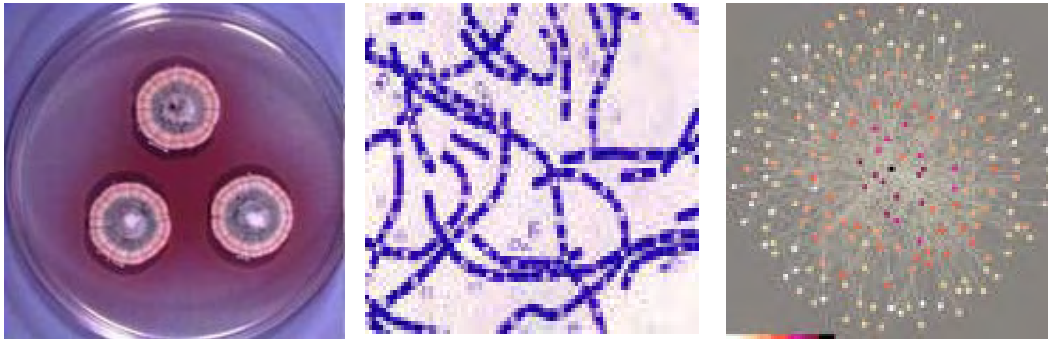


UV-c STERILIZERS FOR WATER TREATMENT

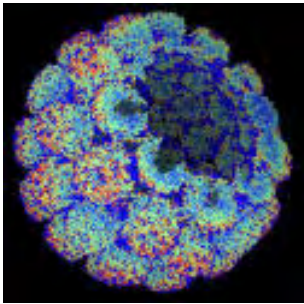


UVC TECHNOLOGY FOR DISINFECTING WATER

PRINCIPLE

Ultra violet rays emitted at 254 nm, generally known as UVC, are capable of destroying living micro organisms and notably bacteria, viruses, fungi and algae. UVC rays act directly on organisms' DNA.

THE ADVANTAGES OF UV



- A system that avoids the use of chemical products:
 - it is therefore ecological and has no impact on the environment,
 - it does not create harmful sub-products,
 - it enables compliance with the European Directives related to the use of biocides.
 - A physical active agent:
 - it does not modify the treated fluid's physico-chemical balance,
 - there is no risk of excess dosage,
 - no sub-products are formed.
 - It may be used in combination with other types of treatment without any constraints:
 - filtration,
 - softening and demineralisation,
 - inverse osmosis,
 - biological treatment,
 - combination of H₂O₂/UV and ozone/UV.
 - Investment and maintenance costs are low:
 - easy installation,
 - maintenance is limited to cleaning and UVC ray lamp replacement.
-

APPLICATIONS

- Drinking water
- Industrial process water:
 - foodstuffs,
 - pharmaceuticals,
 - cosmetics,
 - glassmaking.
- Water for technical applications:
 - cooling water,
 - swimming pools,
 - air conditioning and fine spraying,
 - farm fish.
- Maintaining quality of stored water.

DETAILS ON TREATMENT BY ULTRA VIOLET LIGHT

UV DOSAGE

The UV dose corresponds to the UV energy that a living micro-organism has to absorb in order to be destroyed.

The table below presents the UV doses required to kill 99.9% of micro-organisms. (those are only examples).

BACTERIA

Aeromonas	3620	Proteus vulgaris	6600
Agrobacteria tumefaciens	8500	Pseudomonas aeruginosa (lab. strain)	3900
Bacillus anthracis	8700	Pseudomonas aeruginosa (env. strain)	10500
Bacillus magaterium (vegetative)	2500	Rhodospirillum rubrum	6200
Bacillus magaterium (spores)	52000	Salmonella enteritidis	7600
Bacillus subtilis (vegetative)	11000	Salmonella paratyphi	6100
Bacillus subtilis (spore)	58000	Salmonella typhimurium	15200
Ceratomyxa shasta	30000	Salmonella typhosa	6000
Clostridium tetani	22000	Saprolegeria hyphae	10000
Corynebacterium diptheriae	6500	Sarcina lutea	26400
Esherichia coli	7000	Serratia marcescens	6200
Legionella bozemanii	3500	Shigella dysenteria	4200
Legionella dumoffii	5500	Shigella flexneri	3400
Legionella gormanii	4900	Shigella sonnei	7000
Legionella longbeachae	2900	Staphylococcus epidermidis	5800
Legionella micdadei	3100	Staphylococcus aureus	7000
Legionella pneumophila	3800	Streptococcus faecalis	10000
Leptospira interrogans	6000	Streptococcus hemolticus	5500
Mycobacterium tuberculosis	10000	Streptococcus lactis	8800
Neisseria catarrhalis	8500	Viridans streptococci	3800

Mold spores

Mucor ramosissimus	35200
Penicillum expansum	22000
Penicillum roqueforti	26400

Algae

Chlorella vulgaris	22000
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Viruses

Bacteriophage	6600
Hepatitis virus	8000
Influenza virus	6600
Poliovirus	21000
Rotavirus	24000

APPLICABLE REGULATIONS

The circular DGS/PGE/1D n°52 issued by the Ministry of Health on 19th January 1987 governs the use of ultra violet rays for disinfecting water destined for human consumption.

This circular stipulates the conditions for:

- UV sterilizer design (wavelength, dose, control system),
- Installation and sizing of systems (transmittance analyses, physico-chemical and bacteriological analyses),
- System maintenance and surveillance.

UV sterilizers are equally subject to EC standards for:

- Electrical appliance security.
 - Electromagnetic compatibility.
-

COMPLIANCE

All our UV sterilisers comply to the very highest and strictest standards:

- Circular DGS/PGE/1D n°52
 - EC
-

SANIPRO, YOUR PARTNER FOR YOUR UV PROJECTS

AN INNOVATIVE GROUP

SANIPRO is specialised in UVC technologies. The Group contains all the skills required for the development of innovative UV solutions in the fields of water, air and surface treatment.



**PRODUCT
RANGES
ADAPTED TO
YOUR
REQUIREMENTS**

We have developed a full range of UV sterilizers that reply to our clients' requirements in numerous fields of application:

- Domestic use,
 - Industrial process water,
 - Drinking water,
 - Industrial water for technical use,
 - Effluents.
-

**CUSTOMISED
PRODUCTS**

- In/out diameters as per request.
 - S bend I/O connections.
 - Electro-polish or micro-blasting finish.
 - Reactors made to measure, notably for easy replacement of existing sterilizers.
 - Development of specific UV applications.
-

**A HIGH LEVEL OF
SERVICES**

- Spare parts delivered within 24 hours.
- Fast UVc transmittance analyses.
- Preparation of pre-installation specifications and technical surveys.
- Technical and sales support on the field.
- After sales technical assistance.

THE ADVANTAGES OF OUR UV STERILISERS

DESIGN AND MANUFACTURE

Our UV sterilisers are designed and produced using state of the art technologies:

- Computer Aided Design and Manufacture,
 - Laser cutting,
 - Soldering under a controlled atmosphere.
-

RELIABILITY

High quality finish and reassuring reliability:

- Mirror polished reactors,
 - Industrial quality electrical units,
 - Exclusive use of mono-base, high yield lamps,
 - Ballast is electronic without starter and do not heat,
 - All components are of the highest quality and tested.
-

INSTALLATION

Installation is fast and easy:

- Our reactors are of vertical design,
 - Compact size,
 - Reactors and electrical units are delivered pre-wired,
 - An upper purge cap enables air removal when placed in the water.
-

MAINTENANCE

Maintenance has been made simple:

- The reactors are designed to enable 100% emptying,
- Lamps can be changed without stopping the water flow,
- An exclusive proofing system prevents any risk of breaking the quartz tube or of leaks.

DBP SERIES: UVc sterilizers for the production of domestic and light industrial drinking water

APPLICATIONS



- Domestic water
- Mains water after dechlorination on active carbon
- Light industrial requirements



FLOW RATES

0.5 to 3.5 m³/hour

Giving a dose of 40 mJ/cm² at the least effective spot and transmittance of 98%.

CHARACTERISTICS

- Reactor: micro-polished 316L stainless steel.
- Male threaded joints.
- Linear in/out with flow limiter...
- Low pressure UV lamp, 33 and 60W.
- Electronic ballast without starter.
- Lamp operating indicator lights.
- Hour counter.
- Fuse protection.
- On/Off switch.
- Option: selective UV sensor at 254 nm plus control monitor.

TECHNICAL DATA

Designation	Flow	UV lamps	Joint	Diameter
UV F16	0,7 m ³ /h	1 x 16 W	3/4"	63 mm
UV F33	1,4 m ³ /h	1 x 33 W	3/4"	63 mm
DBP2	2,5 m ³ /h	1x 33W	3/4"	90 mm
DBP3	3,4 m ³ /h	1x 60W	3/4"	90 mm

IBP SERIES: UV sterilizers for drinking water and industrial process water production

APPLICATIONS



- Drinking water for small groups
- Industrial process water
- Diverse technical uses



FLOW RATES

From 3 to 75 m³/hour

Giving a dose of 40 mJ/cm² at the least effective spot and transmittance of 98%.

CHARACTERISTICS

- Reactor: micro-polished 316L stainless steel.
- Male threaded joints.
- 100% valve for emptying.
- Low pressure UV lamp, 36 and 75W.
- Electronic ballast without starter.
- Lamp operating indicator lights.
- Lamp alarm and alarm contact indicator.
- Digital hour counter with reset function.
- Option: selective UV sensor at 254 nm plus control monitor.

TECHNICAL DATA

Designation	Flow	UV Lamps	Joint	Diameter
IBP 10	3,2 m3/h	1x 36W	1"	90 mm
IBP 10HO	4,6 m3/h	1x 75W	1"	90 mm
IBP 20	5,7 m3/h	1x 36W	1"1/2	150 mm
IBP 30HO	8,0 m3/h	1x 75W	1"1/2	150 mm
IBP 2150 HO	13 m3/h	2x 75W	2"	150 mm
IBP 3150 HO	22 m3/h	3x 75W	2"	150 mm
IBP 4205 HO	39 m3/h	4x 75W	2"1/2	205 mm
IBP 5205 HO	54 m3/h	5x 75W	2"1/2	205 mm
IBP 10 AM	8,5 m3/h	1x120W	1"	90 mm
IBP 30 AM	15 m3/h	1x120W	1"1/2	150 mm
IBP 2150 AM	25m3/h	2x120W	2"	150 mm
IBP 3150 AM	41m3/h	3x120W	2"	150 mm

IAM SERIES: UV Sterilizers for the production of drinking water for communal use (A.E.P)

APPLICATIONS



- Drinking water networks
- Industrial water requiring high UV doses or low transmittance.



FLOW RATES

From 9 to 300 m³/hour
 Giving a dose of 40 mJ/cm² at the least effective spot and transmittance of 98%.

CHARACTERISTICS

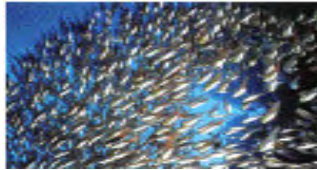
- Reactor, mirror polished 316L stainless steel.
- Flange joint.
- 100% valve for emptying.
- Low pressure, high yield UV lamp.
- Electronic ballast without starter.
- Lamp operating indicator lights.
- Lamp alarm and alarm contact indicator.
- Digital hour counter with reset function.
- Selective UV sensor at 254 nm plus control monitor with display of UV intensity and with 4-20mA connectors for remote management.

TECHNICAL DATA

Designation	Flow	UV Lamps	Joint	Diameter
IAM 1090/120	8,5 m3/h	1x 120W	DN65	90 mm
IAM 1150/120	15 m3/h	1x 120W	DN80	150 mm
IAM 2205/120	41 m3/h	2x 120W	DN100	205 mm
IAM 3273/120	80 m3/h	3x 120W	DN150	273 mm
IAM 1150/300	26 m3/h	1x 300W	DN80	150 mm
IAM 2273/300	95 m3/h	2x 300W	DN150	273 mm
IAM 3273/300	150 m3/h	3x 300W	DN150	273 mm
IAM 4273/300	200 m3/h	4x 300W	DN200	273 mm
IAM 5273/300	250 m3/h	5x 300W	DN200	273 mm

PEHD SERIES: UV sterilizers for treating corrosive water

APPLICATIONS



- Sea water
- Brackish water
- Corrosive water



FLOW RATE

From 5 to 80 m3/hour

Giving a dose of 33 mJ/cm² at the least effective spot and transmittance of 85%.

CHARACTERISTICS

- Reactor : HD polyethylene
- Flange joints.
- 100% valve for emptying.
- Low pressure, high yield UV lamp.
- Electronic ballast without starter.
- Lamp operating indicator lights.
- Lamp alarm and alarm contact indicator.
- Digital hour counter with reset function.

TECHNICAL DATA

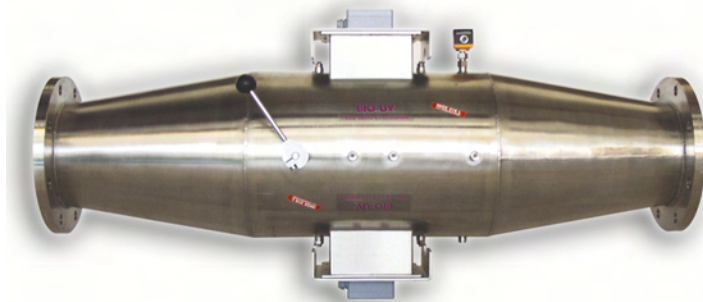
Designation	Flow	UV Lamps	Joint	Diameter
PE 1160 HO	5 m3/h	1x 75W	DN 75	160 mm
PE 2160 HO	10 m3/h	2x 75 W	DN 75	160 mm
PE 3160 HO	20 m3/h	3x 75 W	DN 75	160 mm
PE 4250 HO	30 m3/h	4x 75W	DN 90	250 mm
PE 5250 HO	40 m3/h	5x 75W	DN 90	250 mm
PE 6250 HO	50 m3/h	6x 75W	DN 90	250 mm
PE 4250 AM	60 m3/h	4x 120W	DN 90	250 mm

MP SERIES: UV sterilizers for the treatment of effluents and industrial technical water

APPLICATIONS



- Industrial waters requiring high UV doses
- Purified waste water



FLOW RATES

80 to 2000 m³/hour
 Giving a dose of 60 mJ/cm² at the least effective spot and transmittance of 98%.

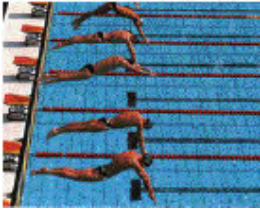
CHARACTERISTICS

- Reactor: mirror polished 316L stainless steel.
- Flange joint.
- Manual or automatic quartz tube cleaning system.
- Medium pressure, high intensity UV lamp.
- Lamp operating indicator lights.
- Lamp alarm and alarm contact indicator
- Digital hour counter with reset function.
- Selective UV sensor at 254 nm.
- Control monitor.

TECHNICAL DATA

Designation	Flow	UV Lamps	Joint	Diameter
MP100	80 m ³ /h	1 x 1 KW	DN125	273 mm
MP125	140 m ³ /h	1x 2,5 KW	DN150	273 mm
MP140	280 m ³ /h	1x 4 KW	DN200	355 mm
MP240	450 m ³ /h	2x 4 KW	DN250	355 mm
MP340	675 m ³ /h	3x 4 KW	DN300	355 mm
MP440	900 m ³ /h	4x 4 KW	DN300	355 mm

PUBLIC Swimming pool & SPA :



- allow to reduce chloramine at least of 50%.
- Saving on water renewal.
- Water and environment more healthy and comfortable.



FLOW RATES

80 to 2000 m³/hour

Giving a dose of 60 mJ/cm² at the least effective spot and transmittance of 98%.

CHARACTERISTICS

- Reactor: mirror polished 316L stainless steel.
- Flange joint.
- Manual or automatic quartz tube cleaning system.
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TECHNICAL DATA

Designation	Flow	UV Lamps	Joint	Diameter
MP100	80 m3/h	1 x 1 KW	DN125	273 mm
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MP140	280 m3/h	1x 4 KW	DN200	355 mm
MP240	450 m3/h	2x 4 KW	DN250	355 mm
MP340	675 m3/h	3x 4 KW	DN300	355 mm
MP440	900 m3/h	4x 4 KW	DN300	355 mm

Aquarium and ornamental basin:



Our range of sterilizers treat from 0.5 to 500 m³/h and play the function of clearer and guarantee a healthy water for the respect and the health of the aquatic fauna and flora.



Prevention of air transmission disease (i.e. legionnaire's disease):



In big buildings with central A/C or in the sanitized hot water network, the sterilizers adapted with flow rates and with the temperature can secure all the installations from disease spreadings.



Surface treatment:



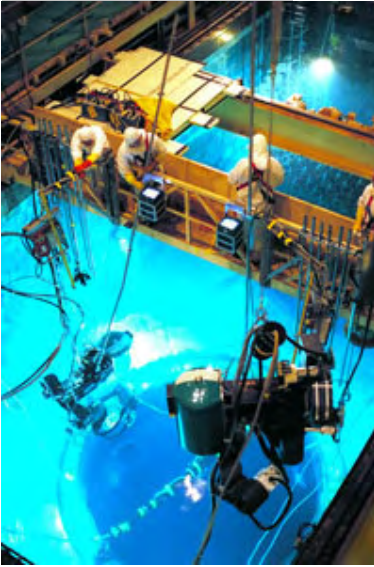
On request, our design department will concept some specific reactors that will answer to the industry needs (agro-aliment, food processing, medical, pharmaceuticals, cosmetic, etc ...)

SNOW GUN:



Assembled on snow gun, the UV sterilizers guarantee the good functioning of the machines and as well the safety from pollution (bacteria, virus, algae, ...) of the underground spring waters and of the ground, at the time of melting of snow.

Nuclear Central:



In order to maintain water deprive of algae and microorganism without the use of corrosive chemical products.

Boat & desalinization plant:



Used for desalt plant and systems and as well for inverse osmoses system (UV protect the membranes from the micro-organism aggressions).

The range:

Today, we have built many types of sterilizers. The sterilizers in INOX 316L or in PEHD (special plastic for corrosive environment), are capable to treat from 0.2 up to 2000 m³/hour (soon up to 4000 m³/h).

Built with lamps of the latest technology (low pressure lamps – high intensity – “amalgame” – from medium to high pressure), electronic ballast, flow organization, they guarantee an optimal efficiency at the requested flow rate for each type of application.

Are as well available some optional and auxiliary equipment:

- Selective UV sensor for the measurement of the radiation,
- Control of the lamp intensity modification with alarm,
- Manual or Automatic cleaning of the quartz casing,
- Specific input and output (even tailor made),
- Automatic Regulator of the pH, tH and TAC,
- Additional chemical products (as active oxygen, choc...),
- etc....

SECURITY AND CONTROL OF UV TREATMENT

LAMP OPERATIONAL CONTROL

All our UV sterilisers are equipped with an indicator showing the operating status of the UV lamps.

Our electrical units can be fitted with a red light to indicate lamp defects and a dry contact to communicate the fault.

UV INTENSITY MONITORING

Our reactors can be equipped with a selective UV sensor at 254 nm.

The sensor is connected either to:

- an LED display monitor and dry contact for communicating the information,
- an LCD UV intensity display monitor with 4-20mA output for remote management.



LAMP LIFE DURATION CONTROL

Our electrical units are equipped with a digital hour counter with reset function. The end of a lamp's working life is indicated by visual display and a dry contact is available to the UV control monitor.

CUSTOMISATION

Joints

Brides, Clamp, SMS...

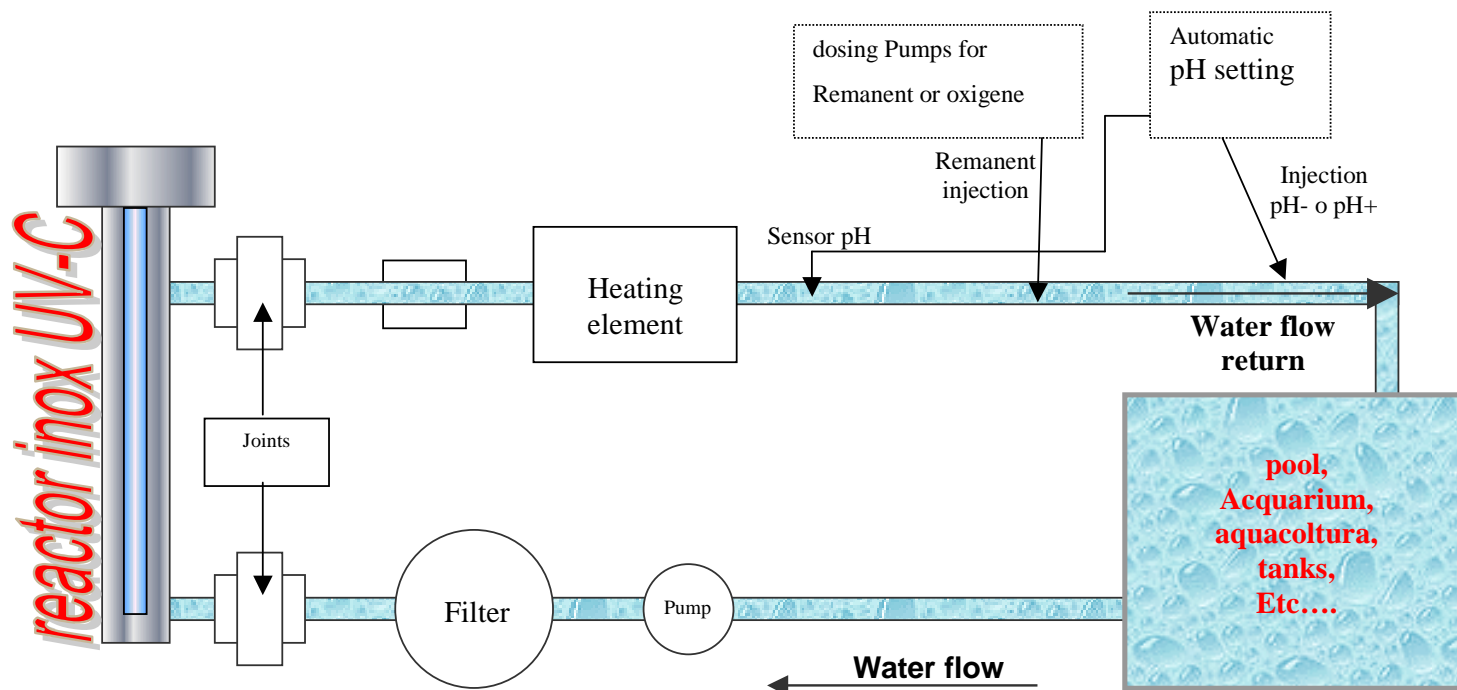
Emptying

Standard or flame sterilised valves

Finish

Electro-polishing

Example of installation



Disegni e brevetti registrati

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