

INDUSTRIAL UV SYSTEMS

# OptiVenn™ Series

High performance, cost-effective system for stringent Industrial applications

 Aquafine™





\*Images are for reference purposes

## Redefining Flexibility, Reliability and Robustness for Industrial Ultraviolet (UV) Water Treatment.

The OptiVenn Series is a family of robust and flexible UV Systems with advanced technology designed to meet the stringent requirements of Pharmaceutical, Food & Beverage, Microelectronics and other Industrial Markets.

The treatment chamber is constructed of 316L SS with two finish options. The control panel is constructed of 304 SS and is equipped with a Universal Controller which provides control, monitoring and operational information in a single convenient location.

The treatment chamber and control panel are extremely compact, yet offer flexibility of installation to accommodate into different skid designs or as a stand-alone UV System.

**MARKETS:** Food & Beverage, Life Sciences, Microelectronics, and General Industrial Applications

**APPLICATIONS:** Disinfection, Ozone Destruction, Chlorine Destruction and TOC reduction

## Introducing Aquafine OptiVenn

### **Compact Footprint.**

Optimized chamber design and multiple lamp arrays enable cost-effective installation in extremely compact spaces.

### **Proven, Robust Components.**

UV sensors, lamps, drivers and panels have demonstrated reliability worldwide in thousands of installations.

### **Flexible Panel Installation.**

All stainless steel control panels provide maximum installation flexibility and are able to be mounted in different locations such as on the chamber or remotely to adapt to stringent space requirements.

### **Compact Chamber Design.**

The configurable treatment chamber makes it easy to fit the UV System into small spaces and tight pipe networks. The cylinder can be rotated to allow inlet and outlet connections at 4 different angles.

### **User-friendly Human Machine Interface (HMI).**

Intuitive interface enables at-a-glance system status checks.

### **Improved Lamp Technology.**

Low-pressure high-output lamp (LPHO) technology provides increased process performance and extended lamp life.

### **Delivering Water Confidence and Comprehensive Warranty.**

Aquafine UV Systems include a Lifetime Performance Guarantee and industry-leading warranties for systems and parts.

### **Global Support. Local Service.**

A comprehensive network of certified service providers offer fast response for spare parts and service.

## Ultraviolet (UV) Technology in Your Treatment Process

Ultraviolet (UV) light is a versatile, reliable, chemical-free approach to address numerous requirements in industrial water treatment.

### UV for Broad-based Disinfection

- Inactivates bacteria, viruses and chlorine-resistant protozoa
- 254 nm UV penetrates the cell wall of microorganisms, attacking DNA genetic material and preventing replication
- Chemical-free process; No carcinogenic disinfection by-products are created, and no transportation, storage or handling of toxic or corrosive chemicals is necessary

### UV for TOC Reduction

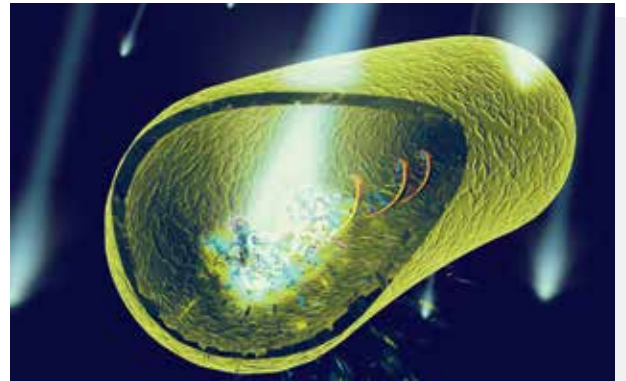
- 185 nm UV at a minimum dose of 90 mJ/cm<sup>2</sup>\* creates powerful hydroxyl radicals that oxidize total organic carbon (TOC) molecules
- UV can be used together with Deionization (DI) and Reverse Osmosis (RO) to reduce TOC to levels below 1.0 ppb

### UV for Ozone Destruction

- Residual ozone (O<sub>3</sub>) is efficiently removed by UV at a wavelength of 254 nm
- Ozone absorbs the UV energy and quickly breaks down to dissolved oxygen (O<sub>2</sub>)
- Typically 1.0 ppm of ozone can be reduced to less than 0.1 ppm with a UV dosage of 90 mJ/cm<sup>2</sup>

### UV for Chlorine Reduction

- Free chlorine residuals up to 2.0 ppm can be successfully destroyed by the application of UV light
- Reduces carcinogenic by-products and is an environmentally-friendly form of disinfection
- Lower maintenance costs compared to carbon beds or chemical injections



UV light attacks the microorganisms genetic material (DNA) preventing replication and infection.

## Aquafine Performance Guarantee and Support

As an added incentive to keep your Aquafine equipment operating at its optimum level, Aquafine provides a Lifetime Performance Guarantee for the equipment. A Lifetime Performance Guarantee means that the UV system will achieve the targets for which it was designed and sized on the original sales order of the equipment, which considers operational parameters such as UVT of the fluid, maximum flow rate, operating pressure, fluid temperature, among others.

A Lifetime Performance Warranty will only be applicable with the use of genuine OEM replacement parts. This guarantee is valid for the life of the equipment and it is available for both new and existing equipment when applicable conditions are met.

Customer support is available from our Authorized Distributor Network and from our 24/7 Technical Service Group. For questions regarding your application needs, please contact your local Authorized Distributor or Aquafine for more information.



\*Required dose may vary depending on application. Please contact Aquafine for proper sizing.

# System Design

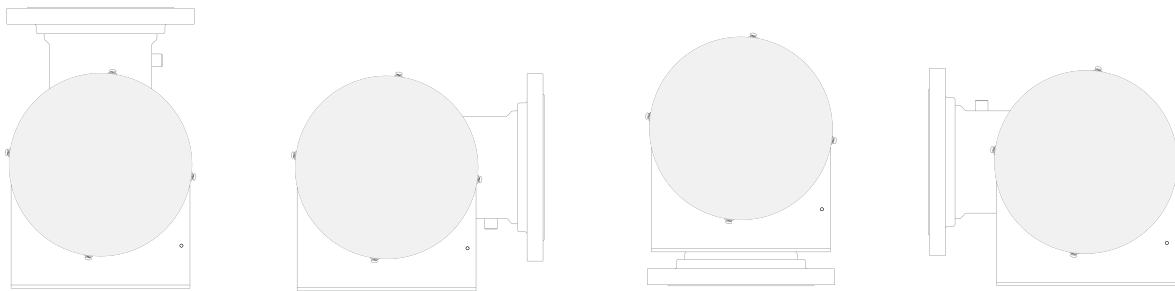
## Flexible Treatment Chamber Requires Less Space

### Benefits:

- An internal baffle and an anti-vibration mechanism optimize treatment performance, support quartz sleeves and ensure reliable system performance even at high flow rates.
- The UV System can be installed with the chamber easily rotated to one of 4 different angles (12, 3, 6 and 9 o'clock position). No special customization is required.
- The flexible chamber, enabling rotation, reduces pipework, elbows, space and installation costs
- Inlet and outlet connections are always at the same angle



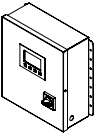
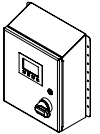
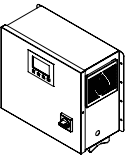
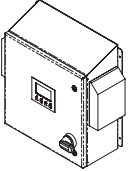
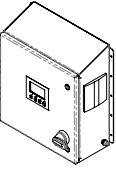
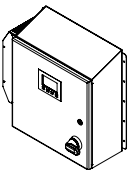
Chamber with panel mounted on the front and connections rotated to the back



## Universal Control Panel Provides Installation Flexibility

### Benefits:

- All UV Systems have a stainless steel control panel designed to provide maximum installation flexibility and fit within stringent space requirements.
- All control panels are compliant with the following electrical codes: cULus (Canada, USA), CE (Europe)

|  | Standard Control Panel   |  | Optional Control Panel   |   |
|--|--|--|--|---|
| <b>Systems with 4 lamps or less</b><br>Shape | Stainless Steel<br>UL Type 1 (IP51)<br>No need for fan or A/C<br>Flat Top<br>Mount on chamber or remotely* |  <span style="background-color: #4a86e8; color: white; padding: 2px 5px;">SMALL</span>  | Stainless Steel<br>UL Type 4X (IP66)<br>No need for fan or A/C<br>Sloped Top<br>Mount on chamber or remotely   |  <span style="background-color: #4a86e8; color: white; padding: 2px 5px;">SMALL</span>                     |
| <b>Systems with 6 to 8 lamps</b><br>Shape    | Stainless Steel<br>UL Type 1 (IP51)<br>Includes fan<br>Flat Top<br>Mount on chamber or remotely**          |  <span style="background-color: #4a86e8; color: white; padding: 2px 5px;">MEDIUM</span> | Stainless Steel<br>UL Type 12 (IP54) with fan<br>UL Type 3R (IP55) with fan / shroud<br>UL Type 4X (IP66) with AC<br>Sloped Top<br>Remote mount only |  <span style="background-color: #4caf50; color: white; padding: 2px 5px;">LARGE</span><br>UL Type 3R shown |
| <b>Systems with 10 to 12 lamps</b><br>Shape  | Stainless Steel<br>UL Type 12 (IP54) with fan<br>Sloped Top<br>Remote mount only                           |  <span style="background-color: #4caf50; color: white; padding: 2px 5px;">LARGE</span>  | Stainless Steel<br>UL Type 3R (IP55) with fan / shroud<br>UL Type 4X (IP66) with AC<br>Sloped Top<br>Remote mount only                               |  <span style="background-color: #4caf50; color: white; padding: 2px 5px;">LARGE</span><br>UL Type 4X shown |

\*No mounting option for 01CDS and 03CDS

\*\*Mounting options vary by model and configuration

## System Design

### Compact System Design to Preserve Space

#### Benefits:

- The panel can be mounted in different locations to optimize the use of space, especially for frame mounted designs.
- The small and medium control panels can be mounted on top of the cylinder (between the inlet and outlet connection), in front of the cylinder or remotely up to 15 feet apart from the cylinder. The location of the panel can be easily changed at any point in time. It is recommended that the large panel be mounted remotely (not on the cylinder).
- Mounting is possible based on configuration and orientation of inlet and outlet.\*



### User-Friendly HMI

#### Benefits:

- Intuitive interface enables at-a-glance check status of the system.
- Information displayed includes: individual lamp status, operational hours of the system and lamps, UV intensity and temperature condition of the chamber and control panel.
- A 4-20mA output signal is included with the UV monitoring option.
- Base model includes HOA (Remote Start and Stop) and LOA (Lamp Out Alert)



### High Performance UV Lamps

#### Benefits:

- The LPHO lamps are approximately 3 times more efficient than medium pressure lamps, delivering most of the UV output in the germicidal absorbance curve peak. Low pressure lamps operate at a lower temperature than medium pressure lamps, which leads to less fouling and less maintenance requirements.
- The OptiVenn series lamps can restart immediately after a shut down (no cool down period required) which maximizes system uptime.



\*Mounting options vary by model and configuration

# OptiVenn™ Series // Disinfection

| Model:                                    | 01CDS   | 03CDS | 02CDM   | 02DDM  | 04CDM  | 04DDM  | 04CDL  | 04DDL | 06DDL   | 08DDL   | 08EDL  | 08FDL   | 08GDL   | 10GDL | 12GDL | 12HDL |
|---|---|-------|---------|--------|--------|--------|--|-------|---------|---------|--|---------|---------|-------|-------|-------|
| <b>Maximum Flow Rate</b>                  |   |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Flow rate (gpm)*                          | 12 gpm - 2,200 gpm  |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Flow rate (m <sup>3</sup> /hr)*           | 2.7 m <sup>3</sup> /hr - 500 m <sup>3</sup> /hr   |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Number of UV lamps                        | 1   | 3     | 2       | 2      | 4      | 4      | 4  | 4     | 6       | 8       | 8  | 8       | 8       | 10    | 12    | 12    |
| <b>Electrical Requirements</b>            |   |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Electrical supply                         | 110-240V, 50/60Hz, L-L or L-N, 2W+GND   |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Operating power (W)                       | 63  | 165   | 155     | 155    | 297    | 297    | 583  | 583   | 1,153   | 1,438   | 1,438  | 1,438   | 1,438   | 1,723 | 2,008 | 2,008 |
| <b>Treatment Chamber</b>                  |   |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Material of Construction                  | 316L Stainless Steel  |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Lamp Length - in (cm)                     | 15 (38)   |       | 30 (76) |        |        |        | 60 (152)   |       |         |         |  |         |         |       |       |       |
| Chamber diameter - in (cm)                | 6 (15)  |       | 8 (20)  | 6 (15) | 8 (20) | 6 (15) | 8 (20)   |       | 10 (25) | 12 (30) | 14 (36)  |         | 16 (41) |       |       |       |
| ANSI flanges size - in (cm)               | 2 (5)   |       | 3 (8)   |        | 4 (10) |        | 6 (15)   |       | 8 (20)  |         |  | 10 (25) |         |       |       |       |
| Optional - Tri-clamp size - in (cm)       |   |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| <b>Monitoring and Controls</b>            |   |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Standard                                  | Base Package:<br>Lamp status indicator, System hours of operation, Lamp out alert (LOA) and Remote start/stop (HOA) |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Optional                                  | UV Monitoring Package:<br>UV intensity reading with NIST certified sensor   |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| <b>Control Panel</b>                      |   |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Standard                                  |   |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Material of Construction                  | 304 Stainless Steel   |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Rating                                    | UL Type 1 (IP51)  |       |         |        |        |        |  |       |         |         | UL Type 12 (IP54) with Fan                                     |         |         |       |       |       |
| Size (HxWxD) in (cm)                      | 16x16x6 (41x41x15)  |       |         |        |        |        | 16x20x9 (41x51x23)   |       |         |         | 22x23x9 (56x59x23)   |         |         |       |       |       |
| Shape                                     | Flat Top  |       |         |        |        |        |  |       |         |         | Sloped Top   |         |         |       |       |       |
| Cooling Mechanism                         | Passive Cooling   |       |         |        |        |        | Fan  |       |         |         |  |         |         |       |       |       |
| Operating Temp °F (°C)                    | 34°-95° (1°-35°)  |       |         |        |        |        | 34°-104° (1°-40°)  |       |         |         |  |         |         |       |       |       |
| Optional                                  |   |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Rating                                    | UL Type 4X (IP66)   |       |         |        |        |        | UL Type 12 (IP54) with Fan<br>UL Type 3R (IP55) with Fan/Shroud<br>UL Type 4X (IP66) with AC |       |         |         | UL Type 3R (IP55) with Fan/Shroud<br>UL Type 4X (IP66) with AC |         |         |       |       |       |
| Size (HxWxD) in (cm)                      | 16x18x7 (41x46x18)  |       |         |        |        |        | 22x23x9 (56x59x23)<br>24.5x23x9 (62x59x23)   |       |         |         | 23x24.5x9 (59x56x23)<br>24.5x23x9 (62x59x23)                   |         |         |       |       |       |
| Shape                                     | Sloped Top  |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| <b>Elastomers</b>                         |   |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Standard                                  | EPDM  |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Optional                                  | Viton   |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| <b>Surface Finish</b>                     |   |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Standard                                  | Ra32  |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Optional                                  | Ra15  |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| <b>Operating Conditions</b>               |   |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Maximum water operating temperature F(°C) | 40°-104° (5°-40°)   |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Maximum Operating Pressure PSI (BAR)      | 150 (10)  |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |
| Hot Water Sanitization °F (°C)            | 194° (90°) with stainless steel sleeve bolts and viton elastomers only  |       |         |        |        |        |  |       |         |         |  |         |         |       |       |       |

\*Dose Level: 30 mJ/cm<sup>2</sup> after 9,000 hours of operation

# OptiVenn™ Series // TOC

| Model:   | 04CTM   | 06CTM  | 08DTM             | 08DTL  | 10DTL | 12DTM   | 12DTL    |
|--|---|--|-------------------|--|-------|---------|----------|
| <b>Maximum Flow Rate</b>   |   |  |                   |  |       |         |          |
| Flow rate (gpm)*   | 6 gpm - 36 gpm  |  |                   |  |       |         |          |
| Flow rate (m³/hr)*   | 1.4 m³/hr - 8.2 m³/hr   |  |                   |  |       |         |          |
| Number of UV Lamps   | 4   | 6  | 8                 | 8  | 10    | 12      | 12       |
| <b>Electrical Requirements</b>                                     |   |  |                   |  |       |         |          |
| Electrical Supply  | 110-240V, 50/60Hz, L-L or L-N, 2W+GND   |  |                   |  |       |         |          |
| Operating power (W)  | 297   | 723  | 868               | 1,438  | 1,723 | 1,153   | 2,008    |
| <b>Treatment Chamber</b>   |   |  |                   |  |       |         |          |
| Material of Construction   | 316L Stainless Steel  |  |                   |  |       |         |          |
| Lamp Length - in (cm)  | 30 (76)   |  |                   | 60 (152)   |       | 30 (76) | 60 (152) |
| Chamber Diameter - in (cm)   | 6 (15)  |  | 8 (20)            |  |       |         |          |
| ANSI flanges size - in (cm)<br>Optional - Tri-clamp size - in (cm) | 2 (5)   | 2 (5) or 4 (10)  |                   |  |       |         |          |
| <b>Monitoring and Controls</b>                                     |   |  |                   |  |       |         |          |
| Standard   | Base Package:<br>Lamp Status Indicator, System Hours of Operation, Lamp out alert (LOA) and Remote start/stop (HOA) |  |                   |  |       |         |          |
| Optional   | UV Monitoring Package:<br>UV Intensity Reading with NIST Certified Sensor   |  |                   |  |       |         |          |
| <b>Control Panel</b>   |   |  |                   |  |       |         |          |
| Standard   |   |  |                   |  |       |         |          |
| Material of Construction   | 304 Stainless Steel   |  |                   |  |       |         |          |
| Rating   | UL Type 1 (IP51)  |  |                   | UL Type 12 (IP54) with Fan                                     |       |         |          |
| Size (HxWxD) in (cm)   | 16x16x6 (41x41x15)  | 16x20x9 (41x51x23)   |                   | 22x23x9 (56x59x23)   |       |         |          |
| Shape  | Flat Top  |  |                   | Sloped Top   |       |         |          |
| Cooling Mechanism  | Passive Cooling   | Fan  |                   |  |       |         |          |
| Operating Temp °F (°C)   | 34°-95° (1°-35°)  |  | 34°-104° (1°-40°) |  |       |         |          |
| Optional   |   |  |                   |  |       |         |          |
| Rating   | UL Type 4X (IP66)   | UL Type 12 (IP54) with Fan<br>UL Type 3R (IP55) with Fan/Shroud<br>UL Type 4X (IP66) with AC |                   | UL Type 3R (IP55) with Fan/Shroud<br>UL Type 4X (IP66) with AC |       |         |          |
| Size (HxWxD) in (cm)   | 16x18x7 (41x46x18)  | 22x23x9 (56x59x23)<br>24.5x23x9 (62x59x23)   |                   | 23x24.5x9 (59x56x23)<br>24.5x23x9 (62x59x23)                   |       |         |          |
| Shape  | Sloped Top  |  |                   |  |       |         |          |
| <b>Elastomers</b>  |   |  |                   |  |       |         |          |
| Standard   | Viton   |  |                   |  |       |         |          |
| <b>Surface Finish</b>  |   |  |                   |  |       |         |          |
| Standard   | Ra32  |  |                   |  |       |         |          |
| Optional   | Ra15  |  |                   |  |       |         |          |
| <b>Operating Conditions</b>  |   |  |                   |  |       |         |          |
| Maximum water operating temperature F(°C)                          | 40°-104° (5°-40°)   |  |                   |  |       |         |          |
| Maximum Operating Pressure PSI (BAR)                               | 150 (10)  |  |                   |  |       |         |          |
| Hot Water Sanitization °F (°C)                                     | 194° (90°) with stainless steel sleeve bolts and viton elastomers only  |  |                   |  |       |         |          |

\*Dose Level: >600 mJ/cm2 after 9,000 hours of operation

## Guaranteed Performance and Support Services

All of our systems come with a lifetime performance warranty. Global customer support is available from our Authorized Distributor Network and from our 24/7 Technical Service Group.

For questions regarding your application needs, please contact your local Authorized Distributor or Aquafine for more information.



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**Aquafine is an ISO 9001 certified company. Aquafine equipment performance is guaranteed with the use of genuine OEM replacement parts.**

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