MASSPHOTON | MuscatPhoton



Under-Sink UVC LED

Water Disinfection Solution

Instant · Mercury-Free · Compact · Intelligent

MASSPHOTON | MuscatPhoton

Executive Summary

This solution is designed specifically for modern households and commercial settings, delivering a highly efficient, safe, and extremely compact under-sink standalone UVC LED water disinfection system. Leveraging advanced deep ultraviolet (UVC) LED solid-state light source technology, it achieves instant inactivation of bacteria, viruses, and microorganisms in water without adding any chemicals or altering the natural taste of the water.

Compared to traditional low-pressure mercury lamps, this solution completely eliminates mercury risks and preheating wait times, offering millisecond-level instant startup, compact size, and low power consumption. It perfectly addresses the pain points of traditional solutions that require damaging the original equipment structure or complex installation, making it the ideal upgrade for the terminal stage of various RO reverse osmosis systems, ultrafiltration systems, and pipeline water dispensers.

Market Pain Points and Demand Analysis

Secondary Pollution Risk

If traditional water purifier filters are not replaced for a long time or storage tanks breed bacteria, the total colony count in the output water may exceed standards.

Chemical Residue Concerns

Some users resist chlorine-based disinfection by-products and prefer pure physical, zero-additive disinfection methods.

Space Limitations

Under-sink spaces are narrow, making it difficult to install traditional large-scale UV sterilization equipment.

Response Speed

Traditional low-pressure mercury lamps require preheating time and cannot achieve “instant on, instant kill”.

Environmental Regulations

Restrictions on mercury-containing products are becoming increasingly strict worldwide; mercury-free solutions are an inevitable trend.



Solution

The UVC LED water disinfection module offers a flexible upgrade for under-sink systems, adapting to RO, UF, and pipeline dispensers. Targeted installation at key points addresses filtration limits, secondary contamination, and bacterial growth.

- *Post-RO Reverse Osmosis Purifier Installation*
- *Ultrafiltration Purifier Terminal Upgrade*
- *Pipeline / Instant Hot Water Dispenser Front-End*



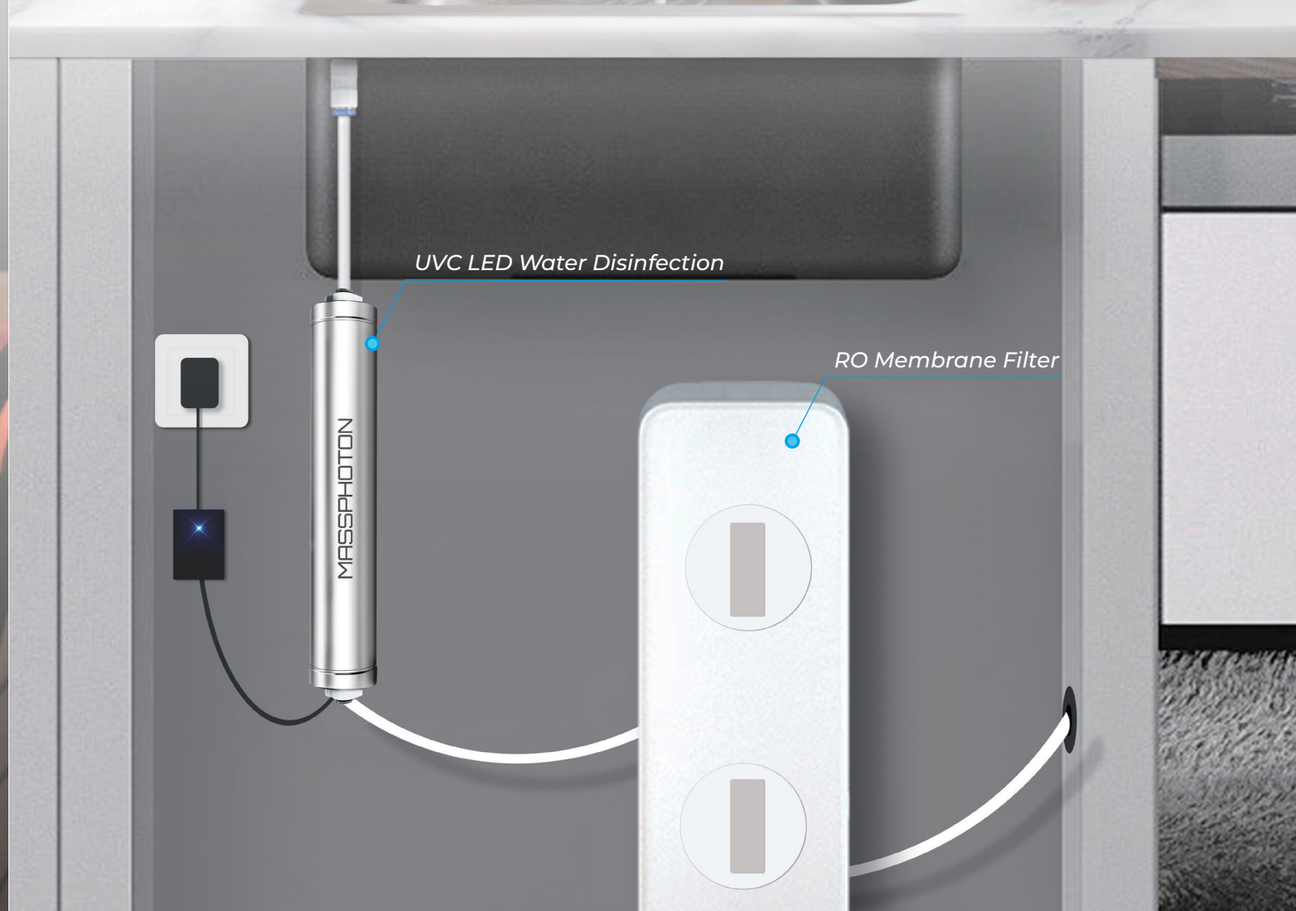
Reverse Osmosis Water Purifier Post-Installation

Core function:

Serves as the final safety barrier. While the RO membrane removes most bacteria, long-term idle post-activated carbon filters can easily breed bacteria, and pure water pipelines may experience secondary pollution. The UVC module completely eliminates residual microorganisms at the endpoint, ensuring 100% sterile water from the faucet.

Installation position:

After the RO membrane filter, after the post-activated carbon filter, and before the faucet.



Ultrafiltration Water Purifier Terminal Upgrade

Core function:

Addresses technical shortcomings. Ultrafiltration membranes have larger pore sizes (0.01 µm) and cannot filter viruses or small-molecule bacteria. Adding the UVC LED module enables physical inactivation of viruses, allowing ultrafiltration system output to meet direct-drinking standards without boiling.

Installation position:

Directly connected in series at the ultrafiltration system outlet.



Pipeline Machine / Instant Hot Water Dispenser Front-End

Core function:

Provides source-level sterile assurance. Ensures the water entering the heating tank is sterile from the start, fundamentally solving biofilm issues caused by long-term water storage in the heating tank, especially suitable for ambient water output modes.

Installation position:

Between the water supply source and the pipeline machine inlet.



Product Introduction / Advantages

Serves as the final safety barrier. While the RO membrane removes most bacteria, long-term idle post-activated carbon filters can easily breed bacteria, and pure water pipelines may experience secondary pollution. The UVC module completely eliminates residual microorganisms at the endpoint, ensuring 100% sterile water from the faucet.

Mercury-Free Safety

Uses mercury-free UVC LED technology to completely eliminate mercury leakage risks. Non-toxic and environmentally friendly, fully compliant with stringent global regulations, safeguarding water and environmental safety from the source.

High-Efficiency Sterilization

Achieves up to 99.999% (5-log) inactivation rate for bacteria, viruses, and microorganisms. Precisely destroys pathogen DNA in the deep UV band, building a solid health defense.

Energy Efficient

Compared to traditional low-pressure mercury lamps, the low-power mode saves up to 90% energy consumption, significantly reducing usage costs while promoting a green, low-carbon lifestyle.

Compact Design

Compact structure breaks space limitations, easily fitting into crowded under-sink cabinets, pipeline machine areas, and other narrow spaces without occupying extra room or adding clutter.

Pure Physical Process

Zero chemical additives, zero odor residue, zero disinfection by-products. Pure physical inactivation of pathogens perfectly preserves the natural sweet taste of water, allowing direct drinking without boiling and restoring the authentic flavor.

Smart Control

Built-in high-sensitivity flow switch with millisecond response to flow changes; intelligent start/stop based on water flow, eliminating no-load energy waste while significantly extending LED lifespan.



Product Parameters

MP-UVC-4LC



Model	MP-UVC-4LC
Rated Flow Rate	≤ 4 L/min
Power Adapter Input	100-240 V 50/60 Hz
Total Power	5 W
Power Supply Method	Adapter
UV-C LED Wavelength	270-280 nm
UV-C LED Lifetime	≥ 15,000 Hours
Disinfection Efficiency	Up to 99.999% or 5.0 Log Reduction (*)
Flow Switch	Integrated
Water Pipe Interface Specification	1/4" Quick Connect
Inlet/Outlet Material	Food-Grade Plastic
Maximum Inlet Pressure	0.4 MPa
Operating Temperature Range	4 ℃ to 60 ℃
Product Dimensions	Φ42 mm * 252 mm
Exterior Material	Stainless Steel

MP-UVC-10LC



Model	MP-UVC-10LC
Rated Flow Rate	≤ 10 L/min
Power Adapter Input	DC 24V
Total Power	7.2 W
Power Supply Method	Terminal
UV-C LED Wavelength	270-280 nm
UV-C LED Lifetime	≥ 15,000 Hours
Disinfection Efficiency	Up to 99.999% or 5.0 Log Reduction (*)
Flow Switch	None
Water Pipe Interface Specification	1/2 Inch Thread
Inlet/Outlet Material	Stainless Steel
Maximum Inlet Pressure	0.4 MPa
Operating Temperature Range	4 ℃ to 60 ℃
Product Dimensions	42 mm * 42 mm * 225 mm
Exterior Material	Aluminum

Test Conditions

(*) The actual disinfection efficiency subjects to the water quality.
The above test results are based on the following test conditions with test strain of Escherichia coli (8099), with 5 × 104 to 5 × 105 CFU/mL dechlorinated sterile test water.

pH	UV transmittance	Turbidity	Temperature	TDS
7.5 ± 0.5	98 ± 2%	< 1.0 NTU	20 ± 2.5°C (68 ± 5 °F)	200 to 500 mg/L

Core Value of Solution

- ***From “passive filtration” to “active sterilization”***

  Goes beyond removing impurities to thoroughly inactivate pathogens, ensuring every drop is reliable.

- ***From “space compromise” to “invisible protection”***

  Under-sink concealed installation delivers powerful function without occupying living space, combining aesthetics and practicality.

- ***From “chemical dependence” to “green & eco-friendly”***

  Pure physical technology with no secondary pollution, aligning with healthy living and sustainable development concepts.