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AQUAVIC MADE IN AUSTRALIA
QUERCUS MAGNAE A GLANDIBUS CRESCANT
THE OFFICIAL MOUTHPIECE OF THE AQUAVIC IONISER USER'S GROUP
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From the Director:
Swimming pool ionisers, as we know them today, were introduced to this country way back in the 1960's and, from day one it was apparent that, apart from their very low chemical requirements, their next best selling point was going to be their low energy requirements. Paradoxically, it is this very feature that has also been the most challenged by current and prospective pool owners conditioned to pool pumps better suited to white water rafting, and complex chemical regimes. They simply did not believe that ionisers could function effectively on so little power. "*Too good to be true*" was the typical response.

Fortunately times and attitudes change and as a society we are developing an ever-increasing awareness of the need to conserve energy and our precious non-renewable resources.

Historically:
Way back in the good old days of state-run power facilities and simple electricity bills – remember there was not much emphasis on the need to cut household energy consumption. Uninsulated, single glazed households and work places were the norm. To cool the house we simply opened the windows. And for heating, it was a wood, oil, or gas fire, or large free-standing energy guzzling electric radiators that were so power hungry you could actually see the street lights dip when they were turned on. It was the ways things were because there was no shortage of brown coal in The Valley.

In the days before natural gas, all power stations and large boilers generally were all fuelled by a never ending supply of domestic and industrial brown coal briquettes transported to The Big Smoke by the LaTrobe Valley's briquette shuttle. It was the very same low calorific value fossil fuel that our state government would prefer to burn today, rather than invest in renewables.

Swimming pools, for those who could afford them, typically had very large pumps, chlorine gas generators, long running times to achieve the specified turn-over rates (12 hours per day was not unusual) and a host of chemicals to keep it all in order. But it all came with a cost, a significant portion of which was reflected in the bottom lines of energy bills.

In the intervening years we've gradually moved away from traditional 10 sq, family home to multi storey McMansions that virtually cover the whole of the building blocks, and sit cheek by jowl with their neighbors. Even the garages these days are larger than the old family home.

Enter **Aquavic** with its all Aussie **New Millennium** Ionisers – and the paradox mentioned in the opening para. *"How best to convince prospective buyers that the numbers were not figments of our imagination?"*

And Now:
Out of this paradox was born the basic costing / energy comparison chart, a screen shot of which is reprinted below. It is based on an industry standard 5-year life cycle, and, in this example, is a direct comparison of an **Aquavic New Millennium** Series II ioniser, and a generic chlorine gas generator aka salt chlorinator. The hypothetical pool is a typical 40,000 litre domestic outdoor pool.

The data allocated to the ioniser are actual numbers. Those attributed to the CGG are based on an average of manufacturer's price lists, and feedback directly from the owners of the salt pools that we've converted. One glance at the bottom line confirms that a CGG is ***conservatively*** 6 times more expensive to run than an Aquavic ioniser - **$1473.00** for the ionised pool as opposed to **$9315.00** for a salt pool.

Aqua Vic

Your Ref: Insert Customer's Details Here. Iss: 14.07.2016

Cost Compaison Chart for a Typical 5 Year Cycle.

Consumables

RRP Replacement Ioniser electrodes:	$ 224.14	Estimated Life Cycle (months) =	48	Per 5 Year Cycle =	$ 280.18
RRP Replacement typ. CGG* Salt Cell:	$ 450.00	Estimated Life Cycle (months) =	48	Per 5 Year Cycle =	$ 562.50

Power Consumption - Ioniser
(Typical 40,000 litre Outdoor Pool)

Flowcell	DC Volts	7.8	DC Amps	0.30	kW =	0.002	Hrs. Run time per day =	3.0	kWh 5 Year Cycle = 12.812
Salt Cell	DC Volts	9.0	DC Amps	22.00	kW =	0.198	Hrs. Run time per day =	8.0	kWh 5 Year Cycle = 2890.800

Power Consumption - Pump
(Typical 40,000 litre Outdoor Pool)

Pump - Ionised Pool.	0.50 kW	Run time per day =	4.0	Total kWh/day =	2.0	Total kWh 5 Year Cycle =	3650.0
Pump - Salt Pool.	1.10 kW	Run Time per day =	8.0	Total kWh/day =	8.8	Total kWh 5 Year Cycle =	16060.0

Input kWh Tarrif Applicable = $ 0.40

Operator Input Required.

* CCG denotes Chlorine Gas Generator

Total Cost Ionised pool =	Per Annum =	$ 122.73	Per 5 Years =	$1,472.81
Total Cost CGG Pool =	Per annum =	$ 776.23	Per 5 Years =	$9,314.80

Screen Shot of Cost Comparison Chart.
(Live copy available on request to Aquavic)

Still Not Convinced?
Putting aside the obvious differences in pump running times, the next most significant difference is in the frugal energy requirements of our ioniser's flowcell (7.8 VDC x 0.3 Amps or **2.34 Watts**) and that of a typical salt cell (9.0 VDC x 22 Amps or **198 Watts**) the former being the energy required to release those all-important copper and silver ions, and the latter being the energy required to convert common pool salt to chlorine gas / hypochlorus acid – liquid pool chlorine.

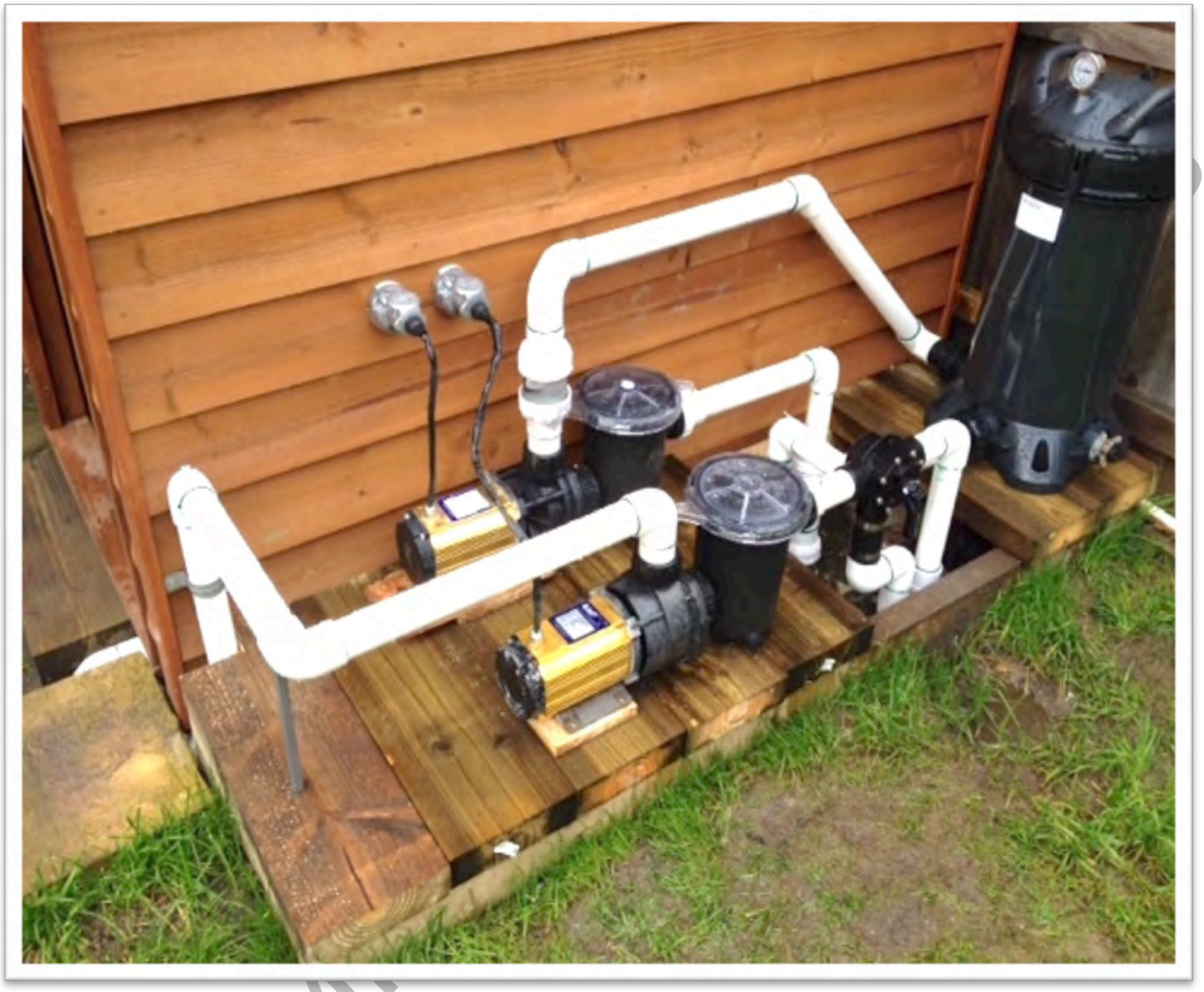
Tariffs vary dramatically from place to place, and from state to state. The number chosen for our chart, $0.40 / kWh, represents an average of a number of energy suppliers. The 5-year life cycle is fixed and cannot be altered.

Pump Sizing:
It will also be noted that there is also a significant difference in the size of the pumps. Once again, this is based on two decades of experience, not just something we dreamed up.

Because of the intrinsically strong residual of the copper and silver ions - they are not affected one jot by UV or temperature - we do not need anywhere near the turn-over rates specified for chlorinated pools. Thus our pool pumps are approximately half the size of those installed / supplied with chlorinated and salt water pools, and our run times are at least 50% less, *with 75% reduction in run times not unusual*.

And this is where the big savings really begin to kick in.

- BTW, both the filtration and solar heating pumps on the company's own 65,000 demo litre pool are 48V, 0.5 kW (or approx. 0.67 HP) brushless DC motors. The summer peak run times (filtration) are 4.0 hrs./day, and 0.5 hrs./day in the off season. And at 65,000 litres, it is approximately 1.6 times larger than that nominated on the chart.



The two 48V DC (off grid) pumps on the company's 65,000 litre demo pool.

That Old VS Chestnut:
And then, of course, comes that old chestnut of the dramatic energy savings of a VS pump. Balderdash!

To put it crudely, if you halve the speed of your pump, circulation suffers, your suction-dependant pool vac no longer performs, and you've doubled the pump's run time – *and you've saved nothing*.
I've been down this road so many times and yet to be seriously challenged. For an explanation, part of an article published in ACIDE vol.11 no:4 is reproduced below. Click on the link below for the complete article.

My Last Word:
By now you will be very much aware of where I stand on the pros and cons of variable speed pumps. In spite of the fact that those previous editions of this newsletter have been read and downloaded many times, I'm still waiting to receive a counter-argument to my views that they are unlikely to make any difference to your power bill without sacrificing the quality and aesthetics of the water. Basically, my argument was that the laws governing centrifugal pumps are "set in stone" - you cannot change any one of the characteristics of the pump without affecting all the others. Even Blind Freddy can see that.

For those of you who might be contemplating installing a variable speed pool pump in the hope and expectation of reducing your power bill by, shall we say, a very interesting percentage, trot out to the pump house and gather the data from your existing pump and the pool, then trot out your calculators and check the numbers from the Pump Laws, which, for the purposes on this exercise are:

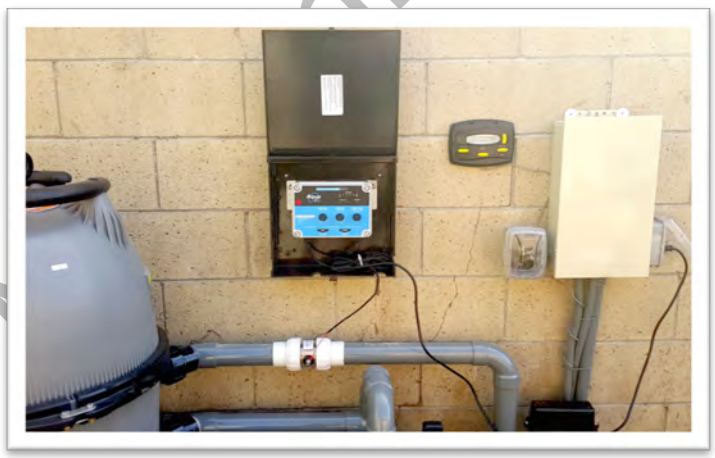
$$Q / Q_1 = N / N_1 \qquad H / H_1 = (N / N_1)^2 \qquad P / P_1 = (N / N_1)^3$$

Where:
Q = quantity of pool water passing through the pump in **litres per second.** (dictates the pool's turn-over rate).
H = Head or Height of a column of water supported by the pump, given as static pressure in **kPa**
N = is the speed of the pump's impeller given as **revs per second.** (Typically around 40 r/s)
P = Power required by the pool pump. It is given in **kW**. (most commonly around 1.2 kW).

Part of the article – ACIDE vol.11 no:4
www.aquavic@optusnet.com.au/newsletters/ACIDE_vol11_no4.PDF

Out of the Weather:
We need to confirm that both versions of our **New Millennium** Ionisers are registered for indoor or protected use. They must not be mounted in such a way as to be fully exposed to the weather. For example, pictured below is one of our **New Millennium Series II** ionisers installed on a family member's pool in Los Angeles USA.

Note that the owner has heeded this advice and installed the controller in an IP rated enclosure. The flowcell, BTW, should have been mounted in a vertical pipe leg, not horizontal as shown here. For a new pump this is of little concern, but if the pump was worn and underperforming, the flowcell may have developed a "spirit level" type bubble which would expose the electrodes. The pool builder obviously didn't read the instructions!



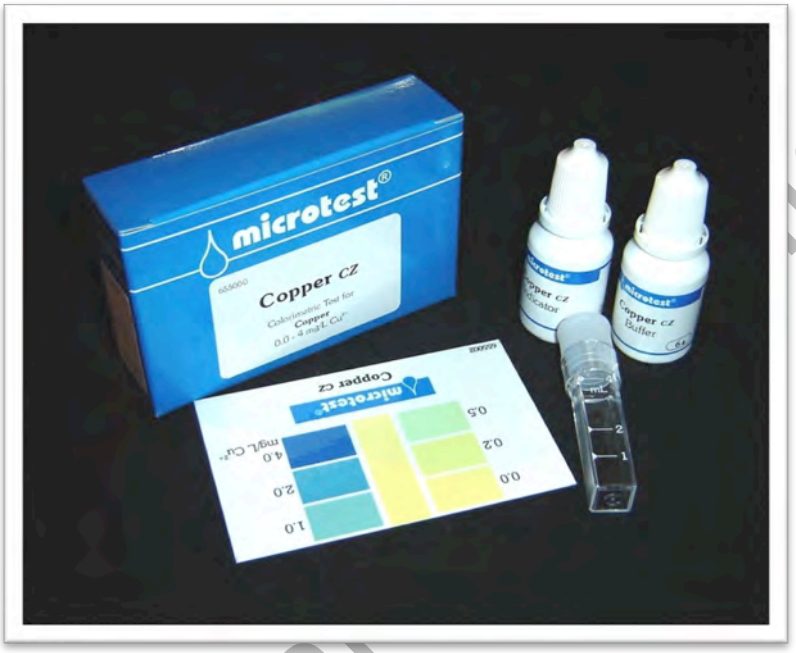
An Aquavic **New Millennium Series II** very much at home in the USA.

Copper Test Kits:
For the pool owner, the only reliable way of determining just how hard your ioniser is working is by measuring free copper levels in a sample of the pool water. Over the years we're used a number of different methods and found the Australian-made Aquaspex "Microtest" colourimetric kit to be the most accurate and consistently reliable "poolside" test.

Coincident with the cooler weather has been an increase in the number of queries we received about nil to very low copper readings in spite of the fact that the ioniser was definitely releasing the requisite amount of copper (and 5% silver). There are a number of explanations for low to nil readings, but we felt that there might be more to this phenomenon than met the eye so we decided to send a sample back to the manufacturer for comment.

The instructions supplied with each kit advise that at temperatures < 18 deg.C, the indicator will crystallise, but may be restored by immersing in warm water, then shaking for 30 seconds. But…they also found that if the indicator AND the sample itself were cold, the 5 minutes specified to set the colour was not long enough and may result in a low reading. We understand that the instructions will now be amended.

For all customers who have an Aquaspex copper test kit #655000, we advise as follows:
At temperatures < 18 deg.C, immerse the "frozen" indicator in warm water until completely thawed, and shake thoroughly to ensure that it is well mixed. Warm the sample to room temperature, and carry out the test procedure as directed – but wait 10 minutes, not 5 – before comparing the sample with the colour card. Alternatively, keep your test kits indoors.



An Aquaspex "Microtest" copper test kit

The Director