INDUSTRIAL UV SYSTEMS

Avant™ Series

State-of-the-art UV water treatment system for industrial applications

Aquafine®



Aquafine® Avant™

Powerful performance, lower total cost of ownership

The Avant series of UV water treatment systems incorporates the latest innovations in UV technology and best-in-class components to break down trace chemicals, such as total organic carbon (TOC), chlorine, chloramine, and ozone, and provide microbial inactivation.

The Avant's compact footprint and modular system architecture allow you to tailor the system to your operational needs, reduce installation costs, and minimize maintenance expenses.



Improved performance

The Avant series treats up to three times more flow than prior Aquafine systems, making it ideal for facilities of any size that need to break down trace chemicals, TOC, ozone, and chlorine.



Configuration flexibility

The skid-mounted design allows for compact and flexible installation options. The modular system architecture supports stacked configurations of up to four chambers, with customizable alarms and optional UV intensity sensors.



Energy-efficient lamps

Efficient low-pressure, high-output (LPHO) lamp technology significantly reduces the energy needed to treat the required flow rate, which means fewer lamps are needed. Lamp power can be set to optimize electrical consumption while meeting treatment targets.



User-friendly operator interface

Avant makes the job easier for engineers and plant operators with an intuitive interface that provides an at-a-glance view of system health, key status, and operational data.

Aquafine® Avant™



Key markets and applications

- Microelectronics
- TOC reduction
- Chlorine and chloramine reduction
- Microbial inactivation
- Ozone reduction
- Life sciences

Centralized control

A single HMI manages up to four systems, reducing hardware, installation, and maintenance costs. This streamlined design simplifies operations, supports flexible configurations, and scales with your needs.

Predictive diagnostics

Our system controls offer advanced lamp power control, remote monitoring, and enhanced diagnostic capabilities to enable proactive maintenance that protects equipment, reduces costs, and minimizes downtime.

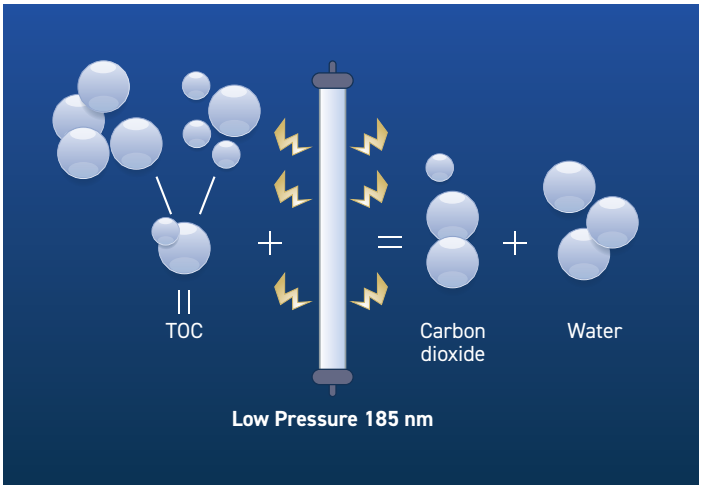
Ease of maintenance

The Avant system is designed to improve access to components, streamline cable routing, and allow for modular assemblies, reducing service time and maintenance complexity.

Global support with local service

Our comprehensive network of local certified service providers offers fast response for service and spare parts. Additionally, Avant systems support multiple languages and regional configurations, such as JIS and DIN flanges, ensuring compliance and usability around the world.

Ultraviolet (UV) technology



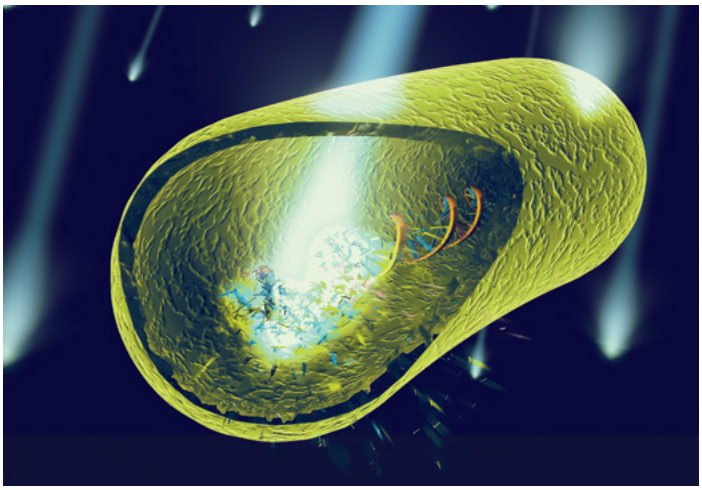
▲ UV light promotes the formation of free radicals, leading to the oxidation of organics into carbon (CO_2) and water (H_2O) molecules.

Ultraviolet light is a versatile, reliable approach for addressing water quality requirements in industrial applications.

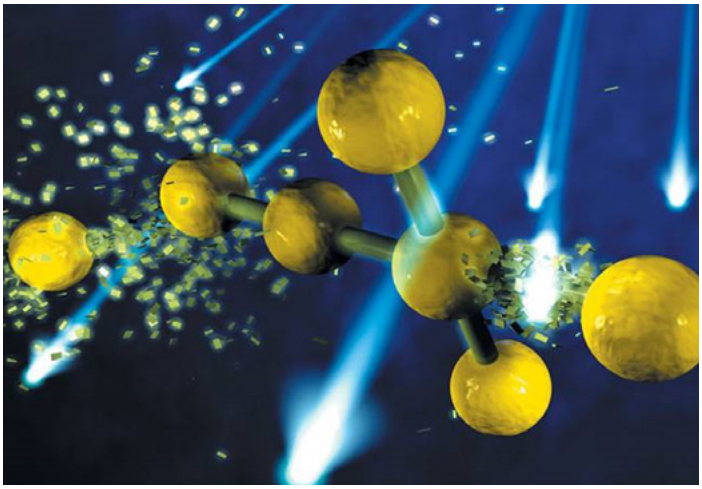
TOC reduction

Ultraviolet light treats trace organic contaminants in water through UV photolysis. The 185 nm photons, generated in the emission spectrum of a low-pressure mercury amalgam UV lamp, photolyze water molecules to produce hydroxyl radicals (·OH).

Hydroxyl radicals are highly reactive species that break down organic and inorganic compounds. While some compounds are completely decomposed to carbon dioxide and water, most compounds are ionized (i.e., converted to ionic species) and subsequently removed by downstream high-purity, mixed-bed ion exchange resin.



▲ UV light attacks the microorganisms' genetic material (DNA), preventing replication.



▲ UV breaks down the bonds of chlorine and chloramine molecules to reduce their levels to parts per billion.

Microbial inactivation

UV wavelengths inactivate microorganisms by damaging their DNA and instantaneously rendering them incapable of reproducing. The speed and efficiency of the treatment process allow the footprint of UV systems to be relatively small, with no need for storage or contact tanks. Because the UV inactivation process only adds ultraviolet light to the water, it does not impact the water's taste, odor, or color.

A UV system can be installed in multiple locations throughout an industrial facility to prevent microbial growth. Typical locations include post-carbon filter, pre-membrane filtration, pre- and post-reverse osmosis (RO), and pre-storage tanks.

UV can either serve as the primary disinfection method at the factory's point of entry or support a multibarrier strategy with other technologies like ozone to avoid bromate conversion and meet required treatment targets.

Chlorine and chloramine reduction

To control microorganisms in distribution lines, municipalities are required to add a residual to drinking water, which can result in an extra pretreatment step for industrial facilities. If left in the facility's incoming water, chlorine and chloramine can damage metal piping, membrane filters, and RO systems, and degrade rubber, such as O-rings, gaskets, or seals. Popular removal methods, such as carbon beds or chemical injection, can be problematic. Sodium metabisulfite replaces one chemical with another and creates food for microorganisms. Carbon beds can be inefficient, vulnerable to channeling, provide breeding grounds for microorganisms, and require significant maintenance and clean-in-place (CIP). UV solves the problems of reducing chlorine and chloramine while providing a smaller footprint and lower maintenance costs.

State-of-the-art design

Innovative features and enhancements provide greater flexibility, usability, and reliability, while delivering the proven performance Aquafine is known for.

Programmable logic controller (PLC)

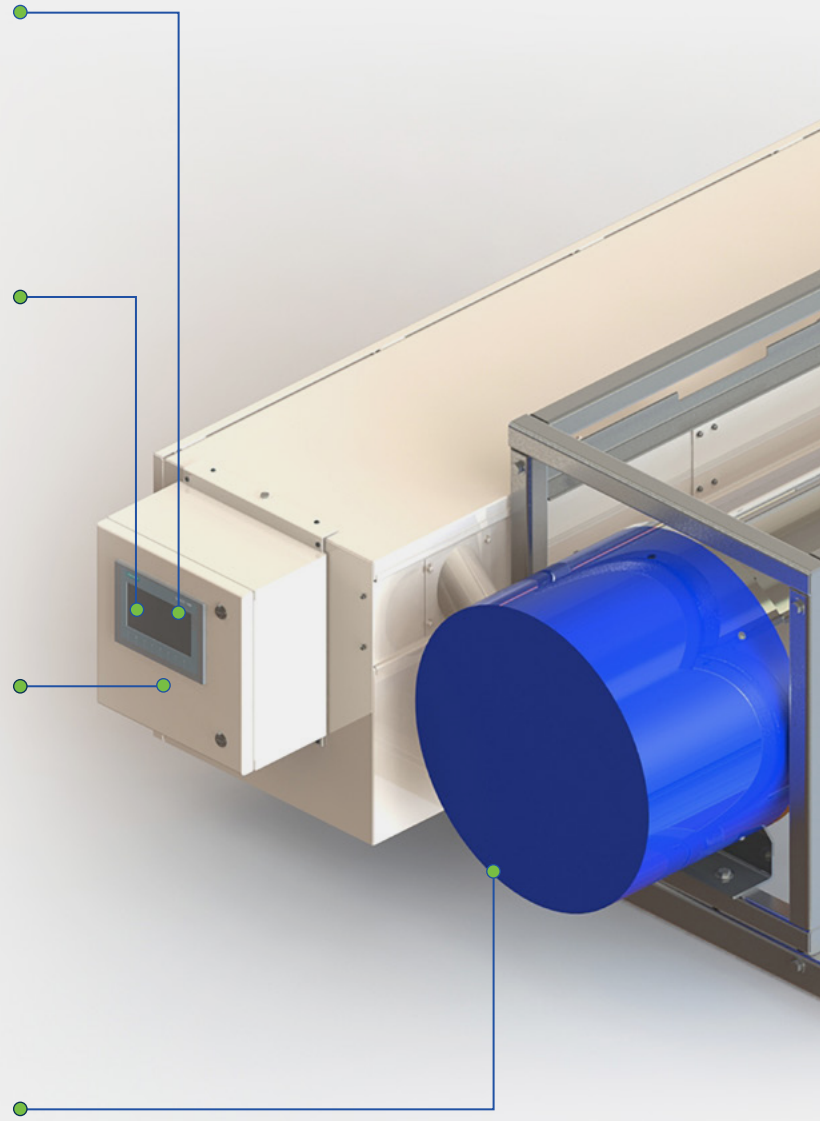
Continuously monitors and controls UV system functions, including safety conditions, and generates critical and non-critical alarms for off-spec conditions.

Centralized control system

Supports up to four systems with a single, user-friendly 7-inch touchscreen HMI, enabling flexible configuration and simplified operation. Clear alarm indicators and intuitive navigation provide a quick view of system health, including key status and operational data, and easy access to lamp status and controls.

UL Type 12 (IP55) electrical cabinet

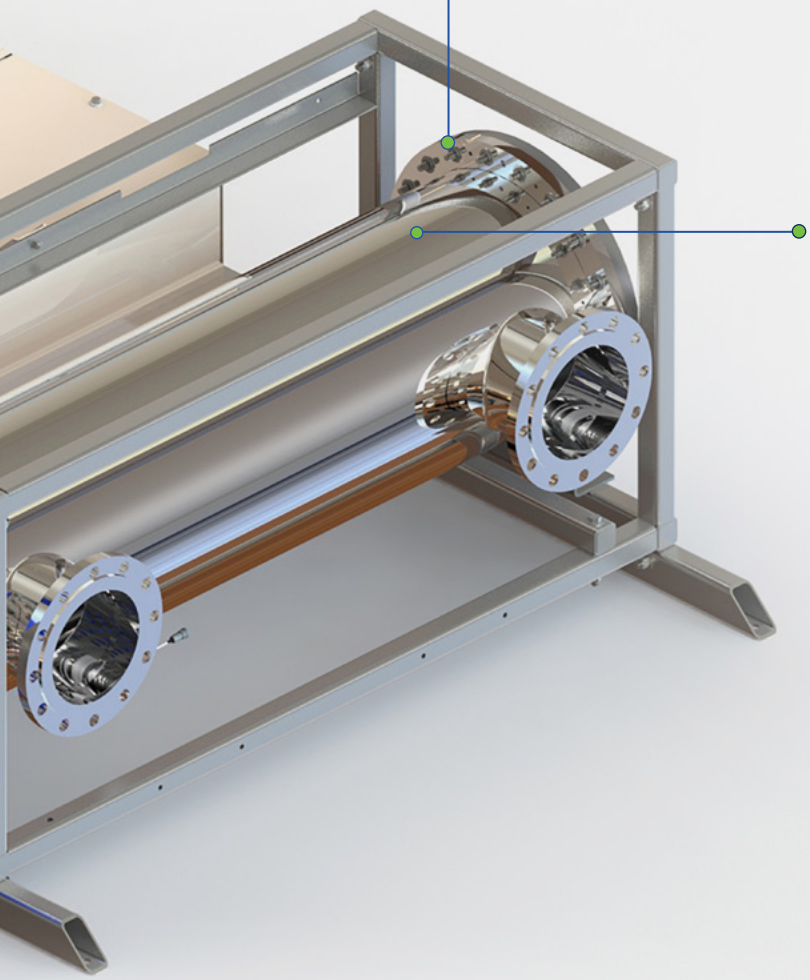
Offers superior protection against dust and water ingress, ensuring reliable performance in demanding environments. Painted carbon steel Type 12 (IP55) panels are available in a skid-mounted variation, stackable up to four systems. Cables are routed through enclosed raceways for improved organization, safety, and protection from physical damage and environmental conditions.



End cap

Covers the UV chambers to safeguard the lamp plugs from external splashing, debris, and mechanical damage.

System Design



Configurable inlet/outlet

Adapts to piping requirements by allowing water to flow in either direction.

Inlet-outlet options

Can be manufactured with either standard ANSI, DIN, JIS, inlet-out flanges, or tri-clamps to comply with the Food Contact Materials regulation concerning wetted parts.



UV chamber

Is an electropolished 316L stainless steel chamber that fits into existing piping galleries or tight spaces.

High-efficiency, high-output lamps

Provide superior system performance, reduce electric consumption, and decrease operating costs. Single-ended lamps are located within protective quartz sleeves with easy access from the service entrance.



UV intensity sensor*

Continuously monitors UV lamp output to ensure specified dose levels are maintained. Aquafine offers a unique sensor for fluids with low ultraviolet transmittance, such as liquid sugar in food and beverage applications, that is mounted in the center of the chamber for a 360-degree view of the lamp output from the entire array of lamps in the chamber.

**Part of the upgrade package*

Efficient lamp technology

Our efficient low-pressure, high-output (LPHO) lamp technology significantly reduces the energy needed to treat your flow rate. As fewer lamps are required for treatment, you can realize substantial savings on power, lamp replacements, and maintenance expenses.



Avant systems come with best-in-class Aquafine **Colorguard® UV lamps**. Colorguard lamps are operating reliably in more than 100,000 systems across a wide range of applications worldwide. Colorguard makes it easy for team members responsible for ordering and replacing UV lamps to identify where lamps are needed.

Same reliable performance, more energy-efficient operation

Lamps undergo a rigorous quality control inspection and testing program to ensure efficient operation and reliable performance over the life of the lamp. When compared to a previous generation of our systems, the Avant met the same performance level—reducing TOC levels below 2 ppb—with significantly lower power consumption.

	Previous series	Avant HP
Lamp quantity	8	**3**
Annual power consumption	531,050 kW	**209,121 kW**

Cumulative energy savings over five years



User-friendly controls and predictive maintenance

Advanced lamp control

Operate systems in one of three modes: 100% on, manual dimming, and grouping. The grouping mode allows you to turn off a set number of lamps to optimize treatment under changing conditions. This enhanced power control enables you to meet treatment targets while minimizing electrical consumption and operating expenses.

Predictive maintenance tool

Monitor for any unusual power consumption or operating patterns and track the health of individual lamps, enabling operators to improve troubleshooting and avoid unplanned failures.

Smart driver technology

Recognize a lamp failure, preventing damage to the driver by attempting to turn on a lamp that is no longer operational.

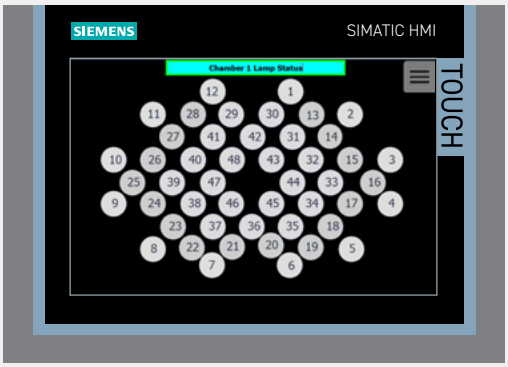
Remote system monitoring

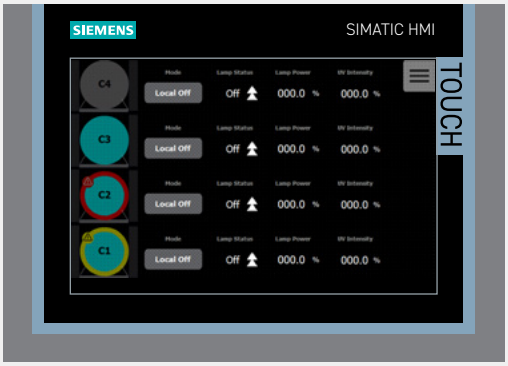
Continuously monitor all available system information from a remote location, reducing operational expenses and allowing for immediate action if an issue arises.

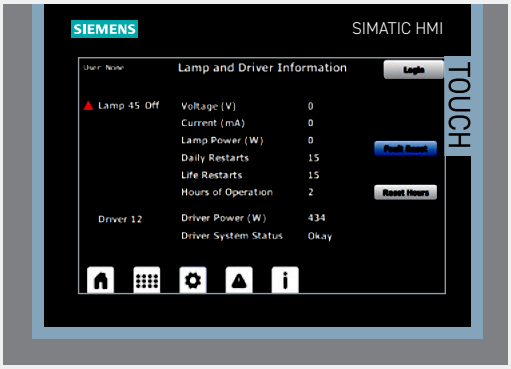
Expanded control functionality

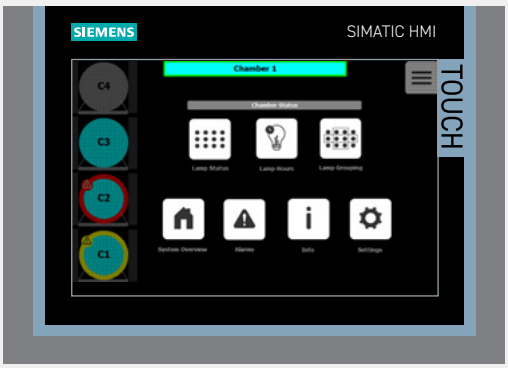
Based on customer feedback, the Avant system has been upgraded to enhance operational flexibility, diagnostics, and the user experience. Capabilities now available include:

- **Custom grouping** enables tailored operation through manual on/off control for individual lamps.
- **Water leak** detection alarms notify operators if water intrusion is detected in a lamp sleeve.
- **User-configurable alarm grouping** allows bundling of alarms into a single digital output or SCADA notification.
- **Alarm silencing** suppresses minor lamp, driver, and UV intensity faults indefinitely.
- **Larger lamp icons** make viewing and controlling individual lamp status and on/off functionality easier.









Avant Series | TOC reduction

MODEL NAME	Avant 20	Avant 36	Avant 44	Avant 48
Lamps				
185 nm	Standard			
Lamp power	155 W			
Quartz material – Avant	Natural			
Quartz material – Avant HP	Synthetic			
Number of UV lamps	20	36	44	48
Lamp type	Low-pressure, high-output			
Flow rate				
Maximum hydraulic flow	386 gpm (87.6 m^3/hr)	867 gpm (196.9 m^3/hr)	867 gpm (196.9 m^3/hr)	1,500 gpm (340.6 m^3/hr)
Pressure drop at max flow	5 psi (0.34 bar)	7.8 psi (0.54 bar)	5.3 psi (0.37 bar)	13.3 psi (0.9 bar)
Minimum cooling flow rate @ 25°C	1.5 gpm (0.36 m^3/hr)	2.4 gpm (0.54 m^3/hr)	2.9 gpm (0.66 m^3/hr)	3.2 gpm (0.73 m^3/hr)
For application-specific sizing, contact Lenntech - info@lenntech.com				
Treatment chamber				
Chamber length[1]	79 in. (2006 mm)			
Chamber diameter	12 in. (305 mm)	14 in. (356 mm)	16 in. (406 mm)	18 in. (457 mm)
Standard I/O size	4 in. (101 mm)	6 in. (152 mm)	6 in. (152 mm)	8 in. (203 mm)
I/O type	Standard: ANSI | Optional: DIN, JIS, Sanitary			
Pressure rating	Up to 150 psi [PN10]			

Electrical requirements								
Electrical supply	System power (kVA)	System current (A)	System power (kVA)	System current (A)	System power (kVA)	System current (A)	System power (kVA)	System current (A)
208Vac, 3PH, 50/60Hz 3W + GND	3.9	12	6.8	19	8.3	24	9	25
220-240Vac, 1PH, 50/60Hz, 2W + GND	3.9	18	6.9	31	8.3	38	9	41
240Vac, 3PH, 50/60Hz, 3W + GND	4	11	6.9	17	8.3	21	9.1	22
480Vac, 3PH, 60Hz, 4W + GND (UL only)	4.3	6	7.2	9	8.7	12	9.4	12
Transformer								
400Vac, 3PH, 50/60Hz, 3W + GND	4.1	8	7.2	12	8.7	14	9.4	15
440Vac, 3PH, 50/60Hz, 3W + GND	4.1	7	7.2	11	8.7	12	9.4	13
480Vac, 3PH, 50/60Hz, 3W + GND	4.1	7	7.2	10	8.7	12	9.4	13

Control power panel	
Material and rating	Painted carbon steel, Type 12 (IP55)
Dimensions H×W×D	22 in. x 64 in. x 21 in. (559 mm x 1,620 mm x 533 mm)
Cooling	Forced air and vent
Installation location	Indoor only
Remote HMI	
Material and coating	Painted carbon steel, Type 12 (IP55)
Dimensions HxWxD	14 in. x 14 in. x 8 in. (356 mm x 356 mm x 203 mm)
Cooling	Passive
Installation location	Indoor only, fixed to system
Certifications	KC c UL us LISTED CE

NOTES: Dimensions are for informational purposes only and not to be used for design. Refer to system layout drawings.

[1] Overall length with end cap installed

Aquafine Performance Guarantee and Regional Support



Aquafine provides a Lifetime Performance Guarantee for its UV products. 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, and fluid temperature, among others.

The 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.

Our extensive network of local certified service providers offers fast response for service and spare parts.

Contact: Lenntech - info@lenntech.com

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