

UV-LED Water Disinfection Solutions

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2. PRODUCT PORTFOLIO
3. PearlAqua Micro™ A
4. PearlAqua Micro™ B & C
5. PearlAqua Deca 30C™
6. DWM Series
7. PearlAqua Tera™ & Kilo™

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About NIKKISO

The company's diversified business activities include the manufacture and sale of dialysis machines, as well as aircraft parts and pumps for LNG plants.



Company Name	NIKKISO CO., LTD.
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President & CEO	Toshihiko Kai
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Head Office	Yebisu Garden Place Tower 22nd Floor, 20-3, Ebisu 4-Chome, Shibuya-ku, Tokyo 150-6022, Japan
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Date of Establishment	December 26, 1953
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Stock exchange listings	Prime Market, Tokyo Stock Exchange
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Number of Employees	7,629 (Consolidated)
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We provide the whole spectrum of UV-C LED solutions.

Product Portfolio

					
Model	PearlAqua Micro™ A	PearlAqua Micro™ B & C	PearlAqua Deca 30C™	DWM Series	PearlAqua Tera™ & Kilo™
Flow Rate	1.2~2.0L/min	1.2~8.0L/min	1~15L/min	50~200L/min	>10,000L/min
Application	Water Dispenser	<ul style="list-style-type: none"> • Water Dispenser • Water Heater 	<ul style="list-style-type: none"> • Residential • Industrial 	<ul style="list-style-type: none"> • Fisheries • Industrial 	<ul style="list-style-type: none"> • Municipal • Process Water

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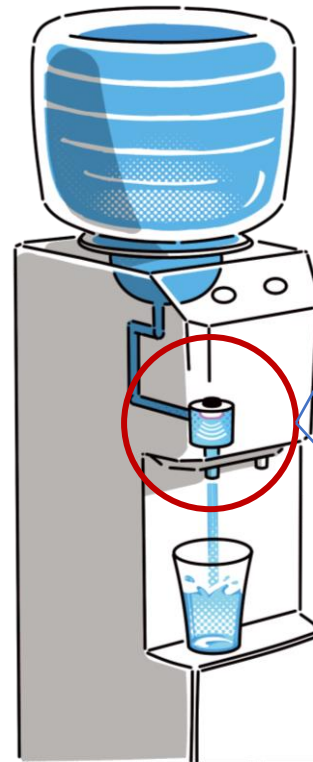


Believed to be the smallest UV-C LED water disinfection system in the world *1, deploying Aquisense's patented reactor technology into a very small footprint for dispensing applications.

Product Image



How it works



Last Mile Protection

Last mile protection offers disinfection from pathogens that might be growing at any point prior to the outlet.

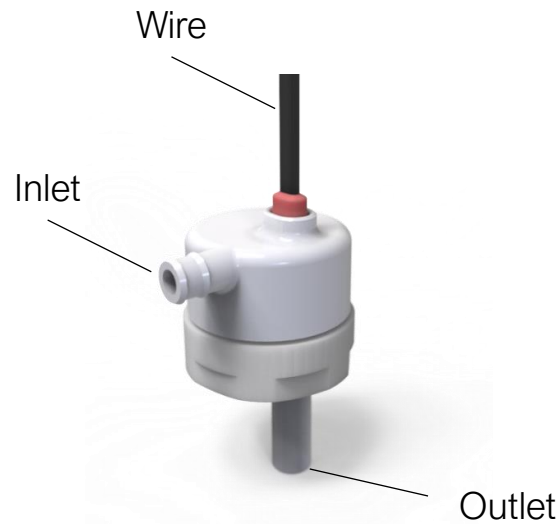
Retrograde Protection

Retrograde protection offers disinfection at the outlet, preventing retrograde contamination that happens when bacteria from the outlet contaminates the system by growing up the pipeline into the system.

*1 : As mass-production product for water disinfection

We are receiving large volume orders for water dispenser applications from Korea and Japan.





<Procedure>

1. Turn off water to plumbing where the device will be installed.
2. Attach Inlet and Outlet fluid connections using the appropriate fittings.
3. Turn on water and allow flow through system, check and correct any leaks.
4. Installation is finished, to activate UV disinfection simply apply power to the PearlAqua Micro. Power should only be applied while water is flowing.

Product Name	PearlAqua Micro	
Model Number	PAQ-03A	PAQ-06A
Max Flow Rate ^{※1} [L/min]	2.0L/min @14mJ/cm ²	2.0L/min @30mJ/cm ²
Inlet Water Connection	8 mm barb with 20mm length or 1/4 inch straight with 22mm length	
Headloss [psi / kPa]	1.5 psi / 11 kPa @ 2.0L/min	
Outlet Nozzle Type	Optional 1/4 inch straight with 20mm length	
Outlet Water Connection	1/8 NPTF	
Weight [g]	77	
Max Operating Pressure [bar / MPa]	2.0 bar / 0.2 MPa	
Environmental Protection	IP55	
Lamp Life ^{※2} [hours]	3,000~	
Ambient Temp [°C]	0~45	
Fluid Temperature [°C]	0~30	
Electrical Connection	2 Wire, 26 AWG	
Input Voltage [VDC]	12	
Input Power [W]	8.5	

※1 : 3rd party bioassay tested with T1 Phage and E.coli at 98% UV-T with reference to 254 nm.

※2 : Until 70% UV output. Dependent on product configuration and application.

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The Micro offers validated disinfection performance through UV-C LEDs and a patented flow cell design. PearlAqua Micro is designed to be integrated into point-of-use systems and processes.



[NSF/ANSI 55-2019](#)

The PearlAqua Micro is Tested and Certified by NSF International against NSF/ANSI 55 for materials and structural integrity requirements.

[Reliable](#)

More than 100,000 units have been shipped.

[Compact System](#)

Highly configurable, this product can be installed directly at the point of use.

OASIS International

Since 1910, OASIS International has focused on bringing refreshing water to the world. Since inventing the modern-day drinking fountain, the company has become the global leader in the design, manufacture, and distribution of clean drinking water systems.



Problem

Harmful bacteria in drinking water has become a rising concern. Water-borne bacteria (such as Crypto and E. coli) can multiply in the plumbing systems, becoming a public health hazard. According to the CDC, for the past 2 decades Cryptosporidium (Crypto) has become recognized as one of the most common causes of waterborne disease (recreational water and drinking water) in humans in the United States.

Result

Together, OASIS International and AquiSense Technologies designed Quasar – a UV-C LED system for point-of-dispense disinfection. The system provides instantaneous disinfection with a pathogen inactivation rating of 99.99%. The system offers smart operation with 15-minute intervals to keep the dispense point disinfected. Fail-safe parameters were designed to prevent the flow of water in the occasion that the UV LEDs do not activate.

Mitsubishi Electric

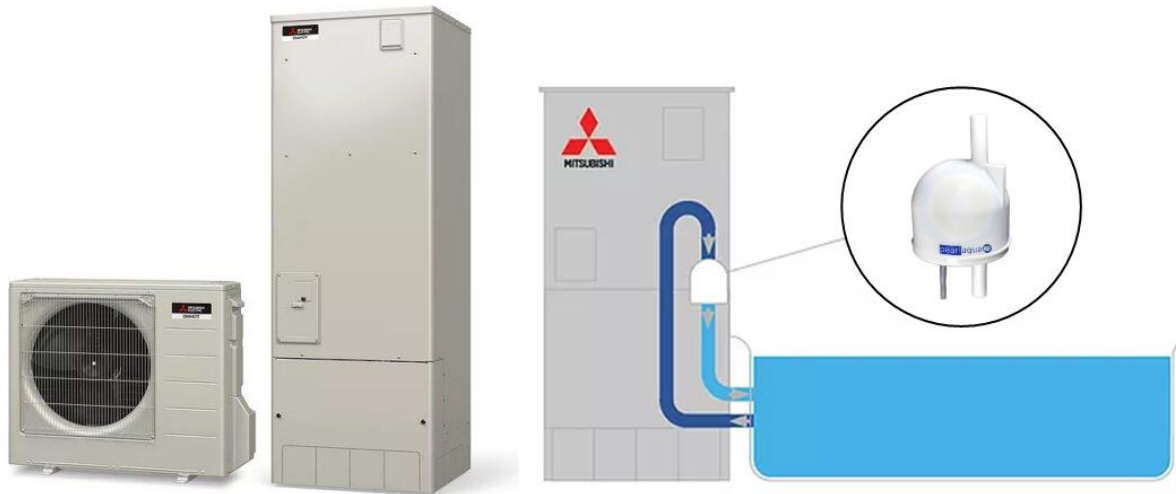
In Japanese culture, bathtime is a special time of the day, a chance to relax, have a soak, and let all your trouble float away. It is also customary for a family to use the same bathwater, rather than spending time running yourself an entirely new tub.

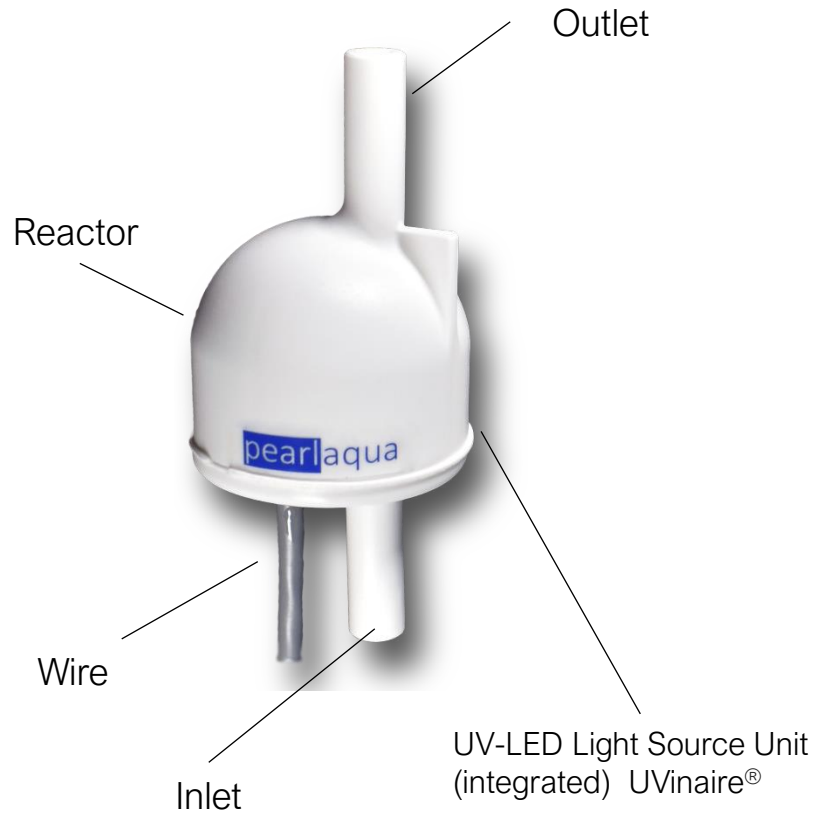
Problem

However, in Japanese culture, children have their baths a lot earlier than their parents meaning that the bathwater is left to sit for long periods of time being heated and then allowed to cool, before being heated again and so on and so forth. So while the hot water supply system is ensuring everyone gets their perfect bath, it is also creating the perfect conditions for bacteria to grow.

Result

Working with Mitsubishi Electric, we were able to design a UV-C module that could be fitted to their new CO2 heat-pump hot water supply system. As a result, Mitsubishi Electric's new system was able to meet the needs of their customers by supplying them with a heat-pump that **not only was able to keep bath water warm for long periods of time and after multiple uses but was also able to stop the formation and multiplication of bacteria in that bathwater that could be harmful.**





Product Name		PearlAqua Micro				
Model Number		PAQ-03B	PAQ-06B	PAQ-09C	PAQ-12C	
Max Flow Rate* ¹ [ℓ/min]	UV Dose	10 mJ/cm ²	1.2	2.0	5.3	8.0
		16 mJ/cm ²	0.9	1.5	4.0	5.0
		40 mJ/cm ²	0.25	0.50	1.75	2.25
Headloss [kPa (psi)]		6.5 (0.9)	16.5 (2.4)	40.7 (5.9)	91.7 (13)	
Inlet/Outlet Water Connection		Male: 3/8 inch		Male: 3/8 inch or 1/2 inch		
Weight [g]		77		162		
Max Operating Pressure * ² [bar / MPa]		8.3 bar / 0.8 Mpa				
Environmental Protection		IP68				
Lamp Life* ² [hours]		~ 10,000				
Ambient Temp [°C]		~ 80				
Fluid Temperature [°C]		0 – 50		0 – 45		
Electrical Connection		4-Core Cable, 150 mm (6") length				
Input Voltage [V DC]		12 or 24		12		
Input Power [W]		2.5 – 4	5 – 8	7 – 11	9 – 14	

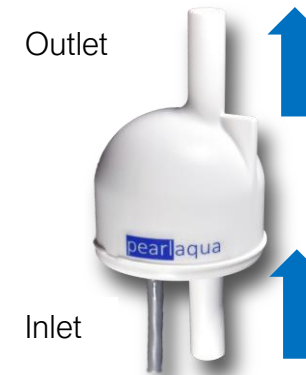
※1 : 3rd party bioassay tested with T1 Phage and E.coli at 98% UV-T with reference to 254 nm.

※2 : Until 70% UV output. Dependent on product configuration and application.

<Procedure>

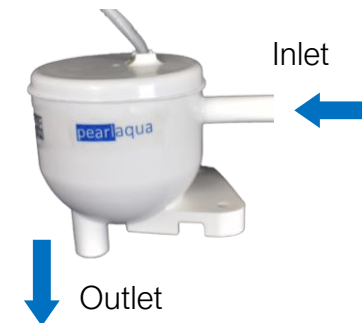
1. Remove the PearlAqua Micro™ from its packaging; ensure contents of the package are complete.
2. Do not power the PearlAqua Micro without flowing water.
3. For installation, consider ease of access, maximum length and minimum bend radii of piping, electrical connections, and air circulation when selecting the installation location.
4. Do a quick test fit of the unit before beginning any installation
5. Use appropriately sized tubing for the fittings selected. Polyethylene or nylon tubing should be used.

Recommended orientation of non-horizontal enclosure to prevent trapped air which may affect disinfection performance



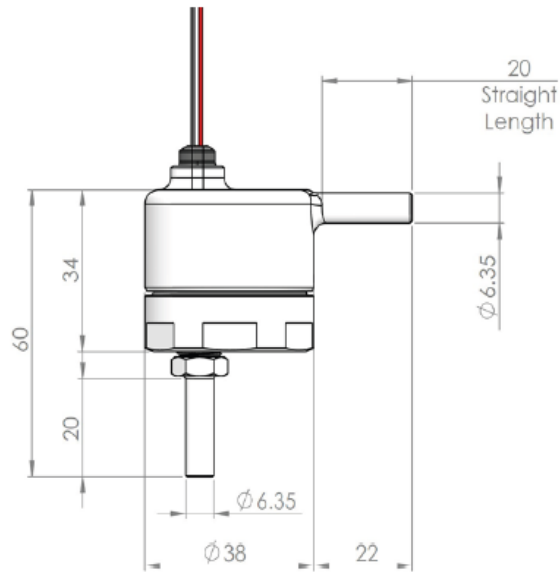
Recommended orientation and direction of flow for a non-horizontal enclosure—Vertical positioning with flat side down.

Recommended orientation of unit with horizontal enclosure



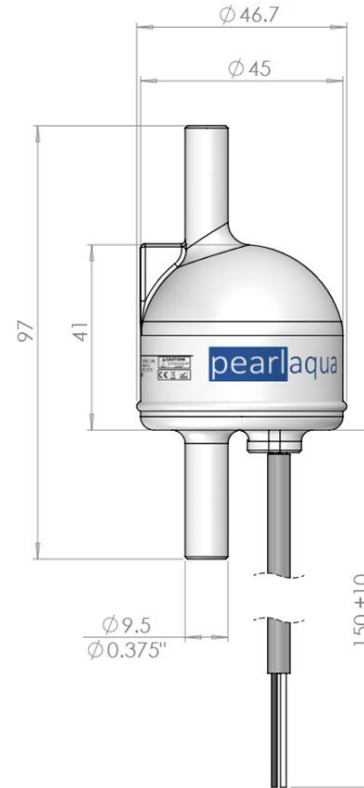
Recommended orientation and direction of flow for a horizontal enclosure—Flat side up, with outlet straight down.

PearlAqua Micro A

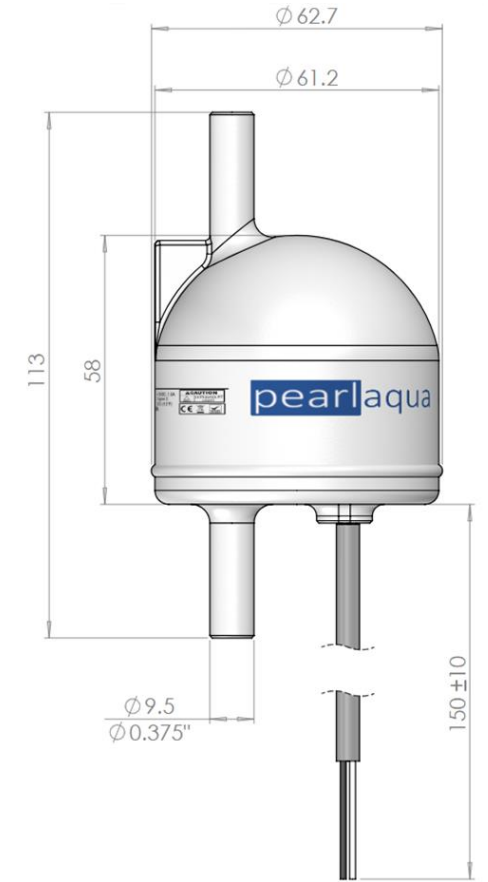


※Drawing of 1/4 inch straight inlet connection.
 ※Outlet nozzle is optional.

PearlAqua Micro B



PearlAqua Micro C



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The PearlAqua Deca 30C offers effective treatment for larger point-of-use applications and for smaller point-of-entry applications.



Commercial Application Use

PearlAqua Deca 30C is ideal for point of use applications with higher flow rates such as showers and soda machines, or smaller point of entry applications including RVs, boats, and tiny homes.

Low Cost of Ownership

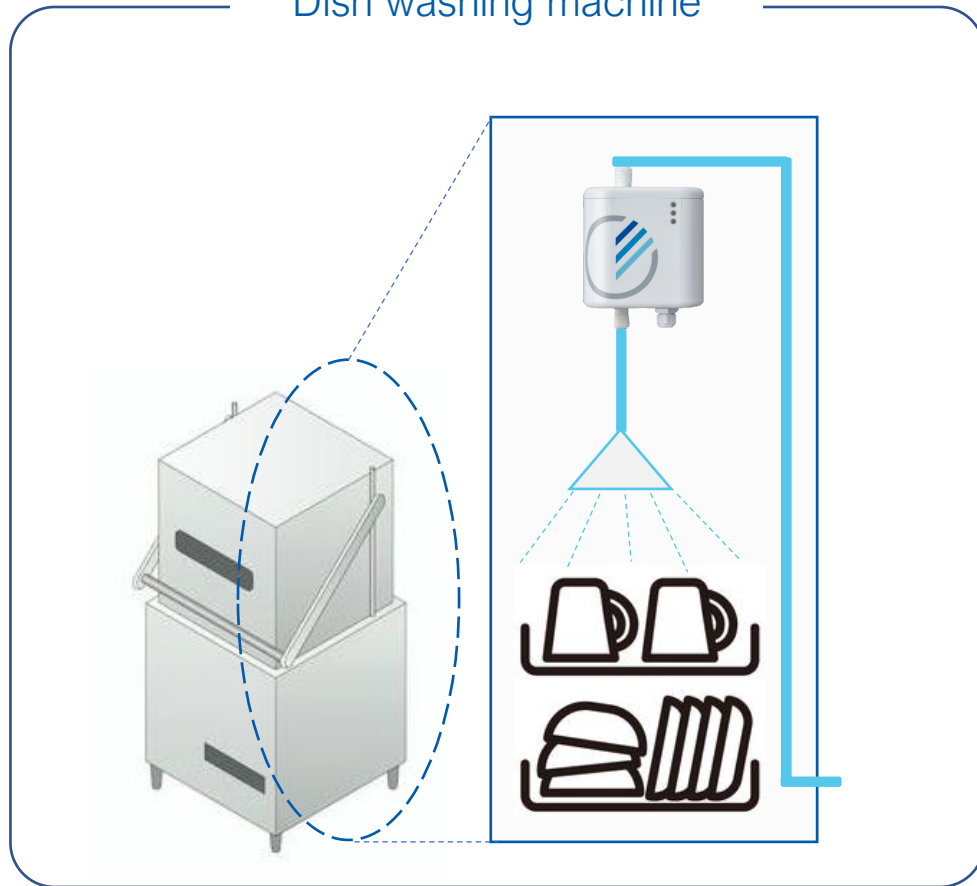
Efficient UV LED technology cuts your electric consumption. Designed for intermittent flows, PearlAqua Deca only uses power when water is flowing, drastically reducing the energy needed.

Low Maintenance

The PearlAqua Deca features a 5-year lamp replacement interval, reduced mineral fouling, and no handling of fragile lamps or sleeves making it the lowest maintenance option on the market.

The compact design allows for incorporation into point of use applications. It enables disinfection at a point of consumption.

Dish washing machine



Household water purification system



30C is suitable for commercial and industrial water treatment, food and beverage processing, and residential use. It's perfect for showers, soda machines, RVs, boats, and tiny homes.



Industrial

- Pure water equipment
- Industrial water equipment
- Water purification equipment



Residential

- Installed in water supply pipes
- Installed at various points in the house, such as kitchens and bathrooms
- for reuse of gray water

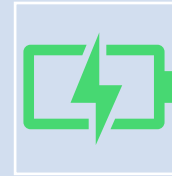


Commercial

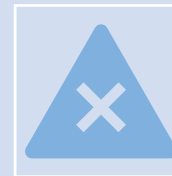
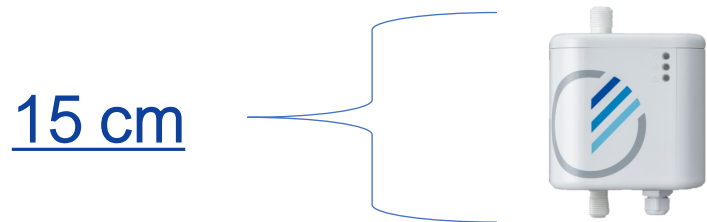
- Shoes washer, commercial washing machines
- Commercial dishwashers
- commercial ice machines, water purifiers



Flow rate of 15 L/min
(30mJ/cm²)



Long Lifetime
(>10,000 hours)

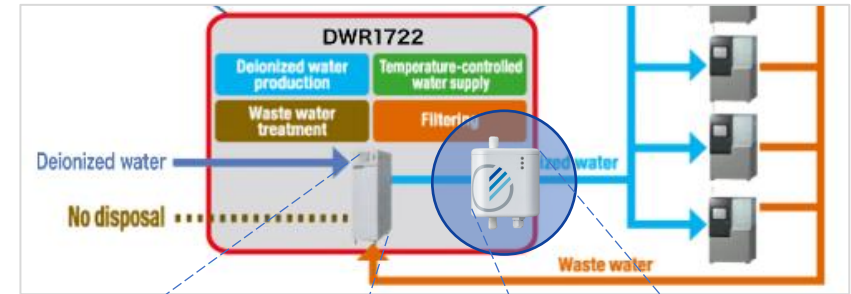


Mercury Free

Camping Car



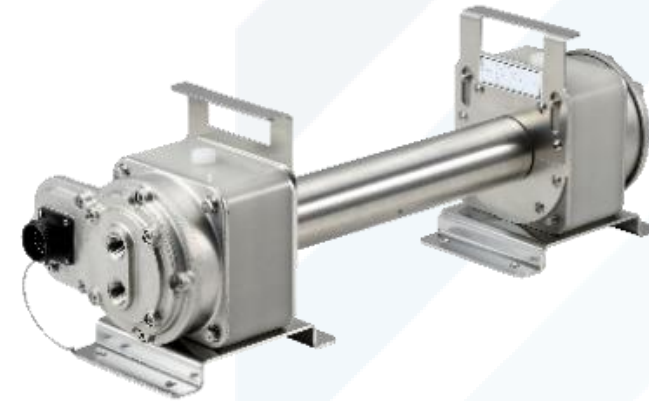
Deionized Water Recycling Unit



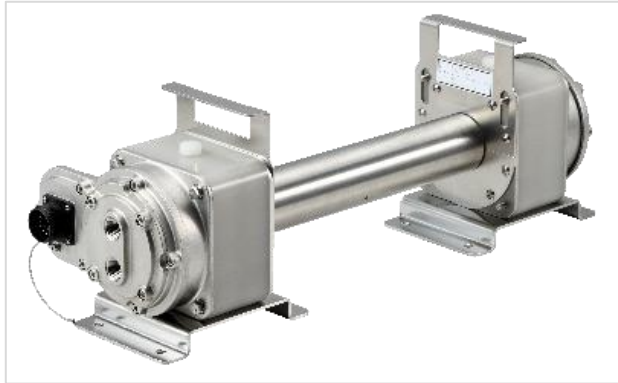


Product Name	PearlAqua Deca	
Model Number	30C	30C No Flow Switch
Max Flow Rate*1 [ℓ/min]	15L/min @30mJ/cm ²	
Minimum Flow Rate [ℓ/min]	1	0.5
Headloss [kPa (psi)]	45 (6.58)	34 (5)
Inlet/Outlet Water Connection	3/8 inch NPT or BSPP	
Weight [g]	545	500
Max Operating Pressure [bar / MPa]	8.3 bar / 0.83 MPa	
Lamp Life*2 [hours]	>10,000	
Ambient Temp [°C]	-10~45	
Fluid Temperature [°C]	0~40	
Input Voltage [VDC]	11-30 or 110-240 V AC-DC Power Supply	
Input Power [W]	45	

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Equipped with deep ultraviolet LEDs developed in collaboration with Nobel Prize winners. Medium to high flow rate type with a maximum treated water volume of 200 L/min with Lifetime of 35,000 hours.



The DWM series is a medium to high flow rate type product capable of treating a maximum flow rate of 200 L/min among the various water disinfection products offered by Nikkiso.



The greatest feature of this product is that it combines a long life of 35,000 hours with a large flow rate. It can be used for a long time in environments where a constant flow rate is required for disinfection. These features have been highly evaluated, and the product is used in a variety of applications, including the purification of water used for factory treatment, aquaculture, and agriculture.

Case 1

Client

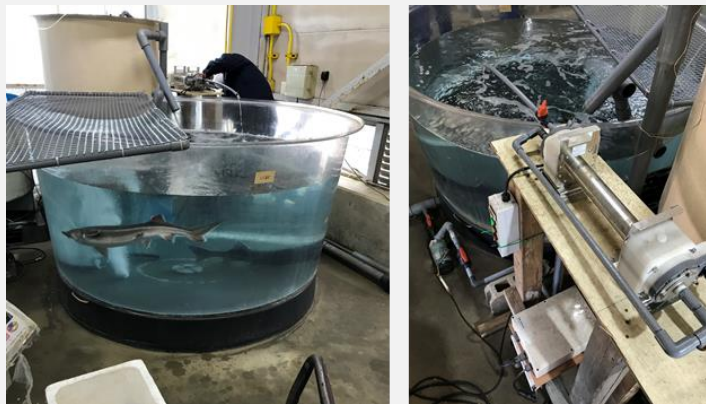
A company in Ibaraki Prefecture, Japan, using a pre-shipment water tank for land-based aquaculture.

Problem

The water in the tank was contaminated by bacteria, which caused the aquaculture products to smell.

Solution & Result

DWM made it possible to control bacterial growth, and successfully suppressed the odor of bacteria-derived water.



Sturgeon pre-shipment tank appearance

Case 2

Client

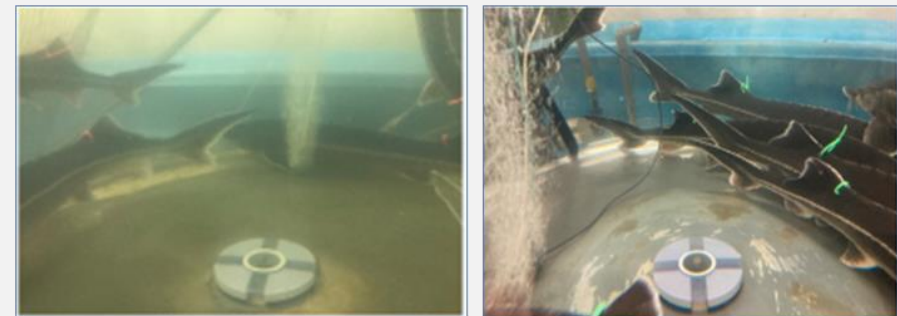
Land aquaculture tank at a certain company in Ibaraki Prefecture

Problem

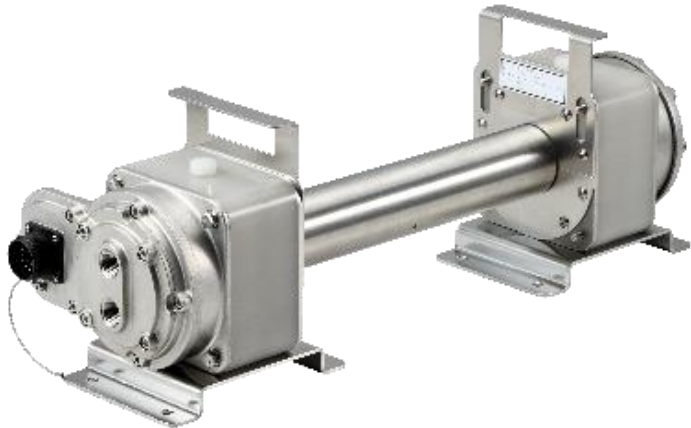
Bacteria and viruses are breeding in the tank water from leftover food. This leads to turbidity and odor in the aquaculture tank.

Solution & Result

DWM made it possible to control bacterial growth, and successfully reduced the turbidity and odor in the aquaculture tank.



Sturgeon aquaculture tank (Left: mercury lamp, Right: UV-LED)



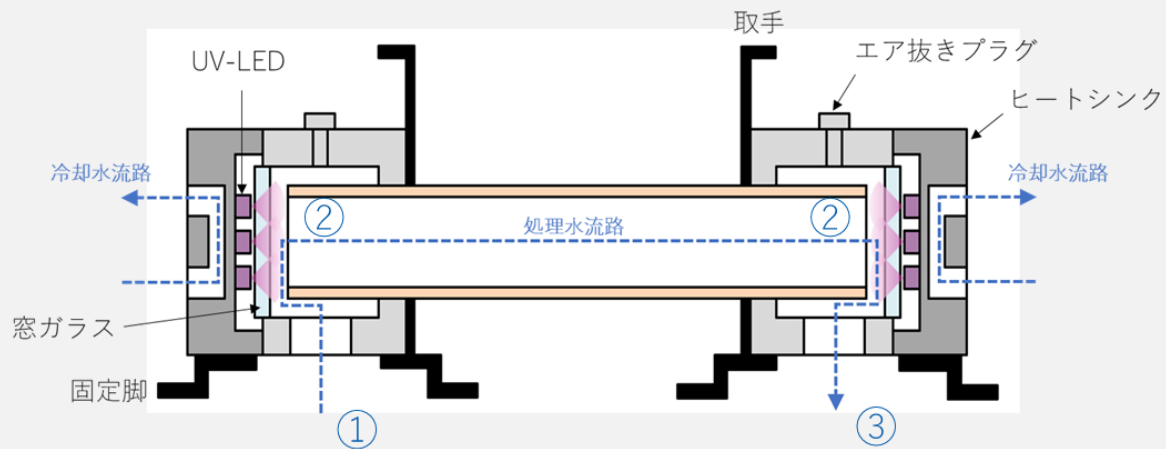
UV Dose	66 mJ/cm ² ※ (66,000μW·sec/cm ² equivalent)	
Recommended Flow Rate	3-6 m ³ /hour ※※	
Estimated Lifetime	35,000 hours ※※※	
Pressure Resistance	≤ 0.5 MPa	
Utility	Input Power	AC100V ± 10%
	Cooling Water	Required flow rate 3 L/min, Water temperature 35 °C or less
Rated Power	82W (Max 93W)	
Material	Treatment Water	SUS316, FEPM, SiO ₂ , PTFE, PVDF
	Cooling Water	SUS316, FEPM
Weight	Main Body	13 kg (dry)
	LED Drive Controller	3 kg
Option	Remote Control Box	

※ Calculated value when the transmittance at 280 nm is 98% and the water flow rate is 50 liters / minute.

※※ Please contact us if you wish to flush water at 6 m³/hour or more.

※※※ Lifetime is defined as the time it takes for the amount of ultraviolet ray to decrease by 30% from the initial value.

Structure



Procedure

1. Water is drawn into the treated water path from the bottom of the product.
2. The water flowing through the treated water channel is irradiated with ultraviolet rays from deep ultraviolet LEDs placed at both ends.
3. The purified water is sent out from the bottom of the opposite side of the intake. The process is repeated from (1) to (3) to purify the water.

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The PearlAqua Kilo & Tera platform is one of the world's largest UV-C LED products designed for municipal and industrial water disinfection.



Maximum Environmental Protection

PearlAqua Kilo/Tera offers the most advanced disinfection without any risk to the environment. Low power requirements and no harmful materials - such as mercury, make the PearlAqua Kilo/Tera the best option.

Replaceable Lamp Module

This advanced module is a replaceable LED lamp that is the heart of the PearlAqua Kilo/Tera. Featuring stable UV-C output power and advanced cooling, the system optimizes consistency and lifetime.

Low Cost of Operation

With instant on/off capabilities, unlimited on/off cycling and low maintenance, the PearlAqua Kilo/Tera provides you with extended treatment without extra cost on parts and maintenance.



Case

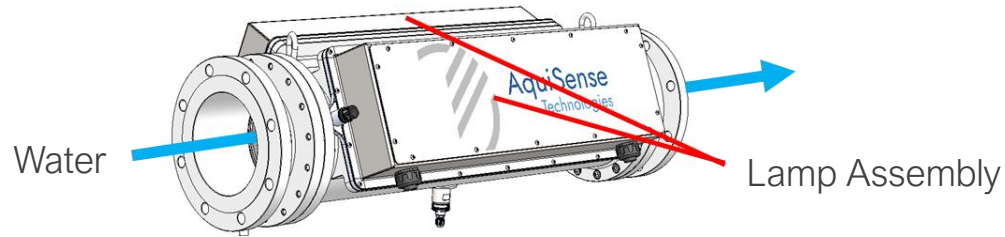
Municipal Water Treatment System in North America

Problem

In the Las Vegas Valley Water District, contamination of domestic water with Cryptosporidium has been a potential health hazard.

Solution & Result

No health hazard due to Cryptosporidium has been confirmed since the introduction of this system. [The system has proven to be applicable to water disinfection at the urban level of about 20,000 m³/day.](#) The system can be retrofitted and used for small-scale demonstrations as well.



<Procedure>

1. Water is drawn into the water inlet at the center of the main body.
2. A box equipped with deep ultraviolet LEDs is located on both sides of the main unit. The water is disinfected by irradiating deep ultraviolet rays to the water passing through the box.
3. The disinfected water is discharged from the water outlet on the opposite side.

Model Number	3R2
Flange sizes (in)	8
Est. Max Flow [m ³ /D] Dependent on target UV Dose	7,500
UV-Transmittance	> 90% recommended
Max Water Temp [°C]	30
Headloss [kPa (psi)]	4 (0.9)
Max Flow Pressure [MPa (psi)]	0.9 (130)
Cooling	Chiller, heat exchanger, or process water
Input Voltage [VAC]	208
Max Power Draw per Lamp [kW]	9
Number of Lamps	1 or 2
Lamp Monitoring	UV Intensity, Temperature, LED failure
Protection Class	IP65
Reactor Material	316 stainless steel
Weight [kg]	250
LED Driver	Integrated into lamp module
Controller	PLC optional