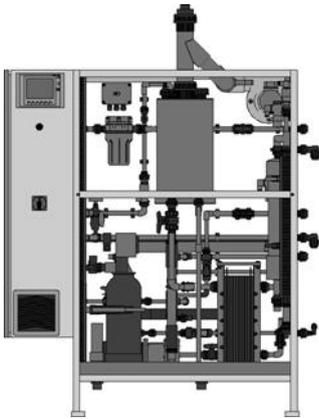


Output of 100 – 10.000 g/h of sodium hypochlorite (20 – 25 g/l)



The CHLORINSITU® III is a membrane cell electrolysis system generating a sodium hypochlorite (NaOCl) solution with a concentration of 20 – 25 g/l. Depending on the set-up of the machine and the adjustments made to the process a max. 8 % (80 g/l) sodium hypochlorite solution can be made.

This customer specific solution however needs to be engineered on the customers' specific demands.

The electrochemical reaction takes place in two electrode chambers (anode and cathode) which are separated by a cation selective membrane. The formation of active chlorine and sodium hydroxide is physically separated. In the CHLORINSITU® III the freshly produced sodium hypochlorite (NaOCl) is a mixture of both pure product (active chlorine and sodium hydroxide) which are mixed in a special reactor, forming the sodium hypochlorite solution (20 – 25 g/l FAC, pH 9,5 – 10), which can be stored temporarily in a (day)storage tank and metered as needed.

A saturated brine solution is made out of common salt (NaCl) and produced in a separate brine dissolving tank, which is included in the scope of delivery.

Sodium hydroxide (NaOH) and hydrogen gas (H₂) are produced in the cathode chamber while ultra-pure active chlorine and an exhausted residual brine are produced in the anode chamber. Both chambers are separated by special cation selective membrane. An injector producing a constant vacuum guarantees a safe and controlled mixing of the active chlorine which is bounded to the sodium hydroxide and is collected as sodium hypochlorite in a (day)storage tank. The vacuum is kept constant by a frequency controlled circulation pump. This creates less mechanical stress on the membrane in the electrolysis cell as well as on other parts of the system. The final sodium hypochlorite solution can be metered, as required, by separate metering pumps.

Due to its moderate pH value of 9.5 – 10, it affects the pH of the treated water significantly less than if conventional sodium hypochlorite with a pH of 12 – 13.5 were used. Much less acid is used to adjust the pH value, enabling savings of up to 70%. The hydrogen always produced during any electrolysis is diluted with fresh air through an ATEX 95 approved blower and discharged safely.

The process water (for salt-dissolving and filling of the machine) comes from a (simplex or duplex) softener integrated in the system, thereby preventing the formation of lime deposits and ensuring the long service life of the membrane cell. The efficiency of the electrolysis is constantly monitored by various flow meters, the addition of water depending on the sodium hydroxide production and an Ultrasonic level control in the storage tanks.

In the membrane cell electrolyzers producing sodium hypochlorite, the higher chemical and electrical yield results in hypochlorite solutions with a relatively high active chlorine content (20 – 25 g/l) compared to open cell electrolyser CHLORINSITU® II.

A saturated brine is used as a salt solution, which is produced in a separate salt dissolving tank from salt of a defined quality.

The electrical and chemical yield is very high. Chemical conversion is approx. 85% of brine, resulting in a low salt- and energy consumption and relatively high chlorine concentrations (20 – 25 g/l FAC) in the end product. The relatively low chloride and chlorate levels into the water to be treated are a result of the CHLORINSITU® III membrane cell technology.

Your benefits

- ✓ Sodium hypochlorite solution low in chloride and chlorate with a high chlorine concentration (20 – 25 g/l FAC)
- ✓ Minimal acid consumption for pH correction, making savings of up to 70 % possible
- ✓ Safe system control with remote diagnosis by Remote Control Engineer
- ✓ Excellent service life of the membrane cells, due to constant vacuum
- ✓ A frequency-controlled circulation pump maintaining the vacuum constant in the completely closed anode area
- ✓ Maximum operating safety due to their design as negative pressure systems
- ✓ Dynamic “SMART production” level control in the storage tank ensures optimised chlorine production
- ✓ Active process control of production by largely internal measuring and control technology
- ✓ Cost-effective operation thanks to the use of sodium chloride as an inexpensive raw material and lower chemical consumption for pH adjustment
- ✓ Robust, simple technology
- ✓ Compact, space-saving design

Technical details

- ✓ Modern Siemens PLC with large illuminated display Simatic TP 7 Comfort panel
- ✓ SMARTview feature on Simatic TP 7 Comfort panel optional
- ✓ Integrated Remote Control Engineer for remote diagnosis and troubleshooting
- ✓ Storage tank for multiple points of injection

Field of application

- ✓ Potable water
- ✓ Waste water
- ✓ Process water
- ✓ Cooling tower
- ✓ Swimming pool water – indoor and outdoor pools

Scope of delivery

Electrolysis systems of type CHLORINSITU® III are mounted, ready-wired with a PLC, in a powder-coated stainless steel frame in the control cabinet. They include a Remote Control Engineer for remote diagnosis and troubleshooting, integrated water softener system, membrane electrolysis cells, ATEX 95 compliant hydrogen ventilation system and separate salt dissolving tanks and level monitoring unit. The system also includes Ultrasonic level sensors to be mounted in the (day)storage tank to be set up on site for sodium hypochlorite.

A duplex water softener is fitted as standard for systems producing more than 2.000 g/h.

A chlorine gas warning unit and automatic monitoring of water hardness downstream of the softening system come as standard with systems producing more than 600 g/h.

On the smaller systems 100 – 500 g/h this can be delivered optionally.

Note

Electrolysis systems of type CHLORINSITU® II, III, V and V Plus are offered and planned to meet customer specifications. This is true both for the system documentation and the subsequent supply of spare parts and maintenance.

Technical Data CHLORINSITU® III
Power supply 3 x 400 V (VAC/3P/N/PE/50 Hz)

Capacity	Fuse	Power uptake	Max. salt consumption	Max. volume of process water	Max. cons. of cooling water	Dimensions L x W x H (mm)	Brine tank	Recomm. capacity storage tank
g/h	A	kW	kg/d	l/h	mm	mm	liter	liter
100	3 x 16	1,10	5	4	80	1,250 x 600 x 1,550	130	200
200	3 x 16	1,50	10	8	80	1,250 x 600 x 1,550	130	300
300	3 x 16	1,90	15	12	100	1,250 x 600 x 1,550	200	400
400	3 x 16	2,30	20	16	100	1,250 x 600 x 1,550	200	500
500	3 x 16	2,70	25	20	125	1,250 x 600 x 1,550	200	600
600	3 x 20	3,10	30	24	125	1,650 x 600 x 2,000	380	700
750	3 x 25	3,70	35	30	150	1,650 x 600 x 2,000	380	800
1.000	3 x 25	4,70	50	40	150	1,650 x 600 x 2,000	380	1.200
1.250	3 x 35	5,70	60	50	150	1,650 x 600 x 2,000	380	1.500
1.500	3 x 35	6,70	70	60	180	1,650 x 600 x 2,000	380	1.700
1.750	3 x 35	7,70	80	70	180	1,650 x 600 x 2,000	380	2.000
2.000	3 x 50	8,70	100	80	200	1,750 x 1,200 x 2,000	520	2.200
2.500	3 x 63	10,70	125	100	250	1,750 x 1,200 x 2,000	520	3.000
3.000	3 x 63	12,70	150	120	300	1,750 x 1,200 x 2,000	520	3.300
3.500	3 x 80	14,70	175	140	350	1,750 x 1,200 x 2,000	520	4.000
5.000	3 x 90	20,70	250	200	500	3,100 x 1,800 x 2,070	1.180	5.800
7.000	3 x 100	29,40	350	280	700	3,100 x 1,800 x 2,070	1.180	6.000
8.500	3 x 130	35,70	425	340	850	4,300 x 1,800 x 2,070	1.180	7.500
10.000	3 x 160	40,70	500	400	1.000	4,300 x 1,800 x 2,070	1.180	11.000