Leopard UV®

Ultraviolet Water Treatment System
Installation, Operation and Maintenance Manual

KEEP THIS MANUAL ON HAND

IMPORTANT: Anyone responsible for the installation, maintenance or operation of this equipment must have a thorough understanding of the instructions and safety requirements before attempting to install or service this system.

Dear Customer:

Thank you for selecting UV Superstore, Inc. to provide the equipment for your ultraviolet water treatment needs. The LeopardUV® Series is engineered, designed and assembled in-house and built with the customer in mind. While most models are made in the USA, other models are assembled in the USA. These systems deliver Disinfection, TOC reduction or Ozone destruction. Your LeopardUV® system reflects our broad experience in UV water treatment and our commitment to quality craftsmanship. When properly installed and maintained, your UV Superstore, Inc. equipment will provide years of reliable service.

Please review the Installation, Operation and Maintenance Manual carefully and keep it on hand for readily available assistance. UV Superstore, Inc. designs its models for service maintenance ease. The manual provides essential information to safely install and service your system.

UV Superstore, Inc. manufactures ultraviolet equipment with the highest quality components available. Your equipment has met thorough testing procedures ensuring the efficiency of your system. As with any equipment regular maintenance procedures are required. You will have to replace your UV lamps and other items from time to time. UV Superstore, Inc. offers a complete line of replacement parts, not only for your products, but for most lines of ultraviolet water treatment equipment. Please call us for details.

UV Superstore, Inc. has built an industry-leading reputation by providing a reliable and knowledgeable technical support team. We stand by ready to assist you in all of your UV water treatment needs. Please contact us with any questions you may have regarding your system.

Best regards,

The UV Superstore Team

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Refer to the separate UV Monitoring System Options Manual for operational and monitoring instructions for Standard and WatchDog UV Monitoring Systems

Refer to the separate UV Monitoring System Options Manual for operational and monitoring instructions for Standard and WatchDog UV Monitoring Systems

SAFETY INSTRUCTIONS

In order to protect end users and operators from injury, safety precautions must be followed. This installation, operation and maintenance manual outlines important safety issues. The following **WARNING SYMBOLS** will be found throughout the manual to alert the end users to take important precautions:

EYE PROTECTION

This symbol indicates that eye protection must be worn to protect from UV light as well as debris.

HAND PROTECTION

This symbol signifies that hand protection must be worn to protect the lamps from skin oils as well as protect the operator from UV light and sharp materials caused by a broken lamp/quartz.

ELECTRIC SHOCK

This symbol signifies electrical shock possibility.

CAUTION

This symbol indicates a potentially dangerous situation. Failure to adhere to this warning may lead to serious injury and/or death.

INFORMATION

This symbol signifies helpful information.

1) Information

Please read this manual prior to installing, starting up and operating the equipment. The equipment uses the latest in UV technology, but has been designed to make operation and maintenance easy.

The quality of the liquid entering the UV system needs to be monitored. Based on your water quality, the UV system will need to be cleaned on a periodic basis. Maintenance of the UV system will require replacement parts. It is suggested that key spare and replacement parts be kept on hand. For best operation, it is recommended to use the correct replacement parts. Incorrect replacement parts could result in damage to the system and void the warranty.

2) About Ultraviolet (UV) Disinfection

The technology uses UV light to target and disable disease-causing microorganisms (pathogens).

Over 100 years ago, scientists discovered that if you exposed pathogens to UV light, their reproduction was limited. The UV light source that they used, resided in the UVC range of the light spectrum. Specifically, they discovered that light in the 254 nanometer (NM) range was the most effective wavelength for this process.

When many pathogens are exposed to UV light, their cells become damaged and this damage inhibits reproduction. The UV light, produced by a special UV lamp, damages the cell's DNA and RNA and once damaged, they are unable to replicate. This physical process renders them harmless. The amount of damage is a result of the intensity of the UVC output multiplied by the time the pathogens are exposed to the light. The applied dosage is commonly referred to as microwatt seconds per square centimeter or millijoule per square centimeter and is often expressed as $\mu Ws/cm^2$ or mJ/cm^2. Most industrial applications require a dosage of 30,000 $\mu Ws/cm^2$ or $30mJ/cm^2$.

Why are plants and operators selecting UV technology?

a) UV is considered a green technology
b) No chemicals are added, so there is no need for chemical removal
c) No chemical storage
d) UV works instantly without requiring a residence time
e) Easy maintenance

3) Major Components

The UV disinfection system will come with a number of components.

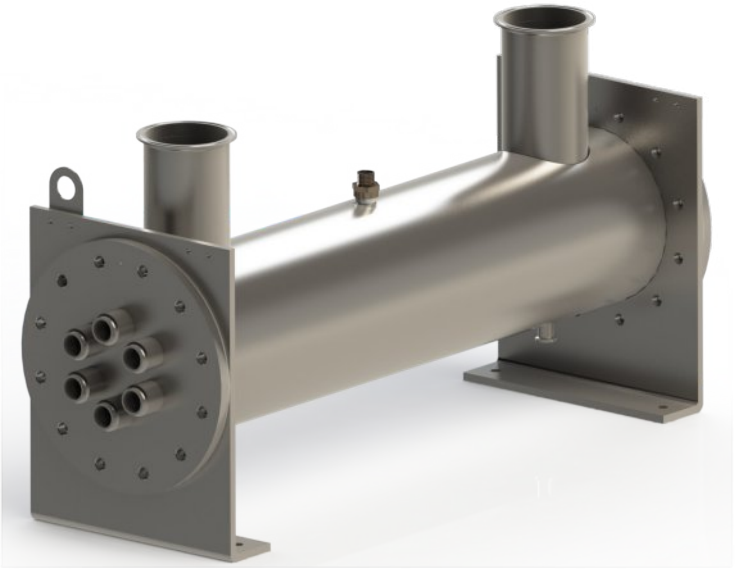
The following list highlights the main ones:

a) Disinfection Chamber (aka vessel)
b) Ultraviolet Lamps and Quartz Sleeves
c) Manual Quartz Sleeve Wiper System
d) Electronic Control Center (ECC)

a) Disinfection Chamber

The chamber is manufactured from high-grade 316L stainless steel. The chamber has been electropolished and passivated to protect against aggressive high purity water.

The chamber has an inlet/outlet connection, drain, sampling (model dependent), and monitoring ports.



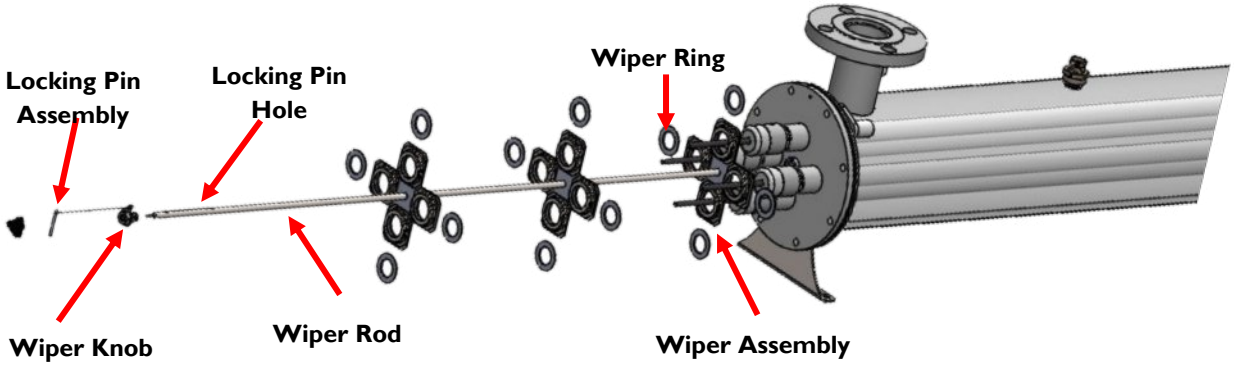
b) Lamp and Quartz Sleeve Inspection

Use cotton gloves when handling lamps and quartz sleeves to prevent them from becoming dirty. If you break the lamps or quartz sleeves, take extra care to prevent yourself from becoming injured.

If damage has occurred during shipment, please put to the side in the original packaging and contact manufacturer. A claim will have to be made immediately to the shipping company.

c) *Manual Quartz Sleeve Wiper System*

The quartz sleeve wiper system consists of a wiper rod attached with a wiper rings(s), wiper seal nut assembly, wiper locking pin assembly and a wiper knob. The wiper rod slides through the wiper seal nut assembly through the lamp head plate and into the vessel. The quartz sleeve is inserted through the wiper rings(s). The wiper system is manually operated utilizing a push/pull system.



d) Electronic Control Center (ECC)—

for Polycarbonate Enclosures

The ECC is designed to be remote mounted within 4-6 feet of the chamber. Prior to final placement, ensure that the supplied cable lengths (8 ft.) are adequate to reach between the ECC and the chamber.

The ECC requires clean power. Information on voltage and cycle is found on the wiring diagram located in the back of this manual. Equipment should be kept off lines where there are surges or brownouts. Always disconnect power before servicing the system.

The ECC will contain the ballasts and other electrical controls. For models equipped with the standard UV Meter Board Monitor option and/or standard High Heat option, the ECC will display operation status such as individual Lamp Indicator, Elapsed Runtime Meter (ERTM), optional UV Monitor Intensity, optional Low UV Indicator, and optional High Heat indicator.

For models equipped with the optional Standard UV Meter Board Monitor, the ECC displays operation status such as individual Lamp Indicator, Elapsed Runtime Meter (ERTM) , lamp runtime hours and relative UV lamp intensity. For models equipped with the WatchDog Monitoring System, the ECC will display operation status such as individual Lamp Indicator, and is capable of monitoring total runtime hours, lamp runtime hours, lamp intensity, relative UV percentage, temperature and in some models, real-time dosage.

The ECC is equipped with a manual on/off switch for standard models. The optional HOA (Hands Off Auto) switch enables you to remotely power on/off your UV system.

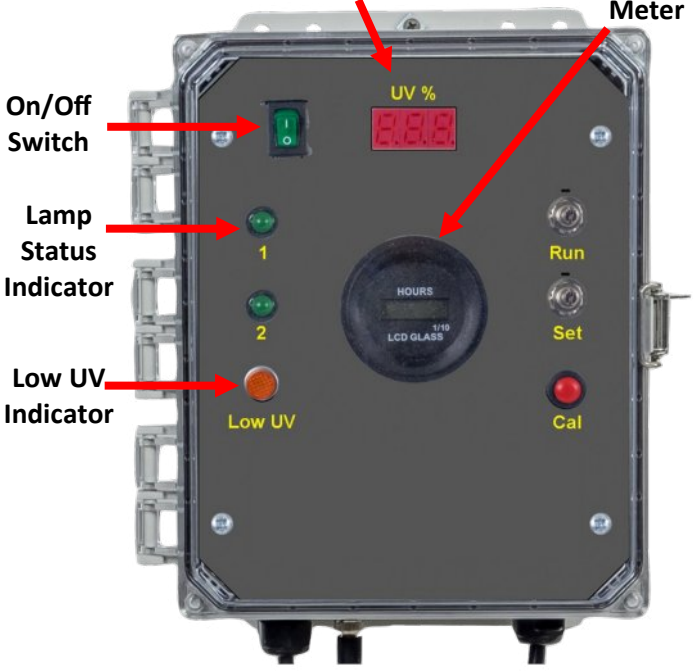


Photo shown is Display Plate for the Standard UV Meter Board Monitor Option and Standard High Heat Option

Display Plate for WatchDog Monitoring System Option

Display Plate for Standard UV Monitoring System Option

Display Plate for WatchDog Monitoring System Option

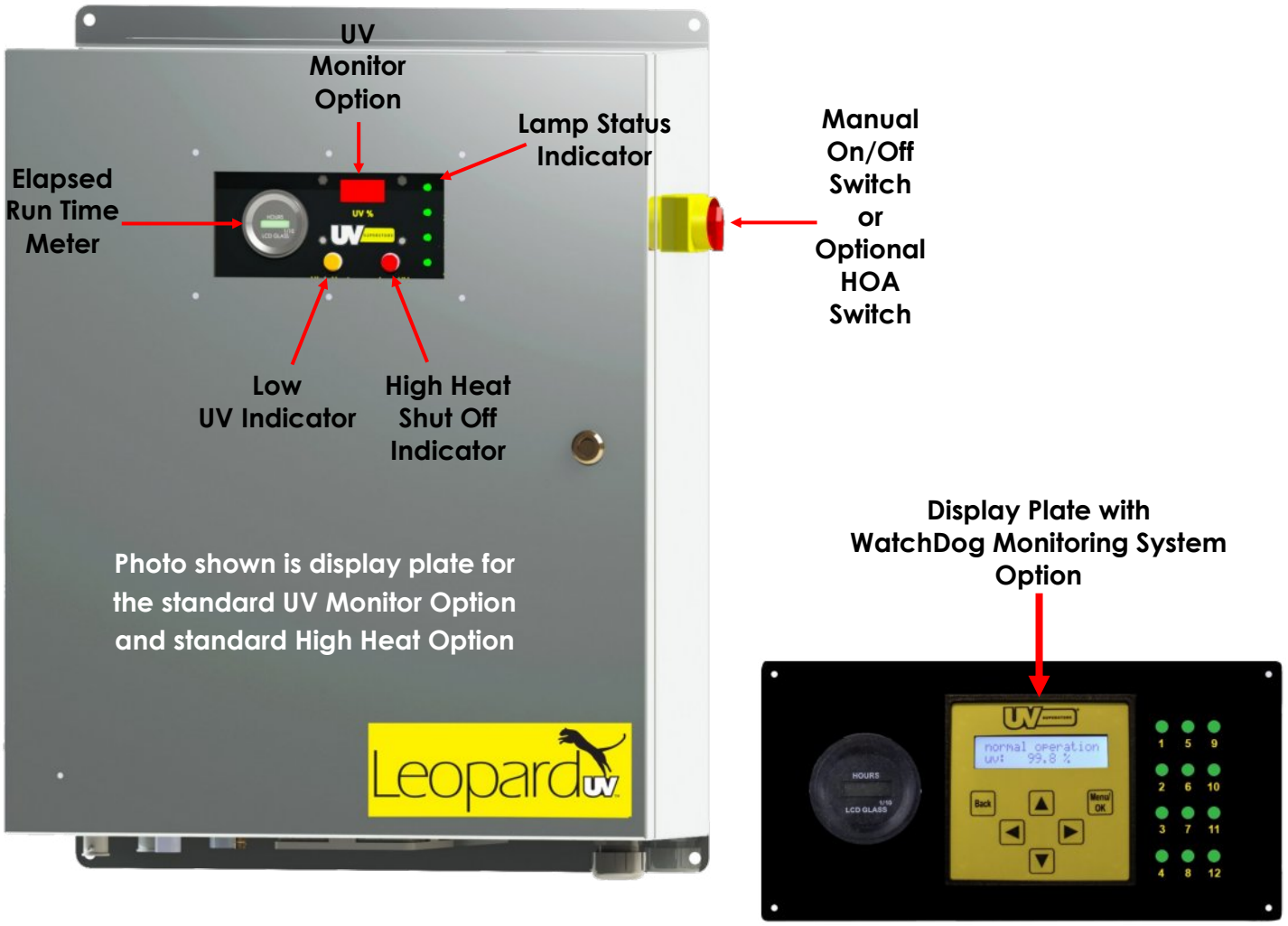
Electronic Control Center (ECC)
For Stainless Steel Enclosures

The ECC is designed to be remote mounted within 4-6 feet of the chamber. Prior to final placement, ensure that the supplied cable lengths (8 ft.) are adequate to reach between the ECC and the chamber.

The ECC requires clean power. Information on voltage and cycle will be on the wiring diagram inside the ECC cover. Equipment should be kept off lines where there are surges or brownouts. Always disconnect power before servicing the system.

The ECC will contain the ballasts and other electrical controls. For models equipped with the standard UV Monitor option and/or standard High Heat option, the ECC will display operation status such as individual Lamp Indicator, Elapsed Runtime Meter (ERTM), optional UV Monitor Intensity, optional Low UV Indicator, and optional High Heat indicator. For models equipped with the optional WatchDog Monitoring System, the ECC will display operation status such as individual Lamp Indicator, and the WatchDog Monitoring System display is capable of monitoring total runtime hours, lamp runtime hours, lamp intensity, relative UV percentage, temperature and in some models, real-time dosage.

The ECC is equipped with a manual on/off switch for standard models. The optional HOA (Hands Off Auto) switch enables you to remotely power on/off your UV system.



4) Preparation for Installing UV System

The following information is meant to be used by engineers, contractors, operators and owners to help better understand the technology, its' benefits and potential hazards.

a) Water Quality

For optimum performance of your UV system, water quality is extremely important. Proper pretreatment is essential for the UV disinfection system to operate as intended.

UV disinfection dosages are dependent upon the quality and clarity of incoming water. Impurities in water can interfere with UV intensity and cause dosage to fall to unsafe levels. Have your water tested to determine it meets the standards in the below table. If any of the elements exceed the maximum levels shown in the table, contact your water professional for recommendations for proper pretreatment.

The following table shows levels that are recommended for installation:

Element	Recommended Maximum Levels (1mg/L=1ppm)	Actual Value
Turbidity	<5 NTU	
Suspended Solids	<5 mg/l	
Color	None	
Iron	0.3 mg/l	
Manganese	0.05 mg/l	
pH	6.5 to 9.5	
Hardness	<120 ppm	

b) Important Safety Information

UV lamps and their quartz sleeves can become razor sharp if broken. Take care when installing and removing the quartz sleeves. Only hand-tighten compression fittings. Do not use wrenches or other tools.

	UV light is extremely harmful to eyes and skin and will cause burns. Do not look directly or indirectly at the UV light. Do not expose your skin for any prolonged time. Use protective clothing and eyewear (make sure it is UV resistant) when servicing equipment. If accidentally exposed to UV light for an extended period, immediately seek medical attention. Symptoms for eye exposure include burning, itching and redness. Symptoms for skin exposure are similar to sun burn.
	Use cotton gloves when handling lamps and quartz sleeves. Skin oils will adhere to the lamps and sleeves and prevent UV light from properly emanating. If the sleeves become dirty, wipe them with a lint free cloth with denatured alcohol.

c) Optimizing System Performance

The UV lamps and their corresponding quartz sleeves need to be maintained. As a general rule, the lamps need to be changed after a year of usage (10,000 hours). Quartz sleeves should be changed every three (3) to five (5) years or sooner if damaged.

Quartz sleeves also need to be cleaned on a periodic basis based on real world plant conditions. The factory recommends using denatured alcohol or a commercially available non-abrasive cleaning product. In addition to cleaning, please remember to wear gloves when handling lamps and sleeves. It is important that the cleaning product you select leaves no residue.

d) Environmental Issues Relating to UV Lamps

UV lamps need to be recycled like fluorescent lamps because they contain mercury. Please follow your local recycling laws. Please visit www.lamprecycle.org for help finding a recycling center in your area. In the event that you are unable to find a disposal location, please contact manufacturer's representative.

e) Receiving UV Equipment and Spare Parts

Inspection of the UV equipment must be made immediately upon receipt for damage and verification of contents. It is important to compare the contents of your shipment to the actual packing list. Any deviations must be brought to the factory's attention. Additionally, lamps and quartz sleeves need to be inspected for damage. If shipment or parts are damaged, immediately contact factory and hold broken contents and their containers for inspection by shipping company. Failure to make a damage claim within 2 business days of receipt of product can result in loss of claim.

f) Electrical Configuration

The UV disinfection system uses sophisticated electronics and specialty lamps. The UV system's electronics requires clean power. The system has been designed to use a certain specified voltage. UV equipment must be protected from surges. If the plant is susceptible to brownouts, please contact factory.

Do not exceed 3 ON/OFF cycles per 24-hour operation. Excessive cycling of the UV system will cause the UV lamps to age prematurely.

5) Installation

Qualified professionals (contractors, plumbers and electricians) should install the mechanical and electrical components as per code as per the engineering documents.

a) ECC Wiring —

The ECC is supplied with either a power cord or conduit opening depending on the model. The ECC is designed to be remote mounted within 4-6 feet of the chamber. Prior to final placement, ensure the supplied cable lengths (8 ft. / 15 ft.) are adequate to reach between the ECC and the chamber. Make sure power to the equipment matches the voltage requirements of the system. Make sure the system is properly grounded. For complete wiring instructions, see wiring diagram inside the electrical enclosure or the pullout in the back of this manual.

a.1 Polycarbonate Enclosures

The ECC is supplied with a power cord. Make sure power to the equipment matches the voltage requirements of the system. Make sure the system is properly grounded. Plug the power cord into the appropriate outlet.

a.2 Stainless Steel Enclosure with Power Cord

To provide power to the Electrical Enclosure for 120V:
Make sure power to the equipment matches the voltage requirements of the system. Make sure the system is properly grounded. Plug the power cord into the appropriate outlet.

To provide power to the Electrical Enclosure for 220V:

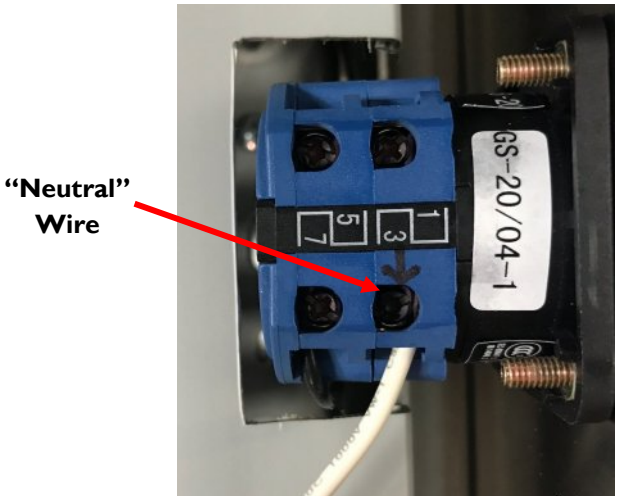
1. To make installation easy, first remove the wire duct cover and unscrew the display plate (this does not need to be removed completely) to access the circuit breaker to install incoming power wires.
2. Locate the power connection point and install your incoming 220V power wires through the strain relief on the bottom of the enclosure to the breaker.
3. Connect ground wire to the ground bar.
4. Turn the breaker on.
5. Mount the display panel back onto standoffs and reapply the wire duct covers.

a.3 Stainless Steel Enclosure

The ECC is designed to be remote mounted within 4-6 feet of the chamber. Prior to final placement, ensure the supplied cable lengths (8 ft. / 15 ft.) are adequate to reach between the ECC and the chamber. Make sure power to the equipment matches the voltage requirements of the system. Make sure the system is properly grounded. For complete wiring instructions, see wiring diagram inside the electrical enclosure or the pullout in the back of this manual.

To provide power to the Electrical Enclosure for 120V:

1. To make installation easy, first remove the wire duct cover to install incoming power wires.
2. Locate the power connection point and install your incoming 120V "hot" wire to the breaker.
3. Install the "neutral" wire to # 3 on the switch.
4. Connect ground wire to the ground bar.



To provide power to the Electrical Enclosure for 220V:

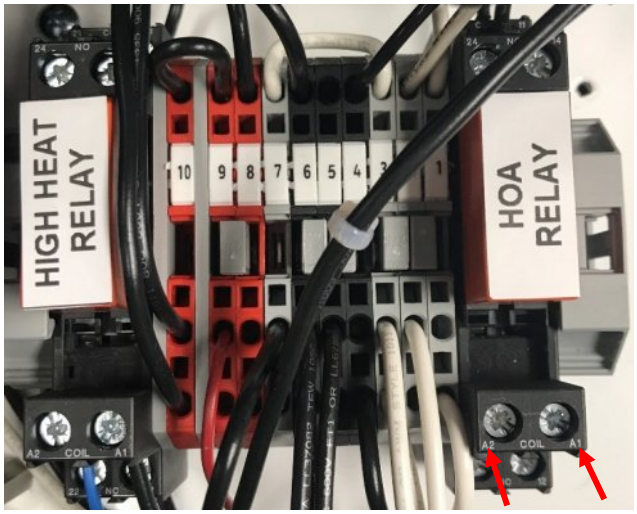
1. To make installation easy, first remove the wire duct cover and unscrew the display plate (this does not need to be removed completely) to access the circuit breaker to install incoming power wires.
2. Locate the power connection point and install your incoming 220V power wires through the strain relief on the bottom of the enclosure to the breaker.
3. Connect ground wire to the ground bar.
4. Turn the breaker on.
5. Mount the display panel back onto standoffs and reapply the wire duct covers.

b) Hands Off Auto Switch Wiring

b.1 Polycarbonate and Stainless Steel Enclosure with Power Cord

To wire the HOA Switch for remote access:

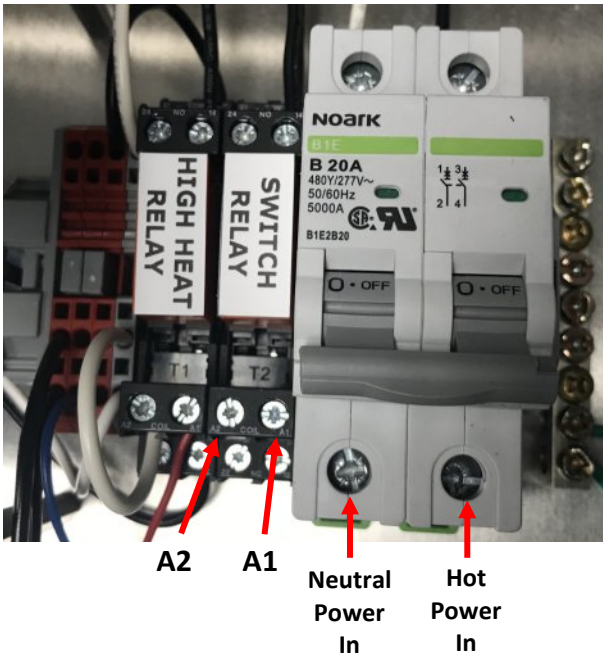
1. Remove the display/cover plate to access the HOA relay connection points for the remote switch.
2. Locate strain relief supplied at bottom of ECC for wiring to the HOA connection points.
3. Run 120V hot and neutral leads through the strain relief to the A1 and A2 on the HOA relay.
4. Re-assemble display/cover plate.
5. Turn switch on enclosure to "Auto"



b.2 Stainless Steel Enclosures

To wire the HOA Switch for remote access:

1. Remove the display plate to access the HOA switch relay connection points for the remote switch.
2. Locate the strain relief supplied at bottom of ECC for wiring to the HOA connection points.
3. Run 120V hot and neutral leads through the strain relief to the A1 and A2 on the HOA switch relay.
4. Re-assemble display plate.
5. Turn switch on enclosure to "Position 2"



c) Lamp Out Alert (Optional)

For models equipped with Lamp Out Alert ballast(s), connect your external control (PLC or SCADA) to the bottom of the enclosure via the auxiliary connection.

Warning! Control signal may not exceed 32V AC, 50V DC, 50mA current

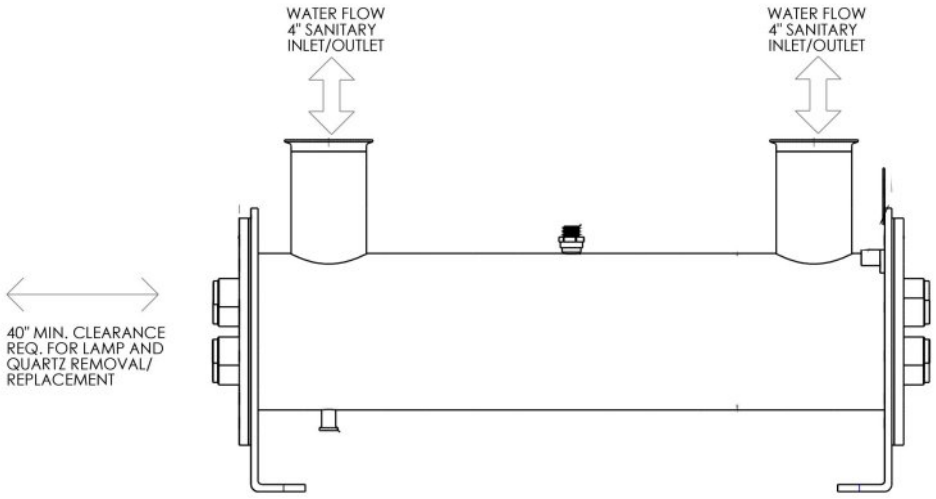
d) Chamber

Minimum Clearance

Ensure that you have adequate space on the lamp side of the treatment chamber to insert and remove the quartz sleeve and UV lamp(s).

- 40" or more is preferred for short chambers
- 70" or more is preferred for long chambers

If thought is not given to this aspect, the lamps and quartz sleeves will be impossible to install.



Picture Shown UV Treatment Chamber Short with 4" Sanitary Inlet / Outlet

Short UV Treatment Chamber—minimum clearance is at least 40" for lamp and quartz removal/replacement

Long UV Treatment Chamber—minimum clearance is at least 70" for lamp and quartz removal/replacement

e) Sensor Probe Installation—For Models Standard UV Monitoring System or WatchDog Monitoring System

P/N SNSR0007 Wetted Sensor

For models equipped with the Standard UV Monitoring System, a sensor probe and sensor cable will need to be installed on the UV chamber. The sensor probe contains an O-ring to ensure a watertight seal. To install, first attach the sensor probe to the sensor port on the UV chamber and secure. Then attach the sensor cable to the sensor probe.

Sensor Probe & Sensor Fitting

Attaches to Sensor Cable

P/N SNSR0004 Wetted Sensor

For models equipped with the WatchDog monitoring system, a sensor probe, sensor port fitting and sensor cable (not shown) will need to be installed on the UV chamber. The sensor fitting and sensor probe contains an O-ring to ensure a watertight seal. To install, first attach the sensor fitting to the sensor port on the UV chamber. Slide the sensor probe through the fitting and secure. Then attach the sensor cable to the sensor probe.

Sensor Probe & Sensor Fitting

Attaches to Sensor Cable

P/N SNSR0005 Non-Wetted Sensor and Viewing Window

For models equipped with the WatchDog monitoring system, a sensor probe, sensor viewing window and sensor cable (not shown) will need to be installed on the UV chamber. The viewing window and sensor probe contains an O-ring to ensure a watertight seal. To install, first attach the sensor viewing window to the sensor port on the UV Chamber. Slide the sensor probe through the viewing window and secure. Then attach the sensor cable to the sensor probe.

Attaches to Sensor Port on UV Chamber

Viewing Window

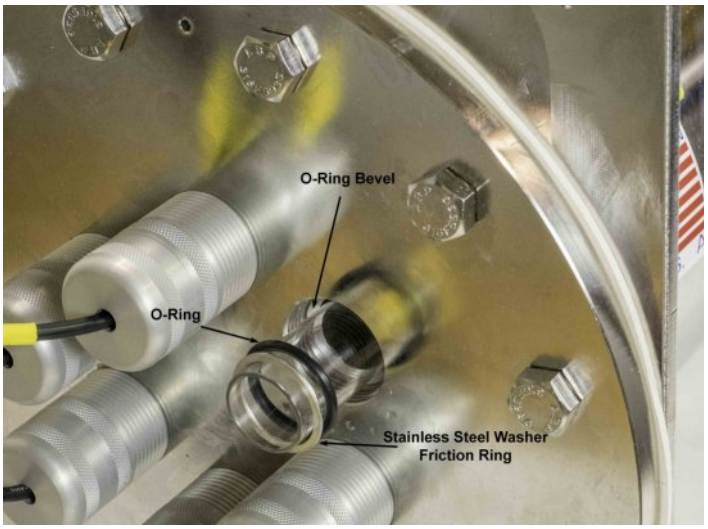
Attaches to Sensor Cable

Sensor Probe

f) Quartz Sleeve Installation for Open Ended Sleeves

When working on this task a single operator is appropriate..

The quartz sleeves seal by using a compression nut, a stainless steel washer and an O-Ring. This task requires no tools. Use cloth gloves to handle quartz sleeves and UV lamps to avoid putting fingerprints on them.



Manual Wiper System (Optional)—

If your unit includes a manual wiper system, wet the quartz sleeve before installing. Carefully slide the O-ring onto the end of the quartz sleeve as indicated below. Slowly and carefully slide the quartz sleeve through the lamp head plate and wiper ring. Make sure the quartz sleeve is aligned properly with the wiper ring(s).

Then, follow remaining steps below.

First, place the O-ring onto the end of the quartz sleeve as shown below.

Note: The O-ring should slide down the quartz sleeve about 1/4". More than 1/4" can make installation more difficult.

The quartz sleeve needs to be inserted into the lamp head plate gradually and securely through to the other end. As the quartz sleeve approaches the opposite end, make sure you guide the sleeve all the way through. It is suggested that a finger or a dowel may be used to catch the end of the quartz..

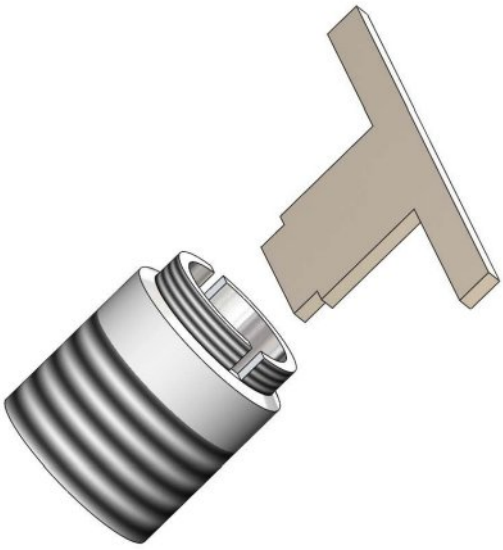
Once through, make sure that each end of the quartz sleeve protrudes the same amount on both sides. Before sliding the O-Ring on, it is suggested to lubricate both the O-Ring and the sleeve making it slippery. Then slide an O-Ring over each end of the sleeve. Once the O-Rings are on then place the stainless steel washers on each end. See Figure 1.

Figure 1

The compression fittings should first be hand tightened and the process needs to be completed for each quartz sleeve. **Do NOT install the UV lamp at this time.**

Do not use a wrench to tighten the compression nuts. Doing so can crack the quartz sleeves and cause leakage. A compression nut tool has been provided with the system to further tighten the compression nuts. See Figure 2.

Figure 2



Once secure and once all other ports are closed, it is time to pressurize the system to look for any leaks at the compression seals. Slowly fill the vessel with water. Prevent any onrush of water or water hammer as this may damage the sleeves. Also ensure that the UV lamps have not been placed in the vessel. In the event of a water hammer, the quartz sleeve(s) may break and if the lamps are already installed, they too could break.

Once pressurized, let stand for 10 minutes and inspect the seals. If any are found to be leaking, stop water, release pressure, drain system and then redo the leaking seals. Once redone, run the pressurization test and ensure that all seals are not leaking.

g) Lamp and Lamp Harness Bracket Installation

Use cloth gloves to handle UV lamps to avoid putting fingerprints on the lamps.

The electrical path for each lamp is identified and carried through the whole electrical system. The LED on the electrical enclosure for lamp one corresponds to lamp one in the treatment chamber. Each lamp harness is numbered and each lamp nipple is numbered on the lamp head plate. Match the corresponding numbered lamp lead to the corresponding numbered lamp nipple.

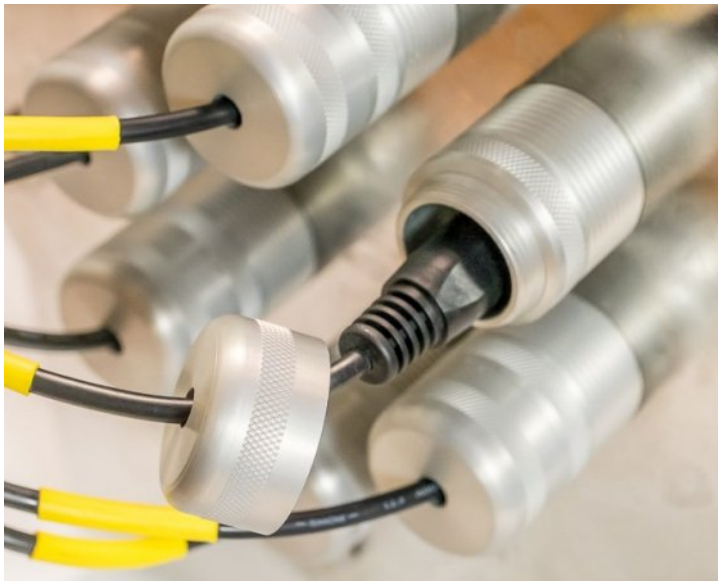
You must first install the lamp harness bracket if it is not attached to the UV chamber. If this is the case, your shipment includes all the necessary components to properly install. Attach the lamp harness bracket to the back side of the lamp head plate and secure with the 2 additional nuts.

Lamp Harness Bracket

Once the lamp harness bracket is secured, the UV lamps can be installed.

Insert the lamp into the quartz sleeve and slowly slide in, blank end first, pin end last. Leave the lamp protruding out of the sleeve far enough to be able to push the lamp connector onto the lamp. Make sure the lamp connector is firmly pushed onto the lamp base leaving no space between the connector and base. Failure to push the lamp connector all the way onto the base may allow electrical arcing to occur between the pins, overheating the lamp and possibly causing a fire.

Slowly slide the lamp into the sleeve, blank end first, pin end last. Leave the lamp protruding out of the sleeve far enough to be able to push the lamp connector onto the lamp. Make sure the lamp connector is firmly pushed onto the lamp base leaving no space between the connector and base. Failure to push the lamp connector all the way onto the base may allow electrical arcing to occur between the pins, overheating the lamp and possibly causing a fire. After the lamp harness is connected, then screw on the compression nut cap. Repeat for each lamp. The compression caps hold the lamp harness in place and prevent exposure to UV radiation.



6) Operation and Monitoring

a) Electronic Control Center (ECC)—

The ECC will be the focal point for system Operation and Monitoring.

a.1 Polycarbonate Enclosures

Do not exceed 3 ON/OFF cycles in a 24-hour period. Excessive cycling of the UV system will reduce the EOL (End of Life) output and/or cause premature aging of the UV lamps.

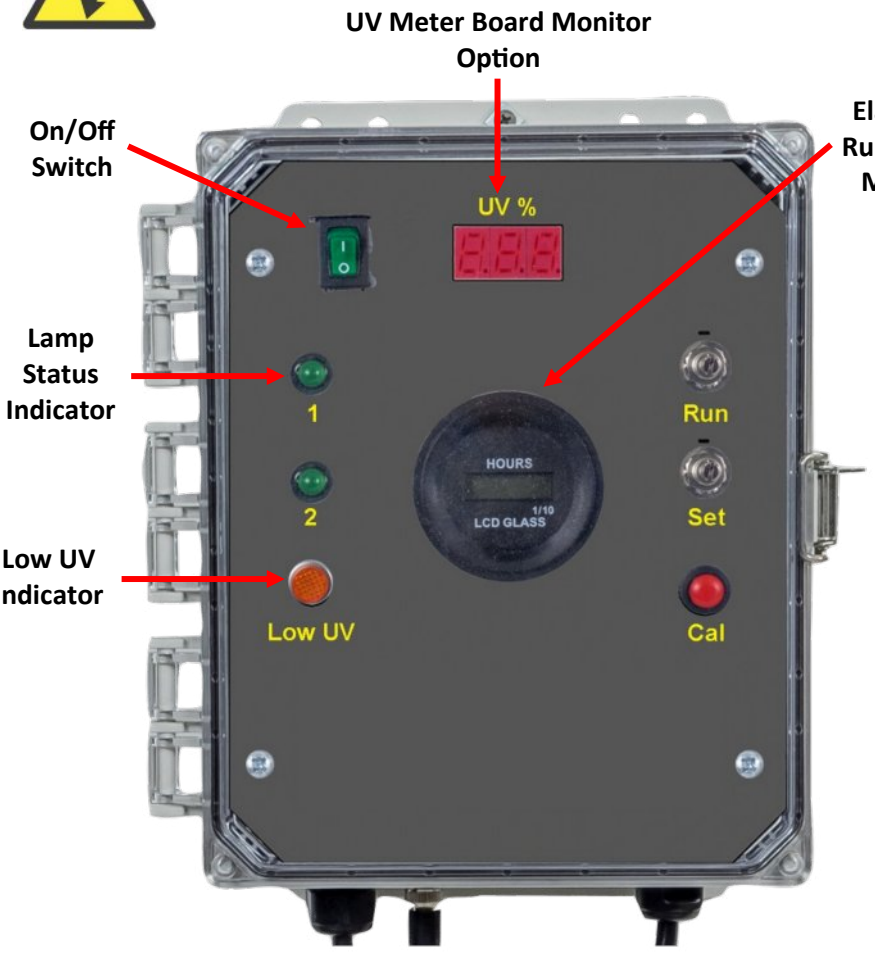


Photo shown is Display Plate for the Standard UV Meter Board Monitor Option and Standard High Heat Option

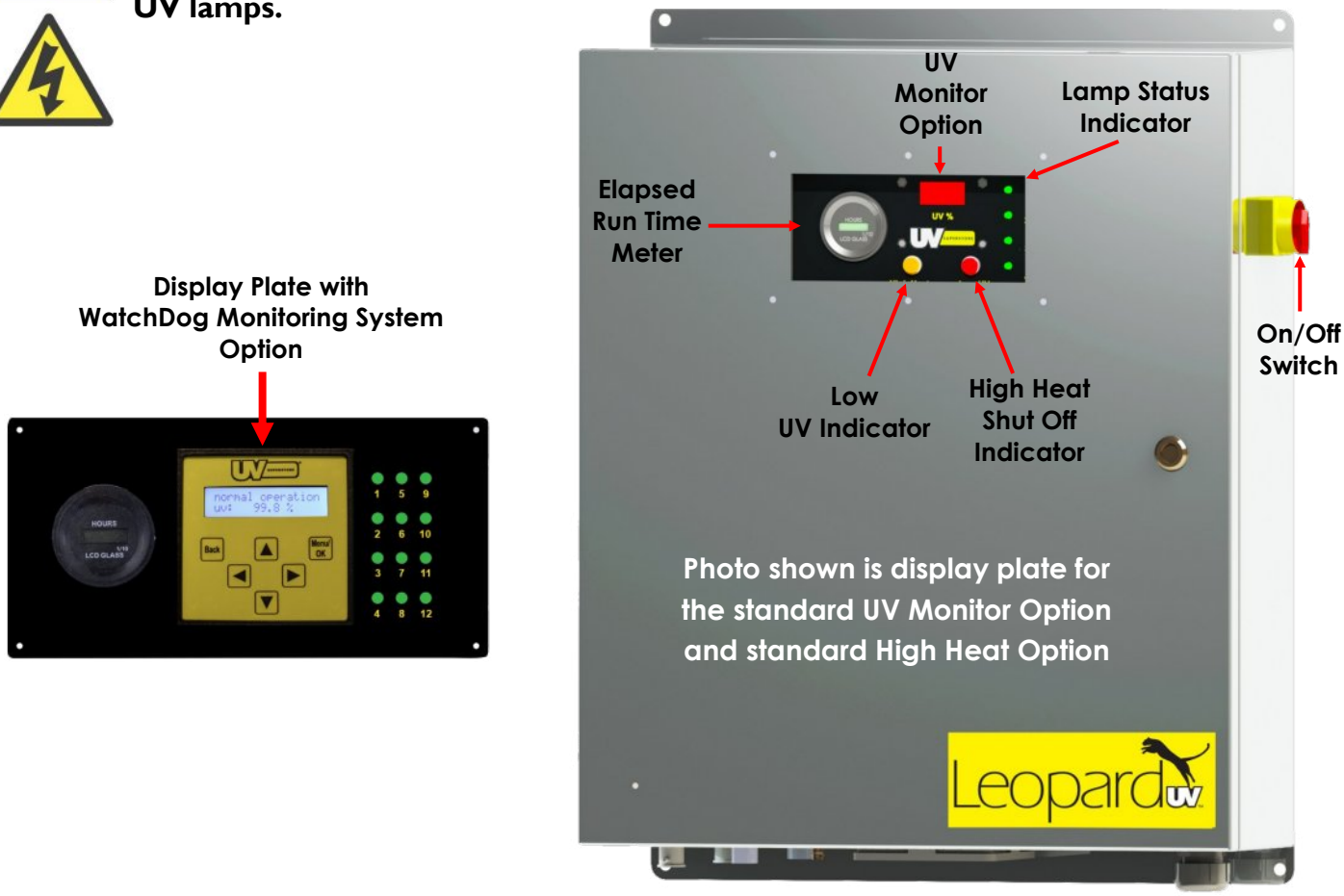
Display Plate for Optional WatchDog Monitoring System

Display Plate for Optional WatchDog Monitoring System

Display Plate for Optional Standard UV Monitoring System

a.2 Stainless Steel Enclosures

Do not exceed 3 ON/OFF cycles in a 24-hour period. Excessive cycling of the UV system will reduce the EOL (End of Life) output and/or cause premature aging of the UV lamps.



1. On/Off Switch

The on/off switch controls the electrical power to the UV system, manually.

a. Hands Off Auto (HOA) Switch Option
Polycarbonate and Stainless Steel Enclosures with power cord

This is an optional feature and is for models equipped with the HOA switch. Make sure the switch is wired as specified in the wiring diagram inside the ECC cover or refer to the wiring instructions in the Installation Section of this manual.

To operate remotely, turn switch to the "Auto" position.

b. Hands Off Auto (HOA) Switch Option
Stainless Steel Enclosures

This is an optional feature and is for models equipped with the HOA switch. Make sure the switch is wired as specified in the wiring diagram inside the ECC cover or refer to the wiring instructions located in the Installation Section of this manual.

To operate remotely, turn switch to the "2" position.

2. Lamp Status

The ECC will display each individual lamp status indicators in the form of Light Emitting Diodes (LEDs) located on the display plate behind the window on the front door. The LEDs glow green when the lamp is on. An extinguished LED indicates a possible lamp problem.

If the LED goes off, then it may mean that a lamp is no longer functioning. However, it may also indicate a problem with the LED, the lamp's corresponding ballast or a problem located within the lamp holder.

3. Runtime Monitoring

A digital non-resettable time meter has been integrated into the display plate of the ECC. This elapsed runtime meter (ERTM) tracks operational hours on the system as a whole. It does not track individual lamp run hours nor does it indicate when to service. The runtime meter is a tool to help track running hours to help operators know when it is time to change lamps.

Operators should keep tracking logs in order to know when it is time to change lamps. Lamps need to be changed every 10,000 hours (one year). UV lamps lose intensity over time and the system is designed to provide proper dosage up to 10,000 hours of lamp life. Running the lamps more than 10,000 hours could result in improper UV dosage.

b) Lamp Out Alert (Optional)

Lamp out alert ballast(s) are used to connect an external control (PLC or SCADA) to the enclosure. The Lamp Out Alert ballast contains relay contacts which provides a signal to the external control via lamp on / lamp fault conditions. The enclosure has been wired with two red terminal blocks that is specifically for this operation. An external control signal from a PLC or SCADA unit can be wired to the terminal blocks for a closed circuit/open circuit condition for external control logic.

To operate, the circuit starts at one of the terminal blocks and runs to the incoming contact of the lamp out relay of the first ballast and across the closed circuit contacts on the relay. From the outgoing relay contact of the first ballast, the wires are fed to the incoming contact on the next ballast and across the closed circuit contacts of the next ballast and so on to the last ballast (according to the number of lamps in the unit) and fed back to the second red terminal block. In the normal operating state with all lamps lit, the circuit is closed. If any of the lamps in the circuit fails, the corresponding lamp out relay will switch states, the chain will be broken, and the circuit will be open. An external control signal from a PLC or SCADA unit can be wired to the terminal blocks for a closed circuit/open circuit condition for external control logic.

Warning! Control signal may not exceed 32V AC, 50V DC, 50mA current

c) Viewport

For models not equipped with a UV Monitor, a viewport has been installed on the UV chamber. The purpose of a viewport is to safely verify lamp operation without the potential exposure to UV rays. The viewport assembly consists of a viewport, sight glass, foam washer and an O-ring.

d) Manual Quartz Sleeve Wiper System

Water quality will determine the frequency of operating the manual wiper system. It is recommended to use the wiper system weekly; however this task may be performed more often or less depending on your water conditions. To operate, release pressure off the locking pin assembly and remove the locking pin. Always operate the wiper system with a straight and even stroke.

7) UV Monitoring System Options

For units that are equipped with either the Standard UV Monitoring system or WatchDog UV Monitoring System, refer to the separate UV Monitoring System Options Manual for operational and monitoring instructions.

a) Standard High Heat Sensor (Optional)

Operation

Optimum operating temperature of a standard Low Pressure ultraviolet lamp is around 105°F. UV intensity falls off when the temperature of the lamp rises above the optimum operating temperature. In order to guard against a possible falloff of UV intensity due to high heat and possible damage to other components, an optional high heat sensor can be used. The High Heat Sensor option consists of a thermostat, a thermostat mounting bracket, a relay, and a High Heat indicator lamp. When an overheat situation occurs, the relay will trip, shutting off power to the ballasts and illuminating the High Heat Lamp indicator.

Operational "Normal" State **–** The High Heat Sensor controls voltage to the High Heat Relay. Voltage flows from the relay's common terminal to the NO terminal, feeding operating voltage to all components of the ECC allowing "normal" operation of the unit.

Fault State **–** The High Heat Sensor is factory set at 120°F. If vessel temperature reaches 120°F, the thermostat will not allow power to pass through, tripping the High Heat relay. Voltage through the relay will switch from the common terminal to the NC terminal, feeding voltage to the High Heat light and denying voltage to the ballasts and runtime meter. The UV lamps will shut off, the runtime meter will shut off, and the High Heat light will illuminate. If the unit is equipped with an optional UV Monitor, because the lamps are now shut off, the UV monitor will go into the fault state, illuminating the Low UV light, sounding the audible alarm, switching the state of the relay contacts on the UV Meter board, and the UV display should read "0". The unit will turn back on when water flows, cooling the unit or when water temperature falls below 90°.

8) Maintenance

Always disconnect power before servicing the system.

a) Lamp Maintenance

Most ultraviolet lamps are rated to provide 10,000 hours of continuous use. After 10,000 hours, the lamp may no longer provide the sufficient amount of 254nm or 185nm that is required for UV output. Therefore, the lamps need to be replaced on a yearly basis. Lamp status should also be checked on a periodic basis by inspecting the LEDs on the ECC.

It is best to always keep spare lamps available in case of emergency needs.

If it becomes necessary to clean the lamp due to dust or fingerprints, the lamps can be cleaned with either denatured alcohol or a non-abrasive cleaner. Use cotton gloves and a clean cloth when cleaning the lamps. Wait for lamps to cool before cleaning.

b) Quartz Sleeve Maintenance *(***FRAGILE:** Be careful when handling quartz sleeves! Always use cotton gloves when handling.)

In order to ensure proper disinfection, the quartz sleeves need to be inspected, monitored and maintained. The UV lamps produce heat and UVC output, which may cause certain water characteristics to adhere to and bond on the sleeve preventing the UVC from reaching the targeted pathogens. This can cause the quartz sleeves to foul. To a great extent, your frequency of cleaning will depend upon the water quality (i.e. amount of minerals present in the liquid). The more minerals present in the water, the more frequently the quartz will require cleaning.

Manual Cleaning

Significant film or debris deposits formed on the quartz sleeves will impair the ability of the ultraviolet rays to penetrate through the quartz and into the water.

A periodic visual inspection of the quartz will be necessary to determine the frequency of cleaning. Initial inspection should take place after thirty (30) days of operation. If the quartz are dirty, shorten the cleaning intervals. If the quartz are clean, lengthen the cleaning intervals.

To clean quartz sleeves, depressurize the unit by first turning off the valves on the inlet and then the outlet of the vessel. Turn off the power to the UV system. Drain the vessel. Disconnect the lamps, allow to cool and slowly and carefully remove the lamps using clean cotton gloves. Back off the compression quartz gland nuts and remove the O-rings. The quartz sleeves may be cleaned with denatured alcohol. If this is not adequate, a mild non-abrasive cleaner can be used. It is important to use cleaners that leave no residue. **FRAGILE: Be careful when handling quartz.** Whenever the quartz are cleaned, the quartz O-rings should be replaced. Install the quartz sleeves with clean cotton gloves.

c) Manual Quartz Sleeve Wiper System Maintenance

The wiper seal nut assembly (where the rod enters the chamber head) consists of O-Rings that may need to be changed. The wiper nut assembly prevents water from escaping through the wiper rod of the pressurized system. The wiper seal nut assembly consists of a total of 3 Viton O-Rings. If leaking occurs at this point, a new seal nut may need to be installed. To replace, release pressure, drain the vessel, remove the locking pin assembly, remove wiper knob and then unscrew the existing seal nut and install a new one.

d) ECC Maintenance

Polycarbonate Enclosures—

Electronic Control Consoles (ECC) made of polycarbonate material is custom designed with a sealed door. It should require little maintenance other than occasional cleaning. A damp cloth and mild detergent can be used to clean the outside of the enclosure. While most penetrations are sealed, it is not suitable to withstand a hose wash-down or large amounts of water. Any water penetrating the enclosure can lead to damage and possible electrical shock.

Stainless Steel Enclosures—

Electronic Control Consoles (ECC) made of 304 stainless steel is custom designed with a sealed door and sealed Lexan window kit. It should require little maintenance other than occasional cleaning. A damp cloth, mild detergent or other stainless steel cleaner may be used to clean the outside of the enclosure.

Routine maintenance should also include checking and cleaning the filters on the air intake fans. Fans have been integrated to keep the electronics cooler to ensure optimum performance. Prior to cleaning the filters, the ECC must be powered down. Once powered down, snap the covers off by hand then remove and wash the filter with warm water. Filter must be dry before reinstalling.

The ECC is not suitable to withstand a hose wash-down or large amounts of water. Any water penetrating the enclosure can lead to damage and possible electrical shock.

e) Viewport Maintenance

For models not equipped with a UV Monitor, a viewport has been installed on the UV chamber. The purpose of a viewport is to safely verify lamp operation without the potential exposure to UV rays. The viewport assembly consists of a viewport, sight glass, foam washer and an O-ring.

The foam washer acts as a cushion between one side of the sight glass and the viewport itself. The O-ring provides a seal and serves as a cushion to the other side of the sight glass.

This assembly will require periodic maintenance similar to the lamp and quartz maintenance schedule. A periodic visual inspection of the viewport assembly is recommended. Unscrew the nickel plated viewport from the chamber and inspect the sight glass for any cracks. If a crack has occurred this will need to be replaced. It is recommended to replace the O-ring every 3-5 years as the O-ring can degrade over time.

Reattach viewport after routine maintenance has been performed.

f) High Heat Shutoff Maintenance— Models with Standard High Heat Option

Many applications can have significant times of no flow. During these times, heat can build up in the vessel. To prevent the lamps from overheating and the quartz sleeve fouling, a thermostat (high heat shut off) may have been provided as an option.

The High Heat Sensor is attached to the cylinder flange plate welded to the vessel. It is held in place with a mounting bracket held by one of the head plate bolts. The sensor is attached to the electronics via a plug in connector. The sensor generally shuts down at 120°F. This is meant to protect the lamps. The system will turn back on once the system cools down. The sensor is factory set and cannot be adjusted. No maintenance is needed other than to make sure the sensor is held tightly in place.

g) Sensor Probe Maintenance

1) Models with Standard UV Meter Board Monitor—

For models equipped with a standard UV Monitor, a sensor probe has been installed on the UV chamber. The sensor probe contains an O-ring that will need to be replaced periodically. Annual routine maintenance is recommended similar to lamp and quartz maintenance.

Unscrew the sensor probe from the sensor port. Inspect and clean as needed. A buildup can coat the sensor probe and failure to clean may result in a false reading. It is recommended to replace the O-ring every 3-5 years as the O-ring can degrade over time.

Reattach sensor probe after routine maintenance has been performed.

2) Models with Standard UV Monitoring System or WatchDog Monitoring System—

a) Wetted Sensor Probe (SNSR0007 & SNSR0004)

For models equipped with either the Standard UV Monitoring System or WatchDog Monitoring System, a sensor probe and sensor cable is used and attached to the UV chamber. The sensor probe consists of a an O-ring that will need to be replaced periodically. Annual routine maintenance is recommended similar to lamp and quartz maintenance.

You must shut down the system and depressurize the chamber before performing any maintenance. Detach the sensor cable from sensor probe and unscrew the probe from the sensor port. Inspect and clean as needed. A buildup can coat the sensor probe and failure to clean may result in a false reading. It is recommended to replace the O-ring every 3-5 years as the O-ring can degrade over time.

Reattach sensor probe and sensor cable after routine maintenance has been performed.

Standard UV Monitoring System
P/N SNSR0007
Wetted Sensor Probe

WatchDog Monitoring System
P/N SNSR0004
Wetted Sensor Probe

b) Non-Wetted Sensor Probe with Viewing Window (SNSR0005)

For models equipped with the WatchDog monitoring system, a sensor probe has been installed on the UV chamber. The sensor probe viewing window is made of a quartz disc that will need to be cleaned and contains an O-ring that will need to be replaced periodically. Annual routine maintenance is recommended similar to lamp and quartz maintenance. Before cleaning the viewing window, you must shut down the system and depressurize chamber.

Unscrew the viewing window from the sensor port. Inspect and clean as needed. A buildup can coat the quartz disc and failure to clean may result in a false reading. It is recommended to replace the O-ring every 3-5 years as the O-ring can degrade over time.

Reattach viewing window after maintenance has been performed.

P/N SNSR0005
Non-Wetted Sensor Probe

Viewing Window

h) Chamber Maintenance

The chamber requires periodic maintenance. The Chamber is made of 316L Stainless Steel and is electropolished and passivated. It should provide years of reliable service. The exterior can be cleaned with a damp cloth and mild detergent or a stainless steel cleaner. **Be careful around the compression nuts as the compression cap is not watertight.** The chamber interior will require cleaning on a periodic basis depending on the quality of the water passing through. Some water will introduce solids, minerals, and other debris in the vessel. Inspection of the vessel can be made without removal of the heads.

Prior to performing inspection, ensure that the power to the ECC and that the water supply has been turned off before and after the chamber. Once isolated, drain the system. Prior to draining, release pressure in line by opening a valve. Failure to do these tasks can result in serious injury and property damage.

Once drained, the operator can remove a lamp and quartz sleeve to peek through a nipple in the lamp head to get a limited view of the vessel. The UV sensor probe (if so equipped), or the viewport can also be removed to inspect the chamber.

The heads can also be removed to inspect or clean the chamber.

Chamber Breakdown – Removal of Heads

Once determined there is reason to believe that the vessel needs to be cleaned, the operators will need to set aside some work time to perform a complete system break down.

As with inspection, the vessel needs to be powered off, completely drained and allowed to cool down.

The operator will need to remove the lamps, the compression nuts, O-rings and quartz sleeves. All of these parts should be checked for wear and should be stored in an area where they will not get lost or broken.

Operators will need to loosen the nuts and bolts on the lamp head plate and inlet head plate. Once loosened, the nuts, bolts and lock washers need to be removed and stored.

The head will need to be replaced in the exact position in which it was removed. There is an alignment pin on the cylinder flange that mates to a hole in the removable head to ensure the head is in the proper position upon reinstallation.

Lower the head to the ground. The gasket should be inspected for wear and also stored in a safe place. Having one head off will allow for both visual inspection and cleaning.

Once cleaned, perform maintenance on the quartz sleeves and replace any gaskets/O-rings.

NOTE: It is recommended that a new gasket be installed.

When re-installing the head, use a crisscross pattern to tighten the nuts. This is similar to putting a tire on a car. Bolts should be torqued to 25 foot pounds.

9) Water Sampling (for Flange Models)

UV Superstore, Inc. recommends a program of water sampling to ensure delivery of the desired water quality. While the frequency of sampling will depend upon site conditions and requirements, the user should establish a disciplined program.

a) Sampling Valves

UV Superstore, Inc. recommends installation of sampling valves on the inlet and outlet sample ports located on the ultraviolet unit risers. The wetted material should be 316 stainless steel construction. A minimal length of thread connections of the sample valve port should be maintained to reduce the dead volume on the upstream side of the valve. The inside diameter of the sample valve must not exceed one-quarter inch (1/4") to insure proper velocity. Any valve used for sampling should be constructed in a manner to reduce or prevent the retention of bacteria within its internal surfaces. The valve should also be easy to sanitize.

b) Sampling Procedure

1) Prior to sampling the water, acquire an adequate supply of bacteriological monitors, total count water samplers, pre-sterilized plastic bottles within pre-sterilized plastic bags from a water testing laboratory.

2) With the ultraviolet system operating, open the sample valve fully and flush for at least one minute at full fast flow. Then, close the valve.

3) Sanitize the valve and sampling port in accordance with the proper standards established for the specific valve installed. Isopropyl alcohol 70% to 90% is recommended.

4) Fully open and flush the valve again to remove any contaminants. The flushing time sequence may run from a minimum of three to five minutes. Do not reduce the water flow before taking the water sample because the back of the valve (not previously exposed) may contain contaminates. If you reduce the flow prior to taking a sample, continue to flush as before.

5) When sampling, take the measurement at the center of the stream in order to reduce the possibility of bio-fouling.

6) Follow ASTM or your bacteriological monitor manufacturer guidelines when using that monitor, with a total count water sampler and a pre-sterilized plastic bag, to sample the in-line.

7) Carefully fill the pre-sterilized bottle from the bottom up allowing the water stream to overflow and flush the bottle for a minimum of one minute.

Food and Drug Administration Statement

UV Superstore provides state of the art Ultraviolet Water and Air Treatment Systems for many commercial and industrial applications.

The U.S Food and Drug Administration approval process does not allow for individually approval of any material, piece of equipment, or apparatus that is not deemed a medical device. Therefore UV Superstore designs our brand UV Systems and spare parts to be in compliance with the U.S Food and Drug Administration Code Of Federal Regulations Title 21 Sub Section 177.

Stainless Steel and quartz material are acceptable in FDA applications. All O-ring and gasket materials are in compliance with Title 21 Sub Section 177.

The U.S Food and Drug Administration regulations that deal with the items addressed above are as follows:

1) Part 129, Subpart C, Sec. 129.40 Equipment and procedures.

2) Part 177, Subpart C, Sec. 177.2600 Rubber articles intended for repeated use.

3) Part 211, Subpart D, Sec 211.65 Equipment Construction.

All UV Superstore products are built to exacting standards with the highest quality materials available to meet the above referenced guidelines.

UV Superstore, Inc.

Engineering Department

LeopardUV® Series
Ultraviolet Treatment Systems

Heat Sanitization

For Heat Sanitization, we recommend temperatures no higher than 194°F (90°C). If the unit has a UV Monitor, the sensor probe must be removed and the sensor port plugged prior to sanitization. The sensor probe manufacturer states temperatures higher than 140°F (60°C) can possibly either damage the electronic components inside the housing, or affect sensor calibration. The sensor port for P/N SNSR0004 requires a 1/4" BSPP male thread plug. The sensor port for P/N SNSR0005 requires a 1" BSPP male thread plug.

The most critical part is that the system is not heated or cooled too quickly, as with anything made with like materials, if this is heated or cooled too quickly there is a good chance of very fast expansion or contraction and this is where the problems will come from as far as cracking of the stainless steel chamber or welds, compression fittings failure, quartz sleeves failure and other components failure along with chances of leaking by the various seals for the UV system. Heat and cool SLOWLY.

- Turn UV System OFF, UV Lamps should not be operational during this process.

- Maximum Temperature:

  Models without a UV Monitor: 194°F (90°C)

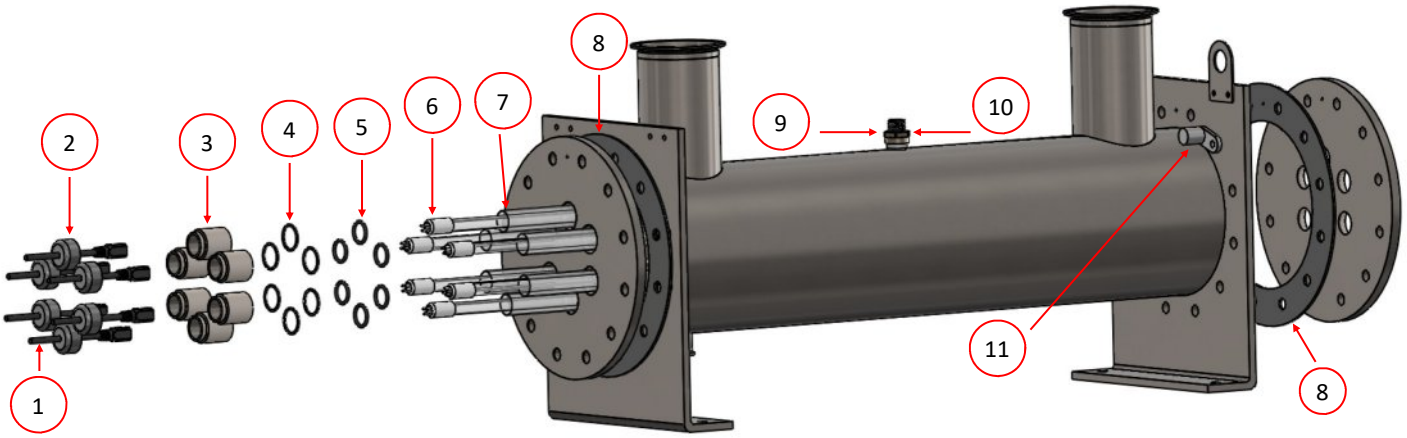
  Models with a UV Monitor: 140°F (60°C)

- Remove UV Sensor Probe and plug sensor port.

- Heat and cool SLOWLY to avoid fast expansion or contraction.

Replacement Parts List

Leopard Series Short Chambered Systems

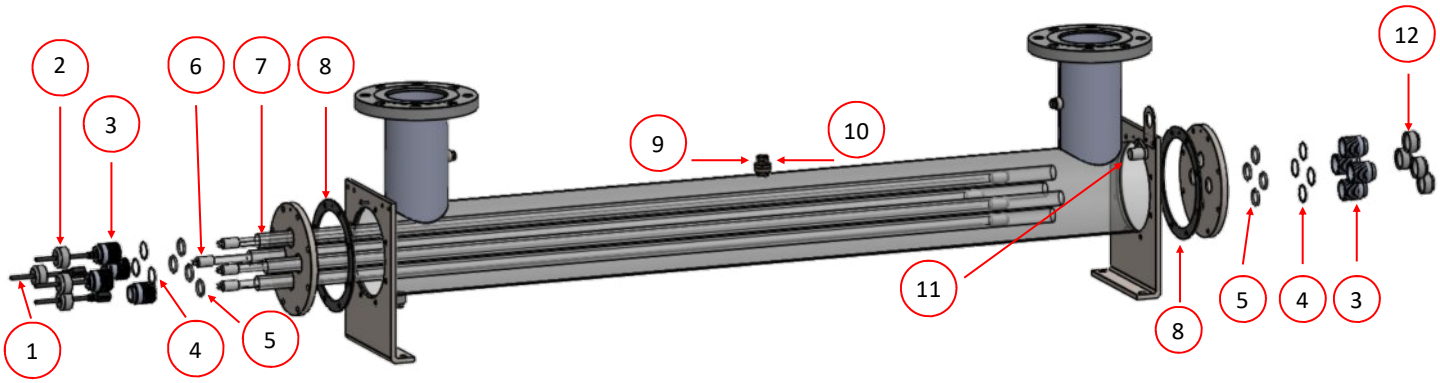


LeopardUV® Model Numbers:
High Output—LP1SHO-6, LP2SHO-6, LP3SHO-6, LP3SHO-8, LP4SHO-6, LP4SHO-8
Amalgam—LP1SA-6, LP2SA-6, LP3SA-6, LP3SA-8, LP4SA-6, LP4SA-8, LP5SA-8, LP6SA-8, LP8SA-8

Item No.	Part No.	Description	Quantity Required # Of Lamps in system						
			1 Lamp	2 Lamp	3 Lamp	4 Lamp	5 Lamp	6 Lamp	8 Lamp
1	LH0001 LH0002	Lamp Harness (4 wire) Lamp Harness (2 wire)	1	2	3	4	5	6	8
2	CN0005	Compression Cap with hole for Lamp Harness	1	2	3	4	5	6	8
3	CN0004 CN0006	Compression Nut Compression Cap (not shown)	2 1	4 2	6 3	8 4	10 5	12 6	16 8
4	SS1015 2-0159	Sleeve Washer, Stainless Steel Sleeve Washer, Stainless Steel (For Wiper System)	2	4	6	8	10	12	16
5	ORNG0102 AQ35492	Sleeve, O-Ring, EPDM Sleeve O-Ring, EPDM (For Wiper System)	2	4	6	8	10	12	16
6	GL-5843-4H74Y GV-5843-4H74A GL-6843-4A74G GV-6843-4A74B	UV Lamp—High Output 254NM UV Lamp—High Output 185NM UV Lamp—Amalgam 254NM UV Lamp—Amalgam 185NM	1	2	3	4	5	6	8
7	QZ53-968 QZ47-962	Quartz Sleeve, Open Quartz Sleeve, Open (For Wiper System)	1	2	3	4	5	6	8
8	GSKT0014 GSKT0004	Head Gasket—for 6” Chambers Head Gasket—for 8” Chambers	2						
Model Options									
9	VPM0001 002045	UV Viewport O-Ring for Viewport (Models without UV Monitoring System)	1						
10	4-0008 ORNG0101 SNSR0004 ORNG0101 SNSR0005 SW0001 ORNG0102	UV Sensor Probe O-Ring for Sensor Probe (Models with Standard UV Meter Board) UV Sensor Probe O-Ring for UV Sensor Probe UV Sensor Probe Sight Window for Sensor Probe O-Ring for Sight Window (Models with WatchDog Monitoring System)	1						
11	THERM0100	Thermistor (Models with Standard High Heat)	1						

Replacement Parts List

Leopard Series Long Chambered Systems

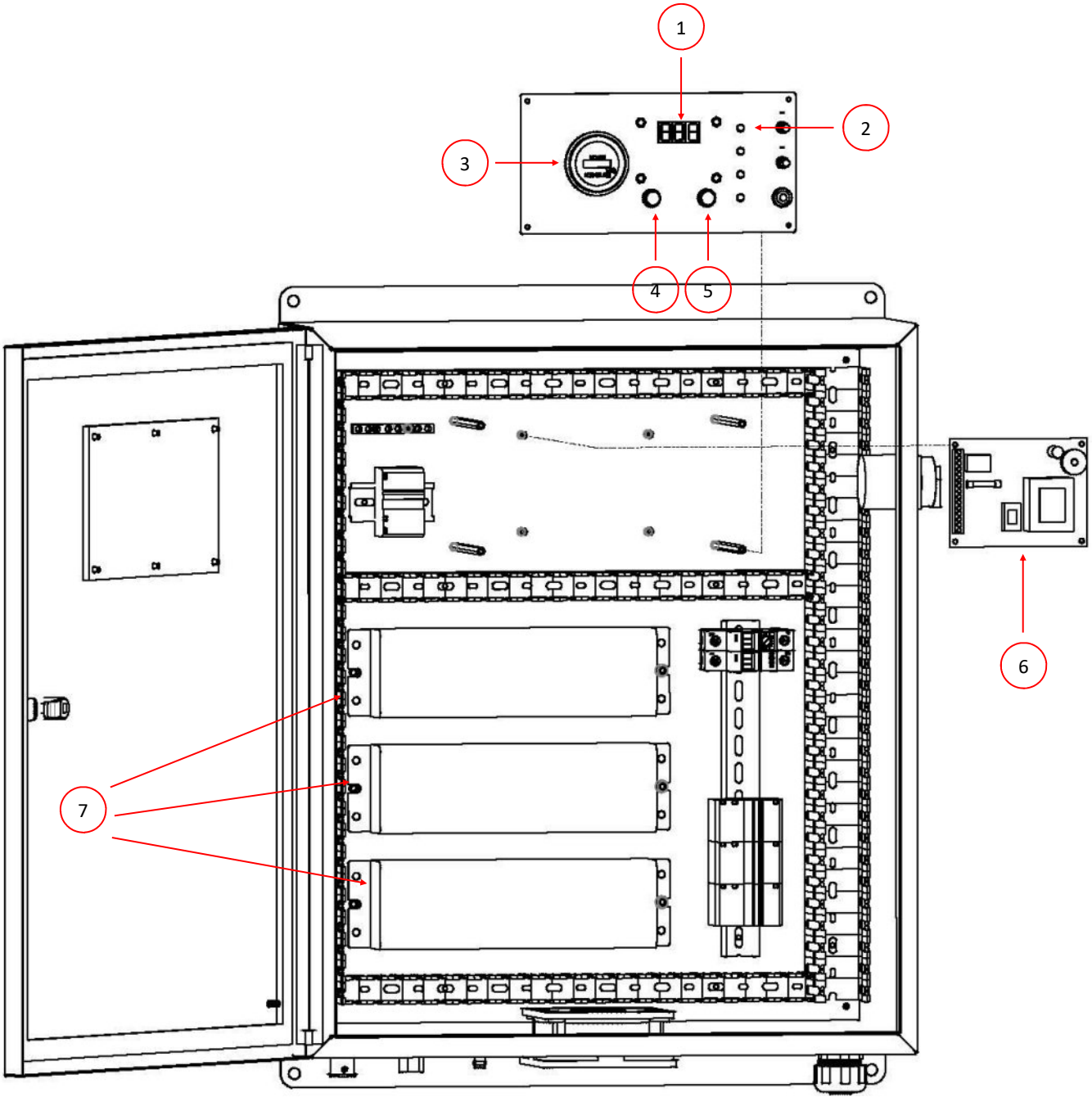


LeopardUV® Model Numbers:
High Output—LP4LHO-6, LP4LHO-8, LP5LHO-6, LP5LHO-8, LP6LHO-8
Amalgam—LP4LA-8, LP5LA-8, LP6LA-8, LP4LA-10, LP5LA-10

Item No.	Part No.	Description	Quantity Required # Of Lamps in system		
			4 Lamp	5 Lamp	6 Lamp
1	LH0002	Lamp Harness (2 wire)	4	5	6
2	CN0005	Compression Cap with hole for Lamp Harness	4	5	6
3	CN0004	Compression Nut	8	10	12
4	SS1015 2-0159	Sleeve Washer, Stainless Steel Sleeve Washer, Stainless Steel (For Wiper System)	8	10	12
5	ORNG0102 AQ35492	Sleeve O-Ring, EPDM Sleeve O-Ring, EPDM (For Wiper System)	8	10	12
6	GL-51554-4H74Y GV-51554-4H74A GL-61570-4A74G GV-61570-4A74B	UV Lamp—High Output 254NM UV Lamp—High Output 185NM UV Lamp—Amalgam 254NM UV Lamp—Amalgam 185NM	**4**	**5**	**6**
7	QZ53-1643 QZ47-1637	Quartz Sleeve, Open Quartz Sleeve, Open (For Wiper System)	4	5	6
8	GSKT0014 GSKT0004 GSTK0005	Head Gasket (For 6” Chamber) Head Gasket (For 8” Chamber) Head Gasket (For 10” Chamber)	2 2 2	2 2 2	X 2 X
Model Options					
9	VPM0001 002045	UV Viewport O-Ring for UV Viewport (Models without UV Monitoring System)	1		
10	4-0008 ORNG0101 SNSR0004 ORNG0101 SNSR0005 SW0001 ORNG0102	UV Sensor O-Ring for sensor probe (Models with Standard UV Meter Board) UV Sensor Probe O-Ring for UV Sensor Probe UV Sensor Probe Sight Window for Sensor Probe O-Ring for Sight Window (Models with WatchDog Monitoring System)	1		
11	THERM0100	Thermistor (Models with Standard High Heat)	1		
12	CN0006	Compression Cap	4	5	6

Replacement Parts List—Electrical Enclosure

Leopard Series Short & Long Chambered Systems



****WatchDog and Standard Monitoring System is not included in parts blowup****

LeopardUV® Model Numbers:

High Output Models

Short—LP1SHO-6, LP2SHO-6, LP3SHO-6, LP3SHO-8, LP4SHO-6, LP4SHO-8

Long—LP4LHO-6, LP4LHO-8, LP5LHO-6, LP5LHO-8, LP6LHO-8

Amalgam Models

Short—LP1SA-6, LP2SA-6, LP3SA-6, LP3SA-8, LP4SA-6, LP4SA-8, LP5SA-8, LP6SA-8, LP8SA-8

Long—LP4LA-8, LP5LA-8, LP6LA-8, LP4LA-10, LP5LA-10

Item No.	Part No.	Description	Quantity Required # Of Lamps in system						
			1 Lamp	2 Lamp	3 Lamp	4 Lamp	5 Lamp	6 Lamp	8 Lamp
1	ELEN0028	Intensity Display Board (Models with Standard UV Meter Board Option)	1	1	1	1	1	1	1
2	LED0100-29	Lamp Status Indicator	1	2	3	4	5	6	8
3	ERTM0100	Elapsed Runtime Meter	1	1	1	1	1	1	1
4	LGHT0003	Low UV Indicator—120V	1	1	1	1	1	1	1
	LGHT0004	Low UV Indicator—220V (Models with Standard UV Meter Board Option)	1	1	1	1	1	1	1
5	LGHT0001	High Heat Shutoff Indicator—120V	1	1	1	1	1	1	1
	LGHT0002	High Heat Shutoff Indicator—220V (Models with Standard High Heat Option)	1	1	1	1	1	1	1
6	ELEN0029-420	UV Meter Board with 4-20mA Output (Models with Standard UV Meter Board Option)	1	1	1	1	1	1	1
7	BLST0034	Ballast 100-277V 50-60Hz (Short High Output Lamp)	1	2	3	4	X	X	X
	BLST0056	Ballast 120-240V 50-60Hz (Short HO Lamp Out Alert)	1	2	3	4	X	X	X
	BLST0066	Ballast 120-277V 50-60Hz (Long High Output Lamp)	X	X	X	2	3	3	X
	BLST0058	Ballast 220-277V 50-60Hz (Long HO Lamp Out Alert)	X	X	X	2	3	3	4
	BLST0015	Ballast 120V 50-60Hz (Short Amalgam Lamp)	1	2	3	4	5	6	8
	BLST0016	Ballast 220V 50-60Hz (Short Amalgam Lamp)	1	2	3	4	5	6	8
	BLST0057	Ballast 220-277V 50-60Hz (Short Amalgam Lamp Out Alert)	1	2	3	4	5	6	8
	BLST0003	Ballast 120V 50-60Hz (Long Amalgam Lamp)	X	X	X	4	5	6	X
	BLST0004	Ballast 230V 50-60Hz (Long Amalgam Lamp)	X	X	X	4	5	6	X
	BLSTA0073-01	Ballast 220V 50Hz (Long Amalgam Lamp Out Alert)	X	X	X	2	3	3	X

Maintenance Log

You must perform routine maintenance in order to achieve optimum performance levels from your LeopardUV® water treatment system. As you perform routine maintenance or necessary service on your system, record the dates in the maintenance log. The maintenance section of the Owner's Manual provides instructions for servicing and maintenance procedures.

Replace Lamp (every 365 days)	Clean Sleeve (as needed)	Replace Quartz Sleeve (every 3 years)	Replace O-Rings (with Quartz sleeve change)

Troubleshooting

Situation	Recommended Action
Lamp status LED light is out	• Check lamp socket and lamp connection. Verify it is securely connected. • If lamp is on, replace LED assembly. • If lamp is out, go to next step “lamp is out”.
Lamp is Out	• Exchange lamp connectors from questionable lamp to known good lamp. If lamp lights, replace bad lamp. • If the lamp does not light, exchange lamp connectors at enclosure from questionable ballast to known good ballast. If lamp lights, replace ballast. • Check input voltage. Must be above 120V/60Hz or 220V/50Hz. Install a voltage regulator or check for floating neutral at power source.
Short Lamp Life	• Damper excessive vibration which causes degradation of lamp filaments by checking for poorly connected pipes, erratic or improperly installed pumps, or move the UV equipment to isolate it from vibration. • Consult manufacturer for frequent start/stop requirements (recommend not more than six (6) in 24-hour period).
Leak at Quartz End Plate	• Inspect the compression nut and O-ring to ensure the nut is tightened and O-ring is sealed properly. • Inspect quartz sleeve. Ensure the quartz sleeve is not cracked. Replace if defective or cracked. • O-rings and gaskets can deteriorate and become damaged over time. Replace O-ring and/or gasket. • When replacing end gasket, make sure bolts are torqued to 25 foot lbs.
Poor Bacterial Performance	• Replace old or defective lamps. • Inspect quartz sleeve(s) and make sure it is clean. • Check water quality. Ensure that color, turbidity, and iron content are within normal parameters. • Verify sampling technique. • Verify flow rate. • Ensure proper sample valves are used. • Check for bypass valve contamination.
Low UV Monitor Reading (Less than 85% transmission)	• Check water quality. Ensure that color, turbidity, and iron content are within normal parameters. • Verify lamp output. • Ensure input voltage matches requirements. • Replace old or defective lamp(s). • Clean quartz sleeve(s). • Clean UV sensor lens. • If reading is at 0%, ensure UV sensor cable is connected.

If questions still remain after completing a troubleshooting procedure, please contact the manufacturer.

Limited Warranty

UV Superstore's LeopardUV® Commercial and Industrial Water Treatment systems are provided with a limited warranty. These units carry a warranty to be free from defects in materials and workmanship for one year from date of purchase under the conditions of normal usage and service for the complete system and a four year warranty for the treatment chamber. If the product fails or malfunctions during the warranty period, UV Superstore shall inspect the inoperative product and have the option to repair or replace any components, which, in the assessment of UV Superstore were originally defective or became so under normal conditions of use and service. Customers must first call UV Superstore and be issued a Return Authorization number before returning any product or component. The equipment or component must be returned to UV Superstore freight prepaid and insured to the address below.

Warranty Statement

UV Superstore warrants replacement lamps, purchased for routine maintenance, to be free from defects in material and workmanship for a period one year from the date of purchase. During this time, UV Superstore will repair or replace, at its option, a defective lamp free of charge except for shipping and handling charges and any prorated charges (where applicable).

The warranty period on replacement lamps will be verified using date codes and/or purchase receipts. UV Superstore will advise whether the defective item needs to be returned for failure analysis.

None of the above warranties cover damage caused by improper use or maintenance, accidents, acts of God or minor scratches or imperfections that do not materially impair the operation of the lamp. The warranties also do not cover products that are not installed as outlined in the applicable Owner's Manual.

The limited warranties described above are the only warranties applicable to the equipment outlined. These limited warranties outline the exclusive remedy for all claims based on a failure of or defect in any of these lamps, whether the claim is based on contract, tort (including negligence), strict liability or otherwise. These warranties are in lieu of all other warranties whether written, oral, implied or statutory. Without limitation, no warranty of merchantability or of fitness for a particular purpose shall apply to any of this equipment.

UV Superstore, Inc. does not assume any liability for personal injury or property damage caused by the use or misuse of any of the above products. UV Superstore, Inc. shall not in any event be liable for special, incidental, indirect or consequential damages. UV Superstore liability shall, in all instances, be limited to repair or replacement of the defective product or part and this liability will terminate upon expiration of the applicable warranty period.

For all warranty claims you must contact UV Superstore at the below address. All claims must be filed within 30 days.

UV SUPERSTORE®

820 Tucker Court, Winder, GA 30680

Phone: 770-307-3882

Fax: 770-307-3872

sales@uvsuperstore.com

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