



**HAYWARD®**

# HydroRite PVCUV

Low Pressure Uv Light System

## Owner's Manual



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HYR75  
HYR150  
HYR400

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## IMPORTANT SAFETY INSTRUCTIONS

When using this electrical equipment, basic safety precautions should always be followed, including the following:

- READ AND FOLLOW ALL INSTRUCTIONS
- **WARNING:** Risk of Electric Shock. Connect HydroRite PVCUV only to a grounding type receptacle protected by a ground-fault circuit interrupter (GFI). Hayward recommends installation to a dedicated GFI circuit breaker performed by a licensed electrician.
- **WARNING:** Disconnect power before servicing.
- **WARNING:** All power cords should be inspected frequently. Any damaged power cords must be replaced immediately to reduce the risk of electric shock. Never operate the HydroRite PVCUV without a functional flow sensor or functional flow.
- **WARNING:** Installation requires a properly located GFI protected receptacle. Never use an extension cord for electrical connections to the HydroRite PVCUV.
- **WARNING:** Always mount the HydroRite PVCUV in a safe area not subject to damage by moving objects. Never bury power cords.
- **WARNING:** Any person using, adjusting, or monitoring the PVCUV must be at least 18 years of age and be familiar with these instructions and the contents of this manual.
- **Caution:** The HydroRite PVCUV should not be installed where it is accessible to the public.

## SAVE THESE INSTRUCTIONS



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## Foreword

Congratulations on your wise investment. The product you have selected from the Hayward® line should provide you with substantially reduced chemical maintenance, improved compliance with Health Department operating standards, chemical cost savings, and many years of reliable operation.

The HydroRite PVCUV is relatively simple to install, please take the time to read this entire manual, compare package contents with the parts list, and gather all tools required before beginning installation. Improper installation may void the warranty and create unnecessary hazards. Properly preparing for installation will also reduce facility down time.

For the purposes of this manual, it is presupposed that the installer is familiar with the physical characteristics of the pool or spa. As is the case when installing any filtration system component, all recirculating pumps, heaters, etc. need to be turned off prior to installation. If the filtration system is located below water level, additionally adjust all valves required to eliminate pressure from the system.

Physically, installation of the HydroRite PVCUV is no more challenging than installation of a chemical feeder. Any swimming pool contractor or maintenance engineer should have the tools and knowledge to perform the installation. Our technical support line can also be used to answer any questions pertaining to installation.

Congratulations on your purchase. Please complete and return your warranty registration card today.



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## Introduction

### Description

The HydroRite PVCUV system is a low pressure, high output amalgam, ultraviolet light sterilizer designed for commercial swimming pool applications. The system operates at light wavelengths of 254nm for sterilizing and 185nm for oxidizing. The HydroRite PVCUV is designed for commercial service and can be run 24 hours a day. The HydroRite PVCUV components are outlined below.

### UV Light Chamber

The UV Light Chamber is made from highly polished 316L stainless steel lined PVC. Quartz sleeves separate the low pressure, high output amalgam germicidal lamps from the water. The water to be treated flows into the bottom of the chamber. Once in the chamber, the germicidal bulbs produce a minimum 3-log reduction in pathogens. The water is then returned to the source.

### Power Supply

The power supply provides the current to start and maintain the germicidal lamps. A visual indication of bulb output is displayed on the face of the power supply and a counter is located in the power supply to display hours of operation.



### General Specifications And Sizing Guidelines

This unit has demonstrated an ability to provide three log inactivation of *Enterococcus faecium* and *Pseudomonas aeruginosa*. This unit has not demonstrated an ability to provide three log kill or inactivation of *Cryptosporidium parvum*. This product is designed for supplementary disinfection and is intended for use with appropriate residual levels of EPA registered disinfecting chemicals. Specific residual levels of EPA registered disinfecting chemicals may be required by the regulatory agency having authority.



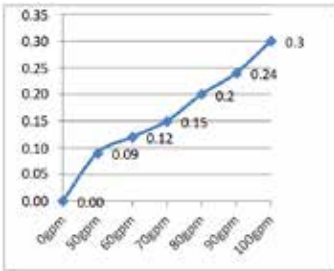
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## Models

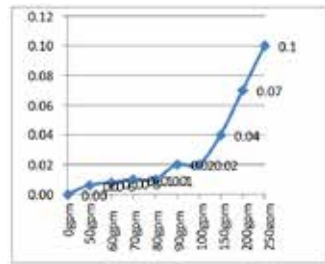
Model #	Rated Pressure (psi)	Max Rated Flow (gpm)	Rated Power (KW)	Number of Bulbs	Volume of Chamber (Gallons)	Length and Diameter of Chamber
HYR75	50	up to 61	120	1	4.85	45.625"L x 6"D
HYR150	50	up to 150	240	2	8.6	47.375"L x 8"D
HYR400	50	up to 350	480	4	12.9	47.4"L x 10.75"D

## Head Loss Data in ft of H<sub>2</sub>O

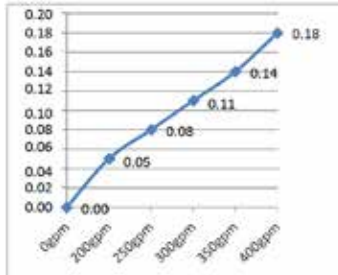
### HYR75



### HYR150



### HYR400



## Lamp Life

Lamp life is rated at 13,000 hours of operation

## Electrical Specifications

Model #	Rated Voltage (AC)	Rated Amps
HYR75	120	1.5
HYR150	120	3
HYR400	120	6



## Sizing Guidelines

HydroRite PVCUV Sterilizers will effectively treat water up to the maximum rated flow for each size unit (END of lamp life). See flow calculator below. UV sizing must comply with local codes. Please contact your local health department for specific requirements or contact your local Hayward representative for assistance.

The chart and temperature compensation formula below are used to determine the maximum system flow rate for satisfactory system performance. Select the chart for your UV model and a flow rate from the chart based on the % Transmittance (%T) of the pool. If you are unsure of the %T, use 95%. The flow rate must then be compensated for temperatures less than 88°F. Determine the average pool temperature and use the formula below to determine the maximum flow rate.

avT = average pool temperature  
 $((100 - (88^\circ - avT)) / 100) \times \text{GPM}$

Example for model HYR75, 95%T, and average pool temperature of 84°:  
 $((100 - (88^\circ - 84^\circ)) / 100) \times 61 \text{ GPM}$   
 $((100 - 4) / 100) \times 61$   
 $.96 / 100 \times 61$   
.96 x 61  
58.56 GPM

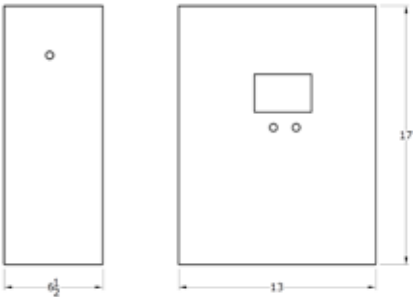
HYR75	
%T	GPM
100	75
99	73
97	67
96	64
95	61
94	60
93	58
92	56
91	54
90	53
85	44
80	37
75	31

HYR150	
%T	GPM
100	154
99	150
97	141
96	137
95	133
94	129
93	125
92	121
91	117
90	109
85	92
80	79
75	67

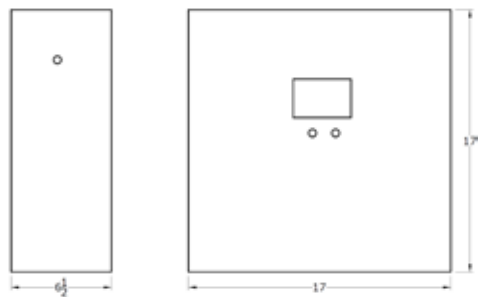
HYR400	
%T	GPM
100	426
99	411
97	381
96	367
95	352
94	337
93	322
92	307
91	293
90	278
85	204
80	164
75	131

## Dimensions

HYR75 & HYR150



HYR400



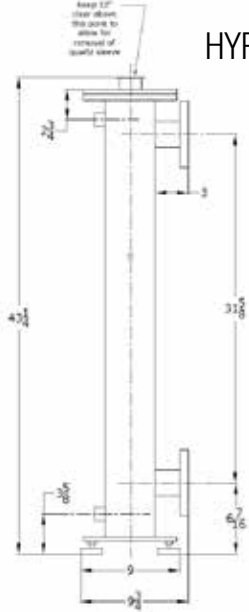


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Flanges Opposed



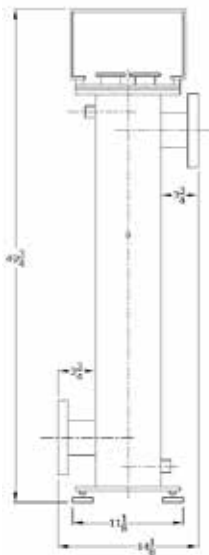
Flanges Same Side



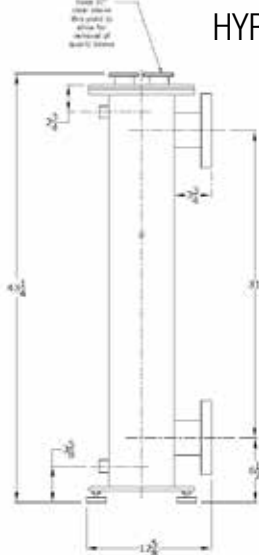
## HYR75



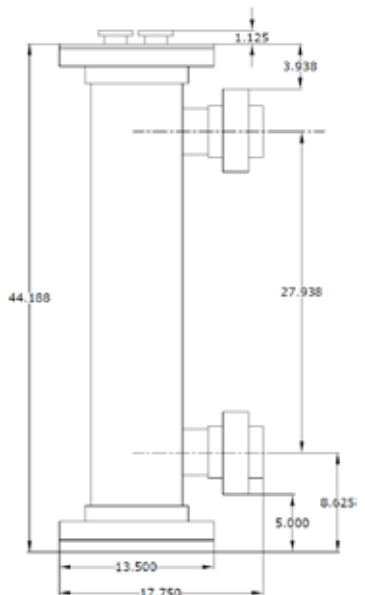
Flanges Opposed



Flanges Same Side

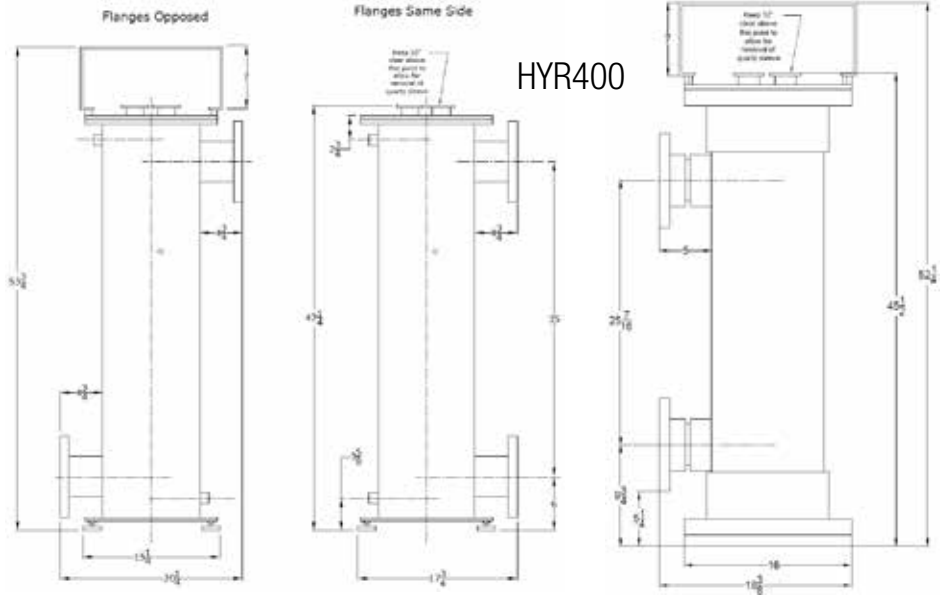


## HYR150



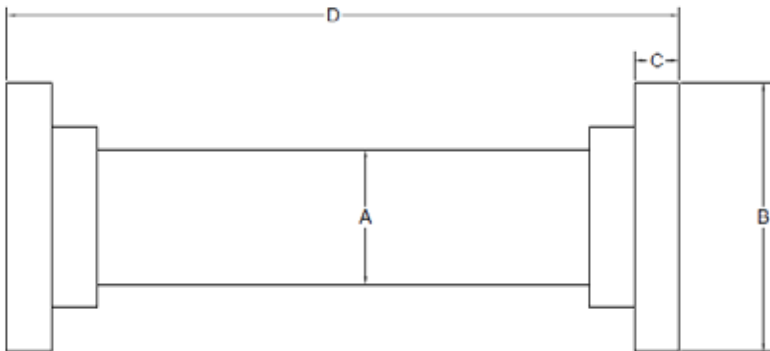


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Strainer Spool Dimensions (Flanged)

Nominal Pipe Size	Pipe OD (A)	Flange OD (B)	Flange Thickness (C)	Overall length (D)
2	2 1/2	6	3/4	15 1/2
3	3 1/2	7 1/2	1	16 1/4
4	4 1/2	9	1	17 1/4
6	6 1/2	11	1 1/4	17 1/4
8	8 1/2	13 1/2	1 3/8	18 1/2
10	10 3/4	15 3/4	1 3/4	18 3/4



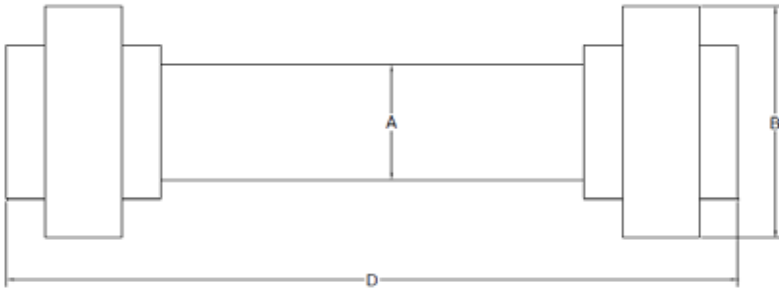




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Strainer Spool Dimensions (Union)

Nominal Pipe Size	Pipe OD (A)	Union OD (B)	Overall length (D)
2	2 1/2	5 1/4	20 1/2
3	3 1/2	7 1/8	21 3/4



## Installation

When installing, operating, and maintaining this equipment, keep safety considerations foremost. Use proper tools, protective clothing, and eye protection when working on or installing the equipment. Follow the instructions in this manual and take any additional safety measures appropriate. Be extremely careful in the presence of hazardous substances. The personnel responsible for installation, operation, and maintenance of this equipment must be fully familiar with the contents of this manual. Any servicing of this equipment must be done with the unit fully off and disconnected from the power source and all pressure bled from the liquid lines.

Almost every pump room encountered is different. It is imperative to have prior knowledge of the facility in which the unit is to be installed and to evaluate what type of tools, wall anchors, etc. will be needed to make the installation as problem free as possible.

### Power Supply Installation

**WARNING** - Never try to support the weight of the power supply using only drywall anchors. The power supply must have a stud for support!

**CAUTION** - The power supply may cause interference with sensitive electronics. Avoid installing the power supply and lamp lead wire near sensitive electronics.

Locate a space on the wall, in the pump room, that will accommodate the dimensions of the power supply. The power supply must mount within 5 feet of the UV chamber to ensure that the cables can easily reach the chamber and within 3 feet of a 120 volt, 15- amp wall outlet protected by a ground fault circuit interrupter. On a drywall installation, locate studs to hold the weight of the power supply. Use concrete anchors for installations into concrete walls. Install in an easy to access location. Some installations may require a mounting stand be fabricated based on chamber access.



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## UV Chamber Installation

Place the UV Chamber on a level surface within 5 feet of the power supply. The chamber may be installed in a vertical or horizontal position. Ensure that the unit is accessible. U shaped horizontal installations require that the water is plumbed going down into the inlet of the chamber and coming out in the up direction from the outlet of the chamber. Z shaped horizontal installations should be plumbed so the water is flowing up in to the chamber and up out of the chamber. Vertical installations require that the water is plumbed going into the inlet of the chamber (bottom) and out of the outlet of the chamber (top). Secure the chamber with suitable hardware.



## Quartz Sleeve Installation

**CAUTION** - Lamps and quartz sleeves are made of glass and are extremely delicate. Take care when handling or replacing these components. Wear cotton gloves when handling lamps. Hold lamps by the ends only. Never touch the glass with bare hands. Wipe any fingerprints from lamps with alcohol.

**WARNING** - Quartz sleeves are shipped with small rubber stops inside the bottom of the sleeve. This rubber stop must remain in place to prevent damage from lamp installation.

Place a gasket on the quartz sleeve quick disconnect flange. Carefully lower the quartz sleeve assembly into the chamber. Quartz sleeves must be carefully lined up with the spring or damage to the sleeve may occur. When the quartz sleeve is properly located in the spring assembly the quick disconnect quartz sleeve assembly will rest about  $\frac{1}{4}$ " to  $\frac{1}{2}$ " above the 2" gasket. Gently press the quick disconnect quartz sleeve assembly into place and install the quick disconnect clamp to secure the sleeve in place.

## Lamp Installation

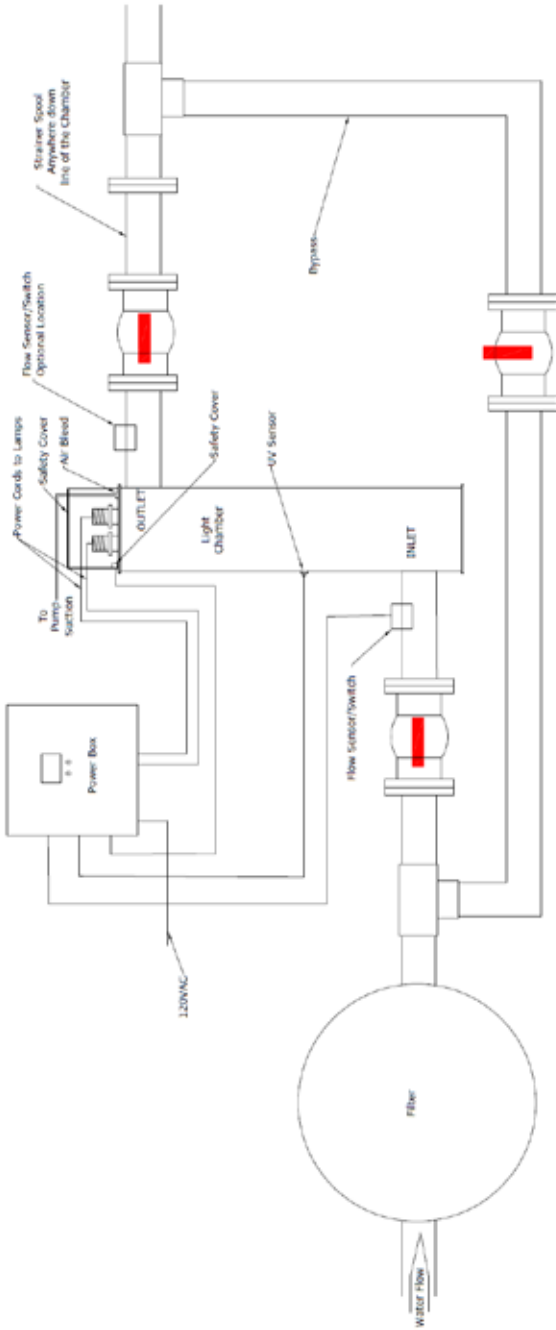
**CAUTION** - The wiring connector for the lamp must be installed on the lamp before the lamp is lowered into the quartz sleeve or damage to the lamp or quartz sleeve may occur.

Place the connector onto the lamp and lower the lamp all the way to the bottom of the quartz sleeve. Screw the viewing cap onto the quick disconnect quartz sleeve assembly. Push the lamp lead wire through the viewing cap until the lamp is against the rubber cushion at the bottom of the quartz sleeve and tighten the liquid tight gland.



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## UV system installation diagram



The entire water volume of the circulation system should pass through the UV chamber. Plumb the inlet of the UV chamber as close to the outlet of the pool filter as possible. Plumb a bypass around the UV chamber to facilitate service. Use valves to isolate the chamber from the circulation system.



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## Plumbing The Strainer (Optional)

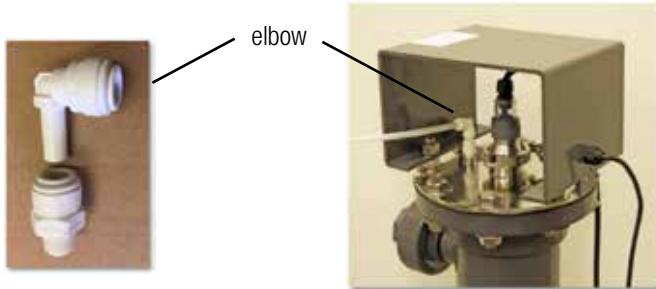
The strainer is installed on outlet side of the UV chamber plumbing. The strainer can be installed anywhere in the return line plumbing that is downstream of the UV chamber outlet.

## Plumbing The Flow Switch

Tap the ½ inch NPT flow switch into the Chamber inlet or outlet. The flow switch must be installed within the isolation valves. Connect the flow switch wire to the connection on the side of the power supply marked Flow.

## Plumbing The Air Bleed On Vertical Mount Chambers

1. Insert 3/8" elbow into the 3/8" female adapter (shown below) on top of the UV chamber.



2. Tap 3/8" NPT valve into the pump suction plumbing.
3. Connect the two points with 3/8" tubing.
4. Turn on the pool pump then open the 3/8" valve.

3/8" NPT  
Valve



## System Wiring

All systems must be wired so that when the pool circulation pump is off the power to the HydroRite PVCUV is off with the exception of spray pads that may have bypass flow through the chamber when the main pumps are off.

**120-VOLT SYSTEMS:** These units are cord connected at the factory with two standard plugs for a 15-amp wall outlet. Connect both power cords to a 120V electrical outlet protected by a ground fault circuit interrupter.



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## Safety Cover Wiring

Place the safety cover on top of the UV chamber and attach with the supplied nuts. Be sure the micro-switch is depressed when the cover is installed. Route the safety cover wire through the open liquid tight gland at the bottom of the power supply.

## Uv Sensor Installation

Install the UV sensor o-ring, quartz window, and UV sensor into the sensor boss. Hand tighten the UV sensor nut.

# Operation

## Start-Up Procedures

Open the chamber isolation valves and close any bypass valves. Allow the chamber to fill with water. Turn the system on with the switch located on the power supply.

Operate the system for 10 minutes to allow the lamps to warm up to full power. After 10 minutes the UV monitor will read 60mj/cm<sup>2</sup> and the green led will be illuminated.

## Uv Meter Operation

The UV meter displays the UV dose in mj/cm<sup>2</sup>. An adequate dose is 40mj/cm<sup>2</sup> to 60mj/cm<sup>2</sup>. When the display is initially powered on, a mj dose will appear with both the green and yellow LED off. After 10 minutes of operation the display will show 60mj/cm<sup>2</sup> and the green LED will be illuminated. The display will automatically calibrate with no input required. When the UV dose falls to 39mj/cm<sup>2</sup> the green LED will go out and the yellow LED will illuminate. This indicates the need for quartz sleeve and sensor window service or lamp replacement. If the yellow LED is ignored and dose drops to 30mj/cm<sup>2</sup>, the yellow LED will begin to flash. This indicates that service is critical.

# Maintenance

## Daily Check

Check the UV meter and LED lights on the power supply daily. Under normal operating conditions, the UV meter will indicate a value over 40mJ/cm<sup>2</sup> and the green LED will be illuminated. If the UV meter falls below 40mJ/cm<sup>2</sup>, the green LED will go out and the yellow LED will illuminate. A meter display of less than 40mJ/cm<sup>2</sup> with a yellow LED is an indication that maintenance or repairs are needed. The most common cause is dirty quartz sleeves and sensor window.

## Manually Cleaning Quartz Sleeve and UV Sensor Window (Non-NSF Models)

**CAUTION** - Lamps and quartz sleeves are made of glass and are extremely delicate. Take care when handling or replacing these components. Wear cotton gloves when handling lamps. Hold lamps by the ends only. Never touch the glass with bare hands. Wipe any fingerprints from lamps with alcohol.

QUARTZ SLEEVES ARE SHIPPED WITH SMALL RUBBER STOPS AT THE BOTTOM OF THE SLEEVE. THIS RUBBER STOP MUST REMAIN IN PLACE TO PREVENT DAMAGE FROM LAMP INSTALLATION.

Unplug the unit from the power source to prevent the risk of electric shock or system damage. Isolate the chamber from the pool circulation system by closing the inlet and outlet valves and opening the bypass valve. Drain the chamber. Loosen the liquid tight gland and remove the viewing cap. Lift the



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lamp out of the quartz sleeve without disconnecting it from the wiring harness. Once the lamp is completely free of the quartz sleeve it can be safely disconnected from the wiring harness. Remove the quick disconnect clamp and remove the sleeve from the chamber.

**NOTE:** If the power supply is within 5 feet of the UV chamber, the quartz sleeve may be removed without disconnecting or removing the lamp.

**WARNING** - Read all cautions and directions provided with the muriatic acid used. Always add acid to water. Use only with adequate ventilation. If strong odor is noticed, STOP, ventilation is inadequate. Leave area immediately. If the work area is not well ventilated you **MUST** use a properly fitted and maintained NIOSH approved respirator for acid fumes.

Clean the quartz sleeve by wiping with a clean cotton cloth and a standard glass cleaner. Sleeves with calcium accumulation will require cleaning with a 5:1 water and muriatic acid solution.

Check the gasket on the quartz sleeve quick disconnect flange. Carefully lower the quartz sleeve assembly into the chamber. Quartz sleeves must be carefully lined up with the spring or damage to the sleeve may occur. Gently press the quartz sleeve into place and install the quick disconnect clamp to secure the sleeve in place.

Remove the UV sensor from the chamber and carefully remove the quartz window. Clean the quartz window by wiping with a clean cotton cloth and standard glass cleaner. Windows with calcium accumulation will require cleaning with a 5:1 water and muriatic acid solution. Reinstall the window and sensor. On models without the quartz window, clean the quartz on the face of the monitor.

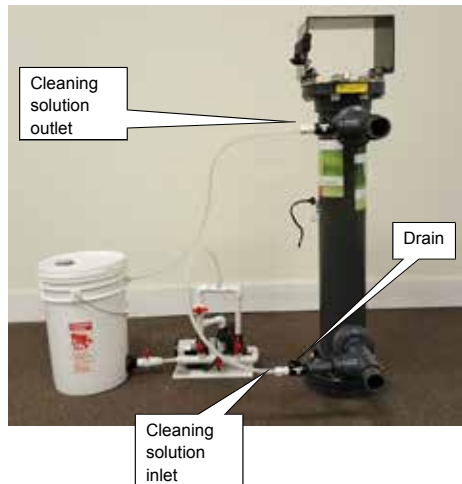
## Chemically Cleaning Quartz Sleeve and UV Monitor Window (NSF Models)

Unplug the unit from the power source to prevent the risk of electric shock or system damage. Isolate the chamber from the pool circulation system by opening the bypass valve and closing the inlet and outlet valves. Drain the chamber.

Connect a HydroRite PVCUV Acid Washer or other suitable cleaning setup to the chamber as shown. Water and muriatic acid are mixed in the cleaning solution tank at a ratio of 5:1. Five parts water to one part muriatic acid. Flush the chamber for 2 to 5 minutes with cleaning solution. Drain the cleaning solution from the chamber. When using the HydroRite PVCUV Acid Washer, the solution is pumped back into the cleaning solution tank for reuse. Remove the cleaning solution hoses from the chamber and close the cleaning solution valves. Open the inlet and out valves to restore pool circulation to the chamber.

## Lamp Replacement

Lamps are designed to provide a useful service life of 13,000 hours. After that time, the lamps will need replacing.





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**CAUTION** - Lamps and quartz sleeves are made of glass and are extremely delicate. Care should be taken when handling or replacing these components. Wear cotton gloves when handling lamps. Hold lamps by the ends only. Never touch the glass with bare hands. Wipe any fingerprints from lamps with alcohol.

Unplug the unit from the power source to prevent the risk of electric shock or system damage. Loosen the liquid tight gland and remove the viewing cap. Lift the lamp out of the quartz sleeve without disconnecting it from the wiring harness. Once the lamp is completely free of the quartz sleeve it can be safely disconnected from the wiring harness.

**CAUTION** - the wiring connector for the lamp must be installed on the lamp before the lamp is lowered into the quartz sleeve or damage to the lamp and sleeve may occur.

Place the connector onto the lamp and lower the lamp all the way to the bottom of the quartz sleeve. Screw the viewing cap onto the quick disconnect quartz sleeve assembly and tighten the liquid tight gland.

## Recommended Broken Lamp Handling Practices

Guidance on proper methods of handling broken fluorescent lamps is available from the US EPA and from many state agencies and local health and environmental authorities. The EPA guidelines can be found at <http://www.epa.gov/mercury/spills/index.htm>.

## Replacement Parts



FSKHARWIL2MSCNOT



LA120W185SP



KITPSLW8.25LGSP



FSKHARWIL2MSC



WH7-120-H



S-MCLD



KITUVLSPVC



QDCQSSTDA

Vendor Part #	Part #	Description	Carton Qty	Weight	Crate Dimensions
S-MCLD	HYXUVDSPCK	Replacement UV Display	1	2	8x8x4
WH7-120-H	HYXUVBALCK	Replacement UV Ballast	1	5	14x8x5
QDCQSSTDA	HYXUVQTZCK	Replacement UV Quartz Sleeve Kit - Complete	1	4	8x8x40
LA120W185SP	HYXUVLAPCK	Replacement UV Lamp	1	3	8x8x40
KITUVLSPVC	HYXUVSECK	Replacement UV Sensor Kit - Complete	1	2	8x8x4
KITPSLW8.25LGSP	HYXUVEXTCK	Replacement UV Lead Wire	1	2	8x8x4
FSKHARWIL2MSCNOT	HYXUVFL240CK	Replacement UV Flow Switch for Model 240PVC/480PVC	1	2	8x8x4
FSKHARWIL2MSC	HCXUVFL120CK	Replacement UV Flow Switch for Model 120PVC	1	2	8x8x4

# HAYWARD® Pool Products Limited Warranty

To original purchasers of this equipment, Hayward Industries, Inc. warrants its HydroRite PVCUV to be free from defects in materials and workmanship for a period of Three (3) years from the date of purchase with the following exception. The UV lamps, UV sensor, Quartz sleeves and stainless steel sleeve carry a One (1) year warranty from the date of purchase.

Part	Warranty Period	Coverage
Controller	1 Years	Parts only
Vessel	1 years	Parts only
UV Lamp	6 Months	Parts only
UV Sensor	1 Year	Parts only
Quartz Sleeve	6 Months	Parts only
Stainless Steel Sleeve	6 Months	Parts only

The limited warranty excludes damage from freezing, negligence, improper installation, improper use or care or any Acts of God. Parts that fail or become defective during the warranty period shall be repaired or replaced, at our option, within 90 days of the receipt of defective product, barring unforeseen delays, without charge.

Proof of purchase is required for warranty service. In the event proof of purchase is not available, the manufacturing date of the product will be the sole determination of the purchase date.

To obtain warranty service, please contact the place of purchase or the nearest Hayward Authorized Service Center. For assistance on your nearest Hayward Authorized Service Center please visit us at [www.haywardpool.com](http://www.haywardpool.com).

Hayward shall not be responsible for cartage, removal, repair or installation labor or any other such costs incurred in obtaining warranty replacements or repair.

The Hayward Pool products warranty does not apply to components manufactured by others. For such products, the warranty established by the respective manufacturer will apply.

The express limited warranty above constitutes the entire warranty of Hayward Pool Products with respect to its pool products and is in lieu of all other warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose. In no event shall Hayward Pool products be responsible for any consequential, special or incidental damages of any nature.

Some states do not allow a limitation on how long an implied warranty lasts, or the exclusion of incidental or consequential damages, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

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\*Supersedes all previous publications.



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