AGRICULTURAL RESERVOIR HYGIENE SYSTEM

CANDELA UV

NOT JUST WATER DISINFECTION — RESERVOIR HYGIENE MANAGEMENT

Advanced submerged UV-C recirculating reactor for agricultural water reservoirs, hydroponics, greenhouses and fertigation systems.

UV-C
254 nm

Dual
Quartz Sleeve

Multi-Pass
Recirculation

SS316L/304
Construction

CLEAN WATER. CLEAN TANKS. BETTER HARVESTS.

Agricultural water storage creates hidden risks

Water that appears clean may still support microbial regrowth, algae formation and biofilm development during storage.

1 Microbial Growth

- Bacteria and viruses
- Protozoan contamination
- Warm climate acceleration

2 Reservoir Fouling

- Algae growth
- Wall slime and sludge
- Biofilm formation

3 Irrigation Problems

- Drip emitter fouling
- Line contamination
- Higher cleaning frequency

In hot climates such as Bahrain and the GCC, storage reservoirs and agricultural water tanks can become active microbial growth environments if water is not continuously managed.

CANDELA™ RESEARCH CENTRE

Traditional UV systems treat flowing water — not the stored reservoir

Most systems disinfect water before storage. They do not continuously manage water quality inside tanks, reservoirs and nutrient systems.

The effectiveness of UV-C disinfection is governed by the **Beer–Lambert Law**, which states that UV intensity decreases exponentially with distance through water. As a result, conventional UV systems effectively treat only water within a limited irradiation zone near the lamp.

Candela UV overcomes this limitation through a dual quartz sleeve reactor and continuous recirculation, repeatedly exposing stored water to high-intensity UV-C for enhanced reservoir-wide disinfection.

Conventional UV

- Treats moving water only
- Single-pass exposure
- Limited reservoir protection
- Dead zones remain
- Biofilm can continue forming

CANDELA UV

- Treats stored stagnant water
- Continuous multi-pass disinfection
- Whole-tank microbial management
- Active hydraulic recirculation
- Biofilm formation is suppressed

UV intensity decreases with distance. **Candela UV overcomes this by forcing water through a controlled irradiation channel**.

Candela UV- Continuous in-storage UV-C protection

A submerged dual quartz sleeve recirculating reactor engineered for agricultural water storage systems.

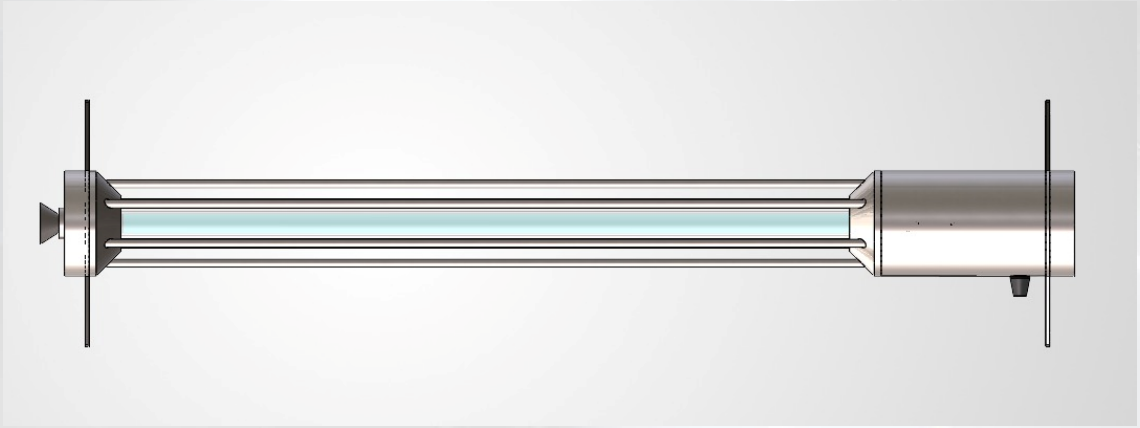
Designed to manage water while it is stored

- Continuously recirculates stored water
- Passes water through a controlled UV-C exposure zone
- Suppresses microorganisms that lead to algae and biofilm
- Helps maintain cleaner water and cleaner tanks
- Chemical-free operation for agriculture and hydroponics

AGRICULTURE | HYDROPONICS | GREENHOUSES

Dual quartz sleeve technology

The reactor creates a controlled annular irradiation path that keeps water close to the UV-C source while isolating the lamp from water.



- **Inner Quartz Sleeve**
  Contains and isolates the UV-C source.
- **Outer Quartz Sleeve**
  Forms the protected water exposure chamber.
- **Annular Flow Path**
  Maintains water within optimized UV distance.
- **SS316L/304 Construction**
  Supports corrosion-resistant submerged operation.

Multi-pass UV-C disinfection

Water is continuously transported through the UV-C irradiation zone. Repeated exposure creates cumulative dose and improved reservoir hygiene.

1 Water enters reactor

Recirculation draws stored water into the annular exposure channel.

2 UV-C exposure

254 nm UV-C damages microbial DNA/RNA and prevents replication.

3 Cleaned water returns

Treated water is discharged back into the reservoir for mixing.

4 Repeated passes

The reservoir is continuously reprocessed to suppress regrowth.

UV Dose Total = Pass 1 + Pass 2 + Pass 3 + Pass 4 + ...

Continuous recirculation converts a stagnant tank into a managed hydraulic-irradiation environment.

Not just water disinfection

Reservoir Hygiene Management

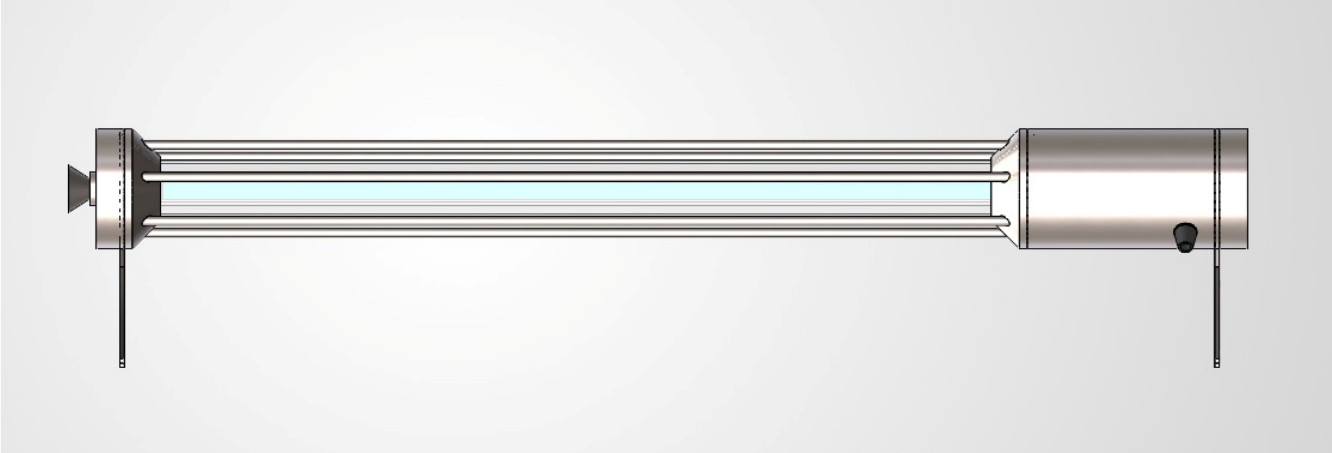
Candela UV™ helps protect the storage environment itself by combining direct UV-C exposure near the reactor with continuous reduction of microorganisms in the stored water.

- ✓ Reduced algae attachment
- ✓ Reduced biofilm formation
- ✓ Reduced slime accumulation
- ✓ Cleaner tank walls over time
- ✓ Lower reservoir cleaning frequency
- ✓ Cleaner irrigation and fertigation systems

Clean Water. Clean Tanks. Better Harvests.

Horizontal tank installation

Recommended for agricultural tanks, rectangular reservoirs and accessible water storage systems.



Ideal For

- Rectangular irrigation tanks
- Ground level reservoirs
- Hydroponic holding tanks
- Farm storage systems

Key Advantages

- Simple access
- Easy removal
- Uniform recirculation
- Service-friendly layout

Vertical installation

A compact configuration for deep tanks, hydroponic reservoirs and space-limited installations.

Advantages

- Small footprint
- Suitable for deeper water levels
- Easy lifting and service
- Continuous vertical circulation
- Suitable for modular farm reservoirs

Standard vertical unit dimensions

Engineering drawing for installation planning and tank layout coordination.

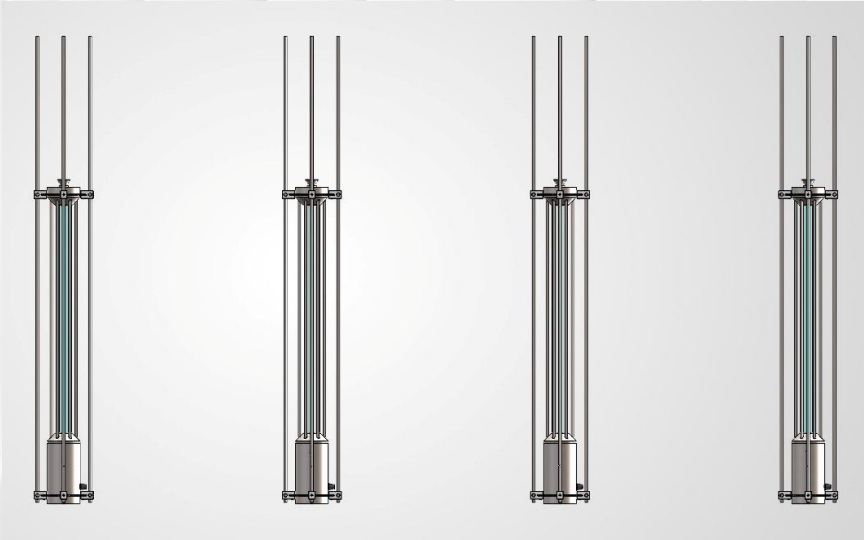
Reference Dimensions

Overall height	1100 mm
Effective height	1000 mm
Footprint width	430 mm
Top diameter	Ø100 –110 mm

Dimensions are based on the supplied vertical installation drawing and may be updated for production versions.

Large reservoir coverage

Multiple Candela UV units can be installed as an array for large tanks and reservoirs.



Recommended array spacing: 1.5 m to 2.0 m apart, depending on tank geometry, water volume and mixing requirement.

Applications across agriculture

Candela UV™ supports water hygiene management across multiple agricultural and irrigation environments.

Hydroponics

Nutrient tank disinfection and reservoir hygiene management.

Greenhouses

Water protection for misting, fertigation and irrigation systems.

Vegetable Farms

Water quality preservation for farm storage tanks.

Nurseries

Cleaner seedling irrigation water and lower reservoir fouling.

Landscape Irrigation

Municipal parks and commercial landscaping reservoirs.

Large Reservoirs

Array formation for higher volume water storage systems.

Microorganisms Controlled

UV-C targets pathogens and nuisance organisms that affect water hygiene.

Bacteria

- E. coli
- Salmonella spp.
- Shigella spp.
- Pseudomonas
- Legionella

Viruses

- Norovirus
- Rotavirus
- Enteroviruses
- Hepatitis A
- Adenoviruses

Protozoa & Nuisance

- Giardia
- Cryptosporidium
- Green algae
- Cyanobacteria
- Yeasts & moulds

Continuous microbial reduction helps suppress biofilm formation and algae proliferation.

Technical specifications

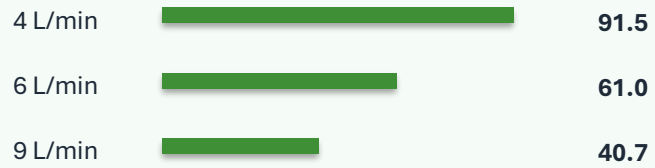
Current reactor engineering parameters for the Candela UV™ agricultural reservoir hygiene system.

Lamp Model	**Philips / Signify TUV 36T5 HO**
Electrical Power	75 W
Useful UV-C Output	25 W
Wavelength	254 nm
Rated Lamp Life	9,000 hours
End-of-Life UV Output	85%
Design UV Intensity	10 mW/cm^2
Exposure Volume	Approx. 0.61 litres
Construction	SS316L / SS304 options
Operation	Continuous submerged recirculation

Design Dose Range

Within the design envelope, calculated UV doses range from 91.5 mJ/cm^2 at 4 L/min to 40.7 mJ/cm^2 at 9 L/min.

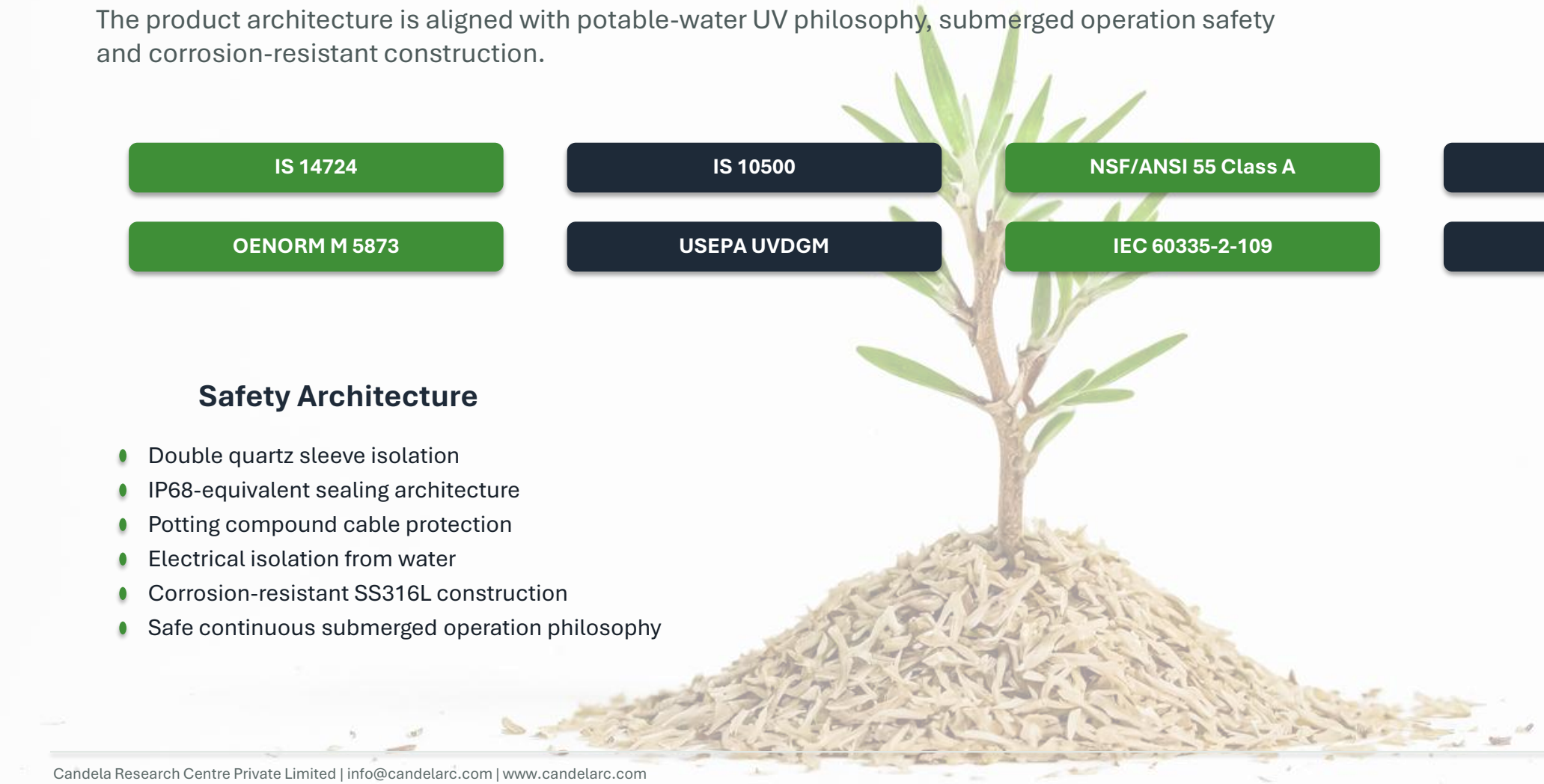
International target threshold: >= 40 mJ/cm^2



Designed around international safety and UV standards

The product architecture is aligned with potable-water UV philosophy, submerged operation safety and corrosion-resistant construction.

- IS 14724
- IS 10500
- NSF/ANSI 55 Class A
- DVGW W294
- OENORM M 5873
- USEPA UVDGM
- IEC 60335-2-109
- IEC 60529



Safety Architecture

- Double quartz sleeve isolation
- IP68-equivalent sealing architecture
- Potting compound cable protection
- Electrical isolation from water
- Corrosion-resistant SS316L construction
- Safe continuous submerged operation philosophy

CANDELA UV

Clean Water. Clean Tanks. Better Harvests.

The Agricultural Reservoir Hygiene System

Candela Research Centre Private Limited

Ward No IX, Oolayil, Door No. 312/A
Paravur, Kollam, Kerala, India
Phone: +91 98950 67193 / +91 62826 90608
Email: info@candelarc.com Website: www.candelarc.com

Developed by Candela Research Centre Pvt. Ltd.