Rheem Australia Pty Ltd

ABN 21 098 823 511

SERVICE INSTRUCTIONS

27 Litre External/Internal

Electronic Gas Continuous Flow Water Heater

TM049

First Issued: Dec 09

Revision: AL

Issued: April 2019

Solahart	Edwards	Everhot	Vulcan	Rheem
10143272	362027	274X27	244X27	862X27
10143273	372027	276X27		864X27
10143274	374X27			866X27
10143275				872X27
				874X27
				876X27

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INTRODUCTION

The information provided in these service instructions is based on the water heater being installed in accordance with AS/NZS 5601 and 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 27L 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 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).

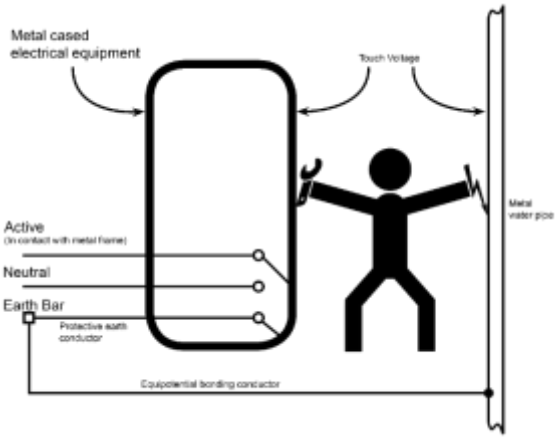


Diagram 1

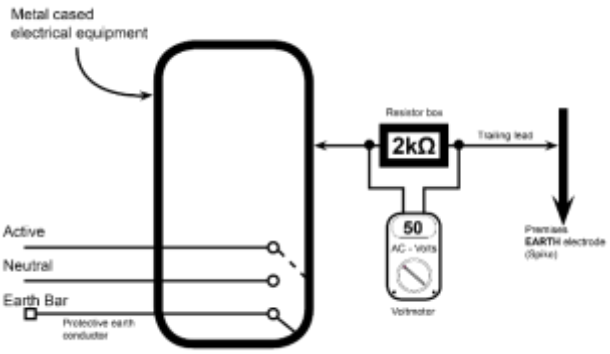


Diagram 2

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.

In-Service Testing

It is a requirement of AS/NZS 3760 that an in-service test be performed when re-instating an appliance to service.

Following any repairs to the water heater ensure that both an earth continuity test and insulation test are carried out prior to completing service call as follows:

Wear Personal Protective Equipment when conducting these procedures to reduce the risk of electric shock. Refer to Rheem safety procedure on electrical testing.

Procedure 1: Check "Continuity" of the earth conductor.

1. ***Isolate power to the water heater by switching off at power point and unplugging appliance 3 pin plug from power point.***
2. Set multimeter to x1 resistance scale.
3. Measure between the Earth pin on the 3 pin plug and the heater jacket, a reading of ≤ 0.5Ω should be obtained. If a reading greater than 0.5Ω is returned check the earth connection at the water heater, if ok replace the cord.

Procedure 2: Insulation resistance of the water heater Active Circuit (reading not to be below 1MΩ).

4. Connect megger leads to the Active and Earth pins of the 3 pin plug.
5. Operate megger. A reading above 1MΩ should be obtained.
6. If a reading below 1MΩ is indicated, all component parts will need to be individually tested to locate the fault.

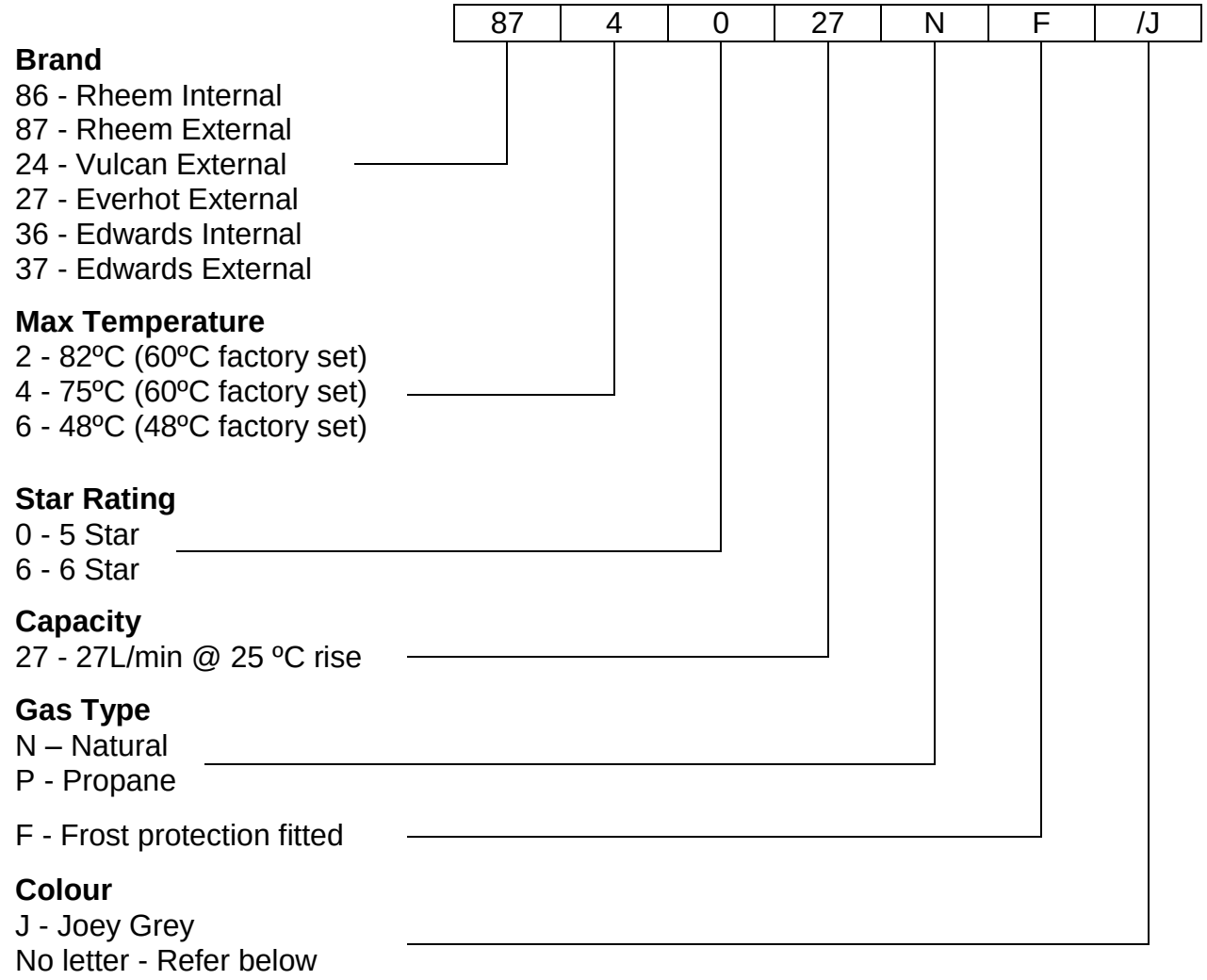
Procedure 3: Insulation resistance of the water heater Neutral Circuit. (Reading not to be below 1MΩ).

7. Connect megger leads to the Neutral and Earth pins of the 3 pin plug.
8. Operate megger. A reading above 1MΩ should be obtained.
9. If a reading below 1MΩ is indicated, all component parts will need to be individually tested to locate the fault.
10. Plug 3 pin plug back into power point and switch on power point. ***Note: If continuing with any diagnostic procedures do not perform this step.***

WATER HEATER MODEL IDENTIFICATION

Rheem/Vulcan/Everhot/Edwards

The model number is designed to convey detailed information about the water heater to which it is attached.



Casing colour variations: Rheem/Edwards/Solahart - Antique White, Everhot - Joey Grey

Solahart Model Identification

	Natural Gas	Propane
Solahart Gas Ext CF 60º 27L 5*	10143272	10143273
Solahart Gas Ext CF 60º 27L 6*	10143274	10143275

The model number, serial number and date of manufacture should be quoted in all correspondence.

Model Options

The following model variants are available in the 27L CF range:

External Models:

Rheem	5 Star	6 Star
Rheem Gas CF 60º 27l/m Nat/Pro Ext	874027NF / PF	874627NF / PF
Rheem Gas CF 50º 27l/m Nat/Pro Ext	876027NF / PF	876627NF / PF
Rheem Gas CF 70º 27l/m Nat/Pro Ext	873027NF / PF	873627NF / PF
Rheem Gas CF 82º 27l/m Nat/Pro Ext	872027NF / PF	872627NF / PF

Vulcan	5 Star	6 Star
Vulcan Gas CF 60ºC 27l/m Nat/Pro Ext Site Int	244027NF/J / PF/J	244627NF/J / PF/J

Everhot	5 Star	6 Star
Everhot Gas CF 60ºC 27l/m Nat/Pro Ext	274027NF / PF	274627NF / PF
Everhot Gas CF 50ºC 27l/m Nat/Pro Ext	276027NF / PF	276627NF / PF

Solahart	5 Star	6 Star
Solahart Gas CF 60ºC 27l/m Nat/Pro Ext	10143272 / 73	10143274 / 75

Edwards	5 Star	6 Star
Edwards Gas CF 82ºC 27L/M Nat/Pro Ext	372027NF / PF	-
Edwards Gas CF 60ºC 27l/m Nat/Pro Ext	374027NF/J / PF/J	374627NF/J / PF/J

Internal Models:

Rheem	5 Star	6 Star
Rheem Gas CF 50º 27l/m Nat/Pro Int	866027NF / PF	866627NF / PF
Rheem Gas CF 60º 27l/m Nat/Pro Int	864027NF / PF	864627NF / PF
Rheem Gas CF 82º 27l/m Nat/Pro Int	862027NF / PF	862627NF / PF

Edwards	5 Star	6 Star
Edwards Gas CF 82ºC 27L/M Nat/Pro Int	362027NF / PF	-

SPECIFICATIONS

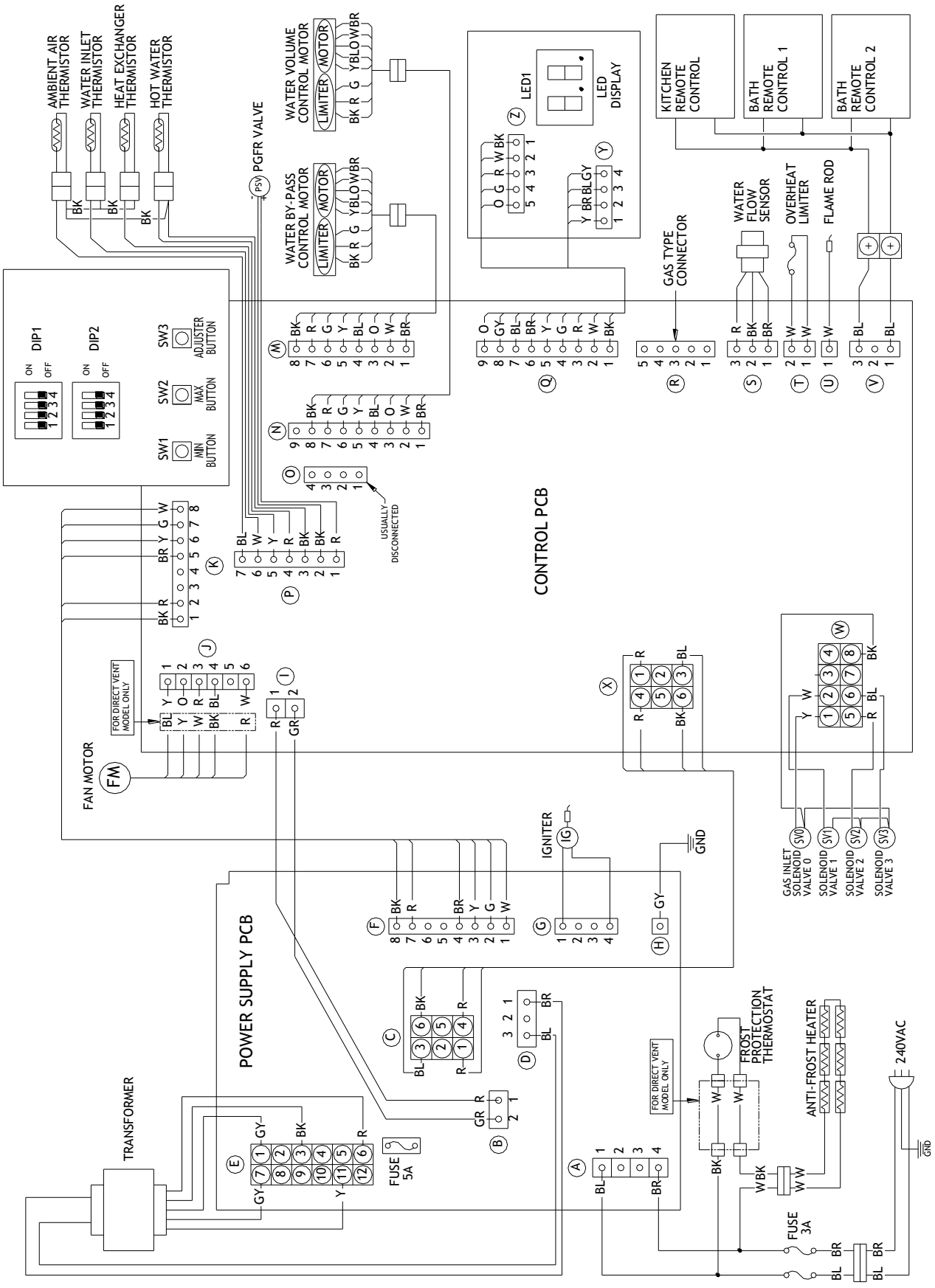
Model			27 NAT	27 PROP
Gas Input (MJ/hr)			205	205
Output (kW)			46[1] 46.5[2]	46[1] 46.5[2]
Installation	Indoor		Wall Mounting – can be flued horizontally or vertically.	
	Outdoor		Wall Mounting	
Mass (kg)			24	
Min Water Pressure (kPa)			140	
Max Water Pressure (kPa)			1000	
Min Water Flow (L/M)			2.0 (+0.5/-0.25)	
Max Flow Rate @ 25°C Rise (L/M)			27	
Max Flow Rate @ 40°C Rise (L/M)			16.5[1] 16.7[2]	
Gas/Water Connections			R¾/20	
Flue connection (mm) (indoor models only)			Concentric 76.2 x 127	
Max Flue Length (indoor models only)			9 metres with 3 bends	
Injector Orifice (qty x dia mm)			16 x 2.05	16 x 1.25
Burner Test Point Pressure (kPa)	Indoor	Min	0.165	0.252
		Max	0.900	1.325[1] 1.550[2]
	Outdoor	Min	0.193	0.277
		Max	0.905	1.430[1] 1.540[2]
Min Inlet Gas Pressure (kPa)			1.13	2.75
Max Inlet Gas Pressure (kPa)			3.5	
Relief Valve Setting (kPa)			1750	
Electrical	Rating		240 VAC/50Hz, 3 Amps	
	Fuse		2 x 3A Fuse (line voltage), 5A fuse on power supply PCB	
Safety Devices			Over Heat Limiter for Heat Exchanger	
			Heat Exchanger Thermistor (Boiling Point Safety)	
Freeze Protection			-20°C (Without Wind-Chill Factor) with power applied	
Controllers (optional)			Kitchen Controller (K) or Deluxe Kitchen Controller (K)	
			Bath Controller (B1) or Deluxe Bath Controller (B1)	
			Bath Controller (B2) or Deluxe Bath Controller (B2)	
			EziSET® Kit (876 models only)	

Burner test point pressure varies by model. Model type can be determined by referring to model number:

[1] 5 star model (4th digit of model number is 0, eg: 874**0**27NF)
[2] 6 star model (4th digit of model number is 6, eg: 874**6**27NF)

WIRING DIAGRAM

A wiring diagram is also located on the inside of the front cover panel.



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 (876027 / 876627 / 866027 / 866627 models).

The kit is required to be installed by a qualified technician; it includes a PCB (refer A) that is to be fitted inside the water heater and a PLT plug (Power Line Telecommunication) 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.

Water Body & PCB Modification

Domestic models (874/876/864/866) manufactured from January 2018 and commercial models (872/862) manufactured from February 2018 are fitted with a revised water body and PCB.

The revised water body features a new flow turbine design and a material change to the water body retaining ring. The PCB has been modified to suit this new water body assembly.

The revised water body can be identified by a black plug on the flow sensor wiring loom (refer to fig 1) and the revised PCB can be identified by a black socket for the water body flow sensor wiring plug (refer to fig 2).

Fig 1

Fig 2

Water Body Field Service Replacements – 862/872 Series Commercial Models:

The revised water body, part number 41-18374-00, is now available as a spare part to use as a service replacement for any commercial models (862/872 Series), however it must be noted when fitting this revised water body to an existing heater manufactured pre-Feb 2018 it will also be necessary to replace the main PCB, part number 41-18376-00. Failure to replace the PCB will result in the water heater not operating. **NOTE:** if the PCB socket for the water body flow sensor plug is black (refer fig 2) this indicates that PCB has already been modified and is compatible for use with revised water body and does not need to be replaced again. Refer to TB18-001 for further details if required.

Water Body Field Service Replacements – Domestic Models:

Existing domestic models (874/876/864/866) manufactured pre-Jan 2018 that require a new water body or PCB do not need to undergo this revision and will continue to use the original water body, part number 20-51136-00 or PCB, part number 41-02890-00 as required for service replacements.

6 Star Release - From April 2012 production a revised 27L CF model will be produced. This new model has a higher operational efficiency and therefore has been awarded a 6 star rating. The new 6 star model is very similar to the 5 star model with the only difference between the two models being model number, heat exchanger layout, GTC, fan speed and the flue outlet on internal models.

The 5 and 6 star models can be differentiated by the model number. The model number of the original 5 star units has a '0' at the 4th digit i.e. 874**0**27NF. The new 6 star models have a '6' at the 4th digit eg: 874**6**27NF.

The 5 star internal models require a water heater flue adapter (p/n: 295121) to be fitted to the flue outlet and if required a condensate drain section (p/n: 295120) is to be fitted directly to this adaptor however the water heater flue adapter and the condensate drain are now included as part of the 6 star heater's flue outlet assembly (refer images below).

86X027 model (5 Star)

86X627 model (6 Star)

NOTE: If a condensation trap is not needed, the condensation spigot MUST have a cap and clip to prevent exhaust gases escaping into the room on the 6 star product.

EZ-Link™ system – With the release of the 6 star models it will no longer be mandatory for a remote temperature controller to be fitted to EZ-Linked models. Where a remote is fitted the unit with the remote connected is the master, whereas in a system where a remote is not fitted the master must be determined by the installer by modifying the dip switch settings (refer to page 27 for more information).

PRESET TEMPERATURE ADJUSTMENT

Factory pre-set and maximum hot water outlet temperature settings for each water heater series are shown below:

Model	Factory setting	Maximum Temp	Solar
276, 866, 876	48ºC	48ºC*	N
244, 274, 374, 864, 101, 874**	60ºC	75ºC	Y
372, 862, 872**	60ºC	82ºC	Y

**When used as an inline solar booster these models must be set at a minimum outlet temperature of 70ºC.

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.

To check or adjust the preset outlet temperature setting:

1. Remove the front cover from the water heater.
2. Switch dip switches 3 and 4 to the ON (up) position on the DIP1 set of dip switches on the PCB.
3. The current preset outlet temperature setting will be displayed on the LED1 display at bottom right hand side of water heater.
4. Press the MIN button to decrease or the MAX button to increase the preset outlet temperature setting to the desired setting. (The MIN and MAX buttons are located below the dip switches.)
5. Turn dip switches 3 and 4 to the OFF (down) position on the DIP1 set of dip switches on the PCB.
6. The LED1 display will go blank. The preset outlet temperature is now set.
7. Refit the front cover to the water heater.

*Outlet Temperature Compensation Adjustment (applicable to 50ºC models only)

The maximum outlet temperature 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 **MUST NOT** exceed 50°C 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.

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 2°C higher than the setting shown on the controller.

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

NOTE:

- This procedure cannot be conducted with a temperature controller connected to the water heater. Any temperature controller(s) connected to the water heater must be disconnected prior to the commencement of this procedure.
- The preset outlet temperature setting of this water heater must be set at 48°C prior to the commencement of this procedure.

Outlet Temperature Compensation Adjustment Procedure:

To adjust the outlet temperature:

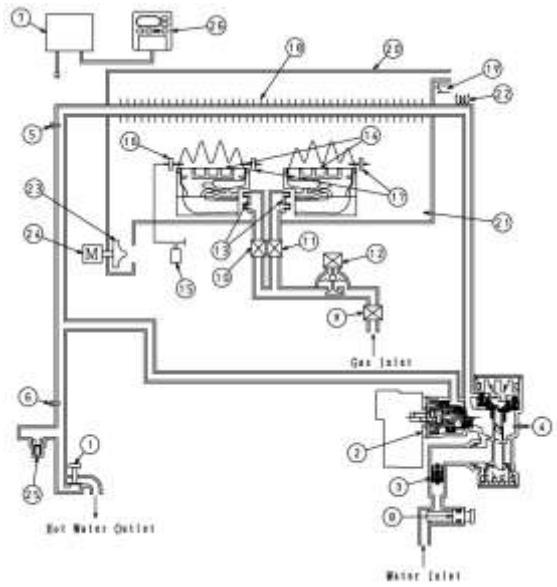
1. Disconnect all remote temperature controllers attached to the water heater.
2. Switch on the electrical supply at the power outlet to the water heater.
3. Locate the first hot tap in the hot water pipe work after the water heater used for personal hygiene purposes.
4. Turn on the hot tap.
5. Using a thermometer, measure the temperature of the water from the tap, until the temperature stops increasing. If the water temperature is below 50°C the maximum outlet temperature of the water heater can be adjusted upwards.
6. Turn off the hot tap.
7. Switch off the electrical supply at the power outlet to the water heater.
8. Remove the screws holding the front panel to the jacket.
9. Gently disengage the front panel and pull forward to remove from the water heater.
10. Switch on the electrical supply at the power outlet to the water heater.
11. Switch dip switches 1 and 2 to the on (up) position on the DIP 2 set of DIP switches on the I.C. Board. The temperature setting of “48” will show on the LED display, if this has not previously been adjusted.
12. Press the MAX button once to increase the preset outlet temperature setting to the next increment. Each press of the MAX button will increase the temperature setting by one increment. The increments are: 48, 50, 51, & 52. The MAX button is located underneath the DIP 1 and DIP 2 set of DIP switches.
13. Switch dip switches 1 and 2 to the off (down) position on the DIP 2 set of DIP switches on the I.C. Board. The LED display will go blank.
14. Repeat steps 2 to 5. If the water temperature is still below 50°C and is required to be increased, repeat steps 10 to 12, followed by steps 2 to 5 until an acceptable water temperature not exceeding 50°C is measured at the same hot tap. If the water temperature exceeds 50°C, then;
    - Switch dip switches 1 and 2 to the on (up) position on the DIP 2 set of DIP switches.
    - Press the MIN button once to decrease the preset outlet temperature setting to the next increment. Each press of the MIN button will decrease the preset temperature by one increment. (The MIN button is located underneath the DIP 1 and DIP 2 set of DIP switches and to the left of the MAX button).
    - Switch dip switches 1 and 2 to the off (down) position on the DIP 2 set of DIP switches.
    - Repeat steps 2 to 5 to confirm the water temperature does not exceed 50°C.
15. Switch off the electrical supply at the power outlet to the water heater.
16. Refit the front panel and screws to the water heater.
17. Reconnect the controller cables (if a temperature controller is fitted).
18. Switch on the electrical supply at the power outlet to the water heater.

SEQUENCE OF OPERATION

Refer to 'Sequence of Operation Component Diagram' on page 17 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 pre-heater is installed) enters the water heater and passes through the Water Flow Sensor **(3)** and Heat Exchanger **(18)**. 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 19).
2. The Water Flow Sensor **(3)** sends a pulse signal to the PCB **(7)**. Once the pulse signal reaches a pre designated frequency (at a min. flow rate of 2L/m the PCB **(7)** activates the Fan Motor **(24)** and the Fan **(23)** starts rotating.
3. After the Fan **(23)** completes a pre purge to ensure the vent is clear, the Proportional Gas Flow Regulator **(12)** allows gas to flow to the Burner **(14)**. At the same time the Igniter **(15)** starts sparking continuously and ignites the gas at the Burner **(14)**.
4. After ignition the Flame Rods **(17)** sense and monitor the burner flame. The PCB **(7)** constantly monitors all inputs to ensure the outlet water temperature is maintained within 1ºC of the thermostat setting. The Proportional Gas Flow Regulator **(12)** continuously adjusts the gas volume and the water flow is also adjusted to assist in supplying a stable hot water temperature at all times.
5. As the gas flow rate, controlled by the Proportional Gas Flow Regulating Valve **(12)** changes, the PCB **(7)** varies the speed of the Fan Motor **(24)** 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 the gas valve. The post purge operation then commences to cool the heat exchanger **(18)**.
7. Once the post-purge operation is completed power to the Fan Motor **(24)** is cut and the Fan **(23)** stops.

Sequence of Operation Component Diagram



1) Hot Water Tap
2) Water Flow Servo Motor
3) Water Flow Sensor
4) Inlet Water Temperature Thermistor
5) Combustion Chamber Thermistor
6) Outlet Water Temperature Thermistor
7) PCB
8) Water Filter (Strainer)
9) Gas Inlet Solenoid Valve
10) Gas Solenoid Valve 1
11) Gas Solenoid Valve 2
12) Proportional Gas Flow Regulator
13) Nozzle
14) Burner
15) Igniter
16) Igniter Electrode
17) Flame Sensor
18) Heat Exchanger
19) Over Temperature Limiter
20) Exhaust (Flue) Outlet
21) Combustion Chamber
22) Anti Frost Heater
23) Fan
24) Fan Motor
25) Drain Plug With Relief Valve.
26) Controller (Optional)

Bypass Operation

The bypass is a section of copper pipe work connected between the water body assembly and the outlet of the heat exchanger and allows a quantity of cold water to bypass the heat exchanger. The purpose of the bypass is to ensure the heat exchanger operates at temperatures above the dew point of the combustion gases, ensuring condensate is not produced, but low enough to maximise the heat exchangers life. The PCB activates the water bypass control motor based on heat exchanger temperature and selected outlet water temperature.

Anti-Frost Heater Circuit

All models have an anti-frost heater circuit. The anti-frost heaters are wired in series and operate independently from the water heater.

A thermostat 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 becomes open circuit the total heater circuit is rendered inoperable. There are six anti-frost heaters in total.

Refer to ‘Anti-Frost Heaters’ on page 74 for replacement procedure.

COMPONENTS AND THEIR FUNCTION

Water Body Assembly - A two part component that comprises the water volume control assembly and the water bypass control assembly. The water volume control assembly houses the water flow sensor and cold water inlet thermistor.

Proportional Gas Flow Regulator Valve (P.G.R.F.) - Gas valve that modulates and only allows the amount of fuel needed to heat the water being used.

Flame Rod - Safety device that detects the presence of flame.

Igniter - Spark igniter that lights the main burner.

Thermistor(s) - A thermistor is an electronic thermostat that is used to measure temperature. There are four thermistors: cold water inlet, hot water outlet, heat exchanger and ambient air.

Hot water Outlet Valve - Valve that delivers hot water to the piping system and measure the hot water outlet temperature with the aid of a thermistor.

Gas Inlet Connection - A connection port (separate from the gas valve) to connect the incoming gas supply.

PCB (Printed Circuit Board) - The control board that processes all the inputs required to make the heater operate.

Remote Temperature Controller - Digital control panel that allows user to adjust temperature, monitor status of the machine and review certain maintenance functions.

Fan Assembly - Fan (blower motor) that draws fresh air into the heater to be mixed with fuel for burning in the combustion chamber.

Burner Assembly - Burner component that ignites the fuel-air mixture and provides heat for the heat exchanger.

Strainer - In-line filter on the cold water inlet assembly that filters out debris and sediment.

Gas type connector - Removable electronic chip that programs the fuel type, product type and model number.

Overheat Limiter - a plastic film that wraps around the heat exchanger. It constantly monitors the heat exchanger temperature and will show an Error Code 14 if the heat exchanger gets too hot.

IN-SERIES GAS BOOSTING

Remote 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.

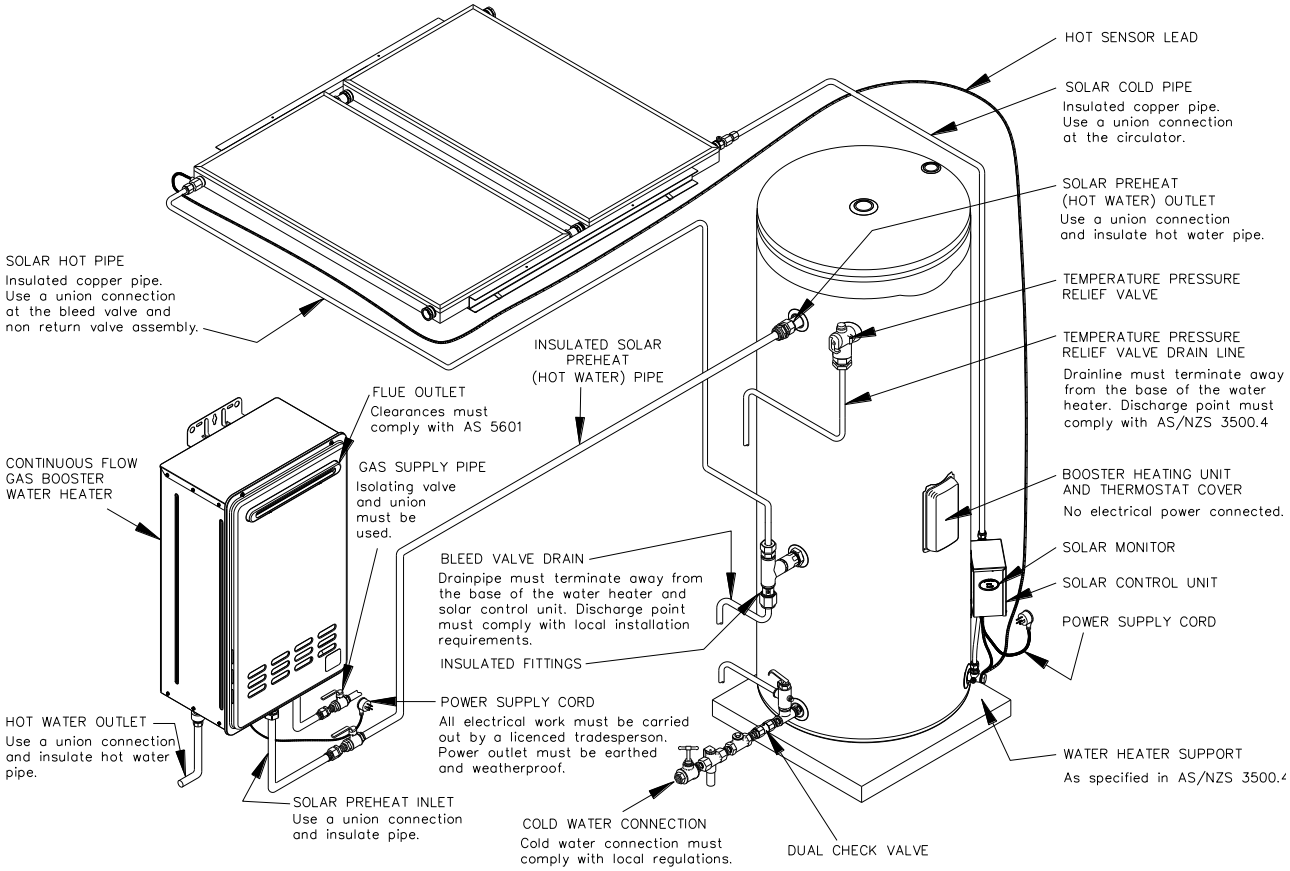
50ºC models are not suitable for use as in-series solar gas boosters.

Only solar compatible models with a temperature setting of 70ºC or higher can be installed as an in-series booster water heater to a solar preheat water heater. In this application the outlet temperature setting of the heater must be set at a minimum of 70°C to comply with the requirements of AS3498. Refer to page 14 for details on checking and adjusting the outlet temperature.

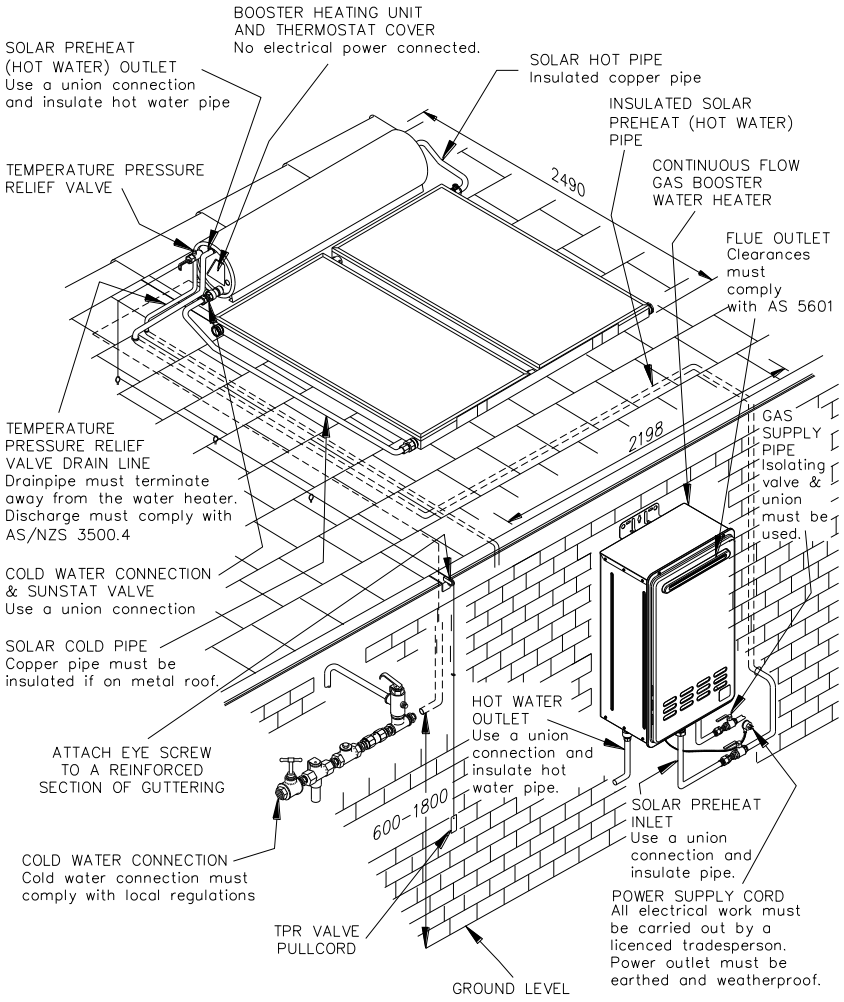
When the inlet water temperature is 58°C or higher the fan and burner will not operate despite water flowing through the heat exchanger. When the inlet water temperature is less than or equal to 57°C the burner will fire and boost the outlet temperature to 70°C provided the flow rate is greater than 2 litres per minute.

Note: If an existing 871 series Integrity water heater with a bypass valve is replaced with a new solar compatible CF heater, the solar bypass valve must be removed and the plumbing connections remade directly to the inlet and outlet water connections of the replacement water heater.

In-series Gas Boosting - Solar Loline Installation



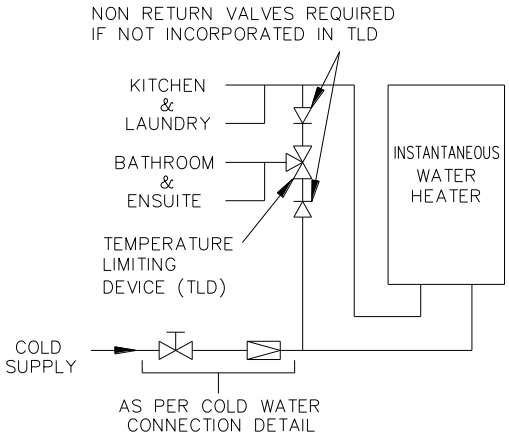
In-series Gas Boosting - Solar Hiline Installation



TEMPERING VALVES

50 degree fixed models comply with AS/NZS 3498 and therefore do not require a tempering valve to be fitted unless the unit is installed in an early childhood centre, school, nursing home or a facility for young, aged, sick or disabled people.

It may be required by regulations that an approved temperature limiting device be fitted on all other models. 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 50°C however the delivered water temperature at the tap will be that set by the tempering valve which will be no hotter than 50°C.



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

REMOTE TEMPERATURE 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 Smartphone based.

Controller Type	Bathroom 1	Bathroom 2	Kitchen
Standard (with cable)	299851	299852	299850
Deluxe (with cable)	299859	299860	299858
EziSET® Kit	052310		

Note: EziSET® is not to be used in conjunction with hard wired controllers.

Hard Wired Controllers:

Standard and deluxe controllers **cannot** be mixed in a single installation; other manufacturers' controllers cannot be used.

One, two or three unique 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 50°C when connected to a 274, 864, 874, 862, 872, 863, 873, 372 series model or 48°C when connected to a 276, 866, 876 series model.

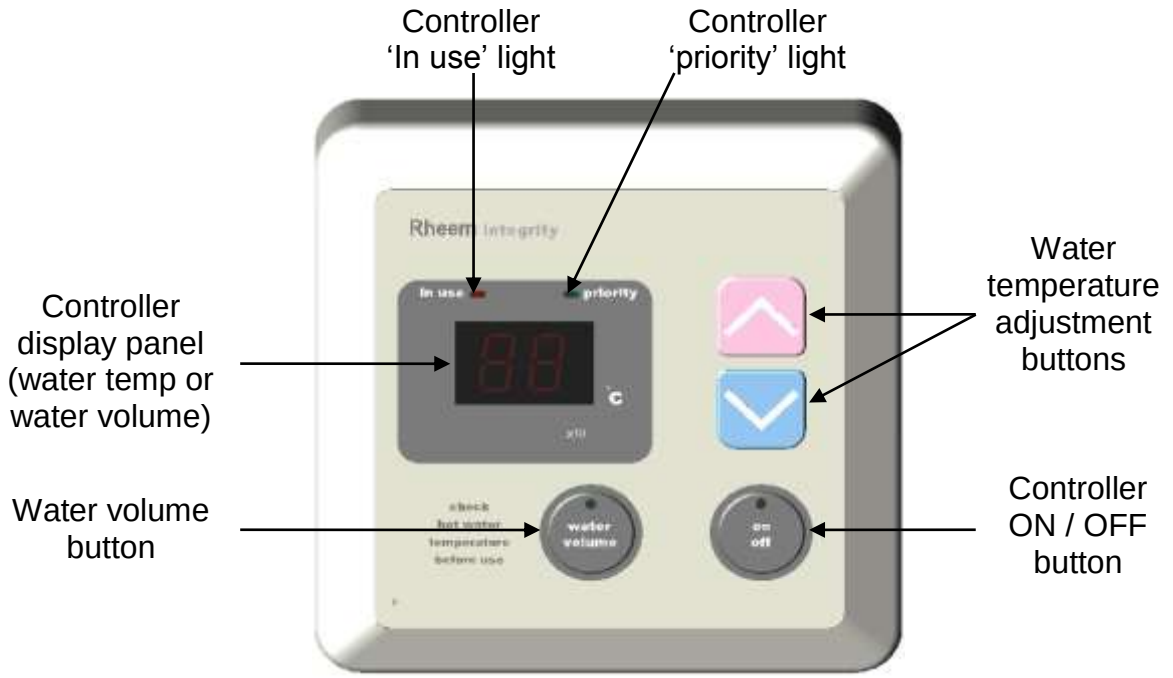
276, 866 & 876 models are factory set so that they cannot deliver water hotter than 48°C.

When no hot water is flowing, temperatures can be selected between 37°C and 43°C by pressing and holding the temperature control buttons, to select temperatures above 43°C press the temperature control button once for each selection.

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

When hot water is flowing, the temperature can be increased from 37°C to 43°C only. The water temperature can be decreased from any setting whether hot water is flowing or not.

Standard Controller



Standard Controllers (cont'd)

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:

Kitchen Controller:
37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 50*, 55*, 60*, 70*, 75*°C.

Bathroom Controllers:
37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 50°C*.

* Temperatures above 48°C are not available on controllers fitted to 276, 866, 876 series models as these units have a maximum selectable temperature of 48°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:

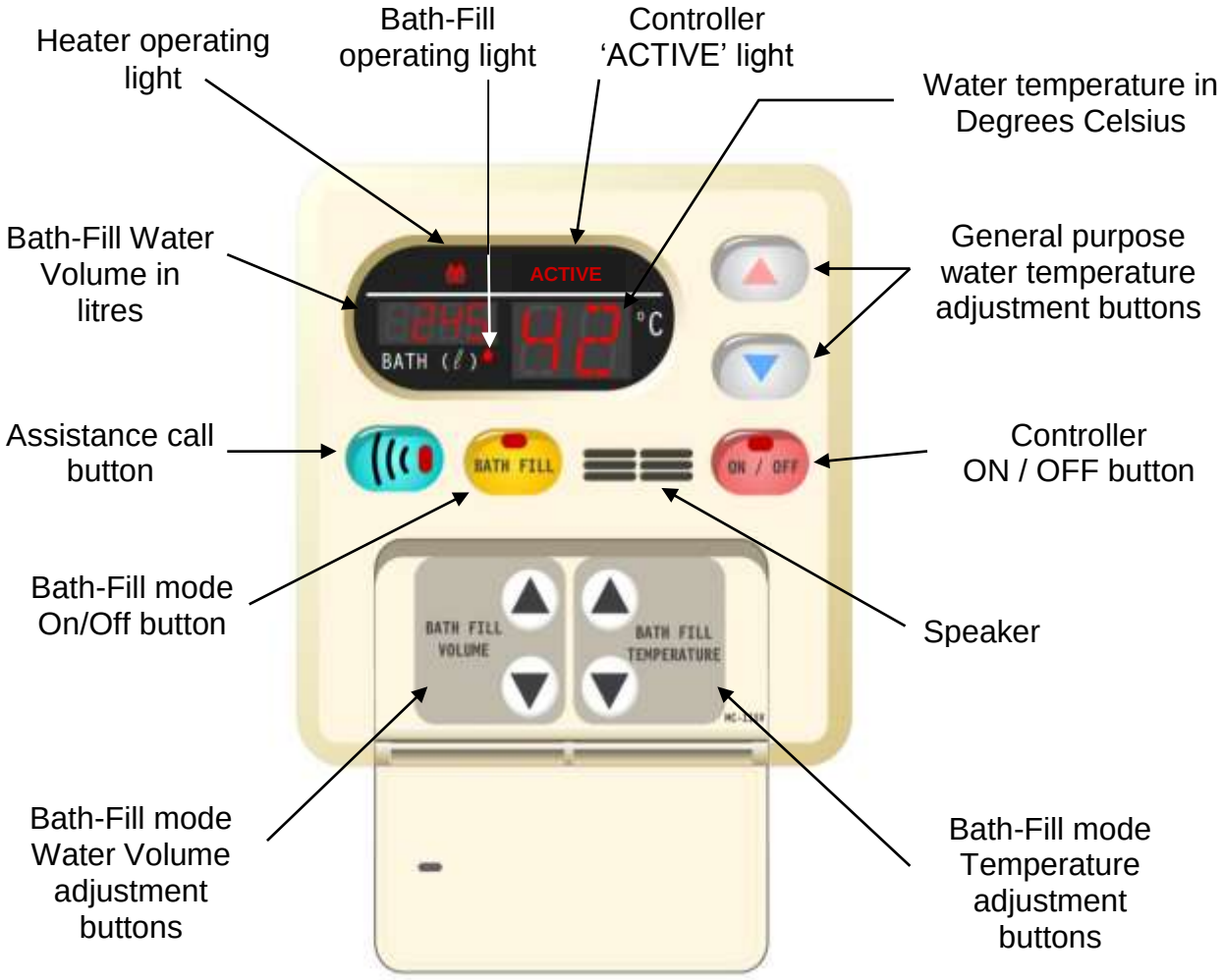
- The water volume function is designed to warn, by a beeping sound, that a certain volume of water has been delivered from the water heater. **It does not stop either the flow of or the heating of water.**
- The Kitchen controller does not require priority nor to be on in order to set the water volume function.
- The water volume function can be set whilst a hot tap is open.

Standard Controllers (cont'd)

- 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

(Shown with Bath-Fill control cover open)



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, 47, 48, 50*, 55*, 60°C*

Deluxe Bathroom Controllers:
37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 50°C*

Bath-Fill Mode – All Deluxe Controllers:
37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48°C

* Temperatures above 48 degrees are not available on controllers fitted to 276, 866 & 876 models as these units have a maximum selectable temperature of 48°C at all locations.

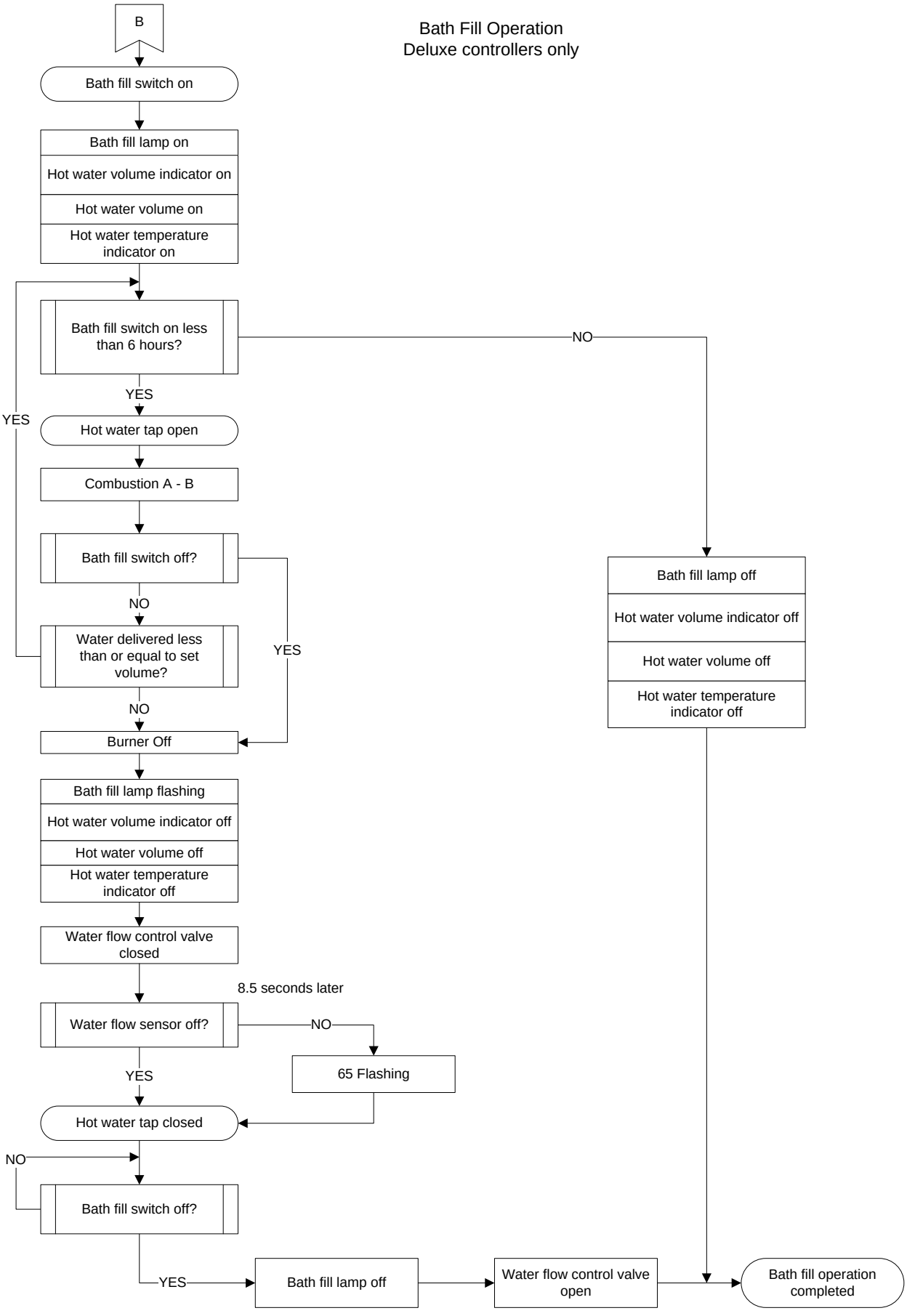
Deluxe Controller Functions

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, has 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 notes:

- The Deluxe controller will cease the flow of hot water from the water heater once the desired volume of hot water has been delivered when in Bath Fill mode.

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.

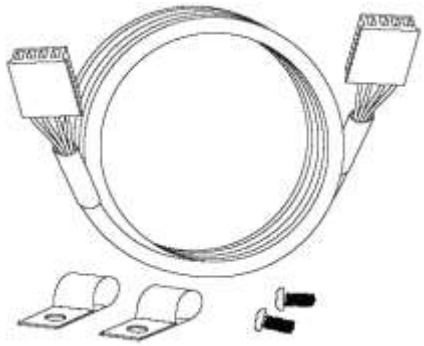
Bath Fill function: The water volume is measured as the water flows through the water heater. Therefore if more than one hot tap is open the expected water volume from the first tap will not be delivered before hot water flow ceases.

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.

EZ-LINK™ SYSTEM

The EZ-Link™ system is designed to electronically control two continuous flow gas water heaters and have them operate as one. One or both water heaters may be in operation depending upon the hot water demand. The second water heater will only operate when the hot water demand exceeds the capacity of the first water heater.



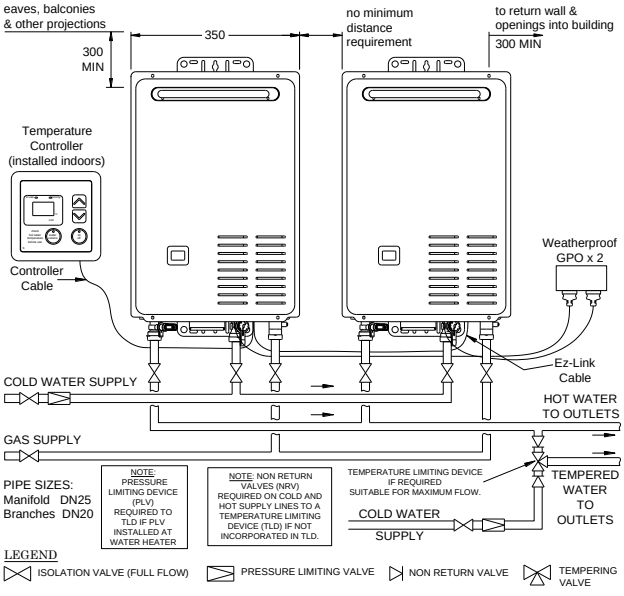
The EZ-Link™ system consists of a cable that is connected between the two units. The cable is connected into terminal O on each control PCB. Dip switch 4 on the DIP1 set of switches is to be switched to the 'ON' position in each water heater in order for EZ-Link system to function correctly.

When a remote temperature controller is not used with an EZ-Link™ system one of the water heaters must be nominated as the master. Dip switch 1 on the DIP2 set of switches is to be switched 'ON' in one of the units to make it the master heater. The temperature setting of the master heater will determine the temperature setting for both heaters.

If a remote/s is to be fitted either the standard or deluxe temperature controller/s can be used. The unit that has the remote/s fitted will become the master unit.

The EZ-Link™ will vary the start up sequence of the two water heaters. These two continuous flow water heaters must be of the same model as the performance of two different models cannot be guaranteed.

If it becomes necessary to test the operation of both units, increase the hot water flow by opening multiple hot water outlets simultaneously until both units operate.

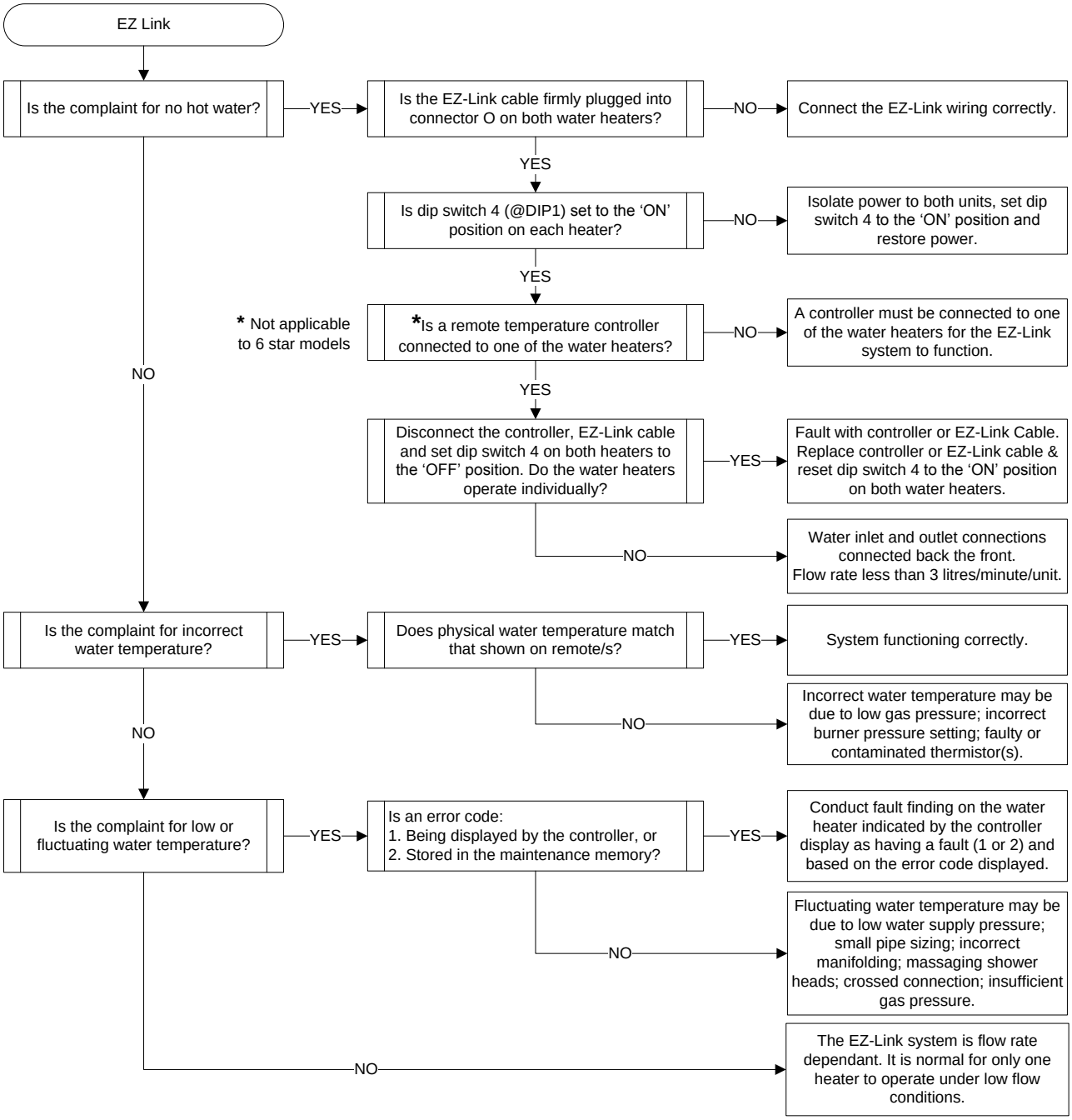


The diagram opposite details a typical installation utilising the EZ-Link system.

EZ-Link™ Error Code Display on Remote Control (if fitted)

If a fault is present with one of the water heaters connected via the EZ-Link™ system, in addition to displaying the normal error codes, the remote controller will also display a 1 or a 2 to indicate which unit is at fault. 1 indicates the unit to which the remote temperature controller is connected has the fault, 2 indicates the unit which does not have the remote controller connected has the fault.

EZ-Link™ Fault Finding



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.

Left digit in LED display (Numerical) - Use DOWN (▼)arrow key on Remote Control

Right digit (Alphabetical) – Use UP (▲) arrow key on Remote Control

	0	1	2	3	4	5	6	7	8	9
E	Management Number	Error Code for the previous 8 faults								Null
F	Null	Sequence number of the previous 8 faults								Null
C	Total combustion starts X 10,000	Total combustion operations since last error X 10,000								Null
D	Total combustion starts X 100	Total combustion operations since last error X 100								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 (See table below)	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	Null
A	Null	Control Line Voltage	Fan Detective Value	Fan Motor Current	Fan Motor Current Curve (Average)	Fan Motor Current Curve (After closing tap)	Fan Motor Current Curve (Combustion)	Null	Null	Sequence number

Eg: to view the current temperature being measured by the outlet thermistor select 5Y. Refer to page 31 for the procedure to display maintenance information.

Flame Sensor Status

The chart below explains the maintenance information displayed at cell ***0y:***

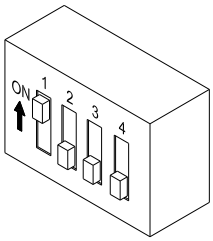
0y display	**00**	**01**
Flame Rod 1	X	O

X = Not detecting flame
O = Is detecting flame

Displaying Maintenance Information

Without Remote Controller:

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.



1. Remove the front cover from water heater.
2. Switch dip switch 1 to the ON (up) position on the DIP1 set of dip switches.
3. The LED1 display at bottom right hand side of water heater will display 1E.
4. Use the MIN button to change the left digit (0→1etc.) in the display to the required maintenance code identified from the maintenance information table on page 30.
5. Use the MAX button to change the right digit (E→F etc.) in the display to the required maintenance code identified from the maintenance information table on page 30.
6. The maintenance code and the value of that code will alternate on the LED display.
7. If required, the maintenance information can be locked and will be unable to be modified by turning dip switch 2 to the ON (up) position on the DIP1 set of dip switches whilst dip switch 1 is also in the ON (up) position.
8. Switch all DIP1 dip switches to the OFF (down) position to return to normal operation.

With Remote Controller:

Isolate power whilst connecting a remote controller.

1. Fit remote controller if not already fitted.
2. Restore power supply and ensure the remote controller is turned off.
3. Press the temperature increase and decrease buttons simultaneously for 3 seconds until an audible beep is heard.
4. Use the temperature decrease button to change the left digit (0→1etc.) in the remote controller display to the required maintenance code identified from the maintenance table on page 30.
5. Use the temperature increase button to change the right digit (E→F etc.) in the remote controller display to the required maintenance code identified from the maintenance table on page 30.
6. The maintenance code and the value of that code will alternate on the LED display of the Remote Controller.
7. Press the on/off button twice on the remote controller to cancel maintenance information.

In order for the unit to operate while in Maintenance Mode quickly press the ON/OFF button once. The temperature will default to 50º but this will not be displayed so maintenance information can be displayed. If a hot tap is opened, the unit will operate and the “Y” maintenance information can be viewed in real time (flow rate in litres per minute etc).

CLEARING ERROR CODE HISTORY

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.

After 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. Ensure all DIP SWITCHES are in the off position (down position).
4. On the DIP1 set of switches, turn DIP SWITCH 1 on (up position) and then off (down position) again.
5. Within 5 seconds of turning DIP SWITCH 1 off, press and hold either the MIN or MAX button for more than 2 seconds.
6. Verify clearing of fault history by entering Maintenance Mode and check the code at location 1E; it should read -- (no record)
7. 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.

To reset Error Code 99 it is necessary to:

1. Ensure all controllers (if fitted) are turned off and all hot taps are closed.
2. Ensure all DIP SWITCHES are in the off position (down position).
3. Turn DIP SWITCH 2 on (up position) and then off (down position).
4. Within 5 seconds of turning DIP SWITCH 2 off, press and hold both the MIN and MAX buttons for more than 2 seconds. ‘UL’ will flash on display and will become solid once the 2 second period has expired.
5. Open and close a hot tap to complete the reset procedure.
6. Refit the water heater front panel.

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. Error codes are displayed via the red LED mounted on the PCB. If fitted, the remote controllers will also display error codes.

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 39.

By locating the error code 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 in the Operational Flow Charts

P.G.F.R Valve	Proportional Gas Flow Regulating Valve	**F.F**	Flame Failure
G.I.S.V.	Gas Inlet Solenoid Valve (SV0)	**S.V. 1**	Solenoid Valve 1
O.H.L	Over Heat Limiter	**S.V. 2**	Solenoid Valve 2
I.U.I	In Use Indicator (Combustion Indicator)	**S.V. 3**	Solenoid Valve 3

Stepping gas rate change sequence by solenoid

Step 1	Step 2	Step 3
SV1 ON	SV1 & 2 ON	SV 1, 2 & 3 ON

Sequence Number Table

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

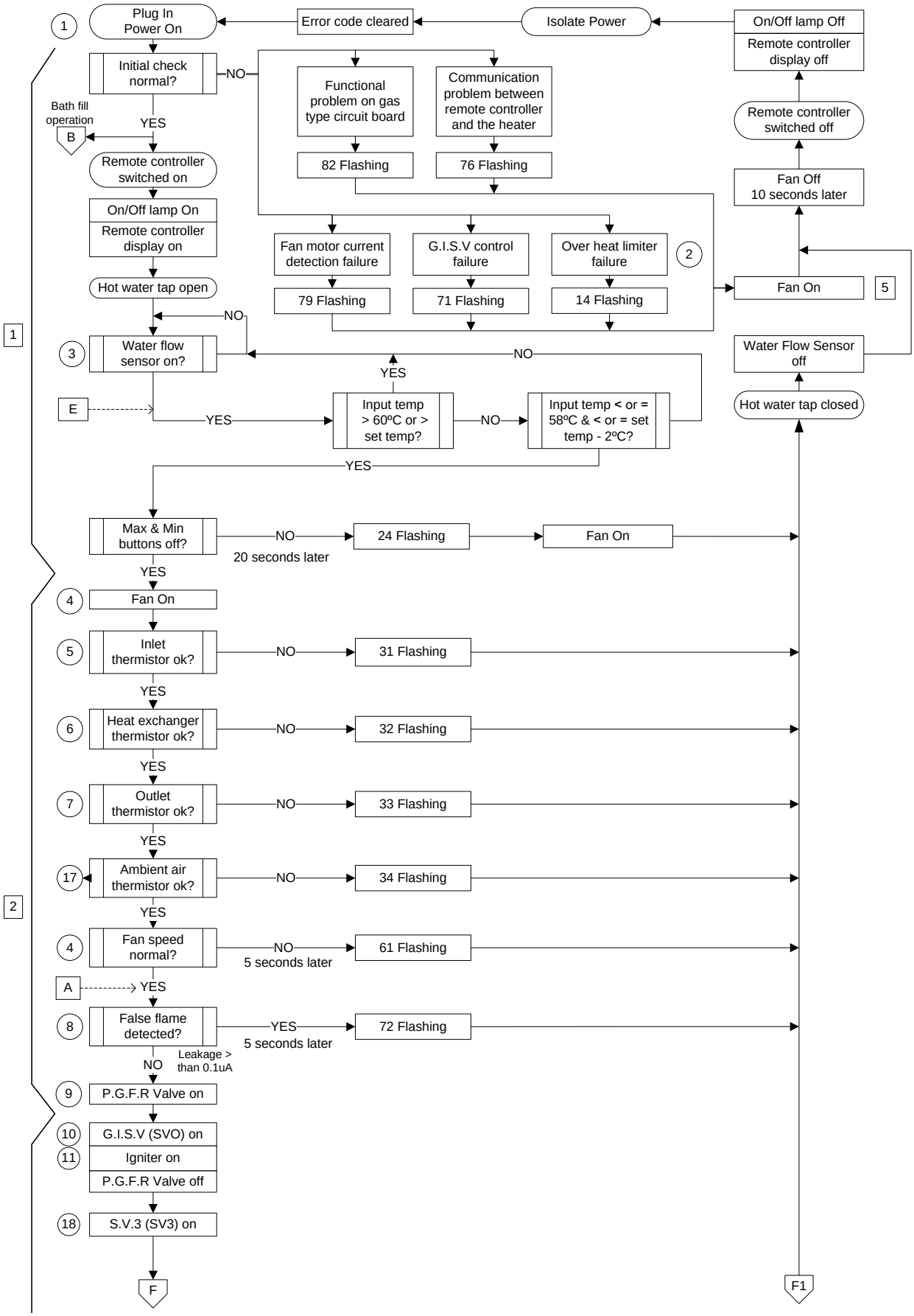
Test Equipment

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.

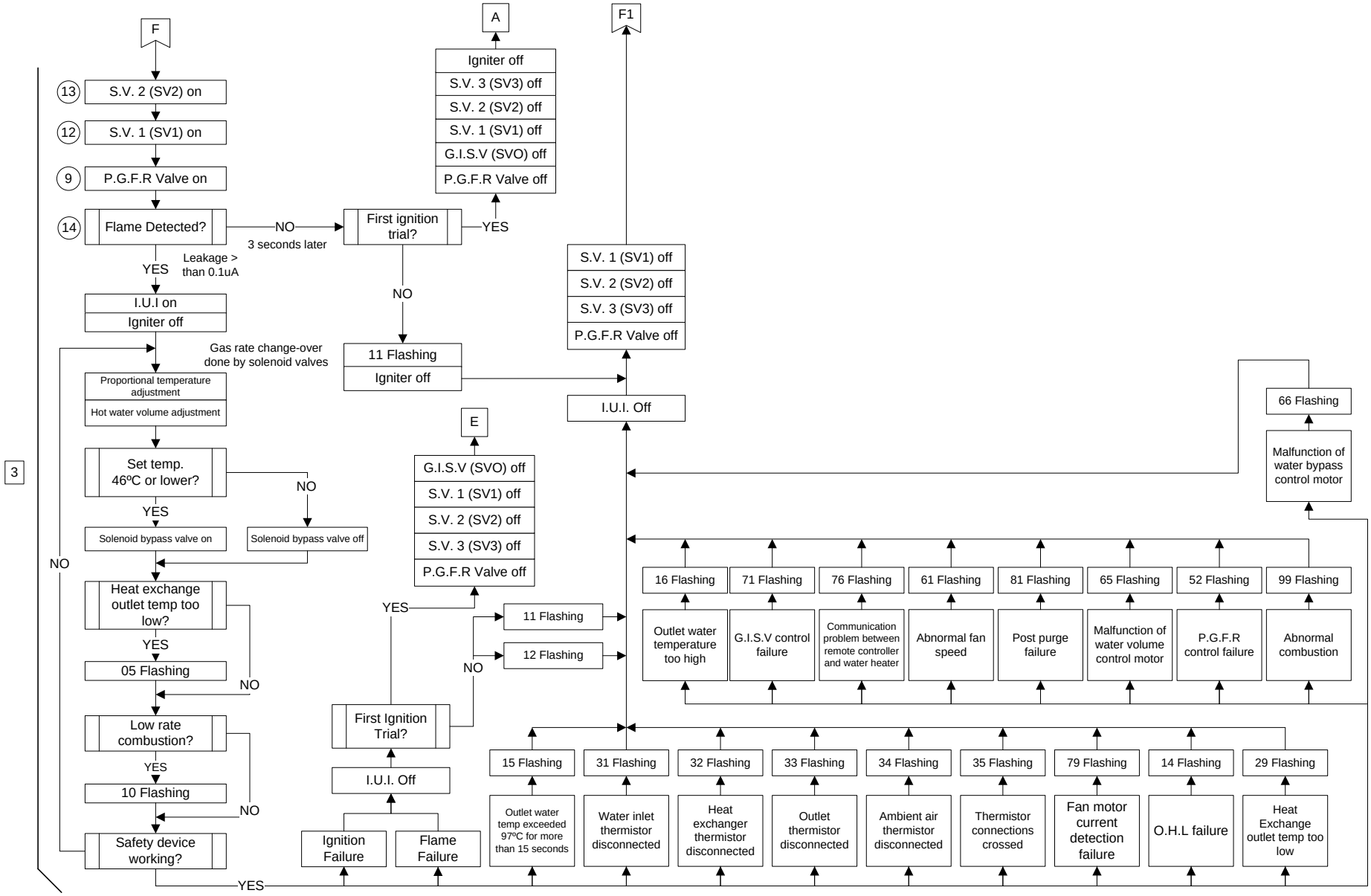
Flame detection simulator	WH0020080
Flame sensor current (uA) detection kit	WH0020081
Fine probe adapter kit	WH0020082
Heat exchanger fin brush	WH0020083
Probe to alligator clip kit	WH0020084

Operational Flow Charts

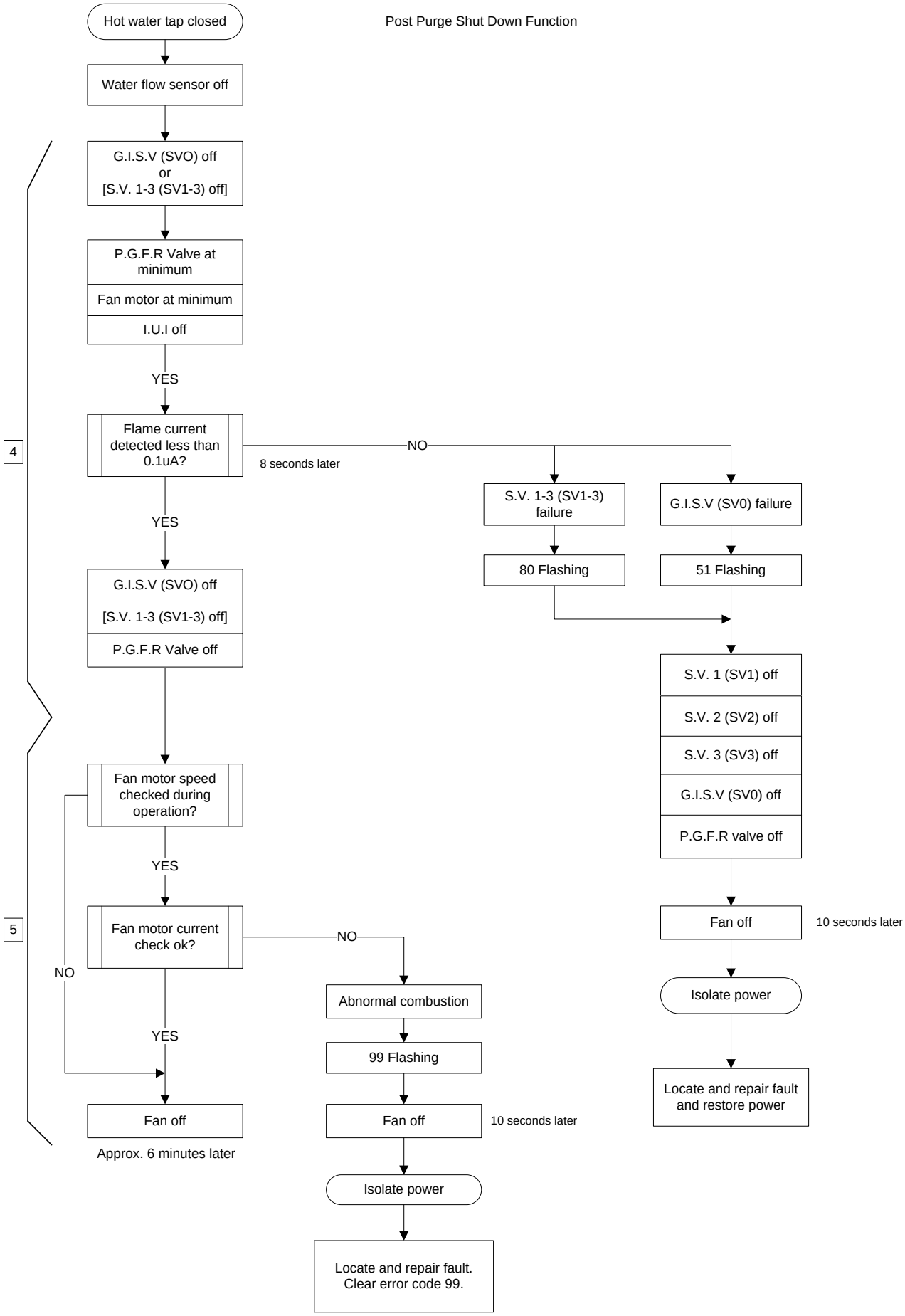
Operational Flow Chart 1



Operational Flow Chart 2



Operational Flow Chart 3



ERROR CODES

Code	Fault	Point to Check
03	EZ Link	Check communications cable. Ensure dip switch 4 on DIP1 set of switches is in the ON position on both heaters.
05	Imperfect Combustion Alarm	Clean air inlet filter. Clean combustion air fan. Clean heat exchanger fins. Check for adequate combustion air ventilation openings and clean if necessary. Check vent system for partial blockage and correct as necessary.
10	Air Supply or Exhaust Blockage *Warning code not a fault code.*	Check all vent components for proper connections. Ensure there are no restrictions in the flue inlet or exhaust. Ensure condensation trap/drain was installed correctly. Ensure heat exchanger fins, fan, and air intake are not blocked.
11	No Ignition	Ensure gas supply to the appliance is turned ON. Ensure gas type and pressure is correct. Bleed all air from gas lines. Ensure gas line, meter, and regulator are sized properly. Ensure appliance is properly grounded. Check gas solenoid valves for open or short circuits. Ensure igniter is operational. Check igniter wiring for damage. Check heat exchange thermistor and transformer.
12	Flame Failure	Ensure gas type and pressure is correct. Bleed all air from gas lines. Ensure flame rod wiring is correct. Check flame rod for carbon build-up. Ensure gas line, meter, and regulator are sized properly. Ensure appliance is properly grounded. Check gas solenoid valves for open or short circuits. Check power supply for proper voltage and voltage drops. Disconnect remote control. Check heat exchange thermistor and transformer.
14	Overheat Limiter Fault	Ensure high fire and low fire gas burner pressure is correct. Check gas type of unit and ensure it matches gas type being used. Check heat exchanger for cracks and/or separations. Check gas type connector. Check for restrictions in airflow around unit and vent terminal. Check over heat limiter wiring and ensure it is plugged in correctly. Check replacement procedure 23.
15	Boiling Safety Device	Check for closed water heater inlet valve or restrictions in cold water inlet pipe (must be fully open). Check for clogged heat exchanger (scale build up). On a commercial water heater, lower the set point temperature below 82°C at high altitude. Check heat exchange and hot water outlet thermistor.
16	Over Temperature Warning	Check for blocked heat exchanger. Check for restrictions in airflow around unit and vent terminal. Check PGFR, heat exchanger thermistor and hot water outlet thermistor.
24	Malfunction of Operational Switch	Disconnect remote control and retry. Verify unit is electrically grounded. Ensure Min, Max and/or Adjuster buttons have not been inadvertently depressed.
29	Heat Exchanger Outlet Temp. Too Low	Check air intake filters and heat exchanger fins.
31	Water Inlet Temperature Sensor Fault	Check sensor wiring is intact and not damaged. Check and clean scale from sensor if necessary. Ensure resistance is correct.
32	Heat Exchanger Temperature Sensor Fault	
33	Outgoing Water Temperature Sensor Fault	
34	Ambient Air Temperature Sensor Fault	
35	Improper Thermistor Connection	Check that all thermistors are connected to proper connections on PCB. Ensure the hot and cold plumbing to the heater is not reversed.

ERROR CODES (cont)

Code	Fault	Remedy
51	Gas Inlet Solenoid Valve Fault	Check gas inlet solenoid valve wiring for loose or damaged terminals. Check flame rod.
52	PGFR Valve Fault	Check PGFR valve wiring for loose or damaged terminals.
61	Combustion Fan Failure	Ensure fan motor will turn freely. Motor will operate with a small amount of restriction. Check wiring to motor for damaged and/or loose connections. Ensure the flue length does not exceed max length and number of bends. Check transformer and PCB.
65	Water Volume Control Fault	Check water flow solenoid valve wiring harness for loose or damaged terminals. Check for proper voltage to water flow solenoid.
66	Water By-Pass Control Fault	Check water by-pass solenoid valve wiring harness for loose or damaged terminals. Check for proper voltage to water by-pass solenoid.
71	Gas Inlet Solenoid Valve Control Fault	Check gas inlet solenoid valve wiring for loose or damaged terminals. Ohm out solenoid valve.
72	Flame Sensing Device Fault	Ensure flame rod is touching flame when unit fires. Check inside burner chamber for any foreign material blocking flame at flame rod. Check all wiring to flame rod for damage. Check flame rod for proper voltage. Remove flame rod and check, clean with steel wool.
76	Communication Fault with Remote Control	Check remote control wiring for loose or damaged connections. Bypass remote control cable by connecting remote control directly to remote control terminals on PCB. Replace cable if found to be faulty.
79	Fan Motor Current Fault	Ensure fan motor will turn freely. Motor will operate with a small amount of restriction. Check fan motor for proper voltage and for water (condensation) damage.
80	Gas Cut-off Failure	Ohm out all solenoid valves. Check voltage of all flame rods.
82	PCB data failure. Control board is not programmed.	Ensure gas type connector is fitted.
90	Blocked Flue Fault	Clean any blockage in heat exchanger, combustion fan, inlet filter, and exhaust flue.
99	Fan Motor cannot vent	Clean Air Inlet Screen; Clear vent blockages Check for blocked heat exchanger.
No code	Nothing happens when water is flowing through unit.	Make sure unit is connected to proper power supply and circuit breakers are on. Clean inlet water supply filter. Ensure at least the minimum flow rate required is present. On new installations ensure hot and cold water lines are not crossed. Check Transformer.

DIAGNOSTIC TEST POINTS

Measurement Point			Normal Value	Point to Check
No.	Connection	Wire Colour		
1	A	BL1 – BR4	216~264 VAC	Main Power.
2	T	W1 – W2	50kΩ – 500kΩ	Over Heat Limiter.
3	S	BR1 – BK2	2 – 5 VDC (pulse) >1310 pulses/minute	Water Flow Sensor pulse signal. (Only when water is flowing)
		R3 – BK2	11 – 17 VDC	Water Flow Sensor.
4	J	BL4 – W6 (outdoor)	144 – 192 VDC	Fan Motor has proper voltage.
		BK4 – R6 (indoor)		
		R3 – BL4 (outdoor)	12 - 18 VDC	Fan Motor has proper voltage.
		W3 – BK4 (indoor)		
		Y1 – BL4 (outdoor)	4 – 10 VDC (Pulse) >4800 pulses/minute	Fan Motor producing a regular pulse.
		BL1 – BK4 (indoor)		
5	P	W6 – BK3	Refer to thermistor resistance chart on following page.	Cold water inlet thermistor.
6	P	Y5 – BK3		Heat exchanger thermistor.
7	P	R4 – BK3		Hot water outlet thermistor.
17	P	BL7 – BK3		Ambient air thermistor.
8	U	W1 – GND	0.3 – 100VAC	Flame rod not detecting flame.
14			1 – 100VAC	Flame rod detecting flame.
9	P	R1 – BK2	1.5 – 14 VDC	PGFR (Proportional Gas Flow Regulating Valve)
			40 – 80Ω	
10	W	Y1 – BK8	75 – 100 VDC	GISV 0 (Gas Inlet Solenoid Valve 0) (Primary fuel inlet to gas valve)
			0.8 – 2.4kΩ	
11	G	R1 – R4	90 - 110VAC	Igniter
12	W	W2 – BK8	75 – 100VDC	Solenoid valve (SV1) (Fuel to ODS and front right burner)
			0.8 – 2.4kΩ	
13	W	R5 – BK8	75 – 100VDC	Solenoid valve (SV2) (Fuel to back right burner)
			0.8 – 2.4kΩ	
18	W	BL6 – BK8	75 – 100VDC	Solenoid valve (SV3) (Fuel to left side burner)
			0.8 – 2.4kΩ	
15	N	W2 – BK8	8 – 16VDC	Water volume control motor has proper voltage.
		R7 – BK8	8 – 16VDC	Water volume control motor has proper voltage.
		GR6 – BK8	Less than 1VDC (Limiter on) 4 – 6VDC (Limiter Off)	Water volume control motor position switch is normal.
22	M	W2 – BK8	8 – 16VDC	Water bypass control motor has proper voltage.
		R7 – BK8	8 – 16VDC	Water bypass control motor has proper voltage.
		GR6 – BK8	Less than 1VDC (Limiter on) 4 – 6VDC (Limiter Off)	Water bypass control motor position switch is normal.

DIAGNOSTIC TEST POINTS (cont)

Measurement Point			Normal Value	Point to Check
No.	Connection	Wire Colour		
23	D	BR1 – BL3 (outdoor)	16 - 22Ω	Transformer.
	D	BR1 – BL3 (indoor)	10 - 14Ω	
	E	BK3 – Y11 (outdoor)	7 - 11Ω	
		BK3 – Y11 (indoor)	5 - 8Ω	
		BK3 – R6 (outdoor)	5 - 8Ω	
		BK3 – R6 (indoor)	3 - 6Ω	
		GY1 – GY7 (outdoor)	12 - 18Ω	
		GY1 – GY7 (indoor)	10 - 16Ω	

THERMISTOR RESISTANCE CHART

Temp °C	Resistance KΩ		Temp °C	Resistance KΩ		Temp °C	Resistance KΩ		Temp °C	Resistance KΩ
0	23.73		26	8.177		52	3.262		78	1.465
2	21.733		28	7.583		54	3.055		80	1.384
4	19.925		30	7.037		56	2.863		82	1.307
6	18.286		32	6.536		58	2.686		84	1.236
8	16.799		34	6.076		60	2.52		86	1.169
10	15.449		36	5.653		62	2.367		88	1.106
12	14.221		38	5.264		64	2.225		90	1.048
14	13.104		40	4.905		66	2.092		92	0.993
16	12.086		42	4.574		68	1.968		94	0.941
18	11.157		44	4.269		70	1.853		96	0.893
20	10.309		46	3.987		72	1.746		98	0.847
22	9.534		48	3.726		74	1.646			
24	8.826		50	3.485		76	1.552			

FAULT FINDING

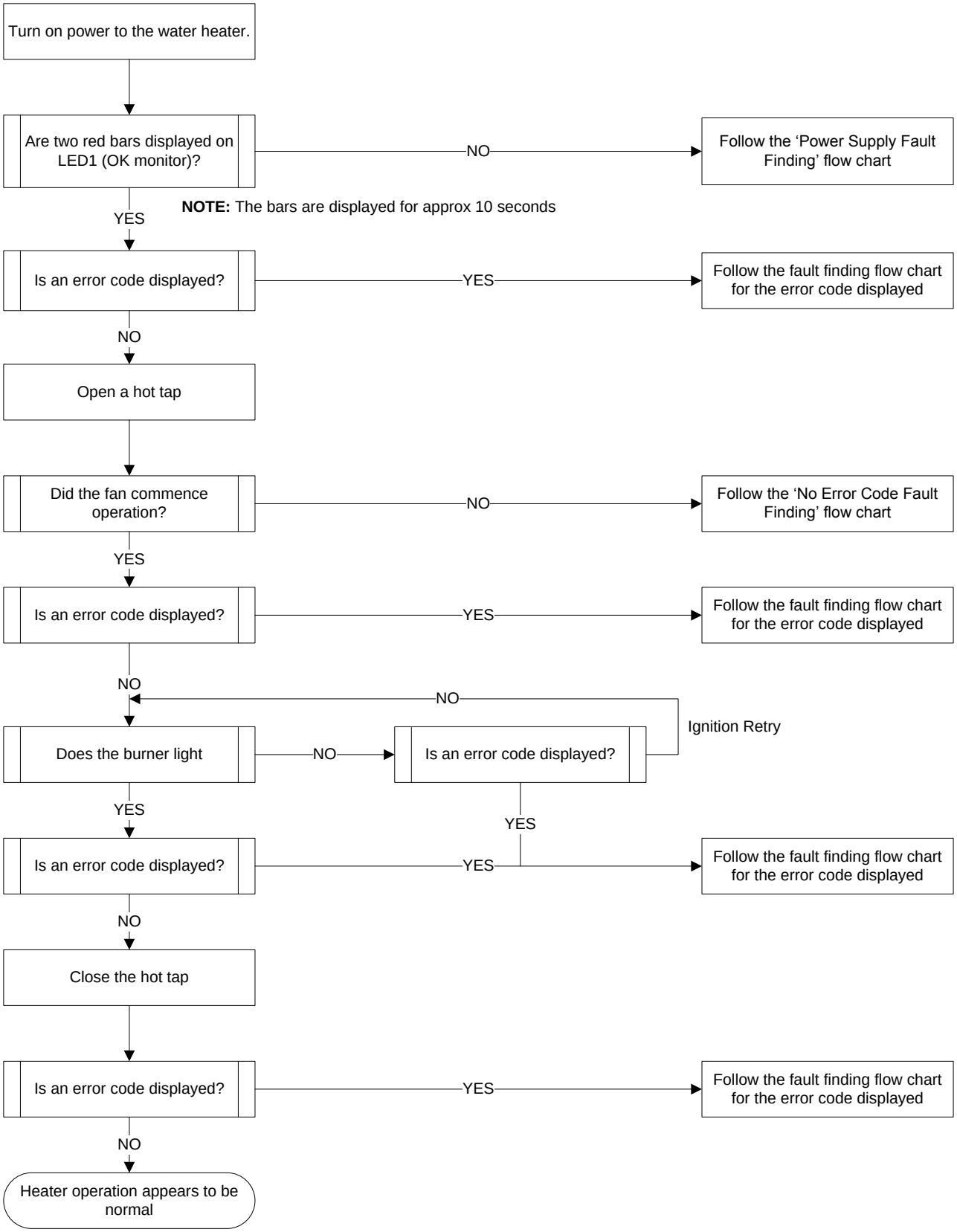
When measuring ***resistance*** of a part, turn off the electric power and be sure to disconnect the part completely before measuring (from connector or terminal). Resistance checks are performed on the part while it is disconnected from the control board.

"Live" testing to be conducted. Personal Protective Clothing (PPE) shall be worn to reduce the risk of electric shock. Refer to Rheem Safety Procedure on electrical testing.

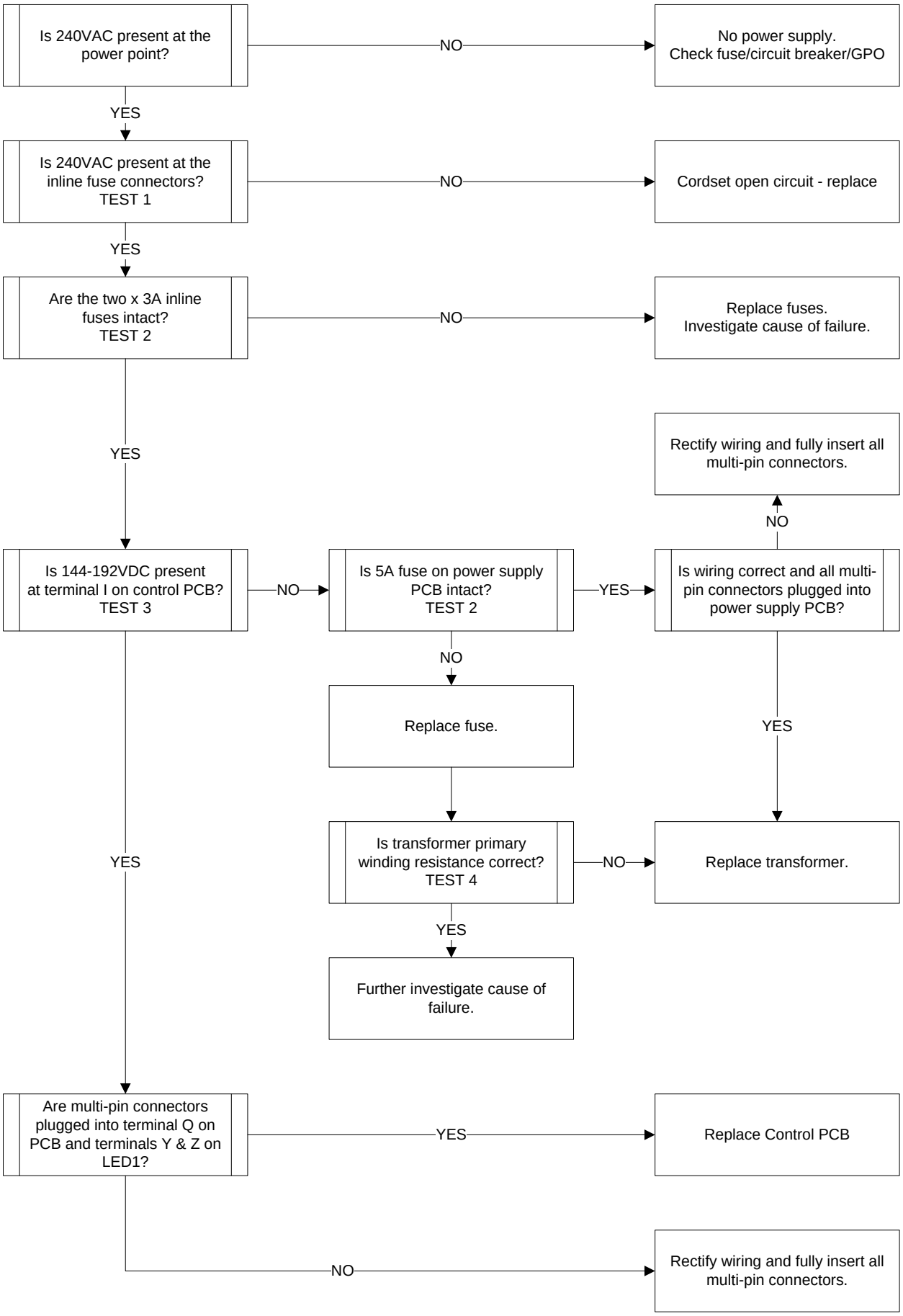
All Molex connections only go to one location and fit one way. You do not need to force a connection.

CAUTION: When performing maintenance and/or servicing the water heater, wait for the water heater to become cool. Be careful to avoid injury on the sharp edges.

Fault Diagnosis Sequence

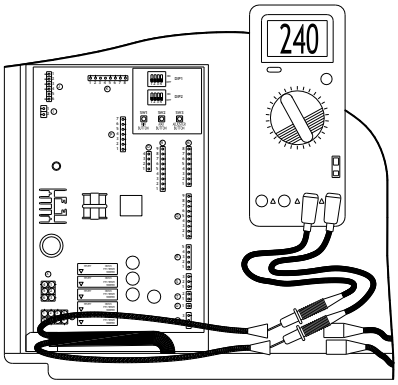


Power Supply Fault-Finding



Fault-Finding Tests 1 - 4

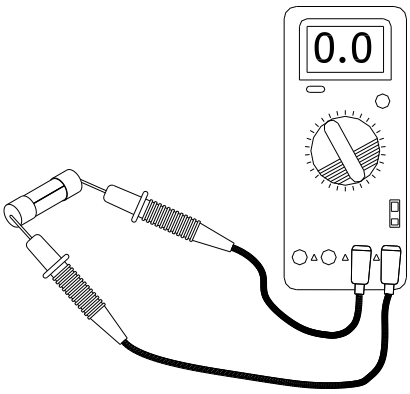
Test 1



Using a multimeter set on the AC volts scale, measure the voltage between the blue and brown wires at the inline fuse connectors.

Normal voltage is between 216 and 264VAC.

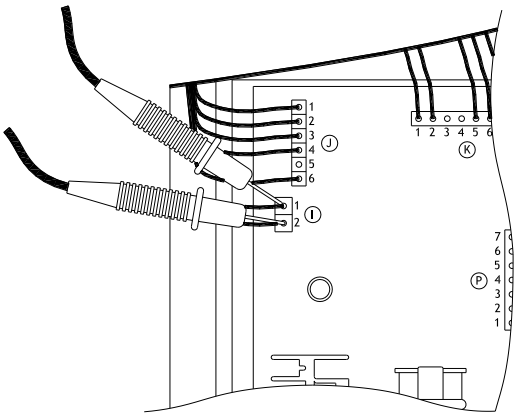
Test 2



Using a multimeter set on the ohms scale, measure across each fuse.

Resistance should be 0 ohms.

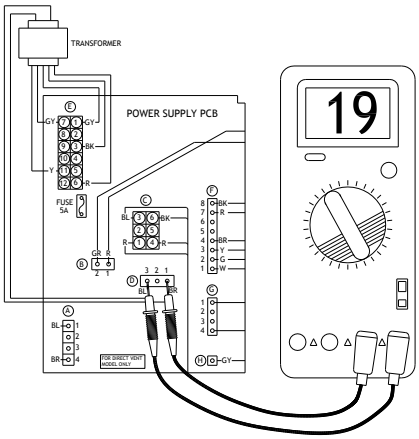
Test 3



Using a multimeter set on the DC volts scale, measure the voltage between red and grey wires at terminal I on the control PCB.

Normal voltage is between 144V and 192V DC.

Test 4

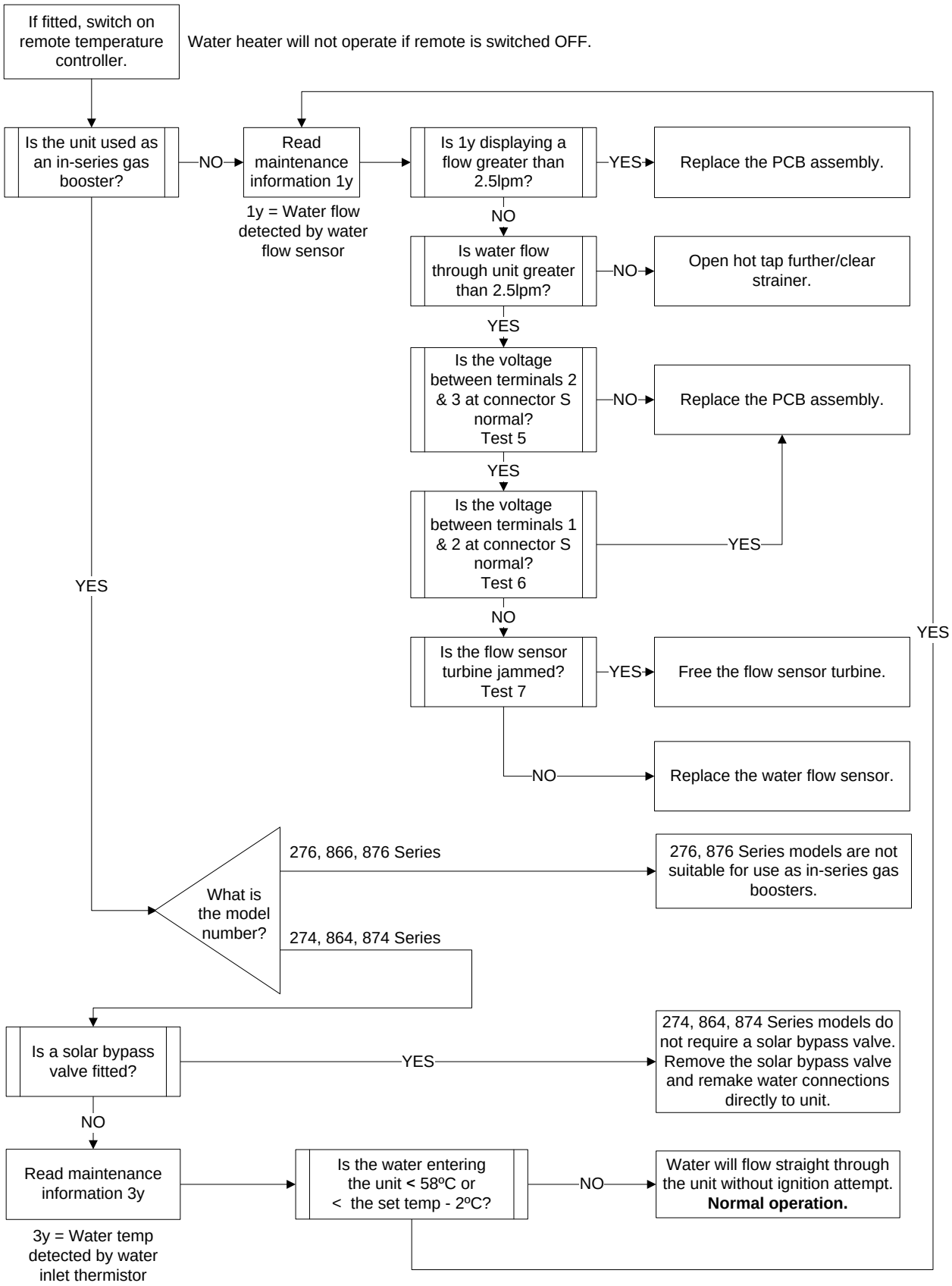


Using a multimeter set on the ohms scale, measure the resistance between the blue and brown wires at terminal D whilst the multi-pin connector is unplugged from the power supply PCB.

Resistance should be 16-22Ω (outdoor) and 10-14Ω (indoor models).

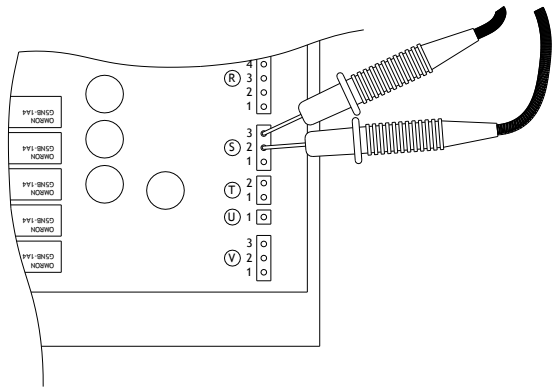
NOTE: if the value is below 10 ohms it will cause the fuse to blow during the start up cycle without fault code being displayed.

No Error Code Fault Finding



Fault-Finding Tests 5 - 7

Test 5

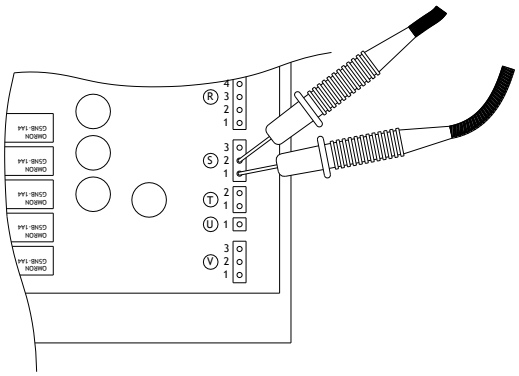


Conduct test with no water flow.

Using a multimeter set on the DC volts scale, measure the voltage between 3 Red and 2 Black at terminal S on the control PCB.

Normal voltage should be between DC11 – 17V.

Test 6

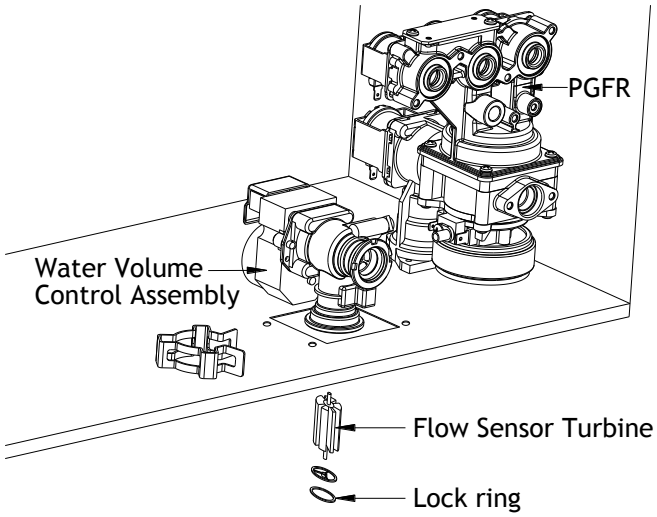


Conduct test with water flowing.

Using a multimeter set on the DC volts scale, measure the voltage between 1 Brown and 2 Black at terminal S on the control PCB.

Normal voltage should be between DC2 – 5V.

Test 7



Remove the flow sensor turbine. Refer to ‘Flow Sensor Turbine’ procedure on page 72.

Check for excessive wear of turbine or blockage by foreign material such as thread tape. The power must be isolated during water flow sensor removal.

Error Code 11

Ignition Failure. Error code 11 can be caused by one of three different scenarios. Match the scenario to the fault condition before continuing fault finding. At a minimum check the following in all cases:

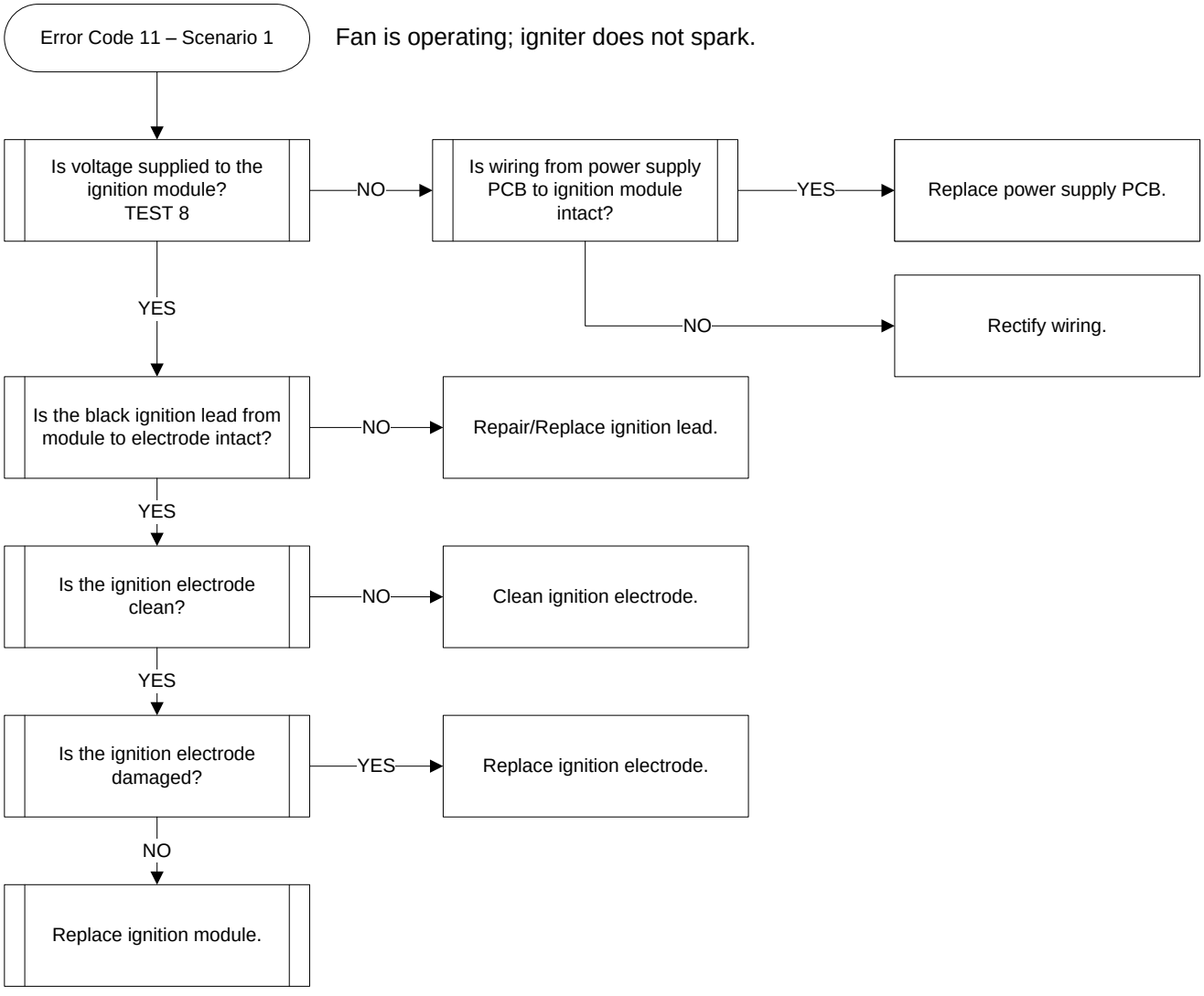
1 Ensure gas supply is available.

2 Bleed all air from gas lines.

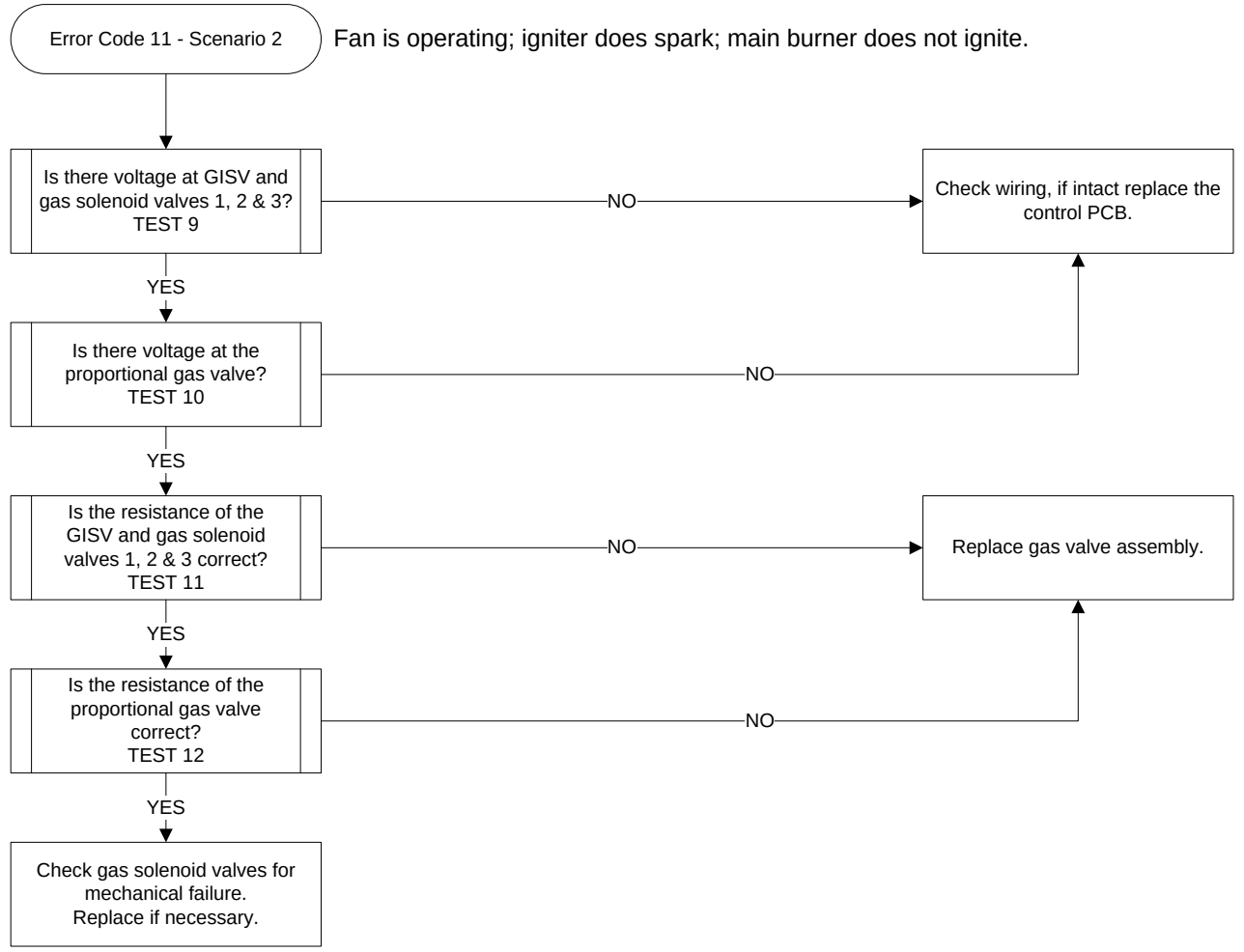
3 Ensure appliance is properly earthed.

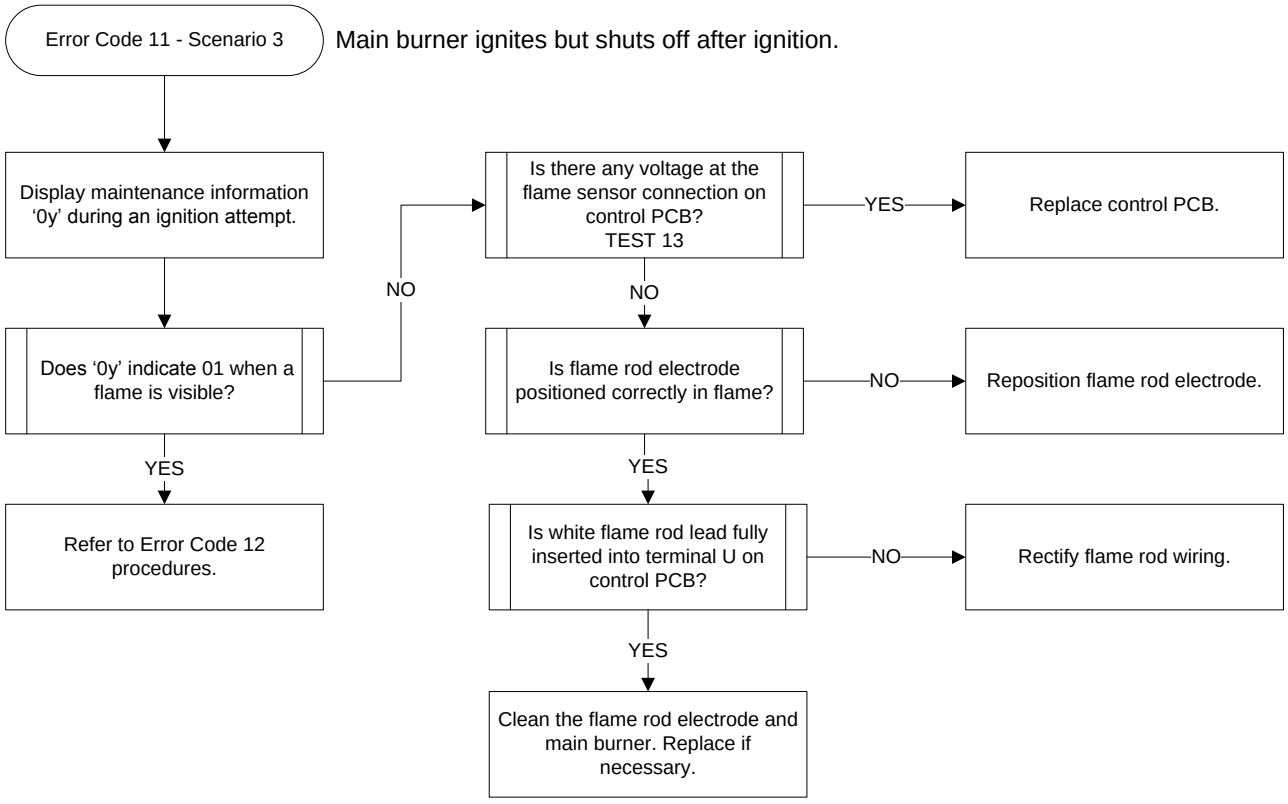
4 Ensure gas line, meter, and regulator are sized properly.

5 Ensure gas type and gas pressure to the unit is correct.



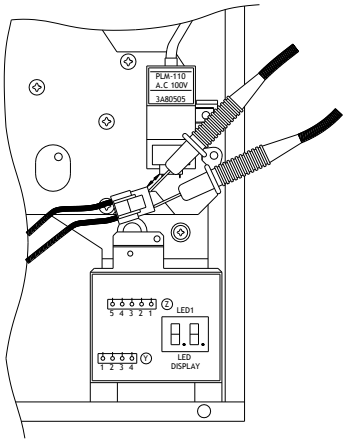
Error Code 11 (cont)





Fault Finding Tests 8, 9 & 11

Test 8

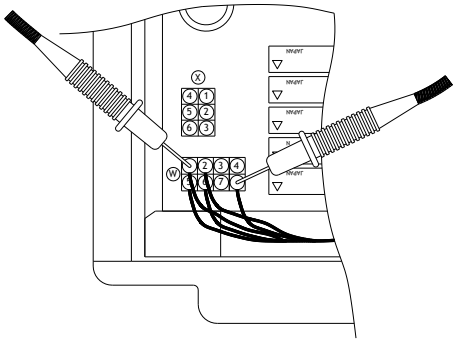


Conduct test during ignition attempt.

Using a multimeter set on the AC volts scale, measure the voltage between the two red wires at base of the ignition module.

Normal voltage should be between 90 – 110VAC.

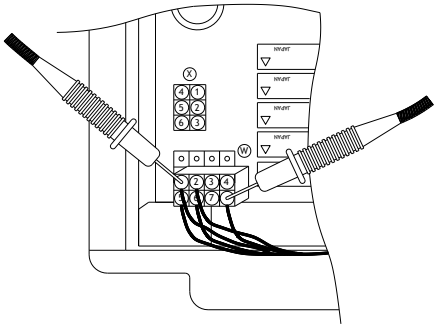
Test 9



Conduct test with water flowing.

Using a multimeter set on the DC volts scale, measure the voltage with multi-pin connector plugged into terminal W, on control PCB.

Test 11

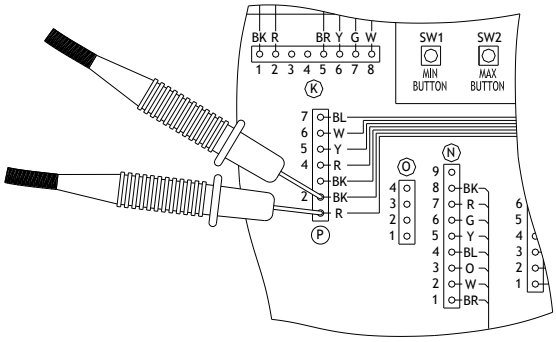


Using a multimeter set on the kilo-ohms scale, measure the resistance with multi-pin connector unplugged from terminal W, on control PCB.

Solenoid Valve	Normal Voltage	Test Point	Diagnostic Point	Solenoid Valve	Normal Resistance	Test Point	Diagnostic Point
GISV	DC75 to DC100V	1 Yellow 8 Black	10	GISV	0.8 kilo-ohms to 2.4 kilo-ohms	1 Yellow 8 Black	10
1		2 White 8 Black	12	1		2 White 8 Black	12
2		5 Red 8 Black	13	2		5 Red 8 Black	13
3		6 Blue 8 Black	18	3		6 Blue 8 Black	18

Fault Finding Tests 10 & 12 - 14

Tests 10 and 12



Test 10: Conduct test with water flowing.

Using a multimeter set on the DC volts scale, measure the voltage between 1 Red and 2 Black at terminal P whilst plugged into PCB.

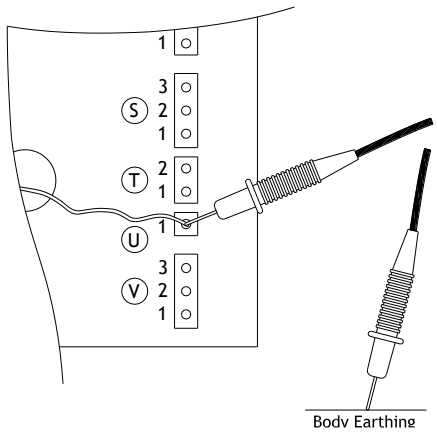
Normal voltage is between DC1.5 and 14.0V.

Test 12:

Using a multimeter set on the ohms scale, measure the resistance between 1 Red and 2 Black at terminal P whilst unplugged from the PCB.

Normal resistance is between 40 ohms and 80 ohms.

Test 13

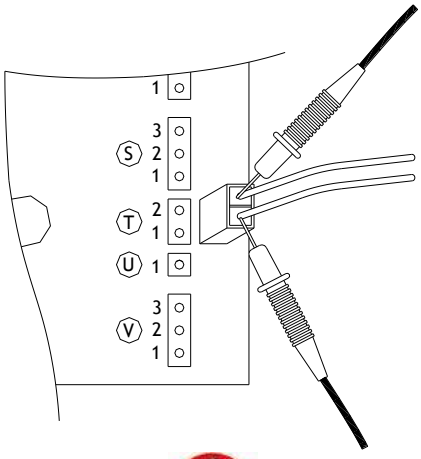


Conduct test with flame present.

Using a multimeter set on the AC volts scale, measure the voltage between W1 at terminal U and earth.

Normal voltage should be 1 - 100VAC.

Test 14



Unplug multi-pin connector from terminal T on control PCB and using a multimeter set on the kilo-ohms scale, measure the resistance of the Over Heat Limiter assembly.

Normal resistance should be between 50 - 500 kilo-ohms.

Error Code 12

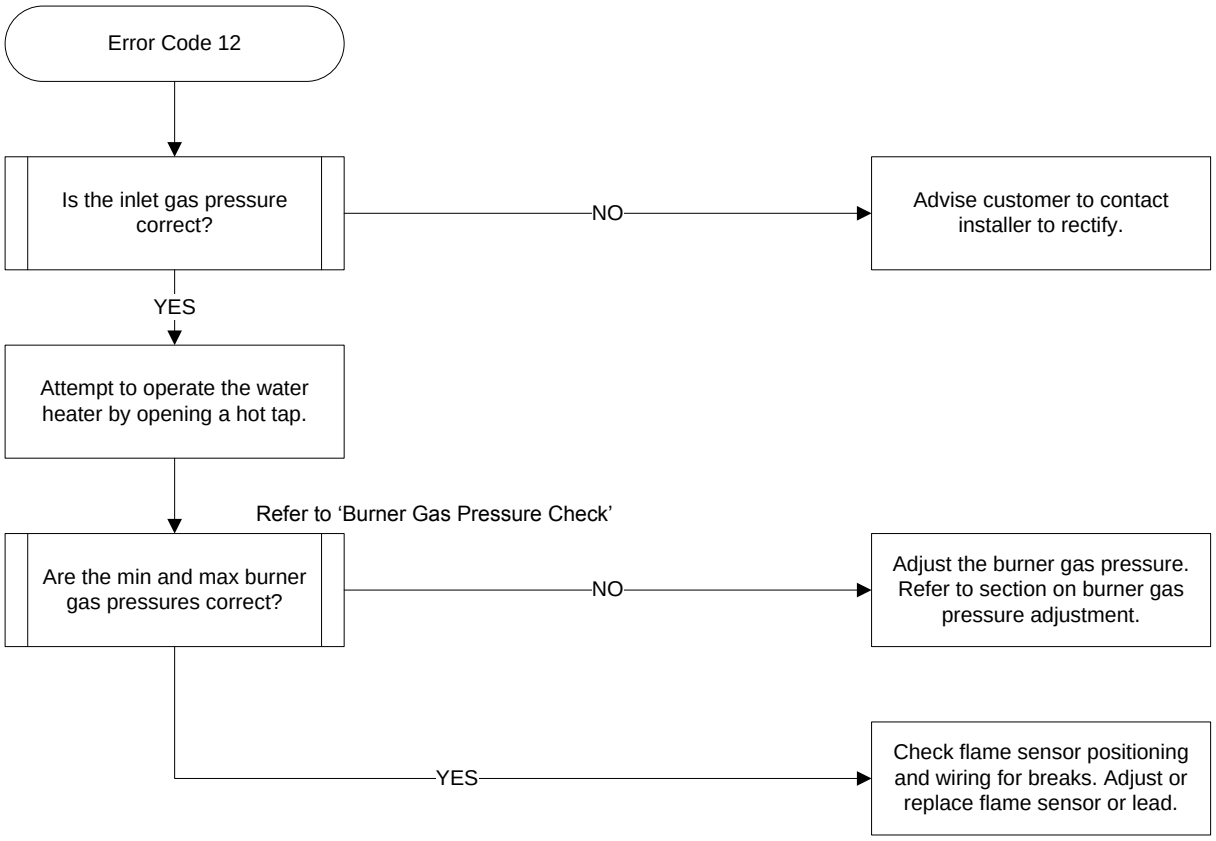
Flame Failure. Unit operated for a period of time; but has since lost flame or the ability to verify the presence of flame. At a minimum check the following in all cases:

1 Bleed all air from gas lines.

2 Ensure appliance is properly earthed.

3 Ensure gas line, meter, and regulator are sized properly.

4 Ensure gas type and gas pressure is correct.



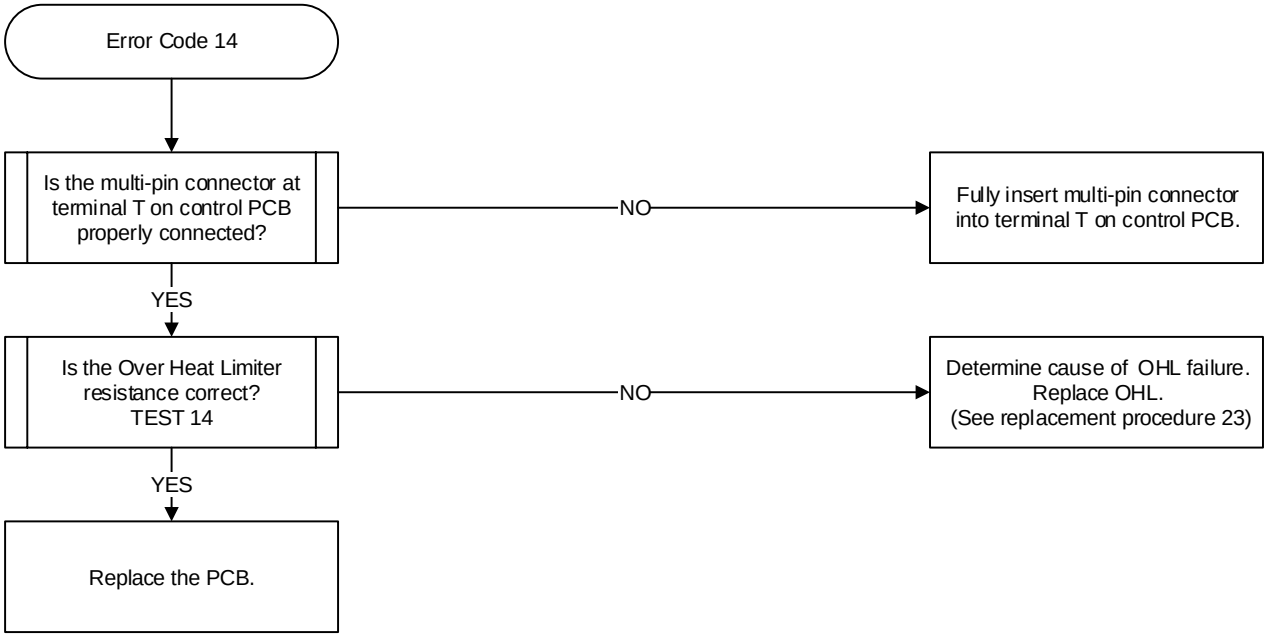
Error Code 14

Overheat Limiter has activated. There may be a hot spot on the heat exchanger that has caused the overheat limiter to fault. At a minimum check the following:

1 Check gas type of unit and ensure it matches gas type being used.

2 Check heat exchanger for cracks and/or separations.

3 Check for foreign material that may restrict airflow through the exhaust flue or terminal.

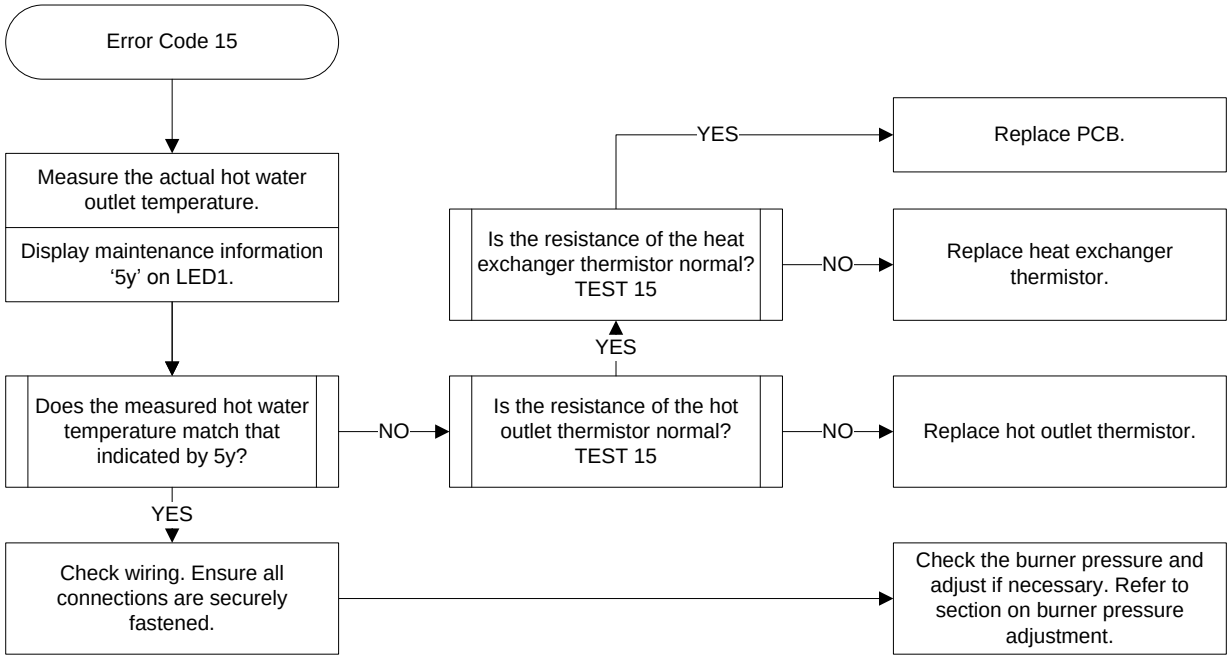


Error Code 15

Boiling Safety Device. The heat exchanger is too hot. At a minimum check the following:

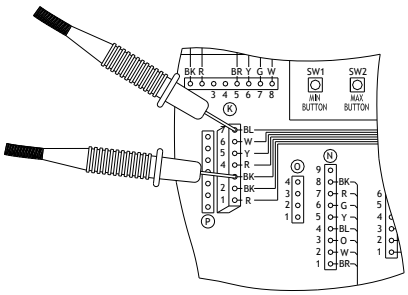
1 Check for foreign material that may restrict airflow through the exhaust flue or terminal.

2 Back flush the unit to remove any sediment build up in the heat exchanger.



Fault Finding Test 15

Test 15

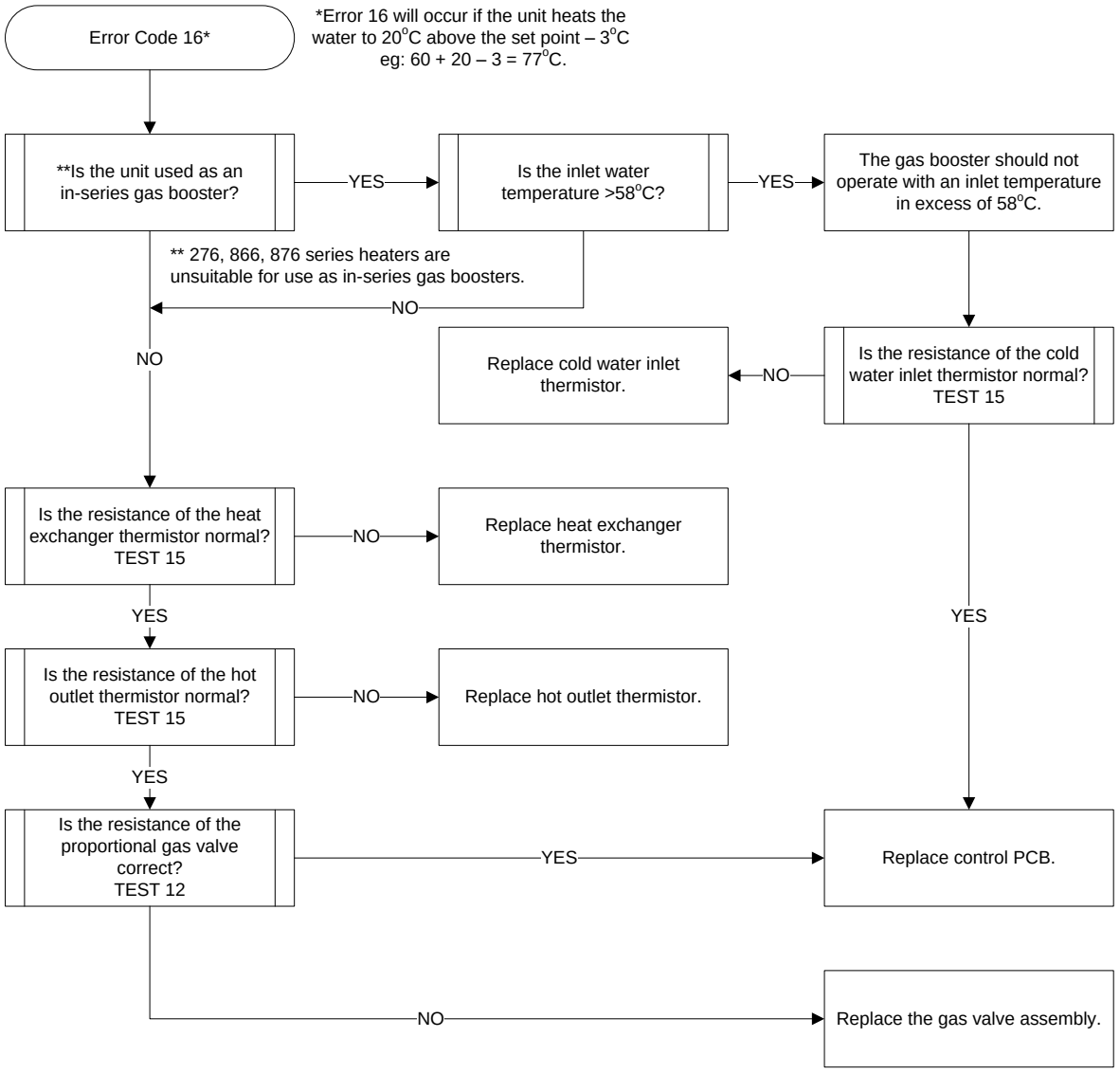


Using a multimeter set on the ohms scale, measure the resistance at terminal P whilst unplugged from the PCB.

Maintenance display code	Test Point	Measured Value
2y: Ambient Air Thermistor	7 Blue & 3 Black	@20ºC – 10.3 kilo-ohms @40ºC – 4.9 kilo-ohms
3y: Cold Inlet Thermistor	6 White & 3 Black	
4y: Heat Exchanger Thermistor	5 Yellow & 3 Black	
5y: Hot Water Outlet Thermistor	4 Red & 3 Black	

Error Code 16

Outlet water temperature is too hot.



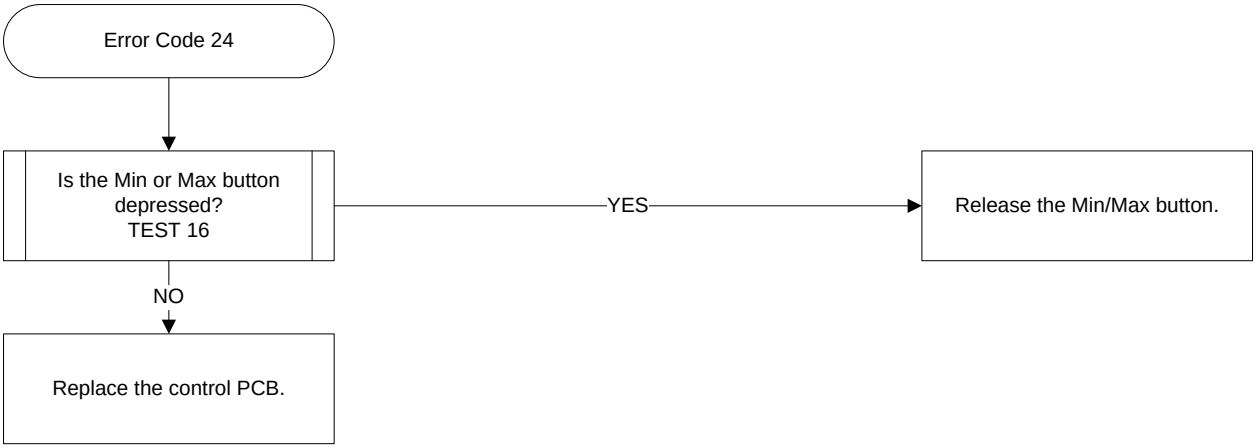
Error Code 24

Malfunction of Operational Switch. At a minimum check the following:

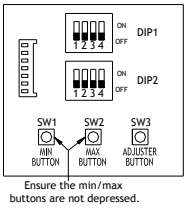
1 If fitted, disconnect remote temperature control and retry.

2 Verify unit is electrically earthed. Do not use a 2 prong electrical adapter on the power cord.

3 Check for presence of return circulation pump in the system. Any water flowing through the unit prior to turning unit ON may cause error code 24.



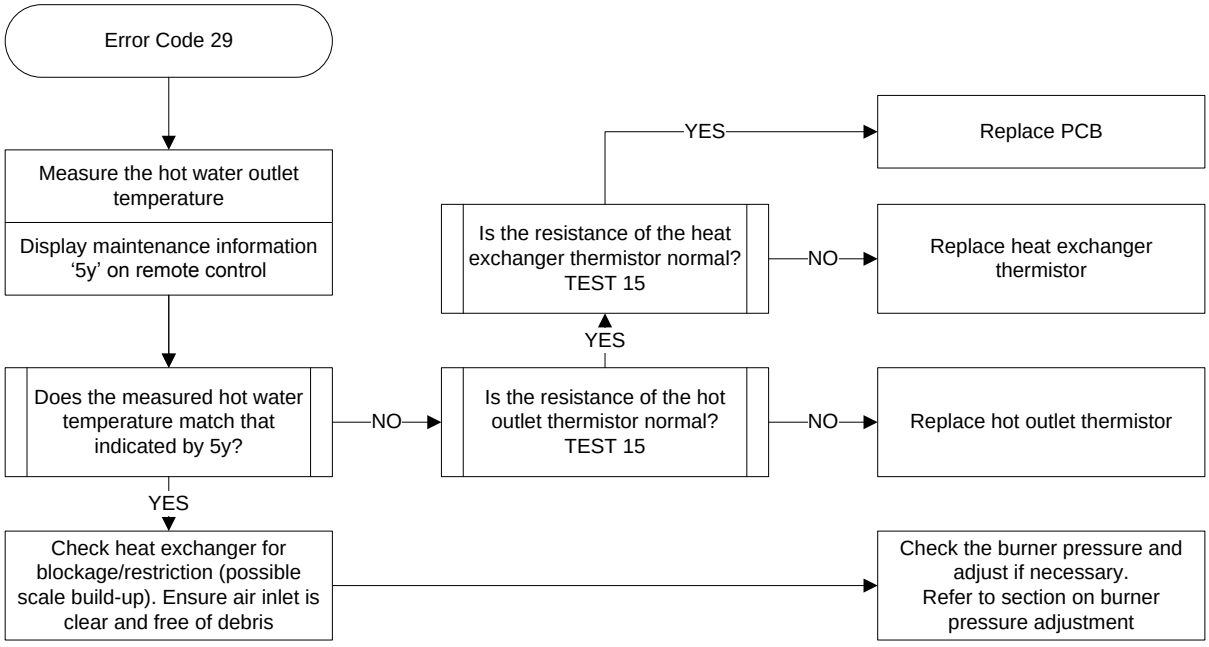
Test 16



Are the controller cables or any other cables/components inadvertently depressing the Min/Max or Adjuster buttons on PCB?

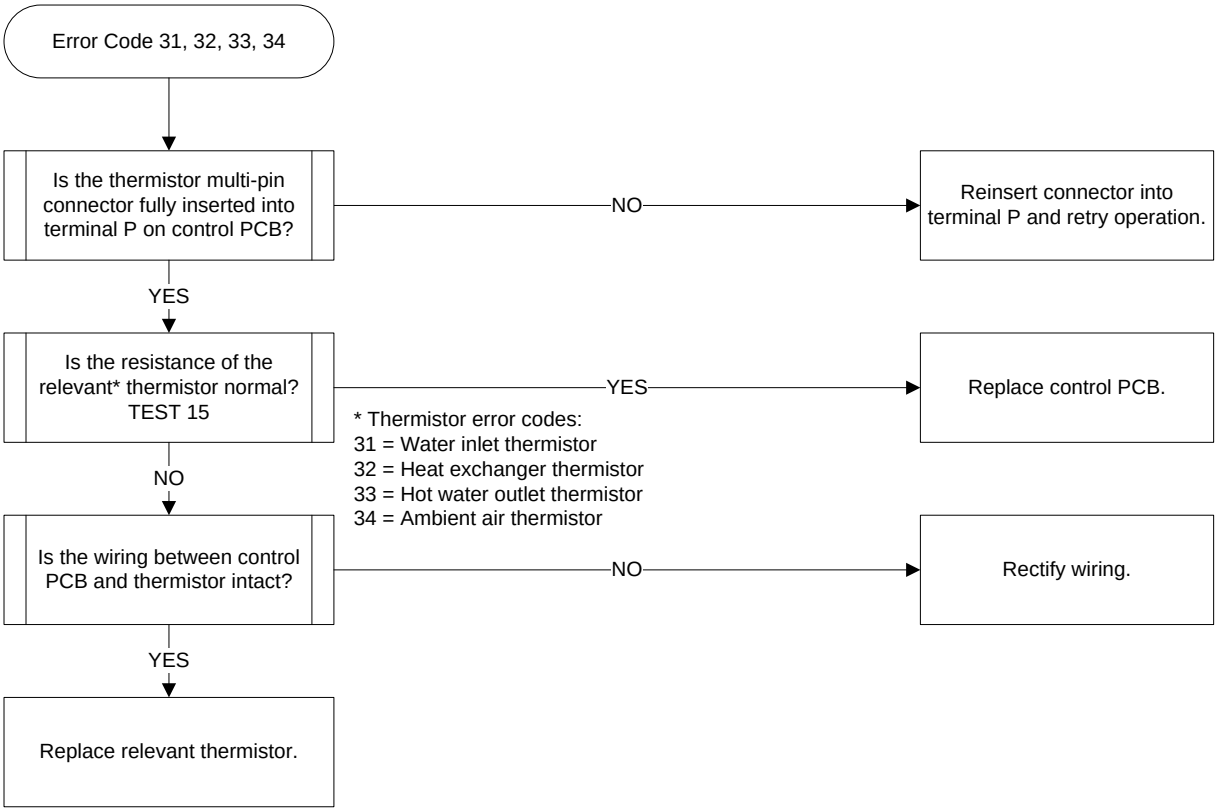
Error Code 29

Heat exchanger outlet temperature is too low.



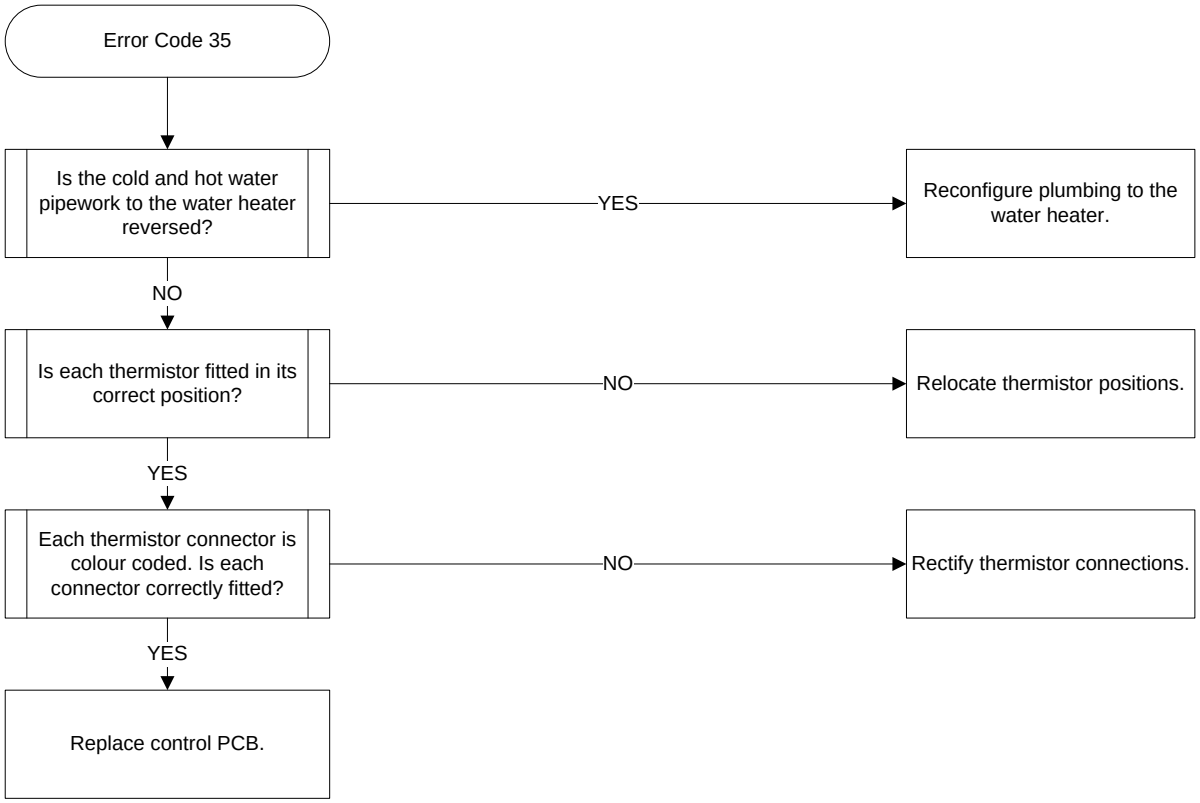
Error Code 31, 32, 33 & 34

Thermistor fault.



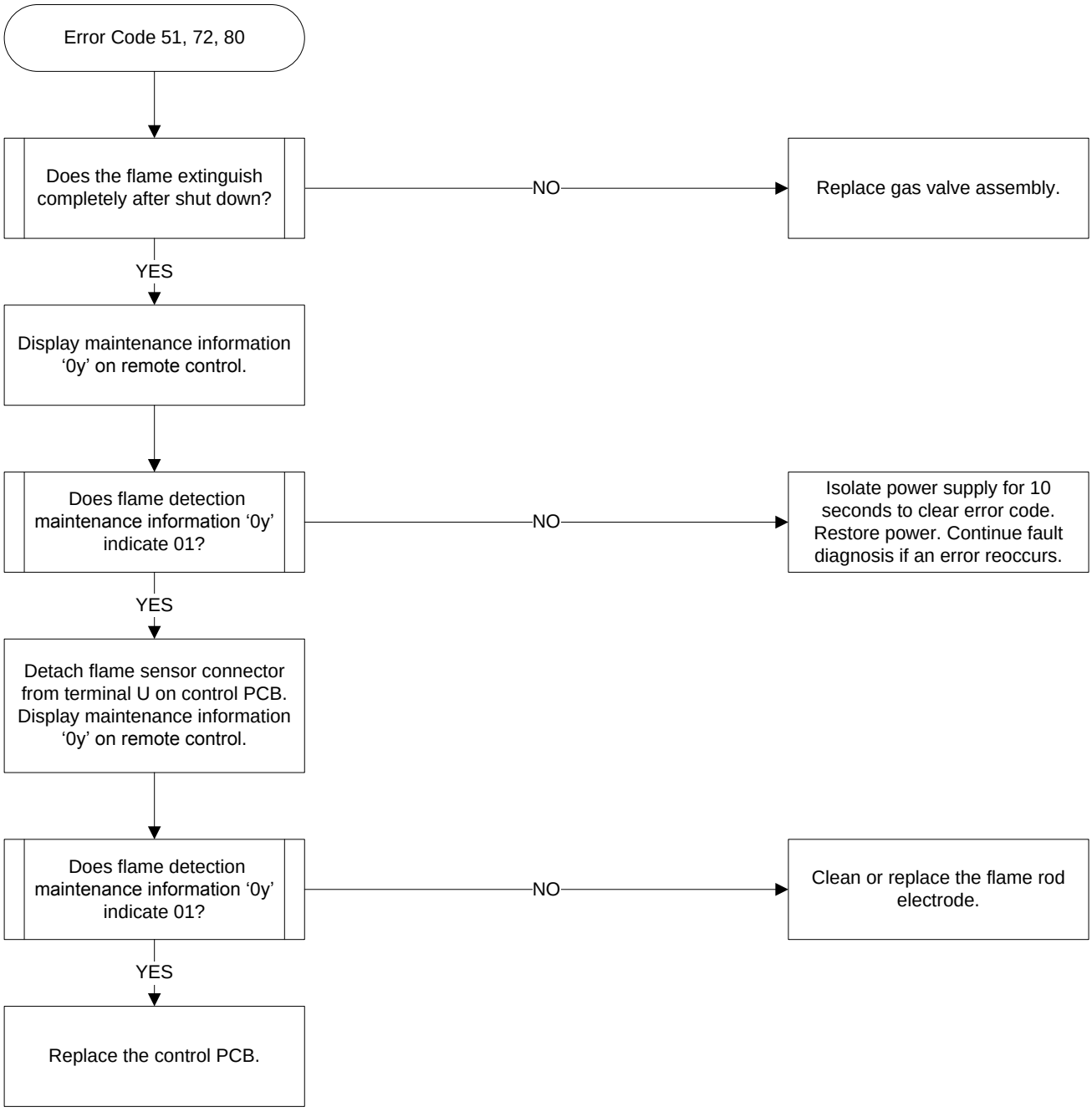
Error Code 35

Improper Thermistor Connections.



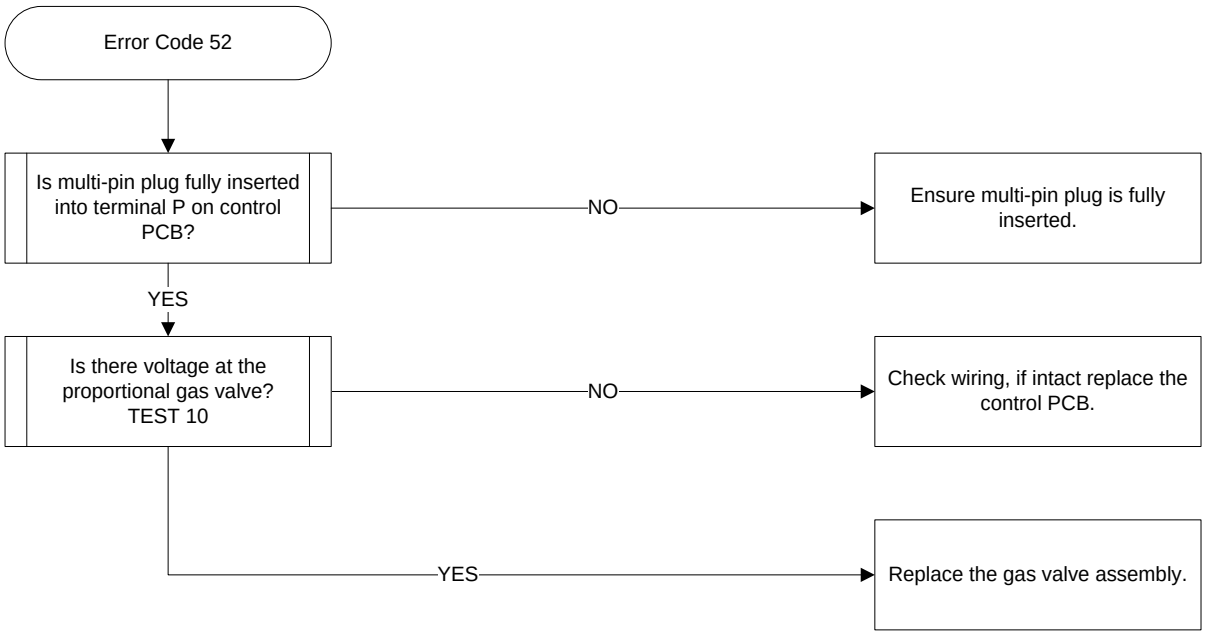
Error Code 51

False Flame Detected.



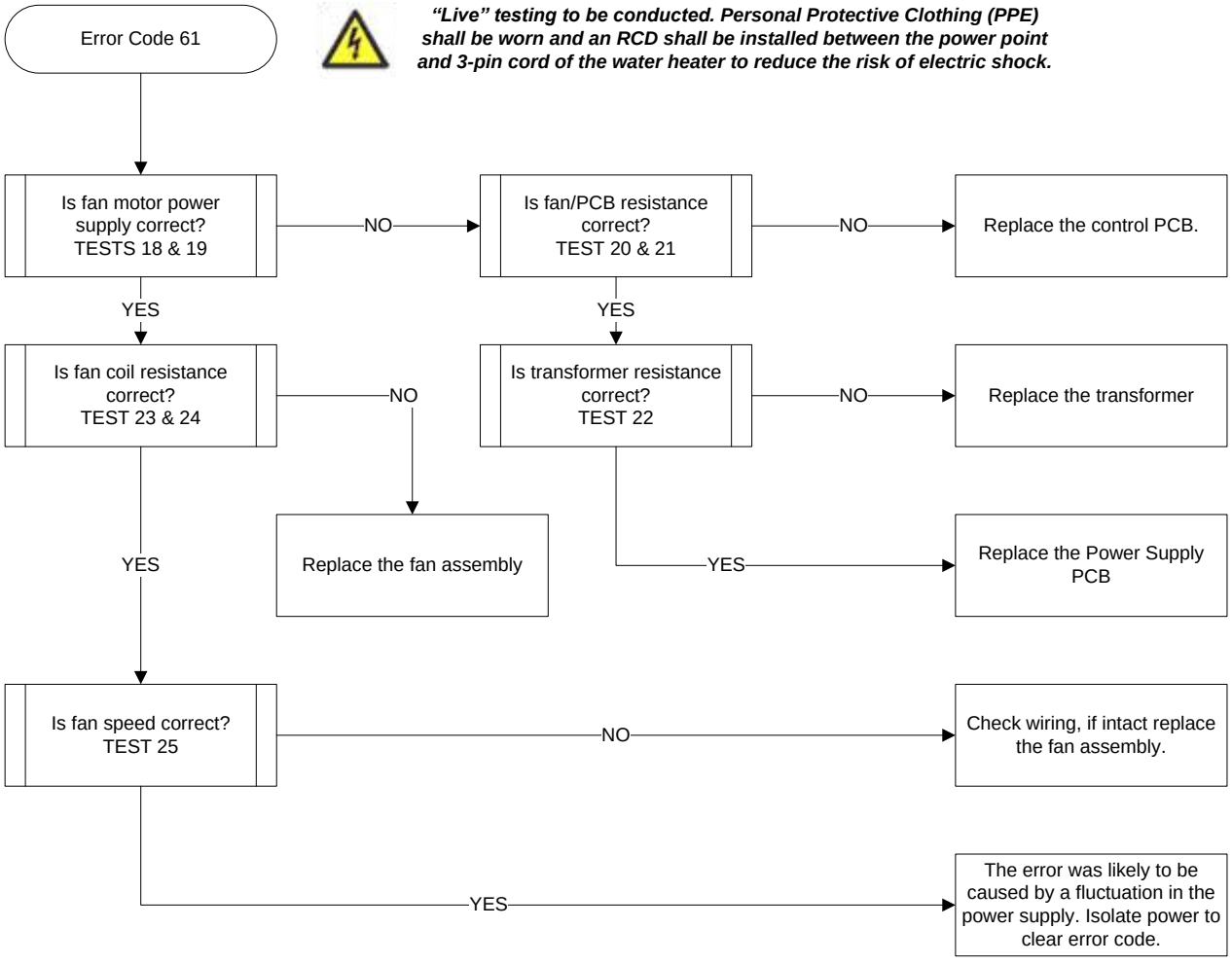
Error Code 52

Proportional Gas Flow Regulator (PGFR) Valve fault.



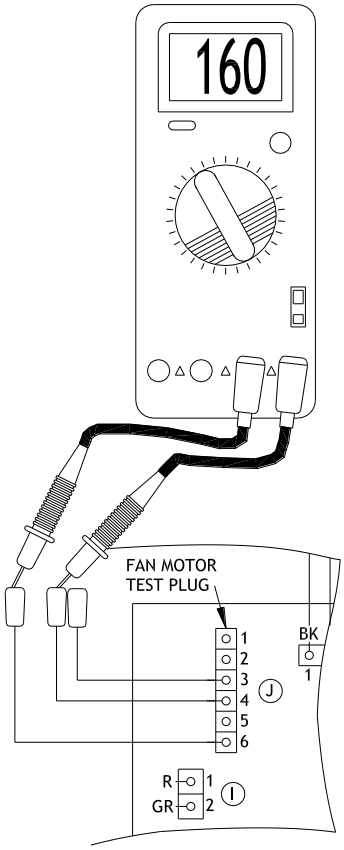
Error Code 61

Combustion fan failure.



Fault Finding Tests 18 - 21

Tests 18 & 19



Conduct test with water & gas isolated

Ensure power is off whilst disconnecting the fan plug (connector J) from control PCB.

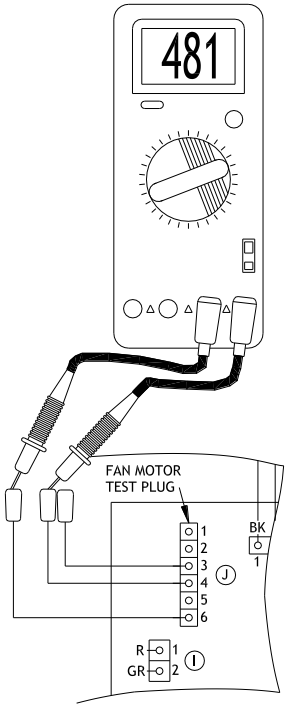
Using a multimeter set on the DC volts scale, insert the multimeter test probes into the test points, as listed below for the specific test being undertaken.

Reapply power to water heater. Once initialisation period has expired (~2mins) depress MIN (SW1) or MAX (SW2) button to initiate fan operation.

Test measurements are to be as follows:

Test	Check Point	Measured Value
18	6 Red – 4 Black (Indoor)	DC144 - 192V
	6 White – 4 Blue (Outdoor)	
19	3 White – 4 Black (Indoor)	DC12 - 18V
	3 Red – 4 Blue (Outdoor)	

Test 20 & 21



Disconnect the fan plug (connector J) and power plug (connector I) from control PCB.

Using a multimeter set on the kilo-ohms scale, insert the multimeter test probes into the test points, as listed below for the specific test being undertaken.

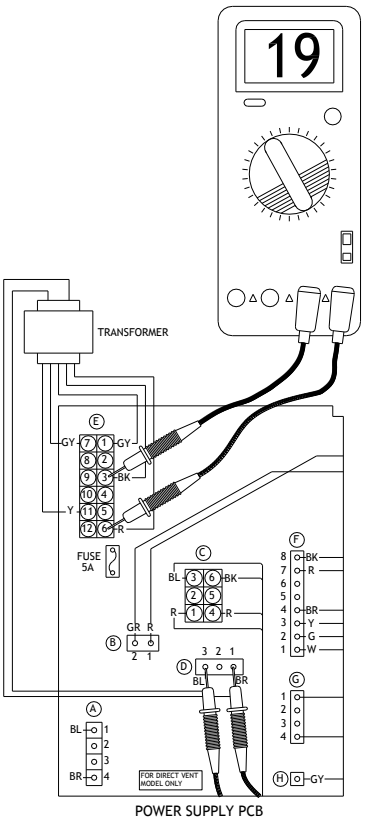
Test measurements are to be as follows:

Test	Check Point	Measured Value
20	6 Red – 4 Black (Indoor)	481 kΩ (+/- 5%)
	6 White – 4 Blue (Outdoor)	
21	3 White – 4 Black (Indoor)	8.1 kΩ (+/- 5%)
	3 Red – 4 Blue (Outdoor)	

NOTE: Short circuit at test point 20 will damage the transformer and a short circuit at test point 21 will damage the fan.

Fault Finding Tests 22 – 24

Test 22



This test will require access to the Power Supply PCB. The Power Supply PCB is mounted on the rear of the Control PCB. Disconnect the 4 x mounting screws, all plugs and harnesses from the Control PCB to enable the complete PCB assembly to be rotated in order to gain access to the Power Supply PCB.

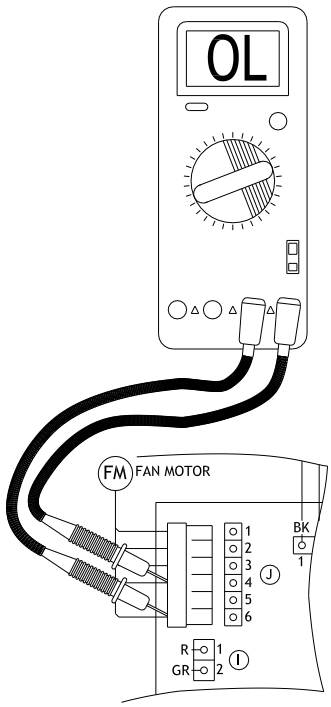
Locate connector D and E on Power Supply PCB. Remove the protective covers from each connector to enable clear access for multimeter test probes.

Using a multimeter set on the ohms scale, conduct the four tests listed below by inserting the multimeter test probes into the test points as listed.

Test measurements are to be as follows:

Plug	Check Point	Measured Value	
		Outdoor	Indoor
E	6 Red – 3 Black	5 - 8Ω	3 - 6Ω
E	11 Yellow – 3 Black	7 - 11Ω	5 - 8Ω
E	1 Grey – 7 Grey	12 - 18Ω	10 - 16Ω
D	1 Brown – 3 Blue	16 - 22Ω	10 - 14Ω

Test 23 & 24



Disconnect the fan plug (connector J) from control PCB.

Remove the protective covers from connector J to enable clear access for multimeter test probes.

Using a multimeter set on the kilo-ohms scale, insert the multimeter test probes into the test points as listed below for the specific test being undertaken.

Test measurements are to be as follows:

Test	Check Point	Measured Value
23	6 Red – 4 Black (Indoor)	Open Circuit
	6 White – 4 Blue (Outdoor)	
24	3 White – 4 Black (Indoor)	34 - 37 kΩ (+/- 5%)
	3 Red – 4 Blue (Outdoor)	

NOTE: Short circuit at test point 23 will damage the transformer and a short circuit at test point 24 will damage the PCB.

Fault Finding Test 25

Test 25

Conduct test with water & gas isolated

Ensure power is off whilst confirming the fan wiring is securely in place.

Reapply power to water heater. Once initialisation period has expired (~2mins) enter heater maintenance mode and display 6Y (fan speed in RPM). Lock this code by turning Dip switch 2 on DIP1 set of switches 'ON'.

Depress and hold MIN (SW1) button to initiate low fire fan operation and use table below to confirm fan speed is correct.

Depress and hold MAX (SW2) button to initiate high fire fan operation and use table below to confirm fan speed is correct.

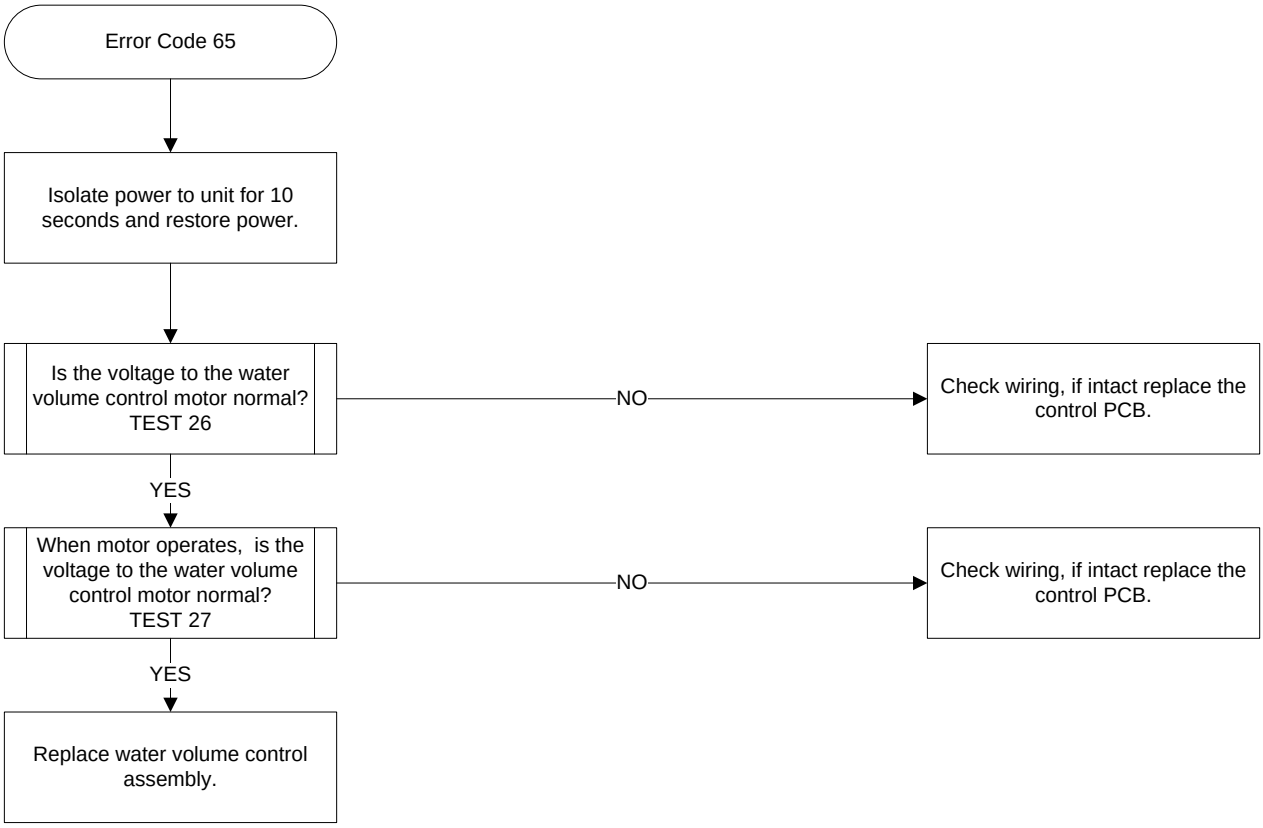
Fan speeds are to be as follows:

5 Star Models	Sea Level		1000 – 2000 Metres		2001 – 3000 Metres	
Model	MIN	MAX	MIN	MAX	MIN	MAX
27L Ext NG	2700	6700	2900	7100	3100	7500
27L Int NG	2700	6050	2819	6250	2984	6650
27L Ext Prop	2800	6600	3000	7000	3200	7400
27L Int Prop	2630	6400	2768	6800	2932	7300

6 Star Models	Sea Level		1000 – 2000 Metres		2001 – 3000 Metres	
Model	MIN	MAX	MIN	MAX	MIN	MAX
27L Ext NG	3200	6400	3400	6800	3600	7200
27L Int NG	3000	6800	3200	7250	3350	7600
27L Ext Prop	3200	6650	3400	7050	3600	7450
27L Int Prop	3250	6750	3450	7150	3650	7550

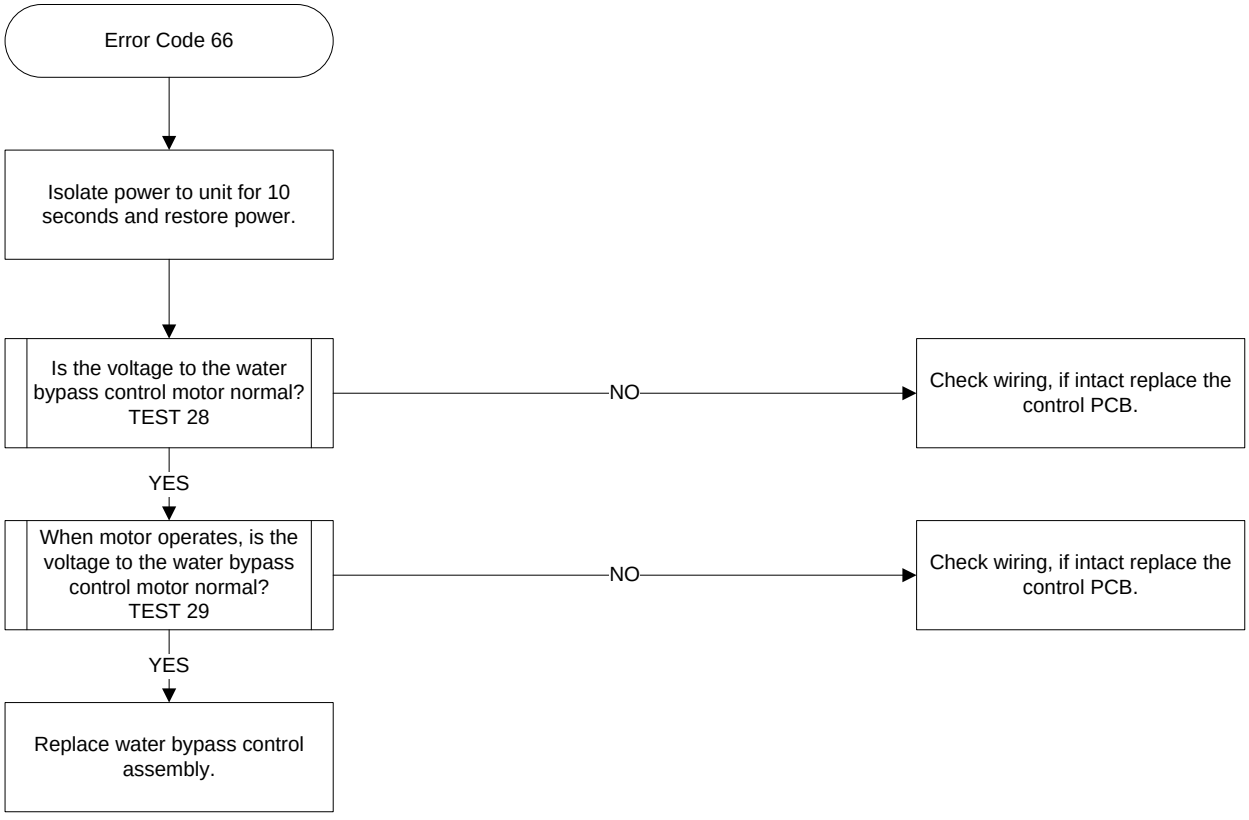
Error Code 65

Water Volume Control Motor fault (Water Body Assembly)

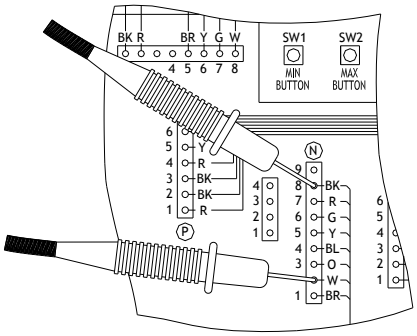
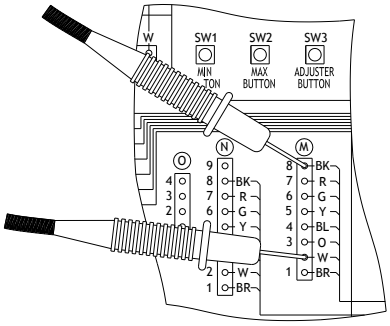


Error Code 66

Water Bypass Control Motor fault.

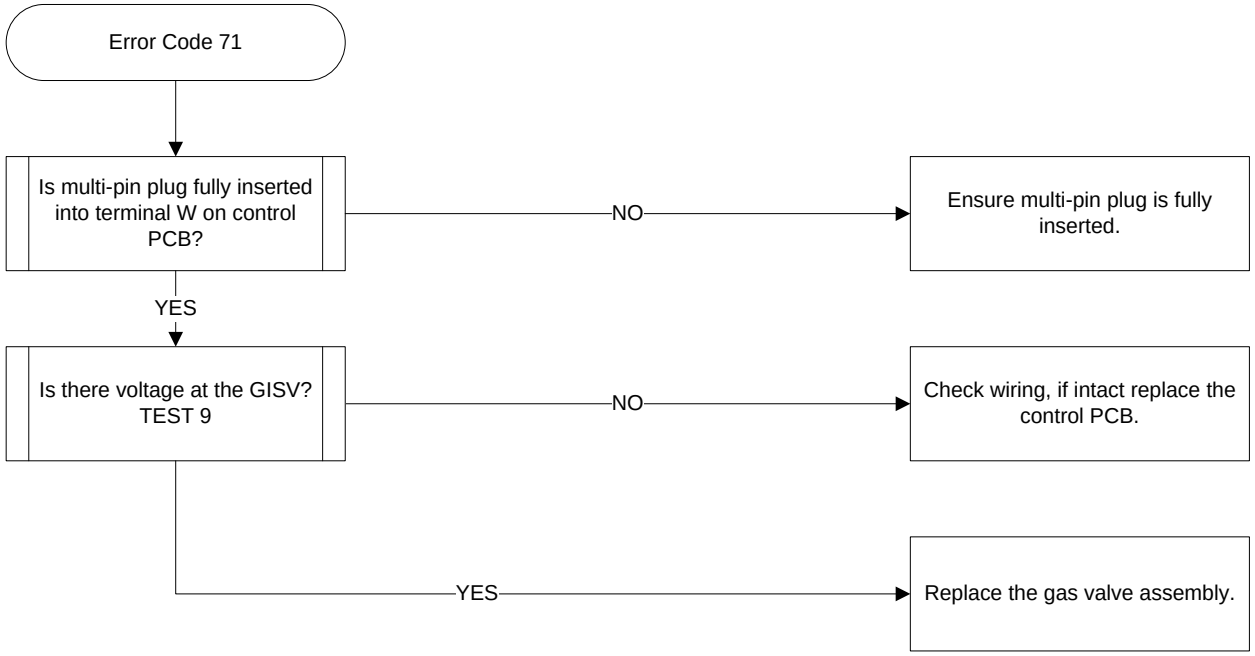


Fault Finding Tests 26 - 29

Test 26 & 27			Test 28 & 29		
					
Conduct test with water flowing Using a multimeter set on the DC volts scale, measure the voltage at connector N whilst plugged into PCB.			Conduct test with water flowing Using a multimeter set on the DC volts scale, measure the voltage at connector M whilst plugged into PCB.		
Test	**Check Point**	**Measured Value**	**Test**	**Check Point**	**Measured Value**
26	7 Red - 8 Black	DC8 – 16V	28	7 Red - 8 Black	DC8 – 16V
27	2 White - 8 Black	DC8 – 16V	29	2 White - 8 Black	DC8 – 16V

Error Code 71

Gas Inlet Solenoid Valve (GISV) fault.

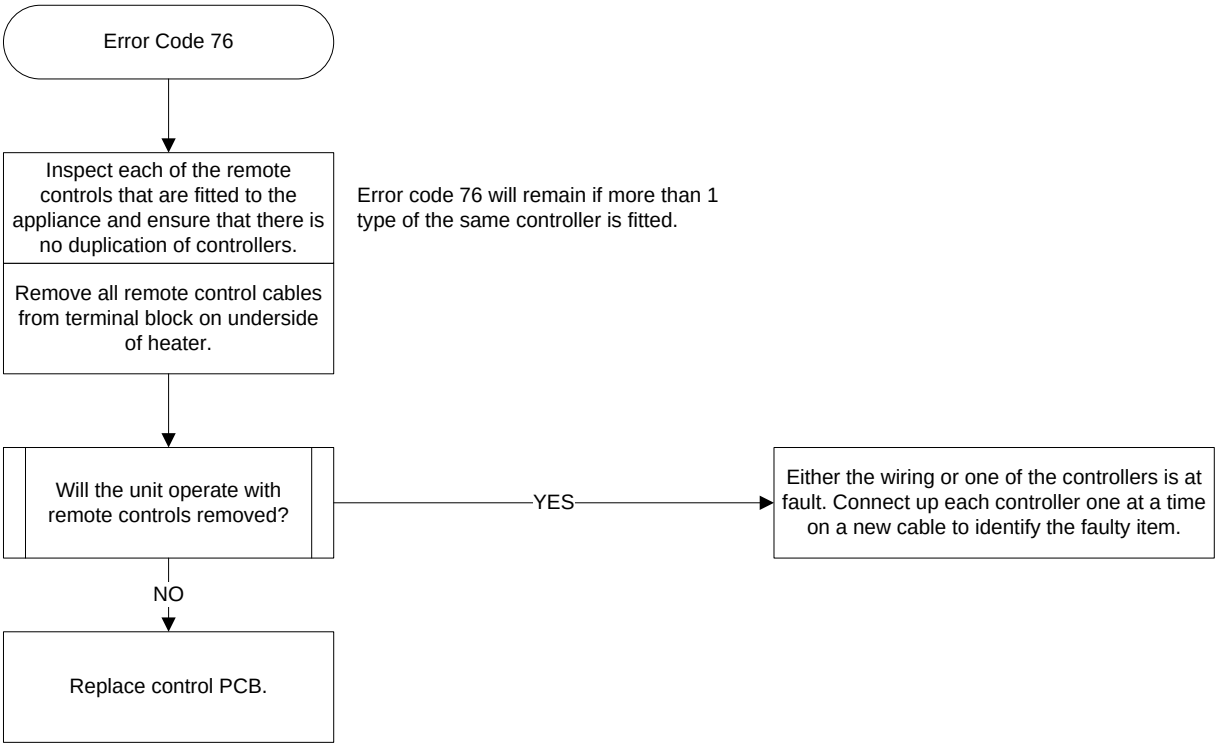


Error Code 72

Follow the same procedure as used in Error Code 51.

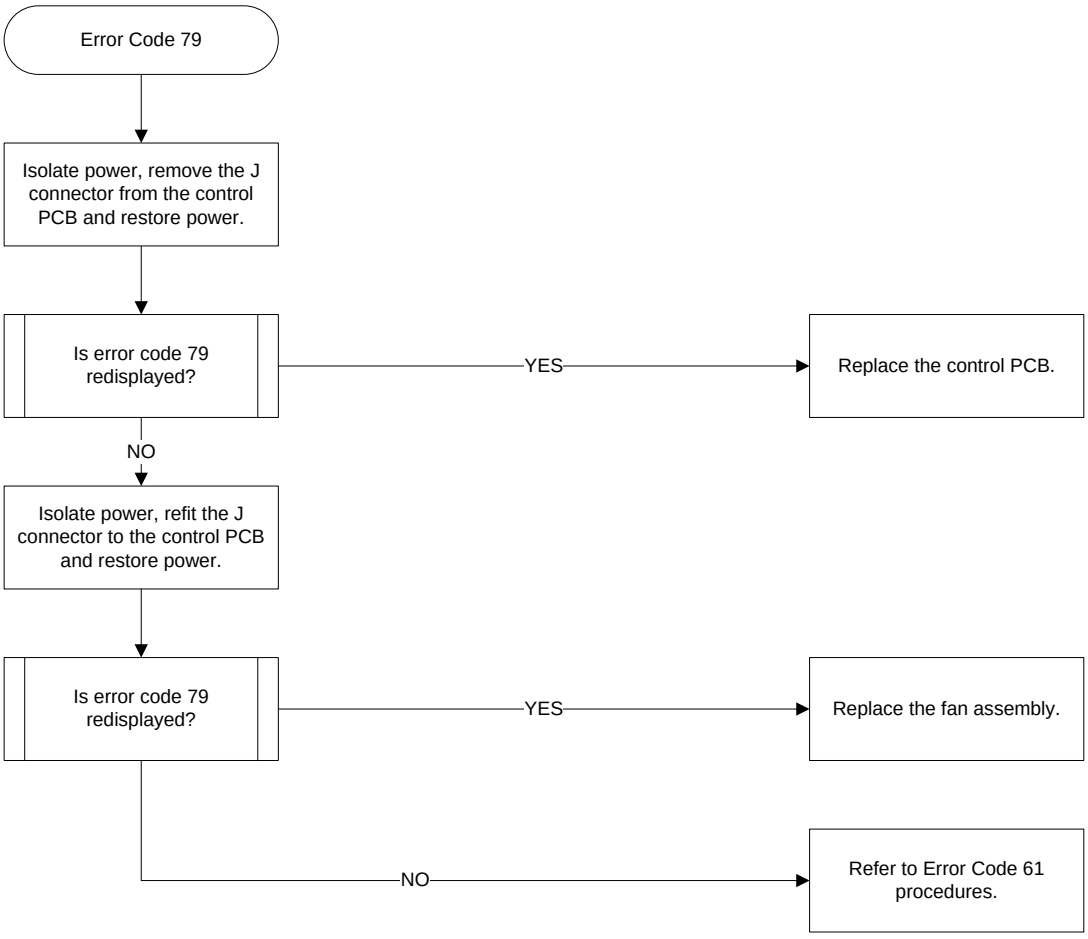
Error Code 76

Communication fault with remote temperature control



Error Code 79

Fan Motor Current Fault

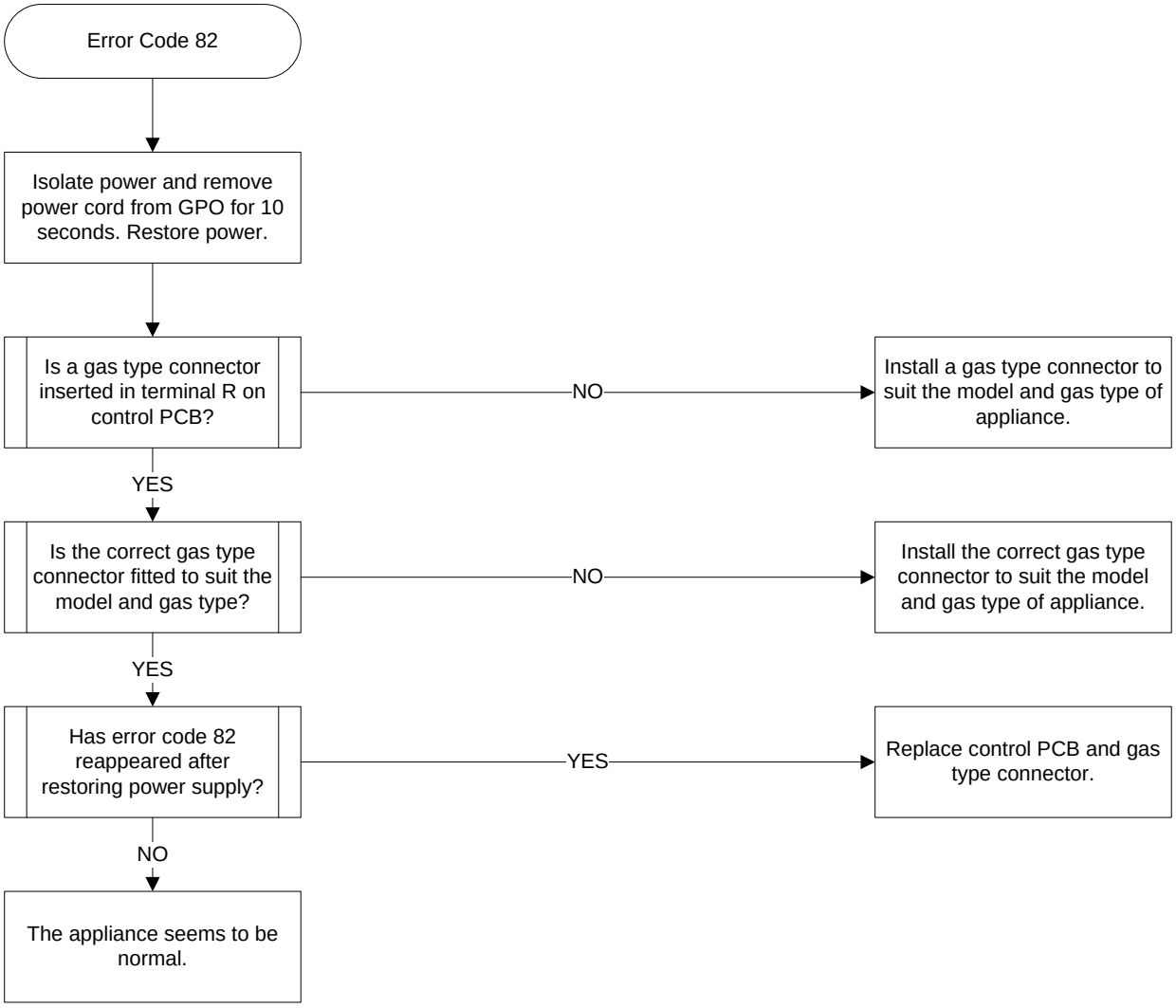


Error Code 80

Follow the same procedure as used in Error Code 51.

Error Code 82

Gas Type Control Data Failure.



Error Code 90

Indoor Models: Blocked Flue. The fluing system has failed the pre-purge test. At a minimum check the following:

1 Ensure maximum vertical vent length and elbows do not exceed allowable limits.

2 Ensure maximum horizontal vent length and elbows do not exceed allowable limits.

3 Ensure entire vent structure is clear of any obstructions.

4 Remove all obstructions. Check the flue termination on the outside of the building and the flapper valve at the top of the heat exchanger.

5 Temporarily disconnect the flue structure from the water heater. If this fixes the problem, then the issue lies in the fluing. If this does not fix the problem, then the issue lies in the fan motor or PCB.

Error Code 99 / Warning Code 10

Fan Motor is not creating enough ventilation. The fluing system passed pre-purge, but has failed during normal operation. At a minimum check the following:

1 Check for blockage of heat exchanger fins.

2 Check heat exchanger flapper valve at vent connection of water heater moves freely.

3 Clean air intake filter.

4 Remove all obstructions. Check the flue termination on the outside of the building and the flapper valve at the top of the heat exchanger.

5 Temporarily disconnect the flue structure from the water heater. If this fixes the problem, then the issue lies in the fluing. If this does not fix the problem, then the issue lies in the fan motor or printed circuit board.

Warning Code P1

Water flow rate is less than minimum for main burner ignition. The unit must have 2.5 litres per minute before the main burner will light or sustain burner. When water flow does not reach minimum flow rate for five seconds the warning code is displayed. At a minimum check the following:

1 Check cold water inlet strainer for debris.

2 Check fixture aerator strainer for debris.

Noisy Operation

Internal Models – As the unit is a room sealed heater the air supply for combustion is delivered via the coaxial flue. Ensure that the correct Rheem approved coaxial fluing has been fitted. If the Rheem approved coaxial flue is not fitted the unit may be starved of oxygen and excessive vibration/noise will be generated.

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:

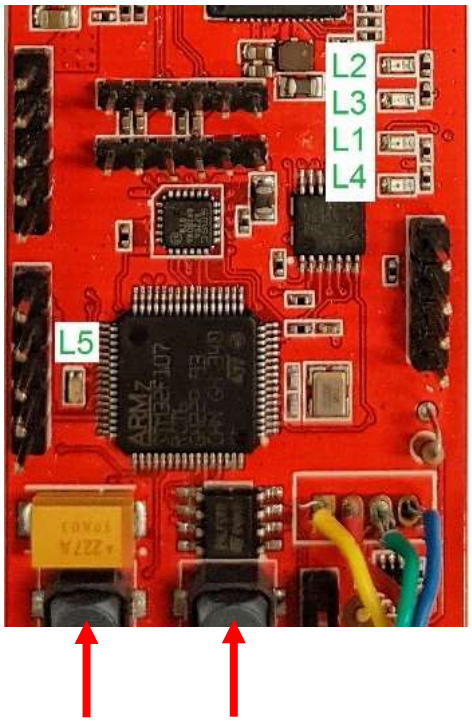
PLT LED	LED OFF	LED Flashing
Ethernet	CF water heater is not switched on	Ensure 4 pin plug from EziSET is connected to terminal O of CF PCB
Data	Ethernet cable is not connected. Router switched off	Normal Mode - data exchange
Power	GPO is not switched on or PLT is not plugged in.	Pairing Mode*

* 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.

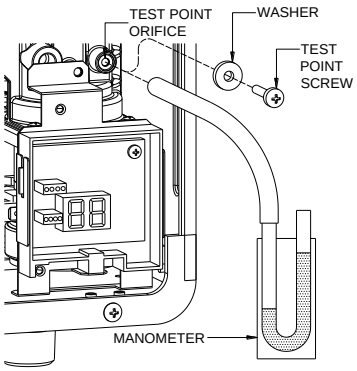
LED 5 (L5) – Dual LED (Green and Red)

- **Green LED (flashing)** – Normal. Program running
- **Red LED:**
  - Solid Red - 4-pin plug from EziSET® PCB is not connected to the CF PCB (terminal O)
  - 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 & ADJUSTMENT

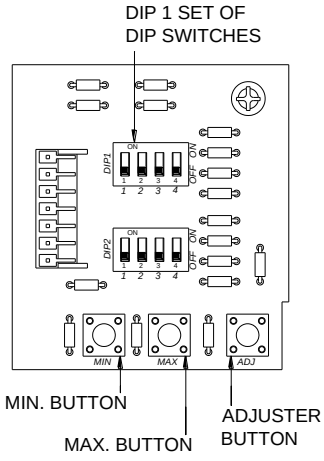
Voltages up to 240 volts will be present within the water heater, take care not to touch wiring terminals. Use an insulated tool when operating the DIP switch or MIN and MAX buttons.

Minimum Burner Gas Pressure



1. Ensure all hot taps are closed.
2. Disconnect the remote temperature controller cables (if fitted) from terminal block on underside of heater cabinet.
3. Remove the front cover from the water heater.
4. Locate the burner pressure test point on the burner manifold.
5. Remove the test point screw and fit manometer.
6. Open a hot tap slowly, to achieve the minimum flow rate at which the burners will ignite.
7. Press and hold the MIN button ("1L" is shown on the LED display) and observe the reading on the manometer.
8. Release the MIN button. If the reading observed in step 7 matches the minimum gas pressure indicated on the rating label no further adjustment is required.
9. To adjust minimum gas pressure, press and hold the adjuster button ("LH" is shown on the LED display). **Note:** The adjuster button must be held down through steps 9 to 12.
10. Press and hold the MIN button and observe the reading on the manometer.
11. Release the MIN button when the pressure indicated on the manometer matches the minimum gas pressure listed on the rating label.
12. Release the adjuster button.

Maximum Burner Gas Pressure



13. Open the hot water tap fully to allow the water heater to ignite at maximum operating flow. Multiple outlets may need to be opened in order to achieve maximum water flow.
14. Press and hold the MAX button ("3H" is shown on the LED display) and observe the reading on the manometer.
15. Release the MAX button. If the reading observed in step 14 matches the maximum gas pressure indicated on the rating label no further adjustment is required.
16. To adjust maximum gas pressure, press and hold the adjuster button ("LH" is shown on the LED display). **Note:** The adjuster button must be held down through steps 16 to 19.
17. Press and hold the MAX button and observe the reading on the manometer.
18. Release the MAX button when the pressure indicated on the manometer matches the maximum gas pressure listed on the rating label.
19. Release the adjuster button and turn the hot tap/s off.
20. Remove manometer, refit the test point screw ensuring the seal is gas tight, reconnect remote controllers if disconnected in step 2 and refit the front cover to the water heater.

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

NOTE: If the burners extinguish or an error code appears during this procedure, release the buttons, close the hot tap, clear the error code and recommence the procedure from step 5.

COMPONENT REPLACEMENT PROCEDURES

Front Cover: (Procedure 1)

1. ***Isolate power, gas and water supplies.***
2. Remove four screws, two from the top and two from the bottom of the front panel.
3. Remove the front panel.

Control PCB: (Procedure 2)

1. ***Isolate power supply.***
2. Remove the front cover. Refer to procedure 1.
3. Remove the screw retaining the power cord to the bottom left hand side of heater cabinet.
4. Remove the two retaining screws at top right and bottom left hand side of the PCB.
5. Disconnect the multi-pin connectors from the PCB Assembly.
6. Carefully lift the right hand side of the PCB and remove PCB assembly.
7. Reassembly in reverse order of above.

   Note: When replacing a PCB it is important to ensure that the correct PCB is installed as fitment of an incorrect PCB will result in unit malfunction. There are two PCB options available and the correct type to use is dependent on the type of water body assembly that is installed i.e. if the water body has a black plug on the flow sensor wiring loom, the PCB must have a matching black socket, refer TB18-001 for further details.

Power Supply PCB: (Procedure 3)

1. ***Isolate power supply.***
2. Remove the front cover and control PCB. Refer to procedures 1 and 2.
3. Remove the four screws that are retaining the PCB housing. Two from the top of the PCB housing and two from the underside of the heater cabinet.
4. Remove the screw retaining the earth lead to the bottom left hand side of heater cabinet.
5. Disconnect the wiring harness mounted on the right hand side of PCB housing.
6. Carefully lift the top of the PCB housing to expose the power supply PCB.
7. Disconnect the multi-pin connectors from the power supply PCB Assembly and remove power supply PCB from heater cabinet.
8. Reassembly in reverse order of above.

OK Monitor & Plate: (Procedure 4)

1. ***Isolate power supply.***
2. Remove the front cover. Refer to procedure 1.
3. Remove the two multi-pin connectors from LED display.
4. Remove three retaining screws (one from top at Gas valve and two from underside of heater cabinet).
5. Undo the two wiring harnesses to free wires and remove LED display.
6. Reassembly in reverse order of above.

Burner Cover Plate: (Procedure 5)

1. ***Isolate power and gas supplies.***
2. Remove the front cover. Refer to procedure 1.
3. Open the Over Heat Limiter sheet (OHL) to expose burner plate cover and heat exchanger.
4. Remove the fourteen screws retaining the burner cover plate.
5. Remove the burner plate cover.
6. Reassemble in reverse order of above. Replace gaskets if required.
7. Position the Overheat Limiter correctly as per step 6 of procedure 23 on page 76.

Gas Manifold Assembly: (Procedure 6)

1. ***Isolate power and gas supplies.***
2. Remove the front cover and burner cover plate. Refer to procedures 1 and 5.
3. Disconnect the connector with two red wires from base of igniter on bottom right hand side of manifold assembly.
4. Remove igniter from manifold assembly by removing screw on right hand side of igniter.
5. Disconnect white wire from flame sensor at top left hand side of manifold assembly.
6. Remove six screws that retain the manifold assembly to the gas valve and burner assembly (one at top left hand side and one at top right hand side of manifold and four at gas valve assembly on bottom right hand side of manifold).
7. Lift the burner manifold up to remove from heater cabinet.
8. Reassemble in reverse order of above. **NOTE:** Ensure wiring to igniter and flame sensor is not pinched during reassembly. Ensure the three gaskets on gas valve assembly are intact and correctly fitted.
9. Position the Overheat Limiter correctly as per step 6 of procedure 23 on page 76.
10. Test for gas leaks using soapy water solution.

Burner Assembly: (Procedure 7)

1. ***Isolate power and gas supplies.***
2. Remove the front cover, burner cover plate and gas manifold assembly. Refer to procedures 1, 5, and 6.
3. Remove the rubber gland and white flame rod wire from the left hand side of lower combustion chamber.
4. Remove the rubber gland and black ignition lead from the right hand side of lower combustion chamber.
5. Remove the burner assembly by sliding forward out of the lower combustion chamber.
6. Reassemble in reverse order of above. **NOTE:** Ensure wiring to igniter and flame sensor is not pinched during reassembly. Ensure the three gaskets on gas valve assembly are intact and correctly fitted.
7. Position the Overheat Limiter correctly as per step 6 of procedure 23 on page 76
8. Test for gas leaks using soapy water solution.

Flame Sensor: (Procedure 8)

1. ***Isolate power and gas supplies.***
2. Remove the front cover, burner cover plate and gas manifold assembly. Refer to procedures 1, 5, and 6.
3. Remove the protective silicon tube from flame sensor mounted on the front left hand side of burner assembly.
4. Remove retaining screw from flame sensor holder and remove flame sensor.
5. Reassemble in reverse order of above. **NOTE:** Ensure wiring to igniter and flame sensor is not pinched during reassembly. Ensure the three gaskets on gas valve assembly are intact and correctly fitted.
6. Position the Overheat Limiter correctly as per step 6 of procedure 23 on page 76.
7. Test for gas leaks with soapy water solution.

Power cord: (Procedure 9)

1. ***Isolate power and unplug power cord from power point.***
2. Remove the front panel. Refer to procedure 1.
3. Undo cord clamp screw located on bottom left hand side of PCB and remove clamp.
4. Disconnect Earth connection at PCB housing.
5. Disconnect the power cable wiring loom plug and withdraw power cable through slot in heater jacket.
6. Reassemble in reverse order of above.

Proportional Gas Flow Regulating Valve: (Procedure 10)

1. ***Isolate power and gas supplies.***
2. Remove the front cover, OK monitor and plate, burner cover plate and gas manifold assembly. Refer to procedures 1, 4, 5, and 6.
3. Disconnect the gas supply pipe from the gas inlet connection.
4. Remove the three silver screws from the gas inlet connector on the underside of the heater cabinet. Gently pull the gas inlet connector to remove.
5. Carefully remove the proportional gas flow regulating valve (PGFR) from the water heater.
6. Disconnect the multi-pin wiring plugs from the gas inlet solenoid valve (GISV), the proportional gas flow regulating valve (PGFR) and solenoid valves 1, 2 & 3.
7. ***Indoor Models Only:*** Remove the screw that retains the air balancing tube on the bottom left hand side of PGFR. Remove air balancing tube.
8. Reassemble in reverse order of above. Ensure the three gaskets on gas valve assembly are intact and correctly fitted (replace gaskets if required).
9. Test for gas leaks with soapy water solution.

Ignition Electrode: (Procedure 11)

1. ***Isolate power and gas supplies.***
2. Remove the front cover, burner cover plate, gas manifold assembly and burner assembly. Refer to procedures 1, 5, 6 and 7.
3. Remove the burner assembly by sliding forward out of the lower combustion chamber.
4. Remove the protective silicon tube from the ignition electrode mounted on right hand side of burner assembly.
5. Remove retaining screw from ignition electrode holder and remove electrode.
6. Reassemble in reverse order of above. **NOTE:** Ensure wiring to igniter and flame sensor is not pinched during reassembly. Ensure the three gaskets on gas valve assembly are intact and correctly fitted.
7. Position the Overheat Limiter correctly as per step 6 of procedure 23 on page 76.
8. Test for gas leaks with soapy water solution.

Water Bypass Control Assembly: (Procedure 12)

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. ***Isolate power and water supplies.***
2. Unscrew the water drain plug and pressure relief valve and drain the water heater.
3. Remove the front panel. Refer to procedure 1.
4. Remove the two retaining flanges on the copper pipes located on the outlet of the water bypass control assembly by removing four screws.
5. Carefully disengage the two copper pipes from the water bypass control assembly.
6. Remove the stainless steel spring clip that connects the water bypass control assembly to the water volume control assembly. Disengage these two components by gently pulling them apart.
7. Remove the black protective cover from the top of the water bypass control assembly to expose the multi-pin connector. Disconnect multi-pin connector from the bypass control.
8. Remove water bypass control assembly from heater cabinet.
9. Reassemble in reverse order of above. Ensure an o'ring is fitted to each of the three connections on the water bypass control assembly.

Water Body Assembly: (Procedure 13)

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. ***Isolate power and water supplies.***
2. Unscrew the water drain plug and pressure relief valve and drain the water heater.
3. Remove front cover and water bypass control assembly. Refer to procedures 1 and 12.
4. Remove the stainless steel spring clip that connects the water volume control assembly to the cold water inlet connection.
5. Remove the black protective cover from the top of the water volume control assembly to expose the multi-pin connector. Disconnect multi-pin connector from the volume control.
6. Disconnect the multi-pin connector from terminal S, on control PCB. **Note:** Some wiring harnesses will need to be removed in order to release the water flow sensor cables.
7. Disconnect the cold water inlet thermistor from water volume control assembly by removing the retaining screw.
8. Remove water volume control assembly from heater cabinet.
9. Reassemble in reverse order of above. Ensure an O-ring is fitted to each of the connections on the water volume control assembly. **Note:** When replacing the water body assembly it is important to ensure that the correct PCB is installed as fitment of an incorrect PCB will result in unit malfunction. There are two PCB options available and the correct type to use is dependent on the type of water body assembly that is installed i.e. if the water body has a black plug on the flow sensor wiring loom, the PCB must have a matching black socket, refer TB18-001 for further details.

Flow Sensor Turbine: (Procedure 14)

1. ***Isolate power and water supplies.***
2. Remove the front panel. Refer to procedure 1.
3. Unscrew the water drain plug and pressure relief valve and drain the water heater.
4. Disconnect the cold water supply pipe from the cold water inlet connection.
5. Remove the stainless steel spring clip that connects the water volume control assembly to the cold water inlet connection
6. Remove the four screws from the cold water inlet connection on the underside of the heater cabinet and withdraw the inlet connector from the base of the water heater.
7. From the underside of the heater cabinet, gently withdraw the flow sensor turbine from the inlet of the water volume control motor assembly by using a pair of long nose pliers.
8. Reassemble in reverse order of above. Ensure turbine is correctly centred and all o’rings are fitted.

Combustion Fan Motor: (Procedure 15)

1. ***Isolate power supply.***
2. Remove the front cover, control PCB and power supply PCB. Refer to procedures 1, 2 and 3.
3. Remove the three screws (four on indoor models) that retain the fan motor to the fan housing.
4. ***Indoor Models Only:*** Remove the screw that retains the air balancing tube on the bottom left hand side of PGFR. Remove air balancing tube.
5. Lift the fan motor clear of fan housing.
6. Reassemble in reverse order of above.

Cold Water Inlet Thermistor: (Procedure 16)

1. ***Isolate power and water supplies.***
2. Unscrew the water drain plug and pressure relief valve and drain the water heater.
3. Remove the front cover, control PCB, power supply PCB and water bypass control assembly. Refer to procedures 1, 2, 3 and 12.
4. Rotate the water volume control assembly to the left to expose the cold water inlet thermistor.
5. Remove the thermistor retaining screw and withdraw the thermistor taking care not to damage the o'ring. Ensure o'ring remains located within thermistor housing.
6. Disconnect the cold inlet thermistor lead from the white cable connector.
7. Reassemble in reverse order of above.

Ambient Air Thermistor: (Procedure 17)

1. ***Isolate power supply.***
2. Remove front cover, control PCB and power supply PCB. Refer to procedures 1, 2 and 3.
3. Locate the ambient air thermistor and remove retaining screw. **Outdoor Models:** Thermistor is mounted on bracket at right hand side of fan housing. **Indoor models:** The thermistor is mounted in the intake hood assembly (to the right of the water volume control assembly)
4. Remove the thermistor from retaining bracket.
5. Disconnect the ambient thermistor lead from the blue cable connector.
6. Reassemble in reverse order of above.

Hot Water Outlet Thermistor: (Procedure 18)

1. ***Isolate power and water supplies.***
2. Relieve water pressure through a hot tap.
3. Remove front cover, control PCB and power supply PCB. Refer to procedures 1, 2 and 3.
4. Locate the hot water outlet thermistor at the hot water outlet connection on left hand side of heater cabinet.
5. Remove the two thermistor retaining screws and withdraw the thermistor taking care not to damage the o'ring. **Note:** Water may escape during this procedure. Ensure o'ring remains located within thermistor housing.
6. Disconnect the hot outlet thermistor lead from the black cable connector.
7. Reassemble in reverse order of above.

Heat Exchanger Thermistor: (Procedure 19)

1. ***Isolate power and water supplies.***
2. Relieve water pressure through a hot tap.
3. Remove front cover, refer to procedure 1.
4. Locate the heat exchanger thermistor at the top left hand side of heat exchanger.
5. Remove the stainless steel spring clip and withdraw the thermistor taking care not to damage the o'ring. **Note:** Water may escape during this procedure. Ensure o'ring remains located within thermistor housing.
6. Disconnect the heat exchanger thermistor lead from the yellow cable connector.
7. Reassemble in reverse order of above.
8. Position the Overheat Limiter correctly as per step 6 of procedure 23 on page 76.

Anti-Frost Heaters: (Procedure 20)

1. ***Isolate power supply.***
2. Remove front cover, control PCB and power supply PCB. Refer to procedures 1, 2 & 3.
3. Disconnect the red anti-frost wiring loom connector located to the right of the water bypass control assembly.
4. Remove the two screws from the hot water outlet flange to release the hot water outlet anti-frost heater.
5. Remove the screw from the cold water inlet connection to release the cold water inlet anti-frost heater.
6. Unclip the two anti-frost heaters from the heat exchanger (Note the positions of both). It may be necessary to remove the heat exchanger to refit the anti-frost heaters to the heat exchanger (refer procedure 21).
7. Unclip the two anti-frost heaters from the copper pipes exiting the water bypass control assembly.
8. Remove the anti-frost heater assembly from heater cabinet (Some wiring retainers will need to be released to enable removal of wiring).
9. Reassemble in reverse order of above.
10. Position the Overheat Limiter correctly as per step 6 of procedure 23 on page 76.

Heat Exchanger Removal (Procedure 21)

1. ***Isolate power and water supplies.***
2. Remove the front cover, control PCB, power supply PCB, burner cover plate, gas manifold assembly, ambient air thermistor, heat exchanger thermistor and anti-frost heaters. Refer to procedures 1, 2, 3, 5, 6, 17, 19 and 20.
3. Remove the two flanges from the water bypass control assembly and carefully disengage the two pipes from the water bypass control assembly.
4. Remove the two screws from the hot water outlet flange retaining the hot water outlet pipe and carefully disengage the pipe.
5. Remove screw from the bottom left hand side of the fan housing.
6. **Outdoor Model:** Remove the three screws retaining the heat exchanger. Two from the top of the heat exchanger to the side of the flue outlet and one from the bottom of combustion chamber to the right of fan housing.

   Indoor Model: Remove the seventeen screws retaining the heat exchanger. Eight from the outside of the heater cabinet around the flue outlet, six from the flue assembly, one from each side of the flue terminal and one from the bottom of combustion chamber to the right of fan housing.
7. Remove heat exchanger by gently lifting the assembly up and clear of heater cabinet.
8. Some wiring retainers will need to be released to enable removal of wiring.
9. Reassemble in reverse order of above.
10. Position the Overheat Limiter correctly as per step 6 of procedure 23 on page 76.
11. Test for gas leaks using soapy water solution
12. Check for water leaks.

Heat Exchanger Replacement (Procedure 22)

1. ***Isolate power and water supplies.***
2. Remove heat exchanger. Refer procedure 21.
3. Remove the burner assembly, anti-frost heaters, fan assembly and cowling assembly from the old heat exchanger and refit to the replacement heat exchanger.
4. Check the overheat limiter. Replace if damaged or open circuit.
5. Reassemble in reverse order of above.
6. Position the Overheat Limiter correctly as per step 6 of procedure 23 on page 76.
7. Test for gas leaks using soapy water solution
8. Check for water leaks.

Over Heat Limiter (OHL) Assembly: (Procedure 23)

Replacement of the OHL requires removal and possible replacement of the heat exchanger.

1. Remove heat exchanger. Refer procedure 21.
2. Inspect the heat exchanger for damage. (Replace heat exchanger if necessary)
3. Remove the two white wires from the terminal block on the right hand side of OHL.
4. **Outdoor Model:** Remove the two plastic rivets retaining the overheat limiter assembly to the back of heater cabinet and remove the overheat limiter assembly.

   Indoor Model: Remove the three screws retaining the overheat limiter assembly to the air intake hood and remove the overheat limiter assembly.
5. Reassemble in reverse order of above
6. Reposition the Overheat Limiter as per the following procedure. Failure to follow this step may lead to premature OHL failure.

When closing the OHL the short end should be at the front and joined at position 0 (refer to fig 1) for both indoor and outdoor models.

Fig 1

The long end of the OHL must then be positioned on the cable guide retained by the top left screw on the combustion chamber front panel (refer to fig 2) at the positions noted below;

Fig 2

For all 27L indoor models position **8** must sit on the cable guide (refer to fig 3).

For all 27L outdoor models position **2** must sit on the cable guide (refer to fig 4).

Fig 3

Note: Ensure all multi-pin plugs are reconnected and all wiring is neatly repositioned and retained to prevent damage during operation.

Incorrectly setting or positioning the OHL may lead to a nuisance failure (open circuit), resulting in error code 14 being displayed and rendering the water heater inoperable.

Fig 4

Ignition Pack Replacement: (Procedure 24)

1. ***Isolate power supply.***
2. Remove the front cover, burner cover plate, gas manifold assembly and burner assembly. Refer to procedures 1, 5, 6 and 7.
3. Disconnect black high voltage lead from ignition electrode on right hand side of burner assembly.
4. Replace ignition pack.
5. Reassemble in reverse order of above. NOTE: Ensure wiring to igniter and flame sensors is not pinched during reassembly.
6. Position the Overheat Limiter correctly as per step 6 of procedure 23 on page 76.

Transformer: (Procedure 25)

1. ***Isolate power supply.***
2. Remove the front cover, LED display, control PCB, power supply PCB and PGFR. Refer to procedures 1, 2, 3, 4 and 10.
3. Disconnect primary transformer windings (blue & brown wires) from middle of power supply PCB (Terminal C).
4. Disconnect the secondary windings from the top left hand side of power supply PCB (Terminal E).
5. Remove the four screws retaining the transformer to the back of the water heater cabinet.
6. Lift the transformer out of heater cabinet.
7. Reassemble in reverse order of above.

Air Intake Hood: (Procedure 26)

1. ***Isolate power supply.***
2. Remove the front cover, control PCB, power supply PCB, burner cover plate, gas manifold assembly, PGFR, water bypass control, water volume control, ambient air thermistor, heat exchanger thermistor, anti-frost heaters, heat exchanger and transformer. Refer to procedures 1, 2, 3, 5, 6, 10, 12, 13, 17, 19, 20, 21 and 25.
3. Remove the nine screws from around the outside of the air intake hood.
4. Remove the air intake hood from heater cabinet.
5. Reassemble in reverse order of above.

EziSET® PCB: (Procedure 27)

1. Switch off the electrical supply at the power outlet to the water heater.
2. Remove the front panel. Refer to Procedure 1.
3. Disconnect the EziSET® PCB black lead from terminal O of the main PCB (refer C).
4. Disconnect the 2 x yellow wiring harnesses (refer B).
5. Disengage the top and bottom brackets that fix the EziSET® PCB (refer A) to the main PCB and remove.
6. 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 28)

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).

FLUING REQUIREMENTS FOR INTERNAL MODELS

As the internal models are room sealed, a coaxial flue is used to allow for both the discharging of combustion products outside the building and supply of air for combustion from outside of the building. It is imperative that only the Rheem approved coaxial fluing is fitted to ensure correct and safe operation of the water heater.

Where more than one water heater is installed, each water heater must be individually flued. A common flue system cannot be used.

Ensure the installation of the secondary flue has been carried in accordance with AS 5601, local authority requirements and the installation instructions.

The water heater must be flued separately from all other appliances and flued to the outdoors. Minimum clearance requirements apply from the flue terminal in accordance with AS/NZS 5601. The flue must not discharge into a chimney.
Where the flue penetrates through walls or ceilings, the penetration must comply with local regulations for fire rating. There is no requirement on the flue to maintain a minimum distance from combustible materials.

The water heater flue may be terminated either horizontally with a horizontal flue terminal or vertically with a vertical flue terminal. The secondary flue must be self-supporting and not impose a load on the water heater.

⚠ **Warning:** Never operate the water heater unless it is has been installed in accordance with the installation instructions. Incorrect fluing of the water heater may result in unsafe operation of the water heater, possibly causing fire, explosion, serious injury and asphyxiation from carbon monoxide.

Maximum Flue Length

The system will not operate if there is excessive restriction (pressure drop) in the fluing system.

- The maximum permissible flue length with no bends and a terminal is 13.5m.
- Each 90º bend has an equivalent length of 1.5m. For each 90º bend used subtract 1.5m from the permissible flue length (eg: 3 x 90º bends will reduce maximum flue length to 9m).
- Each 45º bend has an equivalent length of 0.75m. For each 45º bend used subtract 0.75m from the permissible flue length.

Minimum Flue Length

The minimum horizontal flue distance which may be used is 300 mm, provided:

- The flue adaptor is connected to the flue outlet of the water heater (5 star only).
- one 90° elbow is connected to the flue adaptor, and
- one 300 mm horizontal flue pipe is connected to the elbow, and
- The horizontal flue terminal is connected to the flue pipe.

Flue Terminal Location

The flue design, installation and termination point must comply with AS 5601. As a guide the following requirements extracted from the Australian Gas Installations Standard AS 5601, must be observed for the flue termination.

Horizontal Flue Terminal Location

- At least 300 mm between the top of the flue terminal and the eaves.
- At least 300 mm between the bottom of the flue terminal and the ground, balcony or other surface.
- At least 500 mm between the flue terminal and the edge of any opening into the building, measured horizontally along the wall.
- At least 300 mm between the flue terminal and a return wall or external corner, measured horizontally along the wall.
- At least 1500 mm between the top of the flue terminal and below any openable window measured vertically.
- At least 1500 mm between the flue terminal and any opening into a building, in the direction of the flue discharge.
- At least 500 mm between the flue terminal and a fence, wall or other obstruction, in the direction of the flue discharge.
- At least 300 mm between the flue terminal and any other flue terminal, cowl or other combustion air intake.

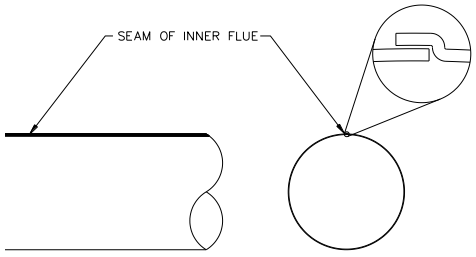
For a multiple unit installation, a minimum distance between flue terminations must be maintained to prevent recirculation of flue gases. Maintain a centre to centre distance between flue terminations of 450 mm.

Vertical Flue Terminal Location

- At least 500 mm between the underside of the flue terminal and the nearest part of a non-trafficable roof.
- At least 2000 mm between the underside of the flue terminal and the nearest part of a trafficable roof designed for personal or public use.
- At least 200 mm between the flue terminal and a chimney where the flue terminates above the chimney.

Horizontal Flue Runs

- A horizontal section of flue must be installed with a gradient of 20 mm per metre (1 in 50 or 1° fall) of horizontal run.
- The flue pipe must be installed with the seam of the inner flue pipe toward the top of the installation.
- A horizontal run of flue pipe between two bends, where the bend closest to the flue terminal is orientated upward, must have a gradient upward in the direction of the flue terminal.
- A condensate trap must be installed as close as practicable to the flue outlet from the water heater if the flue is installed with an upward slope and a condensate trap is not installed immediately after the flue adaptor.



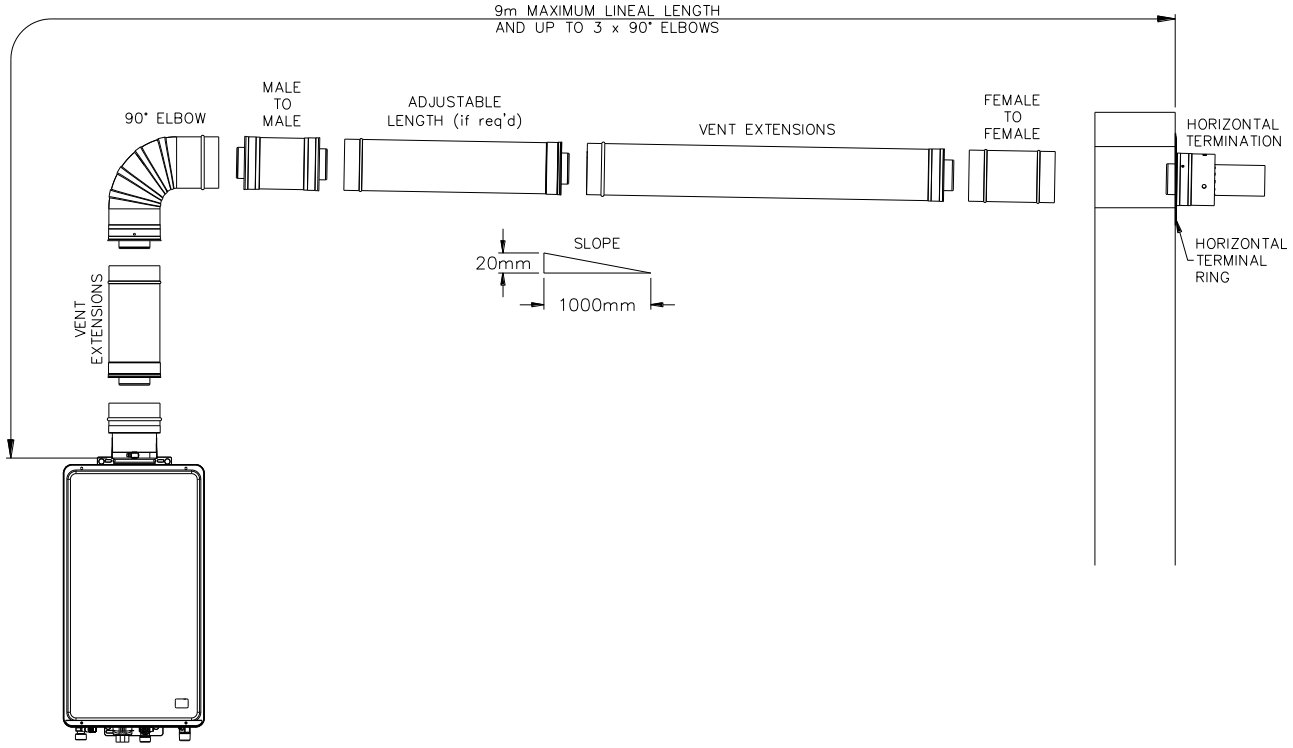
- This ensures any condensate formed during operation of the water heater is prevented from draining back into the water heater.
- A horizontal run of flue pipe connecting directly to a horizontal flue terminal must have a downward gradient to the flue terminal.
  This prevents rainwater from entering the flue and draining back into the water heater.

Draining the Condensate

A flue condensate trap is fitted to the water heater so that acidic flue gas condensate does not enter into the water heater flue-ways which may cause premature failure of the water heater.

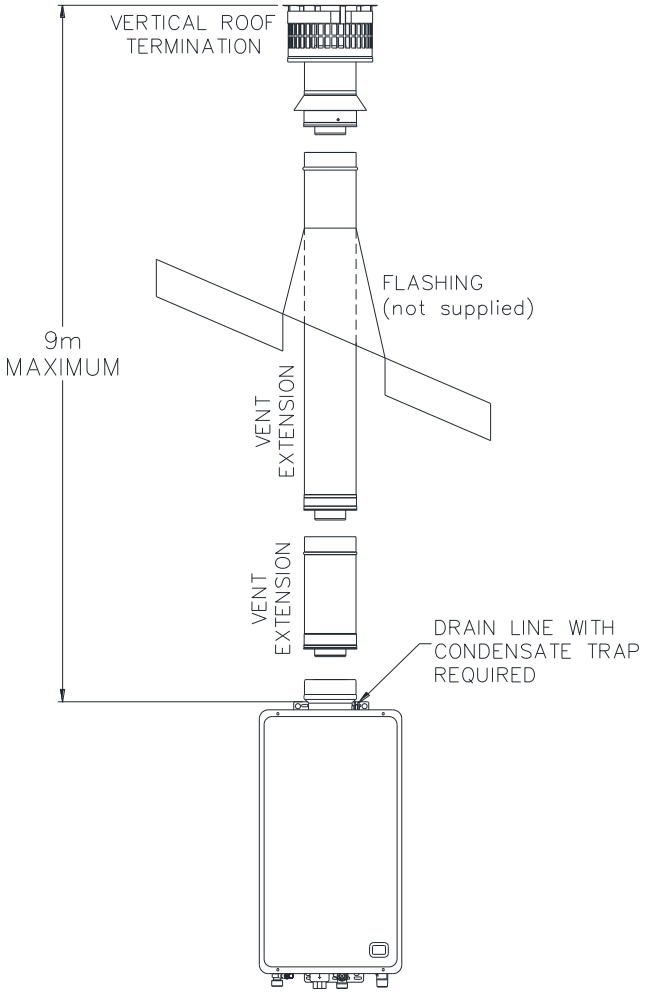
A drain line must be connected to the spigot on the condensate trap. The drain line is to incorporate a trap and filled with water prior to the operation of the water heater. The drain line from the trap to the point of discharge should be as short as possible, have a continuously downward fall all the way from the water heater to the discharge outlet and have no tap, valves or other restrictions in the pipe work. The drain line must be extended to a discharge point where the condensate will not cause injury, damage or nuisance.

Typical Fluing Diagrams

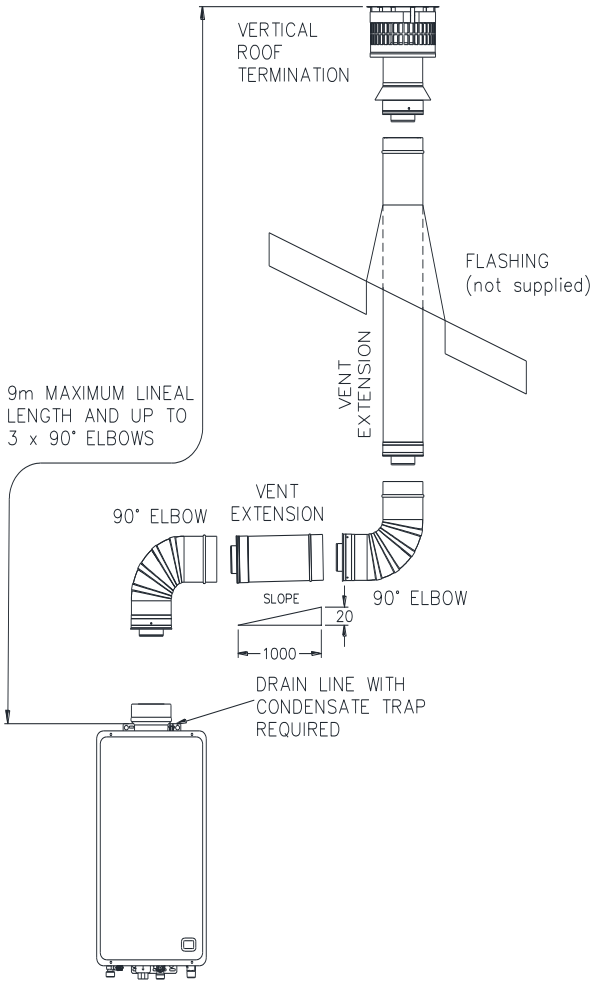


Typical Installation – Horizontal Terminal with One Bend

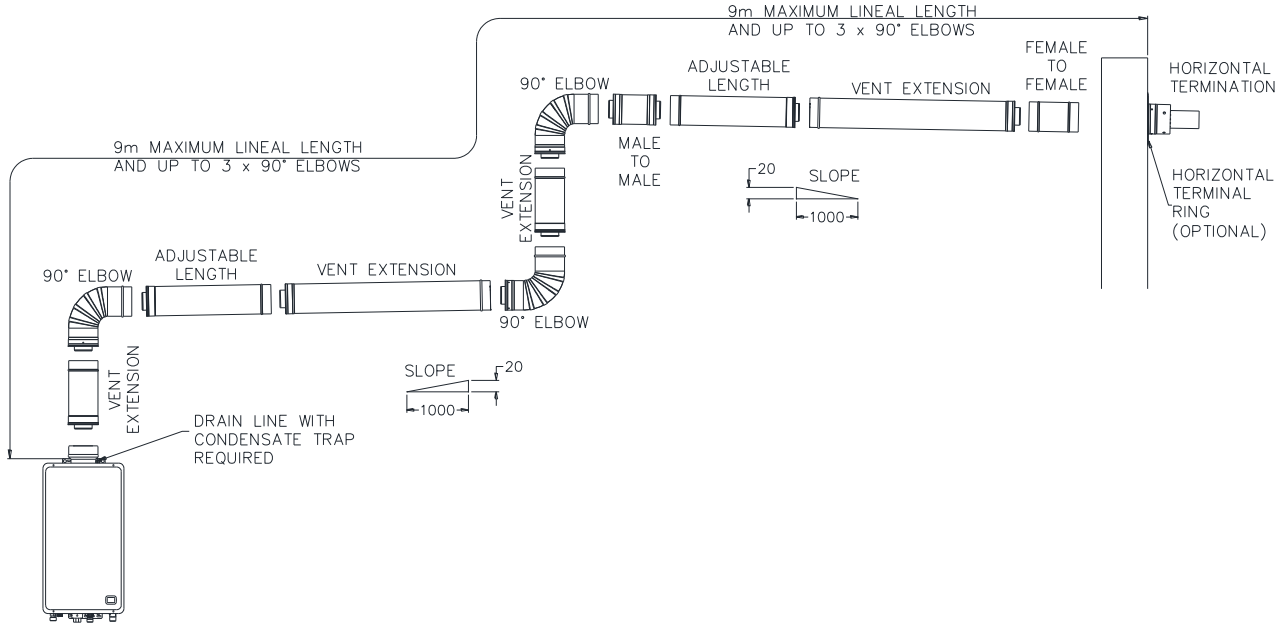
Fluing Requirements for internal Models (cont)



Typical Installation
Vertical Flue



Typical Installation
Vertical Terminal with Vertical and Horizontal Sections



Typical Installation
Horizontal Terminal with Multiple Vertical and Horizontal Sections

DOCUMENT REVISION HISTORY

Title: 27 Continuous Flow Gas Water Heater Service Instructions	Document Nº: TM049

REV	Details of change	D.O.I.
A	Service Instructions issued	12/09
B	Updated gas conversion procedure	02/10
C	Name Badge part numbers added Revised gas pressure adjustment procedure	05/10
D	Added outlet temperature compensation adjustment procedure Increased min. outlet temp setting for inline boosting from 60 to 70ºC	10/10
E	6 Star product release. Added transformer primary winding resistance test to FF chart, Edwards & Solahart models added	05/12
F	Revision to EZ-link information on pages 22 & 23	07/12
G	Error code 99 reset procedure added	11/12
H	Correction to spare part details - Item 17 & 17b on pages 72 & 73	12/12
I	Exploded views and replacement parts lists removed – Now form part of Spare parts manual SPM-CFGWH	08/13
AJ	Addition of touch voltage test; updated test procedures 18-21; Revised water body & PCB details added.	02/18
AK	EziSET® Smartphone remote control kit details added, Live Testing warning and Overheat Limiter position instruction.	02/19
AL	Addition of In-Service Test procedure	04/19