WAFER™

Presentation – December 2019

TRANSFORMING WATER. ENRICHING LIFE.

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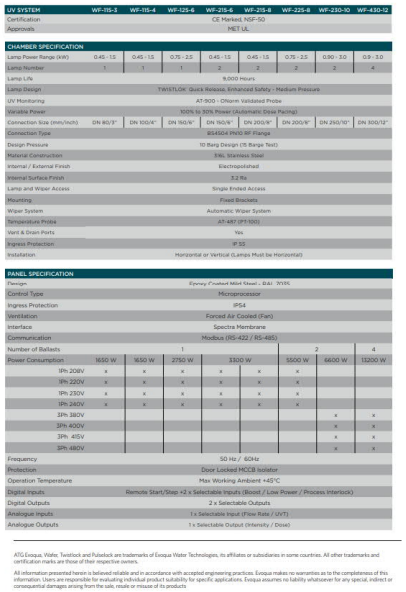
The Wafer

The Wafer is a radical new UV disinfection product cr



UV SYSTEM	WF-115-3	WF-115-4	WF-125-6	WF-215-6	WF-215-8	WF-225-8	WF-230-10	WF-430-12
Certification	CE Marked, NSF-50							
Approvals	MET UL							
CHAMBER SPECIFICATION								
Lamp Power Range (kW)	0.45 - 1.5	0.45 - 1.5	0.75 - 2.5	0.45 - 1.5	0.45 - 1.5	0.75 - 2.5	0.90 - 3.0	0.9 - 3.0
Lamp Number	1	1	1	2	2	2	2	4
Lamp Life	9,000 Hours							
Lamp Design	TWISTLOK Quick Release, Enhanced Safety - Medium Pressure							
UV Monitoring	AT-900 - Ohkam Validated Probe							
Variable Power	100% to 30% Power (Automatic Dose Pacing)							
Connection Size (mm/inch)	DN 80/3"	DN 100/4"	DN 150/6"	DN 150/6"	DN 200/8"	DN 200/8"	DN 250/10"	DN 300/12"
Connection Type	BS4504 PN10 RF Flange							
Design Pressure	10 Barg Design (15 Barge Test)							
Material Construction	316L Stainless Steel							
Internal / External Finish	Electropolished							
Internal Surface Finish	3.2 Ra							
Lamp and Wiper Access	Single Ended Access							
Mounting	Fixed Brackets							
Wiper System	Automatic Wiper System							
Temperature Probe	AT-487 (PT-100)							
Vent & Drain Ports	Yes							
Ingress Protection	IP 30							
Installation	Horizontal or Vertical (Lamps Must be Horizontal)							
PANEL SPECIFICATION								
Designs	Epoxy Coated Mild Steel - RAL 7035							
Control Type	Microprocessor							
Ingress Protection	IP54							
Ventilation	Forced Air Cooled (Fan)							
Interface	Spectra Membrane							
Communication	Modbus (RS-422 / RS-485)							
Number of Ballasts	1					2		4
Power Consumption	1650 W	1650 W	2750 W	3300 W		5500 W	6600 W	13200 W
1Ph 208V	x	x	x	x	x	x		
1Ph 220V	x	x	x	x	x	x		
1Ph 230V	x	x	x	x	x	x		
1Ph 240V	x	x	x	x	x	x		
3Ph 380V							x	x
3Ph 400V							x	x
3Ph 415V							x	x
3Ph 480V							x	x
Frequency	50 Hz / 60Hz							
Protection	Door Locked MCCB Isolator							
Operation Temperature	Max Working Ambient +45°C							
Digital Inputs	Remote Start/Step +2 x Selectable Inputs (Boost / Low Power / Process Interlock)							
Digital Outputs	2 x Selectable Outputs							
Analogue Inputs	1 x Selectable Input (Flow Rate / UVT)							
Analogue Outputs	1 x Selectable Output (Intensity / Dose)							

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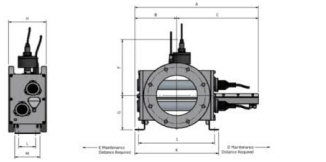
ATG EVOQUA DISINFECTION SYSTEM TECHNICAL DATA SHEET

WF WAFER™ 1-4 LAMP MEDIUM PRESSURE UV SYSTEMS

KEY FOOTPRINT DIMENSIONS



UV SYSTEM	WF-115-3	WF115-4	WF-125-6	WF-215-6	WF-215-8	WF-225-8	WF-230-10	WF-430-12
Chamber Dimensions								
A (mm)	520	520	635	635	635	635	795	795
B (mm)	158	158	215	215	215	215	305	305
C (mm)	362	362	420	420	420	420	490	490
D (mm)	370	370	485	485	485	485	625	625
E (mm)	250	250	250	250	250	250	250	250
F (mm)	232	232	292	292	292	292	321	346
G (mm)	122	122	180	180	180	180	233	258
H (mm)	160	160	180	180	180	180	190	190
J (mm)	275	275	390	390	390	390	560	560
K (mm)	315	315	430	430	430	430	610	610
L (mm)	80	80	80	80	80	80	140	140
M (mm)	120	120	120	120	120	120	180	180
Dry Weight (kg)	27	26	57	58	53	53	78	88
Wet Weight (kg)	30	28	67	68	64	64	99	112
CONTROL PANEL								
Width (mm)	500	500	600	600	600	600	600	600
Height (mm)	500	500	900	800	800	900	800	1200
Depth (mm)	250	250	300	300	300	300	300	300
Weight (kg)	30	30	50	50	50	55	55	<75
Standard Cable (m)	10							
Max Cable Length* (m)	28	28	28	14	14	28	28	28

*It may be possible to extend the cable length beyond the figures given, if this is required please contact us for details

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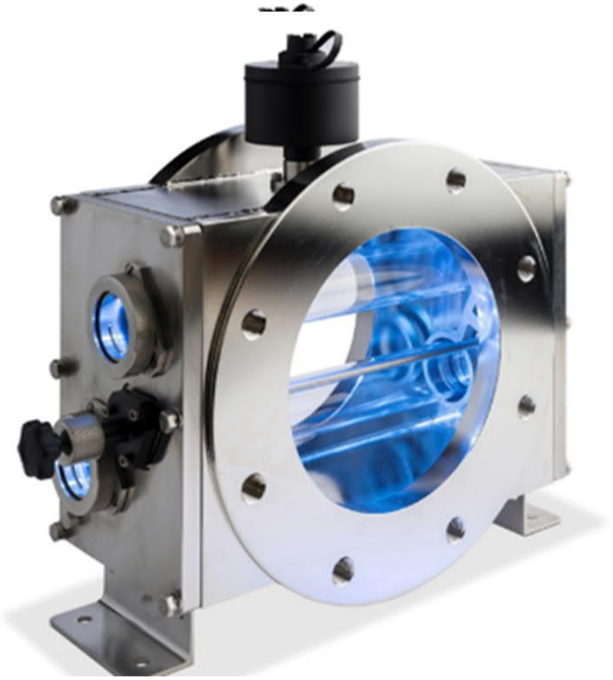
WF-115-4
WF-125-6
WF-215-6
WF-215-8
WF-225-8
WF-230-10
WF-430-12



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UV Treatment – Customer Value Proposition - Aquatics

WAFER UV	
Reduces combined chlorine	Using a WF UV unit will reduce the combined chlorine levels in the water. This has a significant benefit to air quality, improving bather experience and reducing damage to building structures due to the corrosive nature of chloramines
A barrier to chlorine resistant pathogens such as Cryptosporidium	A properly sized UV unit can reduce chlorine resistant pathogens by >99.9% per each pass through the UV reactor. This will reduce the infectivity risk for any Crypto related events.
Clearer water	The use of a correctly sized UV will improve the clarity of the pool water by helping reduce the overall organic load.

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UV Treatment – Customer Value Proposition

WAFER UV	
Safer and simpler maintenance	Twistlok plug and play connectors ensure safe connection and disconnection of UV Lamps for maintenance and service personnel.
Compact	The UV reactor has the smallest installed length on the market ensuring it can be installed in tight spaces giving far more flexibility in design and opening up greater possibilities of applying UV in cramped spaces such as Filter galleries
Efficient	The new CFD design has created a more efficient system. These efficiencies apply to all markets, Aquatics, Industrial and Municipal. With variable power the improved efficiency can reduce power consumption.

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Features and Benefits

FEATURES	BENEFITS	
Optimised hydraulic design	✓	Efficient operation.
Smaller installed footprint	✓	Provides flexibility of installation to meet customer needs
Vertical or horizontal installation	✓	Flexibility for installers
Smaller lighter control systems	✓	Easier to locate and install
More flexible power band (30% - 70%)	✓	Potential power savings by utilising dose pacing
Twistlok connection plug and play and seals interface	✓	Safer for operators, simpler and more reliable maintenance.
Pulselok automatic wiper	✓	Simple to commission, repeatable and accurate.
Validated and NSF-50 listed	✓	Third party approvals to provide product confidence
Spectra 3 Controller	✓	Data logging, remote web monitoring. High quality engineered control systems.

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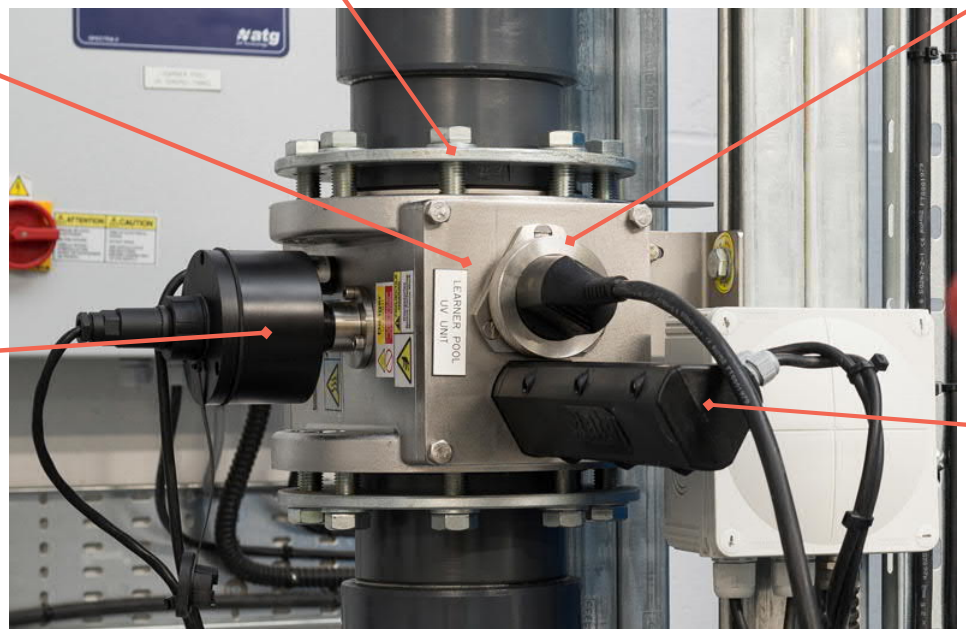
A look at the Wafer Product

Short compact unit for easier installation, vertically or horizontal

Twistlok plug and play with mechanical interlock and improved quartz seal compression - safer, improved reliability and faster maintenance

Maintenance Access from one end



Third party validated UV including validated probes

Pulse lock wiper removes need for limit switches, smaller and easier to maintain, high reliability and simple calibration

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AQUACULTURE AND NVI APPROVAL – LARGE WF UNITS

NVI = Norwegian Veterinary Institute

- The NVI operate a program of certification for UV units for Aquaculture applications
- Important USP for the Aquaculture market
- Based on testing one product and confirming the rest of a coherent product range by CFD
- The Wafer range of products are all approved to NVI

TYPE-APPROVAL UV-PLANT TYPE OF ATG FOR TREATMENT OF INGESTION WATER AND TRANSPORT WATER TO AQUACULTURE-RELATED ACTIVITIES

The Ministry of Agriculture has, pursuant to the Act on Food Production and Food Safety (Food Act) S 33, adopted regulation on disinfection of intake water to and wastewater from aquaculture-related activities (water treatment regulations).

Based on the Water Treatment Regulations, with this ATG UV Technology, the Veterinary Institute provides type approval for UV plants type WF 115-3, 115-4, 125-6, 215-6, 215-8, 225-6, 225-8, 230 - 10, 430-12, 850-20, 640-16, 1060-24 and 1280-32 for treatment of intake water and transport water for aquaculture related activities, applicable for 5 years from the date of this document.

No later than 6 months before the expiry of this approval period, the approval body must have considered operating records and control data as described under operating requirements, points 4 and 5, as a basis for renewal of the approval.

The plants are based on the following principle: All water is pre-filtered through filter / sieve with pore size 300 µm. For transport water, typically 150 µm is used. Water quality and particle content should be crucial for selecting the pre-filter's pore opening.

After filtration, the water is passed to the irradiation chamber, where it is irradiated with a UV dose exceeding 25 mWs / cm 2 calculated in that flow line of the UV chamber having the lowest dose (minimum dose). The irradiation chambers are equipped with UV sensor type AT-463 for continuous measurement of UV intensity. The facilities' safety and alarm functions are controlled by the ATG Spectra II control system. The capacity of the plants as a function of transmission is stated in Appendix 1. The capacity is calculated based on reduced UVC effect after 9000 operating hours, and dose requirements of 25 mWs / cm2 (minimum dose).

The water treatment plant must have at least the following safety features:
1. All water must be pre-filtered through filter / sieve with pore opening 300 µm before further treatment through UV plant. The minimum requirement is filter with pore size 300 µm. For transport water, typically 150 µm is used. Water quality particle content should be crucial for the choice of pore opening.

2. An automatic fuse device shall be fitted which ensures that the maximum water flow does not exceed the maximum capacity of the plant at a given transmission (see Table 1). Such a safety device may be a pump with a given maximum capacity, or a water meter connected to a valve. Maximum capacity as a function of transmission is calculated by dose requirement of 25 mWs / cm2 (minimum dose). The capacity determination has considered the reduced UV-C effect from the lamps at the end of life and reduced intensity through quartz glass.

3. UV sensors type AT-463 shall be installed for continuous measurement of UV intensity. Along with signal from flow meter (possibly fixed set maximum water flow), and value for UV transmission, signal from the UV sensor must ensure that the water is irradiated with a UV dose of at least 25 mWs / cm 2 (minimum dose).

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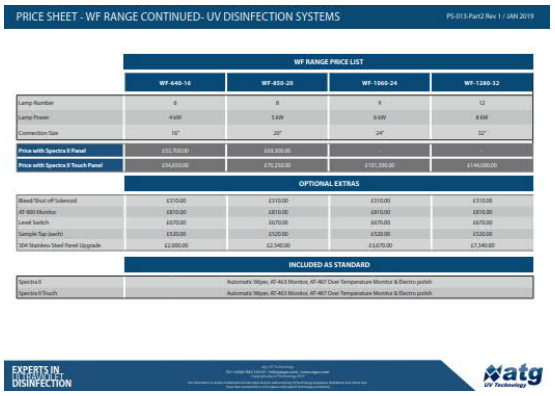
AQUACULTURE AND NVI APPROVAL – LARGE WF UNITS

The Wafer range of products are all approved to NVI

This includes the existing Aquatics products plus four larger products

- WF-640-16
- WF-850-20
- WF-1060-24
- WF-1280-32


PRICE SHEET - WF RANGE CONTINUED- UV DISINFECTION SYSTEMS

PS-013-Part2 Rev 1 / JAN 2019

WF RANGE PRICE LIST

	WF-640-16	WF-850-20	WF-1060-24	WF-1280-32
Lamp Number	6	8	9	12
Lamp Power	4 kW	5 kW	6 kW	8 kW
Connection Size	10"	20"	24"	32"
Price with Spectra II Panel	£53,700.00	£69,300.00		
Price with Spectra II Touch Panel	£54,650.00	£70,250.00	£101,500.00	£144,000.00

OPTIONAL EXTRAS

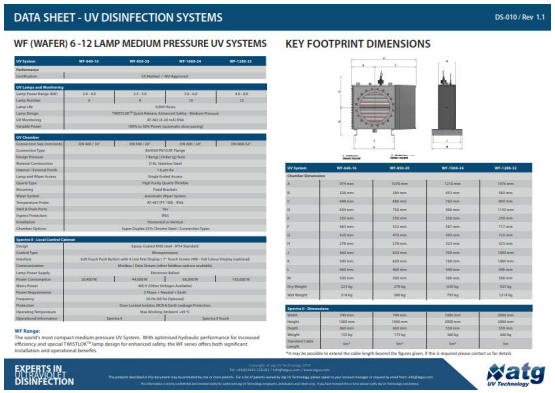
Bleed Shut off Solenoid	£310.00	£310.00	£310.00	£310.00
AT-900 Monitor	£810.00	£810.00	£810.00	£810.00
Level Switch	£670.00	£670.00	£670.00	£670.00
Sample Tap (each)	£520.00	£520.00	£520.00	£520.00
304 Stainless Steel Panel Upgrade	£2,000.00	£2,340.00	£3,670.00	£7,340.00

INCLUDED AS STANDARD

Spectra II	Automatic Wiper, AT-463 Monitor, AT-467 Over Temperature Monitor & Electro polish
Spectra II Touch	Automatic Wiper, AT-463 Monitor, AT-467 Over Temperature Monitor & Electro polish

EXPERTS IN ULTRAVIOLET DISINFECTION

atg UV Technology


DATA SHEET - UV DISINFECTION SYSTEMS

DS-010 / Rev 1.1

WF (WAFER) 6 -12 LAMP MEDIUM PRESSURE UV SYSTEMS

KEY FOOTPRINT DIMENSIONS

EXPERTS IN ULTRAVIOLET DISINFECTION

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