

METROL SEA-CELL

Electrochlorinator

APPLICATIONS

- Treatment of industrial cooling water to prevent infestation with fouling organisms
- Treatment of seawater used in oil and gas platforms for firewater, cooling, and water injection purposes
- Prevention of blockages in heat exchangers, coolers, and pipework
- Onboard ships to prevent marine organism growth

ADVANTAGES

- Vertical orientation for free removal of hydrogen
- Ingress Protection (IP) rating of 66; installation in harsh marine environments with no requirements for secondary enclosures
- Operation rated to 145 psi [1 MPa], pressure tested to 218 psi [1.5 MPa], and subjected to 696 psi [4.8 MPa] during certification trials without leaks
- Use of high-grade titanium electrodes of up to 5-mm thickness for long life and elimination of plate buckling
- No requirement for secondary enclosures
- Self-cleaning unit that requires no acid washing

METROL SEA-CELL* electrochlorinators are in situ generators of hypochlorite from seawater using an electrolytic process. Hypochlorite, one of the most effective oxidizing biocides in use today, is used to prevent life growth in all types of living organisms.

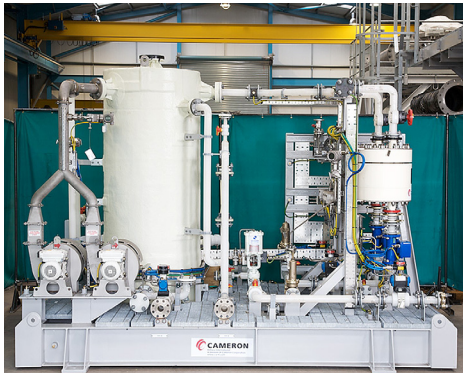
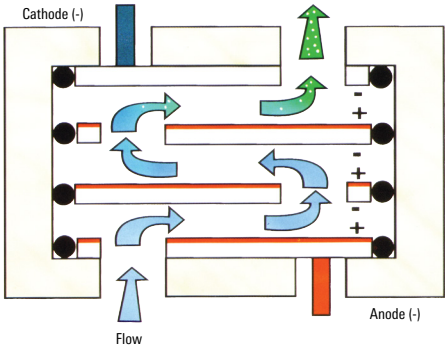
Performance

The SEA-CELL electrochlorinator has been approved by British Approval Service for Electrical Equipment in Flammable Atmospheres (BASEEFA) for use in areas requiring a certified electrical apparatus. Its series flow design creates a self-cleaning unit that does not require acid treatment to maintain efficiency. It can be operated at 0%–100% of rated output through the use of phase angle controlled thyristor rectifiers. Chlorine production is maximized by using one of a range of advanced anode coatings.

Product range

Cells are available in four standard models, providing a broad range of generating capabilities. Actual chlorine production depends on site conditions.

| Cell Size | Generating Capacity (Nominal), lbm/h [kg/h] |
|-----------|---|
| 030 | 1 [0.5] |
| 060 | 3 [1.4] |
| 090 | 7 [3.2] |
| 120 | 11 [5.0] |



Standard SEA-CELL electrochlorinator with integrated power and control panel.

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Operating principle and key features

Enclosed within an integral housing that provides a leak-proof assembly, SEA-CELL electrochlorinators use the electrolysis of chloride ions, present in seawater, as they pass between anodic and cathodic electrodes energized by a direct current. Chloride ions are oxidized at the anode surface, and hydrolysis effectively forms the hypochlorous ion (OCl^-) and hypochlorous acid (HOCl) in equilibrium. This then reacts with bromide ions in the water to create a range of chlorine-produced oxidants. Their oxidizing power is the key to their antifouling effectiveness. In the corresponding reaction at the cathode, hydrogen is released, resulting in an increase in pH.

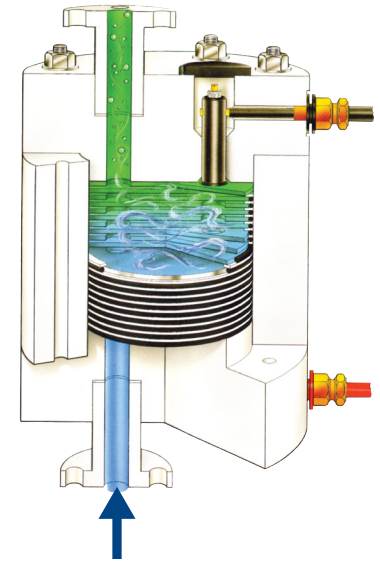
The solubility limit of magnesium and calcium salts is exceeded under these high-pH conditions, which can cause scaling of some cells. This does not occur in the SEA-CELL electrochlorinator because of the high turbulence and water velocity through the cell. The SEA-CELL electrochlorinator is the only unit certified for use in a hazardous environment without requiring a secondary enclosure.

Options and types

The SEA-CELL electrochlorinator is available in four standard models, enabling large modular plants to be supplied with a minimized number of cells. It can be incorporated into automated chlorinator packages complete with detailed instrumentation and control features, which ensure online availability and fail-safe operation. Packages range from single-cell marine standard units to sophisticated offshore hazardous-area packages. Large-capacity units for application in the power and industrial sectors are also available on a modular basis.

Aftermarket support

The Schlumberger global aftermarket network provides an unparalleled level of site support and includes a dedicated team of experienced service and project support representatives. This network provides turnkey expertise and support for customers for the duration of a project—from commissioning to operation. From replacement parts and spares to equipment repair, our mission is to provide the highest-quality support.



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