

# dioxide

## PACIFIC

TITANIUM  
SUBMERGED, WATER  
FLUSHED REACTOR  
FOR HIGHEST  
SAFETY



CD3C  
Chlorine Dioxide Generators  
3-Chemical Generation

If you are concerned about handling acid or bleach, take a look at our Electricide® range of electrochemical chlorine dioxide generators - only one chemical required - no acid or bleach.

Contact us for an Electricide® generator brochure or download from our website [www.dioxide.com](http://www.dioxide.com)



Dioxide Pacific can provide the complete disinfection package or just the components you require.

Optional components include:

- Chemical suction lances
- Chlorine dioxide residual measurement
- Bulk chemical tanks
- External solution tank for multi-point dosing
- Chemical transfer systems
- Chlorine dioxide gas monitors (leak detection)
- Tank level monitoring
- By-pass pump
- Portable building mounting
- Mech and elec installation
- Commissioning
- Maintenance and chemical supply

CHLORINE DIOXIDE IS PRODUCED USING THE 3-CHEM REACTION:



How does the generation reaction take place?

Metering pumps for Electricide-P1 /P5, 30-33% HCl and Bleach (12.5% NaOCl) deliver chemical accurately from chemical drums or tanks into a reaction chamber. In the reaction chamber, intimate mixing and retention time allow the chemical reaction to proceed correctly to obtain the highest possible conversion to chlorine dioxide. Chlorite conversion in the 3-chem reaction is 95-98%.

What concentration chlorine dioxide is generated?

At the outlet of the reactor, ClO<sub>2</sub> solution is diluted to max 0.3% w/w = 3,000 ppm using water.

Are the reactor materials chemically compatible?

The reactor body is constructed from welded Titanium. The other components inside the reactor are PVDF and PTFE, which are 100% compatible with chlorine dioxide and the conditions in the reactor. After dilution to 3,000 ppm, chlorine dioxide solution is in contact with UPVC which is 100% compatible. Full compatibility ensures long life and low service cost.

What is a submerged reactor and why is it safer than other designs?

There are two parts: inner reactor and outer chamber. The inner reactor is where the three chemicals are mixed and chlorine dioxide is produced. The outer chamber is connected to dilution water supply and is always flooded with flowing water. The inner reactor is placed fully inside the outer chamber including the tube connections and injection valves. Since the inner reactor is always submerged in dilution water, if a leak occurs anywhere around the reactor (seals, threads, injection valves), the leak cannot escape into the environment around the operators. ClO<sub>2</sub> can only enter the dilution water to be immediately transported away in water. A chlorine dioxide gas leak into the plant room from the reactor cannot happen if the dilution water is flowing. What better way to protect plant operators!

### Is a static mixer required after the reactor?

No. Concentrated chlorine dioxide in the reactor is mixed with dilution water in the top section of the reactor. Only dilute chlorine dioxide solution is present at the outlet of the reactor. This is safer than other generator types where concentrated chlorine dioxide is present at the outlet of the reactor in pipe where seals can leak, creating a safety hazard.

### Do I need a separate system to control chlorine dioxide dosing?

No. The CD3C generator includes all the control functionality necessary for any dosing scenario. Chlorine dioxide dosing can be selected as either: Flow Paced (FP), PID, Flow Paced with Residual Trim (FPRT), Manual or timer controlled. Inputs are available for flow as 4-20mA, remote stop-start contact input and 4-20mA input from a  $\text{ClO}_2$  residual sensor.

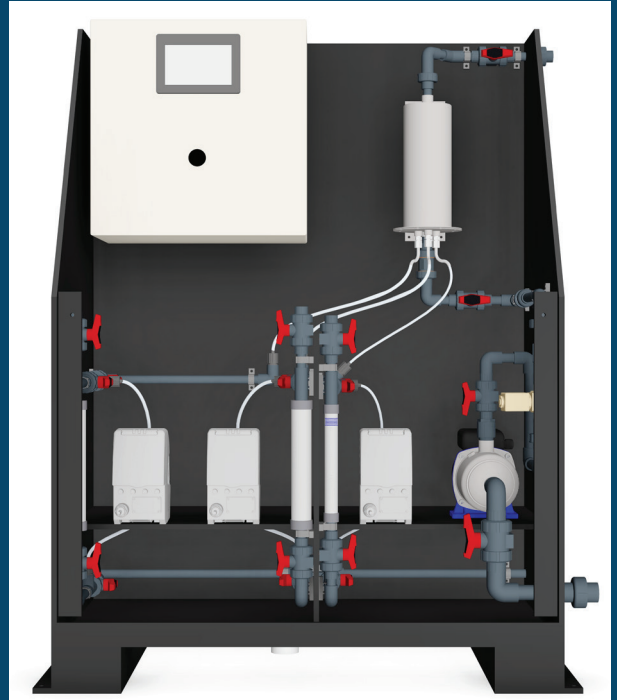
The generator control panel has an intuitive touchscreen (HMI), allowing the operator to enter the desired  $\text{ClO}_2$  dosing setpoint, view residual, flow and operating status of all devices. Loss of chemical flow or other logic will trigger faults and stop the generator.

### Is remote internet access included?

Yes. The CD3C generator includes a web server (as part of the HMI) and 4G router. When a 4G SIM is installed, you have 24/7 access to the HMI to view operation, download historical data, receive email alarm notifications or reset alarms. This is a powerful tool for troubleshooting to minimise service costs. Why send someone to site when most issues can be dealt with remotely? Dioxide Pacific offers Remote Access Support: a monitoring subscription service where we action alarm emails and update software.



**Solution tank for preparation and storage of  $\text{ClO}_2$  solution**



**CD3C-100 Generator.**  
Capacity: 1,890 g/hr = 100 lb/day



**CD3C-1400 Generator.**  
Capacity: 26,460 g/hr = 1,400 lb/day

# TAKE A LOOK AT THE FEATURES OF THE CD3C 3-CHEM GENERATOR

Feature	Benefit	What this means to you
Metering pumps for all 3 chemical precursors.	Reliable and accurate chemical dosing with large turndown capability.	Low chemical consumption per kg (pound) of ClO <sub>2</sub> and accurate dosing of ClO <sub>2</sub> for your process.
PLC controlled system with touchscreen HMI.	All items are controlled from a central PLC and the touchscreen provides an operator friendly way to view plant operation and status. Fault finding is simple.	It is easy to train operators on how the plant operates. They will feel comfortable using the plant. All the information you need and configuration capability is available.
Dosing pumps have flow monitoring	If dosing pumps are operating and flow is not registered, an alarm will be raised and the generator stopped.	If a dosing pump loses prime, the generator won't continue to operate and dose unreacted chemicals into your water circuit. This feature will save chemical and prevent corrosion.
Inbuilt calibration cylinders.	Dosing pumps can be properly calibrated so that dosing is accurate. They also act as suction accumulators to prevent loss of prime.	Chemical consumption is minimized and reliability is maximized.
Inputs for level switches from chemical tanks	Generator will provide an alarm on low chemical and stop on low.	The generator will not continue to operate and waste power if chemical has run out.
By-pass assembly for dilution of chlorine dioxide with inbuilt static mixer.	The safety of chlorine dioxide dosing is increased with the CD3C generator by immediately diluting the chlorine dioxide solution produced in the generator to less than 3,000 ppm. This dilute solution is safe to transport to the dosing point.	Operator and environmental safety is maximized so the safety risk of the installation is low. You can sleep easy knowing that the generator is operating safely.
Inputs for remote on/off; flow 4-20mA, analyzer 4-20mA; outputs for grams of ClO <sub>2</sub> produced and fault.	Full flexibility of dosing from either flow, stop/start or residual control available.	Whatever way you wish to dose chlorine dioxide, you can do it accurately with this generator.
Remote internet access.	Using either a 4G modem or hardwired broadband connection, users can log on to the HMI and view/operate the generator.	The speed of making a change to the generator or fault finding is greatly increased. In most cases, it will not be necessary to send a serviceperson to site and this will save you time and money.
Optimized reaction chamber.	Ensures maximum conversion of chlorite to chlorine dioxide.	You can be assured that unreacted chlorite will not enter your water. You will comply with regulatory guidelines and minimize chemical consumption.
Titanium reaction chamber is water submerged and flushed using the by-pass water flow inside titanium chamber.	Ensures that any leaks from the reaction chamber are dissolved in the dilution water and transported away from the operator. No possibility of chlorine dioxide gas leak at generator.	Risk of operator contact with chlorine dioxide is removed. The reduced risk provides your operators with a safer work place.
Titanium reaction chamber with PVDF injection valves and tube.	Complete chemical resistance ensures long life for components and high purity for chlorine dioxide produced.	You don't need to worry about the lifetime of the reaction chamber.
Complete system fabricated on wall mount or floor standing HDPE skid, fully plumbed and wired ready for installation on site.	Quick and easy installation process so you can be up and running quickly.	Your cost of installation and commissioning is low and there will be minimal disruption to your production.

# GENERATOR MODELS AND TECHNICAL DATA

Precursor Chemicals: Electricide-P1 (31% NaClO <sub>2</sub> ) or Electricide-P5 (25% NaClO <sub>2</sub> ), 12.5% NaOCl, 30-33% HCl									
Model	Capacity		Pressure		Dimensions L x W x H		Weight		Power Supply
	g/hr	lb/day	Bar	Psi	mm	in	kg	lb	
CD3C-10	189	10	10	145	1236 x 600 x 1500	48.7 x 25.6 x 66.9	100	220	100-240V, 50/60Hz
CD3C-25	472	25	10	145	1236 x 600 x 1500	48.7 x 25.6 x 66.9	100	220	100-240V, 50/60Hz
CD3C-50	945	50	10	145	1236 x 600 x 1500	48.7 x 25.6 x 66.9	100	220	100-240V, 50/60Hz
CD3C-100	1,890	100	10	145	1236 x 600 x 1500	48.7 x 25.6 x 66.9	100	220	100-240V, 50/60Hz
CD3C-150	2,835	150	10	145	1236 x 600 x 1500	48.7 x 25.6 x 66.9	100	220	100-240V, 50/60Hz
CD3C-250	4,725	250	10	145	1236 x 600 x 1500	48.7 x 25.6 x 66.9	100	220	100-240V, 50/60Hz
CD3C-500	9,450	500	10	145	1351 x 650 x 1700	53.1 x 25.6 x 66.9	150	330	100-240V, 50/60Hz
CD3C-750	14,175	750	10	145	1552 x 600 x 2050	61.2 x 23.6 x 80.7	225	495	100-240V, 50/60Hz
CD3C-1000	18,900	1,000	10	145	1567 x 650 x 2050	61.7 x 25.6 x 80.7	232	510	100-240V, 50/60Hz
CD3C-1200	22,680	1,200	10	145	1567 x 600 x 2050	61.7 x 23.6 x 80.7	240	528	100-240V, 50/60Hz
CD3C-1400	26,460	1,400	10	145	1567 x 650 x 2050	61.7 x 25.6 x 80.7	250	550	100-240V, 50/60Hz
CD3C-3000	56,700	3,000	8	116	1879 x 700 x 2000	74 x 27.6 x 78.7	280	616	100-240V, 50/60Hz

Model	Chemical Consumption										
	Electricide-P1		Electricide-P5		12.5% NaOCl		30-33% HCl		By-pass Flow		
	L/kg ClO <sub>2</sub>		L/kg ClO <sub>2</sub>		L/kg ClO <sub>2</sub>		L/kg ClO <sub>2</sub>		@ 2 g/L		
	3.71		4.6		3.73		1.69				
	L/hr	GPH	L/hr	GPH	L/hr	GPH	L/hr	GPH	L/hr	GPH	L/min
CD3C-10	0.70	0.19	0.87	0.23	0.70	0.19	0.32	0.08	91	24	1.5
CD3C-25	1.75	0.46	2.17	0.57	1.76	0.47	0.80	0.21	228	60	3.8
CD3C-50	3.51	0.93	4.35	1.15	3.52	0.93	1.60	0.42	457	121	7.6
CD3C-100	7.01	1.85	8.69	2.30	7.05	1.86	3.19	0.84	913	241	15.2
CD3C-150	10.52	2.78	13.04	3.45	10.57	2.79	4.79	1.27	1370	362	22.8
CD3C-250	17.53	4.63	21.74	5.74	17.62	4.66	7.99	2.11	2283	603	38.0
CD3C-500	35.06	9.26	43.47	11.48	35.25	9.31	15.97	4.22	4565	1206	76.1
CD3C-750	52.59	13.89	65.21	17.23	52.87	13.97	23.96	6.33	6848	1809	114.1
CD3C-1000	70.12	18.53	86.94	22.97	70.50	18.63	31.94	8.44	9130	2412	152.2
CD3C-1200	84.14	22.23	104.33	27.56	84.60	22.35	38.33	10.13	10956	2895	182.6
CD3C-1400	98.17	25.94	121.72	32.16	98.70	26.08	44.72	11.81	12783	3377	213.0
CD3C-3000	210.36	55.58	260.82	68.91	211.49	55.88	95.82	25.32	27391	7237	456.5



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