Drinking Water Treatment

TROJANUV®

Water Confidence®
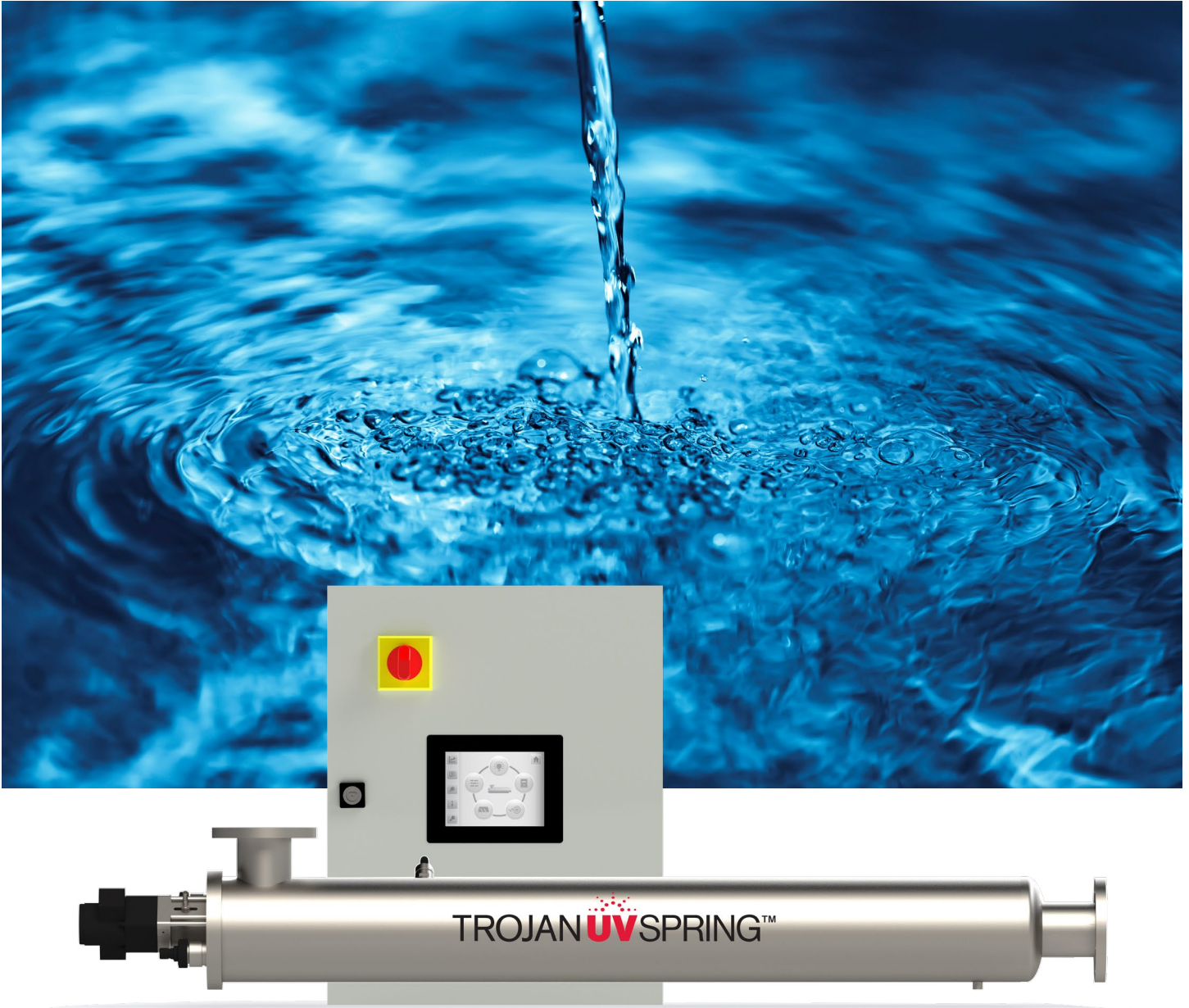
TROJAN**UV**SPRING

A Cost-Effective Solution for Simplified Installations

TrojanUVSpring is designed for small municipalities to treat their drinking water efficiently and reliably. With a simplified design and compact footprint, installation can be streamlined to get a newly commissioned site up quickly or an existing site back online easier. Available in three size configurations,
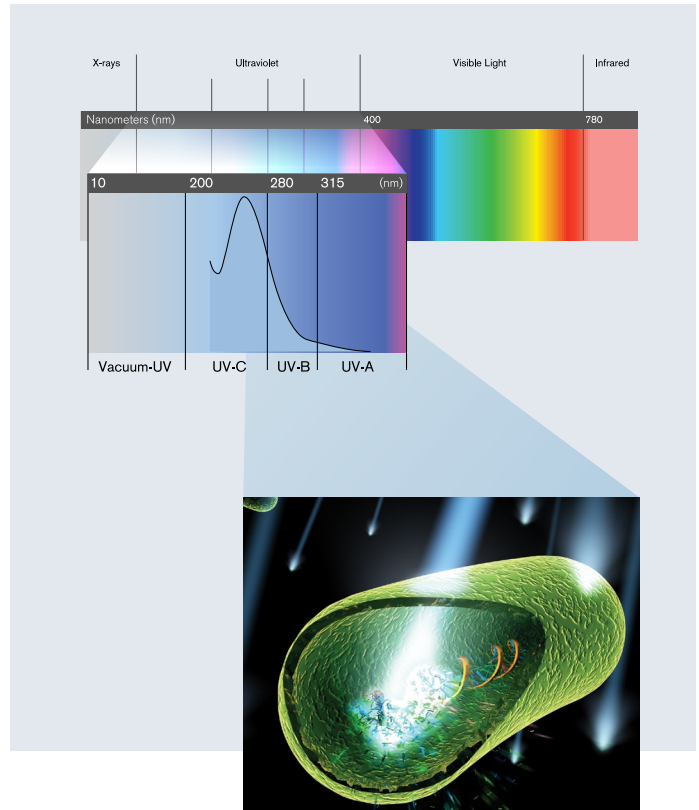
each size ensures there is a suitable solution for your installation's flow rate to utilize ultra-violet (UV) technology to help meet your treatment goals.

TrojanUVSpring inactivates *Escherichia coli (E.coli)*, fecal coliform, and even chlorine-resistant microorganisms like *Cryptosporidium* & *Giardia*.

The Benefits of UV

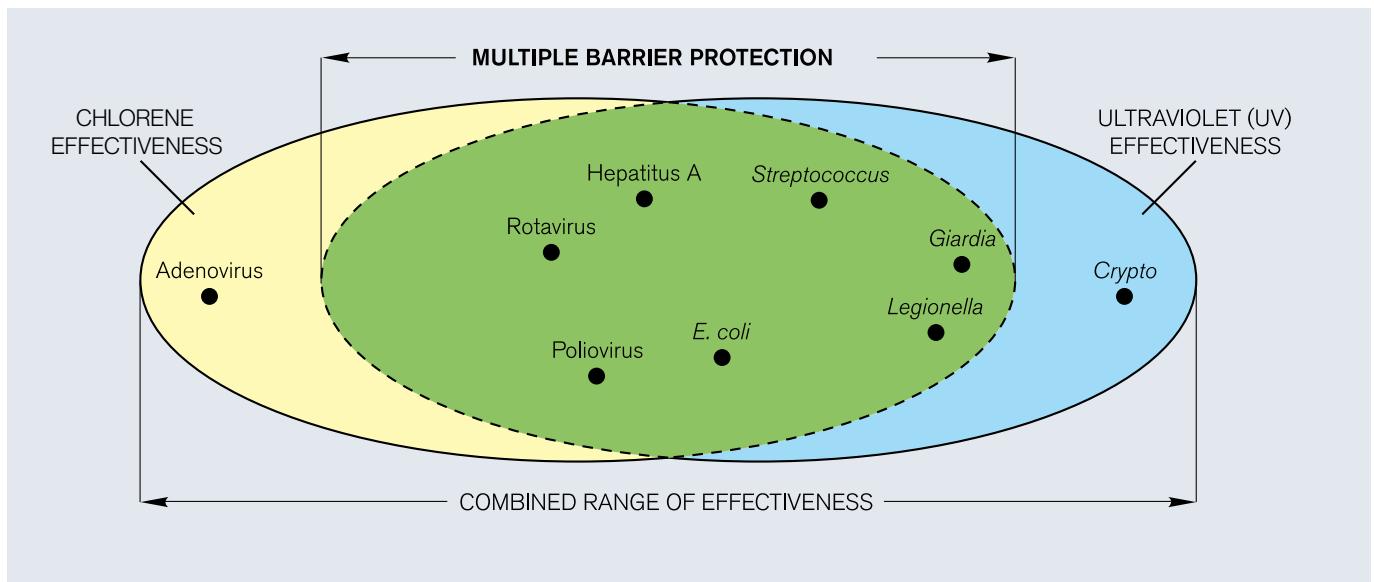## A simple and cost-effective solution for drinking water treatment

- Does not create by-products and does not affect taste
- UV is a cost-effective approach for multi-barrier treatment strategies

| X-rays | Ultraviolet | Visible Light | Infrared |

Nanometers (nm)   400   780

10   200   280   315   (nm)

Vacuum-UV   UV-C   UV-B   UV-A

UV light penetrates the cell wall of the microorganism and alters its DNA so it can no longer reproduce.

Benefits of a Multiple Barrier Treatment Approach

- UV offers a cost-effective, secondary barrier of protection to treat *Cryptosporidium* and *Giardia* in drinking water.

MULTIPLE BARRIER PROTECTION

CHLORENE EFFECTIVENESS

ULTRAVIOLET (UV) EFFECTIVENESS

Hepatitus A   *Streptococcus*

Rotavirus

Giardia

Adenovirus   *Crypto*

Legionella

Poliovirus   *E. coli*

COMBINED RANGE OF EFFECTIVENESS

TROJAN**UV**SPRING

Designed for efficient performance

Control Panel (CP)

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

Remote Monitoring & Control

Robust microprocessor-based controller provides standard I/O signals for on/off control from a remote location. Digital and analog I/O capabilities can generate alarms for individual applications. Select units feature SCADA communication via Modbus..

UV Chamber

Type 316L stainless steel. Rated to 150 PSI (10 BAR). A drain port is located opposite the outlet flange.

UV Sensor

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

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.

Sleeve Wiping System

Optional automatic systems available on select models; operate online, without interrupting treatment. Wipers are mounted in stainless steel yoke around the quartz sleeve of each lamp.. The automatic system allows cleaning at preset intervals using a motor-driven wiper assembly.
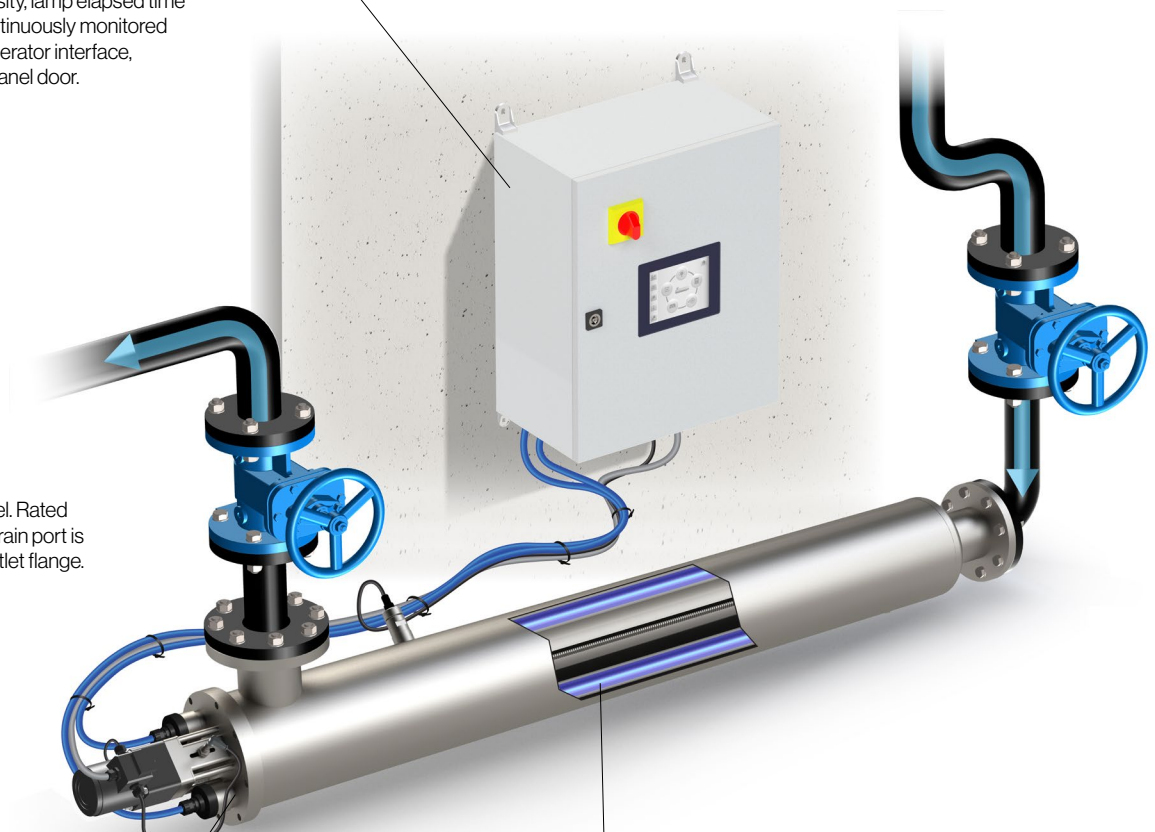
Key Benefits

TrojanUVSpring

Proven performance. Validated through microbial testing. Through this testing, performance data has been generated for UV dose delivery to inactivate *Cryptosporidium*, *Giardia*, and *Adenovirus*.

Compact footprint for installation flexibility. Can handle maximum flow capacity in minimal space. Where approved by local regulators, the system can even be installed immediately after a 90º elbow and other upstream piping configurations.

Fewer lamps required to treat a given flow. High-intensity amalgam lamps minimizes the lamps, seals, and maintenance to meet dose delivery requirements.

Sleeve wiping system reduces maintenance costs. Select models can be equipped with a highly-effective automated sleeve wiping system to minimize the frequency and costs of cleaning.

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

Guaranteed performance and comprehensive warranty. TrojanUV systems include a Lifetime Performance Guarantee* and comprehensive warranties for systems and parts.

Additional Benefits

TrojanUVSpring

Energy-Efficient, High-Output Amalgam Lamps

- Reduces capital and O&M costs
- Minimized lamp count reduces annual maintenance costs for lamp change-outs
- Efficient, LPHO amalgam lamps allow TrojanUVSpring systems to deliver the required UV dose with lower operating costs

Robust Sleeve Wiping System

- Automatic wiping ensures consistent dose delivery and reduces maintenance costs
- Wiping system minimizes fouling of the quartz sleeves
- Ensures consistent UV dose delivery
- Operates online while the lamps are operating, reducing downtime
- Can be programmed to wipe lamp sleeves at preset intervals

User-Friendly Digital Controller

- Intuitive system provides at-a-glance system status and allows remote operation
- Robust, microprocessor-based controller on select models combines extensive functionality with an operator-friendly, digital interface
- Display provides at-a-glance, real-time system status information
- Analog I/O capabilities allow remote on/off control and alarm code differentiation for fast identification of changes in system status
- Modbus protocol on S2 and X2 models allows communication with plant SCADA system for centralized monitoring of UV performance, lamp status, power levels and other parameters
- The Control Panel features a user-friendly digital interface, and can be mounted up to 10 m from the chamber

Designed for Easy Maintenance

- Operator-friendly design for easy routine maintenance
- Single-ended UV lamps simplify replacement
- Externally-mounted sensor allows easy access
- Optional automatic sleeve wiping system reduces the frequency, inconvenience and cost of manual cleaning

Compact Chamber for Installation Flexibility

## Efficient, cost-saving design

Developed using advanced Computational Fluid Dynamic (CFD) modeling, and incorporating high output amalgam lamps, the TrojanUVSpring is extremely space efficient. Its compact footprint allows the system to be integrated into restrictive pipe galleries of water treatment facilities.

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

- 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 chamber to ensure consistent dose delivery – even under challenging hydraulic conditions created by upstream piping

- Low head loss design simplifies integration into existing processes, and minimizes the need for additional pumps and their associated capital and operating costs

- Wall-mounted control panel can be located up to 10 m from the chamber
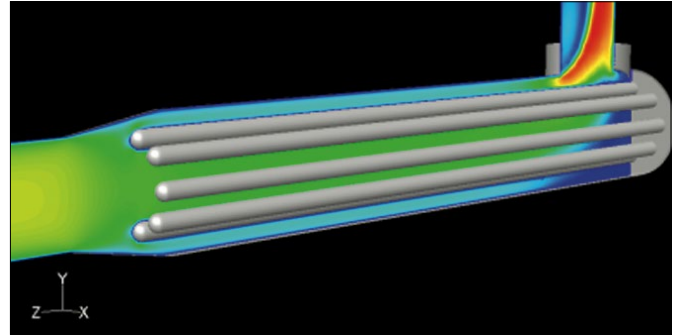
The highly efficient "L-shaped" design and low-pressure, high-output (LPHO) amalgam lamps result in an extremely compact footprint.
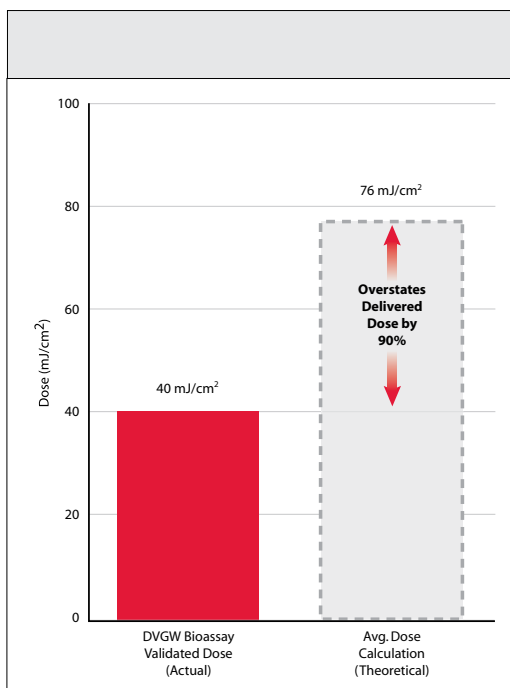
Industry-Leading Bioassay Validations

Validation testing to world standards

Benefits:

- All TrojanUVSpring units are bioassay tested according to German DVGW standards

- Bioassay validations eliminate the use of theoretical calculations which can significantly overstate dose (see Figure 1)

Figure 1. The graph to the left highlights a potential comparison of DVGW bioassay validation results with theoretical dose calculations for a drinking water system. In this example, the theoretical calculation. Overstates the delivered dose by 90%. Had a drinking water system been selected based on the results of the calculated dose, public safety could have been compromised.

TROJAN **UV** SPRING

System Specifications

General		Spring S1	Spring S2	Spring X2
Max DVGW - W294 Validated Flow gpm (m³/hr)		12.8 m³/hr	31.8 m³/hr	76.1 m³/hr
UV Transmittance Range:		70 – 98%		
UV Lamps				
Number of Lamps		1	2	2
Input Power per Lamp & Lamp Type		200 W input (Low-Pressure High-Output)		440 W input (Low-Pressure High-Output)
Servicce Life:		16,000 Hrs		
Control Power Panel (CPP)				
Voltages	230V Single phase, 2 wire + gnd, 50/60 Hz L-N	√	√	√
Lamp Driver Power Level		100% constant		
Control Power Panel Rating		IP54		
HMI		LCD	4" Colour Touchscreen	
Network Interface		Digital Output	Modbus	
Digital input		Remote on/off		
Digital Output		General alarm	General alarm System status High temp panel/chamber Low irradiance	
Analog Input (4-20mA)		N/A	Panel temp sensor UVT meter Flow meter	
Analog Output (4-20mA)		Irradiance Chamber temperature	Irradiance Chamber temperature UVT meter Flow meter	

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