

CrystalClear

CrystalClear Max

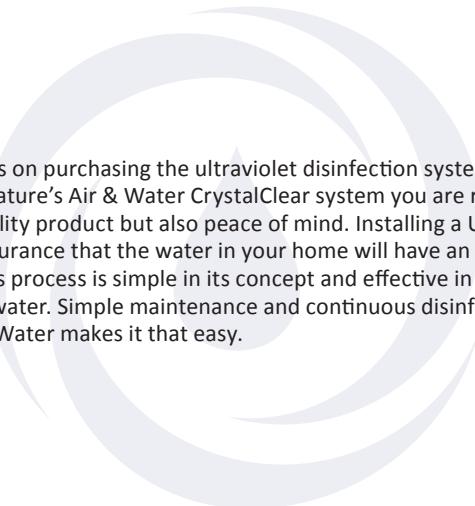


Operation & Installation Instructions



Nature's Air & Water - Standard Systems

System	Rated Flow	System	Rated Flow
CrystalClear	42 gpm	CrystalClear Max	82 gpm



Congratulations on purchasing the ultraviolet disinfection system. By purchasing a Nature's Air & Water CrystalClear system you are receiving not only a high quality product but also peace of mind. Installing a UV system gives you reassurance that the water in your home will have an extra level of protection. This process is simple in its concept and effective in its abilities to disinfect your water. Simple maintenance and continuous disinfection: Nature's Air & Water makes it that easy.

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*Note: These instructions are also available in soft copy from
Nature's Air & Water Customer Service.*

SAFETY CONSIDERATIONS

It is important that care is taken when operating and/or maintaining your system.

Please read the instructions

- 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.
- Children should be supervised so that they do not to play with the appliance.
- WARNING: Do not operate the UV-C emitter when it is removed from the appliance enclosure.
- The appliance is to be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30 mA.
- This appliance contains a UV-C emitter.
- 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 small doses, cause harm to the eyes and skin.
- 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.
- Maximum working voltage of built-in UV driver U-OUT=240V
- If the supply cord is damaged, it must be replaced by Nature's Air & Water, in order to avoid a hazard.
- Before servicing this equipment, disconnect the power cord from the electrical outlet.
- **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.
- For complete disinfection, use ONLY Nature's Air & Water replacement parts.
- Do not operate the unit if it has any damaged or missing components.
- To avoid possible electrical shock, use only with a properly grounded electrical outlet.
- Never perform any maintenance to the system unless you are comfortable in doing so. Contact Nature's Air & Water for service instructions if required.
- 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.
- This 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. 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.
- We recommend that a licensed plumber or certified technician install the system.

This product is not to be used for general lighting / illumination.

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)
- Wrench (for tightening fittings)

Other Materials

- PVC/PVC glue
- Non-hardening pipe-thread sealant specifically rated for use with PVC plastic (THIS SEALANT IS INCLUDED IN YOUR SYSTEM PARTS). Teflon tape and Teflon-based pipe sealants are NOT recommended for use with plastic threads.

Save packaging for quartz tube and bulb for winter storage.

WATER QUALITY PARAMETERS

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

Regular water chemistry testing should be performed as usual.

RECOMMENDED WATER PARAMETERS

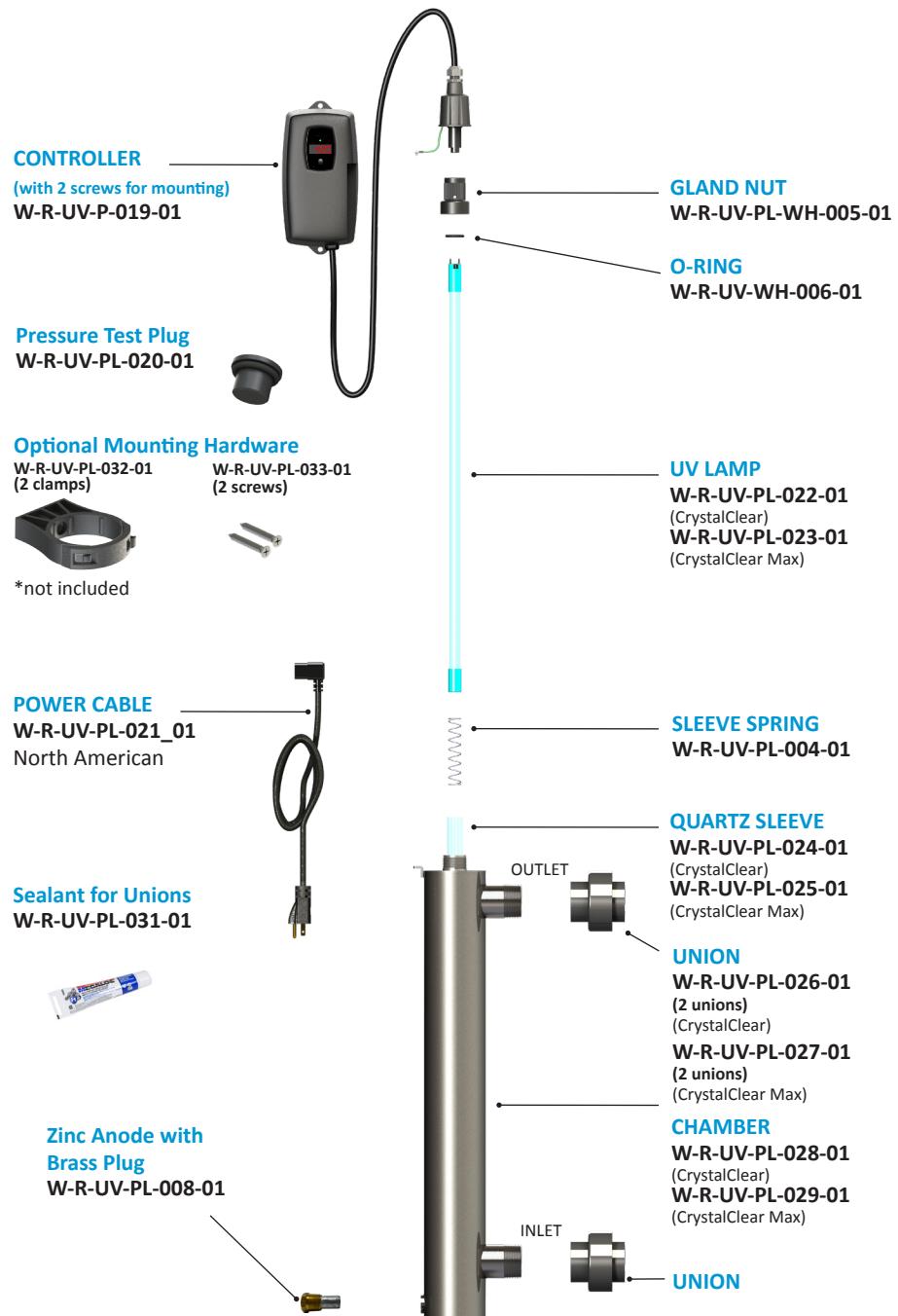
Chlorine residual: 1-3 ppm free chlorine

pH: 7.4 - 7.6

Total alkalinity: 80 - 120 ppm

ASSEMBLY

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



RECOMMENDED PLACEMENT

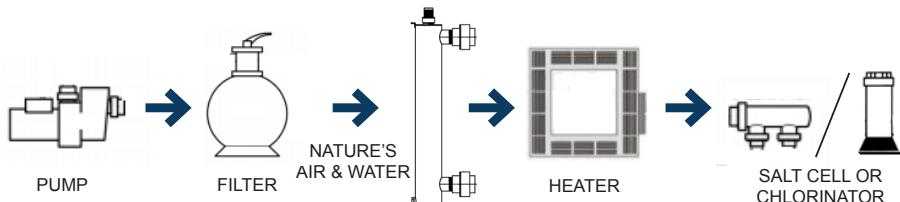


FIGURE 1. DIAGRAM OF FLOW

FLOW RATES

For detailed flow rates see page 13.

LOCATION

Place CrystalClear in an area to ensure there is enough space at the lamp connector end to safely remove the UV lamp and/or quartz sleeve (Figure 2). The controller will require a ground fault circuit interrupter (GFCI or GFI) outlet and should be mounted beside or above the chamber. Ensure controller can be mounted upright & not directly exposed to the elements. **If installing unit in horizontal position, you must assemble all components in vertical position.**

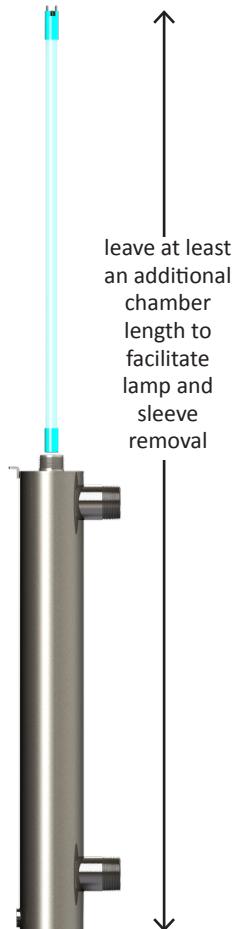


Figure 2. Lamp Removal Spacing

INSTALLATION

The chamber can be installed either horizontally or vertically. Vertical installation is the preferred method with the inlet at the bottom (lamp connection at the top). If installing horizontally additional mounting hardware is required.

The use of a by-pass assembly is recommended as it will allow the isolation of the UV chamber. This will allow for easier access if maintenance is required.

If installing vertically, the base can be mounted to the ground: however, it is recommended leaving the unit unfastened for easy removal when storing during the off season.

It is recommended to have a pool professional connect the UV chamber to the water supply and may be a requirement depending on the location.

Step 1: Plumb system between filter & heater. Please note, the inlet should be at the bottom and the outlet at the top of the chamber. Use the union sealant that is included in the box to glue union to threads on stainless steel chamber. Use regular PVC plumbing glue to attach union to pool piping.

Step 2: Perform a Pressure Test (See Figure 3). Insert pressure test cap into the top of the chamber and screw on the gland nut. Turn on pump and observe for any leaks. Proceed to Step 3 if no leaks are detected.

Step 3: **WARNING: Do not push glass sleeve down too far.** Remove gland nut & pressure test cap. Gently remove the quartz sleeve from its packaging. 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. **Carefully slide the sleeve into the chamber until you feel it rest inside the center of internal metal basket holder at bottom of unit** (see figure 4). There should only be 5/16"-1/2" (8-12mm) of glass exposed. If the sleeve stops with around 1.5" (38mm) of glass exposed, straighten the sleeve before continuing to slide the sleeve into the chamber.

Caution: Any more than 1/2" of glass exposed can cause the quartz tube to break and void warranty.

Step 4: Install the o-ring and spring. Slide the o-ring onto the quartz sleeve until it is butted up against the chamber. Insert spring inside quartz tube. **DO NOT install a UV lamp inside the quartz sleeve without the spring in place.**

Step 5: **HAND TIGHTEN** the gland nut over the quartz sleeve onto the threaded top of the chamber. It has a positive stop to prevent over-tightening. **DO NOT USE TOOLS for this step.**

Step 6: Carefully, remove the lamp from its packaging. Always hold UV lamps by their ceramic ends, not by the glass. Again, the use of cotton gloves is recommended. **Make sure spring is inserted into the sleeve before this step.** Gently lower lamp into quartz sleeve.



Figure 3. Pressure Test Cap Installation

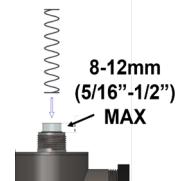


Figure 4. Quartz Sleeve Installation

NOTE: Installation of your CrystalClear system shall comply with applicable provincial / state & local regulations.

Step 7: Plug the lamp connector into the lamp. Note the keying for proper alignment (see Figure 5). Insert the lamp connector into the gland nut and turn the connector approximately $\frac{1}{4}$ turn to lock the connector to the gland nut (Figure 6). The tabs inside the top nut must align with the channels on the lamp connector in order to achieve a proper lock.



Figure 5. UV Lamp Connection

Step 8: Tighten the captive ground screw to the ground lug on the UV chamber (Figure 7).

Step 9: Mount controller in an upright vertical position above or beside the UV chamber. **If controller is directly exposed to the elements, the enclosed ballast cover is required to protect the controller and maintain warranty coverage.**

The CrystalClear system is now ready to be plugged into the appropriate GFCI protected outlet. It is recommended to keep the quartz tube and bulb packaging for off season storage, if this winterization method is required (See page 10).



Figure 6.
Connector

PLEASE NOTE: A timer is recommended in conjunction with your pool pump to ensure the UV system is running at the same time as the pump.

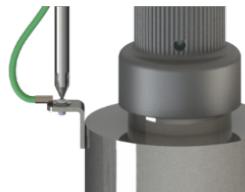


Figure 7. Ground Screw

MAINTENANCE

CLEANING THE QUARTZ SLEEVE/LAMP REPLACEMENT

At a minimum, the quartz sleeve should be cleaned on an annual basis. Depending on the water quality, the quartz sleeve may require periodic cleaning. 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 valve (and/or turn off the pool pump).

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

Step 3: Release water pressure by opening union and letting water drain from the system.

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

Step 5: Remove the lamp connector from the chamber (gland nut) by pushing the lamp connector gently down and turning it $\frac{1}{4}$ turn counter-clockwise. Disconnect the lamp connector from the lamp. **CAUTION: the lamp may be hot!**

Step 6: Remove the lamp from the chamber, being careful to hold it by the ceramic ends.

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

Step 8: Remove the quartz sleeve and o-ring by **gently twisting and pulling** the quartz sleeve.

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 mineral deposits that may be on the outside of the quartz sleeve. Be careful not to get any moisture or liquids inside of the sleeve and ensure spring stays in place inside quartz sleeve.

Step 10: Dry the sleeve with separate cloth.

Step 11: Slide the sleeve back into the chamber following step 3 from the installation section of the manual. **Do not push down too far and ensure it rests in its place at bottom of chamber.** Replace the o-ring and ensure spring is re-installed into quartz sleeve.

Step 12: If the bulb was replaced, remember to reset the countdown timer on the controller. To reset the timer on the controller, firmly hold 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.

INSPECTING THE ZINC ANODE

It is recommended to inspect the Zinc Anode Drain plug once per year. Once pump and system has been shut down, use a wrench to remove the drain plug from the bottom of the chamber. As this is a sacrificial anode, the zinc will break down over time. The zinc anode should be replaced once it reaches approximately $\frac{1}{2}$ " in size (original size of anode is 1"). The anode requires teflon pipe tape to seal. After inspection the tape may have to be replaced. When replacing ensure first thread does not have tape to ensure electrical connection.

WINTERIZATION

Recommended operating temperature is between 36-104°F (2-40°C). Please ensure the CrystalClear system and pump is off before winterizing.

During the winterization process (or on an annual basis) it is important to inspect the zinc drain plug (see above).

There are 2 options for winterization:

WHEN BASE IS NOT AFFIXED TO CONCRETE: The CrystalClear unit should be disconnected and stored indoors for winter. Unscrew the unions to disconnect the plumbing and remove the drain plug to allow excess water to escape. **Keeping the system fully assembled move the chamber and controller inside for the winter.**

WHEN BASE IS AFFIXED TO CONCRETE OR IF REQUIRED TO LEAVE CONNECTED TO PLUMBING: Disconnect Power. Unscrew the unions to disconnect the plumbing and remove the drain plug. Remove the controller from wall mount and carefully disconnect the lamp from the lamp cable. Unscrew ground screw from the ground lug on chamber. Carefully remove the quartz tube and lamp. These are fragile and must be handled with care, gloves are strongly recommended. Ensure the spring remains in the quartz tube as it is essential for reassembly. Utilize original packaging to safely store the lamp and quartz sleeve. Apply the pressure test cap and screw a top gland nut, as noted in STEP 2 of installation. After water has been completely drained the unions can now be re-connected if desired.

TO MAINTAIN WARRANTY COVERAGE, IT IS REQUIRED TO STORE ELECTRONICS/CONTROLLER INSIDE DURING WINTER MONTHS.

*To reconnect the CrystalClear system in the spring, please refer to the original installation instructions above.

**If proper winterization and installation instructions are not followed, the warranty will be rendered void.

OPERATION

CrystalClear systems come with a feature laden controller that incorporates both the lamp driver (ballast) and control features in a fully sealed case to prevent water intrusion. Controllers feature a built in lamp monitor, with both audible and visual indication of lamp life, and auto sensing dual voltage for plug in or hard wired use.

CONTROLLER



Simplistic in operation, this system features a tri-colour LED light 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 sound. To remedy this condition, the UV lamp must be replaced with a new genuine CrystalClear system UV lamp.

PLEASE NOTE: A timer is recommended in conjunction with your pool pump to ensure the CrystalClear system is running at the same time as the pump.

LAMP COUNTDOWN SEQUENCE

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



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.



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 disinfection rate will be compromised.



LAMP REPLACEMENT

See page 9 for full instructions.

SYSTEM TROUBLESHOOTING

Hard Alarms: The following give a constant audible alarm.

System Display	Problem	Resolution
A black digital display with a red LED screen. The screen shows the letters "LF" in red. Above the screen, there is a small red circular indicator light.	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 chamber.
A black digital display with a red LED screen. The screen shows the letters "BB-BI" in red. Above the screen, there is a small red circular indicator light.	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 chamber.

For any other questions or troubleshooting, please contact support@naturesairandwater.com.

SYSTEM SPECIFICATIONS

Model	CrystalClear	CrystalClear Max
Flow Rate 16mJ/cm ² @ 95% UVT	42 GPM	82 GPM
	159 lpm	310.4 lpm
	9.5 m ³ /hr	18.6 m ³ /hr
Port Size	1.5" MNPT	2" MNPT
Electrical	90-265V/50-60Hz. (IEC power cord included)	
Plug Type	NEMA 5/15	
Lamp Watts	67	101
Replacement Lamp	W-R-UV-PL-022-01	W-R-UV-PL-023-01
Replacement Sleeve	W-R-UV-PL-024-01	W-R-UV-PL-025-01
Replacement Controller	RCHO-4.12P	
Chamber Material	316L Stainless Steel, A249 Pressure Rated Tubing	
Chamber Dimensions	3.5 x 26.9" (8.9 x 68.3 cm)	3.5 x 40.7" (8.9 x 103.4 cm)
Controller Dimensions	8.6 x 4.2 x 4" (21.7 x 10.8 x 10.2 cm)	
Operating Pressure	10-150 psi (0.7-10.3 bar)	
Operating Water Temperature	36-104° F (2-40° C)	
Lamp Change Reminder	YES (4-digit LED display)	
Visual Lamp Out Indicator	YES	
Audible Lamp Out Indicator	YES	
Shipping Weight	17.5 lbs (7.9 kg)	22.1 lbs (10.0 kg)

LIMITED WARRANTY STATEMENT

Products of Nature's Air & Water, 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

Three (3) year Limited Warranty on the stainless steel chambers, from the date of original purchase, or installation (proper documentation required for verification).

ELECTRONICS

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

UV LAMPS & QUARTZ SLEEVES

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

Nature's Air & Water warrants that it will repair, replace or refund, at Natures' Air & Waters' 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. Nature's Air & Waters' liability under this warranty shall be limited to repairing or replacing at Nature's Air & Waters' option, without charge, F.O.B. Nature's Air & Waters' factory or authorized service depot, any product that Nature's Air & Water manufactures. Nature's Air & Water 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 Nature's Air & Water are subject to the warranty provided by the manufacturer of said products and not by Nature's Air & Waters' warranty. Nature's Air & Water 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 Nature's Air & Waters' 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 authorized by Nature's Air & Water 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 Nature's Air & Waters' specifications.

FOR WARRANTY SERVICE

To obtain service under this warranty, you must first contact Nature's Air & Water Customer Service at support@naturesairandwater.com to obtain a Warranty Return Authorization. You will then need to return the product to Nature's Air & Water, together with proof of purchase and installation date, failure date, and supporting installation data. Unless otherwise provided, contact Nature's Air & Water for instructions on returning the product. Any defective product to be returned to Nature's Air & Water must be sent freight prepaid; documentation supporting the warranty claim and/or a Return Material Authorization must be included if so instructed.

NATURE'S AIR & WATER 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 NATURE'S AIR & WATER 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. NATURE'S AIR & WATER 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.



Nature's Air and Water

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