

Scotmas Group

Purify • Protect • Perform



SCOTMAS BRAVO MX™

High Purity ClO₂ Generators for Volume Water Treatment

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BRAVO MX

Robust High Purity ClO₂ dosing for high volume water disinfection

The Bravo MX is our solution for larger industrial and municipal water supplies, where high volumes of high purity Chlorine Dioxide require to be delivered on a continuous basis.

The Bravo MX is engineered to have industry WIMES¹ 8.02 specifications and produces Chlorine Dioxide that conforms to BS EN 12671, and thereby Article 10 of the EU Drinking Water Directive 98/83/EC for use in Public Water Supplies.

The Bravo MX offers a turn-key solution for large industrial and water utility clients seeking to quickly take advantage of the benefits of Chlorine Dioxide using a pre-engineered skid mount solution, with a 25 year service life.

Building on the safety and reliability of our smaller generators, the Bravo MX is designed to the exacting, fail-safe and security requirements of water utilities and heavy industrial clients with MODBUS integration, whilst using a flexible, industry standard deployment framework to minimise custom engineering costs and delays. The Bravo MX can also be provided as a fully pre-engineered containerised plant room solution for rapid site deployment, and integration with other packaged plant.



The Bravo MX is designed to operate using bulk storage tanks of concentrated ClO₂ precursors and provides for built-in control of all bulk chemical transfer pumps, air scrubbers and safety systems associated with the package.

Full duty-standby/rotation capabilities are built into the Bravo MX design, allowing for 2 identical models to be easily linked via fibre or Ethernet cable to provide for full redundancy capabilities.

Reliability as Standard

Bravo MX Generators are only specified with premium PLCs and circuitry to provide the reliability and durability necessary for high volume disinfection applications.

Where required, PLCs and other key components can be specified by customers to meet project specific requirements. All control systems are supplied in secure, skid mounted enclosures ready for install to site, or within our rapid deployment containerised systems.

Multi Point Dosing Technology

Multiple-point dosing provides significant savings over traditional approaches.

The Bravo MX offers the ability to dose different levels of ClO₂ independently at up to 12 points throughout the site via DSX Multi Point Dosing Technology, eliminating the need for intermediate bulk storage of Chlorine Dioxide solutions.

Failure risk is reduced – there are fewer pumps, fewer motors, less pipework and less space required, reducing risk of component failure and ensuring a more reliable ClO₂ dosing system. Electrical supply requirements and consumption are reduced.

Each DSX manifold is supplied complete with all instrumentation, pipework and control valves to manage variable ClO₂ dosing at all required locations.



CONTAINERISED - RAPID DEPLOYMENT INSTALLATIONS



Scotmas' containerised water disinfection systems shorten installation time, ensure minimal on-site disruption, and can be built to clients' individual specifications.

Pre-engineered, containerised water disinfection systems have been supplied to customers throughout the U.K., Europe, and the Middle East in sizes from small 'plant room' style containers to 40' high cube units.

Systems are built in our factory from the initial supply of the empty container to the complete installation ready system, and fully tested by Scotmas, and customer representatives if required, prior to delivery on site.

On delivery, a containerised ClO₂ system is installed for minimum downtime and on-site disruption. If site requirements change, containers can be disconnected, moved, and reconnected much more quickly and efficiently than would be possible with an installed solution. All systems are ISO certified.

Scotmas containerised systems are fitted with:



- Full temperature controls
- Fire & smoke alarms
- Ventilation
- Security rated doors

For temporary installations, our containerised solution can also be specified to include on-board chemical storage, providing for maximum levels of safety and security on complex oilfield or construction sites.

Project Management

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Successful implementation of a Chlorine Dioxide system in complex municipal and industrial processes depends on specialist expertise being available at an early stage of the project. Scotmas have successfully worked with consultants, EPC's and water treatment specialists to design and implement Chlorine Dioxide treatment regimes for some of the world's largest industrial processes.

Our practical approach, combined with our extensive global experience means we are well placed to provide early stage support to FEED studies, and back-up scientific support where jar testing and side stream trials are required.

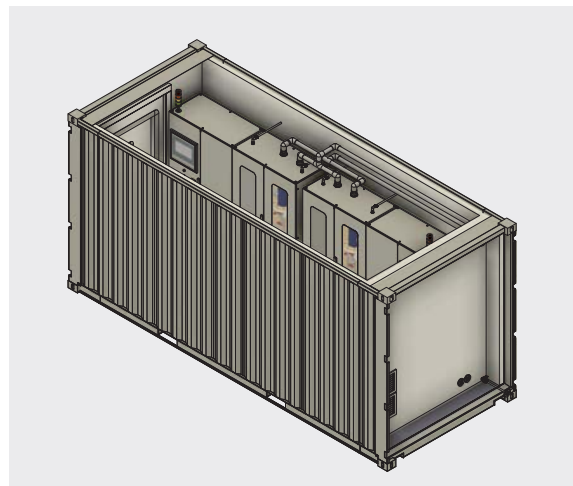
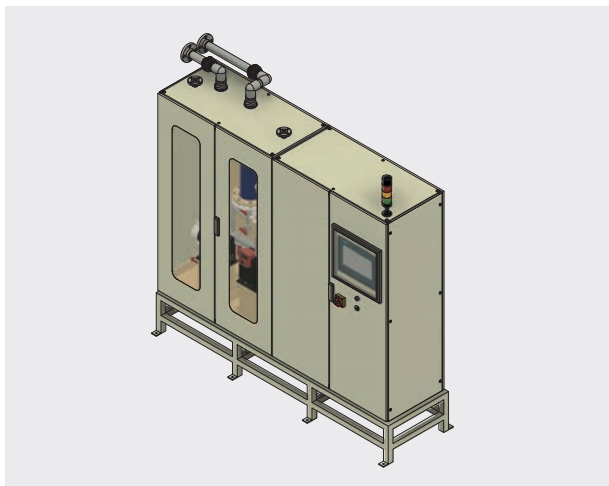
Upon project commencement, our commitment to quality and safety is embodied by our longstanding accreditation to the ISO45001, ISO14001 and ISO9001 safety, environmental and quality standards.

*Scotmas are **the Chlorine Dioxide specialists**, focused on delivering Chlorine Dioxide systems engineered to suit your individual needs.*

Diagnostic analysis can be supplied by our support technicians to ensure that you select the most appropriate ClO₂ dosage and monitoring strategy. Both planned and reactive maintenance can be catered for by a wide range of service options, provided on a “full service” or “parts only” basis.

Our experienced team of engineers and support technicians are accredited to the Global ISO45001 Health & Safety Standard, and have experience working in demanding environments such as offshore oil installations, power stations and healthcare environments. As such, you can expect the highest standards of professionalism and service from our personnel in order to complete your ClO₂ installation quickly, efficiently and above all, safely. Our specialist engineers are experienced in HAZID, HAZOP and LOPA/SIL analyses, and are well placed to provide supporting reference information from previous projects to support your design outcomes.

BRAVO MX MODELS



MX 6,000	6,000,000 l/hr water (144MLD) treated @ 1 mg/l ClO ₂ Generates 3,200 - 6,000g ClO ₂ /hr
MX 12,000	12,000,000 l/hr water (288MLD) treated @ 1 mg/l ClO ₂ Generates 6,000 - 12,000g ClO ₂ /hr
MX 25,000	25,000,000 l/hr water (600MLD) treated @ 1 mg/l ClO ₂ Generates 12,000 - 25,000g ClO ₂ /hr
MX 40,000	40,000,000 l/hr water (960MLD) treated @ 1 mg/l ClO ₂ Generates 25,000 - 40,000g ClO ₂ /hr

BRAVO MX APPLICATIONS

Municipal Water

Chlorine Dioxide water treatment was first applied in European drinking water in 1956, as a pre-oxidant to remove iron and manganese contamination from raw water prior to treatment. Today, Chlorine Dioxide is applied throughout the treatment train - from the pre-treatment of raw and reverse osmosis feedstocks, through to the final disinfection and maintenance of a residual in the distribution network.

Scotmas ClO₂ generation technology has been proven by regulators around the world and selected by some of the largest water utilities to deliver unparalleled levels of safety and efficiency.

Seawater Cooling

Chlorine Dioxide applications for seawater can improve energy efficiency in cooling water systems and reduce the environmental impact from chlorinated by-products, associated with chlorine disinfectants.

As chlorine gas and hypochlorite treatments are increasingly decommissioned, electrochlorination is often promoted as a potential alternative treatment. Power costs, depreciation and maintenance costs of seawater electrochlorination systems are usually considerably higher than the equivalent Chlorine Dioxide approach, which offers a more effective biocidal treatment with minimal environmental impact.

Oil & Gas

Chlorine Dioxide's high oxidation capacity and low oxidation strength make it the ideal water biocide for a number of hydrocarbon extraction applications, whether for sulphide scavenging, enhanced oil recovery, batch biociding, or injection water treatment. Chlorine Dioxide has low environmental impact, as it does not form chlorinated by-products and degrades to salt in most environments. Our capabilities include full integration with your chemistry, corrosion engineering and environmental teams regarding compatibility. We can also offer a fully managed engineering solution comprising installation and site E&I controls.

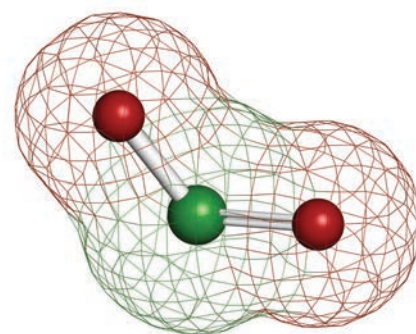
Recirculating Cooling Towers

An effective, eco-friendly solution to biofouling, helping to save millions through better heat transfer efficiency and reduced maintenance costs.

Scotmas ClO₂ systems combine the disinfecting power of Chlorine Dioxide with state of the art control and monitoring systems to minimise chemical consumption, environmental impact and corrosion risk. Our systems are installed on systems ranging from small modular cooling towers through to power station seawater intakes, and paper mill water handling applications.

WHY CHLORINE DIOXIDE

Chlorine Dioxide has been proven to offer a reduced whole-life cost when compared with competing biocidal technologies, such as electrochlorination, ozone, and hypochlorite treatments, due to its powerful mode of action, low dose rates, and superior environmental performance.



Destroys biofilm completely at source

Biofilm removal is the most important part of an effective water treatment system. Without it, it is simply not possible to have a safe, pathogen free environment.

Lower biocidal contamination

Some biocides require very high concentrations to produce the required disinfection impact. Where Hydrogen Peroxide has been promoted as a biocide for water treatment, dose rates can be up to 30 times the equivalent Chlorine Dioxide dose rate to achieve the same disinfection impact.

Disinfection by-products

High concentrations of certain biocides can cause environmentally persistent, potentially carcinogenic by products to form, including Trihalomethanes, Chlorinated Organics and Bromate. Chlorine Dioxide does not react to form complex organic by products.

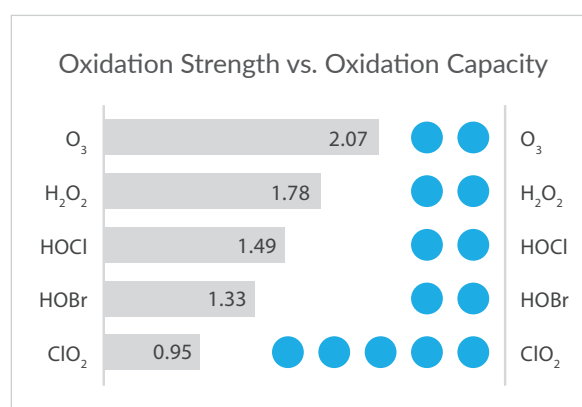
In addition, the superior reaction efficiency of the Bravo MX minimises residual Chlorite and Chlorate levels.

Effective against complex organisms

Chlorine Dioxide has been found to be effective against complex organisms such as cysts and protozoa including Cryptosporidium, Giardia and amoeba.

Oxidation strength vs. oxidation capacity

Compared with other oxidising biocides, Chlorine Dioxide has a significantly lower oxidation strength, yet is strong enough to attack the disulphide bonds found in the membranes of bacteria and other biological material. This process of “selective oxidation” allows the Chlorine Dioxide biocide to be targeted where it is needed most, disinfecting areas quickly at low dose rates, and minimising the creation of potentially harmful disinfection by products.



SCOTMAS YOUR ClO₂ EXPERTS

The Scotmas range of Chlorine Dioxide generators has been designed to deliver ClO₂ for drinking water and disinfection applications safely and securely, with unparalleled control and monitoring capabilities.

With more than 30 years' experience in ClO₂ technology, utilising the latest chemical engineering techniques, Scotmas systems are backed by unrivalled application expertise and technical support.

The team at Scotmas encompasses chemists, microbiologists, electrical, mechanical and controls engineers; working together to innovate and provide support to over 4000 ClO₂ installations worldwide.

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