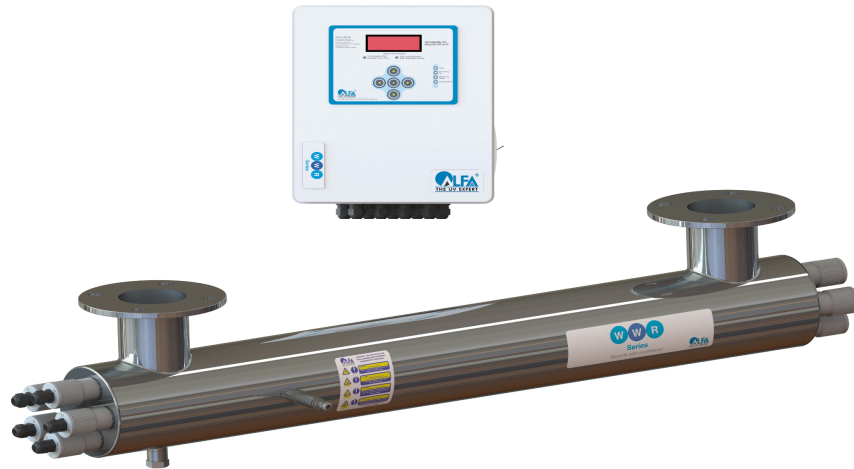


UViQ.IO
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USER MANUAL

READ THIS MANUAL.

UVC-UVM

PLEASE KEEP FOR PERMANENT REFERENCE

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SAFETY INSTRUCTIONS OF REACTOR CHAMBER

WARNING - to guard against injury, basic safety precautions should be observed, including the following:

1. Read and follow all safety instructions.
2. Danger - To avoid possible electric shock, special care should be taken since water is present near electrical equipment. Unless a situation is encountered that is explicitly addressed by the provided maintenance and troubleshooting sections, do not attempt repairs yourself. Instead, please contact our technical support division.
3. Ultraviolet lamps, and the sleeves they are housed in, are constructed of quartz tubing. Quartz tubing is very fragile and easily fractured. Do not strike, bend or apply pressure to this material or it will break. Broken lamps or sleeves can cause serious cuts and are not covered under the warranty. Dispose of lamps and sleeves according to the requirements of authorized hazardous waste disposal services in your area.
4. Acids used for cleaning the sleeves may cause burns. Wear protective clothing and protective eyewear when using these materials. After cleaning, rinse the system components thoroughly with distilled water. Always follow the safety precautions recommended by the manufacturer of the cleaning solution.
5. Operate the system only if the chamber is completely filled with flowing water. Intermittent operation of the system requires that a minimum amount of water flows through the system in order to cool the lamps. Ignoring this will damage the lamps, ballasts, and electrical systems.
6. Connect this system only to AC power that conforms to the system rating as regards voltage and voltage specification.
7. If your system runs with pulse compression or with non-VFD pumps, a buffer tank or other remedial measure must be provided to protect against water hammer which can break the quartz.
8. Carefully examine the UV system after installation. It should not be plugged in if there is water on parts not intended to be wet. Specifically, there should be no leakage from the quartz seals or water inside the quartz sleeve.
9. Do not operate the UV system if it has a damaged cord or plug, if it is malfunctioning or if it is dropped or damaged in any manner.
10. Always disconnect the water flow and electrically unplug the UV system before performing cleaning or maintenance activities.
11. Do not use this UV disinfection system for any other purpose other than disinfection of water. The use of attachments or accessories not approved, recommended or sold by the manufacturer may cause an unsafe condition.
12. Intended for indoor use only. Do not install this UV disinfection system where it will be exposed to the weather or to temperatures below freezing. Do not store this system where it will be exposed to the weather. Do not store this system where it will be exposed to temperatures below freezing unless all water has been drained from it and the water supply has been disconnected.
13. If an extension cord is necessary, a cord with a proper rating should be used. A cord rated for less Amperes or Watts than the UV system rating may overheat. Care should be taken to arrange the cord so that it will not be tripped over or pulled.
14. All repairs are to be done by Ace Hygiene Products Pvt. Ltd. or by qualified specialists only.

15. Depressurize and drain the UV reactor. Pressure must be relieved from the system prior to any maintenance, to prevent damage to the equipment or personal injury.



WARNING: THE UV LIGHT GIVEN OFF BY THIS UNIT CAN CAUSE SERIOUS BURNS TO UNPROTECTED EYES AND SKIN. NEVER LOOK DIRECTLY AT AN ILLUMINATED UV LAMP. WHEN PERFORMING ANY WORK ON THE UV DISINFECTION SYSTEM ALWAYS UNPLUG THE UNIT FIRST. NEVER OPERATE UV SYSTEM WHILE THE UV LAMP IS OUTSIDE OF THE UV CHAMBER.

**IMPORTANT - FOR YOUR PROTECTION
FOR ALL MAINTENANCE PROCEDURES
PLEASE REFER TO THE MANUAL**

		WARNING DANGER HIGH VOLTAGE BEFORE ATTEMPTING TO DISMANTLE ISOLATE POWER AT CONTROL PANEL
		WARNING DANGER ULTRA VIOLET LIGHT UV LIGHT IS HARMFUL TO EYES AND EXPOSED SKIN DO NOT RUN SYSTEM WITH ANY COVERS OR FITTING REMOVED.
		WARNING CHAMBER MAY BE UNDER PRESSURE. BEFORE ATTEMPTING TO REMOVE END PLATES, MONITOR OR QUARTZ, DE-PRESSURISE AND DRAIN CHAMBER.
		WARNING POSSIBLE HIGH TEMPERATURE. BEFORE ATTEMPTING TO DISMANTLE, MAKE SURE CHAMBER AND LAMP IS IN A COOL STATE. USE ONLY GENUINE REPLACEMENT LAMPS AND QUARTZ SLEEVES

Congratulations on choosing the IQ Series range of ultraviolet systems from Alfaa UV. Each unit is designed to provide safe, reliable disinfection performance year after year with minimal maintenance

SYSTEM INTRODUCTION TO UV THEORY

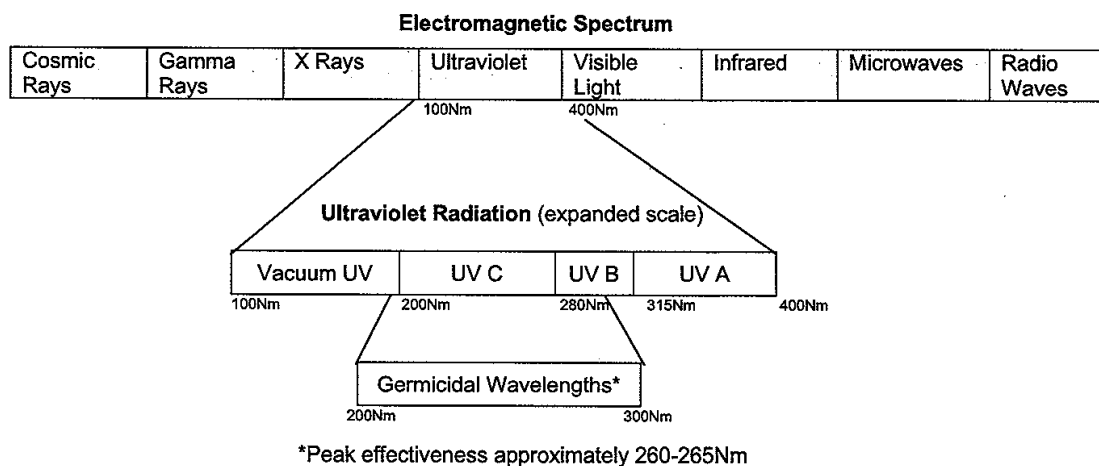
OVERVIEW OF IQ SERIES

The Alfaa IQ Series uses ultraviolet light to treat processed water in food & beverage, semiconductor, pharmaceutical, and other industries requiring high purity disinfected water. It is also an effective replacement for chemical biocide in the cooling towers and re circulation loops used by many industries. The simple, effective design makes it suitable for many large scale applications in industrial water treatment. Unlike chemical treatment, UV does not require the handling of dangerous substances and adds no toxic compounds to the water. The sealed and pressurized reactor chamber of the Alfaa IQ Series has capacity for a high volume of water flow. It is a closed system preventing outside particles from contaminating the treated water. The modular design of the Alfaa IQ Series makes it versatile and permits easy access to the equipment.

WHAT IS ULTRAVIOLET LIGHT

UV light is defined as electromagnetic radiation having a wavelength less than that of visible light (400 nm) and greater than that of X-Rays (100 nm). The unit of wavelength used is a nanometer (nm) equal to 10⁻⁹ meters. The optimum UV wavelength for germicidal effect is 265 nm, which is found only in small amounts in solar radiation because energy at these wavelengths is absorbed by the atmosphere.

The primary source of UV energy in current technology is a special short wave arc lamp (like the ones supplied with your system). The primary reason for its use is that a significant amount of its UV energy output is near the wavelength of 265 nm. This radiation is generated by striking an electric arc through a metallic compound vapor. Discharge of the energy generated by excitation of the metallic molecules results in the emission of the UV light.



DISINFECTION VS. STERILIZATION

Sterilization implies the total elimination of pathogens or disease-carrying microorganisms. In contrast, disinfection is a reduction in the concentration of pathogens to non-infectious levels.

APPLICATION OF UV LIGHT

DISINFECTION

The most common application of UV light is disinfection. 254 nm UV energy penetrates the cell membrane of microorganisms and alters the genetic material of the cell (DNA) destroying its ability to reproduce. In this application, UV is commonly used as an alternate disinfectant to chlorine and other chemical oxidants and also as a protection for other technologies in a complete water treatment system.

OZONE DESTRUCTION

Ozone is typically used in high-purity water systems to oxidize trace chemicals and to disinfect stored water. Often ozone cannot be tolerated in the final product water and therefore any residual must be removed. 254 nm UV energy is absorbed by ozone, causing it to break down into dissolved oxygen.

TOC REDUCTION

In high purity water systems, UV is often used in conjunction with ion exchange equipment for the reduction of trace organics, referred to as TOC (Total Organic Carbon). High-energy UV lamps, emitting UV energy below 200 Nm, are used to trigger the photolysis of water, producing very powerful hydroxyl free radicals (OH). These hydroxyl free radicals attack organic compounds, breaking them down into carbon dioxide and water when fully oxidized. Some organic materials are broken down into weakly ionized acid-based groups which are then easily removed by polishing mixed bed ion exchange equipment.

FACTORS AFFECTING UV DISINFECTION

Ultraviolet light kills bacteria, protozoa and viruses, by destroying their genetic material. The performance of an Alfaa IQ Series unit to disinfect water is expressed in terms of reduction of bacteria, or “kill”. Each system is designed to reduce microorganism counts to a certain allowable level, which depends on the requirements of the specific application or regulatory requirements. The dose of UV light available to kill bacteria is measured in micro watt-sec/cm² or J/m², which is equivalent to the product of the UV light intensity and the duration of exposure, or retention time. Any factor that affects UV light intensity or retention time will affect performance.

$$\text{Dose} = \text{Intensity (W/m}^2\text{)} \times \text{Retention Time (sec)}$$

The Alfaa IQ Series is designed to deliver a dose that takes into account lamp aging.

Factors Affecting Performance

DOSE =	INTENSITY (W/m ²)	X	RETENTION TIME (sec)
	Water Quality • UV Transmittance • Suspended Solids • Level of Dissolved Organics • Total Hardness Lamp Condition • Sleeve Cleanliness • Aging Treatment Process		

UV TRANSMISSION

UV Transmittance is defined as the percentage of UV light at 254 nm not absorbed after passing through 1 cm of water sample. UV Transmittance depends on dissolved and suspended matter in the water. Reduced UV Transmittance lowers the intensity of the light in the water, thus requiring longer exposure time in order to deliver the proper UV dose. The visual clarity of a water sample is not always a good indicator of its UV Transmittance since water that is clear to visible light may absorb invisible ultraviolet wavelengths.

Note: There is NO fixed correlation between turbidity and UV Transmittance.

SUSPENDED SOLIDS

Suspended Solids consist of any filterable particle in the water and are measured in parts per million (ppm) or (mg/L). They lower UV Transmittance by scattering and absorbing the light. They can also reduce kill by protecting bacteria from exposure to UV light.

LEVEL OF TOTAL DISSOLVED SOLIDS

Specific organic compounds in the process water will absorb some energy, which is emitted in the germicidal wavelength region of the spectrum.

TOTAL HARDNESS

The presence of high levels of inorganic magnesium or calcium carbonates in a water stream may contribute to the coating of the quartz sleeve.

QUARTZ SLEEVE CONDITION

To ensure maximum performance from the unit, it is essential that the Quartz Sleeves be kept clean. If a coating is allowed to build up on the sleeves, the amount of UV light transmitted to the water will be reduced.

TREATMENT PROCESS

Water processing equipment located upstream of the Alfaa IQ Series unit such as filters, can affect performance. Different treatment processes produce water with different UV transmittance characteristics and different observed cleaning frequency patterns.

FLOW RATE

The flow rate through the Alfaa IQ Series unit will determine the retention time, which in turn determines the delivered UV dose at a given UV intensity.

WARNING -- DO NOT UNDERSIZE UNITS

UV REACTOR

The reactor chamber is manufactured from stainless steel 316L and is electropolished and passivated. The lamp is housed within a quartz sleeve to prevent direct contact with the fluid.

The chamber is also fitted with a UV intensity sensor. This UV intensity sensor measures the absolute UV Intensity and determines that the system is operating effectively. It is located in a sealed sanitary housing so that it can be removed for maintenance without draining the chamber.

The IQ Series UV systems use lamps which are of a special high intensity, high output. The chamber is designed to mount and should be secured to a suitable support.

INSTALLATION AND COMMISSIONING

GUIDELINES

It is recommended that the UV reactor be installed horizontally to facilitate easy replacement of the lamp and/or quartz sleeve. The UV system should be installed in an easily accessible location to simplify maintenance.

NOTE: OPERATING SPACE EQUAL TO OR GREATER THAN THE REACTOR LENGTH MUST BE ALLOWED ON THE SIDE OF THE REACTOR (TYPICALLY ON THE SIDE WHERE THE LAMP IS CONNECTED) TO ALLOW FOR THE LAMPS AND QUARTZ SLEEVE TO BE REMOVED OR REPLACED.

Install equipment in an indoor environment.

The ambient temperature in the installation area should be between 10°C and 40°C with a relative humidity of less than 80%.

Insulate the unit from extreme temperatures.

Install the chamber horizontally (If mounting vertically first contact Alfaa UV).

To avoid trapping air, ensure the outlet is at the highest point.

Allow maintenance space around the system, including the reactor length for lamp removal.

The maximum cable length between the control panel and the UV reactor is 3.5m. Plan the location of the reactor and panel accordingly. Do not attempt to increase the length of this wire in any way.

REACTOR INSTALLATION STEPS

Pick a suitable location for the UV reactor and the control panel. Make sure that there is a minimum of clear space at the connection end of the chamber to facilitate lamp replacement and servicing.

Support connecting pipes to the UV system to avoid any undue strain on the unit.

Avoid vibration from close proximity to heavy equipment or from erratic pumps. Vibrations from other equipment and/ or water hammering can cause damage to lamps and quartz within the UV reactor.

CAUTION: IN THIS CASE OR IN CASE YOUR SYSTEM RUNS WITH PULSE COMPRESSION, A BUFFER TANK OR OTHER REMEDIAL MEASURE MUST BE PROVIDED. FAILURE TO DO SO WILL RESULT IN BROKEN QUARTZ GLASS AND DAMAGE TO THE LAMPS AND UNIT.

In an effort to adequately protect the electrical components inside the reactor, the unit must be connected to an electrical outlet which is protected by an earthing line as well as a surge suppressor.

In case the quartz sleeves have shipped separately, install the sleeves following the instructions in the section relating to quartz sleeve installation and removal on page 27.

Once the reactor is securely mounted, plumb the inlet and outlet ports to the supply and delivery lines with the appropriate connections. When making connections, be sure not to drop anything into the reactor chamber that may damage the quartz sleeves/lamps or contaminate the reactor.

After all connections are made, SLOWLY turn on the inlet valve and SLOWLY fill the reactor chamber with water. Once the chamber is full, check for leaks from the fittings. Especially check for any leaks from the quartz sealing nuts. If a leak is evident, drain the system and reconnect the fittings.

The system should now be thoroughly flushed to clean out any particulate matter that may have entered the reactor chamber during installation as well as flushing out any air that may have accumulated during the “filling” of the reactor.

WARNING: SUDDEN OPENING OF THE INLET FLOW MAY SERIOUSLY DAMAGE UV LAMPS OR QUARTZ SLEEVES.

Secure the control panel making sure the panel is mounted within a 3.5 meter wire run from the connection end of the reactor chamber.

Install the UV lamps as described in the section relating to UV Lamp installation and removal on page 24 and make all the necessary lamp connections. Do not forget to connect the earthing wire to the earthing stud on the UV reactor using the provided earthing nut.

Carefully install the sensor assembly into the sensor window on the reactor housing by first inserting the sensor o-ring and then the sensor itself. Lock the sensor into place using the provided lock nut. Attach the sensor cable to the sensor.

Next, plug the reactor into the appropriate electrical outlet and power up the system.

Follow the startup instructions in the next section.

SYSTEM STARTUP

Allow the UV reactor to fill slowly with water and ensure a running flow of water through the reactor.

Once the water is flowing, turn on the UV system by using the power switch on the front of the control panel.

CAUTION: NEVER OPERATE THE UNIT WHILE EMPTY OR WITHOUT FLOW FOR AN EXTENDED PERIOD. OPERATE THE SYSTEM ONLY IF THE CHAMBER IS COMPLETELY FILLED WITH FLOWING WATER. INTERMITTENT OPERATION OF THE SYSTEM REQUIRES THAT A MINIMUM AMOUNT OF WATER FLOWS THROUGH THE SYSTEM IN ORDER TO COOL THE LAMPS. FAILURE TO DO SO CAN SEVERELY DAMAGE THE UV LAMPS AND CONNECTORS.

The system will indicate STARTING on the UV controller on the front of the panel. The system will not register any alarms until this warm-up timer has expired (90 Seconds). This feature prevents any false alarms from registering while the system is warming up.

If no alarms are registered after the system has warmed up and a RUNNING message is indicated in the status line, water for disinfection may be allowed to pass through the chamber.

MAINTENANCE

SCHEDULE

Refer to the applicable following sections for specific instructions on how to access components and complete the following checks.

DAILY

- Check the UV controller on the control panel for any new errors or warning conditions.
- Complete the maintenance log sheet for the day.
- Check for leaks.

MONTHLY

Monthly procedures may be required more frequently if either a low dose alarm occurs or if the UV reactor has been turned off for a long period of time.

- If the control panel contains cooling fans check for dirt buildup in their filters. Clean or replace as necessary.
- Ensure all the quartz sleeve sealing nuts are properly tightened.
- In the case of a wiper present, remove the protective shroud and initiate a wipe sequence. Observe the motor action and wipe sequence, listening for unusual noises or vibration which could indicate wiper problems. Keep hands away from the motor while operating.
- Check the quartz sleeves for fouling. Remove a representative sample of quartz sleeves. If external fouling is present, remove and clean all quartz sleeves. If internal fouling is present, replace the sleeve.
- Check UV sensor window opening for fouling. If external fouling is present, remove and clean the UV Sensor Window. If internal fouling is present replace the UV sensor window or contact Alfaa UV to schedule a service request.

Note: Cleaning frequencies are recommendations only and should be used as a guideline. Individual systems may vary depending on effluent quality, algae buildup, etc.

YEARLY

It is recommended that all components be inspected and cleaned yearly. The following components are specifically noted due to the increased wear over time that they are subjected to.

- Check all the O-rings. If there are indications of wear and tear (cracking or brittleness), replace the seal. Alfaa UV recommends that the quartz sleeve sealing O-rings be replaced every time the quartz sleeve is removed /replaced in the system.
- Ensure the UV reactor chamber is cleared of any settled solids.
- Inspect UV lamp socket.

- In the case of an auto wiper system, check wiper rings for indications of wear and tear (cracking or brittleness). If such indications exist, replace components.
- In the case of an auto wiper system, check the lead screw rotary sealing mechanism for leakage.
- Inspect the Housing assembly quad seal.

9,000-12,000 OPERATING HOURS

- Replace all lamps.
- Replace all quartz sleeve sealing O-rings.

MAINTENANCE LOGS

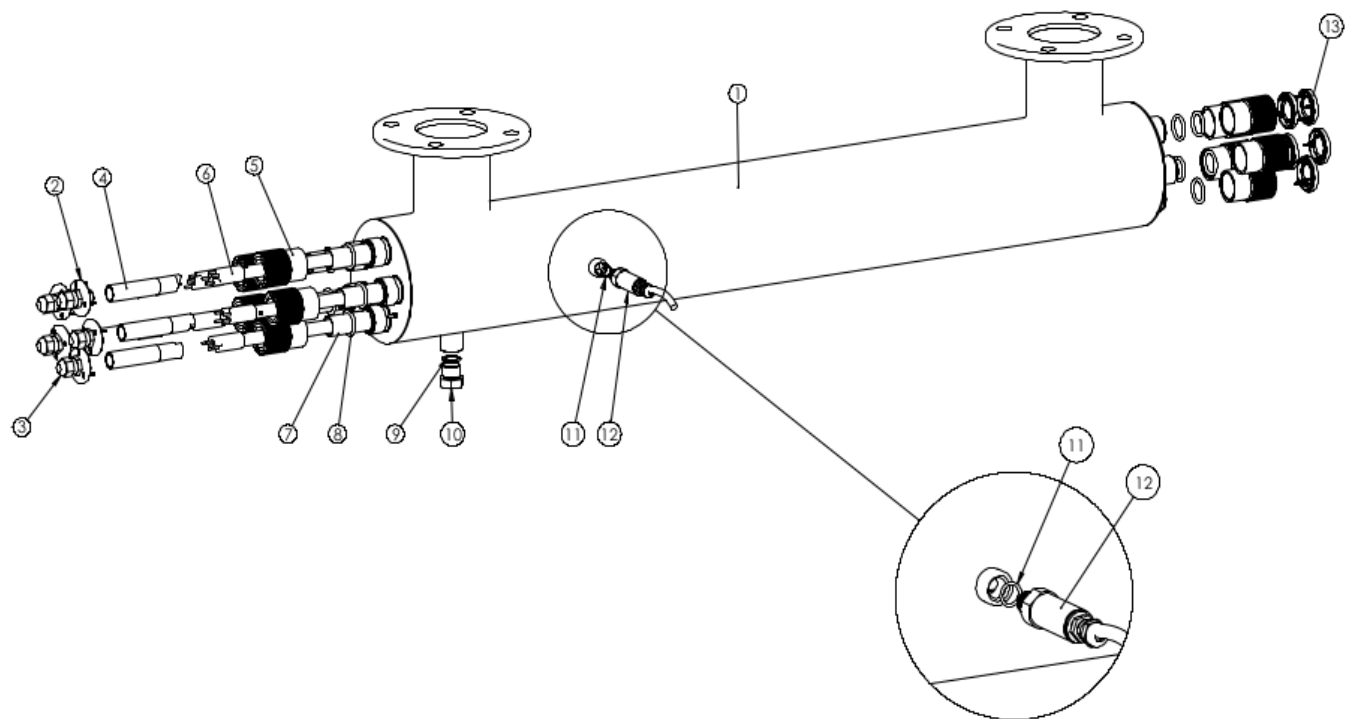
System Operating Parameters											
	Date	Time	Flow (Units _____)	UV Intensity UVR1	UV Intensity UVR2	UV Intensity UVR3	UV Intensity UVR4	UVR Temp. UVR1	UVR Temp. UVR2	UVR Temp. UVR3	UVR Temp. UVR4
Monday											
Tuesday											
Wednesday											
Thursday											
Friday											
Saturday											
Sunday											
	System Alarms (Y/N)	Lamp Hours/ Cycling UVR1	Lamp Hours/ Cycling UVR2	Lamp Hours/ Cycling UVR3	Lamp Hours/ Cycling UVR4	Operator / Signature and Comments					
Monday											
Tuesday											
Wednesday											
Thursday											
Friday											
Saturday											
Sunday											

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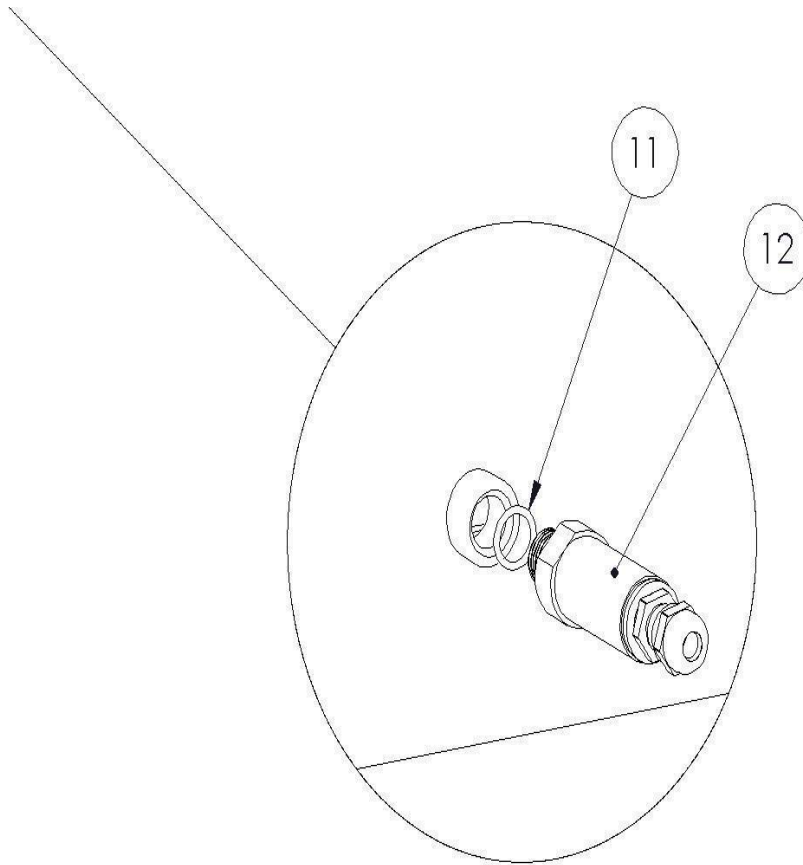
UV REACTOR LAYOUT

Note: The diagram below is for representation purposes only and the actual system may vary as per the specific model and variant purchased.



Note: The diagram below is for representation purposes only and the actual system may vary as per the specific model and variant purchased. Reactor Layout details of the Sensor.

REACTOR LAYOUT DETAIL



DESCRIPTION OF COMPONENTS

Cross-reference the below components against the Reactor Layout and Reactor Layout Detail A.

Sr.No.	Description
1	UV Reactor
2	Quartz sleeve sealing Nut End cover(Lamp End)
3	UV Lamp Harness Cable Gland
4	Locator
5	Quartz Sleeve Sealing Nut
6	UV Lamp
7	Quartz Sleeve
8	Quartz Sleeves Sealing O-Ring
9	UV Reactor Drain O Ring
10	UV Reactor Drain Plug
11	UV Sensor Sealing O-Ring
12	UV Sensor
13	Quartz Sleeve Sealing Nut End Cover (Opposite End)

UV LAMP

The IQ Series UV lamps are mounted inside the UV reactor. Each UV Lamp is housed within its own protective quartz sleeve, which protects it from water flow. The lamps and sleeves are supported by the quartz sleeve holder inside the reactor. The entire lamp and then the quartz sleeve can be removed for service.

The IQ Series germicidal UV lamp is a low-pressure, high intensity and

The frequency of UV lamp replacement will depend on various factors such as:

- Water temperature, max operating temperature= 45 °C
- Frequency of switching lamps ON and OFF
- Total operating time of the lamps. Maximum operating hours are 9,000 to 12,000 hours (depending on the specific model)

NOTE: DO NOT CYCLE LAMPS ON/OFF MORE THAN THREE (3) TIMES PER 24-HOUR PERIOD. CYCLING OF LAMPS ON/OFF MORE THAN 3 TIMES IN A 24-HOUR PERIOD MAY RESULT IN PREMATURE LAMP FAILURE AND VOID OF WARRANTY.

Use only quality replacement parts from Alfaa UV. Using any non-authorized lamps, quartz or spares in the UV system can affect the performance of the system and void the warranty.

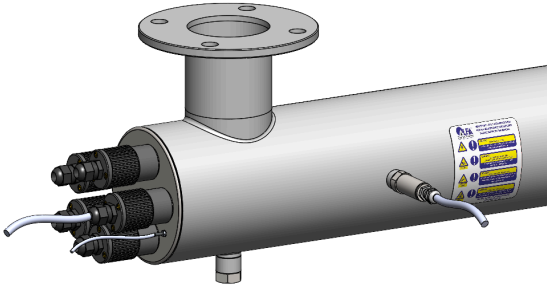
REMOVING THE UV LAMP

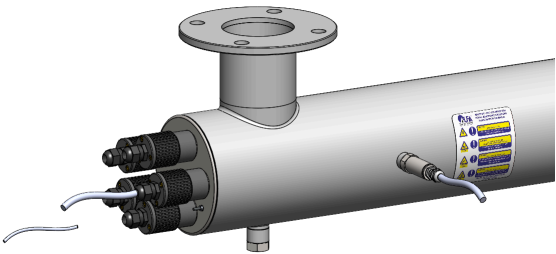
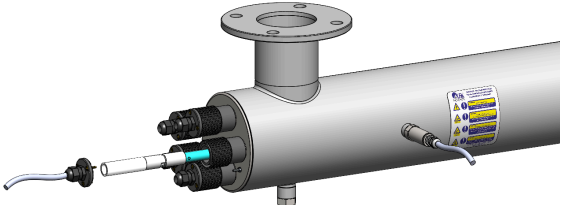
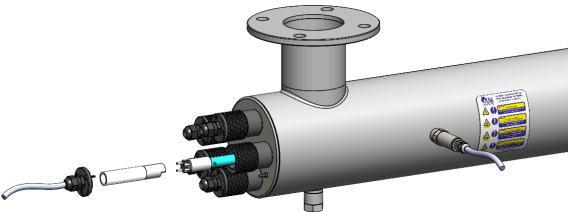
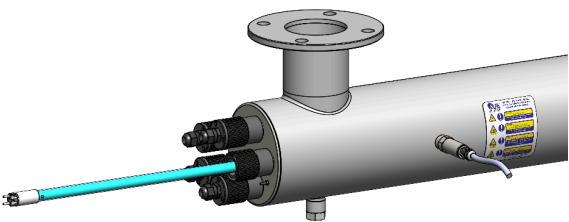
To replace the lamp, there is NO need to disconnect the system from the water supply or to drain the water from the reactor chamber. Lamp replacement is easy, requiring no special tools.

ENSURE THAT YOU DISCONNECT THE MAIN POWER SOURCE AND ALLOW THE UNIT TO POWER DOWN BEFORE PERFORMING THIS OPERATION.

Once that is done follow the instructions below to remove the UV lamp from the reactor.

Note: Diagrams below are for representation purposes only and the actual system may vary as per specific model and variant purchased.

1	Orient yourself with respect to the chamber so that the side with the lamp cable is facing you.	
---	---	--

2	Remove the nut and star washer holding the earthing ring in place and disconnect the wire (optional if your model includes this).	
3	Unscrew the three screws of the end cover. Now gently pull out the lamp harness and extract the lamp connector and UV lamp assembly from the UV reactor. WARNING: LAMP MIGHT STILL BE VERY HOT. IN THIS CASE PLEASE TAKE CARE BY USING GLOVES OR OTHER PROTECTIVE GEAR.	
4	Once you can visually see the lamp, separate the lamp from the connector by pulling them apart. Do not try twisting the connector as it will break. While it is OK to touch the ceramic ends of the lamp, avoid touching the UV lamp "glass" with your fingers. WARNING: TWISTING THE LAMP CONNECTOR OR PULLING IT FROM THE WIRES WILL BREAK IT.	
5	Carefully remove the lamp from the reactor chamber taking special care not to angle the lamp as it is removed. If the lamp is removed at an angle, pressure will be applied on the inside of the quartz sleeve, causing the sleeve to fracture and break.	

INSTALLING THE UV LAMP

To install the UV lamp back into the reactor, follow the instructions shown above in a reverse manner.

If the lamp life hours equal the system run hours the “W: REPLACE LAMP” alarm will be displayed on the UV controller indicating a fault condition. Once the new lamp has been installed you can reset the elapsed time. To perform a lamp replacement in the UV controller refer to the section Performing a lamp replacement.

CLEANING THE UV LAMP

The UV lamp should be handled with powder-free gloves. To remove accidental finger marks clean the UV lamp with isopropyl alcohol. Ensure the lamp is cool before doing this.

QUARTZ SLEEVE

Each IQ Series UV lamp is contained within its own quartz sleeves. The open ends of the sleeves are sealed against the UV reactor end plate by means of an o-ring compressed by the sealing nut. The quartz sleeves are made of clear fused quartz with a high level of UV transmissibility.

If the quartz gets scaled or dirty they can be removed and cleaned by following the instructions below.

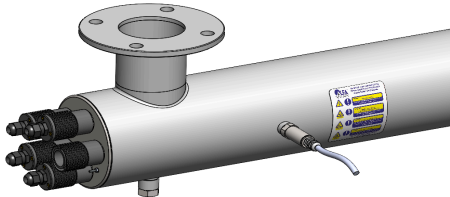
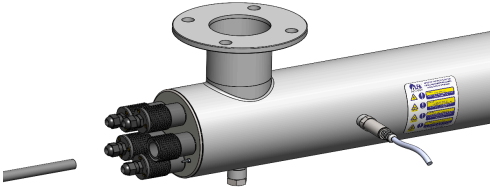
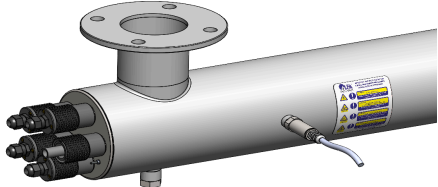
REMOVING THE QUARTZ SLEEVE

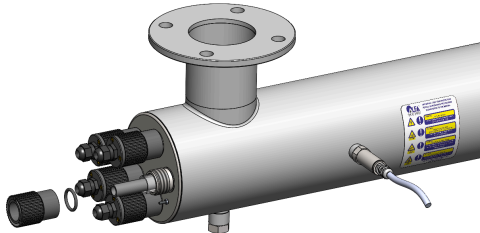
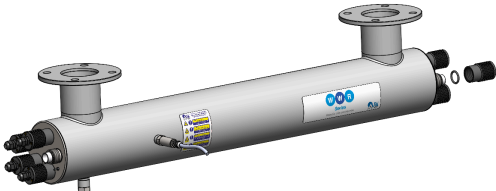
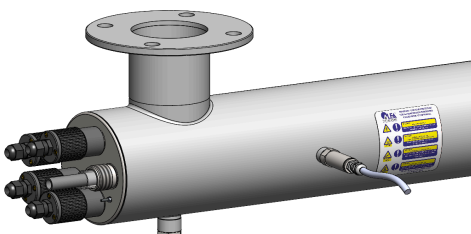
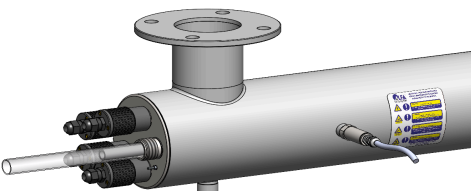
Before starting to remove the quartz sleeve ensure the following:

- Turn off the water flow through the UV reactor chamber. Isolate the UV reactor.
- Shut the power OFF at the control panel.
- Relieve the water pressure and drain the water from the chamber through the drain/valve provided on the UV reactor bottom.

Once this is done follow the instructions below to remove the quartz sleeve.

Note: Diagrams below are for representation purpose only and the actual system may vary as per specific model and variant purchased.

1	If the lamp is in the system, remove the lamp and carefully set it aside as described in the lamp removal section.	
2	Insert the provided guide rod which helps in the removal of the quartz sleeve. In case the guide rod is misplaced or unavailable, use any PVC rod with a length of approximately 2 meters and an outer diameter of 23 mm. PVC electrical pipes are suitable.	
3	Once the guide rod is fully inserted into the chamber ensure that there is a small portion of the rod emerging out from the opposite end of the reactor assembly.	

4	Unscrew the quartz sleeve sealing nut by rotating it in a counter clockwise direction. Do the same at the other end of the reactor.	
5	Remove the quartz sleeve sealing O-ring from the quartz sleeve and keep it carefully. Do the same at the other end of the reactor.	
6	While holding the provided guide rod in place at the opposite end, carefully slide the sleeve out of the chamber. In case it is initially tight, gently try rotating the QG while also pulling it out.	
7	Make sure that the sleeve is not at an angle as otherwise pressure will be applied on the sides of the sleeve and against the reactor chamber causing the sleeve to fracture. WARNING: USE THE PROVIDED GUIDE ROD AS A SUPPORT OR ELSE THE QUARTZ SLEEVE CAN “FALL” INSIDE THE REACTOR WHILE REMOVING AND BREAK.	

Once the quartz sleeve is removed from the system it can either be cleaned or replaced with a new sleeve as required.

CLEANING THE QUARTZ SLEEVE

The quartz sleeve forms the barrier between the UV lamp and the water under treatment. It is essential that the sleeve is kept clean otherwise there will be a reduction of the UV light which will reduce the effectiveness of treatment.

Mild acid solutions can be used for cleaning the sleeves. Acid solutions can be bought commercially or diluted from industrial-strength acids.

- 15% Phosphoric Acid
- 5% Nitric Acid
- 10% Citric Acid

Steps

1. The quartz sleeves should not be handled without gloves. Only use powder-free gloves.
2. If it is lightly soiled then the outside of the quartz sleeve may be wiped with isopropyl alcohol. A soft paper tissue may be used for the initial cleaning but the final cleaning should be done with a lint free cloth. If available, a final rinse and clean with clean water can also be carried out.
3. If it is highly soiled then the outside of the quartz sleeve can be cleaned by a non-abrasive cloth soaked in one of the cleaning solutions listed above and wiped along the length of the quartz sleeve.
4. After cleaning, rinse the acid solution thoroughly from the sleeves with distilled water. Ensure you don't use hard water as it will stain the sleeve.
5. Inspect the interior of the sleeve before installation to make sure they are clean and dry. Clean the interior of the Sleeves with alcohol if they have been exposed to water or acid solutions.

INSTALLING THE QUARTZ SLEEVE

Install/reinstall the cleaned or new quartz sleeve in reverse order.

Carefully slide the quartz sleeve into the reactor through the QG socket until it is locked into place in the internal QG holder. Ensure that the sleeve is inserted straight and not at an angle as doing so will put pressure on the wall of the sleeve and can cause it to crack.

DO NOT FORGET TO INSTALL THE QUARTZ SEALING O-RING ONTO THE SLEEVE UNTIL IT RESTS AGAINST THE QG SOCKET BEFORE RE-TIGHTENING THE SEALING NUT.

ALFAA UV RECOMMENDS INSTALLING NEW QUARTZ SEALING O-RINGS EVERY TIME THE QUARTZ IS REMOVED OR REPLACED.

SAFETY INSTRUCTIONS OF CONTROL PANEL

WARNING - to guard against injury, basic safety precautions should be observed, including the following:

1. Read and follow all safety instructions.
2. **Danger** - To avoid possible electric shock, special care should be taken since water is present near electrical equipment. Unless a situation is encountered that is explicitly addressed by the provided maintenance and troubleshooting sections, do not attempt repairs yourself. Instead, please contact our technical support division.
3. Connection this system only to AC Power that conforms to the system rating as regards voltage and voltage specifications.
4. Do not operate the UV System if it has a damaged cord or plug if it is malfunctioning or if it is dropped or damaged in any manner.
5. If an extension cord is necessary, a cord with a proper rating should be used. A cord rated for less Amperes or watts than the UV System rating may overheat. Care should be taken to arrange the cord so that it will not be tripped over or pulled.
6. Always use proper safety equipment, including appropriate gloves, safety glasses & face shields.
7. Always be cautious when working near high-voltage power lines.

IQ series range of ultraviolet systems from Alfaa UV. Each unit is designed to provide safe, reliable disinfection performance year after year with minimal maintenance.

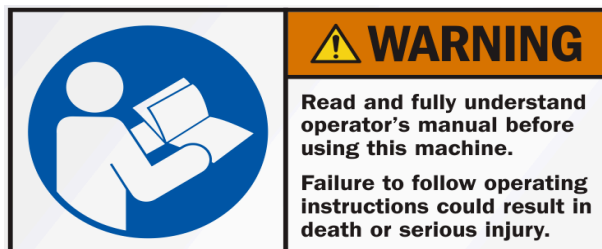
HIGH VOLTAGE



Risk of Severe Electric Shock or Death

- Authorized Personnel Only
- Wear Appropriate PPE
- Keep a Safe Distance

READ USER MANUAL BEFORE OPERATING



For your protection, please refer to the manual for all maintenance procedures.

CONTROL PANEL

The main controller comprises ABS, SS, and a powder-coated MS enclosure. The controller is connected to the chamber via 5 meters of cable to allow for application flexibility.

STANDARD ELECTRONICS

All control boxes are equipped with MCB on/off the panel. When the main power to the system is turned on, the lamp will turn on directly.

A seven-segment LED display monitors the remaining number of useful hours of the UV lamp (Time Elapse Meter) and the days the UV system has been in operation.

An audio-visual “Lamp Life Over” and “Lamp Failure” indicator.

The IQ Series purchased with the UV Intensity meter option includes a built-in UV Intensity meter along with a sensor.

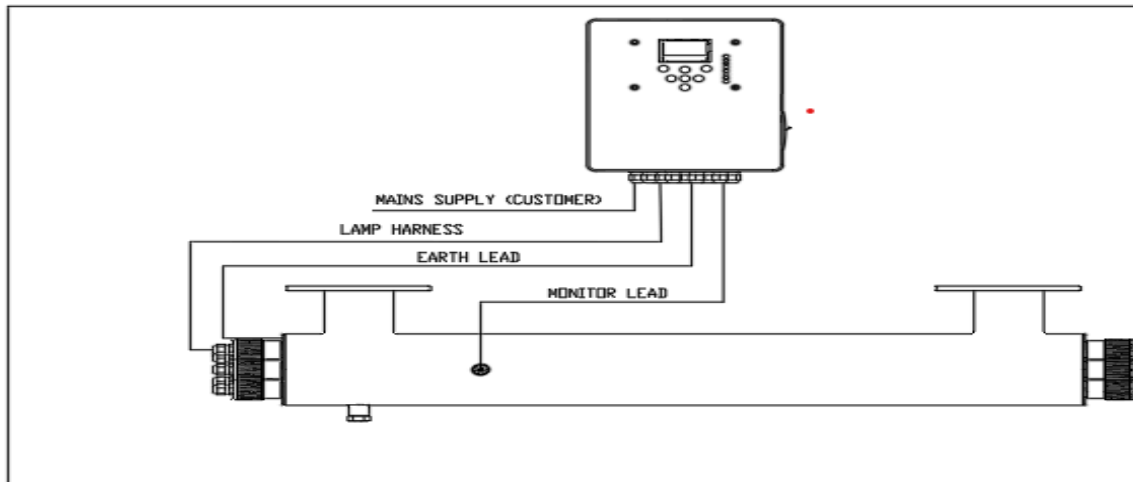
If the system is supplied with Lamp distribution ballast is installed in a separate control panel. for this scenario refer wiring diagram for the connection if you need any further help please contact our service center

CONTROL SYSTEM

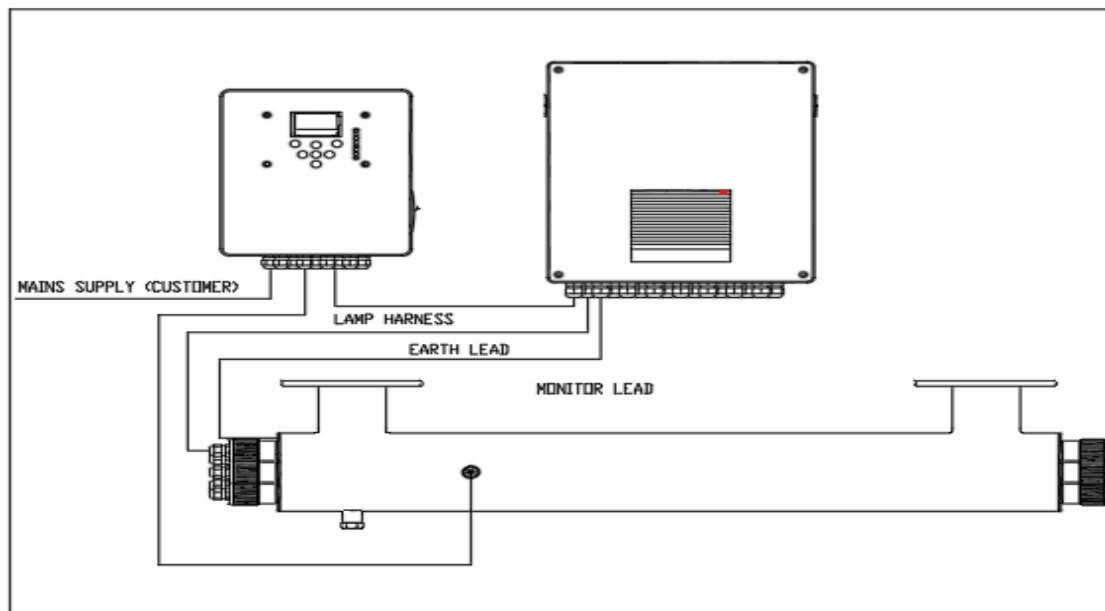
CONTROL SYSTEM OVERVIEW

Each IQ Series UV system is designed to treat water at specified flow rates as the technical specification sheet outlines. All units have three main components: the ultraviolet reactor chamber, the main control panel, and the UV intensity sensor.

IQa with Integrated UV controller with (UVM)



IQa with UV Controller and Lamp Distribution HUB with (UVM)



Note: The diagram above is for representation purposes only and the actual system may vary as per the specific model and variant purchased.

INSTALLATION

INSTALLATIONS GUIDELINES

1. Ensure that the UV controller display and keypad on the control panel are at eye level and easily viewable. Mount the control panel at a height from the floor as a precaution against water flooding.
2. When mounting the control panel on the wall, ensure there is at least a 15-cm (6 inches) of air space around the sides of the panel for sufficient cooling of the inner electronic components. The more air space there is around the control panel the more efficient the cooling will be.
3. The maximum cable length between the control panel and the UV reactor is 3.5m. Plan the location of the reactor and panel accordingly. Do not attempt to increase the length of this wire in any way.
4. The main supply cable to the control panel is already pre-wired. This is connected to the control panel through one of the available inlet ports on the bottom of the panel and is wired directly to the terminal blocks. In case a longer run of wire is required this wire may be replaced, but ensure that the correct gauge wire is used and the connections done properly. Refer to the electrical wiring diagram for more information.
5. Ensure that a situation does not arise where the system is running dry (without water) or where the water is stagnant inside the system. This situation can cause the reactor to overheat damaging the lamps, ballasts, and other electrical systems. If such a situation may arise, provide a bleed valve so that there is always a minimum flow through the UV reactor.

UV INTENSITY SENSOR CALIBRATION RESETTING

In case of a new installation or when the lamp is replaced with a new one, it is important to reset the sensor calibration settings. This must also be performed in case a new sensor is being fitted to the system.

Follow the procedure as described on page 14 to perform this operation.

USING THE IQ SERIES CONTROLLER (WITH UV INTENSITY METER)

CONTROL SYSTEM OVERVIEW

The IQ Series control panel provides control and monitoring of the UV reactor. The system is controlled using a UV controller located in the Control Panel which has a 5-digit seven-segment LED display along with 4 LEDs for status information. The controller can provide the following information and alerts:

- UV intensity (in %).

- UV intensity (in W/m^2).

- Operating hours of the UV Lamps.

- Alarm in case of lamp failure.

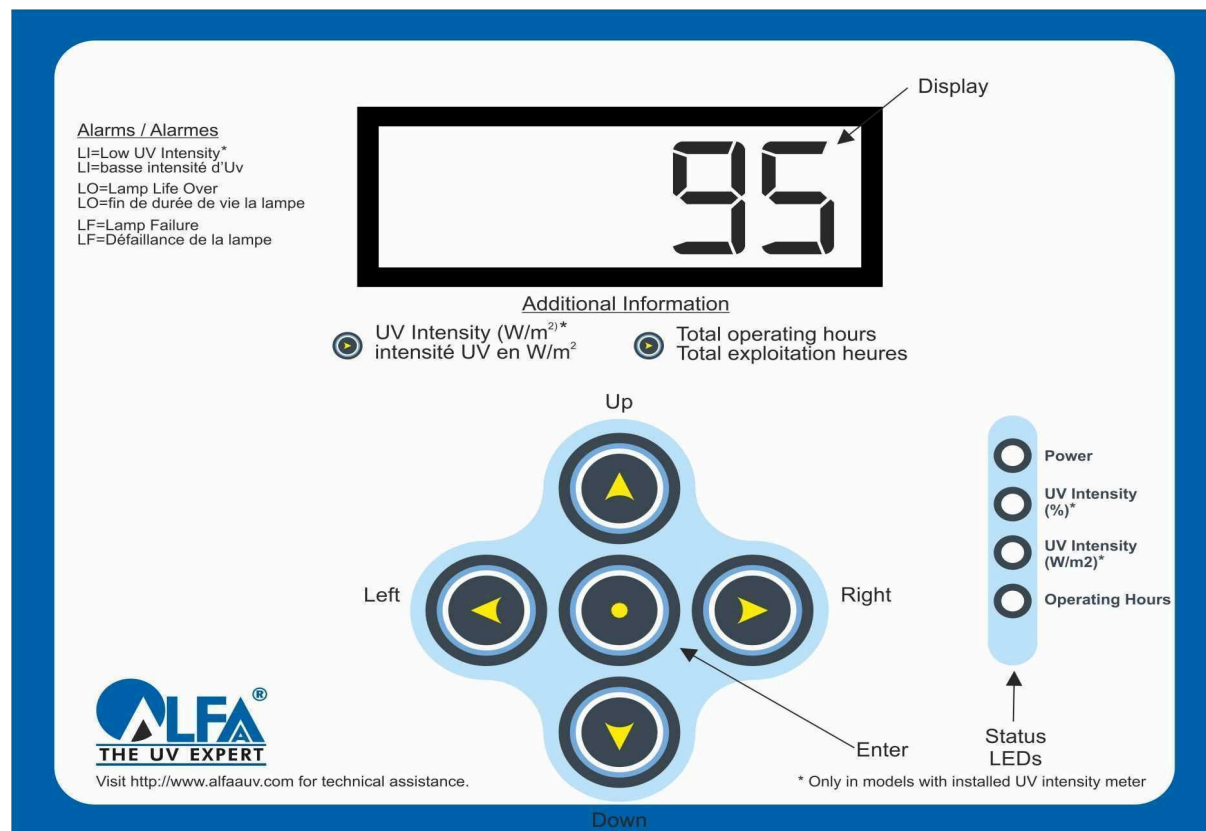
- Alarm in case of lamp life operating hours being exhausted.

- Alarm in case of UV intensity dropping below the critical setpoint.

The main incoming power supply provides power to the entire control panel.

In the event of a loss of power to the controller, the system shall retain the control program and user settings in memory.

CONTROLLER LAYOUT



KEYS

The IQ Series UV controller has 5 keys which are used to navigate the software and input user settings.

- Left / Right: These are normally used to navigate between various screens on the controller, each of which shows different information.
- Up / Down: These are normally used to enter numeric parameters into the software.
- Enter: Used to confirm input to the controller.

DISPLAY

The controller features a 5-digit seven-segment LED display which communicates the various aspects of the working of the UV system in addition to being used to configure and customize the controller. The information on the display changes as the user navigates the various screens and menus.

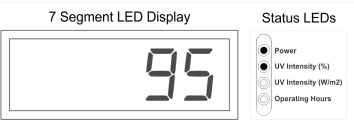
STATUS LEDS

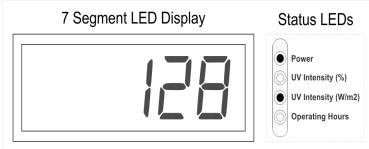
In addition to the display the controller also includes 4 status LEDs which informs the user as to what information is currently being displayed on the 7-segment LED display. The LEDs are as follows

Sr	LED Label	Description
1	POWER	LED ON: Indicates that the power to the UV control panel and controller is turned ON. LED OFF: Power to the panel and the controller is turned OFF.
2	UV INTENSITY (%)	LED ON: Indicates that the numeric display on the 7-segment LED is currently showing the intensity of the UV reactor in percentage terms. This is the default mode.
3	UV INTENSITY (W/m ²)	LED ON: Indicates that the numeric display on the 7-segment LED is currently showing the intensity of the UV reactor in absolute terms (in W/m ²). This mode can be reached by pressing the right arrow key from the above mode.
4	OPERATING HOURS	LED ON: Indicates that the numeric display on the 7-segment LED is currently showing the number of hours the UV lamp has been operated. When the lamp run hours exceed the lamp life, the controller will sound an alarm.

DISPLAY MESSAGES

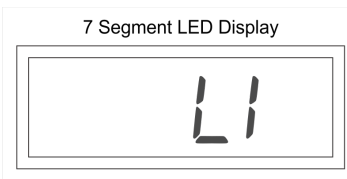
The 5-digit seven-segment LED display can provide the following information to the user in conjunction with the status LEDs also on the controller.

Display / Status LED Combination	Information
	(Default) The controller is currently showing the intensity of the UV reactor in percentage terms. This is the default mode. The normal operating range is between 50% - 120%. Please refer to the section

	regarding UV Intensity Levels on page 23 for more information.
	The controller is currently showing the intensity of the UV reactor in absolute terms in W/m^2. The absolute intensity varies from model to model and is used for troubleshooting and certain regulatory purposes only. To see this screen from the default screen press the right key: 
	The controller is currently showing the number of hours the UV lamp has been operated for. When the lamp run hours exceed the lamp life, the controller will sound an alarm. Please refer to the section on replacing the lamp for information on how to reset this counter. To see this screen again press the right key: 

ERROR CONDITIONS

In case of any error condition, the controller will flash an error message on the display and also sound the built-in audio alarm. Following is a list of the error conditions along with the meaning.

Display / Status LED Combination	Information
	<u>Error</u>: Low UV Intensity <u>Solution</u>: The system is indicating a low UV intensity. This could be due to many reasons such as poor quality water, fouling or scaling on the quartz glass, or fouling on the UV intensity sensor window. Perform a full service of the system and clean the quartz sleeve and sensor window as per the guidelines provided and check again.

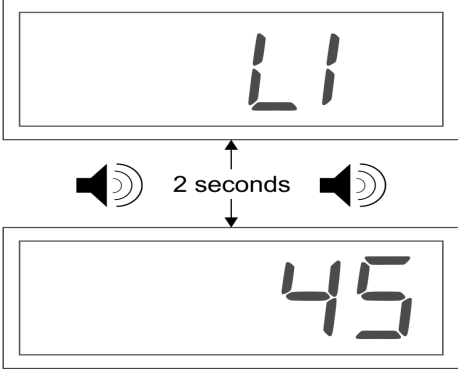
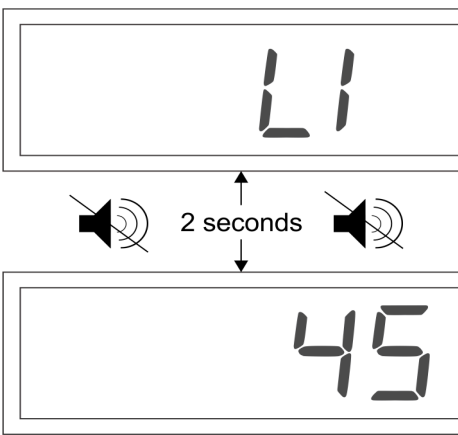
7 Segment LED Display  A 7-segment LED display showing the characters 'Lo' in a digital font. The 'L' is formed by the left vertical bar, the bottom horizontal bar, and the bottom-right vertical bar. The 'o' is formed by the top horizontal bar, the bottom horizontal bar, and the two vertical bars on the right.	<u>Error</u>: The life of the UV lamp is exhausted and needs replacing. <u>Solution</u>: Replace the UV lamp and reset the lamp life counter as described in the following section.
7 Segment LED Display  A 7-segment LED display showing the characters 'LF' in a digital font. The 'L' is formed by the left vertical bar, the bottom horizontal bar, and the bottom-right vertical bar. The 'F' is formed by the top horizontal bar, the middle horizontal bar, and the right vertical bar.	<u>Error</u>: The lamp or ballast has failed. <u>Solution</u>: Replace the UV lamp and check the system. If the problem still persists contact Alfaa UV customer support.

USER ACCESSIBLE FUNCTIONS

There are certain functions as follows that the user can carry out as and when required.

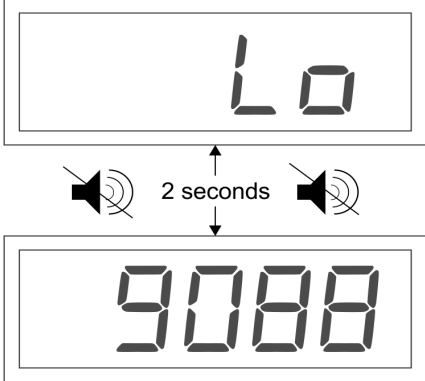
ACKNOWLEDGE ERROR CONDITION

In case of any fault condition, the controller sounds an audio alarm and energizes the common fault OF contact in addition to flashing the error message on the screen (as described above). To acknowledge the error condition and reset the audio alarm and common fault contact do the following.

Ensure that the system has not already been reset by making that the audio alarm is still sounding, and that the error is still flashing on the screen.	 Display Alternating Between Value and Error Condition with Audio Alarm Activated
Press the Enter Softkey for 3 seconds. System will acknowledge the alarm and turn off the audio alarm and de-energize the common fault relay contact.	 Display Alternating Between Value and Error Condition with Audio Alarm Deactivated

RESET THE LAMP LIFE HOUR COUNTER

When the life of the UV lamp is exhausted and is replaced, the controller needs to reset the operating hours of the lamp by performing the following procedure.

Ensure that the replacement lamp error message is being displayed and that the alarm has been acknowledged by following the instructions in the previous section.	 Display Alternating Between Value and Error Condition with Audio Alarm Silent
 Press and keep pressed the Left and Right keys together for 6 seconds. System will ask for confirmation of reset.	 Confirmation Message
 Press the Enter key. System will BEEP as an audio confirmation that the process has been completed successfully. Display will now show 0, indicating that the hour counter has been reset.	 Reset Hour Counter

RECALIBRATING THE UV SENSOR

The UV intensity sensor requires an annual calibration at the authorized Alfaa UV service center. However, whenever the lamp or sensor is replaced, the interface between the sensor and the UV controller also needs to be recalibrated. Follow the instructions below to perform this procedure.

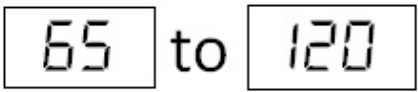
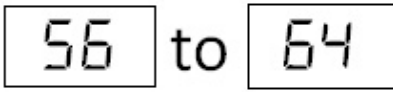
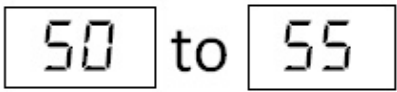
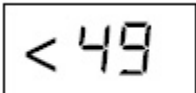
Before recalibrating the UV sensor ensure the following:

1. There is a proper flow of water through the UV reactor.
2. The system has been turned on for at least 30 minutes with steady water flow.
3. Steady-state conditions have been reached.

Ensure that there are no error conditions on the display or if there are, they have properly been acknowledged as per the instructions above. Ensure that the display is on the default display which shows the UV Intensity in percentage terms.	7 Segment LED Display  Status LEDs - Power - UV Intensity (%) - UV Intensity (Wim2) - Operating Hours Display Showing the UV Intensity in %
 Press and keep pressed the UP and DOWN keys together for 6 seconds. System will ask for confirmation of re-calibration.	7 Segment LED Display  Status LEDs - Power - UV Intensity (%) - UV Intensity (Wim2) - Operating Hours Confirmation Message
 Press the Enter key. System will BEEP as an audio confirmation that the process has been completed successfully. Display will now show 100% indicating that the sensor and controllers have successfully been recalibrated.	7 Segment LED Display  Status LEDs - Power - UV Intensity (%) - UV Intensity (Wim2) - Operating Hours Display After Recalibration

UV INTENSITY LEVELS

The following are the UV Intensity levels and their implications:

	Indicates the system is functioning within normal a normal operating range
	Indicates the UV level is still within a safe level, however at this level the system should be examined to determine why the UV level is this low.
	Indicates the UV level is nearing the point of unsafe UV intensity, at this level the system should be closely examined to determine why the UV level is this low.
	indicates the UV level has now reached a level that is unsafe. At this level the water should not be consumed. The system/water supply should be examined to determine the reason for the low UV level of the UV intensity. At this level, the system will flash a low intensity message  on the display alternating with the actual UV intensity percentage.

USING THE 4-20 MA ANALOG OUTPUT FOR PLC CONNECTIVITY

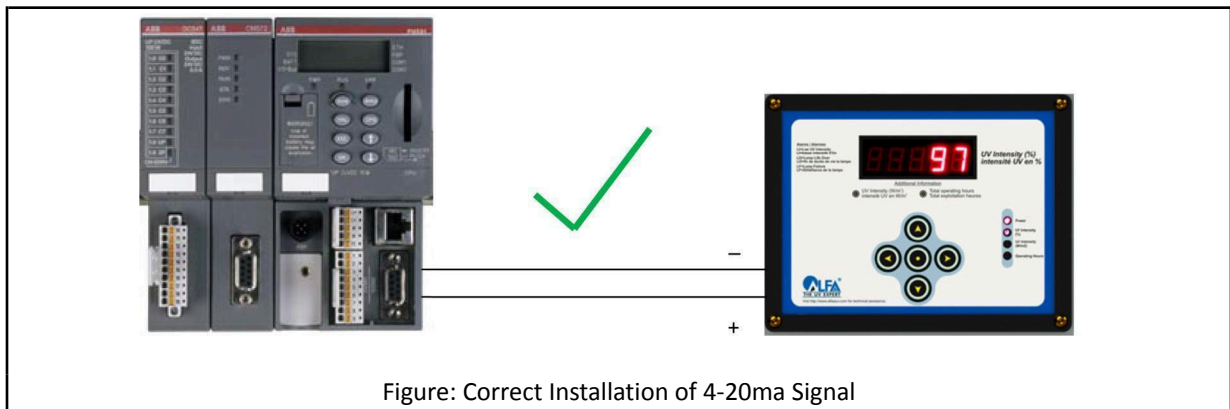
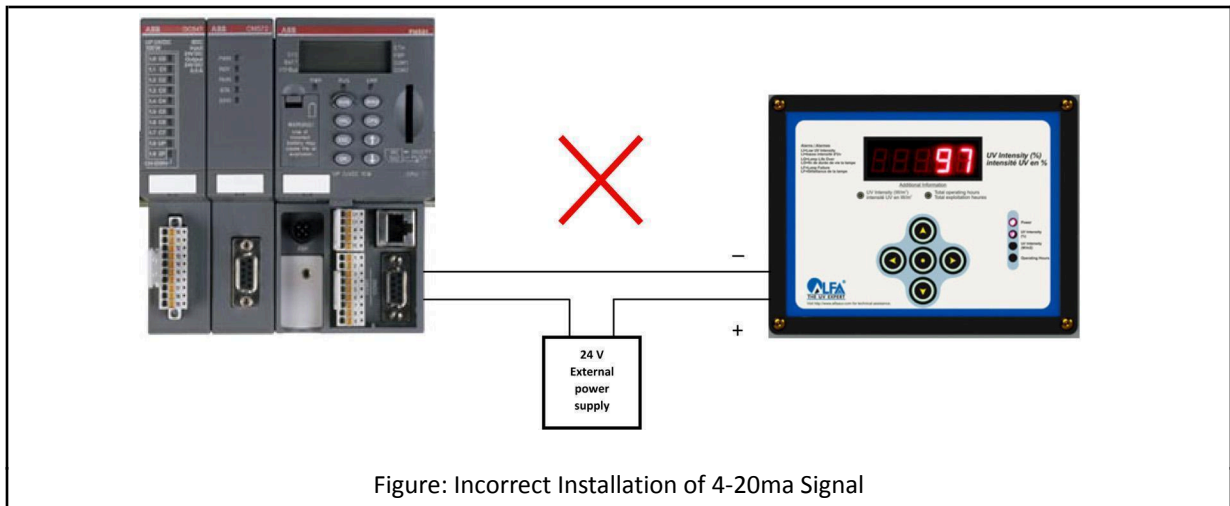
The UV controller provides a **two-wire** 4-20 mA analog output on the PCB to interface with a PLC/SCADA system. To use this function connect the output from the UV controller to the analog input of the PLC and set the range as follows:

- 4 mA = 0% 4 mA = 0 W/m²
- 20 mA = 120% 20 mA = 100 W/m²

By default, the controller outputs the UV intensity as a percentage as per the above range. In specific cases where the absolute UV intensity needs to be transmitted, please contact Alfaa UV customer support.

IMPORTANT NOTES

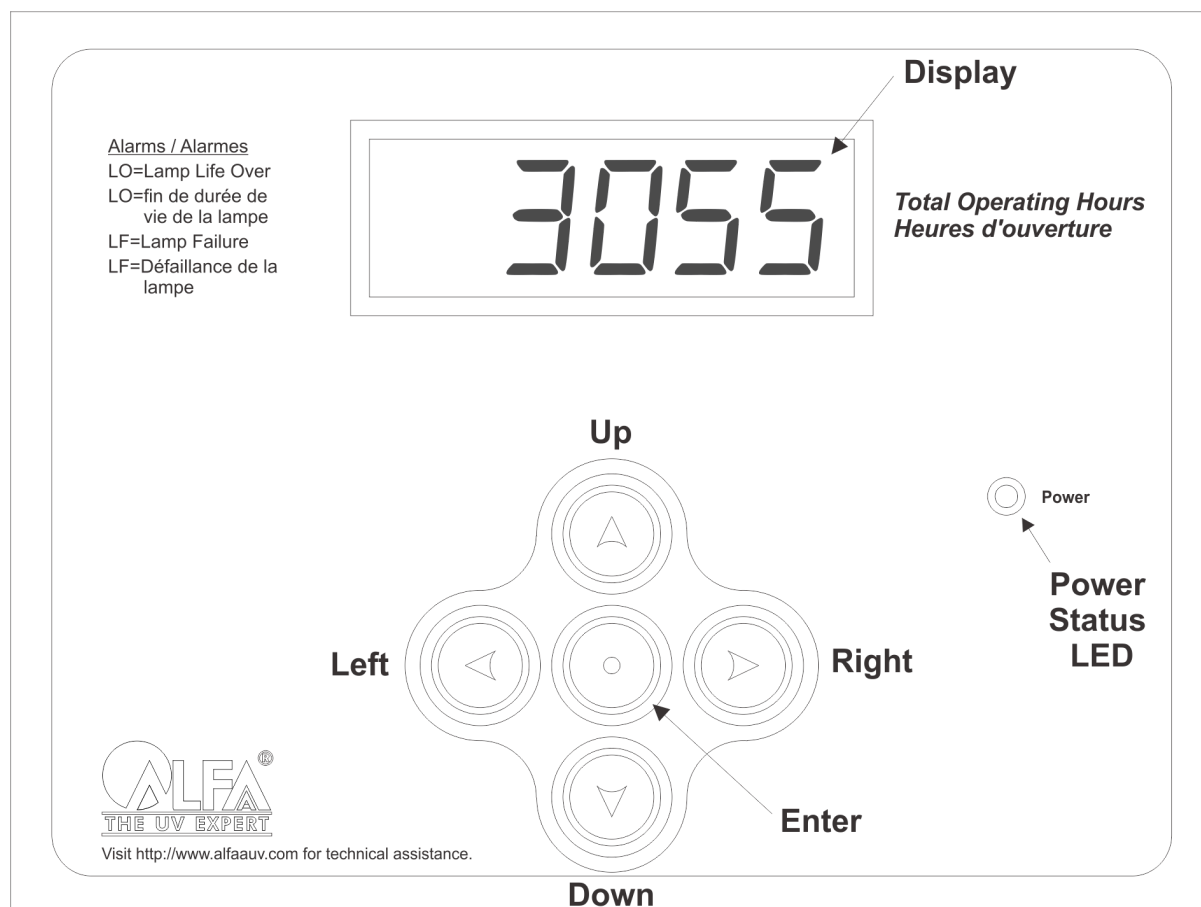
1. Interface wire should be two core shielded cables. Avoid the use of multi-core wire as it causes EMI interference. The shield should be grounded at one end
2. This is 2 wire analog output and does not connect to an external power supply. It will damage the UV controller permanently.



USING THE IQ SERIES CONTROLLER (WITHOUT UV INTENSITY METER)

MODELS WITHOUT INCLUDED UV INTENSITY SENSOR ONLY

CONTROLLER LAYOUT



DISPLAY

The controller features a 5-digit seven-segment LED display which displays the number of operating hours of the lamp. In addition to this, it can also display an error in case of lamp life over or lamp failure.

RESET LAMP LIFE COUNTER

Follow the instructions provided for resetting the lamp life for the model with the integrated UV intensity monitor

PACKAGING

1. Planning and Preparation

- Gather Materials: Obtain all necessary packing materials such as boxes, bubble wrap, packing paper, tape, labels, and markers.
- Create a Checklist: List all items to be packed and their corresponding boxes.

2. Choosing the Right Packing Materials

- Boxes: Use sturdy boxes appropriate for the weight and size of the items.
- Padding: Use bubble wrap, foam for fragile items.
- Packing Paper: Wrap items to prevent scratches and provide additional cushioning.
- Sealing Tape: Use strong tape to secure boxes.

3. Packing Items

- Line Boxes: Start by lining the bottom of the box with a layer of padding (e.g., crumpled paper or bubble wrap).
- Wrap Items: Individually wrap fragile items.
- Place Heavier Items First: Place heavier items at the bottom of the box.
- Fill Gaps: Use packing paper or bubble wrap to fill any gaps, preventing movement.
- Layering: If layering items, add a protective layer between each layer.
- Seal Boxes: Securely tape the top and bottom seams of the box.

4. Labeling

- Label Boxes: Clearly label each box with its contents and destination room.
- Fragile Items: Mark boxes containing fragile items with “FRAGILE” and “THIS SIDE UP.”

5. Final Checks

- Weight Check: Ensure boxes are not too heavy to lift safely.
- Shake Test: Gently shake boxes to check for movement; if items shift, add more padding.
- Seal and Label: Double-check that all boxes are securely sealed and properly labeled.

TRANSPORTATION :

6. Transport and Storage

- Determine Requirements: Identify the type, size, weight, and quantity of goods to be transported.
- Loading Order: Load heavier boxes at the bottom and lighter ones on top.
- Avoid Stacking Fragile Boxes: Keep boxes with fragile items on top or in a separate, safe area.

7. Documentation

Inventory List: Keep an inventory list of packed items for reference and insurance purposes.

WARRANTY

If, within 12 months from the date of original purchase, any component or any part of the Alfaa UV system covered by this Warranty proves to be defective in material or workmanship, Ace Hygiene Products Private Limited will at its discretion replace, repair or rectify the equipment.

Terms and Conditions of Warranty:

1. Usage must be in accordance with the instructions in the Operating Manual. The Warranty does not cover wrong application of the equipment over and above the specified flow rates, pressure and electrical ratings.
2. Consumable components such as ultraviolet lamps, etc are not covered by this warranty.
3. The Warranty shall immediately cease and become full and void if unauthorized repair, alteration or modification is made to the product.
4. The serial number must not be defaced or altered in any way.
5. The Warranty extended herein is in lieu of all implied conditions and warranties under the law and is confined to the repair or replacement of defective parts and does not cover any direct or consequential damage/loss caused due to failure of the product.
6. In case of any defect/malfunctioning of the equipment it shall be intimated to us in writing and only after our content in writing the equipment may be sent back for rectification. The equipment shall be returned by the purchaser in securely packed condition and on freight paid basis.
7. Subject to Mumbai Jurisdiction.

MODEL NUMBER: _____

SERIAL NUMBER: _____

INVOICE NUMBER: _____

For ACE HYGIENE PRODUCTS PVT. LTD.,

AUTHORIZED SIGNATORY



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