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TREATING YOUR WATER THE "RIGHT" WAY

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IONIC ENGINEERING TECHNOLOGY PVT. LTD.

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CED- CAPACITIVE ELECTRO DESALINATION

An innovative non chemical electrical driven, simple, efficient and reliable way (the right way) to treat the water.

In 2016, the term that seems to define the needs of populations around the world, and that has become a mission in its own right, is water reuse. From residential to commercial and industrial consumers, water reuse is becoming more and more essential to our daily survival. The earth's population is expected to climb fully 35%, that's 2.5 billion more people, by 2050, meaning that pressure on global water resources is increasing at an even faster rate than ever before. The need for technologies that cost-effectively enable water reuse is currently at its peak of importance. IONIC offers a new technology CED (Capacitive Electro Desalination) that removes TDS (total dissolved solids) and other dissolved ions (salts) more cheaply and efficiently than any other technology, and does so at ambient temperatures. The introduction of this technology means water treatment and reuse can become an affordable and viable option today.

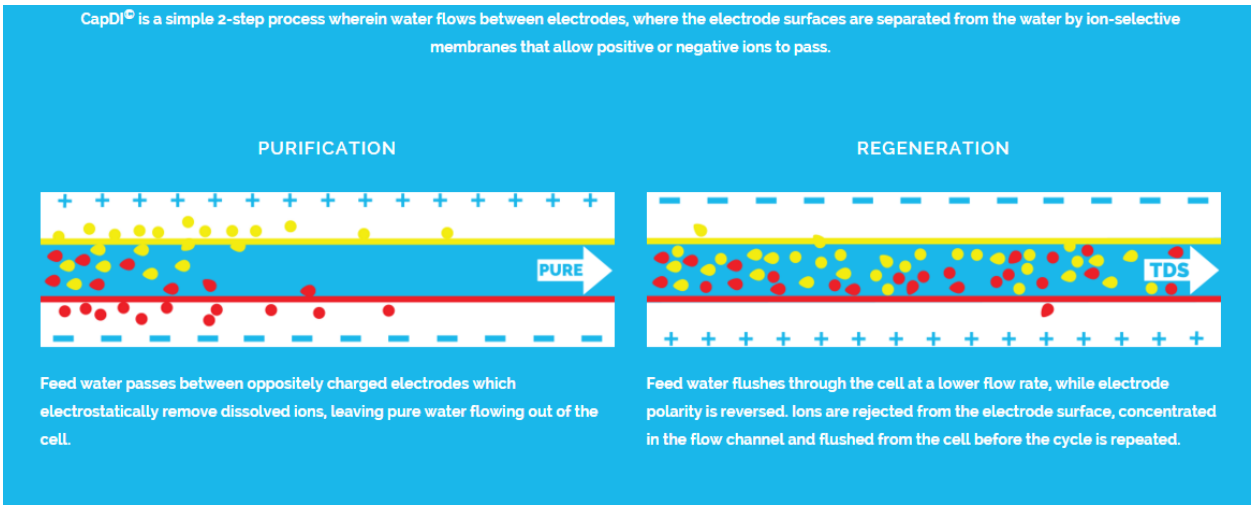
Over the last 15 years, innovations in many fields have so rapidly developed that keeping up with the ever-changing technologies has not only been difficult, but also very expensive. In the water reuse field, there have been numerous technologies that have been developed in order to help solve the water issues we have at hand; the same issues that we have been dealing with for many years now. These technologies are particularly important for industries that consume significant amounts of water during normal operation such as boiler feed, cooling tower make, paint shops, electro plating, manufacturing processes, commercial laundries, textile processing and the list is endless.

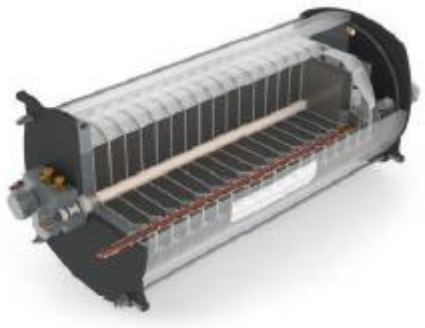
Water reduction and reuse not only helps save the planet by consumers and businesses becoming more environmentally friendly, but it also saves costs in both personal and industrial applications. CED (Capacitive Electro Desalination) brackish water at the lowest economic and environmental cost of any globally available technology. CED is a simple, innovative, and most importantly cost-effective way to remove TDS from water.

Current technologies, such as reverse osmosis (RO) wastes water and operating cost is high due to high energy consumption, water wastage, chemical consumption, maintenance cost etc. CED i technology

from IONIC offers exceptional operational, chemical, and energy costs savings. This technology recovers up to 90% of the water it treats, and does so at low energy cost.

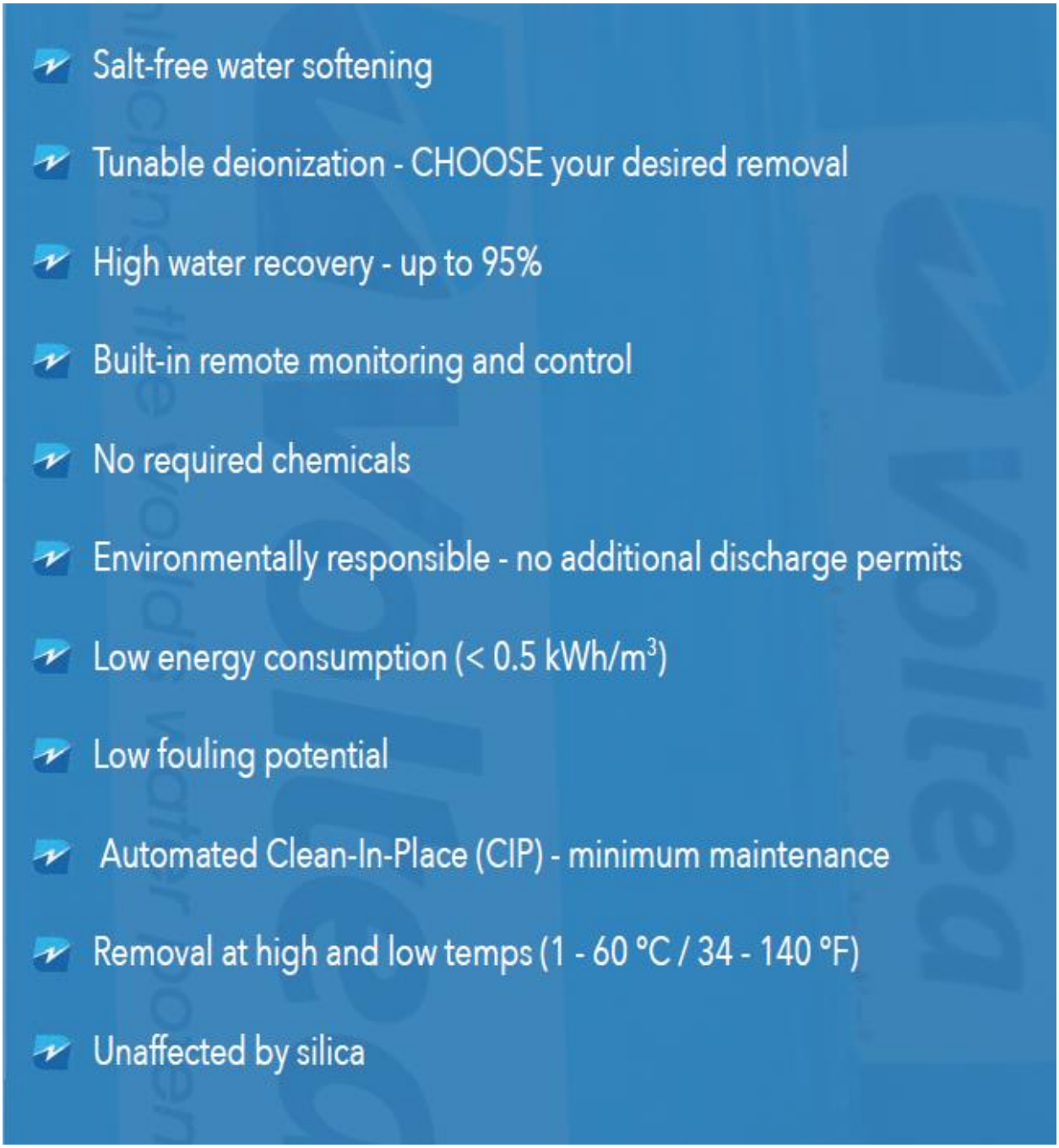
CED is a simple 2-step process wherein water flows between electrodes, where the electrode surfaces are separated from the water by membranes that selectively allow positive or negative ions to pass. In the first step, purification, saline water passes between oppositely charged electrodes which electrostatically remove dissolved ions, leaving pure water flowing out of the cell. In the second step, regeneration, feed water flushes through the cell at a lower flow rate, while electrode polarity is reversed. Ions are then rejected from the electrode surface, concentrated in the flow channel, and flushed from the cell before the cycle is repeated. Moreover, a critically important feature of the technology is that the amount of TDS removed from the water is tunable and the process is dynamically controlled automatically based on feed water characteristics and hence the system can easily handle variations in feed water characteristics.





WE TREAT WATER "DIFFERENTLY"

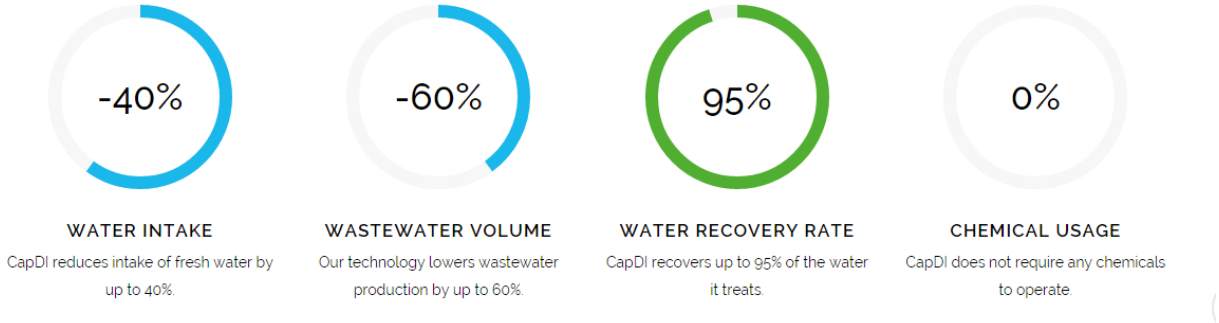
User benefits:



Treated water quality

What makes capacitive electro desalination (CED) special?

CED is special in more ways than one, starting with and most importantly that it removes TDS at ambient as well as high temperatures up to 60 deg C.(with high temperature modules).



No other technology, globally, has the ability to do so. CED is also environmentally friendly in that there are no chemicals used for treatment, which ensures that any unrecovered water flows back into the ecosystem safely. Unlike RO systems that can waste more than 60% of treated water, CED can recover up to 90% of the water it treats, resulting in long-term water conservation. Also unlike RO systems, CED is tunable, meaning that the extent of which salts and other ions are removed can be customized to the consumer's needs, depending on the application and raw water characteristics. It is important in certain applications like drinking water that not all of the dissolved salts and other minerals are fully removed because their presence in low concentrations is necessary for certain types of usage. This is where the tunable removal feature of CED differentiates itself.

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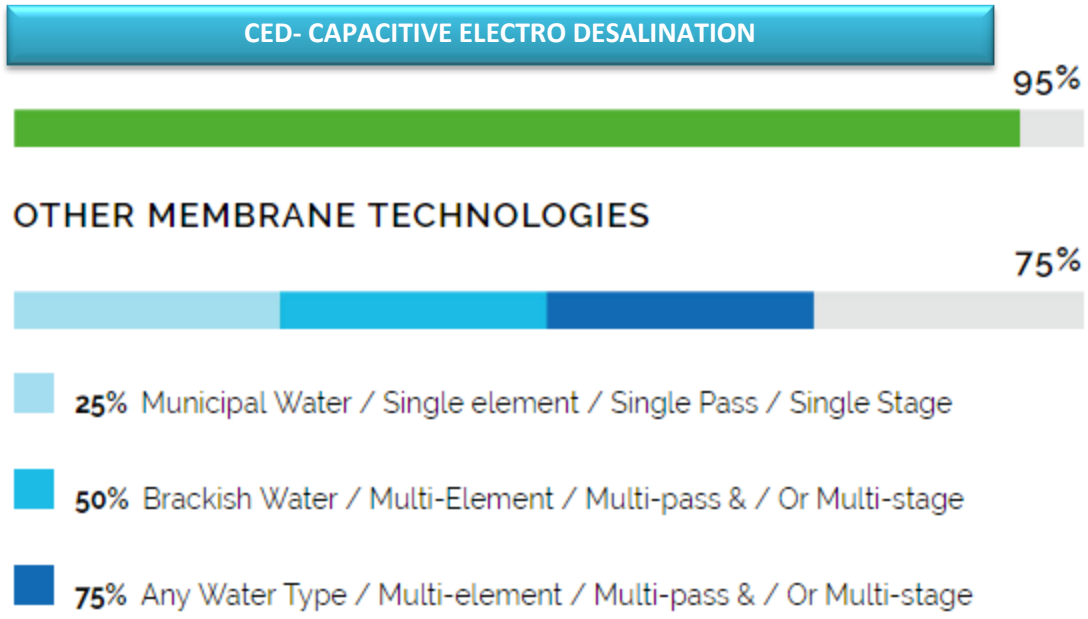
TREATED WATER RECOVERY



Scalable

CED technology treats water types ranging from residential consumer appliances to large-scale industrial plants. Our systems are modular, allowing easy expansion to meet any increased water demands.

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Tunable

CapDI is tunable, allowing adjustable TDS reduction between 25 – 95% depending on customer needs, eliminating the requirement for blending to achieve a specific water quality. The customer sets their desired reduction rate and CapDI maintains this level, continually adjusting itself to account for any fluctuations in feed water characteristics.

Perhaps most interesting feature is its ability to "set it and forget it". Once the unit is tuned to meet a desired product water conductivity, it will continue to deliver the desired water quality, regardless of fluctuations in feed water quality. And, it will automatically adjust the amount of electricity that it requires to meet the water quality goal.

"Traditional RO or thermal desal systems often remove far more salt than is required, whereas CED has the ability to tune the amount of TDS removed. Besides the obvious energy savings, this is important for some applications, such as producing optimal beverage quality, drinking water, process water.

What else can "CED" do?

In recent years, regulations have become stricter regarding the quality of effluent discharged from wastewater treatment plants into rivers or the sea. This regulatory environment makes wastewater reuse for agricultural purposes an attractive option for farmers, wastewater treatment plant operators, and companies providing wastewater reuse solutions.

In manufacturing processes CED can work as a standalone unit to desalinate the water and make it suitable for drinking, boiler feed, cooling tower make, rinse water in paint shops, water jet cutting machines, machine coolant make up, and be part of the RO pretreatment and post treatment, be part of demineralization system pretreatment so that the size of the system can be reduced, chemical consumption and waste water disposal problem can be reduced. In industrial applications, cooling towers use large quantities of water and chemicals. A cooling tower carries away heat through the evaporation of water. This water contains natural salts such as calcium, bicarbonate, chloride, and sulfate. The salts do not evaporate and build up over time, thus causing corrosion and scaling. To prevent this, chemicals are added to the cooling water. Eventually this water is discharged, and the cooling tower is refilled with clean water.

In cooling towers, the CED system treats water before it enters the cooling tower, reducing salts from the incoming water stream by 80%. The cooling tower does not need to be adapted since CED is placed before the cooling tower, treating only the incoming water, because the composition of the recirculating water remains unchanged. This allows the water to remain in the cooling tower up to five times longer, resulting in lower overall water consumption and wastewater production. Fewer scale and corrosion inhibitors are required to treat the water because of the decreased water consumption. For cooling systems that face existing problems with corrosion and scaling, CED can also be used to reduce the scaling and corrosion potential of cooling tower water. Once installed, CED is essentially risk-free since it does not change the chemical treatment program, the conductivity levels, or the settings of the cooling tower.

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The easy-to-implement CED systems improve cooling tower efficiency by reducing water and chemical usage for both industrial and institutional systems. Installing CED in the cooling tower make-up enables make-up water savings of up to 40%, blow-down water savings of up to 60%, scaling and corrosion inhibitor chemical savings of 50%, plus overall improved performance. Lower water usage and lower chemical discharge make CED an exceptional environmentally friendly water reuse leader for industrial facilities that rely on cooling towers. The amount of water that cooling towers use annually, about 30,000 m3 for a small cooling tower, is enough to supply over 200 households with water for an entire year. CED would make a monumental difference in water usage around the world, and set an incredible precedent of how to jump-start other efforts towards solving global water challenges.

What factors you must consider before investing on a water treatment system?

1. Is the water treatment system simple and less complicated?
2. Did the system meet treated water quality targets?
3. Can the system handle fluctuating feed/raw water characteristics?
4. Does it have dynamic process control to automatically adjust operating parameters to maintain treated water quality?
5. How reliable the performance will be?
6. How consistent and reliable the performance will be?
7. How easy to operate?
8. How easy to monitor and trouble shoot?
9. Does it have a Real time remote Monitoring process control?
10. How easy to maintain and clean? Does it have automatic cleaning system in place?
11. How much water can be recovered?
12. How much water goes to waste?
13. What is the specific energy (Kwh/m3 of treated water) consumption?
14. What is the true cost of water?

***Conclusion**: Fresh water availability is a big problem. Even if water is available the fresh water cost is high and quality is not good. Cost of treatment of poor quality water is more. Disposal of waste water is difficult and high. Need of the hours is to embrace better water treatment technology that will provide "Peace of Mind" and not a "Piece of Equipment".*

For further information contact us with complete raw water analysis and your specific requirement.