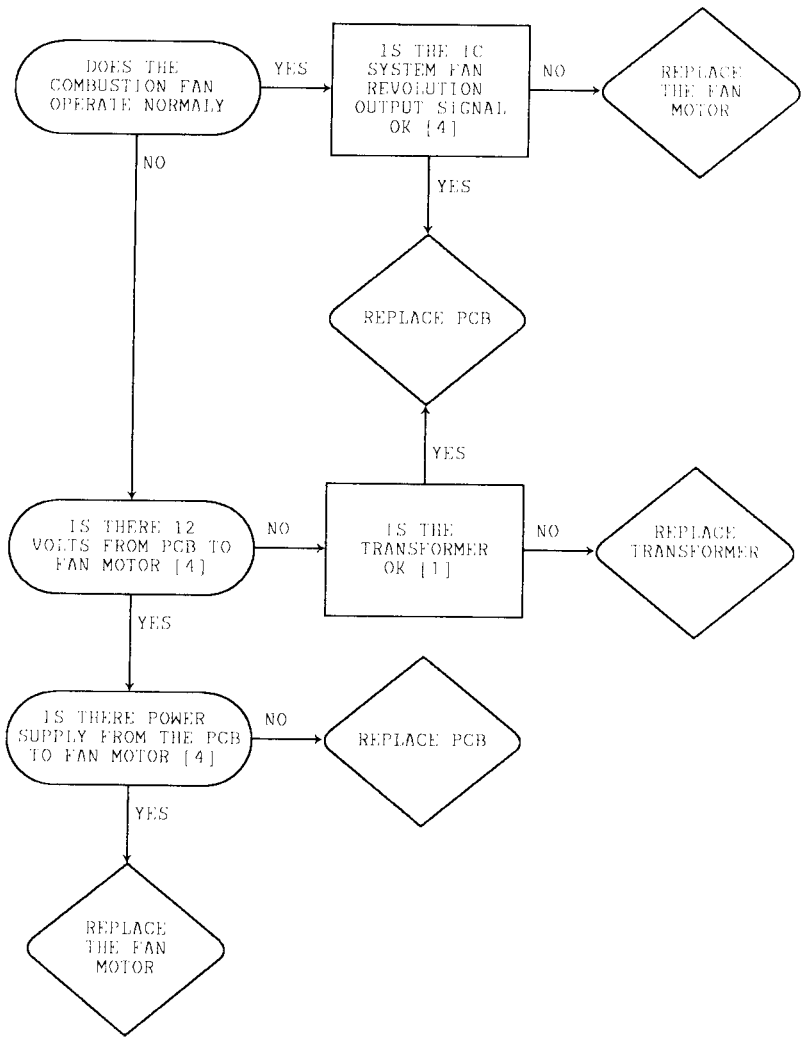
B - 1 continued.



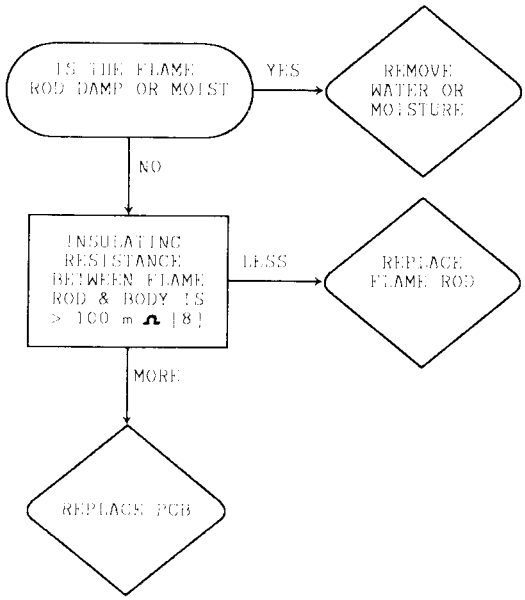
E 1 flashing. (Flame Failure)



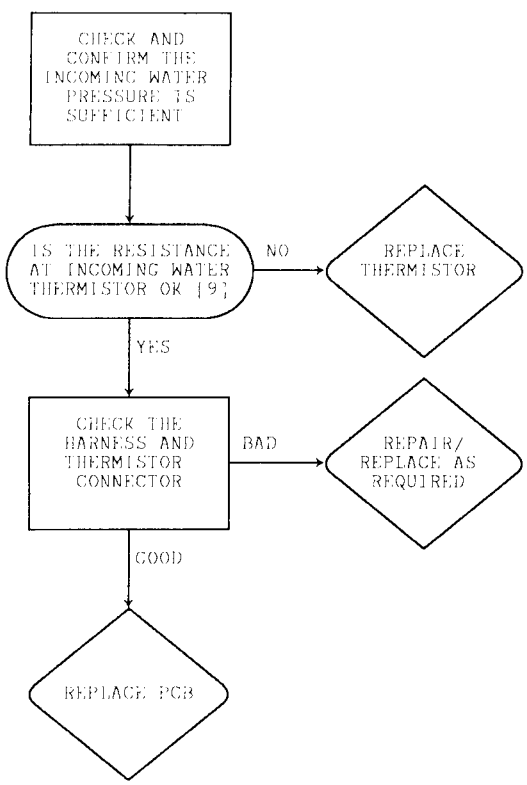
E 3 flashing. (Fan speed error)



E 9 flashing. (Pre-check error)

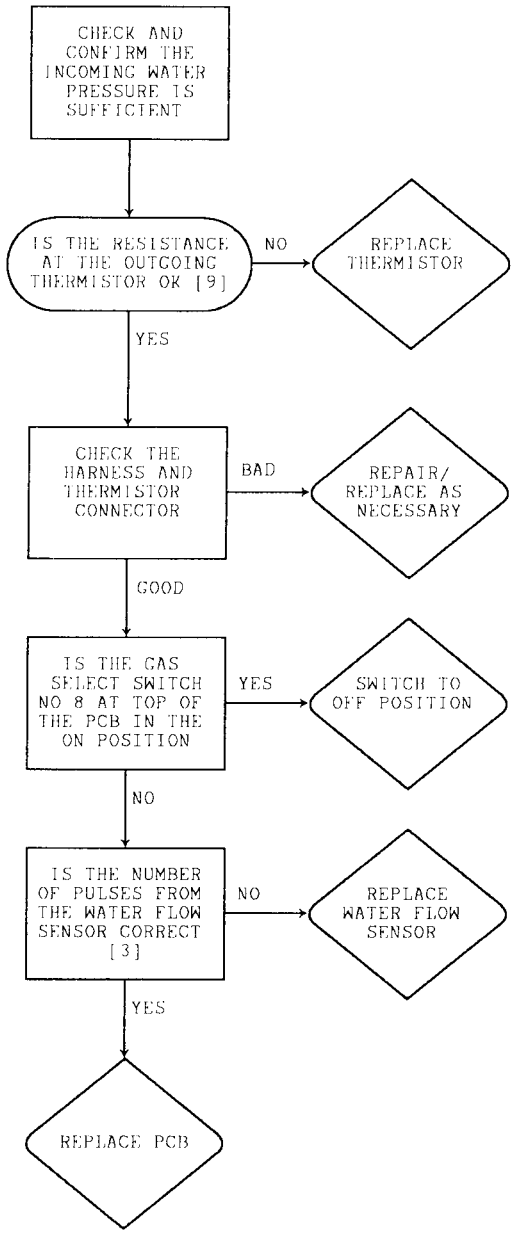


H 1 flashing. (Incoming Water Temperature Thermistor)

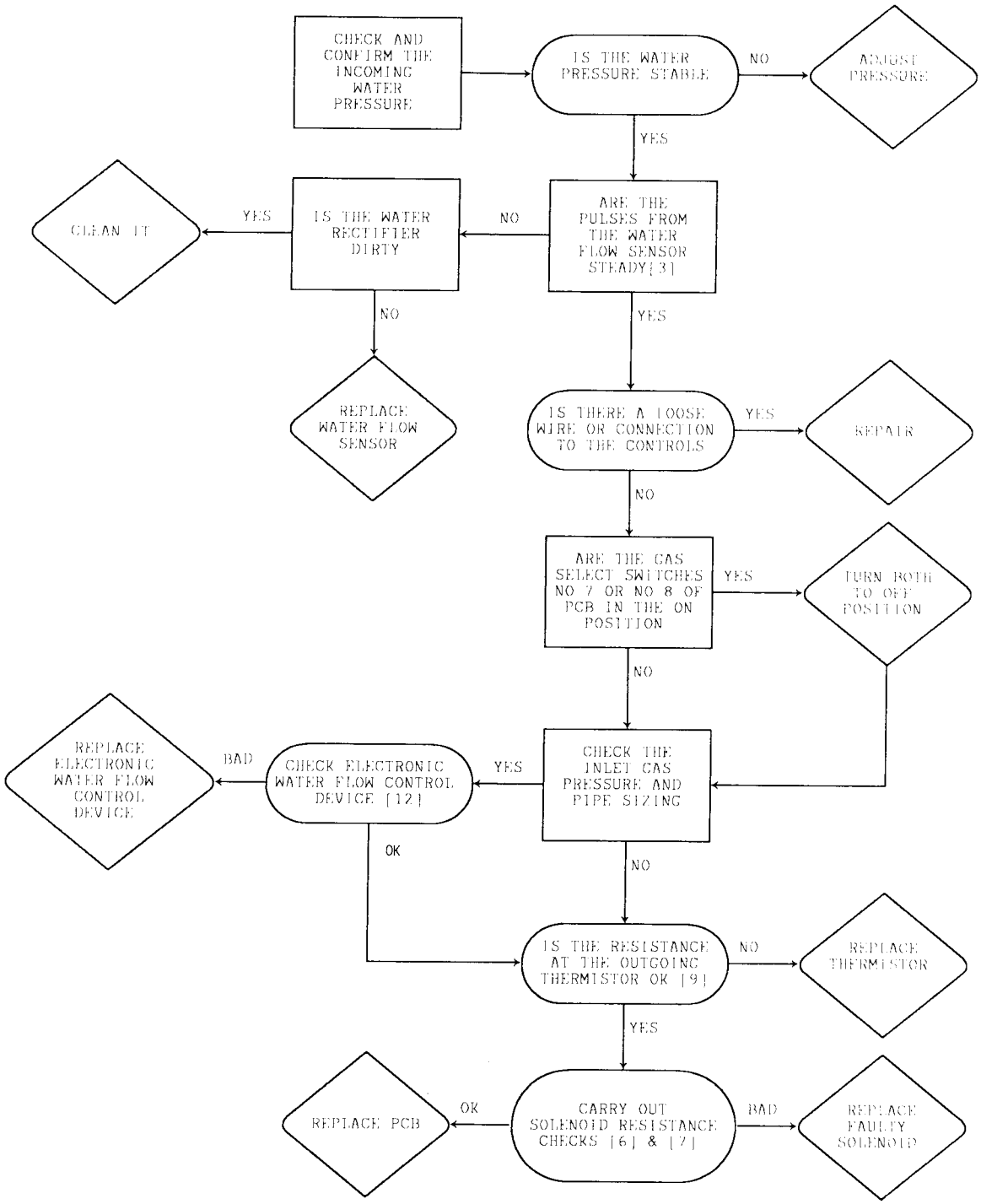


F 2
H 2

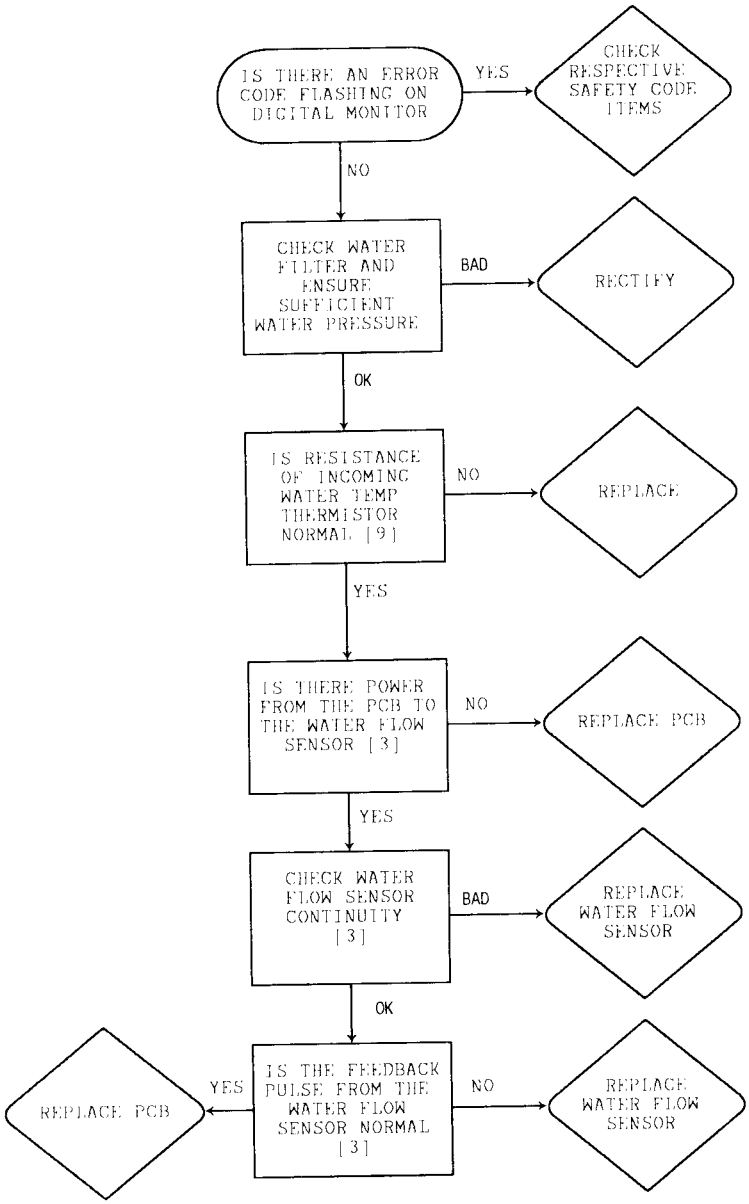
flashing. (Outgoing water temperature thermistor)



C. Hot water temperature will not stabilise.

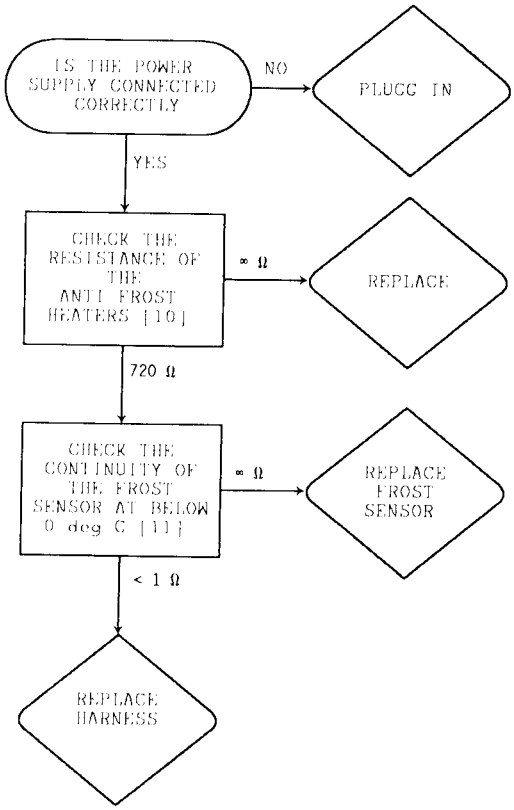


D. There is no hot water.

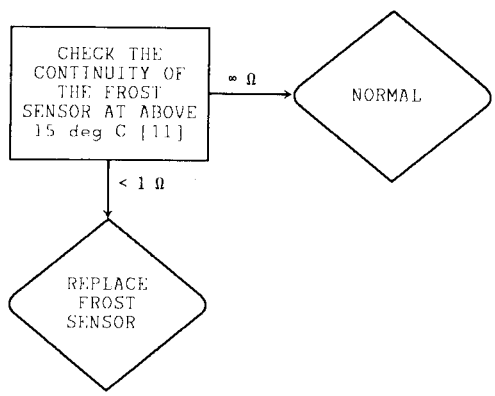


E. Malfunction with the frost protection heaters.

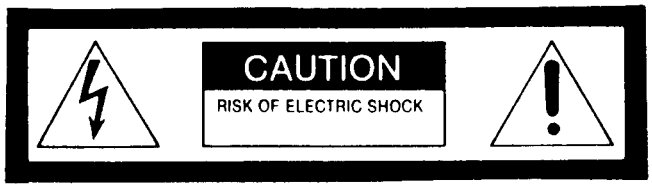
E - 1 Anti-frost heaters will not operate.



E - 2 Anti-Frost Heaters will not turn 'OFF'.



COMPONENT ANALYSIS



NOTE: the letters in brackets,[ie: (H), (F_2)] refer to the corresponding position of the connection on the wiring diagram.(Page 34)

DO NOT ATTEMPT TO REMOVE PUSH ON CONNECTORS FROM SOLENOIDS BY PULLING ON THE WIRES. PULL ON THE BODY OF THE CONNECTORS.

1. P.C.B. SUPPLY TRANSFORMER

Voltage measurement should be done with the power connected. Resistance **must** be checked with the power disconnected.

CON	WIRE COL	NORMAL (VOLTAGE) VALUE (RESISTANCE)	ELECTRICAL CIRCUIT
(I)	W - W	AC 90 ~ 110 V 11 ~ 15 Ω	AC 240 VAC
	G - G	AC 14 ~ 18 V 3.9 ~ 5.3 Ω	Fan motor
	Y - Y	AC 180 ~ 230 V 270 ~ 366 Ω	Flame rod
(J)	Or-Or	AC 25 ~ 32 V 3.1 ~ 4.3 Ω	Mod/gas valve
	R - R	AC 15 ~ 19 V 1.4 ~ 2.0 Ω	Gear motor Water flow sensor. Remotes.
	B - B	AC 8 ~ 12 V 1.8 ~ 2.5 Ω	P.C.B. use

2. ELECTRIC SAFETY CIRCUIT

Voltage measurement should be done with the power connected. Resistance **must** be checked with the power disconnected.

a) Fusible Link

2 pin connector (H)

Disconnect and remove 3A fuse in Blue/grey wire. Connect one lead of the multimeter to the brown pin of connector H, connect the other lead to the brown lead of the fuse holder.

Brown ~ Brown ... below 1 Ω is normal.

b) Remaining Flame Safety Device

2 pin connector (F_2)

Red ~ Red ... below DC 1 V is normal.

3. WATER FLOW SENSOR

a) Measure with the connector connected to P.C.B.

3 pin connector (B_1)

Black(-) ~ Red(+) ... DC 12 V normal.

Black ~ Yellow ... Output pulse.
[Frequency counter required to check pulse]

Normal Output

Water Flow	Pulse (H_Z)
2 l/min	18 ~ 22
5	60 ~ 70
8	100 ~ 120
10	130 ~ 150
12	160 ~ 180
16	220 ~ 240

b) Measure with the connector disconnected to the P.C.B.

3 pin connector [B_1].

Black ~ Red ... Approx 10 k Ω.
... ∞ Ω ⇒ faulty

4. FAN MOTOR

DO NOT check by shorting to the body of the unit.

Measure with the connector connected to the P.C.B.

4 pin connector (E)

Red(+) ~ Black(-) Main power supply.
..... DC 4 V ~ DC 37 V is normal.

Yellow(+) ~ Black(-) Control power supply.
..... DC 12 V is normal.

White ~ Black Pulse output.
..... 4 pulses per rotation.

5. SPARKER

Measure with the connector connected. The best way is to check with the gas turned off.

2 pin connector (G)

Black ~ Black (At time of spark.)
..... AC 90 ~ 110 V is normal.

6. SOLENOID VALVE

Voltage measurement should be done with the power connected. Resistance **must** be checked with the power disconnected.

Measurement at the solenoid terminal is also possible.

7 pin connector (F)

W(-) ~ R(+) DC 80 ~ 100 V (SV_1)
[bottom] ... 0.9 ~ 1.5K Ω is normal.

Y(-) ~ R(+) DC 80 ~ 100 V (SV_2)
[bottom] ... 1.1 ~ 2.0K Ω is normal.

R(-) ~ R(+) DC 80 ~ 100 V (SV_3)
[bottom] ... 1.1 ~ 2.0K Ω is normal.

7. MODULATING VALVE

With the power supply disconnected, release one connector from the solenoid valve then connect the multimeter linked in series to the wiring. Reconnect the power supply and check the mA reading, with water flowing and unit operating.

a) Modulating valve

Standard electrical current value [Reference value mA using input adjustment switches]

	LPG	NG
HIGH	201	145
IGNITION	75	63
MINIMUM	20	20

b) Modulating valve resistance

Disconnect the connectors before taking the Ω reading.

..... 60 ~ 112 Ω is normal value.

8. FLAME ROD

a) Flame current during combustion.

Disconnect the yellow lead (F_1) from the flame rod. Attach the multimeter in series to measure the μA. Operate the water heater.

..... above DC 1.0 μAis normal.

b) Insulation Resistance

Disconnect the yellow lead (F_1) from the flame rod and take a measurement with an insulation resistance tester.

..... above 100 M Ω is normal.

9. THERMISTOR

Measure with the connector disconnected.

2 pin connector (A) ... Thermistor side.

2 pin connector (B_2) ... Thermistor side.

Temperature	Resistance
0	22 ~ 26 K Ω
5	17 ~ 21 K Ω
10	14 ~ 17 K Ω
15	11 ~ 14 K Ω
20	9.5 ~ 11 K Ω
25	8 ~ 9 K Ω
30	6.6 ~ 7.4 K Ω
40	4.7 ~ 5.1 K Ω
50	3.3 ~ 3.6 K Ω
60	2.4 ~ 2.7 K Ω
70	1.7 ~ 2.0 K Ω
75	1.5 ~ 1.7 K Ω

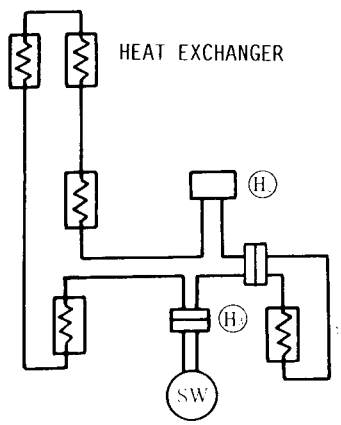
10. ANTI-FROST HEATERS

Measure with the connector disconnected.

2 pin connector. (H_2)

Measure by shorting the connection to the frost sensing switch.

White ~ White
... approx 720k Ω is normal.
... ∞ indicates faulty heaters.



11. FROST SENSOR SWITCH

Measure with the connector disconnected.

Blue ~ Blue ... frost sensor connector.

Below 0°C .... less than 1 Ω is normal.

Above 12°C ... ∞ Ω is normal.

[3.5 ± 3°C ON, 11.5 ± 3°C OFF.]

12. ELECTRONIC WATER FLOW CONTROL DEVICE

Voltage measurement should be done with the power connected. Resistance **must** be checked with the power disconnected.

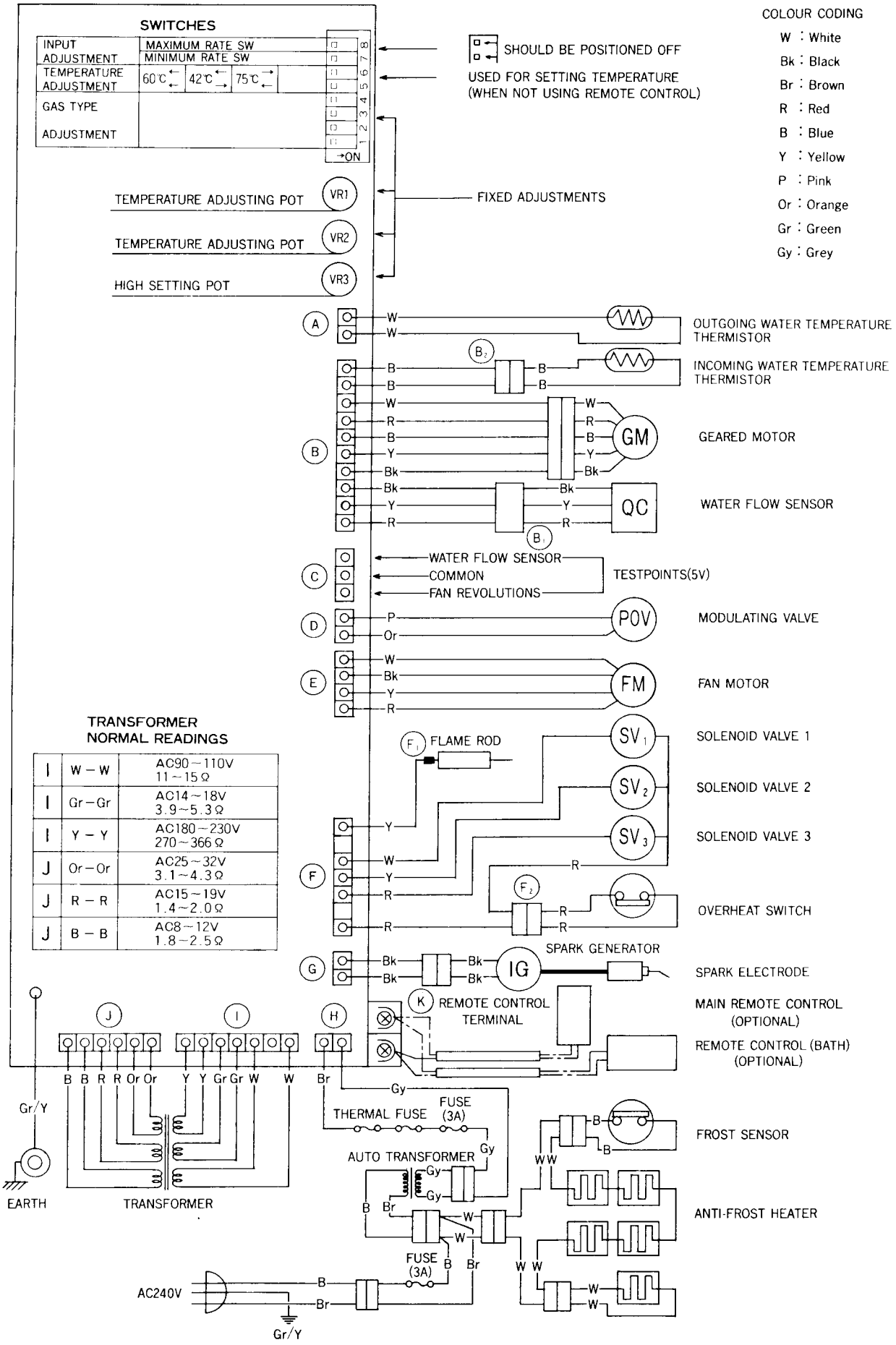
a) With connector connected.

..... DC 12 V is normal.

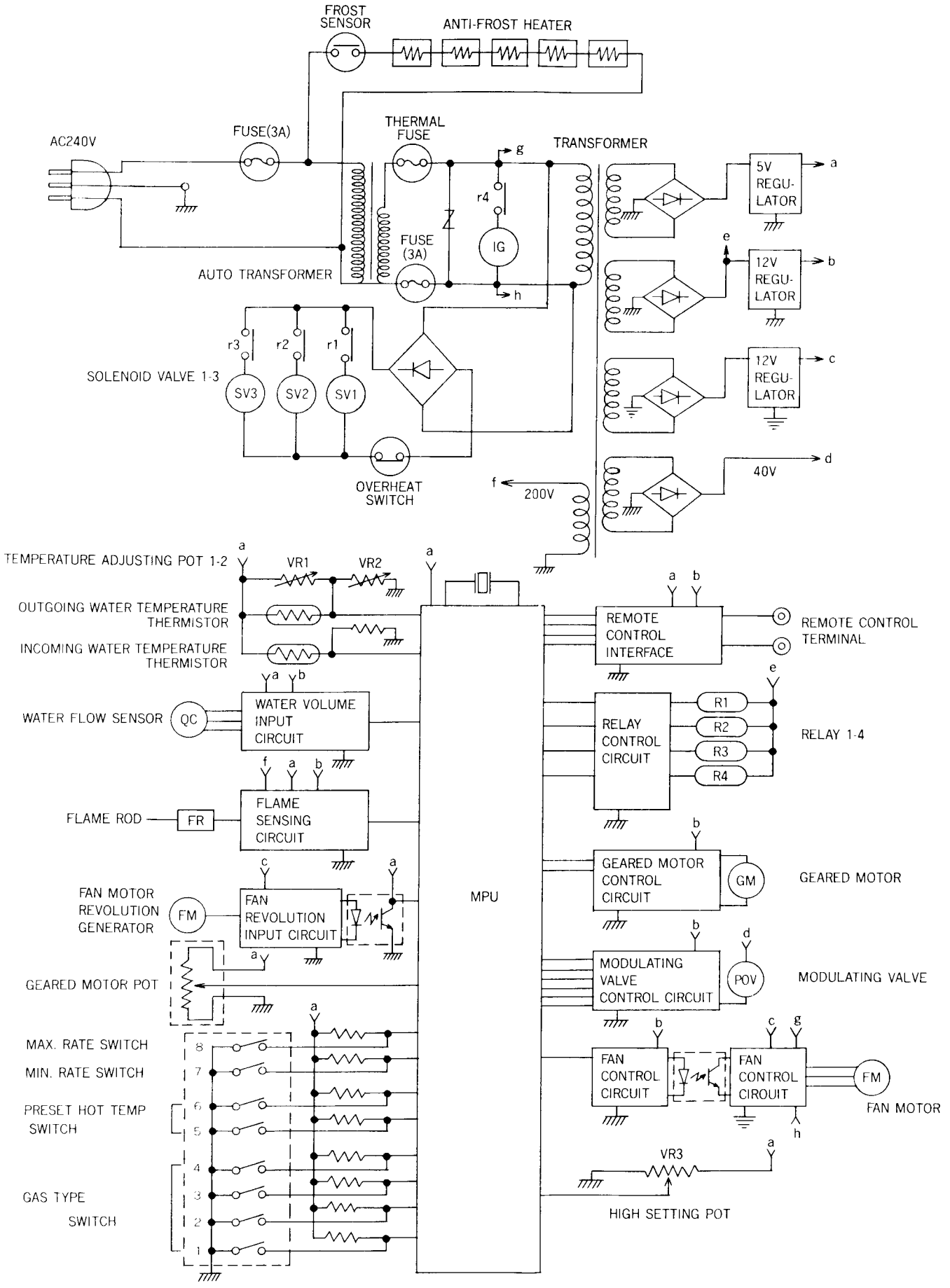
b) With the connector disconnected.

..... 5 kΩ is normal.

WIRING DIAGRAM

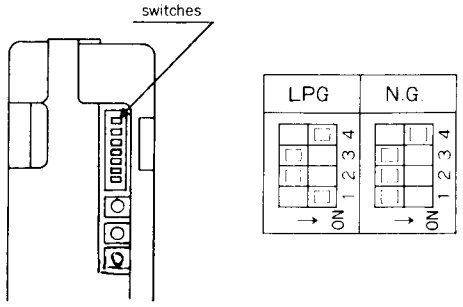


BLOCK DIAGRAM

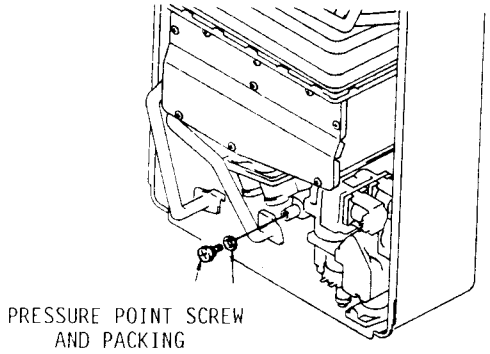


GAS PRESSURE SETTING PROCEDURE

1. Check that the gas selection switches, located at the top section of the P.C.B. are in the correct position; according to the gas type in the area. **Water tap must be open.**



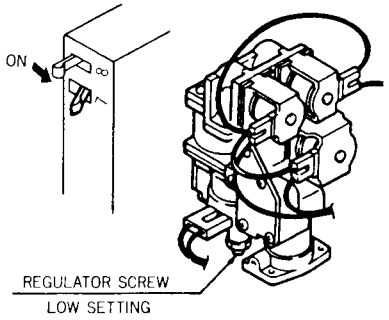
2. Remove the pressure point screw, as shown in the diagram and attach the pressure gauge to the test point. Be careful not to lose the test point screw.



3. Place the No.7 switch in the ON position.

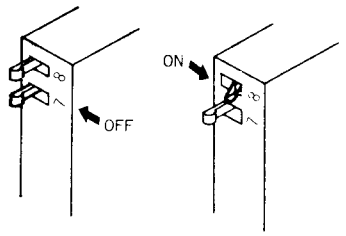
Remove the rubber plug from the bottom panel of the Infinity 20 to enable access to the regulator screw. Adjust the regulator screw accordingly until the required pressure is achieved.

LOW pressure: Natural Gas - 0.10 kPa
L.P.G./Propane - 0.16 kPa



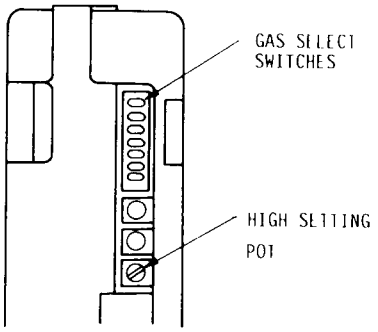
4. Lock the regulator screw after having set the correct LOW pressure requirement.

To adjust HI pressure; place the No.7 switch to the OFF position. Place the No.8 switch to the ON position.



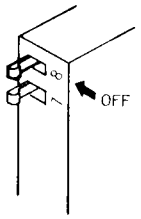
5. Rotate the HI setting potentiometer, located on the P.C.B. to achieve the correct HI pressure setting.

HI pressure: Natural Gas - 0.85 kPa
L.P.G./Prpane - 1.75 kPa



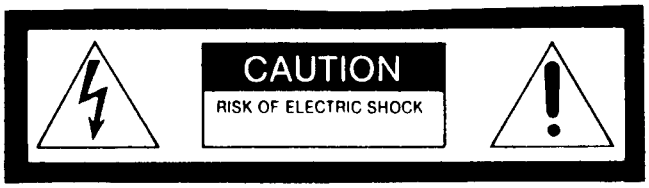
6. After having adjusted the potentiometer to achieve the correct pressure setting, return the No.8 switch to the OFF position.

Remove the pressure gauge, and replace the test point screw.



NOTE: Switches 5, 6, 7, & 8 should be in the OFF position, upon completion of setting the pressure. Only the correct gas selection switch for the area of installation should remain in the ON position.

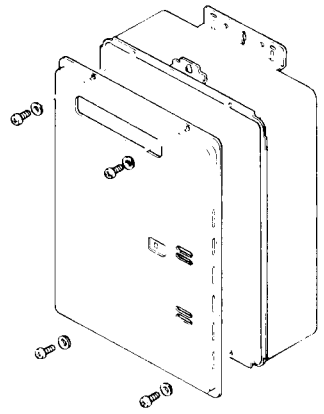
CONVERSION PROCEDURE

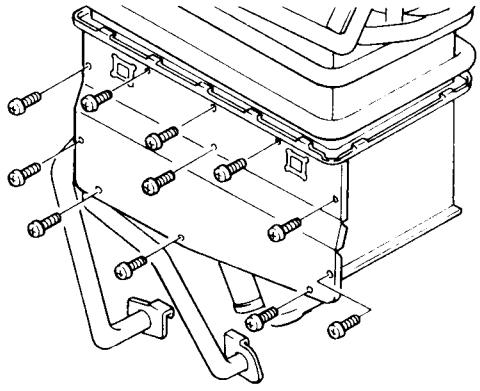


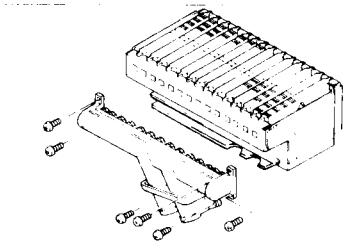
Parts required for:

Propane/LPG - Natural Gas ... main injectors 1.70mm x 14
Natural Gas - Propane/LPG ... main injectors 1.05mm x 14

1. Isolate the gas and electrical supplies, and remove the electrical plug from the wall socket.
2. Remove the front cover. 4 (four) screws.
3. Remove the combustion chamber cover by releasing the 11 (eleven) screws as shown.
4. Undo the 6 (six) screws to release the manifold as shown.
5. Remove 14 (fourteen) injectors.
6. Replace the injectors.
7. Replace the manifold, ensuring that no wires become trapped, and also that the 'O' rings are in position.
8. Replace the combustion chamber cover.
9. Turn on the gas supply. Replace the electrical cord into the wall socket, and switch electricity on.
10. Follow the pressure setting procedure on page 36.
11. Check for gas leaks, in particular around the manifold area. The silicon around the manifold is only required during testing of the appliances at the factory.
12. Identify the gas type on the heat exchanger. Attach appropriate label to casing. Replace the front cover.







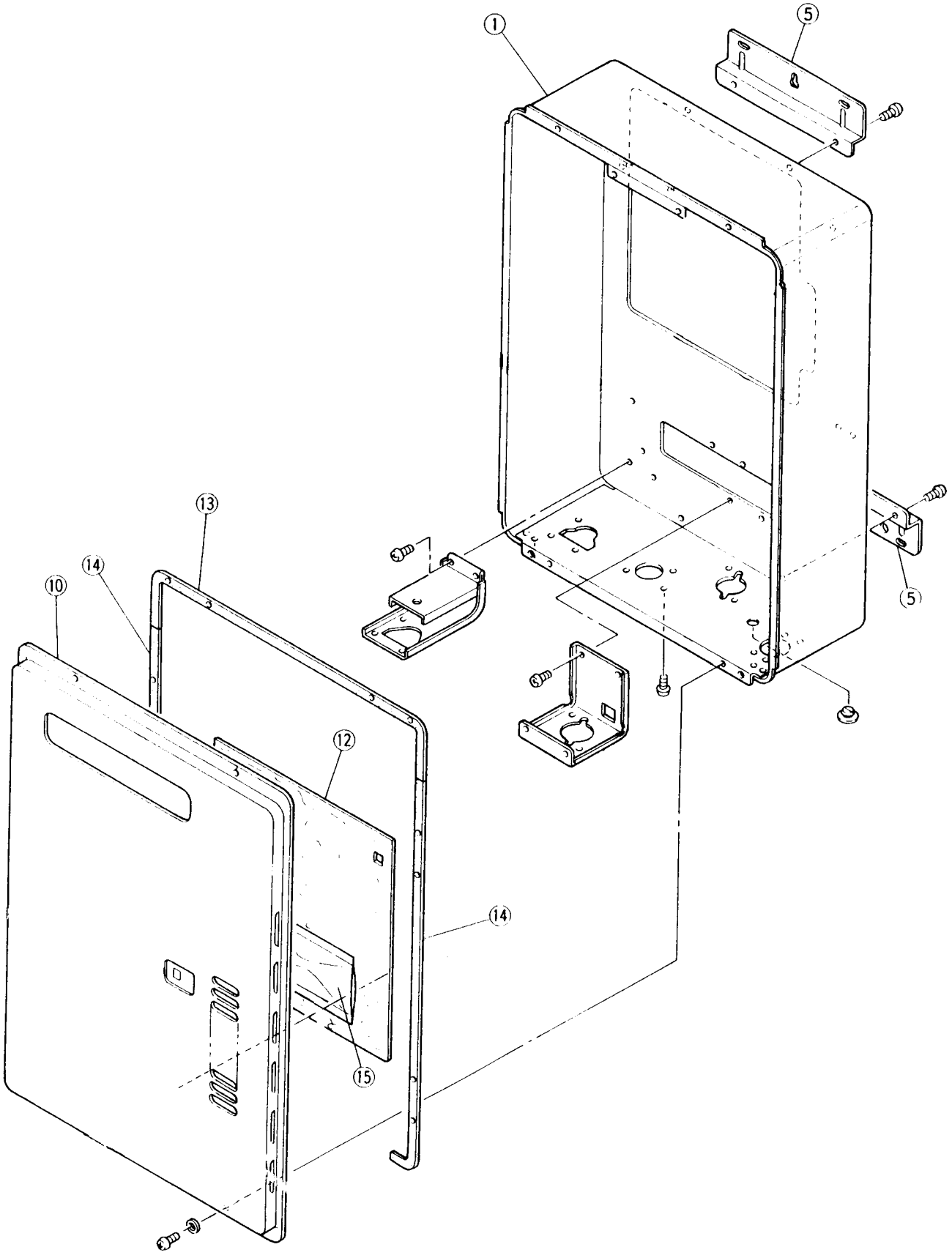
	INJECTOR DIAMETER	HI INPUT TPP	MJ/h	LOW INPUT TPP	MJ/h	FAN SPEED [H_z] MAX	MED	MIN	COMBUSTION CHAMBER PRESSURE mm H_2O
LPG/PROPANE	1.05	1.75	150	0.16	17	300	140	125	MAX 17.8 MIN 3.3
NATURAL	1.70	0.85	160	0.10	17	280	140	130	MAX 15.9 MIN 3.6

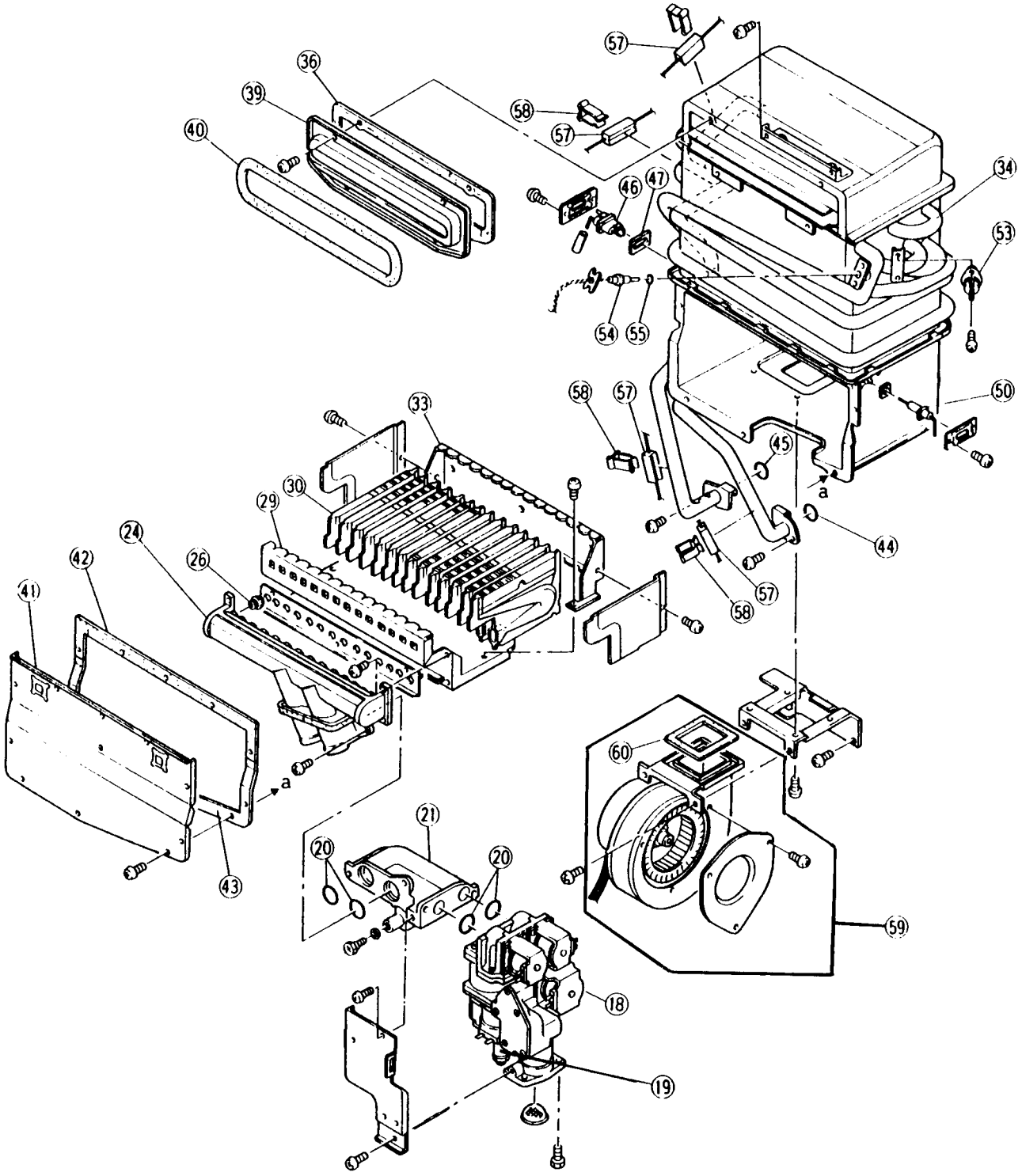
PARTS LIST

Ref	Part Name	RA Part No	RNZ Part No
1	Outer case	92063304	3801
5	Wall mounting bracket	92063312	3802
10	Front panel (ASSY)	92063338	3804
12	Sound buffer	92063346	3805
13	Main body top packing	92063353	3806
14	Main body side packing	92063361	3807
15	Wiring diagram	92063379	3808
18	Double solenoid	92062579	3809
19	Modulating solenoid	92062173	3810
20	Gas valve O ring	92062181	3811
21	Gas connection tube B	92063387	3812
24	Manifold	92063395	3813
26	Injectors N. Gas. x 14 Propane x 14	92062397 92064187	3814 3860
29	Burner case (ASSY)	92063403	3815
30	Individual burner	92063411	3816
33	Burner case rear panel	92063429	3817
34	Heat exchanger (ASSY)	92063437	3818
36	Flue terminal packing	92063445	3819
39	Flue terminal (ASSY)	92063452	3820
40	Front panel packing	92063460	3821
41	Manifold cover	92063478	3822
42	Manifold packing upper	92063486	3823
43	Manifold packing lower	92063494	3824
44	H/Exch inlet O ring	92062199	3825
45	H/Exch outlet O ring	92062207	3826
46	Electrode	92062215	3827
47	Electrode seal packing	92062223	3828
50	Flame rod	92062256	3829
53	Remaining flame safety device [OHS]	92062405	3830

Ref	Part Name	RA Part No	RNZ Part No
54	Outgoing water temperature thermistor	92062231	3831
55	Water use O ring	92062249	3832
57	Anti-frost heater	92063510	3833
59	Fan (Complete ASSY)	92062264	3834
60	Fan connection packing	92063528	3835
63	¾" Gas connection	92063536	3836
64	Gas inlet O ring	92062272	3837
65	½" Water connection	92063544	3838
66	Water filter (ASSY)	92062280	3839
67	Water filter O ring	92063551	3840
69	Water use O ring	92062298	3841
70	Electronic water flow control device	92062306	3842
71	Water rectifier (ASSY)	92063569	3843
72	Water flow sensor O ring	92064328	
73	Water flow sensor	92062314	3844
74	Incoming water temperature thermistor	92062322	3845
75	Thermistor O ring	92062249	3832
77	½" Hot water connection	92063577	3847
78	Pressure relief valve	92062330	3848
79	Pressure relief O ring	92062348	3849
82	P.C.B. (ASSY)	92062363	3850
84	P.C.B. supply transformer	92062355	3851
87	Electronic sparker	92062421	3852
88	High tension lead	92063585	3853
89	Frost sensor switch	92063593	3854
91	Fusible link [Thermal fuse]	92062439	3855
93	Electrical cord	92048206	3856
94	240 x 100 Transformer [AUST] 230 x 100 Transformer [N.Z.]	92062413	 3857
96	Sub control [MC-31-A]	DSC	3858
97	Master control [BC-31-A]	DMC	3859

EXPLODED DIAGRAM

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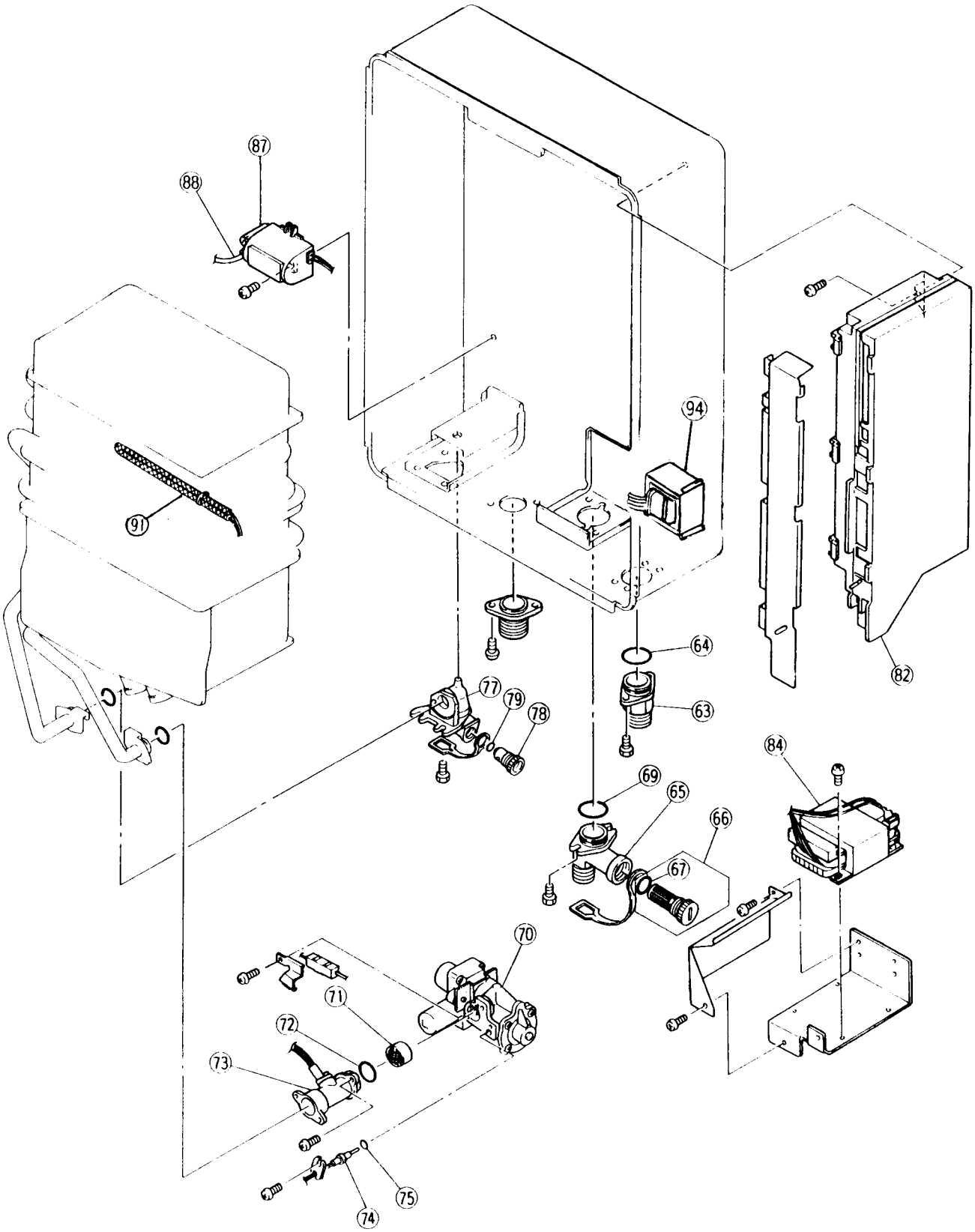
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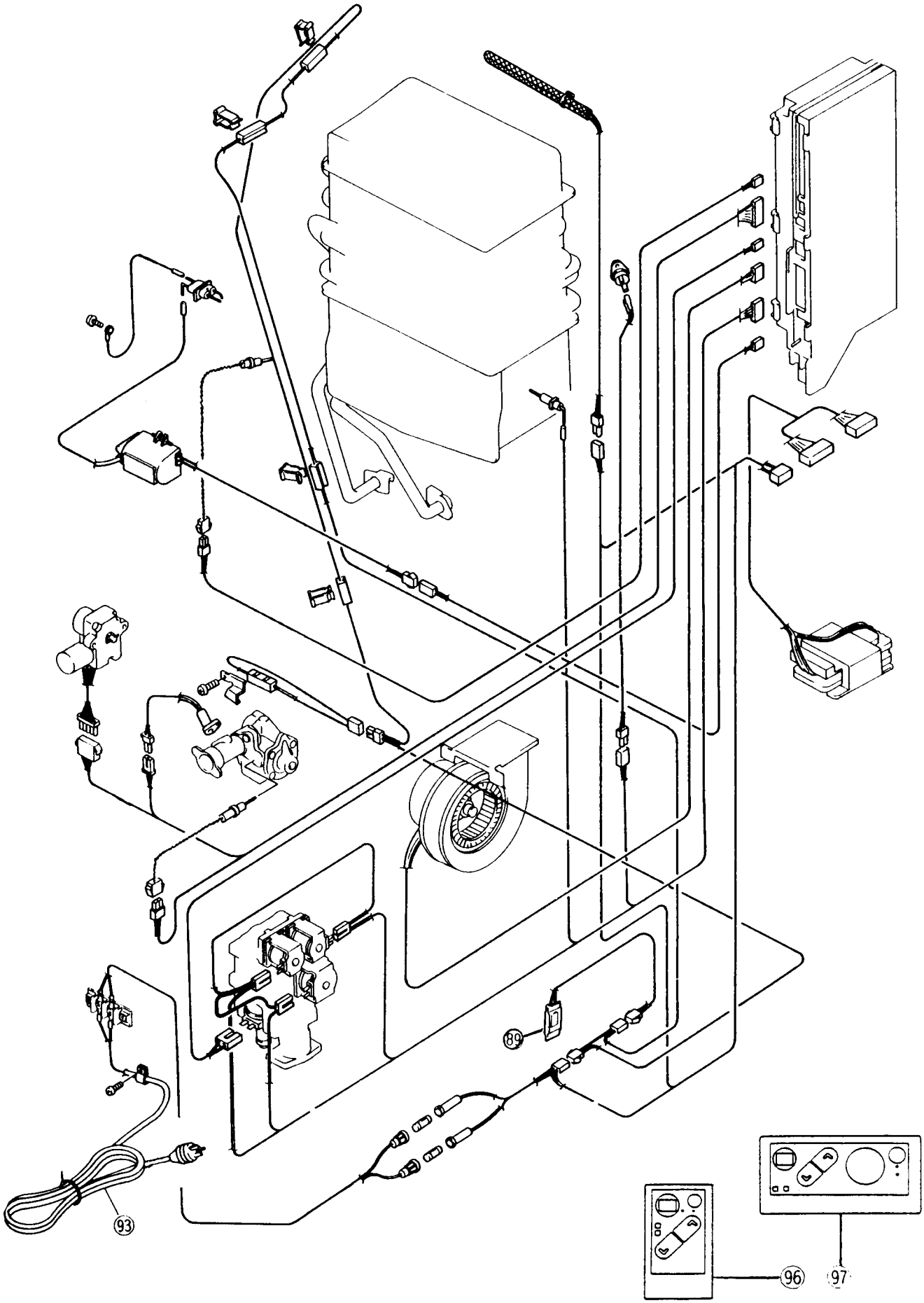
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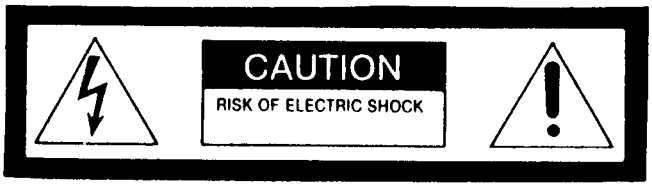
DISMANTLING FOR SERVICE



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

Ie: - Shut OFF gas supply.
- Disconnect power supply from socket.
- Shut OFF the water supply.
- Drain <u>All</u> water from the appliance.

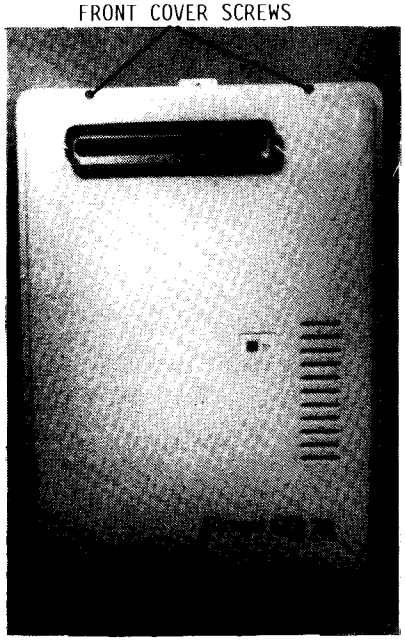
1. Removal of the **Front Cover**
2. Removal of the **Burner**
3. Removal of the **P.C.B. Unit**
4. Removal of the **P.C.B. Supply Transformer**
5. Removal of the **Solenoids**
6. Removal of the **Combustion Fan Assembly**
7. Removal of the **Sparker**
8. Removal of the **Water Flow Sensor**
9. Removal of the **Electronic Water Flow Control Device**
10. Removal of the **Remaining Flame Safety Device**
11. Removal of the **Combustion Chamber (Complete ASSY)**
12. Removal of the **Spark Electrode**
13. Removal of the **Flame Rod**
14. Removal of the **Anti-Frost Circuit**
15. Removal of the **Fusible Link/Thermal Fuse**

1. Removal of the **FRONT COVER.**

CAUTION: 240 VAC exposure. Isolate the power supply to the unit, and reconfirm with a neon screwdriver.

a. Remove 2 x 2 (four) screws located at the top and bottom of the panel.

FRONT COVER SCREWS



FRONT COVER SCREWS

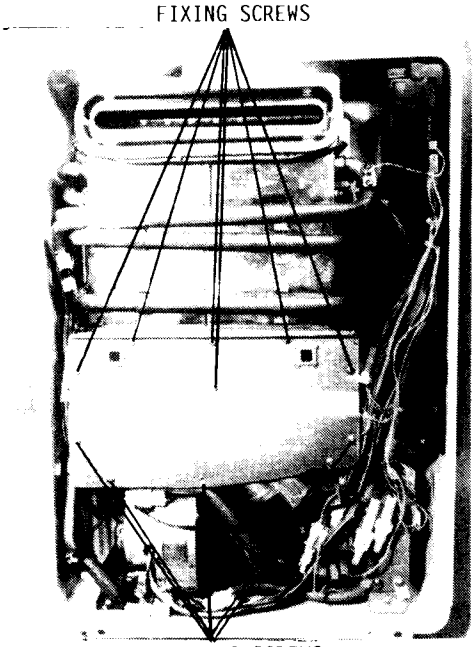
2. Removal of the **BURNER.**

CAUTION: 240 VAC exposure. Isolate the electrical and gas supplies to the unit. Reconfirm with a neon screwdriver.

Follow section **1** first.

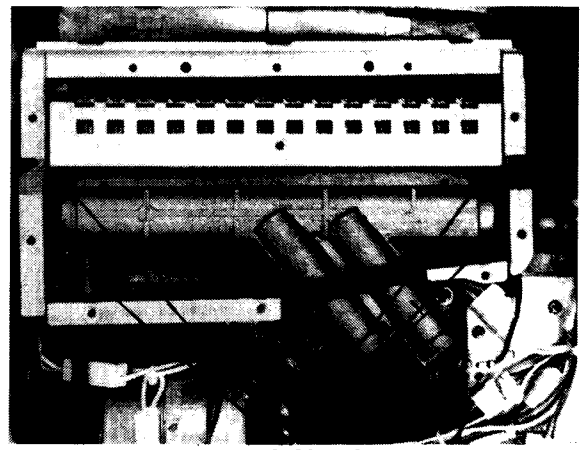
a. Remove combustion chamber cover. 11 (eleven) screws.

FIXING SCREWS



FIXING SCREWS

b. Release the manifold by removing the 6 (six) screws.



FIXING SCREWS

c. Burner is easily removed by lifting forward.

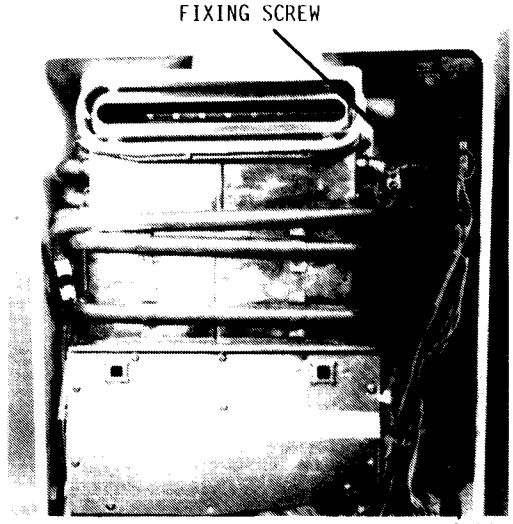
3. Removal of the **P.C.B. UNIT.**

CAUTION: 240 VAC exposure. Isolate the power supply to the unit and reconfirm with a neon screwdriver.

Follow section **1** first.

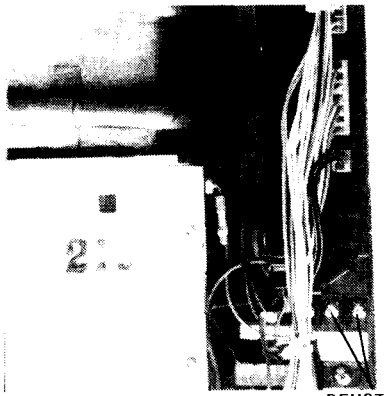
a. Release the plastic P.C.B. case by removing 2 (two) screws.

FIXING SCREW

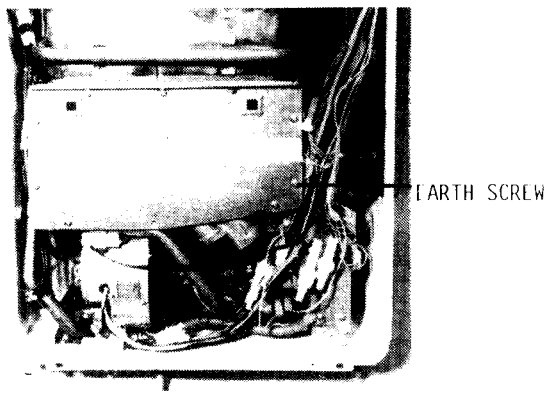


FIXING SCREW

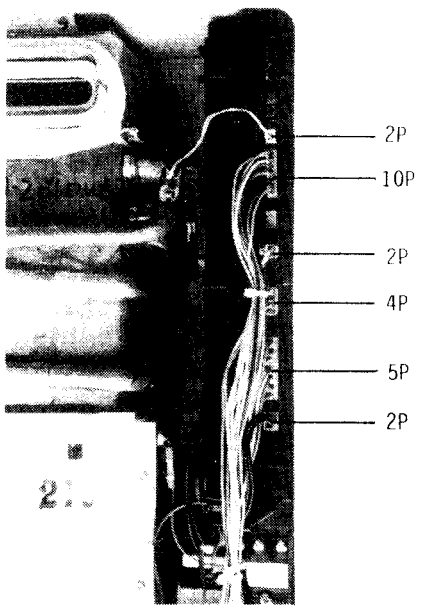
b. Disconnect the remote control connections.



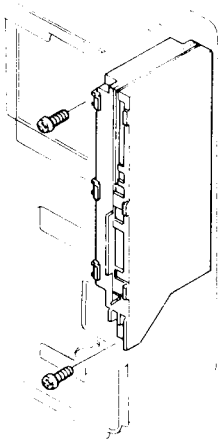
c. Release the P.C.B. earth screw to the manifold.

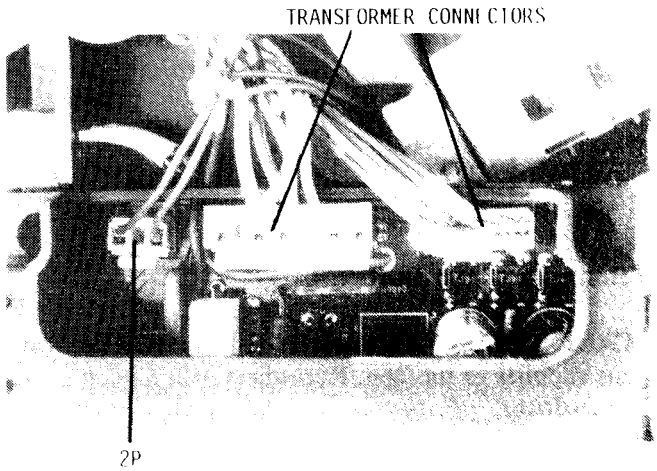


d. Disconnect all visible connectors from the front of the P.C.B. case. 2P (Thermistor); 10P (Water flow control); 2P (Modulating valve); 4P (Fan motor); 5P (Solenoids); 2P (Sparker).



e. The P.C.B. case can now be removed hall way. You should then remove 2P (Brown/Brown) and 2 x P.C.B. supply transformer connectors before the plastic case can be removed in its entirety.



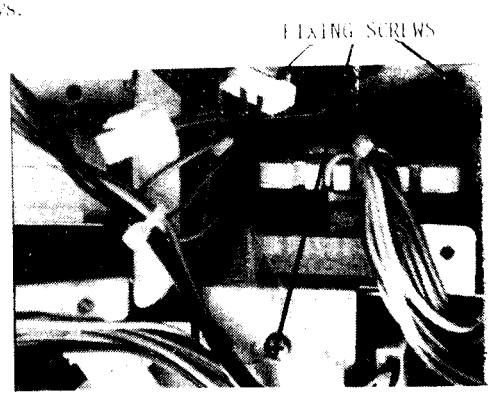


4. Removal of the P.C.B. SUPPLY TRANSFORMER

CAUTION: 240 VAC exposure. Isolate the power supply to the unit and reconfirm with a neon screwdriver.

a. Follow section **3** (a) to (e) first.

b. Remove transformer bracket fixing screws (3 off) screws.



c. The transformer can now be removed from the water heater.

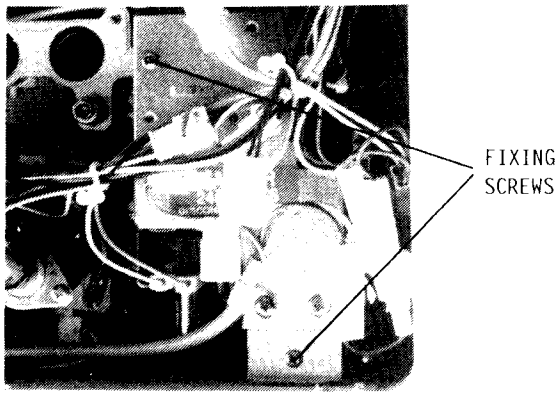
5. Removal of the **SOLENOIDS.**

CAUTION: 240 VAC exposure. Isolate the electrical and gas supplies to the unit and reconfirm with a neon screwdriver.

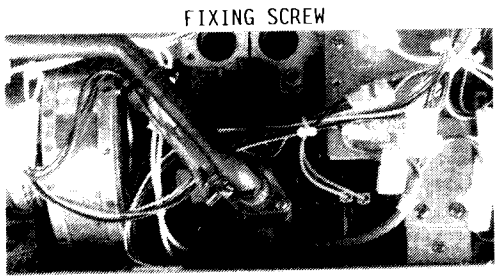
Follow section **1** first.

a. Release manifold. Follow section **2** (a)and (b).

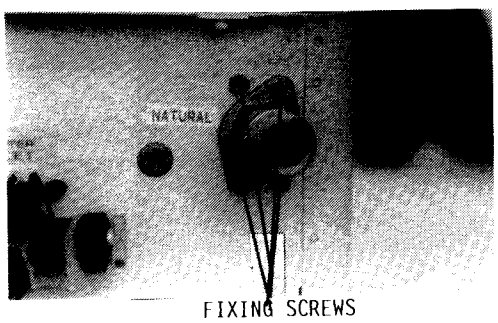
b. Remove gas control bracket. 3 (three) screws.



c. Remove manifold inlet flange fixing screw. 1 (one) screw.



d. Remove gas inlet flange securing screws. 4 (four) screws.



e. Remove connector (Orange/Pink) from modulating valve.

f. Remove connectors from solenoids, 3 (three) points. Be sure that you only pull on the body of the connector and not the wire.

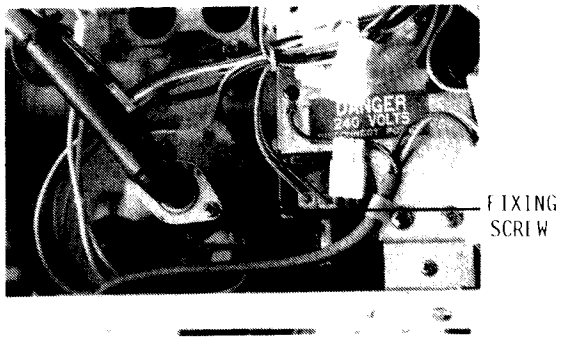
6. Removal of the **COMBUSTION FAN ASSY.**

CAUTION: 240 VAC exposure. Isolate the electrical, gas and water supplies to the unit. Reconfirm with a neon screwdriver. Drain unit.

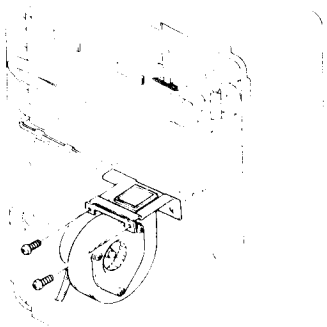
Follow section **1** first.

a. Release 4P connector (W, Bk, Y, R,) from P.C.B.

b. Disconnect water supply connection tube from water flow sensor, 1 screw. Pull forward carefully to release.



c. Remove Fan fixing screws. 2 (two) screws.



d. Fan assembly is removed by pulling forward.

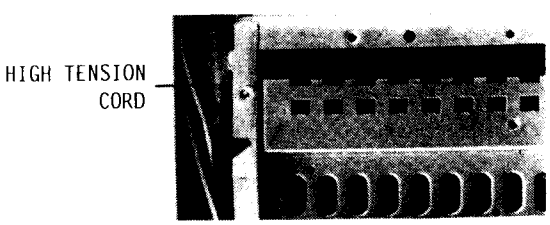
7. Removal of the **SPARKER.**

CAUTION: 240 VAC exposure. Isolate the power supply to the unit and reconfirm with a neon screwdriver.

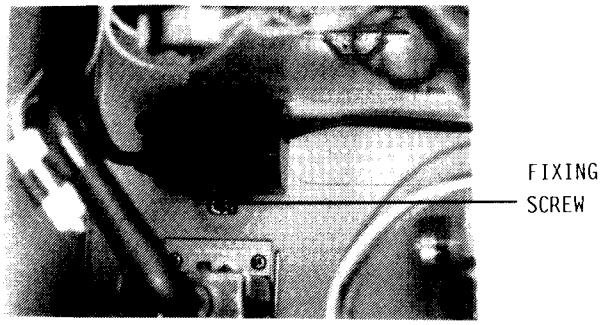
Follow section **1** first.

a. Release 2P connector (Bk/Bk) from the P.C.B.

b. Release high tension cord from the electrode.



c. Remove sparker securing screw. 1 (one) screw.

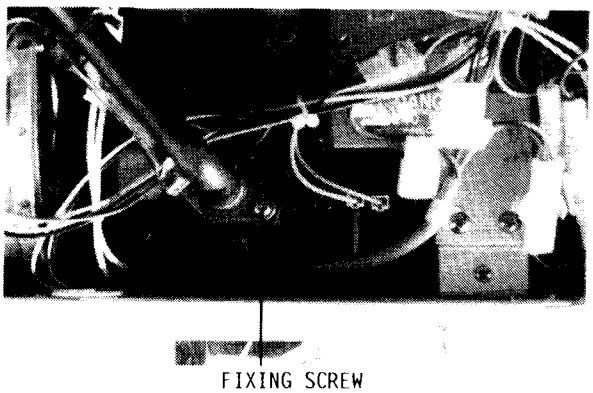


8. Removal of the **WATER FLOW SENSOR.**

CAUTION: 240 VAC exposure. Isolate the water, gas and electrical supplies to the unit. Reconfirm with a neon screwdriver. Drain unit.

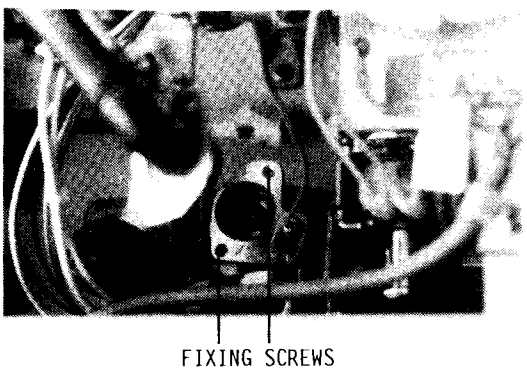
Follow section **1** first.

a. Disconnect the water supply connection tube from the water flow sensor, pull forward carefully to release. 1 (one) screw.



b. Remove the water flow sensor fixing screws. 2 (two) screws.

c. Release the 3P connector relay for P.C.B. The water flow sensor will come forward.



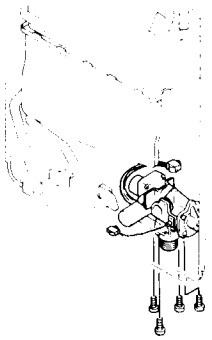
9. Removal of the **ELECTRONIC WATER FLOW CONTROL DEVICE.**

CAUTION: 240 VAC exposure. Isolate the electrical, gas and water supplies to the unit. Reconfirm with a neon screwdriver. Drain unit.

Follow section **1** first.

a. Remove the water flow sensor. Follow section **8** a - c.

b. Remove water inlet flange and water controls fixing screws. 4 (four) screws.



c. Release geared motor 5P [Bk,Y,Bl,R,W]; Incoming water temperature thermistor 2P [Bl,Bl], Automatic frost protection heater 2P [W,W] connectors.

d. Shift water controls forward to release.

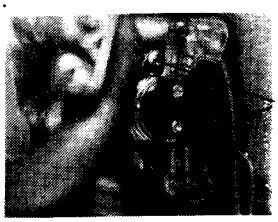
10. Removal of the **REMAINING FLAME SAFETY DEVICE.**

CAUTION: 240 VAC exposure. Isolate the electrical supply to the unit and reconfirm with a neon screwdriver.

Follow section **1** first.

a. Release 2 x wire connections from terminal.

b. Remove remaining flame safety device, 2 (two) screws.



11. Removal of the COMBUSTION CHAMBER COMPLETE ASSEMBLY.

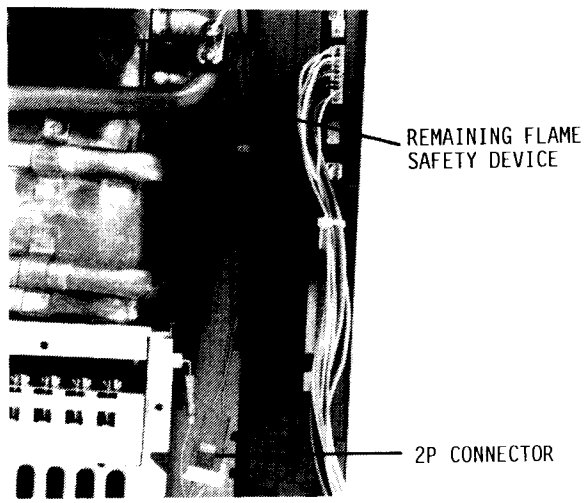
CAUTION: 240 VAC exposure. Isolate the electrical, gas and water supplies to the unit. Reconfirm with a neon screwdriver. Drain unit.

Follow section **1** first.

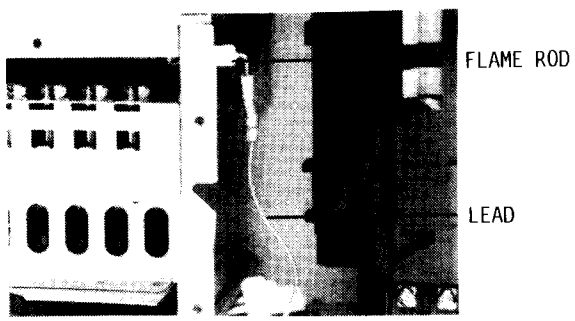
a. Remove Burner. Follow all steps of section **2**.

b. Release outgoing water temperature thermistor connector from P.C.B.

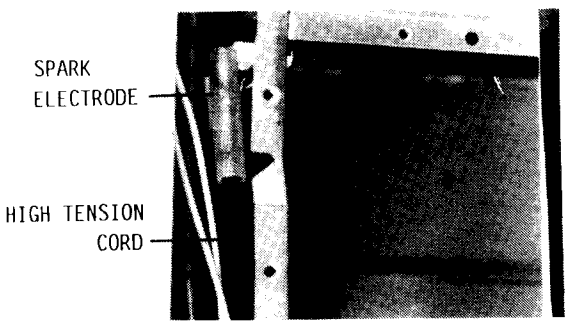
c. Release remaining flame safety device 2P connector (Red/Red).



d. Disconnect yellow lead connector from flame rod.



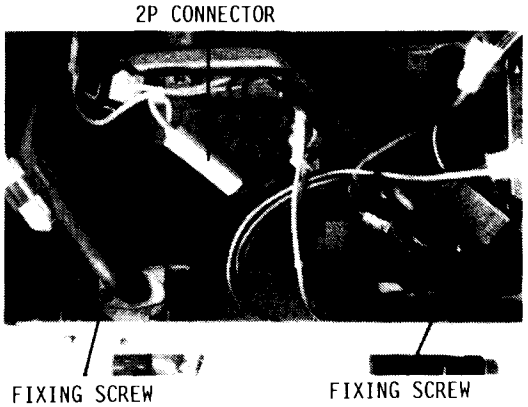
e. Disconnect high tension cord from the electrode.



f. Remove anti-frost circuit 2P connector. (White/White).

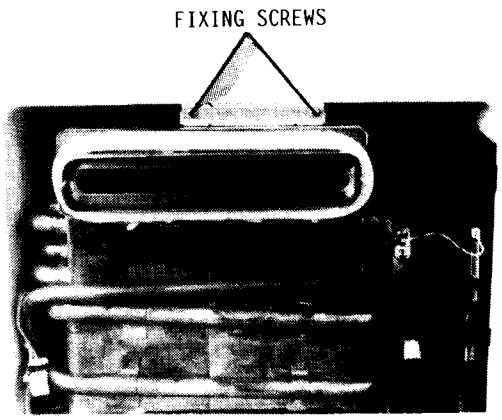
g. Release water supply connecting tube between heat exchanger and water flow sensor 1 (one) screw.

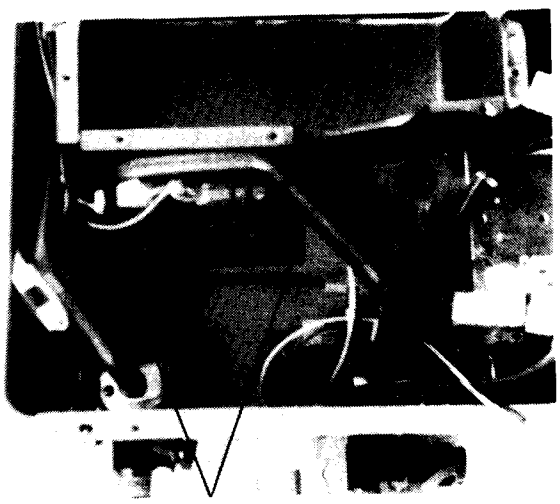
h. Release connecting tube from heat exchanger at hot water outlet.



j. Remove the combustion fan assembly. See section **6**.

k. Remove combustion chamber assembly fixing screws. 4 (four) screws.





l. Combustion chamber and heat exchanger can now be lifted forward and out of the unit.

12. Removal of the **SPARK ELECTRODE.**

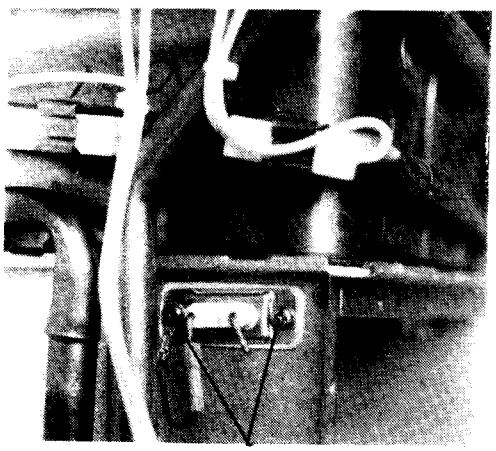
CAUTION: 240 VAC exposure. Isolate the electrical, gas and water supplies to the unit and reconfirm with a neon screwdriver. Drain unit.

Follow section **1** first.

a. Remove combustion chamber complete assembly, see section 11.

b. Release electrode fixing panel on the side of the heat exchanger.

The seals on the electrode and flame rod should be replaced if they are damaged during removal.



FIXING SCREWS

13. Removal of the **FLAME ROD.**

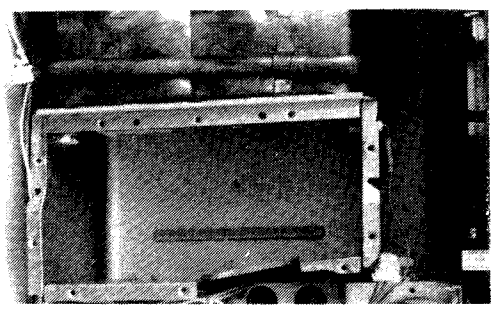
CAUTION: 240 VAC exposure. Isolate the electrical, gas and water supplies to the unit. Reconfirm with a neon screwdriver. Drain unit.

Follow section **1** first.

a. Remove PCB unit. See section **3.**

b. Release flame rod clip. 2 (two) screws, using a stubby screwdriver. It is not necessary to remove the burner assembly.

FIXING SCREWS



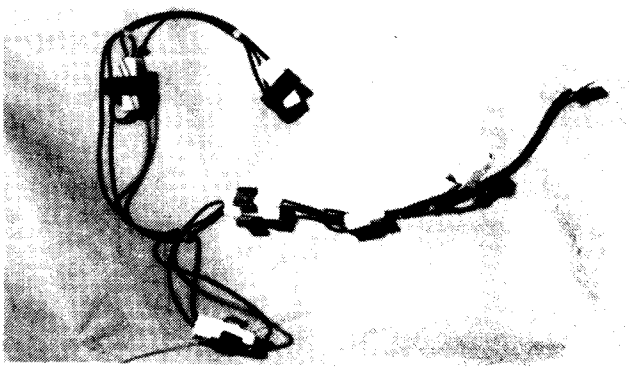
14. Removal of the **ANTI-FROST CIRCUIT.**

CAUTION: 240 VAC exposure. Isolate the electrical, gas and water supplies to the unit. Reconfirm with a neon screwdriver. Drain unit.

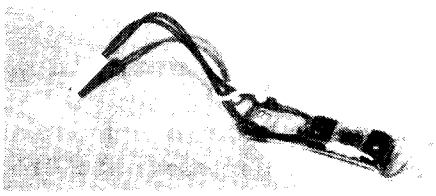
Follow section **1** first.

a. Remove combustion chamber complete assembly, see section **11.**

b. Release the anti-frost circuit heaters by pulling them off the pipe work very gently.



c. Release the frost sensor switch.



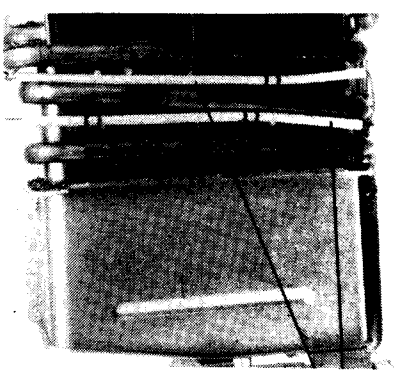
15. Removal of the **FUSIBLE LINK.**

CAUTION: 240 VAC exposure. Isolate the electrical, gas and water supplies to the unit. Reconfirm with a neon screwdriver. Drain unit.

Follow section **1** first.

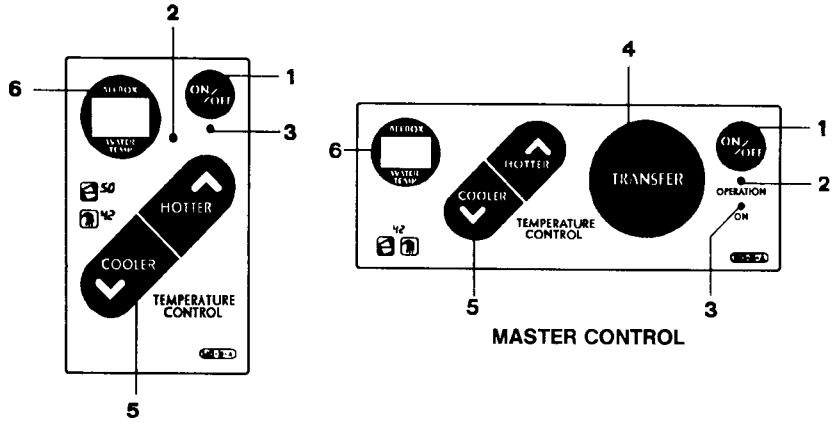
a. Remove the combustion chamber complete Assembly, see section **11.**

b. The fusible link is situated on the rear of the heat exchanger and is secured by clips.



FUSIBLE LINK

REMOTE CONTROL LAYOUT



Number	Control	Function
1	ON/OFF	Power switch to operate Infinity 20 hot water service.
2	COMBUSTION INDICATOR	Indicates that a hot water tap is open in any location, while the Infinity 20 has been turned ON and is operating.
3	ON INDICATOR	Indicates which Remote Control is in control of adjusting the water temperature selection.
4	TRANSFER	Alternates the control of temperature selection between Master and Sub Controls.
5	THERMOSTAT CONTROL	Adjusts the temperature selection in 16 steps from 35°C to 75°C. Selected temperatures are stored in the system memory.
6	DIGITAL MONITOR	Indicates the temperature which has been selected. Error Code flashes in the event of a fault.

TURNING THE INFINITY 20 ON

■ **TO TURN YOUR INFINITY 20 ON.**

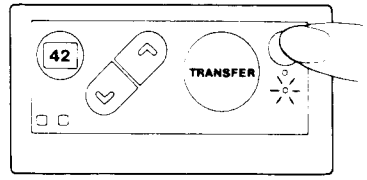
Simply press the ON/OFF button on either Control.

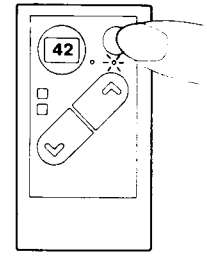
The ON indicator will glow on the Control which you have operated. This indicates that the Infinity 20 is ready to supply hot water as soon as a tap is opened.

To operate the Infinity 20 simply turn any hot water tap on. This will automatically light the burner providing hot water at the temperature displayed on the Digital Monitor.

After installation, and when the ON/OFF button is first pushed, 42°C will be displayed on the Digital Monitor.
This is a safety feature. Thus even if the shower is used without first adjusting the temperature the hot water will be at a safe temperature.

Master Control





Sub Control

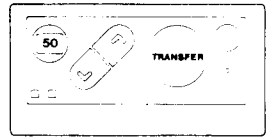
ADJUSTING TEMPERATURE

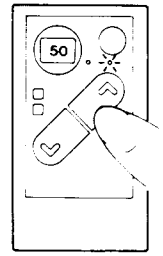
■ **TO INCREASE OR DECREASE THE WATER TEMPERATURE.**

The temperature can only be adjusted on the Remote Control where the ON indicator is glowing, and the same temperature will be displayed on both Controls.

Simply press the HOTTER △ or COOLER ▽ button until the required temperature is displayed on the Digital Monitor.

When any hot water tap is turned on, hot water will be supplied at the temperature displayed on the Digital Monitor.





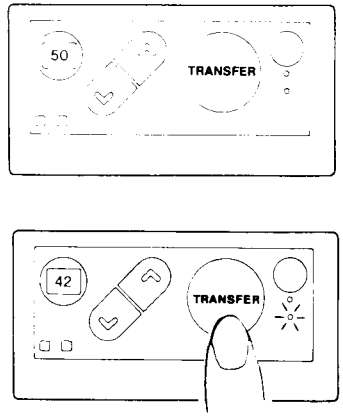
CHECK WATER TEMPERATURE BEFORE ENTERING SHOWER OR BATH

TRANSFERRING PRIORITY OF TEMPERATURE SELECTION

■ To Transfer priority of water temperature selection to the Master Control, simply press the TRANSFER button on the Master Control.

The ON indicator on the Master Control will glow to indicate that priority of water temperature selection has been transferred to the Master Control.

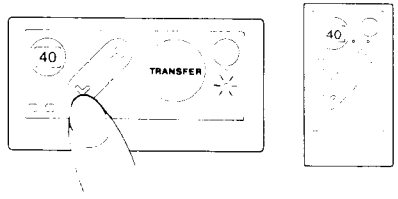
After having transferred the priority of water temperature selection, 42°C will be displayed on the Digital Monitor.



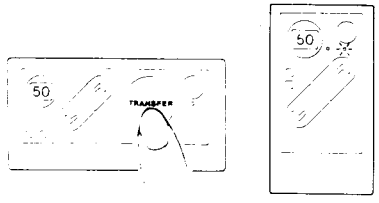
■ The water temperature can now be selected using the Master Control.

Once the desired water temperature is selected, the Remote Control will store it in the system memory until the temperature is changed or the mains power supply is turned off.

You can alternate priority of water temperature selection between the Master and Sub Controls, without erasing the individually stored temperatures from the system memory.



■ To Transfer priority of water temperature selection back to the Sub Control, simply press the TRANSFER button again. The temperature displayed will then return to the temperature which was previously selected at the Sub Control, and the ON indicator will glow to indicate priority control of water temperature selection.



Master Control

TURNING THE INFINITY 20 OFF

■ **TO TURN YOUR INFINITY 20 OFF**

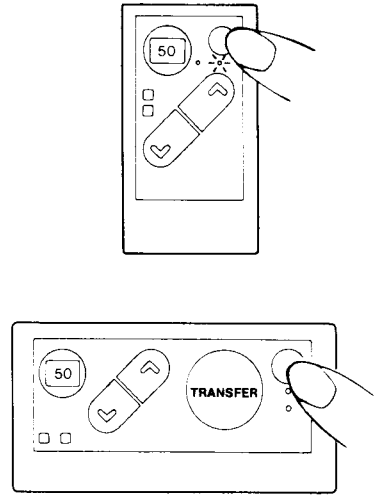
Simply press the ON/OFF button on either Remote Control.

This will shut the Infinity 20 down completely.

If hot water taps are opened when the Infinity 20 is OFF, cold water will flow from the taps.

Selected temperatures are retained in the system memory, even when the Remote Controls have been turned OFF.

When the Controls are turned ON again, the previously selected temperatures will be displayed on the Digital Monitor.

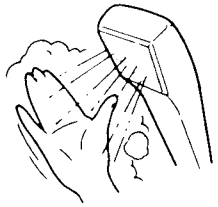


NOTE:

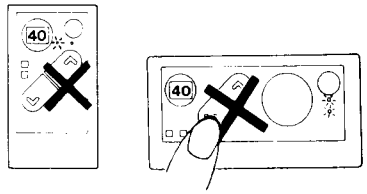
It is recommended that during long periods of non-use, the system be switched off at the Remote Controls.

SAFETY POINTS

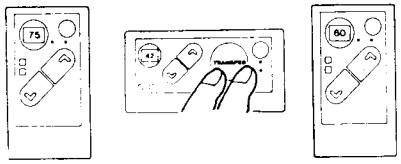
ALWAYS CHECK WATER TEMPERATURE BY HAND BEFORE ENTERING THE SHOWER OR BATH.



NEVER CHANGE WATER TEMPERATURES OR OPERATE THE REMOTE CONTROLS WHILE SOMEONE ELSE IS IN THE SHOWER.

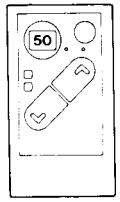


If 75°C has been selected at the Sub Control and then priority of temperature selection is transferred to the Master Control and back again, the temperature on the Sub Control will drop to 60°C. This is a safety feature.



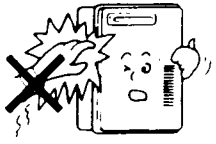
Do not push the ON/OFF button on the Sub Control after having transferred priority of temperature selection to the Master Control.

Turn OFF then ON.



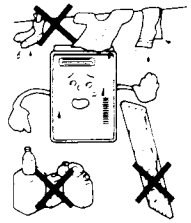
WARNING
This procedure could cause sudden changes in water temperature.

Do not touch the flue outlet when the Infinity 20 is in operation.



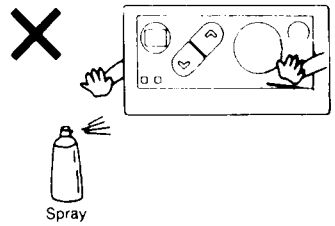
On cold days steam may be discharged from the flue outlet, this is normal with a high efficiency appliance and does not indicate a fault.

Keep flammable materials, trees, shrubs etc. away from the Infinity 20.



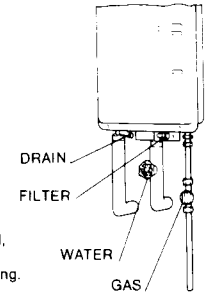
IMPORTANT POINTS

Do not clean Remote Controls with solvents. Use a soft damp cloth.



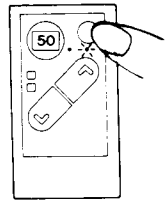
If the Infinity 20 is disconnected from the power supply and freezing conditions are expected, turn off water and gas, and drain all water from the appliance.

Water Off
↓
Gas Off
↓
Drain Water

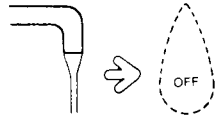


If the power is connected, the automatic frost protection prevents freezing.

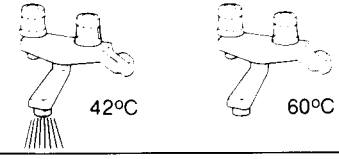
There is no need to turn the Infinity 20 off at the Remote Controls after use. However, if you prefer to turn the Controls off, selected temperatures will be stored in the system memory at all times while mains power remains connected.



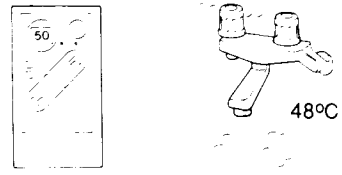
Water flow needs to be more than 2.5L/min. to operate the Infinity 20. Hot water temperature may vary at low water flows or the Infinity 20 may go out without warning.



The Infinity 20 controls the water temperature automatically. To do this it sometimes needs to change the water flow accordingly. The water flow from the hot water tap may vary when the selected temperatures on the Remote Controls are adjusted. The water flow may also vary from summer to winter, as incoming water temperatures differ.



Depending on the weather conditions and the length of the pipe between the Infinity 20 and the tap in use, there may be some variation between the temperatures displayed at the Remote Control and the temperature of the water at the tap.



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May 1992 2nd edition [Abridged version]

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ALL WIRING INSIDE THIS APPLIANCE MAY BE AT 240 VOLTS POTENTIAL.

ALL SERVICE WORK MUST BE CARRIED OUT BY AN AUTHORISED PERSON.

DO NOT TEST FOR GAS ESCAPES WITH AN OPEN FLAME.

This manual has been compiled by the Rinnai Australia Research and Development Department. The department would like to extend an invitation to users of this manual to contact them with any comments that you wish to make. Your comments would be greatly appreciated and may lead to improved content in the future. Rinnai are constantly working toward supplying improved appliances as well as information, therefore specifications may be subject to alteration at any time.

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