MASSPHOTON | MuscatPhoton



Whole-House UVC LED

Water Disinfection Solution

Instant · Mercury-Free · Comprehensive · Intelligent

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Executive Summary

Most whole-house water systems improve water quality through filtration and softening, removing particles, chlorine, and scale. However, these methods mainly target physical and chemical contaminants and provide limited control of microorganisms. In villas, hotels, and commercial buildings, long and complex plumbing systems can allow bacteria such as Legionella and E. coli to grow in tanks and pipelines. Aerosols from showers may also spread these microorganisms, creating potential health risks.

By integrating a UVC LED disinfection module into a whole-house water treatment system, effective microbial control can be added on top of filtration and softening, ensuring safer and more stable water quality at every outlet.

Market Pain Points and Demand Analysis

Whole-house secondary pollution risk

Long-distance pipelines after central purification/softening systems, rooftop tanks, and storage tanks are prone to biofilm growth, leading to excessive bacterial colonies at endpoints, especially the threat of Legionella in hot water systems.

Chemical disinfection by-products

Traditional municipal or community secondary water supply relies on residual chlorine, producing carcinogenic by-products like trihalomethanes, and affecting bathing comfort (dry skin, damaged hair).

Installation space and maintenance challenges

Traditional large-scale UV sterilizers are bulky and difficult to install in narrow equipment rooms; mercury lamps require frequent replacement and involve hazardous waste, leading to high maintenance costs.

Lack of intelligence

Traditional equipment lacks flow sensing and remote monitoring, unable to automatically adjust power based on water usage peaks, resulting in energy waste and disinfection blind spots.

Environmental regulations

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



Solution

UVC LED enables instant, broad-spectrum microbial inactivation across the whole water system without chemicals or changes in water quality. It complements filtration and plumbing systems, serving as a final physical barrier to ensure safe water for all daily uses, including drinking, bathing, and laundry.

- *Main Inlet Disinfection*

Main Inlet Disinfection

Core function:

Core Function: Source Blocking. Instantly inactivates microorganisms in tap water entering the house, preventing reproduction in subsequent pipelines, softener resin tanks, and central purifier activated carbon. It is especially suitable for bacteriostatic protection of "chlorine-free water" after dechlorination.

Installation position:

After the municipal inlet valve and before/after the whole-house central purifier, serving as the first biological safety barrier.



Product Introduction / Advantages

This solution features our independently developed UVC-48LP/75LP intelligent disinfection module, combining “ultra-simple deployment” with “superior performance”.

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 Integrated Design

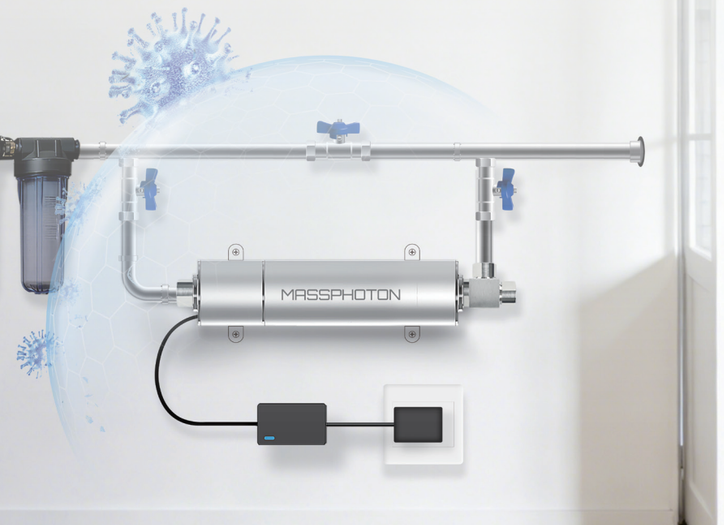
Ultra-compact and highly integrated, allowing flexible installation in the central treatment unit of whole--house water systems or key pipeline branches (such as hot-water recirculation lines), enabling efficient disin-fection without increasing system complexity.

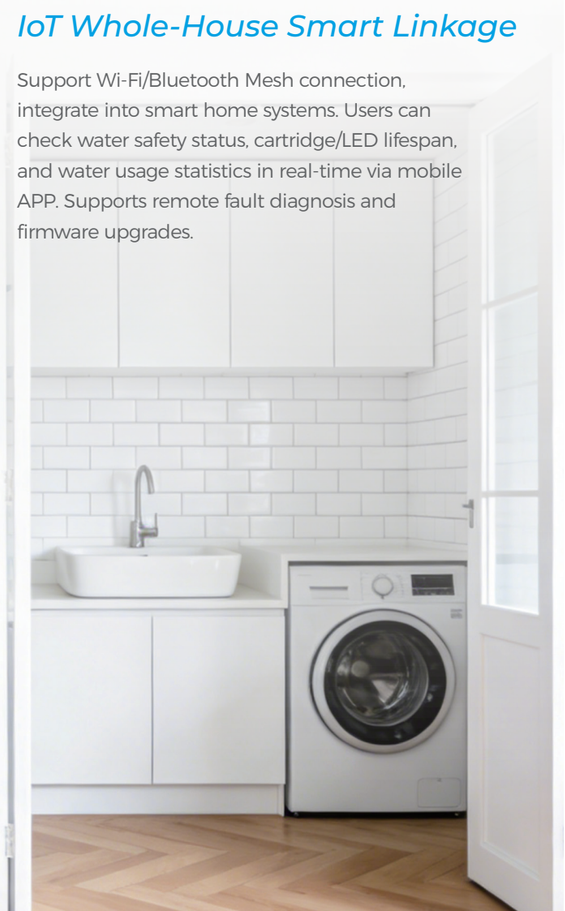
Pure Physical Process

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

IoT Whole-House Smart Linkage

Support Wi-Fi/Bluetooth Mesh connection, integrate into smart home systems. Users can check water safety status, cartridge/LED lifespan, and water usage statistics in real-time via mobile APP. Supports remote fault diagnosis and firmware upgrades.





Product Parameters

MP-UVC-48LP



Model	MP-UVC-48LP
Flow Rates(@16 mj/cm²)	90 LPM（24 GPM）
Flow Rates(@30 mj/cm²)	48 LPM（12 GPM）
Flow Rates(@40 mj/cm²)	36 LPM（9.5 GPM）
Water Pressure	0.1-0.8 MPa (Max 1.6 MPa)
Water Pipe Fitting	1"
Power Adapter Input	100~240 V 50/60 Hz
Power Adapter Output	24 V, 2.7 A
UV-C LED Emission Wavelength	270-280 nm
UV-C LED Lifespan	≥ 15,000 Hours
Exterior Material	Aluminum
Target Microorganisms	E. coli, among others
Disinfection Efficiency	(*) Up to 99.999% or 5.0 Log
Operating Temperature	5 ℃ to 40 ℃
Product Dimensions	Φ70 mm * 338.5 mm (Φ2.8 in * 13.3 in)

MP-UVC-75LP



Model	MP-UVC-75LP
Flow Rates(@16 mj/cm²)	140 LPM（36 GPM）
Flow Rates(@30 mj/cm²)	75 LPM（19 GPM）
Flow Rates(@40 mj/cm²)	56 LPM（14 GPM）
Water Pressure	0.1-0.8 MPa (Max 1.6 MPa)
Water Pipe Fitting	1"
Power Adapter Input	100~240 V 50/60 Hz
Power Adapter Output	24 V, 4 A
UV-C LED Emission Wavelength	270-280 nm
UV-C LED Lifespan	≥ 15,000 Hours
Exterior Material	Aluminum
Target Microorganisms	E. coli, among others
Disinfection Efficiency	(*) Up to 99.999% or 5.0 Log
Operating Temperature	5 ℃ to 40 ℃
Product Dimensions	Φ83.6 mm * 458 mm (Φ3.3 in * 18 in)

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 "Single-Point Purification" to "Whole-Area Sterility"*

  Breaks the limitation of focusing only on drinking water, extending sterile protection to all water usage scenarios including bathing, washing, and cooking, building a true healthy home water ecosystem.

- *From "Passive Defense" to "Active Smart Control"*

  Utilizing AI flow sensing and dynamic power adjustment, transforms passive filtration into active inactivation, ensuring disinfection efficacy under extreme water usage conditions while achieving ultimate energy efficiency.

- *From "Cumbersome Maintenance" to "Invisible Guardianship"*

  The ultra-long lifespan and maintenance-free design, combined with intelligent lifespan reminders, allow users to almost forget the existence of the device, while enjoying top-level water safety protection at all times.

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

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

Water is the origin of life;

Purity is the answer to the future.

“ Voices from Real Customers ”

*The following are just a few examples from our many satisfied users.
Thank you all for trusting our water safety solutions.*

★★★★★ — **Jennifer L., Eco-Conscious Homeowner**

Effective and convenient whole-house water purification system

This UV water filter system is a great solution for improving water quality throughout the entire home. The UV LED purification technology helps reduce harmful microorganisms while keeping the system energy-efficient and mercury-free.

Installation is straightforward, and the unit integrates well with existing whole-house filtration setups. The 12 GPM capacity provides strong water flow while still maintaining effective purification. Overall, it’s a reliable and low-maintenance option for cleaner, safer household water.

★★★★★ — **Sarah J., Villa Owner**

Impressive Whole-House UV-LED System

UV light effectively kills bacteria in your water line. Pair it with RO filters for chemicals and minerals—this MASSPHOTON system acts as the essential sterilization step, ensuring microbial safety without mercury or chemicals. We live in a large villa with a complex plumbing system, and I was always worried about the water quality in our rooftop tanks and long pipelines. Since installing the UVC LED disinfection module, I don't worry about Legionella or E. coli anymore.



★★★★★ — **Mark T., Health-Conscious Parent**

Pure water, without the chemical aftertaste.

Traditional water treatment always left that harsh chlorine smell and taste, and I hated the idea of disinfection by-products affecting my children's skin and hair. Switching to this mercury-free UVC LED system was the best decision. The water tastes natural and crisp, just like spring water. Plus, knowing it’s a purely physical process with zero chemical additives makes a huge difference for us.



★★★★★ — **Kevin S., Property Manager**

Smart, efficient, and reliable. Excellent UV-LED System

This whole-house UV-LED water treatment system is an impressive piece of hardware. The stainless-steel housing is substantial, the machining is clean, and the overall build quality inspires confidence right out of the box. It feels like a serious instrument rather than a lightweight consumer gadget.

The system uses UVC LEDs (270–280 nm) to sterilize water as it passes through the chamber. This is an important distinction:
This is a sterilization system, not a filtration or purification system.
√ Final Thoughts
This is a high-quality, well-engineered UV-LED sterilization system with excellent flow capacity and a very durable exterior. The on-demand LED activation is smart, and the mercury-free design is appealing.

It does not remove sediment, chemicals, minerals, or taste/odor compounds. What it does do is inactivate microorganisms by damaging their DNA/RNA, which is a valuable final step after proper filtration.

√ Strong Performance and Smart On-Demand Operation

The unit includes a flow-activated impeller that only turns on the LEDs when water is moving through the appliance. This is a smart design choice that reduces energy use and should extend LED life. The Amazon listing confirms this on-demand behavior and shows the LED status lights (blue for standby, green for active).