

ULTRAVIOLET DISINFECTION

Chambered Wastewater Disinfection

ILLUMINATION “IL” SERIES



OVERVIEW

Ultraviolet “UV” disinfection is an accepted method for reducing microorganisms in wastewater.

The Illumination “IL” wastewater series incorporates chambers (vessels) to treat a large range of flow rates.

Wastewater enters the chamber and once inside, it is exposed to UV light. The UV lamp used for germicidal disinfection produces the majority of its light in the 254-nm wavelength. At this wavelength, UV light destroys bacteria, protozoa, viruses, molds, algae and other microbes. This includes fecal coliform and such waterborne diseases as: E-coli, hepatitis, cholera, as well as many others.

Systems integrate energy efficient low pressure high output and high intensity (amalgam) UV lamps. These lamps last over 12,000 hours and produce over 90% of their light in the 254 nm range.

The “IL” Series offers plants an alternative to less efficient medium pressure UV lamp systems.

FEATURES

- Electropolished 316L stainless steel vessels
- Low pressure UV lamps (HO and Amalgam)
- Automatic quartz cleaning
- 150 psi (10 Bar) pressure rating
- Flexible flange sizes
- UV lamp monitoring
- Remote stainless steel electrical enclosures
- Lamp status and running time indicators

OPTIONS

- Biologically validated systems available
- Programmable Logic Controls (PLC)
- Online UV transmission monitoring
- Remote On/Off
- Supplemental chemical cleaning system
- Skid system design
- Explosion proof electronics



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SYSTEM DESIGN

The following is a list of information required to size a UV wastewater disinfection chambered system:

- Peak instant flow rate
- No flow situations
- Discharge permit
- UV transmission %
- Total Suspended Solids (TSS)
- Biological Oxygen Demand (BOD)
- Total Dissolved Solids (TDS)
- Iron and Manganese levels
- Installation location (indoor or outdoor)
- Understanding of plant treatment process
- Staffing level for system maintenance

OPERATIONAL OVERVIEW

Wastewater plants have traditionally used open channel UV disinfection systems. Today, plants are installing chambers that integrate energy efficient long life low pressure UV lamps.

As with all UV systems, the main operational and maintenance responsibilities have to do with keeping the system clean and the lamps operating at optimum performance.

Lamps need to be replaced every 12,000 hours. Due to the harsh nature of wastewater, the quartz sleeves (the protective glass-like tubes that protect the lamps) need to be cleaned. The amount of cleaning is directly related to the pre-treatment processes and the make-up of the wastewater effluent. Fouled quartz prevent the UV light from penetrating and will reduce system efficiency.

The “IL” systems incorporate automatic quartz cleaning systems. The pneumatically driven system pushes a wiper mechanism over the sleeves to remove build up.

WASTEWATER



Gallery of three biologically validated wastewater systems



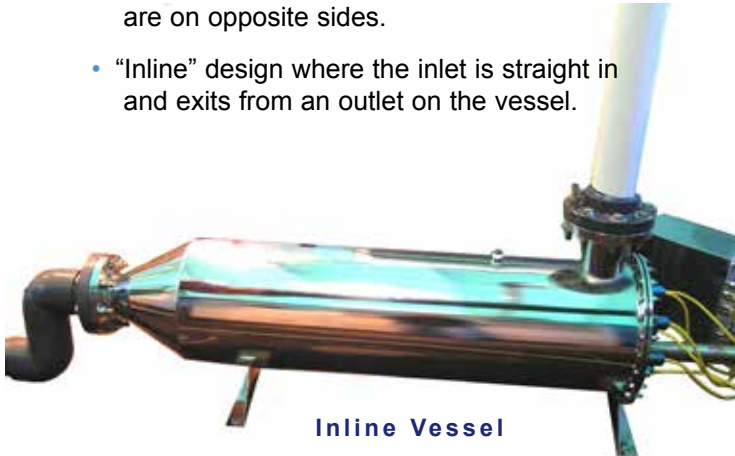
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CONFIGURATIONS

Piping to and from the vessels can cause issues due to spatial constraints and existing piping. Glasco UV offers flexibility when designing the UV system by allowing custom flange sizes and locations.

The various “IL” following orientations are available and shown in the accompanying pictures.

- “U” design where inlet and outlet are on same side of vessel.
- “Opposing” design where inlet and outlet are on opposite sides.
- “Inline” design where the inlet is straight in and exits from an outlet on the vessel.



WASTEWATER

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INSTALLATION DESIGN

When designing a UV wastewater treatment plant, consideration needs to be given to how the units will be configured and plumbed.

The goal is to have the vessels installed in a manner where they are always full of wastewater. This prevents the system from overheating and fouling.

Individual chambers can treat in excess of 4.0 US MGD. Depending on redundancy requirements, systems will be designed to provide both optimal performance and energy savings. Peak flow rates are often shared between multiple chambers.

By splitting the flow, the plant will only utilize the appropriate amount of UV. Additional units come on line as needed.

The UV systems will be powered and controlled by remote modified NEMA 4x stainless steel enclosures that display lamp status, run time and UV output under a window kit.

For plants that require remote operation and automated system cycling, a PLC system will be provided to work in conjunction with plant system.



Ballast Control Center (BCC)



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