

Advanced Energy Transfer

Discover Waters True Potential

By Palm Beach Springs Water Company



An introduction to Advanced High Amp Dual Polarity Electrochemistry for Hydrothermal Operations



ElectroLIFE *for Hydrothermal Operations*

a system engineered by Hiroshi Tanaka, Innovative Designs and Technology Japan



*Hiroshi Tanaka
President*

ID&T, ElectroLIFE, and Hiroshi Tanaka are very well known in Japan and the Asian Market overall.

The ElectroLIFE technology has successfully specialized in enhancing the performance of cooling towers for decades. There are thousands of units in service with the largest and most recognized manufactures as well as Government Entities in the Asian Market.

Most of ID&T's stable sales come from their repeat customers, adding more equipment to their facilities as their operations grow.

The systems are built to last a lifetime with upgradeable, exchangeable, and serviceable parts. The original equipment first manufactured decades ago are still in service today.

Simply stated, ElectroLIFE is a dual polarity electrochemistry generator engineered to provide the correct environment for the entire system and treatments utilized to maintain them. This is accomplished by controlling the polarity of the circulation waters. This is the start and end to the problems with chillers and hydrothermal operations overall.

This document will communicate how this simple change, changes everything in the entire system.

ElectroLIFE The solution is polarity dominance.

The hydrothermal system and all its electrical components put a dominant positive static charge on the system. You run raw water through loaded with basics which have a negative charge, those ions scale to the equipment by magnet attraction. Once the basics are scaled, the acidics denominate the circulation waters and corrode the equipment. No one will argue these are simply polarity issues, what they will argue is how to control them.

It is not that chemical treatments do not do what they are engineered for. It's the out of their control factors that are the problem. Sometimes it's the person responsible for maintaining the system, sometimes its factors out of the control of others. The problem starts with an environment that is not compatible and must be constantly monitored, this everyone will agree, the question is always, how can an environment become compatible and stable. This is where ElectroLIFE joins in.

Neutral Bonded Dual Ion Positive Dominant

Dual polarity electrochemistry in this context creates a specialized restructured medium. Ions are bonded -1/1 for a single neutral ion. The ion is set with a dominant charge, in this context Positive. The positive charge is balanced by the bonded negative ions charge.

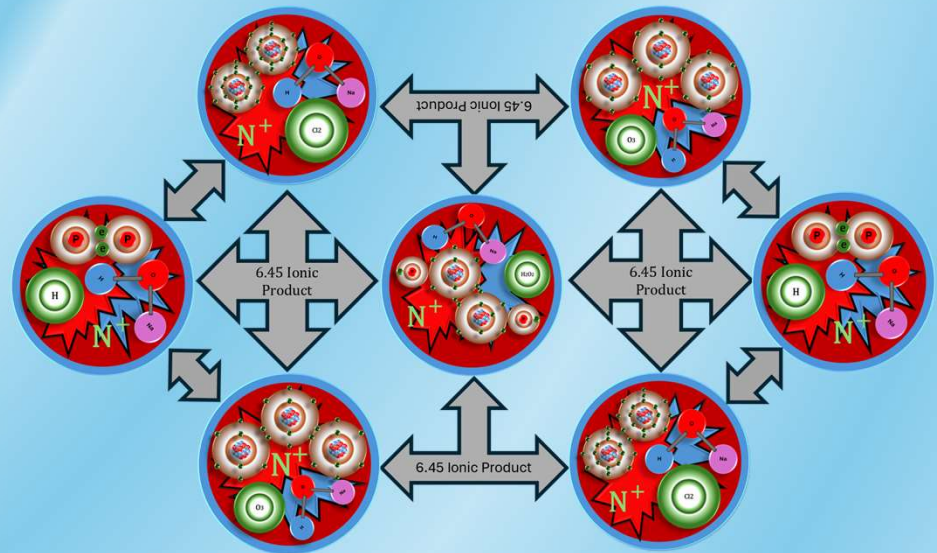
The positive charge controls the circulation, this is not an acidic ion or pH. This is an electrical dominance.

The restructured medium has no pH as it is a bonded dual ion -1/1 and only has equals present no opposites.

Each ion is identical in polarity and power, as such they repel creating an Ionic Product of 6.45 cluster/structure free.

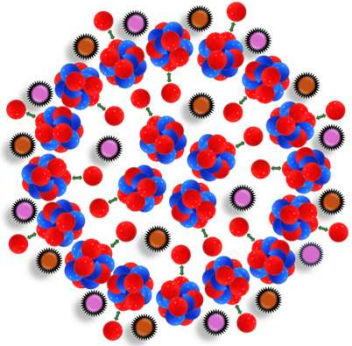
pH from a meter now measures the power of hydrogen or reactive oxygen stored or dissolved not "pH" as a weak acid.

This is now categorized as Functional Electrolyzed Water (FEW).
Neutral Positive Dominant.





ElectroLIFE Restructuring Water Electronically



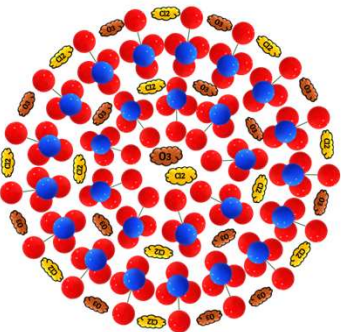
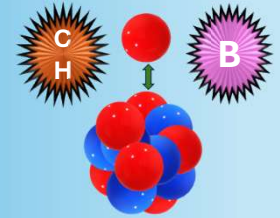
Typical Chiller Water

Typical water at ambient temperature

15 molecule Unbalanced clusters controlled by self ionization

1 molecule dissociation self ionizing

Chemicals, Bacteria, Pathogens suspended in the water clusters



Raw vs 1.37 Nano Cluster

Low Amp Single Polarity Electrochemistry

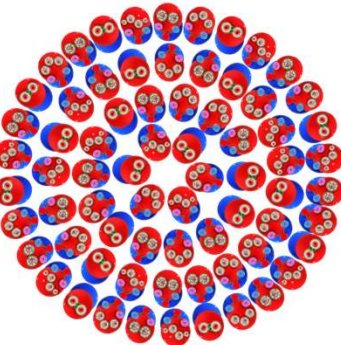
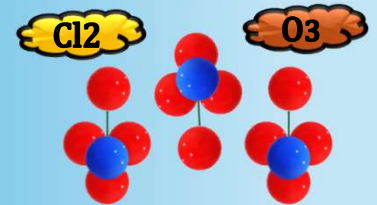
Typical water at ambient temperature

5 molecule unbalanced reduced Nano cluster 1.37 Ionic Product

Increase to 3 molecules ionizing with increased Ionic Product

Unbalanced Hydrogen Gases infused in water suspended in clusters

Chemicals. Bacteria, Pathogens suspended in the water clusters



Nano Cluster vs 6.45 Cluster FREE

High Amp Dual Polarity Reduced 6.45 IP Neutral Negative Dominant

Cluster Free – Single Molecule - Single Bonded Dual Ion 6.45 Ionic Product

100% compatible with all aquaporin transport (*100% absorbable*)

Dissolved balanced dual ion

Dissolved Balanced Single Bubble Gas

Neutral Polarity - Neither an acid or a basic (*alkaline*)

Esperer.H2O RO Purified including Double Coconut Carbon Block is free of chemicals, bacteria, pathogens and contamination of all types.



When it comes down to it, advanced electrochemistry for water is simply using water to its fullest potential.

ElectroLIFE for hydrothermal operations and/or industrial water treatment in general, provides support to the known typical methods used.

ElectroLIFE also brings a variety of new functions beneficial to all hydrothermal environments including the operations in which they are used.

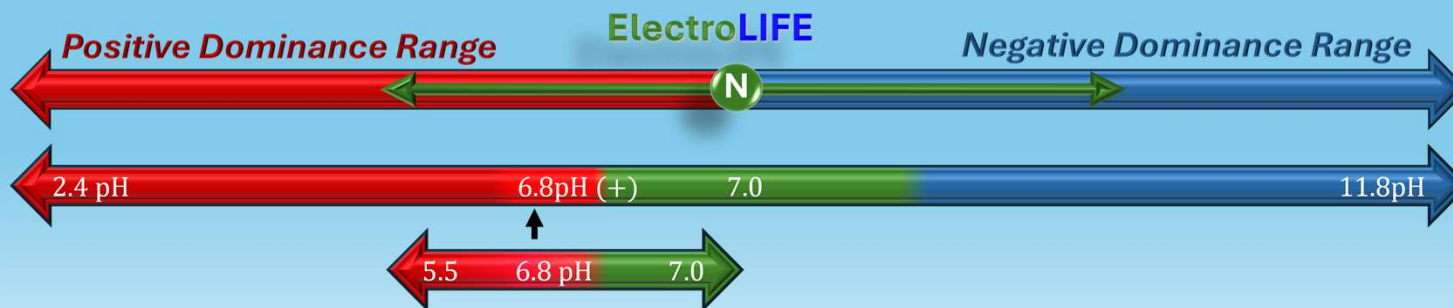
No matter the maintenance system deployed, all will eventually fail and for the same reason, polarity. For this opportunity ElectroLIFE offers a different perspective, one of polarity control which is easy to understand.

We are going to take control of the circulation water, restructure it to one compatible with the equipment and the treatment methods used to maintain them. Both the equipment and the treatments are all positively influenced, the problem is the water they use is negatively influenced.

No one will argue the start of all problems is the source of water used. No matter what we do the source water always wins and enviably a shut down accrues for maintenance or replacement of an entire system.

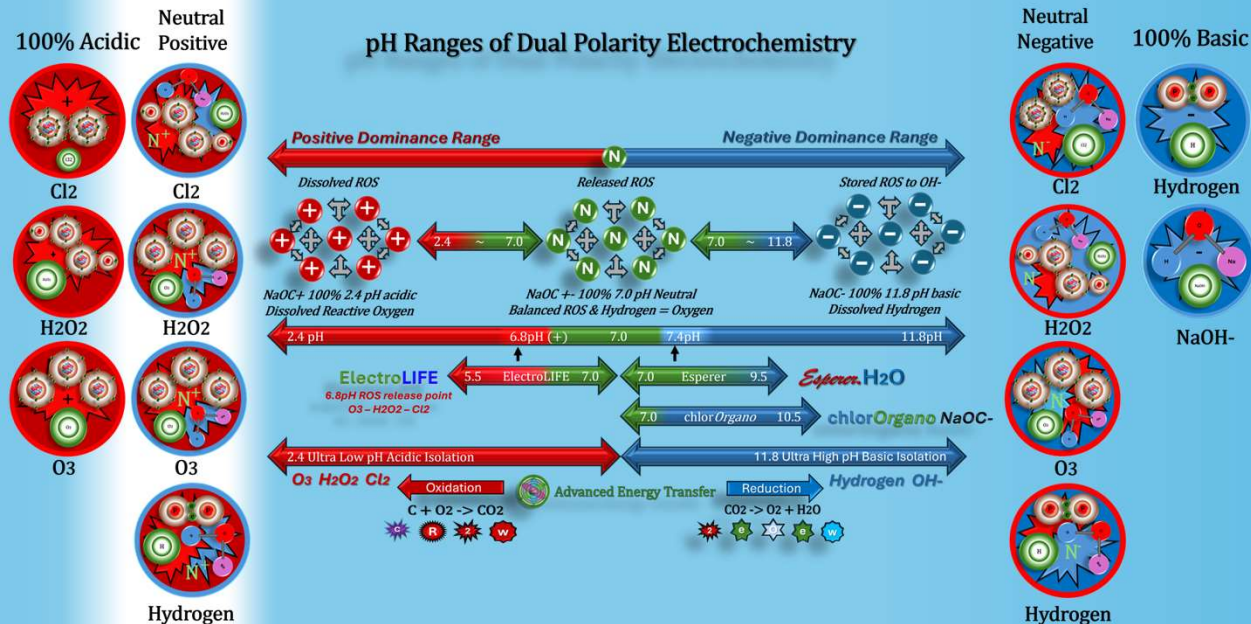
ElectroLIFE changes the environment to one compatible with the operational methods used. Everyone has a different requirement depending on where your located and what type of operation your have. The one thing in common is the difficulty getting water to cooperate.

Scale is not caused by the TDS in water. Scale is made up of the TDS in water, it is caused by the positive static load on the equipment. The positive static load on the equipment attracts the negatively influenced ions in the water and causes them to collect on the surfaces. In electrochemistry this is a polarity problem not a TDS problem. With programed applied energy we decide if we attract or repel an ion, and we can do the same for the ion, we can program it to scale (-) or repel (+). This is a polarity assignment not an assignment of acidic or basic as the ion is neutral.





What is Dual Polarity Electrochemistry



Depending on the objective, the polarity of the water is restructured to the desired range.

The NaCl based mediums dual polarity total range is 2.4 pH ~ 11.8 pH.

For hydrothermal we will be in the Neutral Positive Dominant range of 5.5 pH to 7.0 pH.

ElectroLIFE for hydrothermal is programed for 6.8 pH to stay neutral although Positive Dominant specifically to hydrothermal compatibility.

The term pH will have a slightly different meaning as to its importance and reading, the number is not a measurement of a water as a weak acid. The reading is not a difference in pKa to pKb. There is only Pure pKa 1 ~ Pure Neutral pKw 1/-1 ~ Pure Basic -1, this is Functional Electrolyzed Water (FEW) a synthetic medium created by dual polarity electrochemistry.

Total control over polarity offsets

Water understands electrical charge. Water is pure liquid energy from the moment it is created. First a single molecule is formed. The rules of the universe demand everything must have equal and opposite balance, where there is one (+) molecule of H₂O, there must be one (-) molecule of H₂O.

Once H₂O gains TDS and balances perfectly it becomes -7/7 pKw or 7pH this is self ionization and dissolving minerals in water creating a weak acid with a specific pH.

As H₂O is in constant formation and TDS is in a constant state of dissolving material into H₂O, water is always in a state of self balancing. Self Ionization is very weak in energy (less than 1mA *milliampere*) and therefore very slow in reaction.

Water's objective is to balance to perfect neutral 50% acidic (+) and 50% basic (-), it is the 50% basic (-) that causes your problems. Water will not be content until it can ultimately balance to 7/-7 pKw neutral 7 pH.

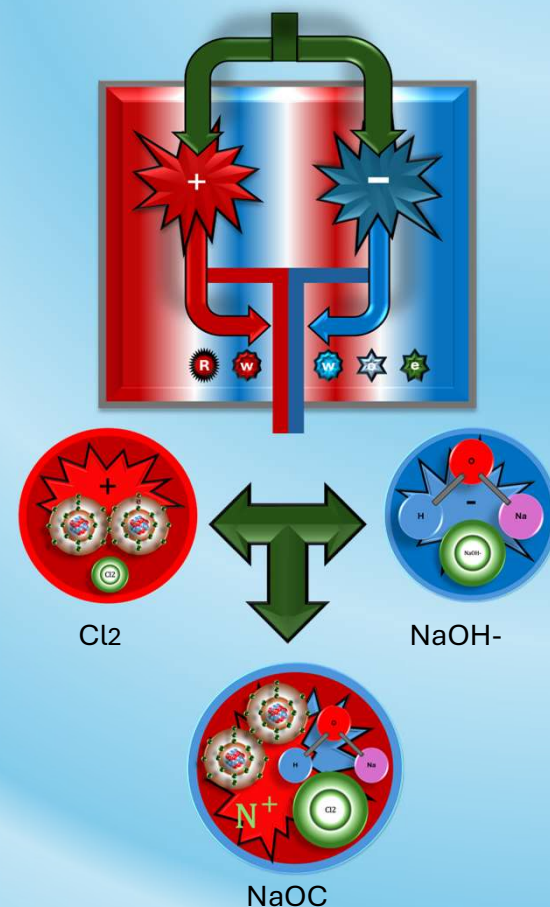
When you restructure the ions to bond 1/-1 neutral, you create waters perfect balance. Nature can only balance to 7/-7 as it is very weak in energy and why it will never stabilize. The power to bond 1/-1 and stabilize applies 10,000 times the power of self ionization, 10 Amps (*10,000 mA*).

To increase the energy in water to its maximum potential, using electrochemistry, you must have equal opposite applications of applied energy. You must apply equal energy to the opposite ions to entice them to bond together just like two magnets of opposite polarity bond together.

When this bond is made, the ion is neutral, just as in statics when an electron and proton combine, you get a neutron, this is basically statics for water. Water is a weak conductor of electricity; it holds the charge in its content of ions and gases individually insulated by the molecule of H₂O from combining for a total charge.

With our programing we control the dominant polarity which is a strong electrical assignment not a pH. The polarity strength is maximum and does not increase with lowering of pH. Lowering of pH combined with an increase in ORP is a reading of dissolved gas concentration and strength only.

10,000 mA Dual Polarity
Splitting H₂O electronically
Re-Structure 1/-1
Positive Dominant
Stored ROS



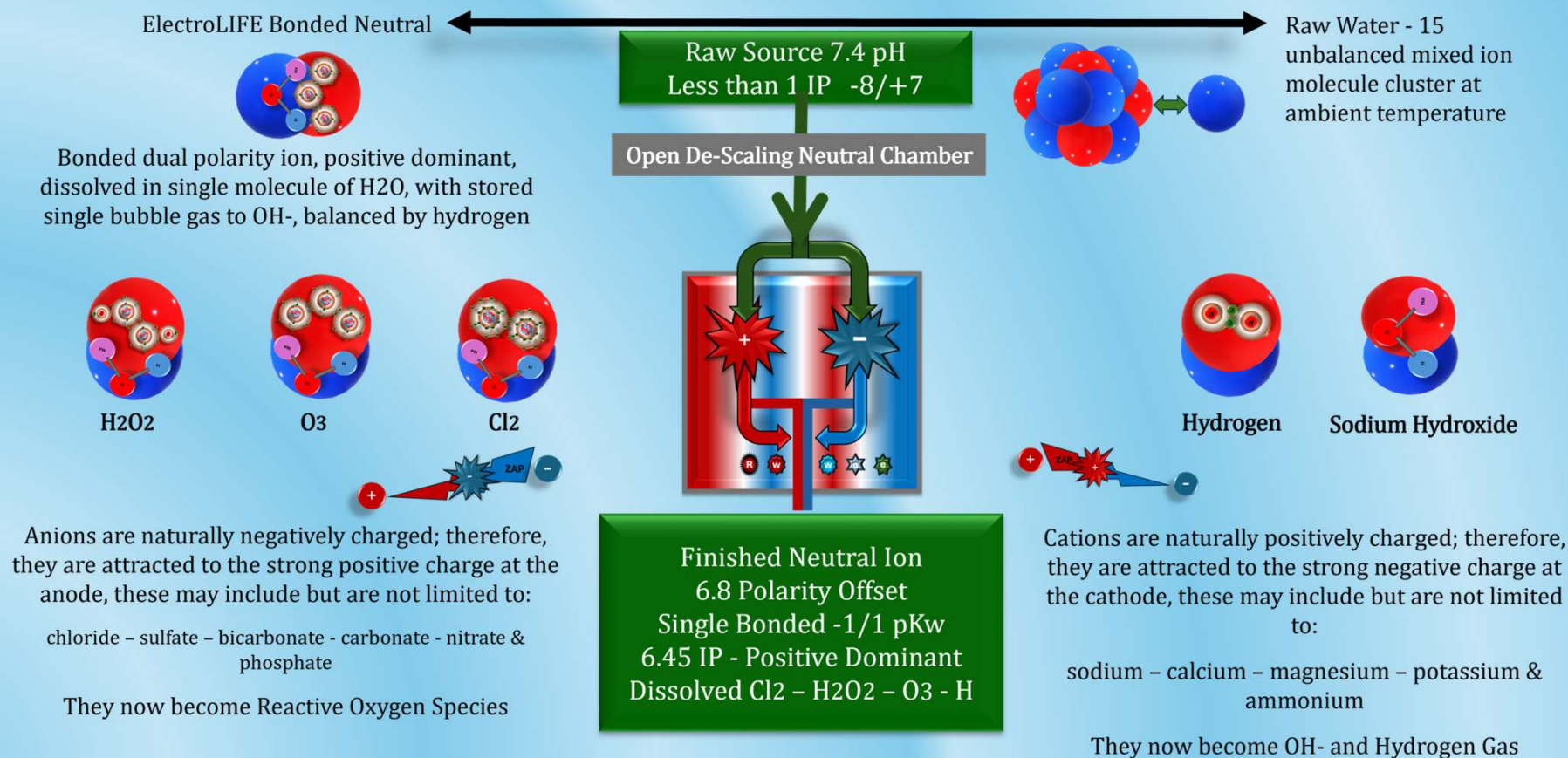
Increasing Ionic Product and assigning a positive dominance



Advanced Energy Transfer

ElectroLIFE

Hydrothermal Water Treatment





Polarity offset control allows for the adjustment of dominance depending on the environmental needs. As discussed, the equipment and treatments are engineered compatible with a positive dominance.

The programming of applied energy is engineered to balance the ions and leave a positive dominant charge on the medium overall making it now compatible with the equipment and treatments used to maintain scale and microbial loading.

Highly charged ions transfer power to lower energy components increasing their potential

Dissolved single bubble gases combine with gases produced by treatments complementing each other through energy like transfer.

The treatments can only be engineered so strong, the dissolved gases are powered by the charged ions and in a continued flow from the generator.

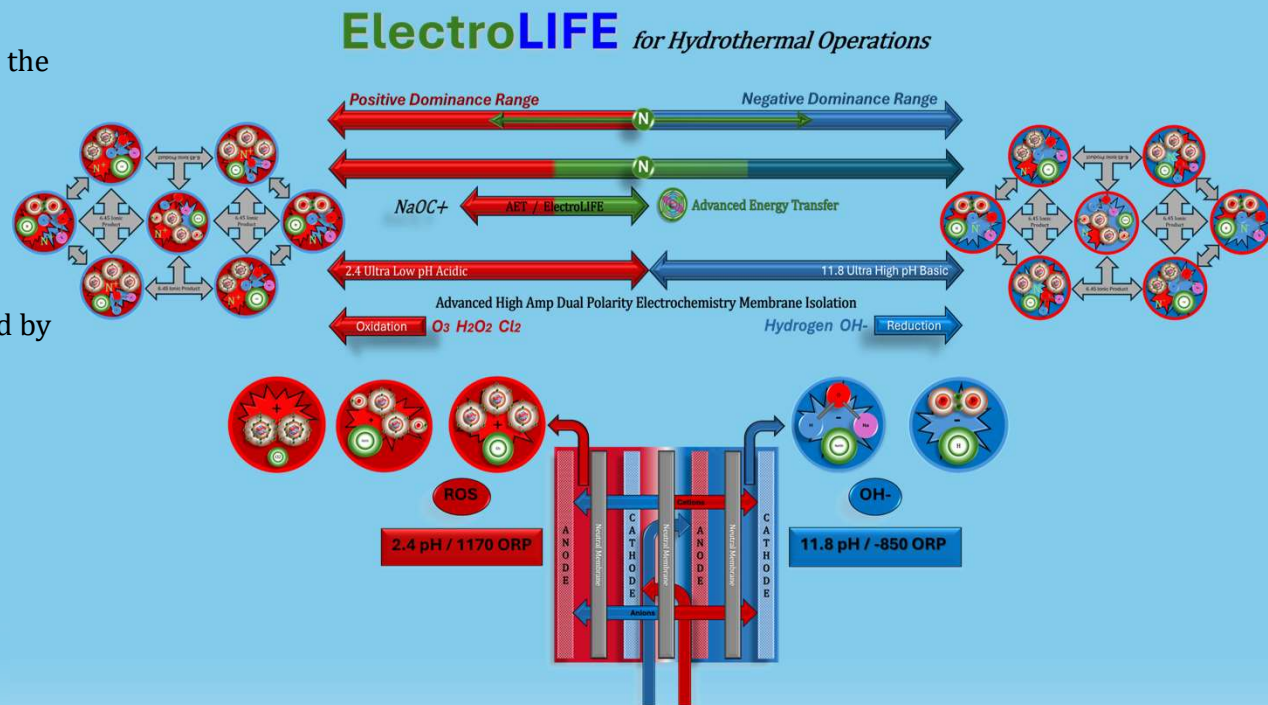
This power is now transferred to the treatments by like polarity energy transfer. This is the purpose of a positive dominance.

If it were the opposite (*consumable water*), we would change the dominance to negative as shown, we have total control over polarity and polarity offset.

Positive Dominance Hydrothermal

Negative Dominance Human

Were not so different when it comes to water, although the charge is different
Organic Hydrothermal Humans are naturally Negatively charged
Synthetic Hydrothermal is mechanically Positively charged



Dual polarity electrochemistry creates energy during the process of oxidation and reduction charging TDS and splitting H₂O. These properties just as their chemical cousins must be in a compatible environment for stability or they will release like the others.

The properties of electrochemistry gases and their chemical cousins share the same descriptions although are very different in manufacturing, they both require the same environment for stabilization regardless.

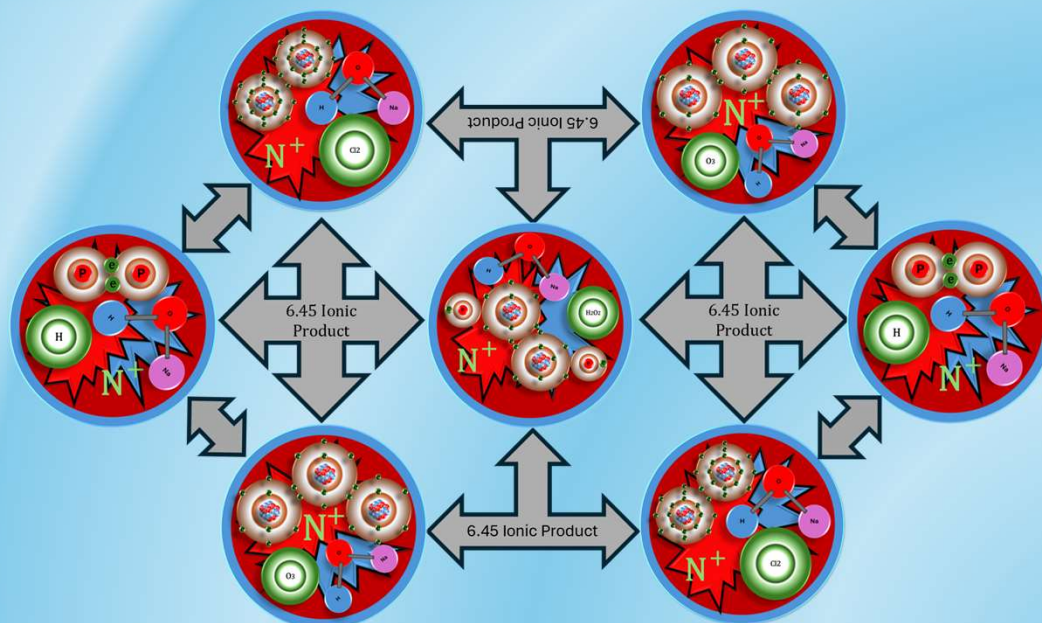
In this positive dominant environment they are compatible, they enhance each others performance and stabilization through advanced energy transfers from ion to ion and gas to gas. The properties and energy created during electrolysis are packaged as dissolved and insulated by the molecule of H₂O they are packaged in from anything added into the volume until stabilized by 6.45 IP separation action.

This elimination of all clustering allows for enhanced distribution of treatments through the positive dominance, dilution and distribution without inhabitation increases performance, very simple to understand.

Natural Green ROS & Hydrogen Gases produced by splitting H₂O

*ROS Bonded and stored to NaOH-
Dissolved in a single molecule of H₂O
Stabilized Neutral with a 6.45 IP Positive Dominance
a synthetic restructured medium purposely created
for industrial hydrothermal operational requirements*

Restructured Bonded Dual Polarity Ion Positive Dominant





pH is a Measure of Power

When you understand this, you can understand products are nothing more than descriptions of pH range which is just a description of the power it holds.

When you look at everything as just an electrical charge, the subject is much easier to understand.

You must track their pH, ORP, and gas concentrations to ensure effectiveness.

Electrochemistry allows for you to simply understand as electrical charges.

The higher the ORP and lower the pH, the stronger the ROS gas power. The stronger the dissolved gases strength.

The lower the ORP and higher the pH, the stronger the dissolved Hydrogen gas power and stronger total concentration of stored ROS gases.

With these readings we can compare to EPA regulated pesticide ranges for performance ranges.

(+) HCl Hydrochloric Acid	3 pH
(+) H2O2 Hydrogen Peroxide	4 pH
(+) HOCl Hypochlorous Acid	5.5 pH
(-) ClO2 Chlorine dioxide	7.5 pH
(-) OCl- Hypochlorite	10.5 pH
(-) NaClO Chlorine Bleach	12 pH
(-) OH- Sodium Hydroxide	13 pH
(-) OH- Lye	14.5 pH



Negative Dominance

-851 ORP / 11.9 pH



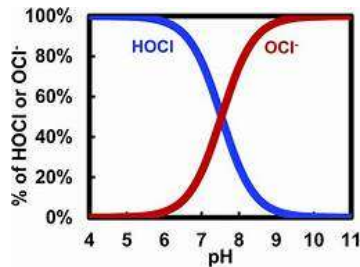
Positive Dominance

1102 ORP / 2.6 pH

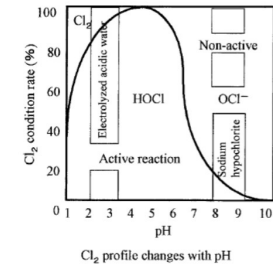
Random Readings for Illustration Only



pH Relevance to Functional Electrolyzed Water



Advanced Dual Polarity Controls Offsets
pH is a reading of power stored to power released in FEW
The greater the negative charge the more OCl- stored concentration
The greater the positive charge the more dissolved HOCl to ROS concentration
Balanced by offset opposites, the range is stabilized at any range desired



Adding a charge to the cations and anions ionizes the content or increases its stored charge/power, in electrochemistry the term is potential. To completely control the potential of water, you must be capable of applying both A/C and D/C directional polarities simultaneously.

To control cations (+) you must have a positive influence; to control anions (-) you must have a negative influence. In electrochemistry we flip everything as opposites attract. Your anions (+) are attracted to the cathode (-) and turned into OH- and Hydrogen while your cations (-) are attracted to the anode (+) and turned into Reactive Oxygen Species (ROS). The potential of the O3, H2O2, and Cl2 and the OH- have been increased by applying 10,000 times their natural energy. As the ROS is created in the same environment as OH-, we are taking advantage of storing ROS like OCl- although the category is NaOC- synthetic organochlorine.

ElectroLIFE positive dominance is set to 6.8 pH, as shown this puts the Total Chlorine (OCl-) to Released Chlorine (HOCl) above the HOCl release allowing for stability in release such as OCl-.

6.8 pH is not actually a pH it is a offset release point. We are in control of the water, through applied energy we can set the pH (*energy*) anywhere within the total range depending if we are looking for strong dissolved gas (*low pH*), looking to release gas (*neutral pH*), or store gases (*high pH*) just as the others meter, although we are using electrical applied power not chemical reactions of acids. This puts a little spin on using a pH meter.

The positive electrical dominance is what is important to the treatments used. ElectroLIFE positive dominance is a electrical assignment. The pH now is irrelevant the ions are neutral they are neither corrosive nor oxidizing regardless of electronic metered pH reading number.

(Note the terms OCl- and HOCl are EPA defined pesticides, we are using them as comparisons in ROS gas range only).



What does this all mean for hydrothermal performance

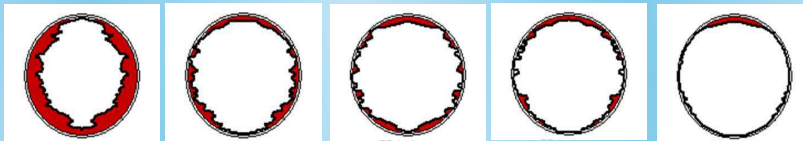
ElectroLIFE has restructured the environment for compatibility. ElectroLIFE has been in service for over 3 decades. With this history there are some well known facts.

Scale – ElectroLIFE electronically restructured the content in the water to a positive dominant charge. This charge is now compatible with the treatments used as scale inhibitors. It is known and proved when including ElectroLIFE in the treatment, not only does the treatments work with out inhabitation, but they are also more powerful and efficient, the environment can remove scale from a unit already scaled by dissolving it.

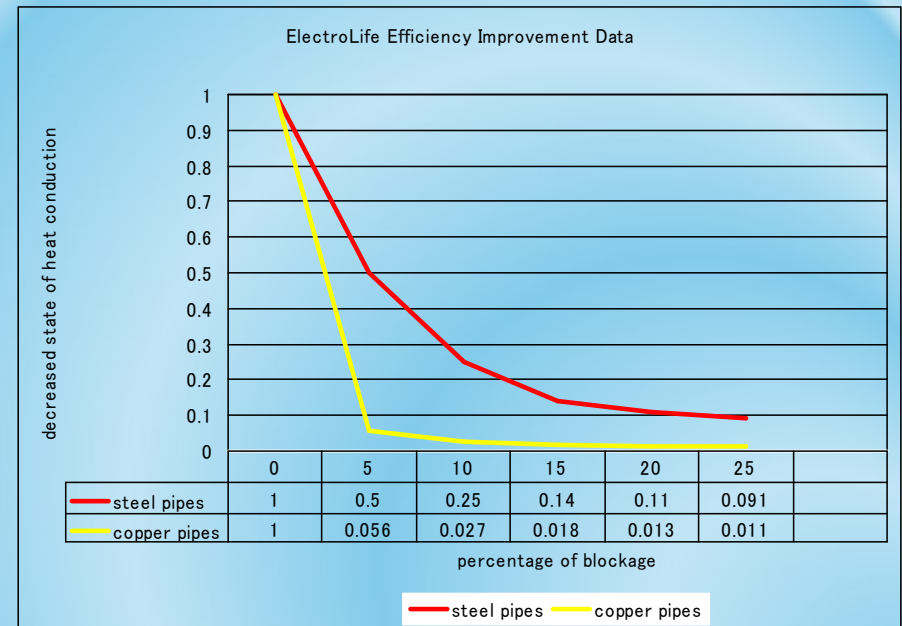
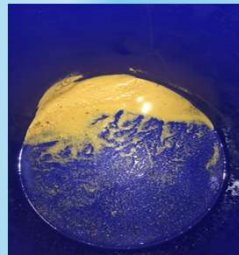


Prior to ElectroLIFE 35% Blockage

35% 13% 12% 10% 3%



Post ElectroLIFE 3% Blockage





ElectroLIFE

Eliminate Scaling through positive dominance compatibility



EL 10 6.6 GPM 300 RT
The smallest of the EL line



Units can run in tandem if space is limited
Multi-chamber systems &
Multi-system operations





CARBON / CO₂ Emissions Reductions, how scaled is your system?

Additional power costs of a scaled system based on a 300RT Cooling Tower

Level of Blockage Costs	Resultant Power Loss	Annual CO₂ Conversion Emissions Additional Consumption
PIPE WITH 58%BLOCKAGE	3.1 KW	118 TON/YR from additional loading
PIPE WITH 73% BLOCKAGE	3.4 KW	130 TON/YR from additional loading

Heat Exchange, when it comes down to it, this is the target with hydrothermal. Heat exchange is optimized to the greatest capability by today's technologies.

Increasing heat exchange potential also lowers energy consumption. Lower energy consumption reduces the carbon emissions created producing the energy as a bonus, in some regulated industries this is very important. This subject is detailed based on a 300RT system.

Eliminating scale from the operation, through an electrical applied energy, providing the positive power dominance needed. The medium and scale inhibitor treatments only work as well as the water they are given. Restructuring the water to compatibility with a positive dominance, structured into the ions, increases the performance of the products used to their maximum engineered capabilities.

6.45 Ionic product eliminating clustering creating the maximum amount of H₂O molecule surface area and molecule spacing for heat exchange.

Neutralizing organic loading electronically in addition to treatment requirements as well as the addition of dissolved ROS gases created during electrochemistry processing bring a whole new standard of water safety to the program. You can never go wrong with additional preventative controls for water borne pathogens.

The ElectroLIFE system was last performance studied by the **Shizuoka University** Japan in August 2011 under a grant by the Japanese Ministry of Energy Conservation and Consumption . These systems are used by the Japanese Government who has funded several grants over the years and put the equipment into the countries operational use.

This **Shizuoka University** study is available upon request. “ *Report on Deterioration of Heat Transfer Performance due to Scale Adherence*”



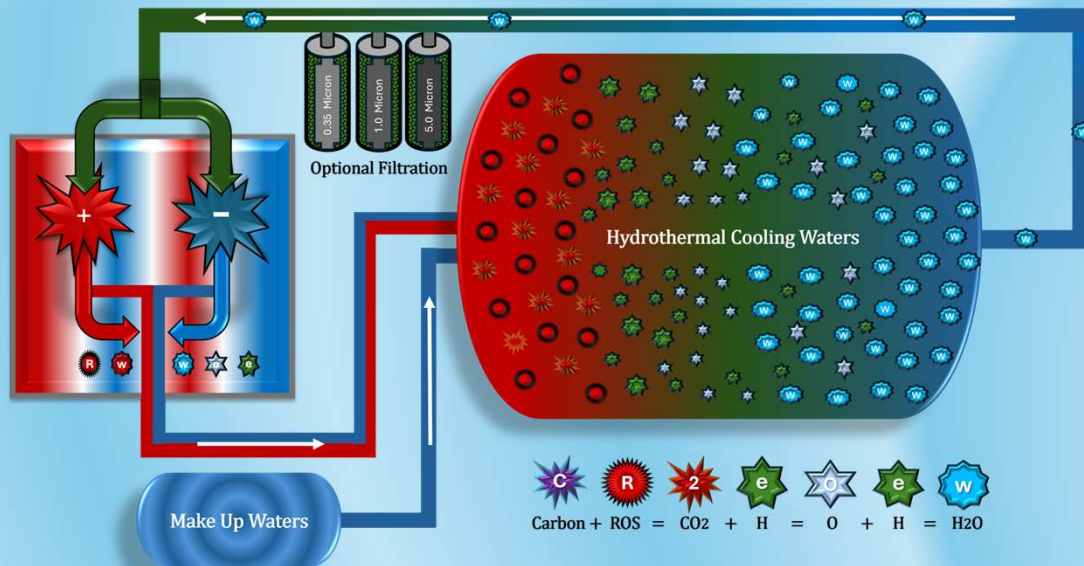
ElectroLIFE Circulation

CARBON / CO2 Emissions Reductions

ElectroLIFE is an independent circulation system. During the process of circulation, the water passes through the electrolysis generator, the restructured water is redelivered to the circulation volume with a fresh positive charge.

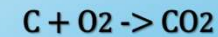
This is a process of continuous oxidation and reduction by direct applied electrical charges.

Anything present subject to oxidation is attracted to the anode, anything subject to reduction is attracted to the cathode. This process continues naturally eliminating these contents in the process, including dissolved carbon and CO2 which is an even bigger in 2024 – 2030 with the emissions goals of manufacturing.

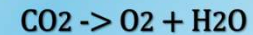


ElectroLIFE reduces Carbon & CO2 emissions through energy reductions in addition to aquatic and atmospheric reductions

Carbon must first be Oxidized to CO2



Then CO2 can be Reduced to H2O





ElectroLIFE Industrial Generators



1.0 = 1440 GPD
 2.6 GPM 156 GPH / 3,744 GPD Standard
 25.0 GPM 1,500 GPH / 36,000 GPD Industrial

**EL flow Rate and system flow rate do not match. El is an independent circulation system not included in system flow, only total volume.*

Refrigeration Ton	Water Usage	per Hour	24 Hours	ElectroLIFE Sizing
300 RT	900 GPM	54,000	1,296,000 1.296=	Single 2.6 GPM
600 RT	1,800 GPM	108,000	2,592,000 2.592	2 stack 2.6 GPM custom
900 RT	2,700 GPM	162,000	3,888,000 3.888	3 stack 2.6 GPM custom
1000 RT	3,000 GPM	180,000	4,320,000 4.320 = 22	Single 25 GPM
3000RT	9,000 GPM	540,000	12,960,000 12.960 = 66	3 stack 25 GPM custom
5000RT	15,000 GPM	900,000	21,600,000 21.600 = 110	5 stack 25 GPM custom
8000RT	24,000 GPM	1,440,000	34,560,000 34.560 = 175	7 stack 25 GPM custom
9000RT	27,000 GPM	1,620,000	38,880,000 38.880 = 195	8 stack 25 GPM custom
Yorks gigantic 10,000RT	30,000 GPM	1,800,000	43,200,000 43.200 = 220	9 stack 25 GPM custom

2018 DOE average analysis calculated, national operational average of \$308 per RT per year. This can get very expensive.
For 2024 with the out-of-control costs?

Refrigeration Ton	Average cost per year	25% energy savings	up to 20% additional	45% Total Savings	New Cost
300 RT	\$ 92,400	\$ 23,100	\$ 18,480	\$ 41,580	\$ 50,820.00
1000 RT	\$ 308,000	\$ 77,000	\$ 61,600	\$ 1,28,600	\$ 179,400.00
3000RT	\$ 924,000	\$231,000	\$184,800	\$ 415,800	\$ 508,700.00
5000RT	\$1,540,000	\$385,000	\$308,000	\$ 693,000	\$ 847,000.00
8000RT	\$2,464,000	\$616,000	\$492,800	\$1,108,800	\$1,355,200.00
Yorks gigantic 10,000RT	\$3,080,000	\$770,000	\$616,000	\$1,386,000	\$1,694,000.00

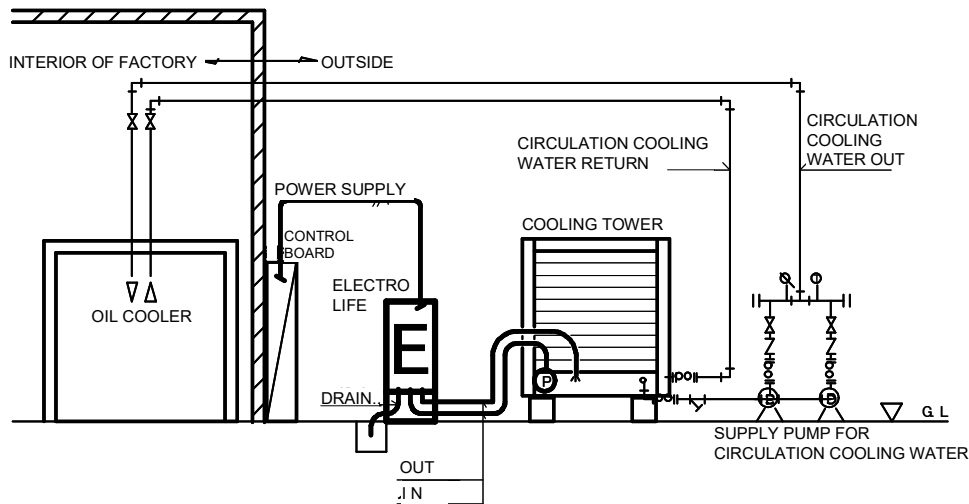
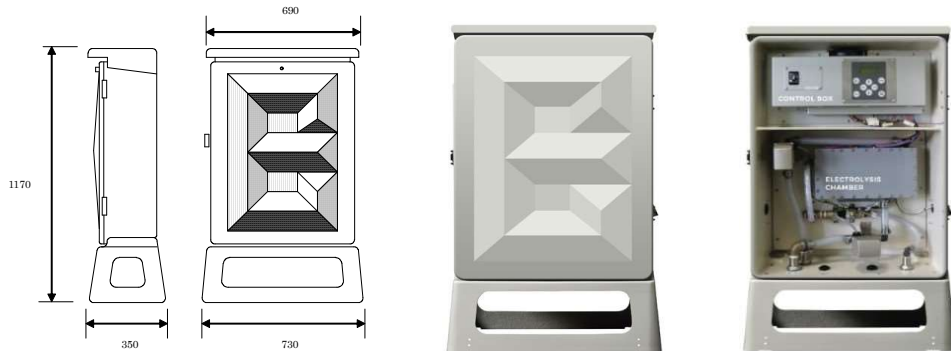
All projects priced job specific

Pricing example: Standard 6.6 GPM 396 GPH / 9,504 GPD Standard Retail \$35,000 saves \$41,580.00 1st year over chemical methods

And depending on system typical condition of 58% blockage (118 Ton Year) to 73% Blockage (130 Ton/Year) reducing energy carbon emissions!



ElectroLIFE SPECIFICATIONS model EL 10



6.6 GPM Generators

DESCRIPTION:	<p>A single cabinet device.</p> <p>Cabinet made of framing enclosed in fiberglass.</p> <p>Unit to sit on firm footing such as concrete.</p> <p>Cabinet equipped with a front door which covers the inner components.</p> <p>Visible LED control panel located at top portion of the device.</p>
DIMENSIONS:	D=350mm (14"), W=700mm (28"), H=1170mm (47")
WEIGHT:	40 kg (88lbs)
WATER PRESSURE:	<p>Below 0.04 Mpa (0.4 Kg f/cm² ~ 0.2 Mpa (2.0 kgf/cm²))</p> <p>The pressure resistance of the electrolysis vessel of 0.2 Mpa (2.0 kgf/cm²)</p>
INPUT POWER SOURCE:	Single phase AC 100V~240V, 50/60Hz
MAXIMUM POWER CONSUMPTION	800W (Main Frame Maximum of 600W)
WATER TREATMENT METHOD:	Electrolysis. (Maximum of 10A, Preset Arbitrary Electrical Current) Once scaling is removed 10A is reduced to 5 A.
MAXIMUM FLOW:	25 liters (6.6 gallons) per minute
ELECTROLYSIS VESSEL SYSTEM:	Continuous flow
LIFE DURATION OF ELECTRODE:	<p>Approximately 1.5 years</p> <p>Life duration is dependent on the quality of water.</p>
WATER SUPPLY, FLUSH, DRAINAGE PIPE RADIUS:	<p>Water supply = 1/2B Hose Nipple,</p> <p>Flush & Drainage = 3/4B Hose Nipple</p>



ElectroLIFE 25 GPM Generators



The 25 GPM Chamber is the optimized industrial chamber. These chambers are bankable with no scale limitations.

Power Consumption

Single Standard 25 GPM

4 Electrodes 150Amp

AC – 5000W ~ DC – 7500W

Flow Rate 25 GPM

Max Volume 36,000 GPD

Scaled for: 1000 RT Circulation System
3,000 GPM ~ 180,000 GPH ~ 4,320,000 GPD

Common misunderstanding ~ ElectroLIFE flow rates are independent of the circulation flow rate.



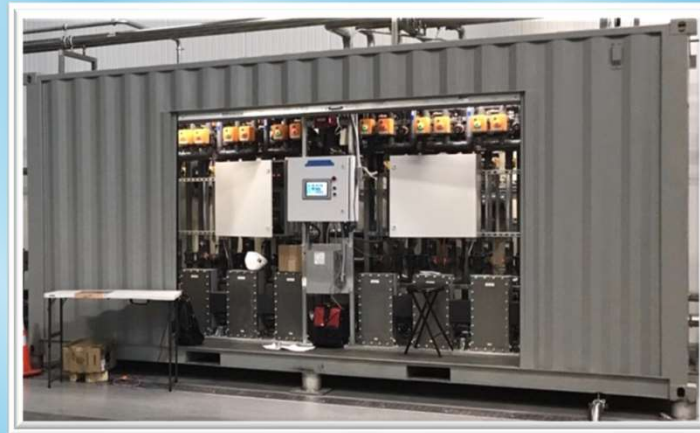
ElectroLIFE Generators

Industrial scaled generators with no limitations

The EL 200 ~ 8 Bank ~ 25GPM Chambers ~ 200 GPM

The largest & highest capacity dual polarity generators on earth

****Made in the USA****



Scaled for: 9000RT ~ 27,000 GPM ~ 1,620,000 GPH ~ 38,880,000 GPD circulation system

ElectroLIFE flow rates are not relevant to the equipment flow rate, they are 2 different flow rates



ElectroLIFE Benefits

*Aquatic and Atmospheric
Carbon Oxidation & CO₂ Emissions Reduction*
Up to 25% reduction energy consumption



The hydrothermal system environment is “Positively” changed to one with compatibility to the desired outcome.

The balance of dual polarity, offered by ElectroLIFE improves the entire operation of a hydrothermal system.

Taking a uncomeatable raw unbalanced cluster of negatively dominant ions filled with contamination and restructuring it too compatible.

1. Balancing Ions and bonding -1/1 neutral, dissolving multiple single bubble gas species in single molecules of H₂O stabilized by 6.45 IP
2. The increase of 6.45 IP maximizes Brownian Motion potential while eliminating the Vander Waals Force.
3. Enhancing organic neutralization electronically in tandem with chemical treatments compatibly, controlling waterborne pathogens
4. Allowing for reasonable filtration of organics to .035m if desired
5. Increased efficiency and lowered energy consumption through 6.45 IP molecule separation enhanced heat exchange
6. Reduction in evaporation through molecule control, clusters hold heat and enhance evaporation, single molecule exchange heat faster cooling quicker reducing evaporation
7. Reductions in splash by, the single molecules flow more evenly.
8. The process of oxidation will oxidize any carbon to CO₂, the action of reduction will reduce any CO₂ to H₂O. This includes the atmospheric contamination generally picked up by the cooling towers and causing additional damage from oxidation to the equipment. This is why chillers located over loading docks have a shorter life span.

ElectroLIFE is a commonsense method for maintaining hydrothermal and overall industrial watertreatment. Using the contents of water to treat and clean water, compatibility to chemical interactions with increased performance benefits.

Aiding in the elimination of scale mathematically by polarity. Aiding in chemical control neutralizing organic loading electronically and with additional ROS created by splitting H₂O naturally.

Increase proficiency by controlling the source, eliminating clusters and increasing surface area for distribution and exchange.

Decades of proven performance saving operations a minimum of 25% operational cost.

ELectroLIFE has proven over decades to be Japan's number one most effective system for increasing the performance of treating water, reduce carbon emissions, optimizing chemical usage, and stabilizing performance.

Thank you for your interest.

Paul E. Seaver

*Palm Beach Springs Water Company Inc.
Arcadia, Florida*



*Paul E. Seaver
President*



*Hiroshi Tanaka
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*Edward Alexander
President*



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