

# AQUARIUS™ UV

## Ballast Water Management Systems



The Hamworthy AQUARIUS™ UV Ballast Water Management System is one of two technology options developed to provide ship owners and operators with a choice of solutions to address the regulatory requirements as defined in the IMO Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004.

### Technical overview

AQUARIUS™ UV is a modular ballast water management system, providing a safe, flexible and economical process for the treatment of ballast water.

Ballast water treatment with the AQUARIUS™ UV system is achieved through a simple and efficient two stage process. Upon uptake the sea water is first passed through a back washing filter (1st Stage). The filtered sea water then passes through a UV chamber (2nd stage) where ultra-violet light is used to disinfect the water prior to entering the ballast tank. Upon discharge, water from the ballast tanks passes through the UV chamber only for a second time.

### Standard Features

- ▶ Broad environmental operating envelope
- ▶ No minimum retention time
- ▶ No active substances
- ▶ Integrated antifouling control system (No CIP)
- ▶ Modular construction for
  - efficient use of space and power
  - easy integration with ship systems
- ▶ Flexible up-scaling
- ▶ Intelligent PLC control ensuring safe, automatic and economical operation

### Operating principle

#### FILTRATION

During uptake ballast water passes through an automatic back washing filter. The filter removes particulates, sediments, zooplankton and phytoplankton over 40 micron. Automatic filter cleaning ensures and maintains filtration efficiency.

#### UV TREATMENT

Filtered ballast water is directed into a disinfection chamber where ultraviolet lamps, set up in cross flow arrangement, deliver UV irradiation to achieve disinfection. Treated ballast water is then directed to the ballast tanks.

Lamps are fitted with an automatic wiper system which prevents bio-fouling and controls the accumulation of deposits on lamp sleeves ensuring maximum performance at all times.

UV light intensity is continuously monitored during system operation to ensure intensity is maintained and the desired dose for maximum treatment efficiency is achieved.

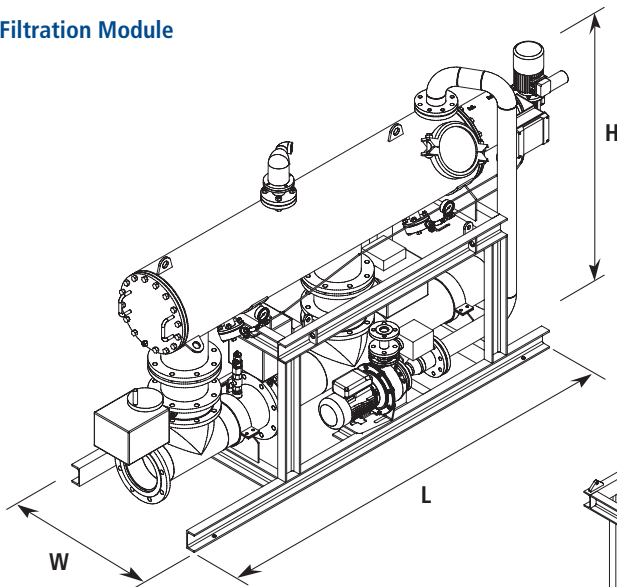
During discharge ballast water is pumped from the ballast tanks back through the UV disinfection chamber for final treatment before being discharged overboard. The filter is bypassed during discharge.

AQUARIUS™ Module	Filtration Module						UV Treatment Module						UV Power Panel				
	Capacity (m³/hr)	Dimensions (m)			Dry Weight (kg)	Flange Size (PN10)	Capacity (m³/hr)	Dimensions (m)			Dry Weight (kg)	Installed/ Standby Power Installed (kW)	Flange Size (PN10)	Dimensions (m)			Weight (kg)
		L	W	H				L	W	H				L	W	H	
AQ-50-UV	0 - 50	2.00	0.75	1.25	460	80	0 - 50	1.80	1.00	0.70	250	14 / 0.3	150	1.20	0.40	1.20	200
AQ-80-UV	50 - 80	2.40	0.75	1.45	630	100	50 - 80	1.80	1.00	0.70	250	14 / 0.3	150	1.20	0.40	1.20	200
AQ-125-UV	80 - 125	2.40	0.80	1.55	760	150	80 - 125	1.80	1.00	0.70	250	14 / 0.3	150	1.20	0.40	1.20	200
AQ-180-UV	125 - 180	2.40	0.80	1.70	860	150	125 - 250	2.40	1.10	0.70	450	27 / 0.3	200	1.20	0.40	1.70	350
AQ-250-UV	180 - 250	2.40	0.80	1.60	1050	200	125 - 250	2.40	1.10	0.70	450	27 / 0.3	200	1.20	0.40	1.70	350
AQ-300-UV	250 - 300	2.40	0.80	1.60	1050	200	250 - 300	2.80	1.10	0.80	550	33 / 0.3	200	1.20	0.40	1.70	350
AQ-375-UV	300 - 375	2.70	1.10	2.00	1400	250	300 - 375	2.80	1.10	0.80	550	40 / 0.3	250	1.20	0.40	1.90	450
AQ-430-UV	375 - 430	2.70	1.10	2.00	1400	250	375 - 430	2.80	1.10	0.80	550	46 / 0.3	250	1.20	0.40	1.90	450
AQ-500-UV	430 - 500	3.00	0.90	2.00	1640	300	430 - 500	2.80	1.10	0.80	550	53 / 0.3	300	1.20	0.40	1.90	450
AQ-550-UV*	500 - 550	3.00	0.90	2.00	1640	300	500 - 750	2.80	1.30	1.00	800	58 / 0.3	350	1.20	0.40	1.90	750
AQ-750-UV*	550 - 750	3.55	1.30	2.30	2300	350	500 - 750	2.80	1.30	1.00	800	58 / 0.3	350	1.20	0.40	1.90	750
AQ-1000-UV*	850 - 1000	3.80	1.30	2.30	2500	350	750 - 1000	2.80	1.30	1.00	800	76 / 0.3	350	1.20	0.40	1.90	750

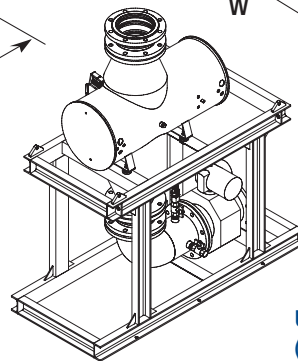
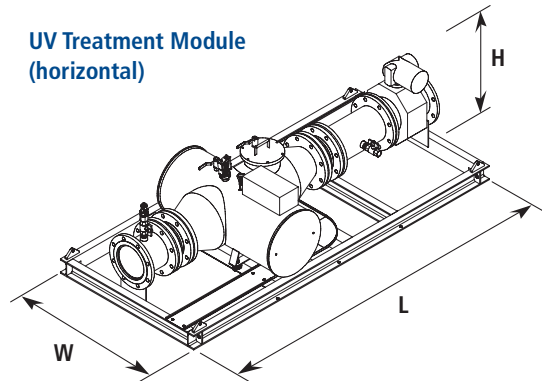
Capacities to 6000m³/hr achieved through a number of modular combinations.

\*Two UV power panels are supplied per system.

**Filtration Module**



**UV Treatment Module (horizontal)**



**UV Treatment Module (vertical)**

**Pressure Drop**

Normal Operation: 0.3 barg  
Backwash Set Point: 0.8 barg

**Control Panel**

Wall Mounted 1000mm Wide x 760mm High x 210mm Deep

**Materials**

Supporting Framework: Mild Steel  
UV Chamber: 316 Stainless Steel  
Filter: Epoxy Coated Mild Steel / Duplex 904L Screen  
Module Pipework: Galvanised Steel  
Consumables: None

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