



**SYS1**

1 GPM / 4 LPM  
Point-of-Use Filtration  
and UV Disinfection



**UV-700**

8 GPM / 30 LPM  
UV Disinfection



**SYS250**

4 GPM / 15 LPM  
Filtration and  
UV Disinfection



**SYS700**

8 GPM / 30 LPM  
Filtration and  
UV Disinfection

***Residential Water Purification Systems***  
***1, 4 & 8 GPM***  
***Basic Models for POU / POE***  
***Available with or without Pre-Filtration***  
***UV Disinfection for Bacteria / Virus Destruction***





# UV-1

## Ultra Violet Water Sterilizer

### Description

The UV-1 is a robust, efficient and cost-effective ultra-violet sterilizer designed for the disinfection of drinking water in the average household at a flow rate of 1 GPM (4 LPM). Typically installed at the point of use (e.g. under the sink), it can treat municipal water as well as ground water from drilled or dug wells, and surface water from lakes, ponds or rivers. Other applications for this sterilizer are for the purification of process water in laboratories and dental offices, or the prevention of biofouling in RO Systems.

This sterilizer contains a low-pressure, high output UV lamp in a 304L stainless steel reaction chamber (also available in 316L). It comes with an electronic ballast that features a lamp-out alarm if there is no power to the lamp.

Combined with a Wyckomar filter set, this sterilizer is the centre piece of a complete water treatment system for the elimination of bacteria and viruses and reduction of taste and odour at the point of use (see part # SYS1-QD4E-1/2).

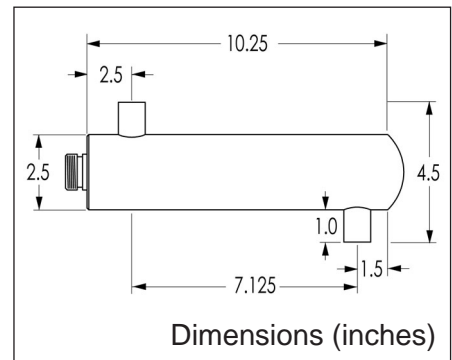
Additional features for this sterilizer can be ordered, such as a thermo-sensitive purge valve at the out port to prevent overheating in no-flow conditions, or volt-free contacts on the ballast for remote signaling. A 12 V DC version for use on boats or RVs is also available.

The UV-1 kills most harmful pathogens such as viruses, bacteria and protozoa with a powerful UV disinfection dose that will inactivate the pathogens at a kill rate of 99.99% (log 4) or more (*Giardia*, *E. coli*, *Cryptosporidium*, *Vibrio cholerae*, *Legionella*, *Salmonella*, *Shigella*, *Streptococcus* and many others)



### Applications

- ▶ Potable Water
- ▶ RV's
- ▶ Cottages
- ▶ RO Systems
- ▶ Laboratories
- ▶ Dental Offices
- ▶ Water Cooler



### Benefits

- ▶ Efficient Disinfection, Low Cost per Litre
- ▶ High UV Dose for Peace of Mind
- ▶ Easy Installation
- ▶ Extremely Simple to Use and Maintain
- ▶ Easy Lamp Replacement
- ▶ High Quality Stainless Steel Reaction Chamber
- ▶ Domed Quartz Sleeve with Single Seal
- ▶ Made in Canada



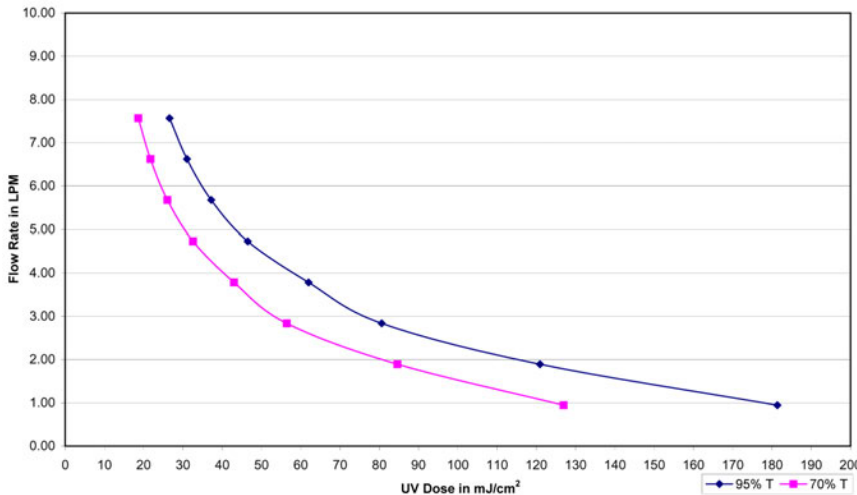
# Specifications

Part # P1/QD4E-1/2

<b>Rated Flow:</b>	4 litres per minute (1 GPM) 240 litres/hour, 5.7 m <sup>3</sup> /day (60 gallons/hour, 1440 gallons/day)
<b>Initial UV Dose at Rated Flow:</b>	63 mJ/cm <sup>2</sup> (63,000 μWsec/cm <sup>2</sup> ) @ 95% UVT 43 mJ/cm <sup>2</sup> (43,000 μWsec/cm <sup>2</sup> ) @ 70% UVT
<b>Electrical:</b>	110-130 Volt AC / 50-60 Hz (Part # P1/QD4E-1) 220-240 Volt AC / 50-60 Hz (Part # P1/QD4E-2) 12 V DC (Part # P1/QD4E-12)
<b>Power Consumption:</b>	18 VA @ 120 V, 23 VA @ 240 V, 0.7 VA @ 12 V
<b>Ballast:</b>	Electronic Ballast (Part # 4-BE-425W-U) w/ Lamp Out Alarm, Power LED
<b>Number of Lamps:</b>	1 at 12 Watts, 425 mA (Part # RL-12/254T5)
<b>UV Monitor:</b>	No
<b>Hour Meter:</b>	Optional (Part # 4-HM-R100)
<b>Max. Operating Temperature:</b>	37 °C (98.6 °F)
<b>Max. Operating Pressure:</b>	125 psi - 8.6 bar (tested to 500 psi)
<b>Plumbing:</b>	3/8" FNPT In/Out
<b>Chamber Material:</b>	304L Stainless Steel (316L SS optional)
<b>Shipping Size and Weight:</b>	1 box 16x7x4 inches, 5 lbs / 2.3 kg

## Dose Chart

UV-1 UV Dose Response Curve



## Additional Features (Optional):

- Electronic Deposit Control System with PVC or Stainless Reaction Chamber
- Volt-Free Contacts on Ballast for Remote Signaling
- Purge Valve at Out Port for Overheat Protection
- Ballast with Hour Meter for Total Runtime Display

## Filtration

This UV sterilizer assumes certain water quality parameters to be met for proper operation. If the source water does not meet the following criteria, pretreatment has to be considered:

**Turbidity (Suspended Solids):** must be < 1 NTU at the time of disinfection. There must be a 5 micron or less sediment prefiltration system installed before the UV system.

**Total Hardness (Sum of Calcium and Magnesium):** Must be < 10 gpg (grains per gallon)

**Iron:** Must be < 0.3 ppm (parts per million)

**Manganese:** Must be < 0.05 ppm

This UV unit is available as complete system with appropriate pre-filtration (Part # SYS1/QD4E-1/2)





# SYS1

## Water Treatment System

### Description

The SYS1 is an All-in-One Water Treatment System that is sized for the needs of the average household to provide purified drinking water at the point of use. Typically installed under the sink, it is used for treating municipal water in apartments and cottages, at laboratories or dental offices. It will purify the water from most contaminants such as sediments, rust and pesticides with filtration in 2 stages down to 0.5 micron. Carbon filtration reduces taste and odour, including sulphur smell and chlorine residuals, as well as cysts. Harmful microorganisms such as viruses, bacteria and protozoa are killed with a powerful UV disinfection dose that will inactivate the pathogens at a kill rate of > 99.99% (log4) (*Giardia*, *E. coli*, *Cryptosporidium*, *Vibrio cholerae*, *Legionella*, *Salmonella*, *Shigella*, *Streptococcus* and many others).

This purifier comes equipped with an electronic ballast that features an alarm system which sounds an audible alarm if the UV lamp is not functioning properly. The filter housings come with pressure relief valves. A 12 V DC ballast for the use on boats and RVs is also available.

An integrated faucet set is included for the provision of the purified drinking water. All installation hardware (mounting bracket, saddle valves and tubing) are supplied with the system.

This residential water purification system offers very efficient water treatment at a low cost per unit volume. The system is designed for ease of installation and is fully tested prior to shipment.



### Features

- ▶ Robust Construction
- ▶ 304L SS Sterilizer
- ▶ Sediment + Carbon Filtration
- ▶ Electronic Ballast
- ▶ Lamp-Out Alarm
- ▶ Self Contained
- ▶ Energy Efficient



Typical Installation for drinking water under the sink

### Benefits

- ▶ Chemical-Free Disinfection, Low Cost per Litre
- ▶ High UV Dose for Peace of Mind
- ▶ Extremely Simple to Use and Maintain
- ▶ Fully Assembled for Easy Installation
- ▶ Ideal for Use on Houseboats, RV's and Condo's



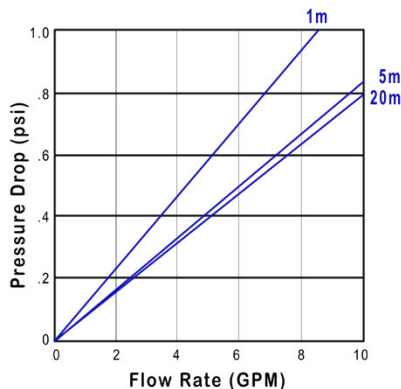


<b>Rated Flow:</b>	4 litres per minute (1 GPM) 240 litres/hour, 5.7 m <sup>3</sup> /day (60 gallons/hour, 1440 gallons/day)
<b>Initial UV Dose at Rated Flow:</b>	63 mJ/cm <sup>2</sup> (63,000 μWsec/cm <sup>2</sup> ) @ 95% UVT 43 mJ/cm <sup>2</sup> (43,000 μWsec/cm <sup>2</sup> ) @ 70% UVT
<b>Electrical:</b>	110-130 Volt AC / 50-60 Hz (Part # SYS1/QD4E-1) 220-240 Volt Ac / 50-60 Hz (Part # SYS1/QD4E-2) 12 V DC (Part # SYS1/QD4E-12)
<b>Power Consumption:</b>	18 VA @ 120 V, 23 VA @ 240 V, 0.7 VA @ 12 V
<b>Ballast:</b>	Electronic Ballast (Part # 4-BE-425W-U) w/ Lamp Out Alarm, Power LED
<b>Replacement Lamp:</b>	Low-Pressure UV Lamp, Part # RL-12/254T5
<b>Filtration:</b>	10" SlimLine (L 9-3/4", OD 2-1/2"), w/ Pressure Relief
<b>Stage 1, Sediment Filter:</b>	Melt-Blown Polypropylene ("Spun Poly"), 5 Micron
<b>Stage 2, Carbon Filter:</b>	C-MAX MAX-CYST Bituminous Carbon, 0.5 Micron
<b>Max. Operating Temperature:</b>	37 °C (98.6 °F)
<b>Max. Operating Pressure:</b>	125 psi - 8.6 bar (tested to 500 psi)
<b>Plumbing:</b>	3/8" In/Out, comes w/ Saddle Valves & Tubing (PVC)
<b>Shipping Size and Weight:</b>	1 box 19x15x7 inches, 15 lbs / 6.8 kg

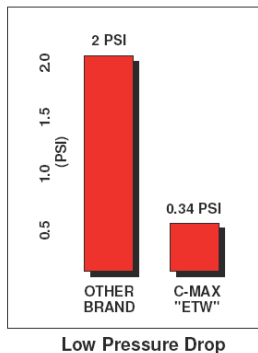
## Pressure Drop Charts

The filter cartridges in this system have a great surface area for long life and reduced filtration costs.

### Sediment Filter



### Carbon Block Filter



## Additional Features (Optional):

- Electronic Deposit Control System with PVC or Stainless Reaction Chamber
- Additional Filtration for Most Common Contaminants and Pollutants
- Purge Valve at Out Port for Overheat Protection
- Ballast with Hour Meter for Total Runtime Display

## Filtration

This UV System comes equipped with dual pre-filtration. The water first enters the sediment filter housing, where a sediment filter cartridge (made from melt-blown Polypropylene) removes dirt, rust and other sediments down to 5 micron (cartridge Part # 14-WFS10-5SP). This is followed by a second filter housing with a carbon block filter cartridge at 0.5 micron (made from Coconut Shell Carbon), which removes chlorine, taste and odour from the water (cartridge Part # 14-WFC10-05CB). Additional filtration stages can be installed, such as a self-cleaning Spin Down Separator that keeps the filter cartridges from clogging up if elevated sediment levels are present (Part # 14-WFS-15SC). The filter cartridges are NSF certified and have an excellent chemical resistance in all food and beverage purification applications.



# UV-250

## Ultra Violet Water Sterilizer

### Description

The UV-250 is a robust, efficient and cost-effective ultra-violet sterilizer designed for the disinfection of drinking water in the average household at a flow rate of 4 GPM (15 LPM). Typically installed at the point of entry, it can treat municipal water as well as ground water from drilled or dug wells, and surface water from lakes, ponds or rivers. Other applications for this sterilizer are for the purification of process water in laboratories and dental offices, or for the production of water dispensers.

This sterilizer contains a low-pressure, high output UV lamp in a 304L stainless steel reaction chamber (also available in 316L). It comes with an electronic ballast that features a lamp-out alarm if there is no power to the lamp.

Combined with a Wyckomar filter set, this sterilizer is the centre piece of a complete water treatment system for the elimination of bacteria and viruses and reduction of taste and odour at the point of entry (see part # SYS250-QD4E-1/2).

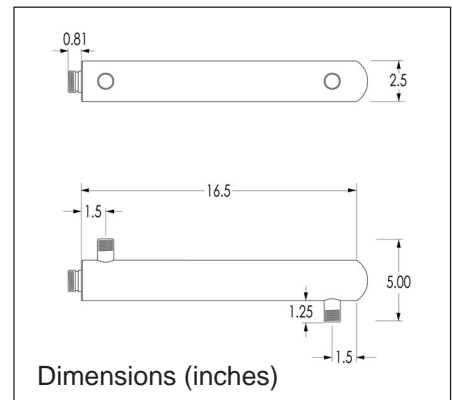
Additional features for this sterilizer can be ordered, such as a thermo-sensitive purge valve at the out port to prevent overheating in no-flow conditions, or volt-free contacts on the ballast for remote signaling.

The UV-250 kills most harmful pathogens such as viruses, bacteria and protozoa with a powerful UV disinfection dose that will inactivate the pathogens at a kill rate of 99.99% (log 4) or more (*Giardia*, *E. coli*, *Cryptosporidium*, *Vibrio cholerae*, *Legionella*, *Salmonella*, *Shigella*, *Streptococcus* and many others).



### Applications

- ▶ Potable Water
- ▶ Whole House (up to 3 People)
- ▶ Cottages
- ▶ Laboratories
- ▶ Water Dispenser
- ▶ RO Systems



### Benefits

- ▶ Efficient Disinfection, Low Cost per Litre
- ▶ High UV Dose for Peace of Mind
- ▶ Easy Installation
- ▶ Extremely Simple to Use and Maintain
- ▶ Easy Lamp Replacement
- ▶ High Quality Stainless Steel Reaction Chamber
- ▶ Domed Quartz Sleeve with Single Seal
- ▶ Made in Canada



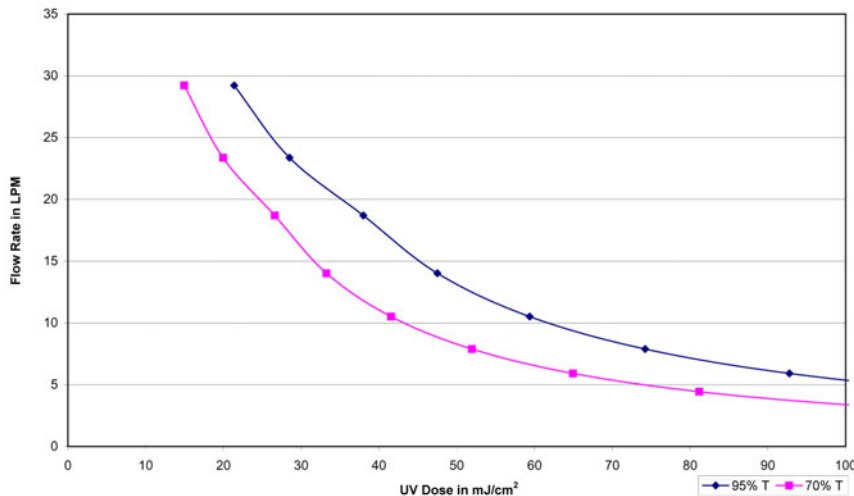
# Specifications

Part # P250/QD4E-1/2

<b>Rated Flow:</b>	15 litres per minute (4 GPM) 900 litres/hour, 21.6 m <sup>3</sup> /day (240 gallons/hour, 5760 gallons/day)
<b>Initial UV Dose at Rated Flow:</b>	46 mJ/cm <sup>2</sup> (46,000 µWsec/cm <sup>2</sup> ) @ 95% UVT 32 mJ/cm <sup>2</sup> (32,000 µWsec/cm <sup>2</sup> ) @ 70% UVT
<b>Electrical:</b>	110-130 Volt AC / 50-60 Hz (Part # P250/QD4E-1) 220-240 Volt AC / 50-60 Hz (Part # P250/QD4E-2)
<b>Power Consumption:</b>	29 VA @ 120 V, 35 VA @ 240 V
<b>Ballast:</b>	Electronic Ballast (Part # 4-BE-425W-U) w/ Lamp Out Alarm, Power LED
<b>Number of Lamps:</b>	1 (Part # RL-23/436T5)
<b>Lamp Wattage and Current:</b>	23 Watts, 425 mA
<b>UV Monitor:</b>	Special Order Only
<b>Hour Meter:</b>	Optional (Part # 4-HM-R100)
<b>Max. Operating Temperature:</b>	37 °C (98.6 °F)
<b>Max. Operating Pressure:</b>	125 psi - 8.6 bar (tested to 500 psi)
<b>Plumbing:</b>	3/4" MNPT In/Out
<b>Chamber Material:</b>	304L Stainless Steel (316L SS optional)
<b>Shipping Size and Weight:</b>	1 box 26x7x6 inches, 8 lbs / 3.6 kg

## Dose Chart

UV-250 UV Dose Response Curve



## Additional Features (Optional):

- Electronic Deposit Control System with PVC or Stainless Reaction Chamber
- Volt-Free Contacts on Ballast for Remote Signaling
- Purge Valve at Out Port for Overheat Protection
- Ballast with Hour Meter for Total Runtime Display
- Available Solar Powered for Use in Off-Grid Applications

## Filtration

This UV sterilizer assumes certain water quality parameters to be met for proper operation. If the source water does not meet the following criteria, pretreatment has to be considered:

**Turbidity (Suspended Solids):** must be < 1 NTU at the time of disinfection. There must be a 5 micron or less sediment prefiltration system installed before the UV system.

**Total Hardness (Sum of Calcium and Magnesium):** Must be < 10 gpg (grains per gallon)

**Iron:** Must be < 0.3 ppm (parts per million)

**Manganese:** Must be < 0.05 ppm

This UV unit is available as complete system with appropriate pre-filtration (Part # SYS250/QD4E-1/2) or as a pre-assembled All-in-One system for 'plug-and-play" installation (Part # SYS-POU250-1/2)





# SYS250

## Water Treatment System

### Description

The SYS250 is an All-in-One Water Treatment System that is sized for the needs of the smaller household (up to 3 people) to provide complete purified drinking water for domestic use. Typically installed at the point of entry, it is used for treating municipal water as well as ground water from drilled or dug wells, and surface water from lakes, ponds or rivers. It will purify the water from most contaminants such as sediments, rust and pesticides with filtration down to 5 micron. Carbon filtration reduces taste and odour, including sulphur smell and chlorine residuals, as well as cysts. Harmful microorganisms such as viruses, bacteria and protozoa are killed with a powerful UV disinfection dose that will inactivate the pathogens at a kill rate of > 99.99% (log4) (*Giardia*, *E. coli*, *Cryptosporidium*, *Vibrio cholerae*, *Legionella*, *Salmonella*, *Shigella*, *Streptococcus* and many others).

This purifier comes equipped with an electronic ballast that features an alarm system which sounds an audible alarm if the UV lamp is not functioning properly.

All installation hardware (mounting bracket, filter wrench and flexible S-pipe for the connection between filtration and UV) are supplied with the system. Shutoffs are not supplied and are optional, depending on the plumbing set-up.

This residential water purification system offers very efficient water treatment at a low cost per unit volume. The system is designed for ease of installation and is fully tested prior to shipment.



### Features

- ▶ **Chemical-Free Water Treatment**
- ▶ **Robust Construction, Pre-Assembled**
- ▶ **10" SlimLine Sediment + Carbon Filtration**
- ▶ **Filter Housings with Pressure Relief Valves**
- ▶ **304L SS Ultra-Violet Sterilizer (316L optional)**
- ▶ **Electronic Ballast with Lamp-Out Alarm**



The system ships complete with all necessary components and installation hardware

### Benefits

- ▶ **Efficient Disinfection, Low Cost per Litre**
- ▶ **High UV Dose for Peace of Mind**
- ▶ **Extremely Simple to Use and Maintain**
- ▶ **Pre-Assembled Filter Set for Easy Installation**
- ▶ **Ideal for Use in Households up to 3 People**





# Specifications

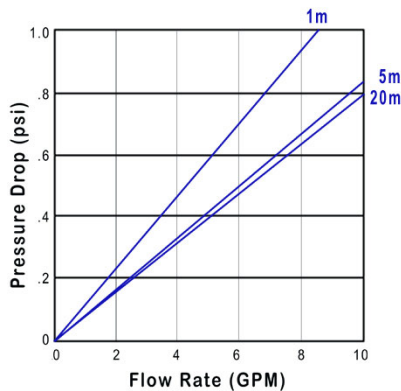
Part # SYS250/QD4E-1/2

<b>Rated Flow:</b>	15 litres per minute (4 GPM) 900 litres/hour, 21.6 m <sup>3</sup> /day (240 gallons/hour, 5,760 gallons/day)
<b>Initial UV Dose at Rated Flow:</b>	46 mJ/cm <sup>2</sup> (46,000 µWsec/cm <sup>2</sup> ) @ 95% UVT 32 mJ/cm <sup>2</sup> (32,000 µWsec/cm <sup>2</sup> ) @ 70% UVT
<b>Electrical:</b>	110-130 Volt AC / 50-60 Hz (Part # SYS250/QD4E-1) 220-240 Volt Ac / 50-60 Hz (Part # SYS250/QD4E-2)
<b>Power Consumption:</b>	29 VA @ 120 V, 35 VA @ 240 V
<b>Ballast:</b>	Electronic Ballast (Part # 4-BE-425W-U) w/ Lamp Out Alarm, Power LED
<b>Replacement Lamp:</b>	Low-Pressure UV Lamp, Part # RL-23/436T5
<b>Filtration:</b>	10" SlimLine (L 9-7/8", OD 2-1/2"), w/ Pressure Relief
<b>Stage 1, Sediment Filter:</b>	Melt-Blown Polypropylene ("Spun Poly"), 5 Micron
<b>Stage 2, Carbon Filter:</b>	Coconut Shell Carbon (Extruded Carbon Block)
<b>Connection betw. UV and Filter (S-Pipe):</b>	SS Flexible Hose (Part # 10-FF18)
<b>Max. Operating Temperature:</b>	37 °C (98.6 °F)
<b>Max. Operating Pressure:</b>	125 psi - 8.6 bar (tested to 500 psi)
<b>Plumbing:</b>	3/4" MNPT In/Out
<b>Shipping Size and Weight:</b>	1 box 26x17x7 inches, 16 lbs / 7.3 kg

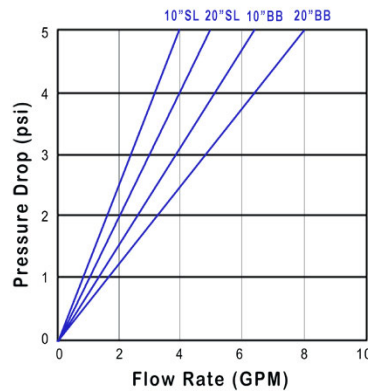
## Pressure Drop Charts

The filter cartridges in this system have a great surface area for long life and reduced filtration costs.

### Sediment Filter



### Carbon Block Filter



## Additional Features (Optional):

- Electronic Deposit Control System with PVC or Stainless Reaction Chamber
- Additional Sediment Filtration with Spin Down Separator for Lake Water Applications
- Purge Valve at Out Port for Overheat Protection
- Ballast with Hour Meter for Total Runtime Display

## Filtration

This UV System comes equipped with dual pre-filtration. The water first enters the sediment filter housing, where a sediment filter cartridge (made from melt-blown Polypropylene) removes dirt, rust and other sediments down to 5 micron (cartridge Part # 14-WFS10-5SP). This is followed by a second filter housing with a carbon block filter cartridge at 10 micron (made from Coconut Shell Carbon), which removes chlorine, taste and odour from the water (cartridge Part # 14-WFC10-5CB). Additional filtration stages can be installed, such as a self-cleaning Spin Down Separator that keeps the filter cartridges from clogging up if elevated sediment levels are present (Part # 14-WFS-15SC). The filter cartridges are NSF certified and have an excellent chemical resistance in all food and beverage purification applications and a low pressure drop.





# UV-700

## Ultra Violet Water Sterilizer

### Description

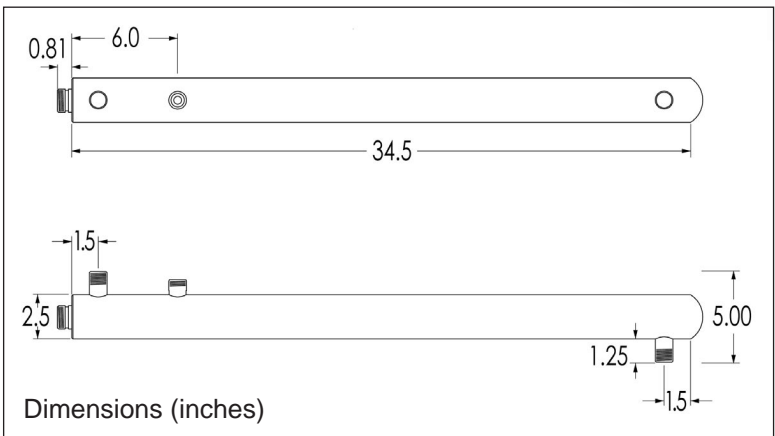
The UV-700 is our best-selling ultra-violet sterilizer designed for the disinfection of drinking water in the average household at a flow rate of 8 GPM (30 LPM). Typically installed at the point of entry, it can treat municipal water as well as ground water from drilled or dug wells, and surface water from lakes, ponds or rivers. Other applications for this sterilizer are for the purification of all incoming water in various small commercial applications, such as coffee shops, doctor's offices or hair salons.

This sterilizer contains a low-pressure, high output UV lamp in a 304L stainless steel reaction chamber (also available in 316L). It comes with an electronic ballast that features a lamp-out alarm if there is no power to the lamp.

Combined with a Wyckomar filter set, this sterilizer is the centre piece of a complete water treatment system for the elimination of bacteria and viruses and reduction of taste and odour at the point of entry (see part # SYS700-QD4E-1/2).

Additional features for this sterilizer can be ordered, such as a thermo-sensitive purge valve at the out port to prevent overheating in no-flow conditions, or volt-free contacts on the ballast for remote signaling.

The UV-700 kills most harmful pathogens such as viruses, bacteria and protozoa with a powerful UV disinfection dose that will inactivate the pathogens at a kill rate of 99.99% (log 4) or more (*Giardia*, *E. coli*, *Cryptosporidium*, *Vibrio cholerae*, *Legionella*, *Salmonella*, *Shigella*, *Streptococcus* and many others).



### Applications

- ▶ Potable Water
- ▶ Whole House Water Treatment (up to 6 People)
- ▶ Small Commercial Applications, such as Coffee Shops, Doctor's Offices, Hair Salons
- ▶ Light Industrial Applications
- ▶ Food and Beverage Manufacturing

### Benefits

- ▶ Efficient Disinfection, Low Cost per Litre
- ▶ High UV Dose for Peace of Mind
- ▶ Easy Installation
- ▶ Extremely Simple to Use and Maintain
- ▶ Easy Lamp Replacement
- ▶ High Quality Stainless Steel Reaction Chamber
- ▶ Domed Quartz Sleeve with Single Seal
- ▶ Made in Canada



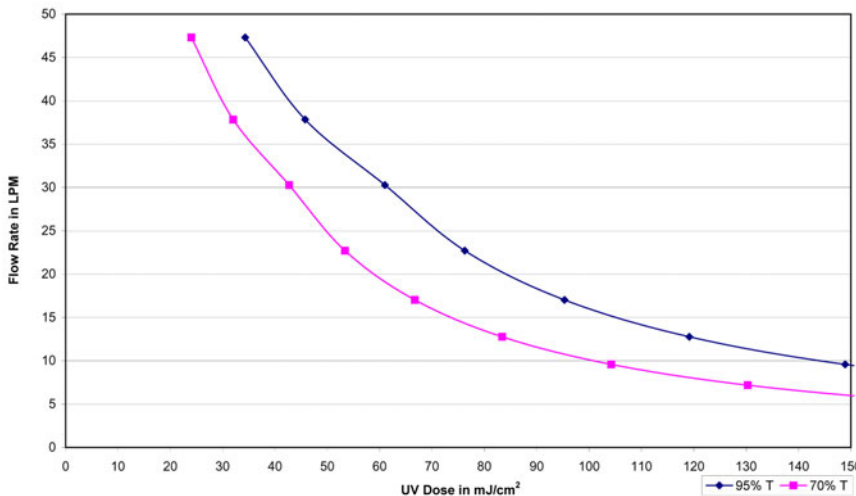
# Specifications

Part # P700/QD4E-1/2

<b>Rated Flow:</b>	30 litres per minute (8 GPM) 1800 litres/hour, 43.2 m <sup>3</sup> /day (480 gallons/hour, 11520 gallons/day)
<b>Initial UV Dose at Rated Flow:</b>	62 mJ/cm <sup>2</sup> (62,000 μWsec/cm <sup>2</sup> ) @ 95% UVT 43 mJ/cm <sup>2</sup> (43,000 μWsec/cm <sup>2</sup> ) @ 70% UVT
<b>Electrical:</b>	110-130 Volt AC / 50-60 Hz (Part # P700/QD4E-1) 220-240 Volt AC / 50-60 Hz (Part # P700/QD4E-2)
<b>Power Consumption:</b>	53 VA @ 120 V, 66 VA @ 240 V
<b>Ballast:</b>	Electronic Ballast (Part # 4-BE-425W-U) w/ Lamp Out Alarm, Power LED
<b>Number of Lamps:</b>	1 (Part # RL-40/867T5)
<b>Lamp Wattage and Current:</b>	40 Watts, 425 mA
<b>UV Monitor:</b>	Optional (Part # 4-UV/MS-1/2 V3)
<b>Solenoid Valve:</b>	Optional (Part # 4-SV-750-1)
<b>Hour Meter:</b>	Optional (Part # 4-HM-R100)
<b>Max. Operating Temperature:</b>	37 °C (98.6 °F)
<b>Max. Operating Pressure:</b>	125 psi - 8.6 bar (tested to 500 psi)
<b>Plumbing:</b>	3/4" MNPT In/Out
<b>Chamber Material:</b>	304L Stainless Steel (316L SS optional)
<b>Shipping Size and Weight:</b>	1 box 45x7x7 inches, 12 lbs / 5.5 kg

## Dose Chart

UV-700 UV Dose Response Curve



## Additional Features (Optional):

- Electronic Deposit Control System with PVC or Stainless Reaction Chamber
- Volt-Free Contacts on Ballast for Remote Signaling
- Purge Valve at Out Port for Overheat Protection
- Ballast with Hour Meter for Total Runtime Display
- Available in Explosion-Proof Configuration

## Filtration

This UV sterilizer assumes certain water quality parameters to be met for proper operation. If the source water does not meet the following criteria, pretreatment has to be considered:

**Turbidity (Suspended Solids):** must be < 1 NTU at the time of disinfection. There must be a 5 micron or less sediment prefiltration system installed before the UV system.

**Total Hardness (Sum of Calcium and Magnesium):** Must be < 10 gpg (grains per gallon)

**Iron:** Must be < 0.3 ppm (parts per million)

**Manganese:** Must be < 0.05 ppm

This UV unit is available as complete system with appropriate pre-filtration (Part # SYS700/QD4E-1/2) or as a pre-assembled All-in-One system for 'plug-and-play" installation (Part # SYS-MD1003-1/2)





# SYS700

## Water Treatment System

### Description

The SYS700 is an All-in-One Water Treatment System that is sized for the needs of the average household (up to 6 people) to provide complete purified drinking water for domestic use. Typically installed at the point of entry, it is used for treating municipal water as well as ground water from drilled or dug wells, and surface water from lakes, ponds or rivers. It will purify the water from most contaminants such as sediments, rust and pesticides with filtration down to 5 micron. Carbon filtration reduces taste and odour, including sulphur smell and chlorine residuals, as well as cysts. Harmful microorganisms such as viruses, bacteria and protozoa are killed with a powerful UV disinfection dose that will inactivate the pathogens at a kill rate of > 99.99% (log4) (*Giardia*, *E. coli*, *Cryptosporidium*, *Vibrio cholerae*, *Legionella*, *Salmonella*, *Shigella*, *Streptococcus* and many others)

This purifier comes equipped with an electronic ballast that features an alarm system which sounds an audible alarm if the UV lamp is not functioning properly.

All installation hardware (mounting bracket, filter wrench and flexible S-pipe for the connection between filtration and UV) are supplied with the system. Shutoffs are not supplied and are optional, depending on the plumbing set-up.

This residential water purification system offers very efficient water treatment at a low cost per unit volume. The system is designed for ease of installation and is fully tested prior to shipment.



### Features

- ▶ **Chemical-Free Water Treatment**
- ▶ **Robust Construction, Pre-Assembled**
- ▶ **20" SlimLine Sediment + Carbon Filtration**
- ▶ **Filter Housings w/ Pressure Relief Valves**
- ▶ **304L SS Ultra-Violet Sterilizer (316L optional)**
- ▶ **Electronic Ballast with Lamp-Out Alarm**



The system ships complete with all necessary components and installation hardware



### Benefits

- ▶ **Efficient Disinfection, Low Cost per Litre**
- ▶ **High UV Dose for Peace of Mind**
- ▶ **Extremely Simple to Use and Maintain**
- ▶ **Pre Assembled Filter Set for Easy Installation**
- ▶ **Ideal for Use in Households up to 6 People**

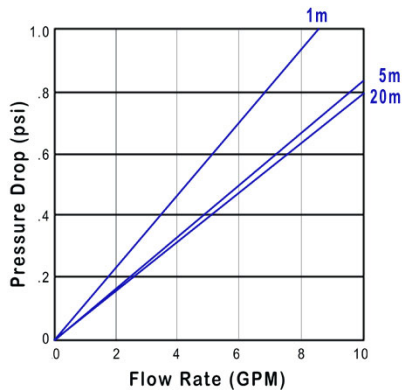


<b>Rated Flow:</b>	30 litres per minute (8 GPM) 1,800 litres/hour, 43.2 m <sup>3</sup> /day (480 gallons/hour, 11,520 gallons/day)
<b>Initial UV Dose at Rated Flow:</b>	62 mJ/cm <sup>2</sup> (62,000 µWsec/cm <sup>2</sup> ) @ 95% UVT 43 mJ/cm <sup>2</sup> (43,000 µWsec/cm <sup>2</sup> ) @ 70% UVT
<b>Electrical:</b>	110-130 Volt AC / 50-60 Hz (Part # SYS700/QD4E-1) 220-240 Volt Ac / 50-60 Hz (Part # SYS700/QD4E-2)
<b>Power Consumption:</b>	53 VA @ 120 V, 66 VA @ 240 V
<b>Ballast:</b>	Electronic Ballast (Part # 4-BE-425W-U) w/ Lamp Out Alarm, Power LED
<b>Replacement Lamp:</b>	Low-Pressure UV Lamp, Part # RL-40/867T5
<b>Filtration:</b>	20" SlimLine (L 20", OD 2-1/2"), w/ Pressure Relief
<b>Stage 1, Sediment Filter:</b>	Melt-Blown Polypropylene ("Spun Poly"), 5 Micron
<b>Stage 2, Carbon Filter:</b>	Coconut Shell Carbon ("Extruded Carbon Block")
<b>Connection betw. UV and Filter (S-Pipe):</b>	SS Flexible Hose (Part # 10-FF36)
<b>Max. Operating Temperature:</b>	37 °C (98.6 °F)
<b>Max. Operating Pressure:</b>	125 psi - 8.6 bar (tested to 500 psi)
<b>Plumbing:</b>	3/4" MNPT In/Out
<b>Shipping Size and Weight:</b>	1 box 45x7x7 inches, 12 lbs / 5.5 kg 1 box 26x17x7 inches, 16 lbs / 7.3 kg

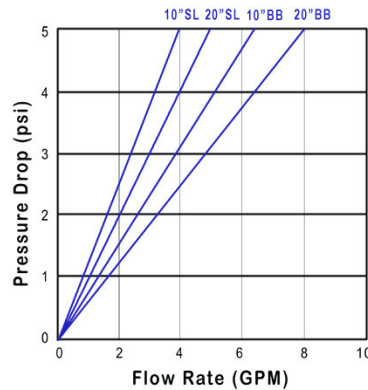
## Pressure Drop Charts

The filter cartridges in this system have a great surface area for long life and reduced filtration costs.

### Sediment Filter



### Carbon Block Filter



## Additional Features (Optional):

- Electronic Deposit Control System with PVC or Stainless Reaction Chamber
- Additional Sediment Filtration with Spin Down Separator for Lake Water Applications
- Purge Valve at Out Port for Overheat Protection
- Ballast with Hour Meter for Total Runtime Display

## Filtration

This UV System comes equipped with dual pre-filtration. The water first enters the sediment filter housing, where a sediment filter cartridge (made from melt-blown Polypropylene) removes dirt, rust and other sediments down to 5 micron (cartridge Part # 14-WFS20-5SP). This is followed by a second filter housing with a carbon block filter cartridge at 10 micron (made from Coconut Shell Carbon), which removes chlorine, taste and odour from the water (cartridge Part # 14-WFC20-5CB). Additional filtration stages can be installed, such as a self-cleaning Spin Down Separator that keeps the filter cartridges from clogging up if elevated sediment levels are present (Part # 14-WFS-15SC). The filter cartridges are NSF certified and have an excellent chemical resistance in all food and beverage purification applications and a low pressure drop.



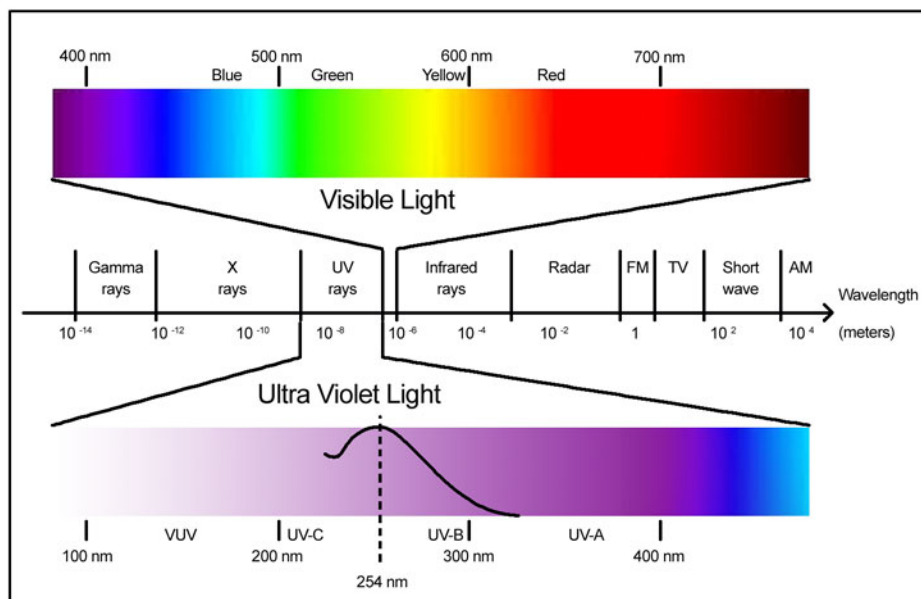
## Ultraviolet Sterilization Technology

Ultraviolet disinfection systems are mysterious to many people – how can “light” kill bacteria? But the truth is it can. Ultraviolet (UV) technology has been around for more than 50 years, and its effectiveness has been well documented both scientifically and commercially. It is nature’s own disinfection/purification method. With consumers becoming more concerned about chlorine and other chemical contamination of drinking water, more dealers are prescribing the ultraviolet solution suitable for both small flow residential applications as well as large flow commercial projects.

Ultraviolet is a means of killing or rendering harmless microorganisms in a dedicated environment. These microorganisms can range from bacteria and viruses to algae and protozoa. UV disinfection is used in air and water purification, sewage treatment, protection of food and beverages, and many other disinfection and sterilization applications. A major advantage of UV treatment is that it is considered safer and more reliable for disinfection of water than chemical alternatives, while the level of disinfection is much higher. UV treatment systems are also extremely cost efficient and require less space than alternative disinfection systems.

### What is UV and how does it work?

Ultraviolet light is one energy region of the electromagnetic spectrum, which lies between the x-ray region and the visible region. Wavelengths of visible light range between 400 and 700 nanometers (nm). UV itself lies in the ranges of 200 nm to 390 nm. Optimal UV germicidal action occurs at 254 nm.



*The Electromagnetic Spectrum*

Since natural germicidal UV light from the sun is screened out by the earth’s atmosphere, we must look to alternative means of producing UV light. This is accomplished through the conversion of electrical energy in a low-pressure

mercury vapor “hard glass” quartz lamp. Electrons flow through the ionized mercury vapor between the electrodes of the lamp, which then creates UV light.

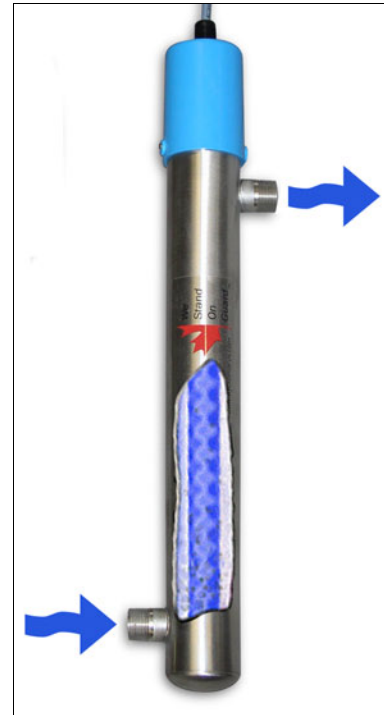
*The Filaments and Arc in a UV Lamp*



As UV light penetrates through the cell wall and cytoplasmic membrane of a microorganism that is in the water while it flows through the unit, it causes a molecular rearrangement of the microorganism’s DNA, which prevents it from reproducing. If the cell cannot reproduce, it is considered dead or “inactivated”.

### Dosage

UV dosage is the most critical function of UV disinfection, because the extent of inactivation is proportional to the dose applied to the water. As individual UV lamps emit a set amount of ultraviolet energy, it is important that a system be sized correctly. Flow rates are the determining factor and must not be overstated. Contact time, which is the time the water is within the sterilization chamber, is directly proportional to dosage, which is the amount of energy per unit area (calculated by dividing the output in watts by the surface area of the lamp), and thus the overall effectiveness of microbial destruction in the system. This product of intensity and time is known as the Dose and is expressed in microwatt seconds per centimeter squared (uWsec/cm<sup>2</sup>). **Divide by 1000 to express the dose in mJ/cm<sup>2</sup>, the preferred notation.**



*Water flows through the chamber in an upward circular path*

$$\text{DOSE} = \frac{\text{time (sec)} \times \text{output (watts)}}{\text{area (cm}^2\text{)}}$$

For maximum UV transmission a “hard glass” quartz sleeve is recommended for two main reasons. It isolates the lamp from the water to offer more uniform operating temperatures and allows for higher UV output into the water.

### Optional Features

A variety of optional features may be added on to the UV sterilizers. They include UV monitoring devices that measure the actual UV output in real time, solenoid shut-off devices that will stop the water flow in



the event of a system failure, flow control devices to properly limit the water flow in the units, audible and visual alarms (both local and remote) to warn of lamp failures, high temperature sensors to monitor excessive temperatures in the reactor chamber or control panel, and hour meters to monitor the running time of the UV lamps.



*A solenoid valve shuts off the flow of water, if the intensity of the UV lamp goes down*

## **Advantages of UV Sterilization**

Following are the advantages of UV sterilization:

- Environmentally friendly, no dangerous or toxic chemicals to handle, no problem of overdosing (it's impossible), no need for specialized storage equipment, no WHMIS requirements.
- Low initial capital cost as well as reduced operating expenses when compared with similar technologies such as ozone, chlorine, etc.
- Immediate treatment process, no need for holding tanks, long retention times, etc.
- Extremely economical, hundreds of gallons may be treated for each penny of operating cost.
- No chemicals are added to the water supply – no chlorinated by-products are generated (i.e. chlorine + organics = trihalomethanes).
- No change in taste, odor, pH or conductivity or the general chemistry of the water, essential minerals and trace elements remain in the water
- Automatic operation without special attention or measurement, operator friendly.
- Simplicity and ease of maintenance, periodic cleaning (if applicable) and annual lamp replacement, no moving parts to wear out.
- Easy installation, only two water connections and a power connection.
- Compatible with all other water processes (i.e. RO, filtration, ion exchange, etc.)

## **Factors Affecting UV**

Because UV does not leave any measurable residual in the water, it is recommended that the UV sterilizer be installed as the final step of treatment and located as close as possible to the final distribution system. Once the quality of your water source has been determined, you will need to look at things that can inhibit the UV from functioning properly (e.g., iron, manganese, TDS, turbidity, and suspended solids).

**Iron and Manganese** will cause staining on the quartz sleeve and prevent the UV light from transmitting into the water at levels as low as 0.3 ppm of iron and 0.05 ppm of manganese. Proper pretreatment is required to eliminate this staining problem.



**Total Dissolved Solids (TDS)** should not exceed 500 ppm. There are many factors that make up this equation such as the particular make-up of the dissolved solids and how fast they absorb on the sleeve, again impeding the UV energy from penetrating the water.

**Turbidity** is the inability of light to travel through water. Turbidity makes water cloudy and aesthetically unpleasant. In the case of UV, levels over 1 NTU can shield microorganisms from UV light, making the process ineffective.

**Suspended Solids** need to be reduced to a maximum of 5 microns in size. Larger solids have the potential of harboring or encompassing the microorganisms and preventing the necessary UV exposure. Pre-filtration is a must on all UV applications to effectively destroy microorganisms to a 99.9% kill rate.

**Additional Factors** - UV levels fluctuate with temperature levels. The optimal operating temperature of a UV lamp must be below or near 40°C (104°F). Typically, a quartz sleeve is installed to buffer direct lamp-water contact, thereby reducing any temperature fluctuations. The UV dose applied to the water decreases significantly with temperatures over 40°C.

## UV Applications

One of the most common uses of ultraviolet sterilization is the disinfection of domestic water supplies due to contaminated wells or surface water sources. Coupled with appropriate pre-treatment equipment, UV provides an economical, efficient and user-friendly means of producing safe potable water.

The following list shows where ultraviolet technology is currently in use:

surface water	laboratories	bottled water plants
ground water	wineries	pharmaceuticals
cisterns	dairies	mortgage approvals
breweries	farms	electronics
hospitals	hydroponics	aquaria
restaurants	spas	boats and RV's
vending machines	canneries	printing
cosmetics	food products	butter processing
bakeries	distilleries	petro chemicals
schools	fish hatcheries	photography
boiler feed water	water softeners	swimming pools
cooling towers	sprinkler systems	bottling plants
and much more...		

## Installation and Maintenance Guidelines

Once the application has been determined, you should find a location that offers easy access for service. You will need to have access to the pre-filters, to the

UV chamber for annual lamp changes and regular maintenance on the quartz sleeve. You will want to locate near an electrical outlet. \*Note: Using a UV system and a pump on the same electrical line may cause problems and shorten the life of the UV lamp and ballast. A surge protector with a rating of at least 3600 Joules should be installed to protect the electronic ballast from damage due to power spikes or lightning strikes. UV units are installed on the cold water line before any branch lines and should be the last point of treatment. Clearance for lamp change has to be considered during installation. All points of the distribution system after the sterilizer must be chemically “shocked” to ensure that the system is free from any downstream microbial contamination. Lamp changes should be done at least once every year. Filter changes are done according to the condition of the feed water. If there is residue left, you may need to use a non-abrasive cleaner that does not scratch the surface and is formulated to remove iron and scale buildup. Do not leave fingerprints on the glass! It is imperative to follow the manufacturers guidelines on feed water quality and operational procedures.

## Summary

The need for ultraviolet sterilization products can be found in virtually all areas in both residential and commercial applications alike. Its simplistic design, ease of maintenance and low capital and operating costs make UV disinfection the number one choice in contaminated water situations. Because of its advantages, UV irradiation is on the way to become the most popular choice for the disinfection of water supplies in the 21<sup>st</sup> century.

Next time, purify water “*natures way*”...use ultraviolet light.



# UV Inactivation Chart\* (in mJ/cm<sup>2</sup>)

Organism	Type	Affiliated Disease, Contamination, Toxin	Dose log 3	Reference
Adenoviridae	Virus	Upper respiratory infections (most UV-resisant virus known)	90	Meng and Gerba, 1996
Acanthamoeba spp. (cysts)	Protist	Amoebic keratitis and encephalitis	140	Maya et al, 2003
Aeromonas hydrophila	Bacterium	Tissue damage in humans (opportunistic pathogen)	3.9	Wilson et al, 1992
Agrobacterium tumefaciens	Bacterium	Crown Gall disease in Dicotyledons (Grapes, Berries, Fruits, Nuts)	8.5	
Aspergillus flavus (yellow green)	Fungus (Mold Spore)	Aspergillosis of the lungs, corneal infections	99.0	
A. glaucus (blue green)	Fungus (Mold Spore)	Allergenic	88.0	
A. niger (black)	Fungus (Mold Spore)	Otomycosis, Black mold on fruits and vegetables	330.0	
Bacillus anthracis	Bacterium	Anthrax	8.7	
B. anthracis (spores)	Bacterium	Anthrax	46.2	Pasteur Institute, Paris
B. megatherium (vegetable)	Bacterium	Infections, food poisoning	2.5	
B. megatherium (spores)	Bacterium	Infections, food poisoning	52.0	
B. paratyphosus	Bacterium	non pathogenic	6.1	
B. subtilis (vegetable)	Bacterium	Ropiness in bread dough, food contamination	11.0	
B. subtilis (spores)	Bacterium	Ropiness in bread dough, food contamination	61.0	Chang et al, 1985, Sommer et al, 1998
Campylobacter jejuni	Bacterium	Food poisoning, gastroenteritis	4.0	Wilson et al, 1992
Chlorella vulgaris	Protist (algae)	Plant pathogen	22.0	
Clostridium tetani	Bacterium	Tetanus	23.1	Pasteur Institute, Paris
C. botulinum	Bacterium	Produces Botulin toxin	11.2	
C. perfringens	Bacterium	Food posoning (ex C. welchii)	75.0	Jacangelo et al, 2003
Coliphage	Virus	Bacteriophage that infects E. coli	6.6	
Corynebacterium diphtheriae	Bacterium	Diphtheria	6.5	
Coxsackie A	Virus	Hand, foot & mouth disease, conjunctivitis, herpangina	6.9	
Coxsackie B	Virus	Pericarditis, myocarditis, gastrointestinal distress	20.6	Battigelli et al, 1993
Cryptosporidium parvum	Protist	Cryptosporidiosis, gastrointestinal illness	25.0	Craik et al, 2001
Cyanobacteria	Bacterium	(blue green algae)	700.0	Masschelein et al, 1989
Desulfovibrio spp	Bacterium	(sulfate-reduction bacteria) Contamination of oilfield process water	10.0	Hagan et al, 2011
Eberthella typhosa	Bacterium	Typhoid fever	4.1	
Entamoeba histolytica	Protist	Amoebiasis	84.0	
Enterococcus spp.	Bacterium	Indicator species for (recreational) water quality	30.0	Beltran and Jimenez, 2008
Escherichia coli	Bacterium	Food poisoning, gastroenteritis, meningitis	8.6	Sommer et al, 1998; Wilson et al, 1992
Fusarium oxysporum	Fungus	Plant pathogen (Fusarium wilt)	100.0	
Giardia lamblia (cysts)	Protist	Giardiasis (Beaver Fever, Traveller's Diarrhea)	10.0	Linden et al, 2002
Hepatitis virus	Virus	Hepatitis, jaundice	15.0	US.EPA, 1999
Influenza virus	Virus	Influenza, respiratory infections	6.6	
Klebsiella pneumoniae	Bacterium		15.0	
Legionella bozemanii	Bacterium	Pneumonia	3.5	
L. dumoffii	Bacterium	Pneumonia	5.5	
L. gormanii	Bacterium	Pneumonia	4.9	
L. longbeachae	Bacterium	Legionnaire's disease, pontiac fever	2.9	
L. micdadei	Bacterium	Influenza, Pittsburgh pneumonia	3.1	
L. pneumophila	Bacterium	Legionnaire's disease	3.8	
Leptospira interrogans	Bacterium	Leptospirosis (Weil's disease, canicola fever, canefield fever, 7-day fever )	6.0	
Listeria monocytogenes	Bacterium	Foodborne Listeriosis	40.0	
Micrococcus candidus	Bacterium		12.3	
M. sphaeroides	Bacterium		15.4	
Mycobacterium tuberculosis	Bacterium	Tuberculosis	10.0	
Mucor racemosus A	Fungus (Mold Spore)	Fungal plant pathogen, zygomycosis and fungal sinusitis in humans	35.2	
Naegleria fowleri (cyst)	Protist	Warm water pathogen	105.0	
Neisseria (Moraxella) catarrhalis	Bacterium	Otitis media, sinusitis, laryngitis	8.5	
Nematode eggs (Roundworm)	Parasite	Ascariasis, Appendicitis, Loeffler's Syndrome	92.0	
Oospora lactis	Fungus (Mold Spore)	Fruit rot (rapid decay of ripe fruits, potatoes), mold in dairy products		
Paramecium spp.	Protist		200.0	
Penicillium digitatum (olive)	Fungus (Mold Spore)	Fungal spoilage in fruits and vegetables	88.0	
P. expansum (olive)	Fungus (Mold Spore)	Postharvest decay of stored apples	22.0	
P. roqueforti (green)	Fungus (Mold Spore)	Producing harmful secondary metabolites (alkaloids and other mycotoxins)	26.4	
Phytophthora tumefaciens	Bacterium	Crown Gall disease in Dicotyledons (Grapes, Berries, Fruits, Nuts)	8.5	
Polio virus	Virus	Poliomyelitis (Polio)	29.0	Snicer et al, 1998, Wilson et al, 1992
Proteus vulgaris	Bacterium	Infections (esp. sinus and respiratory, urinary tract)	6.6	
Pseudomonas aeruginosa (lab)	Bacterium	Hospital acquired infections, ear infection and dermatitis in pools & tubs	3.9	
Pseudomonas aeruginosa (env.)	Bacterium	Hospital acquired infections, ear infection and dermatitis in pools & tubs	10.5	
Pythium spp	Fungus	Plant pathogen (root rot)	100.0	
Rhizopus nigricans (black)	Fungus (Mold Spore)	Infections, allergic reactions (known as breadmold)	220.0	
Rhodospirillum rubrum	Bacterium		6.2	
Rotavirus	Virus	Infections, severe diahorrea, gastroenteritis	26.0	Battigelli et al., 1993; Wilson et al., 1992
Saccharomyces spp	Yeast		13.2	
Salmonella enteritidis	Bacterium	Egg-associated Salmonellosis (fever, abdominal cramps, diarrhea)	7.6	Tosa and Hirata, 1998
S. paratyphi	Bacterium	Enteric fever	6.1	
S. typhi	Bacterium	Typhoid fever	30.0	Beltran and Jimenez, 2008
Sarcina lutea	Bacterium		26.4	
Serratia marcescens	Bacterium	Nosocomial (Hospital acquired) infections	6.2	
Shigella dysenteriae	Bacterium	Epidemic dysentery	4.2	Wilson et al., 1992
S. flexneri	Bacterium	Shigellosis, dysentery	3.4	
S. sonnei	Bacterium	Shigellosis	7.0	Chang et al., 1985
Staphylococcus aureus	Bacterium	Staph and nosocomical infections, toxic shock syndrome	7.0	Chang et al., 1986
S. epidermidis	Bacterium	Infections in catheters and prostheses	5.8	
Streptococcus hemolyticus	Bacterium	Strep throat	5.5	
S. faecalis	Bacterium	Endocarditis, bladder and prostate infection	8.0	Harris et al., 1987
S. lactis	Bacterium		8.8	
S. pyogenes	Bacterium	Scarlet fever, toxic shock syndrome, flesh eating disease	8.8	
S. viridans	Bacterium	Mouth or gingival infections, endocarditis	3.8	
Tobacco mosaic virus	Virus	Mottling and discoloration in plants	440.0	
Toxoplasma gondii	Protist	Toxoplasmosis	8.0	Linden and Sobsey, EPA 2005
Vibrio cholerae	Bacterium	Cholera	2.2	Wilson et al., 1992
Yersinia enterocolitica	Bacterium	Yersiniosis (fever, abdominal pain, diarrhea)	3.7	Wilson et al., 1992

Typical Wyckomar UV systems produce UV doses of 38 – 60 mJ/cm<sup>2</sup>

\*UV energy levels required at 254 nanometer wavelength for 99.9% (log 3) destruction of organisms