



# ULTRAQUA

UV DISINFECTION SYSTEMS

Product line 2018

# PRODUCT SELECTION



## CLOSED VESSEL UV SYSTEMS



### STAINLESS STEEL

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## ULTRAAQUA UV SYSTEMS

ULTRAAQUA is a well-established manufacturer of high-quality UV systems for all standard applications. Company growth has been strong and ULTRAAQUA products are now in operation all over the world. ULTRAAQUA's design team employs dedicated engineers with research careers of the highest academic level and many years of experience in design and operation of water treatment facilities.

### This is your guarantee for

State-of-the-art UV systems optimized for efficient and trouble-free operation.  
Timely and qualified technical support by experienced engineers.

### Produced in Denmark

High quality UV water disinfection systems manufactured in Denmark.

### Keep it simple

Our "keep it simple" design philosophy is based on a principle to reduce complexity and to increase reliability.

### Simple and robust design for high reliability in harsh environments

UV lamps and associated components of high industry standard to ensure high efficiency and long lifetime.

Hydraulically optimized reactors for lowest possible head loss.

PLC driven control systems with user-friendly menu driven operator interfaces.

### Proof of reliability

ULTRAAQUA UV systems have passed various tests for validation and approval by among others Önorm, DVGW, AMS, IMO and EU ETV.

## GLOBAL NETWORK

ULTRAAQUA has distributors worldwide. They are carefully selected among market leaders in order to guarantee qualified support, innovative solutions and reliability. Please contact us with information on the type of application and geographic location and we will refer you to the nearest distributor.

Our product line has been expanded over the past few years. One entirely new product line has recently been added - UV ÖNORM Validated systems for drinking water applications, based on ULTRAAQUA's newly patented SwirlFlow™ technology. Ultra Low UVT series (ULU) for fluids with very low UVT has been optimized for use in food and pharma applications. Disinfection and chloramine destruction efficiency has been improved in a new generation MP UV series. It is great to see that our UV systems are competitive in the preferred markets, and we are confident that all the new initiatives will lead to many exciting projects with new business partners in the future.

We are proud to present our product line 2018.

Jens Skjølstrup,  
CEO, ULTRAAQUA



# ULTRAAQUA UV SYSTEMS

The main component in the UV system is the UV lamp. This is why we have spent thousands of hours developing and optimizing our lamps to yield the best results possible.

### ULTRAAQUA's ULTRATHERM™ Longlife lamps are:

- ROBUST
- ENERGY-EFFICIENT
- POWERFUL
- LONG-LASTING

It is not enough to have a high-quality UV lamp; it is also necessary for the lamp to be efficient in all normal working temperatures. Our ULTRATHERM™ lamps have a special filling that extends their optimum temperature range from 2 °C to 40 °C.

Our ULTRATHERM™ lamp drivers are sophisticated electronic high-frequency units customized to run the ULTRATHERM™ lamps. The lamp drivers are constantly receiving feedback from the lamps and are dynamically adapting to ensure optimum performance under changing operating temperatures.

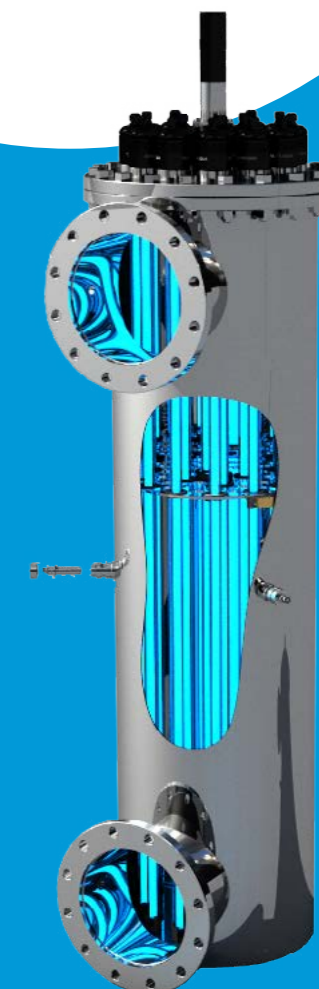
Easy control and access to relevant information on system status are equally important. The current status of ULTRAAQUA UV system can be established by a quick glimpse of the front panel. The unit's touchscreen will reveal all relevant system parameters. ULTRAAQUA systems can also be connected to a SCADA control system if desired.

- ULTRATHERM™ UV LAMPS ARE THE WORLD'S MOST EFFICIENT
- SPECIAL LONG-LIFE INTERNAL COATING ENSURES 16,000 H GUARANTEED LIFETIME
- ULTRATHERM™ LAMP DRIVERS ARE SPECIALLY DESIGNED FOR OUR ULTRATHERM™ UV LAMPS TO ENSURE OPTIMUM PERFORMANCE
- KEY COMPONENTS MANUFACTURED IN THE EU BY MARKET LEADING MANUFACTURERS
- SYSTEMS OPTIMIZED FOR A WIDE RANGE OF WATER TEMPERATURES

## DID YOU KNOW?

The single largest expenditure during the lifetime of a UV system is power

Therefore, ULTRAAQUA has put a tremendous effort into the design and development of the world's most efficient UV lamps and lamp driver combination. You can save up to 22% in operation cost compared to standard LPHO amalgam lamps. We guarantee 16.000h lamp lifetime as the only UV manufacturer in the world.



# LOW-PRESSURE ULTRATHERM™ UV LAMPS

**MARKET LEADING LIFETIME: 16.000H**

Lamp replacement and quartz sleeve inspection can be done in two simple steps without the need of any tools.

## 350 SERIES



ULTRATHERM™ 350 longlife XLC low-pressure high output amalgam UV lamp

- Guaranteed lifetime 16,000 h

## 220 SERIES



ULTRATHERM™ 220 longlife XLC low-pressure high output amalgam UV lamp

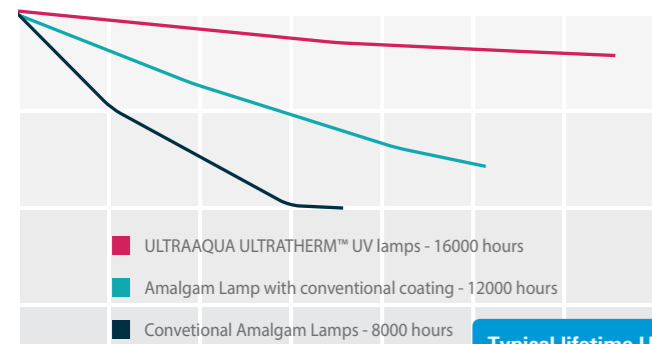
- Guaranteed lifetime 16,000 h

## 75 SERIES

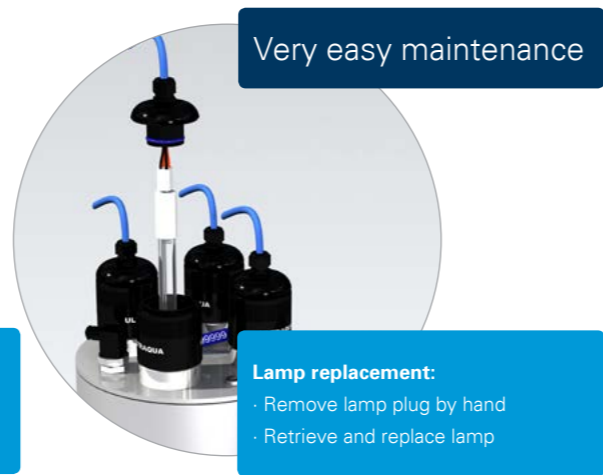


ULTRATHERM™ 75 longlife XLC low-pressure high output amalgam UV lamp

- Guaranteed lifetime 9,000 h



Typical lifetime UV-C emission curve of conventional UV lamps compared with ULTRAAQUA ULTRATHERM™ lamps



# CONTROL CABINETS

ULTRAAQUA control cabinets are built to be durable and easy to operate. The design is based on feedback from numerous customers over time and reflects a “what you need to know when you need to know it” philosophy. Behind the simple appearance, our advanced PLC control system is constantly monitoring and adjusting the electrical parameters of each individual lamp to ensure their optimal performance.

- Touchscreens with intuitive menus
- Rigid corrosion-resistant Glass Fiber Reinforced Plastic (GFRP) or stainless steel enclosure
- High-quality digital lamp drivers with dynamic lamp control for optimum lamp performance
- Advanced controller option for all UV systems
- Installation voltage range for multi-lamp systems from 180v to 306v
- Remote control
- SCADA via modbus

## STANDARD CONTROL

Features

- 4.3” high-resolution multicolor touchscreen
- Individual lamp status LED indicators
- Manual dimming of lamps
- Remote or manual control
- System state outputs
- Lamp performance and lifetime monitoring
- Cabinet and reactor overheat protection
- Up to IP 67
- Operating temperature up to 70°C
- ÖNORM certified UV sensor
- CE or UL approved

## ADVANCED CONTROL

Features

- ÖNORM certified UV sensor
- Intelligent fully automatic cleaning system
- 6-12” touchscreen
- Automatic lamp dimming (power save mode)
- Dose control/pacing
- Performance and event log
- Various digital/ analog I/O
- SCADA via Modbus
- CE or UL approved



Enclosures are available in GFRP - Stainless steel - Mild steel.

# ONE LAMP SYSTEMS



**MR1-75 SS**  
 · 1½" BSP  
 · Max flow 8 m³/h  
 · AISI 316l Electropolished



**MR1-220 SS**  
 · DN80  
 · Max flow 37 m³/h  
 · AISI 316l Electropolished



**MR1-350 SS**  
 · DN100  
 · Max flow 60 m³/h  
 · AISI 316l Electropolished



**MR1-440 SS**  
 · DN100  
 · Max flow 69 m³/h  
 · AISI 316l Electro-polished



**MR1-75 PP - L config**  
 · 1½" BSP  
 · Max flow 7 m³/h  
 · Polypropylene/PEHD



**MR1-220 PP**  
 · DN80  
 · Max flow 34 m³/h  
 · Polypropylene/PEHD



**MR1-350 PP**  
 · DN100  
 · Max flow 55 m³/h  
 · Polypropylene/PEHD



**MR1-440 PP**  
 · DN100  
 · Max flow 63 m³/h  
 · Polypropylene/PEHD



## ONE LAMP SYSTEMS - FLOWS UP TO 69M³/H

Ideal choice for small flows in industrial applications.

- Ideal for smaller flows
- Compact design
- High value
- Easy setup
- Glass fiber reinforced plastic (GFRP) cabinet
- Plug and Play
- Optional UV sensor

To combat harsh and corrosive environments the 220, 350 and 440 one lamps systems are produced with glass fiber reinforced plastic (GFRP) control cabinets. These cabinets are air and water tight up to IP 67, ensuring a dry and safe environment for the electric components.

## GENERAL SPECIFICATIONS - ONE LAMP UNITS

Model	MR1-75SS	MR1-75PP	Control cabinet	Compact SS	GFRP - 75
Max flow m³/h *	8	7			
Power	0.10 kW	0.10 kW		✓	
Inlet/outlet	1½" BSP	1½" BSP			✓
<b>MR1-220 SS/PP</b>					
Max flow m³/h*	37	34			
Power	0.20 kW	0.20 kW		✓	
Inlet/outlet	DN80 / ANSI 3"	DN80 / ANSI 3"			✓
<b>MR1-350 SS/PP</b>					
Max flow m³/h*	60	55			
Power	0.4 kW	0.4 kW			
Inlet/outlet	DN100 / ANSI 4"	DN100 / ANSI 4"			✓
<b>MR1-440 SS/PP</b>					
Max flow m³/h*	69	63			
Power	0.5 kW	0.5 kW			
Inlet/outlet	DN100 / ANSI 4"	DN100 / ANSI 4"			✓

Flange size can be customized

\* Max. flow calculated at UVT 96%, min. UV dose 30 mJ/cm²



GFRP - 75 STD Series



Steel - 75 Series  
Steel - 220 Series



GFRP - 220 series



GFRP - 350/440 series

# MULTI-LAMP SS SYSTEMS

The closed vessel multi-lamp series is built from high-grade AISI 316L stainless steel and are optimized for most water disinfection applications. UV sensor and automatic wiper system are available.

- Corrosion-resistant electropolished stainless steel AISI 316L construction
- Simple installation, operation and maintenance
- Improved energy efficiency due to internal reflection of UV light
- Operating pressure up to 10 bar
- No tools needed for regular maintenance
- Available with standard or advanced controls

**INTERNAL AND EXTERNAL ELECTROPOLISHING ADDS UP TO 30% PERFORMANCE AND INCREASES CORROSION RESISTANCE**



Easy access to lamps and inspection - no tools needed

Internal digital temperature sensor

DIN or ANSI flanges

Optional digital ÖNORM UV sensor

Optional automatic wiper system

Corrosion-resistant electropolished AISI 316L construction



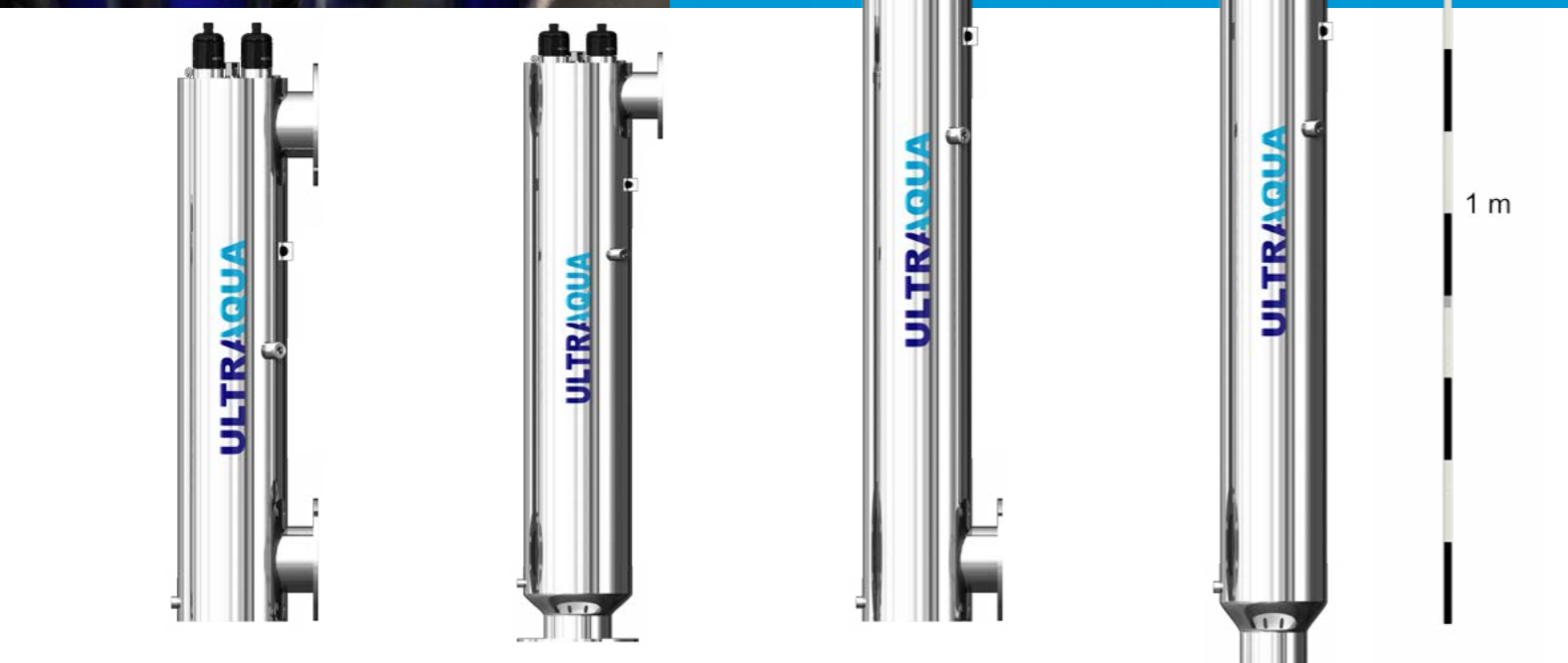
## UNIQUE AUTOMATIC WIPER SYSTEM

Available for 220W and 350W series. ULTRAAQUA's unique automatic wiper system does not obstruct access to UV lamps and quartz sleeves.



## ÖNORM CERTIFIED UV SENSOR

Available for all ULTRAAQUA UV systems



**MR 220 SS Series**  
 · High energy efficiency  
 · Long lamp lifetime  
 Shown: MR4-220SS U

**MR 220 SS L-Line Series**  
 · High energy efficiency  
 · Long lamp lifetime  
 Shown: MR4-220SS L

**MR 350 SS Series**  
 · High energy efficiency  
 · Long lamp lifetime  
 Shown: MR4-350SS U

**MR 350 SS L-Line Series**  
 · High energy efficiency  
 · Long lamp lifetime  
 Shown: MR4-350SS L

## GENERAL SPECIFICATIONS

	MR3-220SS	MR4-220SS	MR6-220SS	MR8-220SS	MR12-220SS	MR16-220SS
<b>220 SS U-LINE SERIES</b> <b>220 SS L-LINE SERIES</b>						
Max flow m <sup>3</sup> /h*	155	230	350	500	760	1000
Power	0.70 kW	1.0 kW	1.4 kW	1.9 kW	2.9 kW	3.8 kW
Inlet/outlet	DN150 / ANSI 6"	DN150 / ANSI 6"	DN200 / ANSI 8"	DN200 / ANSI 8"	DN250 / ANSI 10"	DN250 / ANSI 10"
<b>350 SS U-LINE SERIES</b> <b>350 SS L-LINE SERIES</b>						
Max flow m <sup>3</sup> /h*	260	390	600	870	1300	1650
Power	1.1 kW	1.5 kW	2.3 kW	3.0 kW	4.5 kW	6.0 kW
Inlet/outlet	DN150 / ANSI 6"	DN150 / ANSI 6"	DN200 / ANSI 8"	DN250 / ANSI 10"	DN300 / ANSI 12"	DN300 / ANSI 12"

Flange size can be customized

\*Max. flow calculated at UVT 96%, min. UV dose 30 mJ/cm<sup>2</sup>

# SSV SERIES ÖNORM VALIDATED

The SSV ÖNORM validated series are advanced systems typically used for drinking water applications. The SSV series have an advanced certified UV sensor, automatic quartz sleeve and sensor window wiper system, automatic dose monitoring and automatic dimming of lamps depending on measured UV irradiance.

- Market leading energy efficiency (Ref.: A.W. Schmalweiser | Power efficiency of UV disinfection plants - 2017)
- Patented SwirlFlow™ technology developed by ULTRAAQUA
- Corrosion-resistant electropolished stainless steel AISI 316L construction
- Systems based on ULTRATHERM™ 220 & 350 longlife UV lamps
- Continuous lamp performance / lifetime monitoring
- Event and performance log
- Dose control / pacing
- Automatic wiper cleaning system
- Automatic lamp dimming
- Operating pressure up to 10 bar
- 16.000 h lamp lifetime

220 SSV ÖNORM SERIES	MR1-220SSV	MR3-220SSV	MR4-220SSV	MR6-220SSV
Max flow m³/h*	51	146	230	335
Power	0.24 kW	0.7 kW	1.0 kW	1.4 kW
Inlet/outlet	DN100 / ANSI 4"	DN100 / ANSI 4"	DN150 / ANSI 6"	DN250 / ANSI 10"

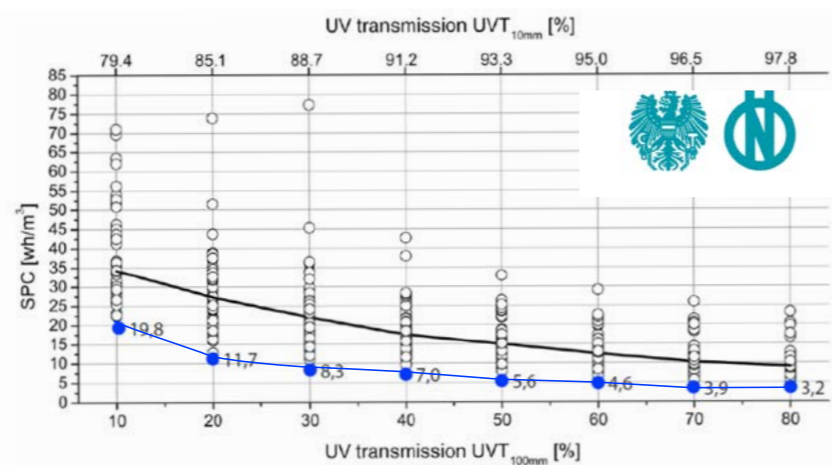
  

350 SSV ÖNORM SERIES	MR6-350SSV	MR8-350SSV	MR12-350SSV	MR16-350SSV
Max flow m³/h*	590	800	1280	1830
Power	2.2 kW	3.0 kW	4.4 kW	5.9 kW
Inlet/outlet	DN300 / ANSI 12"	DN350 / ANSI 14"	DN450 / ANSI 18"	DN500 / ANSI 20"

\* Max. flow according to ÖNORM validation, min. RED 400J/m²

## PROVEN PERFORMANCE

The new ÖNORM 2018 test results from 'Power efficiencies of UV disinfection plants' are shown on the table. The results clearly prove that the ULTRAAQUA's newly validated SSV unit beats all the other UV systems in power efficiency. This outcome was achieved due to ULTRAAQUA's patented SwirlFlow™ technology. By using SwirlFlow™ technology it was possible to optimize the complete SSV UV series for a wide range of UVT applications from 70% to 98% instead of only one UVT application.



●=ULTRAAQUA MR4-220SSV - Lower is better

SPC = Specific Power Consumption - Lower is better

A.W. Schmalweiser | Power efficiency of UV disinfection plants - 2017



## MR3-220 SSV - INSTALLATION IN FINLAND

- Validated according to ÖNORM M5873-1:2001-03
- Highest energy efficiency due to ULTRAAQUA's new patented SwirlFlow™ technology
- Verified by through biodosemetric testing
- Automatic wiper system
- 4.3" high-resolution multicolor touchscreen
- No tools required for regular maintenance

## THE WORLD'S MOST EFFICIENT ÖNORM VALIDATED SYSTEM

16.000H LAMP LIFETIME

ÖNORM CERTIFIED UV SENSOR



AUTOMATIC WIPER SYSTEM

PATENTED SWIRLFLOW™ TECHNOLOGY

"The SwirlFlow™ technology is a revolutionary method to ensure optimal and equal UV exposure of all pathogens passing through the chamber. The unique concept combined with an extensively optimized design provides hydraulic efficiencies around 90% at all water qualities in the operation range."

Dr. Mathias K. Kristensen  
R&D Manager,  
ULTRAAQUA




# ULTRAAQUA case's



**DRINKING WATER - DENMARK**  
Disinfection of drinking water - ÖNORM validated



 **PEPSI PLANT, MIDDLE EAST**  
Disinfection of water used for Pepsi production



 **BALLAST WATER TREATMENT**  
US Coast Guard AMS/IMO approved system including customized UV units



**DRINKING WATER - FINLAND**  
Disinfection of drinking water - ÖNORM validated



**TOC - THAILAND**  
Disinfection of water used for PCB production



**AVIATION INDUSTRY - NETHERLANDS**  
PP UV systems for disinfection of corrosive aviation fluids



**ULU UNIT - ESTONIA**  
Disinfection of ultra low UVT liquids in food processing  
Replacing pasteurisation process



**ORYX GAS TO LIQUID - QATAR**  
UV systems for cooling water, reuse for irrigation



**RAS FISH FARM - SWITZERLAND**  
Large channel systems for Krüger RAS2020 design



**ALLAS SEAS POOL - FINLAND**  
UV system for treating open pool seawater



**WASTEWATER, CROATIA**  
Channel system for wastewater disinfection



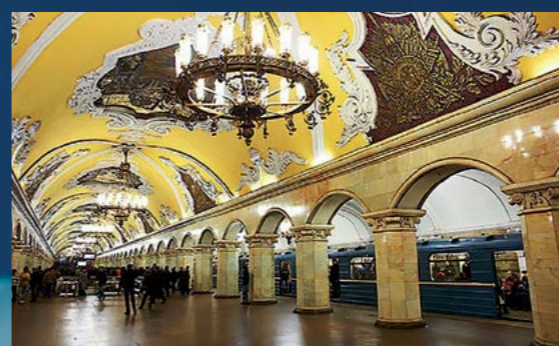
**LARGE SCALE AQUACULTURE, USA**  
Large closed vessels for RAS fish farm



**NATIONAL TEST CENTER, KOREA**  
System used for seawater disinfection



**ARDO-FRIGODAN - DENMARK**  
UV systems for recycled process water in the production of frozen vegetables



**MOSCOW METRO, RUSSIA**  
Channel system for rainwater disinfection



**WORLD EXPO, CHINA**  
Pool water dechloramination and disinfection



# CORROSIVE ENVIRONMENTS

Plastics such as PEHD and PVC are commonly used for non-corrosive UV vessels. From 25 years of experience with seawater disinfection in warm water environments, ULTRAAQUA has extensive knowledge in this field. Based on observations and experimental work, ULTRAAQUA's engineers proved that UV stabilized polypropylene, PP, is the superior material. Development of optimized manufacturing techniques has now made it possible to provide non-corrosive UV resistant vessels at very competitive pricing.

- The two series are based on ULTRATHERM™ 220W and 350W lamps
- Rigid, non-corrosive construction for very harsh environments
- Temperature sensor in titanium housing
- Simple installation, operation and maintenance
- Available with standard or advanced control cabinets
- Optional UV monitoring with digital UV ÖNORM certified sensors
- Available with DIN or ANSI flanges
- No tools needed for regular maintenance
- GFRP control cabinet optimized for corrosive environments
- 16000h guaranteed lamp lifetime

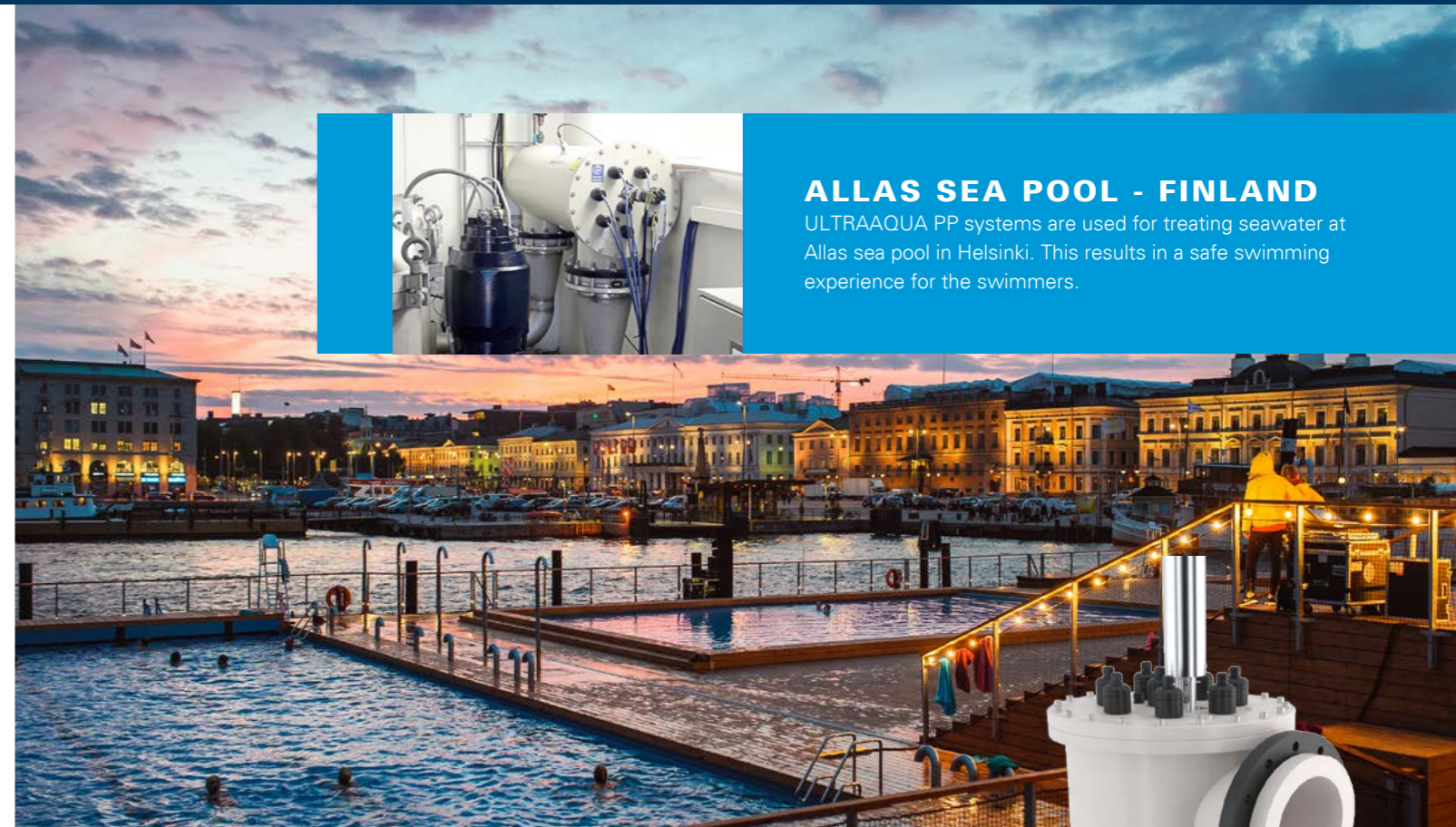
ULTRAAQUA's UV sensor technology is based on duplex steel and teflon materials, developed for corrosive environments.

## AVAILABLE IN PP & PEHD

The main advantages of UV stabilized PP over PEHD and PVC are:

- PP is more temperature resistant
- PP is more pressure resistant
- PP is chemically resistant to salts, acids, bases, oils etc
- PP has extremely long lifetime

For applications with high concentrations of ozone in the water or if the treated fluid is very cold (below 0°C) ULTRAAQUA recommend PEHD.



## ALLAS SEA POOL - FINLAND

ULTRAAQUA PP systems are used for treating seawater at Allas sea pool in Helsinki. This results in a safe swimming experience for the swimmers.

- Automatic wiper system
- Titanium temperature sensor
- Corrosion-resistant UV sensor technology
- DIN or ANSI flanges

## GENERAL SPECIFICATIONS

75 PP SERIES	MR2-75PP	MR3-75PP	MR4-75PP			
Max flow m³/h*	14	27	45			
Power	0.2 kW	0.2 kW	0.3 kW			
Inlet/outlet	1½" BSP	2" BSP	DN100 / ANSI 4"			
220 PP SERIES	MR3-220PP	MR4-220PP	MR6-220PP	MR8-220PP	MR12-220PP	MR16-220PP
Max flow m³/h*	115	155	230	310	460	590
Power	0.70 kW	1.0 kW	1.4 kW	1.9 kW	2.9 kW	3.8 kW
Inlet/outlet	DN150 / ANSI 6"	DN150 / ANSI 6"	DN150 / ANSI 6"	DN200 / ANSI 8"	DN250 / ANSI 10"	DN250 / ANSI 10"
350 PP SERIES	MR3-350PP	MR4-350PP	MR6-350PP	MR8-350PP	MR12-350PP	MR16-350PP
Max flow m³/h*	245	365	570	830	1250	1650
Power	1.1 kW	1.5 kW	2.3 kW	3.0 kW	4.5 kW	6.0 kW
Inlet/outlet	DN150 / ANSI 6"	DN150 / ANSI 6"	DN200 / ANSI 8"	DN250 / ANSI 10"	DN300 / ANSI 12"	DN300 / ANSI 12"

Flanges can be customized

\*Max. flow calculated at UVT 96%, min. UV dose 30 mJ/cm2



# LUVT SYSTEMS FOR LOW UVT FLUIDS

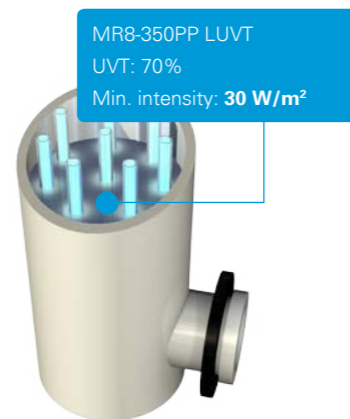
## FROM 40 - 70% UVT

The LUVT Systems are parallel to the standard 220 and 350 stainless steel and polypropylene models. The 350 LUVT Series has been designed for high turbidity, colored water and wastewater applications. A more compact design reduces the distance between lamps and eliminates "dark areas" resulting from low UVT.

- Designed for applications with poor water qualities, like wastewater
- Suitable for high-risk applications such as hospitals, biotech and ultrapure water applications
- Available with the same features and options as the standard 220 and 350 series
- 350 PP and SS series approved for water treatment by the ETV (EU Environmental Technology Verification). ETV is a validation of environmental technology performance by qualified third parties based on test data generated through testing using established protocols or specific requirements.



MR8-350PP Standard  
UVT: 70%  
Min. intensity: 9 W/m<sup>2</sup>



MR8-350PP LUVT  
UVT: 70%  
Min. intensity: 30 W/m<sup>2</sup>

### MonoRay standard

At low water UV transmittance the standard design develops dark areas with very low UV intensity. This allows some particles to pass through the UV without receiving a proper dose - even if the average dose is high.

### MonoRay LUVT

By reducing vessel diameter lamps are moved closer together and closer to the wall of the vessel. Dark areas are reduced and the guaranteed minimum dose received by any organism is dramatically increased without significant effect on average dose compared to a standard system.



Available in PP/PEHD and SS



# UVT IS UV TRANSMISSION

Wastewater can have a very low UV transmission (UVT) typically caused by organic matter and iron

## GENERAL SPECIFICATIONS - LUVT SERIES

220 PP LUVT SERIES	MR1-220PP	MR4-220PP	MR6-220PP	MR8-220PP	MR12-220PP	MR16-220PP
Max flow m <sup>3</sup> /h*	14	49	73	95	140	175
Power	0.25 kW	1.0 kW	1.5 kW	2.0 kW	3.0 kW	4.0 kW
Inlet/outlet	DN100 / ANSI 4"	DN100 / ANSI 4"	DN150 / ANSI 6"	DN150 / ANSI 6"	DN200 / ANSI 8"	DN250 / ANSI 10"

220 SS LUVT SERIES	MR1-220SS	MR4-220SS	MR6-220SS	MR8-220SS	MR12-220SS	MR16-220SS
Max flow m <sup>3</sup> /h*	15	52	76	99	146	184
Power	0.25 kW	1.0 kW	1.5 kW	2.0 kW	3.0 kW	4.0 kW
Inlet/outlet	DN100 / ANSI 4"	DN100 / ANSI 4"	DN150 / ANSI 6"	DN150 / ANSI 6"	DN200 / ANSI 8"	DN250 / ANSI 10"

350 PP LUVT SERIES	MR1-350PP	MR4-350PP	MR6-350PP	MR8-350PP	MR12-350PP	MR16-350PP
Max flow m <sup>3</sup> /h*	23	83	124	163	240	300
Power	0.4 kW	1.5 kW	2.2 kW	3.0 kW	4.5 kW	6.0 kW
Inlet/outlet	DN100 / ANSI 4"	DN100 / ANSI 4"	DN150 / ANSI 6"	DN150 / ANSI 6"	DN200 / ANSI 8"	DN250 / ANSI 10"

350 SS LUVT SERIES	MR1-350SS	MR4-350SS	MR6-350SS	MR8-350SS	MR12-350SS	MR16-350SS
Max flow m <sup>3</sup> /h*	25	88	131	170	250	315
Power	0.4 kW	1.5 kW	2.2 kW	3.0 kW	4.5 kW	6.0 kW
Inlet/outlet	DN100 / ANSI 4"	DN100 / ANSI 4"	DN150 / ANSI 6"	DN150 / ANSI 6"	DN200 / ANSI 8"	DN250 / ANSI 10"



MR4-350SS LUVT



### MR12-350SS LUVT - WASTEWATER

ULTRAAQUA's LUVT system - low UVT - treating municipal wastewater in Luumäki, Finland. The UV system is equipped with automatic wiper system, which will keep both the quartz sleeves and the UV sensor clean. The automatic wiper system is based on mechanical wiper system, which is composed of a stainless steel 316L spindle and wiper plate with teflon wiper rings, driven by IP65 DC motor.

Flow rates are indicative. Vessel size depends on actual UVT.

\* Max. flow calculated at UVT 70%, min. UV dose 30 mJ/cm<sup>2</sup>



3 PCS MR48-350SS - Vermont USA

# LARGE SCALE CLOSED VESSEL UV SYSTEM

CONTACT  
ULTRAQUA  
ENGINEERING  
DEPARTMENT



8 PCS MR56-350SS Svelgen Norway



MR50-350SS Channel Vertical

**VERTICAL INSTALLATION**

# WASTEWATER OPEN CHANNEL SERIES

SPECIALISTS IN  
WASTEWATER  
DISINFECTION



MR32-220SS Channel Inclined

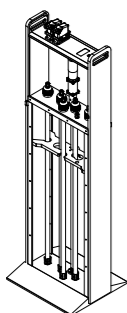
**INCLINED INSTALLATION**

# OPEN CHANNEL SERIES

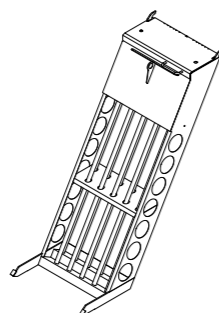
The stainless steel (SS) and polypropylene (PP) channel series offers a very low head loss and cost efficient solution for open channel applications. Channel system series is commonly used for municipal wastewater treatment and large aquaculture systems. Lamp banks are based on modular design and can be expanded to treat any flow. The SS/PP channel series is versatile and will fit into a variety of channel depths and widths.

- Modular frame and control system
- Polypropylene or electropolished stainless steel AISI 316L construction
- Simple installation, operation and maintenance
- Vertically installed lamps - all lamps accessible during operation - no submerged electrical components
- No tools needed for maintenance
- Continuous lamp performance / lifetime monitoring
- Optional water level control and UV sensor
- Available with standard or advanced control
- High level of customization - to fit in any channel dimension
- Automatic wiper system

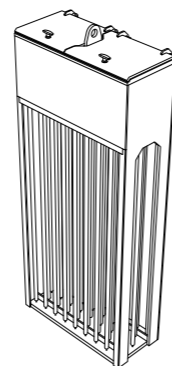
**SIZE CAN BE CUSTOMIZED TO FIT INTO A VARIETY OF CHANNEL DEPTHS AND WIDTHS**



**MR4-220PP Channel Vertical**  
Shown:  
MonoRay 4-220PP Channel  
Polypropylene  
With automatic wiper system  
Vertical design



**MR10-220SS Channel Inclined**  
Shown:  
MonoRay 10-220SS Channel  
Stainless Steel  
Inclined design



**MR42-350PP Channel Vertical**  
Shown:  
MonoRay 42-350PP Channel  
Polypropylene  
Large flows  
Vertical design

## VERTICAL OR INCLINED INSTALLATION

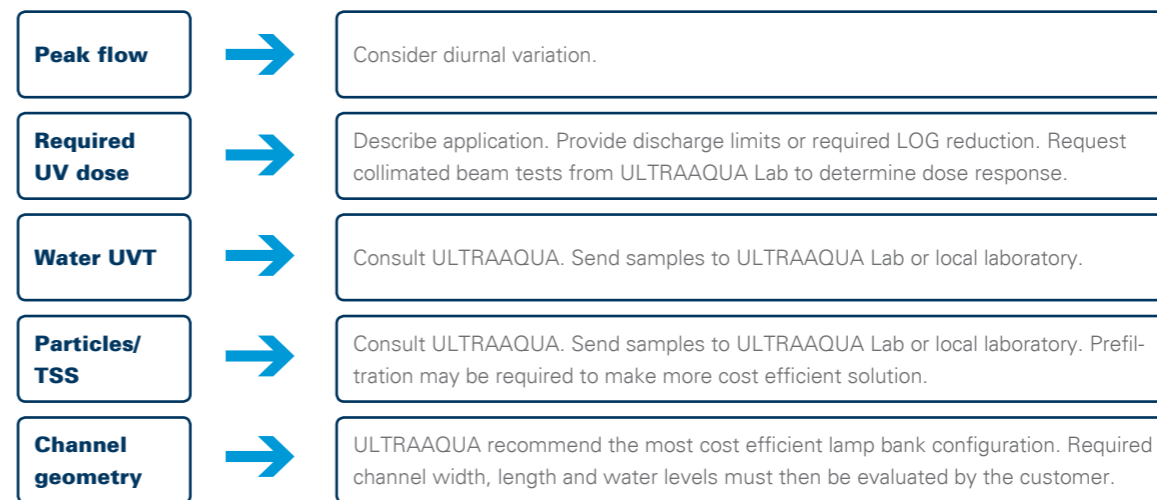
ULTRAAQUA's 20 years of experience with UV systems for open channel installations has shown that vertical or inclined installation is clearly advantageous compared to horizontally/fully submerged UV lamps. All electrical connections are placed in dry and clean top compartment. This will ensure stable operation throughout the lifetime of the system. It is also important to note that both the UV lamps and the UV sensors can be serviced in a very quick, safe and hygienic manner without elevating the lamp banks.

- Easy access to sealed compartment - no tools necessary
- 16000h guaranteed lamp lifetime
- Automatic wiper system UV sensor
- Robust rail mounted lamp banks



## OPEN CHANNEL SIZING PROCESS

Parameters required for sizing



ULTRAAQUA sizes and designs the most efficient open channel UV system configuration. ULTRAAQUA will provide 2D/3D drawings.

CAD work/exchange



Client can send site 2D/3D drawings to ULTRAAQUA.

**PROPOSING THE FINAL OFFER**



# ULTRA LOW UVT SYSTEMS FLUIDS FROM 2 - 40% UVT



### MonoRay Ultra Low UVT - ULU Systems

ULTRAAQUA's ULU unit have been developed for those special applications where the transmittance of the fluid is very low, such as wine, beer or juice. In these applications regular UV systems are not effective. Contact ULTRAAQUA specialist to find the right solution for your application.

### APPLICATIONS

- Food processing
- Horticulture
- Dechlorination
- Isotonic concentrates
- Salt brines
- Wine

### PROVEN PERFORMANCE



### MR12-220 SS ULU

The MR12-220SS ULU was installed for liquid sugar UV disinfection at Cola plant located in Cuba. This UV system is optimized for Ultra Low UVT applications, in which a very high degree of safety is required.



# TOC AND AOP APPLICATIONS ADVANCED OXIDATION

ULTRAAQUA's engineers and researchers are world leading experts in advanced oxidation. One product group finalized by the R&D department is UV systems for TOC degradation. ULTRAAQUA has now profound experience in this field as first systems were installed in 2007.

200, 300 SS TOC and MP series are used in TOC and AOP applications. The combination of specially developed gas fillings, amalgam types and extremely high purity quartz material provides high intensity output of UV-rays capable of both direct photolysis and generation of free hydroxyl radicals from molecules containing oxygen atoms. Efficiency has been proven to be unsurpassed in the UV-industry.

TOC destruction UV systems are widely used in the semiconductor industry. Many organic contaminants in fresh water resources can be degraded by this process. Such contaminants include pesticides, NDMA, dioxane and nitrosamines.

### EXPERTS IN ADVANCED OXIDATION

ULTRAAQUA engineering team can precisely size the required UV system for specific tasks. We can also determine if there is a potential for process optimization by combining with dosing of chemical oxidants such as hydrogen peroxide, ozone or chlorine. Please also consult the group with questions re. possible need for upstream pre-filtration.



# MULTIRAY SERIES

## MEDIUM-PRESSURE SYSTEMS

ULTRAAQUA MultiRay medium-pressure systems are designed and optimized for advanced photo oxidation processes as well as general disinfection. This includes chloramine reduction in swimming pools and various chemical compounds in industrial wastewater.

- Electropolished stainless steel AISI 316L construction
- Simple installation, operation and maintenance
- Energy saving by lamp dimming based on sensor value or timer
- Insignificant head loss
- PLC control module with touchscreen
- Manual wiper mechanism
- Automatic wiper system optional
- Operating pressure up to 10 bar
- 6" high-resolution touchscreen



MP3000 installed in Lalandia Waterpark, Denmark



Digital ÖNORM UV sensor

Double sensor system eliminates risk of heat damage

Handle for manual cleaning Automatic wiper available

All Internal parts from UV resistant PTFE and stainless steel AISI 316L

Quartz and lamp positioning designed to optimize UV dose distribution

Artificial quartz eliminates solarization problems associated with natural quartz

Intelligent power saving control based on timer

Effective dual sensor overheat protection

All seals made from heat and UV resistant Viton rubber

High quality manual wiper mechanism design

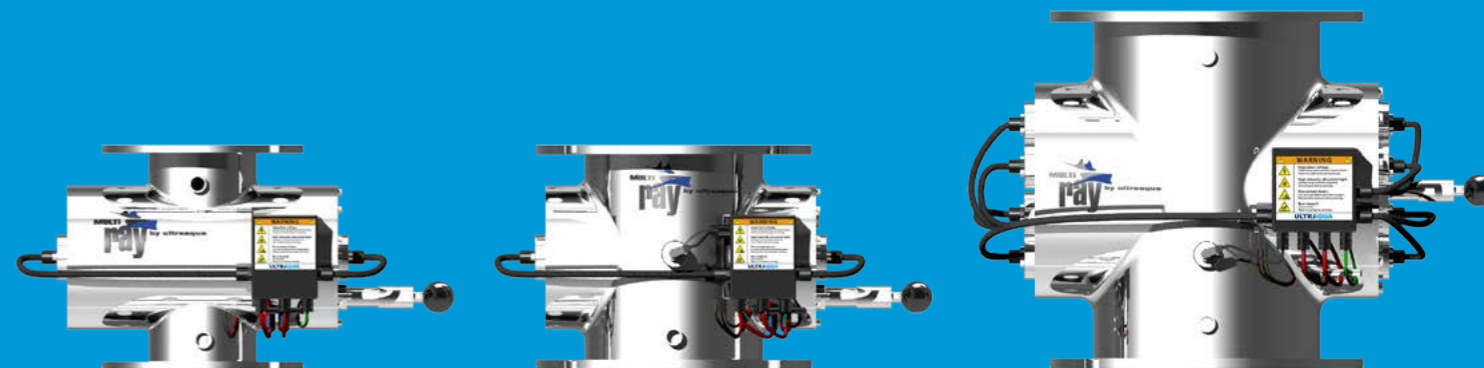
### STANDARD SYSTEMS TO 12KW

Bigger systems upon request



### HYLLIE WATER PARK, MALMÖ, SWEDEN

7 systems of MultiRay MP 3000-12000 effectively remove chloramines and microorganisms in Sweden's largest swimming pool and wellness center.



### ULTRATHERM MEDIUM-PRESSURE LAMPS

ULTRATHERM 1kW, 2kW and 3kW medium-pressure UV lamps

- Lifetime 9,000 hours
- Developed for high radiation output at wavelengths 200-240 nm to maximize photo oxidation performance



### GENERAL SPECIFICATIONS

	Max flow for disinfection*	Max. chloramine reduction flow**	Lamp type	Max power consumption	Connection flange PN10 / corresponding plastic pipe	UV Reactor dimension H W D
MP1000	88 m³/h	55 m³/h	Ultratherm 1000W	1.1 kW	DN 150 / D160 / ANSI 6"	350 x 650 x 400 mm
MP2000	248 m³/h	155 m³/h	Ultratherm 2000W	2.2 kW	DN 250 / D250 / ANSI 10"	255 x 550 x 350 mm
MP3000	344 m³/h	220 m³/h	Ultratherm 3000W	3.1 kW	DN 250 / D250 / ANSI 10"	450 x 800 x 500 mm
MP6000	792 m³/h	510 m³/h	2 x Ultratherm 3000W	6.2 kW	DN 300 / D315 / ANSI 12"	500 x 850 x 500 mm
MP9000	1200 m³/h	800 m³/h	3 x Ultratherm 3000W	9.3 kW	DN 300 / D315 / ANSI 12"	500 x 850 x 500 mm
MP12000	1680 m³/h	1100 m³/h	4 x Ultratherm 3000W	12.4 kW	DN 300 / D315 / ANSI 12"	500 x 850 x 500 mm

\* Max. flow for general disinfection calculated at UVT 96%, min. UV dose 30 mJ/cm2

\*\* Max. flow for chloramine reduction calculated at UVT 96%, min. UV dose 60 mJ/cm2



# ULTRAAQUA

UV DISINFECTION SYSTEMS

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