

## COPPER ION GENERATOR



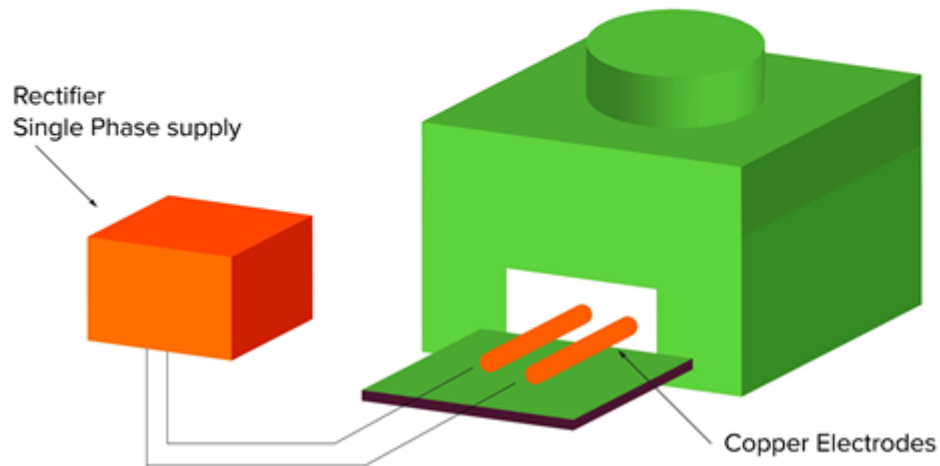
### Concept and working principle

Copper Ion Generator is brought about by electrolysis. An electric current is created through Copper, causing positively charged copper and silver ions to form. Copper Ion Generator brings us back to basic chemistry: an ion - an electrically charged atom, has a positive charge when it gives up an electron and a negative charge when it takes up an electron. A positively charged ion is called a Cation and a negatively charged ion is called an anion.

During Ionization, atoms turn into cations or anions. When Copper Ionization is applied, positively charged copper ( $\text{Cu}^+$  and  $\text{Cu}^{2+}$ ) and silver ( $\text{Ag}^+$ ) ions are formed. The electrodes are placed close together. The results will show a higher concentration of copper and silver ions within the said water system.

## Where Copper Ion Generator is installed?

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Copper Ion Generator has residual effects in all of the water system and is not limited to the immediate local water treatment where the electrodes are located. When an electric current is created and applied to the electrodes, this causes the outer atoms of the electrodes to lose an electron and become positively charged. The larger part of the ions flows away through the water, before reaching the opposite electrode. The ion concentration is determined by the water volume and flow. The number of ions that is released increases, when power output is higher. Also, water conductivity will play a key role in the Copper Ion Generator application. When copper ions ( $\text{Cu}^+$ ) dissolve in water, they are oxidized immediately to form  $\text{Cu}^{2+}$  ions. Copper can be found in the water in free form.

### Why Copper Ion Generator?

Copper Ion Generator is suitable for a large number of applications. Copper Ion Generator is mainly used for irrigation, domestic hot water systems, cooling towers and swimming pool water disinfection. Copper Ion Generator is not dependent on temperatures. It is active in the entire water system.

A benefit of Copper Ion Generator is that ions remain in the water for a long period of time. This causes long-term disinfection and protection from recontamination. Copper and silver ions remain in the water until they precipitate or absorb to bacteria or algae, and are removed from water by filtration after that.

Copper Ion Generator effectively deactivates Legionella bacteria and bio film and it improves water quality. Copper Ion Generator has a larger residual effect than most other disinfectants. Copper and silver ions remain in the water for a long period of time. Copper is effective throughout the entire water system, even in dead-end points and parts of the system that contain slow-running water. When Copper is used, less maintenance to the water system is required. Copper is non-corrosive; it causes less strain on the distribution system. Because of a decrease in the use of chemicals, the lids and pumps are not affected. Furthermore, shower heads, tanks and taps are not contaminated. When Copper Ion Generator is applied, there are no transport and storage difficulties.

Electrically charged copper ions ( $\text{Cu}^{2+}$ ) in the water search for particles of opposite polarity, such as bacteria, viruses and fungi. Positively charged copper ions form electrostatic compounds with negatively charged cell walls of microorganisms. These compounds disturb cell wall permeability and cause nutrient uptake to fail. Copper ions penetrate the cell wall and as a result they will create an entrance for silver ions ( $\text{Ag}^+$ ). These penetrate the core of the microorganism. Silver ions bond to various parts of the cell, such as the DNA and RNA, cellular proteins and respiratory enzymes, causing all life support systems in the cell to be immobilized. As a result, there is no more cellular growth or cell division, causing bacteria to no longer multiply and eventually die out. The ions remain active until they are absorbed by a microorganism.

## **Features**

- Easy to install & Commissioning.
- Ion Generation can be regulated easily.
- Simple in Design.
- Minimal power consumption.
- Maintenance free and Environmental friendly.
- Dose not add any pollution Problem.
- Copper are non-corrosive and causes less strain.
- Copper has larger residual effect than any other disinfectants.
- Copper treatment is effective throughout the system even in dead points and parts of the system that contents slow running water.

## Benefits

- To reduce existing algae formation and bacterial growth.
- To reduce slime formation across the condenser.
- To extract scale from cooling tower water.
- Settles suspended solid particles in cooling tower sump.
- Combination of copper ionization & non-oxidizing biocides gives better control on algae, bacteria, slime formation, suspended solids etc.

## Copper Electrodes in Cooling Tower sump

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Cleaned copper electrodes



Copper ions and scale deposition



## Applications

- HAVC
- Cooling towers
- Swimming pools