INDUSTRIAL UV SYSTEMS

OptiVenn® Series

High performance, cost-effective system for stringent Industrial applications

Aquafine®



Aquafine® OptiVenn®



*Images are for reference purposes

Redefining Flexibility, Reliability and Robustness for Industrial Applications.

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 OptiVenn breaks down the following micro-organisms: *E.coli* and fecal coliform as well as trace chemicals; ozone, chlorine, total organic carbon.

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: Aquaculture, Recreational Water, Oil & Gas, Power Generation, and General Industrial Applications.

APPLICATIONS: Treatment, Ozone Reduction, Chlorine Reduction 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.

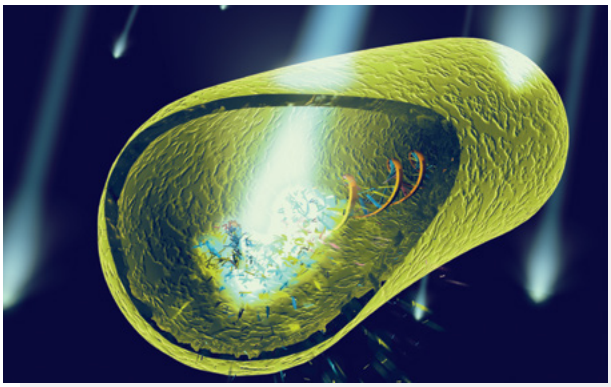
A comprehensive network of certified service providers offer fast response for spare parts and service.

Ultraviolet (UV) Technology

Ultraviolet (UV) light is a versatile, reliable approach to address numerous requirements in industrial water applications.

UV for Broad-based Treatment

- The Aquafine OptiVenn UV Water System treats the following: Escherichia coli (*E. coli*) and fecal coliform.
- The Aquafine OptiVenn UV Water System breaks down trace chemicals; ozone, chlorine, total organic carbon.
- The OptiVenn system model 01CDS, 02CDS, 03CDS, 02CDM, 04CDM, 04CDL, 02DDM, 04DDM, 04DDL, 06DDL, 08DDL, 08EDL, 08FDL, 08GDL, 10GDL, 12GDL and 12HDL treats the following: Escherichia coli (*E. coli*) and fecal coliform.
- The OptiVenn system model 04CTM, 06CTM, 08DTM, 12DTM, 08DTL, 10DTL and 12DTL break down trace chemicals; ozone, chlorine, total organic carbon.



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

UV for TOC Reduction

- 185 nm UV at a minimum dose of 90 mJ/cm²* 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 Reduction

- Residual ozone (O_3) is efficiently removed by UV at a wavelength of 254 nm.
- Ozone absorbs the UV energy and quickly breaks down to dissolved oxygen (O_2).
- Typically 1.0 ppm of ozone can be reduced to less than 0.1 ppm with a UV dosage of 90 mJ/cm².

UV for Chlorine Reduction

- Free chlorine residuals up to 2.0 ppm can be successfully reduced by the application of UV light.
- Reduces carcinogenic by-products.
- Lower maintenance costs compared to carbon beds or chemical injections.

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 Guarantee 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.

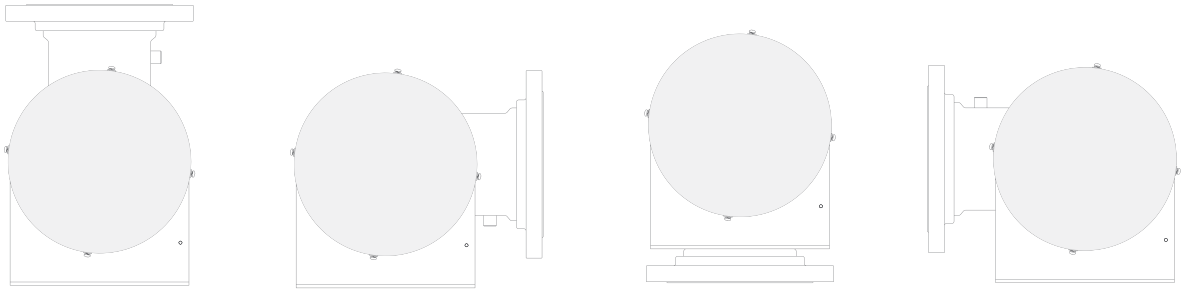
Flexible Chamber Requires Less Space

Benefits:

- An internal baffle and an anti-vibration mechanism optimize 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.



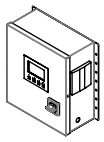
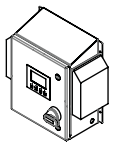
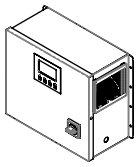
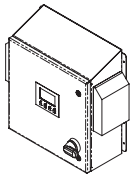
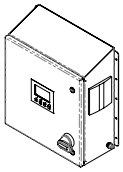
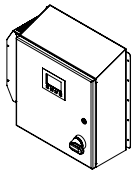
Chamber with panel mounted on the front and connections rotated to the back.



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	
Systems with 4 lamps or less Shape	Stainless Steel UL Type 1 (IP51) Includes Fan Flat Top Mount on chamber or remotely*	 SMALL	Stainless Steel UL Type 4X (IP56) with fan/shroud Includes Fan Sloped Top Mount on chamber or remotely	 SMALL
Systems with 6 to 8 lamps Shape	Stainless Steel UL Type 1 (IP51) Includes fan Flat Top Mount on chamber or remotely**	 MEDIUM	Stainless Steel UL Type 12 (IP54) with fan UL Type 4X (IP56) with fan / shroud UL Type 4X (IP66) with AC Sloped Top Remote mount only	 UL Type 4X shown LARGE
Systems with 10 to 12 lamps Shape	Stainless Steel UL Type 12 (IP54) with fan Sloped Top Remote mount only	 LARGE	Stainless Steel UL Type 4X (IP56) with fan / shroud UL Type 4X (IP66) with AC Sloped Top Remote mount only	 UL Type 4X shown LARGE

*No mounting option for 01CDS and 03CDS
**Mounting options vary by model and configuration

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 18 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:

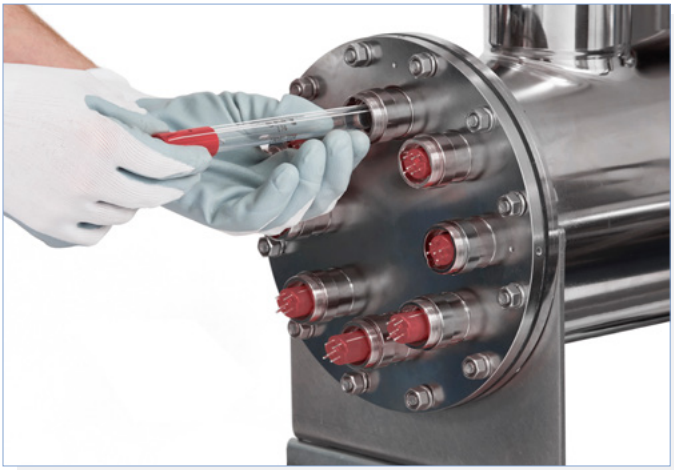
- Intuitive interface enables at-a-glance check status of the system.
- Information displayed includes: individual lamp status, operational hours of the system and lamps, UV intensity and temperature condition of the chamber and control panel.
- A 4-20mA output signal is included with the UV monitoring 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

Model:	01CDS	02CDS	03CDS	02CDM	02DDM	03CDM*	04CDM	04DDM	04CDL	04DDL	06DDL	08DDL	08EDL	08FDL	10GDL	12HDL
Maximum Flow Rate																
Maximum Flow @ 94% UVT, 30mj/cm² USGPM (m³/hr), Based on primary I/O	35 (7.9)	60 (13.6)	87 (19.8)	120 (27.3)	164 (37.2)	87 (19.8)	230 (52.2)	320 (72.7)	353 (80.2)	564 (128.1)	793 (180.1)	793 (180.1)	1080 (245.3)	1398 (317.5)	1412 (320.7)	2206 (501.0)
Maximum Flow @ 99% UVT, 30mj/cm² USGPM (m³/hr), Based on primary I/O	42 (9.5)	72 (16.4)	88 (20.0)	146 (33.2)	199 (45.1)	88 (20.0)	278 (63.1)	353 (80.2)	353 (80.2)	719 (163.3)	793 (180.1)	793 (180.1)	1412 (320.6)	1412 (320.6)	1412 (320.6)	2006 (501.0)
Pressure Drop at Max. Flow @ 99% UVT PSI (bar)	0.4 (0.03)	1.1 (0.07)	1.7 (0.12)	1 (0.10)	1.7 (0.12)	1.7 (0.12)	1.6 (0.11)	1.9 (0.13)	2.6 (0.18)	3.9 (0.27)	3.2 (0.22)	3.5 (0.24)	4 (0.28)	2 (0.14)	1.8 (0.13)	2.2 (0.15)
Number of UV Lamps	1	2	3	2	2	3	4	4	4	4	6	8	8	8	10	12
Electrical Requirements																
Electrical supply	110-240V, 50/60Hz, L-L or L-N, 2W+GND															
Operating power (W)	63	145	165	155	155	297	297	297	583	583	1,153	1,438	1,438	1,438	1,723	2,008
Chamber																
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) Optional - Tri-clamp size - in (cm)	2 (5)			3 (8)		4 (10)				6 (15)			8 (20)			10 (25)
Primary: Inlet/Outlet Flange Sizes	ANSI 2" 3A Sanitary 2"	ANSI 2" 3A Sanitary 2"	ANSI 2" 3A Sanitary 2"	ANSI 3" 3A Sanitary 3"	ANSI 3" 3A Sanitary 3"	ANSI 2" 3A Sanitary 2"	ANSI 4" 3A Sanitary 4"	ANSI 4" 3A Sanitary 4"	ANSI 4" 3A Sanitary 4"	ANSI 6" 3A Sanitary 6"	ANSI 6" 3A Sanitary 6"	ANSI 6" 3A Sanitary 6"	ANSI 8" 3A Sanitary 8"	ANSI 8" 3A Sanitary 8"	ANSI 8" 3A Sanitary 8"	ANSI 10" 3A Sanitary 10"
Primary: Center to Center Distance (Inches)	9"	9"	9"	22"	22"	25"	22"	22"	50"	45"	45"	45"	41.5"	41.5"	39"	37"
Secondary: Inlet/Outlet Flange Sizes (Inches)	-	-	-	ANSI 2" 3A Sanitary 2"	ANSI 3" 3A Sanitary 3"	-	ANSI 3" 3A Sanitary 3"	-	-	-	-	-	-	-	-	-
Secondary: Center to Center Distance (Inches)	-	-	-	22"	24"	-	22"	-	-	-	-	-	-	-	-	-
Monitoring and Controls																
Standard	Base Package: Lamp status indicator, System hours of operation, Lamp out alert (LOA) and Remote start/stop (HOA)															
Optional	UV Monitoring Package: UV intensity reading with NIST certified sensor															
Control Panel																
Standard																
Material of Construction	304 Stainless Steel															
Rating	UL Type 1 (IP51)														UL Type 12 (IP54) with Fan	
Size (H×W×D) in (cm)	16×16×7 (41×41×18)										16×20×9 (41×51×23)				22×23×9 (56×59×23)	
Shape	Flat Top														Sloped Top	
Cooling Mechanism	Fan										Fan					
Operating Temp °F (°C)	34°-104° (1°-40°)										34°-104° (1°-40°)					
Optional																
Rating	UL Type 4X (IP56)										UL Type 12 (IP54) with Fan UL Type 4X (IP56) with Fan/Shroud UL Type 4X (IP66) with AC				UL Type 4X (IP56) with Fan/Shroud UL Type 4X (IP66) with AC	
Size (H×W×D) in (cm) **	18×19×8 (46×49×21)										22×23×9 (56×59×23) 24.5×23×9 (62×59×23)				23×24.5×9 (59×56×23) 24.5×23×9 (62×59×23)	
Shape	Sloped Top															
Elastomers																
Standard	EPDM															
Optional	Viton															
Surface Finish																
Standard	Ra15															
Operating Conditions																
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/cm² after 9,000 hours of operation.

**Please consult drawings for exact specifications.

OptiVenn® Series | TOC

Model:	04CTM	06CTM	08DTM	08DTL	10DTL	12DTM	12DTL
Maximum Flow Rate							
Flow rate (gpm)*	6 gpm - 36 gpm						
Flow rate (m3/hr)*	1.4 m^3/hr - 8.2 m^3/hr						
Number of UV Lamps	4	6	8	8	10	12	12
Electrical Requirements							
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
Chamber							
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) Optional - Tri-clamp size - in (cm)	2 (5)	2 (5) or 4 (10)					
Monitoring and Controls							
Standard	Base Package: Lamp Status Indicator, System Hours of Operation, Lamp out alert (LOA) and Remote start/stop (HOA)						
Optional	UV Monitoring Package: UV Intensity Reading with NIST Certified Sensor						
Control Panel							
Standard							
Material of Construction	304 Stainless Steel						
Rating	UL Type 1 (IP51)				UL Type 12 (IP54) with Fan		
Size (H×W×D) in (cm)	16×16×7 (41×41×18)	16×20×9 (41×51×23)			22×23×9 (56×59×23)		
Shape	Flat Top				Sloped Top		
Cooling Mechanism	Fan	Fan					
Operating Temp °F (°C)	34°-104° (1°-40°)	34°-104° (1°-40°)					
Optional							
Rating	UL Type 4X (IP56)	UL Type 12 (IP54) with Fan UL Type 4X (IP56) with Fan/Shroud UL Type 4X (IP66) with AC			UL Type 4X (IP56) with Fan/Shroud UL Type 4X (IP66) with AC		
Size (H×W×D) in (cm)**	18×19×8 (46×49×21)	22×23×9 (56×59×23) 24.5×23×9 (62×59×23)			23×24.5×9 (59×56×23) 24.5×23×9 (62×59×23)		
Shape	Sloped Top						
Elastomers							
Standard	Viton						
Surface Finish							
Standard	Ra15						
Operating Conditions							
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						
Accreditations†	UL, CE, NOM, NSF/ANSI/CAN 61&372, W270/KTW-BWGL:2022, DWI, ACS, EC 1935:2004, FDA CFR 21						

† Accreditations may be specific to certain configurations.

*Dose Level: >600 mJ/cm^2 after 9,000 hours of operation.

**Please consult drawings for exact specifications.

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