

processpartners
Food Industry Specialists

Radical Waters Hygiene Generator Technology

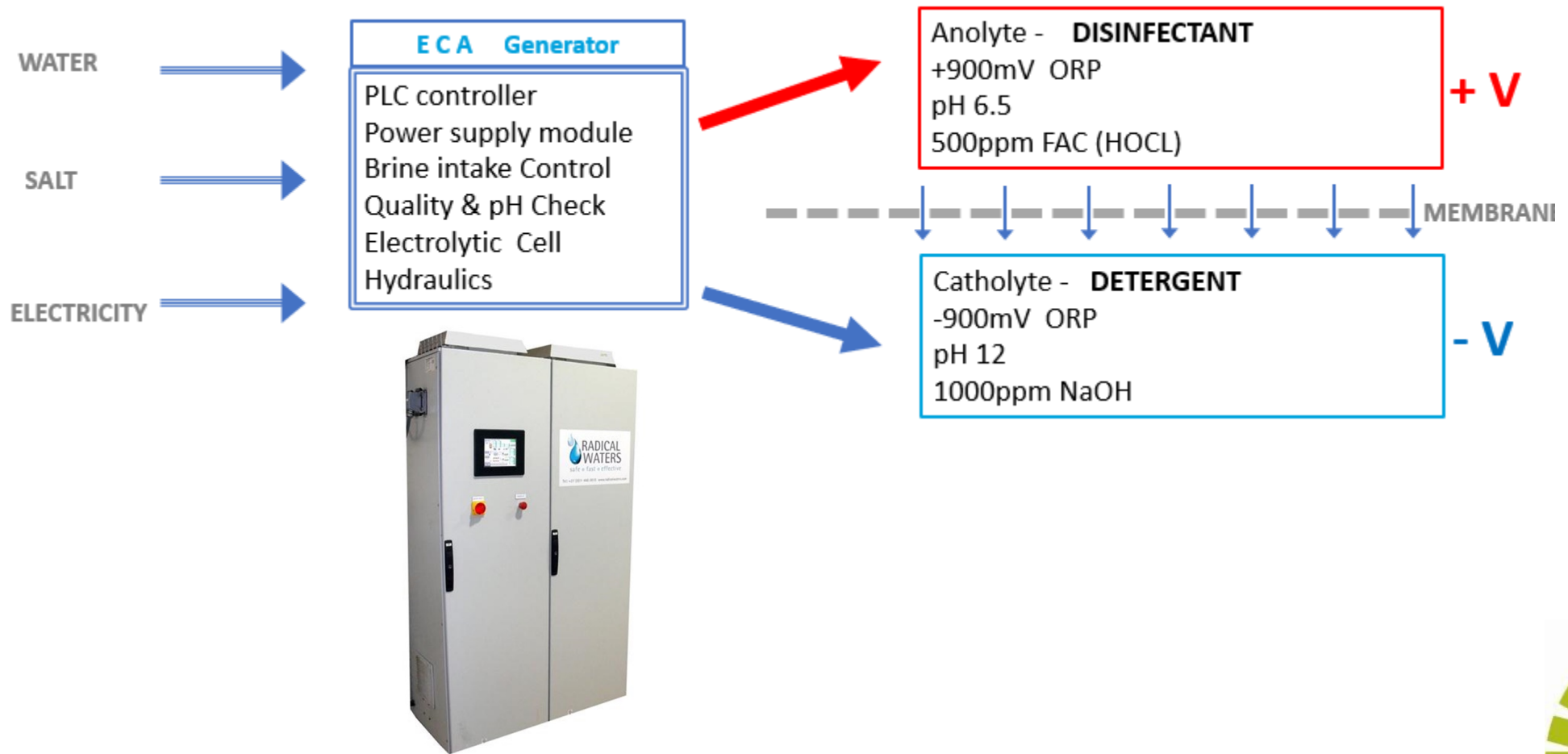


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What is Electrochemical Activation of Salt & Water (ECA)?



Who is Radical Waters?

- Supplier of ECA Technology
 - Proven commercially viable applications
 - 23 Patented applications
- ECA global leader
 - Greater than 75 plants installed in 23 countries
 - Global distributor network to localise sales and after sales support
- Operates in
 - Food & Beverage
 - Water treatment
 - Medical
 - Agriculture & Aquaculture
- Process Partners distribution agreement in August 2022



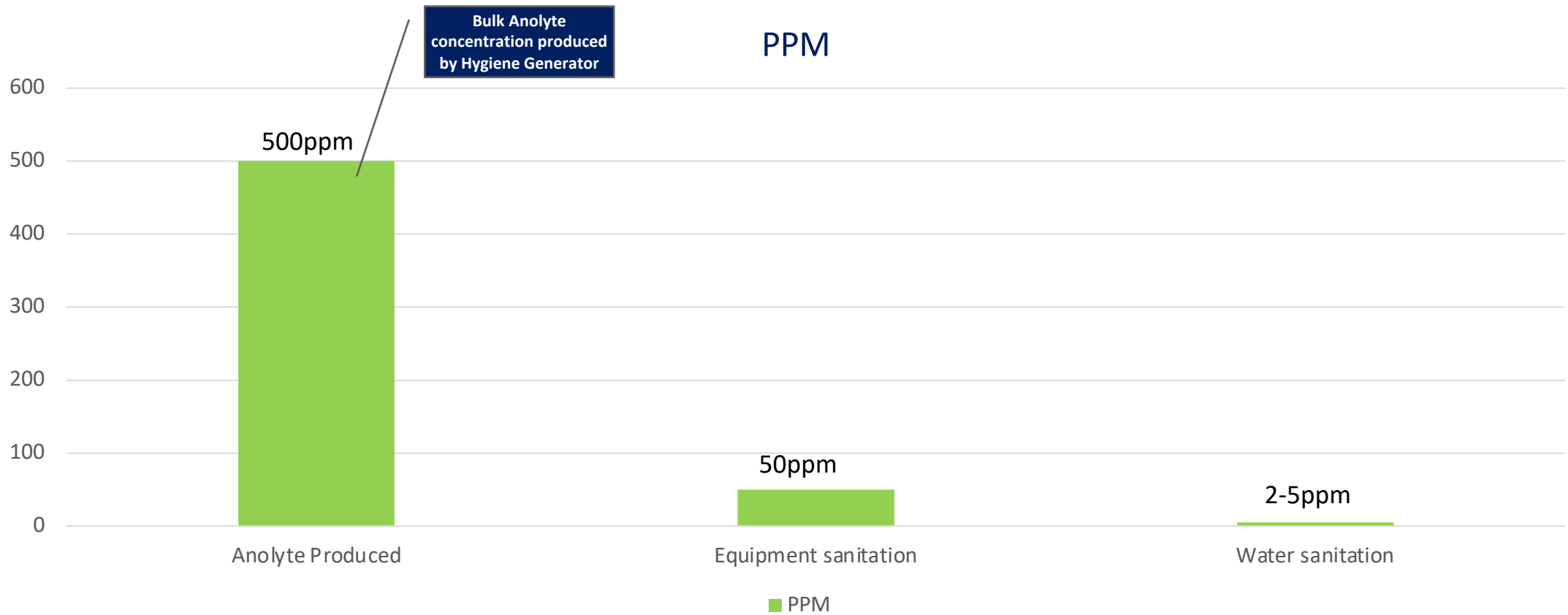
What is an Anolyte Disinfectant?

- Anolyte strong oxidiser (disinfectant)
 - Oxidation Reduction Potential (ORP) 850-950 mV
pH range 6-7
 - Main component Hypochlorous acid (HOCl same chemical produced in white blood cells)
 - Powerful broad spectrum biocide
 - Non-toxic to plants and animals

FDA and European approved for disinfection of drinking water and Food



Anolyte (Disinfectant) Dosage Rates



Anolyte Applications - Examples

- Sanitation of process equipment or environments
- Cooling tower control of Legionella
- Waste water treatment to reduce bacteria to safe levels prior to disposal
- Water disinfectant making it safe without producing chlorine odours or by-products
- Can neutralise colour and odour
 - Ideal for product changeovers and eliminating product cross contamination



Untreated line



Anolyte treated line



Anolyte Applications – How it Works

- The low active chlorine concentration of Anolyte diluted in water does not result in any toxicity effects or the production of any toxic by-products.
- The Electrochemical Activation process breaks the hydrogen bonds in water resulting in “micro water” which allows Anolyte to penetrate microscopic pores, fissures and thereby reaching and eliminating previously unreachable microorganism’s
- Anolyte effectively eliminates biofilm and algae from water distribution systems.

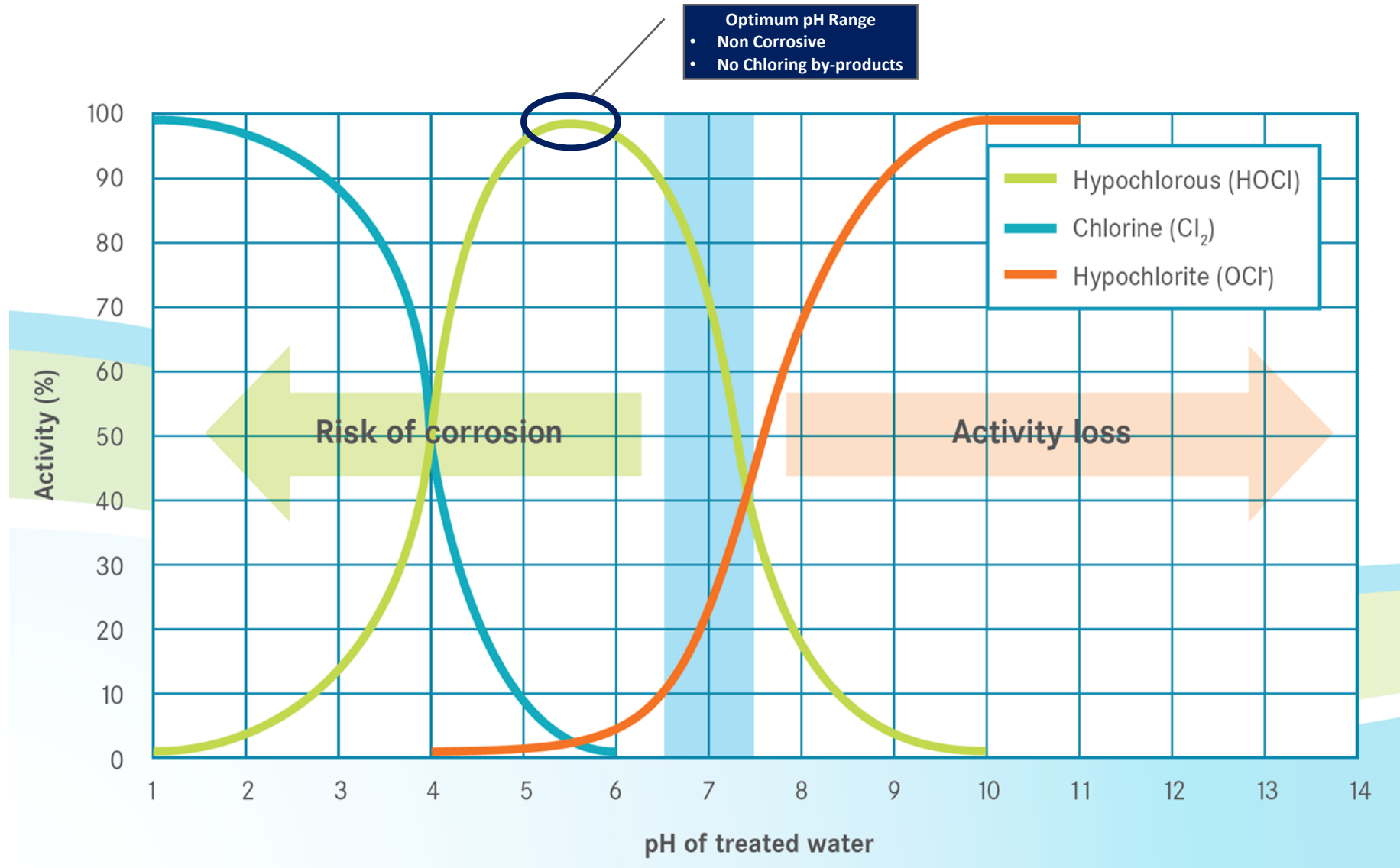


Anolyte Applications – How it Works

- Anolyte is “free rinsing” i.e. any surface, tank or pipeline can be used immediately after the application of Anolyte eliminating the need for a final rinse.
- Anolyte can be made and stored for later use.
- Dosing of Anolyte does not require any special equipment easily integrated to existing CIP sets or water treatment systems.
- High level of safety: Both the ingredients (water and salt) and final product (Anolyte) are non-toxic or hazardous.



Anolyte is a pH Neutral Sanitiser pH 6-7 ideal



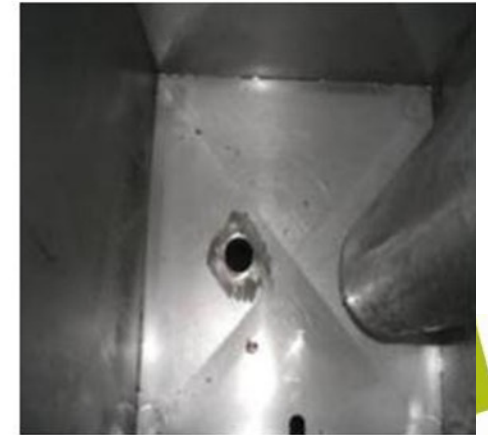
What is Catholyte Detergent

- A Catholyte Acts As a Detergent
 - pH 12
 - Main component NaOH (0.1%)
 - Detergent / de-greaser
 - Removes Biofilms

Biofilm pre Cleaning



Post Catholyte Application



Catholyte Applications

- CIP systems for cleaning
 - Can replace traditional caustic CIP
- Proven beverage CIP applications
- Used before Anolyte to break down heavy bio-films

Biofilm pre Cleaning

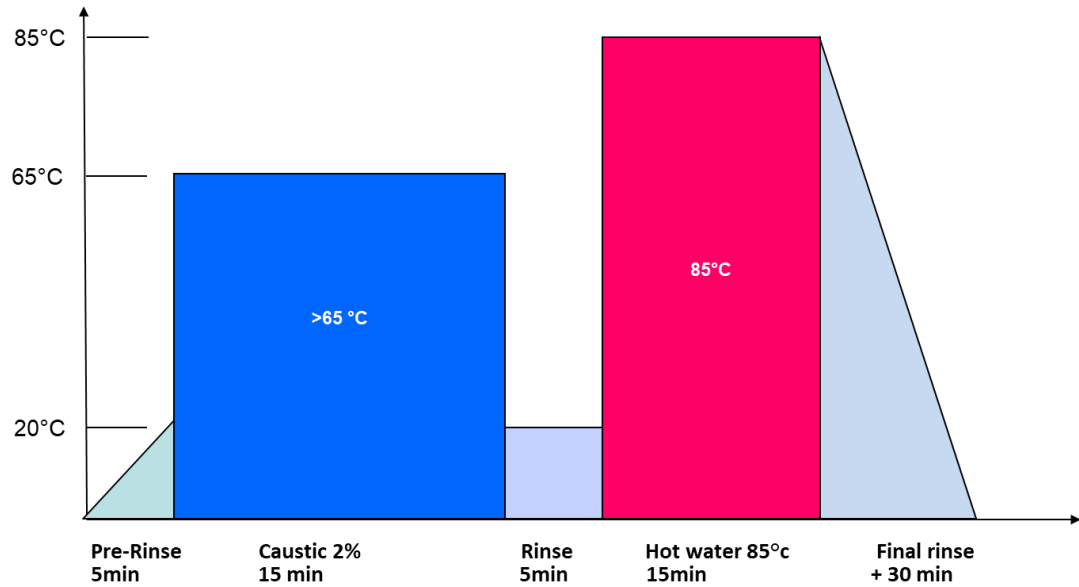


Post Catholyte Application



CIP of Beverage Plants Patented Applications Comparison

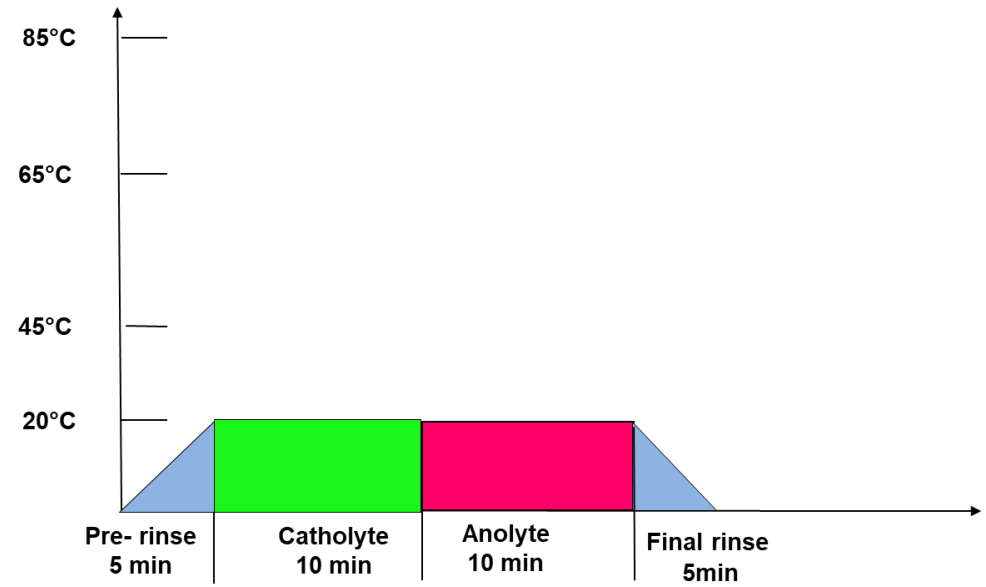
Carbonated Beverage Traditional CIP



Traditional CIP



CIP with Catholyte and Anolyte

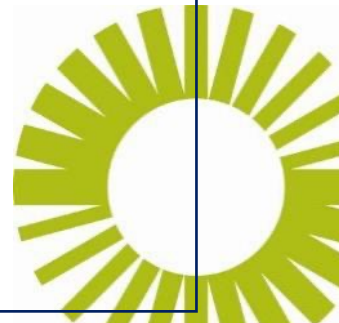


Anolyte/Catholyte



KPI

- Time
- Energy
- Caustic
- Cost (opex)
- Cost (capex)

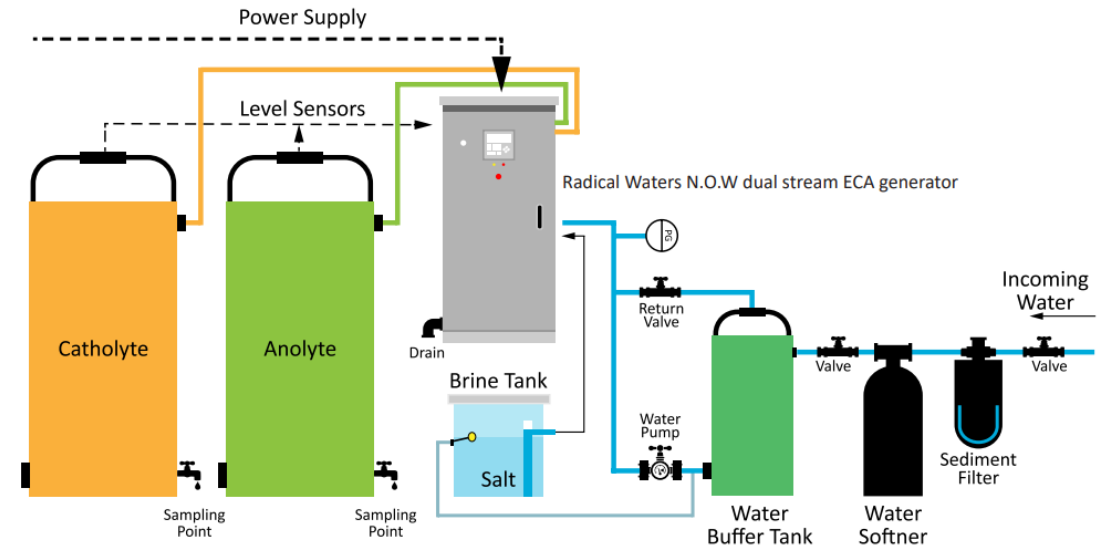


Hygiene Generator Systems Available

- High Salt Single Stream
 - Where corrosion is not an issue
 - Agriculture, surface cleaning non-metal
 - Produce either Catholyte or Anolyte
 - Higher salt and power consumption
 - Lower capital cost

- Low Salt Single Stream
 - Most efficient
 - Lower salt and power consumption
 - Ok to use in Food & Beverage SS equipment
 - Produces Anolyte

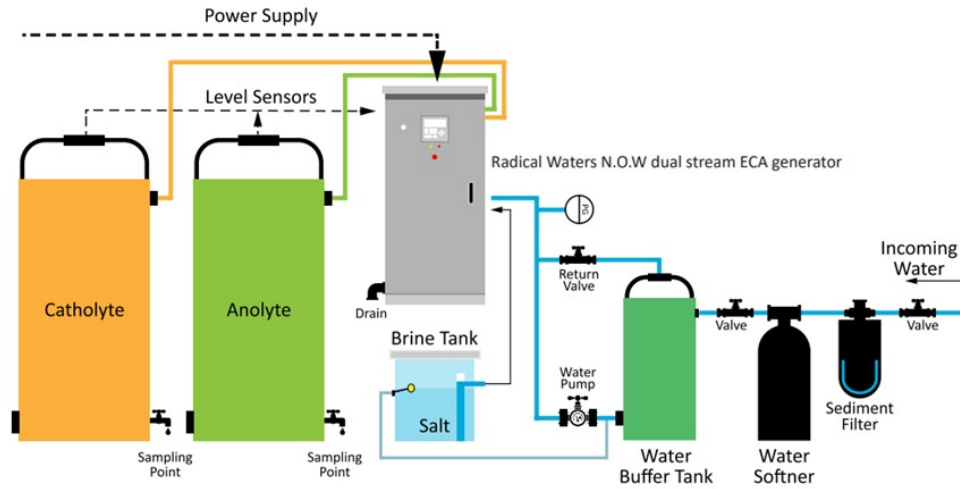
- Low Salt Dual Stream
 - Produces both Catholyte and Anolyte



Installation diagram for a Radical Waters N.O.W Low Salt dual stream ECA generator



How to Integrate into Existing Operations



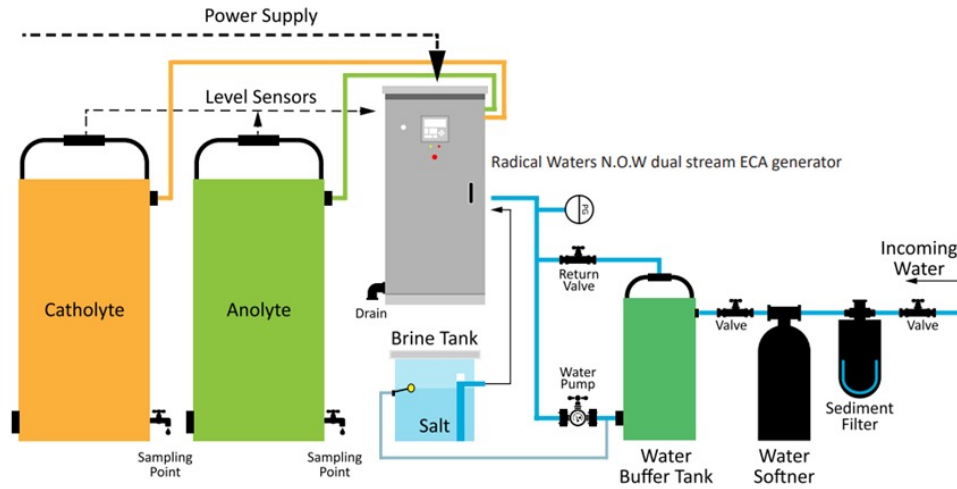
Installation diagram for a Radical Waters N.O.W Low Salt dual stream ECA generator



- System fully automated
 - Anolyte controlled to 500ppm
 - Catholyte controlled concentration
 - Production start/stop
 - Inbuilt alarms



How to Integrate into Existing Operations



Installation diagram for a Radical Waters N.O.W Low Salt dual stream ECA generator



Water treatment

- Water softening treatment may be required
 - 20 micron filter
 - Soft water <20ppm hardness
 - Supply Pressure 1.5-2.5bar

Brine make up

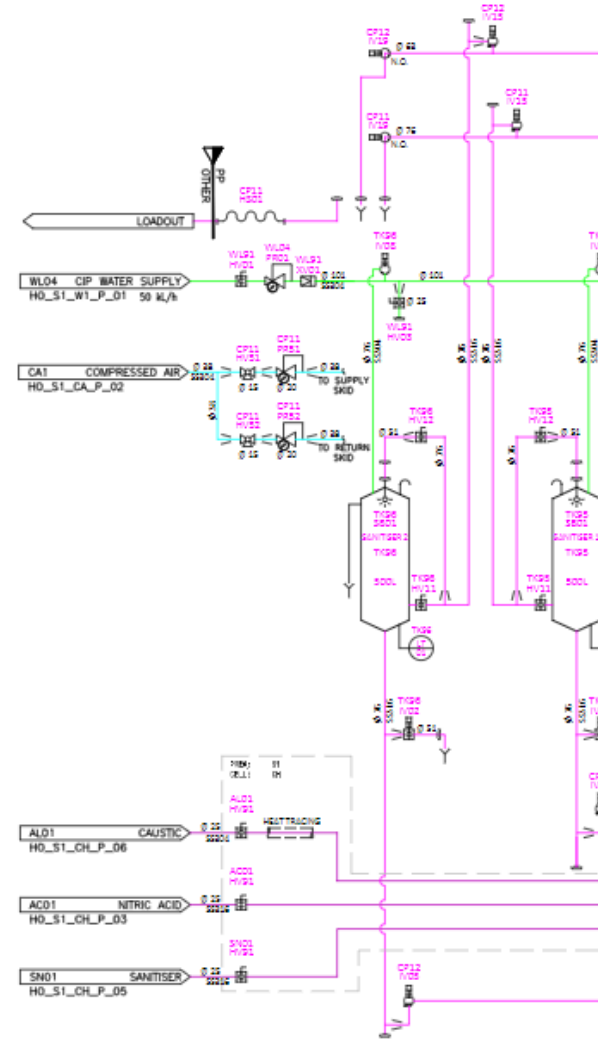
- Salt needs a bit more description
 - Food grade course salt >99% purity
 - Non iodised salt
 - No anti-caking or free flow agents



How to Integrate into Existing CIP Systems

Dosing control to CIP set

- Single use dose to a volume
 - Dose as a ratio into CIP flow
 - Anolyte 10:1
 - Catholyte 2:1-5:1
- Re-use CIP, make up to controlled parameter in CIP tank
 - Conductivity
 - Free chlorine



Operating Cost

- Electricity 5kWh per 1,000 litres of 500ppm Anolyte
- Salt 1.5 Kg per 1,000 litres of 500ppm Anolyte
- Spare electrochemical cell replaced 13,000 hours \$ 2,000- \$ 4,000 (depends on size)
- 1,000 litres of 500ppm anolyte < \$2 enough to make up 10,000 litres of sanitising solution
- 1,000 litres of 500ppm anolyte < \$2 enough to treat 100,000 litres of water



Summary

- FDA approval in place for food processing and sanitation
- Non-toxic to humans, animals and plants
- No toxic by products
- Eliminates dangerous goods handling and storage
- Can be made on demand on site



Summary

- Powerful biocide (anolyte)
- Trade waste and Biodigester system friendly
- Can be applied in liquid, ice or aerosol (fog) form
- Is hypoallergenic
- Low cost solution

Puts You in Control of Your Plant Sanitation.

