

UV-GUARD™



S-Series™

Protect your water from pathogens and disease with the UV-Guard S-Series.

The S-Series is a robust and dependable UV disinfection system able to provide recommended UV dose rates at flows of up to 737 liters per minute, from commercial business installations to hospitals, mining camps and more.

Accredited by the WaterMark certification scheme, a requirement documented within The Plumbing and Drainage Code Australia, making the S-Series food grade compliant.

Flow rates are calculated using complex UV dosage programs and are based on the requirements of the Austrian, German and USA NSF 55 'Class A' UV water disinfection standards.

Free UV transmittance (UVT) testing performed on request to ensure correct system is specified*.

Protect:

- Remote communities, employees, customers and family members from E.coli, Giardia and Cryptosporidium contained within drinking water supplies.
- Water treatment processes from microbial colonisation.
- Fish farms from disease outbreaks resulting in greater yields and a better quality product.
- Display fountains and ponds from algae, increase aesthetic qualities and enabling safe human contact.
- Pool users from bacteria and viruses, eliminate algae, reduce chlorine use by up to 90% and create a more pleasant experience.
- Residents from Legionella found within warm water systems.
- Food and beverage products from bacteria, viruses, spores, yeast and mold without any detrimental impact on product quality.
- Pharmaceutical products and processes where ultra-pure water is essential.
- Any other water user or water using process where disinfection is required!



Benefits

- No micro-organism is known to be immune to UV - even the chlorine resistant Giardia and Cryptosporidium
- Economical and efficient operation – disinfecting at the point of use, no contact time required
- No harmful by-products – chemical free, no impact on taste or colour and no corrosion problems
- No risk of overdosing – reducing the risks associated with chemical overdosing
- Easy maintenance – lamp can be replaced easily without interrupting water flow
- Proven performance and flexibility – system designed according to application and project requirements
- Peace of mind – power supplies show when lamp is in operation and audibly alerts any faults.



Options

- Lamp life run counter and alert – to indicate when the lamp needs replacing
- Volt free contacts - for remote system status indication
- Industrial IP rated outdoor power boxes and indoor power supplies – customized to suit your requirements
- Temperature management – thermostat and solenoid valve linked to power box to ensure unit temperature does not increase to unsafe levels
- UV intensity monitoring – real time monitoring to alert when design UV intensity is not being achieved
- Manual and automatic wiping mechanisms** – ensure the quartz remains in good condition, limiting fouling and ensuring design UV intensity is continuous

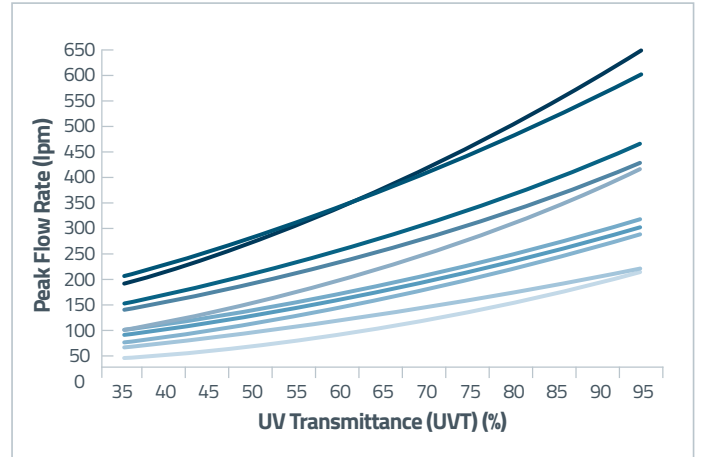
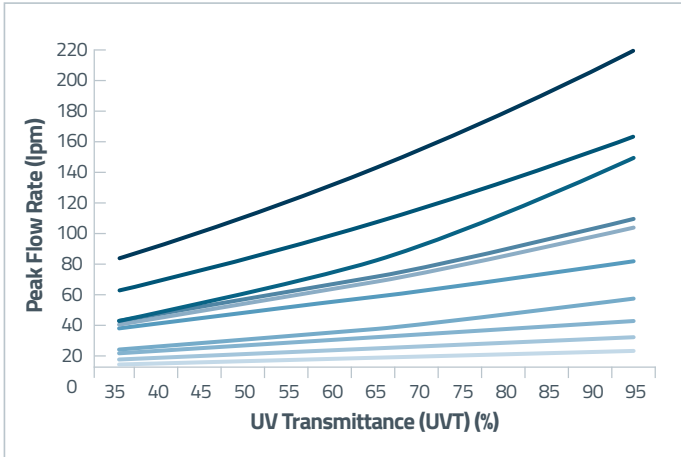


Standard Features

- Systems accredited by the WaterMark certification scheme – guaranteeing quality and fit for purpose
- High quality 316 grade stainless steel reactor – ensures longevity of the system
- BSP threaded connections in a number of inlet/outlet location choices – for ease of connection to plumbing infrastructure
- Heavy duty stainless steel brackets – system permanently mounted securely
- Lamp fail alarm – alerts user and prevents untreated water from being consumed
- Innovative high output, low pressure UV lamps – target UV dose is maintained throughout lamp life
- Pure fused quartz sleeves – allows optimum UV output from the lamp to the water
- Lamps parallel to water flow – water disinfected from chamber entry point to exit



S-Series - peak flow vs UVT graph for 40 mJ/cm²

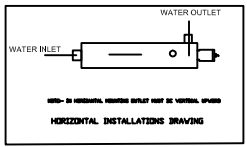
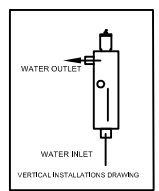
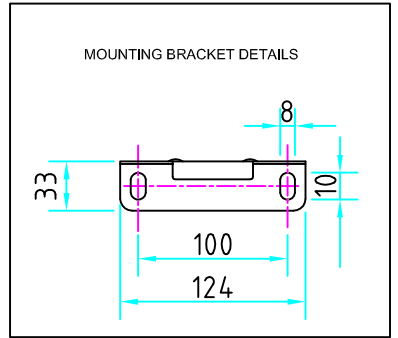
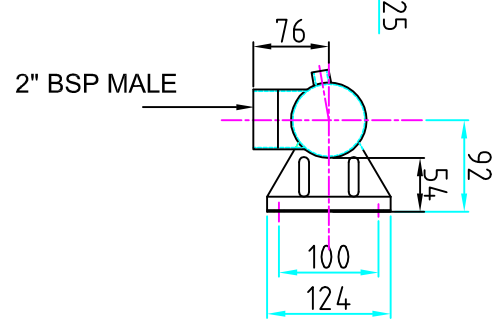
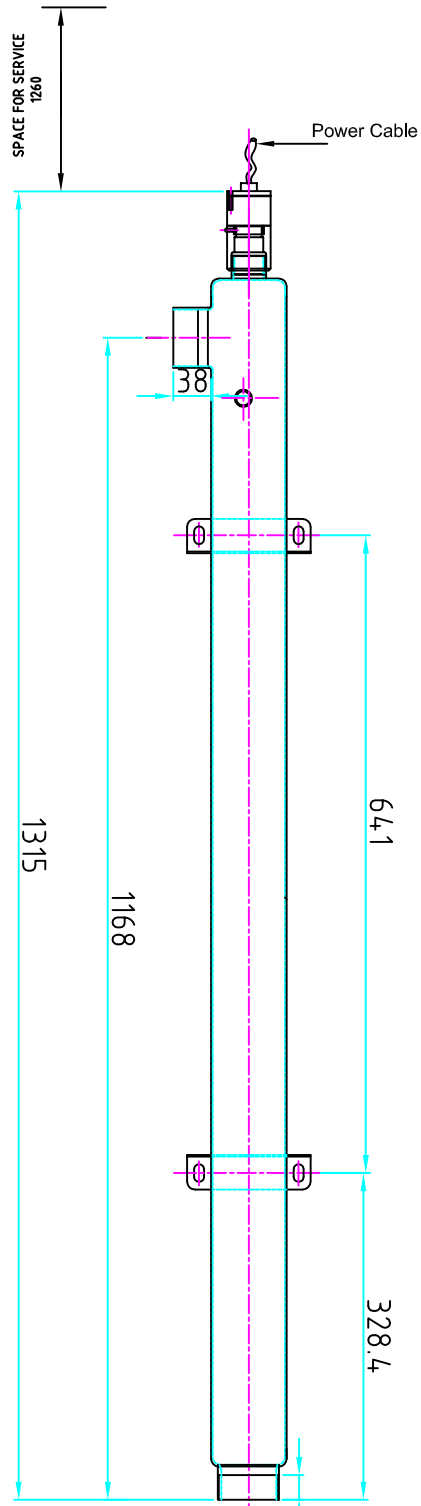


- S20
- S30
- S40-62
- S40-76
- S40T
- S125-100
- S160
- S160-100
- S245
- S125T
- S75
- S80
- S80-100
- S125
- S172
- S245-100
- S172T
- S160T
- S245T
- S440

Model	Flow rate per UV Dose figure***		Connection	Lamp Power (W)	Dimensions (cm)
	40mJ/cm ²	30mJ/cm ²			
UVG S20	17 lpm	23 lpm	¾" male BSP	20	32l x 6.2w
UVG S30	25 lpm	34 lpm	¾", 1" male BSP	30	59l x 6.2w
UVG S40-62	35 lpm	46 lpm	1" male BSP	40	97l x 6.2w
UVG S40-76	45 lpm	60 lpm	1", 1½" male BSP	40	97l x 7.6w
UVG S40T	69 lpm	92 lpm	2" male BSP	40 x 2	97l x 29w
UVG S75	90 lpm	120 lpm	1", 1½" male BSP	80	97l x 7.6w
UVG S80	86 lpm	115 lpm	2" male BSP	80	97l x 7.6w
UVG S80-100	118 lpm	157 lpm	2" male BSP	80	97l x 10w
UVG S125	137 lpm	183 lpm	2" male BSP	125	97l x 7.6w
UVG S172	186 lpm	248 lpm	2" male BSP	172	97l x 7.6w
UVG S125-100	188 lpm	250 lpm	2" male BSP	125	97l x 10w
UVG S160	203 lpm	270 lpm	2" male BSP	160	128l x 7.6w
UVG S160-100	271 lpm	361 lpm	2" male BSP, 3" Table E Flange	160	128l x 10w
UVG S245	263 lpm	351 lpm	2" male BSP	245	128l x 7.6w
UVG S125T	275 lpm	366 lpm	2" male BSP	125 x 2	97l x 29w
UVG S245-100	358 lpm	478 lpm	2" male BSP 3" Table E Flange	245	128l x 10w
UVG S172T	372 lpm	496 lpm	2" male BSP	172 x 2	97l x 29w
UVG S160T	406 lpm	541 lpm	2" male BSP	160 x 2	128l x 29w
UVG S245T	527 lpm	702 lpm	2" male BSP	245 x 2	128l x 29w
UVG S440	553 lpm	737 lpm	3" Table E Flange	440	154l x 10w



* UVT testing provided free of charge following a system order. **No wiper option for S20 and S30 chambers. ***Approximate flow rates calculated using 'UVCalc' software and are based on a UV transmittance (UVT) of 85% and a UV dose at the end of lamp life.



UNIT DESCRIPTION		INSTALLATION DRAWING		UNSPRINTED
S-120/160-76-B-2 BSP				
DRN	DATE	MATL.	SS316L	UNSPRINTED
CHKD.	DATE	DRGND.		SCALE
APRD.	DATE			MKS
ALL DIMS IN mm IF IN DOUBT ASK				SHEET 1/1

INSTALLATION AND MAINTENANCE INSTRUCTIONS



MODELS

S20, S30, S40-62, S40-76, S75, S80, S125, S172, S40X2, S125X2, S172X2, S160, S160X2, S160X4, S245, S245X2, and S245X4 Stainless Steel Water Disinfection Units

ATTENTION

**Please read this manual carefully and follow the instructions.
Installation shall be carried out only by authorised technicians.**

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1. GENERAL APPLICATIONS

UV disinfection is an efficient, low cost and environmentally friendly process. UV light kills pathogenic micro-organisms quickly without leaving any residues, harmful by-products or affecting the smell or taste of the water.

These units use UV lamps which emit UVC radiation at 254nm which disrupts the DNA in the micro-organisms, so they are either killed or their ability to replicate is destroyed.

The kill rate depends on the UV dose received by the micro-organisms, i.e. the time that a micro-organism is exposed to a certain intensity of UV radiation (Wm^2). A UV dose of $400 J/m^2$, ($40 mJ/cm^2$) is recognized internationally as suitable dose requirement to ensure safe disinfection.

The disinfection performance of a UV system is determined by the intensity of the UV light, water flow rate, the optical transmission of the water at 254nm and the geometry of the reactor. The sizing of the UV system should be based on these parameters.

As there are no disinfection substances added to water by UV radiation, there are no residual effects once the water has passed through the UV Reactor.

Only original spare parts should be used to ensure proper operation and performance.

General Safety Instructions

ELECTRIC SHOCK !

Attention: Dangerous electric voltage is present inside the power supply box and chamber. These instructions must be followed closely to prevent serious personal injuries.

ENSURE EYE PROTECTION IS WORN WHEN SERVICING AND INSTALLING THIS UNIT!

UV-C radiation is harmful to the eyes and skin! UV lamps should be used only when properly installed in the irradiation chamber. Persons should never be exposed to UV-C radiation.

- Make sure this disinfection unit is only used for the intended purpose as described in the operating instructions.
- This disinfection unit is to be installed properly, according to these operating instructions, before use.
- Do not use a unit with a damaged electrical lead or plug, a unit with any faulty functions, or a unit which has been dropped or has been damaged in some way.

- Make sure that the unit is unplugged when it is not being used, before fitting, or removing any parts, or before cleaning the unit.
- Ensure the disinfection unit is electrically isolated before carrying out any service work
- The unit must be depressurized before maintenance.
- Do not use the UV lamp outside of the UV disinfection reactor.

UV lamps have been designed for permanent operation to reach their best disinfection capacity. Frequent switching on and off reduces the life of the UV lamp and may affect warranty! The UV lamps may take 2-5 minutes to reach maximum output

2. ASSEMBLY AND INSTALLATION

Installation should be carried out only by qualified technicians.

The Following MUST be Checked Prior to Installation:

- A maximum operating pressure of 1000KPa (10 bar) must not be exceeded.
- The maximum ambient temperature is 40°C
- The maximum water temperature should be 60°C (maximum recommended flow rates may be reduced for some units, such as UVG S75 and S80 models, at temperatures higher than 25°C)
- The maximum flow rate should not exceed specified rate (see section 2.1)
- The Reactor must be plumbed so it remains full of water at all times while the lamp is operating.
- The S series units should not be installed so there are long periods with no flow. Recommended maximum period with no flow is 60 minutes. Longer periods for S80 and larger units, may damage the UV lamp due to overheating. If there are going to be long periods with no flow for these units, it is recommended a thermostat controlled solenoid valve is installed downstream of the UV unit so that if the temperature of the UV reactor gets too hot, the solenoid valve will open to return a small amount of water to the source, or dump to waste. The water flow from this action which will cool the reactor.

2.1 Reactor Types

1. The following reactor types are available in the S series. (Table 1a & 1b)

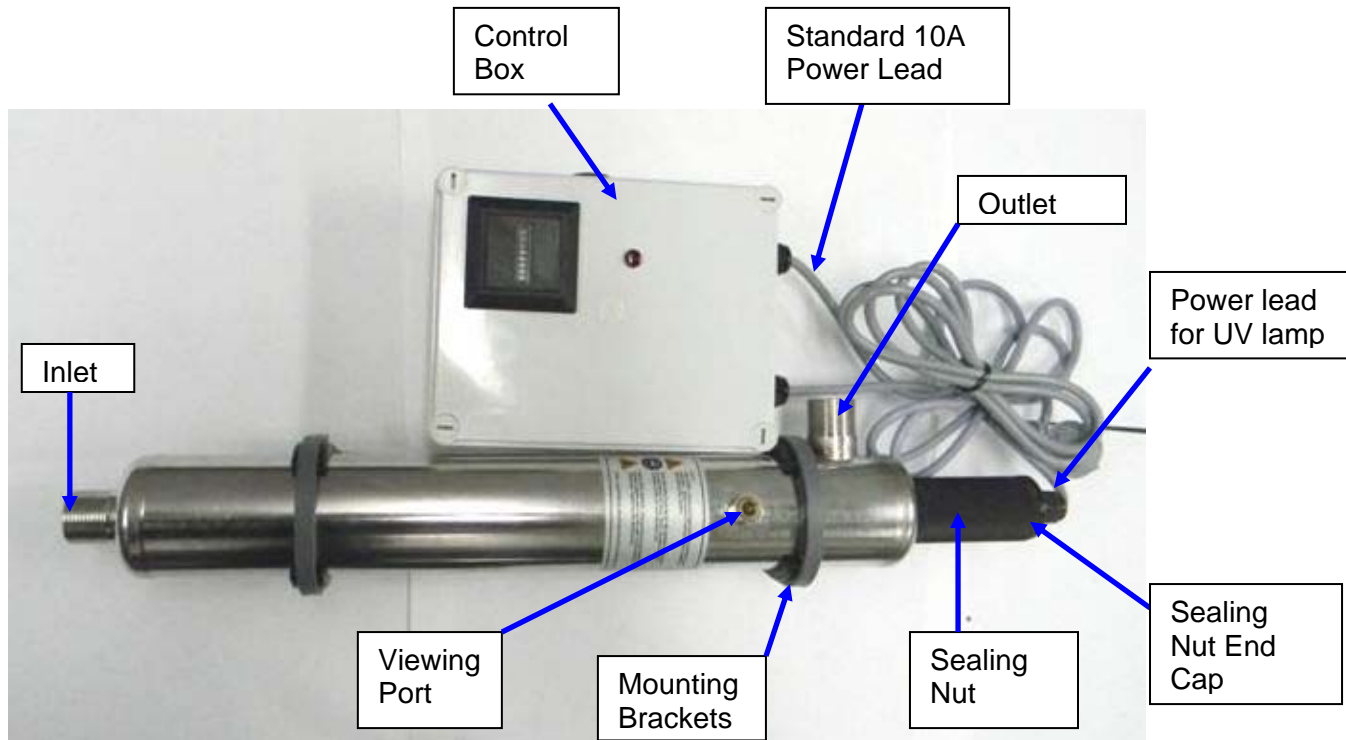
Series	Length	No. Lamps in unit	Diameter mm
S20	245mm	1	62
S30	505mm	1	62
S40-62	895mm	1	62
S40-76	895mm	1	76
S75	895mm	1	76
S80	895mm	1	76
S125	895mm	1	76
S172	895mm	1	76
S40X2	895mm	2	62
S80X2	895mm	2	62
S125X2	895mm	2	62
S172X2	895mm	2	62
S160	1210mm	1	76
S160X2	1210mm	2	76
S160X4	1210mm	4	76
S245	1210mm	1	76
S245X2	1210mm	2	76
S245X4	1210mm	4	76

Table 1a

Series	Inlet/outlet Ø	Min. space to service reactor at power end of chamber mm	Max. flow rate l/h - Drinking water	Max. flow rate l/h - Treated effluent
S20	¾" BSP Nipples	300	500	150
S30	¾" BSP Nipples	600	2000	500
S40-62	1" BSP Nipples	1000	2,700	2000
S40-76	1½" BSP Nipples	1000	3,600	
S75	1½" BSP Nipples	1000	6,700	4200
S80	2" BSP Nipples	1000	6,800	4600
S125	2" BSP Nipples	1000	10,500	7100
S172	2" BSP Nipples	1000	14,000	6500
S40X2	2" BSP Nipples	1000	7,200	4000
S80X2	2" BSP Nipples	1000	14,000	8000
S125X2	2" BSP Nipples	1000	20,000	14,000
S172X2	2" BSP Nipples	1000	26,000 (hydraulic limit)	13,000
S160	2" BSP Nipples	1300	13,700	9200
S160X2	2" BSP Nipples	1300	26,000 (hydraulic limit)	18400
S160X4	2" BSP Nipples	1300	26,000 (hydraulic limit)	26,000 (hydraulic limit)
S245	2" BSP Nipples	1300	18,400	12,300
S245X2	2" BSP Nipples	1300	26,000 (hydraulic limit)	24,600
S245X4	2" BSP Nipples	1300	26,000 (hydraulic limit)	26,000 (hydraulic limit)

Table 1b

- Before installation ensure you know which reactor type you are using.
- Make sure that there is enough free space to service the glassware with the reactor. (for dimensions, see Section 2.1, Table 1a). Otherwise it will not be possible to install the UV lamp and maintain the UV system.



2.1.1 Installing the Reactor

- The disinfection chamber comes complete with its own wall mounting brackets (except for the S20 and the S30 units).
- The preferred orientation for the reactor is horizontal however vertical orientation is acceptable for all single lamp reactors. It is recommended that the outlet port is above the main body of the chamber to prevent airlocks. Multi-chamber reactors such as the S40X2, S80X2, S125X2, S172X2, S160X2, S160X4, S245X2, and S245X4 must be wall or frame mounted horizontally with flow coming in from underneath and out the top, so the water flow will expel any air.
- Refer to Table 1a for the distance from the sealing nut, required for servicing the unit.
- When mounting the chamber, consideration must be made for the weight of the system due to the stresses associated with pipe work etc.
- The stainless steel chamber and surrounding pipe-work must be properly earthed to prevent electrolysis/corrosion.

2.1.2.1 Installation of the Power Box

- The power supply box must be mounted clear of the floor as a precaution against the ingress of water.
- The power supply box is not designed for remote mounting. Recommended maximum distance of chamber to power supply box is two (2) metres.
- Depending on which version of the power supply box is ordered, there may be an audible lamp fail alarm included. This will sound in the event of a lamp failure to notify the operator to replace the UV lamp.
- The power supply box should be mounted so it is not exposed to rain or direct sunlight.



Power supply 40048 (40088)
For S20, 30, 40 (75 and 80) Must
be installed under cover



Power supply 50162 For
S125 and S160 Can be
installed in weather
away from direct
sunlight



Power supply 50044 (50081)
For S20, 30, 40 (75 & 80). Can be installed in
weather away from
direct sunlight



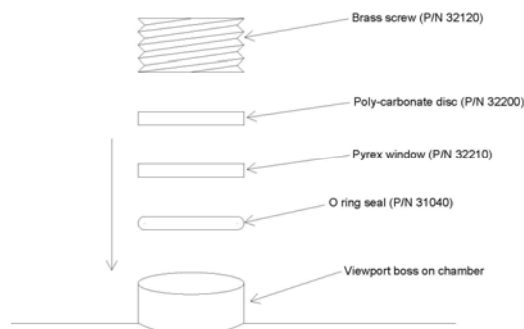
Power supply 40044 For
S20, 30 and 40
Must be installed under cover

2.1.2 Installation of View Port, Quartz Thimble and UV Lamp

View Port:-

The view port consists of an O ring seal, a pyrex window and a poly carbonate window, held in place by a brass annular screw. The pyrex window is inert and in contact with the water, while the polycarbonate window prevents any UV light from escaping.

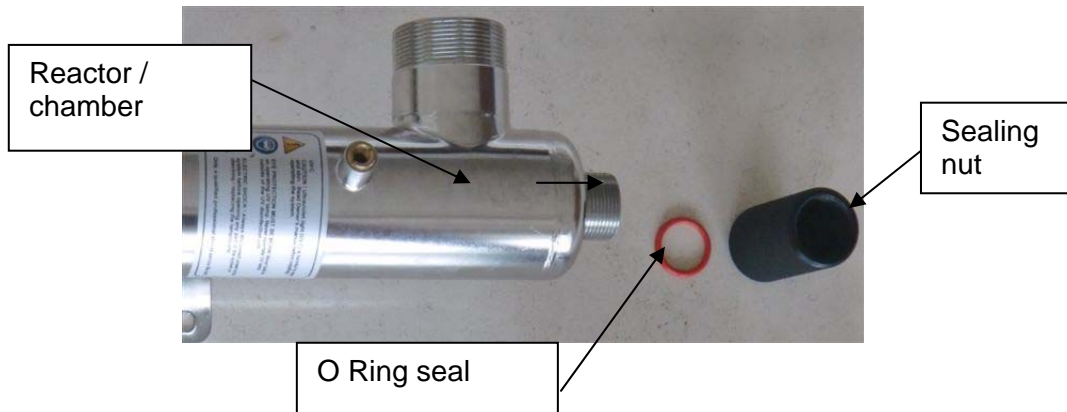
- Remove the brass screw from the chamber view port
- Insert the view port O ring into the view port
- Insert the pyrex window into the view port
- Insert the polycarbonate window into the view port
- Secure all components in place by screwing the brass screw firmly into place.



Quartz Thimble:-

DUE TO THE FRAGILE NATURE OF THE QUARTZ, CARE MUST BE TAKEN WHEN HANDLING AND INSTALLING THE QUARTZ THIMBLE and UV LAMP.

- Unscrew the sealing nut from the top of the reactor, take care to remove the orange O ring as well.



- Place the O ring inside the sealing nut so that it is seated in its groove on the threaded side of the nut.



There are two types of reactors that have different methods for installing the quartz thimble. There are the reactors / chambers with a spring support for the quartz thimble. These chambers have inlet ports at the end of the chamber. Then there are the reactors chambers with static support cups for the quartz thimble. These chambers typically have side entry inlet ports or are twin series (-X2) chambers. Once you have determined which version you have, proceed according to the instructions below. In either case the quartz thimble needs to be wiped with alcohol / methylated spirits then dried clean to remove any finger marks or deposits on the quartz. Once the quartz has been cleaned, ensure it is only handled with clean cotton gloves, or rag or tissue. Ensure that no thread tape is used on the sealing nipple. The O ring provides the seal. The sealing nipple may be lubricated with silicon grease or petroleum jelly.

For chambers with Spring quartz support:

To load the quartz for these units it is best to insert the open end of the quartz sleeve into the sealing nut before inserting the quartz into the chamber.

- Insert the open end of the quartz into the sealing nut past the O ring so it rests against the stop inside the sealing nut (Fig. 1)



Fig 1.

- Then insert the domed end of the quartz, with the sealing nut attached, into the chamber through the sealing nipple. (Fig. 2)

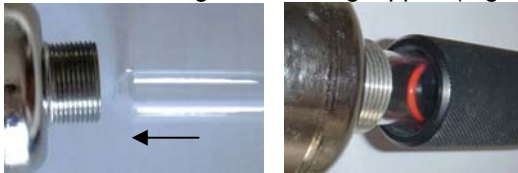


Fig. 2

- Slide the quartz into the chamber and it will centre itself in the spring support
- Keeping firm hold of the sealing nut so it does not spring back, start screwing the sealing nut onto the chamber. Carefully screw the sealing nut until it just starts compressing the O ring seal, then another 1/2 to 3/4 turn so it is firmly hand tight should be sufficient to ensure it is properly sealed. (Fig. 3)



Fig. 3

- You can inspect the O ring through the sealing nut to confirm it is compressed on the quartz thimble with 2-3mm of O ring flat against the quartz. The unit should be checked against maximum water pressure to ensure it is properly sealed. Compression can be increased by turning the nut in a clockwise direction.

For Chambers with Static quartz support:

To load the quartz for these units it is best to load the quartz thimble into the chamber before using the sealing nut.

- insert the domed end of the sealing nut and ensure it is located in its support cup at the closed end of the chamber. There should be 5-15mm sticking out the open end of the chamber and square with the end of the chamber when it is properly located. (Fig. 4)

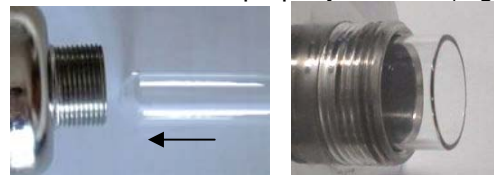


Fig. 4

- Take the sealing nut with the O ring in place and screw it on to the chamber over the top of the open end of the quartz thimble that is protruding from the chamber. During this process the O ring should slip over the open end of the quartz thimble. It is important to ensure the O ring does not become pinched as it slips over the end of the quartz as this may break the quartz. You may look through the end of the sealing nut with a light source to check or you could check with your finger inside the sealing nut, as it is being screwed on. (Fig. 5)

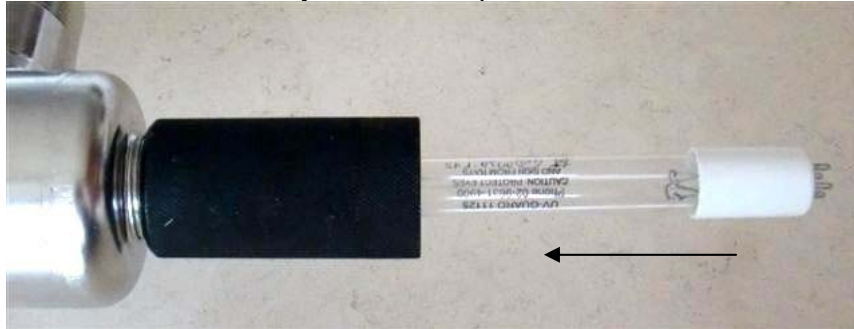


Fig. 5

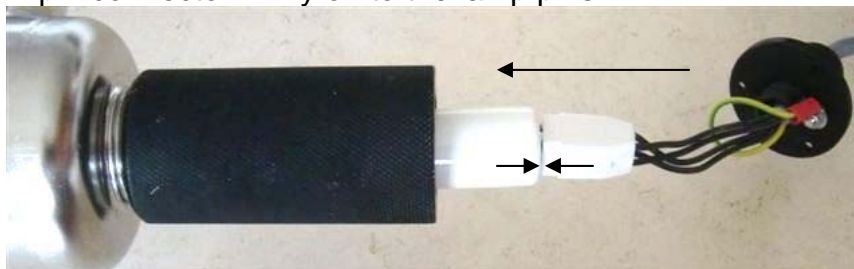
- Carefully screw the sealing nut until it just starts compressing the O ring seal, then another 1/2 to 3/4 turn so it is firmly hand tight should be sufficient to ensure it is properly sealed. Do not over tighten with multi-grips.
- You can inspect the O ring through the sealing nut to confirm it is compressed on the quartz thimble with 2-3mm of O ring flat against the quartz. The unit should be checked against maximum water pressure to ensure it is properly sealed. Compression can be increased by turning the nut in a clockwise direction.

UV Lamp:-

- Remove the UV lamp from its protective wrapping and wipe down with a soft cloth/tissue soaked in methylated spirits. Do not touch it without protective gloves, care should be taken not to leave markings of any nature on the UV lamp, as this could have a detrimental effect on the performance of the UV lamp.
- Insert the UV lamp into the quartz thimble through the hole through the centre of the sealing nut. If the chamber is installed vertically, NEVER drop the lamp into the quartz thimble, as this may break the quartz thimble and the UV lamp.



- Always keep a firm hold of the UV lamp until it is secured to its four pin connector. Using cotton gloves or a soft cloth to hold the UV lamp, push the female 4 pin connector firmly on to the lamp pins.



- Locate the three holes in the end cap with the three holes on the end of the sealing nut. Screw all three screws (M3) through the holes in the end cap, into the sealing nut.



- Return full water pressure to the UV reactor. Insert the power lead into the outlet then turn power on. The UV lamp will ignite and come on, however it will take between 2 and 5 minutes for the lamp to reach full output.

3. SERVICING

The servicing of this UV reactor should only be carried out by a qualified service technician. Failure to do so will result in the warranty being void.

3.1 Servicing the Quartz Thimble

The UV unit must be switched off and hydraulically isolated and drained before servicing.

- Isolate the water supply to the UV reactor.
- Switch off main power supply to the UV disinfection reactor.
- Release pressure and drain water within the UV disinfection reactor.
- Remove the three screws that secure the end cap to the sealing nut. Slide the lamp out enough to be able to remove the four pin plug.



- Disconnect the four pin plug from the end of the UV lamp. Remove the UV lamp from the reactor and place in a safe place or if it is being replaced dispose of the used UV lamp according to local regulations



- Unscrew the sealing nut in an anti-clockwise direction and carefully remove it from reactor. Take care with chambers with spring quartz support as the spring will suddenly push the quartz out of the chamber when the sealing nut becomes disengaged from the chamber. Take care to hold on to the quartz thimble as it may come out of the reactor at the same time. Remove the sealing nut from the quartz thimble and store in a safe place. You can then remove the quartz thimble from the reactor.



- If the thimble is due for a clean, wipe it down with a cleansing cream or similar and then wash down with water. It may be necessary to scrape off the remnants of the old O ring with a sharp knife or razor blade. Repeat this step

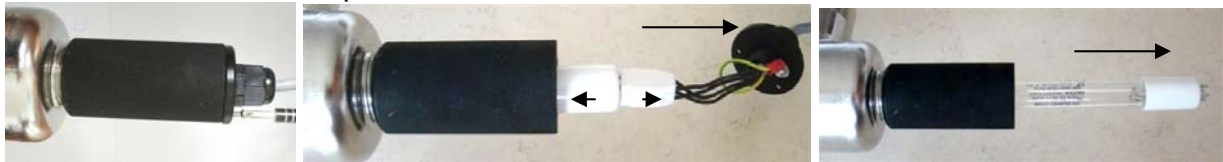
until the quartz thimble is clean, then wipe down the quartz thimble with a soft cloth/ tissue that has been soaked in methylated spirits, then dry it. (take care to protect your hands with suitable gloves).

- Reassemble the unit as described in section 2.1.2 above.

3.2 Servicing the UV Lamp

The UV unit must be switched off and hydraulically isolated and depressurized before servicing.

- Switch off the mains power to the UV disinfection unit.
- Remove the three screws that hold the end cap in place on the end of the sealing nut. The UV lamp will be attached to the lead that goes through the end cap.
- Slide the UV lamp out just enough so that you are able to get a firm hold on it, you will then be able to remove the four pin plug that is connected to the end of the UV lamp.



- Disconnect the 4 pin plug from the lamp (inserting a thin screw driver between the plug and lamp may assist). Remove the UV lamp from the reactor and place in a safe place. If it is being replaced dispose of the used UV lamp according to local regulations.
- Reinstall UV lamp. (see in section 2.1.2.2 above).

3.3 Power Supply Box

The servicing of the power supply box should be only carried out by a qualified service technician.

4. SPARE PARTS LIST WITH CORRESPONDING PART NUMBERS

Series	Quartz thimble	UV Lamp	Quartz O Rings	Sealing Nuts
S20	20280	11020	31000	32100
S30	20290	11030	31000	32100
S40-62	20310	11040	31000	32100
S40-76	20310	11040	31000	32100
S75	20310	11074	31000	32100
S80	20140	11080	31010	32110
S125	20140	11125	31010	32110
S172	20140	11172	31010	32110
S40X2	20140	11040	31010	32110
S80X2	20140	11080	31010	32110
S125X2	20140	11125	31010	32110
S172X2	20140	11172	31010	32110
S160	20200	11160	31010	32110
S160X2	20200	11160	31010	32110
S160X4	20200	11160	31010	32110
S245	20200	11248	31010	32110
S245X2	20200	11248	31010	32110
S245X4	20200	11248	31010	32110

Table 2

Series	View port (pyrex)	Viewing port (polycarbonate)	Viewing Port O Ring
All S series units	32210	32200	31040

Table 3

Optional Power Supplies

Power boxes with options such as UV intensity monitors will be supplied with a supplemental operating manual to cover the optional items.