

TROJANUV3000™B

Wastewater Disinfection

TROJAN ™

 Water
Confidence™

TROJAN UV3000™ B

Robust, operator-friendly solutions designed for economical disinfection

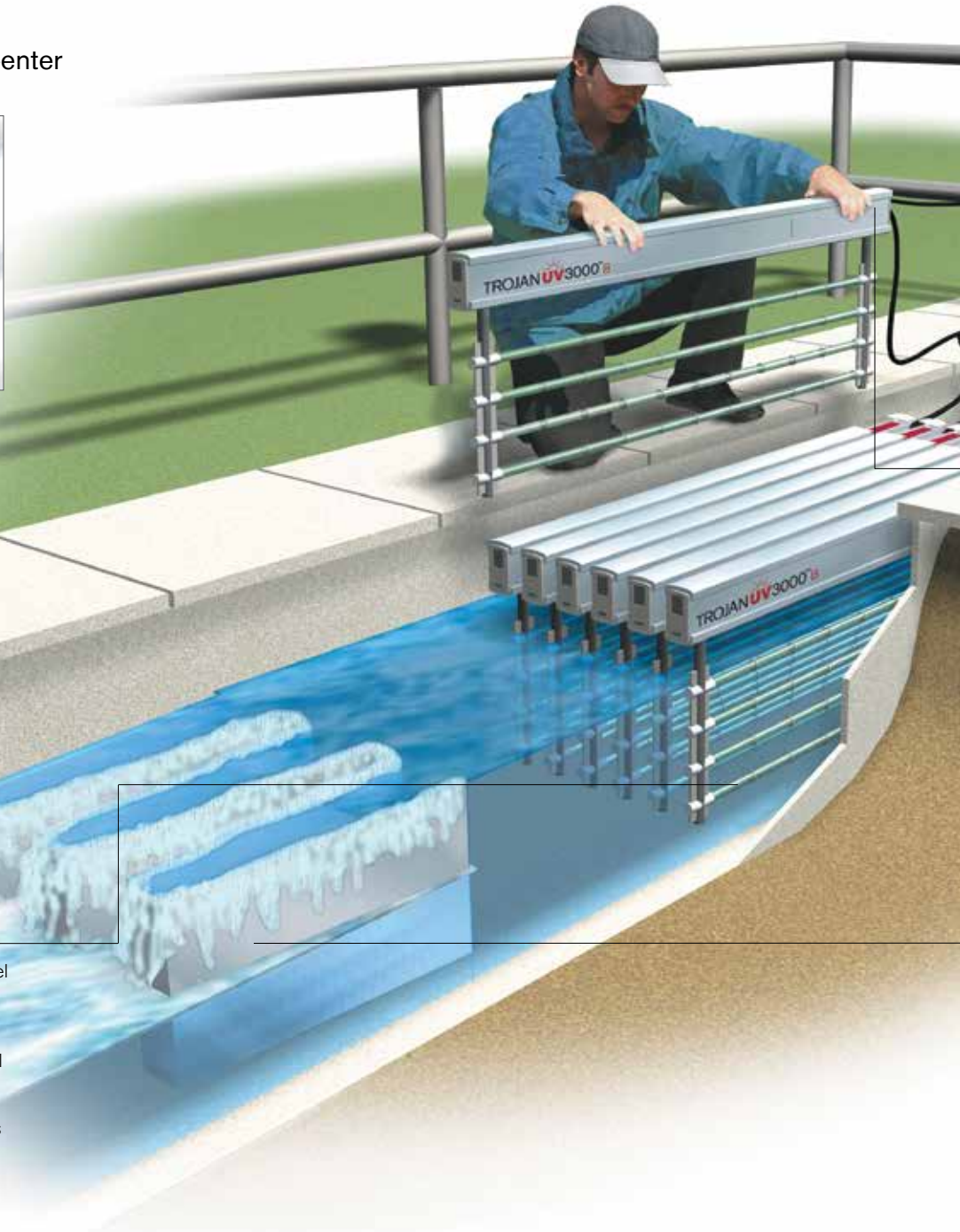
System Monitor/Control Center



The System Control Center takes a signal from a submersible UV sensor, and provides digital output of UV intensity from each bank. Elapsed time display provides continuous readout of actual hours of operation (lamp hours).

UV Modules

UV lamps are mounted on stainless steel frames. Lamps are enclosed in quartz sleeves and submerged horizontally and parallel to water flow. A bank is made up of multiple modules placed in parallel positions. All wiring, from ballasts to lamps, runs inside the module frame. A display showing individual lamp status is provided on top of each module.



Power Distribution

The Power Distribution Center (PDC) is constructed of stainless steel and is mounted across the channel. The PDC distributes power to individual modules and allows electrical isolation of each module for easy service.

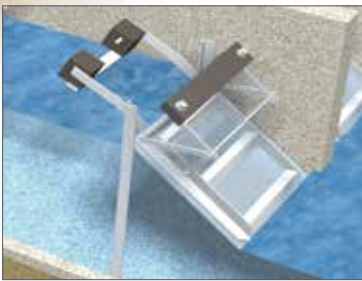


Electronic Ballast



The electronic ballast is mounted within its own Type 6P (IP67)-rated watertight enclosure within the module frame and is cooled by convection.

Water Level Control



Available with a fixed weir or Automatic Level Control (ALC) gate in the channel to maintain the appropriate water level over the lamps. Engineers will work with you to select the appropriate level control device for your application.



The System Control Center (SCC) provides control of all UV functions, tracks lamp hours, and uses a submersible UV sensor (one per bank) to monitor UV intensity. The SCC is capable of flow pacing – automatically turning banks of UV lamps off or on in response to changes in the flow rate in order to conserve power and prolong lamp life.



The optional Touch Smart controller provides more sophisticated controls over the basic controller adding the ability to control up to two channels with three banks in each, SCADA communications, data logging, redundant bank logic and remote on/off signal in addition to the standard basic controller features.

Simple, Dependable UV Solutions

Proven, chemical-free disinfection from the industry leader

UV is the most effective, safe and environmentally friendly way to disinfect wastewater. It provides broad-spectrum protection against a wide range of pathogens, including bacteria, viruses and chlorine-resistant protozoa (such as *Cryptosporidium* and *Giardia*).

The TrojanUV3000™B is an example of a simple, robust and operator-friendly UV system used for the disinfection of wastewater. This highly flexible system has demonstrated effective and reliable performance around the world. The TrojanUV3000B offers increased capacity and is available with a controller that enables flow pacing to maximize operating efficiency and extend lamp life. The system turns UV lamp banks on and off automatically to ensure the required dose is met using the fewest lamps and least electricity.

The proven infrastructure of the TrojanUV3000B has been continuously refined to enhance friendly operation.



Key Benefits

TrojanUV3000B

Increased operator, community and environmental safety. Uses environmentally friendly ultraviolet light – the safest alternative for wastewater disinfection. No disinfection by-products are created and no chlorine compounds are transported, stored or handled by plant staff.

Proven disinfection. Based on actual dose delivery testing (bioassay validation). Verified field performance data eliminates sizing assumptions resulting from theoretical dose calculations.

Reduced engineering and installation costs. The system can be easily retrofitted into existing chlorine contact tanks and effluent channels, and comes pre-tested, pre-assembled and pre-wired to minimize installation costs.

Designed for simplicity and reliability. Systems are straightforward to operate and require minimal operator involvement, thanks to modular design and robust components.

Operator-friendly maintenance. Our lamps are guaranteed for 12,000 hours of operation and can be replaced without tools in less than three minutes per lamp. Modules are electrically separate, allowing a single module to be removed without disrupting flow or taking the system offline.

Outdoor installation flexibility. All components can be installed outdoors, eliminating the need and costs of a building, shelter and air conditioning for ballast cooling.

Well suited to changing regulations. Our systems do not have any negative impact on receiving waters, making them strategically sound choice for long-term treatment as regulations continue to become increasingly stringent.

Guaranteed performance and comprehensive warranty. Our systems include a Lifetime Disinfection Performance Guarantee.

Advanced, Self-Contained UV Modules

Compact footprint simplifies installation and eliminates air conditioning costs

Benefits:

- Space-saving, electronic ballasts are housed in the modules to minimize footprint size, installation time and costs
- Convection cooling of the ballasts eliminates costs associated with air conditioning or forced-air cooling
- Lamps are protected in a fully-submersible, Type 316 stainless steel frame
- All wiring and cables are safely enclosed inside the waterproof module frame – fully protecting them from effluent and UV light
- Modules are electrically separated from each other, allowing them to be individually removed for maintenance and spare modules quickly inserted to maintain maximum performance



The advanced, self-contained modules incorporate convection-cooled ballasts and feature a UV lamp status indicator (below) for at-a-glance confirmation that all lamps are operating.

- Streamlined modules minimize head loss and prevent buildup of debris on the lamps
- All module wiring is pre-installed and factory-tested



Innovative Ballasts and Enclosures Provide Significant Advantages

Module-mounted Ballasts	<ul style="list-style-type: none"> ▪ Take up less space and reduce footprint, minimizing installation time and costs
Convection Cooling	<ul style="list-style-type: none"> ▪ Housing the ballasts in the module allows for natural convection cooling to dissipate the heat of the ballasts into the air ▪ The ballasts are kept sealed and protected ▪ No air conditioning or forced-air cooling required
Clean, Water-tight Protection	<ul style="list-style-type: none"> ▪ Some suppliers use external cabinets with forced-air cooling. This introduces dust and moisture onto circuit boards and other electronic components, greatly reducing the life of these components ▪ Internal housing in sealed modules keeps all components dry and clean
Internal Cabling	<ul style="list-style-type: none"> ▪ All lamp/ballast wiring is contained within the module frame. This configuration protects wires and cables from exposure to effluent, debris fouling and UV light ▪ Internal cabling allows all electrical connections within the module to be factory-tested

Proven Performance, Components and Design

Validated through regulatory-endorsed bioassay testing

Benefits:

- Performance data is generated from actual field testing (bioassay validation) over a range of flow rates, effluent qualities and UV transmittances
- Provides regulatory-endorsed physical verification that systems will perform as expected – ensuring public and environmental safety
- Most accurate assessment of system sizing needs
- Low-pressure lamps and ballasts have proven their outstanding reliability in thousands of installations
- Open-channel design allows cost-effective installation into existing effluent channels & chlorine contact basins
- Systems can be installed outdoors to reduce building capital costs
- Modular design is scalable for precise sizing, and expandable to meet new regulatory or capacity requirements



Gravity-fed, open channel design delivers cost savings at installation through simple retrofits into existing effluent channels and chlorine contact tanks. Rugged, proven components make operation and maintenance extremely cost effective.

Designed & Built for Easy Maintenance

User-friendly design requires minimal service and operator involvement

Benefits:

- Lamps are warranted for 12,000 hours
- Routine maintenance can be scheduled and completed without disrupting disinfection
- Replacement of UV lamps can be completed without tools and requires less than three minutes per lamp



Lightweight, self-contained modules are operator-friendly and make routine maintenance quick and easy. Modules can be individually removed for periodic sleeve cleaning and lamp replacement after 12,000 hours. An optional, mobile cleaning rack simplifies maintenance procedures.

Flow Pacing Reduces O&M Costs

TrojanUV3000B system controller offers flow-pacing for increased operating efficiency

Benefits:

- The System Control Center (SCC) provides monitoring and control of all UV functions
- The SCC provides digital display of bank status, lamp hours, and UV intensity (mW/cm^2)
- The SCC allows the system to be flow paced – meaning the UV lamps of individual banks are turned on and off automatically in response to variations in flow rate (based on a flow meter signal)
- Flow pacing maximizes operating efficiency by matching UV output to disinfection requirements, and reducing electrical consumption during periods of low flow by turning lamps off (Figures 1 & 2)
- Flow pacing also increases the operating life of UV lamps, thereby reducing the frequency, expense and labor required for lamp replacement



The optional Touch Smart controller provides more sophisticated controls over the basic controller adding the ability to control up to 2 channels with 3 banks in each, SCADA communications, data logging, redundant bank logic and remote on/off signal in addition to the standard basic controller features.

Flow Pacing Optimizes System Efficiency

Figure 1: Operation During Periods of High Flow

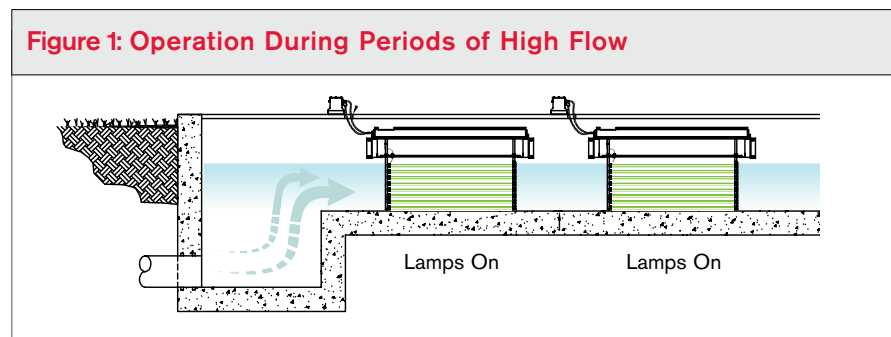
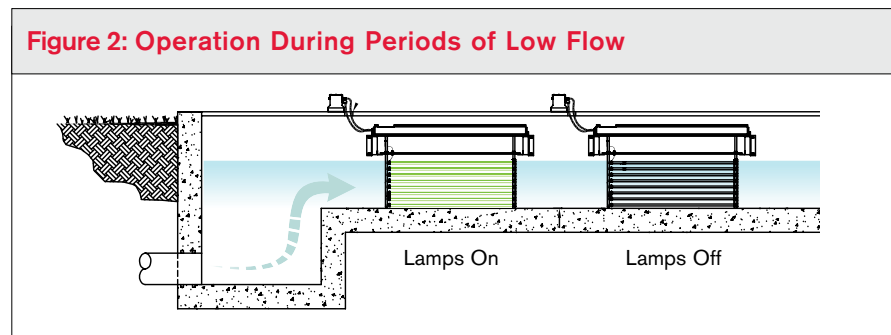


Figure 2: Operation During Periods of Low Flow



System Specifications	
System Characteristics	TrojanUV3000™B
Typical Applications	1 – 5 MGD (158 – 789 m ³ /hr)
Lamp Type	Low-pressure
Ballast Type	Electronic; non-variable
Input Power Per Lamp	87.5 Watts
Lamp Configuration	Horizontal, parallel to flow
Module Configuration	4, 6 or 8 lamps per module
Bank Configuration	Up to 20 modules per bank
Channel Configurations	
Lamp Banks in Series	Up to 3
Channel Options	Concrete (by others)
Level Control Device Options	ALC gate or fixed weir
Enclosure Ratings	
System Monitor/Control Center	304 stainless steel
Ballast Enclosure	Type 6P (IP67)
Ballast Cooling Method	Convection; no air conditioning or forced air required
Installation Location	Indoor or outdoor
System Monitoring & Controls	
Controller	Monitoring and bank control
UV Intensity Monitoring	Optional
Flow Pacing	Optional
Inputs Required	4-20 mA flow signal for Flow Pacing
Local Status Indication	Lamp Age (hours) UV Intensity (mW/cm ²) Bank Status (on/off) Low Intensity Alarm
Remote Alarms	UV Intensity (4-20 mA) Common Alarm (discrete)
Location	Indoor or outdoor
Maximum Distance from UV Channel	20 ft. (6 m)
Electrical Requirements	
Power Distribution	Power Distribution Centre
Quantity Required	1 PDC per bank
Power Input	120V; single phase 208V, 3-phase 240V; single phase

TrojanUV3000™B Controller Capabilities		
Size Constraints		
	Basic Controller	Touch Smart Controller
Max # of Channels	1	2
Slide Gate Control	No	Monitor Only
Max Modules/Bank	20	20
Max Banks/Channel	3	3
Control/Alarm Constraints		
Screen Interface	7 Segment Numeric Display	7" Color Touch Screen
Flow Pacing	Yes	Yes
Dose Pacing	No	No
Individual Lamp Status	No	No
Lead Bank Rotation	Automatic	Automatic or Manual
Redundant Bank Logic	No	Yes *
Multiple Lamp Failure	No	No
Adjacent Lamp Failure	No	No
Module Failure Alarm	No	No
Bank Comm. Fail Alarm	No	No
Low Water Level ***	No	Yes
High Water Level ***	No	Yes
Remote System On/Off	No	DI
Remote Bank On/Off	No	-
Add additional bank	No	DI
USB Data Logging	No	Yes
Remote Monitoring Constraints		
SCADA	No	Yes **
Bank Status	Yes	Yes
Common Alarm	Yes	Major, Minor
Low UV Intensity Alarm	No	Yes
Bank UV Intensity Alarm	No	SCADA
Average UVI Analog Out	No	Yes
Input/Output Constraints		
Discrete Inputs	0	8
Discrete Outputs	4	8
Analog Inputs	Flow	Flow and UVT ***
Analog Outputs	0	2 (One (1) per Bank)

*Note – redundant bank logic is driven by a single lamp failure OR low UVI alarm in a bank as there is no way to distinguish between one or many lamps failed

**Note – Modbus Ethernet SCADA is standard, Modbus RTU is option, as an add-on. Other protocols are possible as a custom solution. All remote monitoring signals are available on SCADA. Remote capabilities - no control available over SCADA.

***Note – level alarms require optional level sensor probe, UVT measurement requires optional UVT meter

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