

On-site Sodium Hypochlorite Generators

ClorTec® DN Series

5.4 kg/d to 1360 kg/d (12 to 3000 lb/d)



ClorTec® makes electrochlorination easy

The latest generation of brine electrochlorination technology, the ClorTec® DN systems, offers simple operation and maintenance as well as unrivaled performance and safety advantages.

ClorTec® DN systems generate sodium hypochlorite using three common consumables: water, salt and power. The benefits of generating on-site include:

- Safe, simple and reliable technology solution
- Less hazardous hypochlorite solution compared with bulk hypochlorite (<1% by volume)
- Does not require the transportation of hazardous materials
- Does not require costly chemical containment systems and risk management planning
- Reduced cost vs bulk hypo (protection against chemical price fluctuations)
- Reduced chlorate and other disinfection by-product formation

De Nora and ClorTec®

- A leader in electrochlorination with >3500 brine systems and 6000 systems total; 25+ years experience across many markets
- Provided the largest installed capacity brine on-site sodium hypochlorite generation system in the world at 9525 kg/d (21000 lb/d)
- Wide range of systems/units from 5.4 kg/d (12 lb/d) to 1360 kg/d (3000 lb/d)
- Utilizes DSA® non-sacrificial anode technology pioneered by De Nora to generate hypochlorite
- Utilizes proven technology supported by a dedicated R&D Center and experienced electrochemistry staff.

ClorTec® Advantages

- ClorTec® DN systems utilize the De Nora DSA® bipolar electrodes which provide the most efficient salt and power usage at 3.0 kg (3.0 lb) of salt and 4.4 kWh (2.0 kWh) ac electrical energy per kg (lb) of chlorine equivalent produced
- Guaranteed 0.8% hypochlorite concentration
- Individual hydrogen venting on each cell
- Simplified piping and open access reduce maintenance time
- Fewer instruments and simplified controls offer easy operation
- Electrolytic cells operated on high current/low voltage for optimal power efficiency
- Cell casings made from PVC/FRP and acrylic
- Utilizes a double star transformer/rectifier configuration for precise and stable control of current for high efficiency and reliable performance
- Electrolytic cell acid cleaning solution accessory cart available
- Multiple Frame Material/Finish Options: Carbon Steel/ Powdered Coated, 304SS/Electro Polish
- Hydrogen is safely diluted to a concentration below 25% of the LEL and vented to atmosphere
- Wide range of after sales services available
- New internet based Web MI "Smart Monitoring" system designed for remote monitoring, troubleshooting, alarming and trending to support optimum system operation and performance
- NSF 61 Certified

Simplicity and Ease of Operation

ClorTec® on-site systems generate 0.8% sodium hypochlorite by combining three common consumables:

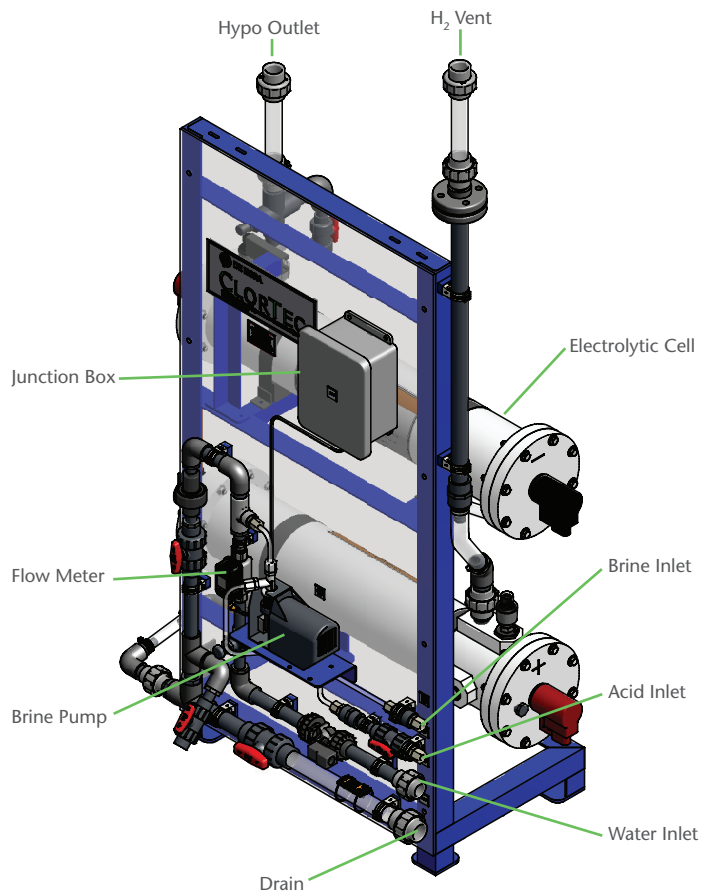


or

salt + water + electricity =

sodium hypochlorite + hydrogen gas

- Salt in the brine storage tank is combined with water to produce a saturated brine solution.
- The saturated brine solution is pumped via brine pump and mixed with softened water to make a 2.2% brine solution, which is fed to the ClorTec® electrolyzer. The brine and water flow rates are constant and steady.
- The brine solution is passed through the ClorTec® electrolytic cells containing De Nora DSA® electrodes and generates a consistent and guaranteed 0.8% hypochlorite solution upon applying a dc electrical current.
- The process parameters such as temperature and electrolyte flow in the electrolytic cell are continuously monitored by the PLC to ensure reliable and efficient operation of the system.



- The only by-product generated by the ClorTec® system is hydrogen, which is vented from each cell and diluted with air to reduce H₂ concentration to below 25% of LEL in air before venting out to atmosphere.
- The design of the ClorTec® DN electrode/cell allows for rapid and effective removal of hydrogen from each cell due to the short height of the electrode and baffles in the cell. The ClorTec® design prevents an increase in hydrogen bubble sizes as they rise and reduces amount of hydrogen on the surface of the electrode to minimize blinding the electrodes surface, which prevents an increase in resistivity and therefore cause fluctuations in solution concentration and chlorine production.
- Horizontal configuration of the cells allows a low temperature to be maintained without the addition of recirculation piping.
- After passing through the cell, the sodium hypochlorite flows to the product tanks. The hypochlorite temperature is monitored as it exits the system.
- The system is controlled by a simple, easy to operate HMI/PLC logic controller.



Control Panel Interface



ClorTec® Acid Cleaning Cart



ClorTec® Electrodes offer unique advantages thanks to their unique coating.

Specifications

Capacities: 5.4 - 1360 kg/d (12 - 3000 lb/d) free available chlorine.

Control: Automatic batch, controlled by product storage tank level

Sodium Hypochlorite: 0.8% ± 0.05%.

Raw Materials: 3.0 kg (3.0 lb) salt, 4.4 kWh (2.0 kWh) ac electrical energy and 125 L (15 gal) water per kg (lb) of free available chlorine produced

Water Supply: Potable water @ 1.2 - 4.8 bar (30 - 70 psi)

Temperature Range: 18°C - 29°C (65°F - 80°F)

Salt Quality: 99.7% pure dry weight solar salt or equivalent

Electrical Power:

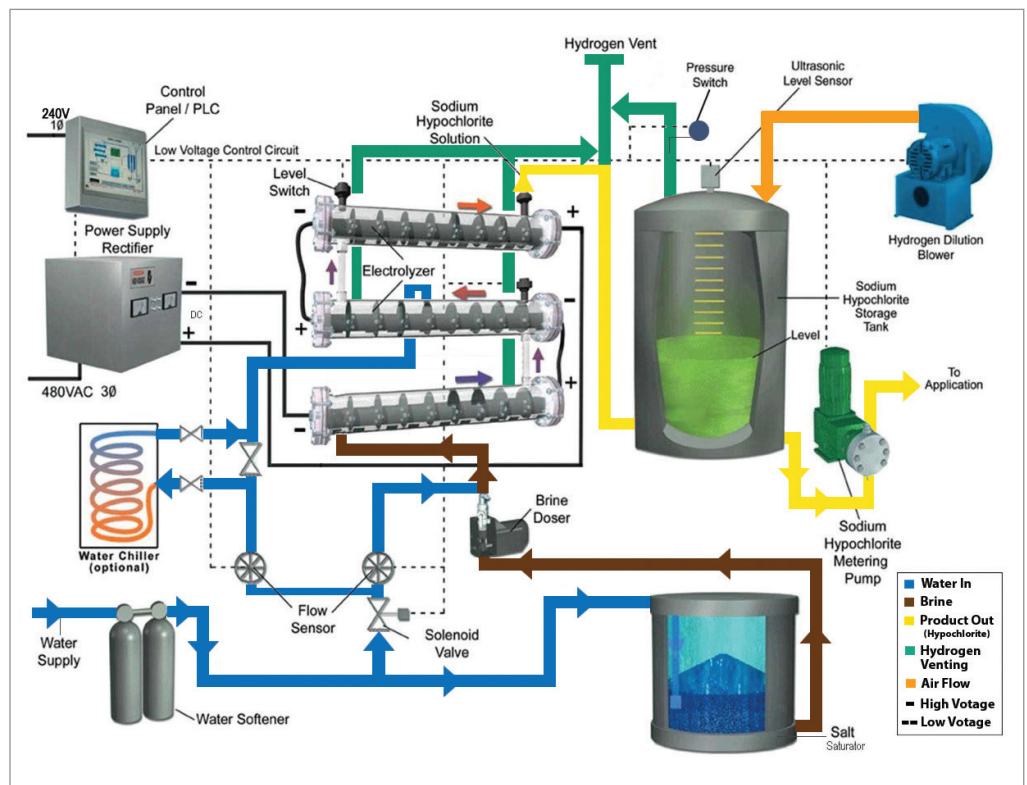
- **Rectifier:** 208 or 240 Vac 1 Phase, 60 Hz or 480 - 600 Vac, 3 Phase, 60 Hz (50 Hz also available)
- **Control Panel:** 208 or 240 Vac 1 Phase, 60 Hz (Any other voltages and 50 Hz are also available)

PLC & Operator Interface: 4"/7" PLC/HMI Touch Screen* (Other PLC & HMI options are also available)

Control Panel: Grey polyester coated NEMA 4 welded steel enclosure UL 508A (Other materials are also available)

Hydrogen Venting: Waste hydrogen is diluted and vented to atmosphere by using air blower(s)

* Data logging and communications capability.



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Product Configuration

Model	Cell Configuration	Output Capacity		Total Flow		Softwater		Brine Flow		Salt	
		(kg/d)	(lb/d)	(m ³ /d)	(gpm)	(m ³ /d)	(gpm)	(m ³ /d)	(gpm)	(kg/d)	(lb/d)
Mini Size System											
MCT-DN12	1 x 12	5.44	12	0.71	0.13	0.65	0.12	0.05	0.01	16	36
MCT-DN24	2 x 12	10.89	24	1.36	0.25	1.25	0.23	0.11	0.02	32	72
MCT-DN36	3 x 12	16.33	36	2.07	0.38	1.91	0.35	0.16	0.03	48	108
Mid Size System											
CT-DN75	1 x 75	34.02	75	4.25	0.78	3.92	0.72	0.33	0.06	102	225
CT-DN100	1 x 100	45.36	100	5.67	1.04	5.23	0.96	0.44	0.08	136	300
CT-DN150	2 x 75	68.04	150	8.50	1.56	7.85	1.44	0.65	0.12	204	450
CT-DN200	2 x 100	90.72	200	11.34	2.08	10.47	1.92	0.87	0.16	272	600
CT-DN225	3 x 75	102.06	225	12.75	2.34	11.77	2.16	0.98	0.18	306	675
CT-DN300	3 x 100	136.08	300	17.06	3.13	15.70	2.88	1.31	0.24	408	900
Large Size System											
CT-DN450	1 x 450	204.12	450	25.57	4.69	23.60	4.33	1.96	0.36	612	1350
CT-DN600	1 x 600	272.16	600	34.07	6.25	31.45	5.77	2.62	0.48	816	1800
CT-DN750	1 x 750	340.20	750	42.57	7.81	39.30	7.21	3.27	0.60	1020	2250
CT-DN900	2 x 50	408.22	900	51.13	9.38	47.15	8.65	3.93	0.72	1224	2700
CT-DN1200	2 x 600	544.31	1200	68.14	12.50	62.90	11.54	5.23	0.96	1632	3600
CT-DN1500	2 x 750	630.39	1500	85.20	15.63	78.60	14.42	6.54	1.20	2041	4500
Dual Large System											
CT-DN1800	2 x 450 + 2 x 450	1800	816.47	17.31	18.75	94.36	17.31	7.85	1.44	2449	5400
CT-DN2400	2 x 600 + 2 x 600	2400	1088.62	23.08	25.00	125.81	23.08	10.47	1.92	3265	7200
CT-DN3000	2 x 750 + 2 x 750	3000	1360.78	28.85	31.25	157.26	28.85	13.08	2.40	4082	9000

WATER MADE EASY

MARINE

ENERGY

MUNICIPAL

INDUSTRIAL



DE NORA
our research - your future

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