

# MONORAY™ SERIES

UV DISINFECTION • EFFICIENT AND CHEMICAL-FREE WATER TREATMENT



**ULTRAQUA**  
UV DISINFECTION SYSTEMS

WE PROTECT YOUR MOST VALUABLE RESOURCE

## MONORAY™ SERIES

THE MONORAY SERIES OFFERS RELIABLE AND EFFICIENT UV DISINFECTION FOR A WIDE RANGE OF INDUSTRIAL AND MUNICIPAL WATER APPLICATIONS.

THE MONORAY IS AVAILABLE IN MULTIPLE CONFIGURATIONS AND CAN BE FITTED FOR ALMOST ANY FLOWRATE FOR ALMOST ANY APPLICATION REQUIRING CHEMICAL FREE UV DISINFECTION.

### KEY HIGHLIGHTS

- ⚙️ Guaranteed 16,000-hour ULTRATHERM™ lamp lifetime
- ⚙️ Optimized for maximum efficiency
- ⚙️ Easy maintenance and installation
- ⚙️ Easily integrated in complex environments
- ⚙️ Complete control with ULTRATOUCH™ control cabinets
- ⚙️ Automated ULTRAWIPER™ quartz cleaning with tailored brush heads
- ⚙️ Extended 5 years warranty available - subject to terms & conditions



# MARKET LEADING ENERGY EFFICIENCY





## CORE BENEFITS OF UV

**UV TECHNOLOGY IS A GLOBALLY ACCEPTED SOLUTION FOR WATER DISINFECTION, EFFECTIVELY INACTIVATING BACTERIA, VIRUSES, AND PROTOZOA.**

The demand for cost-efficient solutions to provide clean water are at an all-time high and will only increase in the future. UV disinfection solves this complex challenge, being able to meet the strictest requirements regarding bacteria and virus protection.

Due to recent developments, UV disinfection is now an effective alternative in a wide range of water qualities and applications. Improved technological and design configurations have made UV a viable OPEX and CAPEX solution for disinfection processes as well as in more advanced applications such as Advanced Oxidation Processes (AOP).

Choosing UV as the disinfection method ensures optimal CAPEX and OPEX conditions compared to its alternatives, making UV the best solution for a wide range of installations.

ULTRAAQUA UV disinfection systems are easy to install, maintain, and thoroughly cost-optimized. The third-party approvals for performance and quality ensure complete peace of mind, employing the best available solution for complete biosecurity.

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UV DISINFECTION SYSTEMS



### COMPLETE CONTROL WITH ULTRATOUCH™ CONTROL CABINETS

The market leading ULTRATOUCH™ PLC is the very latest in control and touch-screen HMI technology. Full data logging provides complete control to the operator, on site or remotely.

The PLC controls are easily integrated into SCADA layouts, and can be modified by our in-house software engineers. Multiple PLC options combined with various communication protocols makes the ULTRATOUCH highly versatile.

### AUTOMATIC DOSE PACING

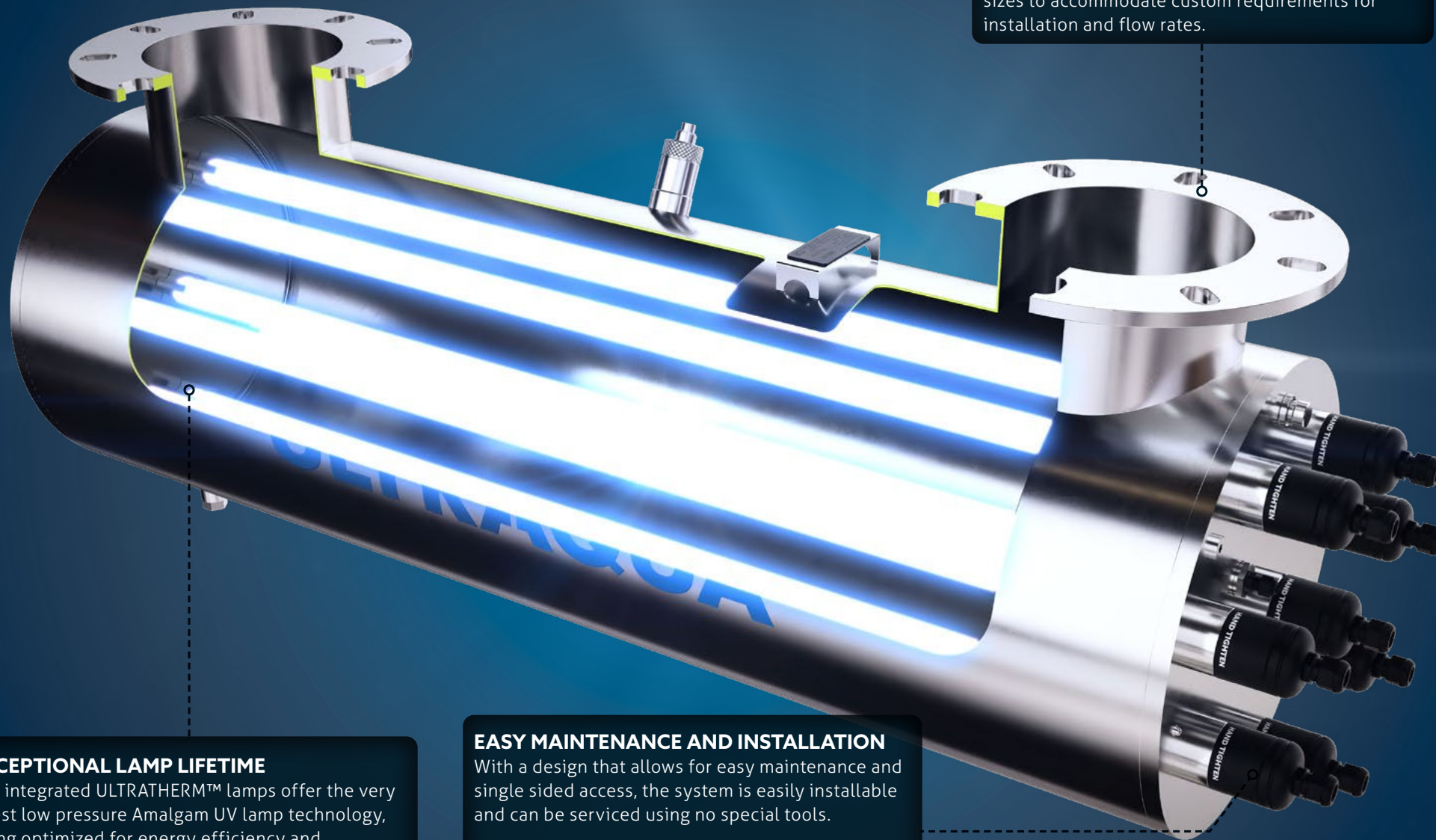
The automatic dose pacing ensures optimized efficiency by reducing power consumption while ensuring a stable dose under operation. The ability to control the power increments ensures that issues related to overdosing and temperature issues are well mitigated.



### HIGH GRADE 316L STAINLESS STEEL

The internal reflection of the electropolished system provides efficiency improvements of up to 30% at high UVT's.





### **MULTIPLE FLANGE OPTIONS**

The MONORAY series is available in multiple flange sizes to accommodate custom requirements for installation and flow rates.

### **EXCEPTIONAL LAMP LIFETIME**

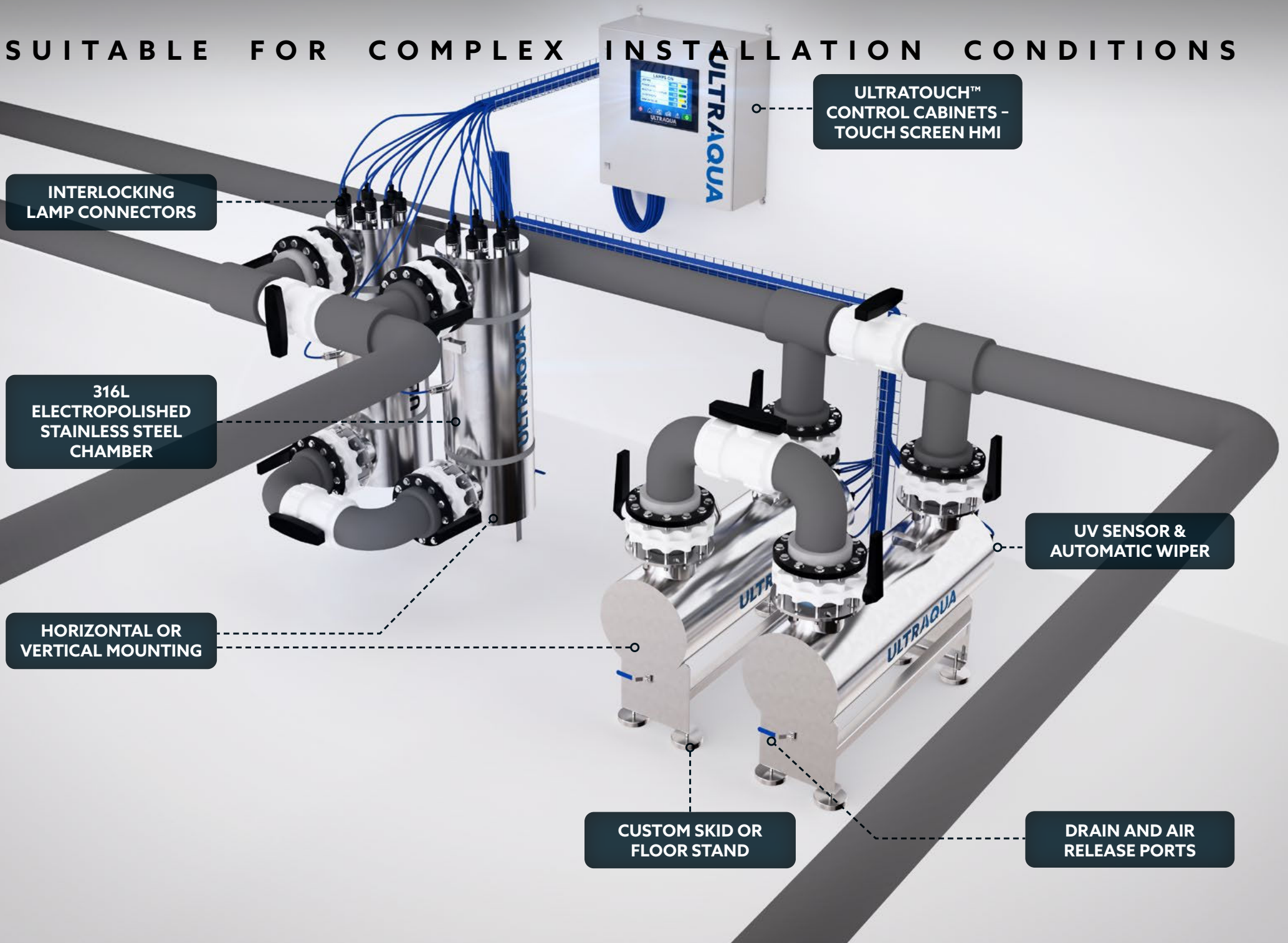
The integrated ULTRATHERM™ lamps offer the very latest low pressure Amalgam UV lamp technology, being optimized for energy efficiency and robustness. The substantial 16,000 hours of lamp lifetime offers market leading lamp efficiency in UV-C output density.

### **EASY MAINTENANCE AND INSTALLATION**

With a design that allows for easy maintenance and single sided access, the system is easily installable and can be serviced using no special tools.

The unique interlocking electrical and mechanical lamp connectors make servicing of the system safe, quick, and fool proof.

# SUITABLE FOR COMPLEX INSTALLATION CONDITIONS







## CUSTOMIZED SOLUTIONS

**ULTRAAQUA EMPLOYS AN ENTIRE DEPARTMENT OF ENGINEERS WHO ARE SPECIALIZED IN THE DESIGN AND CONSTRUCTION OF UV SYSTEMS.**

Multiple years of experience within relevant applications makes it possible to adjust any standard UV system to accommodate specific requirements.

The customization requirements can vary from adjustments such as reactor shape or flange size, to adding new advanced features. This makes the ULTRAAQUA design department function as a consulting agency, working towards an optimized customized solution. This means that we can ensure on site validation to various standards, fitting your exact requirements.

The following possibilities are available for all customized UV units:

### **Customized services**

- ⚙ Integrated CFD Analysis
- ⚙ Particle tracing modeling analysis
- ⚙ Determining fluence rate
- ⚙ Physical testing
- ⚙ Onsite validation testing
- ⚙ Advanced UV disinfection support

### **Customized products**

- ⚙ Custom UV systems for advanced applications
- ⚙ Packaged plant equipment
  - ⚙ Including mobile treatment container
  - ⚙ Skid packages

Comprehensive technical knowledge makes the engineers able to assist with installation details such as weir design, water level control devices, and many other project-specific matters.

# SERVICE & SUPPORT

**ULTRAAQUA IS A GLOBAL COMPANY OFFERING WORLDWIDE SERVICE AND SUPPORT, WITH ITS HEAD OFFICE BASED IN DENMARK.**

With operations in over 120 countries and an install base of 10.000 systems, ULTRAAQUA is able to offer extensive support regarding installation and maintenance with its wide-ranging network of regional offices.

The technical support team in our head office provides 24-hour remote service upon agreement, ensuring that potential emergencies are avoided.

At ULTRAAQUA, we wish to provide a complete product experience for our customers, from the very start of determining requirements to ongoing operational maintenance. This means that our responsibility does not stop after the UV system reaches its destination. By establishing a close collaboration with all clients, a streamlined process is effectively ensured throughout all post-installation activities.

Our support services include, but are not limited to:

- General technical support
- Advanced 24-hour support upon agreement
- Spare part ordering and shipping services
- Commissioning
- On-site training
- On-site technical support

If needed, qualified engineers are available for on-site training and technical support, being able to assist in setting up the entire system. Extensive information and technical knowledge is always provided, to ensure maximum performance and system reliability.



UV SYSTEM	MR1-75SS STD	MR1-75SS ADV
Product ID	21080	21080
Approvals	CE (Option UL/ cUL)	

UV LAMPS & MONITORING		
Lamp Number	1	
ULTRATHERM™ LPHO Lamp	75 W	
Guaranteed Lamp Lifetime	9 000 Hours	
UV Monitoring	N/A	UV Intensity Sensor SS316L
Variable Power	N/A	50-100%

UV CHAMBER		
Connection Size	1½" BSP	
Connection Type	PN10	
Design Pressure	10 Bar	
Chamber Material	SS316L / 1.4404 (Option Super Duplex)	
Internal & External Finish	Electropolished Inside/Out	
Lamp/Wiper Access Single Ended	Yes	
Quartz Type	High Purity Fused Quartz Transmittance >95%	
Mounting	Free Standing	
ULTRAWIPER™ System	N/A	
Temperature Probe	1x PT100	
Vent & Drain Ports	N/A	
Ingress Protection	IP68	
Installation	Horizontal / Vertical	
Minor Wetted Parts	FDA Approved PTFE, PVDF, VITON	
Reactor Dry Weight	7 kg	7 kg
Reactor Volume	6 L	6 L

CONTROL CABINET		
Cabinet Material	GFRP (Option SS304/SS316)	
Cabinet Sizes ( H x W x D )	400 x 300 x 210 mm	600 x 400 x 210 mm
Cable Length	4 Meters (Max. 30 Meters)	
Installation & Ambient	Wallmount 0-40 °C	
Ingress Protection	IP65	
Thermal Control	Passive Dissipation (Option Fan / AC / Heat Exchanger)	
Control Logic	N/A	Microprocessor
Interface/HMI	Status LED Indicators & Hour Counter	4 Line LCD with System State Indication
External Wiring	N/A	Remote ON/OFF, System Status, Alarm & Warning
Power Consumption	0,08 kW	
Power Supply	230VAC +/- 10% +N+PE 50/60Hz	
Cabinet Weight	4 kg	10 kg

ADV. CONTROLLER FEATURES		
SCADA Communication	N/A	MODBUS RTU
Analogue 4-20mA I/O	N/A	Flow Input/UV Irradiance Output
ULTRADOSE™	N/A	
Log	N/A	Alarms
UV Dose	N/A	UV Intensity on Display
UV Dose Alarm	N/A	UV Intensity Pre-Alarm & Alarm

Specifications are subject to change without notice. Version: 24.1



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UV SYSTEM		MR1-220SS STD	MR1-220SS ADV	MR3-220SS	MR4-220SS	MR6-220SS	MR8-220SS
Product ID		21210	21211	21212	21214	21216	21218
Product ID (Incl. ULTRAWIPER)		N/A	N/A	21213	21215	21217	21219
Approvals	CE (Option UL/ cUL)						
UV LAMPS & MONITORING							
Lamp Number	1	1	3	4	6	8	
ULTRATHERM™ LPHO Lamp	220 W						
Guaranteed Lamp Lifetime	16 000 Hours						
UV Monitoring	N/A	UV Intensity Sensor ÖNORM M5873 Certified SS316L					
Variable Power	N/A	50-100%					
UV CHAMBER							
Connection Size	DN80	DN80	DN150	DN150	DN200	DN200	
Connection Type	EN-1092 Type 01A PN10 (Option PN16)						
Design Pressure	10 Bar (Option 16 Bar)						
Chamber Material	SS316L / 1.4404 (Option Super Duplex)						
Internal & External Finish	Electropolished Inside/Out						
Lamp/Wiper Access Single Ended	Yes						
Quartz Type	High Purity Fused Quartz Transmittance >95%						
Mounting	Free Standing (Option Horizontal Duplex Stand)						
ULTRAWIPER™ System	N/A	(Option Automatic Mechanical With PTFE/Fiber Rings (Electrical))					
Temperature Probe	1x PT100						
Vent & Drain Ports	½"						
Ingress Protection	IP68						
Installation	Horizontal / Vertical						
Minor Wetted Parts	FDA Approved PTFE, PVDF, VITON						
Reactor Dry Weight	23 kg	23 kg	38 kg	45 kg	61 kg	78 kg	
Reactor Volume	22 L	22 L	42 L	64 L	93 L	163 L	
CONTROL CABINET							
Cabinet Material	GFRP (Option SS304/SS316)						
Cabinet Sizes ( H x W x D )	400 x 300 x 210 mm	400 x 600 x 210 mm	800 x 600 x 300 mm				
Cable Length	4 Meters (Max. 30 Meters)						
Installation & Ambient	Wallmount 0-40 °C	Wallmount 0-40 °C Non-Condensing					
Ingress Protection	IP65		IP54 (Option IP65/NEMA4X)				
Thermal Control	Passive Dissipation (Option Fan / AC / Heat Exchanger)		Fan with Filter (Option AC / Heat Exchanger)				
Control Logic	Microprocessor		PLC				
Interface/HMI	Status LED Indicators & Hour Counter	4 Line LCD with System State Indication	STD.: 4" ULTRATOUCH™ / ADV.: 7" ULTRATOUCH				
External Wiring	Remote ON/OFF, Safety ON/OFF, System Status, Alarm						
Power Consumption	0,2 kW	0,2 kW	0,7 kW	1,0 kW	1,4 kW	1,9 kW	
Power Supply	230VAC +/- 10% +N+PE 50/60Hz						
Cabinet Weight	8 kg	10 kg	29 kg	29 kg	32 kg	32 kg	
ADV. CONTROLLER FEATURES							
SCADA Communication	N/A	MODBUS RTU	MODBUS TCP/IP / PROFINET (Option I-Device)				
Analogue 4-20mA I/O	N/A	Flow Input/UV Irradiance Output	Flow Input/UV Dose Output/UV Intensity Output (Option UVT Input)				
ULTRADOSE™	N/A	N/A	Automatic UV Dose Pacing 50-100%				
Log	N/A	Alarms	Alarm, Event & Data (UV Dose, UV Intensity & Flow)				
UV Dose	N/A	UV Intensity on Display	Actual UV Dose & Target UV Dose on HMI				
UV Dose Alarm	N/A	UV Intensity Pre-Alarm & Alarm	Pre-Alarm & Alarm				

UV SYSTEM		MR1-350SS STD	MR1-350SS ADV	MR3-350SS	MR4-350SS	MR6-350SS	MR8-350SS	MR12-350SS
Product ID		21310	21311	21315	21320	21325	21330	21335
Product ID (Incl. ULTRAWIPER)		N/A	N/A	21316	21321	21326	21331	21336
Approvals		CE (Option UL/ cUL)						
UV LAMPS & MONITORING								
Lamp Number	1	1	3	4	6	8	12	
ULTRATHERM™ LPHO Lamp	350 W							
Guaranteed Lamp Lifetime	16 000 Hours							
UV Monitoring	N/A	UV Intensity Sensor ÖNORM M5873 Certified						
Variable Power	N/A	50-100%						
UV CHAMBER								
Connection Size	DN100	DN100	DN150	DN150	DN200	DN250	DN250	
Connection Type	EN-1092 Type 01A PN10 (Option PN16)							
Design Pressure	10 Bar (Option 16 Bar)							
Chamber Material	SS316L / 1.4404 (Option Super Duplex)							
Internal & External Finish	Electropolished Inside/Out							
Lamp/Wiper Access Single Ended	Yes							
Quartz Type	High Purity Fused Quartz Transmittance >95%							
Mounting	Free Standing (Option Horizontal SS316 Stand)							
ULTRAWIPER™ System	N/A	(Option Automatic Mechanical With PTFE/Fiber Rings (Electrical))						
Temperature Probe	PT100							
Vent & Drain Ports	½"						1"	
Ingress Protection	IP68							
Installation	Horizontal / Vertical							
Minor Wetted Parts	FDA Approved PTFE, PVDF, VITON							
Reactor Dry Weight	28 kg	28 kg	45 kg	53 kg	70 kg	112 kg	143 kg	
Reactor Volume	32 L	32 L	58 L	89 L	128 L	230 L	296 L	
CONTROL CABINET								
Cabinet Material	GFRP (Option SS304/SS316)							
Cabinet Sizes ( H x W x D )	600 x 400 x 210 mm		800 x 600 x 300 mm			750 x 1000 x 320 mm		
Cable Length	4 Meters (Max. 30 Meters)							
Installation & Ambient	Wallmount 0-40 °C		Wallmount 0-40 °C Non-Condensing					
Ingress Protection	IP65		IP54 (Option IP65/NEMA4X)					
Thermal Control	Passive Dissipation (Option Fan / AC / Heat Exchanger)		Fan with Filter (Option AC / Heat Exchanger)					
Control Logic	N/A	Microprocessor	PLC					
Interface/HMI	Status LED Indicators & Hour Counter	4 Line LCD with System State Indication	STD.: 4" ULTRATOUCH™ / ADV.: 7" ULTRATOUCH™					
External Wiring	N/A	Remote ON/OFF, Safety ON/OFF, System Status, Alarm						
Power Consumption	0,4 kW	0,4 kW	1,1 kW	1,5 kW	2,3 kW	3,0 kW	4,5 kW	
Power Supply	230VAC +/- 10% +N+PE 50/60Hz					3x 400VAC +/- 10% +N+PE 50/60Hz		
Cabinet Weight	10 kg	10 kg	32 kg	32 kg	35 kg	60 kg	66 kg	
ADV. CONTROLLER FEATURES								
SCADA Communication	N/A	MODBUS RTU	MODBUS TCP/IP / PROFINET (Option I-Device)					
Analogue 4-20mA I/O	N/A	Flow Input/UV Irradiance Output	Flow Input/UV Dose Output/UV Intensity Output (Option UVT Input)					
ULTRADOSE™	N/A	N/A	Automatic UV Dose Pacing 50-100%					
Log	N/A	Alarms	Alarm, Event & Data (UV Dose, UV Intensity & Flow)					
UV Dose	N/A	UV Intensity on Display	Actual UV Dose & Target UV Dose on HMI					
UV Dose Alarm	N/A	UV Intensity Pre-Alarm & Alarm	Pre-Alarm & Alarm					



UV SYSTEM	MR16-350SS	MR18-350SS	MR20-350SS
Product ID	21340	21390	21392
Product ID (Incl. ULTRAWIPER)	21341	21391	21393
Approvals	CE (Option UL/ cUL)		

UV LAMPS & MONITORING			
Lamp Number	16	18	20
ULTRATHERM™ LPHO Lamp	350 W		
Guaranteed Lamp Lifetime	16 000 Hours		
UV Monitoring	UV Intensity Sensor ÖNORM M5873 Certified		
Variable Power	50-100%		

UV CHAMBER			
Connection Size	DN300		
Connection Type	EN-1092 Type 01A PN10 (Option PN16)		
Design Pressure	10 Bar (Option 16 Bar)		
Chamber Material	SS316L / 1.4404 (Option Super Duplex)		
Internal & External Finish	Electropolished Inside/Out		
Lamp/Wiper Access Single Ended	Yes		
Quartz Type	High Purity Fused Quartz Transmittance >95%		
Mounting	Free Standing (Option Horizontal SS316 Stand)		
ULTRAWIPER™ System	(Option Automatic Mechanical With PTFE/Fiber Rings (Electrical))		
Temperature Probe	PT100		
Vent & Drain Ports	1"		
Ingress Protection	IP68		
Installation	Horizontal / Vertical		
Minor Wetted Parts	FDA Approved PTFE, PVDF, VITON		
Reactor Dry Weight	179 kg	181 kg	183 kg
Reactor Volume	356 L	356 L	356 L

CONTROL CABINET			
Cabinet Material	GFRP (Option SS304/SS316)		
Cabinet Sizes ( H x W x D )	1000 x 1000 x 320 mm	1000 x 1250 x 320 mm	1000 x 1250 x 320 mm
Cable Length	4 Meters (Max. 30 Meters)		
Installation & Ambient	Wallmount 0-40 °C Non-Condensing		
Ingress Protection	IP54 (Option IP65/NEMA4X)		
Thermal Control	Fan with Filter (Option AC / Heat Exchanger)		
Control Logic	PLC		
Interface/HMI	STD.: 4" ULTRATOUCH™ / ADV.: 7" ULTRATOUCH™		
External Wiring	Remote ON/OFF, Safety ON/OFF, System Status, Alarm		
Power Consumption	6,0 kW	6,8 kW	7,5 kW
Power Supply	3x 400VAC +/- 10% N+PE 50/60Hz		
Cabinet Weight	87 kg	101 kg	104 kg

ADV. CONTROLLER FEATURES	
SCADA Communication	MODBUS TCP/IP / PROFINET (Option I-Device)
Analogue 4-20mA I/O	Flow Input/UV Dose Output/UV Intensity Output (Option UVT Input)
ULTRADOSE™	Automatic UV Dose Pacing 50-100%
Log	Alarm, Event & Data (UV Dose, UV Intensity & Flow)
UV Dose	Actual UV Dose & Target UV Dose on HMI
UV Dose Alarm	Pre-Alarm & Alarm

## CONTROL CABINET VARIANTS

### ONE LAMP STANDARD



### ONE LAMP ADVANCED



### MULTI LAMP



### MULTI LAMP



## COMPANY HISTORY

**ULTRAAQUA IS AN INTERNATIONAL MANUFACTURER OF ADVANCED UV WATER DISINFECTION SYSTEMS FOR A WIDE RANGE OF WATER TREATMENT APPLICATIONS.**

The company was founded in 1996 by two Danish scientists, with the mission of solving the increasing global water safety challenges, by combining extensive research, innovation, and technology. Today, more than 10.000 UV disinfection systems has been supplied worldwide, to help create a more sustainable world.

ULTRAAQUA operates through a carefully selected partner network, with activity in more than 120 countries, making it possible to deliver cutting-edge UV disinfection systems across the globe.

Continuous research and innovation activities have made it possible to maintain the position of delivering cutting-edge solutions to clients with diverse requirements in different applications.

Global experience combined with advanced knowledge of dealing with varying customer requirements, ensures an optimal solution to accommodate every client. Combined with a dedicated support experience, a streamlined operational process is guaranteed.



## VALIDATION OVERVIEW



The **NIPH (Norwegian Institute of Public Health) type approval** ensures that all UV disinfection units meets the requirements for UV dosage.



The **DVGW certification** assures that critical technical requirements are met regarding hygiene, safety, and general functionality.



The **AMS (Analog Mixed Signal) verification** ensures that the electronic components are compliant with the latest industry-standard.



The **ETV-EU verification** is a third-party validation of new innovative environmental technologies, ensuring product credibility for the buyer.

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