Installation, Operation and Maintenance Manual

Lync WQ-AS

Complete Water Quality Solutions

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1. Introduction

1.1. System Overview

Lync WQ-AS is a complete, fully engineered multi-barrier, packaged system that optimizes your system's water quality by integrating scale prevention, sediment filtration and UV disinfection. Lync WQ-AS is factory pre-assembled to minimize installation time and labor. Standard components of this system are:

- Lync AquaSolve scale prevention system (LM8414TM-COM) includes mineral tank, scale prevention media, internal distributor system, stainless steel head component. AquaSolve provides protection from scale formation on internal plumbing surfaces. AquaSolve® prevents scale by transforming the normal dissolved hardness minerals into undissolved crystal microparticles. These crystals stay suspended in the water and have a greatly reduced ability to react and attach to surfaces like dissolved hardness does.

The LM8414TM-COM is certified through WQA against NSF/ANSI/CAN Standard 61, CSAB483.1, and to NSF/ANSI 372 for Lead Free compliance.

- Lync cartridge filtration system includes filter housing (LCH-150) and a replaceable filter cartridge (LBC-150-P5). Lync filter cartridge is a 5 micron filter with a housing that is made of rugged, glass-reinforced polypropylene, so it will not chip, rust or dent. Because all wetted surfaces are non-metallic, they are ideal when chemical compatibility is an issue and for sea water applications.

LCH-150 is certified through NSF to NSF/ANSI/CAN 61.

- Lync UV Disinfection System (LD050AGAA) includes reactor chamber(s), UV lamp(s), quartz sleeve(s), and system controller. Disinfection of water with Lync UV is a simple, rapid physical process. When contaminated water is exposed to Lync UV 254 nanometer UV light, the UV light penetrates the cell walls of microorganisms and disrupts their genetic deoxyribonucleic acid (DNA) material. This quickly inactivates microorganisms by destroying their ability to replicate and infect

Lync UV (LD050AGAA) is certified by the Water Quality Association (WQA) to NSF/ANSI Standard 372 for lead free compliance.

NOTES:

Lync UV complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Lync UV complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Any changes or modifications of this product not approved by the manufacturer could void the user's authority to operate the equipment.

Lync UV complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotopically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Lync UV controller is certified by the Federal Communications Commission (FCC) listed under identification number

FCC ID: 2AFJT-SMARTSTREAM and Industry Canada (IC) listed under IC: 20623-SMARTSTREAM.

WARNINGS!

Lync WQ-UV contains a UV-C emitter (UV lamp). Unintended use of the appliance or damage to the housing may result in the escape of dangerous UV-C radiation. UV-C radiation may, even in little doses, cause harm to the eyes and skin. Appliances that are obviously damaged must not be operated. Do not operate the UV-C emitter when it is removed from the appliance enclosure. The appliance must be disconnected from the power supply before replacing the UV-C emitter. DO NOT look directly at the UV-C emitter while it is ON. Permanent serious eye injury could occur.

This appliance can be used by people aged from 18 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children.

Lync UV systems are engineered with the highest quality components. If at any time a component needs to be replaced, use only parts recommended and supplied by Lync.

DO NOT add components to or remove components from this system. The UV lamp is rated for 9000 hours under normal operating conditions and should be replaced annually to keep the UV intensity at the highest possible output. Quartz sleeves should be cleaned as needed or replaced as needed to guarantee the highest possible UV transmittance into the water. Use only Lync supplied UV lamps and quartz sleeves. Failure to do so may result in system failure and will void all warranty.

DO NOT use this system in a manner that it is not intended for. This purifier is only for use in water applications where the feed water, installation environment and installation method meets the requirements within this manual. The system must be properly sized.

DO NOT exceed the rated flow rate capacity of the system. Flow controllers are available from Lync to ensure system's rated flow is not exceeded. Follow all product safety labeling. DO NOT let the system freeze. System damage may result. Install the system on a flat, and level surface. The quality of the water to be treated must meet the feed water guidelines within this manual. Failure to ensure proper pretreatment will result in inadequate disinfection

1.2. Specifications

WQ-AS Skid	WQAS-050-D	WQAS-100-D
Peak flow rate	50 gpm	100 gpm
Number of Lync UV systems (LD050AGAA)	1	2
Number of Lync Cartridge Filter systems	1	
Number of AquaSolve systems	1	2
Inlet/Outlet	2" SCH80 PVC Flange	
Operating pressure	28 psi to 125 psi	
Max ambient temperature/humidity	122 ^{o}F / 95 % relative humidity (non-condensing)	
Operating temperature	40°F - 100°F (5°C - 38°C)	
Max hardness	30 Grains (513 mg/L as $CaCO_3$)	
Max free chlorine	2 ppm	
Max iron	0.3 ppm	
Max manganese	0.05 ppm	
Max copper	1.3 ppm	
Max silica	20 ppm	
Max TDS	1500 ppm	
pH	6.5 – 8.5	
Total phosphate	3 ppm or less	
Oil and H_2S	Not allowed	
Dimension W x D x H (inches)	78 x 24 x 82	132 x 24 x 82
Shipping weight (lbs)	700	1100
Lync UV		
Flow rate per UV system @ 30mJ (95%UVT @EOL)	50 gpm	
UV Transmittance	95 % UVT	
Standard NPT inlet / outlet ports	1.5"NPT-M / 1"NPT-F Combo Ports	
Chamber material	316L SS	
Controller mounting	On chamber bracket	
Input voltage	120 to 240VAC, 50/60 Hz	
Max nominal input power for each UV system (Watts)	118	

Max nominal electrical power for each lamp (Watts)	112
Lamp technology	Quartz glass low pressure lamp / ozone free / true pre-heat starting / glow-cap indicator
Wireless lamp key	Standard
Lamp dimming / Flow switch	Standard
System display type	Color Touch Screen with multiple languages, intuitive screen navigation, detailed system status messages, maintenance/diagnostic, and dealer programmable with website/contact information/QR codes
UV Sensor	Yes
Lamp life monitor	Display on graphic touch screen, auto-reset with new lamp
Visual alarm	Animated icons and text messages on graphic display
Audible alarm / audible alarm mute	Yes / yes
Alarm relay / Solenoid contacts	Yes / 24V 5 Amp Maximum
Alarm relay manual over-ride	Yes
Lync Cartridge Filter	
Lync Cartridge Filter size	5 micron
Material, filter body & cartridge end caps	Glass reinforced PP
Brass reinforced gauge port	1⁄4" FNPT
Material, swing bolts	304SS
O-ring	EPDM
Lid closure	Swing bolt
Pipe fittings (One inlet and two outlets) PVC	2" SLIP Female PVC
Drain	1⁄2" FNPS with drain plug
Cartridge change-out, sediment	15 psi differential (max.)
AquaSolve	
Flow rate per AquaSolve system	50 gpm
Standard NPT inlet / outlet ports	2" NPT-F / 2"NPT-F

WARNINGS!

- Not for use on closed loop systems.

- Do not let the system freeze. Damage to the tank may result.

- Place the WQAS skid on level surface. Because the system operates in an up-flow, fluidized bed mode, having a level surface is more important than with a softener or media filter.

- A bypass valve should be installed before and after the skid to facilitate installation and service.

- Observe all local plumbing and building codes when installing the system.

- Do not apply any other anti-scalants before or after WQAS skid.

- The addition of soaps, chemicals, or cleaners, before or after AquaSolve treatment, may reverse its anti-scale treatment effects and/or create water with a heavy residue or spotting potential. Any adverse conditions caused by the addition of soaps, chemicals, or cleaners are the sole responsibility of the end user.

- AquaSolve is not a water softener and does not soften the water. Water treatment chemistry requires to be compatible with water quality requirements outlined in the specifications table.

Spotting may occur on external plumbing surfaces. AquaSolve media systems perform best in single pass potable water applications with NO additional chemical additives. Depending on hardness, soft scale spotting may occur. Soft scale spots in most cases can be easily wiped down with a damp cloth and will not form hard scale deposits. A Point of Use (POU) Water Softener should be used on mandatory spot-free applications (e.g. glass stemware, dishware).

Water known to have heavy loads of dirt and debris may require pre-filtration prior to WQAS skid. AquaSolve technology is effective at controlling lime-scale formation inside the plumbing system at influent hardness levels up to 75 grains per gallon (1282 mg/l) of calcium carbonate. Due to variances in water chemistry, 30 grains per gallon is a recommended hardness maximum due to potential aesthetic issues related to soft scale residue formation outside of the plumbing system. Testing should be performed to determine proper application where hardness levels exceed 30 grains per gallon.

Just as with conventional water softening media, AquaSolve media needs to be protected from excess levels of certain metals that can easily coat the active surface, reducing its effectiveness over time. Public water supplies rarely, if ever, present a problem, but if the water supply is from a private well, confirm that the levels of iron (Fe) and manganese (Mn) are less than 0.3 mg/L and 0.05 mg/L, respectively.

Pursuant to the EPA drinking water standards, the copper concentration permitted is up to 1.3 ppm. Typically originating from new copper plumbing, high levels of copper can foul AquaSolve media. For applications with copper concentration greater than 1.3 ppm, please consult Lync Technical Service. To further minimize any problem with excess copper, avoid applying excessive flux on the inner surfaces of the pipe and use a low-corrosivity water soluble flux listed under the ASTM B813 standard.

AquaSolve media does not reduce silica scaling. While silica tends to have a less significant effect on scale formation than other minerals, it can act as a binder that makes water spots and scale residue outside the plumbing system difficult to remove. This 20 ppm limitation is for aesthetic purposes. All other contaminants must meet the requirements of the USEPA Safe Drinking Water Act. Specific Mineral and Metal MCL's, identified in Lync published Feed Water Chemistry Requirements, supersedes the USEPA SDWA.
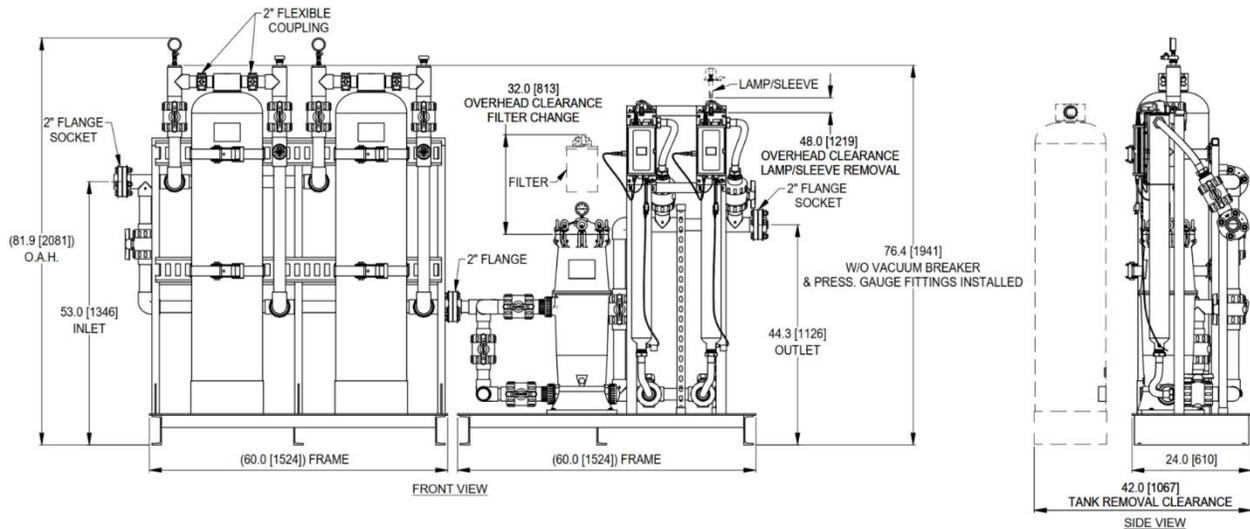
Exceeding maximum flow can reduce effectiveness and void warranty. Pressure drop at peak flow rate is less than 28 psi (pressure drop reading taken with inlet and outlet gauges installed at a common elevation and 80 degree feed water).

2. Lync WQ-AS Components

2.1. WQ-AS Skid Components
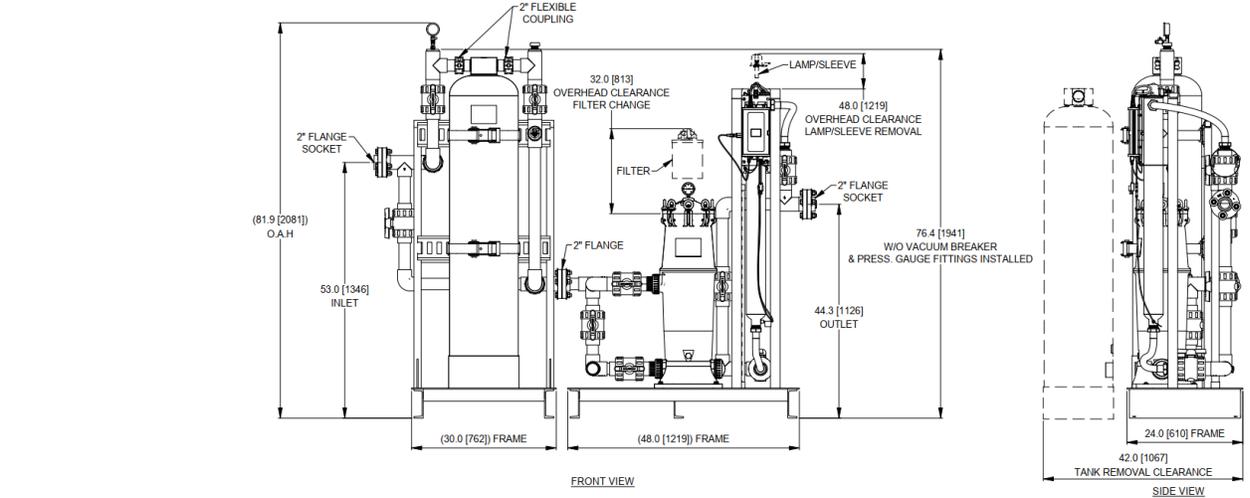
WQAS-050-D

WQAS-100-D

Figure 2-1 General WQ-AS Component Identification

3. Installation and Operation

3.1. Pre-Installation Considerations

Unpack the crates and make sure all components are accounted for according to the table below for each specific model. If any components are missing or damaged contact your Lync representative. If they cannot be reached contact Lync customer service at 1-800-433-5654.

Component	Shipped Loose	Pre-installed	Quantity WQAS-050-D	Quantity WQAS-100-D
Lync Cartridge Filter Housing (LCH-150)		X	1	1
Lync UV System (LD050AGAA)		X	1	2
Lync AquaSolve System (LM8414TM-COM)		X	1	2
Filter Cartridge (LCB-150-P5)		X	1	1
Piping Headers		X	1	1
UV Sensor		X	1	2
Extra Filter Cartridge (LCB-150-P5)	X		1	1
UV Quartz Sleeve	X		1	2
UV Lamp	X		1	2
AquaSolve Inlet Sample Port Assembly	X		1	2
Vacuum Relief Valve	X		1	2
2" Gasket Kit	X		1	1
Quartz Sleeve O-Ring	X		1	2

3.2. Installation Location

Lync WQ-AS is a complete system with factory pre-assembled plumbing and wiring to minimize installation time and labor. Components are fastened onto a steel skid for safe and easy transportation and installation.

1. Confirm that the system being installed matches the flow rate for the application.

2. The WQ-AS system should be installed as close as possible to the treated water's point of use.

3. Position the system in a suitable location with 48 inches of space allowance around the system to allow for the maintenance. Allow 48 inches of overhead clearance for the removal of lamp and quartz sleeve.

4. Responsibility for meeting local electrical and plumbing codes lies with the owner/operator.

5. Install indoors in an area protected from freezing.

NOTES:
- DO NOT install the system near any source of heat. Also, DO NOT install the system near any device or break out area that would be adversely effected by water.
- DO NOT install this system higher in elevation than 10,000 feet above sea level.

- DO NOT install where system is exposed to harsh chemicals or may be subjected to being struck by moving equipment, carts, mops or any other item that may cause damage.
- DO NOT install the system outdoors. Keep system away from moisture, rain, and direct sunlight. Ambient air temperature must remain below 122°F and relative humidity must remain below 95%.
- The system MUST be installed in accordance with all applicable national, state and local codes.
- Additional pretreatment may be necessary so that the feedwater conforms to the Feed Water Specifications.
- The skid can be bolted down to the floor, if required.

3.3. Plumbing and UV Connections

It is the responsibility of the end user to ensure that the installation is done according to local codes and regulations. 2" slip-on PVC flanges in inlet and outlet provides the option for both flange and slip connections.

1. Turn off water heater(s).

2. Turn off the main water supply valve to the pipe the system will be installed in.

3. Relieve pressure within plumbing system by opening then closing both the hot and cold sides of a faucet until water ceases to dispense from faucet.

4. If water heater(s) is equipped with isolation valves, isolate the water heater(s) by closing inlet and outlet valves.

5. If no isolation valve exists at system installation location, it is recommended to install an isolation valve located within 10 feet of the system.

6. After finalizing the installation location, place the AquaSolve skid in installation location and connect the feed water line to the inlet side of the AquaSolve skid.

7. Place the filter and UV skid next to AquaSolve skid. Use the 2" gasket kit to connect the outlet flange of AquaSolve skid to inlet flange of filter and UV skid.

8. Connect the outlet of filter and UV skid to treated water line plumbing.

WARNINGS!
Use gloves for quartz sleeve and lamp handling and installation. DO NOT touch the lamp and quartz sleeve with bare hands. In cases that the lamp and sleeve are touched with bare hands, use alcohol to clean them prior to installation.

9. Once the skids are installed and there will be no relocation, fully insert the quartz sleeve into the reactor chamber of Lync UV system and install the O-ring over the quartz sleeve. Press the O-ring down over the quartz sleeve until it is seated in the bevel of the stainless steel reactor chamber's threaded port.

10. Install the quartz sleeve O-ring onto the visible end of the quartz sleeve. Screw the quartz sleeve nut onto the quartz sleeve port thread and tighten hand tight.

11. Insert the UV lamp into the quartz sleeve. Gently press down on the glow cap and rotate it clockwise until it locks in place on the mounting bracket.

12. Connect the lamp lead wire to the lamp.

13. Use Teflon tape and install the AquaSolve inlet sample port assembly on the inlet side of the AquaSolve tank (see Figure 3-1).

14. Use Teflon tape and install AquaSolve vacuum relief valve on the outlet side of the AquaSolve tank (see Figure 3-1).
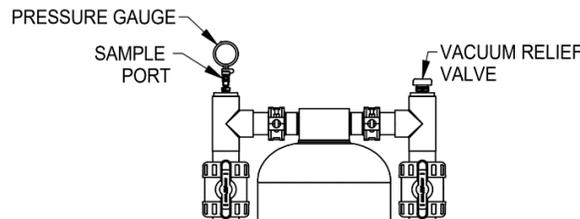
Figure 3-1 WQAS AquaSolve Header Connections

NOTES:

- The Lync Cartridge Filter is inspected prior to shipment to assure it is free from manufacturing defects. Before installation, however, please check the lid's O ring to ensure it is in place.
- If water hammer is evident, install water hammer arrestors before the system.

3.4. Electrical Connections

It is the responsibility of the end user to ensure that the installation is done according to local codes and regulations. Plug in the power cord(s) into an appropriate outlet (refer to specifications table) that is installed and grounded in accordance with all local codes and ordinances.

NOTE: The system MUST be plugged into an uninterrupted power supply that matches the rated power requirement of the system. In European installations, the appliance is to be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30 milliamps.

WARNINGS!

This appliance must be grounded. In the event of a malfunction or breakdown, grounding will reduce the risk of electric shock by providing a path of least resistance for electric current. This appliance is equipped with a cord having an appliance-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is installed and grounded in accordance with all local codes and ordinances.

Improper connection of the appliance-grounding conductor can result in a risk of electric shock. Check with a qualified electrician or service representative if you are in doubt whether the appliance is properly grounded. Do not modify the plug provided with the appliance; if it will not fit the outlet, have a proper outlet installed by a qualified technician.

3.5. Startup

Once the plumbing and electrical connection procedures are completed, the AquaSolve tank(s) needs to be filled with water. Follow the steps below to fill up the tanks:

- Verify that the UV unit(s) is unplugged

- Verify that the inlet valve to Lync Cartridge Filter is closed

- Verify that the inlet valve and outlet valves of the AquaSolve tank(s) are open

- Connect a hose to the hose bibb(s) (outlet sampling valve) after the outlet valve of the AquaSolve tanks

- Run the hose(s) to a drain and open the hose bibb(s)

- Slowly/partially open the supply water valve to the skid and allow the AquaSolve tank(s) to slowly fill with water

- When a steady stream of water appears at the drain, close the supply valve and hose bibb(s)

Once the fill-up procedure of the AquaSolve tank(s) is complete, before the startup, the system needs to be inspected to be free of leak. After it is verified that that there is no leak, follow the steps below to complete the startup:

- Verify that the outlet isolation valve after the skid and the inlet and outlet valves of the UV system(s) are open
- Slowly/partially open the supply water valve to the skid
- Slowly open the inlet valve to the Lync Cartridge Filter and allow the water to pass through Lync Cartridge Filter, and Lync UV
- Check the entire system for leaks and repair as needed
- If leaks occur at cartridge filter, close the inlet isolation valve to the filter, release pressure by pressing pressure release button, remove lid and check the O-ring to be sure it is properly seated.
- Plug in the power cord(s) into an appropriate outlet (refer to specifications table) to start the UV disinfection

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NOTES:
- DO NOT allow this system to remain ON without water in it for extended periods of time.
- DO NOT allow the system to freeze.
- Do not operate filter above 125psi (8.8 bar). In installations where pressure is above 100psi (6.9 bar), install a pressure release valve to release pressure at 125psi (8.8 bar) or less.
- A 1⁄4" FNPT port and pressure gauge has been installed in the filter's lid to indicate working pressure . A second gauge is installed downstream of the filter in the pipe line to indicate pressure differential and help determine when cartridge replacement may be necessary.
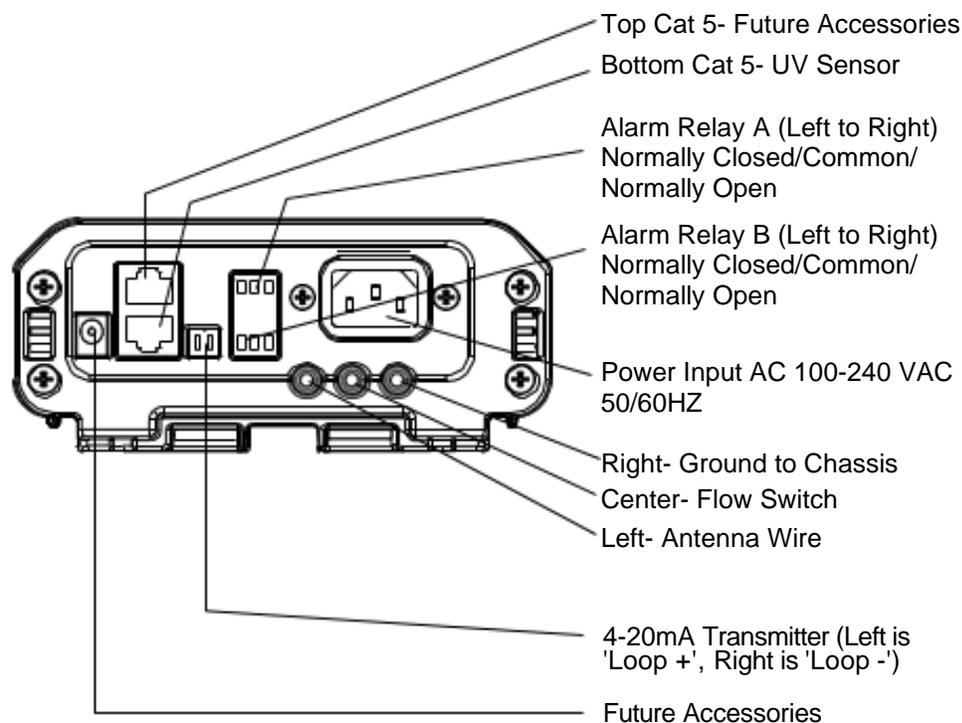

> **WARNING!**
>
> Do not attempt to remove the cartridge filter lid without relieving pressure. To open lid, close shutoff valves before and after filter, press pressure relief button to relieve pressure. Once pressure has been relieved, remove eyebolts and lid. To start up filter, replace lid, tighten eyebolts, and open shutoff valves slowly to check for leaks. If lid O-ring does not seat properly, close shutoff valves, relieve pressure, open lid, apply a small amount of non-petroleum based lubricant to the O-ring to help it seal, reposition O-ring and close lid.

Fill in install date and rebed due date on product label located on the front of each tank as a reminder to replace AquaSolve media every 3 years. The system is now ready for service.

3.6. Lync UV Controller

The Lync UV controller features are:

- Automatic lamp dimming for cooler operation
- Flow switch
- Lamp out audible alarm
- Glow cap lamp indicator
- Graphic touch screen display to show key operational data
- Alarm output for solenoid valve
- UV sensor input
- 4-20 milliamp output for UV Intensity (when UV Sensor is used).

3.6.1. Lync UV Controller Wiring

Top Cat 5- Future Accessories
Bottom Cat 5- UV Sensor
Alarm Relay A (Left to Right) Normally Closed/Common/ Normally Open
Alarm Relay B (Left to Right) Normally Closed/Common/ Normally Open
Power Input AC 100-240 VAC 50/60HZ
Right- Ground to Chassis
Center- Flow Switch
Left- Antenna Wire
4-20mA Transmitter (Left is 'Loop +', Right is 'Loop -')
Future Accessories

Figure 3-2 UV Controller

3.6.2. Overview of Screens

Startup Screen

When the system is first powered up, this screen will appear.
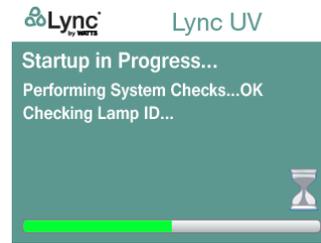
Lamp Warm Up Screen

Once **Startup Screen** system checks are complete, the lamp warm up screen will appear, and automatically complete the lamp warm up sequence.

Home Screen

Upon completion of the **Lamp Warm Up Screen** the **Home Screen** will automatically appear. This is the screen that the system will display during normal operation. From the **Home Screen** four sub-screens can be accessed by touching the icons.

Home Screen - Sub-Screens

1- History Screen

Upon touching [icon], the screen displays the number of days that the system and lamp have been running. It also displays the days remaining for the current lamp.

2- Dealer Contact Screen-Lamp & Sleeve

Upon touching [icon], the screen provides the contact information for the service company that installed the system.

3- Replacement Screen

Upon touching [icon], the screen provides the lamp and sleeve model numbers for the specific system installed along with QR codes for those items.

4- Set Up Screen

Upon touching [gear icon], the screen allows the user to select a language as well as the bypassing and silencing of alarms.

Touching the house icon from any of these sub-screens will return the user to the **Home Screen**.

3.6.3. Normal Operation

System checks are automatically executed by the controller in the **Start Up Screen**, then the system advances to the **Lamp Warm Up Screen**. If an abnormal condition exists, a variety of alarms can be displayed.
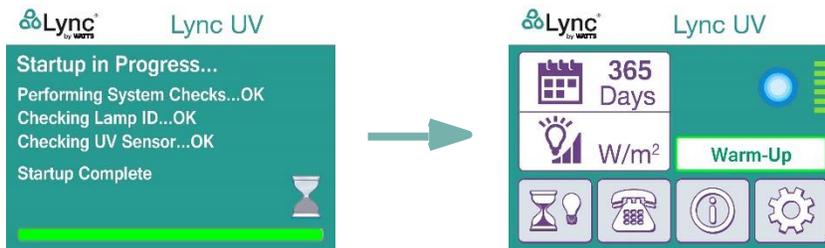
3.6.4. Possible Alarms

Upon start-up of the system, if the UV sensor is not found, the user will be notified via this screen. The system will continue to the **Home Screen** when a UV sensor is not found and display the warning message.

The lamp identifies it's self via radio frequency. If the wrong lamp is used in a system, this message will appear during start up.

Every 15 seconds the screen will change from the Invalid Lamp Type message to the Name of Dealer message. Touch the QR Code to display the correct lamp QR code in full.

Upon touching the QR code, the full QR code is displayed.

The **Home Screen** is the normal operating screen for the system. In this graphic the lamp is operating at full power. If an alarm or warning condition occurs, the system will notify the user from this screen.

This graphic shows the lamp to be in a dimmed condition to reduce water temperature and conserve energy.

If the system detects low UV intensity, a yellow warning will appear. If the UV intensity is too low for safe operation a red warning will appear. In either condition the system should be checked immediately for proper operation.
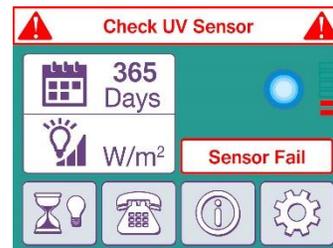
The system will reset an annual calendar upon replacement of a new lamp. When 29 days remain on any given lamp, a yellow warning will appear. Upon zero days remaining on the lamp, a red warning will appear. Replace lamp at this time.

The user will be notified if a lamp failure occurs. Upon a lamp failure condition, the alarm relay will energize to close the outlet solenoid valve (optional) on the system and an audible alarm will sound. Replace lamp if needed

The user will be notified if a UV sensor failure occurs. Ensure proper wiring connections to the controller. Clean or replace sensor if needed.
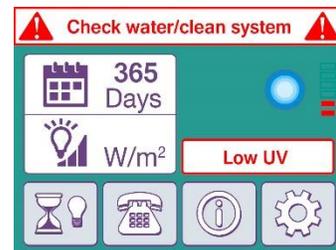
3.6.5. Set Up Screen

The **Set Up Screen** can be accessed by pressing the gear icon on the **Home Screen**. This allows the user to select a language, bypass the alarm relay, and silence audible alarms. Touching the house icon returns the user to the **Home Screen**.

3.6.6. Bypassing Alarms – Alarm Relay Output

Touching the alarm override icon will bring up a confirmation screen. Touch **Yes** to return the alarm relay to the normal operating position and return to the **Set Up Screen**. Touch **No** to return to the set up screen with the alarm relay in the alarmed condition.

The alarm relay output is bypassed.
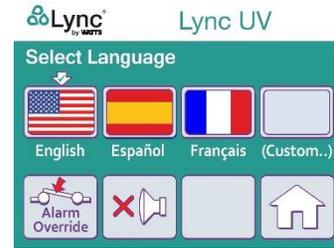
The alarm output relay is *not* bypassed.

3.6.7. Bypassing Alarms – Audible Alarms

Touching the speaker icon will bring up a confirmation screen. Touch **Yes** to mute the audible alarm for 24 hours and return to the **Set Up Screen**. Touch **No** to return to the **Set Up Screen** with the alarm not muted.
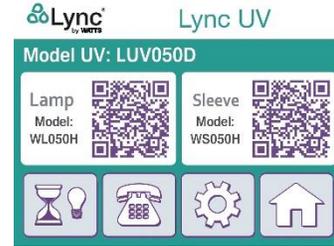
The audible Alarm is muted.

The audible Alarm is *not* muted.

3.6.8. Lamp and Sleeve Replacement Screen

The **Lamp and Sleeve Replacement Screen** can be accessed by touching the information icon at the bottom of the **Home Screen**. This will provide the system model number along with the model number and QR codes for replacement lamps and quartz sleeves.

Touching the QR Code icons on the **Lamp and Sleeve Replacement Screen** will enlarge them.

If there are no buttons touched over a 30 seconds period the system will go back to the **Home Screen**. To return from the full screen QR code, touch the screen.

3.7. Modbus Communication

Remote communication of the Lync UV control system utilizes Modbus over a RS-485 protocol. Connect the RJ45 cable into CAT 5 ethernet connection port at the bottom of Lync UV controller (see section 3.6. to locate the port). In order to connect the control wiring to Building Management System (BAS), use a RJ45 to terminal block adapter and RS-485 wiring.

3.7.1. Serial Communication Settings

The communications settings required by the RS-485 interface are shown in table below.

Baud Rate	19200 Baud
Parity	Even
Data Bits	8
Stop Bits	1

3.7.2. Supported Function Codes

The MODBUS Server in the Lync UV Controller supports the MODBUS function codes and requests shown in table below.

Request	Function Code	
	Base-16	**Base-10**
Read Holding Registers	0x03	3
Read Input Registers	0x04	4
Write Single Register	0x06	6
Report Server ID	0x11	17

3.7.3. Input Registers

The MODBUS input registers of the Lync UV Controller are used to query information about the controller and its installed UV lamp. These registers are listed the table below. The input registers are assigned to one of two logical groupings:

- Lamp Metadata Static (LMS) - This group contains immutable parameters about a lamp that is installed in the system. These values are read directly from the lamp's NFC RFID tag.

- Controller and Lamp Operational Data (CLOD) - This group contains dynamic information about the operation of the Lync UV controller and its installed UV lamp.

Address	Register Name	Parameters Revealed	Group
0x0374	LampType	Lamp Type	LMS
0x0375	LampRatedOpTime	Lamp Rated Operating Time	LMS
0x0470	ControllerOpTimeH	Controller Cumulative Operating Time (high word)	CLOD
0x0471	ControllerOpTimeL	Controller Cumulative Operating Time (low word)	CLOD
0x0472	LampOpTimeH	Cumulative Lamp Operating Time (high word)	CLOD
0x0473	LampOpTimeL	Cumulative Lamp Operating Time (low word)	CLOD
0x0475	LampLifeRem	Lamp Life Remaining	CLOD
0x0476	MeasuredUvLevelH	Measured UV Level Absolute (high word)	CLOD
0x0477	MeasuredUvLevelL	Measured UV Level Absolute (low word)	CLOD
0x0479	ControllerStatusInfo0	Lamp burning Status of Reduced Arc Current (dimming) Lamp Validation Result Lamp Life Status UV Sensor Status UV Level Rating Relay State	CLOD
0x047A	ControllerStatusInfo1	Controller General Operating State Status of User Relay Override Status of User Alarm Mute Warm-up Interval Remaining	CLOD
Legend: LMS: Lamp Metadata Static CLOD: Controller and Lamp Operational Data			

3.7.4. Lamp Type

Input Register Address: 0x0374

This register identifies the specific model of UV lamp that has been attached to the controller.

This value applies to the last lamp for which the lamp tag was successfully read by the system since power was applied. If no tag has been read since power-on, this value reads zero (UNKNOWN).

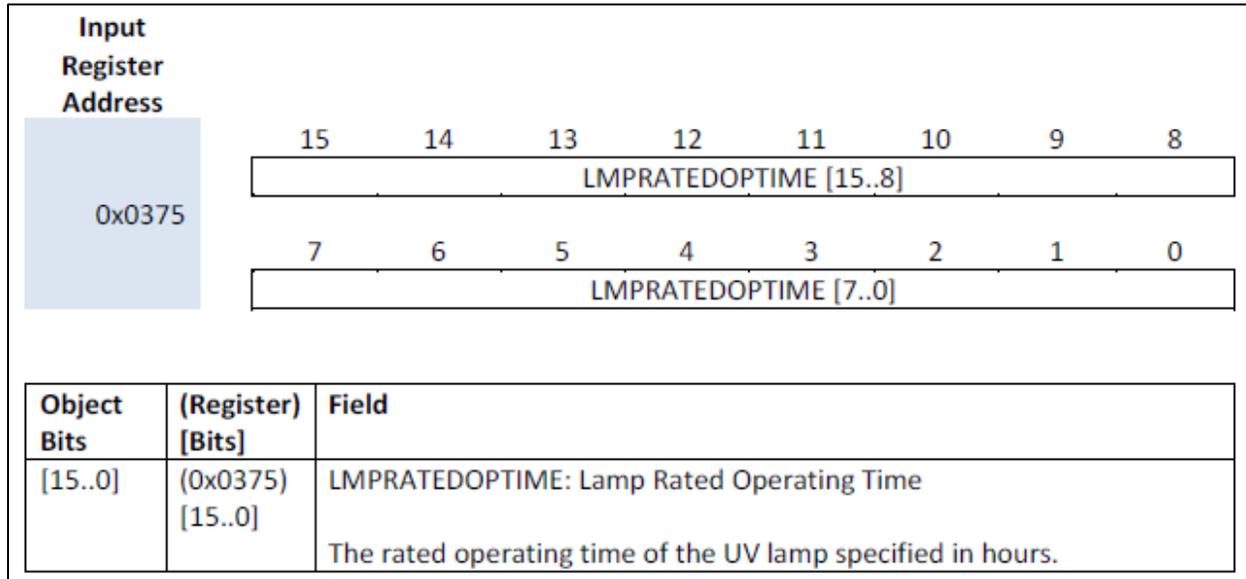| Input Register Address	15	14	13	12	11	10	9	8
0x0374	LAMPTYPE [15..8]							
	7	6	5	4	3	2	1	0
	LAMPTYPE [7..0]							

Object Bits	(Register) [Bits]	Field
[15..0]	(0x0374) [15..0]	LAMPTYPE: Lamp Type Identifies the specific model of UV lamp that has been attached to the controller. See table below.

Value	Lamp Type	Description
0	UNKNOWN	No lamp present or the lamp tag cannot be read.
1	WL012H_045W	LPHO Lamp, 45W
2	WL016H_055W	LPHO Lamp, 55W
3	WL020H_064W	LPHO Lamp, 64W
4	WL025H_064W	LPHO Lamp, 64W
5	WL040H_095W	LPHO Lamp, 95W
6	WL050H_112W	LPHO Lamp, 112W
7	WL001B_010W	LP Lamp, 10W
8	WL002B_014W	LP Lamp, 14W
9	WL006B_025W	LP Lamp, 25W
10	WL008B_032W	LP Lamp, 32W
11	WL012B_032W	LP Lamp, 32W
> 11	*RFU*	*RFU*

3.7.5. Lamp Rated Operating Time

Input Register Address: 0x0375

This register displays the rated operating time of the UV lamp in hours.

This value applies to the last lamp for which the lamp tag was successfully read by the system since power was applied. If no tag has been read since power-on, this value reads zero.
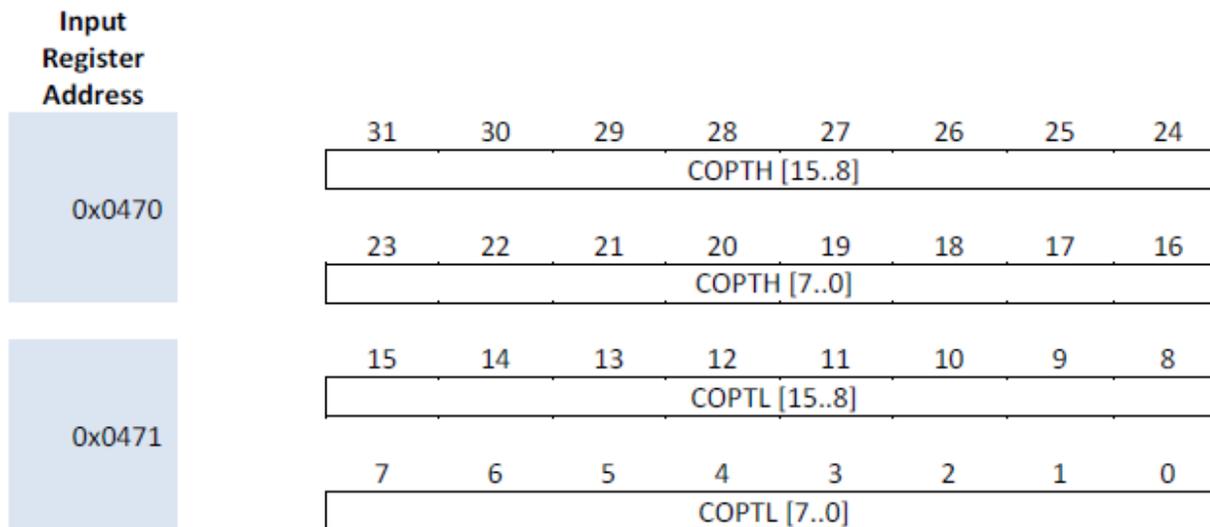
Input Register Address		15	14	13	12	11	10	9	8
0x0375		LMPRATEDOPTIME [15..8]							
		7	6	5	4	3	2	1	0
		LMPRATEDOPTIME [7..0]							

Object Bits	(Register) [Bits]	Field
[15..0]	(0x0375) [15..0]	LMPRATEDOPTIME: Lamp Rated Operating Time The rated operating time of the UV lamp specified in hours.

3.7.6. Controller Operating Time

Input Register Address: 0x0470 : 0x0471

These registers display the cumulative operating time of the controller. The Controller Operating Time is shown in units of 30 minute intervals.

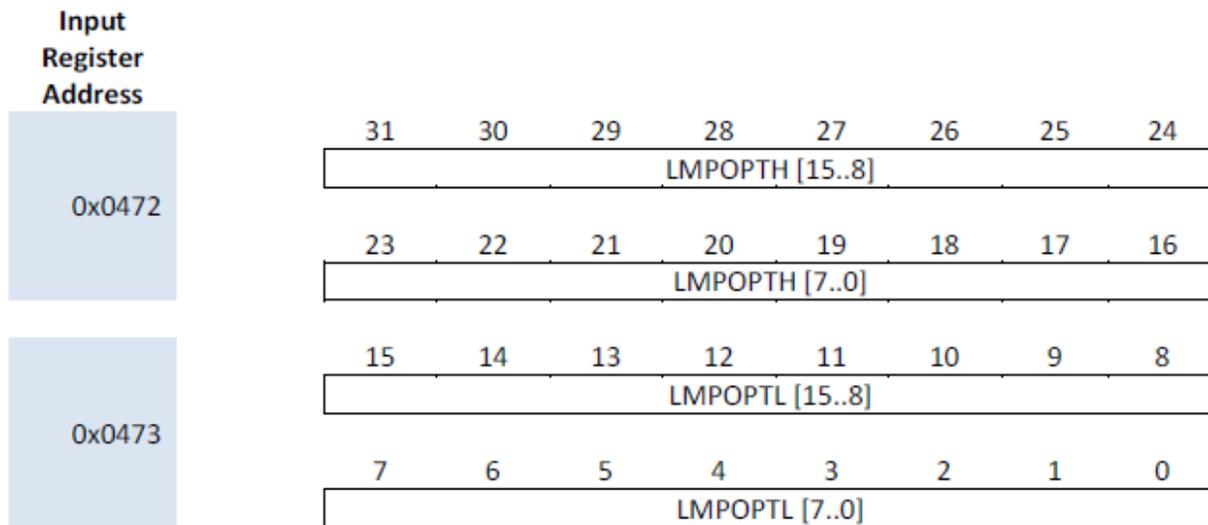| Value (t)	Meaning
$0 \le t < 4294967294$	The controller has been operating for $t \times 30$ minutes
$t = 4294967295$	The controller has been operating for 128,849,018,850 minutes or longer.

Input Register Address

0x0470

31	30	29	28	27	26	25	24
			COPTH [15..8]				

23	22	21	20	19	18	17	16
			COPTH [7..0]				

0x0471

15	14	13	12	11	10	9	8
			COPTL [15..8]				

7	6	5	4	3	2	1	0
			COPTL [7..0]				

Object Bits	(Register) [Bits]	Field
[31..16]	(0x0470) [15..0]	COPTH: Controller Cumulative Operating Time – High Word The most-significant 16 bits of the cumulative operating time of the controller represented in big-endian byte order. Specified in units of 30 minutes.
[15..0]	(0x0471) [15..0]	COPTL: Controller Cumulative Operating Time – Low Word The least-significant 16 bits of the cumulative operating time of the controller represented in big-endian byte order. Specified in units of 30 minutes.

3.7.7. Lamp Operating Time

Input Register Address: 0x0472 : 0x0473

These registers display the cumulative time that the lamp has been operating. The value is specified in units of 15 minute intervals.

This value applies to the last lamp for which the lamp tag was successfully read by the system since power was applied. If no tag has been read since power-on, this value reads zero.

Input Register Address		31	30	29	28	27	26	25	24
0x0472		LMPOPTH [15..8]							
		23	22	21	20	19	18	17	16
		LMPOPTH [7..0]							
0x0473		15	14	13	12	11	10	9	8
		LMPOPTL [15..8]							
		7	6	5	4	3	2	1	0
		LMPOPTL [7..0]							

Object Bits	(Register) [Bits]	Field
[31..16]	(0x0472) [15..0]	LMPOPTH: Cumulative Lamp Operating Time – High Word The most-significant 16 bits of the cumulative time that the lamp has been operating presented in big-endian byte order. Specified in units of 15 minutes.
[15..0]	(0x0473) [15..0]	LMPOPTL: Cumulative Lamp Operating Time – Low Word The least-significant 16 bits of the cumulative time that the lamp has been operating presented in big-endian byte order. Specified in units of 15 minutes.

3.7.8. Lamp Life Remaining

Input Register Address: 0x0475

This register displays the number of days of operation that remain for the lamp before it will have been operated for its rated maximum lifetime or longer.

This value applies to the last lamp for which the lamp tag was successfully read by the system since power was applied. If no tag has been read since power-on, this value reads zero.

This register displays the number of days of operation that remain for the lamp before it will have been operated for its rated maximum lifetime or longer.
This value applies to the last lamp for which the lamp tag was successfully read by the system since power was applied. If no tag has been read since power-on, this value reads zero.

Input Register Address

0x0475	31	30	29	28	27	26	25	24
	LMPLR [15..8]							
	23	22	21	20	19	18	17	16
	LMPLR [7..0]							
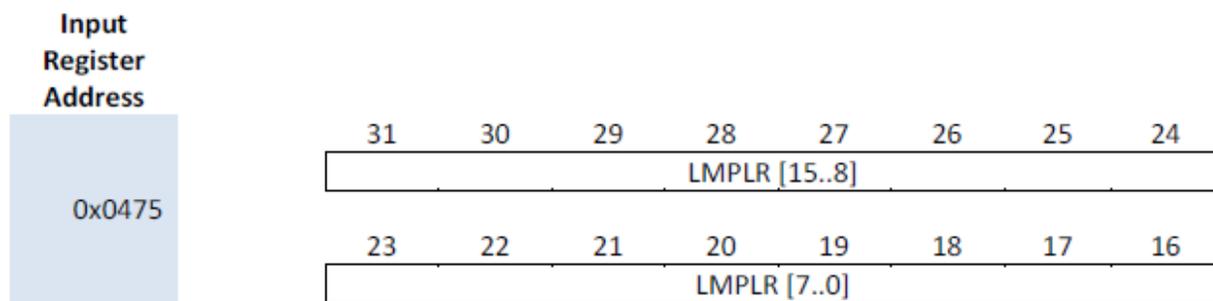
Object Bits	(Register) [Bits]	Field
[15..0]	(0x0475) [15..0]	LMPLR: Lamp Life Remaining The number of days of operation before the lamp will have been operated for its rated maximum lifetime or longer. Specified in units of days.

3.7.9. Measured UV Level, Absolute

Input Register Address: 0x0476 : 0x0477

These registers display the measured UV intensity level reported by the external UV sensor.

The value is reported in units of 0.01W/m2

The value 4294967295 (0xFFFFFFFF) is reserved to indicate that the UV level has overflowed the measurement range of the sensor device.

Input Register Address									
		31	30	29	28	27	26	25	24
0x0476		UVH [15..8]							
		23	22	21	20	19	18	17	16
		UVH [7..0]							
		15	14	13	12	11	10	9	8
0x0477		UVL [15..8]							
		7	6	5	4	3	2	1	0
		UVL [7..0]							
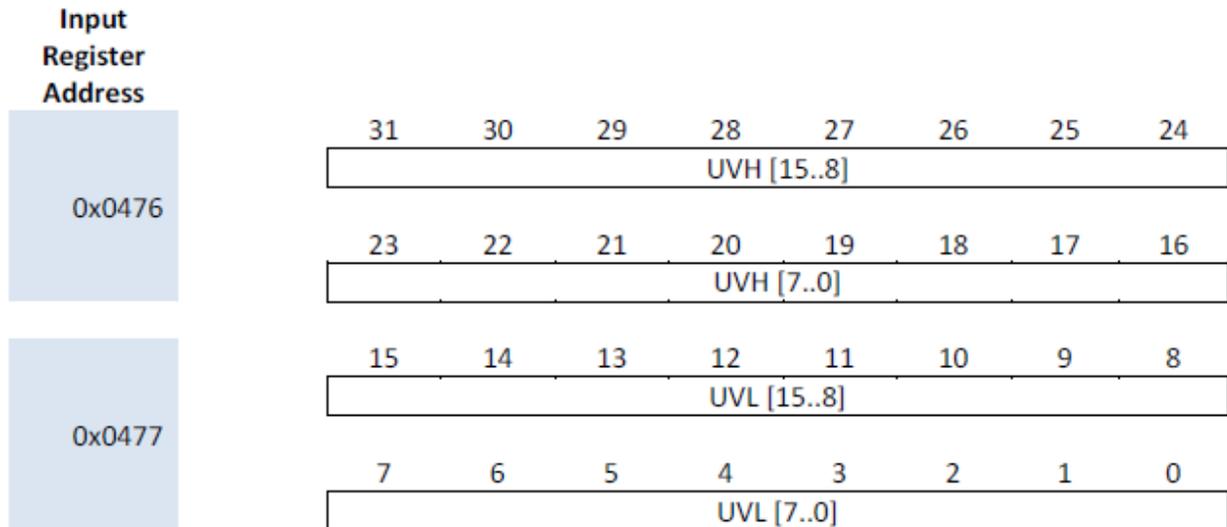
Object Bits	(Register) [Bits]	Field
[31..16]	(0x0476) [15..0]	UVH: Measured UV Level – High Word The most-significant 16 bits of the measured UV intensity level in big-endian byte order. Specified in units of 0.01W/m^2.
[15..0]	(0x0477) [15..0]	UVL: Measured UV Level – Low Word The least-significant 16 bits of the measured UV intensity level in big-endian byte order. Specified in units of 0.01W/m^2.

| | | 3.7.10. Controller Status Information Group 0 | | |

Input Register Address: 0x0479

This register displays various runtime operating parameters of the system.

Object Bits	(Register) [Bits]	Field
[15..14]	(0x0479) [15..14]	LMPBURN: Lamp Burning Status Indicates whether or not the UV lamp arc has been struck (i.e. the lamp is burning). <table><tr><td>0</td><td>Unknown</td></tr><tr><td>1</td><td>True</td></tr><tr><td>2</td><td>False</td></tr><tr><td>3</td><td>*RFU*</td></tr></table>
[13..12]	(0x0479) [13..12]	LMPDIM: Lamp Dimmed Status Indicates if the controller is operating the lamp at a reduced arc current (i.e. the lamp is being dimmed). <table><tr><td>0</td><td>Unknown</td></tr><tr><td>1</td><td>True – the lamp is being dimmed.</td></tr><tr><td>2</td><td>False – the lamp is not dimmed.</td></tr><tr><td>3</td><td>*RFU*</td></tr></table>

[11..8]	(0x0479) [11..8]	LAMPVAL: Lamp Validation Result The results of reading the lamp tag to validate the lamp for use with the system. 	0	Unknown (result not yet available)
1	Valid lamp identified
2	Invalid lamp identified (lamp tag not valid **OR** lamp type incompatible with controller)
3	No lamp (tag) detected
4	Multiple lamp tags detected
5	Error reading from or writing to the lamp tag.
6 : 15	*RFU*	
[7..6]	(0x0479) [7..6]	LLSTAT: Lamp Life Status The status of the remaining lamp life. 	0	Unknown (result not available)
1	Expired - the lamp has been used for longer than its rated operating life.
2	Low - the lamp is approaching its rated operating life.
3	OK – sufficient operating life remains for the lamp, no warnings are required.	
5	(0x0479) 5	RLYSTATE: Relay State The state of the relay coil that is currently being asserted by the controller. 	0	Relay coil de-energized
1	Relay coil energized	

[4..3]	(0x0479) [4..3]	UVSSTAT: UV Sensor Status Indicates whether or not a fault has been identified with the external UV sensor.
		<table><tr><td>0</td><td>Unknown</td></tr><tr><td>1</td><td>A fault has been detected with the UV sensor.</td></tr><tr><td>2</td><td>No UV sensor fault detected.</td></tr><tr><td>3</td><td>*RFU*</td></tr></table>
[2..0]	(0x0479) [2..0]	UVLVLRAT: UV Level Rating The rating assigned by the controller to the UV level measured in the system.
		<table><tr><td>0</td><td>Unknown (result not yet available)</td></tr><tr><td>1</td><td>No UV rating is available.</td></tr><tr><td>2</td><td>The UV level is critically low.</td></tr><tr><td>3</td><td>The UV level is low.</td></tr><tr><td>4</td><td>The UV level is acceptable.</td></tr></table>

3.7.11. Controller Status Information Group 1

Input Register Address: 0x047A

This register displays various runtime operating parameters of the system.

Object Bits	(Register) [Bits]	Field
15	(0x047A) 15	*RFU*
[14..8]	(0x047A) [14..8]	LMPWUIR: Lamp Warm-up Interval Remaining The lamp warm-up time that remains, expressed as a percentage of the full lamp warm-up interval. <table><tr><td>0 to 100</td><td>Remaining lamp warm-up interval in percent of the full warm-up interval.</td></tr><tr><td>> 100</td><td>*RFU*</td></tr></table>
[7..6]	(0x047A) [7..6]	ALARMMUTE: User Audible Alarm Muting Indicates if the operator has applied a temporary muting action to the controller's integrated audible alarm. <table><tr><td>0</td><td>Unknown</td></tr><tr><td>1</td><td>The audible alarm has been muted by an operator.</td></tr><tr><td>2</td><td>The audible alarm is not muted.</td></tr><tr><td>3</td><td>*RFU*</td></tr></table>

| [5..4]	(0x047A) [5..4]	RLYOVR: User Relay Override Indicates if the operator has overridden the alarm state of the relay contacts to keep the contacts closed. <table><tr><td>0</td><td>Unknown</td></tr><tr><td>1</td><td>The relay alarm state is currently overridden by an operator request made through the controller's user interface.</td></tr><tr><td>2</td><td>The relay state has not been overridden by an operator.</td></tr><tr><td>3</td><td>*RFU*</td></tr></table>
[3..0]	(0x047A) [3..0]	OPSTATE: Controller Operating State. The general operating state of the controller. <table><tr><td>0</td><td>Unknown</td></tr><tr><td>1</td><td>Bootup</td></tr><tr><td>2</td><td>System Startup</td></tr><tr><td>3</td><td>Lamp Pre-Start</td></tr><tr><td>4</td><td>Lamp Start</td></tr><tr><td>5</td><td>Lamp Burning</td></tr><tr><td>6</td><td>Lamp Fault</td></tr><tr><td>7</td><td>Lamp Key Fault</td></tr><tr><td>8</td><td>System Fault</td></tr><tr><td>9</td><td>Programming</td></tr><tr><td>10 to 15</td><td>*RFU*</td></tr></table>

4. TROUBLESHOOTING

Problem	Possible Cause	Corrective Action
Bacteria in outlet water	Low or no UV transmittance into the water	Replace lamp
		Clean or replace quartz sleeve
		Replace prefilter
		Confirm the pretreatment is adequate
		Confirm the feed water meets the feed water requirements within this manual
	Biofilm in outlet plumbing	System needs to be sterilized
	System not on	Confirm continuous power supply
	Low power to lamp	Replace controller
Low UV intensity	Lamp over 1 year old	Replace lamp
	Fouled quartz sleeve	Clean or replace quartz sleeve
	Fouled prefilter	Replace prefilter
	High turbidity in feed water	Confirm the pretreatment is adequate
		Confirm the feed water meets the feed water requirements within this manual
	UV sensor fouled or defective	Clean or replace UV sensor
	Low power to lamp	Replace controller
	Lamp intensity does not increase with water flow	Confirm flow switch is functioning
White or milky colored water	Air in water from new prefilter or quartz sleeve replacement	Flow water through the system until water runs clear
Lamp out alarm ON	Filaments broken in lamp	Replace lamp
Glow cap not illuminated	Lamp not rotated into position for normal operation	Rotate lamp glow cap so that electrical connections align with cut out in bracket
Low pressure after system	Clogged cartridge	Clean or replace the cartridge
Quartz sleeve nut leaks	Quartz sleeve nut loose	Tighten quartz sleeve nut
	O-Ring is defective	Replace O-Ring

WARNING

All problem conditions called out within this troubleshooting chart require the disinfection procedure to be conducted after the corrective action has been completed (see section 6.4.).

5. REPLACEMENT PART LIST

5.1. WQ-AS Skid Parts
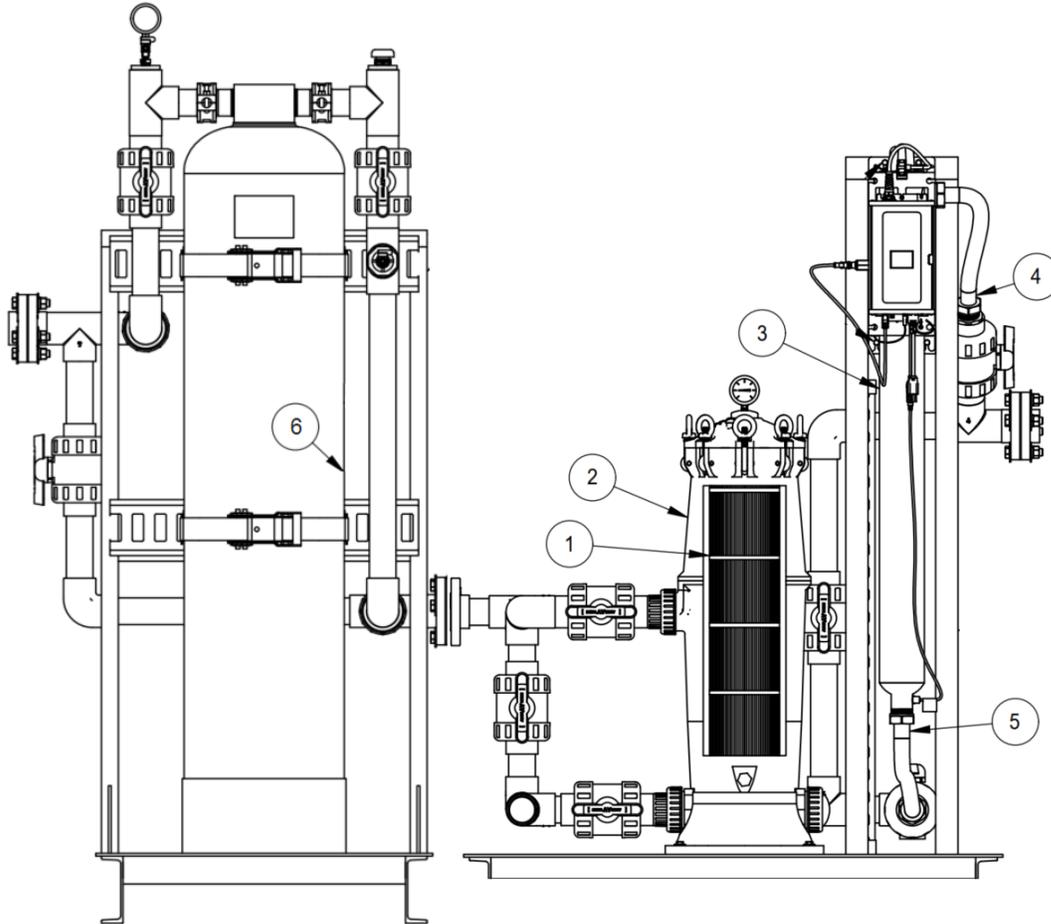
Figure 5-1 WQ-AS Skid Parts

Item	Description	Part #
1	Lync Filter Cartridge (LCB-150-P5)	68100632
2	Lync Filter Housing (LCH-150)	68110217
3	Lync UV 50 GPM (LD050AGAA)	68110226
4	1.5" x 24" SS Flex Connector	68110094
5	1.5" x 18" SS Flex Connector	68108928
6	Lync AquaSolve Anti-Scale System 50 GPM (LM8414TM-COM)	68110220

NOTE:

Cartridge (LCB-150-P5) is cleanable and reusable to reduce costs.

5.2. Lync AquaSolve Parts
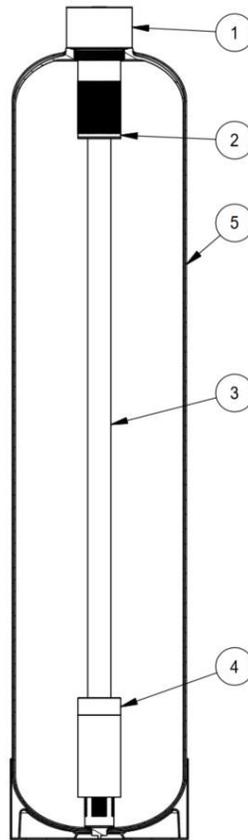
Figure 5-2 AquaSolve Cross Section

Item	Description	Part #
1	Stainless Steel Tank Head	68106656
2	Upper Basket Assembly	68101233
3	1.5" Riser	68103367
4	Bottom Distributor Assembly	68101235
5	14" X 65" AquaSolve Tank Body	68100998
-	Lync AquaSolve Replacement Media for LM8414TM-COM	68105663

AquaSolve Media is certified through WQA to NSF/ANSI/CAN 61, and to NSF/ANSI 372 for Lead Free Compliance.

5.3. Lync Cartridge Filter Parts
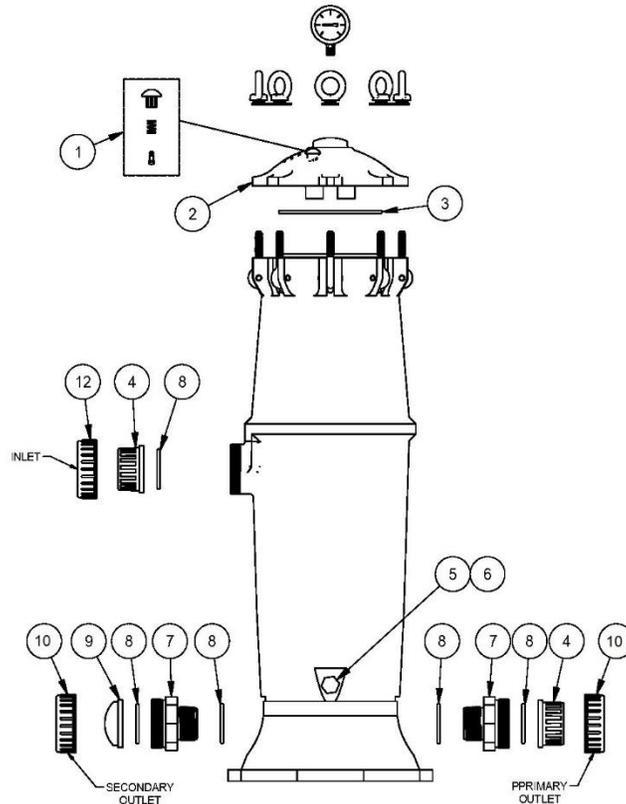
Figure 5-3 Lync Cartridge Filter Parts

Item	Description	Part #
1	Pressure relief assembly includes cap, spring and stem	68100621
2	Lid with brass reinforced gauge port	68100616
3	O-ring for lid closure, EPDM	68100619
4	Adapter 2" PVC	68100608
5	Drain plug ½" NPS without O-ring	68100613
6	Drain plug O-ring	68100612
7	Coupler	68100610
8	Coupler O-ring	68100611
9	Plug for second outlet	68100614
10	Nut for plumbing adapter	68100618

5.4. Lync UV Parts

Use only Lync supplied UV lamps and quartz sleeves. Failure to do so may result in system failure and will void all warranty.
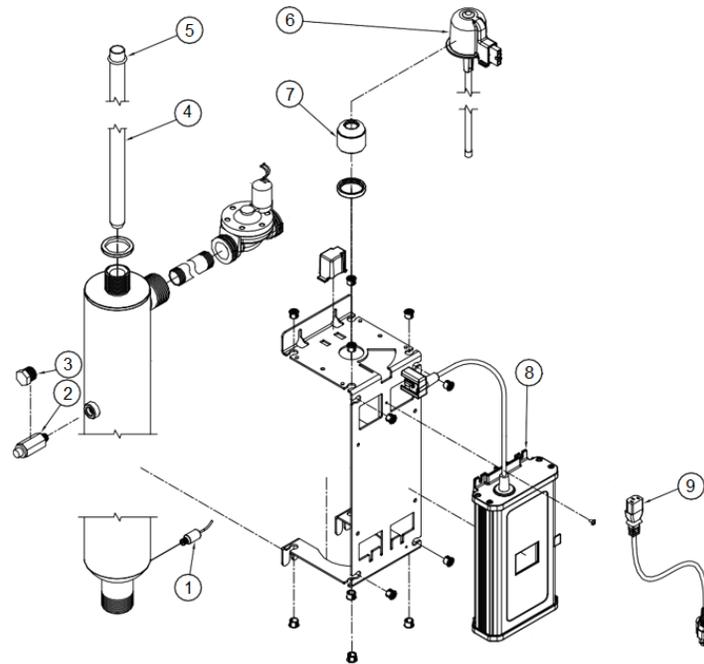
Figure 5-4 Lync UV Parts

| Item	Description	Part #
1	Flow Switch with Cable for All Systems	68108175
2	UV Sensor Accessory Kit with Cable for Controller	68108148
3	Plug for UV Sensor Port when Sensor is Not Used	68108304
4	UV Quartz Sleeve 46.9" (1192mm)	68108171
5	UV Quartz Sleeve O-ring	68108254
6	UV Lamp Assembly	68108162
7	UV Quartz Sleeve Nut	68108121
8	WQ-AS UV Controller with Touch Screen Graphic Display	68110326
9	Power Cord 6' 120V Standard USA Plug with Ground	68108313

6. Maintenance

Maintenance Practice	Frequency
Check for system leaks	Every month
Check the differential pressure* for cartridge replacement	Every two weeks
UV lamp replacement	Every year
Quartz sleeve replacement	Every three years
AquaSolve media replacement	Every three years

* Differential pressure is equal to pressure gauge reading at the inlet side of the filter minus pressure gauge reading at the outlet side of the filter.

Pressure Drop

Lync Cartridge Filter housing is designed to minimize pressure drop by using 2" pipe fittings and large diameter center tube (see chart below for pressure drop data).
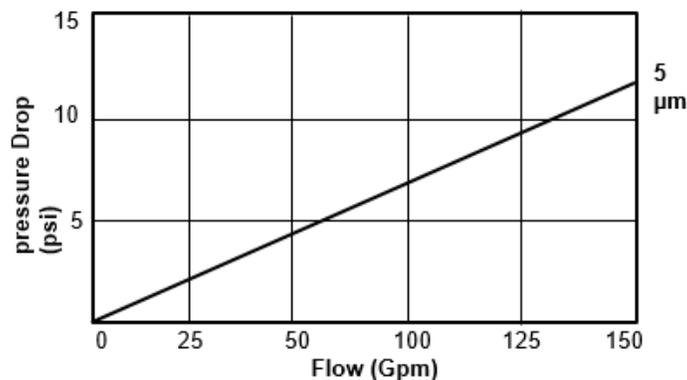
6.1. Replacing AquaSolve Media

1. Shut off the primary feed supply going to the WQ-AS skid.

2. Close the inlet valve to the AquaSolve(s) and the inlet valve to Lync Cartridge Filter to isolate the AquaSolve(s) skid.

3. Open up the 1/4" drain/sample valve(s) after the AquaSolve outlet valve(s) to release the pressure in the tank and in the distribution lines before and after the AquaSolve(s).

4. Disconnect the unions on the inlet and outlet of the tank, and then disconnect flex connectors from head.

5. Using a step ladder and strap wrench, remove the threaded head assembly connection (turning counter-clockwise) and remove the complete upper assembly including grey-colored PVC strainer. Rinse these parts in a nearby sink or bucket of water. Do not drain the tank.

6. Remove the distributor tube with the bottom strainer. Rinse these parts in a nearby sink or bucket of water.

7. Get a 6 foot length of 3/4" sch. 40 PCV and a length of 1" polyvinyl hose. The length of hose depends on the distance to the nearest floor drain. (Both of these can be acquired at Home Depot or Lowes.)

8. Insert one end of the pipe inside the hose and put the other end of the pipe into the top of the tank and down into the media. Put the other end of the hose inside a rice bag and put the rice bag on the floor drain.

9. Get a garden hose and put it on the open end of the poly hose to fill the hose and pipe with water. Air will bubble out of the tank. Once all the air is out of the hose and pipe, you can start a siphon to remove the media. Put the garden hose in the top of the tank and turn it on to keep the tank full of water. Push the pipe up and down in the media to get it all out. The rice bag will catch the media and allow the water to go down the drain.

10. Try not to be too aggressive when extracting the media. You need to take it out in small bites. If you let the whole pipe/ hose fill with media it will plug up. You need to let slugs of water flush out the pipe as you go.
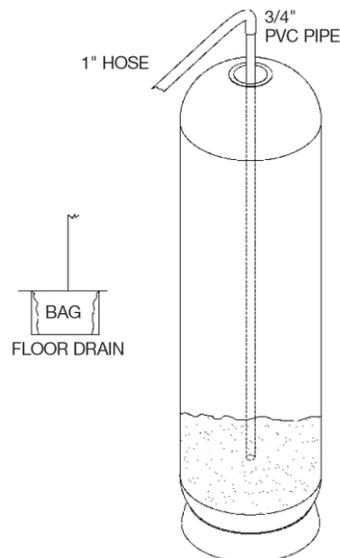
Figure 6-1 Replacing LM8414TM-COM Media

11. When all the old media is removed turn off the garden hose and continue to siphon until the tank is about half full with water.

12. Using the step ladder again, reinstall the distributer tube with bottom strainer that was removed in Step 6. Center the distributor tube in the bottom of the tank. Keeping any and all media from entering the distributor tube, carefully pour-in a new bag(s) of media (see AquaSolve media part number in section 4.2.).

13. Inspect the threaded connection on the top of the tank to ensure no loose beads of media are stuck to the internal threads. If visible, wipe away the beads with a damp cloth.

14. Re-attach the head assembly onto the distributor tube and thread the head assembly back onto the tank. Hand-tighten until the final turn when a strap wrench can help tighten the connection.

15. Reconnect the flex connectors and union connections.

16. Open the feed water inlet (slowly) to fill the tank.

17. Purge the air at a downstream faucet close to the system.

18. Once the tank is full, wait 4 hours for media to "hydrate".

19. Put the tank in service.

Alternative Method for Replacing Media

Follow steps 1 – 6 then:

20. Remove center distributor tube and lower basket and siphon all water from tank

21. Lay tank down on its side and tip upside down while using hose to flush media out

22. When all the old media is removed, stand tank back up and install in original position. Fill the tank so that it is about half full with water.

Then continue with steps 12 – 19.

6.2. Routine Cartridge Replacement

The Lync filter cartridge needs to be cleaned or replaced with a new cartridge at the maximum of 15 psi differential pressure.

23. Close inlet valve.

24. Close outlet valve.

25. Press pressure relief button to relieve pressure.

26. Remove lid after pressure has been relieved.

27. Rotate cartridge counterclockwise and pull upward to remove the cartridge.

28. Install new (or cleaned) cartridge. Push downward and rotate clockwise to engage locking tabs. Lubricating O-rings if necessary.

29. Check lid O-ring to ensure it is properly seated . Lubricate if necessary .

30. Replace lid.

31. Replace eyebolts and tighten. (Hand tight is sufficient.)

32. Open outlet pipe completely.

33. Open inlet pipe slowly to check for leaks.

34. Vent filter to dispel air by depressing pressure relief button. Be careful when relieving pressure or dispelling air if high temperature water is being filtered.

> **NOTE:** If leaks occur, close the inlet and outlet pipes and follow procedures previously described under WARNING in Section 3.3: Plumbing and UV Connections.

6.3. Lync UV Maintenance

UV Lamps have a **1 year (9000 Hour) life span** under normal operating conditions. Quartz sleeves should be cleaned with vinegar, citric acid, or a lime scale removing chemical annually and replaced no less than once every 3 years. If the quartz sleeve cannot be cleaned, or if it is discolored, is must be replaced. Pre filters should be maintained according to the manufacturer's instructions to ensure feed water requirements within this manual are met.

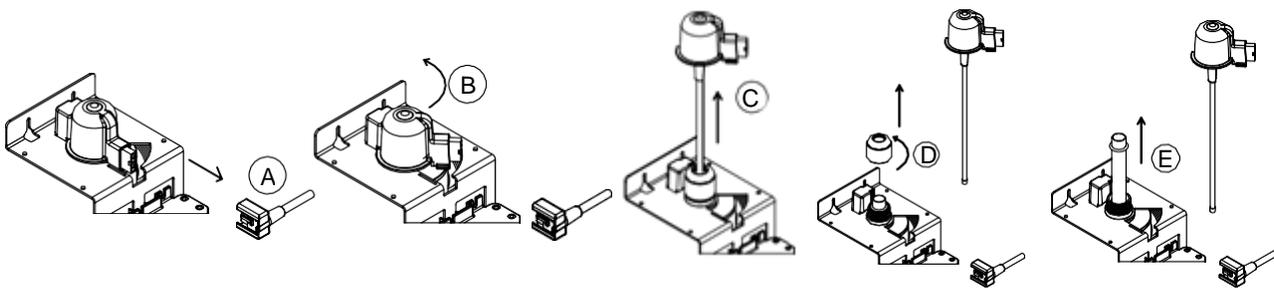**Lamp and Quartz Sleeve Replacement Procedure:**

> **WARNING!**
> If any water comes in contact with any electrical components, dry the components

immediately.

DO NOT energize a system with damp or wet electrical components.

1. Disconnect the power supply from the wall outlet.

2. Turn off the inlet valve and outlet isolation valves.

3. Disconnect the lamp lead wire from the glow cap electrical port. (A).

4. Rotate the glow cap counter clockwise to unlock it from the mounting bracket. (B).

5. Pull up on the glow cap to remove the lamp from the quartz sleeve. (C). If not replacing the quartz sleeve proceed to step 11.

6. De-pressurize the system.

7. Grip the quartz sleeve nut with your hand and unscrew counter clockwise until it can be lifted from the reactor chamber's threaded port. (D).

8. Remove the quartz sleeve from reactor chamber. (E).

9. Fully insert a new quartz sleeve into the reactor chamber and install the O-ring over the quartz sleeve. Press the O-ring down over the quartz sleeve until it is seated in the bevel of the stainless steel reactor chamber's threaded port.

10. Install the quartz sleeve nut onto the threaded port of the reactor chamber. Screw the nut on clockwise and tighten hand tight.

11. Insert a new lamp into the quartz sleeve.

12. Gently press down on the glow cap and rotate it clockwise until it locks in place on the mounting bracket.

13. Reconnect the lamp lead wire to the new lamp.

14. Turn on the inlet valve and check for leaks. Repair leaks as needed.

15. Restore power to the system.

16. Verify new bulb has 365 days remaining on the controller screen.

Immediately after replacement of the UV lamp, and /or quartz sleeve, follow the disinfection procedure below.

Figure 6-2 Lamp and Quartz Sleeve Replacement

6.4. Disinfection Procedure

NOTES:

If hot water is used during disinfection procedure, please use UV Sensor Port Plug # T7402210 and Flow Sensor Port Plug # T7401003.

DO NOT unplug the system.

1. Shut off the inlet and outlet isolation valves on the cartridge filter line.

2. Depressurize the cartridge filter and unscrew the housing.

3. Install a new filter cartridge and pour 1 cup of 6% bleach into the housing.

4. Reinstall the filter housing and open up the filter isolation valves.

5. Flush 2 reactor chamber volumes of water through the UV system(s) then stop and let the solution remain in the UV system(s) for 30 minutes.

6. After 30 minutes, flow enough water through the system to flush all of the residual chlorine from the system. During this time **DO NOT** exceed the rated flow rate of the UV system.