LUMINOR™
BLACKCOMB

ULTRAVIOLET WATER TREATMENT SYSTEM

Operation & Installation
Instructions

LB4, LB5, LB6, LBH4, LBH5, LBH6 Series



ILLUMINATING TECHNOLOGIES
FOR LIFE

LUMINOR™
BLACKCOMB

TABLE OF CONTENTS

Safety Considerations 4

Before You Begin 5

Water Quality Parameters 5

Assembly 6

System Sizing 8

Location 8

Installation 9

System Preparation 12

Cleaning the Quartz Sleeve 12

Cleaning the UV Sensor 13

Operation 14

- BLACKCOMB 4.1 Controllers 14
- BLACKCOMB 5.1 & 6.1 Controllers 14
- BLACKCOMB 5.1 & 6.1 Power-up Sequence 15
- BLACKCOMB 5.1 & 6.1 Operational Screens 16
- Lamp Countdown Sequence 17
- System Service Suggested 18
- Lamp Replacement (BLACKCOMB 4.1 systems) 18
- Lamp Replacement (BLACKCOMB 5.1 & 6.1 systems) 18
- QR Codes 18
- System Troubleshooting 19

Temperature Management Devices 21

Expansion Modules 21

Standard Output System Specifications 24

High Output System Specifications 25

Performance Data Sheet (NSF/ANSI Standard 55, Class A Systems) 26

Performance Data Sheet (NSF/ANSI Standard 55, Class B Systems) 27

Limited Warranty Statement: 28

Warranty Registration 29

SAFETY CONSIDERATIONS

It is important that care is taken when operating and/or maintaining your system.
Please read the instructions.

THIS PRODUCT IS NOT TO BE USED FOR GENERAL LIGHTING / ILLUMINATION

- **WARNING** Do not operate the UV-C emitter when it is removed from the appliance enclosure.
- This appliance contains a UV-C emitter.
- The appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.
- Unintended use of the appliance or damage to the housing may result in the escape of dangerous UV-C radiation. UV-C radiation may, even in little doses, cause harm to the eyes and skin.
- Energy given off by the UV lamp is harmful to your eyes and skin. NEVER look directly at an illuminated UV lamp without adequate eye protection and always protect your skin from direct exposure to the UV light.
- Do not use this system for any purpose other than what it was intended for. Misuse of this system could potentially cause harm to the user or others.
- Children should be supervised so that they do not play with the appliance.
- Never perform any maintenance to the system unless you are comfortable in doing so. Contact the manufacturer for service instructions if required.
- For complete UV disinfection**, use ONLY genuine replacement parts.
- Before servicing this equipment, disconnect the power cord from the electrical outlet.
- If the power cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- Do not operate the unit if it has any damaged or missing components.
- The appliance must be disconnected from the supply before replacing the UV-C emitter.
- The appliance is intended to be permanently connected to the water mains and not connected by a hose-set.
- Your system is intended to be installed indoors and away from leaking plumbing. DO NOT plug the unit in if the system or any of the components are wet.
- We recommend that a licensed plumber or certified technician install the system.
- The appliance is to be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30 mA.
- Maximum working voltage of built-in UV driver U-OUT=240V
- To avoid possible electrical shock, use only with a properly grounded electrical outlet.
- The system should be directly installed into a ground fault circuit interrupter (GFCI). If the use of an extension cord is required, the cord must be manufactured with a minimum of 16 gauge wire and care should be taken to avoid potential tripping hazards.

BEFORE YOU BEGIN

The following will be needed for installing the UV system:

Tools

- Pipe cutter, hacksaw or other specialized tools required to cut into your existing plumbing (e.g. if you have PEX piping)
- Soldering tools (torch, flux, emery cloth and solder)
- Wrench (for tightening fittings)

Other Materials

- Inlet/outlet connections
- Teflon™ tape

WATER QUALITY PARAMETERS

Treated water should be tested for at least the parameters listed below. If the water exceeds the listed parameters LUMINOR strongly recommends that appropriate pretreatment equipment be installed (equipment required will depend on parameters being treated):

Hardness:	<7 gpg (120 mg/L) – if hardness level is 7 gpg or slightly below the quartz sleeve must be cleaned periodically in order to ensure efficient UV penetration; if above the water must be softened.
Water pH:	6.5 - 8.5
Iron (Fe):	<0.3 ppm (0.3 mg/L)
Manganese (Mn):	<0.05 ppm (0.05 mg/L)
Turbidity:	< 1 NTU
Tannins (organics):	<0.1 ppm (0.1 mg/L)
UVT (transmittance):	>85% (Please contact LUMINOR if water has a UVT that is less than 80% for pre-treatment recommendations)

You can have your water tested at a private analytical laboratory or by your local dealer. It is always recommended to install pre-filtration of at least 5 microns prior to a LUMINOR UV disinfection** system.

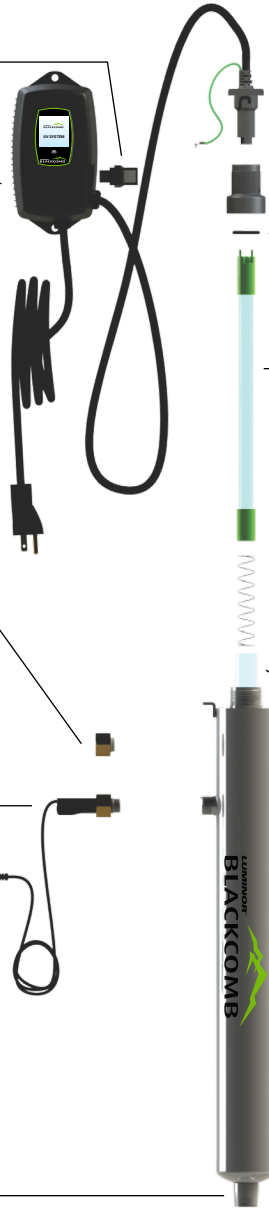
This system is intended to treat drinking water. Other fluids may have adverse influence on materials in the system. Contact LUMINOR Support (Engineering) for support if system is not being used with drinking water.

****LUMINOR's systems are proven by independent lab testing to show a 99.999% reduction (5-log) in E. Coli contamination and a 99% reduction (2.0 log) of the MS-2 coliphage challenge microorganism.**

ASSEMBLY

Unpack the system and ensure all the components are included with the system. Your system is shipped with the following components:

BLACKCOMB (Standard output lamp systems)



LAMP KEY
Comes with new UV lamps
(not sold separately)

CONTROLLER
RC-B4.01 4.1 systems
RC-B56.01 5.1/6.1 systems

GLOW PLUG
(BLACKCOMB 5.1 units only)
300016 Complete Assembly
310026 Teflon Plug
310040 O-Ring
390007 Brass Nut

UV SENSOR
(BLACKCOMB 5.1 units only)
RS-B2.5
RS-B3.5 LB6-20 series
RS-B2.5V NSF Class A series

INLET

GLAND NUT
320006

O-RING
300038

UV LAMP
RL-210 "-02" series
RL-290 "-03" series
RL-470 "-06" series
RL-820 "-10" series
RL-850 "-20" series
RL-999 "-15" series

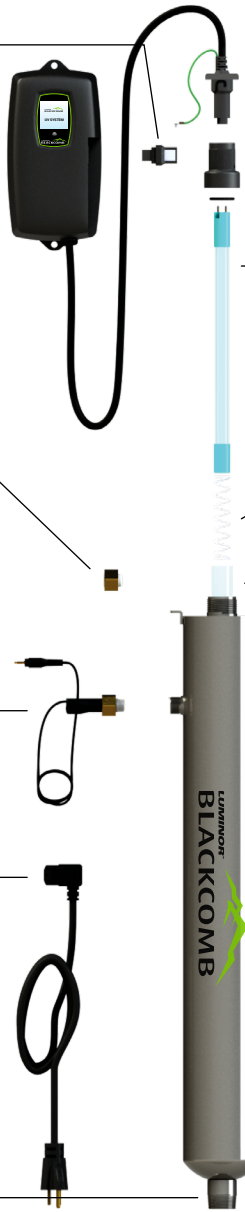
SLEEVE SPRING
310039

QUARTZ SLEEVE
RQ-210 "-02" series
RQ-290 "-03" series
RQ-470 "-06" series
RQ-820 "-10" series
RQ-850 "-20" series
RQ-999 "-15" series

REACTOR
300083 "-02" series
300050 "-03" series
300052 "-06" series
300054 "-10" series
300061 "-15" series
300068 "-20" series

OUTLET

BLACKCOMB-HO (High output lamp systems)



LAMP KEY
Included with UV Lamp

CONTROLLER
RCHO-B4.12 4.1 systems
RCHO-B56.12 5.1/6.1 systems

GLOW PLUG
(BLACKCOMB 5.1 units only)
300016 Complete Assembly
310026 Teflon Plug
310040 O-Ring
390007 Brass Nut

UV SENSOR
(BLACKCOMB 6.1 units only)
RSHO-B3.5 Standard series
RSHO-B3.5V NSF Class A series

POWER CORD
260004 North American
260005 Euro
260006 AUS/NZ
260008 British

INLET

GLAND NUT
320006

O-RING
300038

UV LAMP
RL-210HO "-02" series
RL-330HO "-03" series
RL-420HO "-06" series
RL-600HO "-10" series
RL-950HO "-20" series

SLEEVE SPRING
310039

QUARTZ SLEEVE
RQ-210 "-05" series
RQ-330 "-10" series
RQ-420 "-15" series
RQ-600 "-25" series
RQ-950 "-40" series

REACTOR
300062 "-05" series
300063 "-10" series
300064 "-15" series
300007 "-25" series
300009 "-40" series

OUTLET

SYSTEM SIZING

All LUMINOR UV systems are rated for a specific flow rate in water that meets the quality parameters on page 5. **Increasing the flow above this rating or disinfecting** water that does not meet the quality parameters will decrease the dose and therefore compromise the efficacy of the system.**

If you need to determine your maximum flow rate, you can fill a 1 gallon bucket with water and time how long it takes to fill up. It is always better to oversize your system then to undersize.

LOCATION

ALL LUMINOR UV DISINFECTION** SYSTEMS ARE INTENDED FOR INDOOR USE ONLY.

For Point-of-Entry systems, choose a location where the main cold water line is accessible. The system must be installed after other water treatment equipment (softener or filters), but before any branches (See Figure 1). For Point-of-Use systems, install the unit just before the faucet. **LUMINOR recommends that a 5 micron filter be installed before the UV system for a final polishing step before the water is disinfected.**

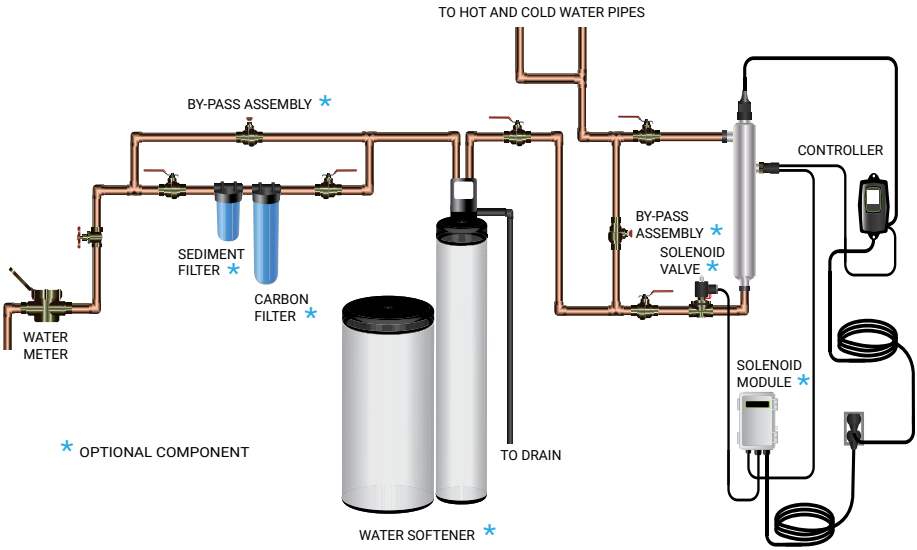


Figure 1. Recommended POE Installation Location

To facilitate lamp removal, ensure there is enough space at the lamp connector end to safely remove the UV lamp and/or quartz sleeve (See Figure 2). The controller will require a ground fault circuit interrupter (GFCI or GFI) outlet and should be mounted beside or above the reactor.

INSTALLATION



Figure 2. Lamp Removal Spacing

Step 1: The reactor can be installed either horizontally or vertically using the clamps provided. Vertical installation is the preferred method with the inlet at the bottom (lamp connection at the top) as it allows any air that may be in the lines to be easily purged from the system.

Step 2: The use of a by-pass assembly is recommended as it will allow you to isolate the UV reactor. This will allow for easier access in case maintenance is required (See Figure 3).

Step 3: Fasten chamber clamps to wall with screws provided (Figure 4a). The screws must anchor securely into solid wood, concrete, or steel structure for adequate strength. Do not attempt to secure screws into drywall (Figure 4a). Install Chamber into clamps (Figure 4b).

Step 4: For water supplies where the maximum flow rate is unknown, a flow restrictor is recommended so that the rated flow of your particular BLACKCOMB system is not exceeded. The flow restrictor should be installed on the inlet port of the reactor.

Step 5: It is recommended to have a licensed plumber connect the UV reactor to the water supply and may be a requirement depending on where you are located.



Figure 4a. Fasten clamps to wall

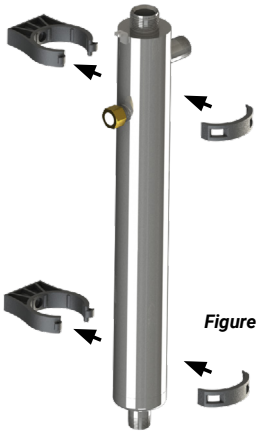


Figure 4b. Install chamber into clamps

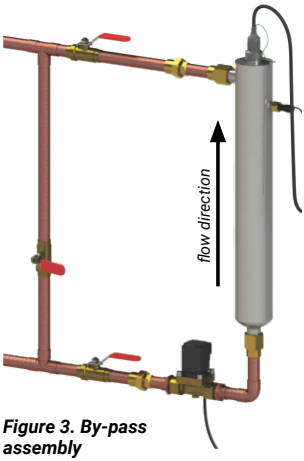


Figure 3. By-pass assembly

Step 6: Once the system has been plumbed in, gently remove the quartz sleeve from its packaging being careful not to touch the length with your hands. **CAUTION: Quartz sleeve is fragile.** The use of cotton gloves is recommended for this procedure as oils from the hands can leave residue on the sleeve and lamp which can ultimately block the UV light from getting to the water.

Step 7: Carefully slide the sleeve into the reactor until you can feel it hit the opposite end of the reactor. Align the sleeve so it is centered along the length of the reactor, then gently push it in to lock it into the internal centering springs in the far side of the reactor. **CAUTION: Pushing too hard when the sleeve is not aligned can damage the centering springs.** Slide the o-ring onto the sleeve until it is butted up against the reactor.

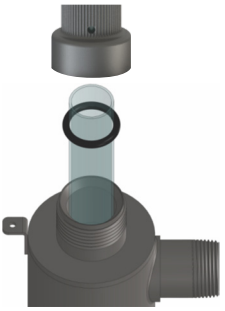


Figure 5. Quartz Sleeve Installation

Step 8: Hand tighten the provided gland nut over the quartz sleeve onto the threaded end of the reactor. It has a positive stop to prevent over-tightening. A firm force may be required to fully tighten the gland nut, but DO NOT USE TOOLS for this step. Insert the provided stainless steel compression spring into the quartz sleeve. The spring works with the lamp and LUMI-Loc™ connector to create the proper lamp alignment.
CAUTION: DO NOT install a UV lamp inside the quartz sleeve without the sleeve spring in place.



Figure 6. UV Sensor Installation

Step 9: Install the UV sensor (**BLACKCOMB 6.1 systems only**). Align the flat portion so it faces the gland nut end and matches up with the half metal lip on the sensor port (see Figure 6). Insert the sensor so it is fully seated and hand tighten the sensor nut.

Step 10: The reactor is now ready for water pressure. When all plumbing connections have been completed, slowly turn on the water supply and check for leaks. Make sure the by-pass valves are functioning properly and that the water is flowing through the reactor. The most common leak is from the o-ring not making a proper seal on the reactor. For new installations, review steps 6 and 7. For older systems drain the reactor, remove the o-ring, dry it and reapply silicone grease. Reinstall the o-ring ensuring that it is properly sealed against the reactor and check again for leaks.



Figure 7. Fasten controller

Step 11: Fasten controller securely to wall with screws provided (see Figure 7). Drywall anchors may be used. Note that the controller must be mounted vertically for adequate airflow across the aluminum heat sink on back. For monitored systems, insert the sensor connector into the IEP located on the right side of the controller (Figure 8). For the sensor to be recognized by the controller, the controller power must be plugged in last. **Do not plug the controller power cord in before the last step.**



Figure 8. IEP Connection

Step 12: Always hold UV lamps by their ceramic ends, not by the lamp quartz. Remove the lamp from its packaging and set aside, being careful to not touch the key's exposed contacts. The key always comes packaged with the lamp and sits on the connector. Again, the use of cotton gloves is recommended. Insert the UV lamp into the reactor, being careful not to drop it.

Step 13: Install the lamp key into the controller **(BLACKCOMB 5.1, BLACKCOMB 6.1 systems only)**. With the key removed from the lamp, orient it so the label is upright and facing you. The key will plug into the lamp key port on the right side of the controller (Figure 9).

Step 14: Plug the LUMI-Loc™ lamp connector into the lamp. Note the keying for proper alignment (see Figure 10a, 10b). Insert the lamp connector into the gland nut and turn the connector approximately ¼ turn to lock the connector to the gland nut as in Figure 11.

Step 15: Tighten the captive ground screw to the ground lug on the UV reactor to ensure proper grounding (Figure 12).

Step 16: Your system is now ready to be plugged into the appropriate GFCI protected outlet. Refer to the following section before any water is allowed to flow through the system.



Figure 9. Lamp Key Installation

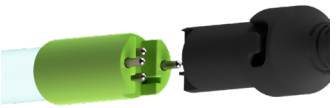


Figure 10a. Standard Output UV Lamp Connection

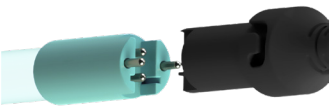


Figure 10b. High Output UV Lamp Connection



Figure 11. LUMI-Loc™ Connector

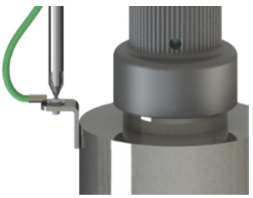


Figure 12. Ground Screw Connection

***INSTALLATION OF YOUR BLACKCOMB UV WATER TREATMENT** SYSTEMS SHALL COMPLY WITH APPLICABLE PROVINCIAL/STATE & LOCAL REGULATIONS.*

SYSTEM PREPARATION

With a new installation, or any time the UV system is shut down for service, without power, or is inoperative for any other reason, the lines in the home or facility could be contaminated. Use the following steps to prepare the lines throughout the entire home or facility. **This preparation requires a pre-filtration cartridge be installed in your water line before the UV system.**

Step 1: Check for and remove any “dead ends” in the lines throughout the home as these can harbor dirt and debris.

Step 2: Remove the filter cartridge from the last sump and fill it with 1-2 cups of household bleach (most are 5.25% chlorine). Replace the sump and slowly turn on the water supply.

Step 3: At a water outlet, run the water until bleach can be smelled. Repeat this for all faucets, toilets, shower heads, refrigerators, outdoor taps, the washing machine, dishwasher, etc. at the home or facility. Once finished, wait a minimum of 30 minutes before continuing.

Step 4: Reinstall the filter cartridge into the sump and flush the chlorine solution by opening all faucets until chlorine can no longer be detected. Your BLACKCOMB UV system is ready to use.

CLEANING THE QUARTZ SLEEVE

Depending on the water quality, the quartz sleeve may require periodic cleaning. At a minimum, the quartz sleeve should be cleaned on an annual basis. The following steps outline a basic cleaning procedure.

Step 1: If a by-pass assembly is installed, shut the inlet valve off to prevent water flow through the system. Otherwise, turn off main water inlet valve (and/or turn off the water pump).

Step 2: Unplug the power for the controller.

Step 3: Release water pressure by opening a downstream faucet and then close the outlet shut-off valve (if any).

Step 4: Unscrew the captive ground screw from the ground lug on the UV reactor.

Step 5: Push down lamp cable and turn ¼ turn counterclockwise to release lamp cable from gland nut.

Step 6: Being careful to touch only the ceramic ends, disconnect and remove the lamp from the reactor. **CAUTION: Lamp may be hot.**

Step 7: Unscrew the gland nut from the reactor exposing the end of the quartz sleeve.

Step 8: Remove the quartz sleeve and o-ring by gently twisting and pulling the quartz sleeve. The spring should remain inside the quartz sleeve. **CAUTION: Quartz sleeve is fragile.**

Step 9: Using a soft, lint-free cloth or towel wipe the sleeve down using a commercial scale cleaner (i.e. CLR® or LIME-A-WAY®). This removes scaling or iron deposits that may be on the outside of the quartz sleeve. Be careful not to get any moisture or liquids inside of the sleeve.

Step 10: Dry the sleeve with separate cloth.

Step 11: Replace the o-ring and slide the sleeve back into the reactor, reversing the previous steps.

CLEANING THE UV SENSOR

Depending on the water quality, the UV sensor may require periodic cleaning. At a minimum, the UV sensor should be cleaned on an annual basis. The following steps outline a basic cleaning procedure.

Step 1: If a by-pass assembly is installed, shut the inlet valve off to prevent water flow through the system. Otherwise, turn off main water inlet valve (and/or turn off the water pump).

Step 2: Disconnect power cord of UV system from electrical outlet.

Step 3: Release water pressure by opening a downstream faucet and then close the outlet shut-off valve (if any).

Step 4: Place something under the reactor to catch any water that may come out of the reactor during the removal of the UV sensor.

Step 5: Unscrew the sensor nut from the reactor and slowly remove the sensor from the sensor port.

Step 6: While holding the sensor, wipe the flat portion (sensor face) with isopropyl alcohol using a clean lint-free cloth.

Step 7: Replace the sensor by reversing the previous steps.

OPERATION

BLACKCOMB systems come with a feature-rich controller that incorporates both the lamp driver (ballast) and control features in one water-tight case. Four main controllers are available for the BLACKCOMB systems (depending on your model). All four models feature a power-factor-corrected, constant-current lamp driver with a universal power input.

PLEASE NOTE: While the LED or display screen is red and the buzzer is sounding the water from the system should NOT be consumed. If any water does pass through the system during this period, please follow the preparation procedure as outlined in this manual before the water is consumed. For BLACKCOMB 4.1 and BLACKCOMB 5.1 systems, even though they have a visual and audible warning built into the controller, a green LED or status screen does not necessarily indicate that the water coming from this system is in fact potable (safe to drink). These systems do not measure the level of UV disinfection**; they simply measure the "on-off" status of the lamp. Please have your water checked for microbiological contaminants on a regular basis.

BLACKCOMB 4.1 CONTROLLERS



LB4 Series



LBH4 Series

Simplistic in operation, these systems feature a tri-colour LED indicating system status and a 4-digit display to indicate lamp life remaining. Pressing the button will change the display to indicate total running time. When the UV lamp is on and within its operating age, the LED will be green. When the UV lamp is not on or the lamp life has expired, the LED will be illuminated red and an audible buzzer will be sounding. To remedy this condition, the UV lamp must be replaced with a new genuine LUMINOR UV lamp.

BLACKCOMB 5.1 & 6.1 CONTROLLERS



LB5/LB6 Series



LBH5/LBH6 Series

A full colour LCD screen provides the user with a detailed description of the system's performance in addition to providing any applicable fault messages and system diagnostics. The controllers used in both the BLACKCOMB 5.1 & 6.1 are identical. The difference is that the BLACKCOMB 6.1 series of products includes a UV sensor All BLACKCOMB 5.1 & 6.1 controllers include an "infinite expandability port" located on the right side of the controller. Simply plug in an optional UV sensor module into the expandability port of a BLACKCOMB 5.1 controller and the system will now monitor the UV intensity.

BLACKCOMB 5.1 & 6.1 POWER-UP SEQUENCE

On start-up, the controller will run through a diagnostic start-up and the sequence will be displayed as follows on the colour LCD:







Next, the controller checks for and initializes any optional modules that may be attached to the system.

Optional Modules Check:

 **- UV Sensor**

 **- Solenoid**

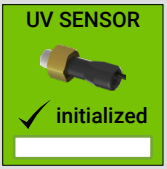
 **- 4-20 mA**

 **- WIFI**

 **- Remote Alarm**

 **- Flowmeter**





OR



A final module screen is displayed showing which specific modules were initialized.

The controller then displays the lamp optimization screen for 60 seconds to allow the lamp to reach its optimum output. Finally, a “start-up complete” screen is displayed. The system will now be ready to disinfect** water flow.



all detected modules



lamp reaching max output



successful start-up

BLACKCOMB 5.1 OPERATIONAL SCREENS

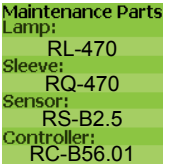
On systems without the UV monitor, the default screen shows the **LUMINOR Home Screen**. At any point during operation the user is able to scroll through the **LUMINOR Home Screen**, **Lamp Life Remaining**, **QR Code**, **Contact Info** and **Maintenance Parts** screens by pressing the button located on the front of the controller.









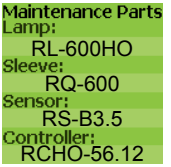










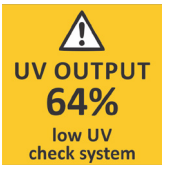


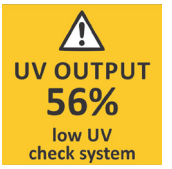
BLACKCOMB 6.1 OPERATIONAL SCREENS

On systems with the UV monitor, the system will display the same screens as on the BLACKCOMB 5.1 except the UV Intensity replaces the home screen. The UV Intensity screen displays the level of UV light detected by the sensor. UV intensity can be affected by poor water quality, scaling on the quartz sleeve and/or sensor, lamp failure or lamp expiration. The following screens show the UV Intensity dropping.

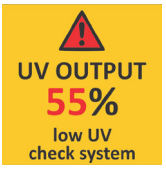




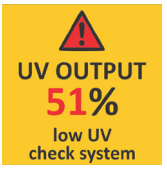




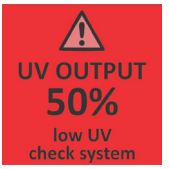
Below 56%, the numbers and warning sign turn red and an audible chirp is given by the controller every 15 seconds. Below 51%, the screen is solid red and a constant audible alarm is given. This alternates with a screen indicating “water may be unsafe for consumption”. With the solenoid module, the controller de-activates the solenoid valve, shutting off all water flow.



audible chirp every 15 seconds



audible chirp every 15 seconds



constant audible alarm



cycles with red low UV screen

LAMP COUNTDOWN SEQUENCE

The system counts down the number of days until a lamp change is required.

BLACKCOMB 6.1
BLACKCOMB 5.1









BLACKCOMB 4.1









At thirty days remaining, the LED or display screen will change to a yellow caution indicator. At seven days remaining, the system will additionally repeat an audible chirp. Past the zero day threshold, the LED or display screen changes to solid red with a continuous buzzer.

BLACKCOMB 6.1
BLACKCOMB 5.1









BLACKCOMB 4.1







At any point during this sequence, the audible chirp or alarm can be deferred for seven days by holding the controller button down for five seconds. The number of deferrals used will be displayed as below. Once the deferral expires, the alarm will sound once again. The deferral can be repeated up to three times. **PLEASE NOTE: At any point after lamp expiration, the water may be unsafe for consumption and should not be consumed without another form of disinfection**.







SYSTEM SERVICE SUGGESTED

BLACKCOMB 5.1 & 6.1 controllers will display the System Service Suggested Screen every 6 months to remind consumers to maintain both their UV and other prefiltration. This will serve as a prompt only and will not put the system into alarm. To clear this condition simply press the button below the screen.



LAMP REPLACEMENT (BLACKCOMB 4.1 SYSTEMS)

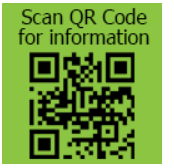
After the lamp is expired, it must be replaced with the same part number as indicated by the label on the reactor. Refer to ***Installation***, starting with step 11 (page 10) for instructions on installing the new lamp. After replacing the lamp, reset the timer in the controller by firmly holding down the button on the controller for 10 seconds. The controller will read “rSt3”, “rSt2”, “rSt1” and then beep. The button can now be released, the lamp countdown timer has been reset.

LAMP REPLACEMENT (BLACKCOMB 5.1 & 6.1 SYSTEMS)

After the lamp is expired, it must be replaced with the same part number as indicated on the Maintenance Parts screen or on the label on the reactor. With the system powered down, remove and discard the lamp key from the controller. The replacement lamp is packaged with a lamp key on the connector at the end of the lamp. Remove the key from the lamp and place it in the controller. Refer to ***Installation***, starting with step 11 (page 10) for instructions on installing the new lamp.

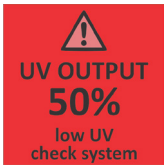
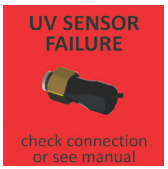
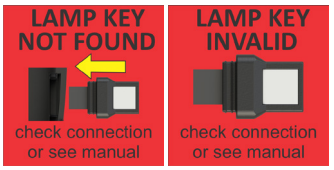
QR CODES

BLACKCOMB 5.1 & 6.1 controllers display a QR code with a link to a webpage with user information about the system. The webpage can direct you to a support or contact page to help address any questions you may have about the UV system. To access the QR code on the BLACKCOMB controller, press the control button until the QR code screen appears.



SYSTEM TROUBLESHOOTING

Hard Alarms: The following give a constant audible alarm. If present, the solenoid valve is closed, and the 4-20, remote alarm and wifi modules transmit the alarm.

System Display	*Problem*	*Resolution*
	The system has detected a problem with the lamp.	Reset lamp protection circuit by unplugging unit for 10 seconds. Replace the lamp with the part as indicated on the silver label on the reactor or on the Maintenance parts screen.
	The UV lamp has expired. Although the lamp is powered and visibly illuminated, due to its age its UV output is no longer sufficient for proper UV disinfection**.	Replace the lamp with the part as indicated on the silver label on the reactor or on the Maintenance parts screen.
	Low UV Intensity.	Remove and clean the quartz sleeve and sensor. Check water quality meets requirements on page 5 and add filtration as required. Replace lamp.
	Wrong lamp or sensor installed.	Replace component with proper model as indicated.
	The UV sensor is no longer communicating with the system.	Ensure all modules are connected properly to the system and to each other. Modules can be tested individually by plugging in one at a time and cycling power to the system. Replace any module that is not detected when plugged directly into the controller.
	A bad connection has been detected in the IEP port.	
	Missing or incorrect lamp key.	Ensure the lamp key (packed with the lamp, on the connector) is installed. Unplug and reinstall the key. Ensure the key part number matches Lamp on Maintenance Parts screen.

Soft Alarms: The following remaining errors give a 15 second audible chirp only

System Display	*Problem*	*Resolution*
	The module indicated is no longer communicating with the system.	Ensure all modules are connected properly to the system and to each other. Modules can be tested individually by plugging in one at a time and cycling power to the system. Replace any module that is not detected when plugged directly into the controller.
	Refer to flow meter manual for detailed troubleshooting	

Warning: After any hard alarm, the home or facility should be disinfected**. Follow the steps under the “System Preparation” heading (page 12).

BOIL WATER ADVISORY

If any failure occurs on a BLACKCOMB UV system, the water must not be used for human consumption until the system is returned to normal operational mode. If the water is used for human consumption during this period, the water must be boiled (minimum 20 minutes at a full boil) prior to consumption.

TEMPERATURE MANAGEMENT DEVICES

Your BLACKCOMB system is designed to run continuously to ensure optimal UV disinfection**. However, during periods when no water is drawn through the system, the energy from the UV disinfection** process can cause the temperature of the water inside the chamber to rise. In extreme situations elevated water temperature or the fluctuation in temperature can lower the output of the UV lamp. In these cases, or if the elevated water temperature is a nuisance, LUMINOR recommends one of the following forms of temperature management devices.



Cooling Fan

Designed for use on the BLACKCOMB-HO systems, the LUMI-cool™ fan runs continuously to cool the water by forced convection. The long-life fan is powered independently using a compact modular power adapter that operates from 100-240V/50-60Hz. ±10%. The cooling fan must only be supplied at SELV.



Temperature Relief Valve (TRV)

On reaching a higher temperature, the TRV is designed to drain a small amount of water to allow fresh, cooler water to enter the system. The TRV works without power and comes complete with 10’ of drain line.

Available for 1/2” to 1 1/2” ports.

EXPANSION MODULES



BLACKCOMB 5.1 & 6.1 controllers incorporate an **“Infinite Expandability Port” (IEP)** which allows for expansion to the UV sensor and all other modules. Each module (including the sensor) comes with both a male and female connection. Connect any device to the controller and all subsequent devices are then connected into the female end of the last device added in a “daisy chain” configuration. The UV sensor must only be supplied at SELV.

The following optional expansion modules are available for use on BLACKCOMB 5.1 & 6.1 UV controllers. Contact your authorized distributor for purchasing information.



REMOTE ALARM CONNECTION MODULE: Allows for a connection to a remote device such as a buzzer, light, alarm system, PLC, etc., via a pair of contacts. In normal operation the OK and COM contacts will be connected, and in a fault condition (Low UV, Lamp fail, Power Fail), the Fault and COM contacts will be connected. Maximum contact rating is 30V / 1A (use 16-22 AWG). The remote alarm module must only be supplied at SELV.



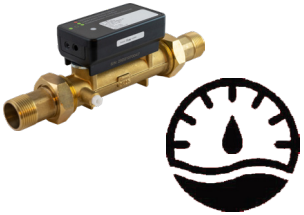
SOLENOID CONNECTION MODULE: Connects a NORMALLY CLOSED line voltage solenoid valve to the controller. Maximum contact rating is 240VAC (50-60Hz) / 30VDC / 2A. On a non-monitored system, the solenoid will only close on a lamp failure error. On a monitored system, the solenoid is closed when the UV level drops below 50%. Also note that in cases where emergency use of untreated water is required, the controller can be placed into a manual override mode allowing for the flow of water in an alarm condition.



4-20 mA MODULE: Outputs a 4-20mA signal of the UV output to a remote device such as a data logger or computer. The 4-20mA module must only be supplied at SELV.



The **WiFi MODULE** and accompanying IoT application allow you to connect your UV system to a smart phone, tablet, computer or other connected platform. View system status, receive SMS or email messages of alarm conditions and monitor the health of your UV from anywhere via this connected platform. Connect the device via the app found on Google Play or the App Store. Connect your UV device to your router, download the software for your connected device and have peace of mind that your UV system is fully operational. **Not available in all markets.*



The **Ultrasonic Flow Meter** enables your UV system to dim power in times of low to no flow, saving you money on energy, reducing water temperature, and decreasing the risk of fouling. The flow meter module must only be supplied at SELV.

BLACKCOMB STANDARD OUTPUT SYSTEM SPECIFICATIONS

System Tested and Certified by NSF International against CSA B483.1

MODEL (includes 12V variants)	LB4-021 LB5-021 LB6-021	LB4-031 LB5-031 LB6-031	LB4-061 LB5-061 LB6-061	LB4-101 LB5-101 LB6-101	LB4-151 LB5-151 LB6-151	LB4-201 LB5-201 LB6-201
LUMINOR FLOW RATE (30 mJ/cm² at 95% UVT)	**2 GPM** (7.6 lpm) (0.45 m³/hr.)	**3 GPM** 11.4 lpm 0.7 m³/hr.	**6 GPM** 22.7 lpm 1.4 m³/hr.	**11 GPM** 41.6 lpm 2.5 m³/hr.	**15 GPM** 56.8 lpm 3.4 m³/hr.	**21 GPM** 79 lpm 4.8 m³/hr.
Alternate Flow Rate (16 mJ/cm² at 95% UVT)	4 GPM 15.1 lpm 0.9 m³/hr.	6 GPM 23 lpm 1.4 m³/hr.	11 GPM 41.6 lpm 2.5 m³/hr.	20 GPM 77 lpm 4.6 m³/hr.	30 GPM 113.6 lpm 6.8 m³/hr.	39 GPM 150 lpm 8.9 m³/hr.
Alternate Flow Rate (40 mJ/cm² at 95% UVT)	1.6 GPM 6.1 lpm 0.36 m³/hr.	2.4 GPM 9.1 lpm 0.5 m³/hr.	4.4 GPM 17 lpm 1.0 m³/hr.	8.3 GPM 31 lpm 1.9 m³/hr.	12 GPM 45.4 lpm 2.7 m³/hr.	16 GPM 59 lpm 3.6 m³/hr.
Port Size	½" FNPT	½" MNPT	¾" MNPT	¾" MNPT	1" MNPT	1" MNPT
Electrical	90-265V/50-60Hz.					
Plug Type	North American, NEMA 5-15, 3-wire for all 110V - "1" suffix (i.e. **LB5-061**) European, CEE 7/7, 3-wire for all 230V - "2" suffix (i.e. **LB5-062**) British Standard, BS 1363, 3-wire for all 230V - "3" suffix (i.e. **LB5-063**) Australian/New Zealand, AS/NZ 3112, 3-wire for all 230V - "4" suffix (i.e. **LB5-064**) 12VDC ships with 6' (1.82 m) bare leads (i.e. **LB5-06-12V**)					
Lamp Watts	8	15	22	39	50	42
Power (watts)	14	20	30	49	62	51
Replacement Lamp	**RL-210**	**RL-290**	**RL-470**	**RL-820**	**RL-999**	**RL-850**
Replacement Sleeve	**RQ-210**	**RQ-290**	**RQ-470**	**RQ-820**	**RQ-999**	**RQ-850**
Replacement Controller	**RC-B4.01** (LB4) | **RC-B56.12** (LB5/6)					
Reactor Dimensions	2.5 x 10.3" (6.4 x 26.2 cm)	2.5 x 14.3" (6.4 x 36.4 cm)	2.5 x 21.3" (6.4 x 54.2 cm)	2.5 x 35.2" (6.4 x 89.5 cm)	2.5 x 40.0" (6.4 x 101.6 cm)	3.5 x 36.1" (8.9 x 91.7 cm)
Chamber Material	Polished 304 Stainless Steel, A249 Pressure Rated Tubing					
Controller Dimensions	17.2 x 9.2 x 10.2 cm (6.8 x 3.6 x 4")					
Operating Pressure	0.7-10.3 bar (10-150 psi)					
Operating Water Temperature	2-40° C (36-104° F)					
254nm UV Sensor	**RS-B2.5** (LB5/6 only)					**RSHO-B3.5** (LB5/6 only)
Solenoid Output	**MOD-SOL** (LB5/6 only)					
4-20 mA Output	**MOD-420** (LB5/6 only)					
Remote Alarm Output	**MOD-RAM** (LB5/6 only)					
Temperature Management Valve	N/A	**130031**	**130032**		**130033**	
Lamp Status Indicator	YES					
Shipping Weight	3.3 kg. (7.2 lbs.)	3.6 kg. (8 lbs.)	4.4 kg. (9.6 lbs.)	6.8 kg. (15.0 lbs.)	8.0 kg. (17.6 lbs.)	8.4 kg. (18.6 lbs.)

BLACKCOMB-HO HIGH OUTPUT SYSTEM SPECIFICATIONS

System Tested and Certified by NSF International against CSA B483.1

MODEL	LBH4-051 LBH5-051 LBH6-051	LBH4-101 LBH5-101 LBH6-101	LBH4-151 LBH5-151 LBH6-151	LBH4-251 LBH5-251 LBH6-251	LBH4-401 LBH5-401 LBH6-401
LUMINOR FLOW RATE (30 mJ/cm^2 at 95% UVT)	**5 GPM** 18.9 lpm 1.1 m^3/hr.	**10 GPM** 37.9 lpm 2.3 m^3/hr.	**15 GPM** 57 lpm 3.4 m^3/hr.	**25 GPM** 95 lpm 5.7 m^3/hr.	**40 GPM** 151.4 lpm 9.1 m^3/hr.
Port Size	½" MNPT	¾" MNPT	1" MNPT	1" MNPT	1 ½" MNPT
Electrical	90-265V/50-60Hz. (IEC power cords required)				
Plug Type	North American, NEMA 5-15, 3-wire for all 110V. - "1" suffix (i.e. **LBH6-051**) European, CEE 7/7, 3-wire for all 230V. - "2" suffix (i.e. **LBH6-052**) British Standard, BS 1363, 3-wire for all 230V. - "3" suffix (i.e. **LBH6-053**) Australian/New Zealand, AS/NZ 3112, 3-wire for all 230V. - "4" suffix (i.e. **LBH6-054**)				
Lamp Watts	18	34	45	67	101
Power (watts)	20 (19 @ 230V.)	38 (36 @ 230V.)	57 (48 @ 230V.)	73 (72 @ 230V.)	115 (108 @ 230V.)
Maximum Current (amps)	1				
Replacement Lamp	**RL-210HO**	**RL-330HO**	**RL-420HO**	**RL-600HO**	**RL-950HO**
Replacement Sleeve	**RQ-210**	**RQ-330**	**RQ-420**	**RQ-600**	**RQ-950**
Replacement Controller	**RCHO-4.12** (LBH4) | **RCHO-56.12** (LBH5/6)				
Reactor Dimensions	3.5 x 11.7" (8.9 x 29.8 cm)	3.5 x 16.5" (8.9 x 41.8 cm)	3.5 x 20.0" (8.9 x 50.8 cm)	3.5 x 26.9" (8.9 x 68.3 cm)	3.5 x 40.7" (8.9 x 103.4 cm)
Chamber Material	316L Stainless Steel, A249 Pressure Rated Tubing, Polished & Passivated				
Controller Dimensions	21.8 x 10.7 x 10.2 cm (8.6 x 4.2 x 4")				
Operating Pressure	0.7-10.3 bar (10-150 psi)				
Operating Water Temperature	2-40° C (36-104° F)				
254nm UV Sensor	**RSHO-B3.5** (LB5/6 only)				
Solenoid Output	**MOD-SOL** (LB5/6 only)				
4-20 mA Output	**MOD-420** (LB5/6 only)				
Remote Alarm Output	**MOD-RAM** (LB5/6 only)				
Temperature Management Valve	**130031**	**130032**	**130033**		**130034**
Cooling Fan	**130014**				
Lamp Status Indicator	YES				
Shipping Weight	4.5 kg. (10 lbs.)	5.4 kg. (11.9 lbs.)	6.0 kg. (13.2 lbs.)	7.7 kg. (17 lbs.)	9.8 kg. (21.6 lbs.)

PERFORMANCE DATA SHEET (ON ALL NSF/ANSI STANDARD 55, CLASS A SYSTEMS)

System Tested and Certified by NSF International against CSA B483.1 and NSF/ANSI 55 for Disinfection Performance, Class A

MODEL	LB6-02XA LB6-02A-12V	LB6-03XA LB6-03A-12V	LB6-06XA LB6-06A-12V	LB6-10XA	LB6-15XA
NSF STANDARD 55, CLASS A Flow Rate (40 mJ/cm² @ 70% UVT)	1.6 GPM 6.1 lpm 0.36 m³/hr.	2.2 GPM 8.3 lpm 0.5 m³/hr.	3.4 GPM 12.9 lpm 0.77 m³/hr.	6.3 GPM 23.8 lpm 1.43 m³/hr.	7.9 GPM 29.9 lpm 1.79 m³/hr.

MODEL	LBH6-05XA	LBH6-10XA	LBH6-15XA	LBH6-25XA	LBH6-40XA
NSF STANDARD 55, CLASS A Flow Rate (40 mJ/cm² @ 70% UVT)	2.2 GPM 8.3 lpm 0.5 m³/hr.	4.0 GPM 15.1 lpm 0.91 m³/hr.	5.4 GPM 20.4 lpm 1.22 m³/hr.	7.9 GPM 29.9 lpm 1.79 m³/hr.	18.0 GPM 68.1 lpm 4.08 m³/hr.
Port Size	½" MNPT	¾" MNPT	1" MNPT	1" MNPT	1" MNPT
Electrical	100-240V/50-60Hz. ±10% I 12VDC for 12V Systems				
Plug Type	American: NEMA 5-15P *See Note (below)				
Operating Pressure	0.7-10.3 bar (10-150 psi)				
Operating Water Temperature	2-40° C (36-104° F)				

***Note:** replace "X" with "1" for all 110V systems with North American NEMA 5-15
replace "X" with "2" for all 230V systems with European CEE 7/7
replace "X" with "3" for all 230V systems with British Standard, BS 1363
replace "X" with "4" for all 230V systems with Australian/New Zealand AS/NZ 3112

Lamp Life: LB6 series UV lamps are rated for 9,000 hours of continuous use (one-year). LBH6 series UV lamps are rated for 10,000 hours of continuous use (approximately 14 months).

General Operation and Maintenance: UV lamps are to be replaced on an annual basis. Quartz sleeves and UV sensors are to be cleaned every 6-12 months and replaced every 5 years. This Class A system conforms to NSF/ANSI 55 for the disinfection** of microbiologically contaminated water that meets all other public health standards. The system is not intended to convert wastewater or raw sewage to drinking water. The system is intended to be installed on visually clear water. NSF/ANSI 55 defines wastewater to include human and/or animal body waste, toilet paper, and any other material intended to be deposited in a receptacle designed to receive urine and/or feces (blackwaste), and other waste materials deposited in plumbing fixtures (greywaste). If this system is used for the treatment of untreated surface waters or ground water under the direct influence of surface water, a device found to be in conformance for cyst reduction under the appropriate NSF/ANSI standard shall be installed upstream of the system.

While testing was performed under standard laboratory conditions, actual performance may vary.

The systems and installation shall comply with applicable provincial/state and local regulations.

PERFORMANCE DATA SHEET (ON ALL NSF/ANSI STANDARD 55, CLASS B SYSTEMS)

System Tested and Certified by NSF International against CSA B483.1 and NSF/ANSI 55 for Disinfection Performance, Class B

MODEL	LB5-02XB LB6-02XB	LB5-03XB LB6-03XB	LB5-06XB LB6-06XB	LB5-10XB LB6-10XB	LB5-15XB LB6-15XB
NSF STANDARD 55, CLASS B Flow Rate (16 mJ/cm² @ 70% UVT)	2.9 GPM 11 lpm 0.66 m³/hr	5.2 GPM 19.7 lpm 1.18 m³/hr	7.6 GPM 28.8 lpm 1.73 m³/hr.	13 GPM 49.2 lpm 2.95 m³/hr	22 GPM 83.3 lpm 5 m³/hr
Port Size	½" FNPT	½" MNPT	¾" MNPT	¾" MNPT	1" MNPT
Electrical	100-240V/50-60Hz. ±10%				

MODEL	LBH5-05XB LBH6-05XB	LBH5-10XB LBH6-10XB	LBH5-15XB LBH6-15XB	LBH5-25XB LBH6-25XB	LBH5-40XB LBH6-40XB
NSF STANDARD 55, CLASS B Flow Rate (16 mJ/cm² @ 70% UVT)	5.4 GPM 20.4 lpm 1.22 m³/hr.	7.6 GPM 28.8 lpm 1.73 m³/hr.	13 GPM 49.2 lpm 2.95 m³/hr	22 GPM 83.3 lpm 5 m³/hr	28 GPM 105.9 lpm 6.35 m³/hr.
Port Size	½" MNPT	¾" MNPT	1" MNPT	1" MNPT	1" MNPT
Electrical	100-240V/50-60Hz. ±10%. 1.5A Max				
Plug Type	American: NEMA 5-15P *See Note (below)				
Operating Pressure	0.7-10.3 bar (10-150 psi)				
Operating Water Temperature	2-40° C (36-104° F)				

*__Note:__ replace "X" with "1" for all 110V systems with North American NEMA 5-15
replace "X" with "2" for all 230V systems with European CEE 7/7
replace "X" with "3" for all 230V systems with British Standard, BS 1363
replace "X" with "4" for all 230V systems with Australian/New Zealand AS/NZ 3112

Lamp Life: LB6 series UV lamps are rated for 9,000 hours of continuous use (one-year). LBH6 series UV lamps are rated for 10,000 hours of continuous use (approximately 14 months).

General Operation and Maintenance: UV lamps are to be replaced on an annual basis. Quartz sleeves and UV sensors are to be cleaned every 6-12 months and replaced every 5 years. This Class B system or component conforms to NSF/ANSI 55 for the supplemental bactericidal treatment disinfected** public drinking water or other drinking water that has been tested and deemed acceptable for human consumption by the state or local health agency having jurisdiction. The system is only designed to reduce normally occurring non-pathogenic nuisance microorganisms. Class B systems are not intended for treatment of contaminated water.

While testing was performed under standard laboratory conditions, actual performance may vary.

The systems and installation shall comply with applicable provincial/state and local regulations.

LIMITED WARRANTY STATEMENT:

Products manufactured by LUMINOR Environmental Inc., (LUMINOR) are warranted to the original user only to be free of defects in material and workmanship for a period as specified below. This warranty only applies to the original purchaser and is not transferable (proper documentation required for verification).

UV SYSTEMS
Ten (10) year Limited Warranty on the stainless steel reactors, from the date of original purchase, or installation.

ELECTRONICS
Three (3) year Limited Warranty on the ballasts and controllers, from the date of original purchase, or installation.

UV LAMPS, UV SENSORS & QUARTZ SLEEVES
One (1) year Limited Warranty on all LUMINOR ultraviolet lamps, UV sensors and quartz sleeves from the date of original purchase, or installation.

LUMINOR warrants that it will repair, replace or refund, at LUMINOR's sole option, any ultraviolet system or component that is defective in materials or workmanship for the period as outlined above, subject to the "Limitations of Warranty" as outlined below. LUMINOR's liability under this warranty shall be limited to repairing or replacing at LUMINOR's option, without charge, F.O.B. LUMINOR's factory or authorized service depot, any product that LUMINOR manufactures. LUMINOR will not be liable for any costs of removal, installation, transportation, or any other charges which may arise in connection with a warranty claim. Products which are sold but not manufactured by LUMINOR are subject to the warranty provided by the manufacturer of said products and not by LUMINOR's warranty. LUMINOR will not be liable for damage or wear to products caused by abnormal operating conditions, accident, abuse, misuse, unauthorized alteration or repair, or if the product was not installed in accordance with LUMINOR's printed installation and operating instructions.

LIMITATIONS OF WARRANTY

This warranty does not apply to any of the following:

- Water Quality Parameters have the following values:

Hardness:	>7 gpg (120 mg/L)
Water pH:	<6.5 or >8.5
Iron (Fe):	>0.3 ppm (0.3 mg/L)
Manganese (Mn):	>0.05 ppm (0.05 mg/L)
Turbidity:	>1 NTU
Tannins (organics):	>0.1 ppm (0.1 mg/L)
UVT (transmittance):	<75%

- A product that has been incorrectly installed according to the owners manual.
- A product that has been modified in any manner, unless approved by the manufacturer.
- A product where the serial number has been altered, defaced, or removed.
- Damage caused by the use of parts that are not compatible, suitable and/or authorized by LUMINOR for use with the product (e.g. non-original lamps or sleeves).
- Damage caused during shipment of the product.

- Water damage is found inside ballast housing or controllers.
- Product is installed outdoors in direct contact with the environment (rain).
- Product is installed in freezing temperatures.
- Humidity (non condensing) of the installed environment is below 10% or exceeds 90%
- Product is used in conditions that exceed LUMINOR's specifications.

TO GET WARRANTY SERVICE

To obtain service under this warranty, you must first contact where the product was originally purchased to obtain a Warranty Return Authorization. You will require proof of purchase and installation date, failure date, and any other requested data. Unless otherwise provided, the Dealer or Distributor will contact LUMINOR for instructions on returning the product. Any defective product to be returned to LUMINOR must be sent freight prepaid; documentation supporting the warranty claim and/or a Return Goods Authorization must be included if so instructed.

LUMINOR WILL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES CAUSED BY FIRE, FLOOD, OR ACTS OF GOD, LOSSES, OR EXPENSES ARISING FROM INSTALLATION, USE, OR ANY OTHER CAUSES. THERE ARE NO EXPRESS OR IMPLIED WARRANTIES, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHICH EXTEND BEYOND THOSE WARRANTIES DESCRIBED OR REFERRED TO ABOVE.

THIS LIMITED WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY MADE BY LUMINOR WITH RESPECT TO THE PRODUCT, AND IS GIVEN IN LIEU OF ANY OTHER WARRANTY. TO THE EXTENT ALLOWED BY APPLICABLE LAW, ANY AND ALL EXPRESS OR IMPLIED WARRANTIES NOT SET FORTH HEREIN ARE WAIVED AND DISCLAIMED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE. LIABILITY UNDER THIS LIMITED WARRANTY IS LIMITED SOLELY TO THOSE LIABILITIES SET FORTH ABOVE. IN THE EVENT THAT ANY PROVISION OF THIS LIMITED WARRANTY SHOULD BE OR BECOME INVALID OR UNENFORCEABLE UNDER APPLICABLE LAW, THE REMAINING TERMS AND CONDITIONS HEREOF SHALL REMAIN IN FULL FORCE AND EFFECT AND SUCH INVALID OR UNENFORCEABLE PROVISION SHALL BE CONSTRUED IN SUCH A MANNER AS TO BE VALID AND ENFORCEABLE.

WARRANTY REGISTRATION

It is imperative that you complete the warranty registration process. This not only registers your UV disinfection** system for the provided manufacturer's warranty, but also allows the factory to provide you with any important product updates or technical bulletins concerning your product. The registration process is simple and can ONLY be done online. When registering please ensure that ALL information is filled in, including a valid e-mail address. PLEASE NOTE: This information is for the sole purpose of technical support for your UV disinfection** system and will not be used, or sold, to any other organization for any other purpose. Please refer to LUMINOR's Privacy Policy statement at luminoruv.com/privacy-policy for further information.

FOR PARTS AND SERVICE CONTACT

LUMINOR Environmental Inc.
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