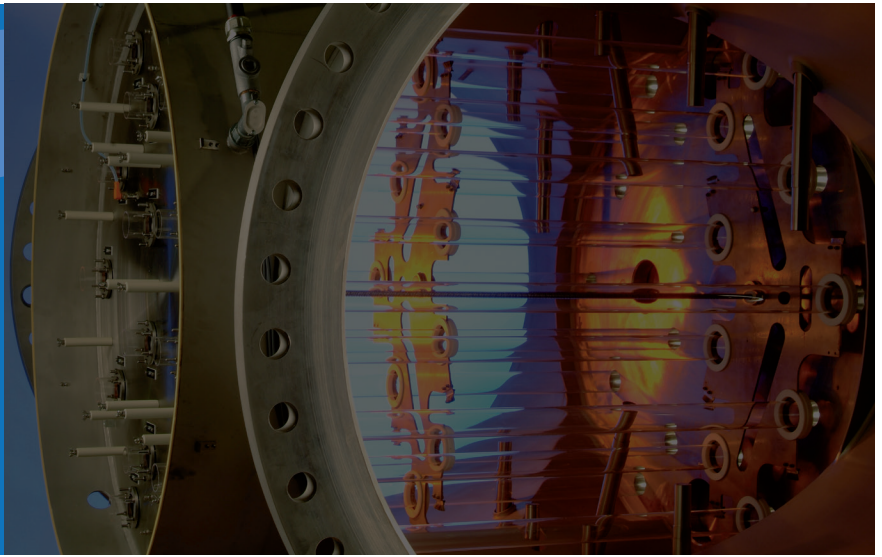


Capital Controls[®] UV Featuring Sentinel[®] Reactor

Drinking Water Disinfection Systems

**Save money, while improving your facility's
performance and operation**

The advantage of Capital Controls® UV systems.



Effective, easy to operate, third party validated UV disinfection systems.

Capital Controls® UV disinfection systems provide safe and clean drinking water. Over 25 years ago, experts from De Nora made the initial discovery of the effectiveness of UV light for treating protozoa, including *Cryptosporidium parvum* and *Giardia lamblia*.

Ultraviolet disinfection of water occurs via a physical process which alters the DNA of harmful organisms, rendering them unable to reproduce and cause harm. Sentinel® UV Reactors, apply a carefully controlled dosage of UV light to the drinking water without the use of any chemicals.

Every day, 30 billion liters (8 billion gallons) of water are treated in Sentinel UV Reactors operating reliably around the clock to support the needs of over 30 million people worldwide. Our installations include Los Angeles, Montreal, Washington DC, Boston, Cincinnati, Indianapolis, San Francisco, Brisbane, Singapore, and many other locations in the U.S. and around the world.

Sentinel systems have undergone third party validation under the U.S. EPA LT2 Enhanced Surface Water Treatment Rule guidelines.



Applications:
Various water borne pathogens can be found in drinking water that can infect humans and ultimately cause sickness.

PROTOZOA

- *Cryptosporidium parvum*
- *Giardia lamblia*

VIRUS

- Poliovirus
- Hepatitis A
- Common Cold

BACTERIA

- Salmonella typhi
- Shigella
- Escherichia coli
- Vibrio cholera

CAPITAL CONTROLS SENTINEL UV REACTOR



LOWER OPEX

Medium pressure lamps require fewer lamps, less manpower to maintain
Quick start up to full power optimizes production



SIMPLE OPERATION, MAINTENANCE AND INSTALLATION

Minimal operator intervention - automatic UV Dose control based on online flow, UV intensity and UV Transmittance measurement



COMPACT DESIGN

High dose in a small footprint



EXPERTISE IN UV DISINFECTION AND ADVANCED OXIDATION

- UV disinfection of drinking water and wastewater,
- UV/peroxide and UV/Chlorine advanced oxidation for the destruction of chemical contaminants including contaminants of emerging concern,
- Regulatory approval of UV systems,
- Validation and CFD modeling of UV systems.

Hundreds of global installations successfully treating a comprehensive range of applications including traditional and contaminants of emerging concern.

Why UV for drinking water disinfection?

- Effective at inactivating *Cryptosporidium parvum* and *Giardia lamblia* at low doses
- Does not require the use of chemicals
- Does not create disinfection byproducts
- Combined with an oxidant for UV AOP treatment to tackle complex applications and contaminants of emerging concern.



Capital Controls SN24 Sentinel UV Reactor

THE ADVANTAGE OF MEDIUM PRESSURE LAMPS

- Lower capital cost on lamp procurement and intensity sensors
- Greater lamp spacing improves efficiency and lowers operating costs in high transmittance water
- Easier to maintain system with automated cleaning mechanisms requires less space and labor time to operate
- Smaller footprint, which is especially beneficial for retrofits or where space is limited

THE SENTINEL UV REACTOR FEATURES

The Sentinel product line delivers a high UV dose in the smallest footprint, minimizing operations and maintenance costs.

- UV Intensity Sensors for Continuous Monitoring (one per lamp)
 - Dry well mount for ease of calibration/maintenance
 - Certified to DVGW standard
- Automated Operation and Control System: PLC-based operation and control
 - Validation provides equations for dose vs. UV Intensity, flow rate and UV Transmittance
 - UV sensor setpoint is continuously calculated based on operating flow and UV Transmittance to achieve the required UV dose
 - Lamp power is continuously adjusted to achieve the sensor setpoint
 - Lamp banks are turned off and on as required minimizing energy consumption
- Medium-Pressure High-Output Lamps
 - High power density, 4-20 kW per lamp
 - Full spectrum polychromatic output
- Variable Lamp Power Supply
- Cleaning System: Automatic chemical-free Quickwipe system
- Safe: automatic emergency shut down



Sentinel 12



Sentinel 48

	Flow Ranges in MGD (MLD)	Lamps	Inlet/Outlet	Total Lamp Power	Power Supply	UV Reactor Body	Max System Pressure	Min. UVT%	UV Reactor Dimensions (L X W x H)
SN12	0.3 to 4.8 (1.1 to 15)	1-3 @ 4 kW	12" (300 mm) - 150# flange	4-12 kW	400-600 VAC	316L stainless steel	150 psi (10.3 bar)	70	29 1/8" x 35 7/8" x 21 1/2" (740 x 910 x 540 mm)
SN24	1 to 28 (3.7 to 106)	2-9 @ 10 kW	24" (600 mm) - 150# flange	20-90 kW	400-600 VAC	316L stainless steel	150 psi (10.3 bar)	55	36" x 53" x 35 15/16" (914 x 1350 x 910 mm)
SN48	3 to 52 (11.3 to 197)	2-18 @ 20 kW	48" (1200 mm) - AWWA Class B flange	40-360 kW	400-600 VAC	316L stainless steel	50 psi (3.4 bar)	60	72" x 78" x 77 1/2" (1830 x 1980 x 1970 mm)

About De Nora

Backed by 100 years of experience, you can be confident in the reliability and safety of Capital Controls® UV Systems. De Nora is the partner-of-choice for communities and companies around the globe. In fact, more than 500 million people around the world drink water treated by De Nora products every single day.

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