CHARGER
Water Treatment Products

Operation & Installation Instructions

CWUV4 Series **CWUV4-C Series** **CWUV5 Series** **CWUV6 Series** **CWUV5-C Series** **CWUV6-C Series**

CHARGER WATER - Standard Systems			
System	**Rated Flow**	**System**	**Rated Flow**
CWUV4-2 **CWUV5-2** **CWUV6-2**	2 gpm	**CWUV4-5C** **CWUV5-5C** **CWUV6-5C**	5 gpm
CWUV4-3 **CWUV5-3** **CWUV6-3**	3 gpm	**CWUV4-10C** **CWUV5-10C** **CWUV6-10C**	10 gpm
CWUV4-6 **CWUV5-6** **CWUV6-6**	6 gpm	**CWUV4-15C** **CWUV5-15C** **CWUV6-15C**	15 gpm
CWUV4-11 **CWUV5-11** **CWUV6-11**	11 gpm	**CWUV4-25C** **CWUV5-25C** **CWUV6-25C**	25 gpm
CWUV4-15 **CWUV5-15** **CWUV6-15**	15 gpm	**CWUV4-40C** **CWUV5-40C** **CWUV6-40C**	40 gpm
CWUV4-21 **CWUV5-21** **CWUV6-21**	21 gpm		

Congratulations on purchasing this Charger Water UV Disinfection system.

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Safety Considerations

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

1. Before servicing this equipment, disconnect the power cord from the electrical outlet.

2. **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.

3. For complete disinfection, use ONLY genuine replacement parts.

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 or others.

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 install the system.

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

UV disinfection is only effective 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.

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

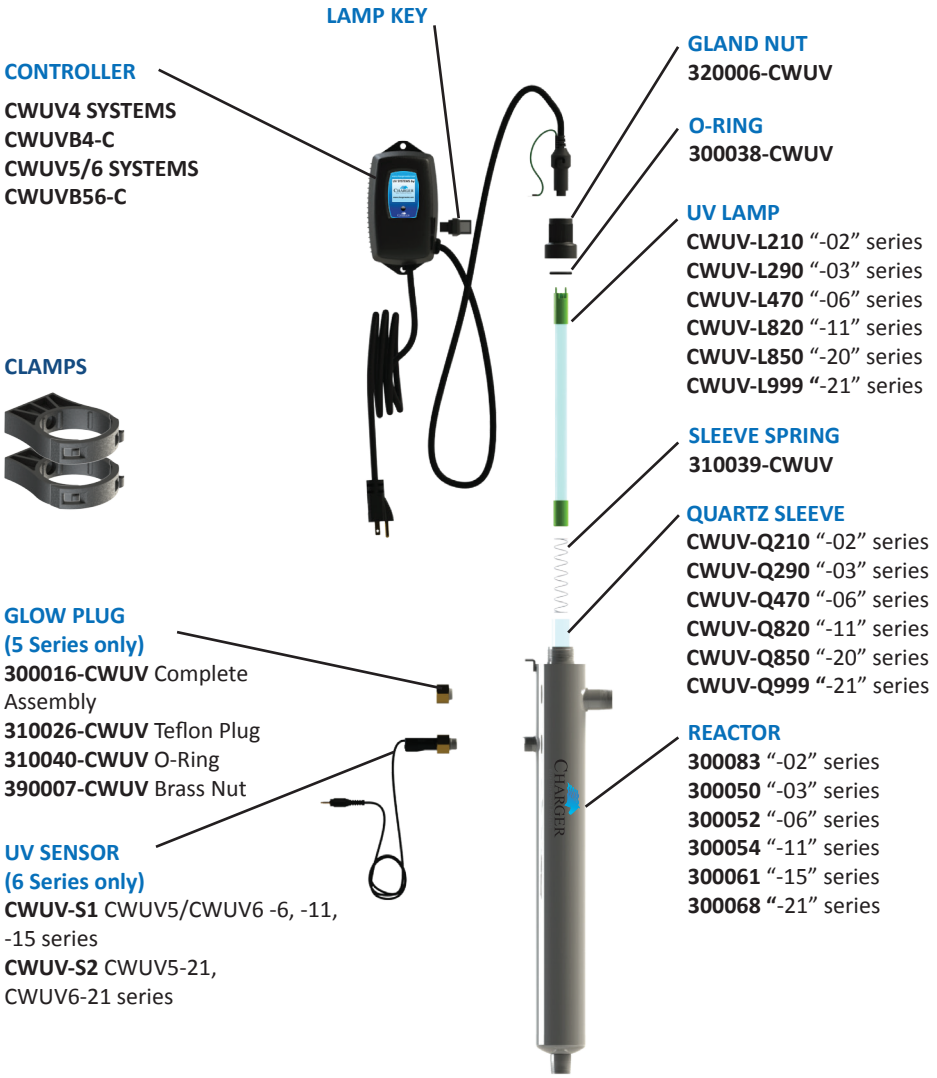
Hardness:	<7 gpg (120 mg/L) – if hardness level is 7 gpg or slightly below the quartz sleeve must be cleaned periodically in order to ensure efficient UV penetration; if above the water must be softened.
Iron (Fe):	<0.3 ppm (0.3 mg/L)
Manganese (Mn):	<0.05 ppm (0.05 mg/L)
Turbidity:	< 1 NTU
Tannins (organics):	<0.1 ppm (0.1 mg/L)
UVT (transmittance):	>85% (Please contact Charger Water 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 UV disinfection system.

Assembly

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

STANDARD OUTPUT LAMP SYSTEMS



HIGH OUTPUT LAMP SYSTEMS

LAMP KEY

CONTROLLER

CWUV4 SYSTEMS
CWUVB4-CC
(fits all units)
CWUV5/6 SYSTEMS
CWUVB56-CC
(fits all units)

CLAMPS

GLOW PLUG
(5 Series only)
300016-CWUV Complete Assembly
310026-CWUV Teflon Plug
310040-CWUV O-Ring
390007-CWUV Brass Nut

UV SENSOR
(6 Series only)
CWUV-S3

POWER CORD
260004-CWUV North American
260005-CWUV Euro
260006-CWUV Australian/ New Zealand
260008-CWUV British

GLAND NUT
320006-CWUV

O-RING
300038-CWUV

UV LAMP
CWUV-L210C "-05" series
CWUV-L330C "-10" series
CWUV-L420C "-15" series
CWUV-L600C"-25" series
CWUV-L950C "-40" series

SLEEVE SPRING
310039-CWUV

QUARTZ SLEEVE
CWUV-Q210 "-05" series
CWUV-Q330 "-10" series
CWUV-Q420 "-15" series
CWUV-Q600 "-25" series
CWUV-Q950 "-40" series

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

System Sizing

All UV systems are rated for a specific flow rate in water that meets the quality parameters on page 5. **PLEASE NOTE** that 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.

To determine flow rate follow these simple steps:

Be sure no water is being used in the home. Open a faucet or tap nearest the pressure system and run until the well pump starts. Close the faucet and using a second hand watch, record the length of time in seconds until the pump stops. This is known as the cycle time.

Then using a container of known volume, preferably in US Gallons, open the faucet or tap nearest the pressure system and measure the amount of water drawn off until the pump starts again. Depending on the size of the container used, it is acceptable to turn the faucet on and off to empty the container. This measurement is known as the draw down.

To calculate the pressure system flow rate divide the draw down by the cycle time and multiply that by 60.

Draw Down_____÷ Cycle Time_____ x 60=_____Pumping Rate in USGPM

Location

For Point of Entry (POE) 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 (POU) systems, install the unit just before the faucet. Debe Flow Group recommends that a 5 micron filter be installed **before** the UV system for a final polishing step before the water is disinfected.

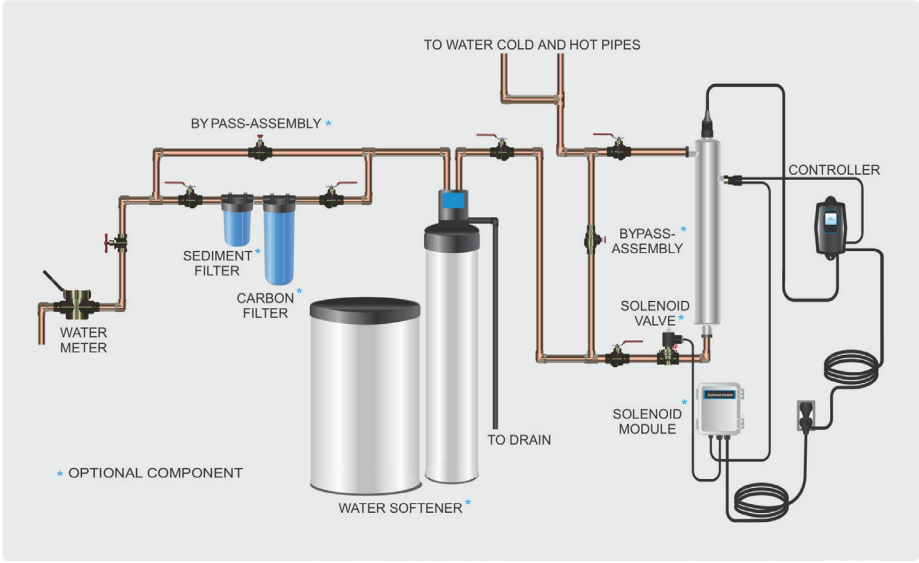
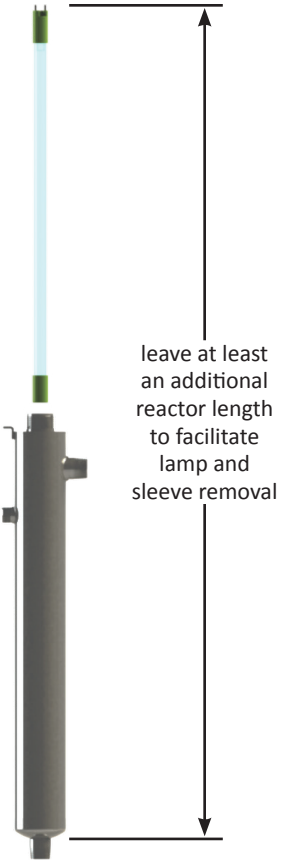


Figure 1. Recommended POE Installation Location

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. **PLEASE NOTE**: All UV disinfection systems are intended for indoor use only as they should not be exposed to the elements.



Installation

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: Use the supplied fasteners to mount the UV reactor to wood or drywall. If mounting to an alternate material you will need to purchase the proper corresponding fasteners.

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 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.

Note: Installation of your disinfection systems shall comply with applicable provincial/state & local regulations.

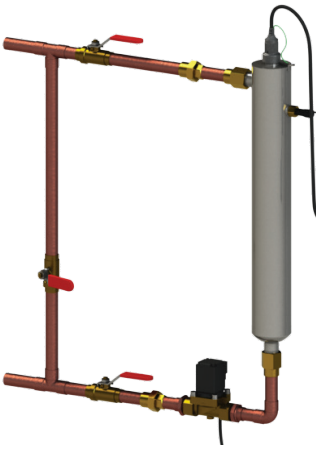


Figure 3. By-pass assembly

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. 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 reactor until you can feel it hit the opposite end of the reactor. Align the sleeve so it 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.

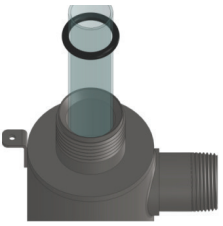


Figure 4. Quartz Sleeve Installation

Step 7: 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 lamp 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 8: Install the UV sensor (ordered separately). 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 5). Insert the sensor so it is fully seated and hand tighten the sensor nut.

Figure 5. UV Sensor Installation

Figure 6. IEP Connection

Step 9: The reactor is now ready for water flow. 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 silicon grease. Reinstall the o-ring ensuring that it is properly sealed against the reactor and check again for leaks.

Step 10: Mount the controller to the wall so it is above or beside the reactor to ensure that no moisture can deposit on any of the connections (see Figure 1). Always mount the controller vertically. For monitored systems, insert the sensor connector into the IEP port located on the right side of the controller (Figure 6). 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.**

Step 11: Always hold UV lamps by their ceramic ends, not by the lamp quartz. Remove the lamp from its packaging. Again, the use of cotton gloves is recommended. Remove the lamp key from the lamp's connector and set it aside for the next step. Be careful to not touch the key's exposed contacts. Insert the UV lamp into the reactor, being careful not to drop it.

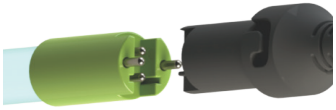


Figure 7a. Standard Output UV Lamp Connection

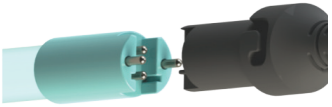


Figure 7b. High Output UV Lamp Connection

Step 12: Install the lamp key into the controller **(CWUV5/6 systems only)**. The key always comes packaged with the lamp and sits on the connector. 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 8).

Step 13: Plug the lamp connector into the lamp. Note the keying for proper alignment (see Figure 7a, 7b). 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 9.

Figure 8. Lamp Key Installation

Figure 9. Lamp Connector

Step 14: Tighten the captive ground screw to the ground lug on the UV reactor to ensure proper grounding.

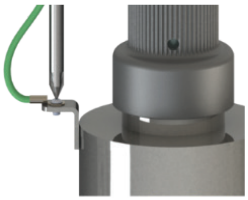


Figure 10. Ground Screw Connection

Step 15: 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.

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.

Step 1: Check for and remove any "dead ends" in the lines throughout the home as these can harbor dirt and debris. Plug in the UV system and wait until it is ready for operation.

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 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: 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). If there is no outlet shut-off valve, expect water to drain from the system as the head pressure in the system will cause the water to flow back down.

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 lamp connector in and turning it ¼ turn counter-clockwise. Disconnect the lamp connector from the lamp. CAUTION: the lamp may be hot!

Step 6: Being careful to touch only the ceramic ends, remove the lamp out of the reactor.

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.

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 following steps 7 and 8 from the installation section 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 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). If there is no outlet shut-off valve, expect water to drain from the system as the head pressure in the system will cause the water to flow back down.

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 following step 9 from the installation section of the manual.

Operation

UV 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 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 CWUV4 and CWUV5 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.

CWUV4 Controllers

CWUV4 Series

CWUV4-C 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 Charger Water UV lamp.

CWUV5/6 Controllers

CWUV5/6 Series

CWUV5/6-C 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 CWUV5 and CWUV6 are identical. The difference is that the CWUV6 series of products includes a UV intensity monitor. All CWUV5 and CWUV6 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 CWUV5 controller and the system will now monitor the UV intensity of the system!

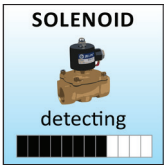
CWUV5/6 Power-up Sequence

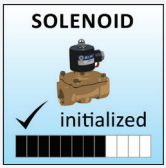
On start up, the controller will run through a diagnostic start-up and the sequence will be displayed as follows on the colour LCD:

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
- Flow Meter





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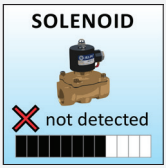


A final module screen is displayed showing which specific modules were initialized.

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.

all detected modules

lamp reaching max output

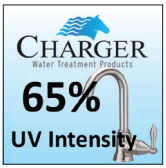
successful start-up

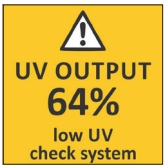
CWUV5 Operational Screens

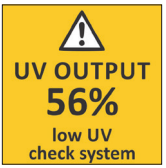
On systems without the UV monitor, the default screen shows the **Home Screen**. At any point during operation the user is able to scroll through the **Home Screen, Lamp life remaining, QR Code, Contact Info and Maintenance Parts** screens by pressing the button located on the front of the controller.

CWUV6 Operational Screens

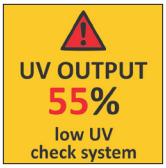
On systems with the UV monitor, the system will display the same screens as on the CWUV5 except the UV Intensity replaces the home screen. The UV Intensity screen displays the level of UV light detected by the sensor. UV intensity can be affected by poor water quality, scaling on the quartz sleeve and/or sensor, lamp failure or lamp expiring. The following screens show the UV Intensity dropping.



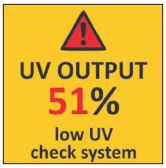




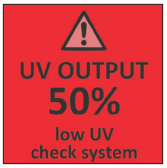
Below 56%, the numbers and warning sign turn red and an audible chirp is given by the ballast every 15 seconds. Below 51%, the screen is solid red and a constant audible alarm is given. This alternates with a screen indicating “water may be unsafe for consumption”. With the solenoid module, the controller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



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.

CWUV6
CWUV5

CWUV4

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.

CWUV6
CWUV5

CWUV4

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. 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

CWUV5 & CWUV6 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 located below the screen.

Lamp Replacement (CWUV4 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 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 (CWUV5 & CWUV6 systems)

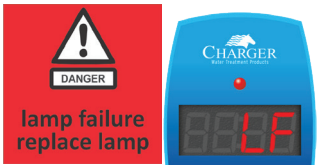
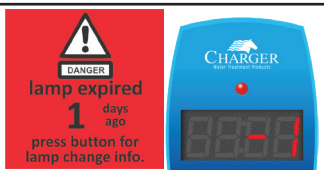
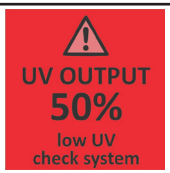
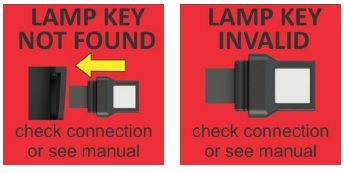
After the lamp is expired, it must be replaced with the same part number as indicated on the Maintenance Parts screen or on the label on the reactor. With the system powered down, remove and discard the lamp key from the controller. The replacement lamp is packaged with a lamp key on the connector at 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 (CWUV5 & CWUV6 systems)

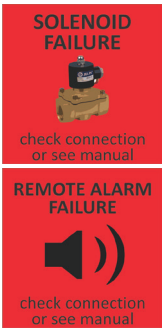
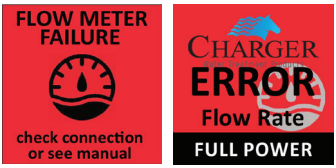
Charger Water uses the QR code to store a link to a specific page on our website. Users with a camera phone equipped with the correct reader application can scan the image of the QR code and over a wireless network connect to a Charger Water web page in the phone’s browser. Charger Water’s QR webpage 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 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 -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.
	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 Disinfection" heading.

Boil Water Advisory: If any failure occurs on an Charger Water 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 UV 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, Charger Water recommends one of the following forms of temperature management devices.

Cooling Fan

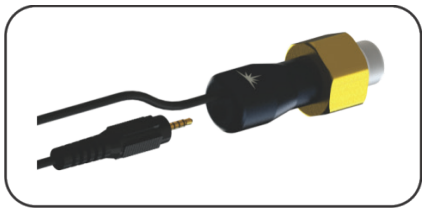
Designed for use on the Hight Output systems, the fan runs continuously to cool the water by forced convection. The long-life fan is powered independently using a compact modular power adapter that operates from 90-265V (47-63Hz). Order PN **MOD-RAM-CWUV.**

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 **MOD-TRV0.5-CWUV** for 1/2" ports, PN **MOD-TRV0.75-CWUV** for 3/4" ports, PN **MOD-TRV1-CWUV** for 1" ports and PN **MOD-TRV1.5-CWUV** for 1 1/2" ports.

Expansion Modules

CWUV5 and CWUV6 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 last device added in a "daisy chain" configuration.



The following optional expansion modules are available for use on CWUV5 and CWUV6 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). Order PN **MOD-RAM-CWUV.**

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. Order PN **MOD-SOL1-CWUV.**

4-20 mA MODULE: Outputs a 4-20mA signal of the UV output to a remote device such as a data logger or computer. Order PN **MOD-420-CWUV.**

The **WiFi module** and accompanying IoT application allows 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.

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.

Standard Output Systems

CHARGER Water Treatment Products	EQUIPMENT SPECIFICATIONS Multi-Use / Residential systems					
MODEL	**CWUV4-2 CWUV5-2 CWUV6-2**	**CWUV4-3 CWUV5-3 CWUV6-3**	**CWUV4-6 CWUV5-6 CWUV6-6**	**CWUV4-11 CWUV5-11 CWUV6-11**	**CWUV4-15 CWUV5-15 CWUV6-15**	**CWUV4-21 CWUV5-21 CWUV6-21**
Flow Rate 30mJ/cm^2 @ 95% UVT	2 gpm	3 gpm	6 gpm	11 gpm	15 gpm	21 gpm
	7.6 lpm	11.4 lpm	22.7 lpm	41 lpm	56.8 lpm	79 lpm
	0.45 m^3/hr	0.70 m^3/hr	1.4 m^3/hr	2.5 m^3/hr	3.4 m^3/hr	4.8 m^3/hr
Flow Rate 16mJ/cm^2 @ 95% UVT	4 gpm	6 gpm	11 gpm	20 gpm	30 gpm	39 gpm
	15.1 lpm	23 lpm	41 lpm	77 lpm	113.6 lpm	150 lpm
	0.87 m^3/hr	1.4 m^3/hr	2.5 m^3/hr	4.6 m^3/hr	6.8 m^3/hr	8.9 m^3/hr
Flow Rate 40mJ/cm^2 @ 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	45.4 lpm	59 lpm
	0.36 m^3/hr	0.50 m^3/hr	1.0 m^3/hr	1.9 m^3/hr	2.7 m^3/hr	3.6 m^3/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	CWUV-L210	CWUV-L290	CWUV-L470	CWUV-L820	CWUV-L999	CWUV-L850
Replacement Sleeve	CWUV-Q210	CWUV-Q290	CWUV-Q470	CWUV-Q820	CWUV-Q999	CWUV-Q850
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	171.5 x 92.1 x 101.6 mm (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 "CWUV6" models. Upgrade available for "CWUV5" models (NOT available on CWUV4 models)					
Solenoid Output	YES (optional solenoid module (**MOD-SOL1-CWUV**) sold separately)					
Dry Contacts	YES (remote alarm module (**MOD-RAM-CWUV**) sold separately)					
4-20mA Output	YES (4-20mA module (**MOD-420-CWUV**) sold separately)					
Temperature Mgmt. Valve	NA	MOD-TRV0.5-CWUV	MOD-TRV0.75-CWUV		MOD-TRV1-CWUV	
Cooling Fan	NO					OPTIONAL
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)

High Output Systems

CHARGER Water Treatment Products	EQUIPMENT SPECIFICATIONS Residential Crossover systems				
MODEL	**CWUV4-5C CWUV5-5C CWUV6-5C**	**CWUV4-10C CWUV5-10C CWUV6-10C**	**CWUV4-15C CWUV5-15C CWUV6-15C**	**CWUV4-25C CWUV5-25C CWUV6-25C**	**CWUV4-40C CWUV5-40C CWUV6-40C**
Flow Rate 30mJ/cm² @ 95% UVT	5 gpm	10 gpm	15 gpm	25 gpm	40 gpm
	18.91 lpm	37.9 lpm	57 lpm	95 lpm	151 lpm
	1.1 m³/hr	2.3 m³/hr	3.4 m³/hr	5.7m³/hr	9.3m³/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	CWUV-L210C	CWUV-L330C	CWUV-L420C	CWUV-L600C	CWUV-L950C
Replacement Sleeve	CWUV-Q210	CWUV-Q330	CWUV-Q420	CWUV-Q600	CWUV-Q950
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	217.4 x 107.5 x 101.6 mm (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 "CWUV6" models. Upgrade available for "CWUV5" models (NOT available on CWUV4 models)				
Solenoid Output	YES (optional solenoid module (**MOD-SOL1-CWUV**) sold separately)				
Dry Contacts	YES (remote alarm module (**MOD-RAM-CWUV**) sold separately)				
4-20mA Output	YES (4-20mA module (**MOD-420-CWUV**) sold separately)				
Temperature Mgmt. Valve	MOD-TRV0.75-CWUV		MOD-TRV1-CWUV		MOD-TRV1.5-CWUV
Cooling Fan	OPTIONAL (MOD-FAN-CWUV 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)

Limited Warranty Statement:

Products manufactured by Charger 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
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 ultraviolet lamps, UV sensors and quartz sleeves from the date of original purchase, or installation (proper documentation required for verification).

This Charger Water Ultraviolet Disinfection System will be repaired or replaced, at our sole option, providing that the ultraviolet system or any component is defective in materials or workmanship for the periods outlined above and subject to the "Limitations of Warranty" as outlined below. Charger Water' liability under this warranty shall be limited to repairing or replacing the product, without charge, F.O.B. Charger Water' closest Distribution Facility or authorized service depot. Charger 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. Charger 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 the Manufacturers 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 Charger 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 Charger Water' specifications.

TO GET WARRANTY SERVICE

Please contact the Dealer or Distributor where the product was originally purchased to obtain service under this warranty. Your Dealer / Distributor will obtain a Warranty Return Authorization and will then need to return the product to Charger Water, together with proof of purchase and installation date, failure date, and supporting installation data. Any defective product to be returned must be sent freight prepaid.

CHARGER 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 CHARGER WATER WITH RESPECT TO THIS ULTRAVIOLET DISINFECTION 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. CHARGER 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 FOUND TO 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 a simple process and can ONLY be done online at **www.uv-warranty. com**. 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 disinfection system and will not be used, or sold, to any other organization for any other purpose.

CHARGER
Water Treatment Products

Charger Water
www.chargerwater.com

EPA Establishment
#088776-CAN-001

PN: 919365
Version Date: 02-2023