

# COMMERCIAL POOLS & SPAS

## Disinfection and dechloramination

In 2003, **BIO-UV** developed and patented a special range of products for disinfecting and dechlorinating commercial pools and spas because, in most countries, chlorine remains mandatory as a disinfectant. So far, more than 1,000 commercial pools & spas in Europe have been equipped to the total satisfaction of their users and operators and for a healthier environment.

**All ranges are NSF-50 certified and Cryptosporidium evaluated. Testing measures for certification are above the usual required standard in order to deliver an optimal efficiency level of microorganisms' reduction such as bacteria, viruses, Crypto, Giardia, etc. which are not eliminated by chlorine and ozone at usual level.**

### PRINCIPLE

The sun emits invisible light: ultraviolet light. This natural phenomenon is reproduced inside the reactors in the **BIO-UV** Group's product ranges using powerful lamps, the result of leading-edge technology, that emit UV-C rays. At 254 nanometers, the optimum wavelength for destroying micro-organisms (viruses, bacteria, algae, yeasts, mould...), UV-C rays penetrate to the heart of DNA and disturb the metabolism of cells until they are totally destroyed. All germs are thus desactivated (including **Legionella** and **Cryptosporidium**) and cannot reproduce.

Today most commercial pools or spas are treated using chlorinated products that are good oxidizing agents, but generate by-products such as chloramines. These by-products are irritant, corrosive and smelly. They are harmful to health and responsible for respiratory illnesses in lifeguards, baby swimmers and competitive swimmers. That is why **BIO-UV** has designed ranges of UV reactors suitable for commercial pools and spas in order to reduce or eradicate these side effects.

### BENEFITS

#### ■ Continuous treatment, immediate disinfection and dechloramination,

- Very effective and safe disinfection thanks to the application of UV-C rays
- 50 to 75% reduction in the combined chlorine rate (chloramines) in order to achieve a mean level of 0.2 to 0.3 ppm
- More environmentally friendly
- Improvement of the ambient air quality for bathers and staff to the benefit of their health
- Greater comfort: no smell of chlorine

■ Improvement of the bathing quality by a reduction of chlorinated by-products in water and air which are responsible for irritations of the skin, eyes, mucous membranes, etc...

- 25 to 60% savings in water renewal
- Optimization of heating and dehumidification costs
- Quick return on investment: 9 to 24 months
- Simple and easy to install
- Simple to maintain
- Corrosion reduction
- Better image for the establishment

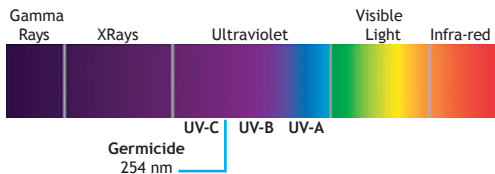
### POWER REGULATION BY BIO-UV

All BIO-UV reactors are equipped with a power regulation for chloramines remove. The range for dechloramination and disinfection in commercial pools and spas is environmentally friendly.

**Enhanced UV-C efficiency**  
**Trichloramines (NCl<sub>3</sub>) significant reduction**  
(which are responsible for health risks for lifeguards, baby swimmers and bathers)  
No THM's increases

**Cutting electricity consumption up to 25%**  
**Longer lamp life** (up to 50%)

**Reduction of energy requirements - Smaller electrical cabinets - Easier installation**



### EFFECTIVE DOSE

The reactors in the **BIO-UV** ranges are dimensioned according to the pump flow rate, as it is the combination of the contact time in the reactor and the power of the lamp(s) that will ensure that the necessary dose (expressed in millijoules per square centimeter or mJ/cm<sup>2</sup>) sufficient to kill 99.9% of the micro-organisms (bacteria, viruses, algae in suspension, ...) is received.

**In the specific case of dechloramination, a dose of 60 mJ is essential in order to be able to significantly reduce the chloramines level. The trichloramines are responsible for respiratory irritation and illnesses in staff and bathers.**

### MP EL SERIES REACTORS (Medium Pressure lamps)

Description	Max. flow rate in m <sup>3</sup> /h *	Performance in millijoules per cm <sup>2</sup> at actual recommended flow rates **	UV Lamp: Number Power consumption	Connection DN	Length of reactor in cm
<b>MPL 030 EL</b>	10 to 30	60	1 x 400 W	4"	45
			1 x 600 W	4"	45
<b>MP 030 EL</b>	15 to 40	60	1 x 600 W	DN 80	45
			1 x 1 kW	DN 80	45
<b>MP 100 EL</b>	80	60	1 x 1 kW	DN 125	117,5
<b>MP 125 EL</b>	140	60	1 x 3 kW	DN 150	115,2
<b>MP 140 EL</b>	300	60	1 x 3 kW	DN 200	124,4
<b>MP 240 EL</b>	450	60	2 x 3 kW	DN 250	102
<b>MP 340 EL</b>	675	60	3 x 3 kW	DN 300	72
<b>MP 440 EL</b>	900	60	4 x 3 kW	DN 300	82,4

\* Contact us for other flow rates

\*\* The performance of these devices have been calculated at the end of the lamp life and with a transmission of 98%

### ADVANTAGES OF THE MP EL RANGE

- The MPEL range delivers 60 mJ at the end of the lamps' life in order to guarantee optimum dechloramination
- Treatment of high flow rates
- Reactors made from micro-bitted and passivated 316L stainless steel, high resistance to the corrosion
- Hydraulic «in line» inlet/outlet connections with nearly non-existent pressure loss
- High power medium pressure and multiwavelengths lamps for reducing the number of lamps installed

- High frequency electronic ballast
- Manuel quartz sleeve wiper system (automatic system in option)
- UV sensor with PLC for management of efficiency parameters (in option: remote management via a 4-20mA output) providing a continuous measurement of the UV-C radiance intensity and a control of all operation and maintenance parameters
- Temperature sensor within the electrical box and the reactor (in option), flow sensor
- Lamp life: 7,000 to 9,000 hours
- **MP EL Range: power regulation**

### HO SERIES REACTORS (Very High Output lamps)

Description	Max. flow rate in m <sup>3</sup> /h *	Performance in millijoules per cm <sup>2</sup> at actual recommended flow rates **	UV Lamp: Number Power consumption	Inlet/Outlet	Length of reactor in cm	Diameter of reactor in cm
<b>UV 3000 HO</b>	15	60	3 x 87 W	63 mm	95,2	15
<b>UV 3205 HO</b>	22	60	3 x 87 W	75 mm	98	20,5
<b>UV 4205 HO</b>	30	60	4 x 87 W	75 mm	98	20,5
<b>UV 5205 HO</b>	37	60	5 x 87 W	75 mm	98	20,5
<b>UV 6205 HO</b>	43	60	6 x 87 W	75 mm	98	20,5
<b>UV 6273 HO</b>	67	60	6 x 87 W	75 mm	101	27,3

\* Contact us for other flow rates

\*\* The performance of these devices have been calculated at the end of the lamp life and with a transmission of 98%

### ADVANTAGES OF HO RANGE

- The HO range delivers 60 mJ at the end of the lamps life's in order to guarantee optimum dechloramination
- Compact reactors made from mirror-polished 316L stainless steel for reasonable flow rates with very low pressure loss
- Optimized performance with UV-C lamps using state of the art technology with high-intensity (HO) performance
- Very long lamp life (13,000 hours depending on the number of switchings on)
- Dedicated electronic ballasts guaranteeing maximum UV efficiency of the lamps and integrated control
- Single-base lamps and patented sealing system for an easy maintenance
- Lamp operating indicator light for each lamp
- Inlet/outlet connections using unions supplied
- Maintenance: lamp change and cleaning of the quartz sleeve very quick and simple

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**BIO-UV, Technical Partner of the French Swimming Federation**

