

# dioxide

## PACIFIC

TITANIUM  
SUBMERGED, WATER  
FLUSHED REACTOR  
FOR HIGHEST  
SAFETY



CD2D & CD2C  
Chlorine Dioxide Generators

2-Chemical Acid-Chlorite Generation

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

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

CD2D FOR DILUTE PRECURSOR CHEMICALS  
CD2C FOR CONCENTRATED  
PRECURSOR CHEMICALS

CHLORINE DIOXIDE IS PRODUCED USING  
THE ACID-CHLORITE REACTION:



How does the generation reaction take place?

Metering pumps for Acid and Chlorite deliver chemical accurately from chemical drums or tanks into a reaction chamber. The reaction chamber is designed for optimum mixing and detention time to ensure maximum reaction conversion to chlorine dioxide.

What concentration chlorine dioxide is generated?

In the reactor, chlorine dioxide is produced as a solution of 2% w/w = 20 g/L. At the outlet of the reactor, this 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. Components inside the reactor are PVDF and PTFE. All materials are fully compatible with chlorine dioxide and the acidic conditions in the reactor. After the reactor, max. 3,000 ppm  $\text{ClO}_2$  solution is compatible with UPVC pipe it is contained in. Full chemical resistance 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 two 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.  $\text{ClO}_2$  can only enter the dilution water, to be immediately transported away in the 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! Other systems have the reactor installed in an air-vented enclosure, evacuated with a water-driven eductor. These systems often leak when the eductor suction fails, causing  $\text{ClO}_2$  to enter the plant room, creating a safety hazard.

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

No. Concentrated chlorine dioxide in the inner reactor is mixed with dilution water in the top section of the outer chamber. The resultant low concentration  $\text{ClO}_2$  solution does not require further mixing.

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

No. The CD2D and CD2C generators include 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. 4-20mA inputs are available for  $\text{ClO}_2$  residual and flow. Digital input for remote start and relay output for generator healthy status.

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 fault logic will trigger alarms and stop the generator.

#### Is remote internet access included?

Yes. The CD2D and CD2C generators include 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.

#### Which generator? CD2D or CD2C?

CD2D generator uses precursor chemicals: Electricide-DA (9% HCl) and Electricide-DC (7.5%  $\text{NaClO}_2$ ). CD2C generator uses precursor chemicals: 30-33% HCl and Electricide-P1 (31%  $\text{NaClO}_2$ ).

If your generation rate is small (0-400 g/hr), you may wish to use the CD2D generator because the capital cost of the generator is lower and the chemical running costs higher.

For larger generators, the higher capital cost of the CD2C is offset by the lower running costs of the commodity precursor chemicals.



**CD2D-1 chlorine dioxide generator  
on s/s frame**

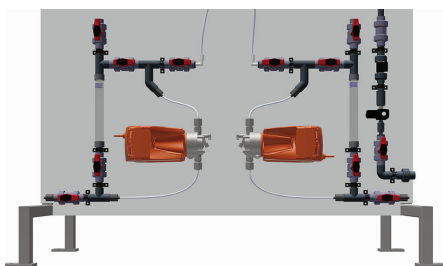


**External solution tank for  
multiple point dosing and  
storage of  $\text{ClO}_2$  solution.**

# CD2D AND CD2C GENERATORS

## Take a look at the features

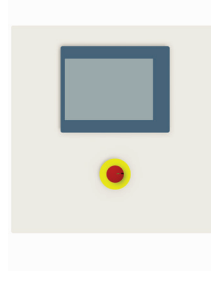
	Benefit	What this means to you
Metering pumps for precursor chemicals.	Reliable and accurate chemical dosing with large turndown capability.	Low chemical consumption per kg (pound) of ClO <sub>2</sub> and accurate dosing of ClO <sub>2</sub> for your process.
PLC controlled system with touchscreen HMI.	All powered generator components are controlled from a 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 generator operates. They will feel comfortable using the plant.
Dosing pumps have flow monitoring.	If dosing pumps are operating and flow is not registered for nominated time, an alarm will be raised and the generator stopped.	If a dosing pump loses prime, the generator won't continue to operate and dose either acid or chlorite 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 and the chemical reaction efficient. 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 mixing.	Concentrated ClO <sub>2</sub> solution is immediately mixed and diluted with water in the reactor to safe 3,000 ppm. This solution can be safely transported in pipe 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 or pulse, analyzer 4-20mA or pulse; 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 a secure 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.	Unexpected chlorite will not enter your water. You will comply with regulations and guidelines.
Titanium inner reactor is water submerged and flushed using the by-pass water flow inside the titanium outer chamber.	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.



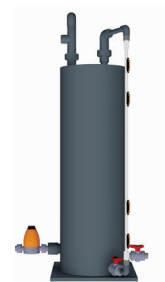
Precursor dosing pumps and backboard on s/s frame



Reactor



Control panel



External solution tank

# GENERATOR MODELS AND TECHNICAL DATA

Dilute Chemicals: Electricide-DC and Electricide-DA

Model	Capacity	Pressure	Dimensions	Weight	Power Supply	Chemical Consumption Each Component		By-pass Flow
	g/hr	Bar	H x W x D (cm)	kg		L/kg ClO <sub>2</sub>	L/hr	Min L/hr
CD2D-1	46	10	120 x 120 x 30	20	220-240V, 50/60Hz	25	1.15	23
CD2D-2	60	10	120 x 120 x 30	20	220-240V, 50/60Hz	25	1.50	30
CD2D-3	120	10	120 x 120 x 30	20	220-240V, 50/60Hz	25	3.00	60
CD2D-4	220	7	120 x 120 x 35	45	220-240V, 50/60Hz	25	5.50	110
CD2D-5	400	7	120 x 120 x 35	45	220-240V, 50/60Hz	25	10.00	200
CD2D-6	800	10	120 x 120 x 35	45	220-240V, 50/60Hz	25	20.00	400

Model	Capacity	Pressure	Dimensions	Weight	Power Supply	Chemical Consumption Each Component		By-pass Flow
	lb/day	Psi	H x W x D (in)	lb		Gal/lb ClO <sub>2</sub>	Gal/hr	Min Gal/hr
CD2D-1	2.4	145	47 x 47 x 12	44	120V, 50/60Hz	3	0.30	6
CD2D-2	3.2	145	47 x 47 x 12	44	120V, 50/60Hz	3	0.40	8
CD2D-3	6.3	145	47 x 47 x 12	44	120V, 50/60Hz	3	0.79	16
CD2D-4	11.6	101.5	47 x 47 x 14	99	120V, 50/60Hz	3	1.45	29
CD2D-5	21.1	101.5	47 x 47 x 14	99	120V, 50/60Hz	3	2.64	53
CD2D-6	42.2	145	47 x 47 x 14	99	120V, 50/60Hz	3	5.28	106

Concentrated Chemicals: Electricide-P1, 30-33% hydrochloric acid and dilution water

Model	Capacity	Pressure	Dimensions	Weight	Power Supply	Chemical Consumption Each Component		Water Dilution		By-pass Flow
						L/kg ClO <sub>2</sub>	L/hr	L/kg ClO <sub>2</sub>	L/hr	
CD2C-1	150	7	120 x 120 x 30	20	220-240V, 50/60Hz	5.26	0.79	36	5.40	75
CD2C-2	420	10	150 x 150 x 40	40	220-240V, 50/60Hz	5.26	2.21	36	15.12	210
CD2C-3	750	7	160 x 150 x 40	70	220-240V, 50/60Hz	5.26	3.95	36	27.00	375
CD2C-4	1500	7	180 x 150 x 43	120	220-240V, 50/60Hz	5.26	7.89	36	54.00	750
CD2C-7	2250	4	180 x 150 x 43	120	220-240V, 50/60Hz	5.26	11.84	36	81.00	1125
CD2C-5	6000	7	300 x 150 x 50	260	220-240V, 50/60Hz	5.26	31.56	36	216.00	3000
CD2C-6	10000	4	300 x 150 x 50	260	220-240V, 50/60Hz	5.26	52.60	36	360.00	5000

Model	Capacity	Pressure	Dimensions	Weight	Power Supply	Chemical Consumption Each Component		Water Dilution		By-pass Flow
						Gal/lb ClO <sub>2</sub>	Gal/hr	Gal/lb ClO <sub>2</sub>	Min Gal/hr	
CD2C-1	7.9	101.5	47 x 47 x 12	44	120V, 50/60Hz	0.63	0.21	4.3	1.43	20
CD2C-2	22.2	145	59 x 59 x 16	88	120V, 50/60Hz	0.63	0.58	4.3	3.99	55
CD2C-3	39.6	101.5	63 x 59 x 17	154	120V, 50/60Hz	0.63	1.04	4.3	7.13	99
CD2C-4	79.2	101.5	71 x 59 x 17	264	120V, 50/60Hz	0.63	2.08	4.3	14.27	198
CD2C-7	118.8	58	71 x 59 x 17	264	120V, 50/60Hz	0.63	3.13	4.3	21.40	297
CD2C-5	316.8	101.5	71 x 59 x 17	572	120V, 50/60Hz	0.63	8.34	4.3	57.07	793
CD2C-6	528.0	58	118 x 59 x 20	572	120V, 50/60Hz	0.63	13.89	4.3	95.11	1321

Electricide-DA = 9% hydrochloric acid  
 Electricide-DC = 7.5% sodium chlorite  
 Electricide-P1 = 25-31% sodium chlorite



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