ETS-UV WAFER™ UV DISINFECTION GENERATOR

NEW PRODUCT RANGE DESIGNED SPECIFICALLY FOR THE AQUATICS INDUSTRY

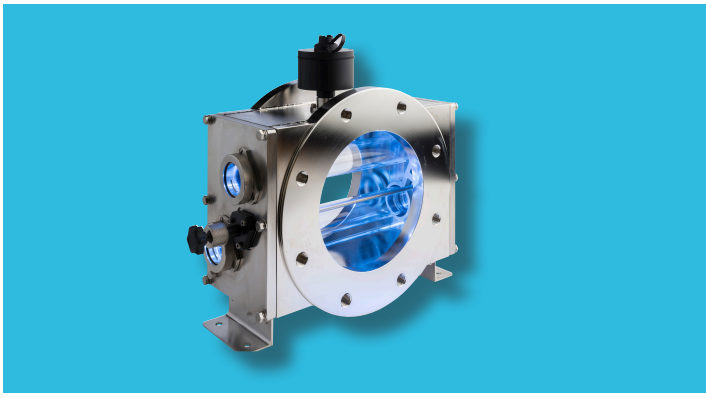
The Wafer™ generator differs from any other UV generator currently on the market, with a unique UV chamber that offers the most compact UV disinfection generator available today. At about one third of the size of comparative UV offerings, and with a significantly reduced maintenance envelope, the Wafer generator delivers an easy to install and retrofit solution that will fit the tightest of mechanical rooms.

Not only does the Wafer UV generator represent the most compact UV solution available on the market, it features a hydraulically optimized generator design and leading polychromatic lamp technology, making it one of the most efficient and highest performing generators as well. The Wafer generator is designed to provide 99.9% inactivation of chlorine-resistant microorganisms such as Cryptosporidium and Giardia.

Operators will also benefit from the inclusion of the Spectra control system as standard, which includes a wide range of features such as a data stream monitoring, process interlocks and programmable set points. A key Spectra control feature includes variable power stepping from 100% to 35% at no extra cost, allowing operators to optimize the operational power of their system to match bather loads and pool operating schedules.

In addition, the Spectra controller features a reactive boost function that automatically operates the lamps at maximum power from a combined chlorine alarm signal, when teamed with a suitable chlorine controller. This is a feature specifically designed for swimming pool applications to break down problematic chloramines as soon as they are detected, significantly improving water quality and eliminating the cause of strong chemical smells, red burning eyes, itchy skin and natatorium corrosion.

THE WAFER UV DISINFECTION GENERATOR OFFERS A COMPACT UV TREATMENT SOLUTION FOR CAPABILITIES OF 50 M^3/HR - 700 M^3/HR IN A SINGLE HIGH OUTPUT UV GENERATOR



PERFORMANCE AND INSTALLATION

- Smaller installation footprint
- Horizontal or vertical installation
- More efficient and enhanced power control
- Higher performance
- Simpler & faster to maintain
- Increased safety
- Ethernet, Modbus® and Profibus®

6 Jefferson Drive, Coventry, RI 02816

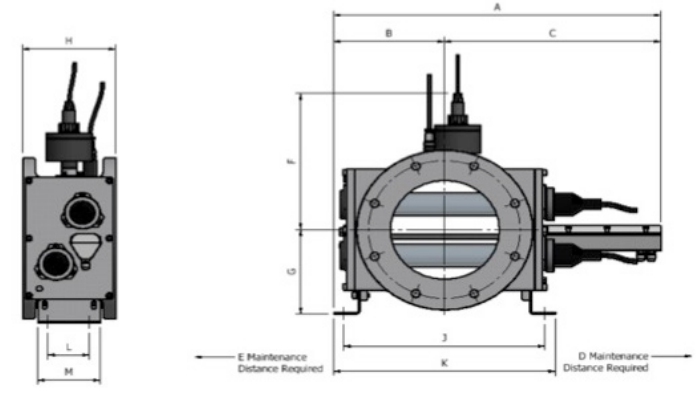
+1 (800) 832-8002 (toll-free) **+1 (401) 821-2200** (toll) **www.evoqua.com/neptune-benson**

Neptune-Benson
EVOQUA

ETS-UV™ DISINFECTION GENERATOR TECHNICAL DATA SHEET

WF WAFER 1- 4 LAMP MEDIUM PRESSURE UV SYSTEMS

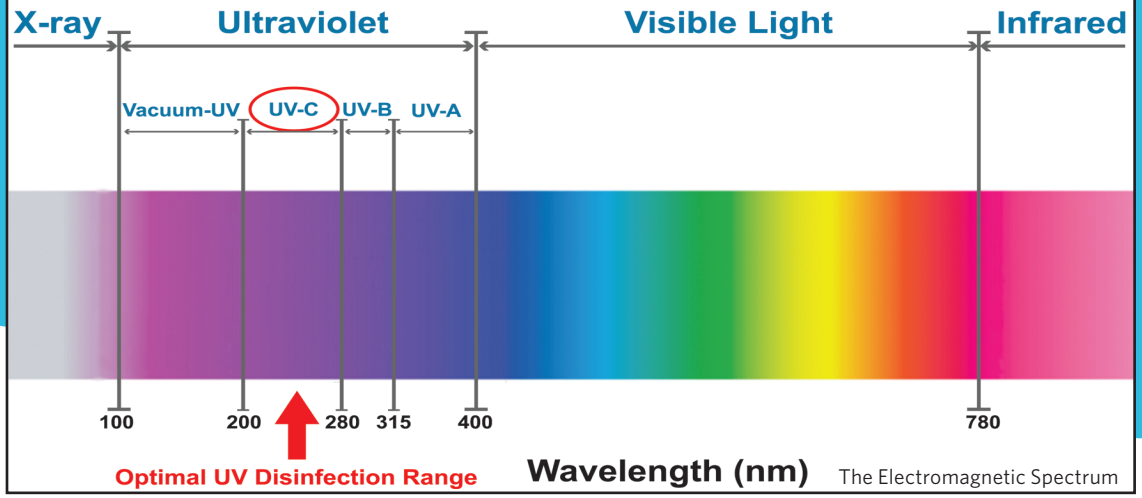
KEY FOOTPRINT DIMENSIONS



UV GENERATOR	WF-115-3	WF-115-4	WF-125-6	WF-215-6	WF-215-8	WF-225-8	WF-230-10	WF-430-12
Certification	CE Marked, NSF-50							
Approvals	MET UL							
CHAMBER SPECIFICATION								
Lamp Power Range (kW)	0.45 - 1.5	0.45 - 1.5	0.75 - 2.5	0.45 - 1.5	0.45 - 1.5	0.75 - 2.5	0.90 - 3.0	0.9 - 3.0
Lamp Number	1	1	1	2	2	2	2	4
Lamp Life	9,000 Hours							
Lamp Design	TWISTLOK´ Quick Release, Enhanced Safety - Medium Pressure							
Lamp Nom. V	200V		330V	200V		330V	400V	
Lamp Nom. I	7.5A							
UV Monitoring	AT-900 - ONorm Validated Probe							
Number of Sensors	1							
Variable Power	100% to 30% Power (Automatic Dose Pacing)							
Connection Size (mm/inch)	DN 80/3"	DN 100/4"	DN 150/6"	DN 150/6"	DN 200/8"	DN 200/8"	DN 250/10"	DN 300/12"
Connection Type	USA (ANSI 150) / RoW (EN1092-1-BS4504)							
Design Pressure	10 Barg Design (15 Barge Test)							
Material Construction	316L Stainless Steel							
Internal / External Finish	Electropolished							
Internal Surface Finish	3.2 Ra							
Lamp and Wiper Access	Single Ended Access							
Mounting	Fixed Brackets							
Wiper System	Automatic Wiper System							
Temperature Probe	AT-487 (PT-100)							
Vent Port	USA (1/2" NPT) / RoW (1/2") Air Release Valve Supplied for Horizontal Installations							
Drain Port	USA (1/4" NPT) / RoW (1/4" BSP)							
Sacrificial Anode	USA (1/2" NPT Included) / RoW (None)							
Ingress Protection	IP 55							
Installation	Horizontal or Vertical (Lamps Must be Horizontal)							
PANEL SPECIFICATION								
Design	Epoxy Coated Mild Steel - RAL 7035							
Control Type	Microprocessor							
Ingress Protection	IP54							
Ventilation	Forced Air Cooled (Fan)							
Interface	Spectra Membrane							
Communication	Modbus (RS-422 / RS-485)							
Lamp Power Supply	3.5kW MP Ballast		3.5kW MP Ballast Heat Sink				4kW MP Ballast	
Number of Ballasts	1					2		4
Power Consumption	1650	1650	2750	3300		5500	6600	13200
1Ph 208V	x	x	x	x	x	x		
1Ph 220V	x	x	x	x	x	x		
1Ph 230V	x	x	x	x	x	x		
1Ph 240V	x	x	x	x	x	x		
3Ph 380V							x	x
3Ph 400V							x	x
3Ph 415V							x	x
3Ph 480V							x	x
Frequency	50 Hz / 60Hz							
Protection	Door Locked MCCB Isolator							
Operation Temperature	Max Working Ambient +45°C							
Digital Inputs	Remote Start/Step +2 x Selectable Inputs (Boost / Low Power / Process Interlock)							
Digital Outputs	2 x Selectable Outputs (System Ready/Critical Alarm/Temp Alarm/Dose Healty/System Running/System Ready Remote/Break Glass)							
Analogue Inputs	1 x Selectable Input (Flow Rate / UVT)							
Lamp Cable	OLFLEX® CLASSIC 135 CH							
Panel Options	Spectra 7" Touch Screen HMI							

UV GENERATOR	WF-115-3	WF115-4	WF-125-6	WF-215-6	WF-215-8	WF-225-8	WF-230-10	WF-430-12
Chamber Dimensions								
A (inches)	20.3	20.3	24.8	24.8	24.8	24.8	31.0	31.0
B (inches)	6.2	6.2	8.4	8.4	8.4	8.4	11.9	11.9
C (inches)	14.1	14.1	16.4	16.4	16.4	16.4	19.1	19.1
D (inches)	14.4	14.4	18.9	18.9	18.9	18.9	24.4	24.4
E (inches)	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
F (inches)	9.0	9.0	11.4	11.4	11.4	11.4	12.5	13.5
G (inches)	4.8	4.8	7.0	7.0	7.0	7.0	9.1	10.1
H (inches)	6.2	6.2	7.0	7.0	7.0	7.0	7.4	7.4
J (inches)	10.7	10.7	15.2	15.2	15.2	15.2	21.8	21.8
K (inches)	12.3	12.3	16.8	16.8	16.8	16.8	23.8	23.8
L (inches)	3.1	3.1	3.1	3.1	3.1	3.1	5.5	5.5
M (inches)	4.7	4.7	4.7	4.7	4.7	4.7	7.0	7.0
Dry Weight (lbs)	60	57	126	128	117	117	172	194
Wet Weight (Lbs)	66	62	148	150	141	141	218	247
CONTROL PANEL								
Width (inches)	20	20	23	23	23	23	23	31
Height (inches)	20	20	23	23	23	23	31	39
Depth (inches)	10	10	12	12	12	12	12	12
Weight (lbs)	66	66	77	77	77	88	<165	<165
Standard Cable (feet)	16							
Max Cable Length* (feet)	92	92	92	46	46	92	92	92

*It may be possible to extend the cable length beyond the figures given, if this is required please contact us for details



The Electromagnetic Spectrum

WHAT IS UV DISINFECTION?

WHAT IS ULTRAVIOLET LIGHT?

Ultraviolet (UV) light is energy within the electromagnetic spectrum that has shorter wavelengths than that which are visible to the human eye. UV light is a range of electromagnetic waves from 100 to 400 nanometers (between x-ray and visible light). The division of UV light is classified as Vacuum UV (100-200 nm), UV-C (200-280 nm), UV-B (280-315 nm) and UV-A (315-400 nm). The energy waves provided in the UV-C spectrum demonstrate germicidal efficiencies that provide highly effective disinfection.

HOW UV DISINFECTION WORKS

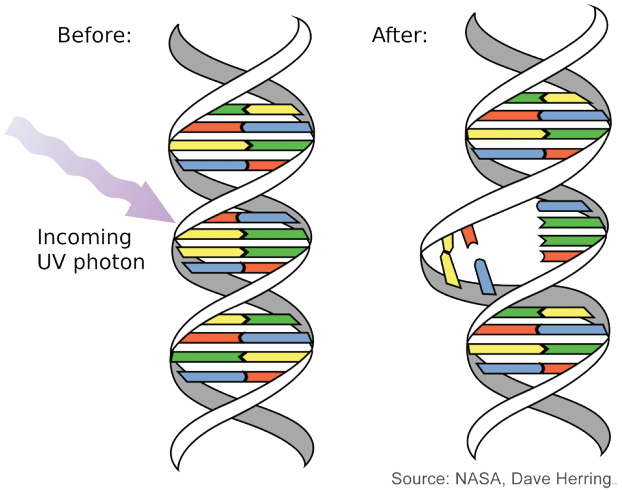
UV light provides effective inactivation of microorganisms such as bacteria, viruses, molds and other pathogens without the use of chemicals. UV light works by causing permanent damage to the DNA or RNA found in all living species. Once the DNA becomes damaged, or dimerized, the organism, such as Cryptosporidium, is unable to carry out the routine cell functions of respiration, the assimilation of food and replication. Once the cell is rendered non-viable the organism quickly dies.

UV is used for disinfection and is also used for removal of organic and inorganic contaminants, including chlorine, ozone and Total Organic Carbon (TOC). UV used in conjunction with an Advanced Oxidation Process (AOP) can remove Compounds of Emerging Concerns (CEC's), Synthetic Organics (SO's), Endocrine Disruptor Compounds (EDC's) and Personal and Pharmaceutical Care Products (PPCP's), as well as various taste and odor compounds from water.

ADVANTAGES OF UV DISINFECTION

- Requires no storage, handling, or transportation of toxic or corrosive chemicals for disinfection*
- Effective at inactivating a wide range of microorganisms including chlorine tolerant pathogens such as Cryptosporidium
- Can be used in Advanced Oxidation Process (AOP)

* UV lamps may contain mercury which requires special handling procedures.



Source: NASA, Dave Herring

WHY ETS-UV™ GENERATORS?

INDUSTRY LEADING TECHNOLOGY

Evoqua continues their strong commitment to solve the water treatment challenges faced by customers. ETS-UV™ disinfection systems are highly efficient, easy to maintain, and offer a flexible design with a small footprint. Our years of experience and in-depth expertise are at the core of our success. Our engineers utilize a wide variety of models and emulation tools to design superior water treatment solutions.

Safety

- Closed vessel UV, no open water source
- Reduced UV exposure

Compact Footprint, Easy Installation

- Lower installation costs which allows for quicker and easier installation
- Provides solutions for new installations or retro fit
- Flexibility of installation either horizontally or vertically to accommodate the most challenging footprint restrictions

Reduced Maintenance

- Wiping mechanism is external to the water
- Wiper rings can be replaced without removing wiping carriage from chamber
- Individual lamp and sleeve replacement offers a twist and lock connection
- Access hatch available on many models

VALIDATED SYSTEMS

Many ETS-UV generators have been validated per rigorous industry specific standards.

Some of our Validations or Approvals Include:

- Validation for drinking water per USEPA UVDGM & NSF/ANSI Standard 61
- Validated to the 2003 and 2012 NWRI Reuse Guidelines
- Certain models meet the requirements under the Model Aquatic Health Code for recreational water
- Meets the requirements in the FDA's Grade A Pasteurized Milke Ordinance (PMO) for UV pasteurized equivalent water in dairy facilities

Applications

- Industrial (food processing, HVAC, oil & gas)
- Municipal (drinking water, wastewater, water reuse)
- Recreational water (water parks, splash pads, pools, spas)

GET THE MOST OUT OF YOUR SYSTEM WITH SPECTRA TOUCH CONTROLLER

SOLUTIONS BUILT FOR YOUR MARKET NEEDS

The ETS-UV™ system controller offers multiple levels of operation from basic controls to full plant system integration. Existing systems can be upgraded.

Easy to Use

The Spectra Touch Controller displays through a 7" non-glare touch screen and offers simple push button operation paired with on screen menus to make operation quick and easy.

Remote Monitoring and Control

The Spectra Touch Controller provides remote monitoring, email notifications of condition changes and remote control of the system operations. Performance checks can be done remotely through a web browser or phone.

Data Logging and Exporting

The Spectra Touch Controller continually logs data providing detailed information on UV intensity, flow rate, faults and more. Data can be viewed remotely and is exportable to .CSV formats for creating reports and working with the data.

Improve Efficiency

The data provided through the Controller can be used to analyze trends and modify operations to maximize efficiency. Data logs can also be used to help troubleshoot by identifying operating issues.

Variable Power Control

Provides consistent precision performance and optimizes energy use.

Web Based Monitoring

- Ethernet & WiFi connectivity
- Data logging accessible on website
- Trend data recorded on website
- View usage patterns and predict service requirements
- Monitor and view current status
- Monitor lamp usage, track hours and strikes
- Review recent alarms and advice on solutions
- Owner can assign operators or regulators access

ETS-UV generator - ECF model with Spectra Touch Controller inside a NEMA 4X panel