

DRINKING WATER TREATMENT





Water Confidence for Communities Large & Small

Trojan's proven UV solutions provide validated, cost-effective disinfection

Trojan Technologies is an ISO 9001:2000 registered company and for more than 25 years has set the standard for proven UV technology and ongoing innovation. With unmatched scientific and technical expertise, and a global network of specialists, representatives and technicians, Trojan is trusted more than any other firm as the best choice for municipal UV solutions – worldwide. The TrojanUVSwift™SC is one of the

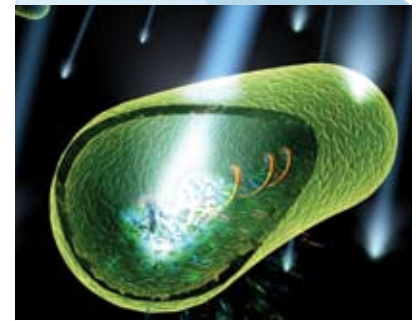
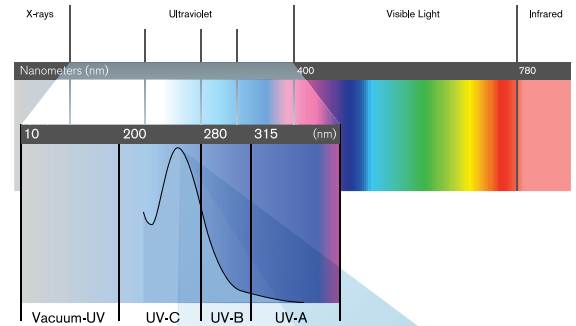
reasons why. With units designed to treat flow rates of 15 GPM to 15.4 MGD (0.6 to 2430 m³/hr), these compact, robust UV systems offer communities an efficient, economical solution for drinking water disinfection. Like all Trojan drinking water products, the TrojanUVSwift™SC is bioassay validated, having undergone rigorous DVGW and USEPA certification to ensure verified dose delivery, maximum public safety and peace of mind.

It's engineered and built to provide reliable performance, simplified maintenance, and reduced operating costs with innovative features like a hydraulically optimized, "L-shaped" reactor, high-intensity amalgam lamps and optional automatic or manual sleeve wiping.

The Benefits of UV

Broad-spectrum, cost-effective protection that offers unparalleled safety

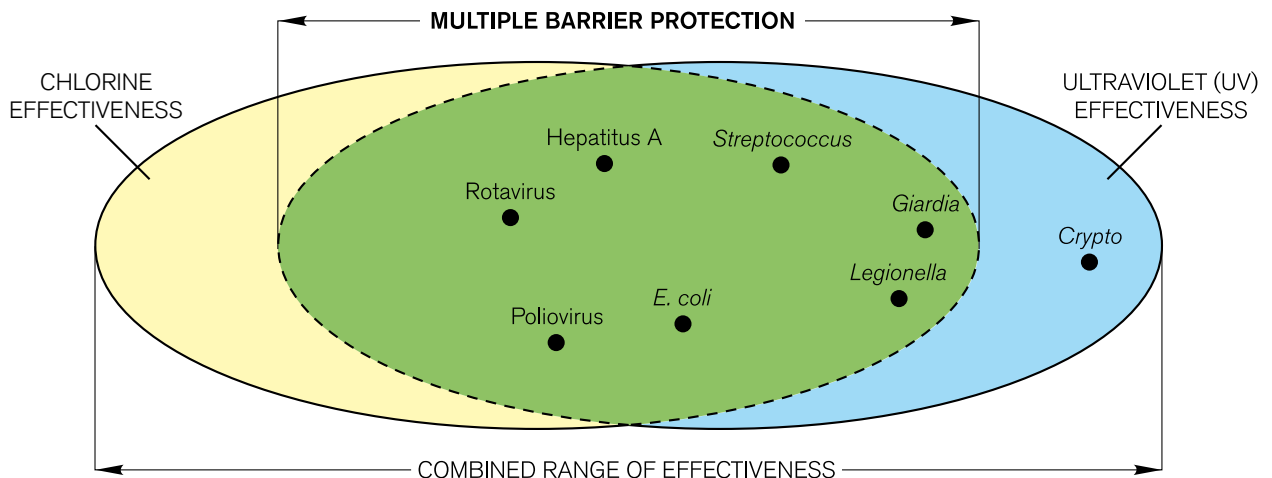
- UV light is an environmentally-friendly, chemical-free way to safeguard water against harmful pathogens
- Proven in thousands of installations, UV is widely accepted and endorsed worldwide for disinfection of drinking water
- UV offers broad-spectrum protection against a wide range of pathogens, including bacteria, viruses, and chlorine-resistant protozoa
- UV treatment provides *Cryptosporidium* and *Giardia* inactivation of up to 4-log at low doses
- UV is a reliable, cost-effective part of a multi-disinfectant treatment strategy often used in conjunction with chlorine to provide a dual barrier
- UV does not create disinfection by-products (DBPs) and does not affect taste
- At approximately 1/5 the cost of ozone disinfection and 1/10 the cost of membrane filtration, UV is the most cost-effective approach for multi-barrier treatment strategies



Ultraviolet light is invisible to the human eye, but a highly effective, chemical-free way of inactivating microorganisms in water. UV light penetrates the cell wall of the microorganism and alters its DNA so it can no longer reproduce or cause infection.

Benefits of a Multiple Barrier Treatment Approach

- UV offers a cost-effective, secondary barrier of protection to safeguard drinking water against virtually all microorganisms treated by chlorine – as well as proven inactivation of chlorine-resistant protozoa, including *Cryptosporidium* and *Giardia*. Dual barrier treatment using UV provides significantly greater community safety and reduced liability risk for municipalities



TROJAN UVSWIFT™ SC

Designed for efficient performance

Amalgam Lamps

Utilizes high-output amalgam lamps. Each is located within its own protective quartz sleeve and supported by a removable, sleeve holder assembly. Designed for easy lamp replacement.



UV Reactor

Type 316L stainless steel. Can be installed vertically or horizontally. Reactor configurations are available with multiple inlet/outlet diameters. Rated to 150 PSI (10 BAR). A drain port is located opposite the outlet flange.

Control Panel (CP)

Epoxy-painted, carbon steel cabinet is designed for indoor, wall-mount installation. Houses a microprocessor-based controller with I/O connection points, and electronic power supplies. Distributes power to the UV reactor as well as the UV sensor and optional automatic wiping system. UV intensity, lamp elapsed time and lamp status are continuously monitored and displayed on the operator interface, located on the control panel door.

UV Sensor

Highly accurate, DVGW approved, photodiode sensor monitors UV output within the reactor. Mounted within the sensor port on the side wall of the reactor for easy access.

Sleeve Wiping System

Optional manual or automatic systems available; both operate online, without interrupting disinfection. Fluorocarbon wipers are mounted in stainless steel yoke around the quartz sleeve of each lamp. The manual system is driven by hand using an external handle. The automatic system allows cleaning at preset intervals using a motor driven wiper assembly.

Remote Monitoring & Control

Robust microprocessor-based controller provides standard input/output signals for on/off control from a remote location. Programmable digital and analog I/O capabilities can generate unique alarms for individual applications, and send signals to operate valves and pumps. All units feature optional SCADA communication via ModBus for remote monitoring and control, and D-Series systems offer dose pacing.



Key Benefits

TrojanUVSwift™SC

Proven performance – full bioassay validation. TrojanUVSwift™SC systems meet the stringent, internationally-recognized standards of DVGW and USEPA – having undergone comprehensive validation at a wide range of flow rates and UV transmittance levels.

Assurance of NSF 61 compliance. TrojanUVSwift™SC systems meet the stringent standards of NSF International.

Compact footprint for installation flexibility. The TrojanUVSwift™SC can handle maximum flow capacity in minimal space. Its compact design allows it to be installed vertically or horizontally in restrictive spaces, thereby lowering installation costs. The system can even be installed immediately after a 90° elbow and other upstream piping configurations.

Fewer lamps required to treat a given flow. Trojan's use of efficient, high-intensity amalgam lamps minimizes the lamps, seals, and maintenance to meet dose delivery requirements.

Sleeve wiping system reduces maintenance costs. The TrojanUVSwift™SC can be equipped with a highly effective manual or fully automated sleeve wiping system to minimize the frequency and costs of cleaning. Both options work while the UV unit is online and disinfecting.

Designed for maximum operating efficiency. High-efficiency, electronic ballasts ensure cost-effective operation. Trojan's high-capacity D-Series models can be equipped with optional dose pacing that adjusts lamp output to match dose to actual disinfection requirements – minimizing operating costs and extending lamp life.

Local service. Global support. Trojan's comprehensive network of certified service providers offers ongoing maintenance programs and fast response for service and spare parts.

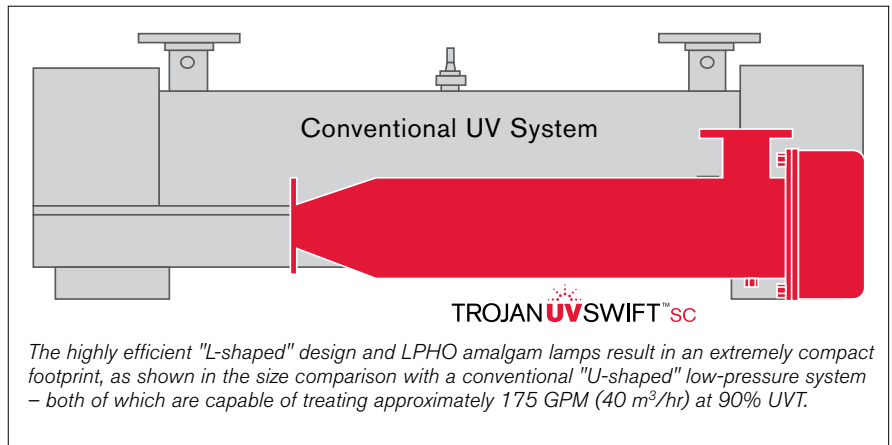
Guaranteed performance and comprehensive warranty. Trojan systems include a Performance Guarantee and comprehensive protection for your investment. Ask for details.

Compact Reactor for Installation Flexibility

Efficient, cost-saving design can be installed vertically or horizontally

Benefits:

- Compact footprint simplifies installation and minimizes related capital costs – making it ideal for retrofit applications into existing water treatment plants
- Engineered to fit into restrictive pipe galleries
- Designed for horizontal or vertical installation to allow maximum flexibility
- Lamps and sleeves are fully serviceable from one side – allowing the system to be installed tight to walls, other equipment or piping
- Validated with a 90° elbow installed immediately before the reactor to ensure consistent dose delivery – even under challenging hydraulic conditions created by upstream piping
- “L-shaped” reactor design is 40% more efficient than “U-shaped” systems
- Low head-loss design simplifies integration into existing processes, and minimizes the need for additional pumps and their associated capital and operating costs
- Compact wall-mounted control panel can be located up to 82' (25 m) from the reactor



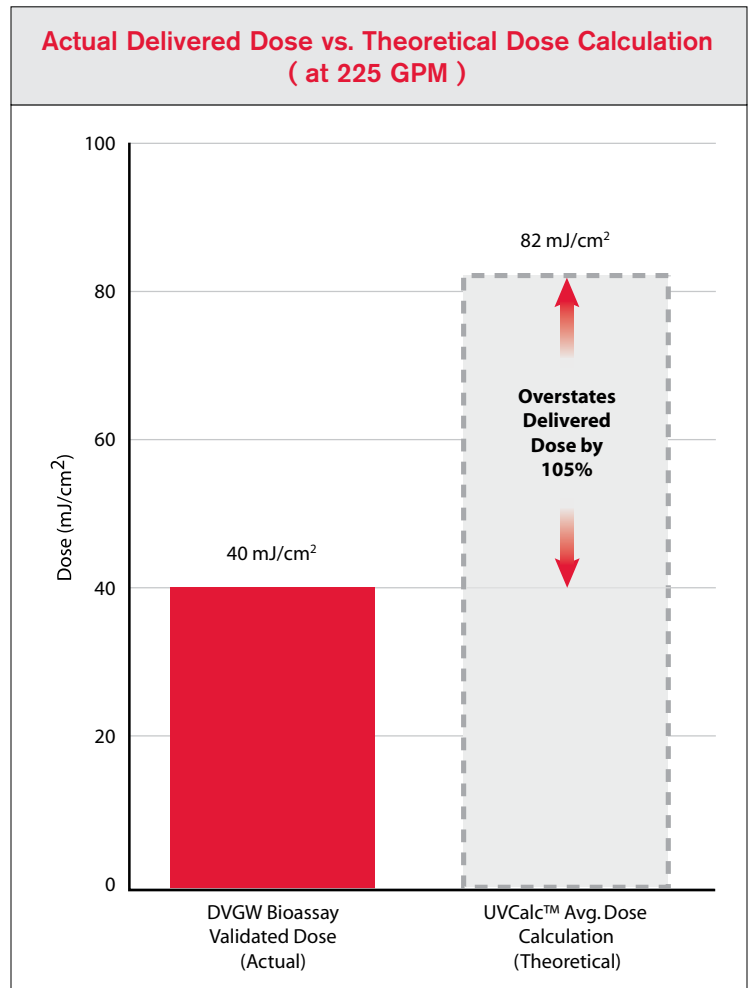
Developed using advanced Computational Fluid Dynamic (CFD) modeling, and incorporating high-output amalgam lamps, the TrojanUVSwift™ SC is extremely space efficient. Its compact footprint allows the system to be integrated into restrictive pipe galleries of water treatment facilities – vertically or horizontally – reducing installation costs and eliminating the need for additions to buildings.

Bioassay Validated Performance

In-field testing ensures public safety over wide range of operating conditions

Benefits:

- All TrojanUVSwift™SC units are certified for source water of various qualities, having been DVGW bioassay tested under a range of UV transmittances (UVT) and flow rates
- The stringent standards of Deutsche Vereinigung des Gas und Wasserfaches e.v. – German Association of Gas and Water (DVGW) are recognized by the USEPA and internationally
- Bioassay performance data for the TrojanUVSwift™SC line was generated under the worst-case orientation – with a 90° elbow at the inlet
- Bioassay validation is widely endorsed as the evaluation standard for UV technologies because it provides the most accurate assessment of equipment sizing needs to ensure public health protection
- Theoretical calculations can significantly overstate dose, jeopardizing water quality and community safety
- Trojan systems meet the stringent standards of NSF International, fully complying with NSF 61



The graph above highlights an actual comparison of DVGW bioassay validation results with theoretical dose calculations using UVCalc™ for a TrojanUVSwift™SC at a flow rate of 225 GPM. The theoretical calculation overstates the delivered dose by 105%. Had a drinking water system been selected based on the results of the calculated dose, public safety could be seriously compromised.



Energy Efficient, High-Output Amalgam Lamps

Need for fewer lamps reduces capital and O&M costs



Efficient, low-pressure, high-output amalgam lamps allow TrojanUVSwift™ SC systems to deliver the required UV dose with fewer lamps and lower operating costs.

Benefits:

- The TrojanUVSwift™ SC requires 1/2 to 1/3 fewer lamps to deliver the required dose compared to traditional UV systems using low-pressure lamps
- With fewer lamps, the TrojanUVSwift™ SC is very compact and can be located in small spaces, reducing installation costs
- Trojan high-efficiency, amalgam lamps draw less energy than competitive high-output systems – minimizing operating costs
- Fewer lamps means reduced annual maintenance costs for lamp change-outs



Robust Sleeve Wiping Systems

Optional manual or automatic wiping ensures consistent dose delivery



Benefits:

- Wiping systems minimize fouling of the quartz sleeves
- Ensure consistent UV dose delivery for maximum public safety
- Systems operate online while the lamps are disinfecting, reducing downtime
- Automatic wiping system can be programmed to wipe lamp sleeves at preset intervals

The optional wiping systems reduce maintenance costs. Operators have a choice of the manual system that is operated by hand, or motorized system (shown above) which can be programmed to wipe automatically at preset intervals.

User-Friendly Digital Controller

Intuitive system provides at-a-glance system status and allows remote operation



The TrojanUVSwift™SC controller and high efficiency electronic ballasts have been proven in thousands of installations. The Control Panel features a user-friendly digital interface, and can be mounted up to 82 ft (25 m) from the reactor.

Benefits:

- Robust, microprocessor-based controller combines extensive functionality with an operator-friendly, digital interface
- Display provides at-a-glance, real-time system status information
- Programmable digital and analog I/O capabilities allow remote on/off control and alarm code differentiation for fast identification of changes in system status
- Optional dose pacing on high capacity D-Series systems minimizes energy use while maintaining required dose
- Optional ModBus protocol communicates with plant SCADA system for centralized monitoring of UV performance, lamp status, power levels and other parameters

Designed for Easy Maintenance

Operator-friendly design for easy routine maintenance



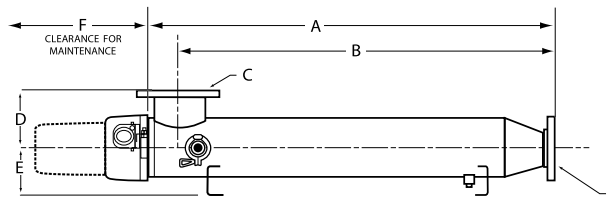
The TrojanUVSwift™SC design simplifies maintenance procedures. For example, lamp changeovers require no tools and take less than five minutes per lamp.

Benefits:

- Single-ended UV lamps simplify annual replacement
- Lamps require less than 5 minutes each to change – without tools or need to drain the reactor
- Externally mounted sensor allows easy access
- Optional automatic or manual sleeve wiping system reduces the frequency, inconvenience and cost of manual cleaning

System Specifications									
Model #	A02	B03	B04	B06	B08	D06	D12	D30	
Maximum Validated Disinfection Flow Rate (98% UVT 40 mJ/cm ²): GPM (m ³ /hr)	57 (13)	132 (30)	185 (42)	330 (75)	577 (131)	1190 (270)	2555 (580)	10695 (2430)*	
UVT Range	Nominal range of 80% to 98%					70% to 98%			
Number of Lamps:	2	3	4	6	8	6	12	30	
Electrical Requirements:									
Standard Voltage	120	208 to 240 Volt, single phase, 2 wire + GND, 60 Hz L-L, 50 Hz L-N							
Connected / Operating Power (W) Single Phase	320 / 320	1060 / 510	1310 / 660	1810 / 960	2310 / 1260	1810 / 1560	3300 / 3060	7810 / 7560	
Ballast Type	Electronic, Constant Power					Electronic, Variable Power			
Sensors:									
Sensors Per Reactor (1 per 10 lamps, as per DVGW)	1					2		3/1*	
Control Panel:									
Materials of Construction	Painted Mild Steel (Gray)								
Dimensions:	inches	16 x 14 x 6	24 x 16 x 10	24 x 16 x 10	24 x 16 x 10	24 x 24 x 10	24 x 16 x 10	24 x 24 x 10	48 x 36 x 10
	cm	41 x 36 x 15	61 x 42 x 25	61 x 42 x 25	61 x 42 x 25	61 x 61 x 25	61 x 42 x 25	61 x 61 x 25	122 x 91 x 25
Rating	Type 12 (IP54)								
Remote ON/OFF (24V - 280V) / Analog Output	Standard/ 4 Optional Outputs (model dependent)								
Intensity Pacing & SCADA Comm, Optional	Not Available					✓			
Panel Weight — lbs (kg)	40/18	70/32	75/34	80/36	100/45	80/36	110/50	300/136	
Water Chamber – Engineered Materials/Options:									
Materials of Construction, Stainless Steel	316L (1.4404 / Europe)								
Max Operating Pressure PSI (BAR)	150 (10)								
Max Fluent Temp °F (°C)	104 (40)								
Sleeve Cleaning Mechanism, Optional	Manual	Manual /Automatic				Automatic			
Reactor Weight (Wet/Dry) (lbs)	65/34	149/72	149/75	160/81	162/85	551/275	839/400	2382/1200	
Mounting Feet	Optional					Standard			
Dimensions – Inches (cm)									
	A:	33 (84)	47 (119)	47 (119)	47 (119)	47 (119)	66 (170)	68 (173)	70 (178)
	B:	30 (75)	43 (109)	43 (109)	43 (109)	43 (109)	60 (152)	59 (150)	56 (142)
Flange Size / Alternate Flange Orientation (✓) C:		3 (80DN)	4 (100DN)	4 (100DN)	6 (150DN)	6 (150DN)	8 (200DN) / ✓	12 (300DN) / ✓	20 (500DN) / ✓
	D:	6 (15)	8 (20)	8 (20)	8 (20)	8 (20)	11 (27)	14 (35)	21 (53)
	E:	6 (15)	7 (18)	7 (18)	7 (18)	7 (18)	9 (23)	12 (30)	18 (45)
	F:	50 (127)	60 (152)	60 (152)	60 (152)	60 (152)	70 (178)	70 (178)	70 (178)

* per USEPA protocols, D30 only



Find out how your drinking water treatment plant can benefit from the TrojanUVSwift™ SC – call us today.

Head Office (Canada)

3020 Gore Road
London, Ontario
Canada N5V 4T7
Telephone: (519) 457-3400
Fax: (519) 457-3030

www.trojanuv.com

Trojan UV Technologies UK Limited (UK): +44 1905 77 11 17
Trojan Technologies (The Netherlands): +31 70 391 3020
Trojan Technologies (France): +33 1 6081 0516
Trojan Technologies Espana (Spain): +34 91 564 5757
Trojan Technologies Deutschland GmbH (Germany): +49 6024 634 75 80
Hach/Trojan Technologies (China): 86-10-65150290

Products in this brochure may be covered by one or more of the following patents:
U.S. 5,504,335; 6,500,346; 6,872,954
Other patents pending.

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