



VOLTEA'S CAPDI[®] TECHNOLOGY PRODUCT & SYSTEMS CATALOG

Voltea's CapDI systems provide clean, pure water for an array of applications through tunable deionization.



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Unlocking The World's Water Potential



ENVIRONMENTAL RESPONSIBILITY

At Voltea, our mission revolves around providing a **superior solution** to water reuse and desalination, where we put our natural resources and environment first. The lasting effects that harsh salts and chemicals have on our water sources is brutally evident, and only regressing with each salt refill and discharge using current traditional desalination and reuse technologies.

Environmentally responsible solutions to water reuse and desalination are crucial to our generation - and our future - and Voltea surpasses these expectations by providing a tunable, salt-free, chemical-free desalination technique that every home and business can adopt.

The tunability feature of Voltea's Membrane Capacitive Deionization (CapDI®) is what differentiates our technology from traditional desalination technologies; we allow treatment of brackish water sources where the customer can choose the level of salt and ion removal based on their treatment needs.

No longer is it necessary to replace removed salt with other salts, add chemicals for cleansing purposes, or cool then re-heat water for high-temperature reuse applications. CapDI accomplishes this all while reducing environmental impact, energy costs, and operational inefficiencies.



Voltea's CapDI Technology

We specialize in **tunable water deionization** that is designed to remove total dissolved salts (TDS) from a variety of water sources, ranging from tap water and brackish groundwater to industrial process water. CapDI achieves this at a lower economic cost and reduced environmental impact than any other available technology.

Uniquely, CapDI operates at temperatures ranging from 5 - 60 °C, or 40 - 140 °F, on challenging higher turbidity feed waters, with minimal operator intervention. Our technology is environmentally friendly by virtue of its low energy consumption and minimal to no chemical usage, thus allowing any unrecovered water to flow back into the ecosystem safely.

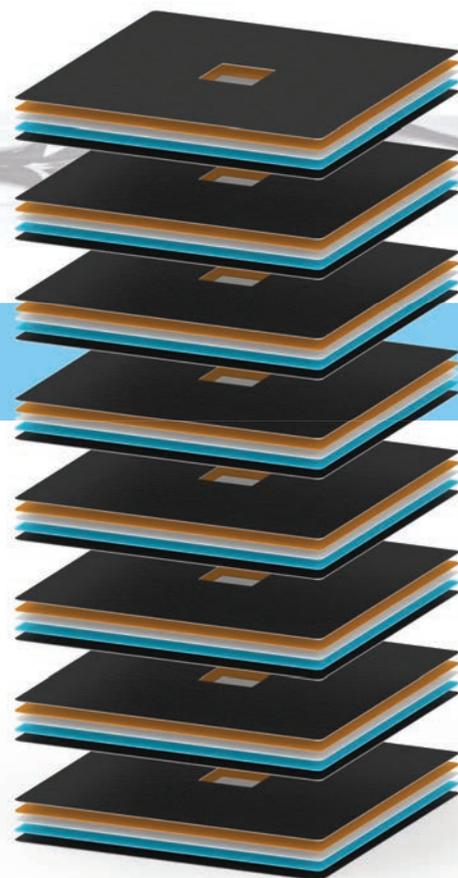
Voltea's technology treats water types ranging from residential consumer appliances to large-scale industrial plants. Our systems are modular, allowing easy expansion to meet any increased water demands.

Tunable Deionization At Your Fingertips

CapDI is tunable, allowing adjustable TDS reduction between 25 - 95% depending upon 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.

PATENTED PROTECTION

Voltea owns over **50 global patents** pertaining to CapDI and how the technology is implemented into modules and systems. Voltea's patent portfolio ensures that the use of ion-selective membranes or coatings in any capacitive deionization device requires a legally binding supply and license agreement with Voltea.

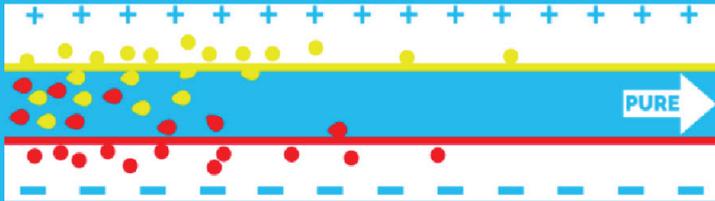


How It Works : CapDI

2 - STEP PROCESS

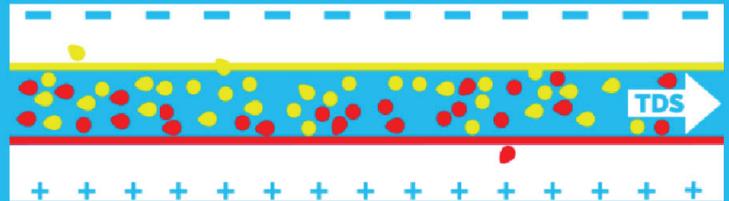
CapDI is a simple 2-step process wherein water flows between electrodes, where the electrode surfaces are separated from the water by ion-selective membranes that allow positive or negative ions to pass.

PURIFICATION



Feed water passes between oppositely charged electrodes which electrostatically remove dissolved ions, leaving pure water flowing out of the cell.

REGENERATION



Feed water flushes through the cell at a lower flow rate, while electrode polarity is reversed. Ions are rejected from the electrode surface, concentrated in the flow channel and flushed from the cell before the cycle is repeated.

Applications That Require Hardness and TDS Removal

Horticulture

Cooling Towers

Wastewater Reuse

Bottling Companies

Commercial Laundry

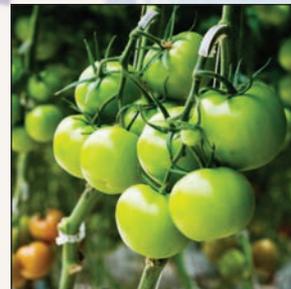
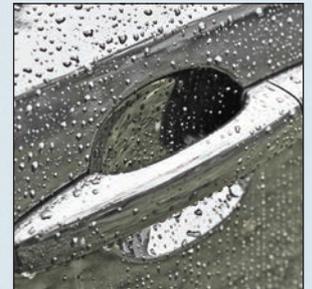
General Deionization

Automotive Paint Line

Consumer Appliances

Residential Water Treatment

Replace Traditional Softeners



CapDI Benefits:

- ⚡ Salt-free water softening
- ⚡ Tunable deionization - CHOOSE your desired removal
- ⚡ High water recovery - up to 95%
- ⚡ Built-in remote monitoring and control
- ⚡ No required chemicals
- ⚡ Environmentally responsible - no additional discharge permits
- ⚡ Low energy consumption ($< 0.5 \text{ kWh/m}^3$)
- ⚡ Low fouling potential
- ⚡ Automated Clean-In-Place (CIP) - minimum maintenance
- ⚡ Removal at high and low temps (1 - 60 °C / 34 - 140 °F)
- ⚡ Unaffected by silica

From the Inside-Out

The composition of Voltea's CapDI Modules is the **game-changing** piece of our patented technology. Our modules are comprised of electrode stacks, where ion removal takes place by means of an electric field.

Our modules operate on a range of flows and feed water salinities, allowing implementation into a host of applications. Simple electrical terminals and water connections allow easy installation and service.

The composition of our smallest and pilot-testing Development Kit (DK) Systems include our C-3 and VS-Series Modules, while our largest Industrial Series (IS) Systems include our C-18AT or C-18HT modules, all shown below.

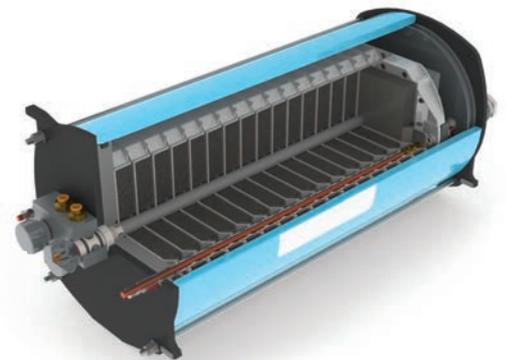


C-18 Module (Internal Views)

The C-Series : Industrial and Commercial Application Modules

There are three C-Series Module sizes for Voltea's Commercial and Industrial Systems; C-3, C-6, and C-18, all depending on the flow rate, feed salinity, and targeted purified water quality.

CapDI C-Series Modules for Commercial and Industrial Systems are available in two configurations; the C-SeriesAT for ambient temperature applications and the C-SeriesHT for **high temperature applications**, such as commercial laundry water reuse.



C-18 Module (Internal View)



C-3 Module



C-6 Module



C-18 Module

C-SERIES MODULE TECH SPECS

Module	C-3	C-6	C-18
Length	28 cm (11")		
Width	28 cm (11")		
Height	32 cm (13")	40 cm (16")	70 cm (28")
Weight	20 kg (44 lbs)	23 kg (51 lbs)	60 kg (132 lbs)
Feed Inlet Coupling	20 mm couplings (1/2" couplings)		
Product Outlet Coupling	10 mm couplings (3/8" couplings)	10 mm couplings (3/8" couplings)	20 mm couplings (1/2" couplings)
Electrical Connections	2 x M8 fine threaded copper rods		
Recommended Power Input	0 - 120 A / 0 - 2 V	0 - 120 A / 0 - 2 V	0 - 400 A / 0 - 2 V
Operational Requirements - Ambient Temperature (AT)			
Instant Flow Rate*	0,2 - 5,0 L/min (0.05 - 1.3 gpm)	0,02 - 0,5 m ³ /hr (0.1 - 2.4 gpm)	0,1 - 1,3 m ³ /hr (0.3 - 5.8 gpm)
Net Produced Flow*	0,12 - 3,0 L/min (0.03 - 0.8 gpm)	0,02 - 0,3 m ³ /hr (0.06 - 1.4 gpm)	0,1 - 0,8 m ³ /hr (0.2 - 3.5 gpm)
Maximum Pressure	10 bar (150 psi)		
Water Temperature	5 - 30 °C (40 - 86 °F)		
Operational Requirements - High Temperature (HT)			
Instant Flow Rate*	0,2 - 3,8 L/min (0.05 - 1.0 gpm)	0,02 - 6,7 m ³ /hr (0.1 - 1.8 gpm)	0,1 - 1,0 m ³ /hr (0.3 - 4.4 gpm)
Net Produced Flow*	0,1 - 2,3 L/min (0.03 - 0.6 gpm)	0,02 - 0,2 m ³ /hr (0.06 - 1.1 gpm)	0,1 - 0,6 m ³ /hr (0.2 - 2.6 gpm)
Maximum Pressure	5 bar (70 psi)		
Water Temperature	5 - 60 °C (40 - 140 °F)		

*Flows are unimpeded and may be limited by system specs. Ranges modeled on 320 ppm TDS at 50% removal.



The VS-Series : Residential and Consumer Appliance Modules

MODULES : VS-SERIES

Voltea has leveraged the same robust industrial technology for smaller scale consumer appliances. These systems are the first to offer consumers the benefits of no-salt softening combined with low TDS for **increased appliance lifetime**. Design freedom and flexibility allows customization of module size, shape and geometry to fit your specific application. From washing machines to coffee makers, appliances benefit from tunable output water quality and hardness reduction.

In a single pass, at very low energy consumption and extremely high water recovery, CapDI delivers softened, deionized water to your appliances. This means higher quality water and appliance longevity for your business and home.



VS-1 Module



VS-2 Module



VS-3 Module

VS-SERIES MODULE TECH SPECS

Module	VS-1	VS-2	VS-3
Length	26,5 cm (10.4")		
Width	22,5 cm (8.9")		
Height	4 cm (1.6")	6 cm (2.4")	8 cm (3.1")
Weight	2,5 kg (5.5 lbs)	3,6 kg (8 lbs)	5 kg (11 lbs)
Feed Inlet Coupling	Size 10 push-in connection - female (3/8")		
Product Outlet Coupling	Size 10 push-in connection - male (3/8")		
Electrical Connections	M5 copper rod with M5 bolts		
Recommended Power Input	0 - 40 A / 0 - 2 V	0 - 80 A / 0 - 2 V	0 - 120 A / 0 - 2 V
Instant Flow Rate*	0,1 - 1,5 L/min (0.03 - 0.4 gpm)	0,2 - 2,8 L/min (0.04 - 0.7 gpm)	0,2 - 4,1 L/min (0.05 - 1.1 gpm)
Net Produced Flow*	0,06 - 0,9 L/min (0.02 - 0.2 gpm)	0,09 - 1,7 L/min (0.02 - 0.4 gpm)	0,1 - 2,5 L/min (0.03 - 0.7 gpm)
Maximum Pressure	2 bar (30 psi)		
Water Temperature**	5 - 30 °C (40 - 86 °F)		

*Flows are unimpeded and may be limited by system specs. Ranges modeled on 320 ppm TDS at 50% removal.

**If you wish to operate VS Modules on temperatures higher than 30°C, please contact Voltea.

EXPLORATORY CapDI

The Development Kit (DK) System is a **versatile evaluation tool** coupled with technical support from Voltea experts. This allows for fast and simplistic exploration of the potential of CapDI for your application. Our DK System is a great way to start your deionization project with Voltea, where we both get a full insight into what our CapDI technology can do for your business or home.

Our DK System couples with any of our VS-Series Modules or the C-3 Module. By operating the reduced sized modules you can establish a baseline representation of a full size system. Included with every DK System purchase is a tailored testing program to ensure clients experience the full capabilities of CapDI technology in relation to their specific application.



DEVELOPMENT KIT

TECH SPECS

DEVELOPMENT KIT

	System	DK Low Range (LR)	DK High Range (HR)
Performance	Flow Rate Capacity*	0,2 - 2,5 L/min (0.05 - 0.7 gpm)	
	Salt Removal	25 - 95%	
	Water Recovery	40 - 95%	
System Specification	System Power Req.	Single - Phase (110 - 240 V - AC / 50 - 60 Hz)	
	Power Output to Modules	1 - 60 A / 0 - 10 V DC	5 - 240 A / 0 - 3 V DC
	System Dimensions (L x W x H)	75 x 50 x 60 cm (2'6" x 1'8" x 1'11")	
	Service Space	0,8 m around system (2'7" around system)	
	Weight***	52 kg (114 lbs)	
	Feed Inlet Coupling	10 mm tubing push-in connection (3/8")	
	Product Outlet Coupling	10 mm tubing push-in connection (3/8")	
System Requirements	Water Feed**	Test barrel	
	Water Temperature**	5 - 60 °C (40 - 140 °F)	
	Operating Ambient Air Temperature	5 - 35 °C (40 - 95 °F)	
Inputs and Outputs	Control	Voltea laptop control program	
	Data Output	txt. file format for Voltea analysis template	
	Compatible Modules	VS-1, VS-2, VS-3, C-3	VS-3, C-3

*Actual flow will depend on module used and settings.

**Please contact Voltea if unavailable.

***Weight without modules

System Evolution : The Horizontal Industrial Series (IS-H) Systems

SYSTEMS : IS-SERIES

Voltea's Industrial Series (IS) Systems employ a simple, cost effective modular design providing **flexibility to align with both current and future water demands**. The IS Systems feature real-time, remote monitoring and control capability, as well as optional automated Clean-In-Place (CIP) and Dynamic Control, allowing minimal operator intervention.

Our IS Systems are used in commercial and industrial applications, from cooling towers and boiler feed to commercial laundries, for water reuse and any other application that benefits from low TDS, softened water.

The modular build of our IS Systems allows for easy expansion upon customer needs. The systems are assigned by the number of modules required, with system framing allowing for growth. Our systems were re-designed for operational and spatial efficiency, where our modules are now situated in a horizontal manner, rather than vertical as before. This change allows a smaller footprint and improved operational process.

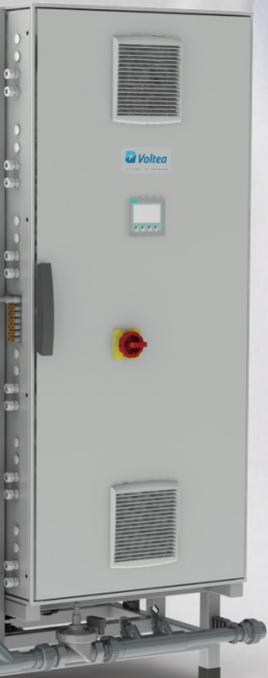
Dynamic Control

Our Dynamic Control feature enables automated continuous control of your product water quality to account for any variations in feed water. Voltea's CapDI Systems are equipped with remote monitoring and control capabilities and once subscribed, customers enjoy peace of mind that the monitoring of their CapDI Systems is by qualified Voltea personnel to ensure optimized system performance.

Customized Solutions

Voltea's Customized Solutions afford CapDI Systems that are tailored to your specific needs. Multiple systems, as well as pre-piped and pre-wired containerized systems, are available. Our modular design allows easy expansion as your operation grows and process flow requirements increase, or alternately, integrate with pre-existing water treatment technology.





IS-8H



IS-10H



IS-12H

IS-HORIZONTAL SERIES TECH

	System	IS-2H	IS-4H	IS-6H
Performance	Instant Flow Rate	0,2 - 2,1 m ³ /h (1 - 9 gpm)	0,4 - 4,1 m ³ /h (1.6 - 18 gpm)	0,5 - 6,1 m ³ /h (2.5 - 27 gpm)
	Net Produced Flow	0,2 - 1,2 m ³ /h (1 - 5 gpm)	0,4 - 2,4 m ³ /h (1.6 - 10 gpm)	2,4 - 3,5 m ³ /h (2.5 - 15 gpm)
	Salt Removal	25 - 95 %		
	Water Recovery	40 - 95 %		
System Specification	System Power Requirements	Single - Phase (4 kW) Specify (110 V / 60 Hz OR 220 V / 50 Hz)		
	System Dimensions L x W x H	0,7 x 0,8 x 1,3 m (2'4" x 2'7" x 4'3")	1,0 x 0,8 x 1,55 m (3'4" x 2'7" x 5'1")	
	Service Space	0,8 m from edge of system (2'7" from edge of system)		
	Weight***	250 kg (550 lbs)	400 kg (880 lbs)	
	Feed Inlet Coupling	3/4" - G 1 1/4" thread (25 mm)	1" - G 1 1/2" thread (32 mm)	
	Product Outlet Coupling	3/4" - G 1 1/4" thread (25 mm)	1" - G 1 1/2" thread (32 mm)	
	Concentrate/Waste Outlet Coupling	2 x 1/2" - G 1" thread (20 mm)	3/4" - G 1 1/4" thread (25 mm)	
Operational Requirements	Water Feed Pressure	≥ 2,1 m ³ /h @ 3 bar ≥ 8 gpm @ 40 psi	≥ 4,1 m ³ /h @ 3 bar ≥ 16 gpm @ 40 psi	≥ 6,1 m ³ /h @ 3 bar ≥ 25 gpm @ 40 psi
	Water Temperature	5 - 60 °C (40 - 140 °F)		
	Compressed Air Line	80 l/min @ 6 bar, pneumatic, size 3/8" (3 CFM @ 90 psi, pneumatic)		
	Operating Ambient Air Temperature**	5 - 25 °C (40 - 77 °F)		
Inputs/Outputs	Start / Stop	Input - Potential free contact (0 - 30 V DC / 0 - 250 V AC / 0 - 5 A)		
	External Pump	Output - Potential free contact (24 V DC)		

*Actual performance will depend on module used and settings.

**Without added cooling

***Weight without modules



IS-36
Lorain, OH



IS-4
Luxembourg



IS-12
Querétaro, MEX



IS-12
Atlanta, GA

SPECS

IS-8H	IS-10H	IS-12H
0,7 - 8,2 m ³ /h (3 - 36 gpm)	0,9 - 10,2 m ³ /h (4 - 45 gpm)	1,1 - 12,2 m ³ /h (6 - 54 gpm)
0,7 - 4,7 m ³ /h (3 - 20 gpm)	0,9 - 5,9 m ³ /h (4 - 26 gpm)	1,1 - 7,0 m ³ /h (6 - 31 gpm)
25 - 95 %		
40 - 95 %		
Single - Phase (110 - 240 V / 50 - 60 Hz / 4 kW) 3 - Phase (400 - 480 V / 50 - 60 Hz / 3,5 kW)		
1,5 x 0,9 x 2,25 m (4'11" x 2'11" x 7'5")		
0,8 m from edge of system (2'7" from edge of system)		
620 kg (1,370 lbs)		
1 1/2" - G 2 1/4" thread (50 mm)		
1 1/2" - G 2 1/4" thread (50 mm)		
2 x 1 1/2" - G 2 1/4" thread (50 mm)		
≥ 8,2 m ³ /h @ 3 bar ≥ 30 gpm @ 40 psi	≥ 10,2 L/min @ 3 bar ≥ 40 gpm @ 40 psi	≥ 12,2 L/min @ 3 bar ≥ 50 gpm @ 40 psi
5 - 60 °C (40 - 140 °F)		
80 l/min @ 6 bar, pneumatic, size 3/8" (3 CFM @ 90 psi, pneumatic)		
5 - 25 °C (40 - 77 °F)		
Input - Potential free contact (0 - 30 V DC / 0 - 250 V AC / 0 - 5 A)		
Output - Potential free contact (24 V DC)		



IS-4
The Netherlands



IS-2
Germany



IS-12
Columbus, OH

The Horizontal Industrial Series (IS-24, 36, & 48H) Systems

SYSTEMS : IS-SERIES



Voltea's IS System re-design into a horizontal configuration has allowed our systems to expand into fully **24, 36, and 48 module single-systems**. This is great news for our clients with higher flow and larger volume needs! These systems have been containerized, and multiple systems may be combined for even greater flows.

IS - HORIZONTAL SERIES **TECH SPECS**

	System	IS-24H	IS-36H	IS-48H
Performance	Instant Flow Rate	2,2 - 17,3 m ³ /h (10 - 76 gpm)	3,2 - 25,9 m ³ /h (14 - 114 gpm)	4,3 - 34,6 m ³ /h (19 - 152 gpm)
	Net Produced Flow	2,2 - 10,0 m ³ /h (10 - 44 gpm)	3,2 - 15,0 m ³ /h (14 - 65 gpm)	4,3 - 20,0 m ³ /h (19 - 87 gpm)
	Salt Removal	25 - 95 %		
	Water Recovery	40 - 95 %		
System Specification	System Power Requirements	3 - Phase with neutral (400 - 480 V / 50 - 60 Hz)		
		15 kW	23 kW	30 kW
	System Dimensions L x W x H	3,1 x 1,0 x 2,3 m (10'1" x 3'3" x 7'7")	4,6 x 1,0 x 2,3 m (12'2" x 3'3" x 7'7")	5,3 x 1,0 x 2,3 m (17'4" x 3'3" x 7'7")
	Service Space	0,8 m from edge of system (2'7" from edge of system)		
	Weight***	1200 kg (2,645 lbs)	1800 kg (3,970 lbs)	2400 kg (5,300 lbs)
	Feed Inlet Coupling	2" - G 2 3/4" thread (63 mm)		
	Product Outlet Coupling	2" - G 2 3/4" thread (63 mm)	2 1/2" (75 mm)	
	Concentrate/Waste Outlet Coupling	2" - G 2 3/4" thread (63 mm)	2 1/2" (75 mm)	
Operational Requirements	Water Feed Pressure	≥ 17,3 m ³ /h @ 3 bar ≥ 80 gpm @ 40 psi	≥ 25,9 m ³ /h @ 3 bar ≥ 120 gpm @ 40 psi	≥ 34,6 m ³ /h @ 3 bar ≥ 160 gpm @ 40 psi
	Water Temperature	5 - 60 °C (40 - 140 °F)		
	Compressed Air Line	160 L/min (6 CFM)	240 L/min (8 CFM)	320 L/min (11 CFM)
		@ 6 bar (90 psi), pneumatic, size 1/2"		
	Operating Ambient Air Temperature**	5 - 25 °C (40 - 77 °F)		
Inputs/Outputs	Start / Stop	Input - Potential free contact (0 - 30 V DC / 0 - 250 V AC / 0 - 5 A)		
	External Pump	Output - Potential free contact (24 V DC)		

*Actual performance will depend on module used and settings

**Without added cooling

***Weight without modules

CapDI GLOBAL FOO



With CapDI Systems deployed in over 20 countries globally, Voltea assures customer satisfaction wherever your water innovation needs may be. From vast industrial plants to small consumer appliances, Voltea's **tunable, salt-free, chemical-free, environmentally responsible** CapDI technology will exceed your water deionization demands.

TPRINT





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