WALLACE & TIERNAN® SYSTEMS OSEC® ELECTROLYTIC CHLORINATION B4-200 SYSTEM

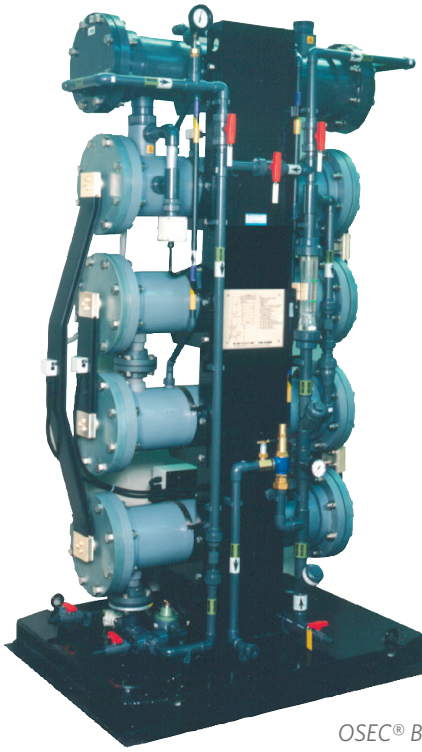
INTRODUCTION

The OSEC® System provides for the continuous production of sodium hypochlorite solution from salt, water and electricity. This eliminates dependence on commercial chlorine suppliers and the problems inherent in the transport and handling of bulk hypochlorite, particularly in remote or residential areas.

In addition, use of these systems could lower operating costs and disinfection by-products significantly compared to the use of bulk hypochlorite. Operation is completely automatic making the B4-200 OSEC System ideally suited for un-manned locations.

Key Benefits

- ATEX compliant
- Major components are prepiped and mounted on a common pedestal
- PLC based control panel
- Power saving electrolyser
- Economical, reliable and low maintenance operation
- Positive hydrogen gas dilution and removal
- Control panel that supervises and monitors the safe
- generation of sodium hypochlorite
- Long life anodes with a five year warranty
- Transformer / Rectifier unit provides the low voltage high current DC supply used for electrolysis



OSEC® B4-200 System

OSEC® SYSTEM COMPONENTS

The complete OSEC® System consists of the following components:

- Water Softener
- Salt Saturator
- Brine Pumps
- Transformer / Rectifier
- Electrolyser
- Product Storage Tanks
- Control Panel
- Product Tank Blowers

Also, the LVN 2000™ liquid feed system, is available for chemical dosing via vacuum induction. Chlorine residual controllers maintain the desired disinfectant level whilst chlorine residual analysers are available to measure chlorine levels in the treated water.

Electrolyser

The B4-200 OSEC System consists of four 200mm tubular PVC electrolyser casing. These house a titanium chassis to which the anodes and cathodes are fixed in a configuration that ensures maximum operational efficiency by providing simple, once through flow operation.

The anodes are DSA-type and manufactured from a titanium substrate with a precious metal oxide coating. The cathodes are made from a special grade of Hastelloy® C material and are fitted with Kynar® spacers which maintain a critical uniform distance from the anode. Each electrolyser contains four cells electrically connected in series, containing sufficient anodes and cathodes to produce the desired quantity of available chlorine.

The internal electrolyser design and vertical orientation of the anodes and cathodes provides for the quick removal of hydrogen from the anode to ensure maximum efficiency. The partition discs have gas ports that pass the hydrogen through the compartments. Baffling effectively eliminates mixing between cells thereby reducing competing electrochemical reactions. This along with an efficient system for removing hydrogen gas from the electrolysing zone results in savings in electrical power and salt.

HYDRAULIC AND ELECTROCAL DATA

kg/Day Cl2	Number of Electrodes		Brine Feed l/h			Peak Water Flow Required l/h	Nominal System Power		Flash Heater Rating kW
	Anodes	Cathodes	Saturated Brine	Dilution Water	† Total Water		DC A	kW AC	
235.2	224	256	120	1200	1320	1740	1568	49.6	6
252.0	240	272	129	1320	1449	1860	1680	53.1	6
268.8	256	288	137	1440	1577	1980	1792	56.6	9
285.6	272	304	146	1500	1646	2100	1904	60.2	9
302.4	288	320	154	1560	1714	2160	2016	63.7	9
319.2	304	336	163	1680	1843	2280	2128	67.3	9
336.0	320	352	172	1800	1972	2340	2240	70.8	9
352.8	336	368	180	1800	1980	2460	2352	74.3	9
369.6	352	384	189	1920	2109	2580	2464	77.9	9
386.4	368	400	198	2040	2238	2700	2576	81.4	9
403.2	384	416	206	2160	2366	2760	2688	85.0	9
420.0	400	432	214	2160	2376	2880	2800	88.5	12
436.8	416	444	223	2280	2503	2880	2912	92.0	12
453.6	432	464	232	2400	2632	3060	3024	95.6	12

† Dilution water ratios based on 10:1 Excludes softener regeneration

30 V TRANSFORMER/RECTIFIER

Type No.	No. of Anodes	DC Amps Output	AC Amps Input	Dimensions			DC Ammeter Max.	Busbar Size (mm)	Gross Weight (kg)
				W	D	H			
B4	224-272	2000 A	100.0	800	1000	2400	2000 A	152 x 13	1300
B4	288-320	2400 A	120.0	1000	1000	1000	3000 A	152 x 13	1400
B4	336-400	3000 A	150.0	1000	1200	2400	1500 A	2 x 102 x 13	1500
B4	416-432	3200 A	160.0	1223	1322	2380	4000 A	2 x 102 x 13	1600

Control Panel

The entire B4-200 OSEC® Systems process is automatically operated and monitored by a central PLC-based control panel. Membrane key pads with character or touch screen display is available.

PLC: Mitsubishi
Input Voltage: 230 VAC, 1 phase, 50 Hz (110 VAC version available)
Control Voltage & Relay: 24 VDC, 5 Amp

Transformer / Rectifier

Type: Thyristor regulated variable output via in-built force air-cooled silicon thyristor regulator.

Enclosure: IP21 - epoxy stove enamelled steel enclosure

Input Voltage: 380V/440V, 3 phase, 50/60Hz, 4 wire

Product Tank

Generally storage is provided for 24 hours of operation, though this can be increased and decreased depending on available space and site conditions. Typically tanks will range from 32000 to 64000 litres capacity.

A transducer outside the tank provides start/stop control of the OSEC System process to maintain a continuous supply of hypochlorite. Air blowers mounted at the base of the tank dilute the hydrogen below the flammability limit and force ventilate the tank to an outside discharge.

Salt Saturator

The salt saturator creates the brine solution that feeds the OSEC System electrolyser. This is created by passing the make-up water through the salt bed forming a 32% saturated brine solution which is then fed by brine dosing pumps to the electrolyser.

Typically the saturator is sized for 30 or more days production to ensure sufficient salt quantity to provide production continuity and economical refill cycles. This results in a saturator capacity of between 2.5 to 8 tonnes for a minimum 30 day period.

Softener

The makeup water used for the salt saturator and feed water used for the dilution of the brine solution must have less than 17mg/l of CaCO3 hardness, otherwise operating efficiency and maintenance free operation will be compromised.

For water supplies with hardness greater than 17mg/l of CaCO3, a water softener is required. This usually is a twin cylinder continuous operation resin based softener operating on a duty/stand by basis.

Anode Warranty

The anodes used in the electro-chlorinator are warranted for five calendar years after installation and commissioning unless stated otherwise at the time of quote

TECHNICAL DATA

Capacity:	235 to 454 kg/day of chlorine equivalent
Housing:	Four 200mm diameter PVC casings
Anodes:	Precious metal oxide coating on titanium substrate
Cathodes:	Hastelloy® C alloy
Spacers:	Kynar® polymer
Chassis:	Titanium
Dilution Water Flowmeter:	Variable-area meter with low flow alarm from proximity switch
Brine Water Flowmeter:	Variable-area meter with low flow alarm from proximity switch
Salt Requirements:	Salt must be high quality, preferably pure vacuum dried food quality. Salt usage is approximately 3.4 kgs/kg of Cl2
Supply Water Requirements:	Hardness not to exceed 17mg/l of CaCO3 Minimum water temperature: 6.5°C (with heat exchanger fitted) Maximum water temperature: 25°C Minimum water pressure: 2 bar Maximum water pressure: 5 bar (Pressure losses through the water softener and heat exchanger must be added to the minimum pressure stated)
Electrical Requirements:	Control Panel: 110/230 VAC, 50 Hz, 1 Phase Transformer/Rectifier: 460 VAC, 50/60 Hz, 3 Phase
Power Consumption:	5.0 to 5.6 kWh AC per kg of Cl2 per day
Hypochlorite Strength:	0.7% to 0.9% concentration by weight
Pipe Connections:	Inlet Water - 1 1/4", Inlet Brine - 1/2" Outlet Product - 2"
Heat Exchanger:	Integral
Alarm:	High & low temperature sensors, low electrolytelevel, low dilution water flow, low brine flow (BASEFFA certified intrinsically safe)
Overall Dimensions:	Height: 2380mm, Width: 1270mm Base: Depth: 915mm, Width: 1220mm (885 x 1185 hole centres)
Optional Equipment:	Hydrogen Detector Pump Accessories
Directives Conformance:	*Explosive Atmospheres Directive (ATEX) 94/9/EC

*All OSEC® B Series System equipment has been examined by Sira Certification Services to assess its compliance with the Explosive Atmospheres Directive (ATEX) 94/9/EC.

The relevant certificate number is Sira 04ATEX4277X. The equipment will now be marked accordingly:

EEx nA II T6
Ta =+5°C to +40°C

For detailed information request ATEX product sheet.

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