OWNERS MANUAL

Operation & Installation Instructions

Mountain Fresh | *Pure water for life*

mountain fresh.

Congratulations on purchasing this ultraviolet disinfection system. By purchasing a Mountain Fresh Disinfection system you are receiving not only a high quality product but also peace of mind. Protecting your water supply with a UV system gives you reassurance that your family will have access to safe drinking water throughout your entire home with no chance of microbiological contamination. This is chemical free process which is simple in its concept and effective in its abilities to inactivate microorganisms present in the water supply. Simple maintenance, continuous disinfection and ultimately safe water, Mountain Fresh makes it that easy.

mountain fresh.

TABLE OF CONTENTS

Safety Consideration:

Although your UV system has been manufactured to the highest safety standards, extreme care must be followed when operating and/or maintaining your system.

1. Whenever you are servicing this equipment, always disconnect the power cord from the electrical outlet.
2. As the energy given off by the UV lamp can be 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.
3. To ensure the system provides adequate disinfection, ALWAYS replace any component (lamp and sleeve) with a genuine manufacturer's replacement part.
4. Do not operate the unit if it has any damaged or missing components.
5. To avoid possible electrical shock, use only with a properly grounded electrical outlet.
6. Never perform any maintenance to the system unless you are comfortable in doing so. Contact the manufacturer for service instructions if required.
7. 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.
8. 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.
9. The disinfection 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.
10. We recommend that a licensed plumber or certified technician perform the installation

Before You Begin:

Before you begin, you'll need the following:

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:

UV disinfection is extremely effective against microorganisms but only if the UV light can pass through the water it needs to treat. This means that the quality of your water is very important in order to ensure complete disinfection.

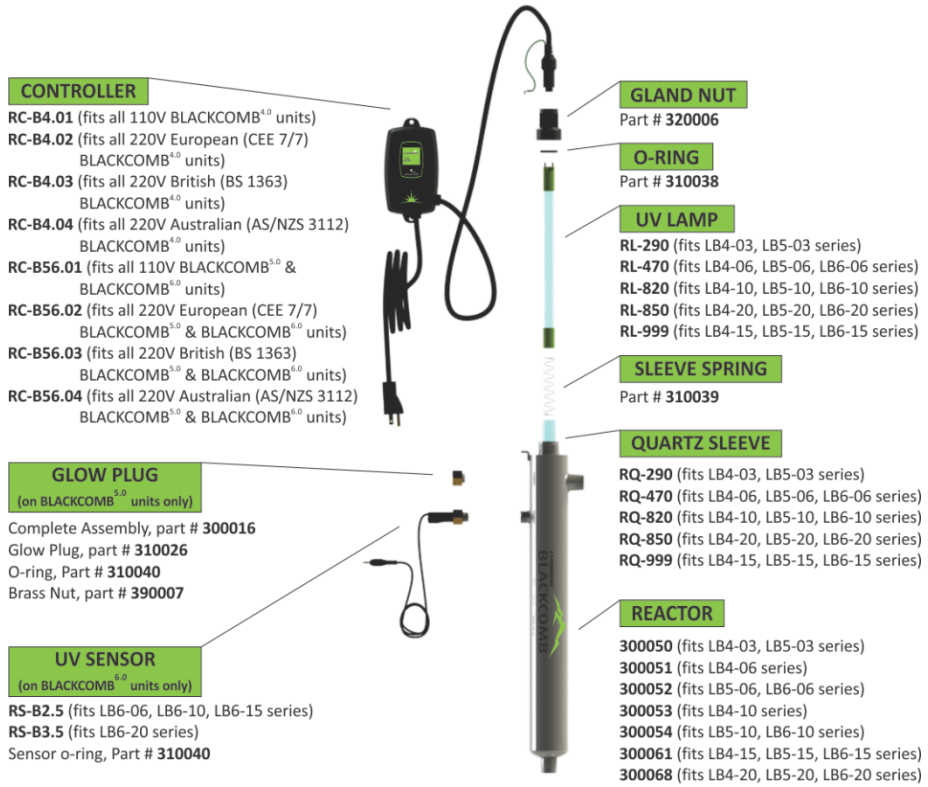
It is imperative that you have your water tested for at the least the parameters listed below. If the water exceeds the listed parameters MOUNTAIN FRESH strongly recommends that appropriate pretreatment equipment be installed (pretreatment will depend on parameters being treated):

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
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 MOUNTAIN FRESH 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 MOUNTAIN FRESH UV disinfection system.

Assembly:

Step 1: Unpack the system and ensure all the components are included with the system. Your system is shipped with the following components:



System Sizing:

All MOUNTAIN FRESH UV systems are rated for a specific flow rate under specific water quality parameters. The equipment has been designed to ensure that the appropriate dose will be delivered provided all parameters are followed. **PLEASE NOTE** that the flow rate for each system can be higher or lower than what the system is rated for however this will change the dose level that the system will deliver. A lower flow is not a concern as the dose will increase however a higher flow rate will decrease the dose and therefore compromise the microorganism inactivation.

It is important to know the maximum flow rate that your water system delivers. If you do not have this information you can simply fill a 3.8 litre (1 gallon) bucket with water and time how long it takes to fill up. This will be the maximum flow rate for the home. Choose a POWER SUPPLY system that is suitable.

PLEASE NOTE: It is always better to oversize your system than to undersize. For example, if your pump delivers 30.4 lpm it is recommended to install any of the POWER SUPPLY 41 lpm systems. There will come a time where your home is using water at the pump's maximum capacity.

Location:

Step 1: Find a suitable location to mount the UV reactor and the accompanying controller. In choosing your location ensure the controller is located within 5 feet of a ground fault circuit interrupter (GFCI) and that there is easy access to the main cold water line prior to any branch lines and before the hot water heater. If you have any other water treatment equipment, such as a softener or water filter, ensure that the UV is the last piece of treatment equipment. PLEASE NOTE: All MOUNTAIN FRESH UV disinfection systems are intended for indoor use only as they should not be exposed to the elements.

Step 2: Your system includes mounting hardware for both the UV reactor and the controller. If the supplied fasteners are not compatible with the structure in which you are mounting the device, please ensure you use the correct fasteners.

Step 3: To facilitate lamp removal, ensure there is enough space at the lamp connector end to safely remove the UV lamp and/or quartz sleeve (a space equal to the length of the unit will suffice) (see Figure 1.).

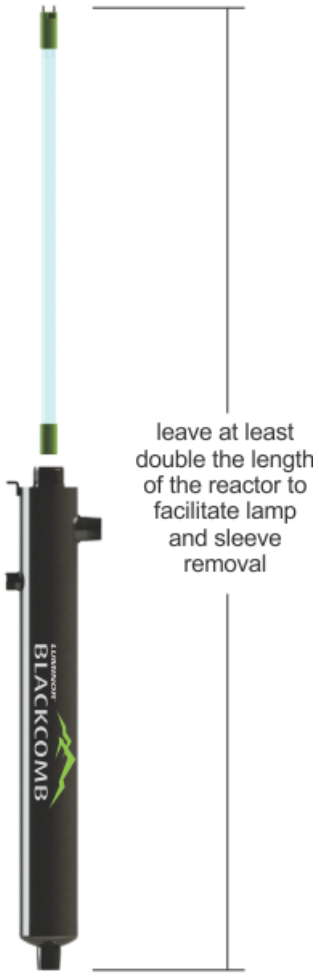


Figure 1. Lamp Removal Spacing

Installation:

Step 1: The UV disinfection system should always be the last piece of treatment before the water branches off to the hot and cold water lines if the intent is for Point of Entry (POE) (see figure 2). If the intent for the UV system is for Point of Use (POU) the system should be the final step before the faucet.

Step 2: MOUNTAIN FRESH strongly recommends that a 20 micron pre-filter and 1 micron filter be installed **before** the UV system for a final polishing step before the water is disinfected.

Step 3: The reactor can be installed either horizontally or vertically using the clamps provided, however 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.

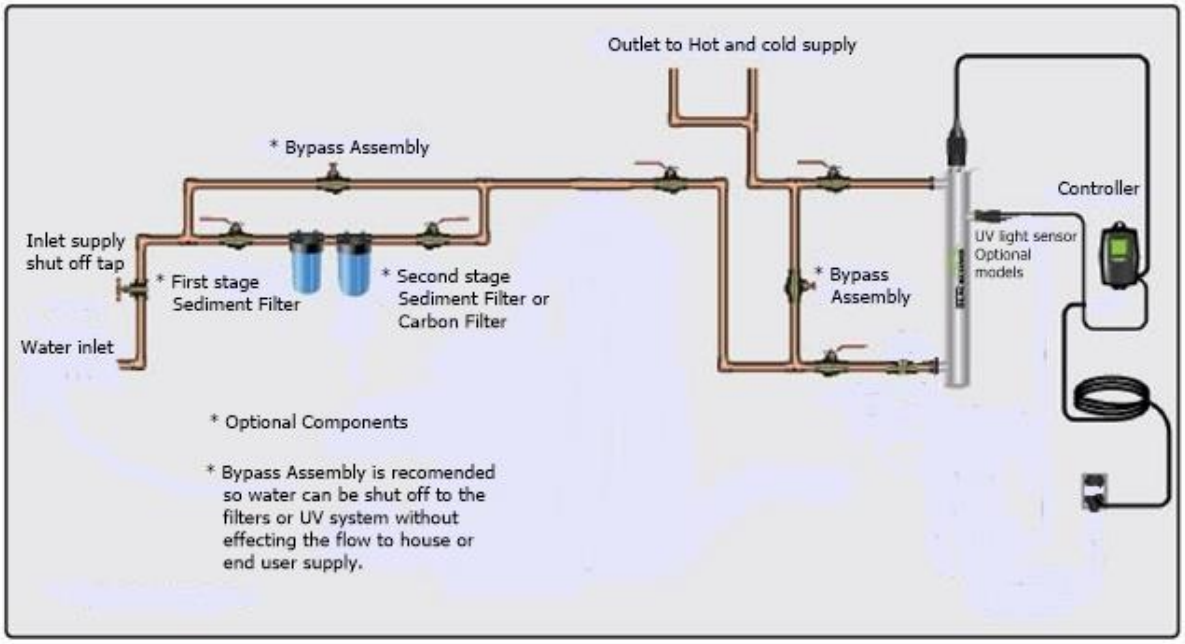


Figure 2. Recommended POE Installation

Step 4: If you do not know the flow rate of the water supply in your home it is recommended that you use a flow restrictor so that the rated flow of your particular MOUNTAIN FRESH POWER SUPPLY system is not exceeded and the UV dose is not compromised. The flow restrictor should be installed on the outlet port of the reactor.

Step 5: It is strongly 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. If you are attempting this yourself, ensure you have all the necessary tools and fittings to accomplish this task.

Step 6: Although there are many methods of installation, this manual will provide a recommended procedure using copper plumbing and standard soldering methods. MOUNTAIN FRESH recommends the use of unions, a by-pass assembly and shut-off valves as this will allow you to isolate and remove the UV reactor if necessary (this method

is a recommended method only however it allows for the maximum convenience but it requires extra components and more time for installation. Please refer to Figure 3 for the recommended installation.

Figure 3. Recommended Installation

Step 7: Before you cut into the cold water line, measure and cut all piping as per the recommended layout. Once all the components are ready, start by installing the female adapters onto the ports of the reactor. To ensure a proper seal, the use of Teflon™ tape is recommended on all threaded connections.

Step 8: Next solder all the assembly together, including ball valves and unions and finally connected the by-pass assembly to the cold water feed line (water in and water out).

Step 9: You can now gently remove the quartz sleeve from its packaging being VERY careful not to touch the length with your hands. The use of cotton gloves (not included) is recommended for this procedure as oils from our hands can leave residue on the sleeve and lamp which can ultimately block the UV light from getting to the water. In the package, you will find a lubricated o-ring. Place the o-ring over the open-end of the sleeve as shown in Figure 4.

Figure 4. Quartz Sleeve Installation

Step 10: Carefully slide the sleeve into the reactor until you can feel it hit the opposite end of the reactor. Slightly push the sleeve in to feel it lock into the spring inside the reactor. Ensure that the o-ring is butted up against the reactor. Assemble the provided gland nut onto the threaded end of the reactor and tighten. The gland nut has a positive stop to avoid over-tightening, hand tighten ONLY. Install the provided stainless steel compression spring inside the quartz sleeve. This spring simply sits in the bottom of the quartz sleeve and works with the lamp and

lock connector to create the proper lamp alignment. **PLEASE NOTE:** DO NOT install a UV lamp inside the quartz sleeve without the sleeve spring in place.

Step 11: (Applies only if you have a UV sensor…POWER SUPPLY$^{6.0}$) The UV sensor for the system is packaged in a separate plastic bag. Carefully remove the sensor from its packaging and insert the sensor into the UV sensor port (remove the protective cap on the UV reactor first). The sensor can only go in one way. Ensure that the flat portion of the UV sensor matches up with the half metal lip on the sensor port (flat portion should face the lamp connection end) (see Figure 5.). Ensure that the sensor is fully seated in the sensor port and then tighten (turning clockwise) the sensor nut. **PLEASE NOTE:** DO NOT over tighten the nut as this could damage the Teflon sensor body. Plug the male connector into the IEP port located on the right side of the controller, Figure 6, (make sure the controller is not plugged in as the sensor MUST be attached before power is applied to the controller.)

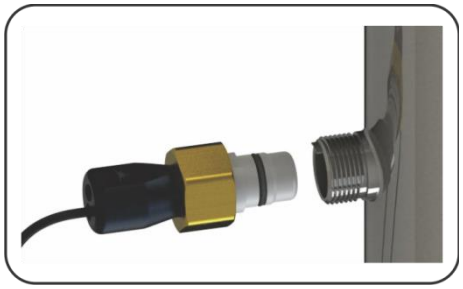


Figure 5. UV Sensor Installation

Figure 6. IEP Connection

Step 12: The reactor is now ready for water flow. When all plumbing connections have been completed you should check for any possible leaks. 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. If this is the case turn the water off, drain the reactor, remove the o-ring, dry it and reapply silicon grease. Replace o-ring ensuring that it is properly sealed against the reactor and check again for leaks.

Step 13: The controller can now be mounted on the wall. The controller should always be above or beside the reactor to ensure that no moisture can deposit on any of the connections (see Figure 2.). Always mount the controller vertically. For safety purposes the controller should be connected to a ground fault circuit interrupter (GFCI) (also known as a ground fault interrupter (GFI)).

Step 14: You can now remove the UV lamp from its packaging being careful not to touch the lamp quartz with your hands. Again, the use of cotton gloves is recommended to avoid deposited oils on the lamp glass. Always hold the lamp by the ceramic ends. With the lamp outside of the reactor, affix the UV lamp to the lamp connector as shown in Figure 7.

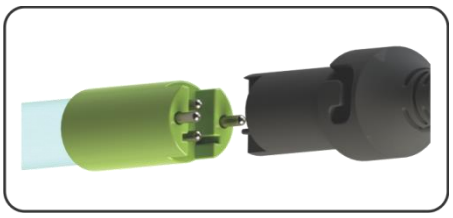


Figure 7. UV Lamp Connection

Step 15: Carefully insert the UV lamp into the reactor sliding it inside the quartz sleeve located inside the reactor (do not drop the lamp into the reactor). Affix the lock connector into the gland nut by inserting the connector into the nut and turning the connector approximately ¼ turn to lock the connector to the gland nut.

Figure 8. Lock Connector

Step 16: Affix the captive ground screw to the ground lug on the UV reactor to ensure proper grounding continuity.

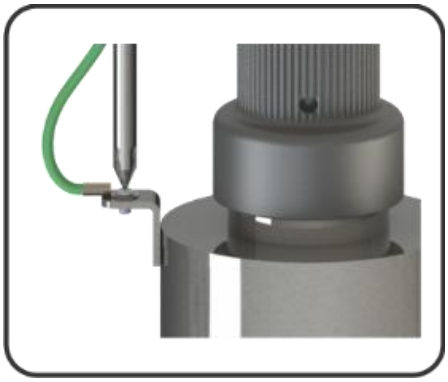


Figure 9. Ground Screw Connection

Step 17: Your system is now ready to be plugged into the appropriate GFCI protected outlet. Plug the unit in and refer to the "System Disinfection" section before any water is allowed to flow through the system.

System Disinfection:

Now that the system is installed you will need to disinfect the lines throughout the entire home or facility. To accomplish this, please follow these simple steps:

Step 1: Before performing this task, check to make sure that there are no "dead ends" in the lines throughout the home as these can harbor bacteria. Also ensure that the UV system is powered-up and ready for operation before you start this disinfection process.

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

Step 3: Go to each location in the home or facility (including outdoor taps) and run some water until chlorine can be detected (by smell). Ensure all faucets, dishwasher, shower heads, washing machine, toilets, showers, refrigerators, etc. are all checked. Once the chlorine is detected at each location close all faucets and let the chlorine sit in the lines for a minimum of 30 minutes.

Step 4: After 30 minutes, reinstall the filter cartridge into the filter sump and then flush the chlorine solution by opening all faucets and let them run until chlorine can no longer be detected (by smell). Your home has now been completely disinfected with your MOUNTAIN FRESH POWER SUPPLY UV system ready to inactivate any microorganisms that enter the home.

PLEASE NOTE: This procedure must be performed following any time the UV is shut down for service, without power, or is inoperative for some reason in order to avoid possible contamination of the water lines.

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 the system has an inlet shut-off valve, shut this valve off to prevent water flow through the system. If there is no inlet shut-off valve, turn off main water inlet valve (and turn of water pump if you have one).

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

Step 3: Release water pressure by opening a downstream faucet and close the outlet shut-off valve if the installation includes one (if there is no outlet shut-off valve, be prepared for water leakage from the system as the head pressure in the system will cause water to flow back through the outlet plumbing and through the reactor).

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

Step 5: Remove the lamp connector from the reactor (gland nut) by pushing the lock connector in and turning it ¼ turn counter-clockwise (gently pull on the lamp cable to ensure the connector is seated properly).

Step 6: Pull lamp out of reactor still attached to connector.

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

Step 8: Carefully pull the quartz sleeve out of the reactor and remove the o-ring

Step 9: Using a soft, lint-free cloth or towel wipe the sleeve down using a commercial glass or scale cleaner to remove any scaling or iron deposits that may be on the outside of the quartz sleeve. Be careful not to get any moisture or liquids on the inside of the sleeve.

Step 10: Wipe the sleeve with a separate dry cloth.

Step 11: Once the sleeve is cleaned replace the o-ring and slide the sleeve back into the reactor following the steps outlined on page 8 of the manual.

Cleaning the UV Sensor:

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

Step 1: If the system has an inlet shut-off valve, shut this valve off to prevent water flow through the system. If there is no inlet shut-off valve, turn off main water inlet valve (and turn off water pump if you have one).

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

Step 3: Release water pressure by opening a downstream tap and close the outlet shut-off valve if the installation includes one (if there is no outlet shut-off valve, be prepared for water leakage from the system as the head pressure in the system will cause water to flow back through the outlet plumbing and through the reactor).

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 (counterclockwise) sensor nut from the reactor and pull the sensor slowly out of the sensor port.

Step 6: Holding the sensor in your hand wipe the flat portion (sensor face) of the sensor with isopropyl alcohol using a clean lint-free cloth.

Step 7: Replace sensor as per instructions on pages 8-9 of the manual

Operation:

Mountain Fresh systems come with a feature laden controller that incorporates both the lamp driver (ballast) and control features in one water-tight case. Four main controllers are available for the Mountain Fresh 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 disinfection procedure as outlined in this manual before the water is consumed. For 4.1 and 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 disinfection; they simply measure the “on-off” status of the lamp. Please have your water checked for microbiological contaminants on a regular basis.

POWER SUPPLY 4.1 CONTROLLER

LB4 Series

LBH4 Series

Simplistic in operation, these systems feature a tri-colour LED that 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 Mountain Fresh UV lamp.

POWER SUPPLY5.1 & POWER SUPPLY6.1 CONTROLLER

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 5.1 and 6.1 are identical. The difference is that the 6.1 series of products includes a UV intensity monitor. All 5.1 and 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 5.1 controller and the system will now monitor the UV intensity of the system!

POWER SUPPLY5.1 & POWER SUPPLY6.1 Power-up Sequence

Upon start up, the 5.1 & 6.1 controller will run through a diagnostic start-up and the sequence will be displayed as follows on the colour LCD:

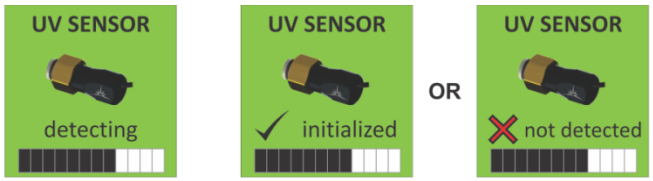
Mountain Fresh Home Screen

starting diagnostic check

lamp preheats, then starts

The controller next checks for the installation of any optional modules that may be installed on the system. It first checks to see if a module is installed and then either initializes the module to function with the controller or returns a “not detected” screen and moves on to the next module. The screens will appear as follows:

UV Sensor Module Check

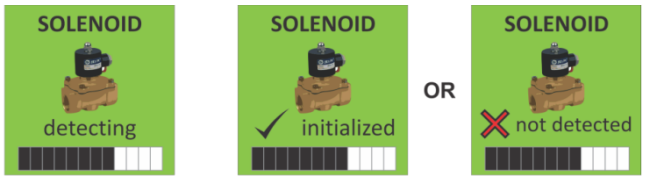


detecting the presence of a UV sensor

if sensor is present, returns this screen

if sensor is not present, returns this screen

Solenoid Module Check

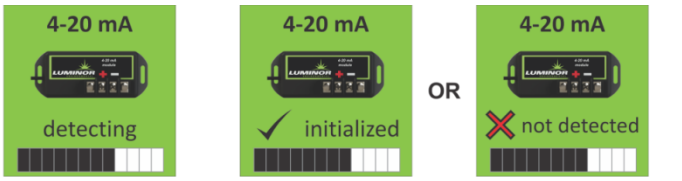


detecting the presence of a solenoid module

if solenoid module is present, returns this screen

if solenoid module is not present, returns this screen

4-20 mA Module Check

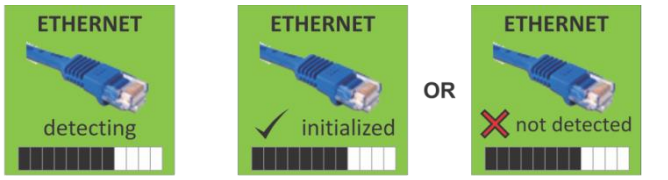


detecting the presence of a 4-20 mA module

if 4-20 module is present, returns this screen

if 4-20 module is not present, returns this screen

Ethernet Module Check

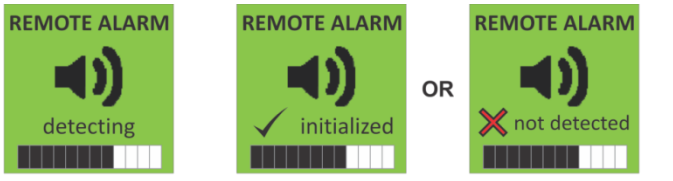


detecting the presence of a ethernet module

if ethernet module is present, returns this screen

if ethernet module is not present, returns this screen

Remote Alarm Module Check



detecting the presence of a remote alarm module

if remote alarm module is present, returns this screen

if remote alarm module is not present, returns this screen

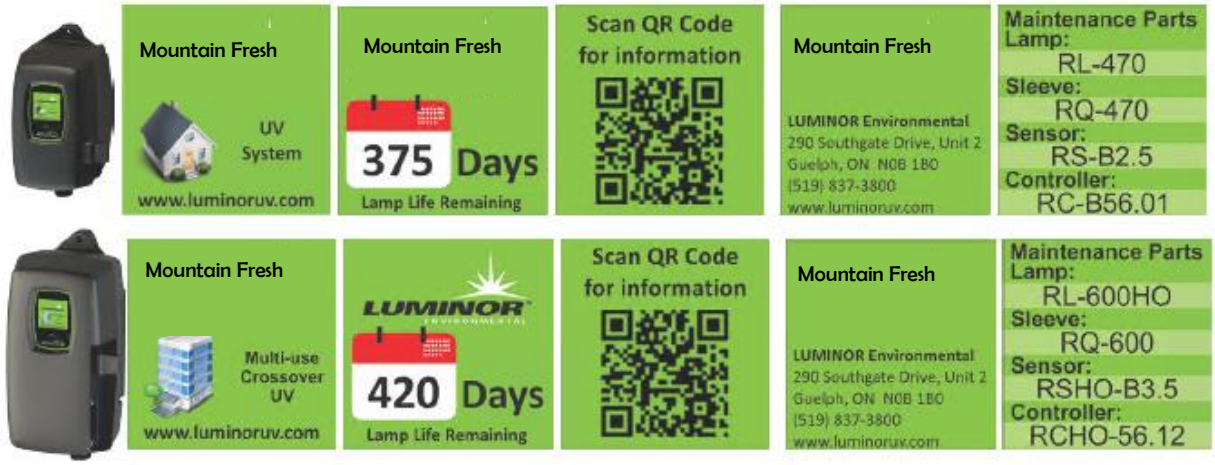
A final module screen is displayed showing which specific modules were initialized.

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

showing all detected modules | lamp reaching optimum output | successful start-up

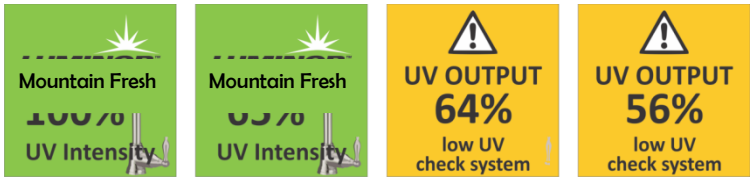
POWER SUPPLY$^{5.1}$ Operational Screens

On POWER SUPPLY$^{5.0}$ systems (without the UV monitor), the default screen shows the **MOUNTAIN FRESH Home Screen**. At any point during operation the user is able to scroll through the **MOUNTAIN FRESH Home Screen, Lamp life remaining** and **QR Code/Contact Info** screens by simply pressing the button located on the front of the controller.

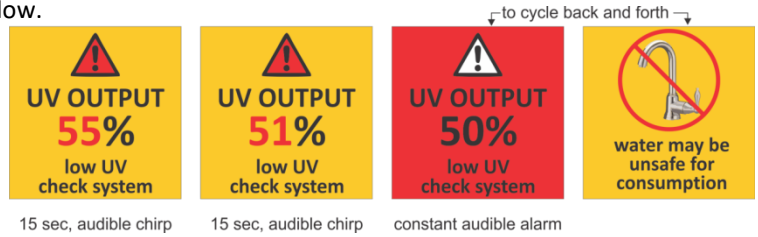


POWER SUPPLY$^{6.1}$ Operational Screens

On systems with the UV monitor, the system will display the same screens as on the MOUNTAIN FRESH LIMITED5.1 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 expiring. The following screens show the UV Intensity dropping.



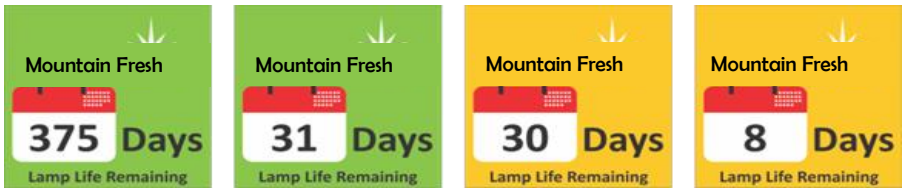
Below 56%, the numbers and warning sign turn red and an audible chirp is given by the ballast every 15 seconds. Below 51%, the screen is solid red and a constant audible alarm is given. This alternates with a screen indicating "water may be unsafe for consumption". With the solenoid module, the controller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



Lamp Countdown Sequence

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

6.1
5.1



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. Systems with a display screen also cycles between a red "lamp expired" screen and a "water may be unsafe for consumption" screen while systems with the 4-digit display will change to "LE".

6.1
5.1

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 a period of five seconds. On systems with display screens 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.

Lamp Replacement (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. Begin replacing the lamp by unplugging the power for the controller, then refer to *Installation*, starting with step 11 (page 11) for instructions on installing the new lamp. To reset the timer in the controller, firmly hold down the button on the controller while plugging the power cord back into the outlet. Continue holding down the button, the display will read “rSEt”, then 375 (or 420). The button can now be released, the lamp countdown timer has been reset.

Lamp Replacement (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 11) for instructions on installing the new lamp.

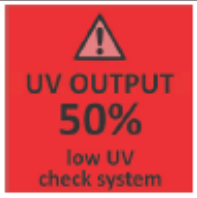
QR Codes

A QR code (Quick Response code) is a matrix barcode first designed for the automotive industry. MOUNTAIN FRESH uses the QR code to store a link to a specific page on our website. Users with a camera phone equipped with the correct reader application can scan the image of the QR code and over a wireless network connect to a MOUNTAIN FRESH web page in the phone’s browser. MOUNTAIN FRESH’s QR webpage has information on how to purchase replacement components as well as a helpful video directory on system servicing (i.e. How to change a UV lamp or quartz sleeve). To access the QR code on the MOUNTAIN FRESH 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 he 4-20, remote alarm and ethernet modules transmit the alarm.

System Display	Problem	Resolution
	The system has detected a problem with the lamp.	Reset lamp protection circuit -unplug 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.
	Although the lamp is powered and visibly illuminated, due to the lamp's age its UV output is no longer sufficient for proper 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 to 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.

Warning: After any hard alarm, the home or facility should be disinfected. Follow the steps under the "System Disinfection" heading.

Boil Water Advisory: If any failure occurs on a MOUNTAIN FRESH LIMITED UV system, the water must not be used for human consumption until the system is returned to a safe 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 Mountain Fresh system is designed to run continuously to ensure optimal disinfection. However, during periods when no water is drawn through the system, the energy from the 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, MOUNTAIN FRESH LIMITED recommends one of the following forms of temperature management devices.

Cooling Fan

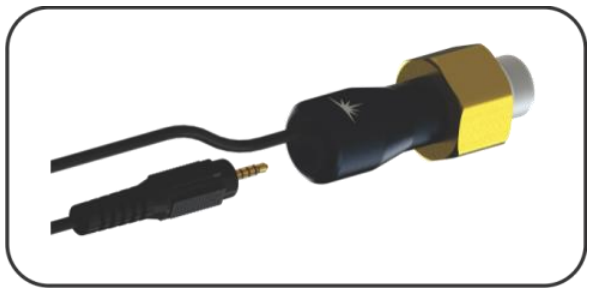
Designed for use on the MOUNTAIN FRESH-HO systems, the "LUMI-coolTM" fan runs continuously to cool the water by forced convection. The long-life fan is powered independently using a compact modular power adapter that operates from 90- 265V (47-63Hz). Order PN 130014.

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. Order PN 130031 for 1/2" ports, PN 130032 for 3/4" ports, PN 130033 for 1" ports and PN 130034 for 1 1/2" ports.

Expansion Modules

As shown earlier in this manual, the POWER SUPPLY$^{5.1}$ and POWER SUPPLY$^{6.1}$ controller incorporate an "**Infinite Expandability Port**" (**IEP**) on the controller. It is through this port and via a custom communication protocol that the UV sensor and all expansion modules are connected. Each module (including the sensor) comes with both a male and female connection. To activate the device, you simply need to connect the first device (does not matter which device it is) to the controller and all subsequent devices are then connected into the female end of the other device. This "daisy chain" method allows for a truly modular approach and is extremely user friendly. An example of this "daisy chain" is shown on the next page.



The following optional expansion modules are available for use on your POWER SUPPLY[5.1] and POWER SUPPLY[6.1] controllers. Contact MOUNTAIN FRESH for purchasing information.

REMOTE ALARM MODULE: Allows for a signal to be connected to a remote monitor 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 1A-120VAC/VDC (uses 16-22 AWG).

SOLENOID CONNECTION MODULE: Allows the integration of a NORMALLY CLOSED line voltage solenoid valve. Simply affix the module's supplied bare lead cord to the solenoid valve, connect the power cable to the electrical outlet, and the male IEP connector to the female IEP port on the controller. **PLEASE NOTE:** When this device is connected to a POWER SUPPLY[5.0] system (without the UV module), then the solenoid will close on a lamp failure mode only. When used on a POWER SUPPLY[6.0] system, the solenoid will close 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: Allows for a 4-20mA signal transfer of the UV output to a remote device such as a data logger or computer. Simply plug the supplied cable into any female IEP connections. Two screw terminals are supplied to connect the wire that leads to the receiving end of the signal. As the distance required is unknown, no wire is supplied with this system; however 16-22 AWG is required.

ETHERNET MODULE: Allows for all controller functions to be connected to a computer via an Ethernet cable. This module is currently in development and is not available at this point-in-time.

mountain fresh.

MODEL	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
NSF Class A Flow Rate 40mJ/cm² @ 70% UVT (add "A" suffix on LB6 models)	1.6 gpm	2.2 gpm	3.4 gpm	6.3 gpm	7.9 gpm	N/A
	6.1 lpm	8.3 lpm	13 lpm	24 lpm	30 lpm	N/A
	0.36 m³/hr	0.50 m³/hr	0.77 m³/hr	1.4 m³/hr	1.8 m³/hr	N/A
NSF Class B Flow Rate 16mJ/cm² @ 70% UVT ("B" suffix on LB5,LB6 models)	2.9 gpm	5.2 gpm	7.6 gpm	13 gpm	22 gpm	N/A
	11 lpm	20 lpm	29 lpm	49 lpm	83 lpm	N/A
	0.66 m³/hr	1.2 m³/hr	1.7 m³/hr	3.0 m³/hr	5.0 m³/hr	N/A
Flow Rate 16mJ/cm² @ 95% UVT	3.8 gpm	6.1 gpm	11 gpm	20 gpm	30 gpm	39 gpm
	15 lpm	23 lpm	41 lpm	77 lpm	110 lpm	150 lpm
	0.87 m³/hr	1.4 m³/hr	2.5 m³/hr	4.6 m³/hr	6.8 m³/hr	8.9 m³/hr
Flow Rate 30mJ/cm² @ 95% UVT	2.0 gpm	3.1 gpm	5.8 gpm	11 gpm	15 gpm	21 gpm
	7.7 lpm	11 lpm	23 lpm	41 lpm	57 lpm	79 lpm
	0.46 m³/hr	0.70 m³/hr	1.3 m³/hr	2.5 m³/hr	3.4 m³/hr	4.8 m³/hr
Flow Rate 40mJ/cm² @ 95% UVT	1.6 gpm	2.4 gpm	4.4 gpm	8.3 gpm	12 gpm	16 gpm
	6.1 lpm	9.1 lpm	17 lpm	31 lpm	45 lpm	59 lpm
	0.36 m³/hr	0.50 m³/hr	1.0 m³/hr	1.9 m³/hr	2.7 m³/hr	3.6 m³/hr
Port Size	½"FNPT	½"MNPT	¾"MNPT	¾"MNPT	1"MNPT	1"MNPT
Electrical	90-265V/50-60Hz. 1A Max.					
Plug Type	American: NEMA 5-15P					
Lamp Power (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
Reactor Dimensions	6.4 x 26.2 cm (2.5 x 10.3")	6.4 x 36.4 cm (2.5 x 14.3")	6.4 x 54.2 cm (2.5 x 21.3")	6.4 x 89.5 cm (2.5 x 35.2")	6.4 x 101.6 cm (2.5 x 40.0")	8.9 x 91.7 cm (3.5 x 36.1")
Chamber Material	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)					
UV Monitor	YES on all "LB6" models. Upgrade available for "LB5" models (NOT available on LB4 models)					
Solenoid Output	YES (optional solenoid module (**MOD-SOL1**) sold separately)					
Dry Contacts	YES (remote alarm module (**MOD-RAM**) sold separately)					
4-20mA Output	YES (4-20mA module (**MOD-420**) sold separately)					
Temperature Mgmt. Valve	NA	PN# 130131	PN# 130132		PN# 130133	
Cooling Fan	NO					OPTIONAL (130014)
Lamp Change Reminder	YES					
Lamp Out Indicator	YES					
Shipping Weight	2.9 kg (6.3 lbs)	3.6 kg (7.9 lbs)	4.4 kg (9.6 lbs)	6.0 kg (13.2 lbs)	6.5 kg (14.4 lbs)	8.2 kg (18.0 lbs)

mountain fresh.

MODEL	LBH4-05X LBH5-05X LBH6-05X	LBH4-10X LBH5-10X LBH6-10X	LBH4-15X LBH5-15X LBH6-15X	LBH4-25X LBH5-25X LBH6-25X	LBH4-40X LBH5-40X LBH6-40X
NSF Class A Flow Rate 40mJ/cm² @ 70% UVT (add "A" suffix on LBH6 models)	2.2 gpm	4.0 gpm	5.4 gpm	7.9 gpm	13 gpm
	8.3 lpm	15 lpm	20 lpm	30 lpm	49 lpm
	0.50 m³/hr	0.91 m³/hr	1.2 m³/hr	1.8 m³/hr	3.0 m³/hr
NSF Class B Flow Rate 16mJ/cm² @ 70% UVT ("B" suffix on LBH5,LBH6 models)	5.4 gpm	7.6 gpm	13 gpm	22 gpm	28 gpm
	20 lpm	29 lpm	49 lpm	83 lpm	110 lpm
	1.2 m³/hr	1.7 m³/hr	3.0 m³/hr	5.0 m³/hr	6.4 m³/hr
Flow Rate 30mJ/cm² @ 95% UVT	4.0 gpm	10 gpm	14 gpm	25 gpm	40 gpm
	15 lpm	38 lpm	53 lpm	95 lpm	150 lpm
	1.1 m³/hr	2.3 m³/hr	3.2 m³/hr	5.7m³/hr	9.1m³/hr
Flow Rate 40mJ/cm² @ 95% UVT	3.0 gpm	7.0 gpm	11 gpm	19 gpm	31 gpm
	11 lpm	26 lpm	42 lpm	72 lpm	120 lpm
	0.68 m³/hr	1.6 m³/hr	2.5 m³/hr	4.3 m³/hr	7.0 m³/hr
Flow Rate Hot Water (-HW suffix) model 30mJ/cm² @ 75% UVT	2.8 gpm	7.0 gpm	9.8 gpm	16 gpm	28 gpm
	11 lpm	26 lpm	37 lpm	61 lpm	110 lpm
	0.6 m³/hr	1.6 m³/hr	2.2 m³/hr	3.6 m³/hr	6.4 m³/hr
Flow Rate Low UVT (-50 suffix) model 30mJ/cm² @ 50% UVT	1.7 gpm	4.2 gpm	6.1 gpm	10 gpm	17 gpm
	6.4 lpm	16 lpm	23 lpm	38 lpm	64 lpm
	0.4 m³/hr	1.0 m³/hr	1.4 m³/hr	2.3 m³/hr	3.9 m³/hr
Flow Rate TOC (-TOC suffix) model 150mJ/cm² @ 98% UVT	0.8 gpm	2.0 gpm	2.8 gpm	5.1 gpm	8.0 gpm
	3.0 lpm	7.6 lpm	11 lpm	19 lpm	30 lpm
	0.2 m³/hr	0.5 m³/hr	0.6 m³/hr	1.1 m³/hr	1.8 m³/hr
Port Size	¾"MNPT	¾"MNPT	1"MNPT	1"MNPT	1 ½"MNPT
Electrical	90-265V/50-60Hz. 1.5A Max.				
Plug Type	American: NEMA 5-15P				
Lamp Power (Watts)	18	34	45	67	101
Power (Watts)	20	36	48	72	108
Replacement Lamp	RL-210HO	RL-330HO	RL-420HO	RL-600HO	RL-950HO
Replacement Sleeve	RQ-210	RQ-330	RQ-420	RQ-600	RQ-950
Reactor Dimensions	8.9 x 29.8 cm (3.5 x 11.7")	8.9 x 41.8 cm (3.5 x 16.5")	8.9 x 50.8 cm (3.5 x 20.0")	8.9 x 68.3 cm (3.5 x 26.9")	8.9 x 103.4 cm (3.5 x 40.7")
Chamber Material	316L Stainless Steel, A249 Pressure Rated Tubing				
Controller Dimensions	21.7 x 10.8 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)				
UV Monitor	YES on all LBH6 models. Upgrade available for LBH5 models (NOT available on LBH4 models)				
Solenoid Output	YES (optional solenoid module (**MOD-SOL1**) sold separately)				
Dry Contacts	YES (remote alarm module (**MOD-RAM**) sold separately)				
4-20mA Output	YES (4-20mA module (**MOD-420**) sold separately)				
Temperature Mgmt. Valve	PN# 130132		PN# 130133		PN# 130134
Cooling Fan	OPTIONAL (130014 sold separately)				
Lamp Change Reminder	YES				
Lamp Out Indicator	YES				
Shipping Weight	4.4 kg (9.7 lbs)	5.2 kg (11.5 lbs)	5.6 kg (12.9 lbs)	7.0 kg (15.5 lbs)	9.6 kg (21.1 lbs)

mountain fresh.

C NSF US

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 LB6-02A-24V	LB6-03XA LB6-03A-12V LB6-03A-24V	LB6-06XA	LB6-10XA	LB6-15XA	LBH6-05XA	LBH6-10XA	LBH6-15XA	LBH6-25XA	LBH6-40XA
NSF Class A Flow Rate (40mJ/cm² @ 70% UVT)	1.6 gpm 6.1 lpm 0.4 m³/hr	2.2 gpm 8.3 lpm 0.5 m³/hr	3.4 gpm 13 lpm 0.8 m³/hr	6.3 gpm 24 lpm 1.4 m³/hr	7.9 gpm 30 lpm 1.8 m³/hr	2.2 gpm 8.3 lpm 0.5 m³/hr	4.1 gpm 15 lpm 0.9 m³/hr	5.4 gpm 20 lpm 1.2 m³/hr	7.9 gpm 30 lpm 1.8 m³/hr	13 gpm 49 lpm 3.0 m³/hr
Port Size	½"FNPT	½"MNPT	¾"MNPT	¾"MNPT	1" MNPT	½"MNPT	¾"MNPT	1" MNPT	1" MNPT	1½"MNPT
Electrical	90-265V/50-60Hz 1A Max					90-265V/50-60Hz 1.5A Max				
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, 3-wire plug
replace "X" with "2" for all 230V systems with European CEE 7/7, 3-wire plug
replace "X" with "3" for all 230V systems with British Standard, BS 1363, 3-wire plug
replace "X" with "4" for all 230V systems with Australian/NewZealand AS/NZ 3112, 3-wire plug

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

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.

mountain fresh.

C NSF US

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

Model	LB5-03XB	LB5-06XB LB6-06XB	LB5-10XB LB6-10XB	LB5-15XB LB6-15XB	LBH5-05XB LBH6-06XB	LBH5-10XB LBH6-10XB	LBH5-15XB LBH6-15XB	LBH5-25XB LBH6-25XB	LBH5-40XB LBH6-40XB
NSF Class B Flow Rate (16mJ/cm² @ 70% UVT)	5.2 gpm 11 lpm 1.2 m³/hr	7.6 gpm 29 lpm 1.7 m³/hr	13 gpm 49 lpm 3.0 m³/hr	22 gpm 83 lpm 5.1 m³/hr	5.4 gpm 20 lpm 1.2 m³/hr	7.6 gpm 29 lpm 1.7 m³/hr	13 gpm 49 lpm 3.0 m³/hr	22 gpm 83 lpm 5.1 m³/hr	28 gpm 110 lpm 6.4 m³/hr
Port Size	½"MNPT	¾"MNPT	¾"MNPT	1" MNPT	½"MNPT	¾"MNPT	1" MNPT	1" MNPT	1" MNPT
Electrical	90-265V/50-60Hz 1A Max				90-265V/50-60Hz 1.5A Max				
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, 3-wire plug
replace "X" with "2" for all 230V systems with European CEE 7/7, 3-wire plug
replace "X" with "3" for all 230V systems with British Standard, BS 1363, 3-wire plug
replace "X" with "4" for all 230V systems with Australian/NewZealand AS/NZ 3112, 3-wire plug

Lamp Life: LB5, LB6 series UV lamps are rated for 9,000 hours of continuous use (one-year of operation). LBH5, LBH6 series UV lamps are rated for 10,000 hours of continous use (approximately 14 months of operation)

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 system and installation shall comply with applicable provincial/state and local regulations

Limited Warranty Statement:

Products manufactured or supplied by MOUNTAIN FRESH 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.

UV SYSTEMS

Ten (10) year Limited Warranty on the stainless steel reactors, from the date of original purchase, or installation (proper documentation required for verification).

ELECTRONICS

Three (3) year Limited Warranty on the ballasts and controllers, from the date of original purchase, or installation (proper documentation required for verification).

UV LAMPS, UV SENSORS & QUARTZ SLEEVES

One (1) year Limited Warranty on all MOUNTAIN FRESH ultraviolet lamps, UV sensors and quartz sleeves from the date of original purchase, or installation (proper documentation required for verification).

MOUNTAIN FRESH warrants that it will repair, replace or refund, at MOUNTAIN FRESH'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. MOUNTAIN FRESH's liability under this warranty shall be limited to repairing or replacing at MOUNTAIN FRESH's option, without charge, F.O.B. MOUNTAIN FRESH's factory or authorised service depot, any product that MOUNTAIN FRESH manufactures. MOUNTAIN FRESH 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 MOUNTAIN FRESH are subject to the warranty provided by the manufacturer of said products and not by MOUNTAIN FRESH's warranty. MOUNTAIN FRESH will not be liable for damage or wear to products caused by abnormal operating conditions, accident, abuse, misuse, unauthorised alteration or repair, or if the product was not installed in accordance with MOUNTAIN FRESH's printed installation and operating instructions.

LIMITATIONS OF WARRANTY

This warranty does not apply to any of the following:

- Water Quality Parameters lie outside of the following ranges
    - Hardness > 120 mg/L (7 gpg)
    - Iron > 0.3 mg/L (ppm)
    - Manganese > 0.05 mg/L (ppm)
    - Tannins > 0.1 mg/L (ppm)
    - Turbidity > 1 NTU
    - Transmittance (UVT) < 75%
- A product that has been incorrectly installed according to the technical installation 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 authorised by MOUNTAIN FRESH 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.
- Product is used in conditions that exceed MOUNTAIN FRESH's specifications.

FOR SERVICE

To obtain service contact MOUNTAIN FRESH Customer Service 0800 787 342 to obtain a Warranty Return Authorisation. You will then need to return the product through the MOUNTAIN FRESH Dealer or Distributor where the product was originally purchased, together with proof of purchase and installation date, failure date, and supporting installation data. Unless otherwise provided, the Dealer or Distributor will contact MOUNTAIN FRESH for instructions on returning the product. Any defective product to be returned to MOUNTAIN FRESH must be sent freight prepaid; documentation supporting the warranty claim and/or a Return Material Authorisation must be included if so instructed.

MOUNTAIN FRESH WILL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, 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 MOUNTAIN FRESH 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. MOUNTAIN FRESH 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.

Pure water for life

mountain fresh.

0800 787 342
sales@mountainfresh.co.nz
www.mountainfresh.co.nz