

Version  
1.2

## SGHOA Pool & Spa Control System



Settlers Green Home Owners Association  
Version 1.2

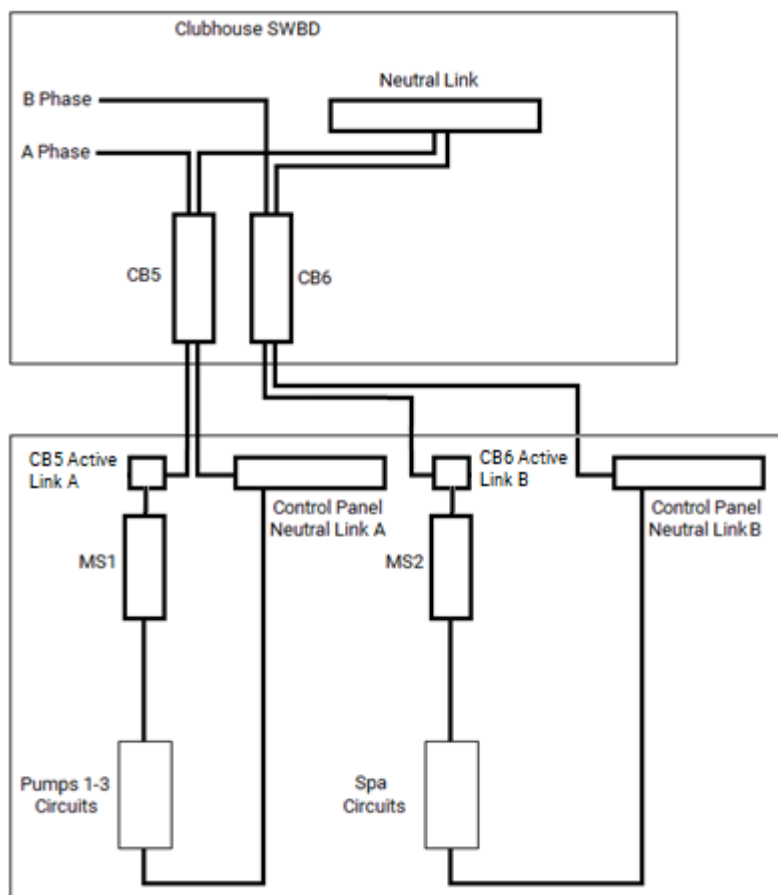
# SGHOA Pool Control System

To address a number wiring issues, the following modifications have been implemented to the SGHOA Swimming Pool and Spa controls as at July 10<sup>th</sup> 2023:

- ❖ Installed modern, Real Time Clock (RTC) based timers to ensure continued synchronicity between pump operations and AEST
- ❖ Installed contactors to control pumps, blower and heater, and bring load current ratings to within specification
- ❖ Installed modern manually operated 'light touch' timer switches to control the spa pump/heater/blower combination
- ❖ Re-located Spa/Heater/Blower operating switches in one easily accessed location
- ❖ Re-wire pool and spa controls in a secure IP6 enclosure

## Pool Pump House Supply

It's important to understand that the electrical circuits supplying the pool equipment is two phase ie. 415V between the two supply active conductors. Additionally, the circuit breakers controlling these supplies (on the Clubhouse Switchboard) are RCCB devices. As a result, the pool controls are split into two (2) supplies, electrically isolated from one another at the Pool Control Panel. The diagram below explains the situation:



If additional circuits are required in the future, adherence to the above circuit layout is essential, as there is a 415V potential difference between the two circuit active conductors, with each neutral return passing through the respective RCCB devices CB5 and CB6. Any crossover will result in instant tripping of both RCCB's on the Clubhouse Switchboard.

## Pool Control Functions

The pool control functions are split into two main areas:

1. Pool Pumps and chlorinators
2. Spa controls

**Pool Pumps and Chlorinators** - Hygiene in the main body of water is controlled by three (3) pumps, split over the zones shown in the diagram below. All three pumps are controlled via Real Time Clock (RTC) timers, with two pumps running simultaneously for two turnover periods – 6 hours. The third pump runs to the same program as the other two pumps in winter, with a different program for summer, allowing the “toddler pond” to be circulated more often (due to the small water volume and greater risk of contamination). Summer routines for all three pumps will need to be changed at the start of each season, with particular emphasis on the heavy use periods during the summer school holidays and Christmas usage times.

Timer ‘A’ is a dual channel timer, with Channel 1 dedicated to all three pool pumps via a three-pole contactor C1. Channel 2 is unused. Timer ‘B’ is a single channel timer dedicated to the Spa Pump and chlorinator. All timer routines are programmed via Bluetooth using the Voltex TCBT app. Initial time settings are programmed as follows:

- Timer A - Channel 1 = 10pm till 4am daily
- Timer A - Channel 1 = 10am till 2pm daily in HOLIDAY mode (set for December 1<sup>st</sup> – January 28<sup>th</sup>)
- Timer B - Channel 1 = 10am till 2pm daily in HOLIDAY mode (set for December 1<sup>st</sup> – January 28<sup>th</sup>)
- Timer B – Channel 1 = 10pm till 12am daily

Time settings are increased for summer months and heavy load periods, however a Maintenance Override feature has been incorporated into the controls as noted below. Additionally, each Timer/Channel can be set to Manual mode in two ways:

- Pressing and holding the appropriate Channel button on the front of the relay bezel for 2 seconds
- Setting the appropriate Channel to ON using the Voltex TCBT app

**NOTE: Overriding a timer Channel MUST be reversed for a return to programmed timer functions**

### The Maintenance Override function

This is a separate control function, operated by a momentary switch on the front of the main Pool Control box. When activated, all four Pool and Spa pumps are turned ON for 60 minutes to allow pool/spa cleaning. This function can also be used when ‘top-up’ sanitation is required.

**Spa Controls** – The Spa controls are split into three distinct functional operations, as it can be run in pump mode, pump plus blower mode or pump plus blower plus heater mode:

Pump Mode – This is an automated sanitation cycle controlled by the Real Time Clock (RTC) timer. In the winter time, this control shares the same time start as pool pumps 1 - 3, although programmed for 2 hours only (six turnover periods), due to the small water volume. The summer program is modified as described above.

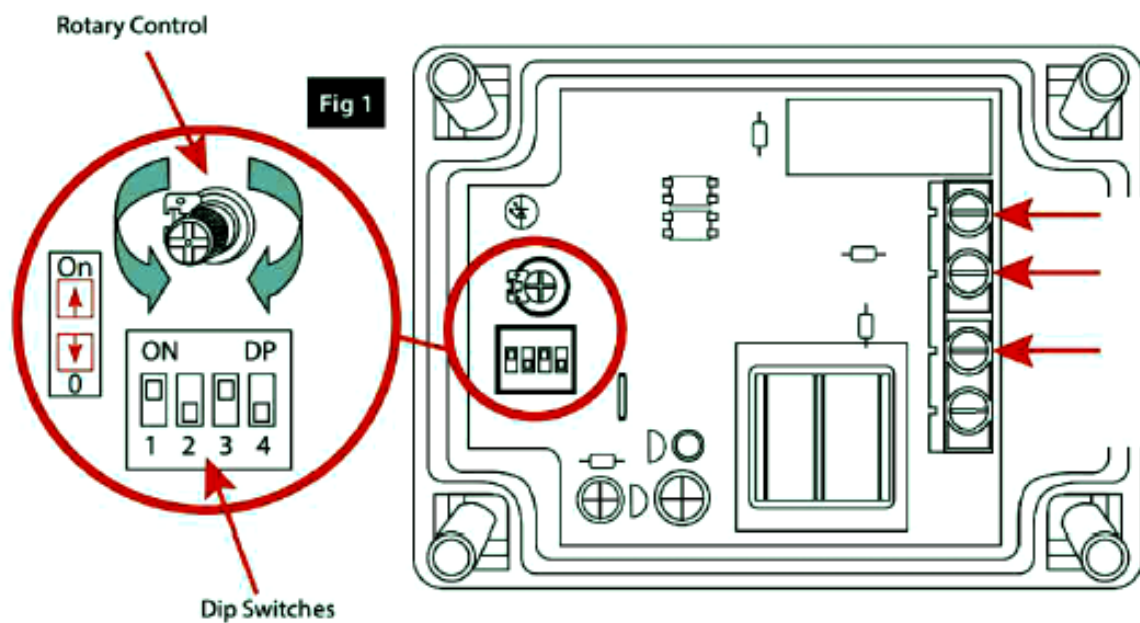
Spa Pump and Blower – In this configuration the Spa pump and blower are controlled by a manually operated switch located to the side of the BBQ area, marked as ‘BLOWER’. This function has a preset running time, and can be run at any time, on demand. The timer is currently set for a running time of 60 minutes.

Spa Pump and Heater - In this configuration the pump and heater are controlled by a second manually operated timer switch with a preset running time. This option can be run at any time, on demand, with the running time set to 60 minutes to allow time for the water to reach temperature. At the conclusion of the

operating period, the pump will continue to operate for an additional 10 minutes via a run-on timer function, to purge hot water from the spa pump lines at the completion of the heating cycle, to avoid damage to the PVC pump lines.

The Spa is provided with a gas heater capable to heating the Spa water volume to 35°C+. The heating cycle is started when the Spa 'light touch' pushbutton switch is engaged, starting the pump which then starts the gas ignition sequence. NOTE – The heater WILL NOT function without the Spa pump RUNNING. Control supply to the Spa Gas heater is provided by CB6.

Setting the Blower and Heater Timers – The timers for the Blower and Heater functions are contained within the 'light touch' switches beside the Pool Area BBQ. Time settings are determined by a DIP Switch and rotary trim pot as shown in the diagram below. Initial values for both will be for 20 minutes (1100 – with the trim pot set to midway). No override function is provided.

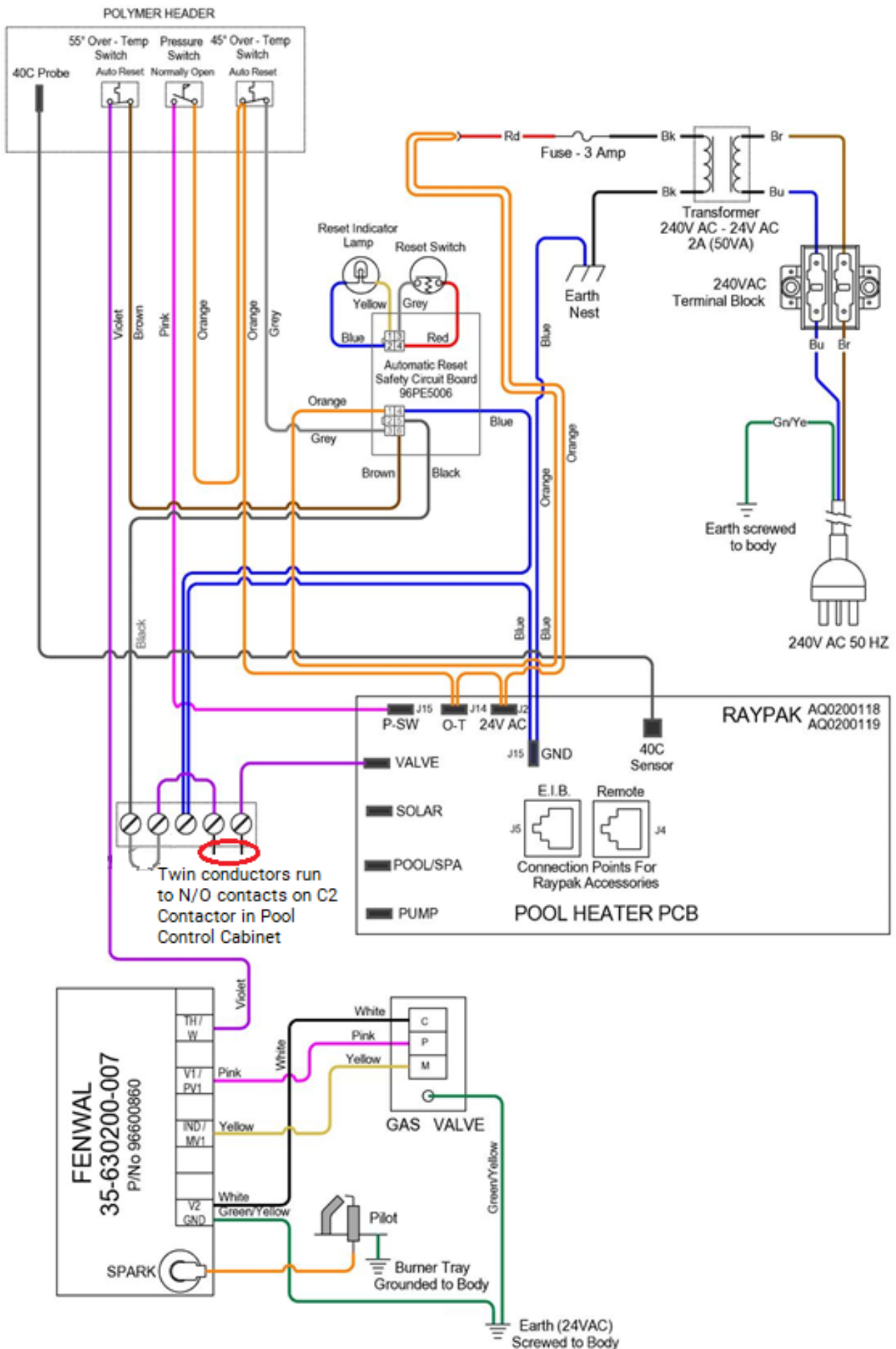


| DIP Switch Setting |   |   |   | Timer Function           |
|--------------------|---|---|---|--------------------------|
| 1                  | 2 | 3 | 4 |                          |
| 0                  | 0 | 1 | 0 | 2 seconds to 50 seconds  |
| 1                  | 0 | 1 | 0 | 50 seconds to 20 minutes |
| 1                  | 1 | 1 | 0 | 20 minutes to 70 minutes |
| 1                  | 1 | 0 | 0 | 70 minutes to 2 hours    |
| -                  | - | - | 1 | Timer function disabled  |

## Operation

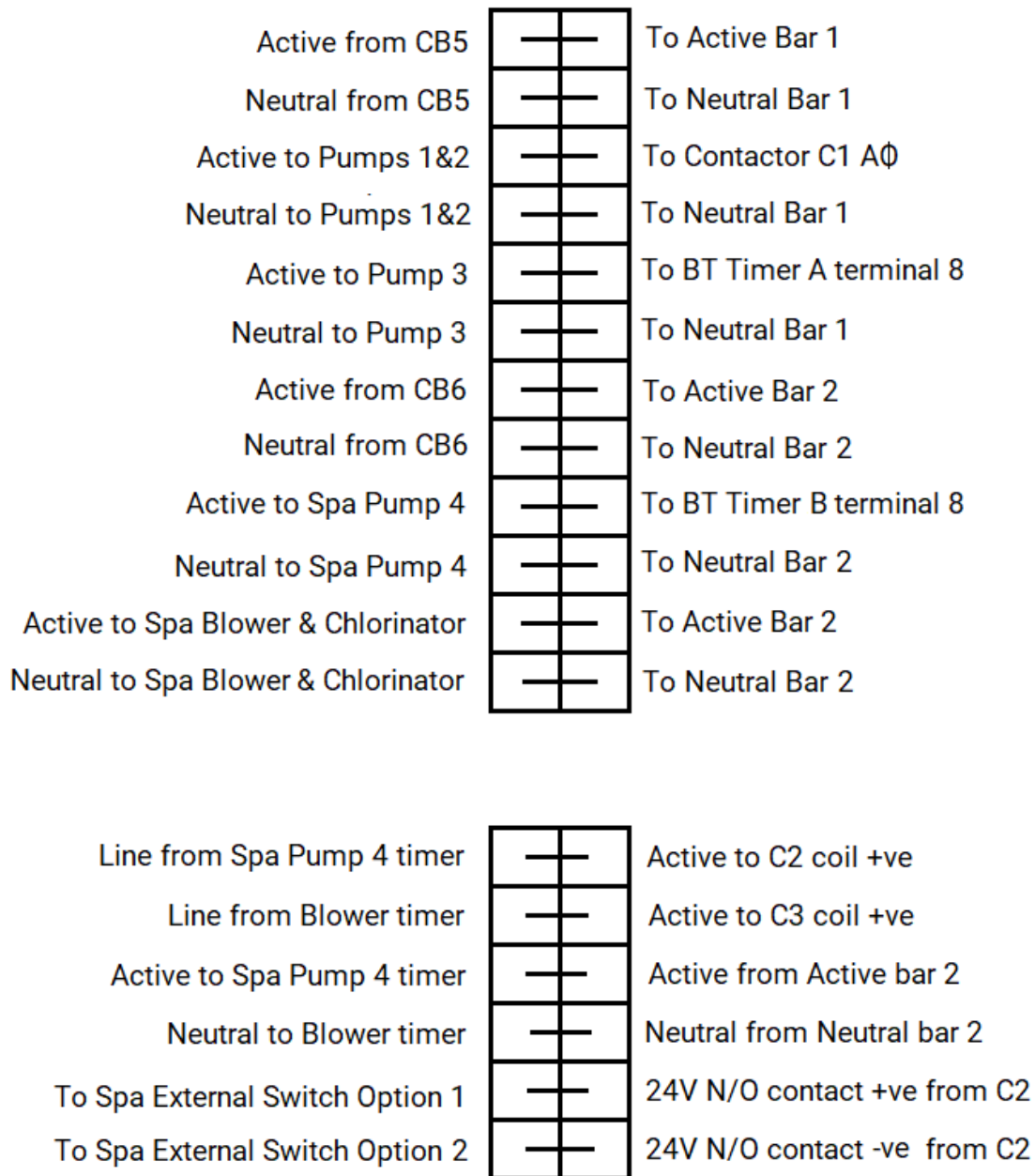
- Once the button is touched the switched power will be supplied for the time period set on the internal controls. Further touches of the button during the timed cycle will shut down the power immediately.
- When the timed cycle has elapsed and the outgoing power is cut, the button can be touched again to begin the timed cycle once more.

# Spa Heating Schematic Diagram



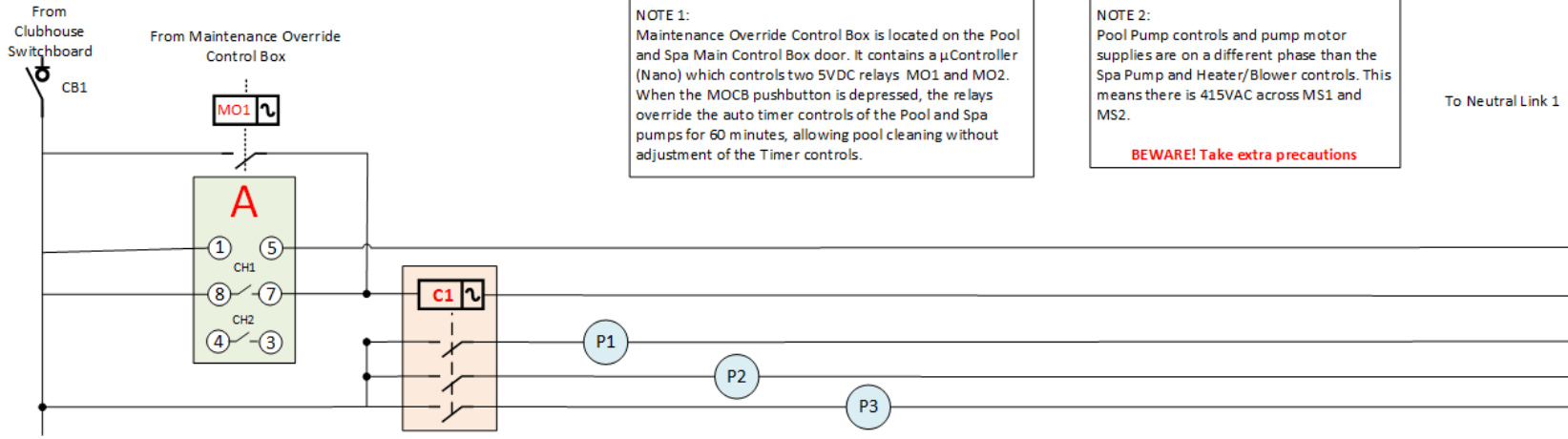
## Control Box Terminal Strip Layout

The following diagram shows the connections associated with the PVC 60A terminal strip at the bottom of the Pool Control Box. Note also, that the GPO's for the Spa Heater supply, the Garden Irrigation System and the Clubhouse Gas Water Heater supply is connected to the CB6 terminals. A second GPO is available for general power supplied by CB5 (internal to Clubhouse).



### NOTE!!

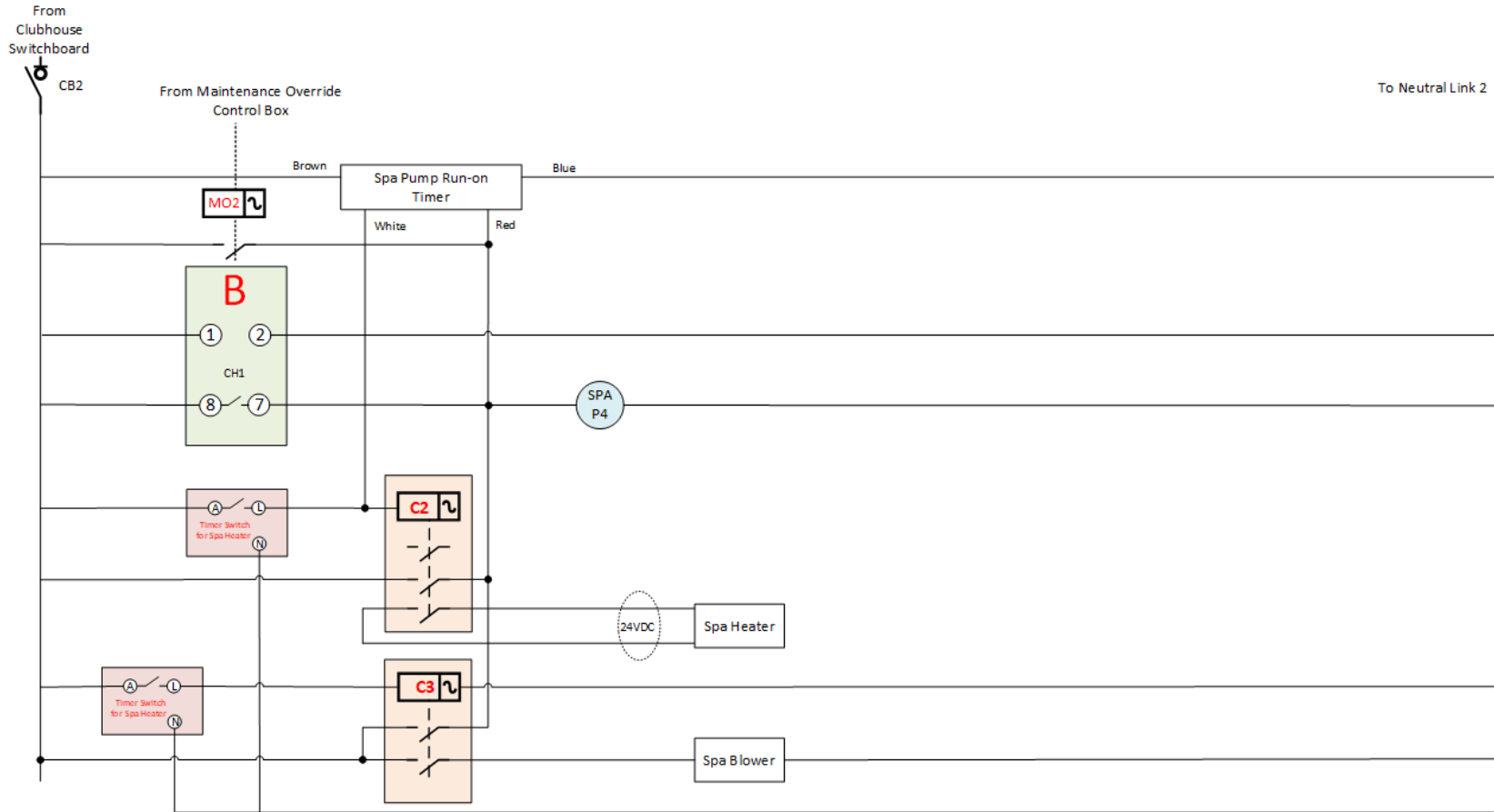
**Changing the plug-in connections to the RED GPO's will disrupt the Control Circuit for the Pool Controls. Pumps and Chlorinators MUST remain plugged into their respective GPO locations for the Pool Controls to function correctly.**



**NOTE 1:**  
Maintenance Override Control Box is located on the Pool and Spa Main Control Box door. It contains a  $\mu$ Controller (Nano) which controls two 5VDC relays MO1 and MO2. When the MOCB pushbutton is depressed, the relays override the auto timer controls of the Pool and Spa pumps for 60 minutes, allowing pool cleaning without adjustment of the Timer controls.

**NOTE 2:**  
Pool Pump controls and pump motor supplies are on a different phase than the Spa Pump and Heater/Blower controls. This means there is 415VAC across MS1 and MS2.

**BEWARE! Take extra precautions**



|              |                                                  |
|--------------|--------------------------------------------------|
| Date:        | Settlers Green Pool and Spa Control Schematic    |
| Dec 22, 2023 |                                                  |
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