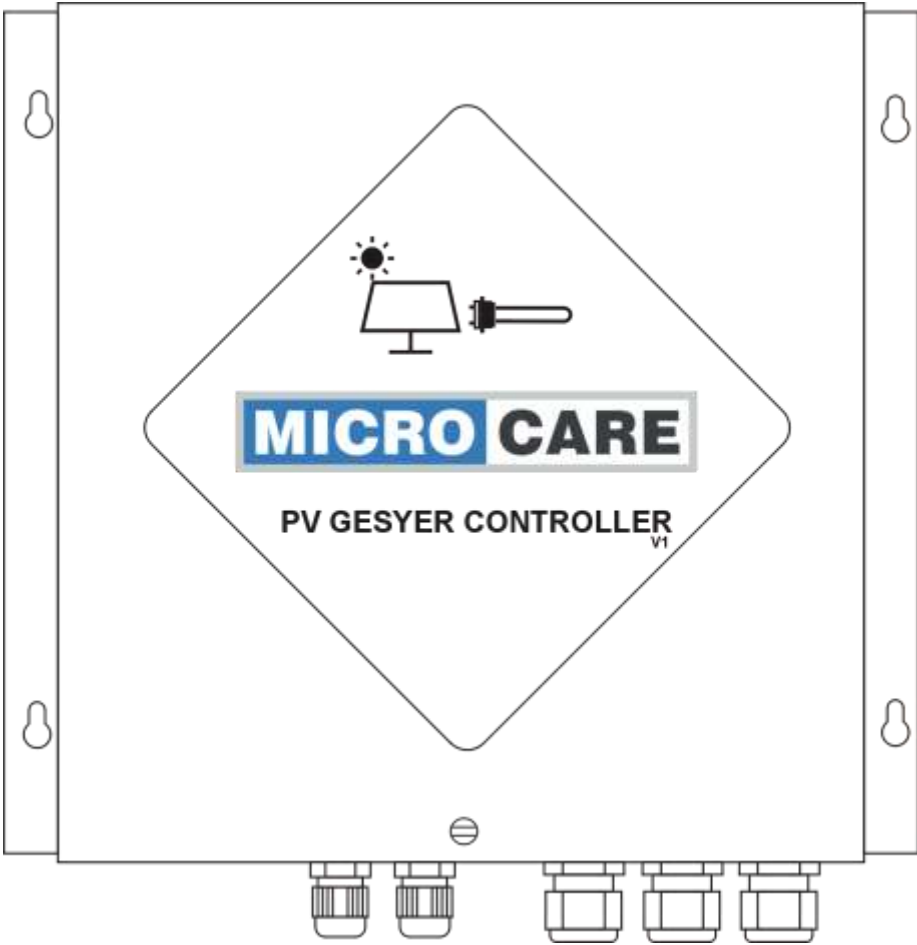




# PV GEYSER CONTROLLER

## User Manual



## Table of Contents

1.	IMPORTANT INFORMATION AND SAFETY INSTRUCTIONS .....	1
2.	INTRODUCTION .....	2
2.1	General Description .....	2
2.2	Key Features.....	2
3.	OVERVIEW .....	3
3.1	Front View.....	3
3.2	Terminal Blocks Overview.....	3
3.3	Bottom View.....	4
3.4	Internal LED indicators.....	4
3.5	Audible Fault Codes.....	4
4.	Solar Panel Sizing .....	5
4.1	2kW Element.....	5
4.2	3 & 4 kW Element .....	5
5.	GEYSER CONTROLLER INSTALLATION .....	5
5.1	Installing the PV Geyser Controller & Timer.....	6
6.	Solar Panel Installation .....	7
6.1.1	3 x PV Panels in series.....	7
6.1.2	4 x PV Panels in series.....	7
7.	WIRING .....	8
7.1	General Wiring Information .....	8
7.2	AC WIRING.....	9
7.3	Solar Panel Wiring .....	10
7.4	Timer Wiring.....	11
8.	THERMISTOR INSTALLATION.....	12
8.1	Remove Geyser Access Cover .....	12
8.2	Disconnect Geyser Thermostat Wiring.....	12
8.3	Remove Geyser Thermostat .....	12
8.4	Thermistor Supplied .....	12
8.5	Fit Thermistor To Thermostat.....	13
8.6	Refit Thermostat.....	13
8.7	Thermistor continuity test .....	13
9.	SETTINGS EXPLAINED.....	15
9.1	Element Size .....	15
9.2	DC Temperature .....	15
9.3	DC Temperature Hysteresis.....	15
9.4	AC Temperature Below DC.....	15

9.5	AC Temperature Hysteresis .....	15
9.5.1	Defaults All Data .....	15
10.	CHECKS PRIOR TO START-UP .....	16
10.1	Test And Startup Procedure.....	16
11.	PROGRAMMING VIA DIP SWITCHES .....	18
11.1	Programming Example:.....	18
11.2	Programming Chart.....	19
11.2.1	Geyser Element Size .....	19
11.2.2	DC Temperature .....	19
11.2.3	DC Temperature Hysteresis .....	19
11.2.4	AC Temp Below DC .....	19
11.2.5	AC Temp Hysteresis.....	19
11.3	Factory Reset.....	19
12.	HOW TO PROGRAM THE PROGAMMABLE TIMER .....	20
12.1	How To Set The Timer Clock .....	20
13.	How To Set The 7-Day Timer .....	20
13.1	How To Set The Daily ON/OFF Settings.....	20
13.1.1	Setting The ON Time .....	20
13.1.2	Setting The Off Time .....	20
14.	GLCD MENU SCREENS .....	21
14.1	Menu Main .....	21
14.2	Menu 1 – Inputs and IO.....	21
14.3	Menu 2 - Timer.....	21
14.4	Menu 3 - Enable.....	21
14.5	Menu 4 – Fault .....	21
14.6	Menu 5 – Stop_When .....	21
14.7	Menu 6 – Fault.L .....	21
14.8	Menu 7 – Other .....	22
14.9	Menu 8 – Other .....	22
15.	SPECIFICATIONS PV GEYSER CONTROLLER.....	23
16.	LIMITED CARRY- IN WARRANTY .....	24
17.	REGISTRATION OF MY MICROCARE PRODUCT .....	26

## 1. IMPORTANT INFORMATION AND SAFETY INSTRUCTIONS

- Installers should be qualified electricians or technicians.
- The installation information in the manual is for information purposes only.
- The monitoring and operation information in this manual is intended for anyone who needs to operate the controller.
- The geyser controller output cannot be paralleled with another geyser controller or AC source.
- Read the instructions carefully before installing and operating the controller.
- Connection and installation instructions must be followed.
- The unit should only be opened by skilled personal.
- To reduce risk of electric shock, disconnect all wiring before making any attempt to maintain or cleaning the unit. Turning off the GEYSER CONTROLLER will not reduce this risk.
- Retain the load within in the rating.
- Mount the controller vertically.
- Do not install the controller on a rugged or inclined surface.
- Do not install controller where it would be exposed to direct sunlight.
- Sketches are intended for illustrative purposes only and are not intended to provide an electrical design.

This manual applies to this Geyser Controller V2R5 onwards  
With Firmware Version V02R02 onwards.



### **WARNING**

#### **HIGH VOLTAGES PRESENT**

**Voltages capable of causing severe injury or death by electrical shock are present in this unit.**

## 2. INTRODUCTION

### 2.1 General Description

The Microcare PV Geyser Controller is a locally designed product that uses standard solar panels to power a common geyser element, outperforming the current range of thermal solar geysers in the market. With no plumbing required this locally designed innovation is easy to retrofit to any system making it price competitive at initial outlay and for the lifespan of the system.

Its unique design uses solar panels and not circulating water thus preventing the problems associated with the old-style collectors that suffer from freezing over in winter and boiling over in summer. For any building, the new Microcare PV Geyser Controller is the preferred solution as there is only electric wires to be installed compared to the long pipes required for traditional solar geysers. There is also no heat loss as the water does not need to circulate and therefore no waiting for water to get hot thus reducing waste.

### 2.2 Key Features

- Uses standard heating elements.
- Outperforms solar thermal heaters.
- Operates in inclement weather.
- Easy installation with no plumbing required.
- Designed for a retrofit.
- No need to replace the element or thermostat.
- Low heat dissipation.
- Efficiency greater than 95% on solar.
- Mains override if no solar is present.
- Accurate digital temperature control.
- Wall mounted.
- External timer included.

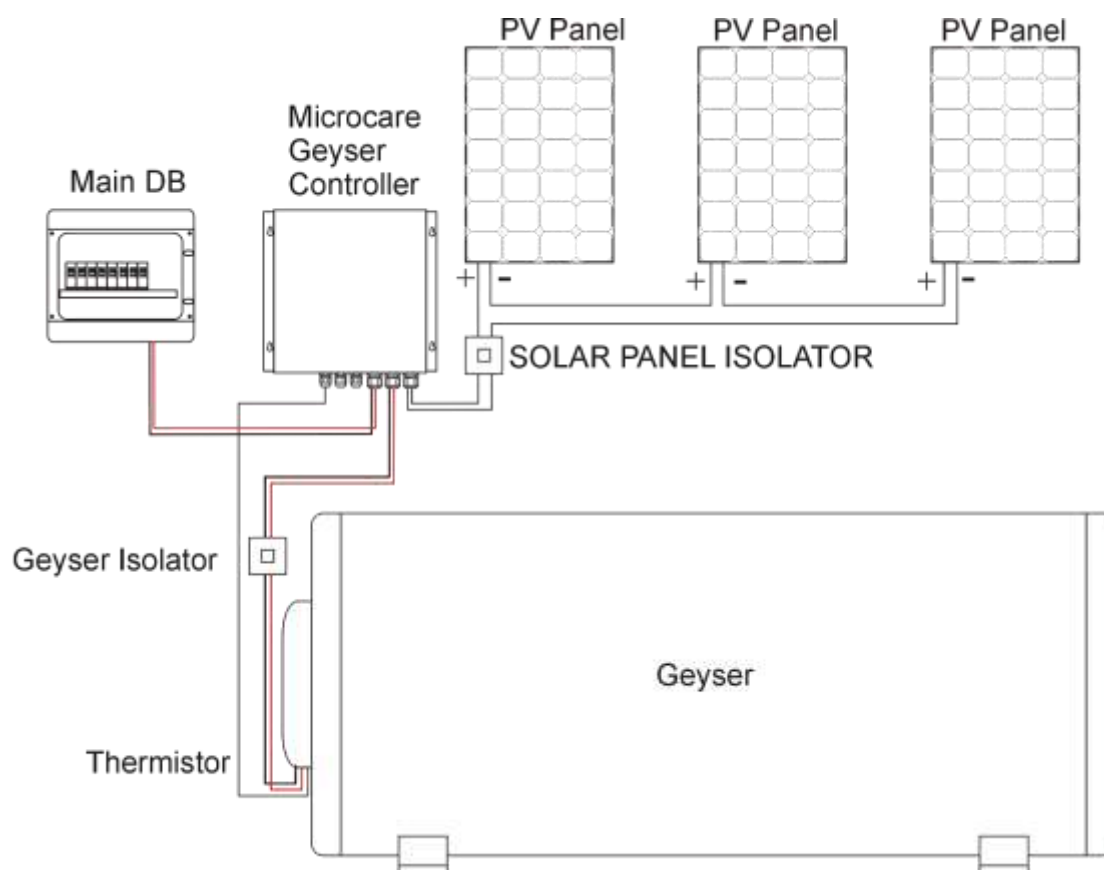
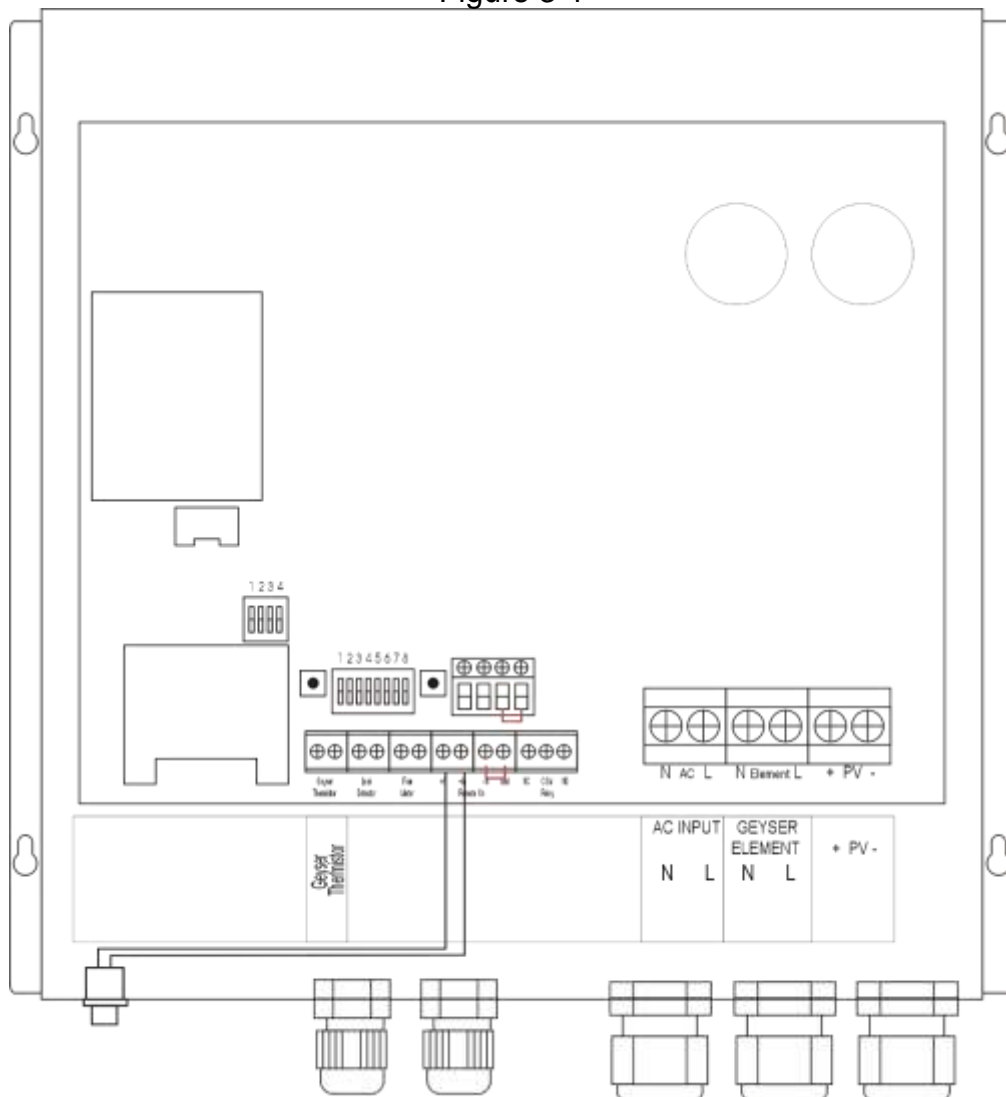


Fig 1: Basic system

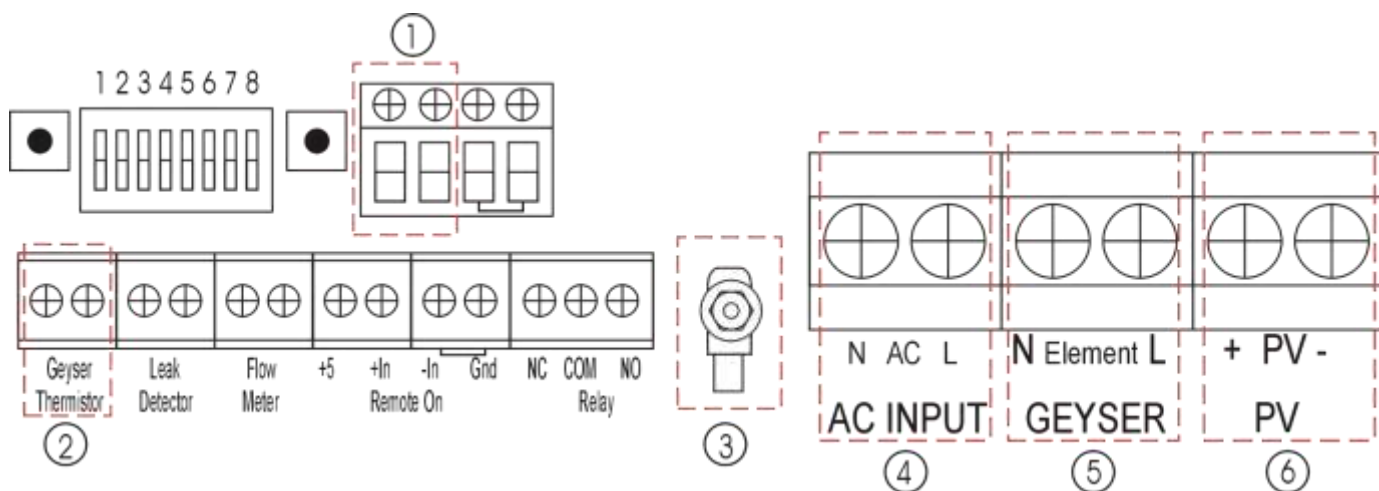
### 3. OVERVIEW

#### 3.1 Front View

Figure 3-1

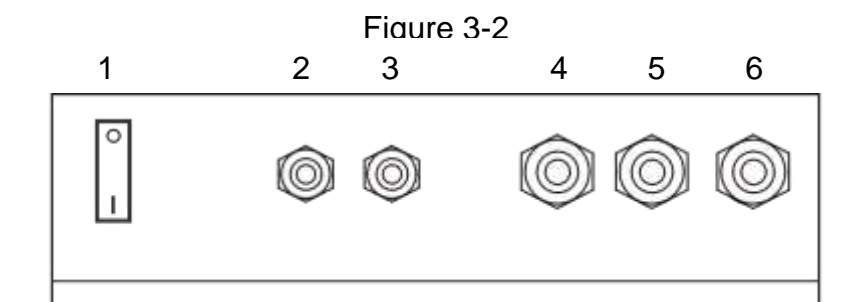


#### 3.2 Terminal Blocks Overview



No	Connector Block Description	No	Connector Block Description
1	Timer Switch Input	4	AC Input Wiring
2	Geyser Thermistor Wiring	5	Geyser Element Wiring
3	Earth Wire Lug	6	Solar Input Wiring Gland

### 3.3 Bottom View



No	Description	
1	ON/OFF Switch	4 AC Input Wiring Gland
2	Geyser Thermistor Wiring Gland	5 Geyser Element Wiring Gland
3	Timer Wiring Gland	6 PV Input Wiring Gland

### 3.4 Internal LED indicators

LED STATUS	PWR LED	Status LED
ON	Controller Switched On	On AC
OFF	N/A	Geyser reached set temperature
Flashing	Controller Switched OFF	On PV
Pulses	Pulses with Audible Fault Codes	

### 3.5 Audible Fault Codes

Nr of beeps	Fault Codes
1	Clock Battery Faulty
2	Clock Fault
3	Earth Fault
4	Element Fail
5	FET Fail
6	Leak Detected
7	Leak Detected Water Meter
8	PV Alarm
9	Relay Fault Transfer To AC
10	Relay Fault Transfer to PV
11	Thermistor Failed/Faulty
12	Panel Voltage to High
13	High temperature Geyser
14	High Controller Temperature

## 4. Solar Panel Sizing

### 4.1 2kW Element

Maximum solar panel array VOC “ Open Circuit Voltage” – 184Vdc to 274Vdc.

Maximum solar array wattage – 900W to 2000W.

### 4.2 3 & 4 kW Element

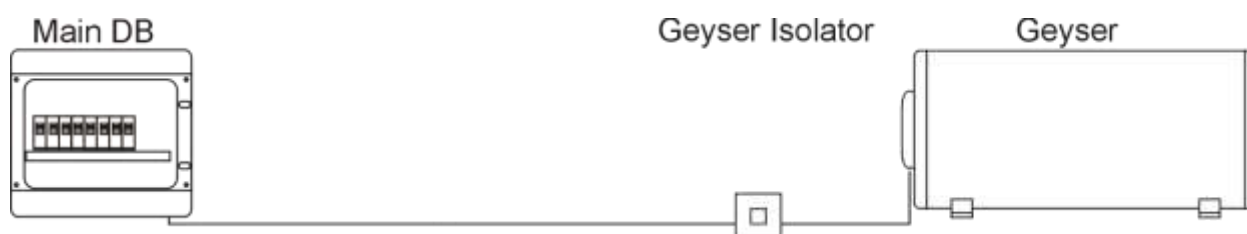
Maximum solar panel array VOC “ Open Circuit Voltage” – 140Vdc to 274Vdc.

Maximum solar array wattage – 900W to 2000W.

## 5. GEYSER CONTROLLER INSTALLATION

**Consider the following before installing the PV Geyser Controller and read the complete manual before commencing with the installation.**

- Install the PV Geyser Controller indoors.
- Do not install the controller in the roof.
- The unit must be mounted in a vertical position at least 2m above floor level.
- Find a suitable temperature resistant surface to mount the controller.
- Do not mount the controller in a closed container.
- Unrestricted airflow is required for the controller to operate at optimal efficiency.
- Install the PV Geyser Controller between the Main DB and Double Pole Isolator at the geyser as shown below.


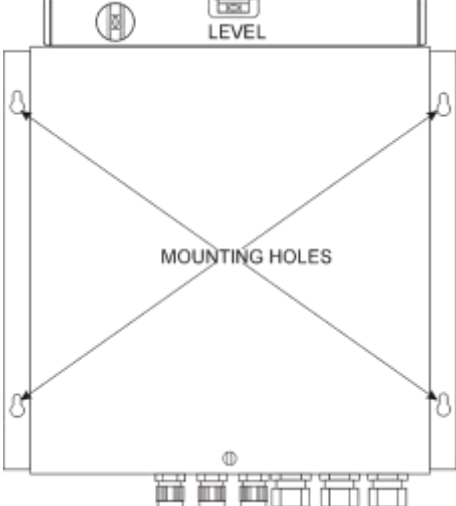
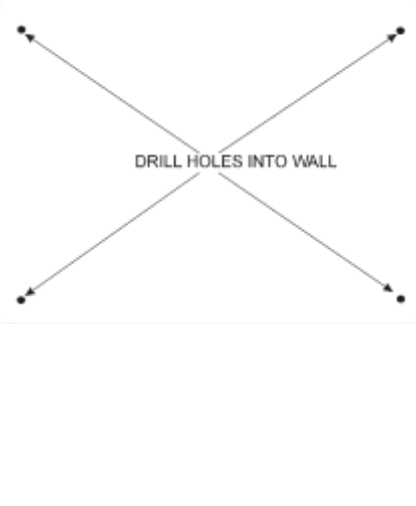


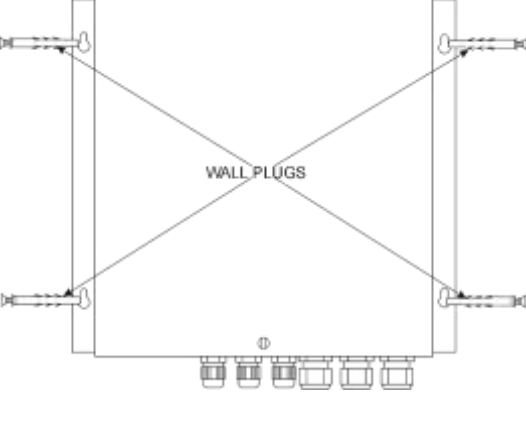
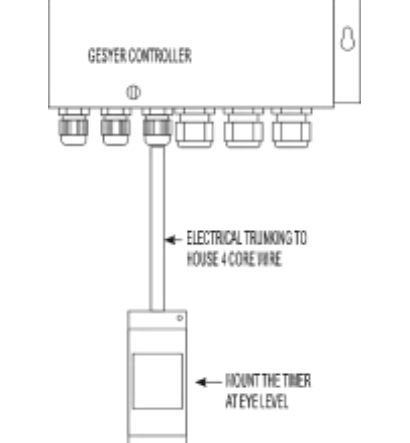

Geyser controller installation location.





### 5.1 Installing the PV Geyser Controller & Timer

<p>Hold the controller against the wall at a height &gt; 2m. Ensure that it is level by means of a spirit level.</p>	<p>Mark the 4 mounting holes against the wall.</p>	<p>Remove the controller from the wall. Drill the 4 holes into the wall with a drill bit that suits the size of the wall plugs.</p>
		

<p>Install the controller onto the mounting surface securing it with wall plugs.</p>	<p>The programmable timer must be installed at eye level and easy to reach by the end user.</p>	<p>Remove timer enclosure top cover. Hold the base against the wall. Mark the mounting holes against the wall. Drill the holes and secure with wall plugs.</p>
		

## 6. Solar Panel Installation

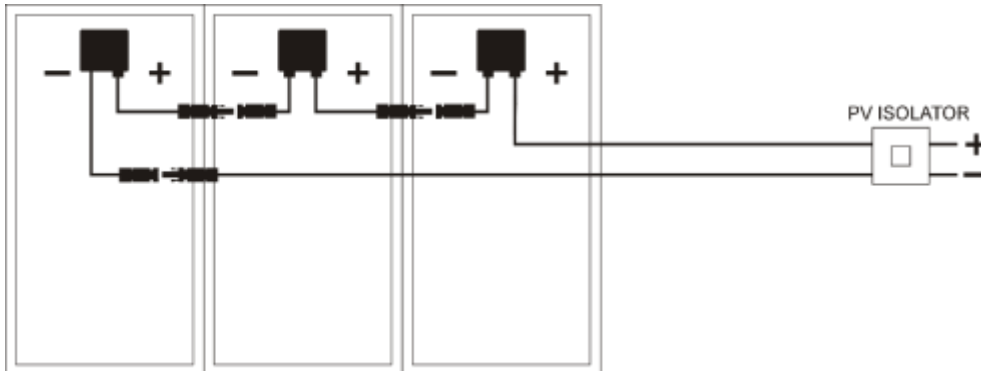


### WARNING

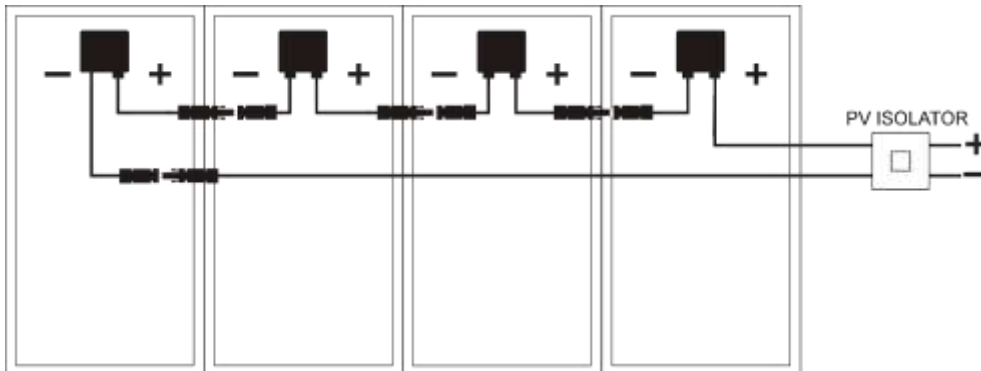
The PV Geyser Controller must be connected to the solar panels via a rated PV disconnect switch/device

- Install the panels as per the solar panel manufacturers specifications and installation manual.

#### 6.1.1 3 x PV Panels in series



#### 6.1.2 4 x PV Panels in series



The Solar Panel “DC isolator” or “Fuse” must be mounted as close as possible to the Geyser Controller. Within arm’s reach.

## 7. WIRING

### 7.1 General Wiring Information

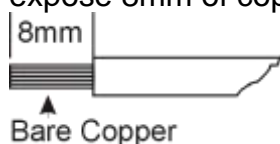
#### WARNING

#### HIGH VOLTAGES PRESENT

Voltages capable of causing severe injury or death by electrical shock are present in this unit.



- Wiring must be performed by qualified personnel / certified electrician.
- Familiarize yourself with the content of the manual following before commencing with the wiring.
- The DC array voltage applied must comply with the controller's specified input voltage and must not exceed Voc.
- The AC voltage must not exceed 240VAC.
- **Before commencing with the AC wiring of the controller:**
  - Ensure that the AC double isolator at the geyser is switched off.
  - Ensure that the geyser isolator at the main DB board is switched off.
  - Ensure that the controller is switched off.
  - Ensure that the Solar Panel isolator is turned off or if a solar fuse is installed open the fuse carriage.
- All wiring must be properly sized.
- Feed the cables through the controllers wiring glands as indicated as per SANS.
- Unscrew the wiring terminal screws fully before connecting wires to the terminal blocks, then tighten the terminal screws.
- The AC and PV wiring that connects to controller's terminal blocks must be stripped to expose 8mm of copper and fully inserted into the terminal blocks.



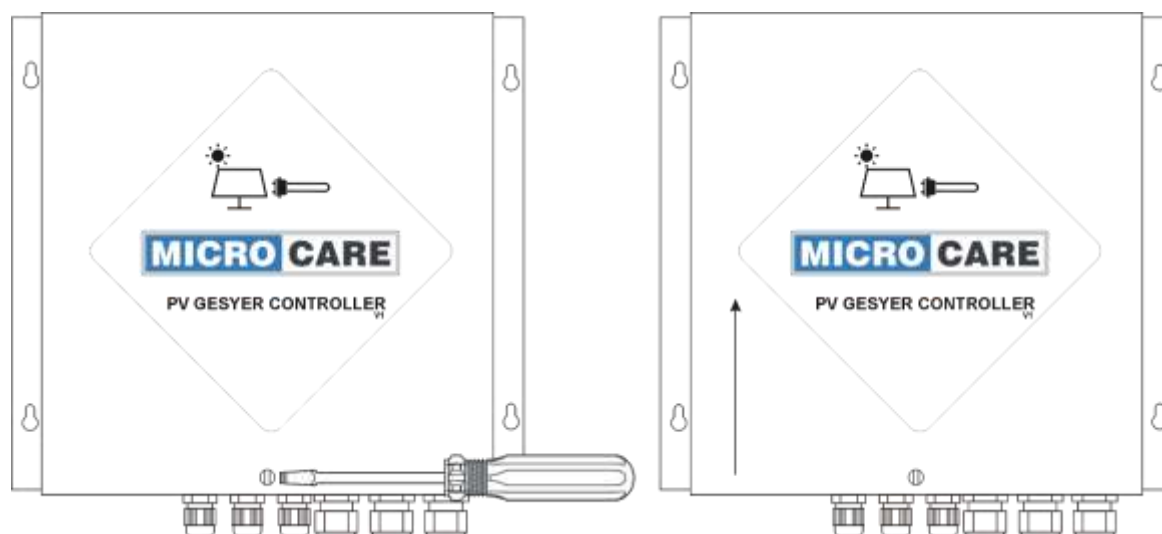
- Use Solar Flex wire for the Solar Panel wiring, do not use house wiring.
- Use bootlace ferrules to terminate the Solar wiring at the controller's terminal block.
- The PV Geyser Controller must be connected to the solar panels via a rated DC Solar disconnect switch or fuse.

#### WARNING

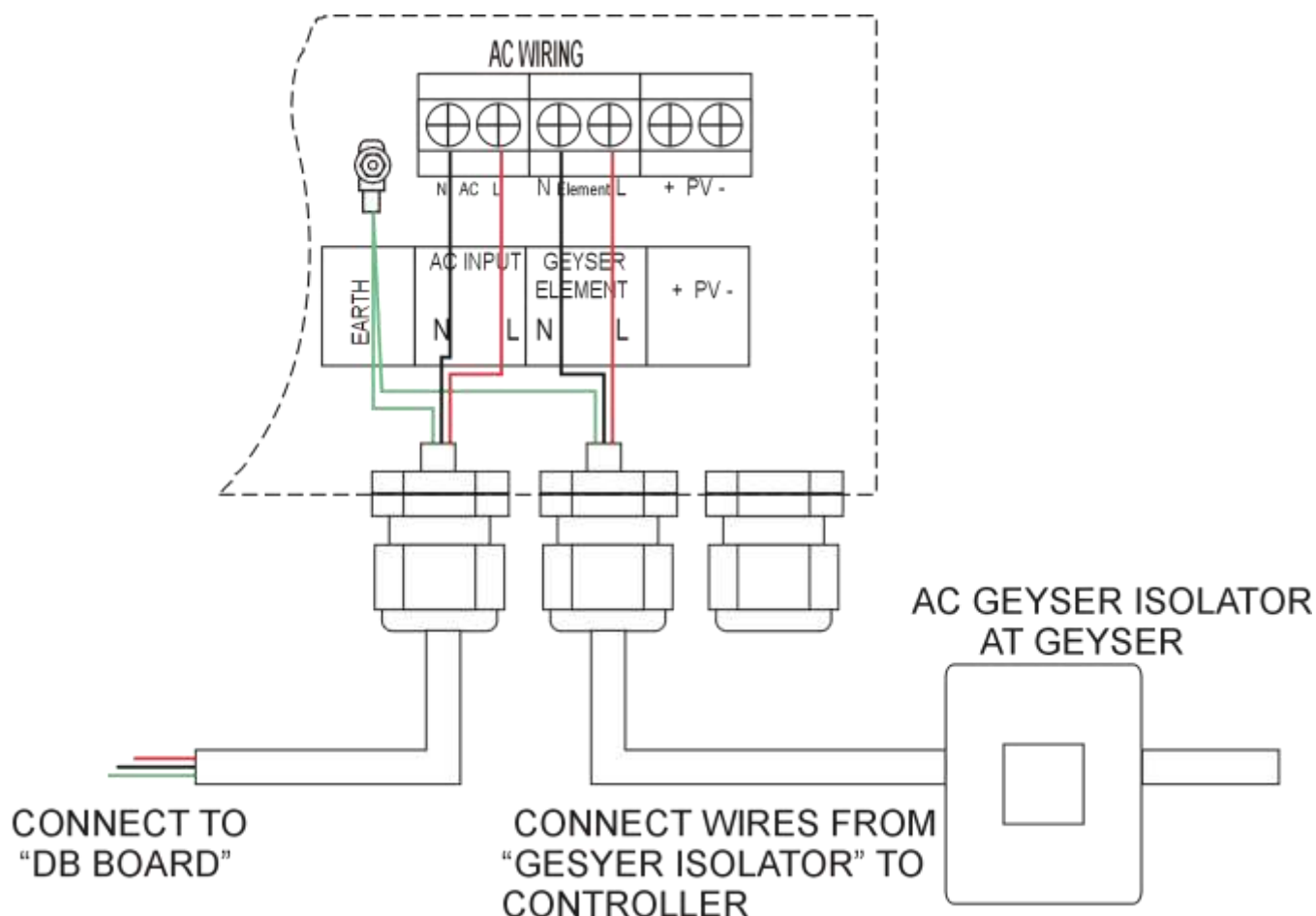
- The controller is not designed for parallel operation with another controller.
- Do not connect the controller's AC output directly to another AC source.
- Do not connect the geyser controller to any other electrical device or equipment.
- Do not disconnect or connect any wiring to the controller under load.

## 7.2 AC WIRING

Access the wiring compartment by removing the screw as indicated below. Slide the cover upwards and remove the front cover.



- Switch the controller On/Off switch to the OFF position.
- Wire the AC wiring from the DB board to controller AC input connector blocks marked below as “AC INPUT”.
- Wire the earth to the earth stud by means of a lug.
- Wire the wiring from the geyser double pole isolator to the controller connector block marked below as “Geyser Element”.
- Wire the earth to the earth stud by means of a lug.

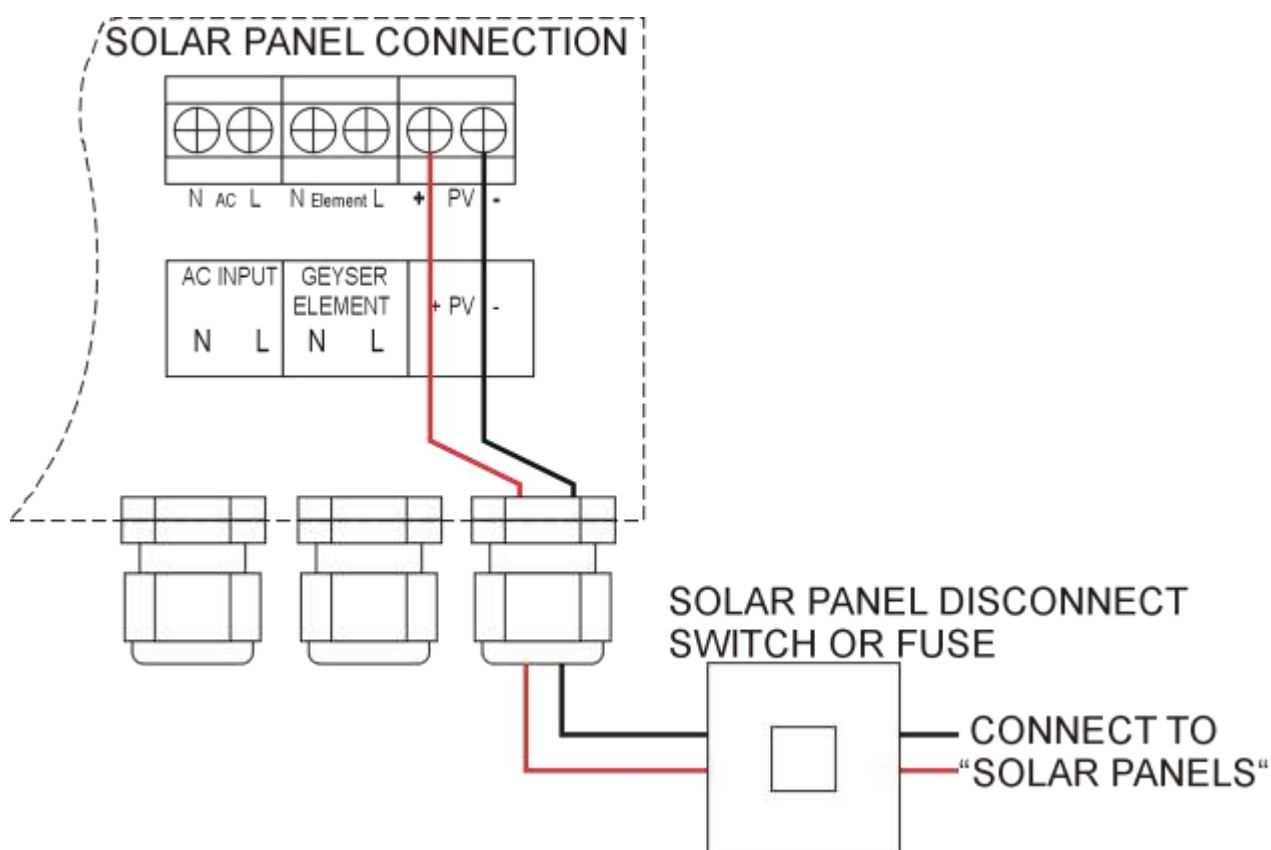


## 7.3 Solar Panel Wiring

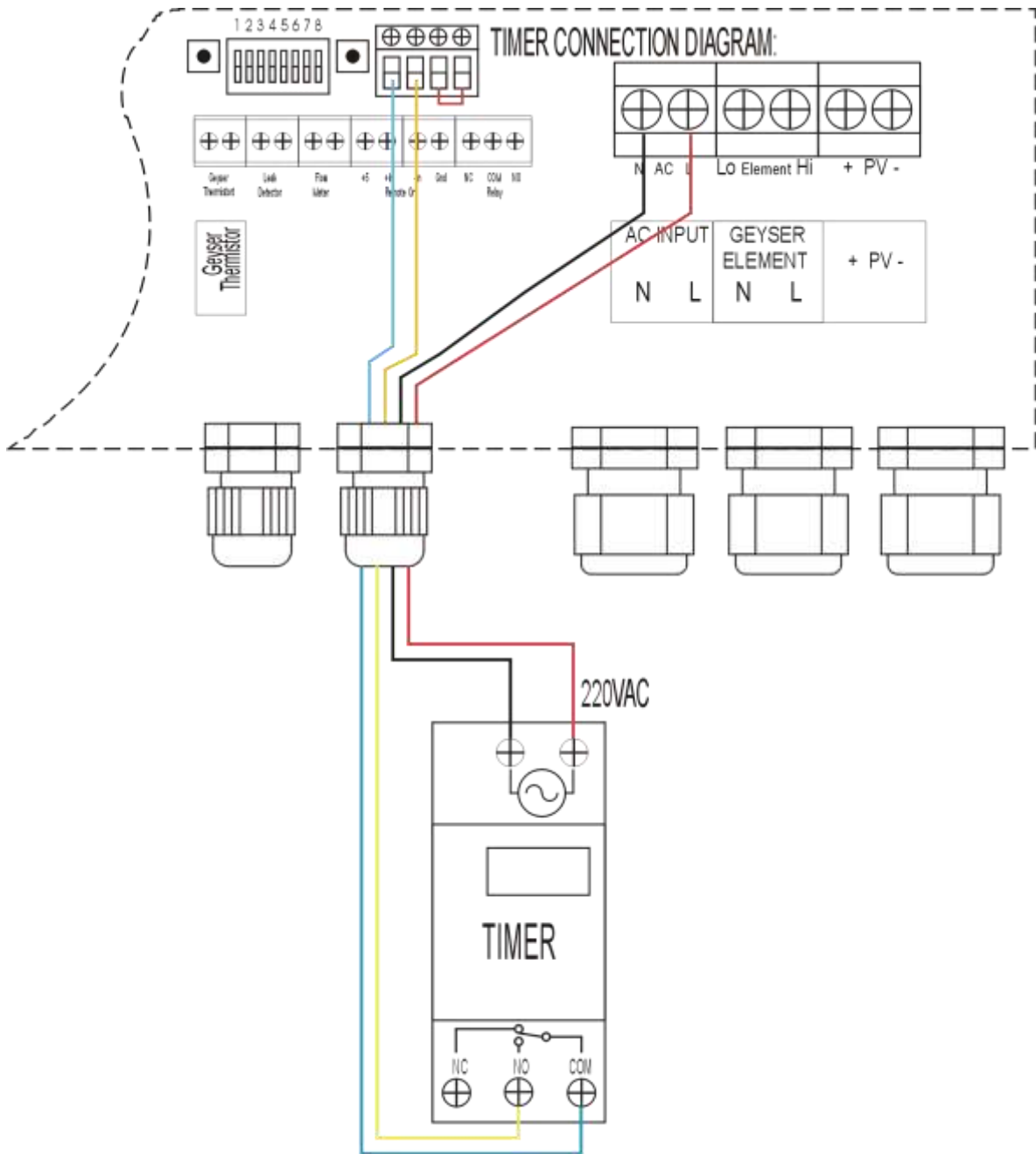


**Warning! The solar panel input is not reverse polarity protected. Reverse polarity will damage the unit!!**

- Ensure that the solar panel array wiring polarity is correct.
- Before connecting the solar panel wires to the controller ensure that the solar panel array voltage is correct.
- Switch the externally installed Solar Panel DC disconnect switch to the **OFF** position.
- If a solar fuse is installed, open the fuse carriage.
- Before connecting the wires to the controller ensure that the polarity is correct.
- Connect the Positive wire from the solar panel array to the Geyser Controller + PV connector.
- Connect the Negative wire from the solar panel array to the Geyser Controller – PV connector.



### 7.4 Timer Wiring



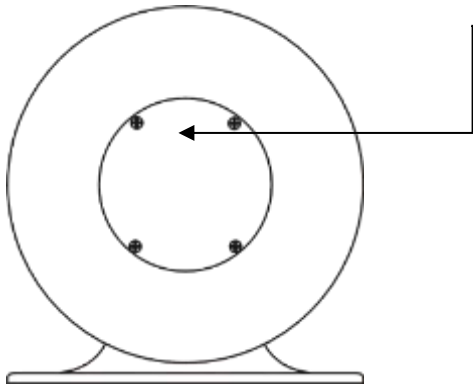
NOTE: CONNECT BETWEEN "NO" AND "COM"

Also note that the timer output contact configuration could be different to the diagram above. Use the "NO" – Normally open and "COM" – Common contacts.

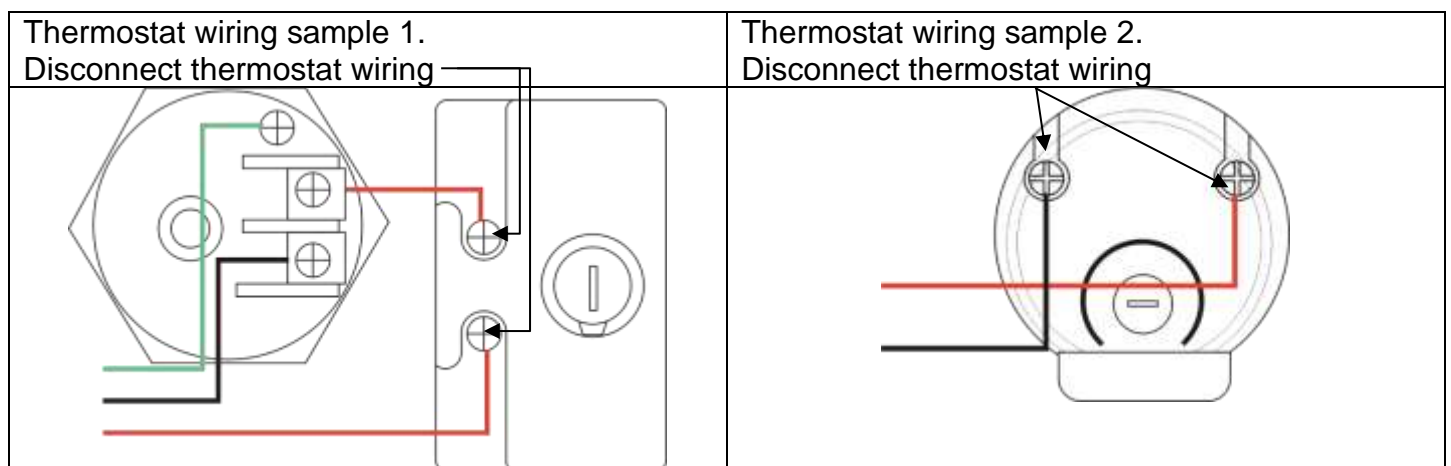
## 8. THERMISTOR INSTALLATION

Ensure that the Geyser Double Pole isolator is switched off.

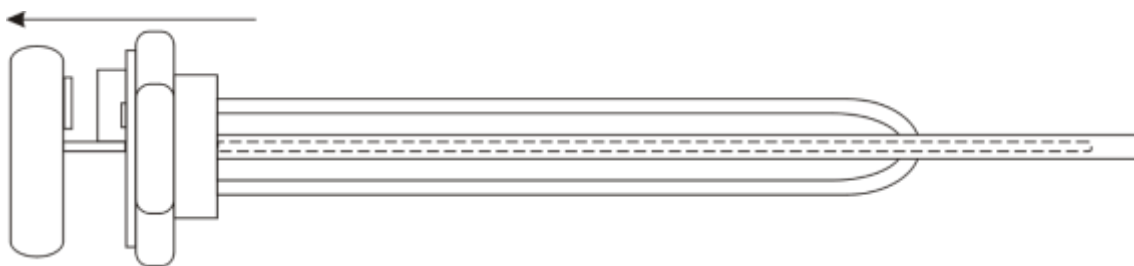
### 8.1 Remove Geyser Access Cover



### 8.2 Disconnect Geyser Thermostat Wiring



### 8.3 Remove Geyser Thermostat



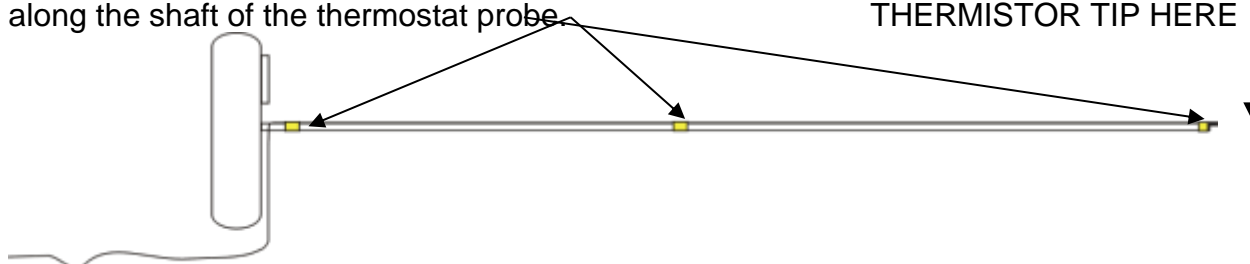
### 8.4 Thermistor Supplied

- The thermistor is supplied with 20m, 0,5 sq mm ripcord. Handle the thermistor with care.
- Ensure that the thermistor is free of any knots or kinks.
- Gently straighten the thermistor wire.



## 8.5 Fit Thermistor To Thermostat

- Fit the thermistor to the thermostat with the supplied high temperature tape as seen below along the shaft of the thermostat probe



## 8.6 Refit Thermostat

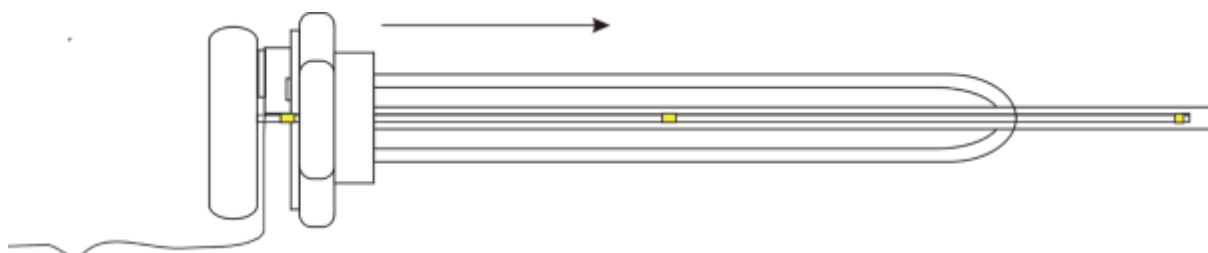
**PLEASE NOTE: Set the thermostat temperature to maximum by turning the dial to max temp.**

In other words:

Set the temperature setting on a 75°C thermostat to 75°C.

Set the temperature setting on a 70°C thermostat to 70°C.

The reason being that the geyser controller will control the temperature via the installed thermistor. Insert the thermostat into the geyser thermostat tube.

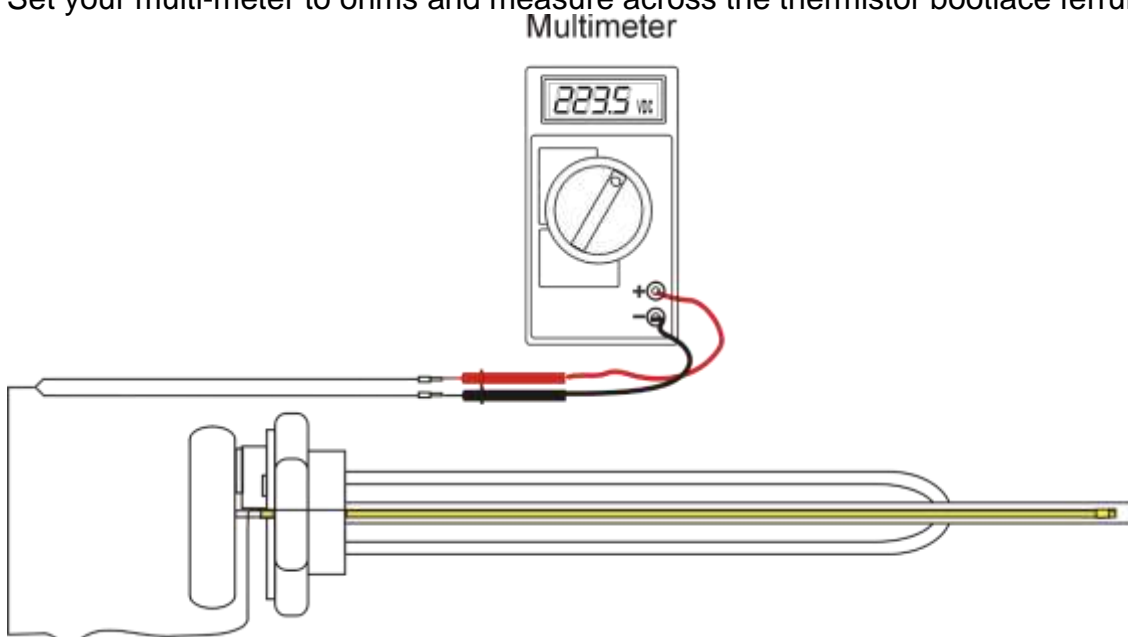


- Ensure that the thermistor wire does not pinch at the exit of the thermostat tube.
- Secure the thermistor ripcord securely as to prevent the thermistor wiring from breaking off.

## 8.7 Thermistor continuity test

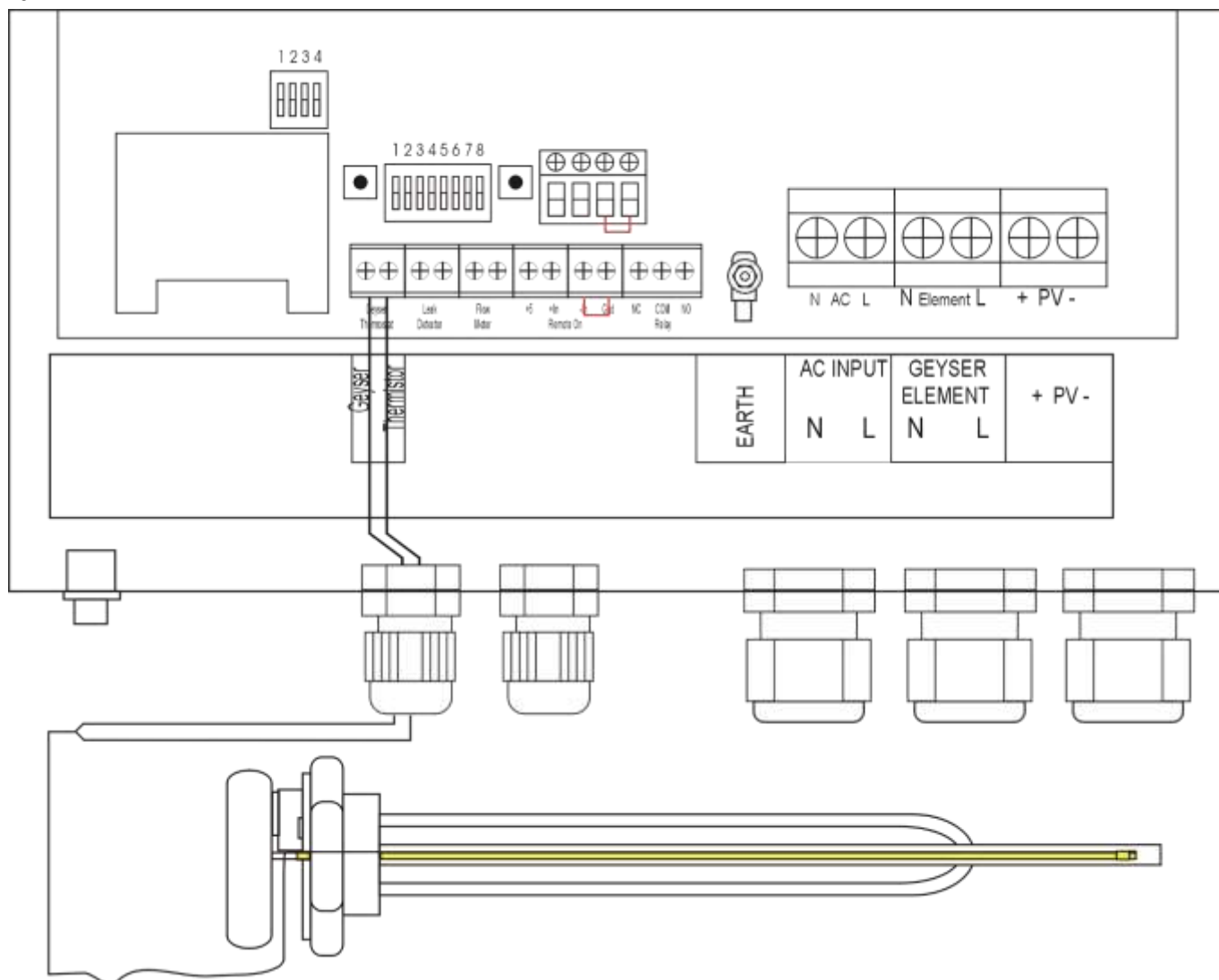
At this point use your multi-meter to measure the resistance of the thermistor.

- Set your multi-meter to ohms and measure across the thermistor bootlace ferrules.





- Depending on the ambient temperature a reading between 6K Ohm and 10k Ohm should indicate that the thermistor wires are intact.  
The thermistor is calibrated at 10k Ohm at 25 °C. The higher the temperature the lower the k Ohm reading.
- Route the thermistor wiring to the Geyser Controller.
- Repeat the Thermistor Continuity test as described in 8.7.
- If the continuity is correct, connect the thermistor ripcord wires to the controller connector blocks marked “Geyser Thermistor” as displayed below.



## 9. SETTINGS EXPLAINED

### 9.1 Element Size

#### Default Element Size: 3kW

Sets the controller dipperswitches to match the geyser element size:

Settings: 2kW, 3kW or 4kW.

---

### 9.2 DC Temperature

#### Default temp: 60 °C.

Sets the max water temperature in PV mode.

Settings: 45, 50, 55, 60, 65 and 70°C.

For a 75°C thermostat set the max DC temp to 65°C or less.

For a 70°C thermostat set the max DC temp to 60°C or less.

---

### 9.3 DC Temperature Hysteresis

Sets DC temperature hysteresis.

Settings: 1, 2, 5, 7 or 10°C.

Hysteresis is the difference between the geyser's on and off temperature.

DC Temperature minus 1, 2, 5, 7 or 10°C.

When the water reaches the set DC temp and the DC hysteresis is set for 5°C, the geyser heats the water until 60°, the temperature set in section 9.2.

The controller then stops supplying power to the element at 60°C.

Set temperature – Hysteresis = 60°C – 5°C = 55 °C.

When the temperature reaches 55°C the geyser switches on.

---

### 9.4 AC Temperature Below DC

Sets the max AC Temperature in AC mode.

Settings: 0, 3, 5 or 10°C.

The water heats to this temperature when connected to AC as described below.

If the DC temperature is set for 60°C and the AC Temp Below DC setting is 5°C, then the geyser heats the water to: 60°C - 5°C = 55°C.

---

### 9.5 AC Temperature Hysteresis

Sets the AC temperature hysteresis.

Settings: 1, 2, 5, 7 or 10°C.

Hysteresis is the difference between the controller's on and off temperature.

AC Temperature minus 1, 2, 5, 7 or 10°C.

When the water reaches the set AC temp and the AC hysteresis is set for 5°C, the geyser heats the water until 55°C, the temperature set in section 9.4.

The controller then stops supplying power to the element at 55°C.

Set temperature – Hysteresis = 55°C – 5°C = 50 °C.

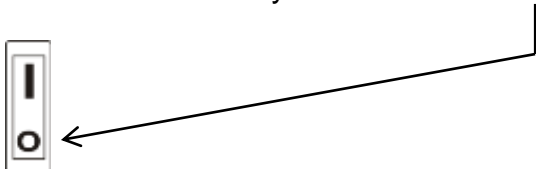
When the temperature reaches 50°C the geyser switches on.

#### 9.5.1 Defaults All Data

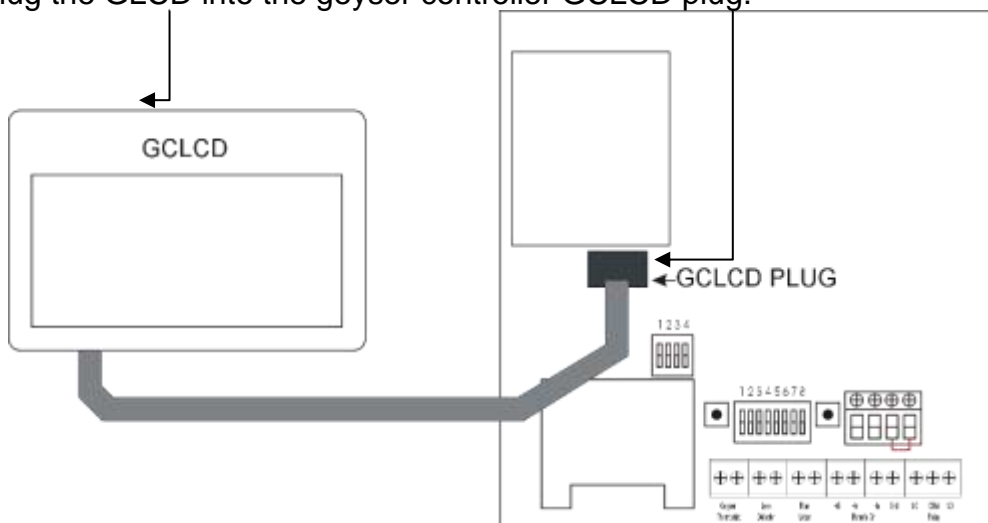
Sets the controller settings to factory default.

## 10. CHECKS PRIOR TO START-UP

Ensure that the Geyser Controller “ON/OFF” SWITCH is switched “OFF”.



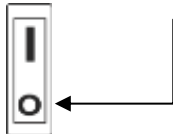
- Ensure that the controller is mounted vertically.
- Check if the Input and Output cables are secured.
- Ensure the correct polarity of the PV connections.
- Ensure that the AC wiring is secured.
- Switch the geyser double pole isolator at the geyser to the “ON” position.
- Switch the external DC PV connect switch to the “ON” position.
- Plug the GLCD into the geyser controller GCLCD plug.



The GLCD “Geyser LCD” is sold separately and the purpose of the GLCD “Geyser LCD”, is to assist the installer with programming and fault finding.

### 10.1 Test And Startup Procedure

- Ensure the Geyser Controller ON/OFF switch is switched OFF.



Observe the GLCD Menu, it should show the following. Note the sections marked in red.

PWR	OFF	Tcntr	ON
PV	167V	0A	0W
Vmp	136V	Duty	0
I_DC+	0	I_AC+	0
30kW Elmnt		Max	1569W
T_Gey 0	40	T_PV	60
PM:	0, TF:	19, TC:	0
FW:	V02R01	0976997570	

“PWR OFF” indicates the controller is switched off.

“PV 167V” indicates the open circuit panel voltage.

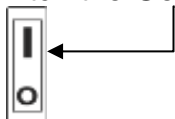
“I\_DC+” indicates 0, meaning “0” DC Amps.

“T\_Gey 0 40”, meaning “40°C”, indicates the current water temperature measured from the thermistor, this also confirms that the thermistor is operational.

Please note:

The DC current I\_DC+ must be 0 Amp at this stage.

- Program all the controller settings as described in the “**Programming Via Dipswitches Section**”, if necessary.
- Switch the Geyser Controller ON/OFF switch to the “ON” position.



Observe the GLCD Menu, it should show the following. Note the sections marked in red.

On	PV	Tcntr	ON
PV	141V	79A	1036W
Vmp	136V	Duty	100
I_DC+	74	I_AC+	0
30kW Elmnt		Max	1569W
T_Gey 0	40	T_PV	60
PM: 0, TF:		19, TC:	0
FW: V02R01		0976997570	

“On PV” indicates the controller is switched on and PV is supplying geyser.  
 “PV 141V” indicates the panel voltage under load.  
 “I\_DC+” indicates 74, meaning “7.4” DC Amps.

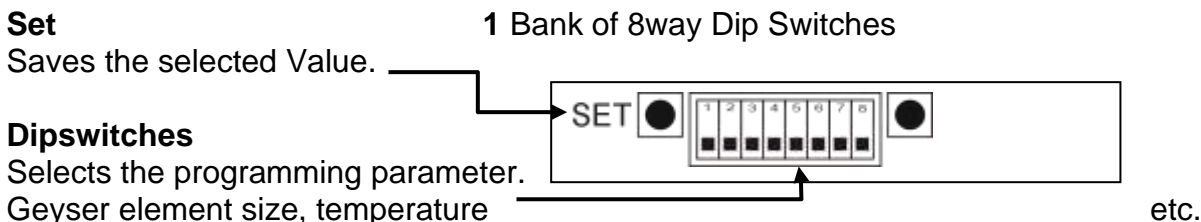
- Switch the Geyser circuit breaker at the main DB board to the “ON” position.
- Program the programmable timer as explained in the “How To Program The Programmable Timer Section”.
- Remove the GCLCD.
- Re-fit the controller wiring cover and secure with the 1 screw if no further programming is necessary.
- Re-fit the programmable timer cover.

## 11. PROGRAMMING VIA DIP SWITCHES

Programming via dipswitches is performed by means of dipswitches located at the bottom of the controller.

- The controller must be connected to the PV array and the array must produce sufficient power to program the controller OR,
- The controller can be connected to AC.
- Turn the Controller ON/OFF Switch to the off position.

Refer to the programming chart for the “Dipswitch Settings” and the section “Programming Example”.



### 11.1 Programming Example:

To select a 3kW Element

**Step 1:** Switch the controller On/Off Switch to the “OFF” position.



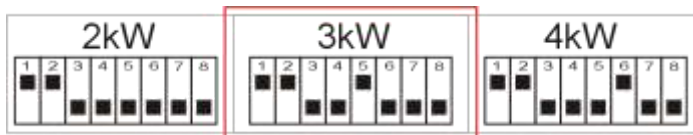
**Step 2:** Ensure that all the dipswitches are in the off position.



Example: To set the element size for 3kW, refer to the programming chart “Geyser Element Size”, set the Dipswitches to the corresponding settings as in “Step 3”.

**Step 3:**

Set Dipswitches according to the dipswitch configuration on the programming chart “GEYSER ELEMENT SIZE”.



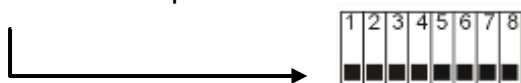
**Step 4:**

Push the “SET Button” until the buzzer beeps. The setting is now saved.



**Step 5:**

Set all the dipswitches to the off position.



To program another setting repeat steps 3, 4, and 5.

**When all settings are programmed, ensure that the dipswitches are all in the “OFF” Position.**



Switch the ON/OFF switch to the ON position to resume operation.

## 11.2 Programming Chart

### 11.2.1 Geyser Element Size



### 11.2.2 DC Temperature



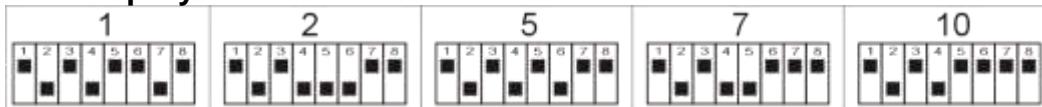
### 11.2.3 DC Temperature Hysteresis



### 11.2.4 AC Temp Below DC



### 11.2.5 AC Temp Hysteresis



## 11.3 Factory Reset



- Switch the controller On/Off Switch to the “**OFF**” position.
- Set the DIP switches as per the above figure.
- Push and Hold the **SET** Button until the buzzer beeps.
- All the LED's will flash once to indicate that the factory reset was successful.
- Set all the dipswitches to the off position.







Re-fit the wiring cover and secure with the 1 screw if no further programming is necessary.

## 12. HOW TO PROGRAM THE PROGRAMMABLE TIMER


### 12.1 How To Set The Timer Clock

If the clock day or time is incorrect.

	<ul style="list-style-type: none"> <li>• Press and hold , press <b>D+</b> to select the correct day.</li> <li>• Press and hold , press <b>H+</b> to set the correct hour.</li> <li>• Press and hold , press <b>M+</b> to set the correct minute.</li> </ul>
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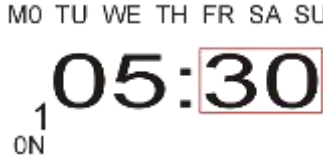
## 13. How To Set The 7-Day Timer

The timer can be programmed for 17 “ON” and 17 “OFF” settings per day.





	<p>DAY/S OF THE WEEK</p> <p>HOURS AND MINUTES</p> <p>Setting: 1-17</p> <p>STATUS: On, Off, Auto On, Auto OFF</p>
--	--

### 13.1 How To Set The Daily ON/OFF Settings

#### 13.1.1 Setting The ON Time

<p>STEP 1: Press  once</p>	<p>STEP 2: Press D+ to set the Day/s of the week</p>	<p>STEP 3: Press H+ to set the hr</p>	<p>STEP 4: Press M+ to set the min</p>
			

#### 13.1.2 Setting The Off Time

<p>STEP 5: Press  once</p>	<p>STEP 6: Press D+ to set the Day/s of the week</p>	<p>STEP 7: Press H+ to set the hr</p>	<p>STEP 8: Press M+ to set the min</p>
			

Repeat Steps 1 to 8 for more daily ON-OFF settings. Press  when done.

Push the “MANUAL” button on the timer and select “AUTO”.

## 14. GLCD MENU SCREENS

The GLCD “Geyser LCD” is sold separately and the purpose of the GLCD “Geyser LCD”, is to assist the installer with programming and fault finding.

### 14.1 Menu Main

The Main Menu can display either of the menus below depending on the state of the controller.

Controller Switched OFF	Controller Switched on and operating from “PV”	Controller Switched On and operating from “AC”
PWR <b>OFF</b> Tcntr ON PV <b>167V</b> 0A 0W Vmp 136V Duty 0 I_DC+ <b>0</b> I_AC+ 0 30kW Elmnt Max 1569W T_Gey 0 <b>40</b> T_PV 60 PM: 0, TF: 19, TC: 0 FW: V02R01 0976997570	On <b>PV</b> Tcntr ON PV <b>141V</b> 79A 1036W Vmp 136V Duty 100 I_DC+ <b>74</b> I_AC+ 0 30kW Elmnt Max 1569W T_Gey 0 40 T_PV 60 PM: 0, TF: 19, TC: 0 FW: V02R01 0976997570	On <b>AC</b> Tcntr ON PV 141V 0A <b>2806W</b> Vmp 136V Duty 0 I_DC+ 0 I_AC+ <b>122</b> 30kW Elmnt Max 1569W T_Gey 0 40 T_AC 55 PM: 0, TF: 19, TC: 0 FW: V02R01 0976997570
20kW Elmnt = 2kW 30kW Elmnt = 3kW 40kW Elemnt = 4kW	DC Amps = I_DC+ / 10 T_Gey 0 = Current water temp T_PV = Max temp on DC	AC Amps = I_AC+ / 10 T_AC = Max temp on AC

14.2 Menu 1 – Inputs and IO	14.3 Menu 2 - Timer	14.4 Menu 3 - Enable
Menu 1 - Inputs and IO ST_On OFF ST_By OFF In_Rem OFF In_By OFF In_ACP OFF In_LD OFF In_R1 OFF In_R2 OFF RX_Rem ON RX_By OFF Con to PV = 0 AC = 0 ST_ACP = 0	Menu 2 Timer YY:MM:DD:DW HH:MM:SS 20: 8: 6: 4 16: 57 :51 20: 8: 6: 4 16: 30 : 0 MCU -> RTC T_Gey 41 Clock Fault = 0 T1=0 T2=0 T_AC=0 H=0 T1=1 S=23: 0 E=23:05	Menu 3 Enable. AC_temp_CNTR = 1 Thermistor_Fitted = 1 Tmr_in_Auto_Mode = 1 GLCD_Connected = 1 GLCD_reboot = 0 GLCD_Full_Menu = 1 Coms_H = 0 Buzzer = 1
	This menu can be ignored	0 = Function Disabled 1 = Function Enabled

14.5 Menu 4 – Fault	14.6 Menu 5 – Stop_When	14.7 Menu 6 – Fault.L
Menu 4 Fault. CLK_Bat -0 CLK_Bat -0 Thermis -0 Thermis -0 Panel_V -0 Panel_V -0 Earth_F -0 Earth_F -0 RY_T_AC-0 RY_T_AC-0 LeakD_S -0 LeakD_S -0 MFET_F -0 MFET_F -0	Menu 5 Stop_When. CLK_Bat -0 CLK_Fit -0 Thermis -1 Element -0 Panel_V -1 PV_Alm -0 Earth_F -1 RY_T_AC-1 RY_T_PV-0 LeakD_S -1 LeakD_M -0 MFET_F -1 Temp_H -1	Menu 6 Fault.L CLK_Bat -0 CLK_Fit -0 Thermis -0 Element -0 Panel_V -0 PV_Alm -0 Earth_F -0 RY_T_AC-0 RY_T_PV-0 LeakD_S -0 LeakD_M -0 MFET_F -0 Temp_H -0
0 = Normal Operation 1 = Fault Condition	0 = Controller will not stop when the condition is true. 1 = Controller stops when the condition is true.	



14.8 Menu 7 – Other	14.9 Menu 8 – Other
Menu 7                      Other VMP Saved =            0 Voc                        =    0 Menu 0 option    0	Menu 8                      na 1 2 3 4 5 6 7
Menu is not relevant	Menu is not relevant

**15. SPECIFICATIONS PV GEYSER CONTROLLER**

Suitable AC Elements	2kW, 3kW & 4kW
Max Input Solar Panel Voltage	275Voc
Min Input Solar Panel Voltage	2KW – 184Voc, 3 & 4kW – 139Voc
Max Input Solar Panel Power	2000W
Min Input Solar Panel Power	900W
Rated AC Input Grid Amps	20A
Rated AC Input Voltage	230V AC
Dimensions	260 x 245 x 75mm
Weight	1.4kg
Warranty	24 months

## 16. LIMITED CARRY- IN WARRANTY

The following Warranty is conditional that the relevant Microcare product has been installed by an approved Microcare Installer, the required paperwork has been submitted to Microcare and that the Client is in receipt of our acknowledgement of this. Our products are innovative pieces of equipment and incorrect installation has been the overriding cause of failure in the past. No exception to this condition will be considered.

Microcare warrants this PV Geyser Controller against defects in workmanship and materials, fair wear and tear accepted, for a period of two years (Inverters manufactured from the 1<sup>st</sup> July 2020 onwards carry a five year warranty) from the date of collection for all equipment and is based on a carry-in basis. Where the installation of the product makes it impractical to carry-in to our workshops, Microcare reserves the right to charge for travel time and kilometres travelled to and from the site where the product is installed.

During this warranty period, Microcare will, at its own discretion, repair or replace the defective product free of charge. This warranty will be considered void if the unit has suffered any physical damage or alteration, either internally or externally, and does not cover damages arising from improper use such as, but not exclusive to:

- Reverse of battery polarity.
- Inadequate or incorrect connection of the product and/or of its accessories.
- Mechanical shock or deformation.
- Contact with liquid or oxidation by condensation.
- Use in an inappropriate environment (dust, corrosive vapour, humidity, high temperature, biological infestation)
- Breakage or damage due to lightning, surges, spikes or other electrical events.
- Connection terminals and screws destroyed or other damage such as overheating due to insufficient tightening of terminals.
- When considering any electronic breakage except due to lightning, reverse polarity, over-voltage, etc. the state of the internal control circuitry determines the warranty.

This warranty will not apply where the product has been misused, neglected, improperly installed, or repaired by anyone else than Microcare. In order to qualify for the warranty, the product must not be disassembled or modified. Repair or replacement are our sole remedies and Microcare shall not be liable for damages, whether direct, incidental, special, or consequential, even caused by negligence or fault. Microcare owns all parts removed from repaired products. Microcare uses new or re-conditioned parts made by various manufacturers in performing warranty repairs and building replacement products. Microcare repairs or replaces a part of a product; its warranty term is not extended. Removal of serial numbers may void the warranty.

All remedies and the measure for damages are limited to the above. Microcare shall in no event be liable for consequential, incidental, contingent or special damages, even if having been advised of the probability of such damages. Any and all other warranties expressed or implied arising by law, course of dealing, course of performance, usage of trade or otherwise, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited in duration to a period of two years (five years for Inverters manufactured from the 1<sup>st</sup> July 2020 onwards) from the date of purchase.

### Life Support Policy

As a general policy, Microcare does not recommend the use of any of its products in life support applications where failure or malfunction of the Microcare product can be reasonably expected to cause failure of the life support device or to significantly affect its safety or effectiveness. Microcare does not recommend the use of any of its products in direct patient care. Microcare will not knowingly sell its products for use in such applications unless it receives in writing assurances satisfactory to Microcare that the risks of injury or damage have been minimised, the customer assumes all such risks, and the Liability of Microcare is adequately protected under the circumstances.

### Caution

While all care is taken by us to dispatch goods with adequate packaging, Microcare is not responsible for any damaged caused to products after they have left our premises. Semi-sealed batteries must be transported

upright and must not be put on their side. Please ensure that your transport company or delivery team is aware of the sensitivity of the products they are collecting.

### **Goods return policy**

The following terms apply to returns of items purchased from Microcare, and we require the following information:

1. Details of the item(s) you would like to return.
2. Our invoice number.
3. The reason for the return.
4. Microcare must be notified within 7 days of your intention to return the goods which were purchased.
5. All items returned will be inspected prior to refund. If our technicians are not immediately available, the goods will have to be left with us until such time as a technician is available to check the items.
6. Proof of purchase is required for all returns.
7. The price paid by the customer is the price on which the refund is based.
8. Items purchased can be returned for a refund, replacement or exchange, provided proof of purchase is provided and subject to all other conditions as set down here.
9. All returns may be subject to an administration and handling fee of 10% of purchase price plus VAT.
10. Returns are based on a carry-in basis.
11. Returns will be refused in the following circumstances:
  - a. Where an item has been tampered with, altered or damaged in any way, or
  - b. Where a return is deemed unreasonable, this will be referred to management.

### **Severability**

If a part of the terms and conditions set out above is held invalid, void, or unenforceable due to any particular national or international legislation, it shall not affect other parts of the terms and conditions remaining.

## 17. REGISTRATION OF MY MICROCARE PRODUCT

Product Serial Number:

---

Product Description:

---

Date Purchased

---

### Where was the Product Purchased?

Company Name

---

Contact Person

---

Contact Number

---

E-mail Address

---

### Installation Company Information:

Company Name

---

Contact Person

---

Contact Number

---

E-mail Address

---

### Details of Product Owner

Name & Surname

---

Address

---

City & Province

---

Contact Number

---

E-mail Address

---

Date Installed

---

Microcare: 15 Swartkops Str, North End, Port Elizabeth  
P.O.Box 7227, Newton Park, 6055  
Tel: 041 453 5761, Fax: 041 – 453 5763  
Technical Support e-mail: [support@microcare.co.za](mailto:support@microcare.co.za)  
Website: [www.microcare.co.za](http://www.microcare.co.za)

Registration by fax: 041 – 453 5763

Registration by e-mail: [support@microcare.co.za](mailto:support@microcare.co.za)

Online Registration: [www.microcare.co.za/register-my-product](http://www.microcare.co.za/register-my-product)