

MICROCLOR

The Next Generation

It is well known that chlorine is a powerful disinfectant used in water treatment and plays a vital role in controlling bacteria and viruses that can cause human illness.

More stringent regulations for transportation and storage of bulk chlorine or pressurized chlorine gas have required many to search for alternative methods of disinfection.

Onsite generation of sodium hypochlorite alleviates the safety concerns associated with storing and using bulk sodium hypochlorite or chlorine gas.



300 PPD

Systems Capable of 20 to 3600 Pounds
per Day Chlorine Equivalent

The MicroClor vertical cell array (V-Ray) allows for the instantaneous passive removal of all hydrogen produced.

Making Bleach Made Easy

- Low Cost Hypochlorite
- Enhanced Performance
- Small Footprint
- 24 Hour Service
- Safe
- Vertical V-Ray Cell Design
- Immediate Hydrogen Removal
- Reduce Scaling
- Low Maintenance

V-Ray
Technology

MICROCLOR



40 PPD

The state of the art patent pending Microclor onsite hypochlorite generation system is a brand new design built upon twenty years of dedicated research and development in the field of onsite hypochlorite generation.

The design incorporates all of the advantages of current industry standards while radically improving all safety aspects of the process. Specifically, the manner in which hydrogen is removed from the electrolytic cell is a huge improvement over more conventional horizontal tubular designs.

The MICROCLOR onsite hypochlorite generation system incorporates a multitude of unique features that are now patent pending. The most significant features are as follows:

1. Passive hydrogen removal.
2. Brine conductivity control.
3. Full wave D.C. rectification.
4. No cell electrode penetrations.
5. High velocity electrolyte flow.
6. Higher performance level.
7. Recirculating cell loop.
8. No internal cell baffles or gasketing.

There is no other onsite hypochlorite system in the marketplace today that possesses even one of the above advantages, no less all eight.

A brief discussion of each feature follows:

Passive Hydrogen Removal

The V-Ray cells are configured in a vertical format with a recirculation loop on each cell that allows for optimized brine utilization and passive release of the hydrogen gas from each cell. Hydrogen gas is not allowed to pass from cell to cell. This design radically increases operator safety and substantially reduces the possibility of hydrogen gas build-up in the cell and the potential of catastrophic failure. Immediate hydrogen removal at the top of each cell loop greatly reduces electrode blinding and associated heat buildup.

Brine Conductivity Control

Constant current is achieved via a current feedback loop where the brine pump speed is controlled by the system programmable logic controller. This feedback loop accounts for variations in temperature, conductivity and water flow. The titanium, Teflon impregnated gear pump is attached to a variable speed drive that continually provides a consistent blended electrolyte flow to the cells maximizing salt efficiency.

Full Wave D.C. Rectification

The DC Rectifier design consists of a fully isolated step-down transformer and bridge rectifier. DC voltage is fixed with primary taps for + 5, 10% voltage correction. DC ripple is less than 4.0% with a power factor of 99% or better. Switching rectifier or phase angle fired SCR voltage correction technology is not utilized as this twenty year old technology has an excessively high failure rate.

No Cell Electrode Penetrations

The V-Ray cells consist of thirteen internal bipolar electrodes while the cell outer plates serve as both terminating anode and cathode. All anodic surfaces are coated with DSA catalytic coating. The design of the cell precludes the need for wet D.C. cable connections or problematic O-ring seals.

High Velocity Electrolyte Flow

The passive hydrogen gas removal provides a hydraulic lift within the V-Ray cell loop which causes a high velocity flow through the recirculation loop and across the V-Ray cell plates. This high velocity flow results in a scouring action between the vertically mounted V-Ray cell plates. This novel self cleaning feature virtually eliminates the need for acid cleaning of the electrolytic cells and reduces heat build up.

Higher Performance Level

PSI's proprietary patent pending vertical V-Ray cell design provides for a far more efficient generation platform than the industry standard of 3.5 pounds salt and 2.5 KWH per pound chlorine equivalent.

The MICROCLOR vertical V-Ray cell produces hypochlorite at 0.8% while consuming less than 3 pounds of salt and 2.0 AC KWH per pound of equivalent chlorine.

There is no competitive open cell process available which is more efficient than the MICROCLOR System.

PSI welcomes a side by side comparison with any manufacturer claiming higher performance levels than MICROCLOR.

No Internal Cell Baffles or Gasketing

There are no internal cell baffles, gaskets or fasteners found inside the cell. The cells are built with clear acrylic guides that support the internal bi-polar plates that allows for direct visual inspection of the plates. Anode and Cathode mono-polar plates are surface mounted to the outside of the acrylic guides.

V-Ray Cell maintenance and replacement

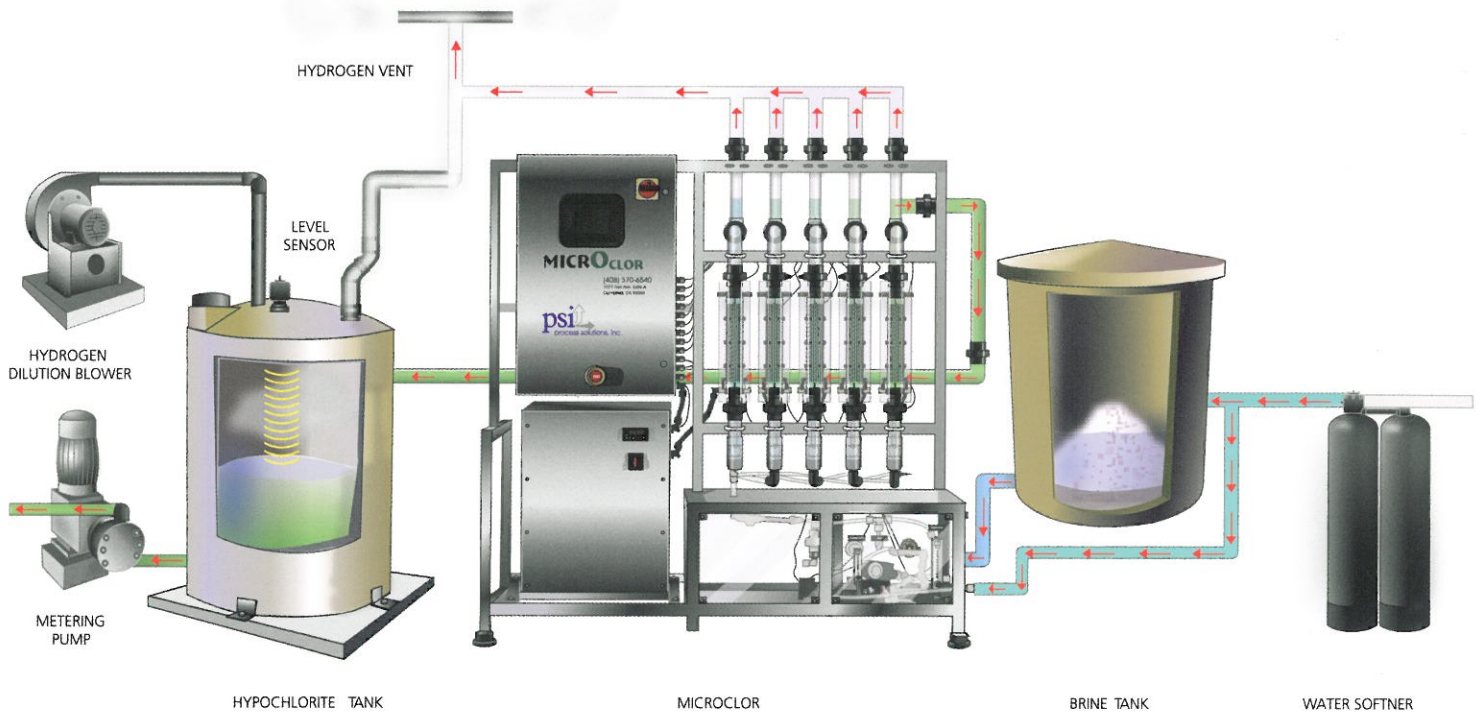
The Microclor vertical V-Ray cell design allows for the cell to easily be removed from the cell carrier piping by simply breaking two unions. This makes for simple cell maintenance and or replacement.

The Microclor design has taken into account every imaginable failure scenario including direct operator error in the handling of the process equipment.

Sequential operations logic is provided for all process variables where the change from standby to process is confirmed for all sensor locations at each start sequence. This auto diagnostic routine locks out generation in the event of sensor failure or electrical bypass.

Microclor hypochlorite systems meet requirements for 20 to 3600 pounds per day chlorine equivalent.

The Next Generation Onsite Hypochlorite Generator



The MicroOclor is modular in design and based on standard components. These components may be customized to meet a wide range of requirements.

Standard components for the MicroOclor system include:

- Stainless Steel Skid Assembly
- Water Softener
- Brine Tank
- Brine Pump
- Electrolytic Cells
- Skid mounted PLC Control Panel
- D.C. Rectifier
- Hypochlorite Storage Tank
- Hypochlorite Metering Pump
- Hydrogen Dilution Blower

Model/Capacity	Cell Size W X H	# of Cells	H2O GPM	Brine GPM	DC Amps	KVA	FLA 208/240 1PH	FLA 480 3 PH
20	2 x 12	1	0.2	0.02	40	2.4	11.5/11	-
40	2 x 12	2	0.4	0.03	80	4.8	23/22	-
60	2 x 12	3	0.6	0.05	120	7.2	35/33.5	-
80	2 x 12	4	0.8	0.07	160	9.6	46/44	13
100	2 x 12	5	1	0.08	40	12	-	16
200	4 x 12	5	2	0.17	80	24	-	32
300	6 x 12	5	3	0.25	120	36	-	48
600	12 x 12	5	6	0.50	240	72	-	96
900	18 x 12	5	9	0.75	320	96	-	128
1200	24 x 12	5	12	1.00	480	144	-	192
1800	24 x 18	5	18	1.50	720	216	-	288

Note: Typical Nominal Operating Amperage is 75% of Full Load Amperage

Capacities: 20-3600 pounds per day free available chlorine.
 Control: Automatic, regulated by storage tank level.
 Percentage Sodium Hypochlorite: 0.8 + 0.05
 Consumables per pound of chlorine produced:
 3lbs salt, 2KWH (AC), 15 gallons water.
 Water Input: Potable water, 30-80 PSI, 40°F-80°F (5°C-27°C)
 Salt: 99.7% pure dry weight Morton White Crystal or equivalent.

Power: 20-80ppd systems - 208V or 240V AC, 1PH, 60HZ
 80-1800ppd systems- 480V, 3PH, 60HZ
 Control Cabinet: 304 stainless steel NEMA 4X
 Operator Interface: 6" Color Touchscreen
 Programmable Logic Controller: Allen Bradley 1200
 Brine Tank & Hypochlorite Storage Tank shall be appropriately sized for each application.

