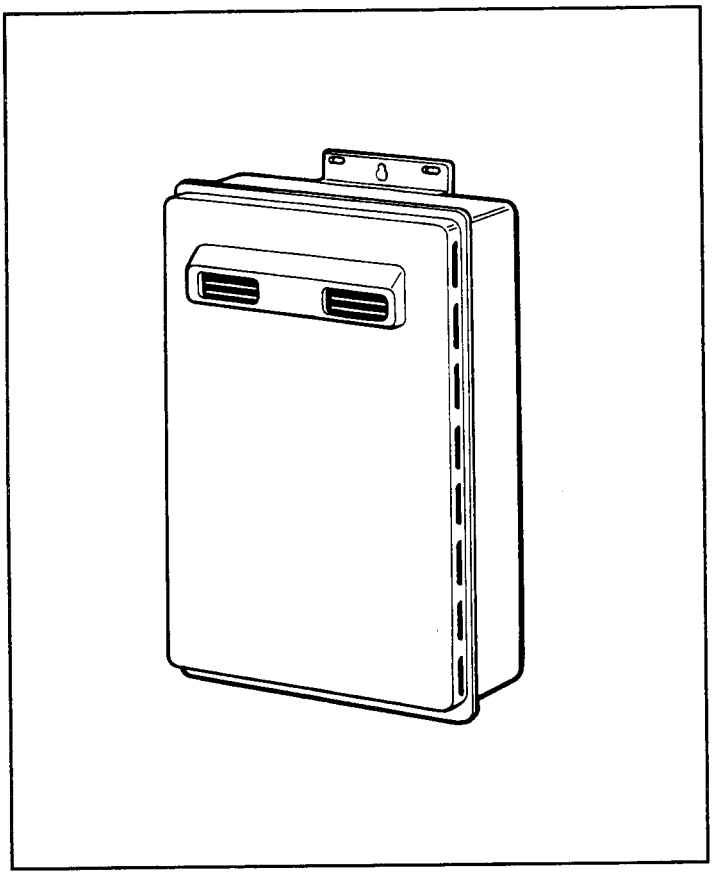
Rinnai

INFINITY

Model - REU-24 W-A



SERVICE MANUAL

WARNING

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 Technical Services Department. While many individuals have contributed to this publication, it will be successful only if you - the reader and customer - find it useful. The department would like to extend an invitation to users of this manual to make contact with us, as your feedback and suggestions are valuable resources for us to include as improvements. Rinnai are constantly working toward supplying improved appliances as well as information, therefore specifications may be subject to alteration at any time.

CONTENTS

DEVELOPMENT BACKGROUND

The REU-24 W-A is one of a range of continuous flow water heaters produced by Rinnai. The main features of this unit are: compact size, low NO, combustion, high efficiency, and remote temperature control. **Rinnai's** patented 'DECS' combustion system has allowed for the volume of the heat exchanger to be reduced by 75% compared with conventional instantaneous water heaters.

CHARACTERISTICS

Low Noise

Incorporation of the 49 dB(A) low noise design in the Infinity 24 allows for installation in crowded or high density residential areas.

Convenience

Wide proportional temperature control of the hot water from 2.2 to 21 litres per minute, ensures hot water at a suitable temperature throughout all seasons is selectable. Control of the water temperature while on the rise to a particular preset temperature with the feedforward and feedback control system prevents overheated water being supplied if the water heater is turned ON and OFF repeatedly.

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 used 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 mis-connection. 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 24 will be shut down by the P.C.B. or directly by the safety devices. In winter, the automatically operated anti-frost protection heaters ensure that the water in the appliance does not freeze up.

Economy

Direct ignition to the main burner 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 high efficiency.

Conventional water heaters supply water at high temperatures. This means that the pipework in the house is also very hot. Hot pipes lose more heat than cooler pipes. With the Infinity 24, the water in the house pipes can be kept much cooler, reducing heat loss and thus effectively saving energy.

INTRODUCTION

The front cover of the appliance is formed from 0.6 mm 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 rear of the main box. The general layout of components is shown on the cut-away diagram on page 8. All components are supported within a box formed from 0.8 mm coated steel.

The heat exchanger occupies the top section of the box, and the burner is attached directly to the heat exchanger.

The air for combustion is supplied by a fan which is connected directly to the burner assembly.

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 through a stainless steel nozzle situated on the front of the appliance, at the top.

The burner body is diecast aluminium, and the ports are formed in a ceramic [Cordierite] plaque. A two chamber manifold supplies gas to the burner. Two brass orifices are situated in the inlet of the manifold.

There are three thermistors - one fitted within the electronic water flow control device, checking the incoming water temperature - part of the feedforward information; another fitted to the outlet of the heat exchanger, checking the temperature of the water as it leaves the heat exchanger; and a third situated at the outlet of the unit, checking the outgoing water temperature. The Infinity 24 relies on feedforward and feedback information to operate effectively. See page 9 for further explaination about how this control function operates.

The aim of this manual is to provide an operational reference **specifically** concerning the Infinity REU-24 W-A water heater. A glossary of abbreviations is provided on page 4, to assist you in understanding some of the language used throughout this manual. Further information about this product is contained in the customers operation information booklet.

SAFETY DEVICES

Flame Failure

Situated on both sides of the burner, the flame rods monitor normal combustion, preventing any discharge of gas to the burner if there is no flame and in conjunction with the P.C.B., isolate the gas.

Remaining Flame Safety Device

If the flame remains on the burner after the tap is closed, and the water temperature inside the heat exchanger reaches 200°C, a DC 90 volt bi-metal cut-off switch isolates the gas to the solenoids.

Boiling Protection

The heat exchanger outlet 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 incoming water flow 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

Is located on the internal rear of the casing. If the heat exchanger bums out, or the temperature outside it reaches 152°C, this device isolates the gas supply, and shuts down the unit completely.

Pressure Relief Valve

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

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 adjusted accordingly.

Automatic Frost Protection

When the outdoor temperature drops below 3.5°C, the frost sensing device is activated, and the anti-frost heaters prevent the water in the appliance from freezing. These anti-frost heaters remain ON until the outdoor temperature rises to 11 .5°C. There are 5 anti-frost heaters located at various points in the appliance. The anti-frost protection device will prevent freezing down to -20°C in a no wind situation, and -15°C in a windy situation.

Water Bypass Distributor

Water at 60°C from the heat exchanger is mixed with cold water via the bypass system when the preset temperature selected at the remote controls is less than 60°C.

Thermocouple

A thermocouple situated on the right hand side of the burner continually monitors combustion by checking the tile temperature. Information is fed back to the P.C.B., which adjusts the air/gas ratio if necessary.

GLOSSARY of ABBREVIATIONS

This glossary of terms is provided to assist you in understanding some of the language used throughout this manual.

dB(A)	-	sound pressure level in decibels, "A" range.
DC	-	direct current.
DECS	-	direct exchange combustion system.
EWFCD	-	electronic water flow control device.
FB	-	feedback information.
FF	-	feedforward information.
Hz	-	Hertz.
IC	-	integrated circuit.
kcal/h	-	kilocalorie per hour.
kPa	-	kilopascals.
L/min	-	Litres per minute.
LED	-	light emiting diode.
mA	-	milliamps.
MJ/h	-	megajoule per hour.
mm	-	millimetres.
mmH_2O	-	millimetters of water (Gauge pressure).
NO,	-	oxides of nitrogen (NO & NO_2).
OHS	-	over heat switch.
P.C.B.	-	printed circuit board.
POT	-	potentiometer.
rpm	-	revolutions per minute.
sv	-	solenoid valve.
TE	-	thermal efficiency.
TIN	-	temperature of incoming water.
TOUT	-	temperature of outgoing water.

SPECIFICATION

Type of appliance	Temperature controlled continuous gas hot water system.	
Exhaust system	Forced combustion.	
Rinnai Australia model N°	REU-24W-A	
Installation	Externally mounted.	
Operation	Remote control, mounted in kitchen and/or bathroom.	
Dimensions	Width - 370 mm. Height - 538 mm. Depth - 210 mm. I With bracket and flue extension]	
Weight	20 kilograms.	
Connections	Gas supply - R ¾ / 20A. Cold water supply - R ¾ / 20A. Hot water supply - R ¾ / 20A.	
Ignition system	Direct electronic ignition.	
Gas consumption	Natural gas - 185 MJ/h HI, 21 MJ/h LOW.	
Electrical consumption	Normal - 72 Watts. Standby - 8 Watts. Automatic frost protection - 144Watts.	
Hot water capacity	2.2 to 24 L/min. [Raised 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 - 2301240 Volts 50 I-Ix. Remote control - DC 12 Volts Digital.	
Safety devices	Flame failure - Flame rod.	
	Remaining flame [OHS] - 200°C bi-metal switch.	
	Boiling protection - 105°C lockout thermistor.	
	Fusible link - 152°C thermal fuse.	
	Burner light back - 135°C bi-metal switch.	
	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.	

COMBUSTION SPECIFICATION

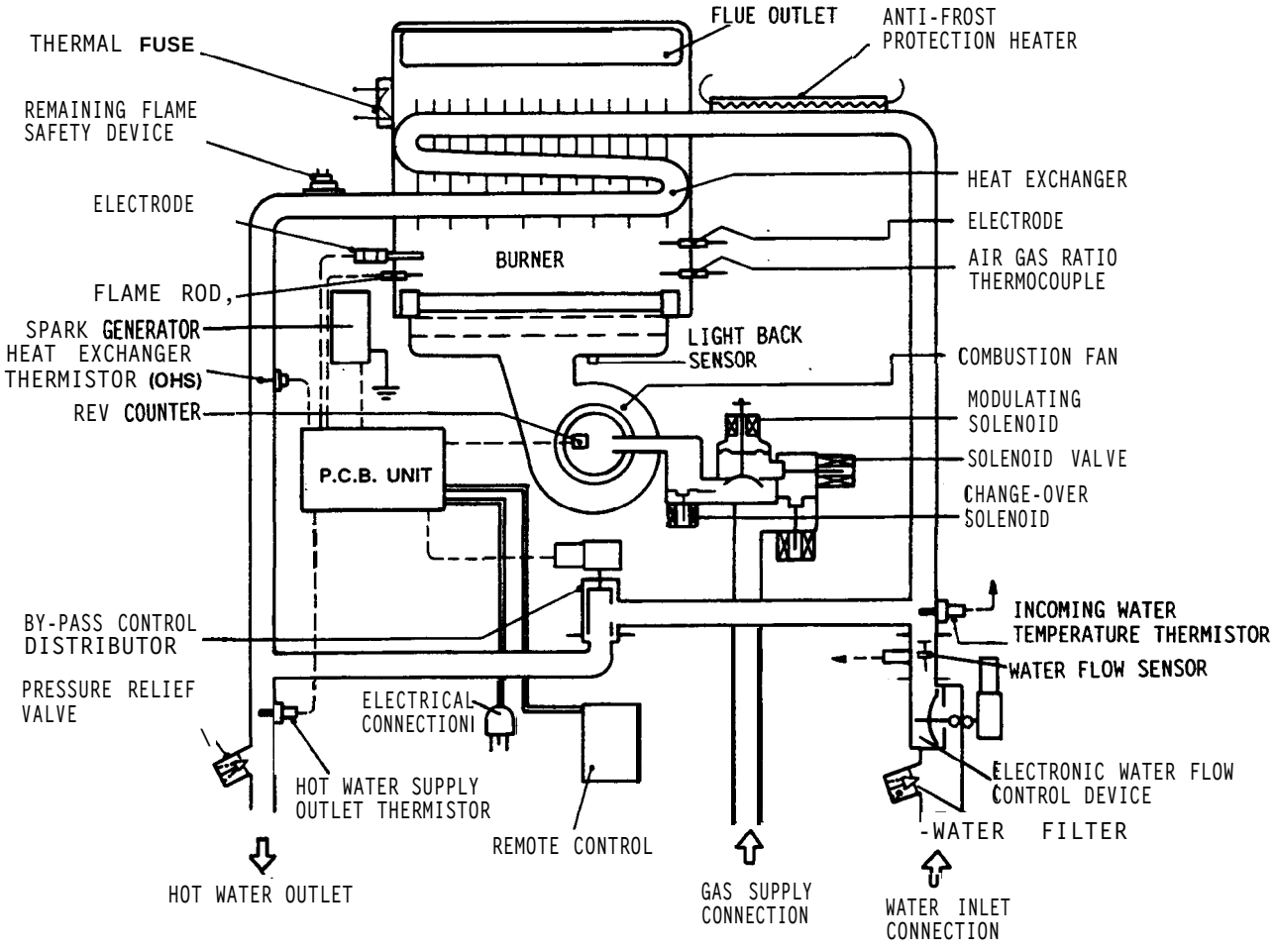
The **REU-24** W-A **is only approved for use on Natural gas.**

Consumption [kcal/h]	Input [MJ/h]	Orifice A [mm]	Orifice B [mm]	Gas type selection switch positions *
44,000	185	0 5.0	0 5.2	1 2 3 4 5 OFF ON OFF OFF OFF

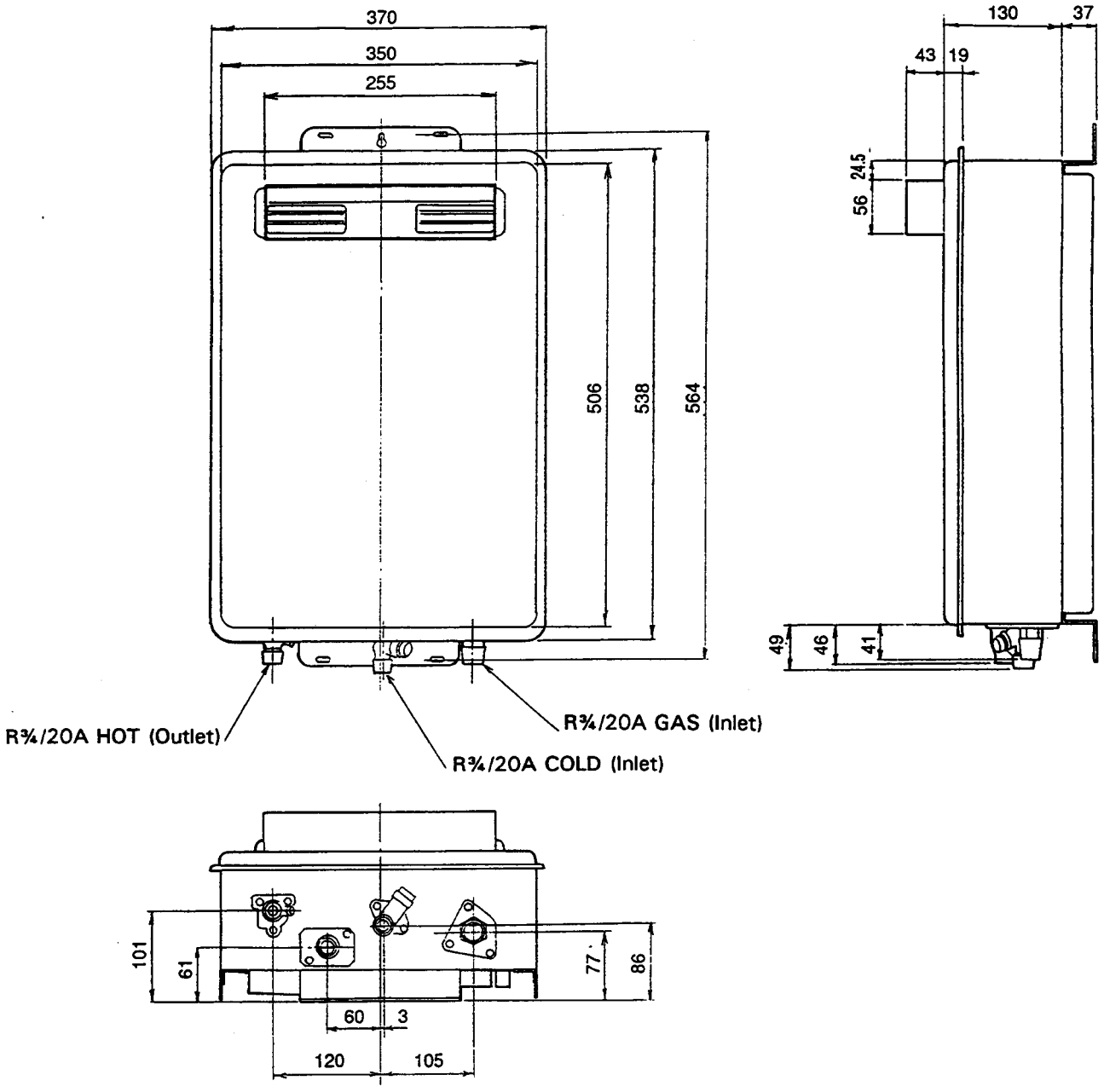
*** Down position = ON, Up position = OFF. See page 34 for further details.**

	Test Point Pressure [kPa]	Modulating valve current [mA]	Fan speed HZ
Maximum	**0.70**	**158 ± 5**	**128 ± 2**
Minimum	**0.04**	**55 ± 5**	**67.5 ± 2**

SCHEMATIC DIAGRAM

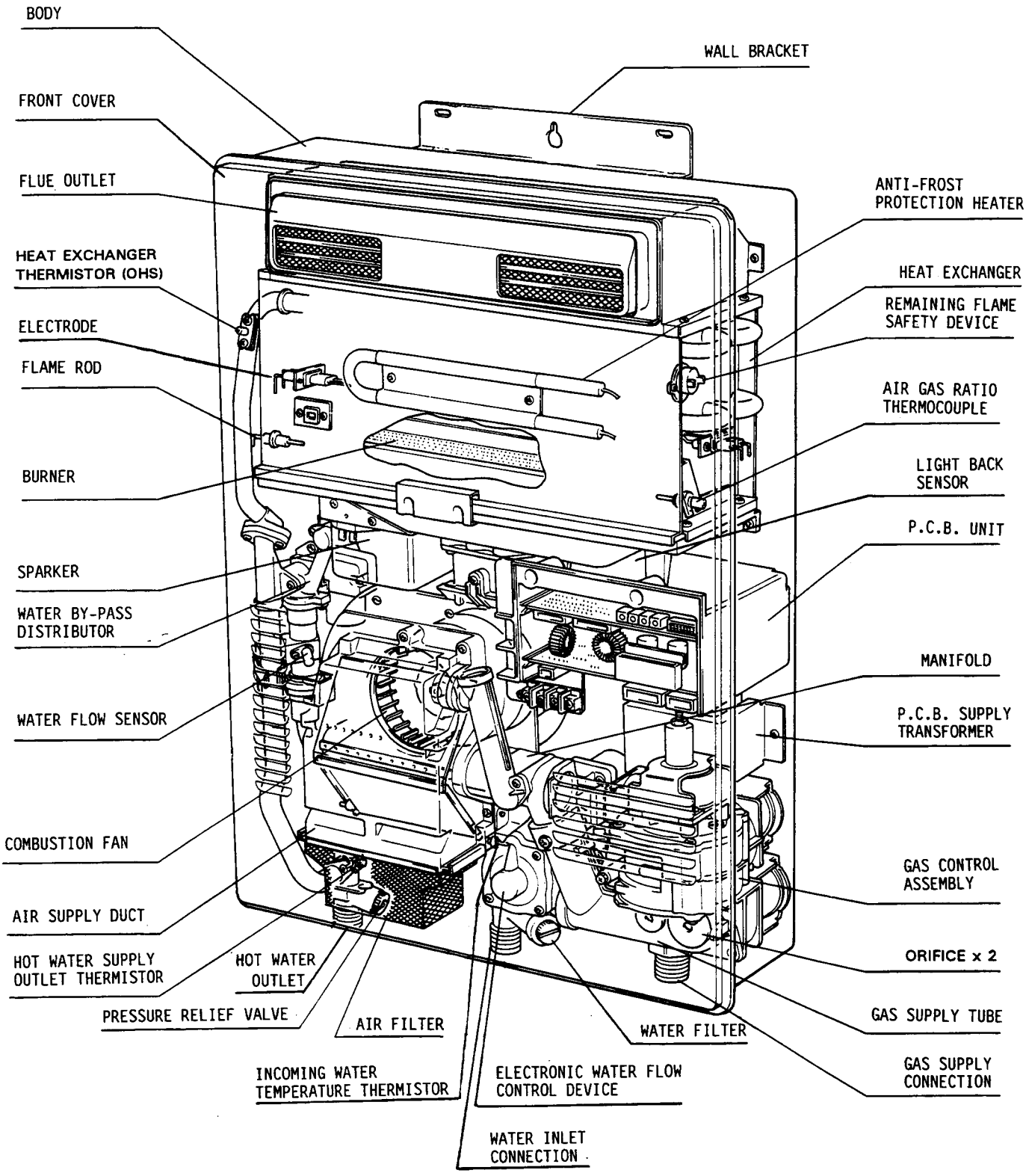


DIMENSIONS



All dimensions are in millimetres.

CUT - AWAY DIAGRAM



FEEDFORWARD AND FEEDBACK

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

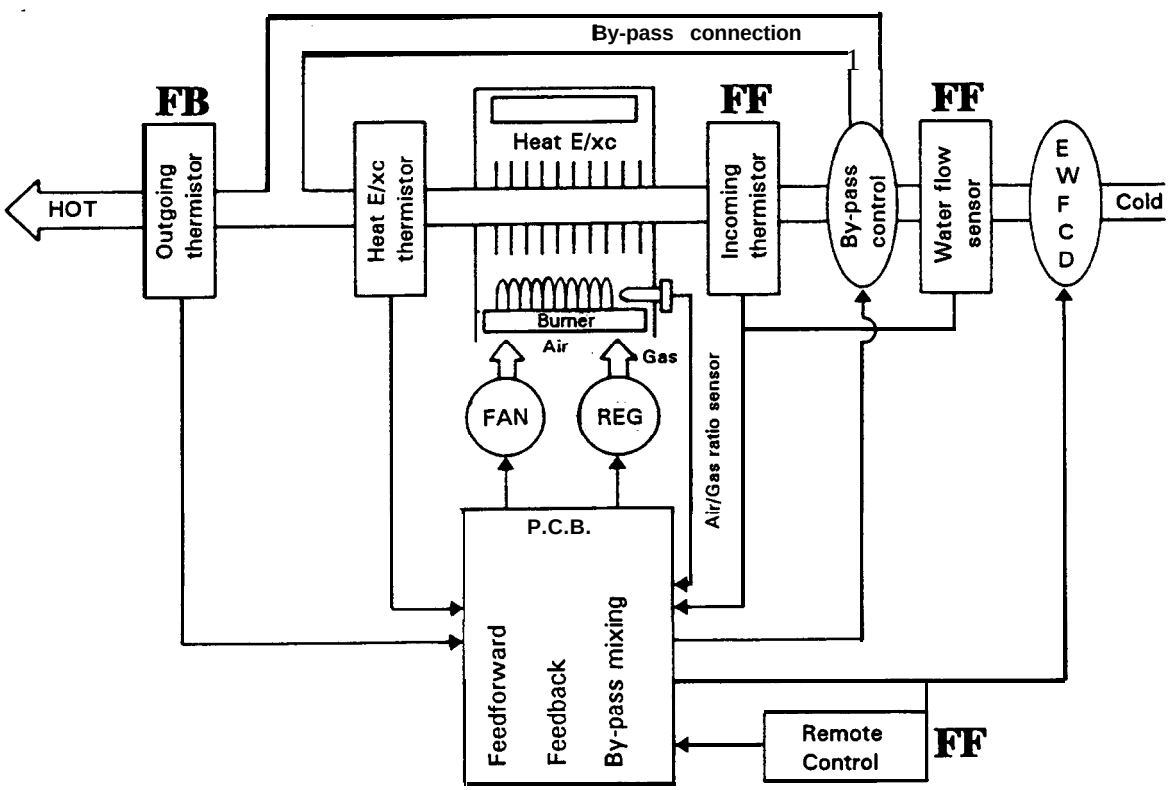
This data is continually monitored by the P.C.B. and adjustments are made to maintain the temperature selected on the remote control.

Feedback Information

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

The temperature of the water discharged from the heat exchanger is maintained above 60°C. This is to prevent condensation inside the heat exchanger. A thermistor located near the heat exchanger monitors the water temperature.

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



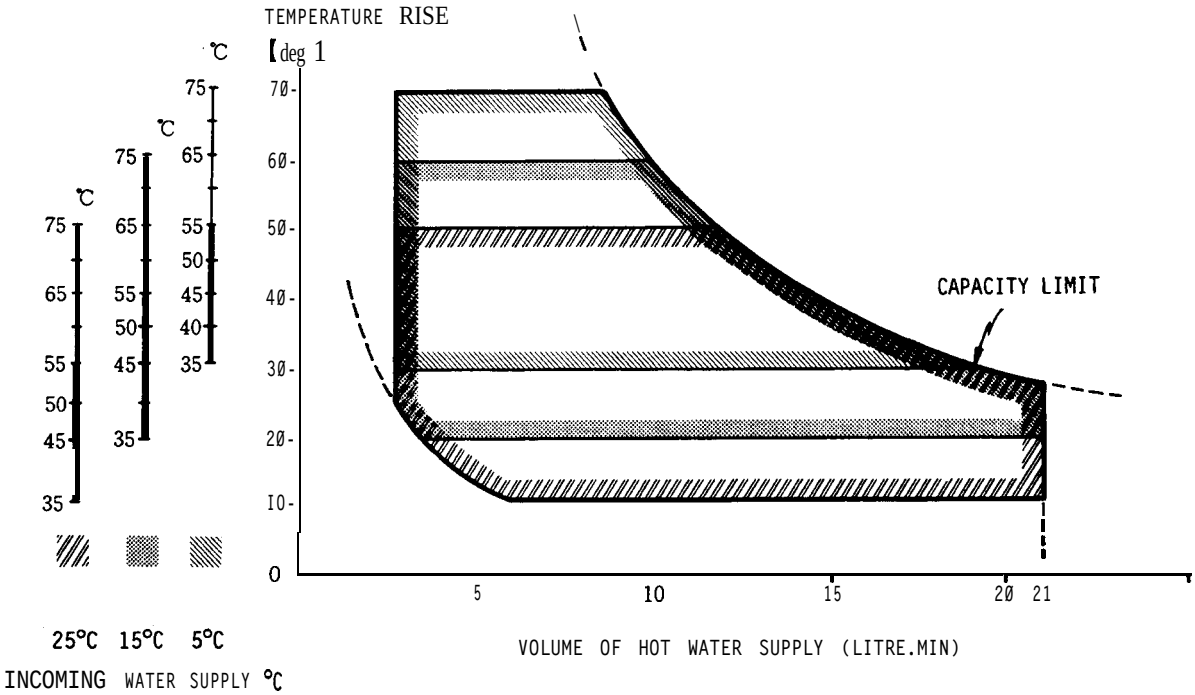
WATER FLOWS

With the Infinity 24, the maximum water flow possible without mixing at the tap is 21 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 24 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.

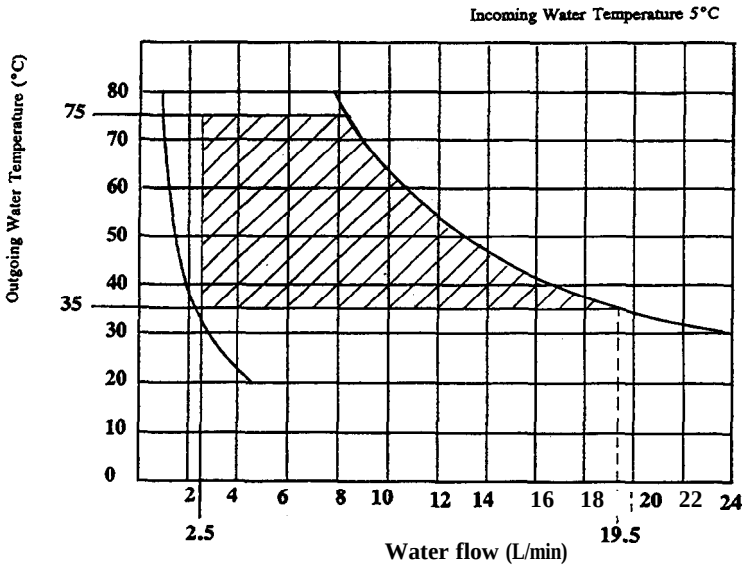
Select the appropriate chart depending on the incoming water temperature. Draw a horizontal line across the graph from the selected temperature at the remote until it intersects the curve. At this point draw the line in the vertical direction. The water flow is indicated where the line intersects the bottom of the chart.

The chart below is a composite graph showing the water flows from the Infinity 24 at three different incoming water temperatures. Graphs on the next page show the same information in separate formats.



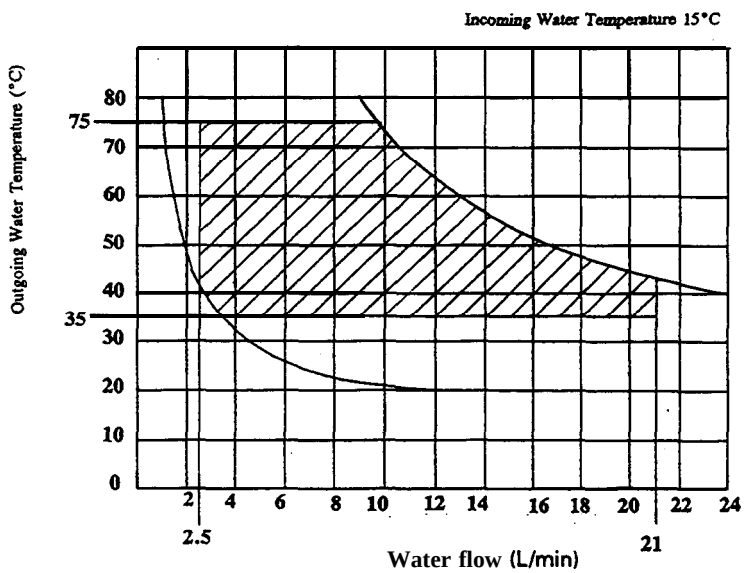
Output water temperature	Incoming + **15°C**	Incoming + **25°C**	Incoming **+ 30°C**	Incoming + **35°C**	Incoming + **45°C**	Incoming + **55°C**
Output water volume	* 40 **(L/min)**	* 24 **(L/min)**	20 **(L/min)**	17.1 **(L/min)**	13.3 **(L/min)**	10.9 **(L/min)**

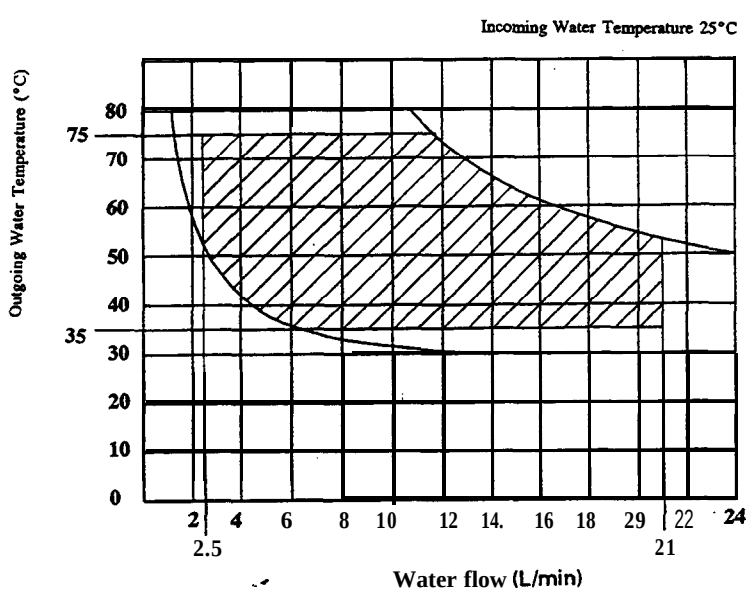
* Calculated value of water capacity using mixing valve, at point of use.



The chart opposite indicates that the water flow rate of the Infinity 24 will, at a preset temperature of 50°C and an incoming water temperature of **5°C,** be 13 litres a minute.

The chart opposite indicates that the water flow rate of the Infinity 24 will, at a preset temperature of 50°C and an incoming water temperature of WC, be 17 litres a minute.





The chart opposite indicates that the water flow rate of the Infinity 24 will, at a preset temperature of 50°C and an incoming water temperature of **25°C,** be 24 litres a minute by mixing at the tap, 21 litres a minute without mixing.

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 on the preceding page. 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 185MJ/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 kilocalories. As 1 kilocalorie raises the temperature of 1 litre of water by 1 degree centigrade, the method of calculation is to multiply the input in MI/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 data	Calculation
Tin = 15°C	44200 x 0.8 = (60 - 15) x 60 x Q
Tout = 60°C	35360 = 45 x 60 x Q
IN = 44200 kcal/h	$\frac{35360}{45}$ = 6 0 x Q
TE = 80%	786 = 60 x Q
Q = Water flow in litres per minute	$\frac{785}{60}$ = Q
	13.1 L/min

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

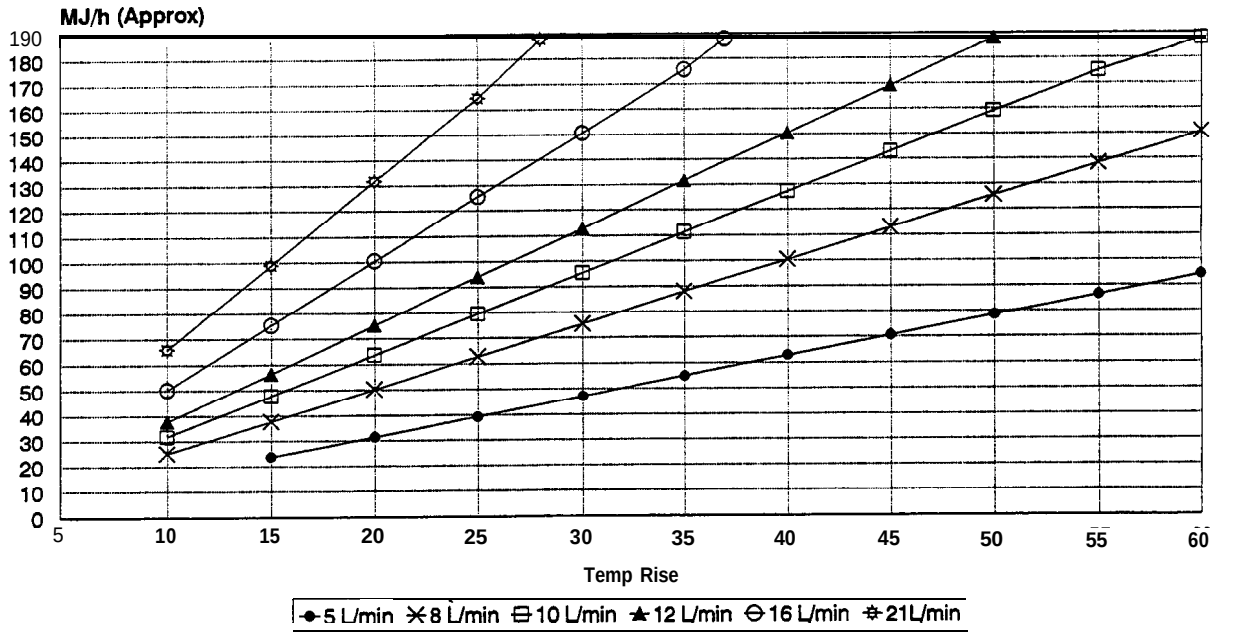
See the previous page for an explanation of Tin, Tout, IN, TE and Q.

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

The Infinity 24 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.**

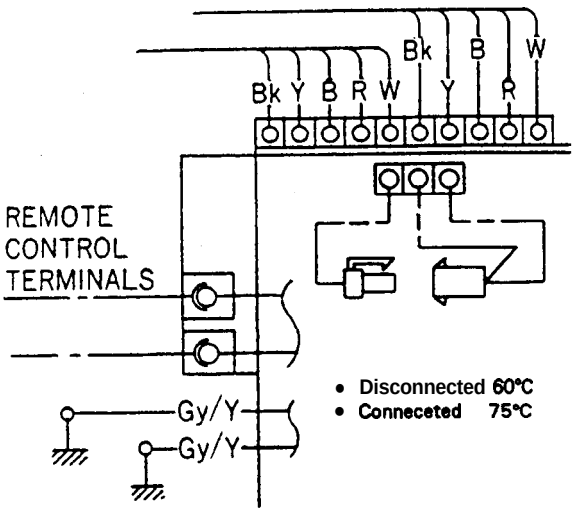


DEFAULT TEMPERATURE SETTING

On the P.C.B. there is a connection to which a plug or connector block can be fitted, [see diagram]. This connection locks the water temperature to a default setting in instances where no remote controls are required. The default water temperature settings are: 60°C and 75°C.

Remote Control Faults

If the remote controls become faulty, the water heater will not operate when a hot water tap is opened unless these connections are bridged. The temperature of the water will be maintained to the default water temperature setting after bridging, depending on which pins are bridged.



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**

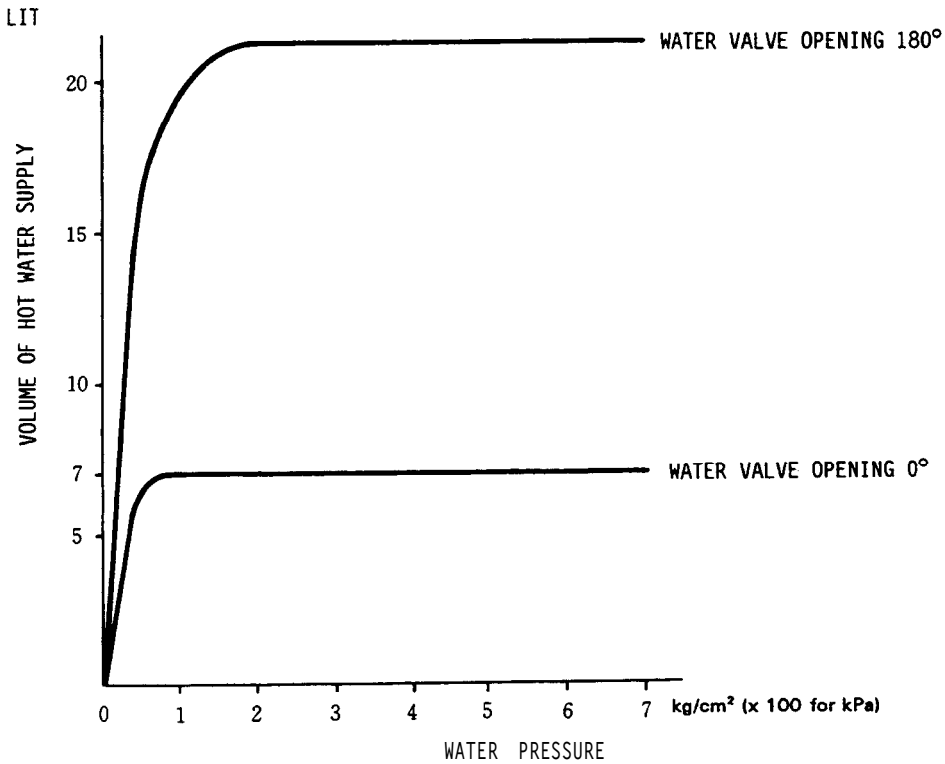
- Bridging the two right hand pins gives a water temperature of **60°C.**
- Bridging all three pins gives a water temperature of 75°C.

GAS AND WATER CONTROLS

Mechanical Water Regulator

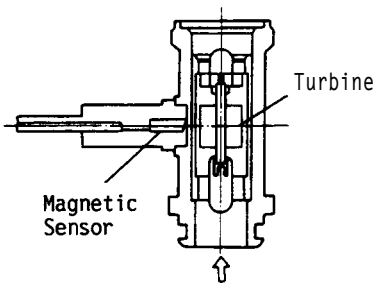
The following graph shows the performance of the water regulator. The top line shows the performance when the electronic water flow control is open, the lower line when it is closed. The bottom line shows that with the electronic water flow control device closed, the maximum flow is 7 L/min. This maximum flow is reached at 100 kPa inlet pressure. The top line shows that with the electronic water flow control device open, the maximum flow is approximately 21 L/min. This maximum flow is reached at 200 kPa inlet pressure.

Note: Although the Infinity 24 will operate at very low water pressures, maximum performance is not reached unless the incoming pressure is 200 kPa or more.



Water Flow Sensor

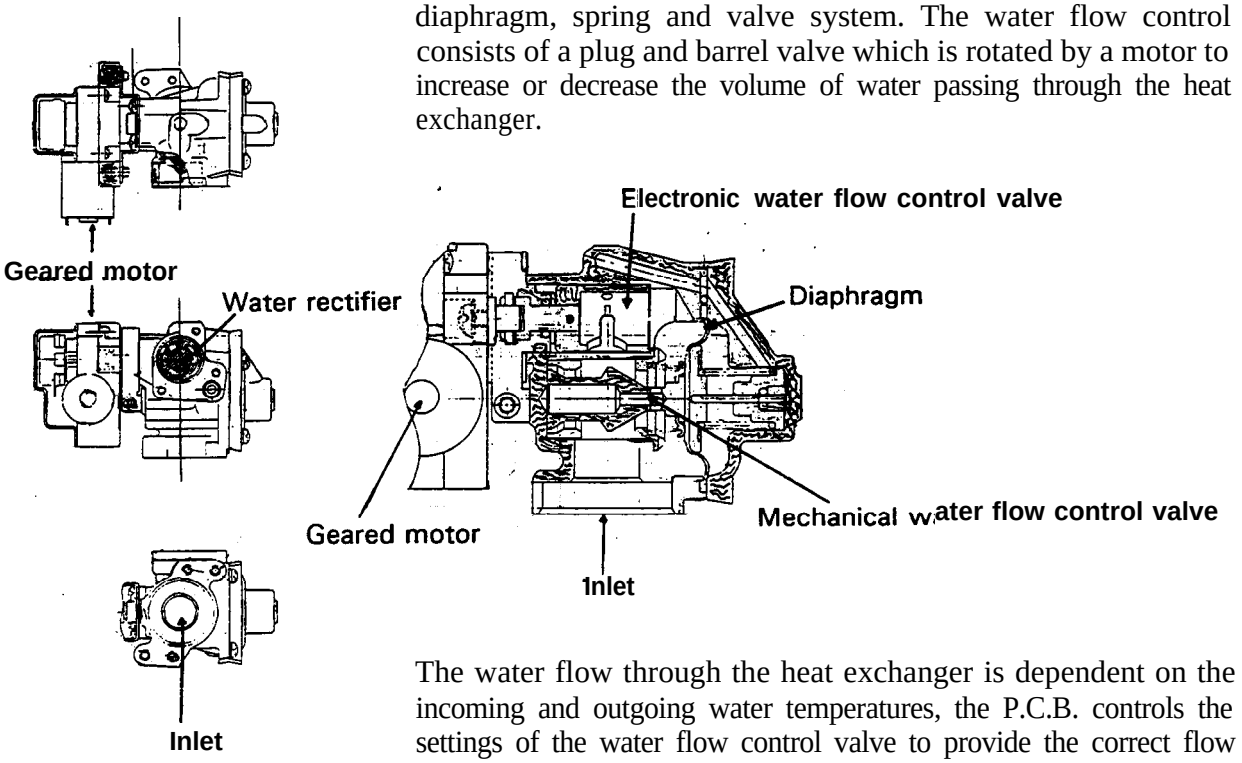
Water flow is detected by a turbine/magnetic pulse generating device. Water flows through the turbine/magnetic sensor providing information to the P.C.B. by generating a predetermined number of pulses in proportion to the water flow. See page 35, section 3, for pulses according to water flow in L/min. 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 the water flow in **litres/minute**.



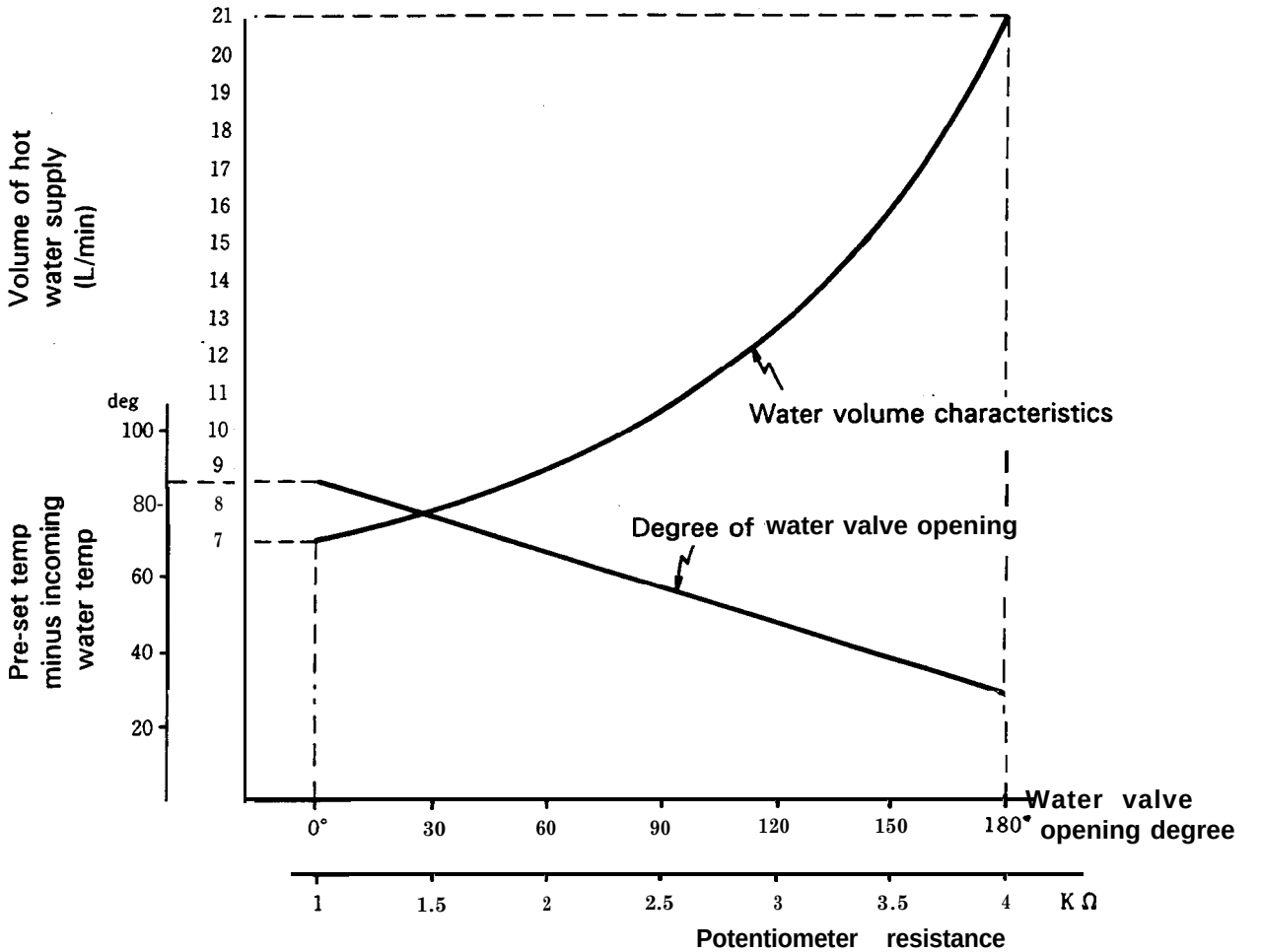
As soon as the required water flow is detected, the P.C.B. activates the combustion fan. The combustion fan speed is monitored by a magnetic pulse sensor. The output from this sensor is processed by the P.C.B. which opens the gas modulating valve to a degree proportional to the fan speed. See also page 17 for further details on the combustion fan.

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 dependent 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. An **explanation on how to use the chart below is at the top of the following page.**



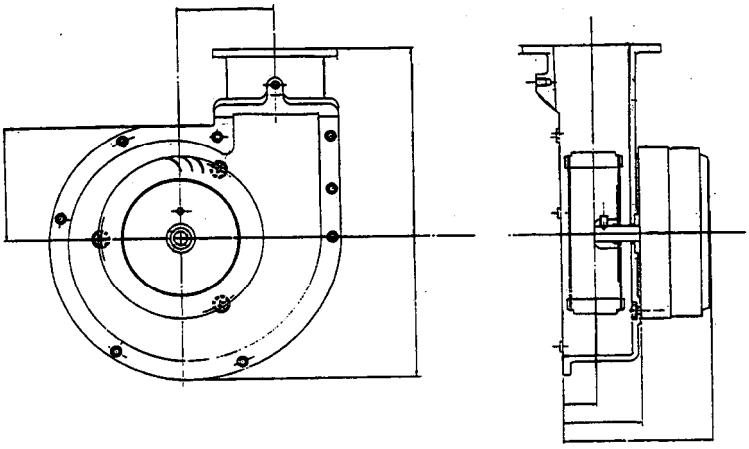
The water flow control device is controlled by a variable resistor (potentiometer). Use the chart on page 16 to determine the approximate resistance of the potentiometer at a given water flow and temperature rise. First determine the water flow from the unit. The tap must be turned on full, the electronic water flow control device does not operate if flow is restricted at the tap. Using this information draw a horizontal line from the **'volume of hot water in litres/minute scale' (upper** section - left hand side of the chart), until it intersects the curved line of the chart. Subtract the incoming water temperature from the preset temperature. Use this result to determine the electronic water flow control device opening degree and approximate potentiometer resistance by drawing a horizontal line from the point on the **'pre-set temperature minus incoming water temperature scale'** (lower section - left hand side of the chart), until it intersects the straight line on the chart, and then draw a vertical line until it meets the **'potentiometer and opening degree'** indications at the bottom of the chart. This vertical line indicates the correct resistance. Join-the intersecting points of the curved and straight lines. An approximately vertical line indicates correct relationship between the various data.

Combustion Fan

The air for combustion is supplied by a centrifugal fan driven by a DC motor. After a pre-purge period of 1 second, 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 temperature selected on 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 operations.

1) The fan speed is constantly corrected to provide optimum combustion conditions.
2) To 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 24 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.

Water Bypass Distributor

Water flowing through the heat exchanger is maintained at a temperature above 60°C at all times. This is to prevent condensation. To provide the correct outlet water temperature, the water from the heat exchanger is mixed with cold water when the remote control setting is set to a temperature below 60°C. The distributor consists of a motorised valve connected between the heat exchanger outlet, the cold water inlet, and the hot water outlet; this is controlled by the P.C.B.

Burner

The gas burner system is a 100% pre-mix with ceramic surfaced construction. Gas is supplied, pre-mixed with air directly to the underside of the ceramic plate. Combustion takes place above the plate. This burner technology, called "DECS" (Direct Exchange Combustion System) has been patented by Rinnai . It provides very low levels of NO,, and the very short flame produced allows for a very small heat exchanger to be used.

Electronic Regulator/Modulating Valve

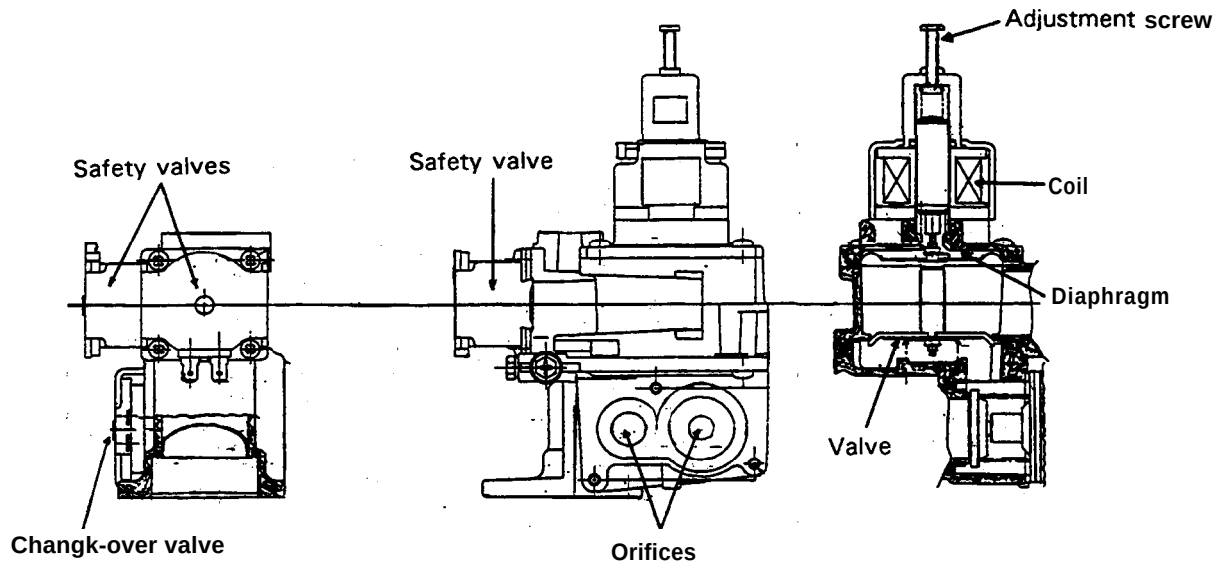
Gas is controlled by a composite regulator/modulating valve, double block safety and changeover valve. This modulating solenoid is electronically controlled depending on the incoming water temperature, water flow and outgoing water temperature.

Supposing that the water flow and/or selected water temperature changes, then the system will adjust the gas flow to the burner automatically in proportion to the water flow, between 21 and 185 MJ/h, ensuring that the outgoing water temperature remains at the temperature selected at the remote controls. A schematic diagram on page 6 shows the basic layout of the gas piping system. Maximum gas rate is predetermined, and the appliance cannot be overloaded. In summary the 3 main functions of the electronic regulator/modulating valve are:

1) To regulate incoming gas pressure.
2) To direct gas to one manifold only, or both manifolds.
3) To modulate gas flow from 21 to 185 MI/h by the combination of change-over and modulating valve positions.

Changeover Solenoid Valve

The changeover solenoid increases the flexibility of the regulator/modulating valve by supplying gas to one manifold only, [10 - 40% input] or both manifolds [10 - 40% input] + [40 - 100% input].



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 14 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 pre-determined 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 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. This maintains 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 17 - combustion fan. The changeover valve directs gas to one or both manifolds. 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 manifolds 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.

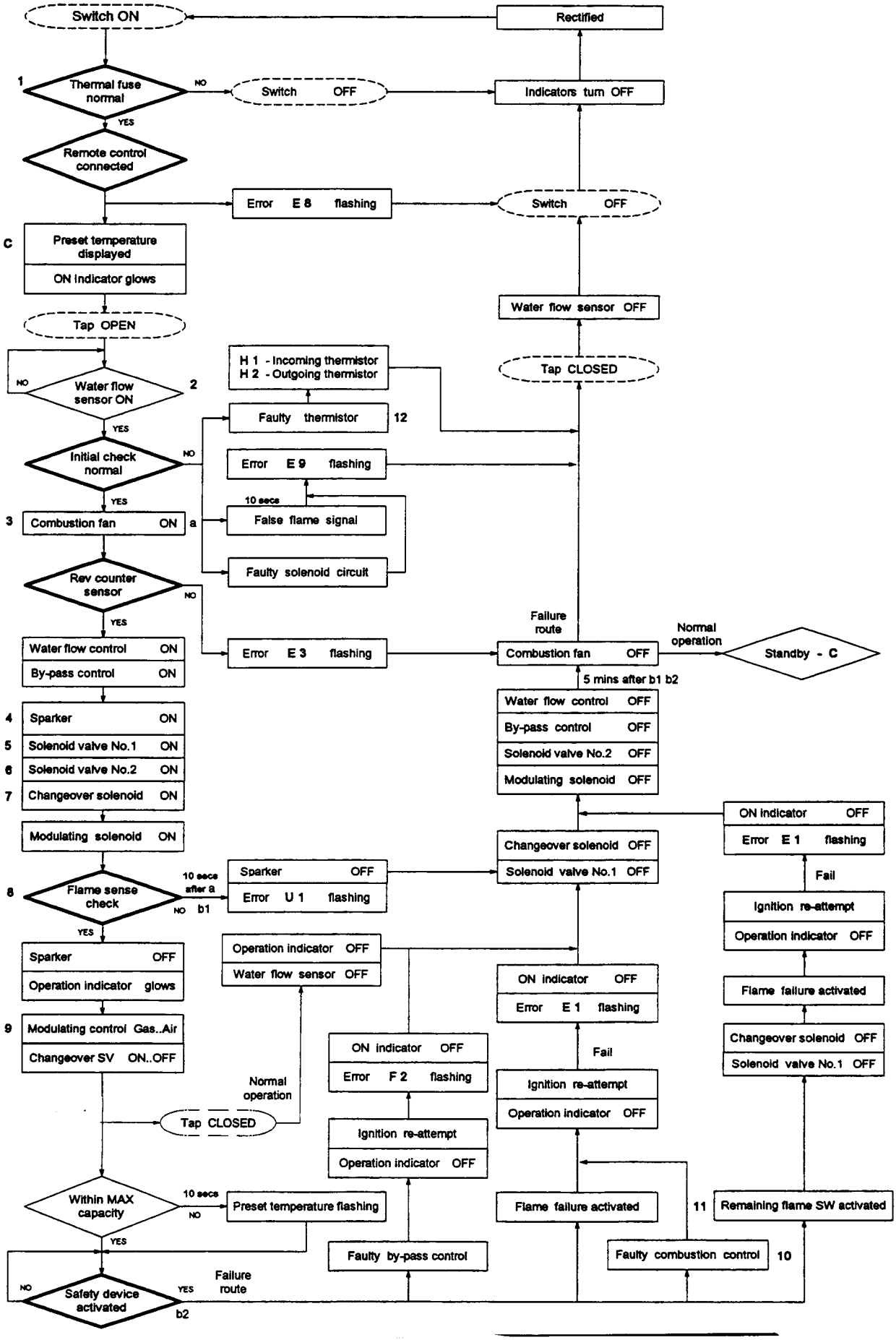
Once the maximum gas rate is reached, the P.C.B. begins to control the water flow through the appliance in order to maintain the preset temperature. This is achieved by the P.C.B. turning the valve within the water flow control device by means of a geared motor, and by the water bypass distributor. Attached to both the water flow control device and the water bypass distributor are potentiometers which relay the position of the valves to the P.C.B. When the valves are in the correct position, the motors stop.

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 16 and 18, for clarification].

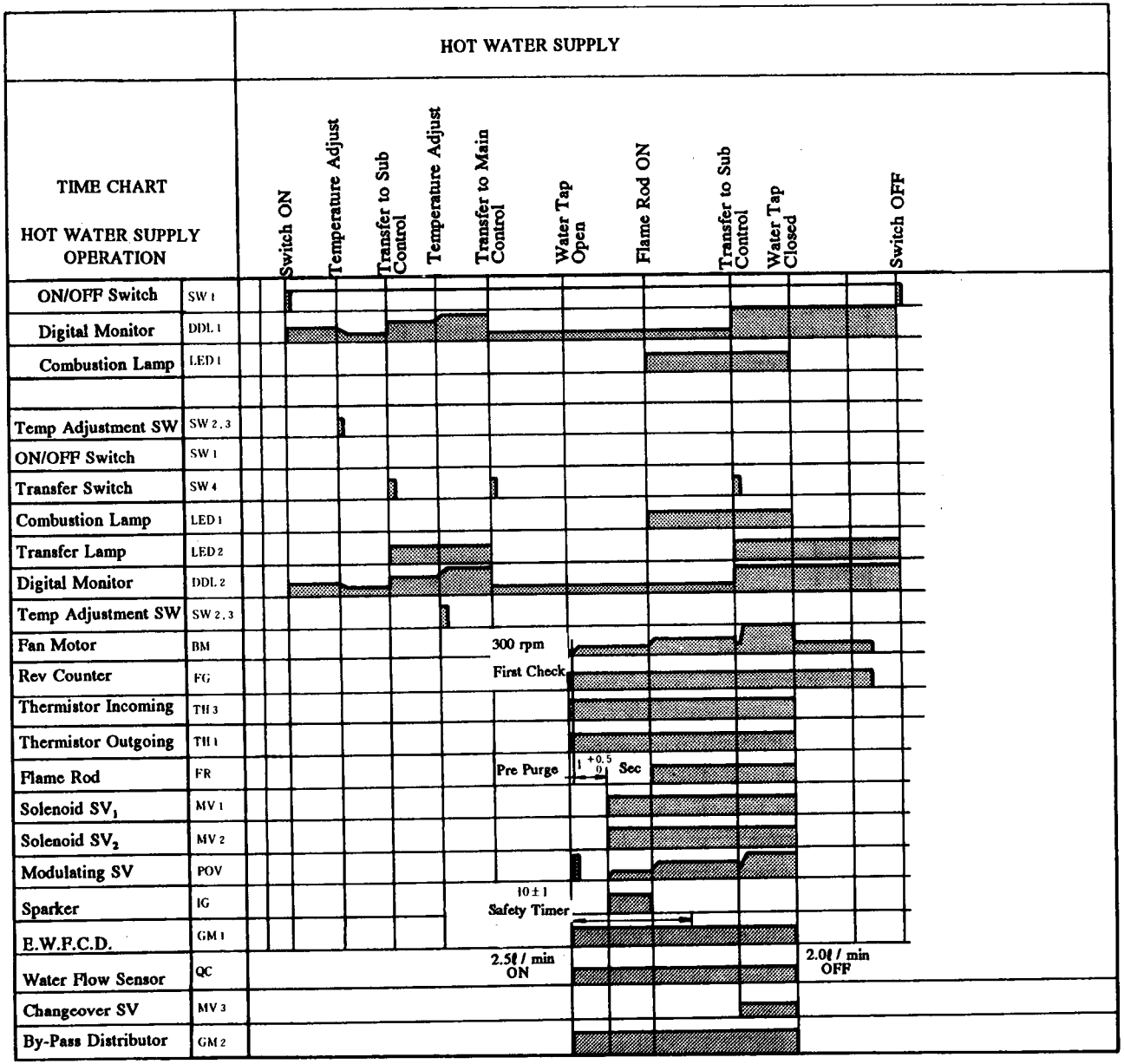
The P.C.B. continually makes adjustments in order to maintain a constant temperature; [adjusting both the gas input, water flow and the water mixing, where necessary.] It also continually monitors the combustion fan rpm, adjusting the gas rate to match.

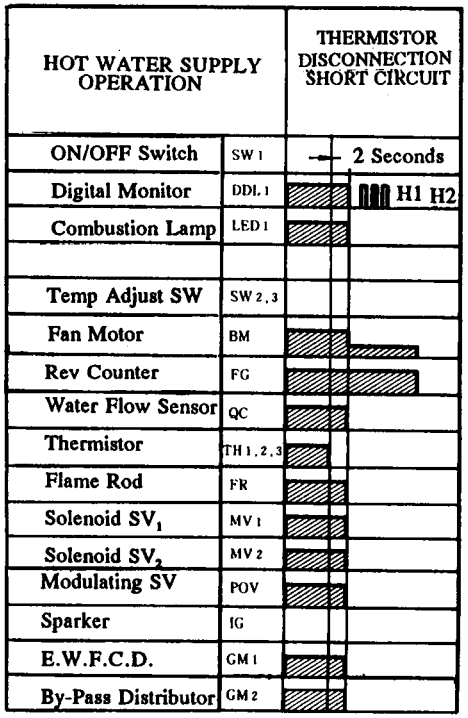
When the hot water tap is turned off the water flow sensor stops revolving, and the magnetic pulse ceases, indicating to the P.C.B. that there is no water flowing, in turn the P.C.B. closes the gas valves. The combustion fan continues to operate for 5 minutes. This is to provide quicker ignition when 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.

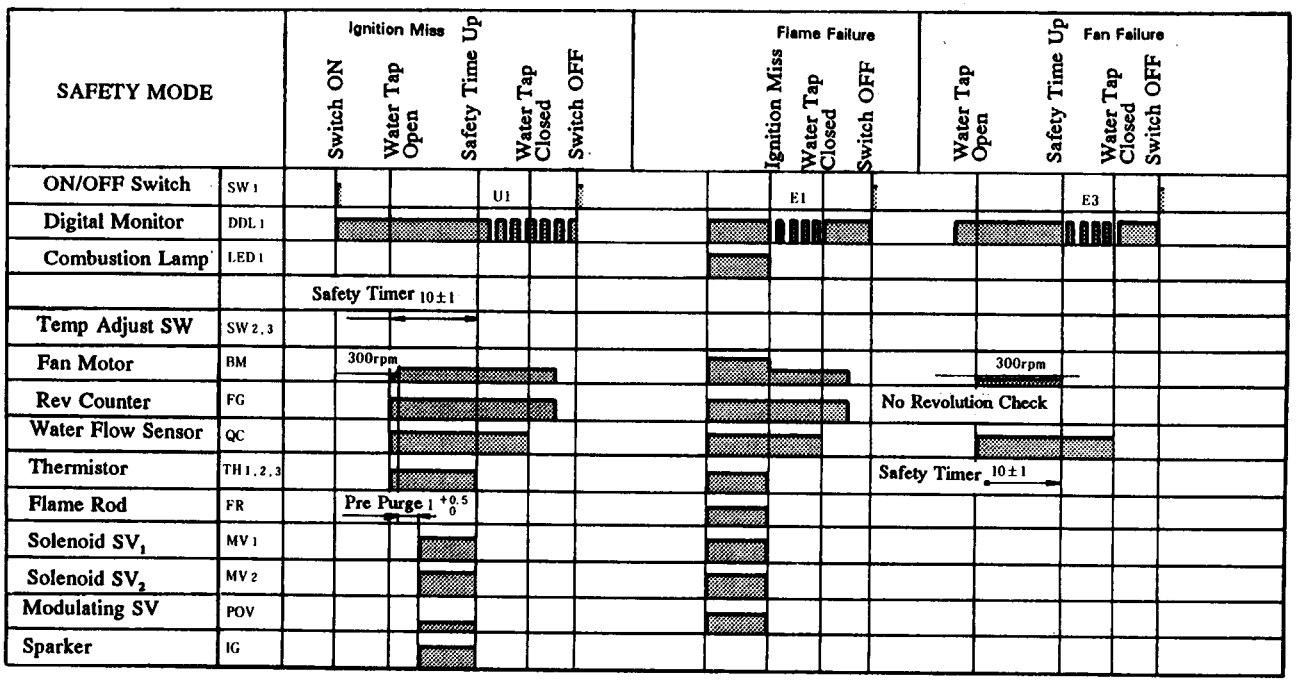
OPERATIONAL FLOW CHART



TIME CHART

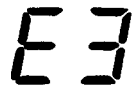

HOT WATER SUPPLY
TIME CHART
HOT WATER SUPPLY OPERATION
Switch ON
Temperature Adjust
Transfer to Sub Control
Temperature Adjust
Transfer to Main Control
Water Tap Open
Flame Rod ON
Transfer to Sub Control
Water Tap Closed
Switch OFF
ON/OFF Switch SW 1
Digital Monitor DDL 1
Combustion Lamp LED 1
Temp Adjustment SW SW 2, 3
ON/OFF Switch SW 1
Transfer Switch SW 4
Combustion Lamp LED 1
Transfer Lamp LED 2
Digital Monitor DDL 2
Temp Adjustment SW SW 2, 3
Fan Motor BM
Rev Counter FG
Thermistor Incoming TH 3
Thermistor Outgoing TH 1
Flame Rod FR
Solenoid SV1 MV 1
Solenoid SV2 MV 2
Modulating SV POV
Sparker IG
E.W.F.C.D. GM 1
Water Flow Sensor QC
Changeover SV MV 3
By-Pass Distributor GM 2
300 rpm
First Check
Pre Purge
1 +0.5 0 Sec
10 ± 1
Safety Timer
2.5ℓ / min ON
2.0ℓ / min OFF

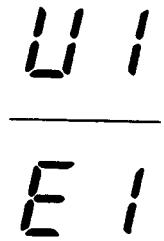

HOT WATER SUPPLY OPERATION
THERMISTOR DISCONNECTION SHORT CIRCUIT
ON/OFF Switch
SW 1
2 Seconds
Digital Monitor
DDL 1
H1 H2
Combustion Lamp
LED 1
Temp Adjust SW
SW 2, 3
Fan Motor
BM
Rev Counter
FG
Water Flow Sensor
QC
Thermistor
TH 1, 2, 3
Flame Rod
FR
Solenoid SV1
MV 1
Solenoid SV2
MV 2
Modulating SV
POV
Sparker
IG
E.W.F.C.D.
GM 1
By-Pass Distributor
GM 2


SAFETY MODE
Ignition Miss
Switch ON
Water Tap Open
Safety Time Up
Water Tap Closed
Switch OFF
Flame Failure
Ignition Miss
Water Tap Closed
Switch OFF
Fan Failure
Water Tap Open
Safety Time Up
Water Tap Closed
Switch OFF
ON/OFF Switch
SW 1
Digital Monitor
DDL 1
U1
E1
E3
Combustion Lamp
LED 1
Safety Timer 10±1
Temp Adjust SW
SW 2, 3
Fan Motor
BM
300rpm
300rpm
Rev Counter
FG
No Revolution Check
Water Flow Sensor
QC
Thermistor
TH 1, 2, 3
Safety Timer 10±1
Flame Rod
FR
Pre Purge 1 +0.5 0
Solenoid SV1
MV 1
Solenoid SV2
MV 2
Modulating SV
POV
Sparker
IG

FAULT FINDING PROCEDURE

1. Fault Analysis - Outline

Problem	Possible Cause			Remedy
Digital Monitor does not glow when system is switched ON.	Power cord unplugged.			Plug in.
	No 240 Volts supply to wall socket.	Mains supply to building is disconnected. Power failure.		Switch ON. Wait for power to come ON.
	There is no fuse, or fuse is blown.	Short circuit in AC 100 V line (fuse blows again after replacing). Incorrect fuse spec.	Short in AC 100 V circuits.	Replace fuse. Repair / Replace.
	ON/OFF switch or indicator is faulty. Broken wire in cable, or disconnection. Faulty transformer. Other electrical components faulty.			Replace remote control. Repair / Replace. Replace. Replace.
"E8" flashes on Digital Monitor after system is switched ON.	Communication error. 	Cable broken or connected incorrectly. Faulty control. Faulty P.C.B.		Replace. Replace. Replace.
Combustion indicator glows after system is switched ON, but hot tap is not open.	Confirm if other hot water taps are open. Faulty P.C.B.			Turn OFF all hot water taps. Replace.
After system is switched ON, and a hot water tap is opened, an error code flashes on the Digital Monitor.	Combustion fan fails to operate. 	Damaged fan harness. Motor fault. Faulty P.C.B. Transformer open circuit.		Repair / Replace. Replace. Replace. Replace.
	Combustion fan operates, but spark does not occur. 	Wiring harness damaged. Faulty ignition electrode. Faulty sparker. Faulty P.C.B.		Repair / Replace. Replace. Replace. Replace.
	Spark is generated, but ignition does not occur. 	Main gas supply is closed. Faulty solenoid valve, open circuit or jammed valves. Faulty P.C.B. Spark gap is incorrect. Incorrect orifice or damper specification. Blocked orifice/burner port.	Damaged harness. Circuit or relay failure. Faulty IC circuit.	Repair / Replace. Repair / Replace. Repair / Replace. Change to correct specification. Repair / Replace

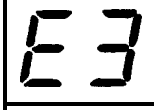
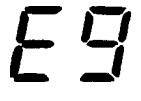
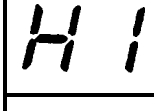
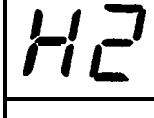
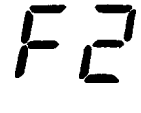
Problem	Possible Cause			Remedy
	Burner goes out soon after ignition.  	Flame rod faulty. Leak in flame rod wire, or disconnected. PCB Earth disconnected. Incorrect position of flame rod electrode. Insufficient flame rod current. Insufficient gas pressure. Faulty transformer. Modulating solenoid valve fails to operate. Fan fails to modulate. Unstable flame. Faulty thermocouple. Flame failure safety device faulty.	Blocked orifice. Burner ports blocked. Incorrect gas type switch positions. Incorrect orifice. Blocked flue, or blocked air filter / ventilation.	Repair / Replace. Repair / Replace. Repair. Adjust position. Remove obstacles. Adjust to correct gas pressure. Replace. Replace motor. Repair / Replace. Rectify. Rectify. Remove obstacles.
	Burner goes out shortly after ignition.  	Faulty incoming water temperature thermistor.	Short circuit. Resistance value incorrect.	Repair / Replace.
	Burner goes out soon after ignition.  	Faulty outgoing water temperature thermistor. Faulty heat exchanger outlet thermistor (OHS).	Disconnected or short circuit. Resistance value incorrect.	Repair / Replace.
	Burner goes out soon after ignition.  	Faulty or disconnected incoming water temperature thermistor. Faulty water by-pass distribution valve.	Open circuit. Resistance value incorrect. Faulty geared motor.	Rectify. Repair / Replace.
Unit will not operate after opening a hot water tap.	No water. There is more than 2.5 L/min of hot water coming from the tap, but the water flow sensor does not operate.	Blocked water filter. Water flow at by-pass distribution valve is less than 2.5 L/min. Water flow sensor jammed. Water flow sensor harness damaged. Faulty P.C.B.		Clean. Increase level to more than 2.5 L/min. Repair. Repair / Replace. Replace.

Problem	Possible Cause			Remedy
Digital Monitor is OFF.	Thermal fuse, overheat safety device operated.	Overheating has occured. Faulty thermal fuse. Faulty P.C.B. Combustion occured without combustion fan operating. (P.C.B rev counter check circuit faulty).	Damage to combustion chamber.	Repair I Replace. Replace rev counter.
Temperature of hot water does not change after altering water temperature on remote control. (Continuous HI temperature water supply).	Faulty remote control, (preset temperature won't change). Faulty thermistor. Faulty modulating valve. Other electrical components faulty.			Repair / Replace. Replace. Repair / Replace. Repair / Replace.
Temperature of hot water does not change after altering water temperatureon remote control. (Continuous LO temperature water supply).	Insufficient gas pressure.			Rectify.
	Faulty remote control, (preset temperature won't change). Faulty thermistor. Faulty modulating valve. Other electrical components faulty.			Repair / Replace. Replace. Repair I Replace.
Hot water temperature setting on digital monitor flashing.	Insufficient gas supply to heat water to selected preset temperature.	Electronic water flow control device faulty.		Check gas pleasure. Repair / Replace. Reduce hot water flow.
Insufficient hot water supply.	Filter is blocked. Water supply valve not fully open. Faulty electronic water flow control device.			Clean. Open water supply valve fully. Repair I Replace.
Water Temperature isn't stable.	Faulty thermistor. Other electrical component faulty.			Repair / Replace. Repair / Replace.
Volume of water isn't stable.	Incoming water supply pressure is not stable.			Rectify.
Anti-frost protection safety device does not Operate.	Power cord is not connected. Faulty anti-frost heater bi-metal switch. Other electrical components faulty.			Connect power cord. Repair / Replace. Repair I Replace.

Problem	Possible Cause			Remedy
Explosive ignition.	Delayed Ignition (slow)	Spark leak. Faulty P.C.B. Faulty sparker.		Repair / Replace. Repair / Replace. Repair I Replace.
	Ventilation duct blocked.			Replace.
	Faulty modulating valve.	Faulty P.C.B.		Repair / Replace. Repair / Replace.
	Incorrect orifice.			Change to correct specification.
	Faulty modulating valve.			Repair / Replace.

2. Error Coded Messages

One of the following error coded messages will flash on the digital monitor of the romote control when a fault has occured with the applaince.

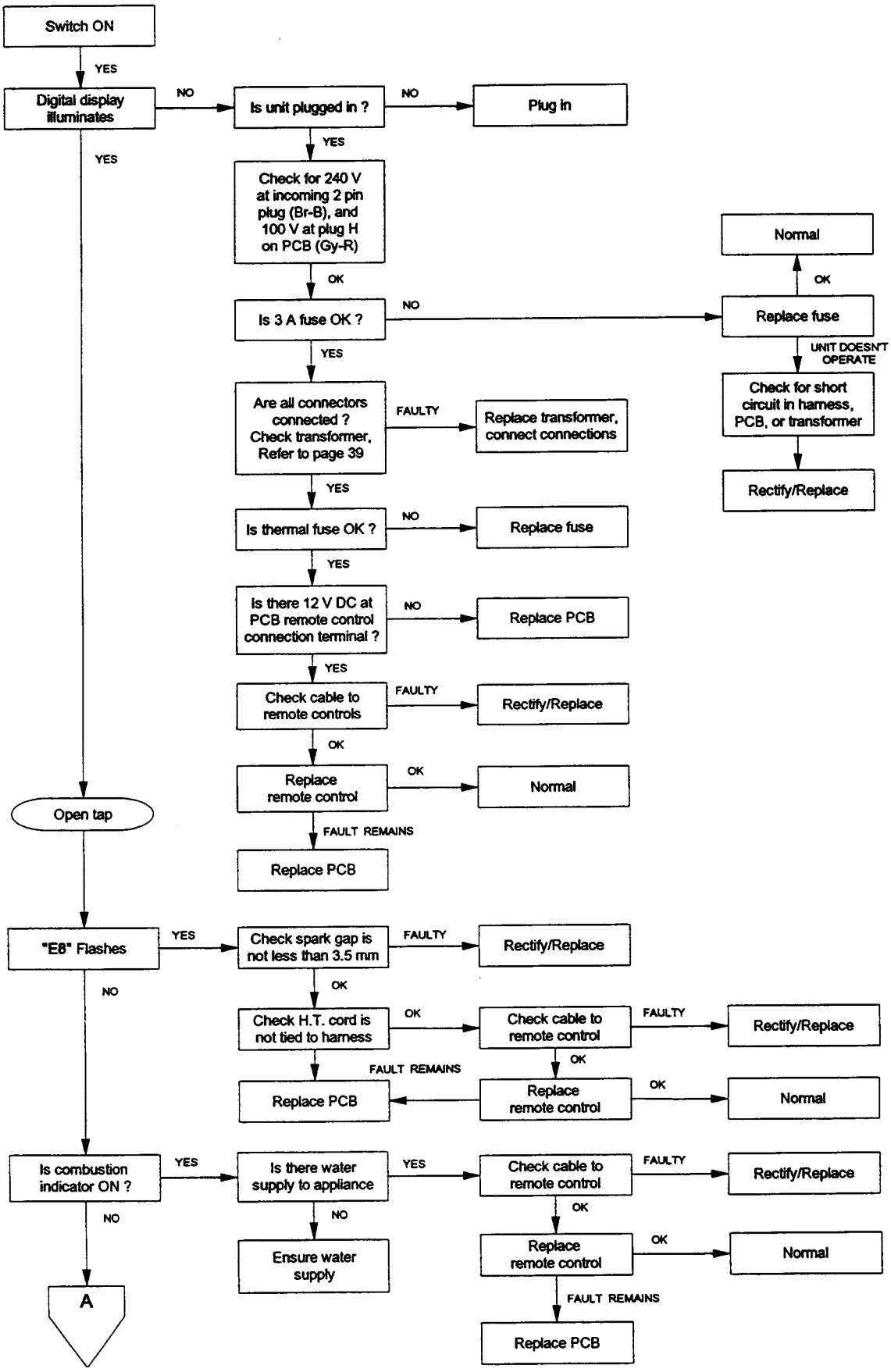
Code	Symptom	Remedy	Check point
	Ignition Miss	After confirming the gas supply, switch system OFF then ON at the remote control, and re-attempt ignition.	* Insufficient gas pressure * Modulating valve * Spark generator * Spark electrode * Flame rod electrode * Main P.C.B.
	Flame Failure	Switch system OFF then ON at the remote control, and re-attempt ignition.	* Product of combustion problem/leak * Modulating valve * Flame rod * Thermocouple output * Main P.C.B.
	Fan Motor Rotation Failure	Switch system OFF then ON at the remote control, and re-attempt ignition.	* Faulty fan motor * Faulty fan motor IC circuit * Main P.C.B.
	Communication Error	Check remote control cable connections. Switch system OFF then ON at the remote control, and re-attempt ignition.	* Cable short circuit * Faulty remote control * Main P.C.B short * Electrical interference from external source
	Initial Self Check Circuit Failure	Switch system OFF then ON at the remote control, and re-attempt ignition.	* Solenoid circuit harness * False flame current * Faulty remote control * Main P.C.B.
	Incoming Water Temperature Thermistor Failure	Switch system OFF then ON at the remote control, and re-attempt ignition.	* Faulty thermistor * Thermistor corrosion * Main P.C.B.
	Outgoing Water Temperature Thermistor Failure	Switch system OFF then ON at the remote control, and re-attempt ignition.	* Faulty thermistor * Thermistor corrosion * Main P.C.B.
	Heat Exchanger Outlet By-pass Mixing Failure	Switch system OFF then ON at the remote control, and re-attempt ignition.	* Faulty by-pass control * Faulty thermistor * Thermistor corrosion * Main P.C.B.

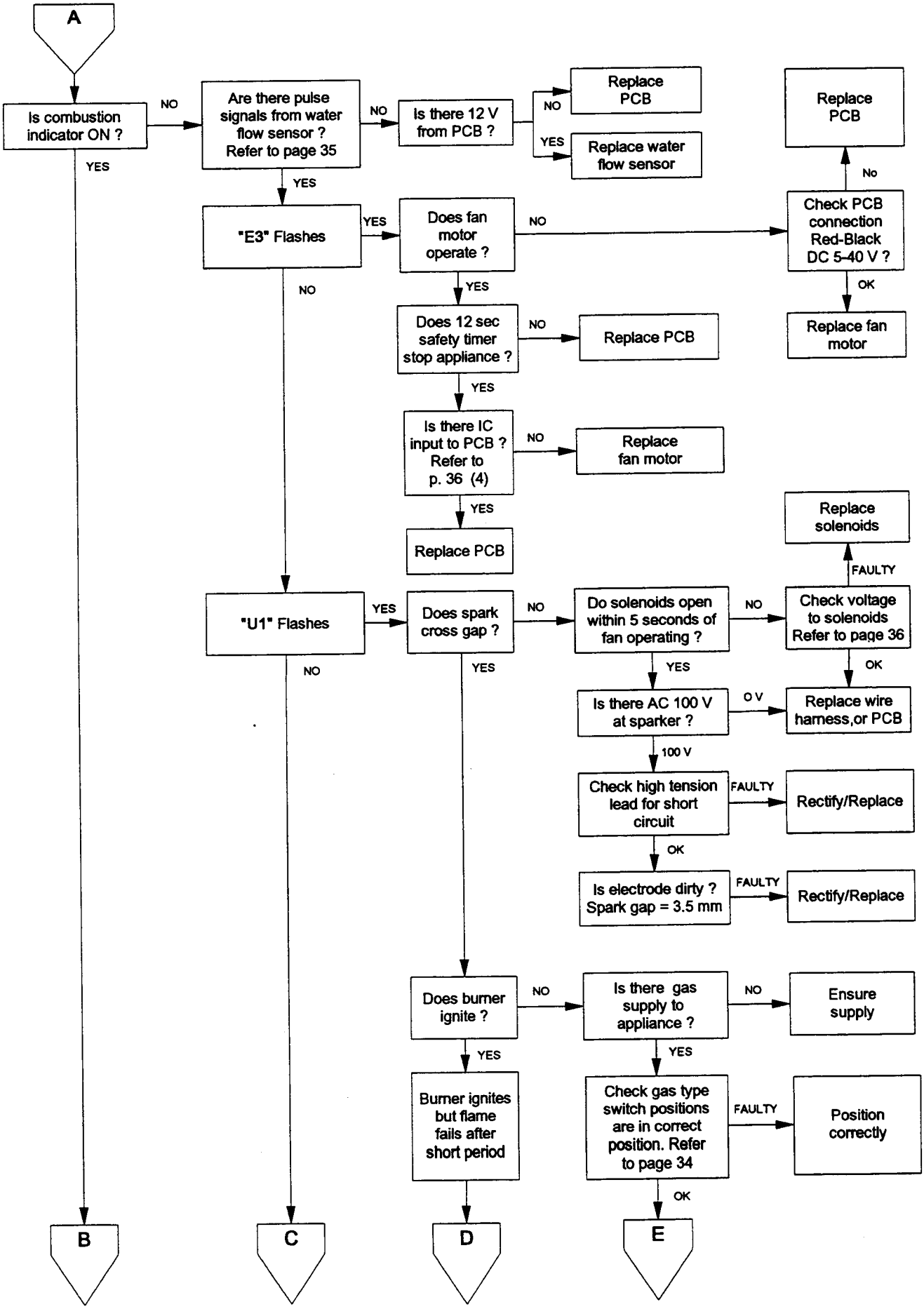
NOTE:

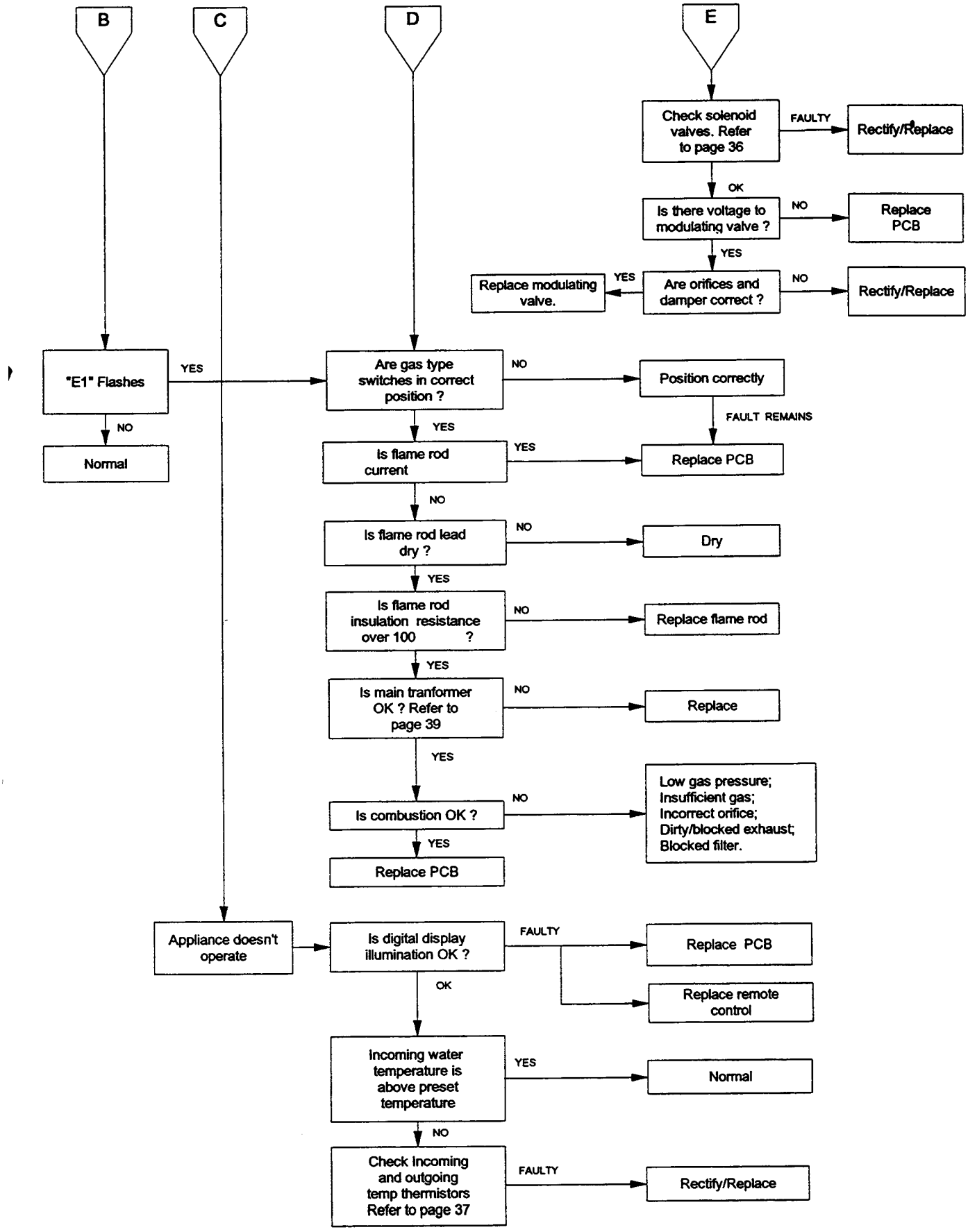
1. **Preset temperature flashing.**
   - **Check electronic water flow control device, see page 37.**
2. **Digital monitor does not illuminate when system is switched ON, or the display drops out while the appliance is operating.**
   - **Check power supply to the appliance.**
   - **Switch system OFF. Switch OFF mains electricity supply then switch ON again, and re-attempt ignition.**
   - **Check remaining flame safety device, see page 35.**
3. **Error coded message flashing.**
   - **Refer to flow charts starting on page 28.**
4. **Appliance operates however symptoms remain, with digital display dropping out and error coded message flashing.**
   - **Isolate potential faulty component using the flow charts on pages 28 thru 30.**

3. Fault Analysis - Flow Charts

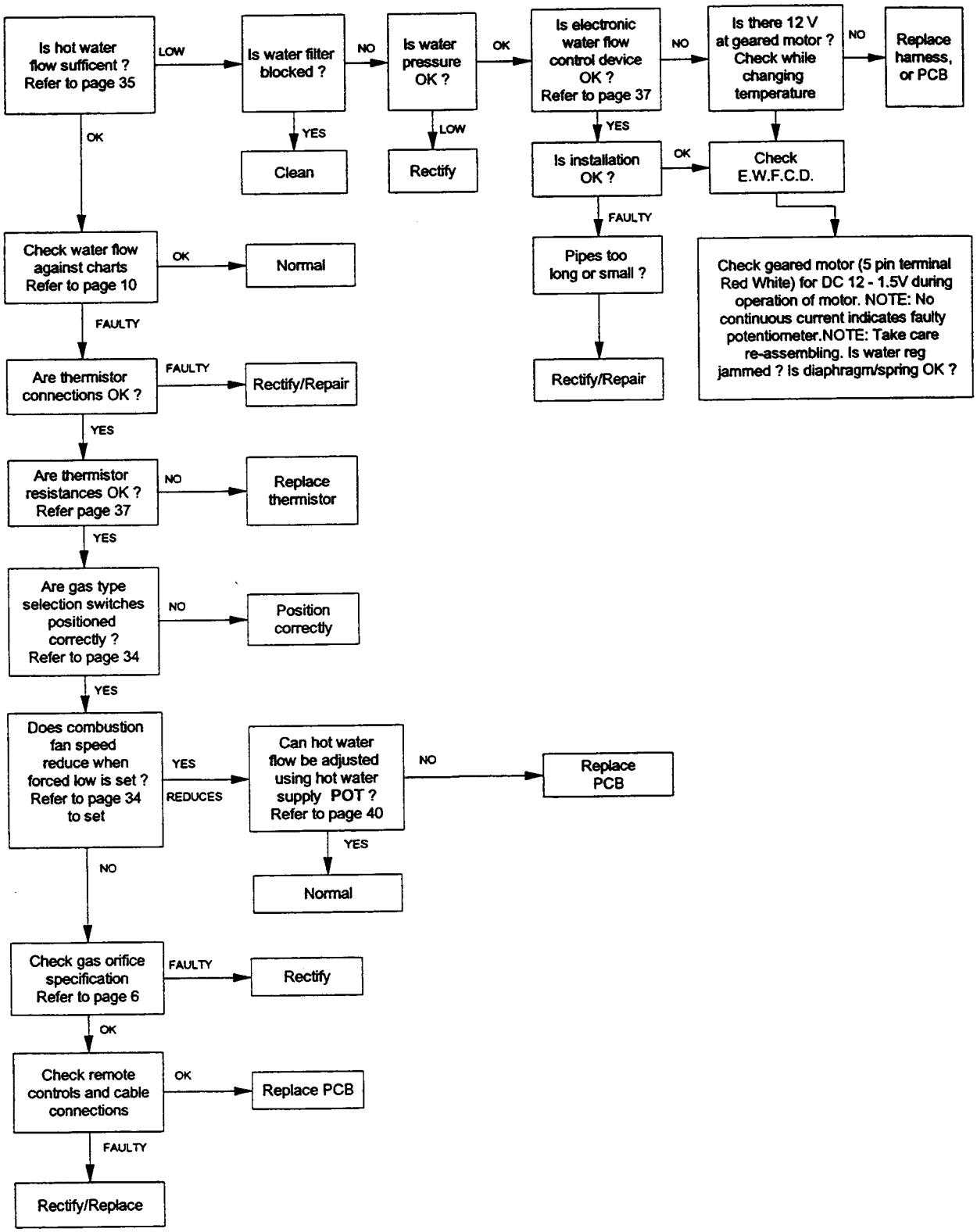
3.1 No Hot Water:



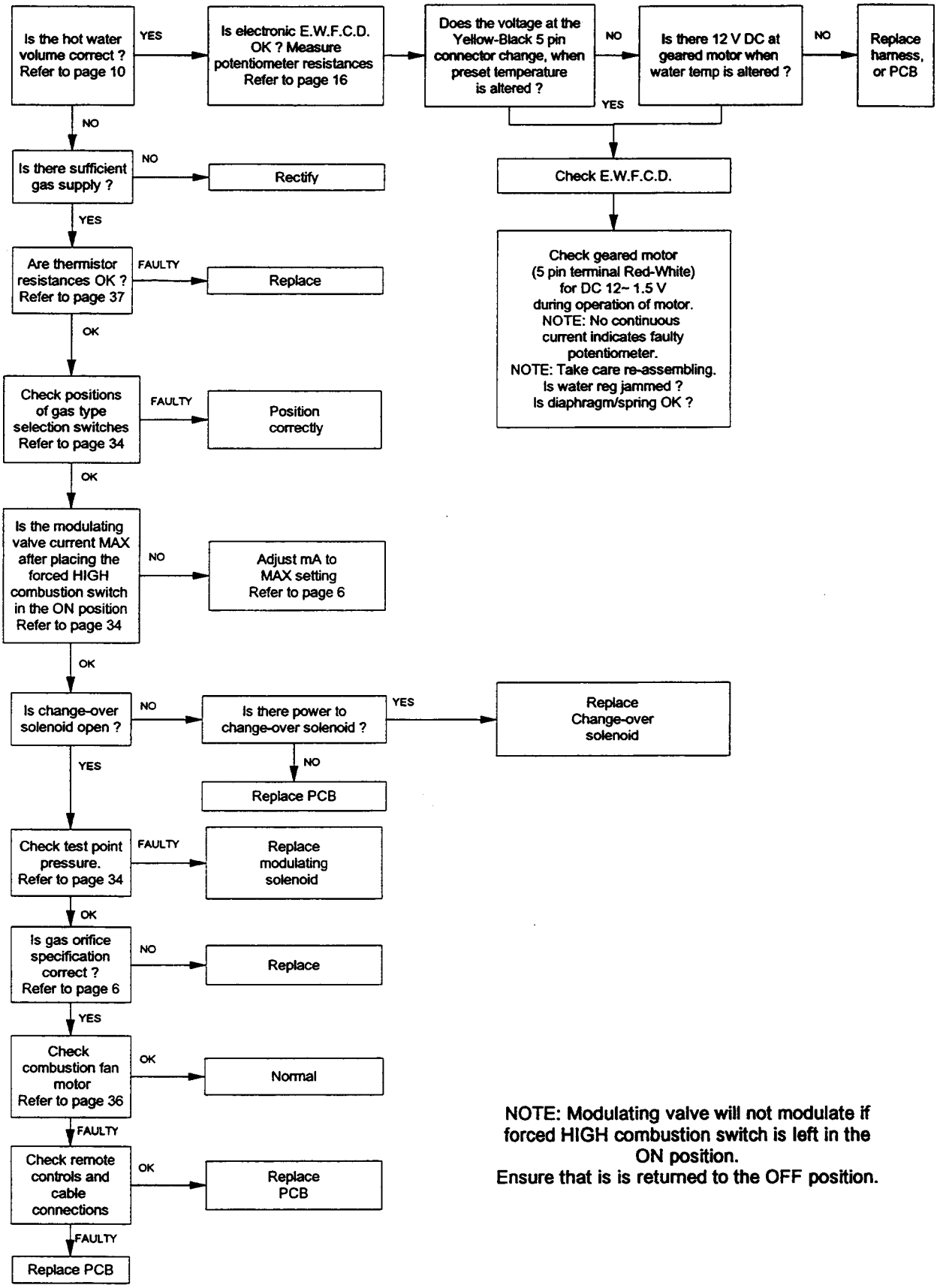

A
Is combustion indicator ON ?
NO
YES
Are there pulse signals from water flow sensor ? Refer to page 35
NO
YES
Is there 12 V from PCB ?
NO
YES
Replace PCB
Replace water flow sensor
Replace PCB
No
Check PCB connection Red-Black DC 5-40 V ?
OK
Replace fan motor
"E3" Flashes
YES
NO
Does fan motor operate ?
NO
YES
Does 12 sec safety timer stop appliance ?
NO
Replace PCB
YES
Is there IC input to PCB ? Refer to p. 36 (4)
NO
Replace fan motor
YES
Replace PCB
Replace solenoids
FAULTY
"U1" Flashes
YES
NO
Does spark cross gap ?
NO
YES
Do solenoids open within 5 seconds of fan operating ?
NO
YES
Check voltage to solenoids Refer to page 36
OK
Is there AC 100 V at sparker ?
0 V
Replace wire harness,or PCB
100 V
Check high tension lead for short circuit
FAULTY
Rectify/Replace
OK
Is electrode dirty ? Spark gap = 3.5 mm
FAULTY
Rectify/Replace
Does burner ignite ?
NO
YES
Is there gas supply to appliance ?
NO
YES
Ensure supply
Burner ignites but flame fails after short period
Check gas type switch positions are in correct position. Refer to page 34
FAULTY
Position correctly
OK
B
C
D
E


B
C
D
E
Check solenoid valves. Refer to page 36
FAULTY
Rectify/Replace
OK
Is there voltage to modulating valve ?
NO
Replace PCB
YES
Replace modulating valve.
YES
Are orifices and damper correct ?
NO
Rectify/Replace
"E1" Flashes
YES
NO
Normal
Are gas type switches in correct position ?
NO
Position correctly
FAULT REMAINS
YES
Is flame rod current
YES
Replace PCB
NO
Is flame rod lead dry ?
NO
Dry
YES
Is flame rod insulation resistance over 100 ?
NO
Replace flame rod
YES
Is main tranformer OK ? Refer to page 39
NO
Replace
YES
Is combustion OK ?
NO
Low gas pressure; Insufficient gas; Incorrect orifice; Dirty/blocked exhaust; Blocked filter.
YES
Replace PCB
Appliance doesn't operate
Is digital display illumination OK ?
FAULTY
Replace PCB
Replace remote control
OK
Incoming water temperature is above preset temperature
YES
Normal
NO
Check incoming and outgoing temp thermistors Refer to page 37
FAULTY
Rectify/Replace

3.2 When Remote Control Preset Temperature Is Low, Water Is Very Hot:

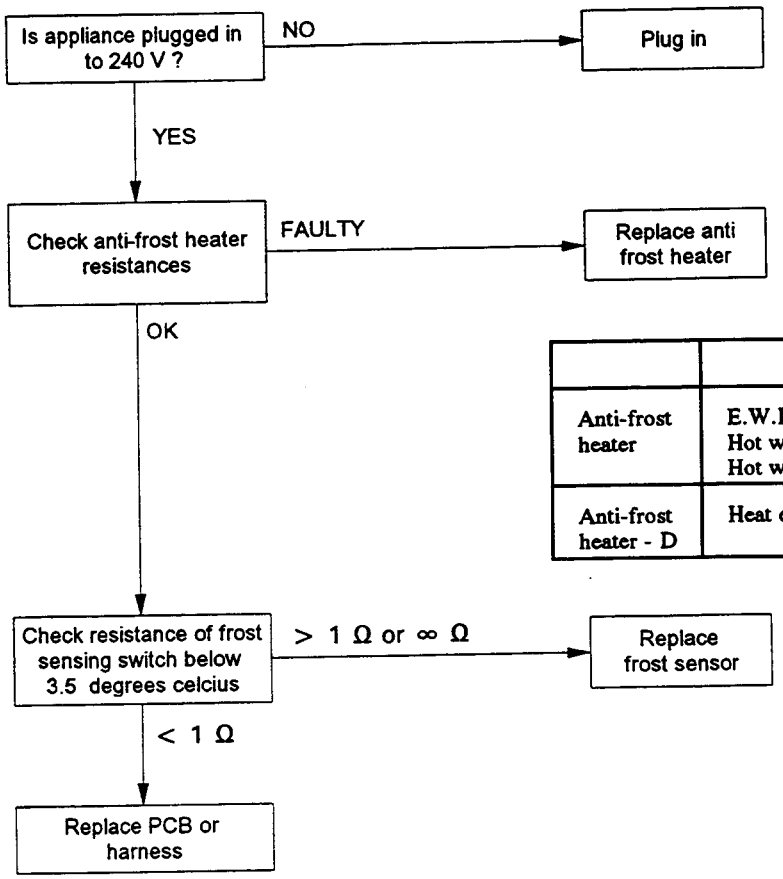


3.3 Setting On Remote Is High But Water Is Cold Or Lukewarm:



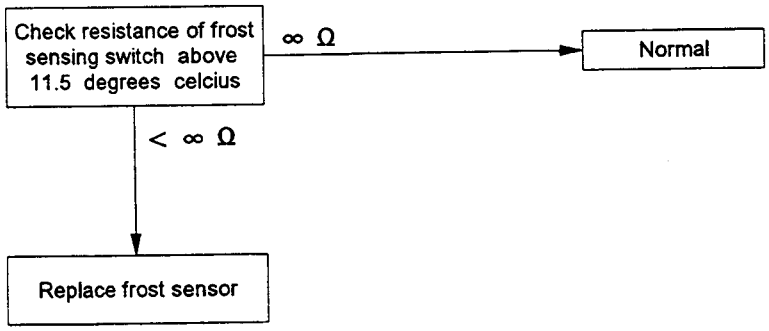
NOTE: Modulating valve will not modulate if forced HIGH combustion switch is left in the ON position.
Ensure that is is returned to the OFF position.

3.4 Anti-Frost Heater Will Not Operate:



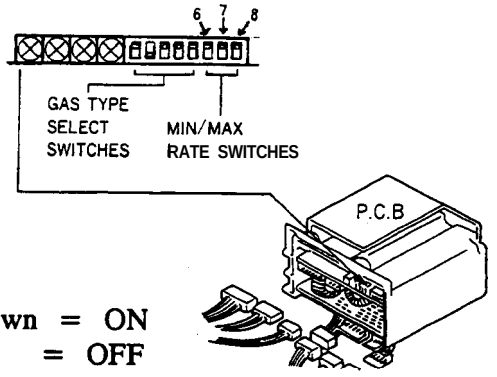
	Position	Resistance values
Anti-frost heater	E.W.F.C.D. Hot water outlet Hot water connection	156 Ω 156 Ω 156 Ω
Anti-frost heater - D	Heat exchanger	200 Ω

3.5 Anti-Frost Heaters Will Not Turn OFF:



GAS PRESSURE SETTING PROCEDURE

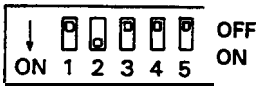
1. To adjust the LO and/or HI pressure, locate the min/max rate switches behind the paper seal on the P.C.B.



Down = ON
Up = OFF

2. Confirm the position of the gas type select switches, according to the diagram below.

(The REU-24 W-A is only approved to operate on Natural Gas)

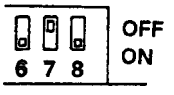


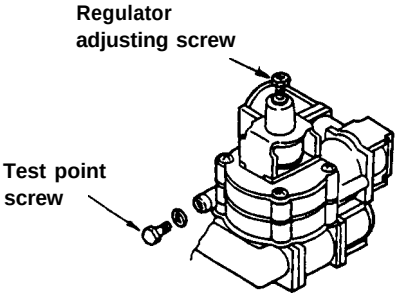
Do not alter the gas type selection switches unless they are incorrect.

3. Adjusting the LO pressure.

LOW setting on Natural Gas - 0.04 kPa

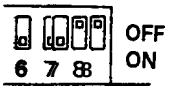
- Remove the test point screw and attach the pressure gauge.
- Open a tap and allow the water to flow slowly.
- Place the **N°.6** and **N°.8** switches in the ON position as shown opposite.
- Adjust the regulator screw if necessary.
- Lock the regulator screw after having achieved the correct pressure.
- Return the **N°.8** switch to the OFF position. (If the HI pressure is not going to be checked, then switch **N°.6** must be returned to the OFF position).



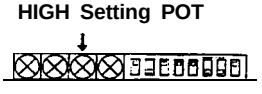


4. Adjusting the HI pressure:

- Open a tap fully to allow maximum water flow.
- With the **N°.6** switch still in the ON position, place the **N°.7** switch in the ON position also, as shown here.

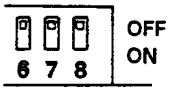


- Adjust the HI pressure by rotating the High Setting POT, shown here.



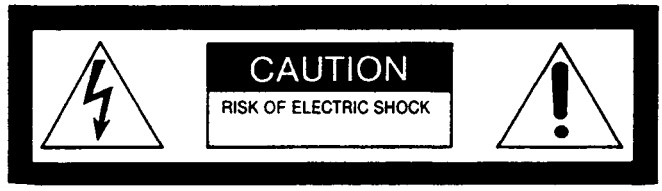
HI setting on Natural Gas - 0.70 kPa

5. After having adjusted the POT to achieve the correct pressure setting, return the **N°.6** and **N°.7** switches to the **OFF** position.



- Remove the pressure gauge and replace the test point screw.
- Replace paper seal over switches.

COMPONENT ANALYSIS



Note: the letters in brackets,[i.e. **(H), (F_2)]** refer to the corresponding position of the connection on the wiring diagram on page 40.

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.

Refer to transformer values - page 39.

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 pin connector **H** (grey/red) from PCB. Connect meter to grey and red leads.

Grey – Red
… below 10 Ω is normal.
(Transformer is in circuit)

b) **Remaining Flame Safety Device**

2 pin connector **(D_1)**

Brown – Brown
… below DC 1 V is normal.

3. Water Flow Sensor

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

3 pin connector (A,)

Black(-) – Red(+)
… DC 12 V normal.

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

Normal Output

Water flow	pulse (Hz)
2 L/min	18 ~ 22
5 L/min	60 ~ 70
8 L/min	100 ~ 120
10 L/min	130 ~ 150
12 L/min	160 ~ 180
16 L/min	220 ~ 240

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

3 pin connector [A,].

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 e)

Red – Red (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.

8 pin connector (D)

Bk(-) – Br(+) Pins 1 & 2
DC 80 – **100 V (SV_1)**
... 1.1 – 2.0 K Ω is normal.

R(-) – R(+) Pins 4 & 5
DC 80 – 100 v **(SV_2)**
... 0.4 – 0.6 K Ω is normal.

Br(-) – Br(+) Pins 1 & 3
DC80 – 100 v **(SV_3)**
. . . 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]

		NG
High		145
Ignition		63
Minimum		20

b) Modulating valve resistance

Turn off power and 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 .O **μA** is 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.

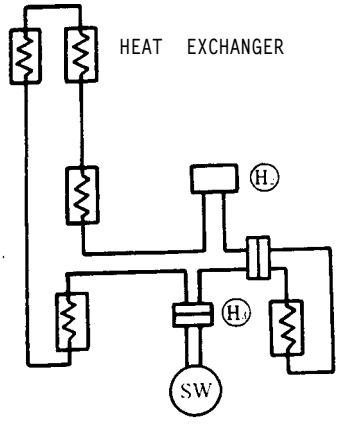
9. Anti-Frost Heaters

Measure with the power and connector disconnected.

2 pin connector. (H_2)

Measure by shorting the connection (H_3) [frost sensing switch].

White – White
... approx 720 kΩ is normal.
... ∞ indicates faulty heaters.



10. Frost Sensor Switch

Measure with the power and connector disconnected.

Blue – Blue . . . frost sensor connector .

Below 3.5°C . . . . less than 1 Ω is normal.

Above 11.5°C . . . ∞ Ω is normal.

[3.5 ± 3°C ON, 11.5 ± 3°C OFF.]

11. Electronic Water Flow Control Device and Bypass Control Motor

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

10 Pin connector I

R & W - LHS geared motor

R & W - RHS Bypass

a) With connector connected.
... DC 1.5 – 12 V is normal.

b) With the connector disconnected.
... 50 Ω is normal.

12. Thermistor

Measure with the connector disconnected.

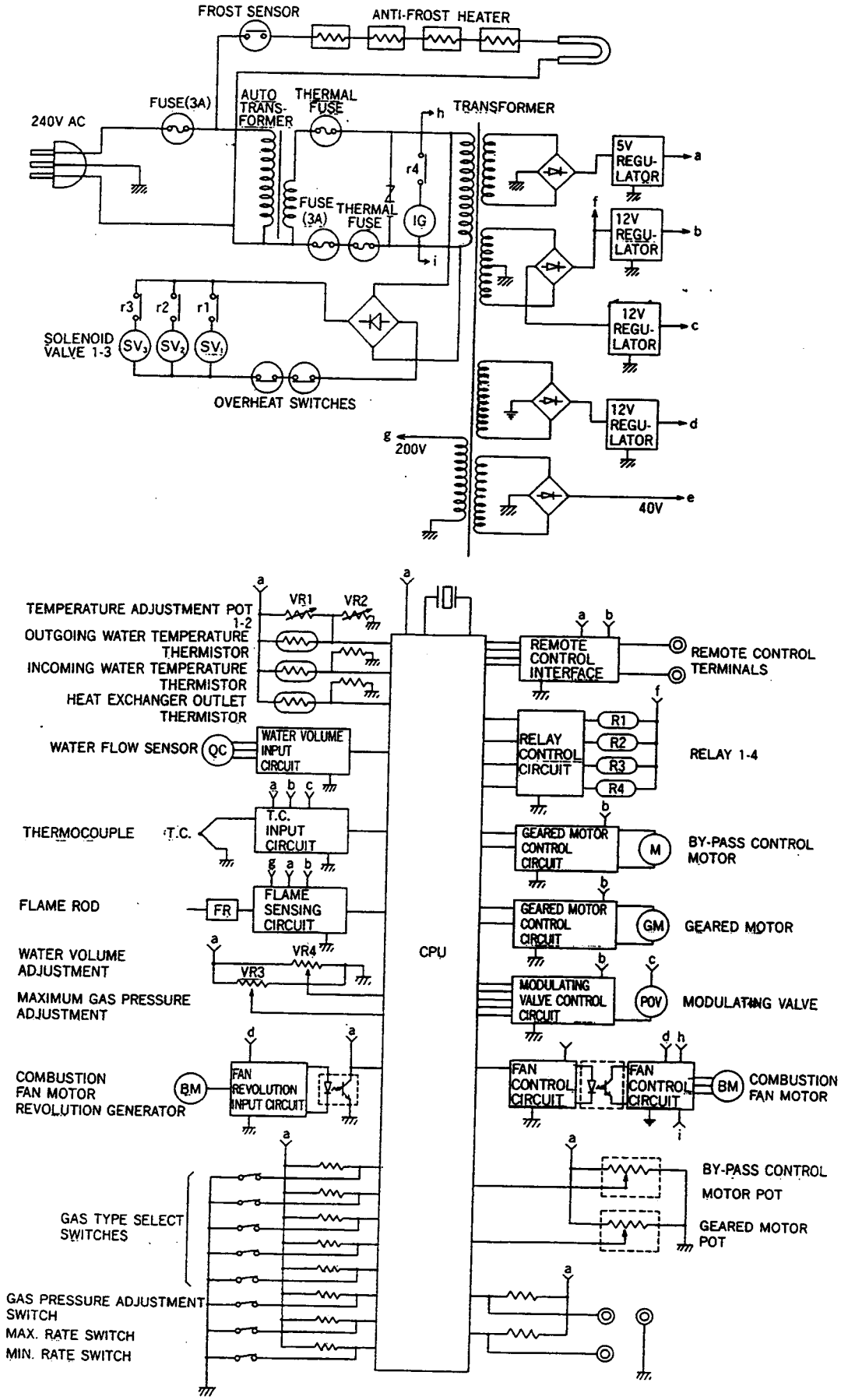
8 pin connector (A) Thermistor side.
Gy - W (H.X. Outlet)

8 pin connector (A) Thermistor side.
Gy - B (Incoming)

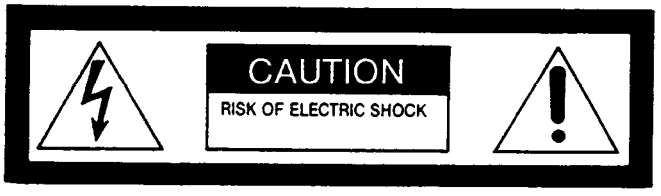
8 pin connector (A) Thermistor side.
Gy - W (Outgoing)

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

BLOCK DIAGRAM



DIAGNOSTIC POINTS



Note: F - refers to the bold numbers at the left of the flow chart on page 20.

W - refers to the position of the connections on the wiring diagram. See page 40.

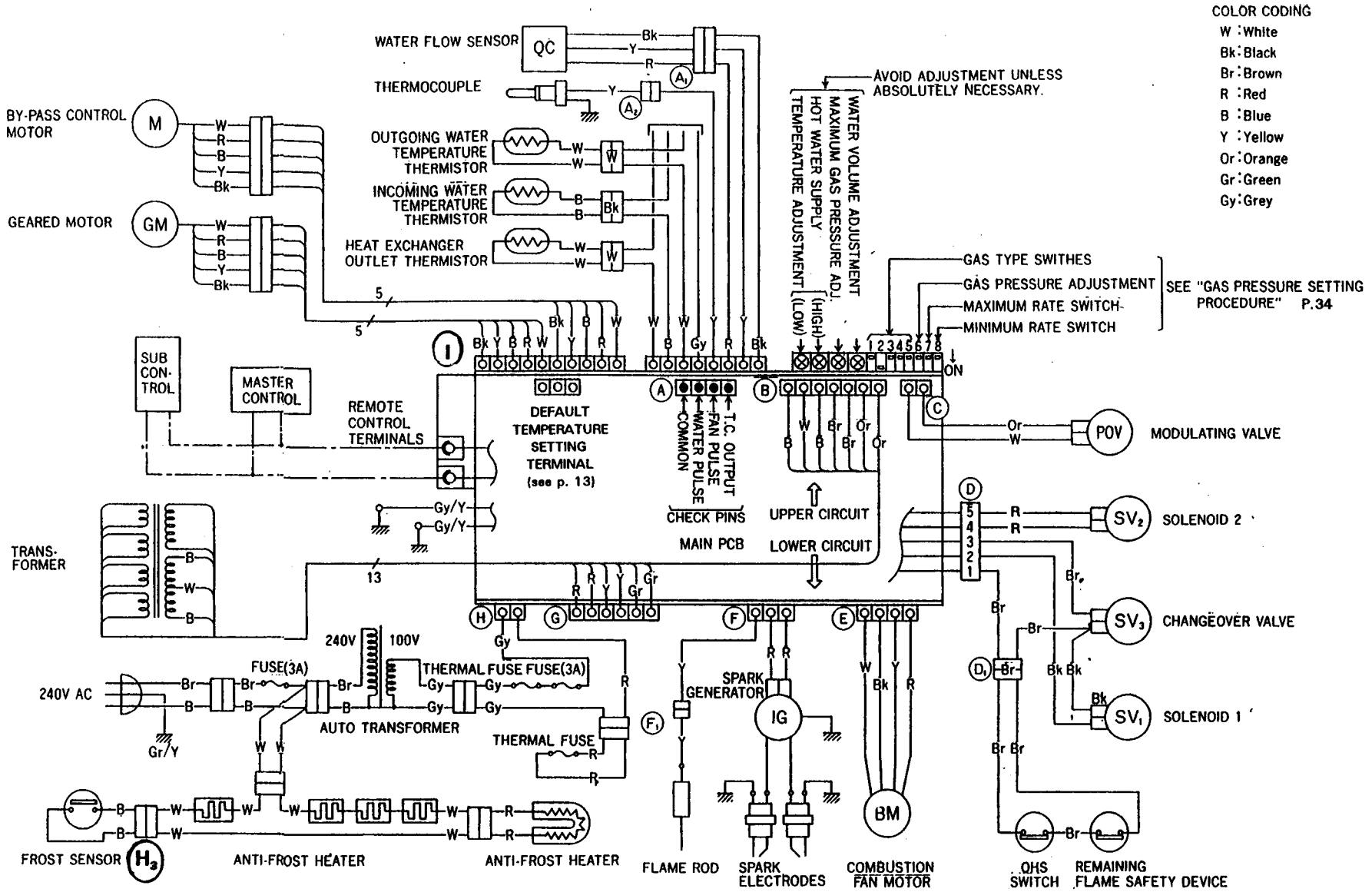
F	Measurement point		Values
	W	Wire colour	
1	H	Gy - Red	AC 90 – 110 Volts
5	D	1Br - 3Br	DC 80 – 100 Volts
			1 – 1.6 kΩ
7	D	1Br - 2Bk	DC 80 ~ 110 Volts
			1 ~ 1.6 kΩ
9	C	O - W	DC 3 ~ 20 Volts
			70 ~ 90 Ω
11	D_1	Br - Br	Below DC 1 Volt
			Below 1 Ω

F	Measurement point		Values
	W	Wire colour	
4	F	Red - Red	AC 90 – 110V
6	D	4Red - 5Red	DC 30 – 60 Volts
			0.4 – 0.6 kΩ
8	F_1	Y - Earth	AC40 – 120 Volts
			Above DC 1 μA
10	A_1	Y - Earth	DC 5 – 32 mV
			Below 2 Ω
12	A	Gy - W Gy - B Gy - W	{10°C: 14 – 17 kΩ {20°C: 9.5 – 11 kΩ {60°C: 2.4 – 2.7 kΩ

Transformer Values

	B	B - B	AC 30 – 40 Volts 3 ~ 7 Ω		G	Red - Red	AC 90 – 100 Volts 9 ~ 12 Ω
	B	Br - Br	AC a – 10 Volts 1.2 ~ 1.5 Ω		G	Y - Y	AC 180 – 220 Volts 0.4 – 0.6 kΩ
B		Or-Or	AC 30 ~ 50 Volts 4 ~ 8 Ω		G	Gy - Gy	AC 10 – 20 Volts 3 ~ 4 Ω

WIRING DIAGRAM



DISMANTLING FOR SERVICE

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

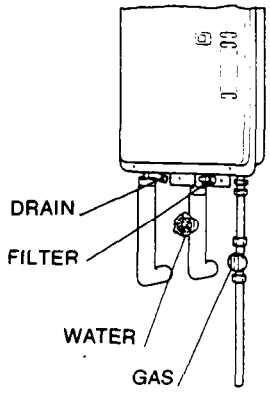
eg. - Isolate gas supply.
- Disconnect electrical supply from wall socket.
- Isolate the water supply.
- Drain **All** water from the appliance.

IMPORTANT

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

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

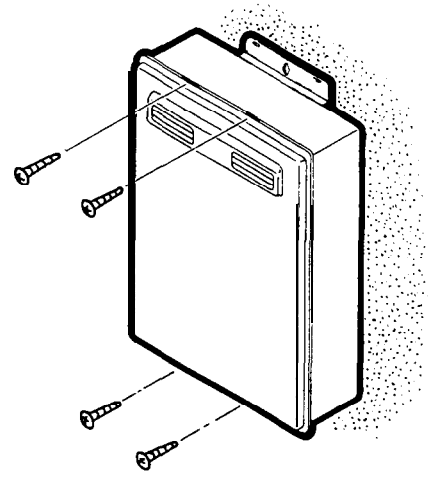
The following diagram may be of assistance.



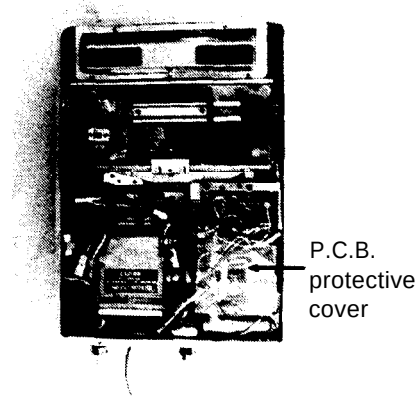
1. Removal of the FRONT COVER

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

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



b. Remove front panel by pulling forward.

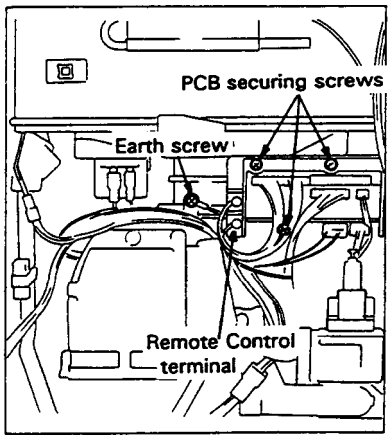


2. Removal of the P.C.B. Unit

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

Follow section **1 first.**

a. Remove P.C.B./Solenoid assembly protective plastic cover.
One (1) screw - see previous picture.



b. Disconnect eight (8) connectors from the P.C.B. Unit.

c. Disconnect remote control cable connections. Two (2) screws.

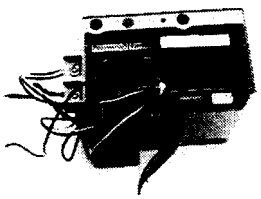
d. Release two P.C.B. Earth connections

e. Remove connecting wire purse clips.

f. Remove three (3) P.C.B. securing screws.

g. To remove P.C.B. Unit, pull forward and out.

h. Release one (1) additional connector to remove complete P.C.B. Unit.

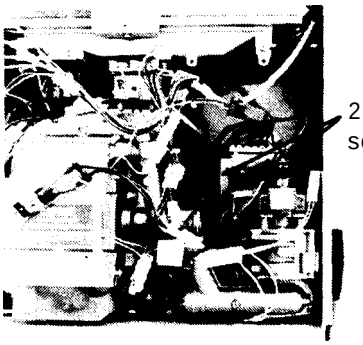


3. Removal of the P.C.B. TRANSFORMER

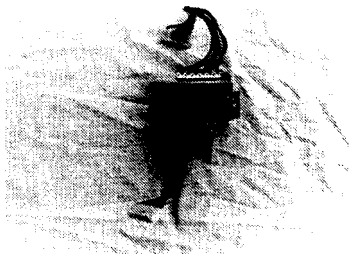
CAUTION: 240 Volt exposure. Isolate the electrical supply to the appliance and reconfirm with a neon screwdriver or multimeter.

Follow **section 1 first.**

a. Remove P.C.B. Unit. Follow section 2.



b. Remove two (2) transformer securing screws.



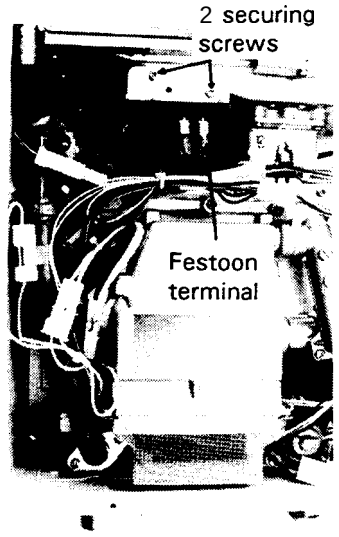
4. Removal of the SPARKER

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

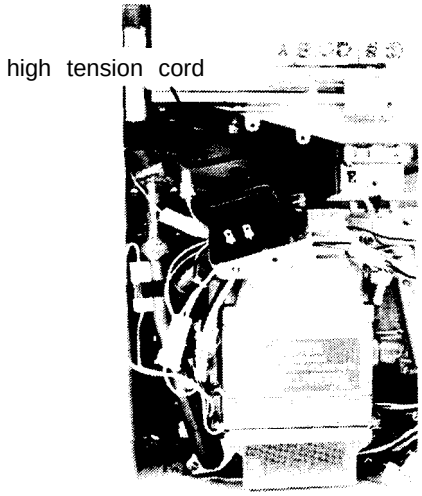
Follow **section 1 first.**

a. Release the two (2) sparker festoon terminal connectors (red-red).

b. Remove two (2) sparker securing screws.



c. Sparker will now drop down and out, whilst remaining attached by the high tension cords. Use pliers to restrain high tension cords and release sparker completely.



d. Remove one (1) screw to release sparker from bracket.

5. **Removal of the SOLENOID ASSEMBLY**

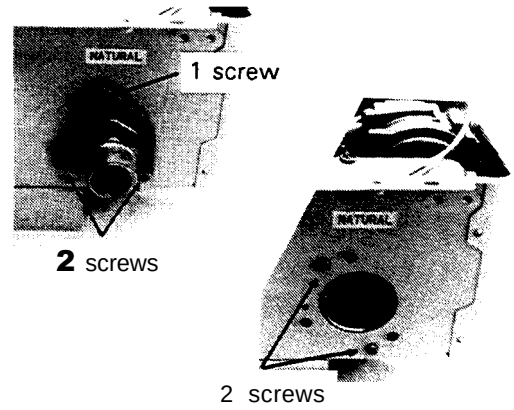
CAUTION: 240 Volt exposure. Isolate the electrical and gas supplies to the appliance, reconfirm with a neon screwdriver or multimeter.

Follow section 1 first.

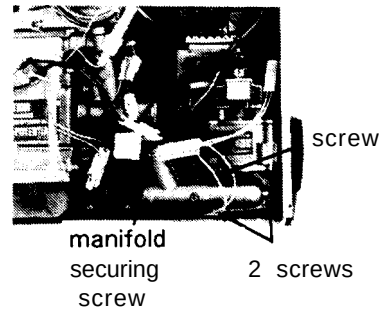
a. Disconnect incoming gas supply union.

b. Remove three (3) gas inlet connection securing screws. Pull connection down to release completely.

c. Remove two (2) solenoid assembly securing screws to free component from casing.



d. Remove three (3) gas supply connection tube A securing screws.



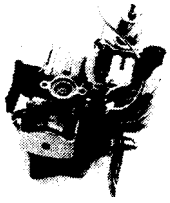
e. Remove the additional screw which secures connection tube A to the manifold.

f. Shift connection tube A forward and rotate to the left:

CAUTION: Orifice seal and Orifices may fall out of the solenoid assembly when connection tube A is moved.

g. Release the O.H.S. connector. (brown-brown) Disconnect the 2 pin and 8 pin connectors from P.C.B. as indicated above.

h. Solenoid assembly can be removed by manoeuvring forward. Once it has been removed from the appliance, release the connectors.



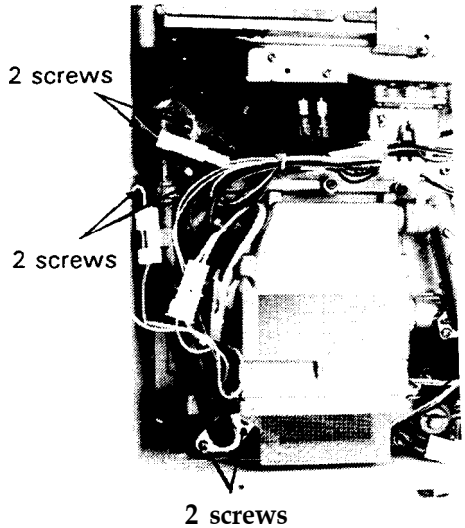
6. **Removal of the WATER BYPASS DISTRIBUTOR and WATER FLOW SENSOR**

CAUTION: 240 Volt exposure. Isolate the electrical and water supplies to the appliance, reconfirm with a neon screwdriver or multimeter.

Drain appliance - see page 42.

Follow section 1 first.

a. Release the hot water supply connecting tube six (6) screws. Pull forward to release, allow it to remain connected by the anti-frost heater harness.

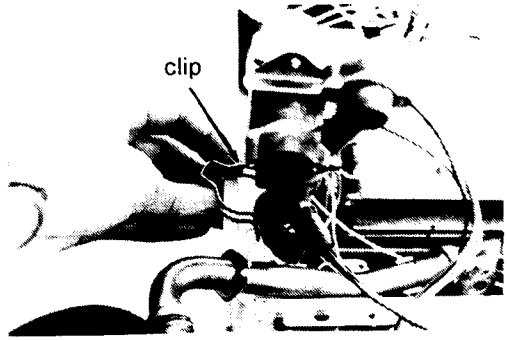


b. Remove two (2) water bypass distributor securing screws.

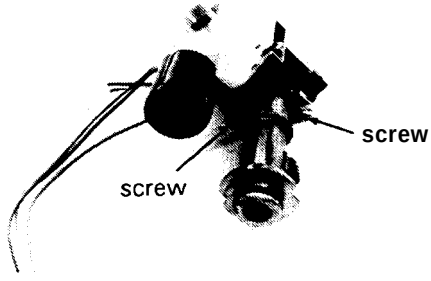
c. Release water bypass distributor 5 pin connector and water flow sensor 3 pin connector.

d. Using your fingers, pull the water bypass distributor with the water flow sensor attached forward until it is in the horizontal position.

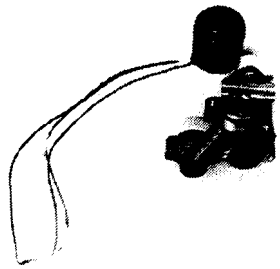
e. Remove the quick fastener clip to remove the complete assembly.



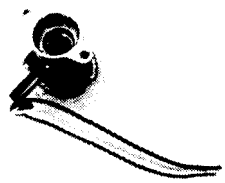
f. Release the water flow sensor by removing the two (2) securing screws indicated below.



Water Bypass Distributor



Water Flow Sensor



7. Removal of the ELECTRONIC WATER FLOW CONTROL DEVICE

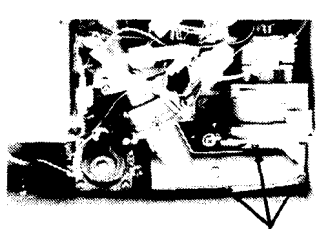
CAUTION: 240 Volt exposure. Isolate the electrical and water supplies to the appliance, reconfirm with a neon screwdriver or multimeter.

Drain appliance - see page 42.

Follow section 1 first.

a. Remove P.C.B. Unit. Follow section 2.

b. Remove three (3) gas connection tube A securing screws.



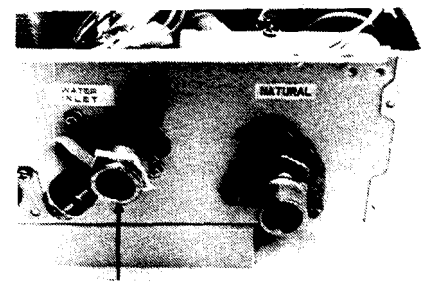
3 screws

c. Pull forward and remove air filter.

d. Remove P.C.B. Transformer. Follow section 3 step b.

e. Remove Solenoid Assembly. Follow section 5.

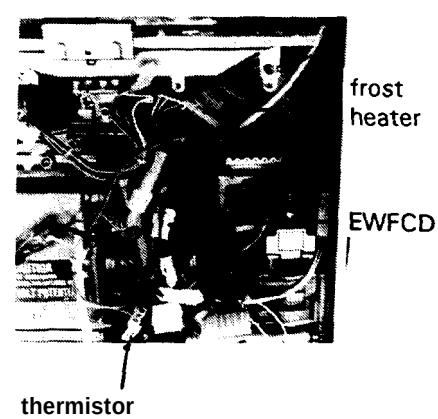
f. Disconnect incoming water supply union. Remove two (2) water inlet connection securing screws. Pull down to release from electronic water flow control device.



water supply union

g. Remove two (2) electronic water flow control device securing screws to free component from casing.

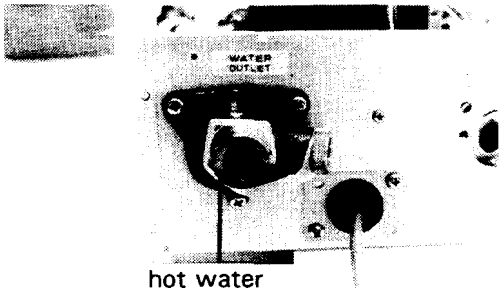
h. Disconnect incoming water temperature thermistor 2 pin connector (blue-blue), electronic water flow sensor 5 pin connector, heater exchanger frost protection heater 2 pin connector, and frost sensor to anti-frost heater harness connector



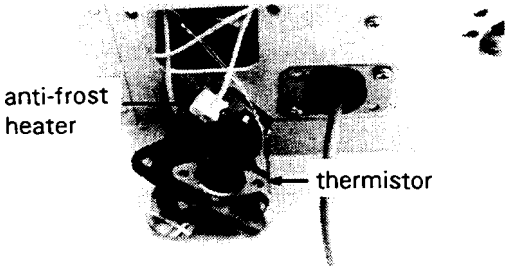
thermistor

i. Remove the hot water supply connection tube, as well as removing the anti-frost protection heater from hot water supply tube. Follow section 6 step a.

j. Remove the three (3) hot water supply outlet connection securing screws. pull down to release.

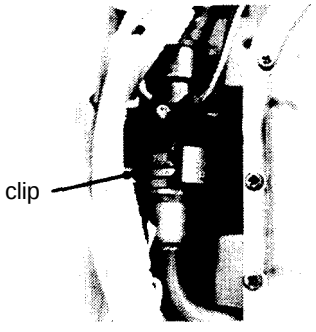


k. Disconnect the outgoing water temperature thermistor connector.



1. Remove the anti-frost protection heater from the hot water outlet connection.

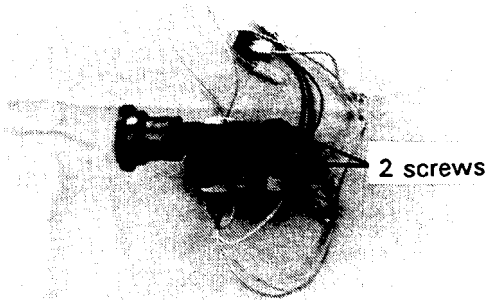
m. Remove the quick fastener clip securing the water supply tube to the water flow sensor.



n. Manoeuvre the electronic water flow control device out of the water heater, with the anti-frost protection heater assembly and incoming water supply tube attached.

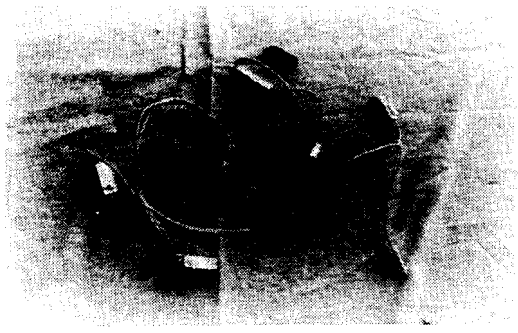
NOTE: The brass connection end of the other supply tube contains the water rectifier.

0. Remove two (2) water supply connection tube securing screws.

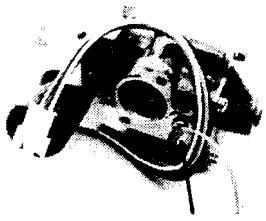


p. Remove two (2) x one (1) anti-frost heater securing screws to disconnect the anti-frost heater assembly harness from the electronic water flow control device.

NOTE: When the anti-frost heaters are reconnected to the electronic water flow control device, be sure to connect them correctly. See below.



q. Remove one (1) incoming water temperature thermistor securing screw. **CAUTION: Avoid losing the 0 ring.**



thermistor

8. Removal of the ANTI-FROST HEATER HARNESS ASSEMBLY

CAUTION: 240 Volt exposure. Isolate the electrical and water supplies to the appliance, reconfirm with a neon screwdriver or multimeter.

Drain appliance - see page 42.

Follow section 1 first.

Follow section 7 steps a → q.

9. Removal of the COMBUSTION FAN

CAUTION: 240 Volt exposure. Isolate the electrical, gas, and water supplies to the appliance, reconfim with a neon screwdriver or multimeter.

Drain appliance - see page 42.

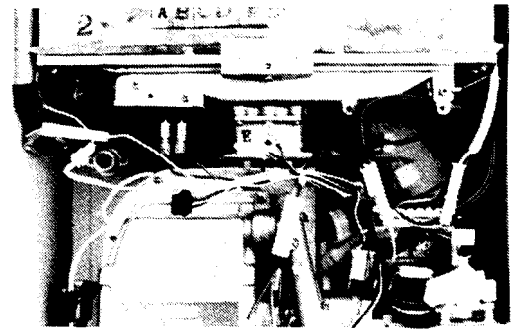
Follow section 1 first.

a. Remove P.C.B. Unit. Follow section 2.

b. Remove hot water supply connection tube and water bypass distributor. Follow section 6 steps a → c.

c. Remove harness B assembly. Release the heat exchanger outlet thermistor connector, outgoing water temperature thermistor, flame rod connector, sparker festoon terminal connectors, water flow sensor connector.

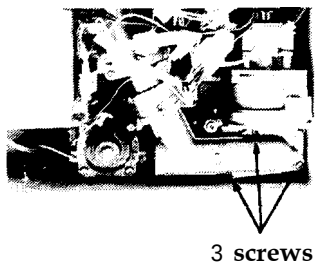
E.W.F.C.D. connector, incoming water temperature thermistor, thermocouple yellow connector. Harness should be free now.



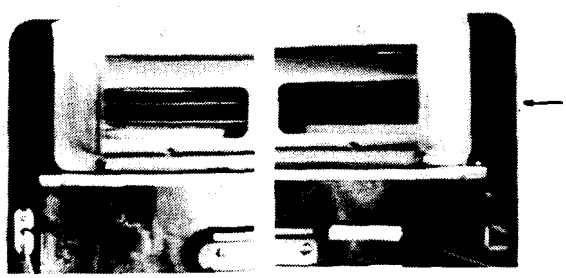
d. Release anti-frost heater connector (white - white), thermal fuse connector, and incoming electrical supply connector.

e. Release O.H.S./ solenoid assembly connector (brown-brown).

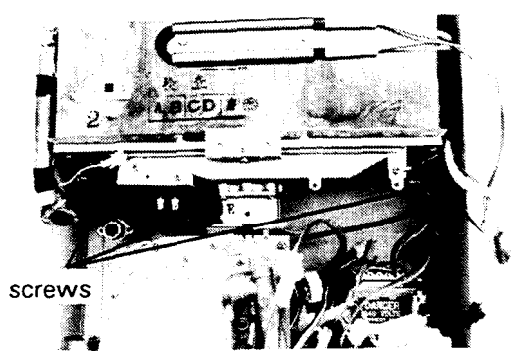
f. Remove three (3) gas supply connection tube A securing screws.



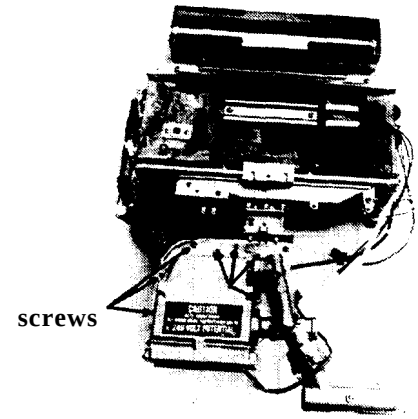
g. Remove two (2) flue terminal securing screws.



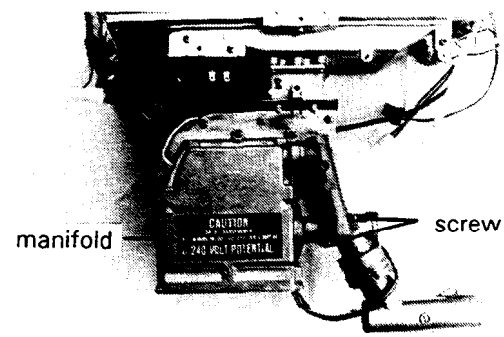
h. Remove three (3) main assembly securing screws.



i. The flue terminal, heat exchanger, combustion fan, manifold cover, gas connection tube A and B can now be removed as one complete assembly.

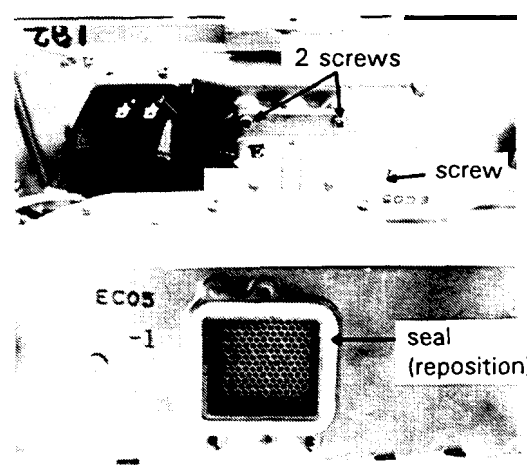


j. Remove seven (7) manifold cover securing screws. Remove two (2) gas connection tube B securing screws.



k. Remove three (3) combustion fan casing securing screws to release the combustion fan assembly from the heat exchanger/burner assembly.

IMPORTANT: There is a burner seal at the connection with the combustion fan assembly. This must be re-positioned upon reassembly.



NOTE: For advice on replacing the fan motor or fan blades contact Rinnai directly.

10. Removal of the **MAIN TRANSFORMER**

CAUTION: 24 0 Volt exposure. Isolate the electrical, gas, and water supplies to the appliance, reconfirm with a neon screwdriver or multimeter.

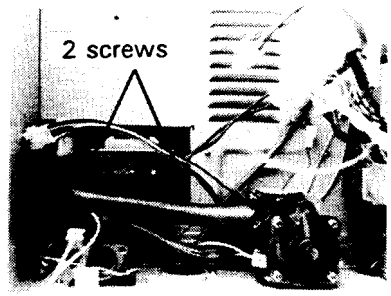
Drain appliance - see page 42.

Follow section 1 first.

a. Flue terminal, heat exchanger, combustion fan, gas connection tube A and B complete assembly must be removed to allow access to the main transformer.

Follow section 9 steps a → j.

b. Remove two (2) screws to release transformer from main casing.



11. Removal of the OVER **HEAT SWITCH**

CAUTION: 24 0 Volt exposure. Isolate the electrical, gas, and water supplies to the appliance reconfirm with a neon screwdriver or multimeter.

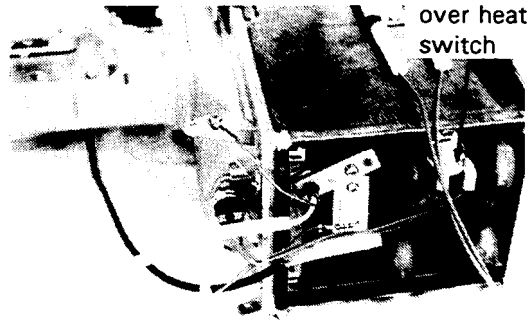
Drain appliance - see page 42.

Follow section 1 first.

a. Follow section 9 steps a → j.

b. Disconnect the harness by pulling it from the O.H.S. festoon terminals.

c. Remove two (2) screws to release the O.H.S. from the heat exchanger.



12. Removal of the **FLAME ROD**

CAUTION: 240 Vol exposure. Isolate the electrical, gas, and water supplies to the appliance, reconfirm with a neon screwdriver or multimeter.

Drain appliance - see page 42.

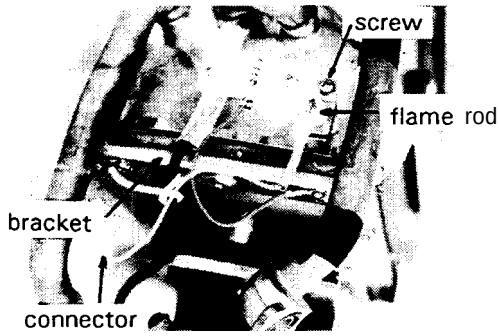
Follow section 1 first.

a. Follow section 9 steps a → j.

b. Remove the flame rod lead from the flame rod terminal.

See next page for photograph.

c. Remove two (2) heat exchanger bracket left securing screws.



d. Remove one (1) flame rod securing screw.

Pull flame rod out to remove.

13. Removal of the THERMOCOUPLE

CAUTION: 240 Volt exposure. Isolate the electrical, gas, and water supplies to the appliance, reconfirm with a neon screwdriver or multimeter.

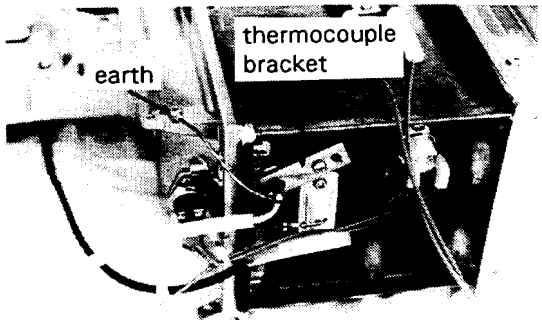
Drain appliance - see page 42.

Follow section 1 first.

a. Follow section 9 steps a → j.

b. Remove one (1) thermocouple fixing bracket securing screw and earthing wire securing screw.

c. Note the order of the seals when removing.



d. Be sure not to damage seals, and that they are in the correct position when replacing

14. Removal of the ELECTRODE LEFT/RIGHT

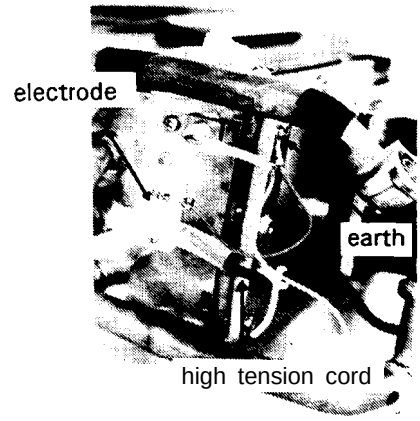
CAUTION: 240 Volt exposure. Isolate the electrical, gas, and water supplies to the appliance, reconfirm with a neon screwdriver or multimeter.

Drain appliance - see page 42.

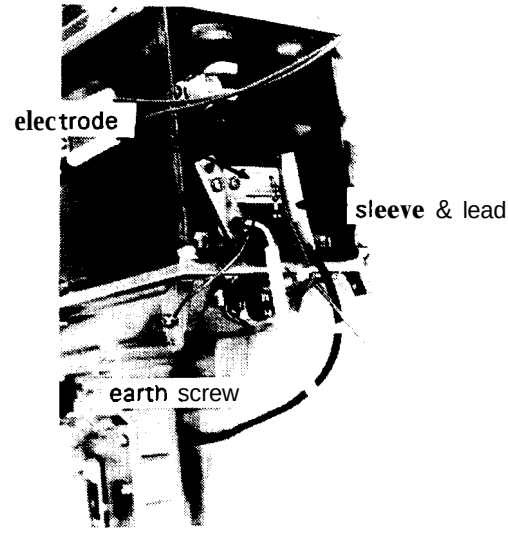
Follow section **1 first.**

a. Follow section 9 steps a → j.

b. **LEFT:** Remove electrode sleeve and high tension cord from electrode. Remove one (1) Earth securing screw.



c. RIGHT: Identical procedure to left.



15. Removal of the BURNER

CAUTION: 240 Volt exposure. Isolate the electrical, gas, and water supplies to the appliance, reconfirm with a neon screwdriver or multimeter.

Drain appliance - see page 42.

Follow section 1 first.

a. Follow section 9 steps a → j.

b. Remove flame rod. Follow section 11 steps b → d.

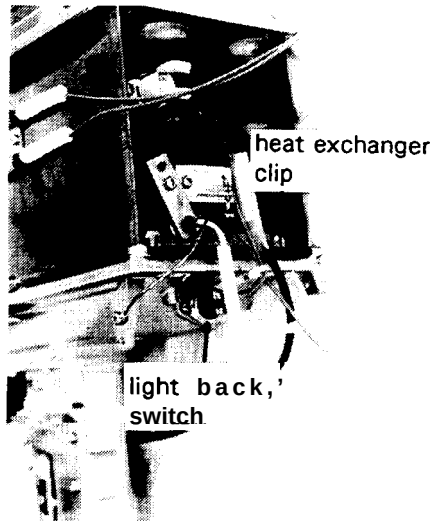
c. Remove thermocouple. Follow section 12 step b.

d. Remove sparker. Follow section 4.

e. Remove two (2) screws to release light back sensor switch.

f. Remove two (2) heat exchanger bracket left securing screws.

g. Remove two (2) heat exchanger bracket right securing screws. Follow section 12 step c.



h Remove combustion fan assembly. Follow section 9 steps j → 1.

i. Remove two (2) heat exchanger clips, one (1) screw.

j. The burner is sealed to the heat exchanger with silicone.

IMPORTANT: If replacing burner, then a high temperature silicon must be used when re-fitting .

For additional advice on replacing the burner, contact Rinnai directly.

16. Removal of the LIGHT BACK SENSOR

CAUTION: 240 Volt exposure. Isolate the electrical, gas, and water supplies to the appliance, reconfirm with a neon screwdriver or multimeter.

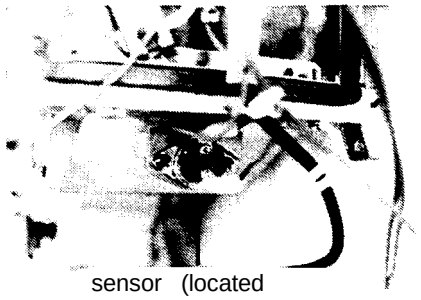
Drain appliance - see page 42.

Follow section 1 first.

a. Flue terminal, heat exchanger, combustion fan, gas connection tube A and B complete assembly must be removed to allow access to the light back sensor switch.

Follow section 9 steps a → j.

b. Remove two (2) screws to release light back sensor switch.



sensor (located to rhs under burner)

17. Removal of the COMBUSTION CHAMBER

CAUTION: 240 Volt exposure. Isolate the electrical, gas, and water supplies to the appliance, reconfirm with a neon screwdriver or multimeter.

Drain appliance - see page 42.

Follow section 1 first.

a. Flue terminal, heat exchanger, combustion fan, gas connection tube A and B complete assembly must be removed first.

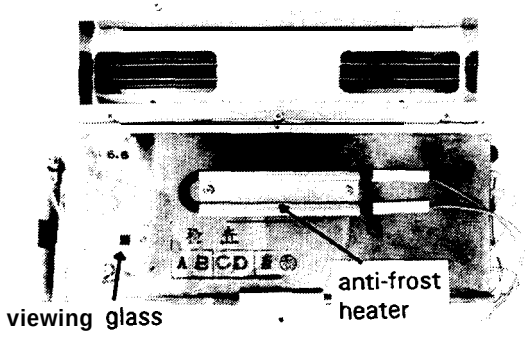
Follow section 9 steps a + j.

b. Remove flame rod. Follow section 12 steps b → d.

c. Remove spark electrodes left and right. Follow section 14 steps b & c.

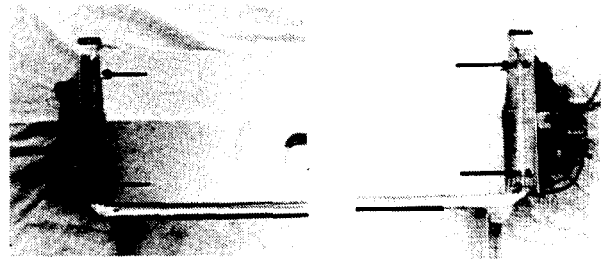
d. Remove thermocouple. Follow section 13 step b.

e. Remove heat exchanger outlet thermistor, viewing glass, and heat exchanger anti-frost protection heater.



f. Remove O.H.S. Follow section 11 steps b & c.

g. Remove four (4) flue terminal to heat exchanger securing screws.



h. Remove burner with combustion fan assembly attached, from heat exchanger. Follow section 15 steps i → j.

18. Removal of the FUSIBLE LINK

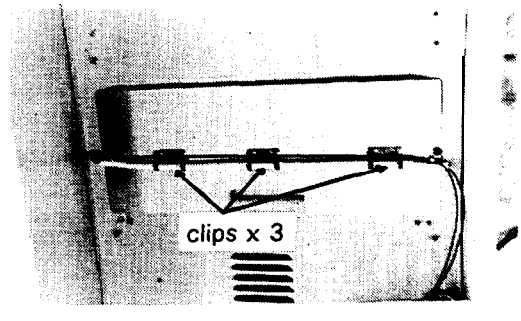
CAUTION: 240 Volt exposure. Isolate the electrical, gas, and water supplies to the appliance, reconfirm **with** a neon screwdriver or multimeter.

Drain appliance - see page 42.

Follow section 1 first.

a. Follow section 9 setps a → j.

b. Fusible link is secured to the rear of the casing with aluminium clips.



19. Removal of the INCOMING WATER TEMPERATURE THERMISTOR

CAUTION: 240 Volt exposure. Isolate the electrical, gas, and water supplies to the appliance, reconfirm with a neon screwdriver or multimeter.

Drain appliance - see page 42.

Follow section 1 first.

a. Remove electronic water flow control device. Follow section 7 steps a → r, then step q.

20. Removal of the OUTGOING WATER TEMPERATURE THERMISTOR

CAUTION: 240 Volt exposure. Isolate the electrical, gas, and water supplies to the appliance, reconfirm with a neon screwdriver or multimeter.

Drain appliance - see page 42.

Follow section 1 first.

a. Release hot water supply connection tube. Follow section 6 step a.

b. Remove hot water supply outlet connection. Follow section 7 step k → 1.

c. Remove two (2) screws to release the outgoing water temperature thermistor.

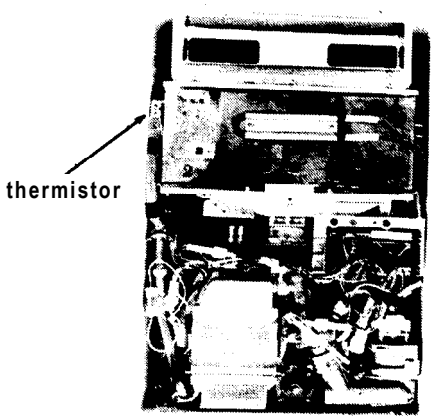
21. Removal of the HEAT EXCHANGER OUTLET THERMISTOR (OHS)

CAUTION: 240 Volt exposure. Isolate the electrical, gas, and water supplies to the appliance, reconfirm with a neon screwdriver or multimeter.

Drain appliance - see page 42.

Follow section 1 first.

a. Disconnect heat exchanger outlet thermistor connector.



b. Remove two (2) screws to **release the heat** exchanger outlet thermistor completely.

SHOWERING TEMPERATURES

An examination of preferred showering temperatures: by David Fishman and Bronwen Jenne. Reprinted here in part from the article 'Some like it Hotter' which appeared in Watson House Bulletin (Vol.46,2,1982).

Variations in water flow rate are less of a problem with gas fired appliances, since any reduction in water pressure, and hence flow rate, automatically reduces gas pressure to maintain an almost uniform water temperature.

Watson House was undertaken to provide data for establishing comfortable showering temperatures which might be used as a basis for new clauses specific to gas shower water heaters in British Standards.

Comparing individuals' reactions to water temperatures in a shower can be difficult since the precise area of the body exposed to water and the degree of immersion, the two most important factors, may be constantly changing.

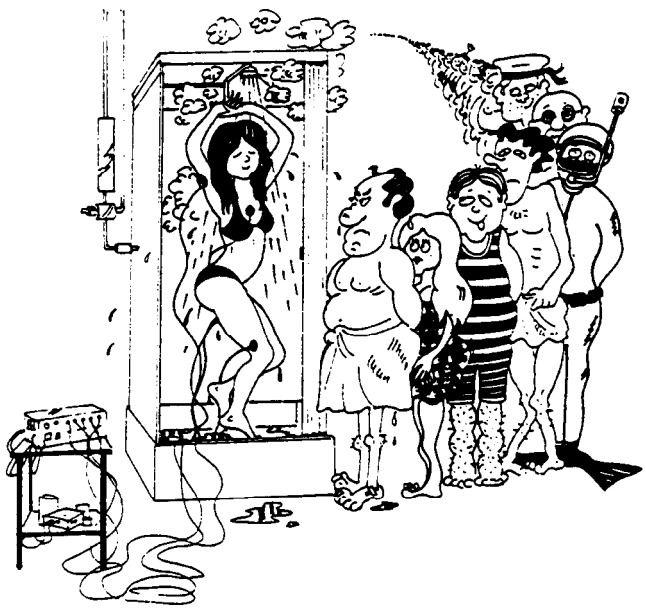
While in the case of a hand-held shower the water temperature would depend on how far the shower head was from the skin. The water loses heat between leaving the shower head and contacting the skin.

Thus the object of the Watson House experiments was to determine an average temperature at which people normally shower and the maximum temperature they are prepared to tolerate.

THE TESTS:

For the tests, a shower cubicle was constructed in a test room with a controlled environment and 97 subjects, (69 males and 28 females) where instructed on the showering procedure they were to follow for the tests. Each subject was exposed to the same environmental conditions before starting. The forehead, sternum (breastbone), scapula (shoulder), right forearm, thigh and foot skin temperatures of each subject were measured during the tests by thermistors taped to the skin.

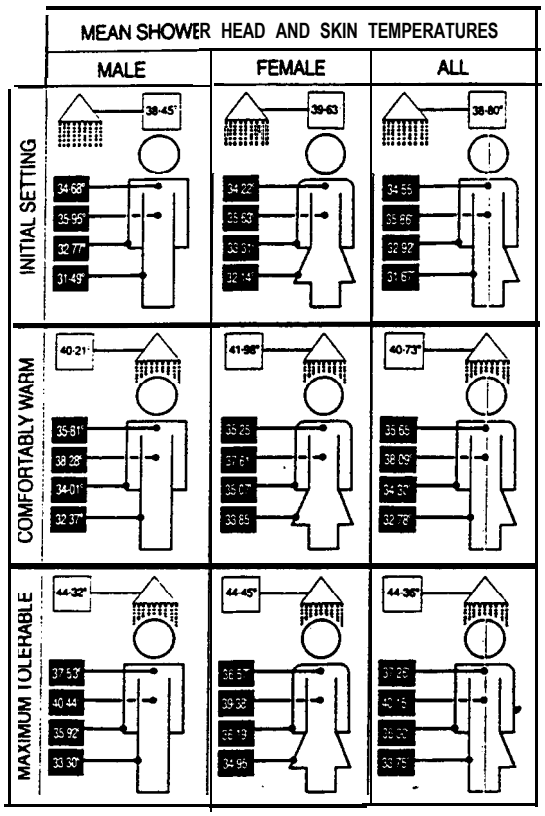
In addition, the water temperature within the shower head and drain, and the temperature of the supply pipe after the



mixing valve, were recorded by thermocouples. The water flow rate was maintained at 0.27 m^3/hr. The height and weight of each subject was also recorded to determine surface area, and other relevant personal information was also noted, though no significant correlations were observed for these personal variables during the tests.

Three important shower head temperatures were recorded during the series of tests. Firstly the subject stood outside the shower and adjusted the water temperature to that at which he or she felt confident enough to step under the water.

Two minutes after entering the shower the subject was asked to adjust the temperature to that which he/she considered to be comfortably warm and after a further two minutes the volunteer increased the water



temperature to the maximum tolerable level whilst still standing under the water.

During the course of the tests all water and skin temperatures were recorded every twenty seconds by the use of a data logging system.

The results from the tests are shown in the accompanying illustrations. Briefly, they show the very wide range of temperatures chosen by subjects during the tests. The mean initial temperature set for showering was 39°C. The mean maximum tolerable for all subjects was **44°C,** while no one was able to tolerate shower head temperatures in excess of 50°C. Throughout the tests the females, due to their anatomical and physiological differences, set a temperature approximately 1°C higher than that of the males. This occurred up to the maximum tolerable at which point both sexes set the same temperature level.

CONCLUSIONS DRAWN:

Four general conclusions may be drawn from the findings:

1. Females prefer shower temperatures 1°C higher than males, up to maximum tolerable setting.

2. The typical temperature initially set for showering was 39°C.

3. The mean maximum tolerable temperature set by the subjects was 44”C, and there was no difference observed between sexes over a two minute showering period.

4. No subject was prepared to withstand showering temperatures in excess of 50°C.

SOME IMPLICATIONS:

These findings imply that new designs of gas fired showering appliances should be set so that the after-heat water temperature at the shower head does not exceed an upper safety limit of 50°C. and that the maximum setting for normal showering purposes delivers water at a nominal design temperature of 44°C for comfort considerations.

PARTS LIST

No	Part Name	RJ Part No	RA Part No	RNZ Part No	QY
100	Front panel assembly	CU115-110x05	92071539	3862	1
101	Front panel packing	AU115-161x01		3760	1
102	Main body packing A	BU103-105x02		3762	1
103	Main body packing side	AU1 15-163	92063361	3768	2
104	Outer case A	CU115-100-ax05		3861	1
105	Wall mounting bracket top	BUx02103-104x02	92071547		1
106	Wall mounting bkt bottom	BU115-108	92071554		1
111	Warning label Data plate AGA Approval badge	BU132-1152 BU115-1051 CP-71128		3769	1
112	Wiring & Block diagram Pressure setting procedure	cu115-1092		3774	1
114	Appliance label	BU115-1053		3775	1
200	R W /20 Gas connection	BU124-21x02	92071562	3776	1
201	Gas inlet 0 ring	ORIAP31NP	92067032	3777	1
202	Modulating solenoid (assy)	C36A-2-2	920669 19	3778	1
203	Gas filter	C36A-1-36	92068899	3779	1
204	Pressure test point screw	ClOD-3	92068907	9994	1
205	Pressure test Doint Packing	CP-30094x02		9995	4
206	Orifice A NG	C36A1-4-050	92068915	3780	1
207	Orifice B NG	C36Al-5-052	92068923	3781	1
208	Orifice packing	C36Al-3	9206893 1	3782	1
209	Gas connection tube A	BU 115-545x02	92071570	3783	1
210	Gas supply 0 ring	M10B-1-25	92067024	1105	1
211	Manifold	CU115-533-ax03		3784	1
212	Rectifier panel	AU1 15-537x01	92068949		1
213	Gas damper A	BU115-589		3785	1
214	Manifold inner packing	AU115-538x02		3786	1
215	Manifold packing	BU115-535x03		3787	1
216	Manifold cover	DU115-536-ax04		3788	
217	Manifold flap assembly	BU 115-540x03		3789	1
218	Manifold flap	AU1 15-541x03		3790	1

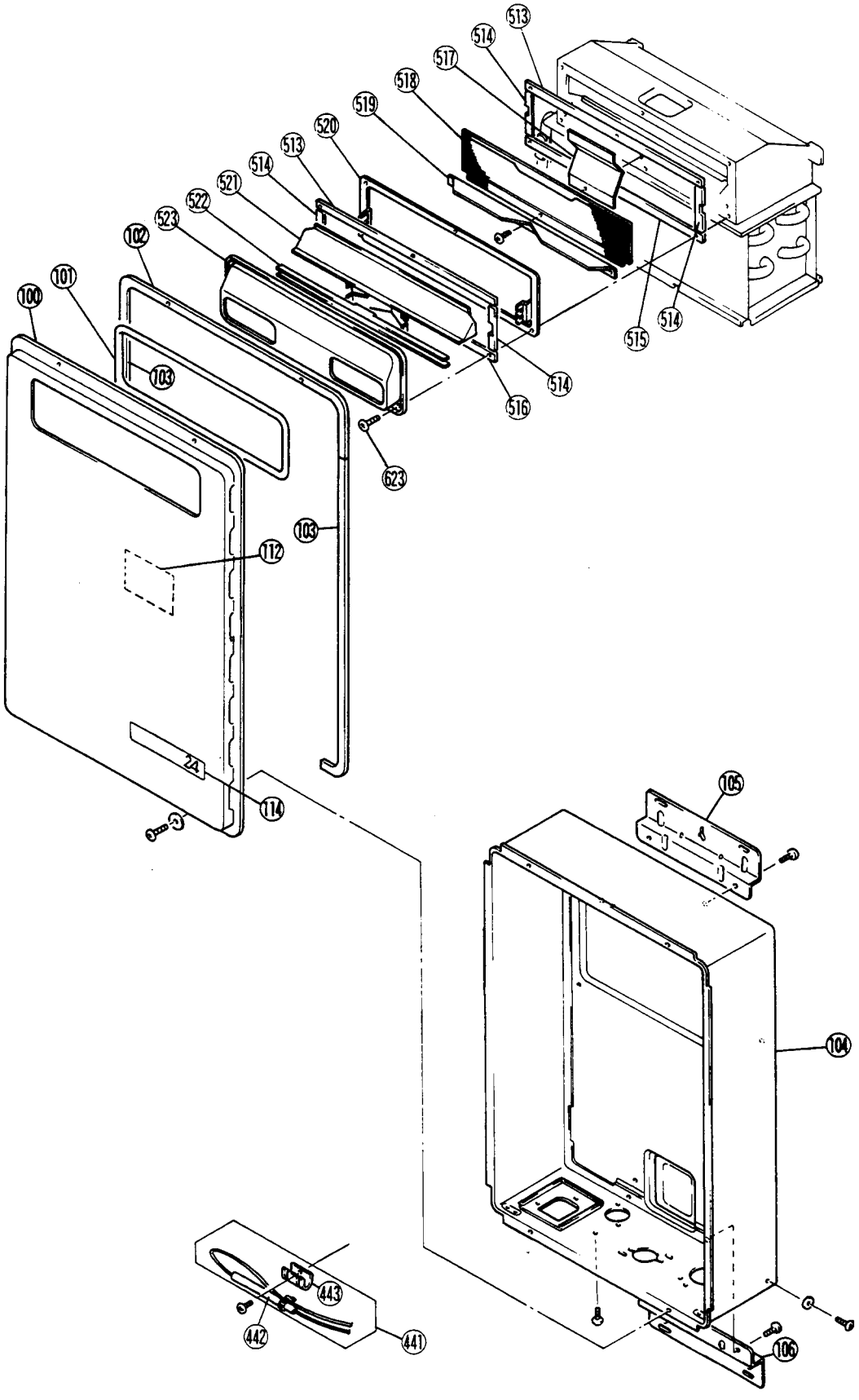
No	Part Name	RJ Part No	RA Part No	RNZ Part No	QY
219	Manifold shaft	AU115-542x02		3791	1
220	Manifold bearing	AU115-543		3792	2
221	E ring	ZUAB02U		3793	4
222	Gas supply "O" ring B	M10B-1-16	92067040	3466	2
223	Gas connection tube B	BU115-547x02	92071588	3794	1
224	Manifold filter assembly	BU115-550x02		3795	1
225	Fan casing assembly	CU115-530x02		3796	1
226	Fan blade assembly B	BU111-632-bx01	92071596	3797	1
227	Fan casing body	DU115-531x01			1
228	Oscillation packing	BU115-261x01		3798	1
229	Fan motor assembly	BU115-260-a	92068998	3799	1
230	Fan casing packing	BU115-532x01		3958	1
231	Fan outlet packing	AU115-203x01		3840	1
232	Burner assembly A	CU115-221-1x08	92066927	3871	1
300	R¾/20 Water inlet fitting	BU115-1122		3866	1
301	Water filter assembly	AU115-343	92062280	3839	1
302	Water filter plug	AU101-502-Bx02	92068956	3867	1
303	Water filter band	AU115-344x01		3872	1
304	Water filter "O" ring	M10B-2-12	92063551	1106	1
305	Water inlet "O" ring	ORG25EW	92071604	3873	1
306	Electronic water flow control device	M2G-2-4	92067016	3868	1
307	Geared motor assembly	M10D-1	92068964	3874	2
309	Thermistor "O" ring	ORPO4EW	92067065	1059	3
310	Incoming water temperature thermistor	BU124-621-3	92062322	3845	1
311	Thermistor clip	CP-90168		3875	2
312	Water connection be "O" ring	ORP16EW	92067057	3876	2
313	Water supply tube	BU115-1110		3865	1
314	Water rectifier	M2G1-19	92063569	3843	1
315	Quick fasteners	M10A1-5-6		3877	1
316	Water flow sensor (assy)	M3D-3-2	92068972	3878	1

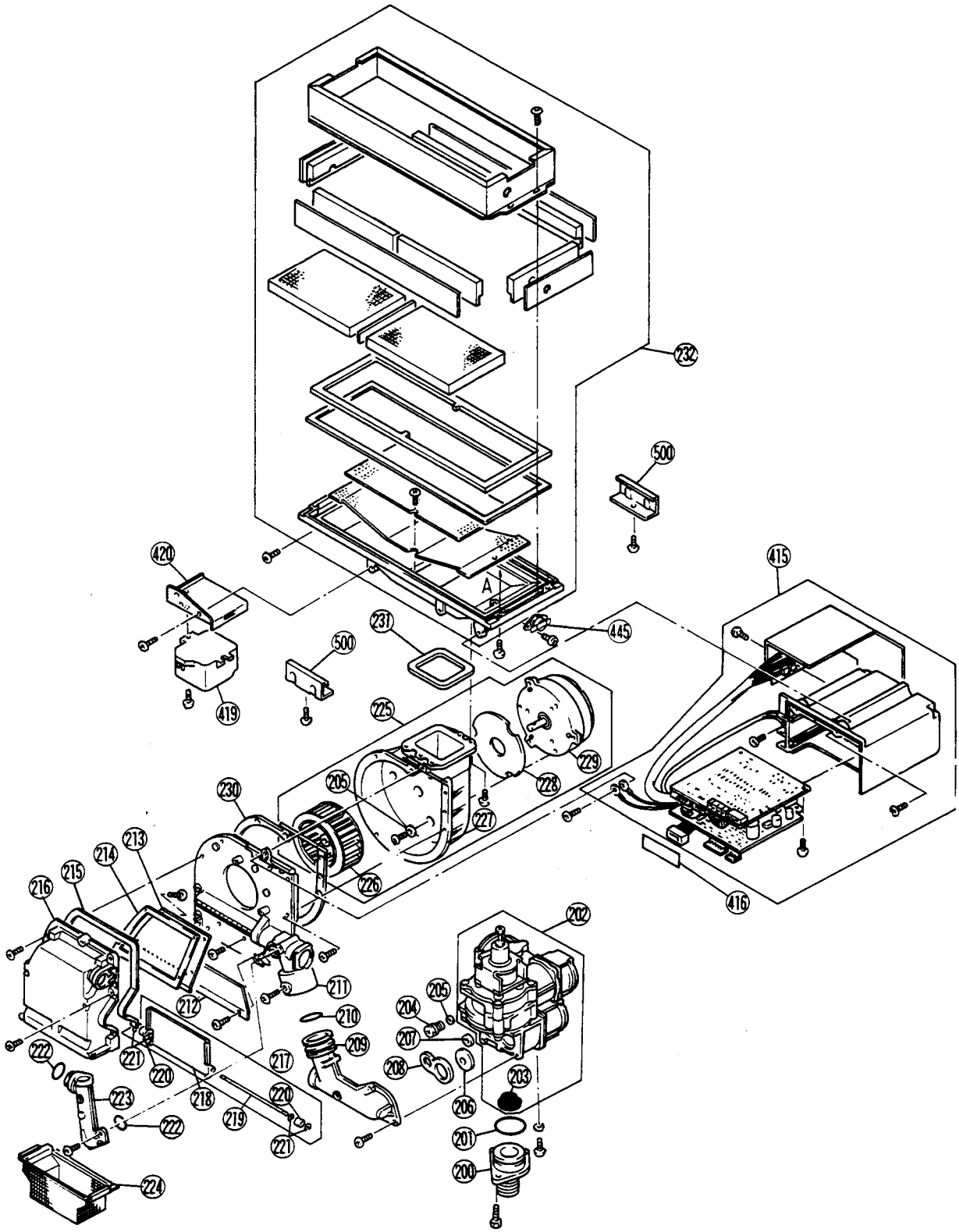
No	Part Name	RJ Part No	RA Part No	RNZ Part No	QY
318	Water flow sensor 0 ring	M10B-2-16	92062199	3825	4
319	Water bypass distribution (assy)	M7C-1	92071612	3880	1
320	Bypass motor bracket	M7C-1-4			1
321	Heat exchanger outlet bypass "O" ring	MlOB-2-14	92062207	3826	1
322	Heat exchanger inlet /outlet 0 ring	ORP14EW	92067073	1098	2
323	Heat exchanger assembly	DU115-300x04	92059004	3863	1
324	H/exc outlet thermistor	BU124-621	92066968	3881	1
325	Thermistor clip, large	CP-90172		3882	1
326	Hot water supply tube	BU115-1115		3865	1
327	R¾/20 water outlet fitting	CU115-1121		3869	1
328	Outgoing water temperature thermistor	BU124-621-2x02	92069012	3883	1
329	Pressure relief valve	BU111-1130	92069020	3870	1
330	Pressure relief 0 ring	ORP10EW		6341	1
331	Pressure relief band	AU103-410x02		3884	1
400	Electrical cord	CP-90182	90148206	3856	1
402	Nylon clamp	AU33-327-d			1
403	Harness A assembly	BU115-660x03		3885	1
404	Glass fuse		92069038	3886	2
405	Harness B assembly	BU115-66 1x03		3887	1
406	Harness E assembly	AU130-403		3888	1
407	Gas connection harness	BU115-668x03		3889	1
408	Anti-frost heater (assy)	BU115-1025	92069046	3890	1
409	Anti-frost heater bkt A	AU11 l-653		3891	1
410	Anti-frost heater bkt L	AU1 15-338-L		3892	1
411	Anti-frost heater bkt R	AU1 15-338-R		3893	1
412	Anti-frost heater panel	AU115-337x02		3894	1
413	Anti-frost heater D	BU104-630-d		3895	
414	Anti-frost heater bkt B	AU104-631x02		3896	1
415	P.C.B. Unit	CU115-1080	92066935	3897	1
416	Adjustment switch seal	AU1 15-1052			1
419	Spark generator	MIG-15	92069053	3898	1
420	Sparker bracket	BU115-644			1
421	P.C.B. transformer	ET-16	92069061	3899	1

No	Part Name	RJ Part No	RA Part No	RNZ Part No	QY
422	High tension cord No. 1	AU1 15-641-1x01		3925	1
423	High tension cord No. 2	AU1 15-641-2		3926	1
424	Earth harness	AU1 15-623x01		3927	2
425	Electrode	BU115-613	92066992	3928	2
426	Electrode seal packing	R1444352	92062223	3828	2
427	Electrode clip	R1444338x01			2
428	Heat exchanger bracket left	BU115-615x02			1
429	Heat exchanger bracket right	BU115-616x01			1
430	Flame rod	AU1 15-604x01	92066984	3929	1
431	Flame rod seal packing	AU1 15-605x01		3930	1
432	Thermocouple assembly	BU102-609x02	92066844	3931	1
433	Thermocouple bracket	AU130-290x01		3932	1
434	Thermocouple seal packing	AU102-607x01	92067 107	3933	1
435	Thermocouple fixing sleeve	AU102-625	92067115	3934	1
436	Flame rod seal packing	AU102-605x02	92067123	3935	1
437	Electrode sleeve	AU102-681x01			2
438	Remaining flame safety device	ES-01079	92067008	3936	1
439	Frost sensing switch	CH4-643-Cx02	92069079	3937	1
440	Flame rod lead	AU1 15-669x01		3938	1
441	Thermal fuse assembly	BU115-624x03	92069087	3939	1
442	Thermal fuse	BU115-624-1			1
443	Thermal fuse holder	RC251B-89			1
445	Light back safety device	ES-01 134	92069095	3940	1
500	Heat exchanger clip	AU1 15-339x02			2
501	Heat exchanger packing	BU115-228		3941	2
502	Viewing glass bracket	AU102-322		3942	1
503	Viewing glass	AU102-320	92069103	3943	1
504	Viewing glass packing	AU102-321		3944	1
505	Flue complete assembly	CU115-560x05		3945	1
506	Flue central exhaust tube	CU115-561x04			1
507	Sound buffer clip main	BUl15-562			1
508	Sound buffer material main	CUl15-563x02		3946	1
509	Sound buffer material upper	CU115-564x02		3947	2
510	Sound buffer material front	CU115-565x02		3948	2

No	Part Name	RJ Part No	RA Part No	RNZ Part No	Q T Y
511	Soun dbuffe rclip front	BU115-566x01		3949	1
512	Soun dbuffe rmaterial side	CU115-569x02		3950	6
513	Flueterminalpackingtop	AU115-137x01		3951	2
514	Flue terminal packing side	AU115-138)	1	3952	4
515	Flue termina lpackin glowe rA	BU115-139-ax02		3953	1
516	Flue terminal packin glowe rB	BU115-139-bx02		3954	1
517	Flue terminal damper	AU1 15-125			1
518	Flue termina lmesh	BU115-567x02		3955	1
519	Flue terminal mesh clip	BU115-568x01			1
520	Louvre clip	BU115-126x03			1
521	Louvre holder assembly	BU115-127x01			1
522	Flue terminal louvre	BU115-132x02		3956	1
523	Flue terminal outer casing	BU115-131x02		3957	1

EXPLODED DIAGRAM

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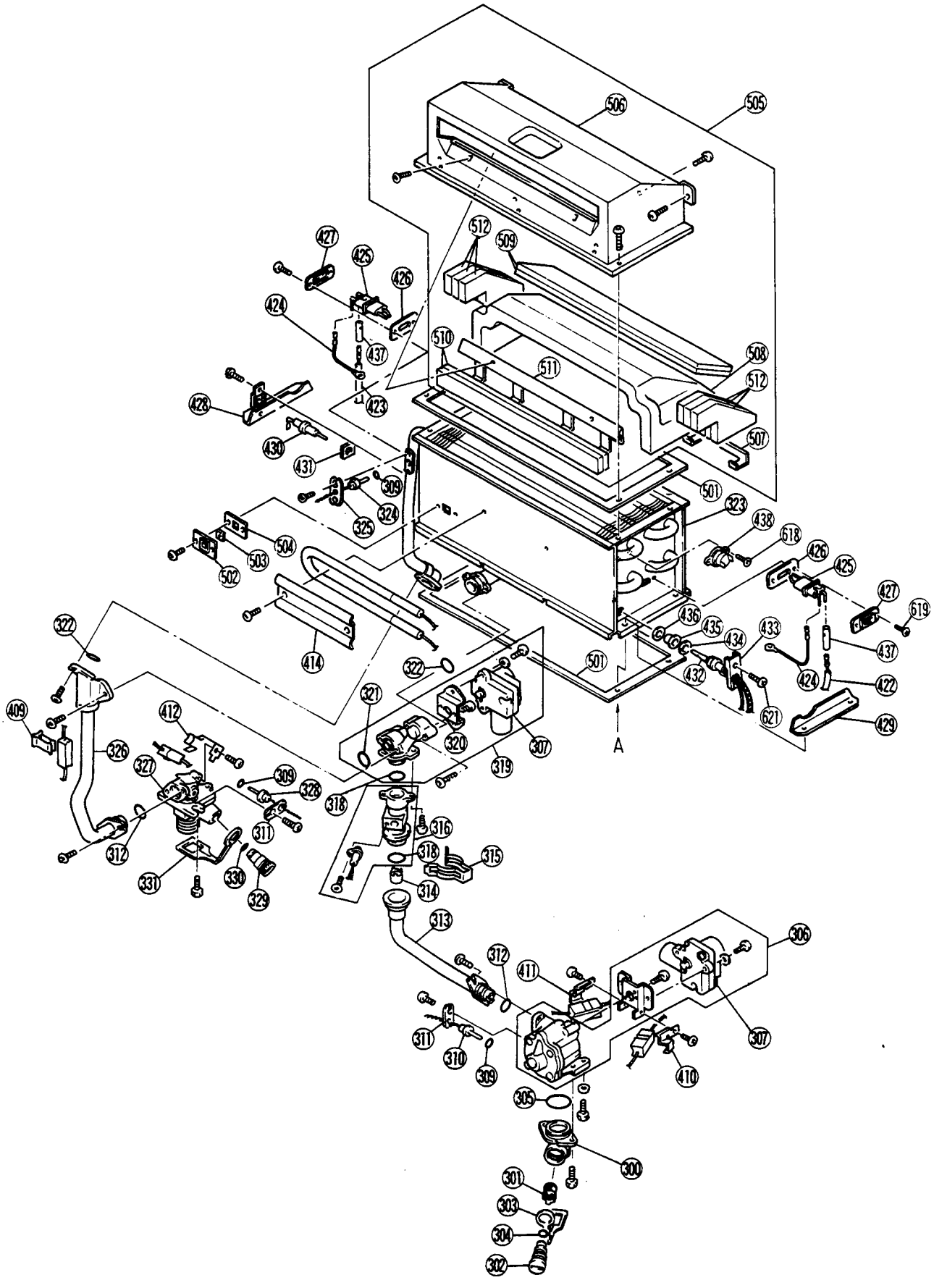
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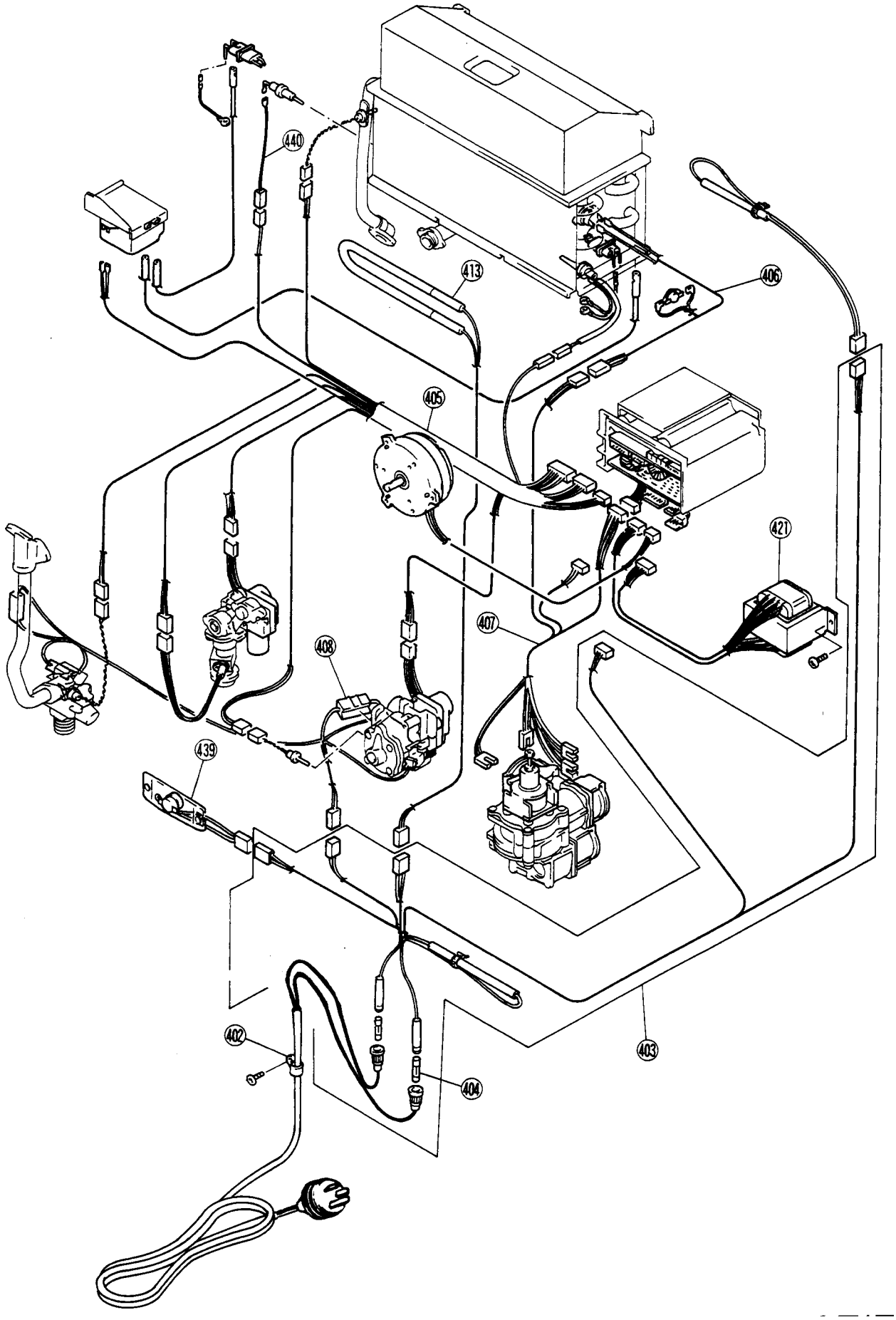
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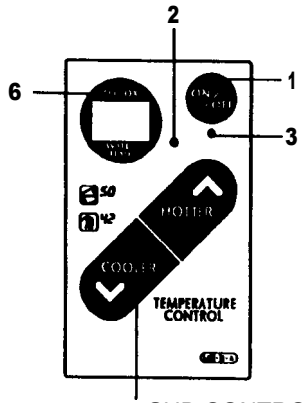
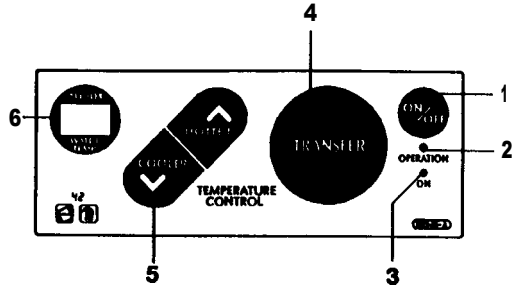
REMOTE CONTROL LAYOUT



SUB CONTROL



MASTER CONTROL

Number	Control	Function
1	ON/OFF	**Power** switch to operate Infinity 24 hot water service.
2	COMBUSTION INDICATOR	Indicates that a hot water tap is open in any location, while the Infinity 24 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**. All selected temperatures other than **75°C** will be 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 24 ON

■ TO TURN YOUR INFINITY 24 ON.

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

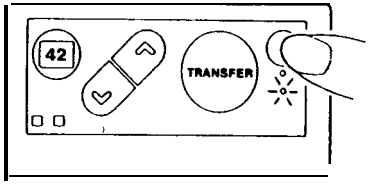
The ON indicator will glow on the Control which you have operated. This indicates that the Infinity 24 is ready to supply hot water as soon as a tap is opened.

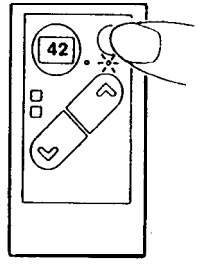
To operate the infinity 24 simply turn any hot water tap on. This will automatically light the burner providing hot water at the temperature displayed on the Digital Monitor.

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

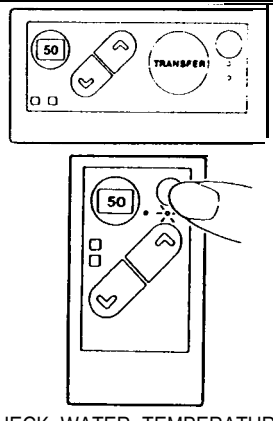
ADJUSTING TEMPERATURE

■ 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 Δ** 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.



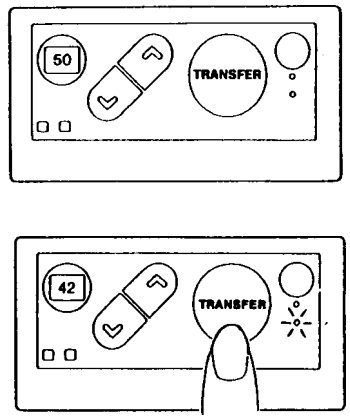
CHECK WATER TEMPERATURE BEFORE ENTERING SHOWER OR BATH

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.

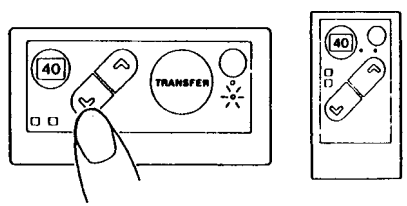
After having transferred the priority of water temperature selection, 42ºC will be displayed on the Digital Monitor.



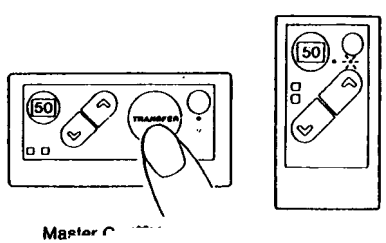
■ The water temperature can now be selected using the Master Control.

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.



TURNING THE INFINITY 24 OFF

■ TO TURN YOUR INFINITY 24 OFF.

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

This will shut the Infinity 24 down completely

If hot water taps are opened when the Infinity 24 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.