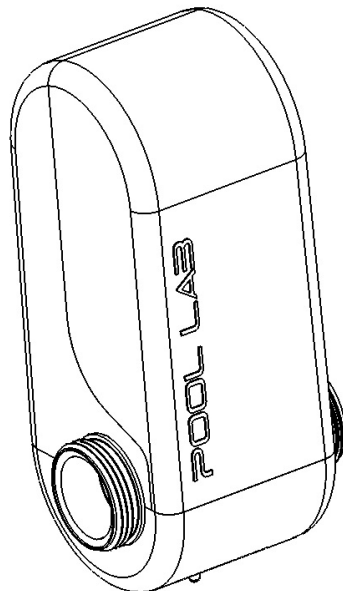


OWNER'S MANUAL

POOL LAB[®]

PL Series ASP – Auto Sampling Photometer



Patented Technology

Patent Technology Numbers:

Australia No. 2003240282
Canada No. 2,483,477
France No. FR 1 511 976
Germany No. 603 28 601.1-08
New Zealand No. 537012
Spain No. EP 1 511 976
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 ASP

KEEP THIS MANUAL IN A SAFE PLACE FOR FUTURE REFERENCE

Manufactured by Poolpower Australia Pty Ltd
Factory 1b, 39-45 Susan Street
ELTHAM, VICTORIA, AUSTRALIA 3095

email: service@poolpower.com.au

rev. 16

IMPORTANT NOTES: ACID DOSING SYSTEM

- Regular inspection and maintenance of the acid dosing system is required
- Failure to complete regular inspections and/or maintenance voids product warranty and may pose a health and safety risk
- Domestic Pools – Service at least every 12 months
- Commercial Applications – Service at least every 6 month
- Ensure area around the acid dosing system is inaccessible to children and animals
- Always wear appropriate protective clothing, gloves, and eye protection when handling acid and when servicing the acid dosing system



ASP Acid Service Kit
Pool Lab Part #55619

READ MANUAL FOR SERVICE INSTRUCTIONS

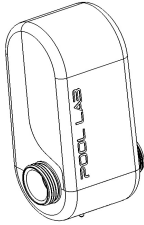
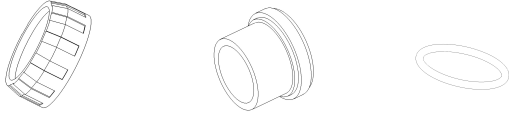
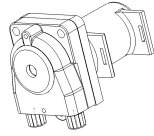
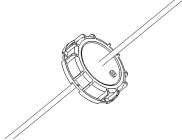
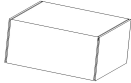




OR


CONTACT YOUR LOCAL SERVICE AGENT

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PACKAGE CONTENTS

Qty	Description	Image
1 x	ASP – Auto Sampling Photometer	
2 x	55601 - ASP Union Tail White 55602 - ASP Union O-Ring 55603 - ASP Union Nut	
1 x	55615 – ASP Peri-Pump (c/w 3.0 meter cable)	
1 x	55620 – Acid Cap Assembly	
1 x	55703 - Free Chlorine / pH Reagent Set	
2 Meters	55617- ASP Peri-Pump Clear Tubing (Smaller Size) 3mm ID – 5mm OD	
1 Meter	55618 – ASP External Waste Line Tubing (Larger Size) 6mm ID – 9mm OD	
1 x	55506-BLACK - Acid Injector w/ check valve & o-ring	
1 x	55616 - ASP Peri-Pump Cable Tie. (365mm x 7.5mm)	

1 x	55617-W ASP Clear Tubing Weight	
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GENERAL PRECAUTIONS

- **Do not use bromine** based products in the pool. Use of bromine will void the warranty on your chlorine cell.
- **Avoid the use of persulfate** based products as this can adversely affect free chlorine test results. Pool Lab recommends to shock dose with liquid chlorine.
- Avoid the use of Soda Ash (Sodium Carbonate) for raising pH levels as under certain conditions this can have a long term adverse affect on pH test results. If raising the pH level is necessary Pool Lab recommends to use sodium bicarbonate as an alternative, but beware this will also raise the total alkalinity level in the water.
- It is the pool owner's responsibility to ensure water is regularly tested and balanced. Your local pool professional can advise you on appropriate testing frequency and balance criteria in your area.
- When taking a water sample for testing, make sure to use an appropriate water sample bottle (available from most pool shops), and ensure the sample is as fresh as possible. Avoid exposing the sample to heat and/or sunlight while in transit.
- Do not use old soft drink bottle for water samples as this may produce highly inaccurate test results.
- Where calcium hardness of the pool / spa water exceeds 200ppm, the water must be balanced according to the Langlier Index to ensure water is not scale forming. Consult you local pool professional for advice.
- Do not assume the chlorinator is faulty if a chlorine test reveals a low free chlorine level. There are many factors that relate to chlorine demand in the water. Refer to the troubleshooting guide in this manual for more information
- Regular manual 'super chlorination' or 'shock dosing' may be required in pools particularly where chlorine demand or bather load is high.
- Test salt level before calculating your salt addition requirements, even on a new installation – especially where liquid chlorine had been used previously.
- Free chlorine levels above 4.0ppm may void manufacturer warranties on your equipment.
- Unnecessarily high salt levels may contribute to corrosion of pool and spa equipment.
- Only use original and proprietary Pool Lab Reagent Bags.
- Never add pool or spa chemicals directly to the skimmer as this can lead to false pH and chlorine readings on the ASP, and therefore incorrect chemical dosing.
- **Pool Lab recommend the use of Cyanuric Acid (Stabilizer) at a concentration of between 50-80 ppm for outdoor pools to help protect chlorine in the water from destruction by sun light**

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

Hydrochloric (Muriatic) Acid Warnings

- Read warnings on the label. Do not allow acid to come in contact with skin, eyes or mouth, and follow directions on label if accidental contact occurs.
- Hydrochloric acid is highly corrosive, and will corrode metallic surfaces.
- General advice for accidental skin or eye contact with Hydrochloric Acid is to flush continuously with fresh running water for at least 15 minutes, and remove any contaminated clothing. Seek immediate medical attention.
- Hydrochloric Acid does produce dangerous fumes. These fumes are highly irritating to skin, eyes and airways, and can also damage equipment. Always ensure the area is well ventilated when handling acid.
- Always wear protective clothing when handling acid or servicing the acid dosing system. Acid resistant gloves, eye protection or face shield, boots and a suitable respirator are recommended.
Note: a Type E filter approved to EN141, European Standard for Gas Filters is suitable for Hydrochloric acid fumes
- Service acid dosing pump at least every 12 months
- When diluting acid, always add acid to water. **Never add water to acid.**
- Store acid in a cool, dry, and well ventilated place away from sources of moisture. Keep away from incompatible materials, such as oxidizing agents, organic materials, metals and alkalis.

Acid Dosing System Warnings

- For installations where an acid leak could result in damage to property such as flooring or nearby equipment, or where a leak may result in a safety hazard, the drum must be located within an additional containment vessel with a capacity no less than 200% of the acid drum volume. The containment vessel must be made from a plastic suitable for containment of hydrochloric acid eg. High Density Polyethylene (aka. HDPE) and should ideally be located directly below the acid pump and feed tubes so that it may catch any potential leaks from acid feed tubing and fittings. This will minimize the risk in the event of a leak.
- The area around the acid dosing system, including the storage drum and feed tubes must be inaccessible to children, animals and other unauthorised persons.
- The acid drum **MUST NOT BE** located in direct sunlight as heat will cause the drum to pressurize, resulting in a safety hazard and increased risk of leakage.
- For a SPA ONLY system, acid drum volume must be limited to 5 Litres.
- The acid drum and acid dosing system components must be located in a well ventilated area (preferably a shaded outdoor area) where there is minimal risk of damage to persons and/or property in the event of an acid leak.
- For indoor installations the installer must complete a risk assessment and discuss plans with the property owner for minimizing risks to persons and property.
- All elements of the acid dosing system must be regularly inspected to ensure it is in safe working order. Components must be replaced when degradation is evident, as per the instructions.

Poolpower Australia Pty. Ltd. will not be liable for damage where a duty of care has not been demonstrated with respect to the installation of this equipment or its ongoing maintenance.

INTRODUCTION

The Pool Lab ASP (Auto Sampling Photometer) utilizes proven photometric technology and a patented analysis technique to automate control of the pH and free chlorine levels in pools and spas. It takes the guesswork out of balancing and treating your pool water, and through automation significantly reduces the requirement to regularly handle dangerous chemicals around your pool or spa.

The need to regularly test water, balance pH, and manage chlorine dosage is fundamental in maintaining healthy balanced water. Bather load and environmental impacts are highly dynamic, therefore guessing the dosage requirements to control these parameters is not always sufficient. The chlorine demand in a pool can vary enormously with changes in bather load, water temperature, debris, weather, and the application of pool covers.

Typically on a domestic pool, the Pool Lab ASP will perform three pH and free chlorine tests per day, and the results of these tests are compared with the user defined targets for these parameters. If a correction is required, the ASP will automatically calculate and administer the required dosage of chlorine and acid, and will also automatically track and account for changes in the chlorine and acid demands in your pool or spa.

Where a pool and spa combination exists, a flow switch on the spa suction line allows the ASP to establish which volume of water it is treating, and adjust dosage accordingly. The ASP will also not deliver acid while the spa is in use.

The Pool Lab ASP will ensure your pool water is correctly sanitized with chlorine, and the pH maintained. Other less volatile water balance parameters such as Total Alkalinity, Calcium Hardness and Stabilizer level must be checked manually, and adjusted by either yourself or your local swimming pool professionals.

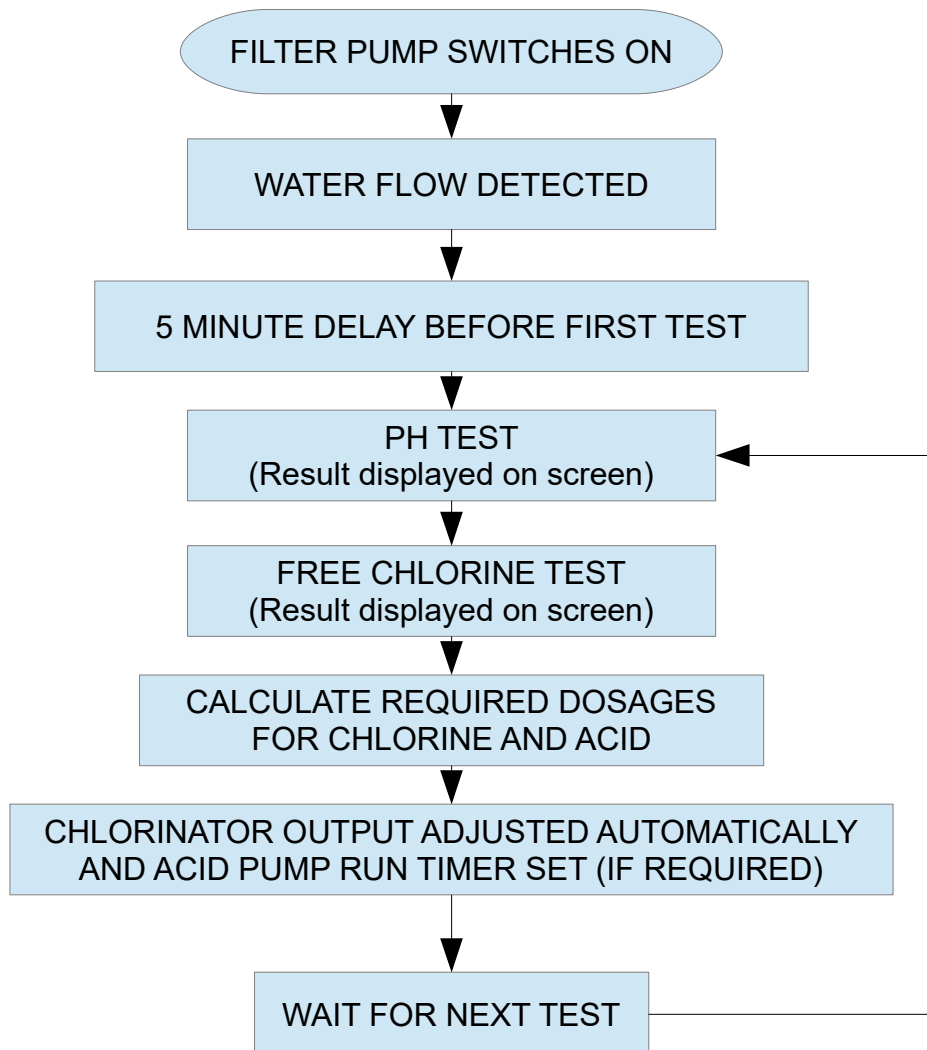
Over 20 years of ground breaking research and development have led to this unique Australian product, with pool owner's globally enjoying the benefits of Pool Lab's innovative technology.

Welcome to Pool Lab!

OVERVIEW

HOW THE POOL LAB ASP WORKS

This flow chart is a basic representation of the ASP test sequence.



NOTES:

- Acid feed will be halted if filter pump is turned off, or low flow is detected.
- If a large increase in pH is detected, acid feed will be paused for 24 hours.
- Safety limits prevent over feeding of acid, based on pool / spa volume.

WATER BALANCE

POOL SHOP OR MANUAL WATER TESTING

The Pool Lab ASP will automatically test your pool or spa water for Free Chlorine and pH levels only. Other important water balance parameters such as Total Alkalinity, Calcium Hardness, Combined Chlorine, and Stabilizer level will need to be regularly checked manually with an appropriate test kit, or by taking a water sample to your local pool shop.

Your local pool shop should also be able to provide you with an appropriate water sample bottle for this purpose. It is worth noting that many containers are not suitable for pool water samples, as the materials used in the construction and the previous contents of the container may drastically alter the results of the water test.

DO NOT USE SOFT DRINK BOTTLES FOR WATER SAMPLES!

A soft drink bottle is a classic example of an inappropriate water sample container. The water sample will tend to gradually take on the pH level of the previous contents, which is generally quite acidic. Most soft drink bottles are also transparent, allowing UV light to enter the container which will break down the chlorine in the sample much faster than would occur in an opaque container.

Do not be alarmed if the Free Chlorine and pH results of a water test do not exactly match the readings observed on the display. The Free Chlorine and pH levels of a water sample are particularly sensitive to change in a small volume of water. Chlorine will break down rapidly, especially when exposed to heat and/or sunlight. This process can also affect the pH of the sample.

CHLORINE PRODUCTION AND CONTROL

Free Chlorine Residual

For your health and safety, a free chlorine residual of 1.0ppm to 3.0ppm must be maintained.

Testing for chlorine levels is very important and should normally be performed on a daily basis. The Pool Lab ASP achieves this better than any other method or device. Typically (by default) the ASP will test the chlorine level three times per day and will control the chlorine level by making adjustments to the chlorine output of your Pool Lab Chlorinator with calculations based on water volume, chlorinator rating and previous demand.

The ability of the chlorine generator to maintain the correct chlorine level will depend on the maximum output of the device (as rated in grams per hour), and the demand imposed by bather load and other environmental factors.

High Chlorine Demand

In the event the chlorine demand is beyond the capability of the chlorine generator, then a longer run time or occasional manual top-up dose with liquid chlorine may be all that is required.

During periods of hot weather and high pool usage you should expect that the demand on chlorine will be much higher than usual. Keep an eye on the free chlorine level, and have some liquid chlorine available to use if the free chlorine level drops below 1.0ppm.

In addition to hot weather and high bather load, there are a few other common reasons why chlorine demand might be higher than usual, these are:

1. Organic Debris – such as leaves, etc. in the water.
2. Low stabilizer level (applies to outdoor pools only).
3. High 'combined chlorine' level (explained on next page).

Chlorine Stabilizer – Cyanuric Acid

For outdoor pools Pool Lab highly recommends using stabilizer (Cyanuric Acid) at a concentration of between 50 – 80ppm. An outdoor pool exposed to sunlight will have extremely high chlorine demand without sufficient stabilizer in the water. Never exceed 100ppm concentration of cyanuric acid, as this will prevent the chlorine from sanitizing the water efficiently.

Combined Chlorine - Chloramines

A common cause for unusually high chlorine demand is the presence of chloramines in the pool water, detectable when a Total Chlorine test result is higher than a Free Chlorine test result by greater than 1.0ppm. The difference between these two test results is known as the “Combined Chlorine”. More advanced test kits will include the Total Chlorine test, otherwise you will need to have your water tested professionally to check for this.

Chloramines are formed when free chlorine reacts with ammonia like compounds called 'amines', and this will build up over time. Chloramines are a poor disinfectant and also reduce the disinfecting power of the free chlorine in the water. Chloramines are irritating to the eyes and respiratory system, and are responsible for the “chlorine smell” most noticeable around heavily used indoor pools.

As a general rule Pool Lab recommend shock dosing your pool with liquid chlorine at least once every swim season as this can significantly reduce chlorine demand and greatly improves the disinfecting power of the free chlorine in the water. For pools with heavier bather loads this may need to be done more often. An accurate measurement of the pool volume and combined chlorine level is essential for calculating the required amount of chlorine to perform the shock dose.

You should consult your local swimming pool professionals for advice on this procedure, and how often is appropriate for your pool.

Note: When shock dosing, avoid the use of persulfate based products as this can adversely affect water test results. Pool Lab recommends to shock dose with liquid chlorine.

pH CONTROL AND ACID DELIVERY

'pH level' refers to a logarithmic scale from 0 to 14, where 0 represents the acidic end and 14 represents the alkaline end. A pH of 7 is neutral.

Generally a pH level between 7.2 – 7.6 is suitable for most pool types, however those requiring a higher pH level will also require a higher chlorine residual.

Each pool finish and type has a specific range of pH that is suitable. You should seek advice from your local pool professionals or your pool documentation to establish the recommended pH for your pool.

Left unchecked, salt chlorination will over time increase the pH of your pool water to around 8.4, and any addition of liquid chlorine can increase it further.

A high pH level will reduce the effectiveness of chlorine and can potentially cause scale on the pool surfaces and equipment, and is irritating to the skin.

A low pH may cause the water to become corrosive, which can damage the pool surfaces and equipment, and is also irritating to the skin.

The Pool Lab ASP will (by default) test the pH in your water three times per day, and will automatically dose with dilute (16.5% maximum) Hydrochloric acid to maintain pH at the desired value.

Total Alkalinity (T.A.)

The total alkalinity is a measurement of all the alkalis in your pool water. This includes carbonates, bi-carbonates and hydroxides. It is measured in parts per million, or ppm.

These alkalis act as a "pH Buffer" which resist changes in the pH and help to keep the pH level stable.

The most common and recommended way of raising the total alkalinity is by the addition of sodium bi-carbonate (or bi-carbonate soda) to your pool water. Most pool shops will refer to this as "pH Buffer".

More advanced home test kits will include a test for total alkalinity, otherwise you will need to have your water tested professionally to establish the correct dose to add.

The recommended T.A. for most pools is 80 – 120 ppm, depending on the interior finish. Consult your local pool professionals or your pool documentation for the recommended range for your pool.

Note: Reducing the total alkalinity is not as simple, and therefore over dosing should be avoided. Consult your local pool professionals for advice on this if required.

Calcium Hardness

Calcium Hardness is a measurement of the level of calcium in the water, and may be referred to as “water hardness”. It is measured in parts per million, or ppm.

This is often one of the most ignored parameters, yet just as important as the others.

The hardness of your pool water is very important in controlling scale and the corrosive effects of water.

A low calcium level may cause pool water to become corrosive, even if the pH is within the recommended range. Left unchecked this can damage the pool interior finish, and the equipment.

A high calcium level may cause the pool water to deposit scale even if the pH is within the recommended range. Scale build up on the pool surfaces can be unsightly and difficult to remove, and it will also build up inside the pool equipment.

Scale can be particularly harmful to heating equipment as it can severely reduce the efficiency of a heat exchange.

Scale can also build up on the plates inside your salt chlorinator cell. If left unchecked this will damage the cell, and also risk voiding your warranty if it is not cleaned regularly.

Pool Lab Chlorinator cells feature a 'self-cleaning' design, but this will only work if your pH, Total Alkalinity and Calcium Hardness parameters are within an acceptable range.

Generally a calcium hardness level between 100 – 200 ppm is recommended for most pools. Consult your local pool professionals or your pool documentation for the recommended range for your pool.

The calcium hardness level can be raised by the addition of calcium chloride to the water. Pool shops usually referred to this as “Hardness Increaser” or similar. Always test the water first before adding this as some water sources may already have significant hardness depending on where it comes from.

In some cases the initial calcium hardness may be well above the recommended range, and in these cases we recommend using the Langlier Index to determine an ideal pH value that will prevent this water from scaling. See next page.

High Calcium (Hard) water sources – the Langlier Saturation Index

The Langlier Saturation Index (Si) is a relationship between the Calcium Hardness, Total Alkalinity, pH and water temperature. When the water is balanced correctly, the Si value should be somewhere between -0.2 and +0.2. A value lower than -0.2 indicates the water is corrosive, and a value higher than +0.2 indicates the water is scaling.

If you are in a situation where the water source for the pool contains a higher level of calcium than is recommended for you pool, then this index can be very useful. It will allow you to find a pH value that will not be corrosive or scale forming, and this pH value will generally be slightly lower than what would normally be recommended for your pool.

The following formula and reference chart can be used to find the current Si for your water. You will need to know the pH level, Total Alkalinity, Calcium Hardness and Temperature of your water.

Use the chart to determine the values for Ti, Ci, and Ai, and insert these values into the formula, along with the measured pH value to determine your Si value.

If you get an Si value higher than +0.2, then your water is scaling. In this case you should reduce the pH in your water by the value of Si to ensure your water is neither scaling or corrosive.

$$Si = pH + Ti + Ci + Ai - 12.1$$

Temperature Degrees C	Ti	Calcium Hardness	Ci	Total Alkalinity	Ai
12	0.3	75	1.5	75	1.9
16	0.4	100	1.6	100	2.0
19	0.5	125	1.7	125	2.1
24	0.6	150	1.8	150	2.2
29	0.7	200	1.9	200	2.3
34	0.8	250	2.0	250	2.4
39	0.9	300	2.1	300	2.5
		400	2.2	400	2.6
		600	2.4	600	2.8
		800	2.5	800	2.9

Example:

pH = 7.6, Temp = 24 (Ti = 0.6), Calcium = 400 (Ci = 2.2), Alkalinity = 125 (Ai = 2.1)

$Si = 7.6 + 0.6 + 2.2 + 2.1 - 12.1,$

$Si = +0.4,$ so the water is scaling.

In this case we would take 0.4 away from the measured pH to find the ideal pH is 7.2. A pH value anywhere between 7.0 and 7.4 would be acceptable in this case.

WATER CIRCULATION

In general the total volume of swimming pool water should be turned over at least 1.5 to 2.0 times per day through the filtration system. Where traditional single speed pumps are used, this is normally achieved within an 8 hour period.

With the introduction of energy efficient multi-speed and variable speed pumps it has become more complicated than just running the pump for a certain amount of time.

It is important to ensure you are maintaining at least the minimum daily turnover of water. If using a multi or variable speed pump at low speed, you may need to consult the pump documentation to help determine the approximate flow rate you have.

If daily turnover is not maintained the chemical and sanitizer distribution in the water may not be uniform, and water test samples may not be representative of the entire pool volume. This can make chemical dosing inaccurate, and can increase the chance of forming black-spot algae on your pool surfaces.

See examples below:

Traditional Fixed Speed Pool Pump

Pool Volume:	50,000 Litres
Pump Rated Flow:	210 LPM (Litres per minute)
Turnover Rate:	approx. 4 hours. (238 minutes)
Time to turn over 1.5 x pool volume:	approx. 6 hours (357 minutes)
Time to turn over 2.0 x pool volume:	approx. 8 hours (476 minutes)

Energy efficient Variable Speed Pump, operating at approx ½ flow rate

Pool Volume:	50,000 Litres
Pump Approximated Flow:	105 LPM (Litres per minute)
Turnover Rate:	approx. 8 hours. (476 minutes)
Time to turn over 1.5 x pool volume:	approx. 12 hours (714 minutes)
Time to turn over 2.0 x pool volume:	approx. 16 hours (952 minutes)

This example illustrates that when you halve the flow rate, you effectively need to double the filtration time.

When performing manual pH and chlorine tests for comparison with ASP results, always obtain the sample as close as possible to the filtration system inlet – usually the skimmer box. This place will be most representative of the readings acquired by the Pool Lab ASP. Also ensure the displayed results are up-to-date by initiating a water test via the ASP TOOLS menu.

CONSUMABLES

Reagent Bags

The Pool Lab ASP reagent bags contain 150mL of reagent each, which will last for approximately 560 tests, or approximately 6 months at 3 tests per day. If the bags are empty, then the ASP cannot perform water tests. In this case there will be no acid dosing, and the chlorinator will continue to run based on previous demand.

NOTE: The Free Chlorine Reagent #1 has a limited shelf life and will slowly change colour over time. Do not be concerned if this reagent has a magenta colour when you install it. The reagent is considered expired only when it begins to turn brown and is no longer transparent.

RED = pH REAGENT

WHITE = CHLORINE REAGENT #1

BLUE = CHLORINE REAGENT #2



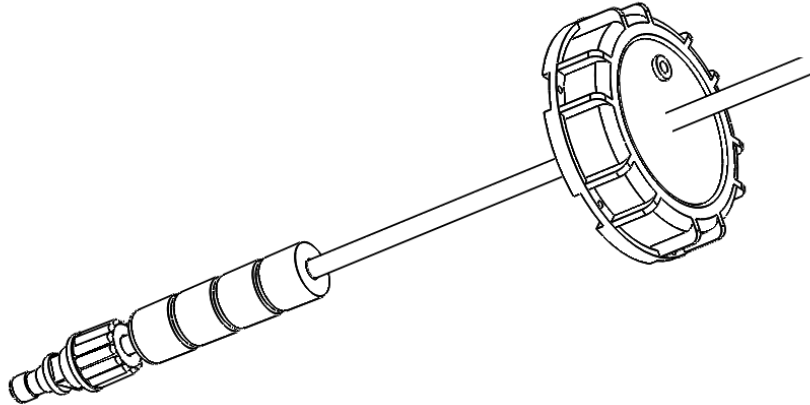
NOTE: After installing new reagent bags, prime the reagent lines by either:

1. Cycle power OFF and back ON after changing reagent bags (clears test history)
2. Select PRIME REAGENT function from the menu system.
 - (a) Go to the MAIN MENU (press and hold VIEW for 3 seconds)
 - (b) Navigate to ASP TOOLS, press VIEW
 - (c) Navigate to REAGENTS, press VIEW
 - (d) Select PRIME REAGENTS, press VIEW
 - (e) Press VIEW once more to initiate the prime sequence.

Hydrochloric Acid – 16.5%

The Pool Lab ASP requires a reservoir of 16.5% hydrochloric acid for maintaining the pH of the pool water. Hydrochloric acid can be purchased pre-mixed in 15 Litre or 20 Litre drums at this strength, or you can dilute 33% acid by half with an equal amount of water. (see instructions on next page).

Replace the cap of your acid drum with the fume stop cap and weight provided and set the tube length so that the weight can reach the bottom of the drum.



IMPORTANT: When changing an acid drum that has been completely emptied you should always cycle the power to your Pool Lab Chlorinator control box OFF then back ON again after approximately 10 seconds. This will reset the acid feed algorithm and prevent the chance of over-feeding on the first acid delivery.

To test the acid feed, or to prime the tubing:

1. Go to the MAIN MENU (press and hold VIEW for 3 seconds)
2. Navigate to ASP TOOLS and press VIEW
3. Navigate to ACID PRIME and press VIEW
4. Press VIEW to start acid pump (will run for 60 seconds)
5. Press BACK to stop acid pump.
6. Press BACK at least three times to exit the menu system.

Always wear appropriate protective clothing such as gloves, eye protection and a suitable respirator (Type E) when handling hydrochloric acid or when servicing the acid dosing system



Procedure to dilute 33% Hydrochloric Acid

The Pool Lab ASP has a peristaltic acid pump which is designed for use with 16.5% Hydrochloric Acid. Most pool shops stock pre-diluted 16.5% Hydrochloric Acid which is suitable for use, but if only 33% Hydrochloric Acid is available then you will need to dilute this 1:1 with fresh water prior to use.

NOTE: While 16.5% Hydrochloric Acid will produce considerably less fumes than 33% Hydrochloric Acid, the diluted acid is still VERY DANGEROUS and VERY CORROSIVE. Always handle acid with due caution and care.

IMPORTANT: *The use of undiluted 33% Hydrochloric acid (or any other unapproved acid types) with your Pool Lab peristaltic acid pump will void your Pool Lab equipment warranties and may cause large pH fluctuations in the pool water. This can lead to health and safety issues and may cause damage to the pool surfaces or other equipment which will not be covered by any warranty.*

Preparation:

- This procedure must be performed outdoors in a well ventilated area
- This procedure must be performed in a location where an accidental acid spill will not cause damage to property or equipment
- **Read section “Hydrochloric Acid (Muriatic Acid) Warnings” before proceeding**
- Always wear appropriate protective clothing as shown below
- Where a SPA ONLY system exists, the total volume of diluted acid must be limited to 5 Litres
- You will need either an empty Hydrochloric Acid Drum (5, 15 or 20 Litre), or a similar container suitable for Hydrochloric Acid
- NEVER USE A CHLORINE DRUM OR ANY CONTAINER THAT HAS BEEN USED FOR CHEMICALS OTHER THAN HYDROCHLORIC ACID
- You will need a measuring jug or similar (for measuring water only), and a plastic funnel suitable for hydrochloric acid

Procedure:

- Using a measuring jug, half fill your empty container with fresh tap water.
eg. Measure out 7.5 Litres of water for a 15 Litre container.
- Using a plastic funnel, carefully top up the container to near full with 33% Hydrochloric acid. Take care not to over fill the container, and leave some air space (approximately 30 – 50 mm) above the liquid to allow for contraction / expansion of the container.

Always wear appropriate protective clothing such as gloves, and eye protection and a suitable respirator (Type E) when handling hydrochloric acid or when servicing the acid dosing system



MAINTENANCE SCHEDULE

ASP Acid Service Kit, part #55619 - replace at least every 12 months or as required

Kit includes:

- Peristaltic Pump Squeeze Tube and Rollers
- Fume Stop Cap (to suit 15L or 20L Acid Drums)
- Injection Point non-return valve
- Acid Feed Tubing
- Tubing weight

Peristaltic Pump Maintenance

Check regularly for signs of wear or leakage, and replace the peristaltic pump squeeze tube and rollers at least every 12 months.

The Pool Lab ASP peristaltic acid pump is fitted with a santoprene squeeze tube which is suitable for 16.5% Hydrochloric Acid.

A split or leaking tube may be dangerous to persons and may cause damage to surrounding property or equipment.

Pro-active maintenance will ensure trouble free operation and peace of mind.

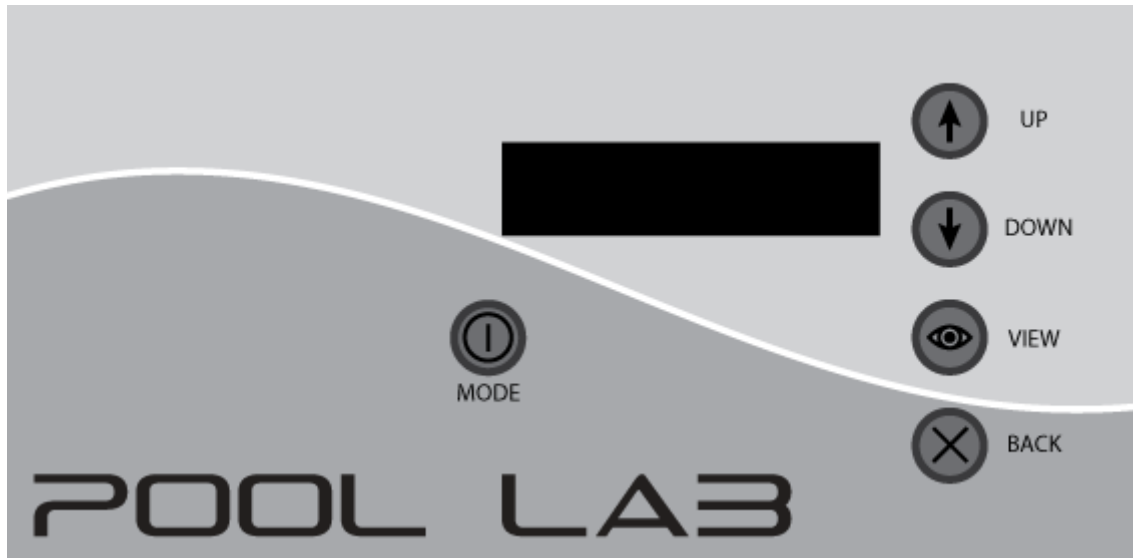
It is recommended that an authorised service person perform this maintenance, however the home owner or user may also perform this procedure if all safety precautions are undertaken and they have some basic DIY skills.

Follow instructions included in the kit: **ASP Acid Service Kit, part #55619**

- x DO NOT allow children or unqualified persons to operate or perform any maintenance on this device
- x DO NOT allow children, unqualified persons or animals access to the chemical dosing equipment, storage drums, feed tubes, chemical pumps or injection point
- x DO NOT use acid stronger than 16.5%, or acid that is not labelled as Hydrochloric or Muriatic Acid
- x DO NOT allow acid to come in contact with chlorine, or any other alkalis
- x DO NOT use non-genuine parts or fittings
- ✓ ALWAYS use protective eye wear, gloves suitable for acid, and a suitable respirator while servicing the acid dosing system. (Type E respirator)
- ✓ ALWAYS ensure acid feed tubing is correctly and neatly installed
- ✓ ALWAYS flush acid dosing system with fresh water before servicing



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

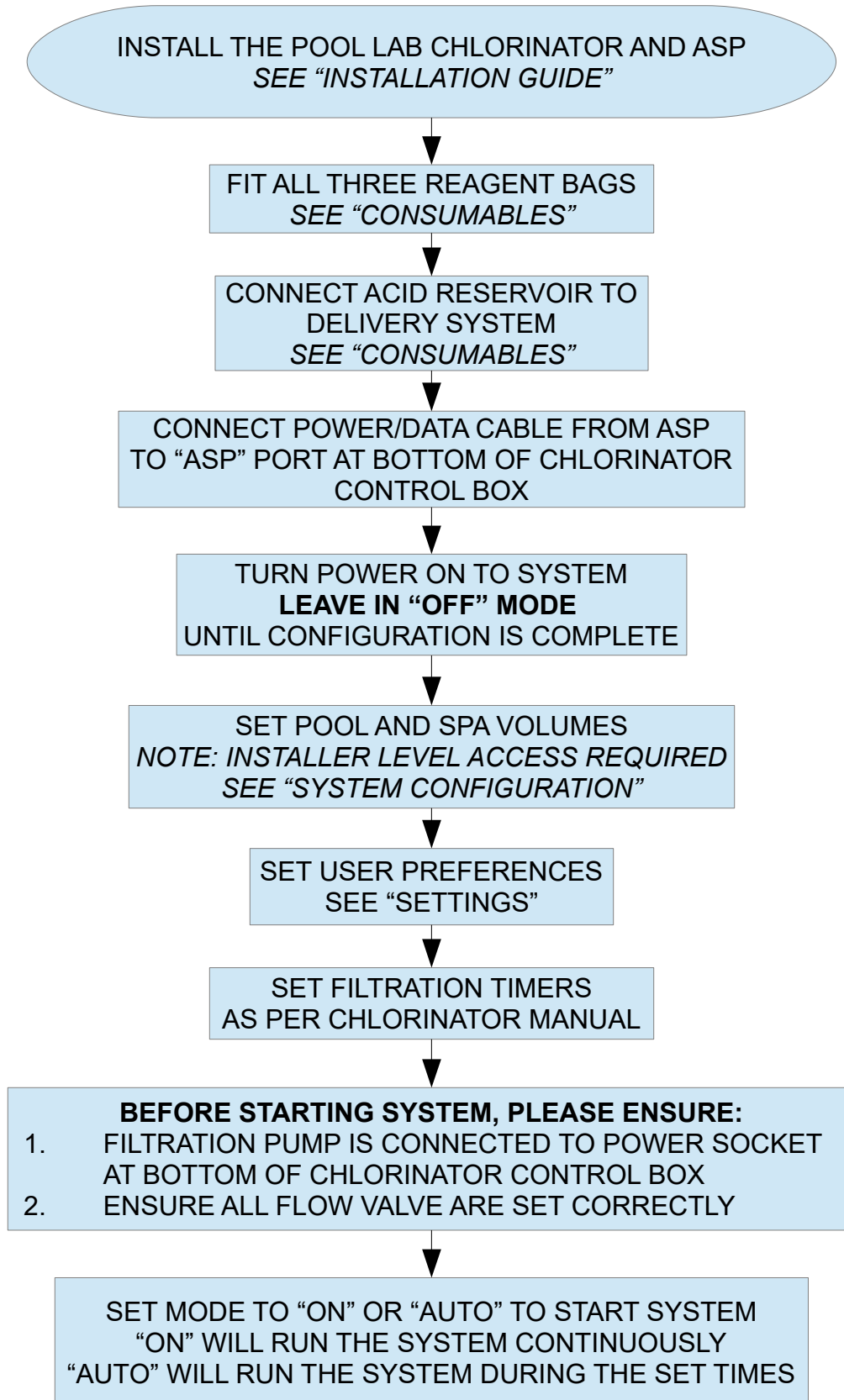
- Return to previous view, or return to view "HOME"
- Exit adjustment mode
- Display detailed cell output data (view "HOME")

MODE BUTTON

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

QUICK START - SET UP GUIDE

The flow chart below shows the steps required to install and start using your Pool Lab ASP for the first time.



SYSTEM CONFIGURATION

Once the Pool Lab Chlorinator has detected that the Pool Lab ASP is connected, the MAIN MENU will have options relating to your ASP configuration and settings.

Authority Level

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 at least 3 times to exit the menu system

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

"TECH" (Technician) authority level provides access to diagnostic tools and advanced settings. This access level requires a PIN which is available in the PL Series Technical Manual. Also note this authority level will not revert back to USER automatically.

"FACT" (Factory) authority level provides access to data that is used for testing and debugging purposes. This authority level requires a PIN and should only be accessed if you are instructed to by a qualified technician.

Pool and Spa Volumes

It is essential to set the pool and spa volumes correctly before running the Pool Lab ASP as they are used to calculate chlorine and acid deliveries.

Set user AUTHORITY to INSTALLER before proceeding (as described above).

1. Go to the MAIN MENU (press and hold VIEW for 3 seconds)
2. Navigate to SYSTEM CONFIG, and press VIEW
3. Navigate to POOL/SPA VOLS, and press VIEW
4. Navigate to POOL VOLUME, and press VIEW to edit
 - (a) Use the UP and DOWN buttons to adjust the value
 - (b) Round the value down to the nearest 5,000 Litres
 - (c) If installed on a SPA ONLY system, set POOL VOLUME to ZERO
 - (d) Press VIEW to save the value
5. Navigate to SPA VOLUME, and press VIEW to edit
 - (a) Use the UP and DOWN buttons to adjust the value
 - (b) Round the value down to the nearest 100 Litres
 - (c) If installed on a POOL ONLY system, set SPA VOLUME to ZERO
 - (d) Press VIEW to save the value
6. Press BACK at least 3 times to exit the menu system

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:

TESTS PER DAY – (Default setting: 3)

The Pool Lab ASP will automatically distribute the selected number of tests over the filtration pump timer periods. The default setting will work for most users. Pools with particularly heavy usage or highly dynamic chlorine demand may benefit from additional tests throughout the day, although this will consume reagents faster.

Note: For Pool Lab software revision CLR-P24-262 and above, when a Pool and Spa combination system is in SPA mode, a water test will be conducted at least every 30 minutes. This parameter is adjustable with TECHNICIAN authority only.

CL TARGET – (Default setting: 2.0)

This is the target value for 'free chlorine' residual in the water expressed in parts per million (ppm). The Pool Lab ASP will automatically adjust the chlorinator output to achieve this target. The default setting will be ideal for most users. A free chlorine residual between 1.0 – 3.0 ppm is recommended to be maintained at all times.

NOTE: Free chlorine residuals over 4.0ppm may void manufacturer warranties on pool equipment. Consult your equipment documentation.

PH TARGET – (Default setting: 7.6)

This is the target for the pH value of the water. The Pool Lab ASP will automatically dose the water with Hydrochloric Acid to achieve this target.

The default setting will be acceptable for most users, although you should consult with your local pool professionals, or your pool documentation on the recommended pH to suit your pool surface finish and specific water conditions.

ADDITIONAL FEATURES

Connecting the Pool Lab ASP to your PL Series Salt Chlorinator unlocks the following additional features:

ASP TOOLS – UTILITIES

To access the ASP TOOLS menu:

1. Go to the MAIN MENU (press and hold VIEW for 3 seconds)
2. Navigate to ASP TOOLS, and press VIEW
3. Navigate the the menu items listed below, press VIEW to select

Reagents

The reagents menu has two options:

- Reagent Status, this option will show the status, OK or EMPTY for each reagent.
- Prime Reagents, this option will allow you to force a prime cycle. All three reagents will attempt to prime after selecting this option.

Run Tests

The RUN TESTS view allows you to manually trigger a test cycle without the system delivering any chlorine or acid after the test. When a test is triggered manually, the test timer will also be reset. The results of this test will be shown in view “HOME” after the test has completed/

Run Tests & Deliveries

The RUN TESTS & DELIVERIES view allows you to manually trigger water tests and the system will dose with chlorine and acid as required. When a test is triggered manually, the test timer will also be reset. Chlorine and acid deliveries may or may not occur after this test depending on the test results and the chlorine and pH target settings.

Acid Prime

The ACID PRIME view allows you to manually run the acid delivery pump. This is useful for testing, or when the acid line is not primed. The ACID PRIME view also has a secondary function when the ACID FEED is PAUSED it can be used to cancel the PAUSED state, and resume acid feeding.

HISTORY

With the default water testing frequency of 3 tests per day, the history will show the results of one weeks worth of water tests. To access the history view:

1. Go to the MAIN MENU (press and hold VIEW for 3 seconds)
2. Navigate to HISTORY and press VIEW.
3. Use the UP and DOWN buttons to scroll through the test history. The most recent test results will be at the top of the list.

CHLORINE DEMAND MONITOR

(Included with Pool Lab software revisions CLR-P24-274 and above)

The demand for chlorine in any pool will vary depending on the seasons and weather, as well as bather load and additional load from leaves and debris etc. entering the water.

Even with an advanced water quality management system in place you may still need to adjust your filtration run time occasionally to find a suitable balance between water quality and energy efficiency.

The Chlorine Demand Monitor feature allows Pool Lab to monitor for increases in chlorine demand and will automatically extend your filtration time as required to cover this demand.

This allows the user to set a more conservative filtration run time for energy efficiency, and the system will then automatically extend the run time if chlorine demand has not been met.

The chlorine demand monitor is disabled by default. To enable this feature press and hold the VIEW button to access the menu system. Navigate to SETTINGS – DEMAND MNTR, and press VIEW.

Use the UP or DOWN button to change between OFF and ON and press VIEW to save the changes, or BACK to cancel.

A small dot will blink in the lower left hand corner of the HOME VIEW when the DEMAND MONITOR is enabled.

IMPORTANT NOTES: *The DEMAND MONITOR feature will increase reagent consumption on days where the chlorine demand has not been met by the end of the filtration period. The amount of extra reagent consumed depends on the amount of time it takes the system to meet the chlorine demand.*

Therefore, you need to avoid setting the filtration time period too conservatively as this will increase reagent use unnecessarily. As a general rule, if the filtration time is being extended on overcast days with no bather load – then you need increase your filtration timer period.

DEFAULT CHLORINE FEED

If the ASP is unable to perform Free Chlorine tests for any reason the system will fallback to “DEFAULT CL FEED” mode, and the chlorinator will deliver chlorine equivalent to approx. half of the average over the previous week.

This fallback feature is primarily designed to prevent the pool from going green too quickly if the reagents bags are empty, and allows the user some time to replace the reagents with minimal affect on water quality.

NOTE: *This mode requires that at least 7 days worth of successful chlorine test results are in the system memory, and that there are at least 9 chlorine test results available over those 7 days.*

INSTALLATION GUIDE

The Pool Lab ASP requires a Pool Lab Salt Chlorinator (Plus or MAX model) to operate. Install the Pool Lab Salt Chlorinator as per the Installation Guide in the Chlorinator Manual.

The following points need to be adhered to when deciding the location for the ASP in the filtration water circuit:

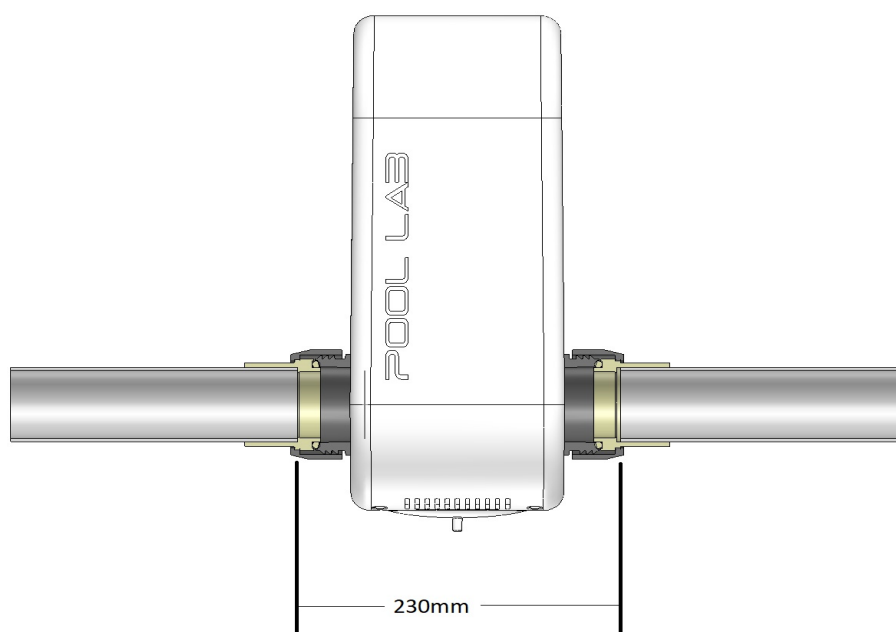
- The ASP must be positioned after the filter.
- The ASP must be positioned before the salt chlorinator cell.
- The ASP must be positioned before any ozone generator injection points.
- The ASP must be positioned before any heating equipment in the water circuit
- The ASP must be mounted upright on horizontal pipework (as shown below)
- The ASP must **not** be located on the suction (vacuum) side of the filtration pump
- Pool and Spa combination systems must use a spa flow switch

Where a pool and spa combination exists a separate spa flow switch **MUST** be used, otherwise the spa will not be safe to use. The spa flow switch must be installed on the spa suction line.

NOTE: For ease and flexibility of installation the Pool Lab ASP is fitted with an internal **BI-DIRECTIONAL FLOW SWITCH**. Therefore it does not matter which direction water is flowing through the ASP unit.

NOTE: Pool Lab SPA FLOW switches are however uni-directional and therefore must be rotated to match the direction of flow in the spa suction line.

HANDY HINT: *If installing into existing pipework, cut a 230mm section from the existing pipe. Tighten unions before glue is set to ensure an accurate fit.*



DRAIN TUBE

The waste water from testing will be expelled out of the drain tube at the bottom of the ASP enclosure. It is safe to allow this water to absorb into soil where the installation location allows this.

The waste water may however cause staining to concrete or paved areas. In this case it may be preferable to capture the waste water in a container to be disposed of as required, or otherwise channel the waste water away to a nearby drain or garden bed.

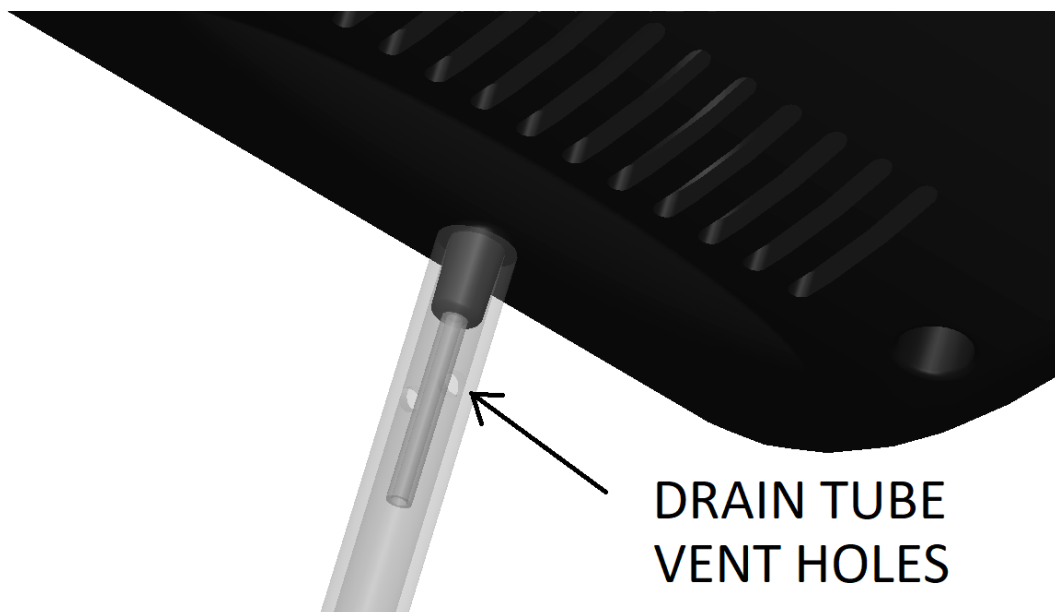
A length of drain tubing is supplied with the unit which may be used to channel the waste water to a container or drain located directly under the ASP unit.

NOTE: The drain tubing should be kept as near to vertical as possible to allow the waste water to flow efficiently.

NOTE: Cut drain tubing to length as required - do not loop excess tubing.

NOTE: There are vent holes located at the TOP end of the drain tubing to prevent flooding of the ASP enclosure if the drain tubing becomes blocked.

NOTE: If draining waste water into a container, ensure the container is vented to avoid pressure build up.



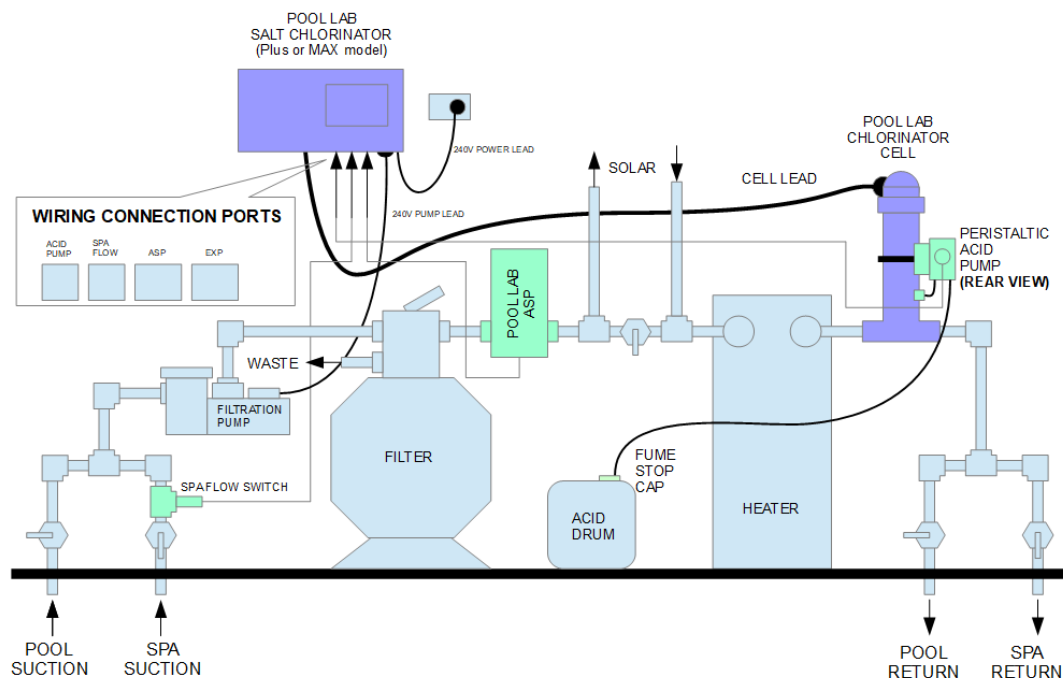
INSTALLATION SCHEMATIC

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.

If the system includes an OZONE GENERATOR the ozone injection point must be after the ASP.

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



WIRING

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

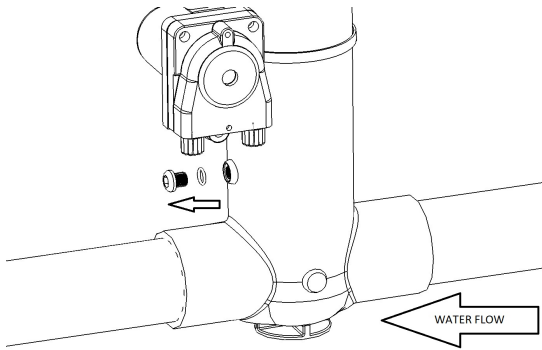
Peristaltic Acid Pump must be connected to the Pool Lab Salt Chlorinator port marked "ACID PUMP".

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

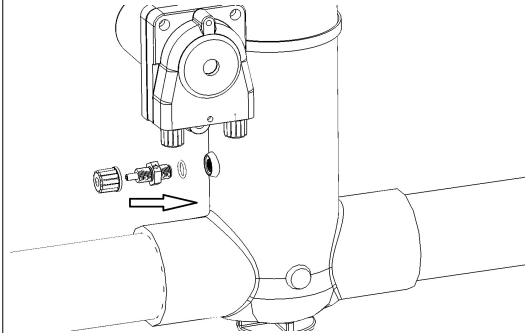
ACID DOSING SYSTEM

The peristaltic acid pump can be mounted directly to the side of the chlorinator cell or alternatively it can be mounted on nearby vertical pipework. Use the heavy duty cable tie provided (or a suitable gear clamp) to secure the pump in position.

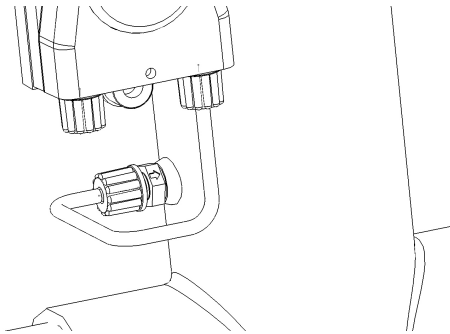
Step 1. Mount the peristaltic pump assembly as shown, or to a nearby vertical pipe. Remove the injector port blanking plug from the cell housing.



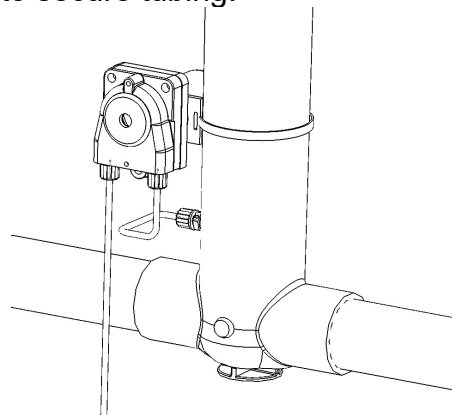
Step 2. Install the Acid Injector. Ensure the o-ring is in place, and tighten by hand only.



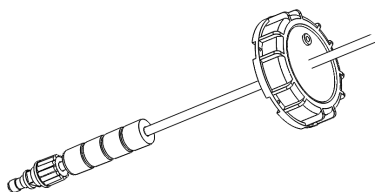
Step 3. Install a short length of 5mm tubing to connect the Acid Pump outlet to the Acid Injector. Tighten lock nuts by hand to secure tubing.



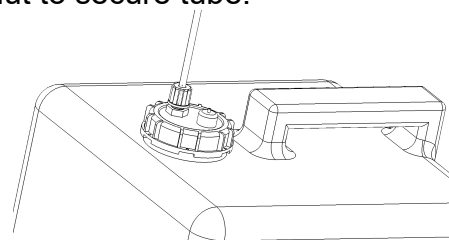
Step 4. Install the remaining 5mm tubing to the Acid Pump inlet. Tighten lock nut by hand to secure tubing.



Step 5. Insert loose end of 5mm tubing into Fume Stop Cap as shown. Ensure tubing can reach bottom of reservoir, and cut to length if required. Fit tubing weight to bottom end of tube.



Step 6. Fit Fume Stop Cap to Acid reservoir, and pass through enough tubing to reach bottom of the drum. Lightly tighten lock nut to secure tube.



TROUBLESHOOTING GUIDE

DISPLAY MESSAGE / SYMPTOM	POSSIBLE CAUSE	SOLUTION
<p>Excessive Reagent Consumption</p> <p><i>Note: For domestic applications Pool Lab recommend the default setting of 3 tests per day. Under these conditions a set of reagents should last approximately 6 months.</i></p>	Power to the Pool Lab system cycling on a timer, triggering unnecessary prime cycles.	With an ASP connected the Pool Lab system must be constantly powered. If you do not wish to use the Pool Lab filtration timers, the pump can be connected directly to a timer or third party controller if required.
	Spa Flow detected	With a Pool & Spa combination the ASP will perform more frequent tests in spa mode. Ensure the spa flow switch is detecting flow correctly.
	Test period too short, especially when using a third party system to control the filtration pump.	The water testing frequency is calculated based on the internal filtration timers, even if these timers are not in use. When using a third party controller, ensure the internal filtration timers are set to approximately the same run time as the third party controller.
<p>Display Message: "xxx REAGENT EMPTY"</p> <p>Tests requiring this reagent will not be performed.</p>	The reagent has failed to prime. If reagent bag is empty it will need to be replaced.	Replace bags if empty and cycle power to initiate a reagent prime cycle. Otherwise check reagent tubing is fitted correctly. Check for blockages, kinks or knots in the tubing.
<p>Display Message: "LOW FLOW (ASP)"</p> <p>Water tests, and acid and chlorine deliveries will not occur in this state.</p>	The ASP internal flow switch has not activated.	Check water flow. Backwash sand filter or clean cartridge filter if required, check skimmer and pump baskets for debris.
<p>Display Message: "PRIMING REAGENTS"</p> <p>The reagent prime cycle is activated. This message is informational only.</p>	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" Acid feed will be paused for the time shown.	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.	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: "ASP FAULT"	Major fault detected in the ASP and chlorinator has reverted to stand-alone operating mode.	Consult an approved service agent. Chlorine output can be adjusted manually using the UP/DOWN buttons.
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 bather load has been high then you may need to bolster the chlorine residual with the addition of liquid chlorine. Have water tested professionally to determine if the pool requires a shock dose of chlorine. For outdoor pools reduce chlorine demand with the use of pool covers, and stabilizer (cyanuric acid).

Display Message: "CALIBRATE ERROR"	The ASP could not calibrate to clear water, or could not acquire a water sample.	Consult an approved service agent.
Inaccurate test results showing on the display.	The pH and free chlorine levels shown on the display are updated immediately after water tests are performed. If water conditions change rapidly these figures may not be up-to-date.	With the system running, press and hold the VIEW button to access the MAIN MENU. Navigate to ASP TOOLS – RUN TESTS to manually initiate a water test for up-to-date results.
	Certain products sold for use in swimming pools and spas can affect the accuracy of test results, however this is generally short term and will rectify itself in time.	Avoid the use of persulfate based products. Avoid the use of Soda Ash.
Display Message: "DEFAULT CL FEED"	The system has not been able to complete it's scheduled chlorine tests and has fallen back to DEFAULT CHLORINE FEED mode.	Investigate the reason for the unit failing it's chlorine tests. In most cases a separate display message will show the reason. Usually it will be a result of the reagent bags running empty.
Blinking dot "." in the lower left hand corner of the display.	This indicates that the CHLORINE DEMAND MONITOR has been enabled. Filtration may run beyond the normal timer periods in this mode.	No action required. This feature is turned ON and OFF via the SETTINGS menu.

WARRANTY INFORMATION

Domestic Applications

Product Warranty – ASP Auto Sampling Photometer

5 Year Warranty* (*Requires product registration – see * note*)

3 Year NEW for OLD exchange Warranty + 2 Years Pro-Rata

Warranty does not restart, warranty start is fixed to the original installation date.

Excluding consumables and all acid delivery maintenance items

Product Warranty – Peristaltic Acid Pump

2 Year NEW for OLD exchange Warranty

Warranty does not restart, warranty start is fixed to the original installation date.

Excluding all maintenance items related to the acid dosing system

Squeeze tube, Rollers, injection point non-return valve, fume stop cap and tubing.

Labour Warranty – ASP Auto Sampling Photometer

1 Year Warranty - In-field labour (Within 30Km of an authorised service agent)

3 Year Warranty – Workshop Repair Labour

Excluding maintenance labour related to acid delivery system

Commercial Applications

Product Warranty – ASP Auto Sampling Photometer

1 Year NEW for OLD exchange Warranty

Warranty does not restart, warranty start is fixed to the original installation date.

Excluding consumables and all acid delivery maintenance items

Product Warranty – Peristaltic Acid Pump

1 Year NEW for OLD exchange Warranty

Warranty does not restart, warranty start is fixed to the original installation date.

Excluding all maintenance items related to the acid dosing system

Squeeze tube, Rollers, injection point non-return valve, fume stop cap and tubing.

Labour Warranty – ASP Auto Sampling Photometer

1 Year Warranty - In-field labour (Within 30Km of an authorised service agent)

3 Year Warranty – Workshop Repair Labour

Excluding maintenance labour related to acid delivery system

CONDITIONS

- For in-field service, labour charges may apply to units installed for a period of less than 12 months.***
- **For in-field service, labour charges will apply to units installed for a period exceeding 12 months or if location is outside of that serviced by an authorised Pool Lab 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 Langelier Index to determine the ideal pH for bore water. Damage caused by the formation of scale is not covered by warranty.*

**** This product may be serviced or replaced by the owner to avoid in-field labour charges*

NOTES