Rheem Australia Pty Ltd

ABN 21 098 823 511

SERVICE INSTRUCTIONS

12-26L Series II

Continuous Flow Gas Water Heater

TM090

Issued: Oct 2017

Revision: AB
Issued: Feb 2019

Rheem	Solahart
874812XF	
876812XF	
874T16XF	
876T16XF	
874820XF	
874820XF/J	
876820XF	
874T26XF	
876T26XF	10143267
874826XF/J	10143268

First Issued: 10/2017

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INTRODUCTION

The information provided in these instructions is based on the water heater being installed in accordance with the Installation Instructions provided with each water heater.

Contact Rheem Technical Support on 1300 712 863 should you require any further technical advice regarding a 12-26L Series II Continuous Flow water heater.

SAFETY WARNING

The purpose of this service manual is to provide sufficient information to allow a person with the skills as required by the Regulatory Authorities to carry out effective repairs to a Rheem Continuous Flow Gas Water Heater in the minimum of time.

Safety precautions or areas where extra care should be observed when conducting tests outlined in this service manual are indicated by print in ***bold italics*** and/or a warning symbol. Take care to observe the recommended procedure.

Live Testing

A number of test procedures detailed within this service instruction require 'live' testing to be conducted.

All State and Territory Authorities stipulate requirements that must be met before working live i.e. conducting a risk assessment and/or preparing a safe work method statement and wearing appropriate PPE.

It is the responsibility of the service person to be aware of and comply with the requirements of the State or Territory where the water heater is installed before working 'live'.

An RCD shall be installed between the power point and 3-pin cord of the water heater to reduce the risk of electric shock.

Isolate power before conducting the indicated test.

Hot surface or liquid. Personal Protective Clothing (PPE) shall be worn to reduce the risk of scalding.

General warning symbol. Observe the instructions accompanying the symbol.

If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard.

When conducting repairs to a gas appliance the gas train including injector sizes must not be altered or modified in any way.

Touch Voltage Testing

Under certain fault conditions it is possible for the metal jacket of a water heater to become live.

The electrical fault may be an internal appliance issue or an issue with the building supply wiring (see diagram 1 opposite).

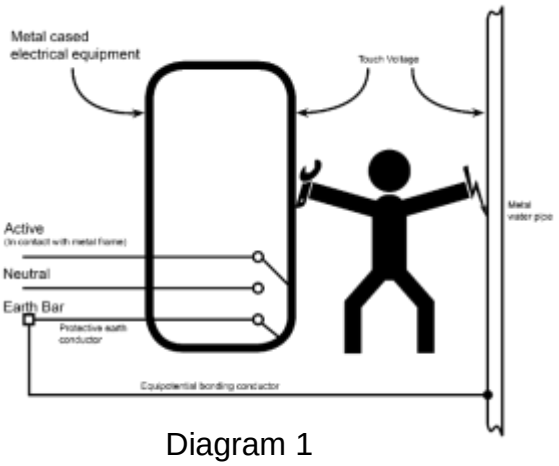


Diagram 1

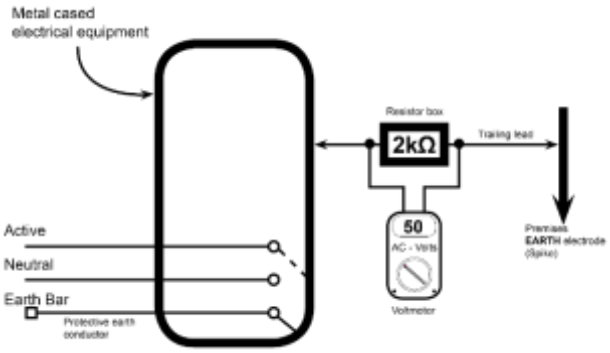


Diagram 2

To check for a shock hazard in a suspect installation a **Touch Voltage Test** must be applied using the following equipment:

1. A high impedance multimeter with an input impedance greater than 5 mega-ohm.
2. A 2kΩ resistor box fitted with contact terminals.
3. A long trailing lead for connection to the premises earth electrode.

Note: The 2kΩ resistor is used to simulate the body resistance of a typical person.

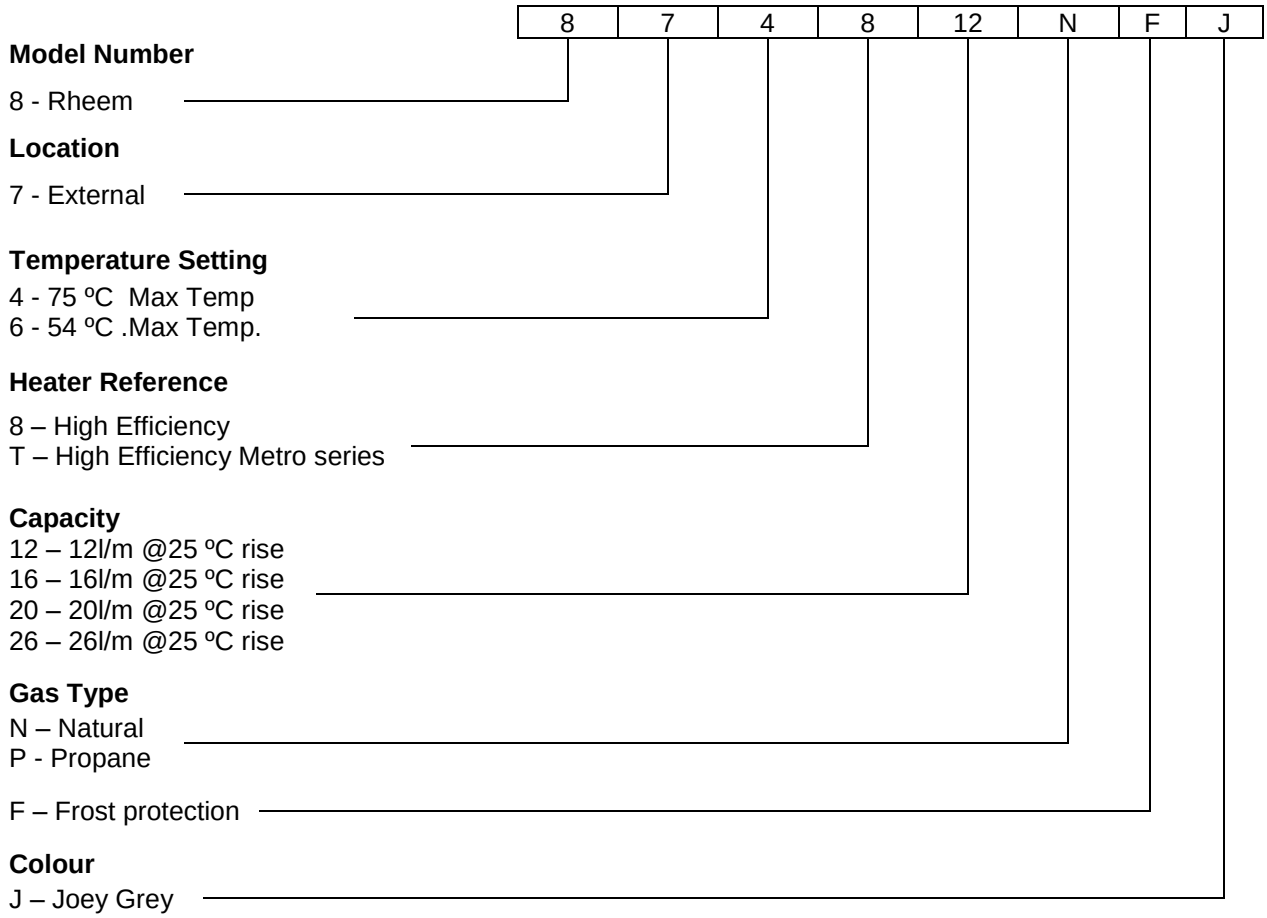
Procedure:

Personal Protective Equipment (electrical insulating gloves) should be worn when conducting this procedure to reduce the risk of electric shock.

1. Connect the resistance box between the metal casing of the appliance and the main Earth electrode (Spike) using the long trailing lead (as shown in diagram 2).
2. Connect the multimeter (set on the AC volts scale) to the resistor box terminals and record the reading.
3. If the reading is higher than 50VAC (Dry) or 25VAC (Wet) then there is a fault either within the electrical installation or with the appliance.
4. To confirm the earthing of the water heater;
    - Electrically isolate the appliance from the electrical circuit
    - Conduct an earth continuity test to AS/NZS 3760 (pay particular attention to the cordset earth on plug in water heaters).
    - If the earth path of the appliance is intact, the problem is with the household wiring.

WATER HEATER MODEL IDENTIFICATION

The identification numbers are designed to convey detailed information about the water heater to which it is attached.



SPECIFICATIONS

Power consumption (Watts)		
Model	**Anti-frost OFF**	**Anti-frost ON**
12L – Natural gas	33	101
12L – Propane gas	36	104
16L – Natural gas	38	106
16L – Propane gas	40	108
20L – Natural gas	44	112
20L – Propane gas	50	118
26L – Natural gas	54	122
26L – Propane gas	59	127

SPECIFICATIONS continued

Model size		**12L**	**16L**	**20L**	**26L**
Nominal gas consumption (MJ/h)	Nat Gas	94	126	157	199
	Propane				
Min gas consumption (MJ/hr)	Nat Gas	12			
	Propane				
Injector orifice No. x Dia. (mm)	Nat Gas	20 x 1.55 / 20 x 1.03			
	Propane	20 x 1.10 / 20 x 0.73			
Min inlet gas pressure (kPa)	Nat Gas	1.13			
	Propane	2.75			
Max burner gas test pressure (kPa)	Nat Gas	0.38	0.40	0.57	0.92
	Propane	0.40	0.43	0.62	0.98
Min burner gas test pressure (kPa)	Nat Gas	0.15			
	Propane	0.19			
Max inlet gas pressure (kPa)		3.5			
Ignition System		Continuous spark			
Minimum working water pressure (kPa)		120			
Maximum working water pressure (kPa)		1000			
Relief Valve Pressure (kPa)		1750			
Heating capacity (L/min @ 40°C rise)		7.5	10	12.5	16.2
Output (kW)		21	27.9	34.9	45.3
Gas inlet connection		R¾ /20			
Water inlet and outlet connections		R¾ /20			

Model Size	**Factory Preset Temp.**	**Max. Temp.**	**Natural Gas**	**Propane**
12L	60°C	75°C	874812NF	874812PF
12L	*48°C	54°C	876812NF	876812PF
16L	60°C	75°C	874T16NF	874T16PF
16L	*48°C	54°C	876T16NF	876T16PF
20L	60°C	75°C	874820NF	874820PF
20L	*48°C	54°C	876820NF	876820PF
26 L	60°C	75°C	874T26NF	874T26PF
26 L	*48°C	54°C	876T26NF	876T26PF

* Hot water delivery temperature is 48°C but displayed as 50°C. As permitted in AS 3498-2009, delivery temperature can be adjusted above 50°C by installers. This allows for the outlet temperature to be increased (offset) to compensate for temperature losses in the pipework, between the water heater outlet and sanitary fixtures.

Accessories		12L	16L	20L	26L
Kitchen Controller P/N 299853		Y			
Bathroom 1 Controller P/N 299854		Y			
Bathroom 2 Controller P/N 299855		Y			
Deluxe Kitchen Controller P/N 299861		Y			
Deluxe Bathroom 1 Controller P/N 299862		Y			
Deluxe Bathroom 2 Controller P/N 299863		Y			
Kitchen controller cable P/N 299856		Y			
Bathroom controller cable P/N 299857		Y			
Recess box		Y			
Pipe cover		Y			
Flue diverter kit	Standard P/N 299287 – NG models only.	Y	Y	N	Y
	Extended P/N 299285 – 26L NG model only	N	N	N	Y
Ez-Link Kit	P/N 299291	Y			
EziSET® Kit	P/N 052310	Y (50ºC models only)			

Product Changes

EziSET® - Smartphone Remote Control

EziSET® enables remote control of a CF water heater via a smartphone where the hot water temperature set point and bath fill features can be controlled by the user through an App installed on their own personal smartphone. Additionally, any applicable fault codes and service contact details will be displayed on the App in the event of a heater fault.

EziSET® is not provided as standard with the CF heater, it is an optional extra that is available to purchase in kit form that is to be retro-fitted to a new or existing installation. Available from February 2019 using part number 052310 the kit is suitable for use with 50ºC models only (suitable for use with 876812 / 876T16 / 876820 / 876T26 models manufactured from 2018).

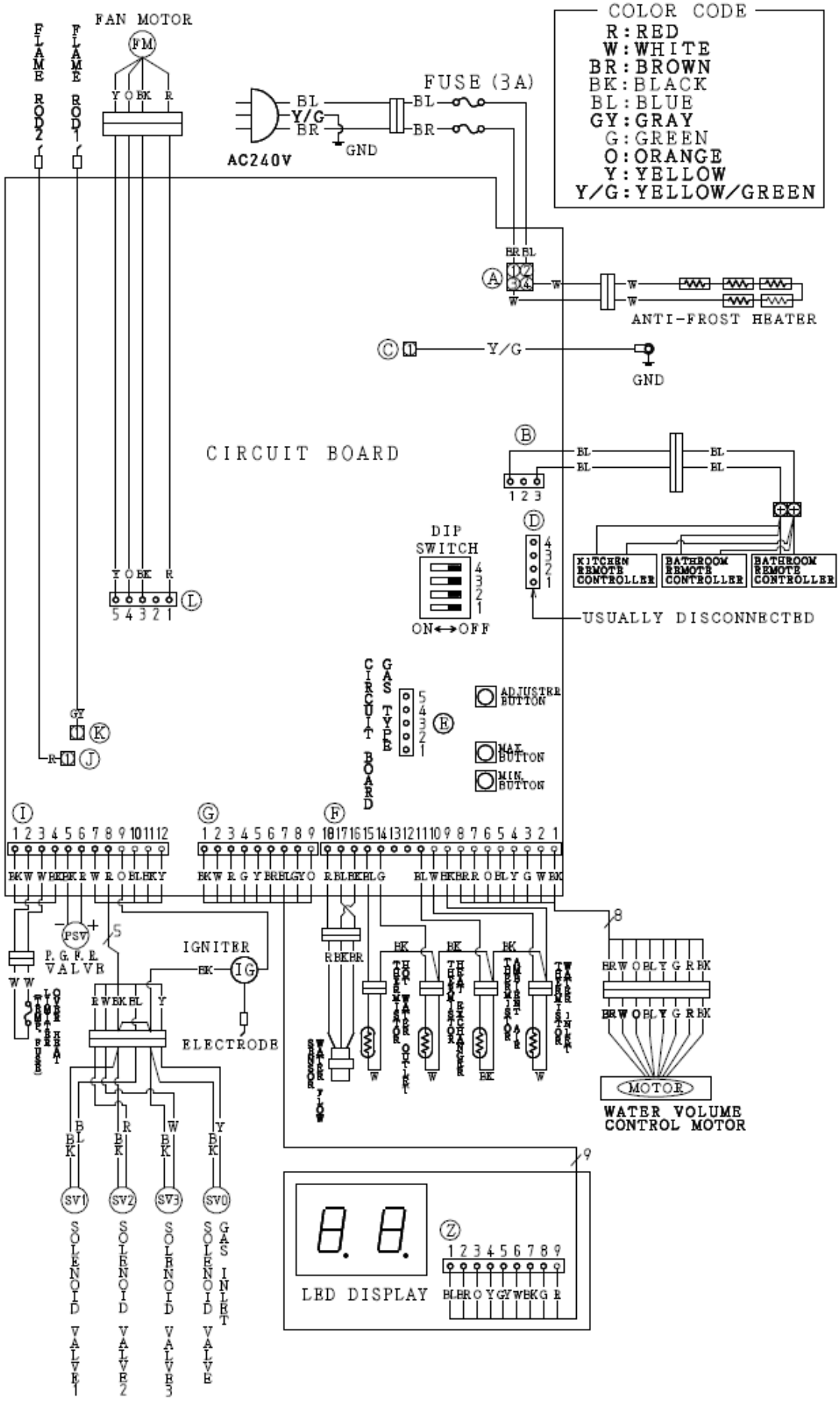
The kit is required to be installed by a qualified technician; it includes a PCB that is to be fitted inside the water heater and a Power Line Telecommunication (PLT) plug that is to be connected to a GPO and wireless router in the home (wireless router is not supplied however any home with an existing Wi-Fi network will have one).

The householder is responsible for the download of the free EziSET® App to their own compatible smartphone. Must have a minimum operating system of iOS 8.1 (iPhone 5 or later; excluding iPhone 5C) or Android 4.0 or later (Windows phone is not compatible).

Up to 10 devices can simultaneously communicate with an EziSET® enabled heater however only one user at a time can have priority control and alter heater settings.

The conventional hard-wired remote temperature controllers will continue to be available for use where a home Wi-Fi network or a compatible mobile device are not available.

WIRING DIAGRAM

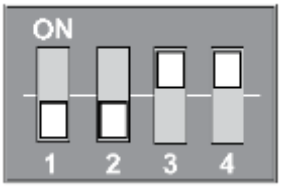


PRESET TEMPERATURE ADJUSTMENT

Voltages up to 240 volts will be present within the water heater, take care not to touch wiring terminals. Use an insulated tool when operating the DIP switches or MIN and MAX buttons.

If this water heater is used as an in-series booster for a solar water heater it must have the outlet temperature set at 70ºC in order to comply with the requirements of AS 3498.

To adjust the preset temperature:



ON

OFF

1. Remove the front cover from the water heater.
2. Turn DIP SWITCHES 3 and 4 on (up position). Refer to area 'D' on page 32 for dip switch location. The current preset temperature is displayed on the OK Monitor.
3. Press the MIN or MAX button, located under the DIP Switches, until the desired temperature is displayed. Available temperatures are:

   Rheem 874 Series / Solahart 60° models:

   38ºC, 40ºC, 42ºC, 43ºC,48ºC, 50ºC, 55ºC, 60ºC, 65ºC, 70ºC and 75ºC.

   Rheem 876 Series 50° models:

   38ºC, 40ºC, 42ºC, 43ºC, 45ºC, 48ºC, and 50ºC.

   Turn DIP SWITCHES 3 and 4 off (down position). The temperature display is now turned off.
4. Refit the front cover to the water heater.

FINE TEMPERATURE ADJUSTMENT

The maximum outlet temperature of a 48ºC model may be adjusted to compensate for temperature losses in the pipe work between the water heater outlet and sanitary fixtures.

After adjustment, the water temperature from the first tap in the hot water pipe work after the water heater used for personal hygiene purposes, such as in a bathroom or ensuite **MUST NOT** exceed:

- 48°C if a temperature controller is connected to the water heater, or
- 50°C if a temperature controller is not connected to the water heater.

If there is a tap, such as a kitchen or laundry tap, in the hot water pipe work between the water heater and the first tap used for personal hygiene purposes, then it is possible for a water temperature to be delivered from that tap of up to 3°C higher than the setting shown on the controller.

It is necessary to have the electrical supply to the water heater switched on during stages of the outlet temperature compensation adjustment procedure.

Note: The preset outlet temperature setting of the water heater must be set at 48°C prior to the commencement of this procedure.

Voltages up to 240 volts will be present within the water heater, take care not to touch wiring terminals. Use an insulated tool when adjusting settings.

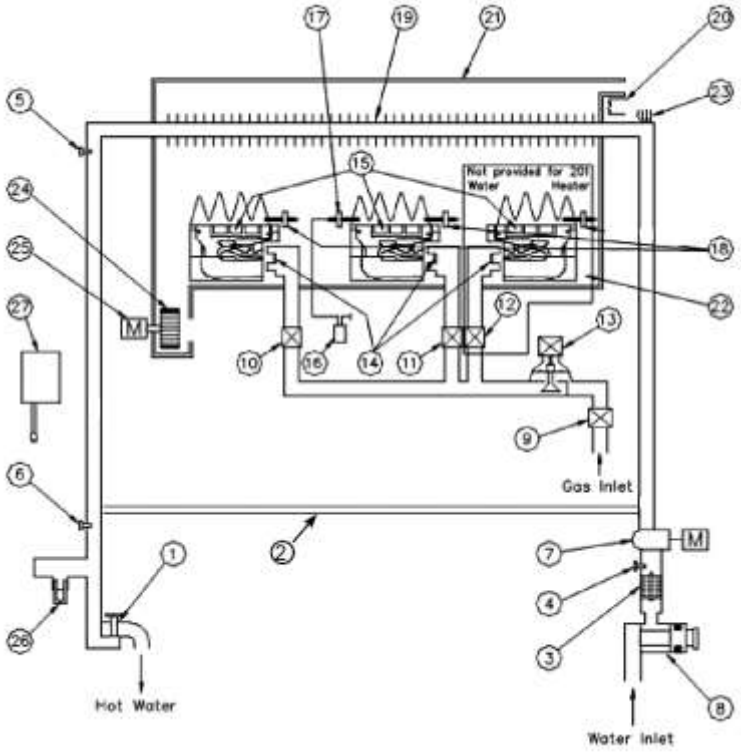
1. Switch DIP SWITCH 3 to the on (up) position on the PCB.
2. Push the MAX button to increase outlet temperature set point. Continue to press MAX button until correct temperature is achieved at first tap used for personal hygiene purposes. The maximum outlet temperature setting is 54ºC.
3. Once correct temperature set point is selected, switch DIP SWITCH 3 to the off (down) position on the PCB.

SEQUENCE OF OPERATION

Refer to 'Sequence of Operation Component Diagram' on page 11 to view components shown in brackets e.g. **(1)**

1. When a hot water tap **(1)** is opened, cold water (or preheated water if a solar preheater is installed) enters the water heater and passes through the Water Flow Sensor **(3)** and Heat Exchanger **(19)**. Note: the inlet water temperature must be less than or equal to 58ºC and less than or equal to the set point temperature minus 2ºC for operation to occur past this point; otherwise water will pass straight through the heat exchanger and fan and burner operation will not occur (for more information on this subject refer to the section titled 'In-series Gas Boosting' on page 12).
2. The Water Flow Sensor **(3)** sends a pulse signal to the PCB **(27)**. Once the pulse signal reaches a pre designated frequency (at minimum flow rate) the PCB **(27)** activates the Fan Motor **(25)** and the Fan **(24)** starts rotating.
3. After the Fan **(24)** completes a pre purge, the Gas Inlet Solenoid Valve **(9)** is activated. Then Step 1 - Gas Solenoid Valve 2 **(11)** is activated, the Proportional Gas Flow Regulating Valve **(13)** adjusts the gas flow rate through Steps 2 – 6, to ensure adequate gas for ignition and gas is then supplied to the Burner **(15)**. (See page 11 Stepping gas rate change sequence).
4. At the same time the Gas Solenoid Valves open the Igniter **(16)** starts sparking continuously and ignites the gas at the Burner **(15)**. After the flame sensor **(18)** detects burner flame, the Proportional Gas Valve **(13)** begins to control the gas flow rate. If there is a difference between the hot water temperature detected by the Hot Water Outlet Thermistor **(6)** and that set on the water heater or selected on the remote controller (if fitted) the PCB **(27)** adjusts the hot water temperature by opening and closing the Gas Solenoid Valves 1 **(10)**, 2 **(11)** and 3 **(12)** and adjusting the Proportional Gas Flow Regulating Valve **(13)**. The water flow rate is also adjusted via the Water Flow Servo Motor **(7)** to ensure the selected temperature of hot water is delivered.
5. As the gas flow rate, controlled by the Proportional Gas Flow Regulating Valve **(13)** changes the PCB **(27)** varies the speed of the Fan Motor **(25)** to maintain the correct air gas mix ratio.
6. When the hot tap **(1)** is closed, the pulse signal from the Water Flow Sensor **(3)** stops and the burner flame is extinguished by closing Gas Solenoid Valves 1 **(10)**, 2 **(11)**, 3 **(12)** and the Gas Inlet Solenoid Valve **(9)**. The post purge operation then commences.
7. Once the post-purge operation ends (up to 6 minutes) power to the Fan Motor **(25)** is cut and the Fan **(24)** stops.

Sequence of Operation Component Diagram



1 Hot Water Tap
2 Bypass pipe
3 Water Flow Sensor
4 Inlet Water Temperature Thermistor
5 Combustion Chamber Thermistor
6 Outlet Water Temperature Thermistor
7 Water Flow Servo Motor
8 Water Filter (Strainer)
9 Gas Inlet Solenoid Valve
10 Gas Solenoid Valve 1
11 Gas Solenoid Valve 2
12 Gas Solenoid Valve 3
13 PGFR Valve
14 Nozzle
15 Burner
16 Igniter
17 Igniter Electrode
18 Flame Sensor
19 Heat Exchanger
20 Over Temperature Limiter
21 Exhaust (Flue) Outlet
22 Combustion Chamber
23 Anti Frost Heater (Models with F in model number only e.g. 874826NF)
24 Fan
25 Fan Motor
26 Drain Plug With Relief Valve.
27 PCB

Burner Configuration (Burner Change-Over Assembly)

Burner 1	Burner 2	Burner 3
Centre Solenoid (S.V. 2)	Left Solenoid (S.V. 1)	Right Solenoid (S.V. 3)

Stepping gas rate change sequence by solenoid

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
SV. 2 ON	SV. 3 ON	SV. 2 & 3 ON	SV. 1 ON	SV 1 & 2 ON	SV 1,2 & 3 ON

Flame Sensor Status

Power	0	1	2	3	4	5	6
R0y Information	00	01	01	01	10	11	11
Flame Sensor 1	X	O	O	O	X	O	O
Flame Sensor 2	X	X	X	X	O	O	O
Solenoid Valve1	OFF	OFF	OFF	OFF	ON	ON	ON
Solenoid Valve2	OFF	ON	OFF	ON	OFF	ON	ON
Solenoid Valve3	OFF	OFF	ON	ON	OFF	OFF	ON

X = Flame sensor is not detecting flame. **O** = Flame sensor is detecting flame

ANTI-FROST HEATER CIRCUIT

The 5 anti-frost heaters are wired in series and are controlled by the ambient air sensor and the PCB. All models have a 68-watt anti-frost system.

A thermistor, sensing ambient air temperature, positioned in the wiring loom near the bottom of the water heater, activates the anti-frost heaters when the ambient air temperature falls to 4ºC +4ºC/-2ºC and deactivates the anti-frost heaters when the temperature rises above 12ºC.

In the event a heater block becoming open circuit the total heater circuit is rendered inoperable. The total heater circuit measures 850 ± 5% ohms.

Refer to Procedure 12 on page 56 for replacement procedure.

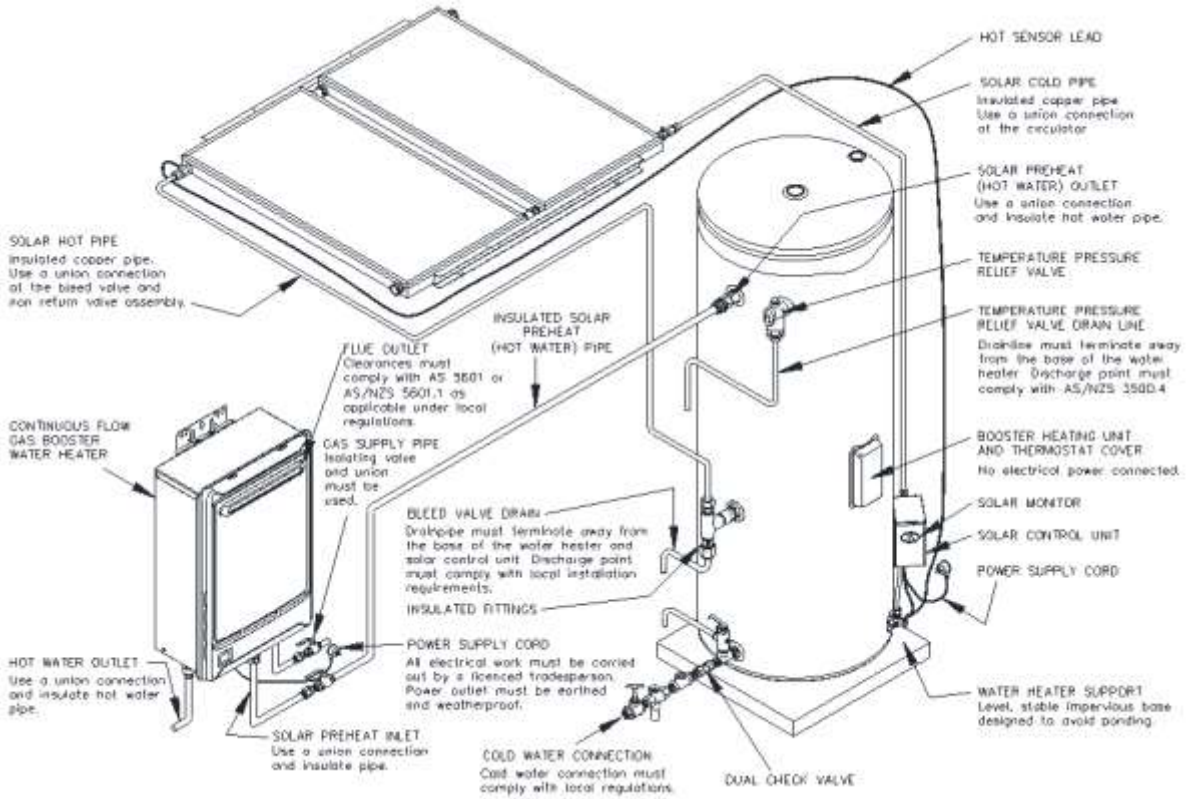
IN-SERIES GAS BOOSTING

Temperature controllers must not be fitted if this water heater is installed as part of a solar water heater system because water at a temperature much higher than the controller setting can be delivered.

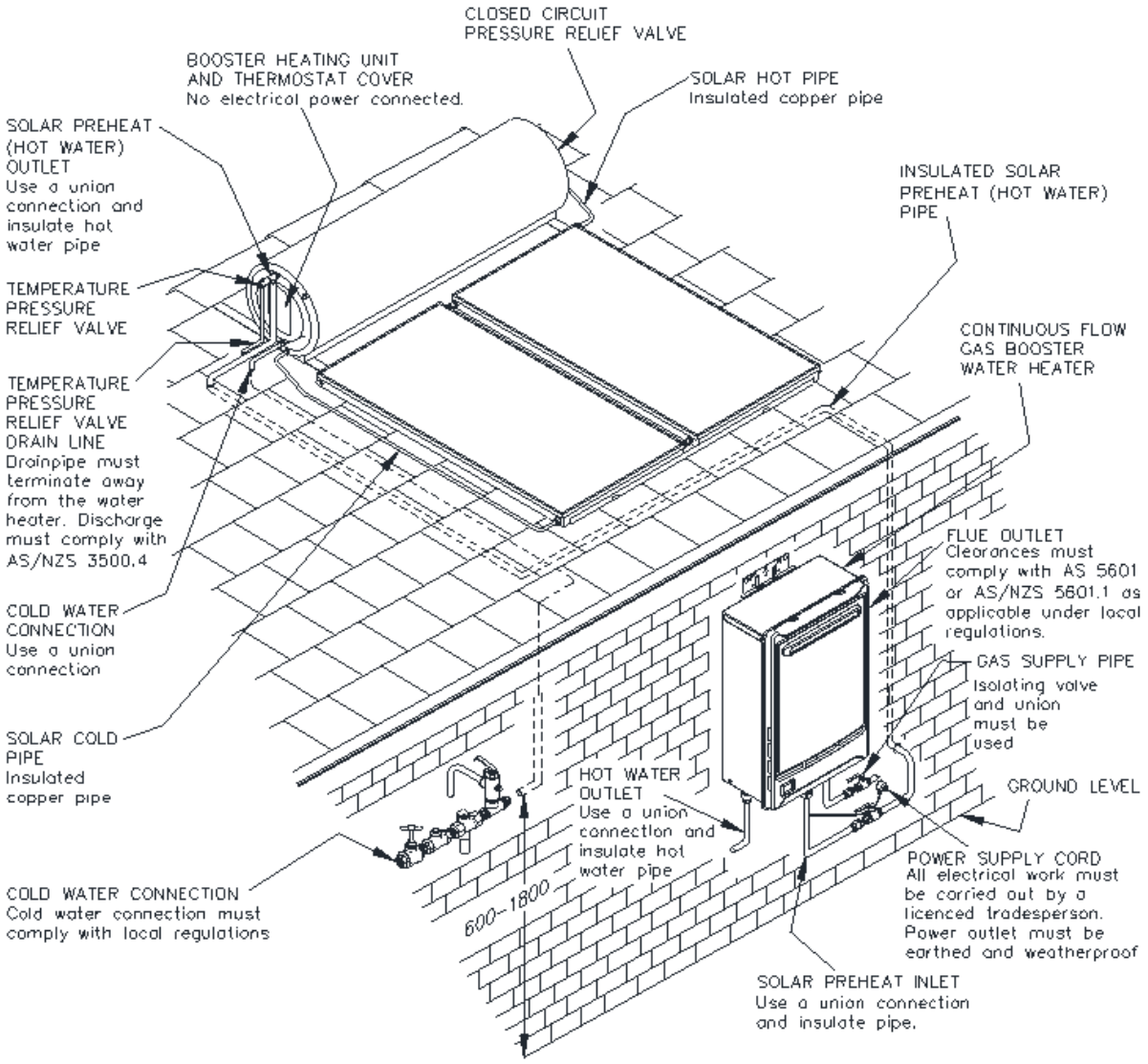
Rheem 874 series & Solahart 60° models may be used as in-series booster water heaters to a solar preheat water heater. When the inlet water temperature is 58°C or higher the fan and burner will not operate despite water flowing through the heat exchanger. When the inlet water temperature is less than or equal to 57°C the burner will fire and boost the outlet temperature to the preset outlet temperature setting provided the flow rate is greater than 3 litres per minute.

In this application the preset outlet temperature setting of the heater must be set at 70°C to comply with the requirements of AS3498. Refer to page 9 for details on checking and adjusting the preset outlet temperature.

In-series gas boosting Solar Loline Installation



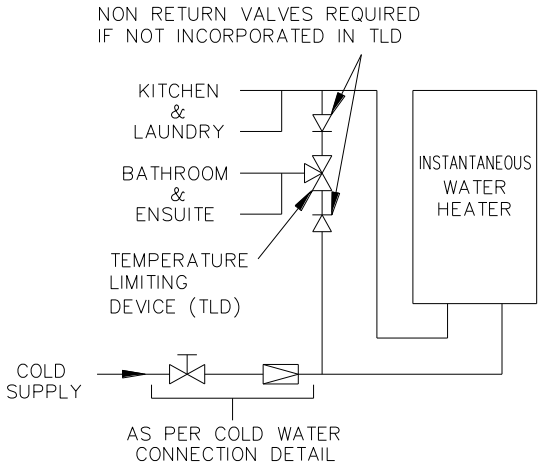
In-series gas boosting Solar Hiline Installation



TEMPERING VALVES

Where a tempering valve is fitted and there is not a separate untempered line for the kitchen or laundry areas, the Kitchen temperature controller will be able to display temperatures above 50ºC however the delivered water temperature at the tap will be that set by the tempering valve which will be no hotter than 50ºC.

To enable delivery of hot water at temperatures above 50ºC a separate untempered line must be provided that supplies hot water exclusively to kitchen and laundry areas (refer to diagram below).



REMOTE CONTROLLERS

Continuous flow gas water heaters can be fitted with optional remote temperature controllers as long as they are not being used in conjunction with a solar system.

There are 3 types of remote controller that can be used, standard, deluxe or EziSET®. Standard and deluxe controllers are hard wired whereas EziSET® is a Smartphone based remote temperature control (**Note:** EziSET® is not to be used with hard wired controllers).

Controller Type	Bathroom 1 Controller	Bathroom 2 Controller	Kitchen Controller	Kitchen Cable 20m	Bathroom Cable 20m
Standard	299854	299855	299853	299856	299857
Deluxe	299862	299863	299861		
EziSET®	052310			NA	NA

Hard Wired Controllers:

Standard and deluxe controllers **cannot** be mixed in a single installation; an individual water heater must have ALL standard or ALL deluxe type controllers fitted, other manufacturers' controllers cannot be used.

Deluxe temperature controllers offer additional functions compared to standard temperature controllers:

- A Bath-Fill auto-stop function allows the bath-fill volume and temperature to be set, once the selected volume of water has passed through the water heater the water servo motor closes, preventing any further flow of hot water.
- An Assistance call button provides a voice or alert tone when pressed that is audible on all controllers.

One, two or three controllers can be installed, however if a Bathroom controller is installed without a Kitchen controller then the maximum selectable hot water temperature will be limited to 50ºC when connected to an 874 model or 48ºC (displayed as 50ºC) when connected to an 876 model.

876 Models are factory set and limited so that they cannot deliver water hotter than 48ºC.

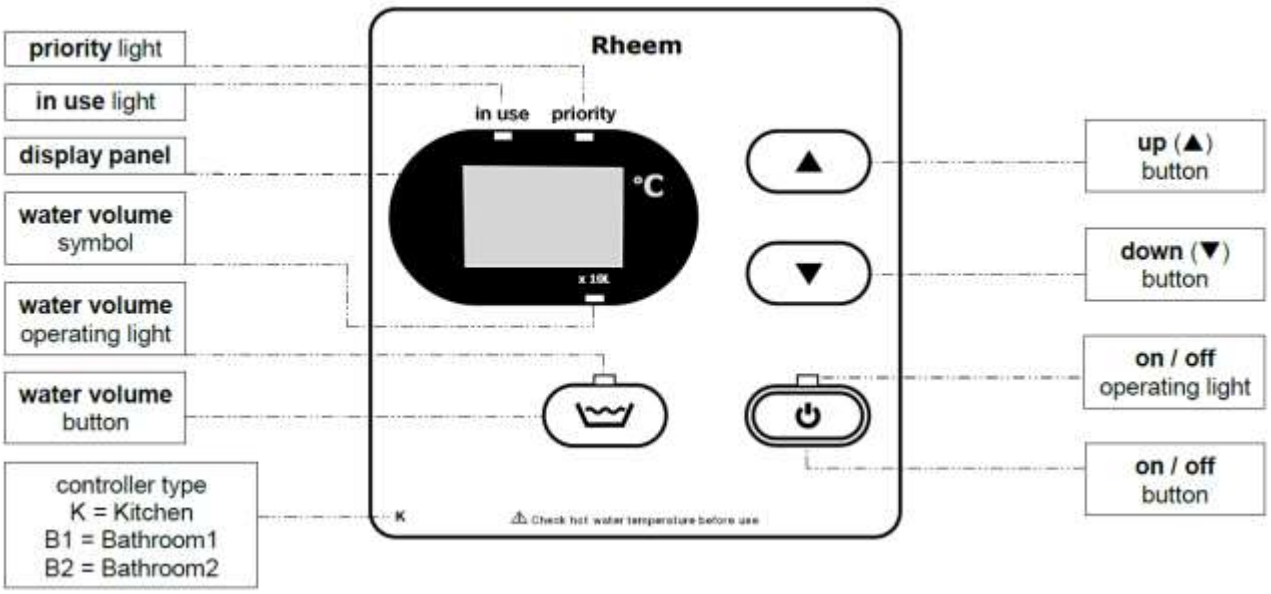
When no hot water is flowing, temperatures can be selected between 37ºC and 50ºC by pressing and holding the temperature control buttons, to select temperatures above 46ºC press the temperature control button once for each selection.

A controller must be turned on and must display the 'ACTIVE' indicator in order to allow adjustment of water temperature.

When hot water is flowing, the temperature can be increased from 37ºC to 46ºC only.

The water temperature can be decreased from any setting whether hot water is flowing or not.

Standard Controller



Note 1: If one or more controllers are installed, at least one must be on for the water heater to operate. If all controllers are off the water heater will only deliver cold water.
Note 2: The water volume button is active only on the kitchen controller

Selectable Temperatures:

Kitchen Controller:
37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48, 50*, 60^{o}C*

Bathroom Controllers:
37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48, 50^{o}C

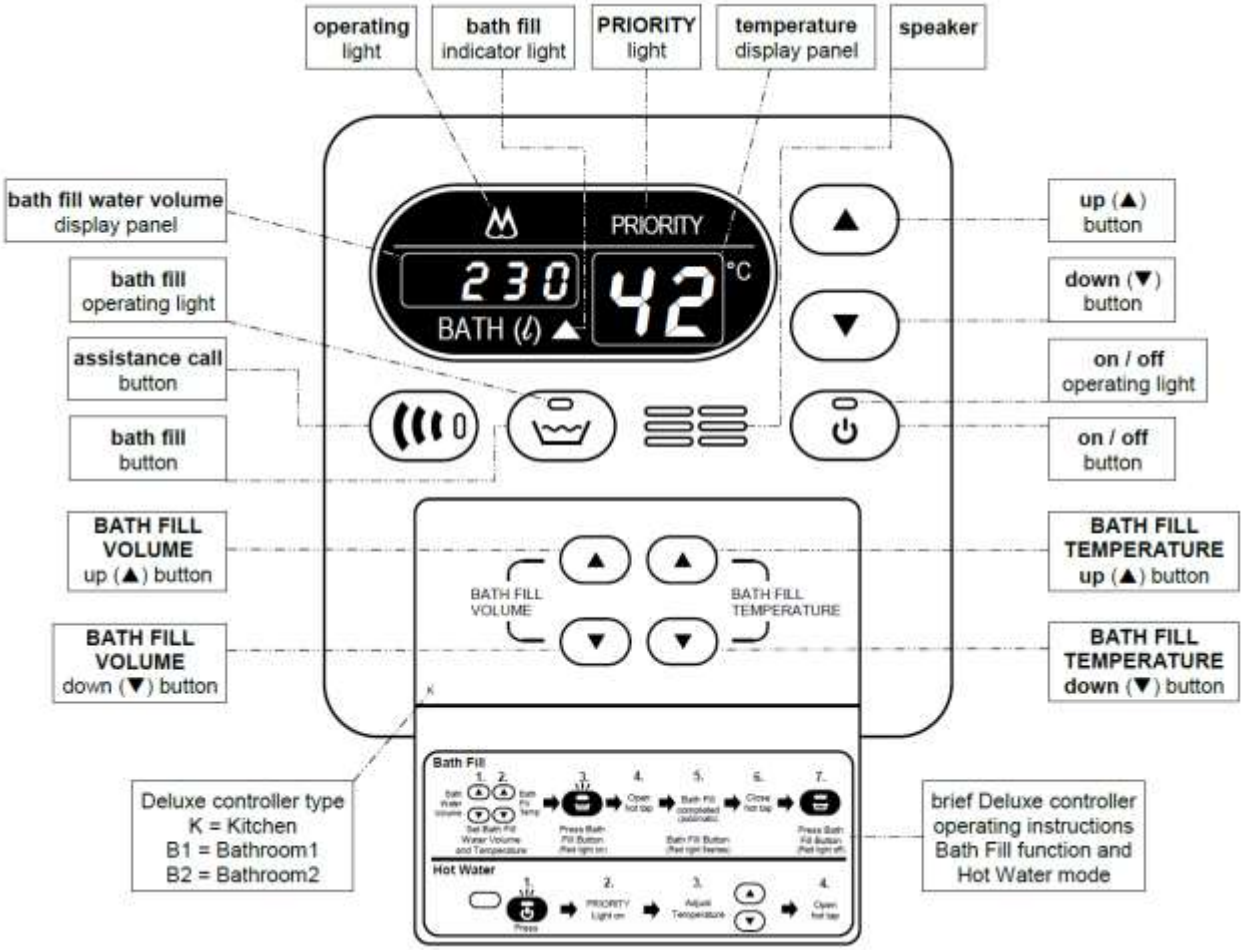
* Temperatures above 48 degrees are not available on 876 series as these units have a maximum selectable temperature of 48^{o}C at all locations.

ON / OFF button	This button must be pressed once to turn on the controller. The light in the button will glow when the controller is on. A controller cannot be turned on if water is flowing from a hot tap. To turn off a controller, press the on / off button once. The light will go out. A controller can be turned off whilst water is flowing.
Priority light	This light will glow on a controller when that controller has priority. The Bathroom controller(s), if they are turned on, have priority over the Kitchen controller. Priority means that controller has control of the water heater temperature setting. The water temperature setting can only be adjusted by the controller that has priority.
In use light	This light will glow on all controllers, whether they are on or off, when hot water is flowing, regardless of which controller has priority.
Display panel	The current temperature setting is displayed on all controllers (whether hot water is flowing or not), when any controller is on. If all controllers are off, then the display remains blank. The water volume can also be displayed on the Kitchen controller. The x10l symbol glows when the water volume is displayed.
▲ (up button)	The up button increases the temperature setting.
▼ (down button)	The down button decreases the temperature setting.
water volume button	(Kitchen controller only) – This feature enables an alarm to sound when a set volume of water has flowed through the water heater (refer to notes below).

Water volume notes:

- The water volume function is designed to warn, by a beeping sound, that a certain volume of water has been delivered from the water heater. **It does not stop either the flow of or the heating of water.**
- The Kitchen controller does not require priority nor to be on in order to set the water volume function.
- The water volume function can be set whilst a hot tap is open.
- The water volume alarm will only sound from the kitchen controller.
- The factory preset water volume is 180 litres.
- To turn off the water volume function before the alarm sounds, press the water volume button twice.
- The water volume is measured as the water flows through the water heater. Therefore if more than one hot tap is open, the alarm will respond to the total water volume drawn from all taps and the expected water volume from the first tap will be decreased.
- If the hot tap is closed before the set water volume flows through the water heater and the water volume button is left on, then the alarm will sound when the remaining water volume is consumed during a later operation. To prevent the alarm from sounding, press the water volume button twice to turn it off.

Deluxe Controller



Note: If one or more controllers are installed, at least one must be on for the water heater to operate. If all controllers are off the water heater will only deliver cold water.

Selectable Temperatures:

Deluxe Kitchen Controller:
37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48*, 50**, 60ºC*

Deluxe Bathroom Controllers:
37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48*, 50ºC

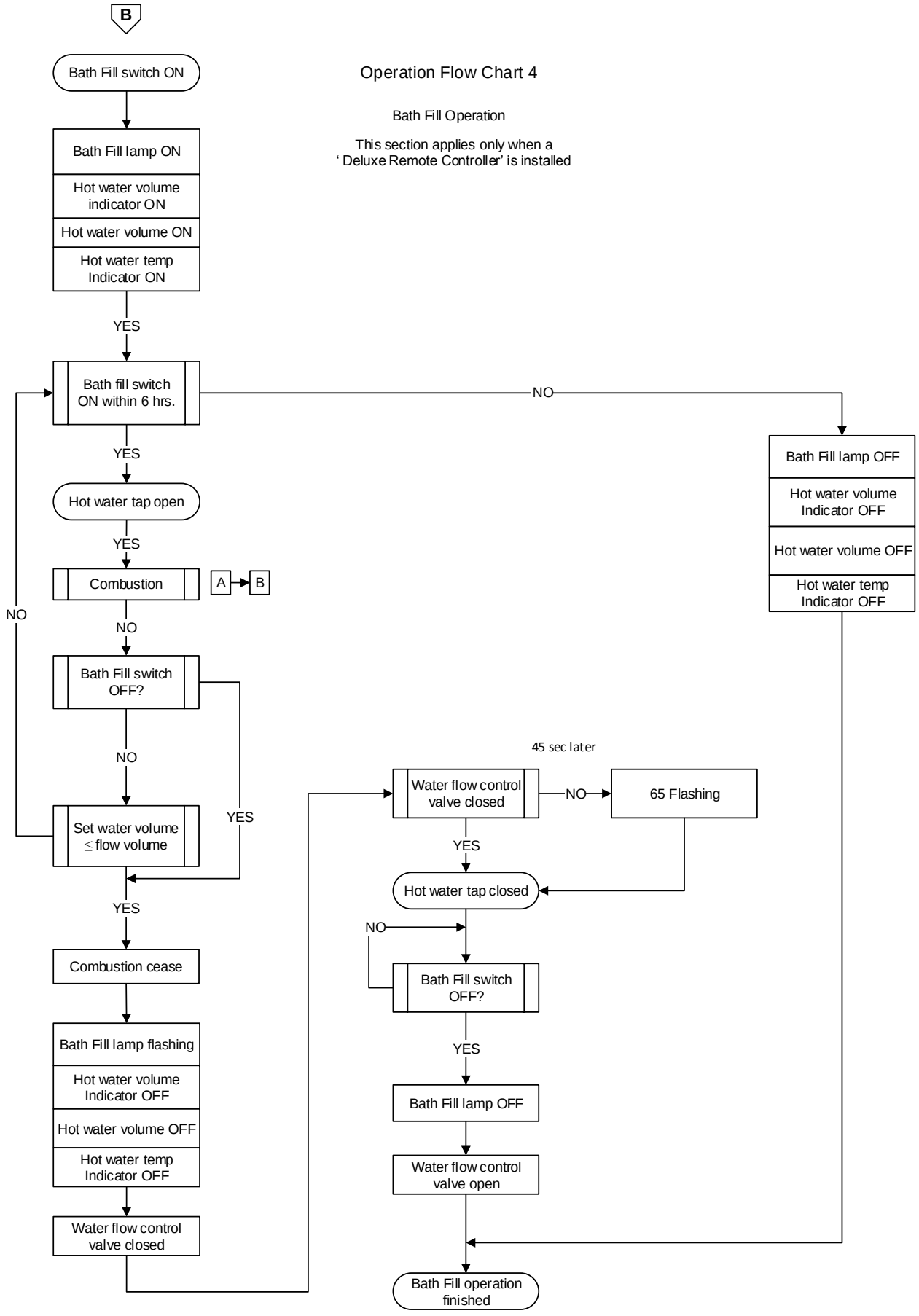
Bath-Fill Mode – All Deluxe Controllers:
37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48ºC

* Limited to 48ºC when the bath fill function is set with 874 and 876 series models
** Limited to 48ºC when 50ºC is displayed with 876 series models

Deluxe Controller Functions

ON / OFF button	Press once to turn on the controller. The button will glow when the controller is on. A controller cannot be turned on if water is flowing from a hot tap. Press the button to turn off the controller. A controller can be turned off whilst water is flowing.
Bath-Fill button	Initiates Bath-Fill mode and once pressed will display the last used Bath-Fill water volume in litres and the last used Bath-Fill temperature in °C. The displayed Bath-Fill water volume and temperature can be adjusted by using the Bath-Fill water volume and temperature control buttons located beneath the hinged panel
Bath-Fill operating light	Illuminates whenever Bath-Fill mode is in operation.
Bath-Fill Temperature ▲ (up button)	Increases the Bath-Fill temperature setting.
Bath-Fill Temperature ▼ (down button)	Decreases the Bath-Fill temperature setting.
Bath Fill Water Volume ▲ (up button)	Increases the Bath-Fill water volume setting in increments of 10 litres up to 500 litres. A further setting of 990 litres can be selected
Bath Fill Water Volume ▼ (down button)	Decreases the Bath-Fill water volume setting
Assistance Call button	When pressed sounds a message or alert tone on the Kitchen Controller indicating that assistance is required in the bathroom.
Bath-Fill Water Volume display	Displays the selected Bath-Fill water volume in litres. The quantity of water can be adjusted using the Bath-Fill Water Volume adjustment buttons located beneath the hinged panel
Heater Operating light	Illuminates on all controllers when hot water is flowing
Heater ACTIVE light	Illuminates when that controller is ‘active’. The Bathroom controller when turned on, have priority over the Kitchen controller. Priority means that a controller has control of the water heater temperature setting. The water temperature setting can only be adjusted by the controller that is displaying the ACTIVE message.
Temperature Display	Displays the current temperature setting on all controllers in °C when any controller is on. If all controllers are off the display remains blank.
▲ (up button)	Increases the general purpose temperature setting.
▼ (down button)	Decreases the general purpose temperature setting.

BATH FILL OPERATION



EziSET® Smartphone Remote Controller:

Title Screen

Figure 1

Main Display with Priority

Figure 2

Main Display without Priority

Figure 3

EziSET® not detected by App

Figure 4

Up to 10 mobile devices can simultaneously communicate with an EziSET® enabled heater however only one user at a time can have priority control and alter heater settings. The user that depresses the 'HOT WATER' button first will assume the priority control and will be able to adjust temperature settings using the temperature increase (+) / decrease (-) buttons as shown in figure 2 above. Any additional devices will be able to view the current set point temperature but will not be able to make any adjustments as the temperature increase / decrease buttons will not be displayed and the temperature dial will not be illuminated (refer figure 3).

The mobile device that has priority can give up priority by pressing the 'HOT WATER' button or will automatically lose priority after a default period of 5 minutes of non-use (the non-use session timeout time can be adjusted from the SETTINGS page if desired). At this point priority may be assumed by another device by depressing the 'HOT WATER' button.

The 'Scan' button appears when the App cannot detect EziSET® on network (refer figure 4). Press 'Scan' to start searching for EziSET on the network again. Once EziSET® is detected the App will automatically connect and figure 3 will be shown.

The maximum selectable hot water temperature will be limited to 50ºC. When no hot water is flowing, temperatures can be selected between 37ºC and 50ºC. When hot water is flowing, the temperature can be increased from 37ºC to 43ºC only. The water temperature can be decreased from any setting whether hot water is flowing or not.

Bath Fill function: The water volume is measured as the water flows through the water heater. Therefore if more than one hot tap is open the expected water volume from the first tap will not be delivered before hot water flow ceases.

NOTE: The Rheem EziSET® App is available from the App or Play Store and is compatible with a smartphone that has a minimum operating system of iOS 8.1 (iPhone 5, excluding iPhone 5C) or Android 4.0 and later (Windows phone is not compatible).

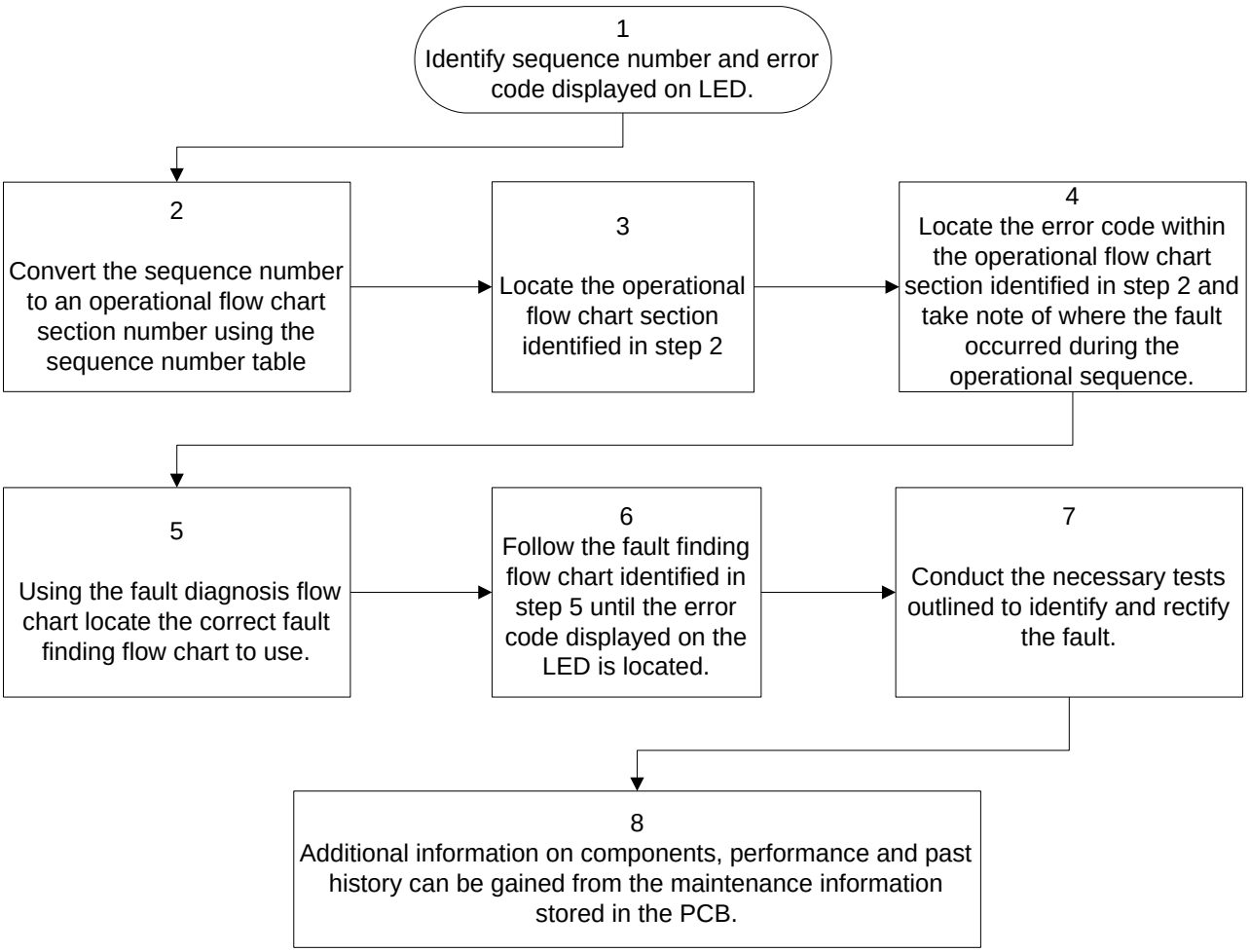
Should the home be supplied by 3-phase power, the wireless router and the water heater MUST be connected to the same phase for EziSET® to operate correctly.

HOW TO FAULT FIND

When conducting fault finding techniques it is important to understand that the same error code with a different sequence number can be displayed at different points during the operational sequence of the water heater. It is important to determine where the fault occurred in relationship to the operational sequence of the water heater before commencing fault finding tests, as the tests may differ even though the same error code can be displayed.

If a fault occurs the LED display will alternate between the error code for the fault and a sequence number that indicates where in the operational sequence of the water heater the fault occurred. The operational flow charts are broken into 5 sections designated by boxed numbers. The table on page 22 converts the sequence number displayed on the LED to the appropriate operational flow chart section.

The flow diagram below outlines the recommended procedure to successfully diagnose, test and rectify faults on the range of water heaters.



About the Operational Flow Charts

The Operational Flow Charts provide information on the start-up sequence and, in the event a failure occurs at any point of the start-up sequence, what error code will be displayed.

When a fault occurs, an error code and sequence number will alternate in the LED display. The Sequence Number Table below indicates the section of the operational sequence (boxed numbers on the operational flow chart) where the fault occurred.

Circled numbers, adjacent to the component or function, indicate the diagnostic test point required to diagnose the fault. Refer to the table on page 27.

By locating the Error Code (displayed on the water heater or remote controller) in the diagnosis charts the component/s or fault can be quickly identified and tested using the diagnostic procedures outlined in this manual.

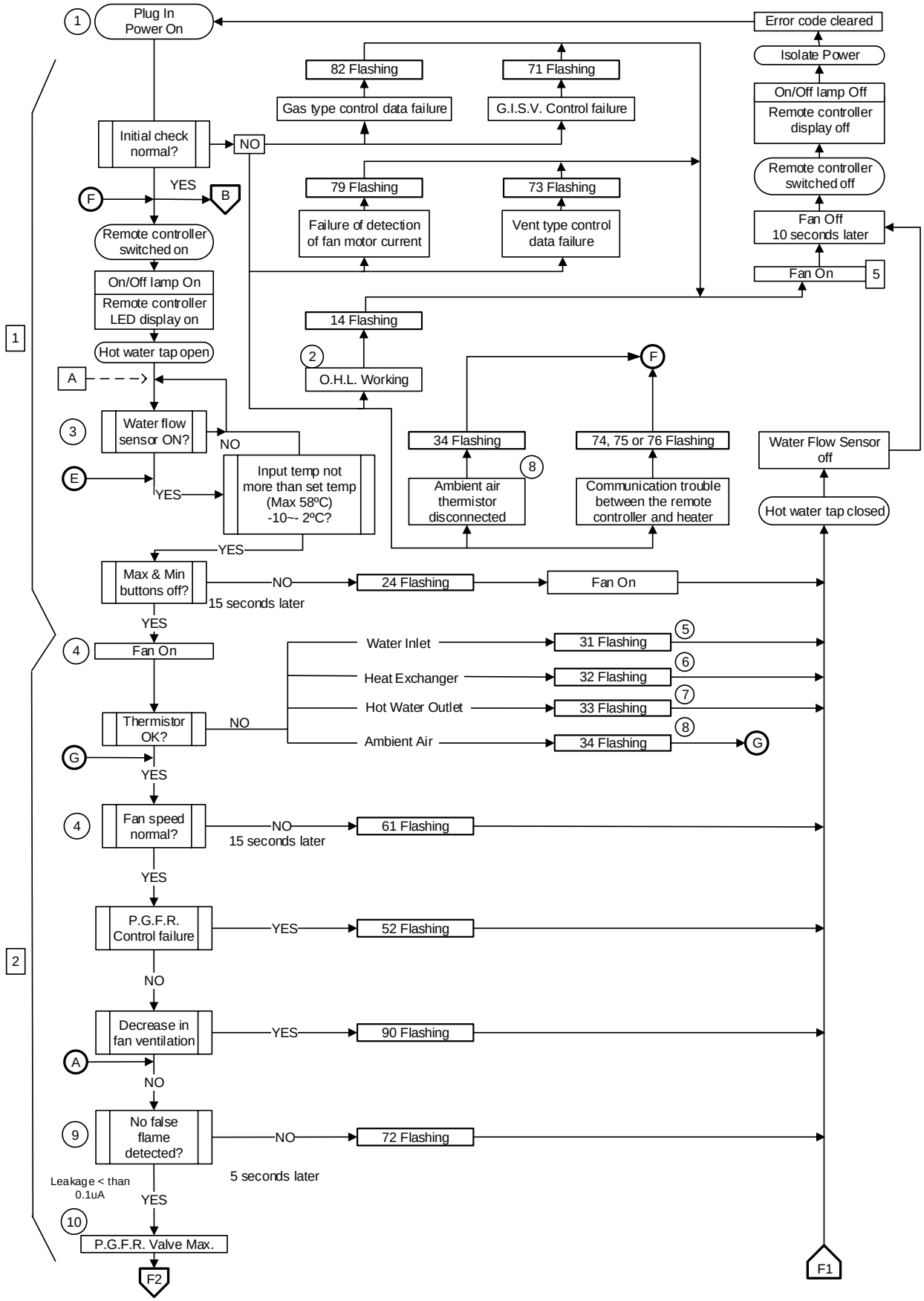
Notes and Abbreviations used on the Operational Flow Charts

P.G.F.R Valve	Proportional Gas Flow Regulating Valve
G.I.S.V.	Gas Inlet solenoid Valve
O.H.L	Over Heat Limiter
C.I	Combustion Indicator
F.F	Flame Failure
PCB	Printed Circuit Board
S.V. 1	Solenoid Valve 1
S.V. 2	Solenoid Valve 2
S.V. 3	Solenoid Valve 3
I.U.I.	In Use Indicator (Combustion indicator)

Sequence Number Table

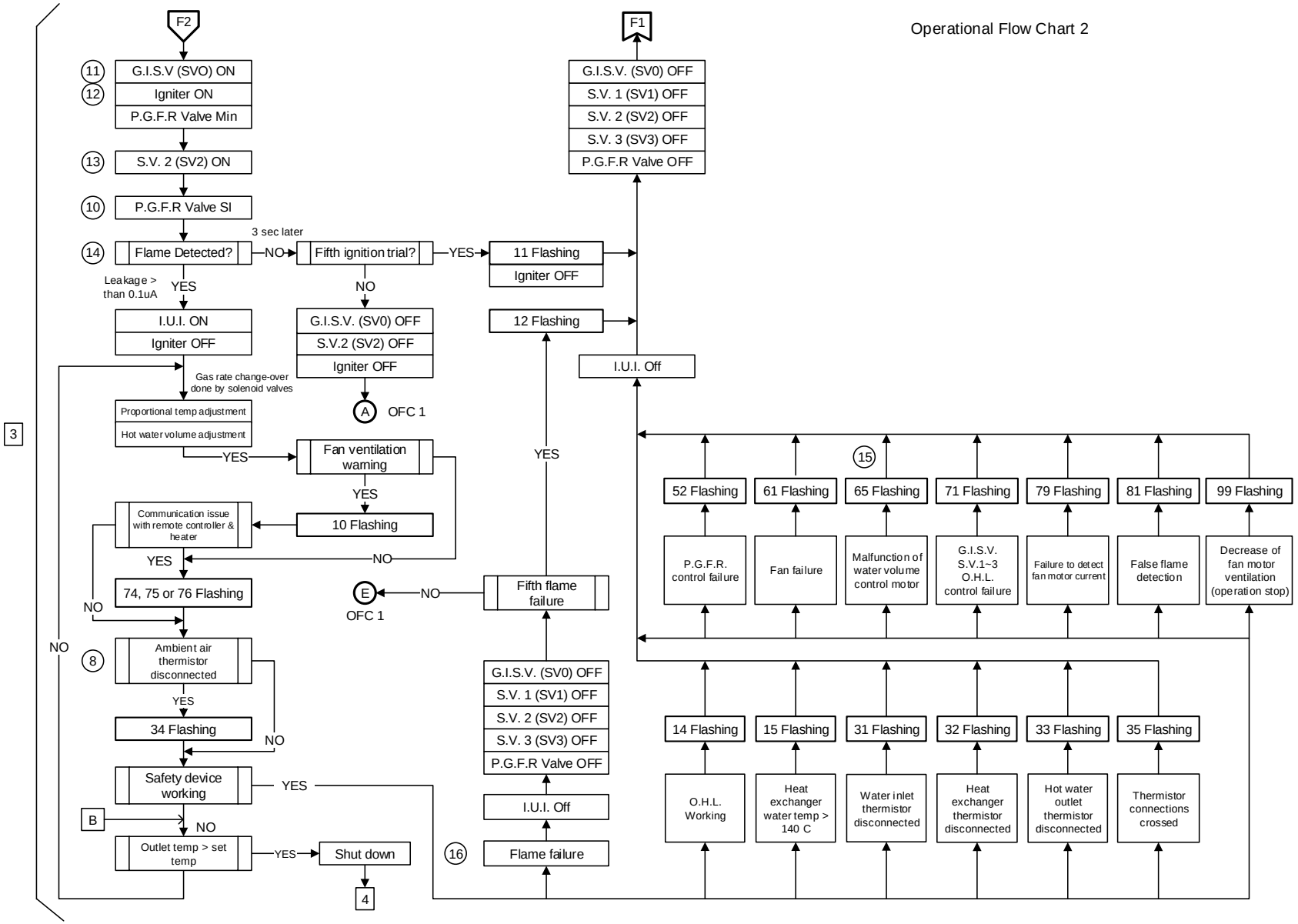
Sequence Number	- 0 to -9	A0 - A9 P0 - P9	C0 - C9 E0 – E9	F0 - F9	H0 - H9 L0 - L9 J0 - J9 U0 - U9
Operational Flow Chart Section	1	2	3	4	5

OPERATIONAL FLOW CHARTS



Note: see page 22 for details on interpreting chart abbreviations

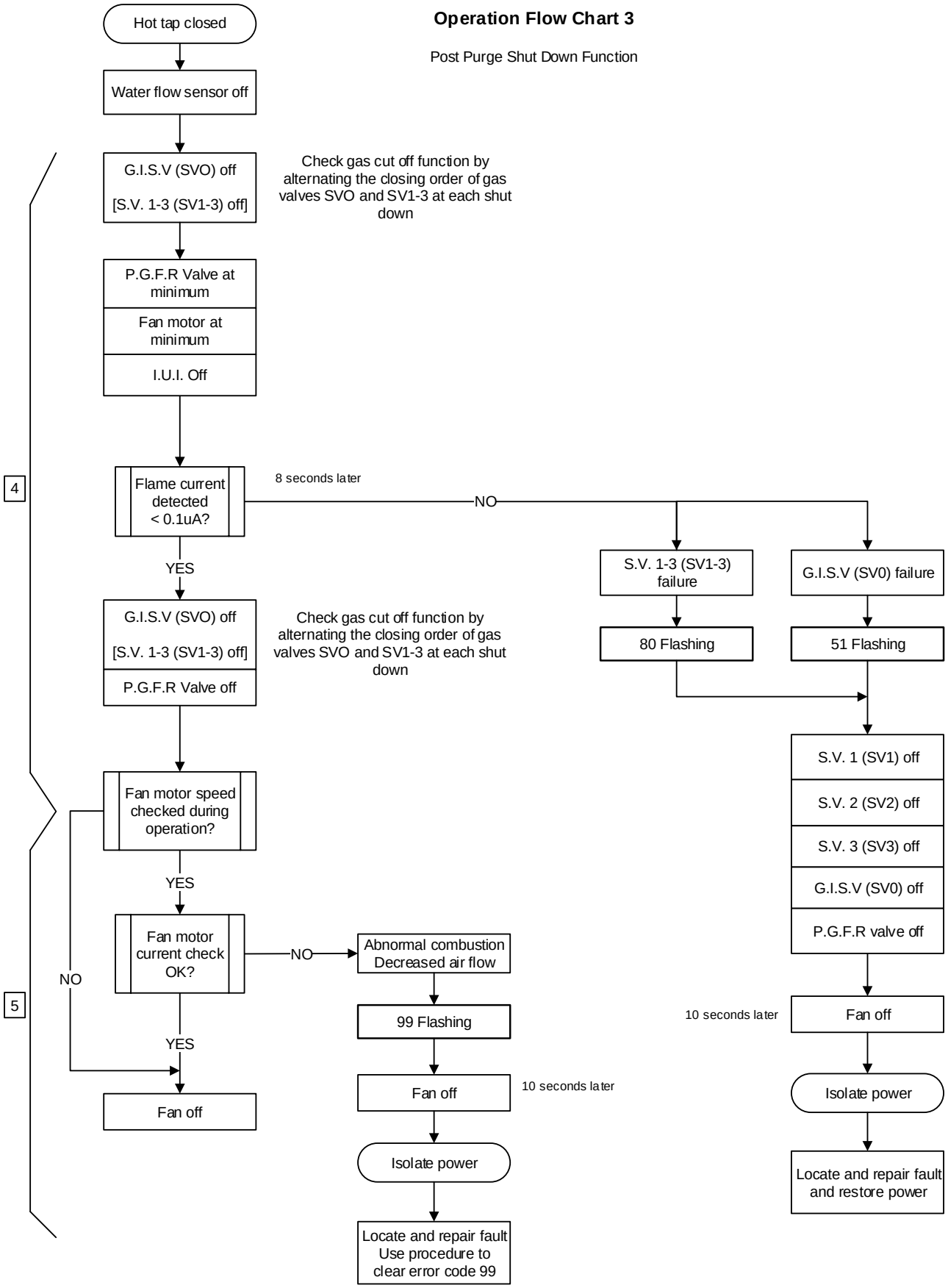
Operational Flow Chart 2



Note: see page 22 for details on interpreting chart abbreviations.

Operation Flow Chart 3

Post Purge Shut Down Function



Note: see page 22 for details on interpreting chart abbreviations.

ERROR CODES

The following table outlines the error codes, possible causes and diagnostic tests to conduct. More detailed diagnosis is outlined in the fault finding and operational flow charts.

Error Code	Fault Condition	Items To Check
10	Abnormal low rate combustion	Blockage in the heat exchanger fins, fan, air intake or flue diagnostic point 4
11	Ignition failure at start up	P.G.F.R Valve - diagnostic point 10 G.I.S Valve - diagnostic point 11 Igniter - diagnostic point 12 Solenoid valve 2- diagnostic points 13, Flame sensors 1,diagnostic points 14
12	Flame failure during operation	P.G.F.R Valve - diagnostic point 16 G.I.S Valve - diagnostic point 16 Solenoid valves 1, 2 & 3 - diagnostic point 16 Flame sensors 1 & 2.- diagnostic points 16
14	Over heating	Over Heat Limiter - diagnostic point 2
15	Very high temperature	Heat exchanger thermistor - diagnostic point 6 P.G.F.R Valve - diagnostic point 10
24	Operational switch faulty	MAX, MIN or Adj button on PC board.-. Remote controller & Bath fill switches
31	Inlet thermistor open circuit	Water inlet thermistor - diagnostic point 5
32	Heat exchanger thermistor open circuit	Heat exchanger thermistor - diagnostic point 6
33	Outlet thermistor open circuit	Hot water thermistor - diagnostic point 7
34	Ambient air thermistor open circuit	Ambient air thermistor - diagnostic point 8
35	Thermistor connections crossed	Connection points of thermistors
51	Gas cut off malfunction (SV0 failure)	G.I.S Valve - diagnostic point 16 Flame sensor 1 & 2 - diagnostic point 16
52	P.G.F.R control failure	P.G.F.R Valve – diagnostic point 16 PC Board (PCB)
61	Abnormal fan speed or fan failure	Fan motor – diagnostic point 4 PC Board (PCB)
65	Malfunction of water volume control motor	Water volume control motor - diagnostic point 15
71	G.I.S valve control failure	O.H.L. - diagnostic point 2 Heat exchange thermistor diagnostic point 6 Gas. Inlet Solenoid Valve diagnostic 10 Solenoid Valves 1, 2 & 3 diagnostic 16 PC Board (PCB)
72	Detected false flame	Flame sensors 1, & 2 - diagnostic point 9 PC Board (PCB)
73	Vent type control data failure	Gas type circuit board
74 75 76	Communication problem between remote controller and water heater	Remote controller PC Board or Remote controller cable
79	Fan motor current detection failure	Fan motor – diagnostic point 4 PC Board (PCB)
80	Gas cut off defective (Solenoid valve 1-3 failure)	Solenoid valve 1, 2 & 3 - diagnostic point 16 Flame sensor 1, & 2 - diagnostic point 16
81	No false flame detected	Solenoid valve 1, 2 & 3 - diagnostic point 16 Flame sensor 1, & 2 - diagnostic point 16 PC Board (PCB)
82	Functional problem on gas type circuit board	Gas type circuit board
90	Decrease in fan motor ventilation.	Blockage in the heat exchanger, fins, fan air intake or flue way
99	Decrease in fan motor ventilation. (Operation stop)	Blockage in the heat exchanger, fins, fan air intake or flue way

Note: see page 22 for interpretation of abbreviations.

DIAGNOSTIC TEST POINTS

Refer to wiring diagram, page 8, for connector and wiring positions.

Test Point	Measuring Point		Normal Condition	Items Under Test
	Connector	Wire Nº & colour		
1	A	BL2 – BR1	AC 207V – 264V	Main Power
2	I	W2 – W3	40 kilo-ohms – 500 kilo-ohms	Overheat Limiter
3	F	BL17 – BK16	DC 2V– 5V(Pulse) ***1** More than 1310 pulse/min	Water Flow Sensor pulse signal
		R18 – BK16	DC 7V – 15V	Water Flow Sensor voltage
4	L	BK3 – R1	DC 5V – 50V	Fan Motor
		O4 – BK3	DC 9V – 15V	
		Y5 – BK3	DC 4V – 10V(Pulse) ***1** More than 4800 pulse/min	Fan Motor pulse signal
5	F	W10 – BK9	@ 20ºC – 10.3 kilo-ohms @ 40ºC – 4.9 kilo-ohms	Water Inlet Thermistor
6	F	G14 – BK9	@ 20ºC – 10.3 kilo-ohms @ 40ºC – 4.9 kilo-ohms	Heat Exchanger Thermistor
7	F	BL15 – BK9	@ 20ºC – 10.3 kilo-ohms @ 40ºC – 4.9 kilo-ohms	Hot Water Outlet Thermistor
8	F	BL11 – BK9	@ 5ºC – 12.5 kilo-ohms @ 20ºC – 6.3 kilo-ohms	Ambient Air Thermistor
9	J	R1 – Earth	AC 1V – 170V ***2**	Flame Sensor detecting flame
	K	GY1 – Earth	AC 1V – 170V ***2**	
10	I	R6 - BK5	DC 1.5V – 14V 40 ohms – 80 ohms	Proportional Gas Flow Regulating
11	I	Y12 – BK11	DC 9V – 15V 17 ohms – 27 ohms	Gas Inlet Solenoid Valve
12	I	O9 – BK11	DC 9V – 15V	Igniter
13	I	R8 – BK11	DC 9V – 15V 14 ohms – 23 ohms	Solenoid Valve 2
14	K	GY1 - Earth	AC 1V – 170V ***2**	Flame Sensor detecting flame
15	F	W2 – BK1	DC 8V – 16V	Water Volume Control Motor position switch
		R7 – BK1	DC 8V – 16V	
		G3 – BK1	Less than DC 1V (Limiter ON)	
			DC 4V – 6V (Limiter OFF)	
16	I	Y12 – BK11	DC 9V – 15V 17 ohms – 27 ohms	Gas Inlet Solenoid Valve
		BL10 – BK11	DC 9V – 15V 14 ohms – 23 ohms	Solenoid Valve 1
		R8 – BK11	DC 9V – 15V 14 ohms – 23 ohms	Solenoid Valve 2
		W7 – BK11	DC 9V – 15V 14 ohms – 23 ohms	Solenoid Valve 3
		R6 – BK5	DC 1.5V – 14.0V 40 ohms – 80 ohms	Proportional Gas Flow Regulating
	J	R1 - Earth	AC1V – 170V ***2**	Flame Sensor detecting flame
	K	GY1 - Earth	AC1V – 170V ***2**	

NOTES:

***1:** Approximate reading measured by digital multimeter on DC range.

***2:** Approximate reading measured by digital multimeter on AC range.

MAINTENANCE INFORMATION

Information relating to both the current and past operation of the water heater can be obtained from the memory; this information is referred to as the maintenance information.

The table below details the information that can be recalled from the memory i.e. to view the current temperature being measured by the outlet thermistor select 5Y, refer to page 30 for the procedure to display maintenance information.

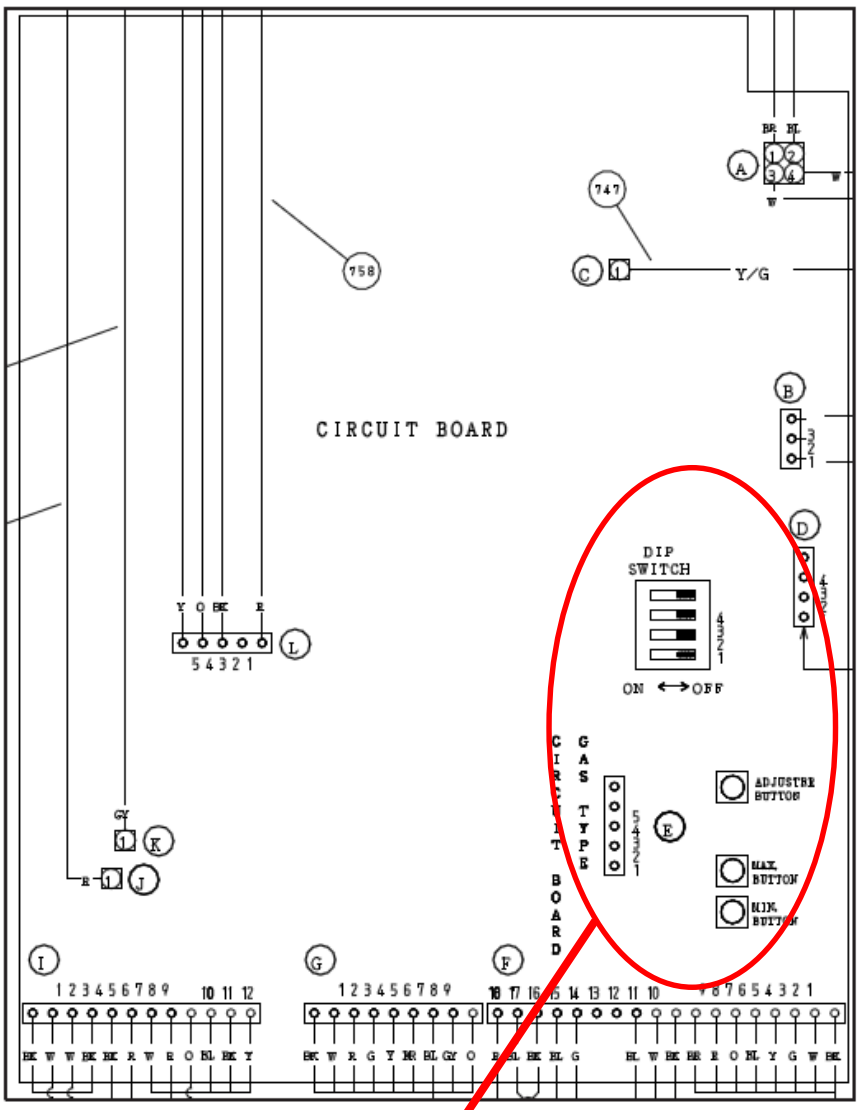
Maintenance Table

Temp. adjust key ➤ (Left digit in LED display (Numerical)

Temp Adjusting key ➤ Right digit in LED display (Alphabetical)

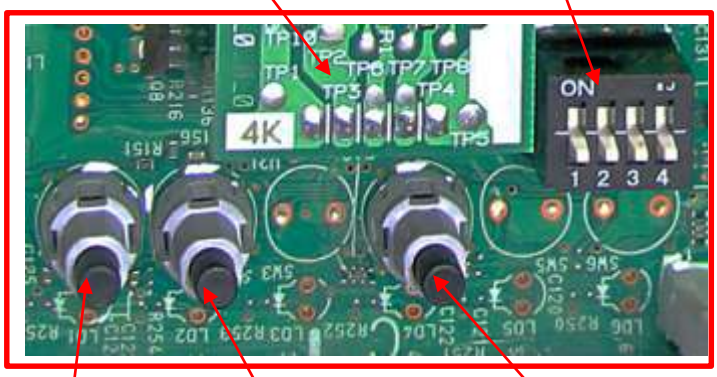
	0	1	2	3	4	5	6	7	8	9
E	Null	Error Code for the previous 8 faults								Null
F	Electrification Years **Years	Sequence number of the previous 8 faults								Null
C	Total combustion starts X 10,000	Total combustion operations since last error X 10,000 hours								Null
D	Total combustion starts X 100	Total combustion operations since last error X 100 hours								Null
H	Total combustion period X 1000 hrs	Total combustion period since last error X 1,000 hours								Null
J	Total combustion period X 10 hrs	Total combustion period since last error X 10 hours								Null
Y	Flame sensor status (Refer page 11)	Water Flow Sensor Litres / minute	Ambient Air Thermistor temp. ºC	Water Inlet Thermistor temp. ºC	Heat Exchanger Thermistor temp ºC	Hot Water Outlet Thermistor temp ºC	Fan speed X100 RPM	Power for P.G.F.R Valve %	Null	Opening angle of Water Volume Control motor in degrees X10
A	Remote control connection status ON: 1 OFF: 0	Null	Fan Motor current value -	Fan Motor Current X 100mA	Fan Motor current value-	Fan Motor current value-	Fan Motor current value-	Fan Motor current value-	Fan Motor current value-	Sequence number
P	Remote control connection status ON: 1 OFF: 0	Power for P.G.F.R. Valve x 10mA	Fan Motor current value-	Fan Motor current value-	Fan Motor current value	Fan Motor current value-	Null	Fan Motor current value-	Fan Motor current value-	Null
U	Exhaust setting 1:A 2:B 3:C 0:Failure	Null	Null	Null	Fan Motor current value-	Fan Motor current value-	Null	Bath fill flow x10 Litre/ minute	Fan Motor current value-	Null

PC Board (PCB)



Gas type circuit board

Dip Switches



Min Button

Max Button

ADJ. Button

Displaying Maintenance Information

Voltages up to 240 volts will be present within the water heater, take care not to touch wiring terminals. Use an insulated tool when operating the DIP switch or MIN and MAX buttons.

At the Water Heater

1. Remove the front panel from the water heater.
2. Using an insulated tool, turn DIP SWITCH 1 on (refer to figure 1).
3. Use the MAX button to change the left digit (0→1etc.) in the LED display to the required maintenance code identified from the maintenance table on page 28.
4. Use the MIN button to change the right digit (E→F etc.) in the LED display to the required maintenance code identified from the maintenance table on page 28.
5. The maintenance code and the value of that code will alternate on the LED display.
6. Turn DIP SWITCH 1 off (down position) when diagnosis is complete.
7. Refit the front panel to the water heater.

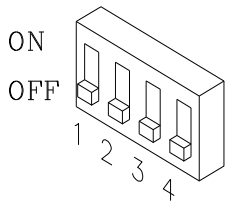


Fig 1

NOTE: Turning on DIP SWITCH 2 will lock the display if required.

From a Remote Controller

1. Ensure the Remote Controller is turned off.
2. Press the temperature increase and decrease buttons simultaneously for 3 seconds
3. Use Temperature decrease button to change the left digit (0→1etc.) in the LED display to the required maintenance code identified from the maintenance table on page 28.
4. Use the Temperature increase button to change the right digit (E→F etc.) in the LED display to the required maintenance code identified from the maintenance table on page 28.
5. The maintenance code and the value of that code will alternate on the LED display of the Remote Controller.
6. Press the on/off button twice on the Remote Controller to end maintenance information.
7. Turn the remote controller ON for normal operation

CLEARING ERROR CODE HISTORY

After successfully repairing the water heater the existing Error Code history should be cleared. This will allow fresh data to be stored and reduce the risk of confusion should it be necessary to service the water heater in the future.

To clear the Error Code history:

1. Ensure all controllers (if fitted) are turned off and all hot taps are closed.
2. Remove the front panel of the water heater.
3. Turn DIP SWITCH 1 on (up position) and then off (down position) again.
4. Within 5 seconds of turning DIP SWITCH 1 off, press and hold either the MIN or MAX button for more than 2 seconds. “CL” will flash in the LED display and then become steady, indicating the history is cleared.
5. Refit the water heater front panel.

RESETTING ERROR CODES

Most Error Codes can be reset by shutting off the hot water flow and turning the controllers (if fitted) off and then on again. It may also be necessary to isolate and restore the power. Where controllers are not fitted it may be necessary to turn the power off at the water heater to clear the error code.

Voltages up to 240 volts will be present within the water heater, take care not to touch wiring terminals. Use an insulated tool when operating the DIP switch or MIN and MAX buttons.

To reset Error Code 99 it is necessary to:

1. Ensure water is not flowing through the water heater.
2. Turn off remote controllers (if fitted).
3. Ensure all DIP SWITCHES are in the off position (down position).
4. Turn DIP SWITCH 2 on (up position) and then off (down position).
5. Within 5 seconds of turning DIP SWITCH 2 off, press and hold both the MIN and MAX buttons for more than 2 seconds.
6. “UL” will flash in the LED display and then become steady.
7. Turn on a controller (if fitted) then open and close a hot water tap to complete the procedure.

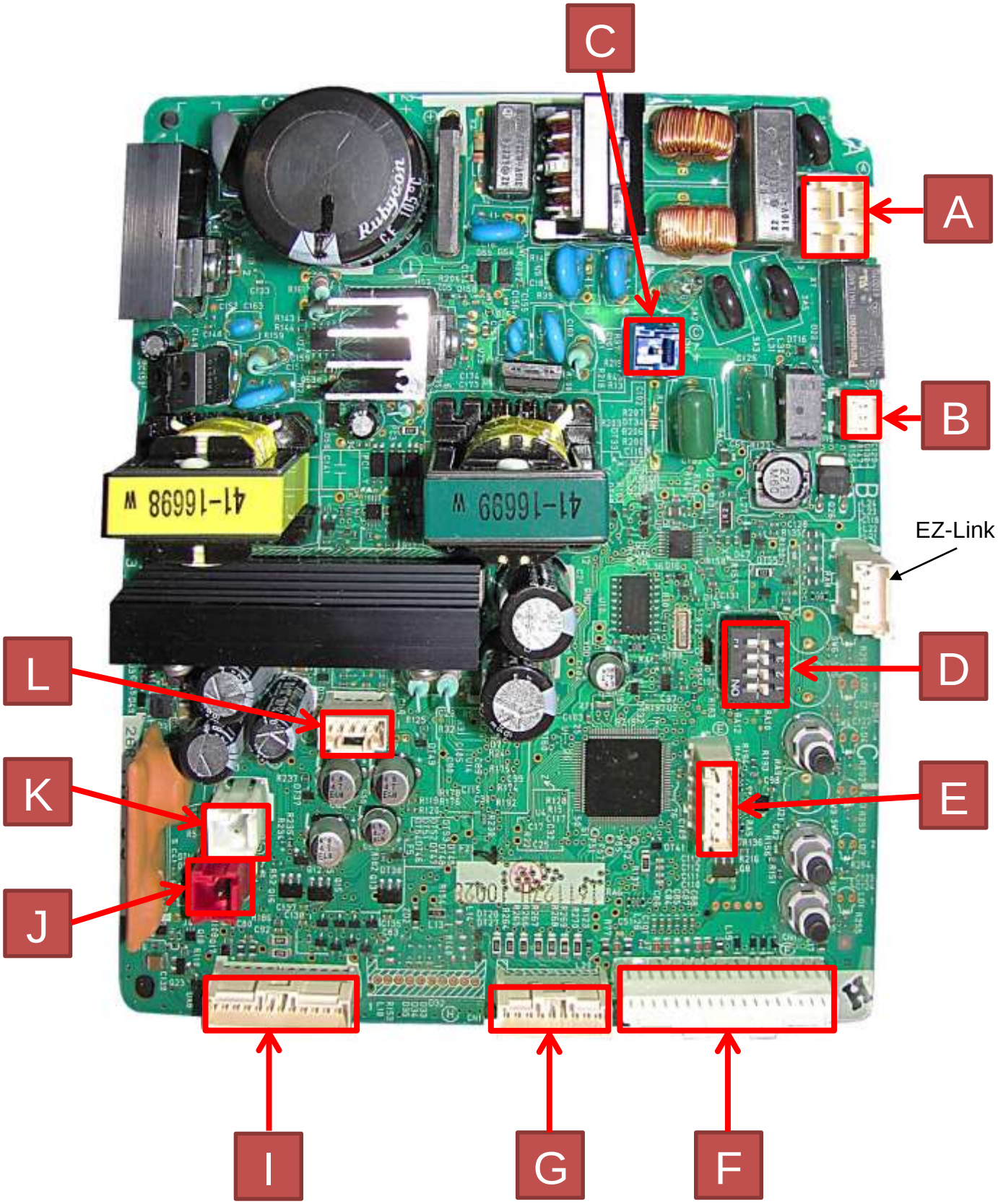
Test Equipment

A list of test equipment which will assist in conducting diagnostic procedures is provided below. This equipment is available from Rheem Service Spare Parts Department.

Flame detection simulator	WH0020080
Flame sensor current (uA) detection kit	WH0020081
Fine probe adapter kit	WH0020082
Heat exchanger fin brush	WH0020083
Probe to alligator clip kit	WH0020084

Wiring Colour Code

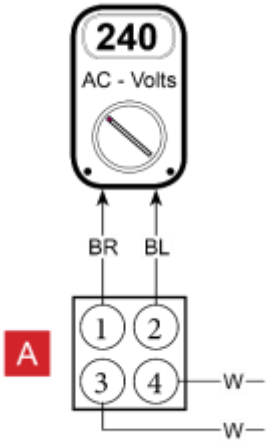
R: Red
W: White
Br: Brown
BK: Black
BL: Blue
GY: Grey
G: Green
O: Orange
Y: Yellow
Y/G: Yellow / Green



Tests 1 -3

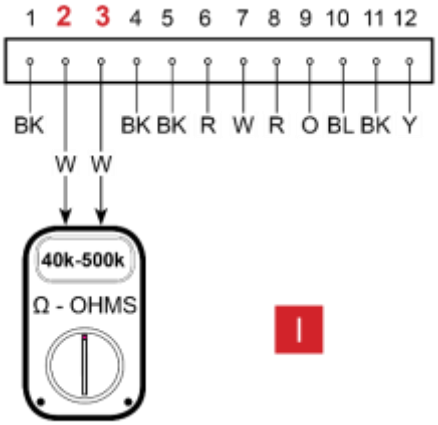
Components will be "Live" when conducting tests, exercise caution.

Test 1 – Mains power



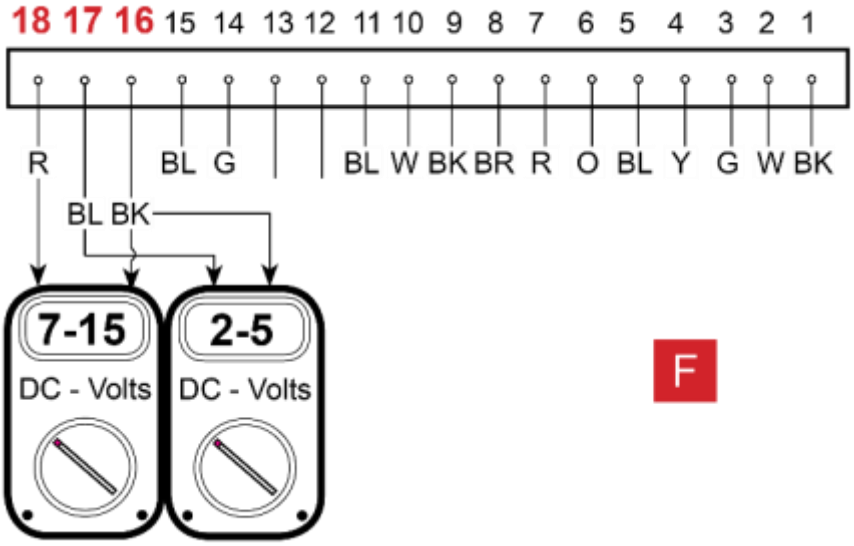
Measure the voltage at the connector plug (Position **'A'** on the PCB) with a multimeter set on the AC voltage scale. If the voltage is between 230V and 250V the cord set and fuses are ok.

Test 2 – Over heat limiter



Unplug connector **'I'** from the PCB and measure the resistance of the Over Heat Limiter Assembly. Resistance should be between 40 kilo-ohms and 500 kilo-ohms between 2 White and 3 White.

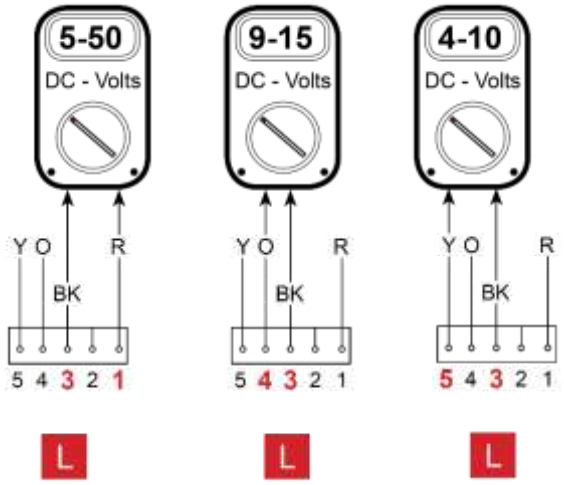
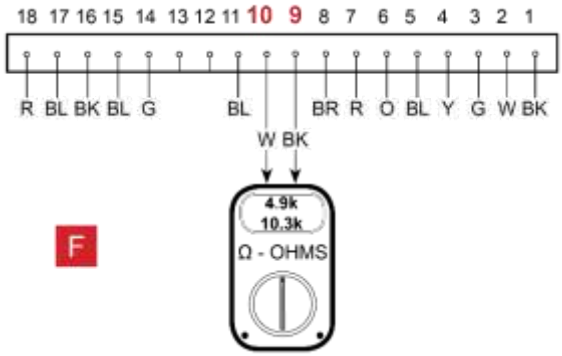
Test 3 – Flow sensor

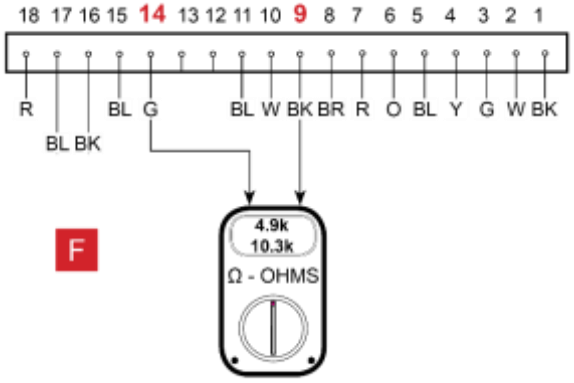
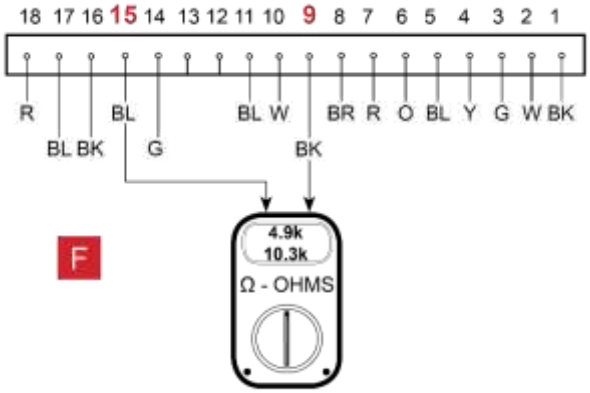


Conduct test with water flowing Measure the voltage between 16 Black and 18 Red connector **'F'.** Voltage should be between DC7 – 15V for correct flow sensor operation

DC2 –5V (or measurement by pulse counter of not less than 1310 pulses per minute) between 17 Blue and 16 Black

Tests 4-7

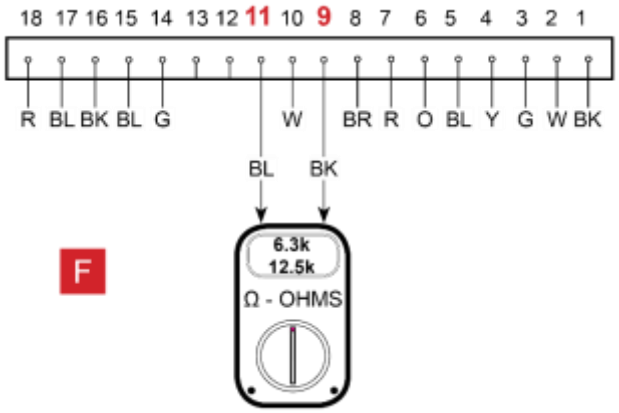
Test 4 – Fan motor	Test 5 – Cold Inlet thermistor
	
DC5V -50V Normal fan voltage operating range (No.3 Black to 1 Red). DC9V -15V Normal fan voltage operating range (No. 3 Black to 4 Orange). DC4 -10V (or measurement by pulse counter of not less than 4800 pulses per minute) 3Black - 5Yellow	Normal operating resistance is 4.9 kilo ohms at 40 ºC and 10.3 kilo ohms at 20 ºC between 10 White and 9 Black

Test 6 – Heat exchange thermistor	Test 7 – Hot outlet thermistor
	
Normal operating resistance is 4.9 kilo ohms at 40 ºC and 10.3 kilo ohms at 20 ºC between 14 Green and 9 Black	Normal operating resistance is 4.9 kilo ohms at 40 ºC and 10.3 kilo ohms at 20 ºC between 15 Blue and 9 Black

Tests 8 - 11

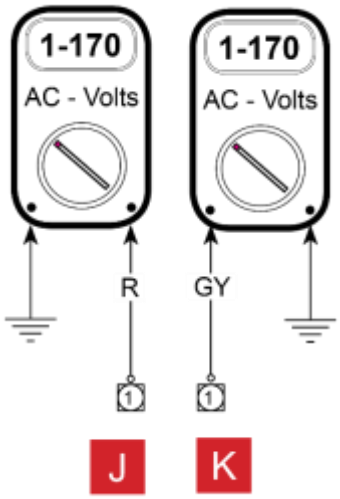
Components will be "Live" when conducting tests, exercise caution.

Test 8 – Ambient air thermistor



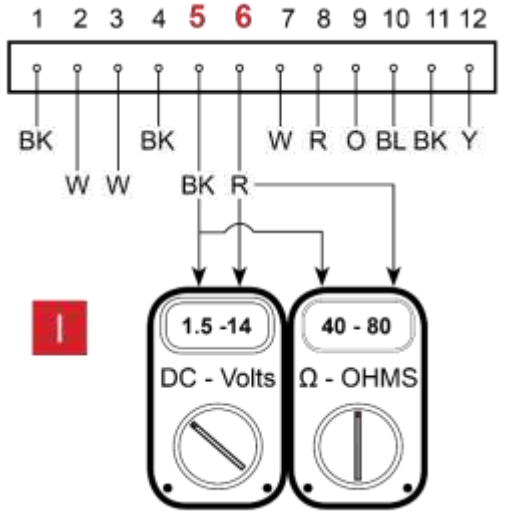
Normal operating resistance is 6.3 kilo ohms at 20 ºC and 12.5 kilo ohms at 5 ºC between 11 Blue and 9 Black

Test 9 – Flame rod



Conduct test with water flowing.
Measure the voltage between Earth and connectors J & K plugged into PCB. Normal voltage is between AC1 and 170V.

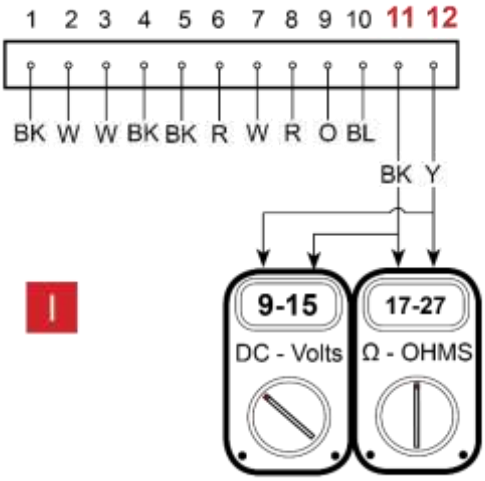
Test 10 – PGFR Valve



Conduct test with water flowing
Measure the voltage with connector I plugged into PCB between 5 Black and 6 Red

Measure the resistance with connector I unplugged from the PCB between 5 Black and 6 Red

Test 11 – Gas inlet solenoid

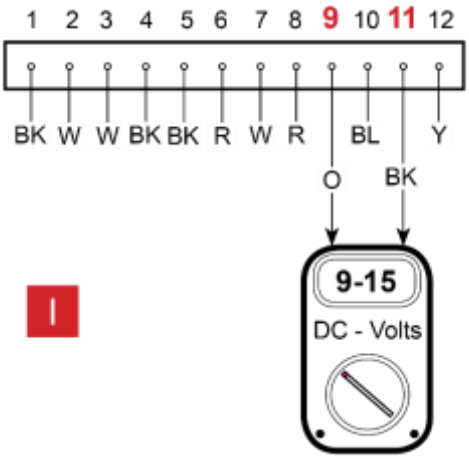


Conduct test with water flowing
Measure the voltage with connector I plugged into PCB between 11 Black and 12 Yellow

Measure the resistance with connector I unplugged from the PCB between 11 Black and 12 Yellow

Tests 12-15A

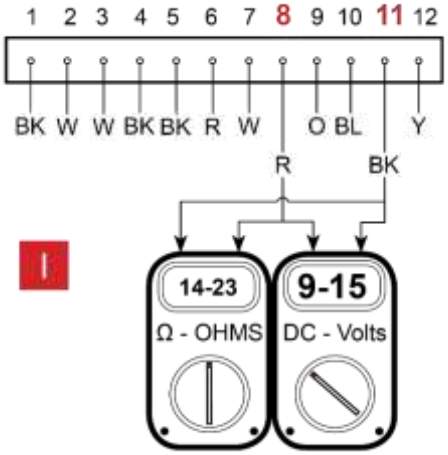
Tests Test 12 – Igniter



Conduct test with water flowing

When ignition sequence commences, normal voltage should read DC 9-15 Volts between 11 Black and 9 Orange, until flame is detected.
(Note: Duration is approximately 3 seconds)

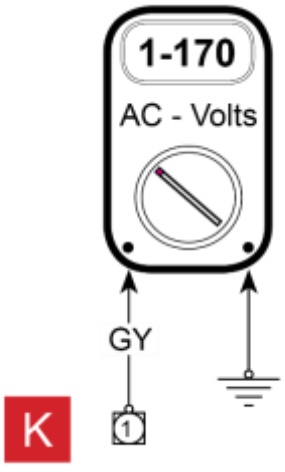
Test 13 – Solenoid valve 2



Conduct test with water flowing
Measure the voltage with connector I plugged into PCB between 11 Black and 8 Red
Measure the resistance with connector I unplugged from the PCB between 11 Black and 8 Red

Components will be "Live" when conducting tests, exercise caution.

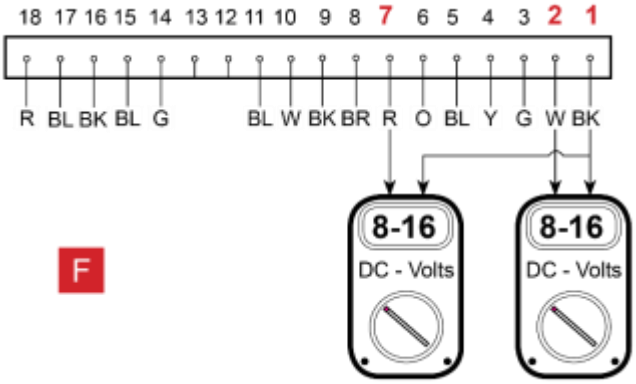
Test 14 – Flame rod



Conduct test with water flowing

Measure the voltage with connector K plugged into PCB. reading AC1 - 170V. between 1 Grey and Earth

Test 15 A – Water inlet valve



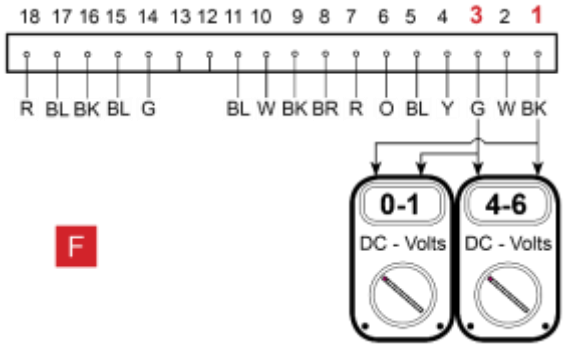
Conduct test with water flowing

Measure the voltage with connector F plugged into PCB. reading DC 8-16 Volts. Between 1 Black and 2 White and between 1 Black and 7 Red.

Tests 15B – 18

Components will be "Live" when conducting voltage tests, exercise caution

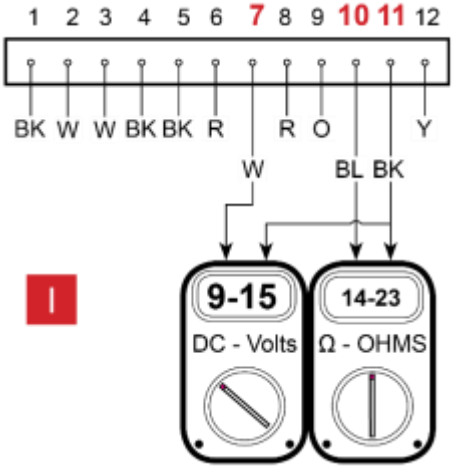
Test 15B – Water inlet position switch



Reading DC 0-1 Volts – Limiter switch is ON

Reading DC 4-6 Volts – Limiter switch is OFF

Test 16 – Solenoid valves 1 and 3



Test solenoid 1 between 10 &11
Test solenoid 3 between 7 & 11

Conduct test with water flowing

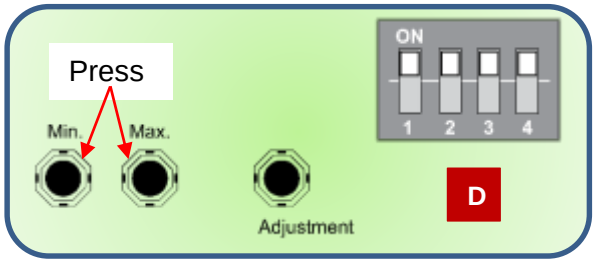
Measure the voltage with connector I plugged into PCB. Reading DC 9-15 volts between 11 Black and 7 White

Measure the resistance with connector I unplugged from the PCB. Reading 14 to 23 Ohms between 11 Black and 10 Blue.

Test 17 – Dip switches

LED Display

Opening the Hot water tap, with MIN and MAX buttons pressed, will display Error Code 24 (for aprox10 seconds.)

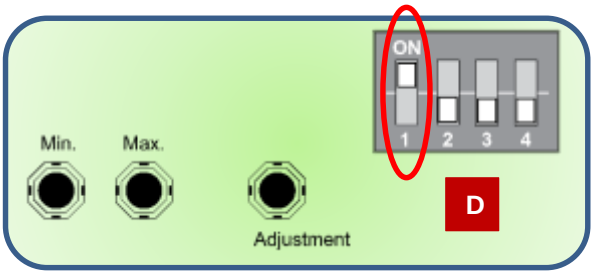


Use an insulated tool when operating the DIP switch or MIN and MAX buttons.

Test 18 – Dip switch 1

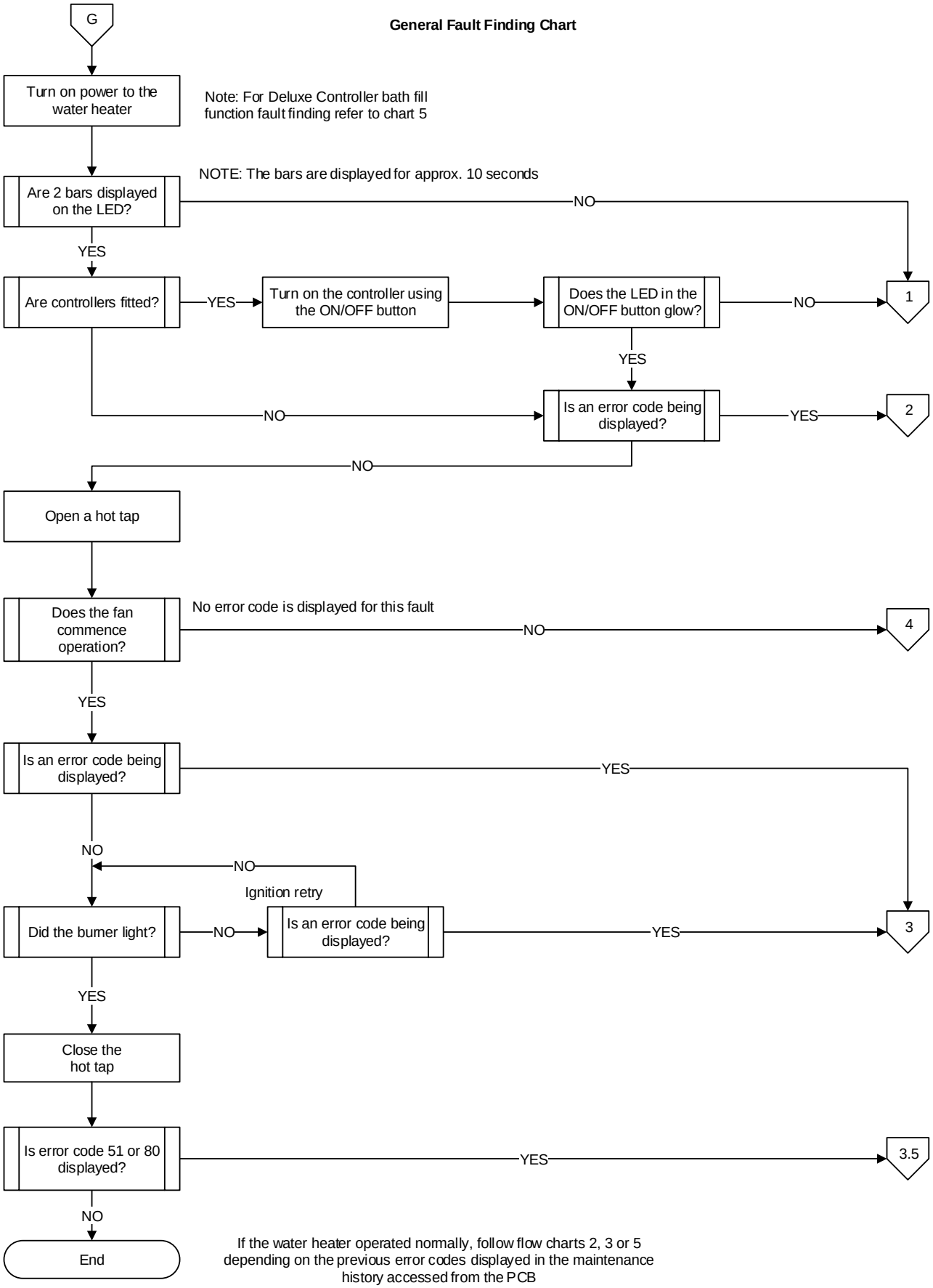
LED Display

If you turn ON dip switch 1, maintenance information will be shown on the LED display



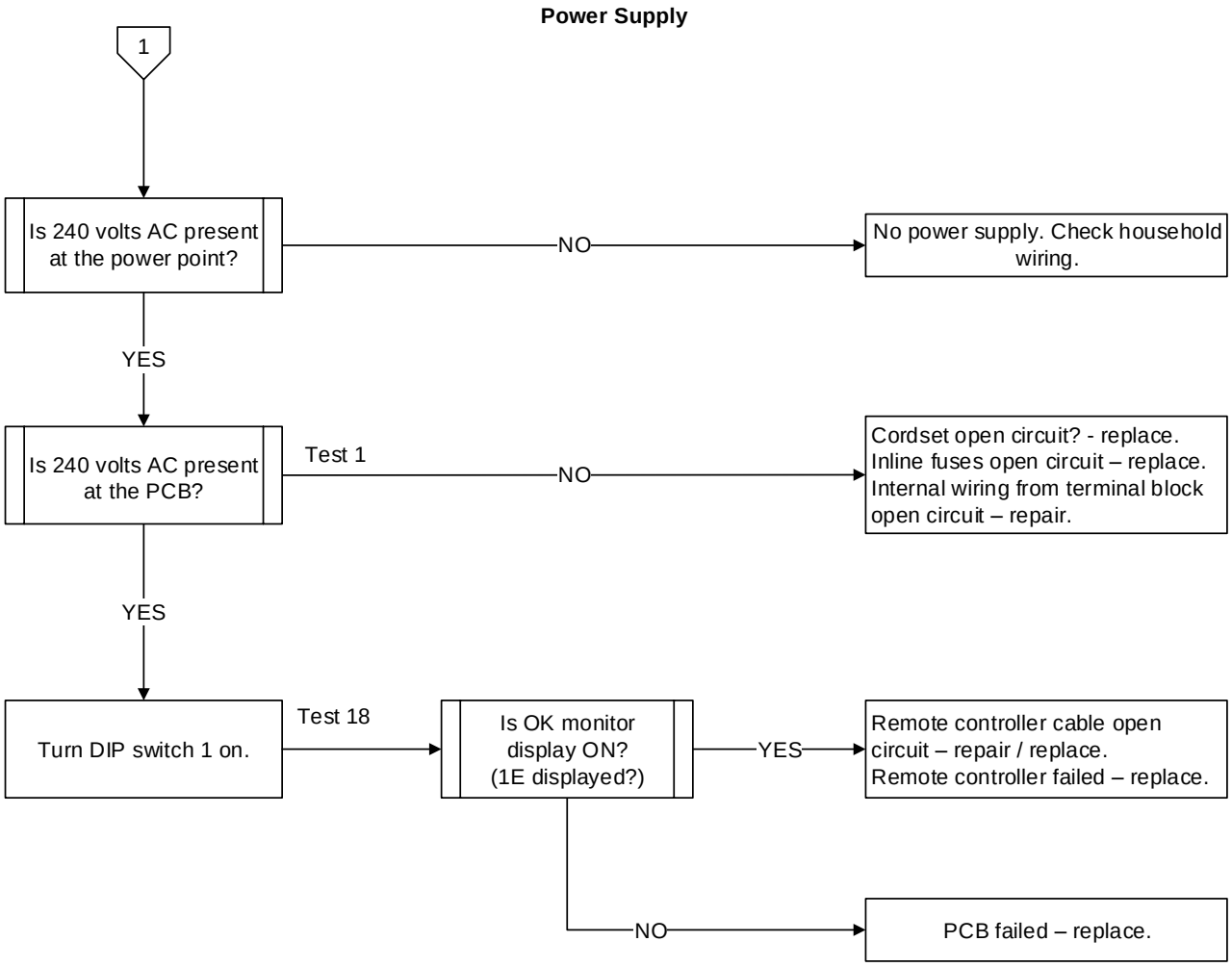
Using an insulated tool, turn DIP switch 1 on

Fault Diagnosis Sequence

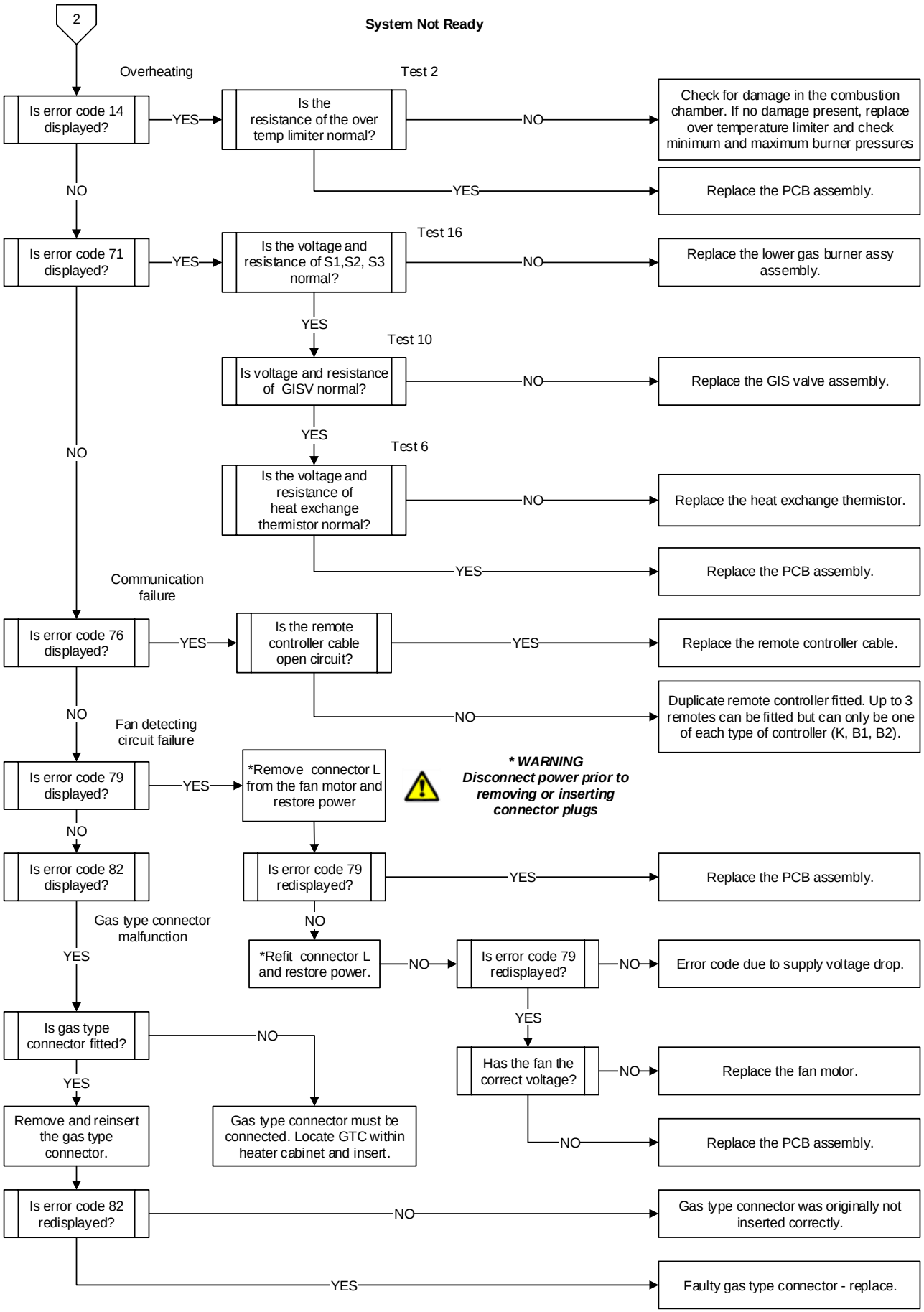


Fault Finding Chart 1

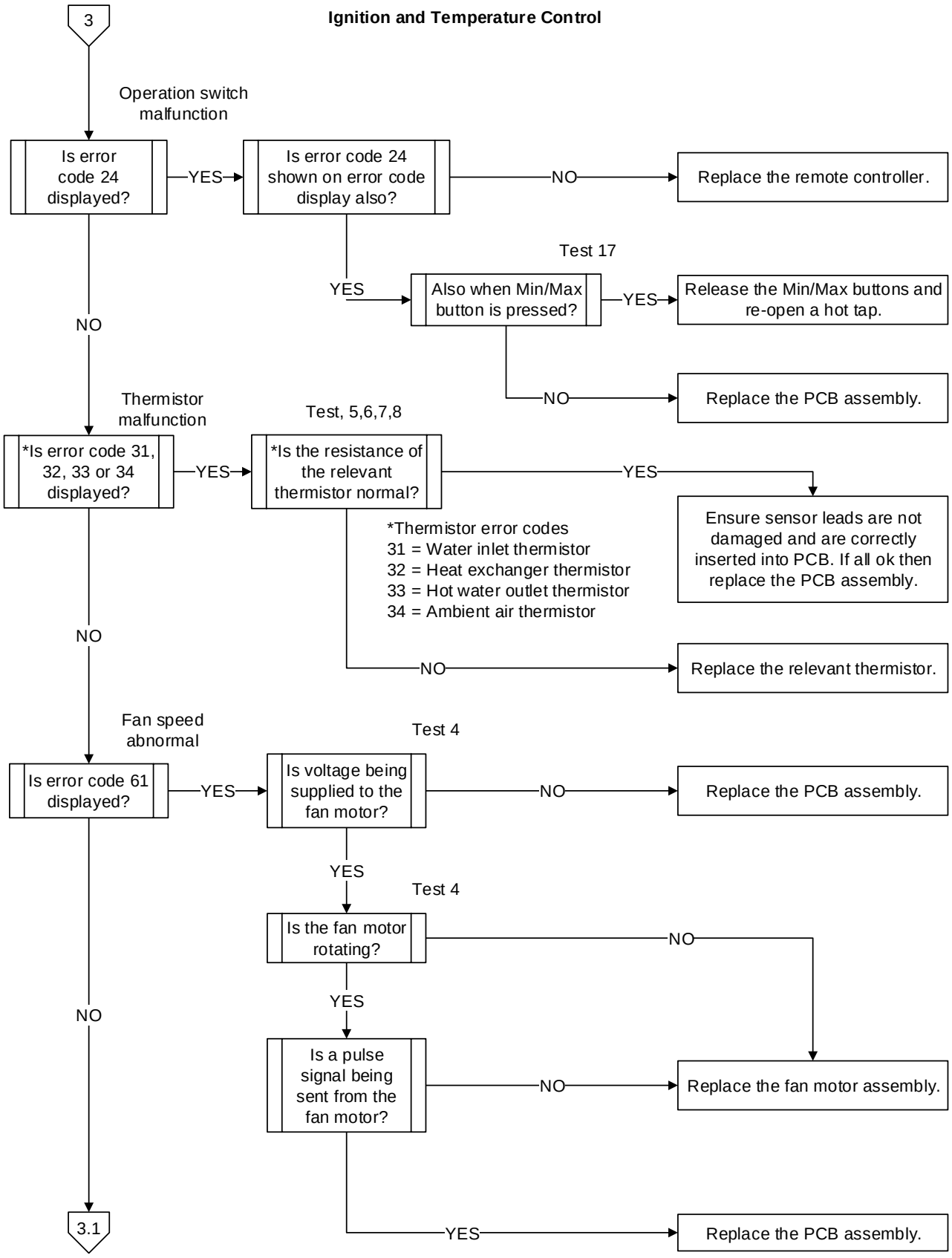
Voltages up to 240 volts will be present within the water heater, take care not to touch wiring terminals. Use an insulated tool when operating the DIP switch or MIN and MAX buttons.



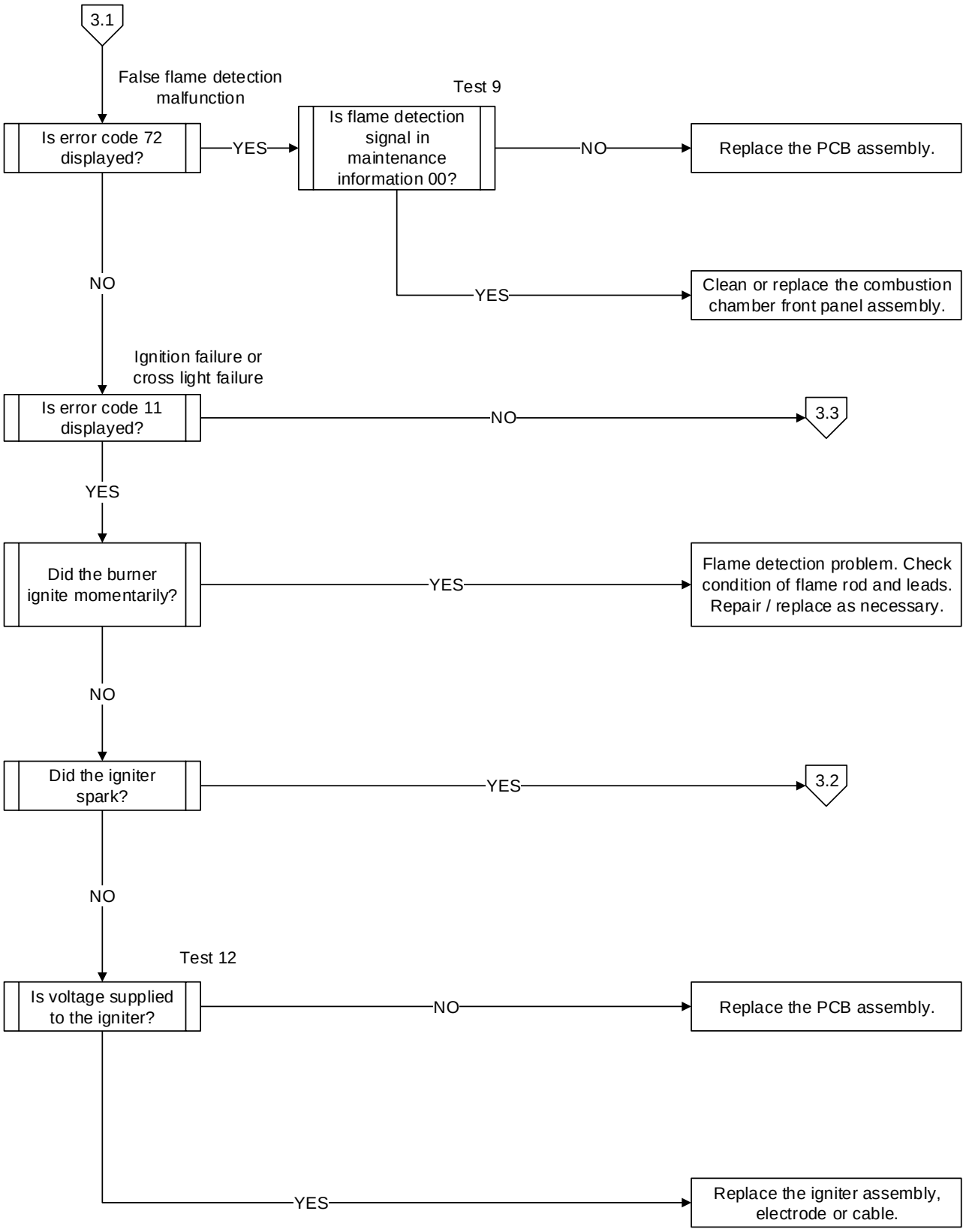
Fault Finding Chart 2



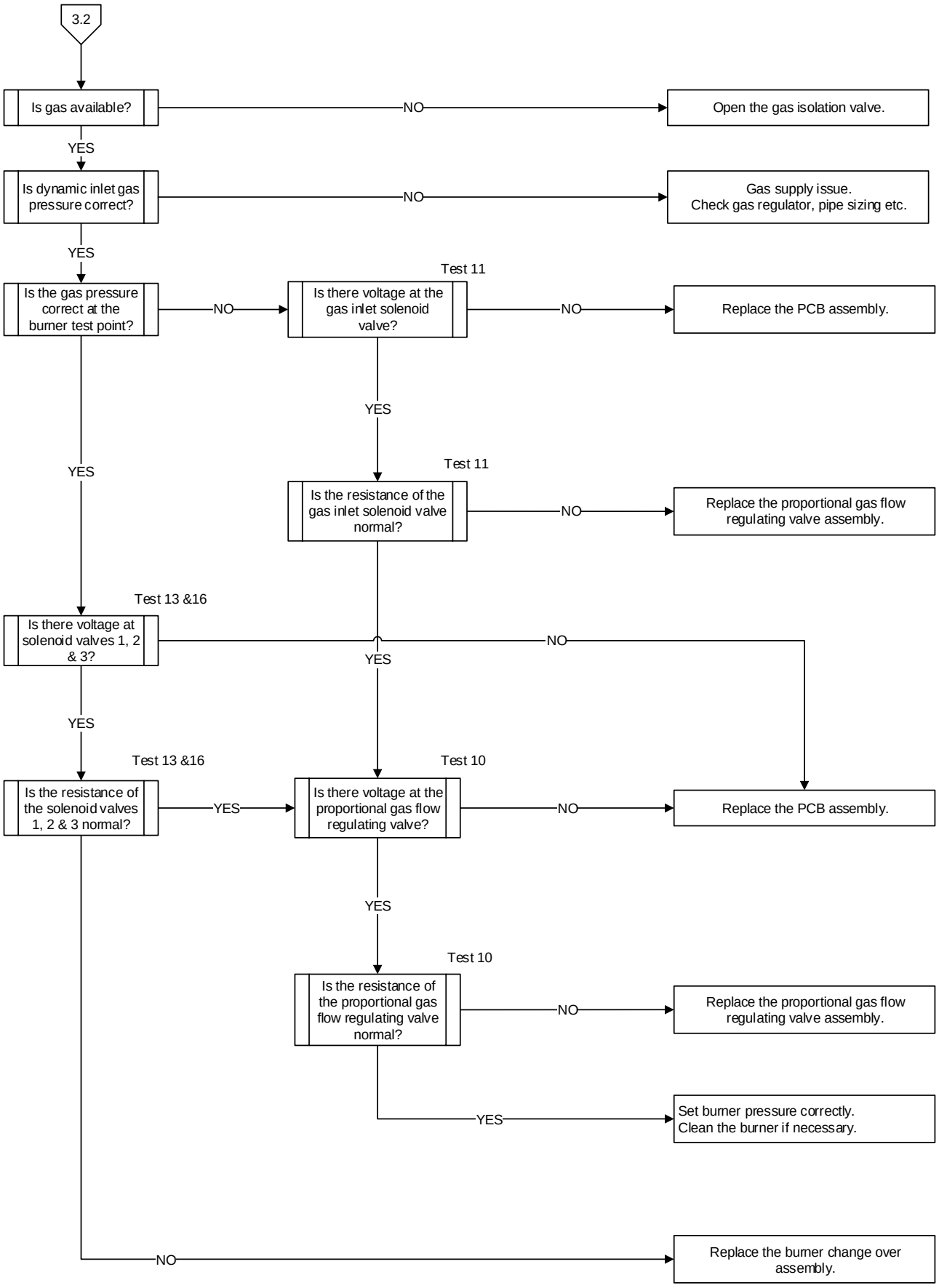
Fault Finding Chart 3



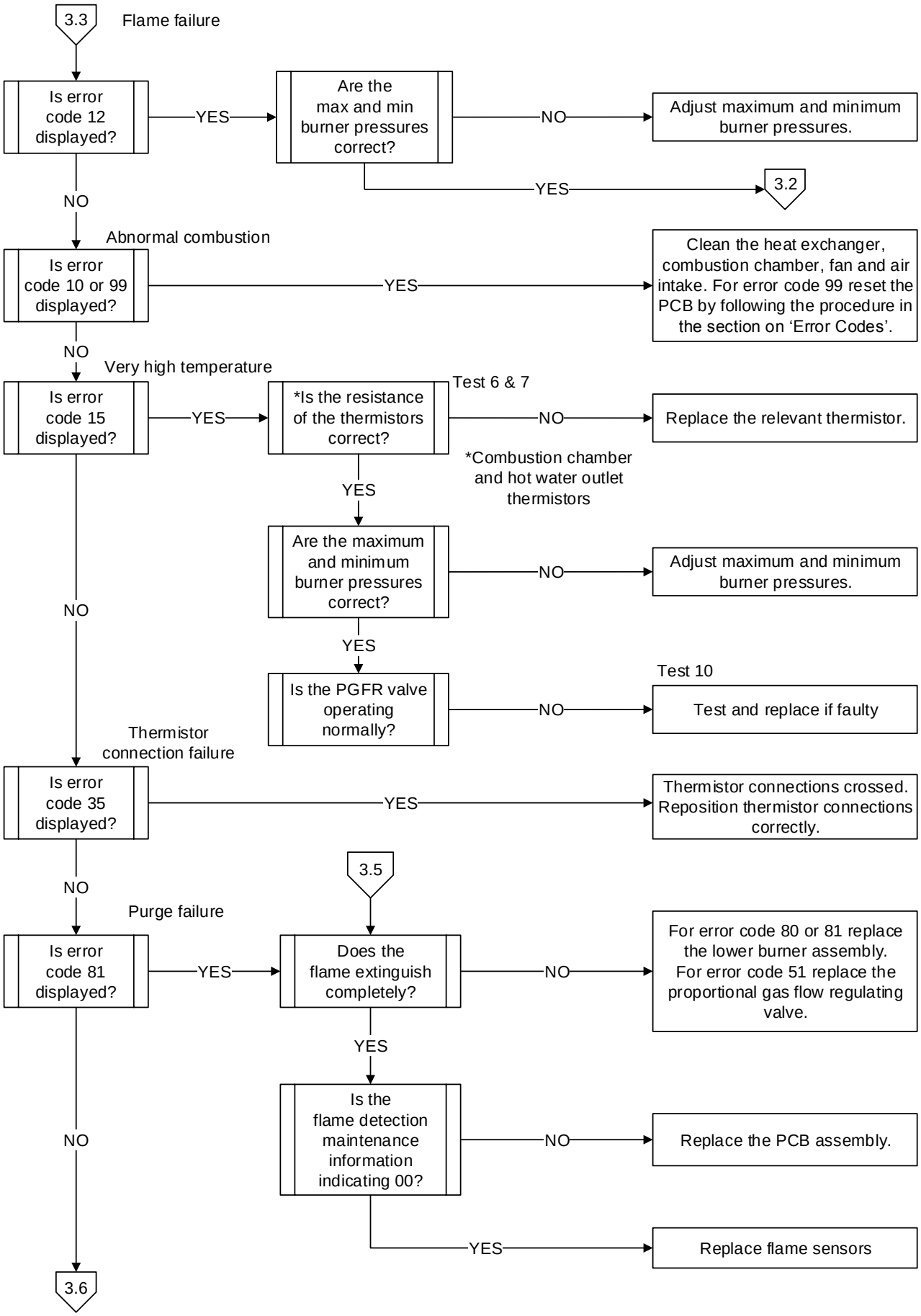
Fault Finding Chart 3.1



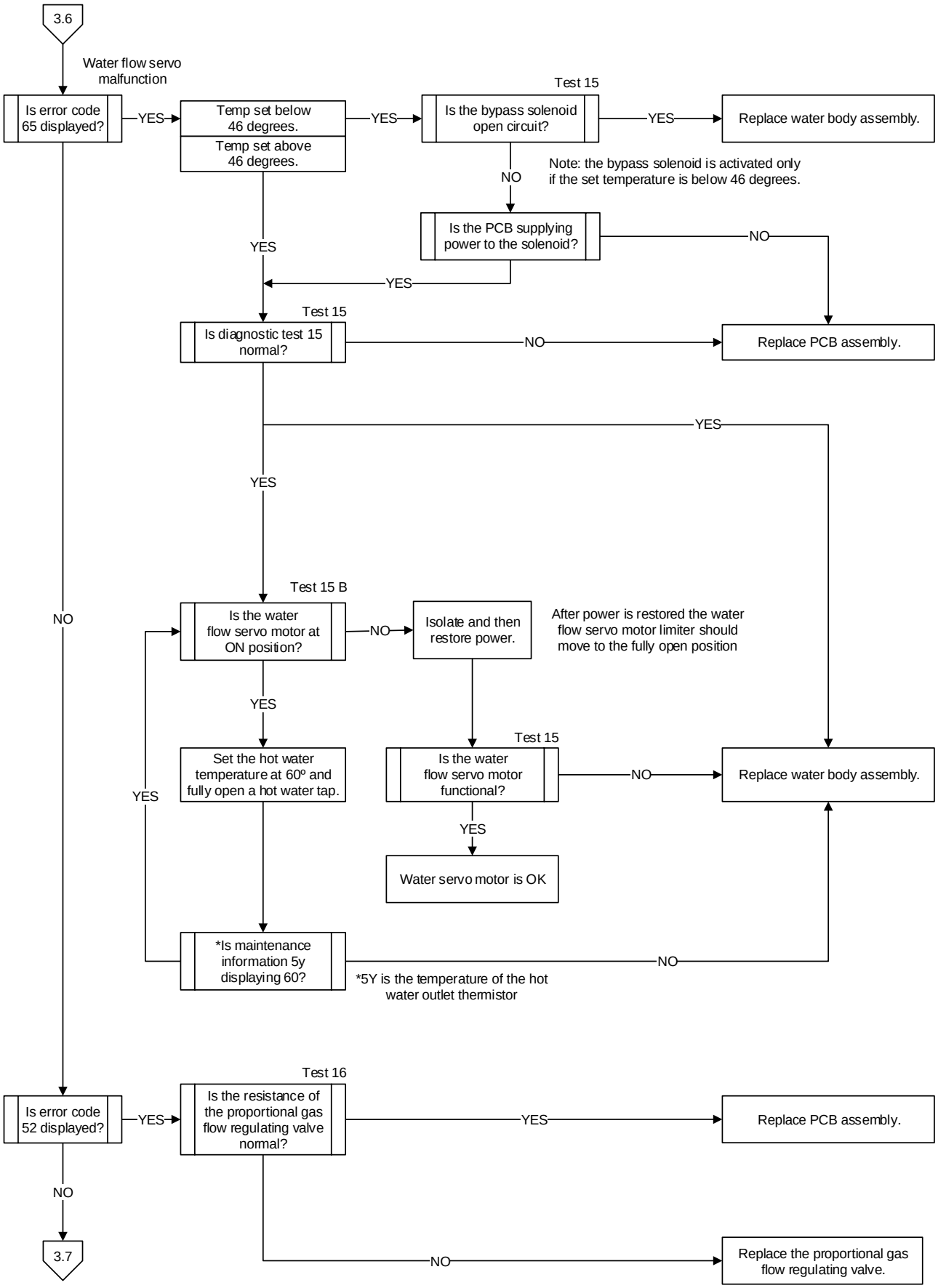
Fault Finding Chart 3.2



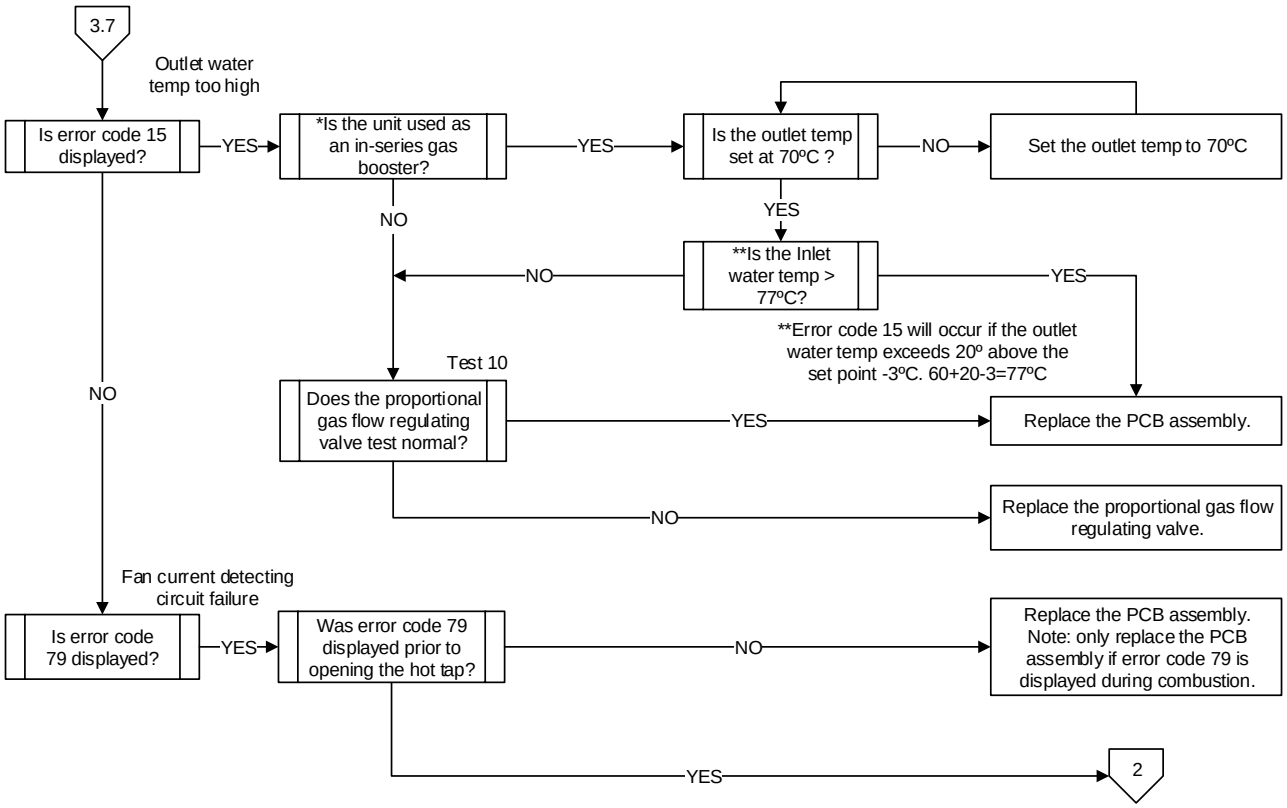
Fault Finding Charts 3.3 & 3.5



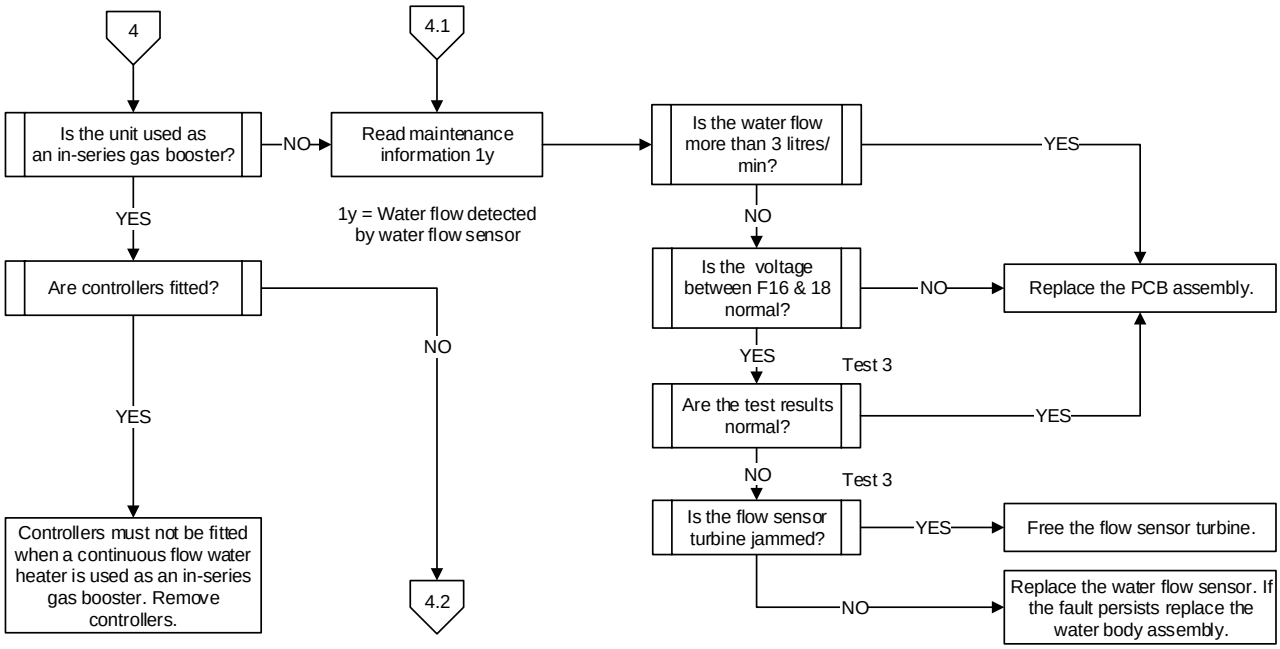
Fault Finding Chart 3.6



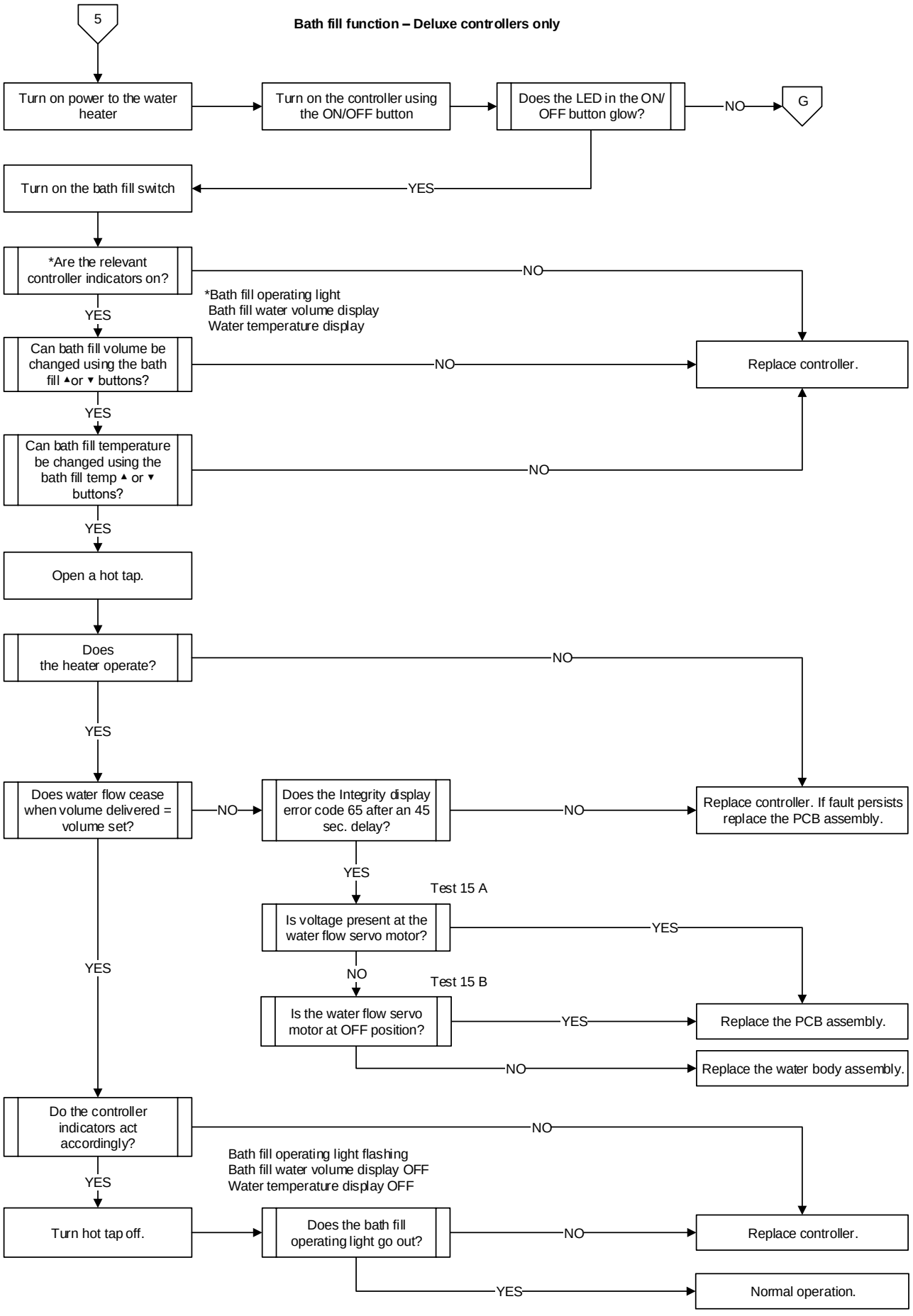
Fault Finding Chart 3.7



Fault Finding Charts 4 and 4.1



Fault Finding Chart 5



Note:

1. EziSET® must NOT be used when the CF water heater is being used as an inline solar booster.
2. EziSET® is suitable for use with 50ºC models only and is not to be used in an install that includes a tempering valve or thermostatic mixing valve.
3. EziSET® is designed to work in place of hard wired remote controllers. Ensure any hard wired remote controllers are disconnected from the water heater for correct operation of the device.
4. If the household has a 3-phase power supply the Wi-Fi router and the water heater MUST be connected to the same phase for correct operation.
5. EziSET® is compatible for use with smartphones that have a minimum operating system of iOS 8.1 (iPhone 5, excluding iPhone 5C) or Android 4.0 or later. (Windows phones are not compatible).

Power Line Telecommunication (PLT) Plug

The EziSET® kit includes a Power Line Telecommunication (PLT) plug (pictured right) and PCB which have been factory paired. It is critical for correct operation that the 'reset' and 'pair' buttons on the underside of PLT plug (refer below) are not depressed at any time.

Ensure the PLT is plugged into a GPO adjacent to the customers' Wi-Fi router (not supplied) and is switched ON. Ensure the PLT is connected to a spare Ethernet socket on the Wi-Fi router using the Ethernet cable provided in the EziSET® kit.

PLT Plug – LED Indication:

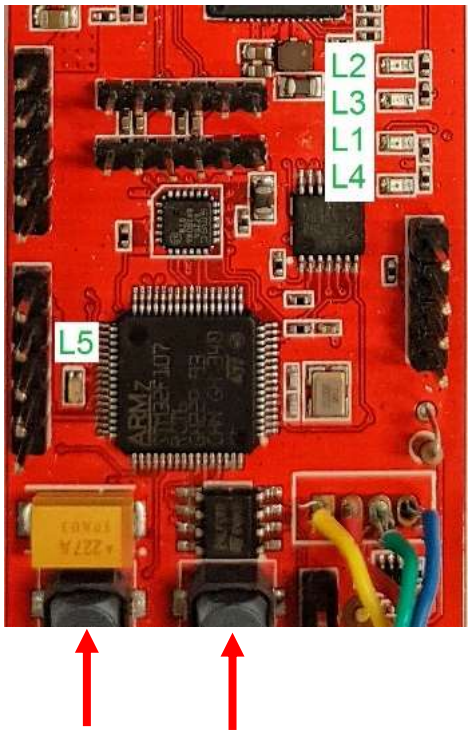
PLT LED	LED OFF	LED Flashing
Ethernet	CF water heater is not switched on	Ensure 4 pin plug from EziSET is connected to terminal D of CF PCB
Data	Ethernet cable is not connected. Router switched off	Normal Mode - data exchange
Power	GPO is not switched on or PLT is not plugged in.	Pairing Mode*

* contact the Rheem Technical Helpline for assistance.

EziSET® PCB

The EziSET® kit includes a PCB which has been factory paired to the PLT. It is critical for correct operation that the 'reset' and 'pair' buttons on PCB are not depressed at any time.

EziSET® PCB - LED Indication:



Important:
The factory reset and/or pairing buttons are not to be depressed at any time.

LED1 (L1) – Green LED

- **ON** – Normal
- **Flashing** – PCB and PLT not paired
  Contact Technical Helpline for assistance

LED 2 (L2) – Green LED

- **ON** – Normal
- **OFF** – Indicates PLT power supply is not switched on. Ensure PLT plugged in and GPO switched on.

LED 3 (L3) – Blue LED

- **Flashing** – Normal. Indicates active communication
- **Solid** – No active communication. Ensure PLT and router are plugged in and switched on and Ethernet cable is connected to both.

LED 4 (L4) – Green LED

- **ON** – Normal. Power supply is ON.
- **OFF** – Power supply is OFF. Ensure CF heater is plugged in and switched on.

LED 5 (L5) – Dual LED (Green and Red)

- **Green LED (flashing)** – Normal. Program running
- **Red LED:**
  - Solid Red - 4-pin plug from EziSET® PCB is not connected to the CF PCB (terminal D)
  - Red Flashing – Ensure PLT is switched on and plugged in and all cables are correctly connected. Contact the Rheem Technical Helpline for assistance if fault remains.

BURNER GAS PRESSURE CHECK

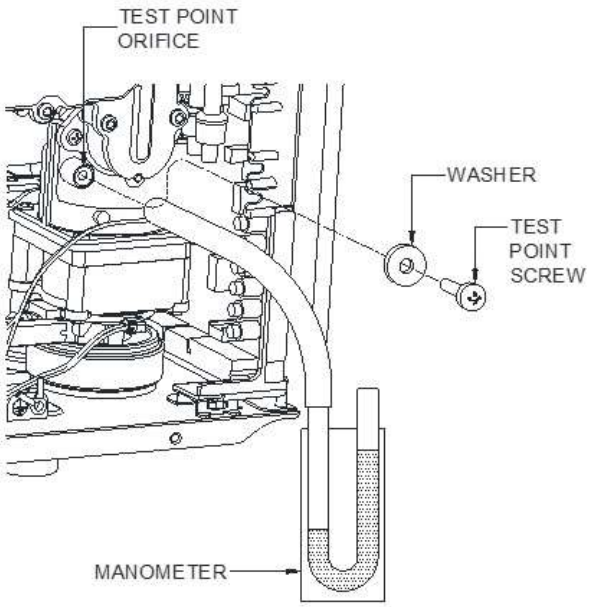
Voltages up to 240 volts will be present within the water heater, take care not to touch wiring terminals. Use an insulated tool when operating the DIP switch or MIN and MAX buttons.

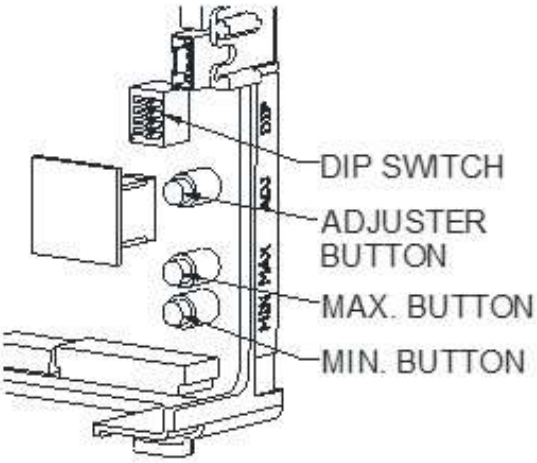
Minimum Burner Gas Pressure

1. Remove the front panel from the water heater.
2. Remove burner test point screw and fit manometer.
3. Turn on the remote controller (If fitted).
4. Open a hot tap slowly, to achieve the minimum flow rate at which the burners will ignite.
5. Press and hold the MIN button (“1L” is displayed on the LED) and observe the reading on the manometer.
6. Release the MIN button. If the reading observed in step 5 agrees with the rating label, no further adjustment is required.

Maximum Burner Gas Pressure

7. Open the hot tap fully to achieve maximum flow rate.
8. Press and hold the MAX button (“6H” is displayed on the LED) and observe the reading on the manometer.
9. Release the MAX button. If the reading observed in step 8 agrees with the rating label, no further adjustment is required.
10. Turn the hot tap off.
11. Remove manometer and refit the burner test point screw ensuring the seal is gas tight.
12. Refit the front panel to the water heater.





Adjustment

Adjustment of the burner pressure will not overcome problems associated with poor supply pressure or incorrect gas supply pipe sizing.

Minimum Burner Gas Pressure

1. Remove the front panel from the water heater.
2. Remove burner test point screw and fit manometer.
3. Turn on the remote controller (If fitted).
4. Open a hot tap slowly, to achieve the minimum flow rate at which the burners will ignite.
5. Press and hold the adjuster button ("LH" is displayed on the LED)

   NOTE: The adjuster button must be held down continuously through steps 5 and 6.
6. Press the MIN button and observe the reading on the manometer.

   NOTE: While the MIN button is pressed, the gas pressure will at first increase then decrease, cycling between an upper gas pressure limit (59 on LED display) and a lower gas pressure limit (01 on LED display).
7. Release the MIN and adjuster buttons when the minimum test point pressure shown on the manometer agrees with the rating label.

NOTE: If the burners extinguish or an error code starts to flash on the LED display during this procedure, release the MIN and adjuster buttons close the hot tap, clear the error code, turn on the water heater and recommence the procedure from step 3. To reset an error code, follow the procedure on page 31.

Maximum Burner Gas Pressure

8. Open the hot tap fully to achieve maximum flow rate.
9. Press and hold the adjuster button ("LH" is displayed on the LED).

   NOTE: The adjuster button must be held down continuously through steps 10 and 11.
10. Press the MAX button and observe the reading on the manometer.

    NOTE: While the MAX button is pressed, the gas pressure will at first increase then decrease, cycling between an upper gas pressure limit (39 on LED display) and a lower gas pressure limit (01 on LED display).
11. Release the MAX and adjuster buttons when the maximum test point pressure shown on the manometer agrees with the rating label.
12. Turn the hot tap off, remove manometer and refit the burner test point screw ensuring the seal is gas tight.
13. Refit the front panel to the water heater.

COMPONENT REPLACEMENT PROCEDURES

Flue Diverter Removal (if fitted): (Procedure 1)

Note: Two types of flue diverter are available for use, only with the 26L Natural Gas models and are constructed from stainless steel sheet to divert the outlet flue sideway. Diverter kit P/N 299287 - 380mm in length, (standard length –wire grille side discharge), Diverter kit P/N 299285 - 1140mm in length, (extended length –front discharge).

1. ***Isolate Power, gas and water supplies***.
2. Undo the screws (2 on each side) securing the bottom brackets to the flue diverter and remove the brackets. NOTE: The bracket on the LHS when facing the water is longer and must be re-installed on the LHS when refitting the diverter.
3. Undo the 4 screws securing the top bracket to the flue diverter
4. Undo the 2 upper front panel screws and remove the flue diverter.

Front Panel Removal: (Procedure 2)

1. ***Isolate power, gas and water supplies.***
2. Remove the flue diverter if fitted. Refer to procedure 1.
3. Un clip the upper and lower plastic trims if fitted.
4. Remove the four screws retaining the front panel.
5. Remove the front panel.

Lower Burner Assembly: (Procedure 3)

1. Remove the front panel. Refer to Procedure 2.
2. Remove the screw retaining the PCB. Withdraw the PCB and place to one side, keeping connections intact.
3. Disconnect the red and grey electrode wires from the PCB.
4. Disconnect the heater strip wires from the Blue terminal connector.
5. Remove the screw retaining the heater strip junction block.
6. Disconnect the Igniter wire from the flame rod.
7. Remove the screw retaining the ignition pack bracket from the lower burner assembly.
8. Disconnect the solenoid loom from the white harness connector.
9. Disconnect the Yellow and Black wires from behind the PGR Valve white connector.
10. Remove the 12 x No 2 Phillips head screws from around the Lower burner Assy.
11. Lift up the assembly to disconnect the three solenoid connections.
12. Place the Lower Burner Assy to one side.
13. Reassemble in reverse order of above. Replace gaskets if required.
14. Test for gas leaks using soapy water solution.

Upper Burner Assembly: (Procedure 4)

1. Remove the front panel and Lower Burner Assembly. Refer to Procedures 2 & 3.
2. Disconnect the outlet thermistor wiring from the green connector
3. Split the heater strip at the joint and move the strip ends out of the way
4. Unscrew and remove the S/S clip securing the inlet copper pipe to the inlet valve
5. Unscrew and remove the S/S clip securing the outlet copper pipe to the outlet valve
6. Unscrew the 2 x upper and 2 x lower screws retaining the burner assy to the housing.
7. Lift the assy to unclip the 3 x ceramic anti frost heaters from the Inlet and outlet copper pipes
8. Remove the Upper Burner Assembly by lifting out of the heat exchanger assembly.
9. Reassemble in reverse order of above being careful not to pinch or damage wiring. Replace gaskets if required.
10. Test for gas leaks using soapy water solution.

PCB Assembly: (Procedure 5)

1. Remove the front panel. Refer to Procedure 2.
2. Remove the screw retaining the PCB Assembly in the water heater.
3. Carefully remove the PCB Assembly complete.
4. Disconnect the multi-pin connectors from the PCB Assembly.
5. Remove the Gas Type Connector IC board and fit to replacement PCB Assembly.
6. Reassemble in reverse order of above.

Flame Rod Electrode removal: (Procedure 6)

Note There are two flame rod electrodes (See also procedure 7)

1. Remove the front panel. Refer to Procedure 2.
2. Disconnect the orange and/or grey wires from inside the flame rods' silicon boots.
3. Remove the 2 x screws retaining the electrodes to the front burner plate
4. Carefully remove the electrodes (item 734) and clamping bracket assemblies noting the angular position of the flame rod, for correct re-alignment.
5. Reassemble in reverse order of above.
6. Replace the felt gaskets (item 740) if required.
7. Test for gas leaks using soapy water solution.

Flame Rod and Igniter Electrode removal: (Procedure 7)

Note One of the flame rods share a common clamping bracket with the Igniter

1. Remove the front panel. Refer to Procedure 2.
2. Disconnect the black and grey wires from inside the flame rod and Igniters' silicon boots.
3. Remove the 3 x screws retaining the electrodes to the front burner plate
4. Carefully remove the electrodes (item 734 and 736) and clamping bracket assemblies noting the angular position of the flame rod and Igniter electrodes, for correct re-alignment.
5. Reassemble in reverse order of above.
6. Replace the felt gaskets (item 740) if required.
7. Test for gas leaks using soapy water solution..

Igniter

Proportional Gas Flow Regulating Valve: (Procedure 8)

1. Remove the front panel and PCB assemblies. Refer to Procedures 2 and 5.
2. Disconnect the gas supply pipe from the gas inlet connection.
3. Remove the three screws from the gas inlet connector. Pull down to withdraw the connector and O-ring from the base of the water heater.
4. Unclip the red and black wires from the side of the proportioning valve.
5. Remove the 2 x PH screws securing the PGRV to the Lower Burner Assembly.
6. Push the valve to the rear of the cabinet then rotate clockwise to carefully remove it from the water heater.
7. Disconnect the Yellow and Black wires from the Gas Inlet Solenoid Valve.
8. Reassemble in reverse order of above. Replace gaskets (item numbers 145 and 146) if required.
9. Test for gas leaks with soapy water solution.

Water Inlet Body, Valve and Sensor Assembly: (Procedure 9)

Do not attempt to dismantle the servomotor, this is factory calibrated. Adjustments will render the water heater either inoperable or cause incorrect water temperature delivery.

1. Remove the front panel, PCB Assy and Proportional Gas Flow Regulating Valve. Refer to Procedures 2, 5 and 8.
2. Disconnect the cold water supply pipe from the cold-water inlet connection.
3. Unscrew the water drain plug (item 402) and drain the water heater.
4. From inside the cabinet, carefully remove the anti-frost heater and the large S/S clip (item 421).
5. Carefully remove the small S/S flange (item 446) securing the copper pipe and allow the pipe to disengage from the body.

6. Disconnect the Red/ Black / Brown wire connector from the wiring loom.
7. Remove 3 x (external) screws from the flange (item 401) and carefully pull down to extract the brass housing.
8. Remove the thermistor from the side of the Inlet valve (secured with 2 x screws) before extracting the valve from the heater.
9. Reassemble in reverse order of above, replacing pipe O-rings (item 428) and thermistor O-ring (item 412) if required.
10. Test for water leaks.

Water outlet Body, Safety Valve and Sensor Assembly: (Procedure 10)

1. Remove the front panel, PCB Assy, Proportional Gas Flow Regulating Valve and Water Inlet Assembly. Refer to Procedures 2, 5, 8 and 9.
2. Disconnect the hot water supply pipe from the hot-water outlet connection.
3. Remove the safety valve (item 431) from the side of the housing.
4. From inside the cabinet, carefully remove the anti-frost heater and temperature thermistor (item 713).
5. Carefully remove the small S/S flange (item 445) securing the copper pipe and allow the pipe to disengage from the body.
6. Remove 3 x (external) screws from the flange (item 430) and carefully pull down to extract the brass housing.
7. Reassemble in reverse order of above, replacing pipe O-rings and thermistor O-ring (item 432) if required.
8. Test for water leaks.

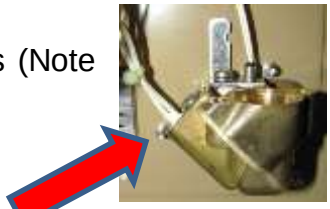
Combustion Fan Motor: (Procedure 11)

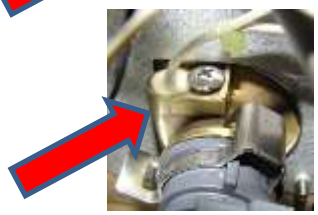
1. Remove the front panel and Lower burner Assy. Refer to Procedures 2 and 3.
2. Disconnect the multi-pin wiring plug from the Fan Motor.
3. Remove the 3 x screws retaining the Fan Motor Assembly and lift the Fan Motor clear.
4. Reassemble in reverse order of above.

Anti-Frost Heaters: (Procedure 12)

Note: There are 5 Anti-Frost heaters, wired in series. Three ceramic, attached to the copper piping and two compound types, fitted to the water inlet and outlet housings respectively.

1. Remove the front panel and follow upper burner Assy steps 1-8. Refer to Procedure 2 and 4.
2. Unclip the 3 x ceramic anti-frost heaters from the copper pipes (Note their positions).
3. Remove the 2 x compound anti-frost heaters from the inlet and outlet housings
4. Remove the Anti-frost Heaters and wiring (Some wiring retainers will need to be released to remove wiring).
5. Reassemble in reverse of above ensuring anti-frost heaters are fitted in their correct positions.





Ignition Pack Replacement: (Procedure 13)

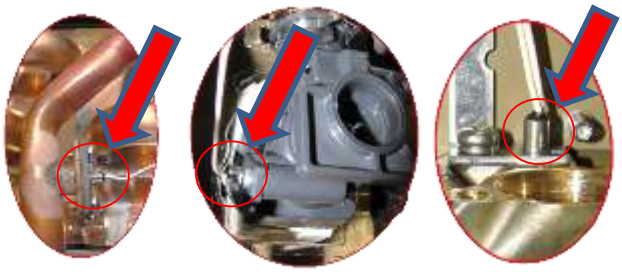
1. Remove the front panel, refer to procedure 2,
2. Disconnect high voltage lead from spark electrode.
3. Disconnect the multi pin connector from the Ignition Pack.
4. Remove the retaining screw.
5. Remove the Ignition Pack.
6. Reassemble in reverse order of above being careful not to pinch or damage wiring when replacing Upper Burner Assembly. Replace gaskets if required.
7. Test for gas leaks using soapy water solution.

Flow Sensor: (Procedure 14)

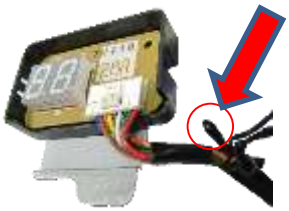
1. Remove the water inlet valve. Refer to procedure 9 steps 1-6.
2. **Note** the plastic webs may be brittle due to ageing. Gently withdraw the flow sensor turbine by pulling it out from inside the inlet port, using a pair of long nose pliers.
3. Reassemble in reverse order of above ensuring open slot on turbine is centred and facing towards the face of the flow sensor.

Thermistors: (Procedure 15)

Note: There are 4 Thermistors, one on the heat exchanger copper pipe outlet, two on the inlet and outlet valve assemblies and an ambient air thermistor (part of the wiring harness).



1. Remove the front Panel. Refer to Procedure 2.
2. Relieve water pressure through a hot tap.
3. Locate the Thermistor requiring replacement.
4. Disconnect the multi-pin plug from the Thermistor.
5. Remove the retaining screw(s) and withdraw the thermistor taking care not to damage the O-ring (Note: With the exception of the Ambient Air Thermistor, water may escape during this procedure).
6. Reassemble in reverse order of above, replacing O-rings (items 412 and 432) if required.



Over Heat Limiter Assembly: (Procedure 16)

1. Remove the upper burner Assembly. Refer to Procedure 4.
2. Remove the 4 x screws retaining the Over Heat Limiter Assembly to the Jacket back and remove the Over Heat Limiter Assembly.
3. Inspect the heat exchanger for holes or combustion damage.
4. Reassemble in reverse order of above (Note: Ensure all multi-pin plugs are reconnected and all wiring is neatly repositioned and retained to prevent damage during operation).
5. Test operation of water heater and ensure the MIN and MAX burner gas pressures are correct. Refer to Procedure on page 51.

Remote Controller: (Procedure 17)

1. ***Isolate power at the water heater.***
2. Remove the small Philips head screw from the bottom of the Remote Controller.
3. Gently pivot the Remote Controller up from the bottom and then lift up and off upper retaining lugs.
4. **Kitchen Controller:** Disconnect the wiring from the terminals on the back of the Controller (Note: The wiring is not polarity sensitive).

   Bathroom Controllers: Disconnect the multi-pin plug.
5. Reassemble in reverse order of above.

Gas Type Circuit Board: (Procedure 18)

1. Remove the PCB Assembly. Refer to Procedure 5.
2. Gently unplug the Gas Type Circuit Board from the PCB.
3. Reassemble in reverse order of above.
4. Restore power.
5. Press the MAX button. 4H should be displayed.
6. Test operation of water heater and ensure the MIN and MAX burner gas pressures are correct. Refer to Procedure on page 51.

Burner Damper: (Procedure 19)

1. Remove the front panel, Burner Change Over Assembly, Combustion Chamber Front Panel Assembly and Lower Burner Assembly. Refer to Procedures 2, 3, 4 & 5.
2. Remove the three screws retaining the nozzle plate and remove nozzle plate.
3. Reassemble in reverse order of above. Replace gaskets if required.

4. Test for gas leaks using soapy water solution.

Power cord: (Procedure 20)

1. ***Switch off power at power point and unplug power cord from power point.***
2. Remove the front panel. Refer to procedure 2.
3. Unscrew screw on power inlet cover and remove power inlet cover.
4. Undo cord clamp screw located next to power filter and remove clamp.
5. Disconnect the power cable wiring loom plug and withdraw power cable through slot in heater jacket.
6. Reassemble in reverse order of above.

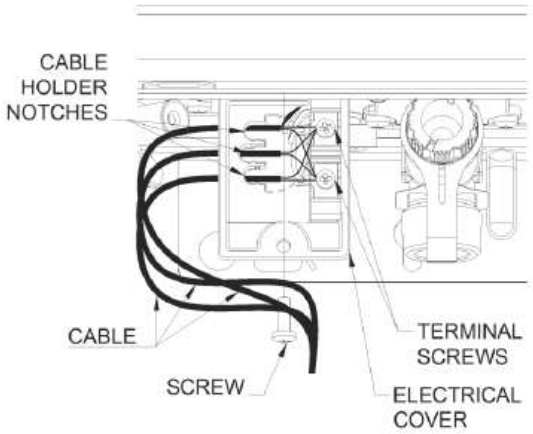
Connecting cord: (Procedure 21)

1. ***Isolate power at the water heater.***
2. Remove the front panel. Refer to procedure 2.
3. Disconnect connecting cord wiring loom plug to power cord.
4. Disconnect remaining two connecting cord wiring loom plugs and remove connecting cord.
5. Reassemble in reverse order of above.

Disconnecting Temperature Controller(s): (Procedure 22)

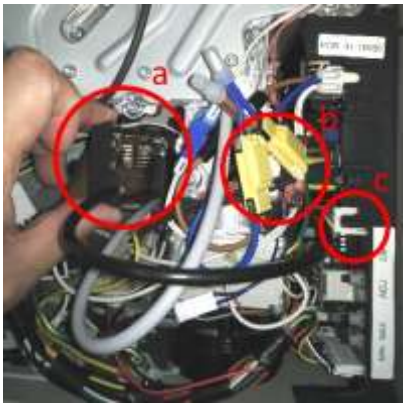
To disconnect the temperature controller(s):

1. Switch off the electrical supply at the power outlet to the water heater.
2. Unscrew and gently flip down the electrical cover on the underside of the water heater.
3. Loosen the terminal screws to release the cable lugs.
4. Withdraw the cable lugs, ensuring they are well clear of the terminals.



EziSET® PCB: (Procedure 23)

1. Switch off the electrical supply at the power outlet to the water heater.
2. Remove the front panel. Refer to Procedure 2.
3. Disconnect the EziSET® PCB black lead from terminal D of the main PCB (refer c).
4. Disconnect the 2 x yellow wiring harnesses (refer b).
5. Remove the 2 x screws that fix the EziSET® PCB to the back panel of the heater casing.
6. Remove EziSET® PCB by sliding forward out of heater cabinet (refer a).
7. Reassemble in reverse order of above.



Note: The EziSET® PCB and PLT must be a matched paired therefore the PLT plug is required to also be replaced if the EziSET® PCB requires replacement (individual spare parts are not available, use complete EziSET® kit 052310 when replacing parts).

EziSET® Power Line Telecommunication (PLT): (Procedure 24)

1. Switch off the GPO that the PLT is plugged into.
2. Remove Ethernet cable from underside of PLT.
3. Remove PLT from GPO.
4. Reassemble in reverse order of above.

Note: The PLT plug and EziSET® PCB must be a matched paired therefore the EziSET® PCB is required to also be replaced if the PLT plug requires replacement (individual spare parts are not available, use complete EziSET® kit 052310 when replacing parts).

DOCUMENT REVISION HISTORY

Title: 12-26 Series II CFGWH Service Instructions	Document Nº: TM090

Revision	Details of change	D.O.I.
00	Service Manual Issued for revised 874/876T26 models	10/17
AA	Service manual updated to include 12, 16 & 20L models	01/18
AB	Addition of Live Testing warning; Solahart Solar Booster models; EziSET® Smartphone remote control kit.	02/19

NOTE: Every care has been taken to ensure accuracy in preparation of this publication. No liability can be accepted for any consequences which may arise as a result of its application.