



UV... PURE AND SIMPLE

AF3 Series

ULTRAVIOLET DISINFECTION

ULTRAVIOLET (UV) TECHNOLOGY IS RECOGNISED AS AN EFFECTIVE CHEMICAL FREE WAY OF DISINFECTING WATER. ACCURATE, RELIABLE, CONTROLLED DELIVERY OF UV IS CRITICAL TO DISINFECTION PERFORMANCE. HANOVIA, ONE OF THE WORLD'S PREMIER SUPPLIERS OF UV DISINFECTION TECHNOLOGY, HAS DESIGNED THE AF3 SERIES SPECIFICALLY TO MEET THAT CHALLENGE.

By specifically focussing on particle kinetics, fluid dynamics and radiation distribution of the UV reactor, our engineers have taken a design pioneered by Hanovia in municipal drinking water systems and produced a product that delivers a precise, controlled, UV dose offering disinfection capacities from 1 to 50 m³/h.

Delivering an optimal combination of low power, low hydraulic

pressure drop and a high micro-organism kill rate, the AF3 Series can be installed either horizontally or vertically, offering the ultimate in installation flexibility, whilst delivering the performance you need to ensure your water is safe.

Hanovia has been a pioneer in designing and manufacturing high quality UV lamps and products for over 80 years. The innovative AF3 is a continuation of this tradition.



Hanovia
WORLD CLASS UV

AF3 Series

ULTRAVIOLET DISINFECTION SYSTEM

THE AF3 SERIES TREATMENT CHAMBER

Designed using Hanovia's proven CFD modelling tools, the AF3 series is one of the most efficient UV reactors available today. This innovative design concept, pioneered and proven by Hanovia in validated large scale drinking water systems, has now been optimised for industrial and pharmaceutical process water applications.

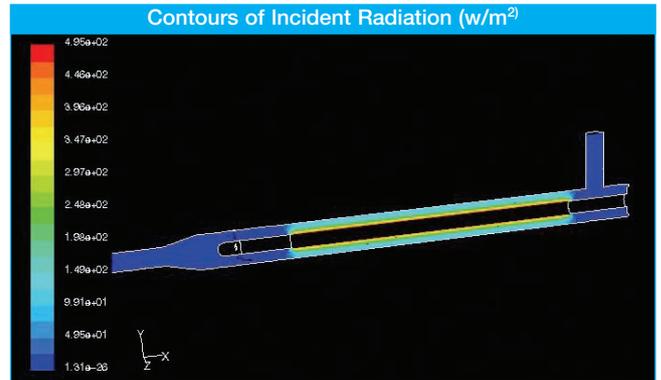
Coupling this novel reactor design with Hanovia's efficient amalgam lamp technology, the AF3 Series uses fewer lamps to generate a given UV disinfection performance compared to conventional Low Pressure technology, with significantly reduced service costs.

Whilst specified against Average Dose performance, the AF3 Series is optimised for the delivery of drinking water disinfection doses (RED*). The germicidal performance of the AF3 series is unparalleled and satisfies international regulatory requirements. Capacity data for drinking water and AOP applications such as TOC, Ozone and Chlorine reduction is available on request from Hanovia.

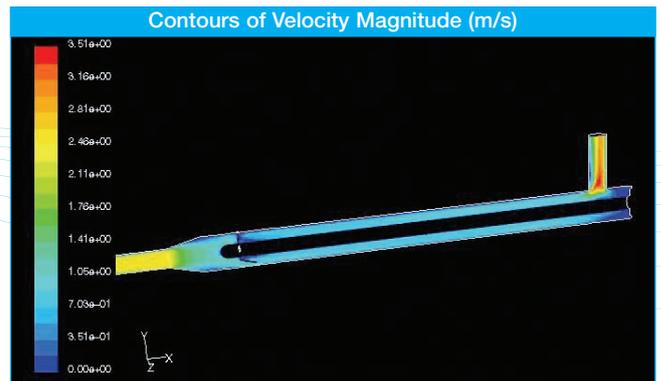
The AF3 treatment chamber is built in our world-class manufacturing facility from high quality passivated and electro-polished 316L stainless steel. Rigorously tested before it leaves our factory, the AF3 series is designed to provide many years of reliable water treatment, with the only maintenance requirements being occasional changes of UV lamps, seals and sleeves.

A version built to cGMP requirements is available for pharmaceutical and sanitary applications. Constructed using highly polished stainless steel and FDA approved seals, all welds are full penetration and 'bug-trap' free. Tri-clamp connections also make it simple to disassemble and verify cleanliness.

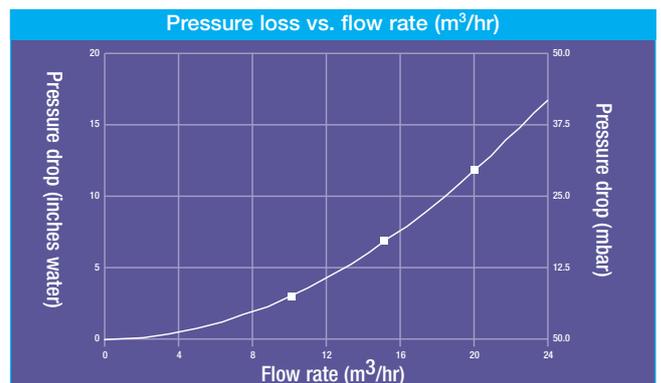
*Reduction Equivalent Dose, also known as REF, Reduction Equivalent Fluence.



Typical incident intensity plot - optimised for delivery of RED



Typical velocity magnitude plot - enhanced hydraulic performance



Pressure drop curve for AF3-0014 - others available on request



The AF3 disinfection chamber is available in standard or GMP version.

UV... PURE AND SIMPLE

ELECTRON CONTROLLER

To ensure the AF3 series integrates simply and effectively with a variety of installation requirements, there are three levels of control (B, RC or RCM). All provide outputs that can be linked to building management or SCADA systems.

The IP65 steel enclosure can be installed up to 5m from the UV reactor. Combining a microprocessor based control system (RC, RCM) with an "intelligent" electronic ballast, the Electron controller offers a user-friendly man machine interface (MMI). Safe and reliable operation is assured with a combination of controls, alarms and clear indicators.

The key features of the Electron controller include:

- Easy-to-read, real time, alpha numeric display
- Display includes lamp run time, alarms, % intensity and cycle count
- Durable and easy to use keypad
- Wall mountable
- Low UV alarm contact
- Remote monitoring and control facilities
- Optional UV intensity monitor
- Optional 4-20mA signal for remote intensity monitoring
- Optional solenoid valve signal

UV DISINFECTION LAMPS

Except for the smallest unit in the range, all AF3 Series systems use Hanovia new amalgam technology UV lamps. These lamps are amongst the most power efficient available, achieving up to three times the UV output of standard mercury low pressure lamps. A key feature is their ability to operate at temperatures of up to 40°C (as opposed to 18°C for conventional low pressure lamps), without significant loss of germicidal output and efficiency.

With a typical operating life of up to 16,000h, Hanovia amalgam lamps represent an economical alternative to conventional low pressure lamps.

Modern manufacturing and testing facilities ensure that the replacement lamps we supply are manufactured consistently, with little or no variation between batches. This means that when replacing a lamp you can get the same level of disinfection performance as the day the unit left our factory – year after year.

UV MONITORING

The optional UV sensor (RCM model) enables the monitoring of the UV intensity delivered in the chamber. By constantly monitoring the UV output, the UV monitor offers the extra peace of mind that your water is safe. The UV intensity is displayed on the screen of the electron controller as a percentage of the intensity of a new lamp. The intensity output is also available as a 4-20mA passive output that can be linked to the plant SCADA system.



AF3 Series

DESIGNED FOR DISINFECTION

PRODUCT SPECIFICATIONS

MODEL: AF3 SERIES	AF3-0002	AF3-0003	AF3-0008	AF3-0014	AF3-0027	AF3-0051
Treatment Capacity ¹ (m ³ /h)	1.5	3.3	7.9	13.5	26.5	51.0
Number of lamps	1	1	1	1	1	1
Power (W)	40	80	80	140	270	270
Expected lamp life ² (hours)	9,000	16,000	16,000	16,000	12,000	12,000
UV REACTOR:	AF3-0002	AF3-0003	AF3-0008	AF3-0014	AF3-0027	AF3-0051
Material of construction	316 L Stainless Steel, electropolished and passivated					
Connections	DN25 BSPT /1" NPT	DN25 BSPT /1" NPT	DN40 BSPT /1.5" NPT	DN50 BSPT /2" NPT	DN50 BSPT /2" NPT	DN80 PN16 /JIS/3" ANSI
Operating Pressure	7 Bar					
Maximum fluid temperature ³	40 °C					
Rating	IP65 (NEMA12)					
Dimensions ⁴ (mm) length x dia	1150 x 63	1150 x 63	1388 x 102	1388 x 102	1388 x 102	1437 x 168
GMP VERSION:	AF35-0002	AF35-0003	AF35-0008	AF35-0014	AF35-0027	AF35-0051
Connections	DN25 Tri-clamp	DN25 Tri-clamp	DN40 Tri-clamp	DN50 Tri-clamp	DN50 Tri-clamp	DN80 Tri-clamp
ELECTRON CONTROLLER:	AF3-0002	AF3-0003	AF3-0008	AF3-0014	AF3-0027	AF3-0051
Material of construction	Painted Carbon Steel (optional 304 St. St.)					
Rating	IP65					
Dimensions (mm) h x w x d	400 x 300 x 155 (excluding brackets)					
Supply voltage	115V or 230V, 50/60Hz					
Operating Temperature Range	+5 °C / +40°C					
Maximum cable length (m)	5					

FEATURES:	Indicators			VFC Outputs		Reset Button	Remote Start/ Stop	Options
	Lamp on	Lamp fail	Power on	Lamp on	Low UV			4-20 mA % Intensity
Electron Models:								
B	YES	YES	NO	YES	NO	NO	NO	NO
RC	YES	YES	YES	YES	NO	YES	YES	NO
RCM	YES	YES	YES	YES	YES	YES	YES	YES

¹ 30 mJ/cm² average dose at 98% T10, end of lamp life.

² Consult Hanovia on vertical installations.

³ All models are designed to take up to 120 °C CIP except AF3-0051 (80 °C max).

⁴ Allow chamber length clearance for lamp and sleeve replacement.

Hanovia has a policy of continuous product development. All specifications are subject to change without notice.

Hanovia is an ISO9001 company. All systems supplied go through stringent quality checks and are supplied with all relevant test certificates and documentation.

Additional information required for cGMP/FDA applications can be provided on request.

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