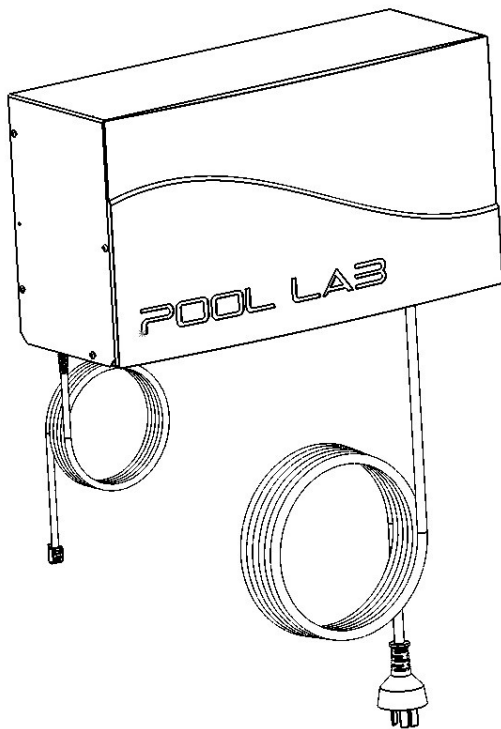


OWNER'S MANUAL

POOL LAB[®]

PL Series EXP – Expansion Module



Patented Technology

Patent Technology Numbers:

Australia No. 2003240282
Canada No. 2,483,477
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Switzerland No. CH 1 511 976
UK No. UK 1 511 976

[USA No. 7,988,916](#)

IMPORTANT

Read this manual carefully before operating your Pool Lab EXP

Before use ensure the unit is securely mounted as per the INSTALLATION GUIDE in this manual, with the outlet sockets facing DOWNWARDS.

**KEEP THIS MANUAL IN A SAFE PLACE
FOR FUTURE REFERENCE**

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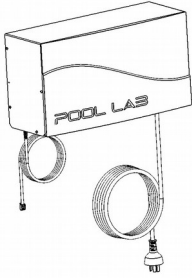
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rev. 1

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PACKAGE CONTENTS

Qty	Description	Image
1 x	EXP – Expansion Module (EXP5 shown)	
1 x	Water Temperature Sensor NOTE: 2 x additional sensors are required for solar control function – sold separately.	
1 x	Wall Mounting Bracket and fastener kit	

EXTRAS – SOLD SEPARATELY

Pool and Spa Combination systems require a “**SPA FLOW SWITCH**” to be fitted to the spa suction line. This is so that the system is able to determine which body of water is being treated by the chlorinator. It is also required for the solar, heater and automatic valve actuator functions to operate correctly.

The Integrated Solar controller requires two additional temperature sensors. One is a roof temperature sensor for measuring available solar energy, and the other is for the solar collector water inlet temperature.

Automatic Valve Actuators can be fitted for automated control of pool and spa flow control valves, as well as up to two additional valves for other functions such as solar control, in-floor cleaning systems, or water features, etc.

IMPORTANT SAFETY INSTRUCTIONS

- ➔ Read all sections of this owner's manual before installing or operating the equipment
- ➔ Do not allow children or any unqualified person to operate or perform any maintenance on this equipment.
- ➔ Always ensure free chlorine level is maintained above 1.0ppm and avoid free chlorine levels above 3.0ppm
- ➔ Ensure water is regularly tested by a pool professional, and ensure all aspects of water balance are properly maintained.
- ➔ Do not allow bathers to use pool or spa if the free chlorine level is above 8.0ppm
- ➔ FOR SPA ONLY INSTALLATIONS: Proper sanitation requires the spa be periodically drained completely. As a guide, the number of days between complete spa drainage should be equal to the volume of the spa in litres, divided by 10 times the maximum number of daily spa users

Health and Hypothermia Warnings

- ➔ People with medical conditions should consult a physician before entering pool or spa water
- ➔ Maximum spa water temperature is 40 degrees C
- ➔ Bathing time in spa water at (or near) 40 degrees C should not exceed 15 minutes

INTRODUCTION

The Pool Lab EXP (Expansion Module) is a feature packed pool and spa automation system that integrates all of your equipment into one powerful controller.

Available in two models to suit your requirements:

All models features integrated gas heater and solar heating system controls, and connections for up to four automated flow control valves.

EXP5 – is a plug-in appliance that comes with a standard 10 Amp power lead. This model is simple to install, and installation does not require an electrician. Features 5 x 240V, 10 Amp outlet sockets and is perfect for smaller systems where the total load of the connected equipment does not exceed 10 amps.

EXP9 – is a hard-wired appliance that requires an electrician for installation. This model features 9 x 240V, 10 Amp outlet sockets separated into two 15 Amp circuits for a maximum total load of 30 Amps.

Flexible configuration options allow the Pool Lab EXP to adapt to almost any residential or small commercial pool and spa configuration.

The solar controller can be configured to suit both integrated or isolated solar systems with options to suit simple valve controlled systems, booster pump (retro-fit) systems, or even multiple pump solar systems.

Multiple outputs can be grouped together where preferable, for example where multiple lighting transformers are connected and you do not need to control them independently.

Over 20 years of ground breaking research and development have led to this unique Australian product, with pool owner's globally enjoying the benefits of Pool Lab's innovative technology.

Welcome to Pool Lab!

CONTROL PANEL OVERVIEW



LCD DISPLAY

- The display has three top level views, and a menu system:
 - HOME – Displays running mode, chlorine and ph levels.
 - TIME/DATE – Displays current time and date
 - TIMER – Displays filtration ON / OFF times
 - MAIN MENU – Access settings and configuration items

UP / DOWN BUTTONS

- Adjust the chlorine output level (view “HOME”)
- Adjust the time / date (view “TIME/DATE”)
- Adjust the ON / OFF times (view “TIMER”)
- Navigate menu system (menu system list views)
- Adjust values (menu system field editing)

VIEW BUTTON

- Switch between LCD display top level views
- Moves to the next adjustable field, or set adjusted field
- Hold for 5 seconds to enter the MAIN MENU (view “HOME” only)
- Select a menu item, or edit a field (menu system views)

BACK BUTTON

- Return to previous view, or return to view “HOME”
- Exit adjustment mode
- Display detailed cell output data (view “HOME”)

MODE BUTTON

- Toggle ON / OFF / AUTO running mode.
- Returns to HOME VIEW (from any top level view)

USER PREFERENCES - SETTINGS

User preferences can be changed at any time. The SETTINGS menu is accessed from the MAIN MENU. The following settings are available:

Pool Temperature

Use the UP/DOWN buttons to adjust the value between 0 – 40°C (default setting 25).

This temperature limit will be used for gas and solar heating when the system is in POOL mode.

In the case of an ISOLATED solar system that always returns water to the pool, this temperature limit will be used for solar heating in both POOL and SPA modes. This allows the solar system to heat the pool while the spa is in use.

Gas heating will only be used in POOL mode if the HEATER configuration item HEAT POOL is set to YES.

Solar heating will only be used in POOL mode if the SOLAR configuration item HEAT POOL is set to YES.

Spa Temperature

Use the UP/DOWN buttons to adjust the value between 0 – 40°C (default setting 35).

This temperature limit will be used for gas and solar heating when the system is in POOL mode.

Gas heating will only be used in SPA mode if the HEATER configuration item HEAT SPA is set to YES.

Solar heating will only be used in SPA mode if the SOLAR configuration item HEAT SPA is set to YES.

INSTALLATION GUIDE

MOUNTING LOCATION

The EXP module must be mounted on a vertical wall or post, with the power sockets facing downwards.

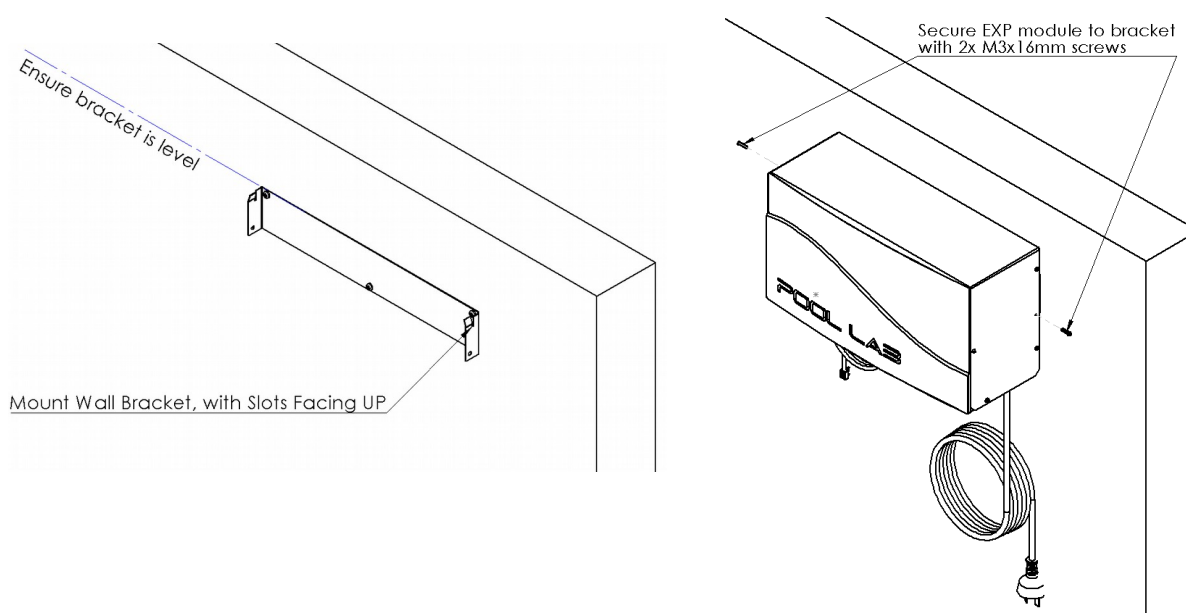
The unit will need to be mounted within approximately 2.5 meters of the Pool Lab Chlorinator control box to allow connection of the data cable. Both units must be mounted outside the pool zones as defined by AN/NZS 3000:2000.

As a general rule for swimming pools, the Pool Lab units must be mounted at least 3.5 meters away from the inside edge of the pool to be clear of the pool zones, and at least 45cm above the ground to protect the outlet sockets from water being splashed up from the ground.

The EXP module should be mounted so that the equipment can be easily connected. Masonry plugs and screws are provided with the mounting bracket, and the screws provided are also suitable for mounting to timber.

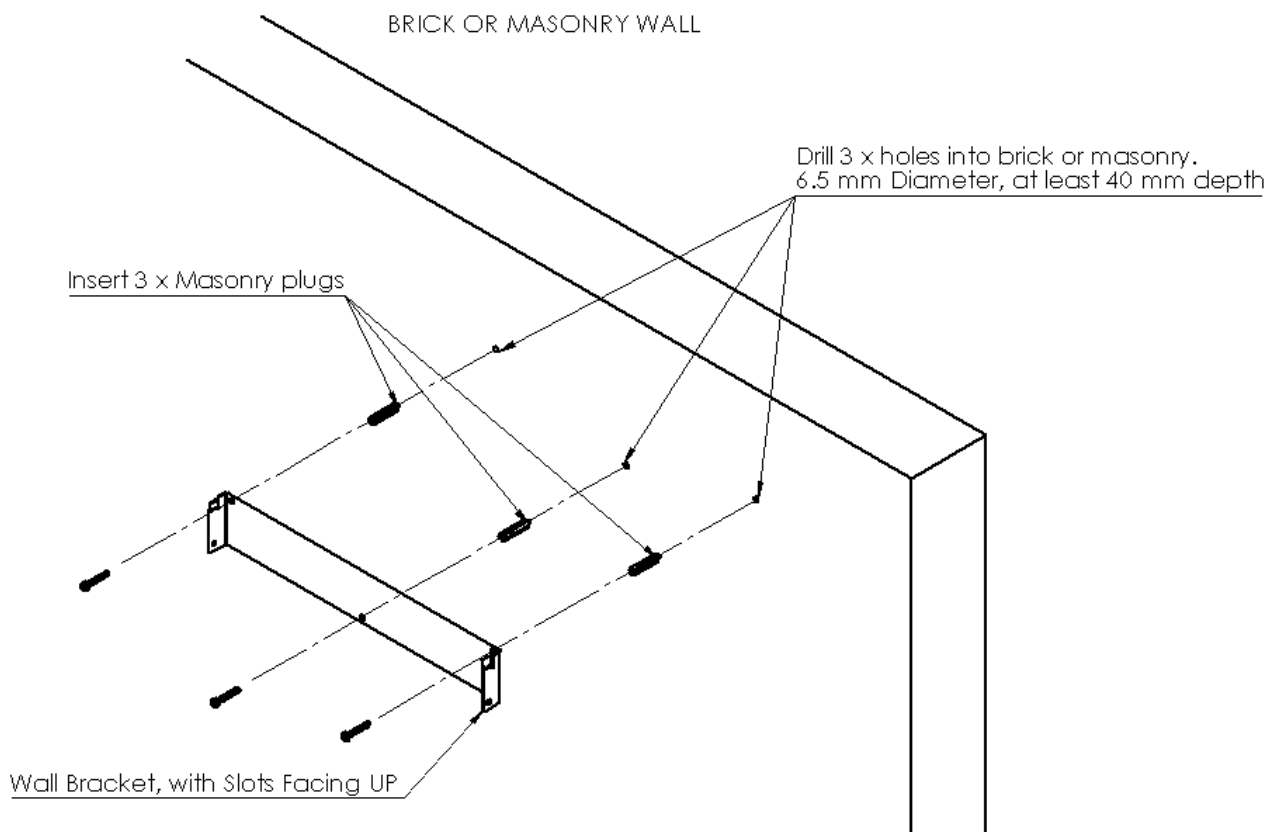
Secure the mounting bracket in place with the slotted edge to the top, and ensure the bracket is level and firmly secured before mounting the EXP module onto it.

The bracket at the back of the EXP module hooks over the slots on the top edge of the mounting bracket. Secure the EXP module to the bracket with the M3x16mm screws provided.



Mounting on Brick or Masonry Wall - Example

- Use the bracket as a stencil to mark the hole locations. Avoid locating holes near the edge of bricks or in mortar joints where possible. Ensure the bracket is level and the slotted edge is to the top.
- Use a hammer drill with a 6.5mm masonry bit, and drill holes to a depth of at least 40mm.
- Use a hammer or mallet to drive the masonry plugs provided into the drilled holes.
- Attach bracket to the wall with the screws provided, and ensure screws are firmly tightened using a Phillips Head screwdriver, or clutched drill / driver with a PH2 bit.
- Mount the EXP module by hooking the bracket at the back of the unit into the slots in the top of the bracket. Secure the unit to the bracket with 2 x M3x16mm screws provided.



ELECTRICAL POWER CONNECTION

EXP5 models are fitted with a power cord for connection to a standard 10 amp power outlet. The unit is protected from overload by a 10 amp manual reset circuit breaker.

EXP10 models require an electrician to complete the electrical power connections before commissioning the unit. The power input is divided into two 15 amp circuits with a manual reset circuit breaker on each circuit. Power may be provided by either 1 x 32 amp circuit, or 2 x 16 amp circuits. An isolator switch must also be installed nearby.

The Pool Lab EXP module is intended to be powered at all times. Power should only be turned off when the system is not in use for an extended period of time.

TEMPERATURE SENSORS

FILTRATION CIRCUIT TEMP SENSOR

The Pool Lab EXP is shipped with 1 x temperature sensor included for the filtration circuit. This sensor should be installed on the filtration system pipework before any solar or other heating equipment. This sensor is required for the integrated gas heater controller to function, and also enables water temperature display.

- Find a suitable location as close to the EXP module as practical.
- If the pipework is below water level, close isolation valves.
- Drain water from the pipework if necessary.
- Drill a 10mm hole in the pipe, and insert the temperature sensor. Fix in place with the gear clamp provided.
- Run the temperature sensor wire to the EXP module terminal block at the base of the unit. Fix wiring to the pipework with cable ties where necessary.
- Trim length if required.
- Connect temperature sensor wires to terminals marked FILTER CIRCUIT TEMP SENSOR (any polarity).

Note: The terminal block is removable to make connection easier.

SOLAR TEMP SENSORS

If the integrated solar controller is to be used this will require 2 x additional temperature sensors which are sold separately. *** SOLAR SENSOR KIT??? ***

One must be installed on the pipework on the inlet side of the solar collector in a location where the water does not drain from the system. Generally the inlet side of the solar pump is an ideal location.

This sensor should be connected to the terminals marked SOLAR INLET TEMP SENSOR.

The other sensor should be installed away from the pipework in a location that is exposed to direct sunlight at approximately the same time as the solar collector.

*** Fit outer sheath??? ie. Piece of solar matting???***

This sensor should be connected to the terminals marked SOLAR ROOF TEMP SENSOR.

HEATER CONNECTION

Where the integrated gas heater controller is to be used, a normally-open relay contact is provided on the terminal block for heater control. Alternatively the auxiliary power outputs can also be configured as a means of controlling a heater if required. Consult your heater documentation for the recommended connection and control method. Some heaters may require configuration settings to be changed for external temperature control. It is recommended to set the heaters internal temperature control to the maximum allowed setting, otherwise the water temperature will be limited to the setting on the heater.

The integrated gas heater controller can also be used for heat pump or electric heating, although power will need to be provided separately for these.

AUTOMATIC VALVE ACTUATORS

For pool and spa combination systems, automated control of your pool and spa mode flow control valves requires 2 x 24VAC valve actuator motors mounted on compatible valves which are sold separately.

Some examples of valve actuator motors that are directly compatible with the Pool Lab EXP module are: Hayward Goldline GVA-24, Pentair CVA24, or Jandy JVA 2444 Valve Actuators.

These must be installed on the filtration pump inlet flow control valve, and the filtration circuit return flow control valves. Consult the valve actuator documentation for specific installation instructions.

It is recommended that a small amount of water flow to the spa when in POOL mode to maintain water quality in the spa. This is usually achieved by setting the cams inside the valve actuator to not completely close the spa return line.

Care should be taken when installing to ensure that flow is not blocked at any time while the valves are in motion.

AUXILIARY EQUIPMENT

Power outlet sockets are provided at the bottom of the unit for connection to auxiliary equipment. Each connected auxiliary must be configured to suit it's application before use.

PLUMBING EXAMPLES

SYSTEM CONFIGURATION

Once the Pool Lab Chlorinator has detected that the Pool Lab EXP is connected, the MAIN MENU will have options relating to your EXP configuration and settings. For your connected equipment to operate as intended, it is important that all configuration items are set to suit your system prior to use.

Authority Level

Most system configuration items are protected against accidental changes with a user AUTHORITY level. Before you can change any system configuration items, you must first set the AUTHORITY level to "INST" (INSTALLER).

1. Go to the MAIN MENU (press and hold VIEW for 3 seconds)
2. Navigate to SYSTEM CONFIG, and press VIEW
3. Navigate to AUTHORITY, and press VIEW
4. Press VIEW again to edit the AUTHORITY level
5. Use the UP / DOWN buttons to change the AUTHORITY level to "INST"
6. Press VIEW to save the changes
7. Press BACK once to return to the SYSTEM CONFIG menu

The AUTHORITY level setting will automatically revert back to USER after 5 minutes of inactivity, or it can be changed back to USER manually at any time.

Pool and Spa Volumes

The Pool Lab EXP uses the pool and spa volumes to determine if you have a pool only, spa only, or a pool and spa combination system. For systems where a Pool Lab ASP is also installed these volumes are used to calculate chlorine and acid deliveries.

POOL VOLUME: 0 – 250 KL (Kilolitres)

eg. 50 KL = 50,000 Litres.

Round the value down to the nearest 5 Kilolitres (5000 Litres).

Include the volume of any additional catchment basins and balancing tanks.

If installed on a SPA ONLY system, set POOL VOLUME to ZERO

SPA VOLUME: 0 – 50 KL (Kilolitres)

Round the value down to the nearest 0.1 Kilolitres (100 Litres).

If installed on a POOL ONLY system, set SPA VOLUME to ZERO

Heater Configuration

HEAT POOL: (YES / NO)

This will allow the gas heater to operate when the system is in POOL mode.

HEAT SPA: (YES / NO)

This will allow the gas heater to operate when the system is in SPA mode.

*Note: To disable the heater controller, set both **HEAT POOL** and **HEAT SPA** to **NO**.*

COOL DOWN: (number of minutes)

Number of minutes required for the gas heater to cool down before allowing the filtration pump to turn off. This can be useful to dissipate excess residual heat which may cause nuisance tripping of the over-temperature limit switch, or in some cases damage to the plumbing.

Note: The COOL DOWN timer is canceled if the filtration mode is set to OFF.

Note: The COOL DOWN timer does not affect AUX outputs configured as HEATER unless they are interlocked to the filtration pump. (See AUXILIARY CONFIGURATION)

FILT O'RIDE: (YES / NO)

The filter override function will allow the heater controller to override the filtration timer periods when the filtration system is in AUTO mode. This will allow the filtration pump and gas heater to run beyond the normal filtration timer periods until the set temperature is achieved.

CAUTION: *If using this setting with HEAT POOL set to YES, you must ensure the heater is capable of achieving the set temperature within a reasonable time period. The system may run the heater indefinitely if it is unable to achieve the set temperature.*

NOTE: *This function will not initiate a start up of the filtration pump outside of normal timer periods, it will only allow the filter pump to run on beyond the timer periods.*

Solar Configuration

HEAT POOL (YES / NO)

For non-isolated solar systems such as retro-fit / solar boost pump or valve operated solar, this will allow the solar heating system to operate when the system is in POOL mode.

For ISOLATED solar systems this will allow the solar heating system to heat the pool in either POOL or SPA mode, and the solar controller will be bound to the pool set temperature.

HEAT SPA (YES / NO)

This will allow the solar heating system to operate when the system is in SPA mode.

*Note: To disable the solar heating controller, set both **HEAT POOL** and **HEAT SPA** to **NO**.*

ECON MODE (ON / OFF)

Economy mode will give priority to solar heating when solar heat is available. This will only take effect when both SOLAR and HEATER are in use at the same time.

If the solar system is isolated, then this will only affect operation in POOL mode.

This setting is particularly useful for saving energy when a combination of gas and solar heating is used. The gas heater will only operate when there is insufficient solar heat available.

ISOLATED (YES / NO)

Set to YES if the solar heating system is isolated from the filtration system, and can be run independently of the filtration system.

For valve controlled solar systems or solar boost (retro-fit) systems that require the filtration pump to be running to operate, set this to NO.

When set to YES the solar controller will always use the temperature target set for POOL mode, and will allow solar heating of the pool in either POOL or SPA mode.

When set to NO the solar controller will select the temperature target based on whether the system is in POOL or SPA mode. If the system also has a gas heater fitted, then the gas heater will be inhibited for a short time every time the solar turns ON – this is to allow some time for air to evacuate the solar system and protect the gas heater from thermal shock.

FILT O'RIDE (YES / NO)

The filter override function will allow the solar controller to override the filtration timer periods when the filtration system is in AUTO mode. This is useful for solar systems that require the filtration pump to be running, as it will allow for solar heating outside the filtration timer periods.

The override function will only operate when the solar system is on, and there is sufficient solar heat available, and the water temperature is below the set target.

Auxiliary Configuration

Each auxiliary output can be configured to one of the following functions:

DISABLED: Output disabled, and associated controls hidden.

ENABLE: General purpose output with timer and ON - OFF – AUTO control.

SOLAR: Solar pump output controlled by the integrated solar controller.

HEATER: Heater output controlled by the integrated heater controller.

FILTER: Output synchronized with the filtration pump.

Alternatively, auxiliary outputs can be placed into the following pre-set labeled groups:

POOLLIGHT - SPA LIGHT - SPA BOOST - SPA BLOWER

INFLOOR – CLEANER - FOUNTAIN

Note: Multiple auxiliary outputs can be assigned to a single group. Each group has its' own timer and ON – OFF – AUTO control, and outputs assigned to that group will be synchronized.

INTERLOCK (YES / NO)

If set to YES this output will only be allowed to operate when the filtration pump is running.

If set to NO this output will operate independently.

*Ensure this is set to YES for any pumps that require the filtration system to be running.
Eg. Retro-fit solar system boost pumps.*

ALLOW w/ SPA (YES / NO)

If set to NO this output will be forced off when the system is in SPA mode.

This feature can be useful for preventing certain nuisance situations when heating the spa.

For example, prevent in-floor cleaning systems with heads in the spa from operating, or prevent solar systems that return water to the spa from operating.

Valve Configuration

Valve 1 and 2 have a fixed configuration, and will always operate as pool / spa suction and return flow control valves.

Valve 3 and Valve 4 can be configured to one of the following functions:

DISABLED: Valve disabled, and associated controls hidden.

ENABLE: General purpose valve with timer and P1 - P2 – AUTO control.

SOLAR: Solar flow diverter valve controlled by the integrated solar controller.

HEATER: Heater flow diverter controlled by the integrated heater controller.

POOL/SPA: Valve synchronized with POOL / SPA mode (same as Valve 1 & 2).

Alternatively, valves can be placed into the following pre-set labeled groups:

INFLOOR – CLEANER - FOUNTAIN

INTERLOCK (YES / NO)

If set to YES this valve will only be allowed to operate when the filtration pump is running.

If set to NO this valve will operate independently.

ALLOW w/ SPA (YES / NO)

If set to NO this output will be forced to P1 (Position 1) when the system is in SPA mode.

This feature can be useful for preventing certain nuisance situations when heating the spa.

For example, prevent in-floor cleaning systems with heads in the spa from operating, or prevent solar systems that return water to the spa from operating.

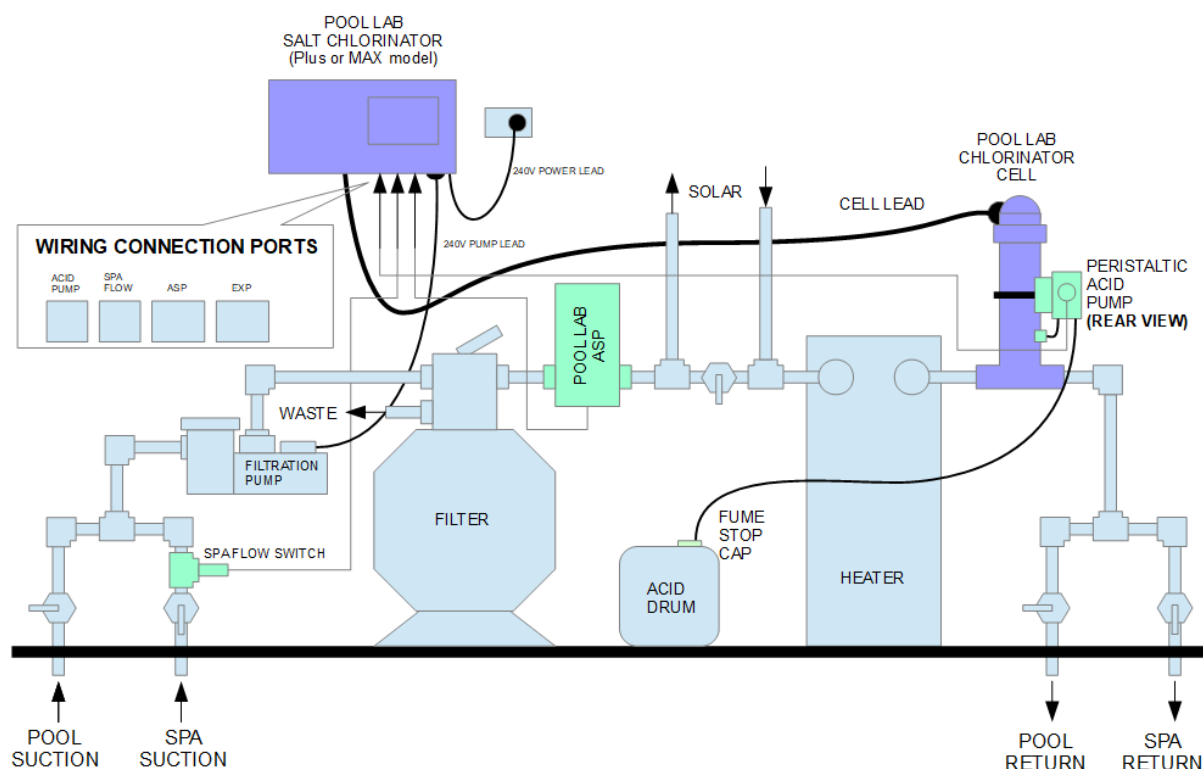
INSTALLATION SCHEMATIC

The following schematic diagram shows an example of a typical installation. This example shows a pool and spa combination with a gas heater and integrated solar.

The ASP must be mounted before any heaters or solar equipment, and after the filter. The ASP must be mounted before the chlorine cell, and before the acid injection point.

The SPA FLOW SWITCH is mounted on the SPA SUCTION line. This is only required for pool and spa combination systems.

B



WIRING

Spa Flow switch (Pool & Spa Combination Systems only) must be connected to the Pool Lab Salt Chlorinator port marked "SPA FLOW"

Peristaltic Acid Pump must be connected to the Pool Lab Salt Chlorinator port marked "ACID PUMP".

The Pool Lab ASP power/data cable must be connected to the Pool Lab Salt Chlorinator port marked "ASP".

TROUBLESHOOTING GUIDE

SYMPTOM / DISPLAY MESSAGE	POSSIBLE CAUSE	SOLUTION
Display Message: “xxx REAGENT EMPTY”	The reagent has failed to prime. If reagent bag is empty it will need to be replaced. Tests requiring this reagent will not be performed.	Replace bag if empty. Otherwise check reagent tubing is fitted correctly. Check for blockages, kinks or knots in the tubing.
Display Message: “LOW FLOW (ASP)”	The ASP internal flow switch has not activated. Water tests, and acid and chlorine deliveries will not occur in this state.	Check water flow. Backwash (sand) filter if required, check skimmer and pump baskets.
Display Message: “PRIMING REAGENTS”	The reagent prime cycle is activated. This message is informational only. The reagent prime cycle occurs on initial power up, or when the prime cycle is requested via the ASP TOOLS menu. A partial prime may also occur during a water test if an air bubble was detected in the reagent line.	If this message occurs regularly or unexpectedly, then you may need to consult an approved service agent.
Display Message: “TESTING WATER”	A water test is currently being performed.	No action required. Water tests are automatically scheduled throughout the filter pump timer cycle. If tests occur when the pump is not running, then you may need to consult an approved service agent.
Display Message: “pH CHANGE DET'D” “ACID FEED PAUSED” “FOR xx HOURS”	A sudden upward shift in the pH value was detected. This may occur as the result of adding alkaline pool chemicals, such as pH BUFFER or LIQUID CHLORINE. Acid feed will be paused for the time shown.	No action required. To cancel the ACID FEED PAUSED state and resume acid feeding, navigate to the ASP TOOLS, ACID PRIME view. Press VIEW to cancel the PAUSED state.

Display Message: "ACID FEED xxx mL/L"	Acid dosing is in progress. Approximate delivery amount remaining is shown.	No action required. Acid feed should only occur while the filter pump is running, otherwise you may need to consult an approved service agent.
Display Message: "pH NOT AT TARGET" "CHECK ACID FEED"	The ASP has detected the pH has not reached the set target value for over 72 hours.	Check acid reservoir, and fill or replace if required. Check acid pump and feed. Use the ACID PRIME function from the ASP TOOLS menu to test the acid pump.
Display Message: "LOW CHLORINE"	The ASP has detected a low chlorine level <1.0ppm for over 72 hours.	If pool usage has been very high, then you may need to bolster the chlorine residual with the addition of liquid chlorine. Try enabling "DEMAND MODE" if this is only an occasional problem. Have water tested professionally to determine if the pool requires a shock dose of chlorine. Reduce chlorine demand with the use of pool covers, and stabilizer for outdoor pools.
Display Message: "CALIBRATE ERROR"	The ASP could not calibrate to clear water, or could not acquire a water sample.	Consult an approved service agent.
Display Message: "DEMAND MODE"	The filtration timer has been extended due to high chlorine demand. Filter will continue to run until the chlorine target is met.	No action required. This feature can be enabled / disabled via the SETTINGS menu.

WARRANTY INFORMATION

DOMESTIC APPLICATIONS

- 3 Year Warranty – Parts (not including consumables or maintenance items*)
- 3 Year Warranty – Workshop Repair Labour (not including maintenance items*)
- 1 Year Warranty – In-field Labour (within 30km of an authorised service agent)

COMMERCIAL APPLICATIONS

- 1 Year Warranty – Parts (not including consumables or maintenance items*)
- 1 Year Warranty – Workshop Repair Labour (not including maintenance items*)
- 1 Year Warranty – In-field Labour (within 30km of an authorised service agent)

CONDITIONS

- **In-field labour charges will apply to units installed for a period exceeding 12 months.**
- In-field labour charges may apply within the 12 month period if location is more than 30 km from an authorised service agent.
- Freight charges are the responsibility of the home owner.
- Under no circumstances shall the manufacturer be liable for incidental or consequential damages, inconvenience or expenses in connection with the removal, installation or replacement of equipment.
- Under no circumstances shall the manufacturer be liable for damage caused to persons or property as a result of use of this equipment.
- Charges will apply during the warranty period if installation or method of operation is not in accordance with **our** instructions.
- Warranty extending beyond 1 year is not transferable.
- **Purchase receipt** must be produced to claim warranty.
- The use of bore water may void warranty where not managed correctly**, and any associated discolouration or staining is not covered by warranty.

THE FOLLOWING INVALIDATES WARRANTY

- Incorrect installations
- Incorrect use
- Misuse
- Water in excess of 40 degrees Celcius, or lower than 0 degrees Celcius.
- Water pressure exceeding 250 kpa
- Where used for a purpose other than described in this manual
- Use of non-genuine components, reagents or indicators
- Use of chemicals or optional equipment not authorised for use by Pool Lab
- Where immediate action has not been taken to rectify a problem

** Maintenance items include the acid dosing system squeeze tube, rollers, injection point non-return valve and fume-stop cap components.*

*** Always use the Langlier Index to determine the ideal pH for bore water. Damage caused by the formation of scale is not covered by warranty.*

NOTES