

# WATER FILTER AND PURIFICATION SYSTEM MANUAL

ver.1.1



There are 2 major components in the system, the water filters and the UV water purification. The components work independently of each other, but together they will deliver high quality safe drinking water. The system only requires periodic maintenance of changing the filter cartridges, approximately every 3 months, and changing the UV bulb once each year. When working properly, the system will deliver 10 gallons per minute of pure drinking water.



## System Details

- 10 inch filter housings
- Viqua UV Max D4 UV light chamber and controller (120 60hz or 240 50hz)
- 3/4inch PVC pipe
- 3/4inch brass shutoff valves
- 3/4inch PVC clear sight tubes
- indicator light RED/BLUE light

# THE WATER FILTERS

There are two water filter housings, (5) micron and (1) micron. The filters cartridges are standard 10inch cartridge filters. The water passes through the first filter removing particles larger than (5) microns. Next, the water passes through the second (1) micron filter removing the smaller particles. Over time the filter cartridges will accumulate particles from the water and will clog reducing pressure in the system and reducing the volume of water delivered by the system. There are two site tubes, one before and one after the filter housings. When the level in the two site tubes are significantly different that indicates it is time to change the filters.

## REPLACING THE FILTER CARTRIDGES

1. turn off the water valve before the water filter housings and turn off the water valve after the filter housings. If there is a pressure relief valve on the top of the housing, press the button to relieve pressure in the housings.
2. place a pan or towel under the filter housings to catch any water that will spill when you open the filter housing.
3. Use your hand or use the filter wrench to loosen the housing by turning it to the left. Remove both filter housings and empty water from the filter housing. Discard the filter cartridges in the trash can.
4. Use a clean paper towel and clean water to wipe the inside of the water filter housing removing any dirt. DO NOT use any chemicals to clean the filter housings.
5. wash your hands. You don't want to contaminate the clean housings or the new filter cartridges.
6. examine the o-ring around the top of the filter housing. If it appears worn or cracked replace it with a new o-ring. Typically the o-ring only needs to be replaced once per year.
7. replace the cartridges with 2 new cartridges. The first cartridge is (5) micron the second filter is (1) micron.
8. reinstall the filter housings. The filter cartridges should be in the center of the housing. Carefully hand tighten the filter housing back onto the housing bracket. After hand tightening use the filter wrench to only give a  $\frac{1}{4}$  turn to ensure a water tight seal.
9. open the valve before the water filter housings and then open the valve after the water filter housings.
10. slowly open the faucet to run water through the system to remove air that got into the system and the flush the new filters for 1 minute.

Optionally a third or fourth housing can be installed in the system to include a pre-filter or a charcoal filter.

# THE UV PURIFICATION SYSTEM

The Ultraviolet (UV) purification system uses high intensity ultraviolet light to kill or sterilize any living bacteria that is not removed by the filters. It is important to filter the water before it passes through the UV system because the UV light is most effective when the water is clear and organisms can not hide behind suspended particles in the water.

The UV light bulb is on all the time and will typically last 365 days before needing to be replaced. The UV light will warm the water a bit so it is important to use the system every day to prevent the water from getting too hot.

## ELECTRICAL OUTAGE

If the electricity shuts off the UV light will not purify the water. The system includes a BLUE/RED indicator light to indicate if the water is safe to drink. If the indicator light is not blue people should not drink the water and the people should notify the person who maintains the system.

1. During an electrical outage the indicator light will not be lit and the UV system will not work.
2. When the electricity comes back on the indicator light will display RED. The UV purification system should come back on and the countdown timer should display the same number as before the electrical outage. Feel the UV purification housing. It should feel warm if the light is working. If the housing is not warm after a couple of minutes the UV bulb may be damaged and need to be replaced.
3. The system should be flushed for 1 minute before drinking the water.
4. After the system is flushed press the silver button on the indicator light and it will display BLUE, indicating the system is working properly and the water is safe to drink.

## THE UV BULB

The UV bulb should last 9000 hours or approximately 365 days. It is very expensive (\$100 USD) and delicate so take extra care when working with the UV bulb. The purification system includes a countdown timer which counts down 365 days from the day the UV bulb is installed. During an electrical outage the clock will not display any numbers but it will continue to run for up to 24 hours using an internal battery to count down the time.

## BEEP BEEP BEEPING

As the 365<sup>th</sup> day approaches the system will start to beep or blink red to indicate it is almost time to replace the bulb. Press the SILENCE BUTTON on the timer to stop the beeping and notify the person who maintains the system. The beeping will return every 24 hours until the bulb is replaced. When the bulb fails the system will beep continuously.

If there is a long power outage the timer will lose its memory. If the power is out longer than 24 hours the countdown clock may not remember how many days have passed since the last bulb replacement. Press the RESET button to reset the clock to 365 and make a note of the date to help estimate the number of days until the time the bulb will need to be replaced.

## **REPLACING THE UV BULB**

Replace the bulb after 365 days. When the bulb fails the system will continuously beep. It is better to replace the bulb after 365 days rather than wait until a failure at an inconvenient time. It always seems to happen in the middle of the night and old UV bulbs do not deliver the same amount of UV light as a new UV bulb. Perform regular UV bulb maintenance every 365 days.

1. wash your hands and put on gloves to protect the bulb from any contamination or oil. **DO NOT** touch the UV bulb with bare hands, this could damage the bulb.
2. **UNPLUG** the countdown timer which is also the power supply to the UV system and wait 10 **MINUTES** for the system to cool off. Prepare a work space with a clean towel for the bulb.
3. **TURN OFF THE WATER.** Close the water shutoff valve before the filter housings. Open the faucet at the end of the system to relieve pressure in the system and to drain a bit of the water.
4. carefully spread the two tabs at the top of the lamp connector and then pull up. Remove the connector. Move it to the side and move the wires out of the way.
5. carefully turn the sleeve bolt counter clockwise to loosen and pull up slowly to remove the UV bulb and the sleeve.
6. remove the bulb from inside the sleeve and discard in the trash. Examine the sleeve. If it appears cloudy it can be cleaned with vinegar and clean paper towel. Wipe the sleeve to clean it. Examine the o-ring on the sleeve. If it appears worn or cracked replace the o-ring.
7. replace the clean sleeve or install a new sleeve by carefully inserting it into the UV chamber. Make sure it is placed in the center of the chamber inserting it into the spring holder at the bottom of the chamber.
8. insert the new bulb inside the sleeve. Be careful not to touch the bulb with bare hands.
9. replace the sleeve bolt turning it clockwise to tighten. Turn the bolt until it is tight to ensure a water tight seal. Teflon tape on the sleeve bolt helps ensure a tight seal if it is available.
10. examine the green ground wire and red strain wire to ensure both are securely connected to the UV housing.
11. align the tabs and the pins on the connector with the top of the bulb, rotate the connector if necessary. Carefully push down on the lamp connector until you hear **TWO CLICKS**. Jiggle it and try again if necessary until you hear **TWO CLICKS**.
12. **TURN ON THE WATER.** Open the shutoff valves and run water through the system for 2 minutes. Check for leaks.
13. **PLUG IN** the UV power supply and press the **RESET** button, hold for 5 seconds to reset counter to 365.

## UV BULB AND SLEEVE MAINTENANCE

It is a good practice to periodically inspect the UV bulb and sleeve. Every 3 months, or when replacing the filters, inspect the UV sleeve. While the water is shut off unplug the UV power supply, inspect the UV bulb and clean the sleeve using vinegar and a clean paper towel. This will ensure good operations of the the UV system.

## INSTALLATION PARTS & FITTINGS

ITEM	COUNT	COST	TOTAL
PVC shutoff $\frac{3}{4}$ slip	1	2.98	2.98
PVC fitting Tee $\frac{3}{4}$ slip, $\frac{3}{4}$ slip	2	.61	1.22
PVC adapter $\frac{3}{4}$ slip $\frac{3}{4}$ threaded male	12	.61	7.32
PVC coupling $\frac{3}{4}$ slip	4	.39	1.56
Brass $\frac{3}{4}$ shutoff threaded	3	15.30	45.9
Brass 90 deg $\frac{3}{4}$ threaded male to female	2	11.84	23.68
PVC union $\frac{3}{4}$ thread $\frac{3}{4}$ slip	3	4.98	14.94
PVC fitting T $\frac{1}{2}$ threaded $\frac{3}{4}$ slip	1	.83	.83
Copper 12 inch threaded male to female	1	10.92	10.92
Teflon tape	2	1.53	3.06
PVC $\frac{3}{4}$ end cap	2	.64	1.28
CLEAR PVC 12 inches	2	2.00	4.00
PVC pipe $\frac{3}{4}$ 10ft	2	1.81	3.62
2x4 (mounting blocks)	7	2.98	20.86
$\frac{3}{4}$ plywood	$\frac{1}{4}$ sheet	15.00	15.00
$\frac{3}{4}$ pipe mounting brackets	1 bag	2.79	2.79
Misc screws/washers/wall anchors/black paint/paint brush			
PVC solvent and glue	1	9.97	9.97
Electrical outlet/box/cover	1	5.93	5.93
Supplyline valve	1	7.87	7.87
	<b>TOTAL</b>		<b>\$183.73</b>

**FILTER and PURIFICATION PARTS**

ITEM	COUNT	COST	TOTAL
Viqua	1	\$549.00	\$2.98
Pentair Blue 10inch Housing	2	\$15.91	\$31.82
Pentair 5micron	4	\$4.49	\$17.96
Pentair 1micron	4	\$13.50	\$54.00
Pentair mounting brackets and Screws	2	\$5.24	\$10.48
Viqua spare bulb, sleeve and o-ring	1	\$93.15	\$93.15
Pentair replacement o-rings	2	\$0.89	\$1.78
Wrench	1	\$6.15	\$6.15
<b>TOTAL</b>			<b>\$764.34</b>

**TOTAL SYSTEM COSTS = \$948.07**

**INSTALLATION TOOLS**

¾ inch hammer drill \$79	PVC cutter	Drill Bits	3/4inch pipe threader
Extension cord (40.97)	Screw driver	¼ ratchet	Hacksaw
crescent wrench	Wire stripper	110v transformer	adjustable pliers
Rags	Trowel, rake	dustpan/broom	

**OTHER TOOLS**

plaques

marker

¾inch concrete hammer drill and 2inch bit 1x 12inch

**FIXTURES & EXTRAS**

Sink Faucet	Drain strainer	Dish drainer	Towel rack
Wire shelf	Rinse hose	Water lines (6.48)	Trashcan
Compost pail	Sponges	Soap dish	Dish pan
Drawer organizer	Towels	Scrubbies	

## **1 YEAR REPLACEMENT PARTS**

- (1) UV Bulb and (1) Sleeve
- (1) Sleeve O-Ring
- (3) 5 micron Filter Cartridges
- (3) 1 micron Filter Cartridges
- (2) Filter Housing O-Rings

## Sección 5 Mantenimiento

### ⚠ ADVERTENCIA



- Desconecte siempre la corriente antes de llevar a cabo cualquier trabajo en el sistema de desinfección.
- Corte siempre el flujo de agua y libere la presión del agua antes de realizar el servicio.
- Examine con frecuencia el sistema de desinfección para asegurar que los indicadores de corriente estén encendidos y que no hay ninguna alarma.
- Reemplace la lámpara UV anualmente (o cada dos años si se trata de un uso casero temporal) para garantizar la máxima desinfección.
- Drene siempre la cámara al cerrar la temporada o al dejar la unidad en un área sujeta a temperaturas de congelación.

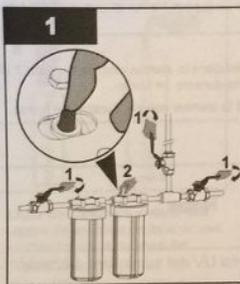
### 5.1 Reemplazo de la lámpara UV

#### AVISO

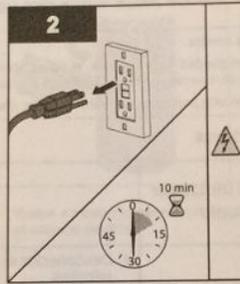
No utilice agua durante la reposición de la lámpara UV.

La reposición de la lámpara es un procedimiento rápido y sencillo que no necesita herramientas especiales. Se debe reemplazar la lámpara después de 9000 horas de funcionamiento continuo (un año aproximadamente) con el fin de garantizar una desinfección adecuada.

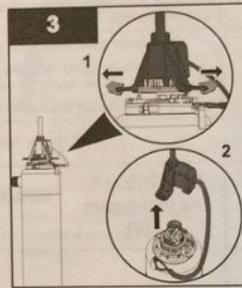
#### Procedimiento:



- Cierre todos los grifos y suministros de agua.
- Pulse el botón de liberación de presión para liberar la presión de los cartuchos.



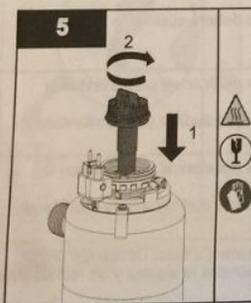
- Desconecte la fuente de alimentación principal y deje que la unidad se enfríe durante 10 minutos.



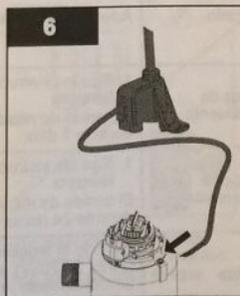
- Retire el conector de la lámpara tirando de las lengüetas y, después, hacia arriba.



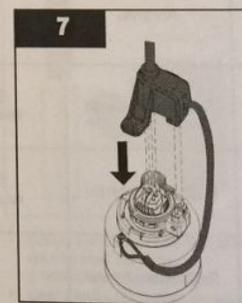
- Sujete el tornillo del manguito con una mano, gire la lámpara en sentido antihorario y tire de la lámpara hacia arriba para extraerla de la cámara.



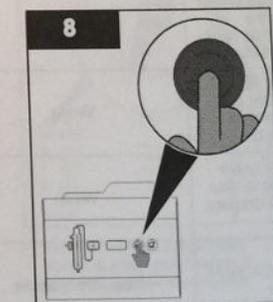
- Inserte la lámpara nueva en el manguito de cuarzo y la tuerca en el tornillo del manguito hasta que haga tope.



- Conecte el cable verde de toma de tierra y el rojo de alivio de tensión a la cámara UV mediante el tornillo de puesta a tierra.



- Alinee los pasadores de conexión con el conector de la lámpara, gire la abrazadera de anillo y monte la toma de la lámpara.
  - Presione el conector de la lámpara sobre los pasadores de la lámpara y el anillo hasta escuchar un clic característico.
- Nota:** Asegúrese de que el conector esté acoplado en ambos lados.



- Restaure la energía.
- Si se ha insertado la lámpara nueva, mantenga pulsado el botón de restablecimiento del temporizador de la lámpara durante 5 segundos. La pantalla debería mostrar 365.
- Abra todos los grifos y entradas de agua. Examine si hay fugas.

## Mantenimiento

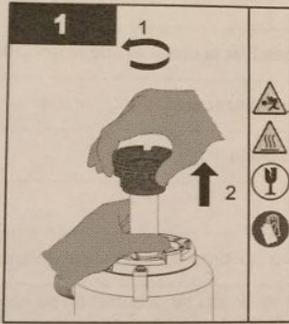
### 5.2 Limpieza y reposición de la vaina tubular de cuarzo

**Nota:** Los minerales del agua van formando lentamente una capa en la vaina tubular de cuarzo de la lámpara. Esta capa debe retirarse porque reduce la cantidad de luz UV que llega al agua, reduciendo de este modo el rendimiento de la desinfección. Si la vaina tubular no puede limpiarse, deberá reemplazarse por otra.

#### Requisitos previos:

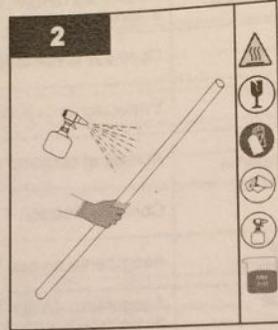
- Cortar el suministro de agua y drenar todas las líneas.
- Despresurizar el sistema. Colocar un paño pequeño debajo de la unidad para recoger el agua que pueda caer.
- Quitar la lámpara UV. Consulte Sección 5.1.

#### Procedimiento:



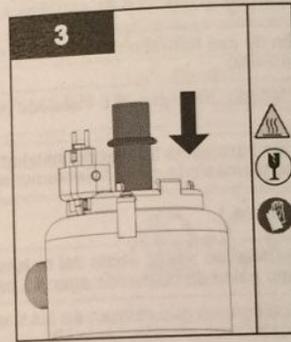
- Afloje el tornillo del manguito y extráigalo con cuidado de la parte superior de la cámara.

**Nota:** Es posible que el manguito esté conectado al tornillo del manguito. Sujete el manguito con la otra mano durante la extracción del tornillo del manguito.

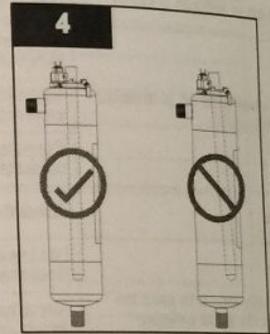


- Limpie la vaina tubular de cuarzo con un trapo empapado en CLR, vinagre u otro ácido blando y, a continuación, aclárela con agua.

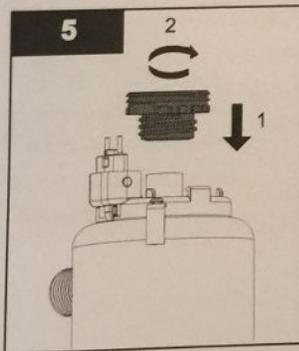
**Nota:** Si no es posible limpiar la vaina tubular por completo o si se raya o se quiebra, reemplácela.



- Coloque la junta tórica en el manguito tal y como se muestra. Inserte el manguito en la cámara como se muestra en el paso 4.



- Asegúrese de que el manguito de cuarzo esté centrado correctamente en la cámara.



- Coloque el tornillo del manguito en el manguito de cuarzo, empuje hacia abajo con cuidado y apriételo manualmente en la cámara.
- Cuando haya finalizado el servicio, realice los pasos que aparecen en los requisitos previos en orden inverso al de desmontaje.

**Notas:** 1) Tras reemplazar la lámpara UV o realizar el procedimiento de desinfección de la vaina tubular de cuarzo, consulte Sección 3.2.

2) Si el sistema se desvía temporalmente o si se contamina después del sistema de desinfección, es necesario...

Parámetros de funcionamiento

Mantenimiento sin herramientas	Sí
enchufe de lámpara especial	Sí
Indicador de funcionamiento de la lámpara	Sí
Indicador de funcionamiento del controlador	Sí
Placa de referencia	Sí
Antalla del temporizador de la lámpara	Sí
Botón de restablecimiento del temporizador de la lámpara	Sí
Botón de silenciamiento	Sí

Dimensiones y distribución

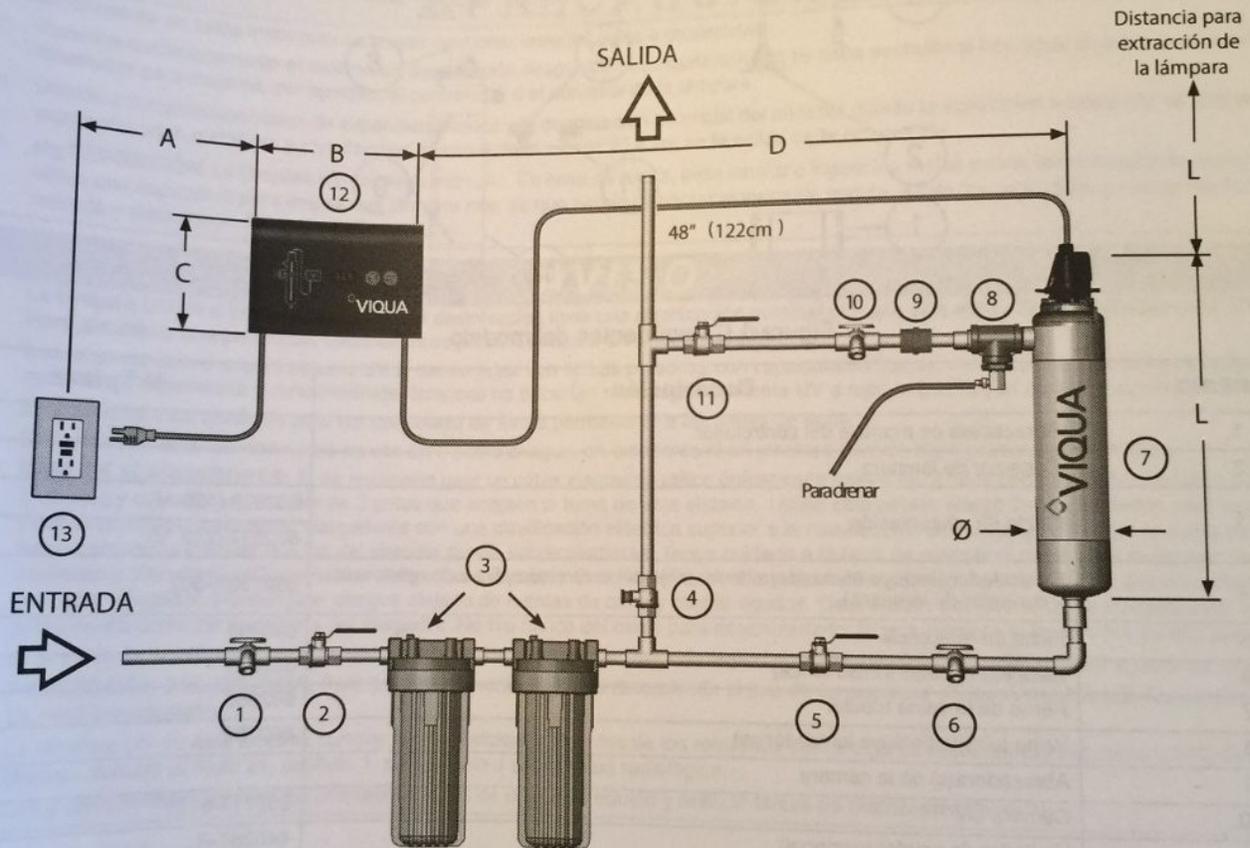


Figura 3 Sistema: dimensiones y distribuciones

Componente	Descripción	Función
	Válvula de muestra	Permite realizar una muestra del agua sin tratar.
	Válvula de corte	Se requiere para permitir el mantenimiento del equipo de tratamiento previo.
	Tratamiento previo	Consulte Sección 1.3. <b>Nota:</b> Se debe instalar un filtro de sedimentos de 5 micrones (nominal) antes del sistema y después de los equipos de ablandamiento de agua.
	Válvula de corte de desvío	La línea y válvula de desvío son opcionales. Están diseñadas para proporcionar un suministro de agua de emergencia cuando el sistema UV no esté disponible.
	Válvula de corte	Se requiere para permitir realizar las tareas de mantenimiento del sistema UV.
	Botón de muestra	Permite tomar muestras del agua que entra en la cámara UV; se necesita para confirmar la calidad del agua que se está tratando.