

**Service notes
for the
Aquabrite System
by**



Telephone 02 99392444

Facsimile 02 99059390

Web page www.aquamatics.com.au

Email info@aquamatics.com.au



ITEM

DESIRED VALUES

pH	paint, fibreglass 6.8 -7.0 pebble tile quartzon 7.2 -7.4 max
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- Only correct the pH 24 hours after the TA,(as below) is balanced.
- Add 500g (maximum per day) of dry acid mixed in a plastic watering can, to the surface of the pool with the filter pump running.
- Check the pH the following day (a false reading may be obtained if done on the same day):
 Fill the large tube with pool water to the pH line on the tube.
 Add 1 drop of solution (antichlor) #4, swirl to mix.
 Add 5 drops of solution (phenyl red) #2, again, swirl to mix.
 Read the pH by comparing the colour in the tube against the scale of colours representing pH adjacent to the tube.

Aquabrite	pink
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- Use the small test tube, fill to the top
- Add a DPD # 1 tablet and shake to dissolve, then leave it for 15 minutes before reading the colour against the chlorine scale (reacts faster with warmer water at spa water temperature).
- colour should be pink, not yellow or colourless. If the colour is less than 2 (on the chlorine scale) then add a 1Kg pack of AQUABRITE to each 50,000L of pool water.

Copper test	yellow
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- This test is normally only required once a month.
- Collect a sample of pool water in the empty tube of the Aquamatics Copper Test Kit provided.
- Add 10 drops of copper reagent.
- Leave for 2 minutes before reading the colour.
- Check the colour that must not be darker than the highest reading on the colour card in the test kit.
- Should the colour be darker than the highest reading on the colour card, the pool is being over-ionised and the ionic water purifier should be turned off until the copper reading drops to within the normal operating range. Measure the copper every week until the system settles down. Generally, operate the Ionic Water Purifier for 1 Hr per day for every 10,000L of water in the pool.

Total Alkalinity (TA)	paint, fibreglass 60ppm pebble tile quartzon 100 - 120 ppm
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- This is a measurement of bicarbonate,(TA), in parts per million (PPM).
- Collect a sample of pool water in the larger test tube and fill to the lower line marked on the tube.
- Add 2 drops of blue dye marked #1, then add dropwise the clear solution marked #3, counting the number of drops it takes until the blue colour disappears (10 - 12 drops indicates 100 to 120 PPM).
- For every drop short of 12 drops, add 1 kg of bicarbonate (maximum per day) slowly through skimmer box.



Service notes for the Aquabrite system by Aquamatics

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HOW TO SERVICE A POOL RUNNING ON THE AQUABRITE SYSTEM. **(The same procedure applies to pools treated with PoolFresh Plus)**

1. **On arrival at the pool check the pH and DPD readings.** The DPD test should be read 15 minutes after adding the DPD No.1 tablet. If the reading is less than 2 (on the chlorine scale) add one pack of Aquabrite for every 50,000 litres of water in the pool.
2. Carry out the usual maintenance jobs while waiting for the DPD reading: clean out the leaf basket, adjust the water level, vacuum the pool etc.
3. **If the DPD reading (after 15 minutes) is less than 2.0 on the 'chlorine scale' then add one pack (1Kg) of Aquabrite for every 50,000 litres of pool water.** Check regularly, especially in summer.
4. Aquabrite should be added to the pool **IMMEDIATELY** after storms or heavy usage to **PREVENT** any problems occurring - not used to fix it up, as is usual in the case of chlorine. (see algaecides p.2)
5. Check the copper concentration using the copper test kit provided. **The copper reading should ideally range from 0.6ppm to 1.0ppm(max).** Check regularly using the Aquamatics Copper Test Kit provided. The tablet-type and 'dip-stick' type of copper test kits are not sensitive enough.
6. Ideally, pH should range from 6.8 for (fibreglass pools) to 7.4 for all other types. **NEVER allow the pH to remain above 7.6 or below 6.5**
7. Total alkalinity (TA) **range from 80ppm to 120ppm.** (p.6) Check every month.
8. Calcium hardness (CH) **range from 100ppm to 250ppm.** (p.6) Check every 2 months.
9. Total Dissolved Solids (TDS) **should not be less than 300ppm or more than 1200ppm.** Check every 2 months or after continuous heavy rain.
10. Liquid or dry chlorine may be used with Aquabrite as a co-disinfectant and bleach for leaf stains. Add a dose, which does not exceed the stand-alone dose for free available chlorine, to the skimmer box with the filter pump running. Check using the DPD test kit but take a reading 30 seconds after addition of the DPD tablet.
11. **Do NOT add chlorine stabilizer (isocyanuric acid).**
12. **Do NOT use aluminium-based pool clarifiers.** (see **HIGH COPPER READING**, p.3)
13. **Do NOT adjust the pH with soda ash, pH UP, (sodium carbonate),** only use buffer (sodium bicarbonate) dissolve first and add it around the pool or via the skimmer.
14. **Do NOT use bromine or bromide compounds.** This is important especially in the case where a spa shares the same filtration system as the pool. The spa water, which is traditionally treated with **bromine** tablets or sticks, will be mixed with the pool water, which is treated with the **Aquabrite System. The two systems are incompatible.** Aquabrite should be added to the spa at the rate of 50 grams per 1000 litres of spa water followed by 25 grams of buffer, instead of bromine.(see note 10 above)
15. **Do NOT use algaecides which contain copper.** If the copper level needs to be increased then call Aquamatics technical staff or your supplier for assistance.

16. **Do NOT add sodium carbonate peroxyhydrate (percarbonate) or sodium tetraborate compounds. They are both very alkaline, incompatible with both Aquabrite and chlorine, and will increase the pH of the pool water.**

AQUABRITE AND POOLFRESH PLUS ARE CHEMICALLY IDENTICAL.

NOTES:

Aquabrite is a blend of special peroxygen compounds, which form an acid solution when added to water. Each 5Kg of Aquabrite requires about 1Kg of sodium bicarbonate to maintain correct water balance in the pool. This is much more important in painted, tiled, vinyl and fibreglass pools than cement-based pools. **Aquabrite should not be confused** with hydrogen peroxide (neutral liquid) or percarbonate-(also known as peroxygen compound)-strongly alkaline powder-neither of which are suitable substitutes for Aquabrite.

Aquabrite has three functions:

1. OXIDISER - OXYGEN BLEACH - (oxidises organic debris which enters the pool)
2. CATALYST - (activates the silver ions produced by the ioniser)
3. POOL ACID - (replaces some of the acid demand in the pool)

NEVER mix Aquabrite powder or strong solutions with any other pool chemicals.

Remember that although it has no chlorine smell it is still a strong oxidiser.

Once a packet is opened the entire packet should be added to the pool. There is no advantage in keeping a part pack of chemical about as it is not destroyed by the sunlight on the pool, as in the case of chlorine, so it might as well be in the pool.

DANGER !

Do not allow Aquabrite powder or concentrated solutions to come into contact with salt or chlorine as the extremely poisonous chlorine gas will be produced.

The Ionic unit generates ions of copper and silver.

The copper ions kill or prevent most of the 5000 or so varieties of algae from growing in the pool.

On rare occasions there may be a copper-resistant strain in which case an algaecide may need to be used. We recommend Algimycin, concentrated Black Spot Treatment, and Metal Free Algaecide which contain polyoxyethylene(dimethyliminio)2 ethylene2 dichloride. Use these algaecides carefully and follow the instructions closely.

Silver ions kill bacteria.

Silver ions which have been activated with Aquabrite kill bacteria faster than chlorine in contaminated pool water. See our website www.aquamatics.com.au

The reason for this is that the active positive ions target specific negative sites on the bacterial membrane which then inhibits transpiration of the organism.

There are also irreversible chemical reactions with proteins in the protoplasm.

Degeneration of the membrane results in the organism's rapid destruction.

However, **it is necessary to maintain the silver in an active form** to ensure optimum performance of the system.

This means the addition of Aquabrite to give a DPD reading of 2.0, or above, on the 'chlorine' scale of the test kit, (after 15 minutes reaction time.)

Unlike Aquabrite, chlorine is largely destroyed by sunlight and side reactions occur with nitrogen contaminants (ammonia and amino acids) in the water to form 'smelly' chloramines. Aquabrite is able to destroy the chloramines as they are formed.

POSSIBLE PROBLEMS AND THEIR SOLUTIONS.

1). HIGH COPPER READING.

Over-ionisation possibly due to excessive operating times of the Ionic unit for the volume of water being treated.

This may be confirmed by a high copper reading in the water, although a high copper reading does not necessarily mean that the copper originated from the Ioniser electrodes.

Other sources of copper should also be investigated such as gas heat exchangers, copper piping or the use of copper-based algacides.

To remove excess copper from the water treat the pool with poly-aluminium chloride or filter alum. Follow the instructions on the pack for the treatment of pool water. As a rule of thumb, every kilo of filter alum will require half a kilo of soda ash (sodium carbonate).

It is a good idea to ***fill the pool right to the top*** and take the cartridges out of the filters or the 'fluffy' alum floc will quickly block the filter membranes.

Where multiport valves are fitted, set the valve to the 'RECIRCULATE' position.

The (aluminium hydroxide) floc, which is formed, will adsorb metal ions from the water under neutral or ***slightly alkaline pH*** conditions and then settle to the floor of the pool over a period of several hours, usually over-night.

The extra water is required to allow for vacuuming the settled sediment to waste the next day.

2). LOW COPPER READING.

This may be due to:

Action to take:

- | | |
|--|--|
| a). Insufficient operating time per day. | Check instructions for operation.
Run Mk5 1Hr per 10,000 litres in summer.
“ Mk 9 “ “ 20,000 “ “ “
“ Mk10 “ “ 100,000 “ “ “ |
| b). TDS high or salt water in the pool. | Fit heat-shrink sleeves over electrodes
or drain, clean and refill the pool. |
| c). Electrodes require replacement. | Fit a new pair of electrodes
obtainable from Aquamatics P/L. |
| d). Aluminium clarifiers being used. | Add special start-up kit to pool.
Check filter, use polyelectrolyte
clarifier instead of alum type. |
| e). Ionic unit undersized for the pool. | Fit an additional unit to boost ions. |
| f). Pool leaking and being frequently topped up. | Locate and fix the leak. |
| g). Continuous heavy rainfall. | Low conductivity water – needs
to be chemically balanced. |

h). The pool is being topped up with tank water.

Tank water and some dam waters have very low mineral content. This water is unable to support ionisation and should be balanced

3). LIME GREEN WATER.

This may be due to:

- a). pH too high (above 7.6)
- b). Aquabrite level too low (less than 1.0 ppm after 5 min reaction time)
- c). Total alkalinity too high or too much buffer added at once.
- d). Calcium hardness too low.
- e). Inadequate filtration.
- f). Solar heating effect.
- g). Peroxides or biguanides used.

Action to take:

- Reduce to normal range with pool acid (7.0 to 7.4 range)
- Add Aquabrite to obtain a DPD reading above 3.0 ppm (requires 24 hrs to take effect, add 1litre of liquid chlorine)
- Limit the addition of sodium bicarbonate to 1Kg per day.
Do not let the pH rise above 7.6.
- Adjust in line with chemical balance (above).
- Extend the daily filtration time to 1 hour per 10,000 litres of pool water in the pool.
- Add 2L liquid chlorine to pool while solar pump is running.
- Add Potassium monopersulphate (1Kg per 10,000L of pool water) to 'burn-out' biguanides.

4). CLOUDY WATER.

This may be due to:

- a). Calcium hardness too high- pH too high.
- b). Carbon dioxide gas.
- c). Low copper reading.

Action to take:

- Replace some of the pool water with fresh water.
Lower the pH of the pool.
- Formed when buffer is added to acidic pool water or acid is added to pools with a high total alkalinity. The water will clear after a few hours.
- Check that the Ionic unit is working. Check electrodes and replace if badly worn.

- | | |
|--|---|
| d). Inadequate filtration time. | Set longer filtration times on the pool time- clock. |
| e). Backwashing sand filters too often.
(also sand filters on indoor pools) | A sand filter which is too clean filters water poorly. Add a handful of filter powder to the skimmer. |
| f). Filter requires backwashing. | If a sand filter is full of rubbish there is insufficient turnover of the water so the water in the pool remains largely unfiltered. Backwash the filter more often. Empty the skimmer basket and the lint filter. |
| g). Hole in septum of D.E. filter. | Check for D.E. powder on the floor of the pool under the return outlets. |
| h). Air being sucked into the pump. | This can usually be seen as air under the lint filter lid and a stream of fine bubbles from the return to pool outlets

Check for holes in pool hose or low water level in the pool. Also cracked or ill-fitting lint filter lid gasket. Replace with a new lightly-greased gasket. |
| i). Pool-water level too high so that the skimming action is prevented. | Lower water level to half-way up the skimmer plate. |

CHEMICAL BALANCING OF THE WATER AFTER FILLING THE POOL.

Some pool service people find this a chore and have difficulty understanding why various chemical factors are really necessary.

Forgetting all the science behind it – the water should exhibit certain qualities.

It must be:

- 1). Aesthetically pleasing in terms of clarity, colour, smell and taste.**
- 2). Free of substances which cause skin or eye irritations.**
- 3). In a sanitary condition. No algae or slime (biofilm) on the sides of the pool or within the filtration system and no algae or bacteria in the water.**

4). Free from chemicals which are toxic to humans.

Control 1 & 2 above by adding certain chemicals* to the water and filtering all the water in the pool each day. Sand or diatomaceous earth (D.E.) filters are used especially on larger pools. Cartridge filters are often used on spas and small pools. Correct maintenance procedures for each type of filter is very important to maintain optimum water clarity.

*Oxidisers are used to burn out both soluble and insoluble organic contaminants and cause the water to appear 'polished' to crystal clarity. Acids or alkalis are used to adjust the pH. Clarifiers, algaecides and numerous other chemicals are available to the Pool Serviceman, who must be familiar with their application and compatibility.

Either a low or high pH and/or low TA typically cause eye and skin irritation.
(needs buffer)

The pH can be stabilised in a pool by adding sodium bicarbonate (buffer) and calcium chloride (hardener) then adjusting with dry pool acid to within the correct range.

Dry pool acid will need to be added a few times until the pH stabilises.

Never throw large amounts of chemicals into a pool – this may bleach, discolour or etch the pool interior.

Dissolve them in water in a plastic bucket and distribute as evenly as possible around the pool or add them slowly to the skimmer box with the filter pump running.

When using a bucket ***always add the chemical to the water*** a little at a time NEVER add water to chemical as considerable quantities of heat may suddenly be produced, possibly causing an explosive reaction. Never mix chemicals together.

How much?

The total alkalinity reading should ideally start at about 120 ppm.

That's equal to 2.0 Kg of buffer for every 10,000 litres in the pool

(assuming there is no alkalinity already existing in the water before we start).

If there is, calculate the amount of sodium bicarbonate to add as follows:

Example: If the total alkalinity reading of the pool water is 40ppm.

$$\frac{(120-40) \times 2.0}{120} = 1.3$$

Add 1.3 Kg of sodium bicarbonate for every 10,000 litres of water in the pool.

The calcium hardness needs to be about 200 ppm.

That's equal to 1.5 Kg of calcium chloride for every 10,000 litres of water in the pool.

The calcium hardness varies considerably in town water supplies all over Australia so it is best to check the calcium hardness before adding any calcium chloride.

Too much calcium hardness can be more trouble than too little.

Calculate the quantity of calcium chloride to add as follows:

Example: If the calcium hardness reading is 50.

$$\frac{(200-50) \times 1.5}{200} = 1.1$$

Add 1.1 Kg of calcium chloride for every 10,000 litres of water in the pool.

Remember that calcium chloride crystals will adsorb water from the air (hygroscopic) so be sure to tightly seal the container after use.

After adding the chemicals allow several hours to elapse (preferably run the pump overnight) before attempting to adjust the pH.

The chemicals react with each other and also other minerals in the pool water.

The waiting time is required for the entire contents of the pool to get into equilibrium with the atmosphere. Many tonnes of water takes several hours to thoroughly mix.

Adjust the pH of the pool by adding either hydrochloric acid (liquid) or sodium bisulphate (dry pool acid). To determine how much to add-do an acid demand test. If using hydrochloric acid it is a good idea to carry acid which has been diluted with an equal part of water. This reduces the vapour pressure of the acid and eliminates the fumes. Hydrochloric acid vapours are toxic and may cause respiratory distress.

Never adjust the pH of the pool with any other forms of acid.

Dry pool acid is preferred. It's much easier to carry and dispense and has no vapours. It's chemical name is **sodium bisulphate** not sodium bisulphite.

Control 3 & 4 above by maintaining a residual sanitiser in the water to oxidise contaminants and kill microscopic life forms. Chlorine is compatible, bromine is not.

Copper, silver and Aquabrite ensure that there is no bio-film on the pool surfaces.

Ensure that the ionizer is operating correctly and that the electrodes are in good condition. They get smaller with time and will last about 2 to 3 years in the average pool.

The residual sanitiser is the combination of activated copper and silver ions and Aquabrite, as already described.

The electrodes normally take on a muddy brown colour. They do not need routine cleaning.

Only clean them if they are entirely blue-green with copper carbonate or have been allowed to dry out for several weeks.

Make up a solution of dry pool acid and warm water – about a cupful of dry acid to 4 litres of warm water in a plastic bucket.

Without unscrewing them first from either the lint filter lid or flow cell end cap, stand the electrodes in the acid solution for a maximum of 20 minutes for cleaning.

The blue solution remaining in the bucket can be poured into the skimmer box rather than wasted as it contains valuable copper and silver ions.

Hydrochloric acid solution is unsuitable for cleaning as an electrically insulating layer of silver chloride is formed on the surface of the electrodes.

NEVER use phosphoric acid or nitric acid in a swimming pool. They are both nutrients for algae and bacteria..

**For further information contact AQUAMATICS
Phone: (02) 9939 2444 or your local supplier.**

THE AQUAMATICS
AQUABRITE SYSTEM
START-UP AND RUNNING PROCEDURE



START UP (newly filled pool)

1. Fill the pool to the **top** of the skimmer box then add either 1Kg Calcium Hypochlorite or 6L Sodium Hypochlorite Then add all chemicals **slowly** slowly through the skimmer to prevent stains.
2. Adjust the total alkalinity (T.A.) to within the range 80-120 mg/L or ppm (as CaCO₃) *¹ (1 Kg of bi carb per day for every 10,000 liters of pool water) This range should be 60ppm for painted or fiberglass pools
3. Adjust the total hardness (T.H.) within the range 100-250 max mg/L or ppm (as Ca CO₃) *²
4. Run the pool pump continuously in **Filter** mode for 12 hours.
5. Backwash the filter and adjust the water level in the pool to **half -way** up the skimmer plate. Adjust the pool pH to within the range 6.8 - 7.0 for fiber glass linings and 7.0 - 7.4 for all others
6. Add Ionic Starter Kit followed by one Kg. Pack of Aquabrite. Plug in Ionic Water Purification System with the pool pump plugged into the piggyback plug and operate according to the following instructions.

RUNNING PROCEDURE

- Operate the pool pump for 1 Hour per day for each **10,000L** of water in the pool ensuring that the Ionic Water Purifier can operate for that period of time. This is the summer running time. For winter, use third of the summer settings.
- It is very important to maintain the pH of the pool water within the range 7.0 -7.4 during this period.(If the pH rises above 7.4 dilute acid must be added to the pool to bring the pool water back to the working range pH7.0-7.4 (**Most Important**)
- Measure the copper concentration (using the test kit provided) on a weekly basis
- Measure the Aquabrite concentration (using a DPD test kit) on weekly basis.
- The demand for **Aquabrite** varies from pool to pool and it is necessary to measure the **Aquabrite** in the water by using DPD# 1 tablet test kit (like measuring chlorine) except that full colour development takes 15 minutes. Maintain a level of **Aquabrite**, which produces a reading of not less than **2 ppm on the chlorine scale.**
- It is advisable to brush the walls to help with the curing of the pool surface. A suction cleaner will aid this procedure. This applies to surfaces such as pebbles, quartzon and marblesheen. It is not necessary with tiled, painted or fiberglass as these are less reactive surfaces and do not leach calcium at the same high rate.

Note

From time to time check the condition of the electrodes especially near the end of their expected life. They will form mud like coating on the surface. This is normal - **Do not clean off** unless the electrodes have been allowed to dry out or the power supply has been disconnected for several weeks.

*¹ To **increase T.A.** by 100 ppm add 170 grams of sodium bicarbonate (buffer) per 1000L of water

To **increase T.H. by 100 ppm add 150 grams of calcium chloride dihydrate per 1000L of water