

Section 15

Ultraviolet Disinfection

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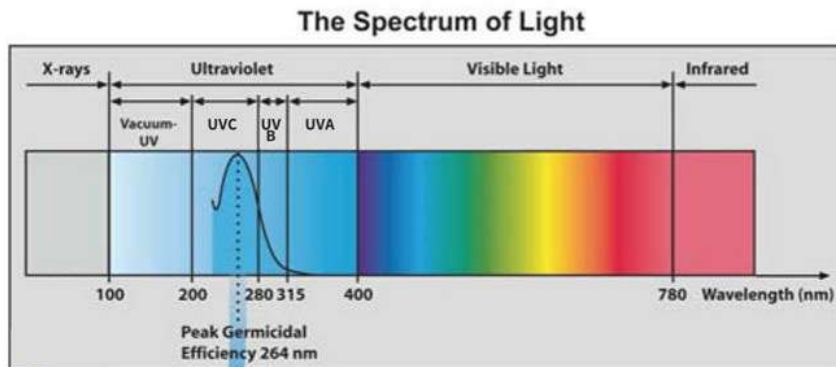
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Ultraviolet Disinfection

Information



Ultraviolet (UV) systems provides a quick, effective and chemical free solution for many applications.

UV light in the range of 200 to 280 nanometres is the most effective range for pathogen destruction and is known as the germicidal spectrum, 254 nanometres being the most effective value.

UVC light has the ability to inactivate a wide range of nuisance micro-organisms by damaging their DNA. This damage prevents the organism from reproducing thus rendering them harmless.

The amount of UV energy you apply is known as the UV dose. It is a product of the UV intensity (energy per unit of surface area) and the exposure time. The UV dose is typically expressed in $\mu\text{Wsec}/\text{cm}^2$ or mJ/cm^2 . The adjustment of either the intensity or flow rate will adjust the applied dose. This is why the same size UV can have different published UV dose rates, depending upon the lamp output, chamber design and the flowrate. You can achieve different UV dose rates simply by changing the flow rate.

The UV dose required to achieve inactivation depends upon the micro-organism. For example e-coli is inactivated at a dose rate of $6.6\text{mJ}/\text{cm}^2$, and both Giardia Lamblia and Cryptosporidium at $10\text{mJ}/\text{cm}^2$. Some viruses and fungi require higher dose rates.

Typically flow rates are quoted at three distinct dose rates. The first is $16\text{mJ}/\text{cm}^2$, and is based on an old US public health publication. A dose rate of $30\text{mJ}/\text{cm}^2$ has since become an industry standard. $40\text{mJ}/\text{cm}^2$ has recently been adopted by NSF, and as a result, by some public authorities as well.

The important thing is to note that different suppliers and manufacturers are quoting different dose rates, and you need to take this into account when comparing units.

The UV chamber is typically manufactured in Stainless Steel to provide a robust and temperature tolerant Unit. The use of properly rated pressure tube and correct manufacturing ensures reliability in service and guards against failure.

The quartz sleeve must be manufactured from pure quartz to provide optimum transmissibility, strength, and provide a thermal barrier with the water being treated.

There are many different types of lamp on the market, and they also come in many lengths, connections and configurations. The effectiveness of any UV unit should have been verified with a specific lamp type. Fitting the wrong lamp type may compromise the performance of the unit. For this reason, spare parts should be genuine, or at the very least specifically designed for the application by a reputable supplier.

NOTE: To prevent particles from shading micro-organisms, pre-filtration to 5 microns is recommended for all UV systems.

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Domestic Ultraviolet Disinfection

ALLAQUA UV Sterilisers

Standard Features:

- Flow Rates Quoted at 30mJ/cm² and 95%UVT
- 304SS Reactors.
- Low Pressure UV Lamps for Consistent UV Output Throughout Life
- Lamp Fail Alarm
- Lamp Life Countdown Timer
- 12 Month Return to Base Warranty



Models:

Model	Flow l/m	Lamp watts	Chamber Dimensions mm	Port Size inch
AUV16	6.6	16	370 x 63.8	1/2
AUV25	23	25	590 x 63.8	1/2
AUV30	30	30	910 x 63.8	3/4
AUV55	45	45	950 x 63.8	3/4

Requirements:

Maximum operating pressure	6 bar	Hardness	<120ppm
Water temperature	2-40°C	Turbidity	<1NTU
Iron	<0.3ppm	UV Transmittance	>85%

Options:

316 reaction chambers, Lamp countdown timer, UV intensity monitors, shut off solenoids, flow switch versions for intermittent use. Commercial size units.

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Validated Ultraviolet Disinfection

LUMINOR BLACKCOMB NSF55 Class A

Standard Features:

- NSF 55 Class A Systems
- NZ Drinking Water Standards Compliant
- NSF Class A Systems are Used for Primary Disinfection to Inactivate or Kill Bacteria, Viruses & Cysts in Contaminated Water
- Normal Flows up to 68lpm
- Flow Rates Quoted at 40mj/cm² and 70%UVT
- 99.99% Destruction of Bacteria, Viruses and Protozoan Cysts
- 304SS Polished and Passivated Tubing
- Continuous Monitoring
- Colour Interface with System Diagnosis and Fault Codes
- Future Proof Expandability Port
- 10 Year Reactor Warranty
- 3 Year Controller Warranty



Models:

Model	Flow l/m	Lamp watts	Chamber Dimensions cm	Connections inch
LB6-154A	30	50	6.4 x 101.6	1
LBH6-404A	68	115	8.9 x 103.4	1-1/2

Requirements:

Maximum operating pressure	10.3 bar	Hardness	<120ppm
Water temperature	2-40°C	Turbidity	<1NTU
Iron	<0.3ppm	UV Transmittance	>85%

Options:

Water shut off solenoid, 4-20mA output, relay output, temperature management, Sherpa, UV concierge.

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Large Scale Validated Ultraviolet Disinfection

LUMINOR

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*** COMING SOON ***

- Large Scale UV systems
- Suitable for Large Applications

*** COMING SOON ***
Enquire Now

LUMINOR — Everest



LUMINOR — Rainier



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LUMINOR Ultraviolet Disinfection

Options and Accessories

All LUMINOR reactors have a common sensor port, fitted with either a UV sensor or glow plug. This means that all models can be upgraded, future proofing your installation.

Controller Options

- LB4.1: Constant output controller with count down lamp timer.
- LB5.1: Features as per 4.1, plus colour screen, Full diagnostic and warnings, expansion port for future upgrades and options.
- LB6.1: Features as per 5.1, plus UV intensity sensor and display.



Package Options

Luminor Ultraviolet sterilisers are available in a range of packaged systems combining filtration and sterilisation in a single convenient package.

Please enquire.

Ultrasonic Flow Meter

Real time flow monitoring for LB5 and LB6 units. No or low-flow signal for the UV controller.

The controller will reduce power to lamp, saving power, reducing quartz sleeve fouling and providing cooler operating temperatures.



Temperature Management

This optional bolt-on cooling fan runs continuously to lower the operating temperature of the ultraviolet steriliser.

Recommended for units with high output lamps.



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LUMINOR Ultraviolet Disinfection

Options and Accessories

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Temperature Management

The TRV is a mechanical temperature management valve. When the water reaches a pre-set temperature the valve automatically opens dumping the hot water to drain.

Recommended for applications where there are extended periods without flow, or where the temperature management is required.



4-20mA Output Option

Provides a 4-20mA signal out for UV intensity.

Suitable for LB6.1 controllers



Remote Alarm Option

Provides a voltage free changeover relay contact for switching a remote alarm.

Suitable for LB5.1 and LB6.1 controllers



Solenoid Valve Option

Provides a shut off solenoid valve to turn off the water if the lamp fails or the UV intensity drops below 50%.

With manual over-ride.

Suitable for LB5.1 and LB6.1 controllers.



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LUMINOR Ultraviolet Disinfection

Options and Accessories

UV Sensor Module

Allows upgrade of all 5.1 systems, or replacement for all 6.1 systems.



Sherpa Wireless Monitoring Module

Remote monitoring of all major and minor alarms on the Blackcomb UV models.



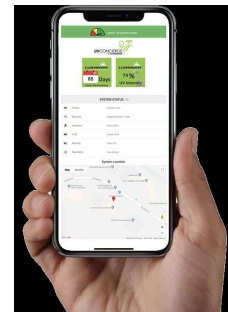
UV Concierge

Check your Blackcomb UV status remotely.

Integrated WiFi solution with data-logging capabilities.

Cloud based information storage.

SMS and email alerts for all major alarms.



Dealer Portal

With the optional dealer module, you can now monitor all of the UV systems you service and get real time reporting on system status. You will know which systems are in need of attention and when servicing is due.

SMS and email alarm messaging is included.



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LED Ultraviolet Disinfection

LUMINOR Glacier UVC LED Series

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Standard Features:

- Compact, High Power Density
- Integral Solid State Control Architecture
- Eco Friendly, Mercury Free
- 5,000 hrs LED Life
- Easy to Use, Install and Maintenance Free
- Temperature Independent Ensuring Constant Output
- Automatic Detection of Water Flow for On-Demand Disinfection for GUV4S & GUV5S
- Fully Integrated LED Based UV Disinfection System with Full Colour Screen Interface for GUV-5S
- Flow Rates Quoted at 30mJ/cm² and 95%UVT
- 3 Year Warranty
- 5000hr LED Usage Warranty



Models:

Model	Flow l/m	Input Power Watts	Voltage	Tube Connections OD inch	Automatic Water Flow Detection for On-Demand Disinfection
GUV-2	0.6	8	12	3/8	
GUV-5	2.4	12	12	3/8	
GUV-4S	2.4	15	12	3/8	✓
GUV-5S	2.4	16	12	3/8	✓

Requirements:

Maximum operating pressure	10.3 bar	Hardness	<120ppm
Water temperature	2-40°C	Turbidity	<1NTU
Iron	<0.3ppm	UV Transmittance	>85%

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LUMINOR Spare Parts

LUMINOR Spare Parts:

Model	Quartz Sleeve	UV Lamp
LB4-024	RQ210	RL210
LB4-034	RQ290	RL290
LB4-064	RQ470	RL470
LB4-104	RQ820	RL820
LB4-154	RQ999	RL999
LB4-204	RQ850	RL850
LBH4-254	RQ600	RL600HO
LBH4-404	RQ950	RL950HO
LBH4-404-HW	RQ950	RL950HW
LB6-024A	RQ210	RL210
LB6-034A	RQ290	RL290
LB6-064A	RQ470	RL470
LB6-104A	RQ820	RL820
LB6-154A	RQ999	RL999
LBH6-404A	RQ950	RL950HO
LBH4-154-50	RQ420	RL420HO
LBH4-254-50	RQ600	RL600HO
LBH4-404-50	RQ950	RL950HO
LBH4-154-TOC	RQ420	RL420HO-TOC
LBH4-254-TOC	RQ600	RL600HO-TOC
LBH4-404-TOC	RQ950	RL950HO-TOC
LB5-02-12V	RQ210	RL210
LB5-03-12V	RQ290	RL290
LB5-06-12V	RQ470	RL470
LBH4-154-HW	RQ420	RL420HW
LBH4-254-HW	RQ600	RL600HW



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