



HF Series



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PREFACE

Contact Information

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About VIQUA – a Trojan Technologies Business

We believe clean water is an invaluable resource. That's why, for more than a quarter of a century, we have led the development of water treatment solutions using environmentally friendly ultraviolet (UV) light. Today, VIQUA has the largest installed base of UV systems in operation on the planet, and many of our innovations define the industry standards for safeguarding our water from the damaging effects of microbial contamination.

From offices and facilities in eight countries, the 800 employees of Trojan Technologies Business are united by an unwavering commitment to deliver advanced water treatment solutions that make water safety a reality worldwide.

VIQUA is an ISO9001:2008 registered company specializing in the design, manufacture and sale of ultraviolet systems for:

- light commercial drinking water
- household drinking water
- point-of-use treatment
- point-of-entry treatment

VIQUA has over 600,000 systems installed worldwide and VIQUA systems can be found in almost every country in the world. Applications of VIQUA systems include rain water harvesting, ground water treatment, disaster relief, humanitarian aid, medical devices and bottled-water refill stations.

Scope

This document highlights the features and specifications of the HF system, ideal for light commercial applications.

1.0 PROJECT & SYSTEM DESCRIPTION

1.1 Project Description

Project Name	Guidelines
Maximum flow rate	see system description below
Operating pressure	15 psi (103 kPa) - 125 psi (861 kPa)
Ambient water temp.	2°C (35.6°F) - 40°C (104°F)
Turbidity	1 NTU max.*
Hardness	120 ppm (7 grains / gallon) max.*
Manganese content	0.05 ppm max.*
Iron content	0.3 ppm max.*
UVT	75% min.*

*after pretreatment

1.2 System Description

Model	SHF-140/SHFM-140	SHF-180/SHFM-180	SHF-290/SHFM-290
Quantity			
Shipping Weight	43.5 kg (96 lb) / 43.7 kg (96.5 lb)	45 kg (99 lb) / 45.1 kg (99.5 lb)	129.7 kg (286.5 lbs) / 130.1 kg (287 lbs)
Flow rate at 95% UVT			
16mJ/cm ²	268 gpm (1014 lpm)	343 gpm (1298 lpm)	543 gpm (2055 lpm)
30mJ/cm ²	143 gpm (540 lpm)	183 gpm (693 lpm)	290 gpm (1098 lpm)
40mJ/cm ²	107 gpm (406 lpm)	137 gpm (519 lpm)	215 gpm (814 lpm)
Chamber			
Material	316L SS	316L SS	316L SS
Dimensions	34" x 6" x 14" (86cm x 15cm x 36cm)	42" x 6" x 14" (107cm x 15cm x 36 cm)	42.5" x 8" x 17" (108cm x 20.3cm x 43.5cm)
Inlet & outlet ports	3" flange slip on 150 lbs	3" flange slip on 150 lbs	4" flange slip on 150 lbs
UL Certified burst pressure	300 psi (2,067 kPa)	300 psi (2,067 kPa)	300 psi (2,067 kPa)
Maximum Rated Operating Pressure	125 psi (862 kPa)	125 psi (kPa)	125 psi (kPa)
Orientation	Horizontal/Vertical	Horizontal/Vertical	Horizontal
Electrical			
Control Panel	17.7" x 21.7" x 8.8" (44.9 x 55 x 22.4 cm)	17.7" x 21.7" x 8.8" (44.9 x 55 x 22.4 cm)	17.7" x 21.7" x 8.8" (44.9 x 55 x 22.4 cm)
Voltage	100 - 240 V AC	100 - 240 V AC	100 - 240 V AC
Frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Max. current	3.5 A (120V); 1.75 A (230V)	4.5 A (120V); 2.3 A (230V)	6 A (120V); 4.5 A (230V)
Max. power consumption	350 Watts	440 Watts	550 Watts
Lamp power	300 Watts	380 Watts	475 Watts

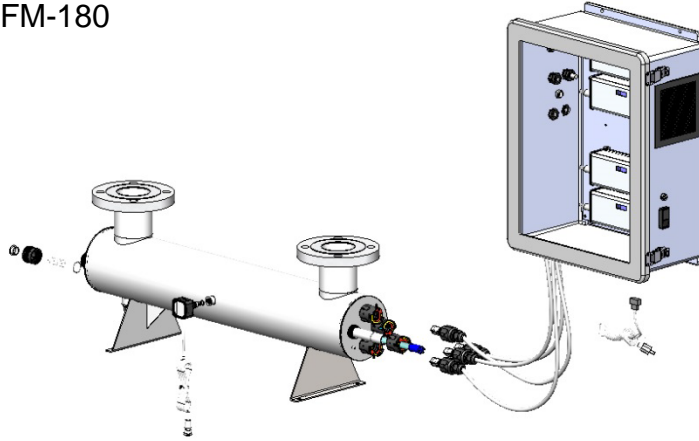
Spare Parts	Quantity	Optional Accessories	Quantity	
Lamps		"Y" cable		
Sleeves		Solenoid conn. cable		
UV sensors				
HF controllers				
HFM				

2.0 PRODUCT DRAWINGS

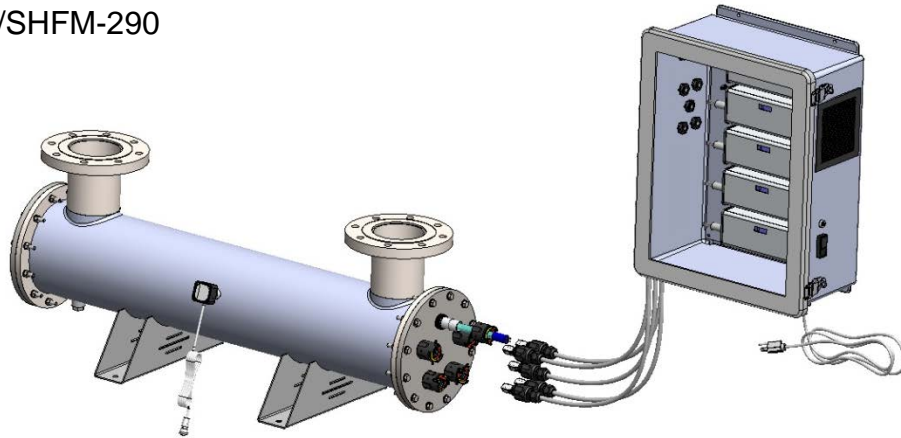
Refer to .pdf and .step files for engineering drawings and part numbers.

2.1 Exploded View

SHF-140/SHFM-140
SHF-180/SHFM-180

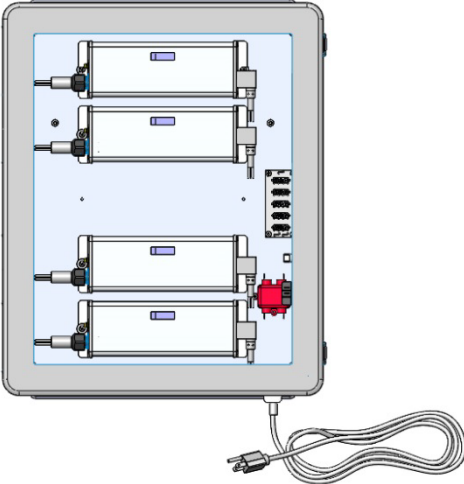


SHF-290/SHFM-290

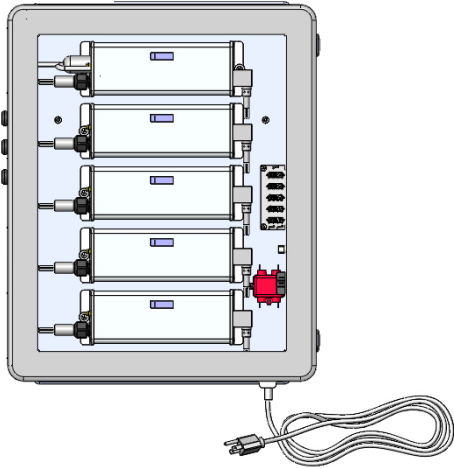


2.2 Panel Front View

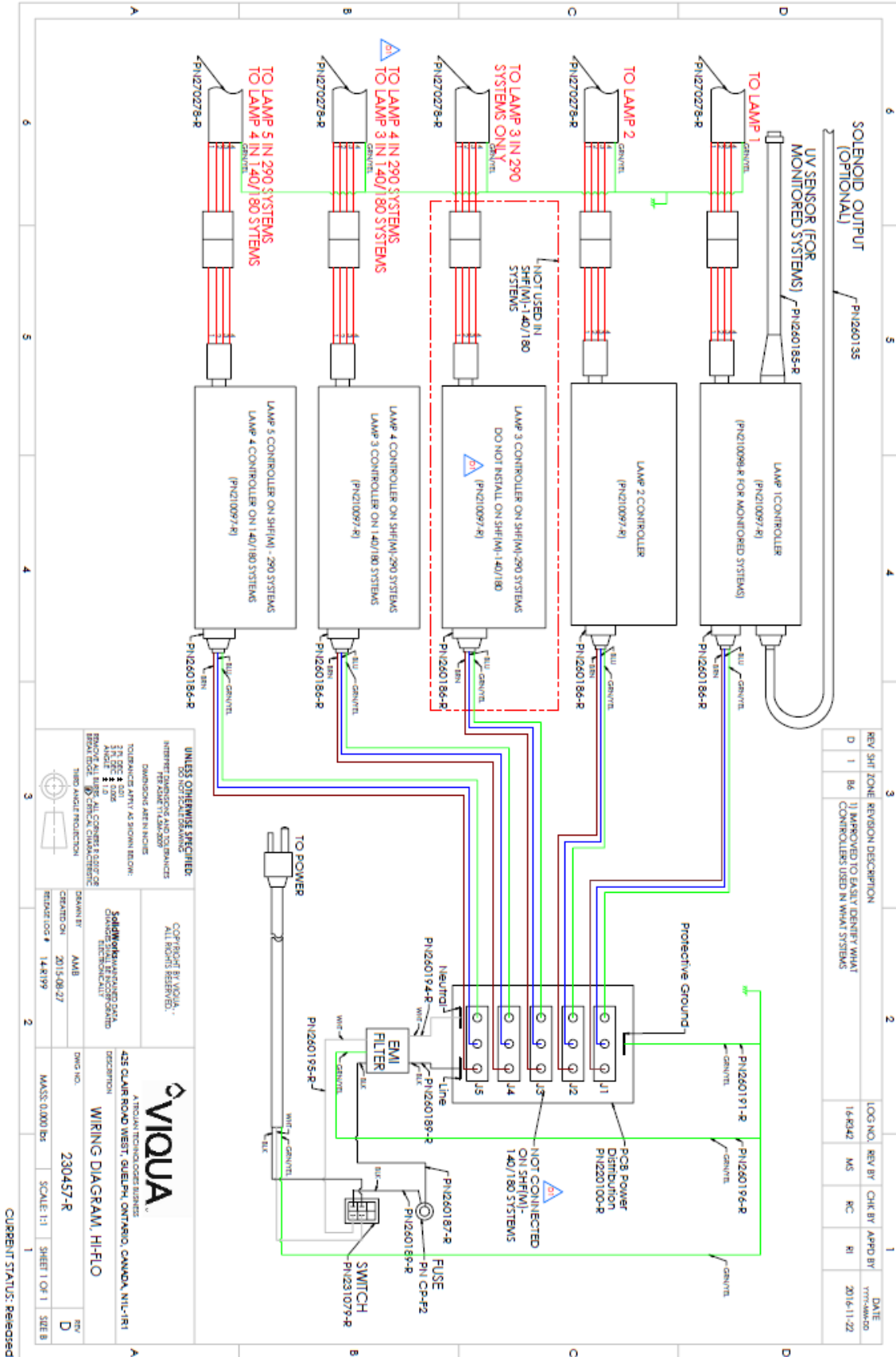
SHF-140/SHFM-140
SHF-180/SHFM-180



SHF-290/SHFM-290



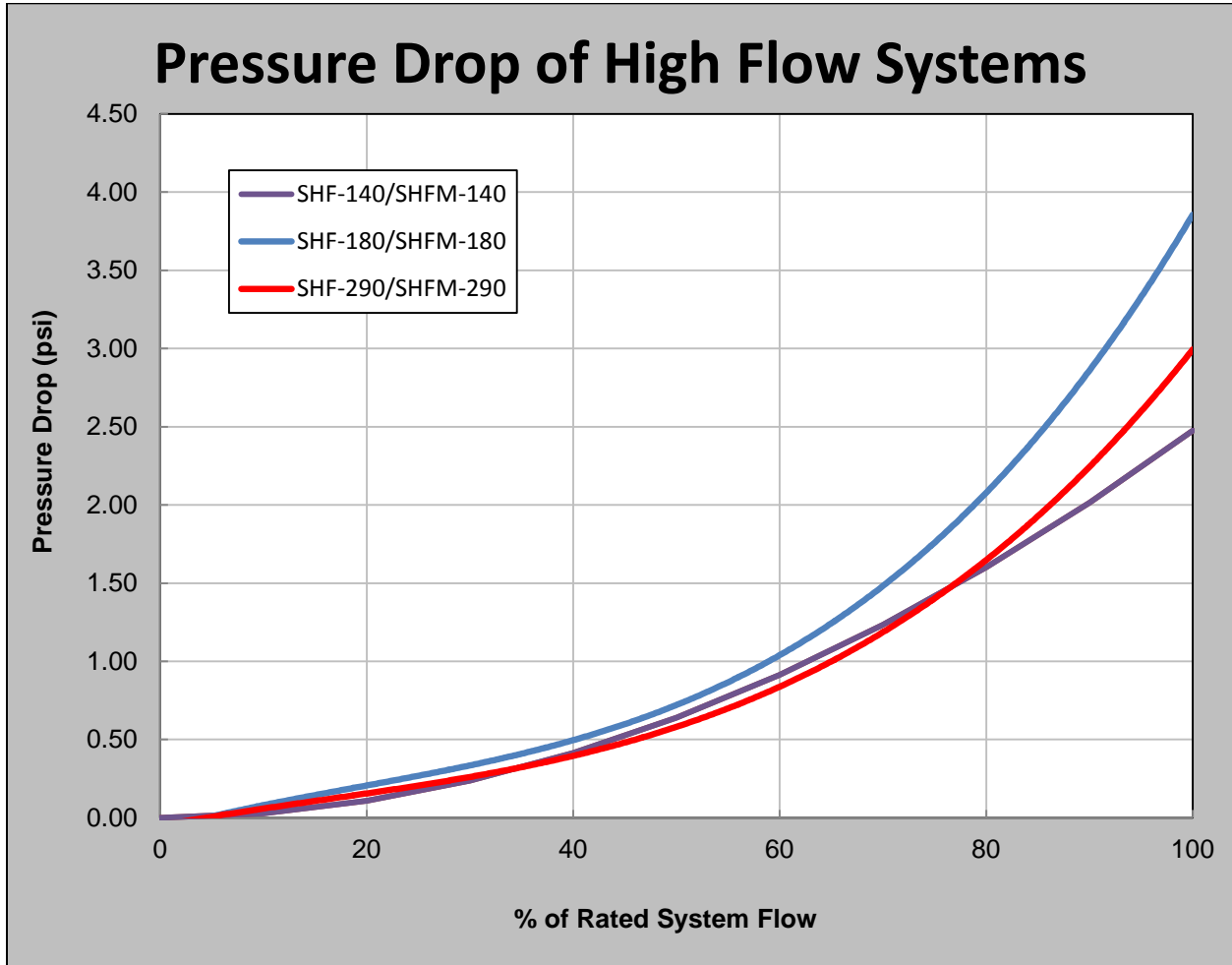
2.3 Wiring Diagram



3.0 SYSTEM OVERVIEW

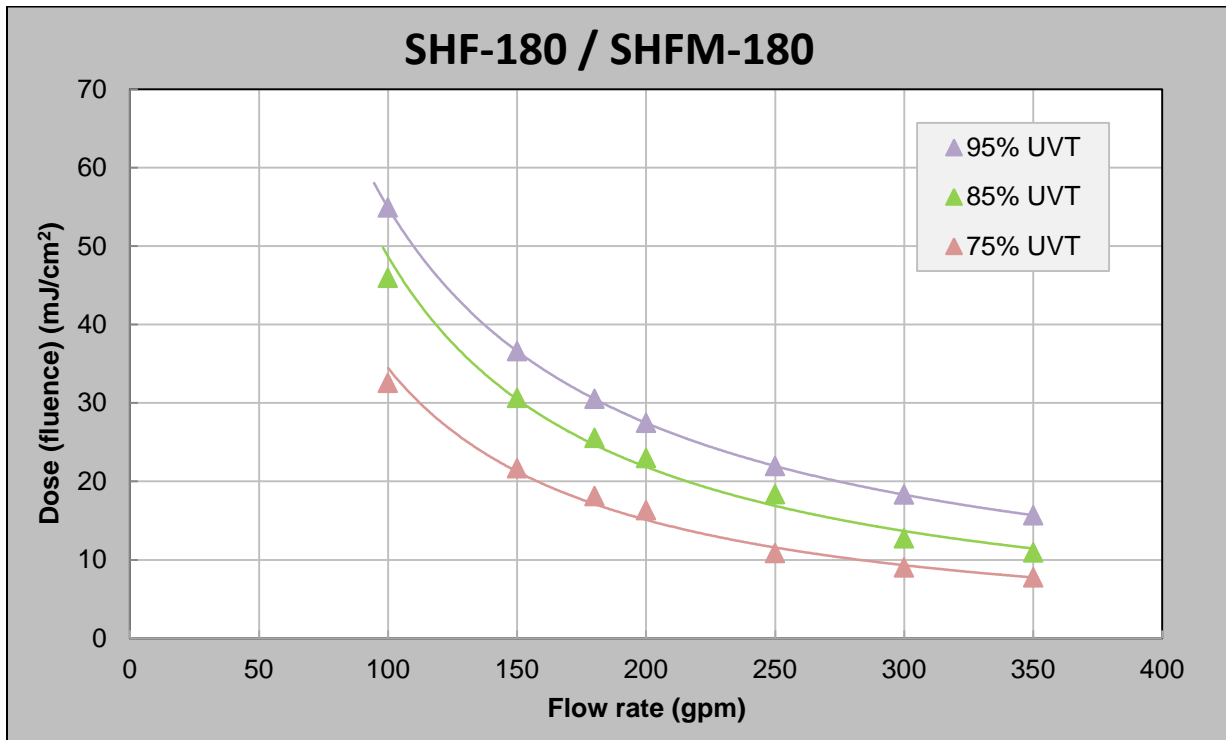
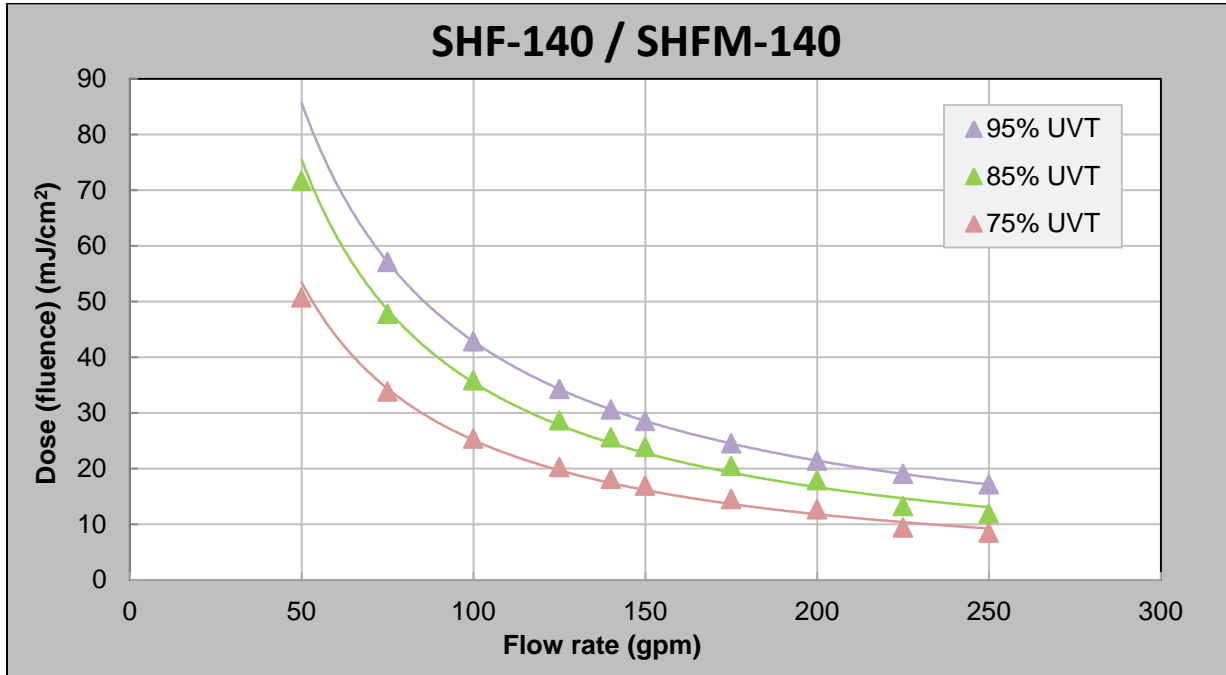
3.1 Pressure Drop

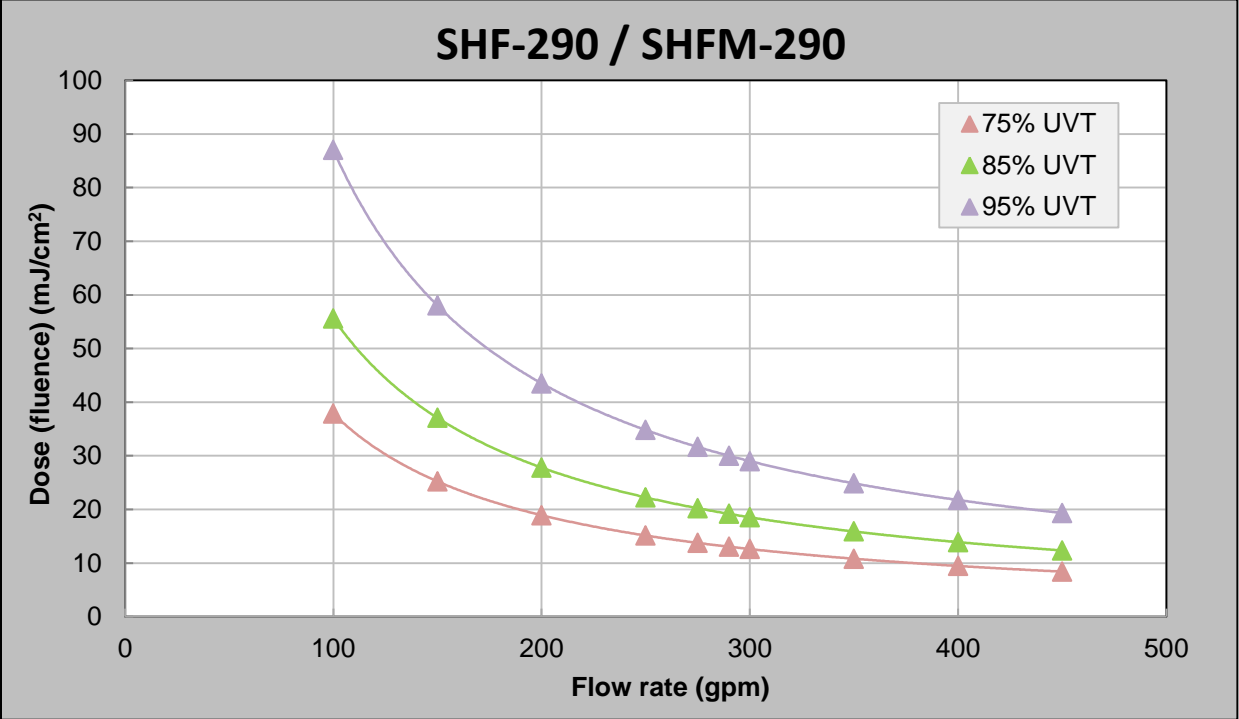
The pressure drop across the system is proportional to the flow through the system. The pressure drop data was generated using calculations.



3.2 Dose Curves

The system size should be selected based on flow rate, UVT, and required UV dose. The dose curves are based on end of lamp life (0.85 EOLL) and 20°C water temperature.

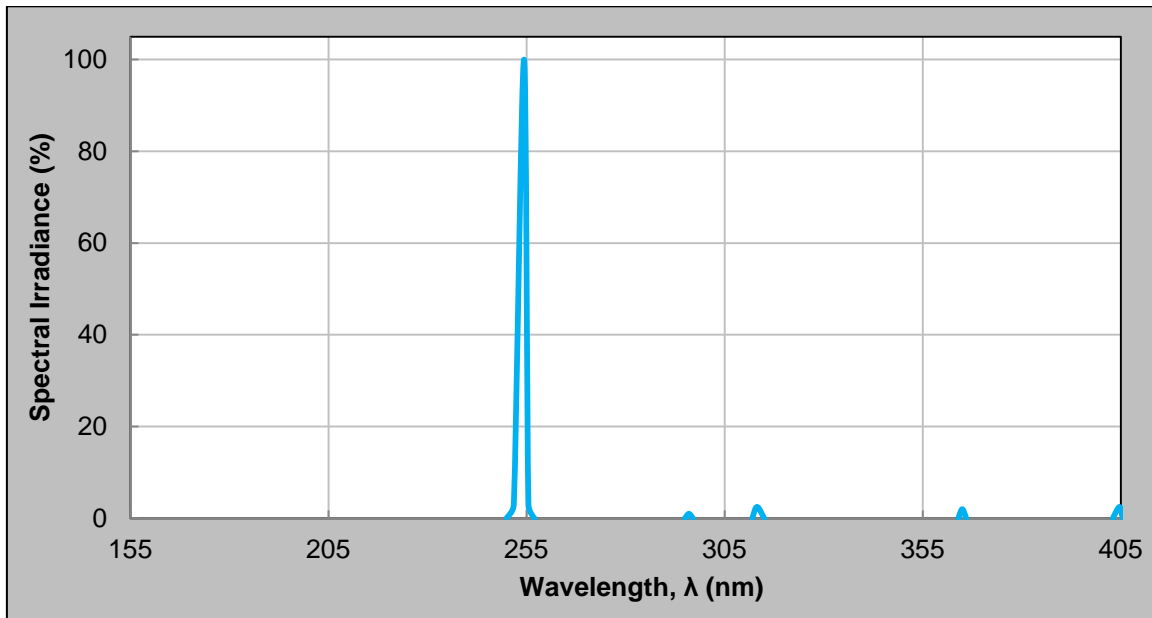




3.3 UV Lamp

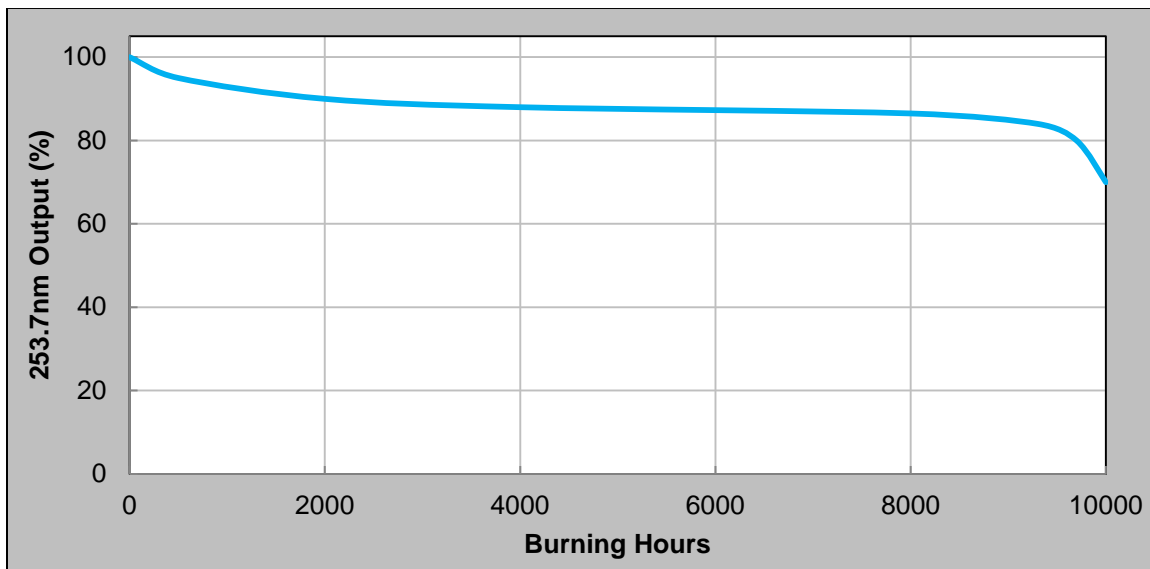
3.3.1 Mercury Discharge Lamp Spectral Output

The lamp produces germicidal ultraviolet light (UV-C) at a wavelength of 253.7 nm. The absence of a peak at 185 nm is significant because it means no harmful ozone will be produced. VIQUA's HF system high-output lamps have a mercury content of less than 15 mg (IMERC registered).



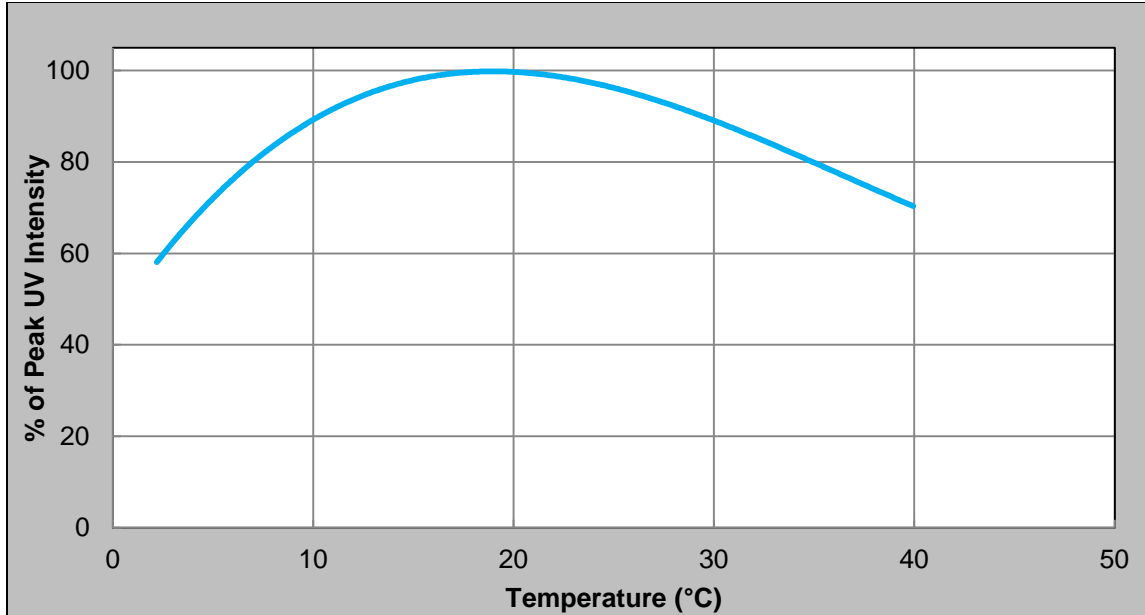
3.3.2 Degradation Chart

High-output lamps have a useful life of approximately 9,000 hours. They can provide adequate disinfection for up to one year and then require replacement.



3.3.3 Temperature Profile

The high-output lamps provide approximately 2 times the power compared to conventional standard output lamps. The UVI performance of the lamps varies across the range of operating temperatures.



3.3.4 Quartz Sleeve

Each of the UV lamps is enclosed by a quartz sleeve made of GE Type 214 or equivalent clear fused silica quartz.

3.4 Maximum Temperature

The maximum temperature of the HF chamber depends on several factors including the chamber size, orientation, plumbing connections, and ambient conditions. A model based on typical operating conditions calculated that the maximum temperature of the SHF-140/SHFM-140 chamber is 56°C, the maximum temperature of the SHF-180/SHFM-180 chamber is 62°C and the maximum temperature of the SHF-290/SHFM-290 IS 58°C.

System	SHF-140/SHFM-140	SHF-180/SHFM-180	SHF-290/SHFM-290
Maximum Operating Temperature	56°C	62°C	58°C

3.5 Product Features

3.4.1 Controller

Each lamp is connected to a controller. Each controller has the following capabilities:

- Counts the number of days remaining until the lamp requires replacement
- Emits an audible and visual alarm to indicate the need to change the lamp
- Tracks the total running time of the controller
- Alarms in the event of a lamp failure (no current running through the lamp)
- Reset end of lamp timer by pressing and holding the push button for 5 seconds while powering up the controller

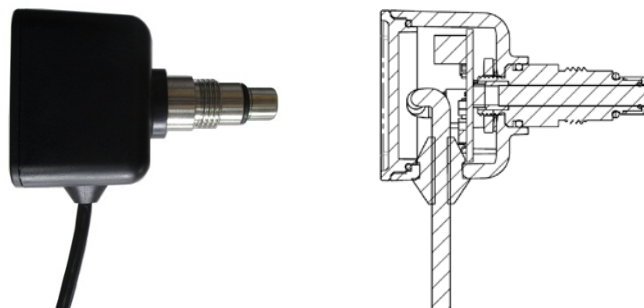
For monitored systems only, the controller will alarm in the following conditions:

- Low UV output
- Over temperature

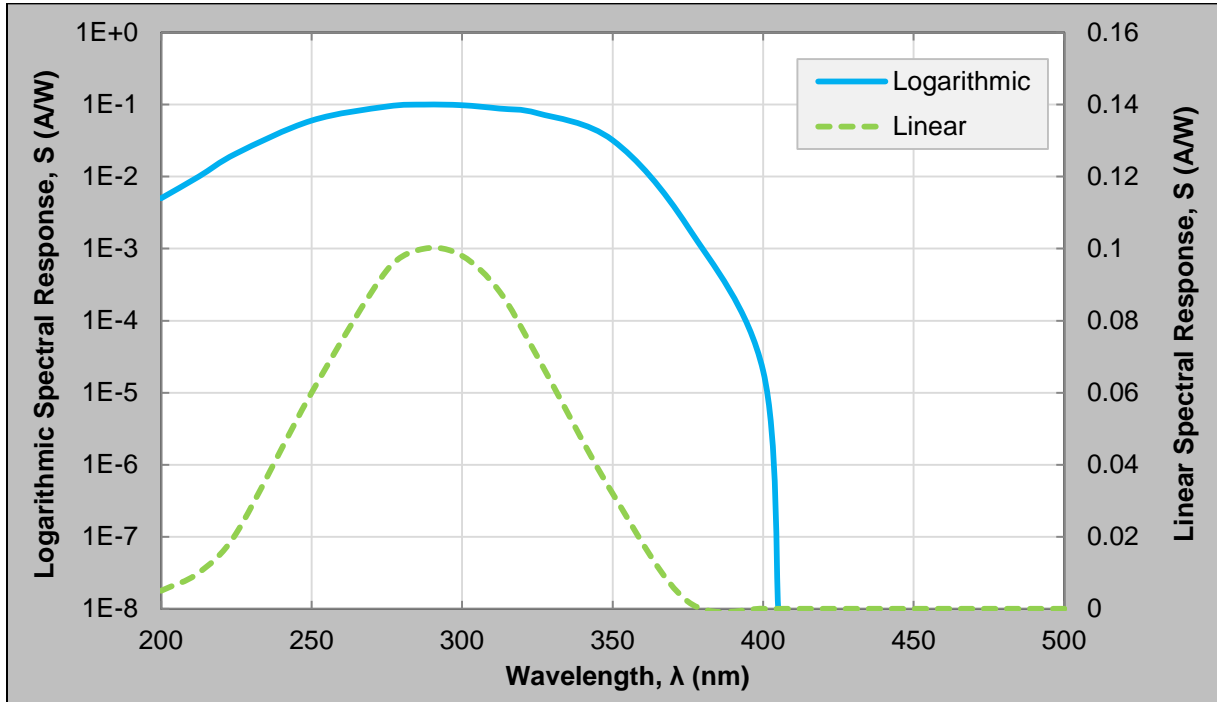


3.4.2 UV Sensor

The HF Monitored series incorporates a UV sensor to detect when the water is no longer being purified properly as a result of change in the water source quality or fouling. The controller displays the UV intensity between 50 to 99 percent and will activate a visual and audible low UV warning if the system drops below 50%.



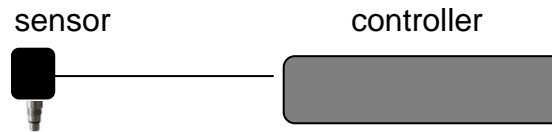
The sensor's photodiode detects the emitted germicidal 253.7 nm wavelength.



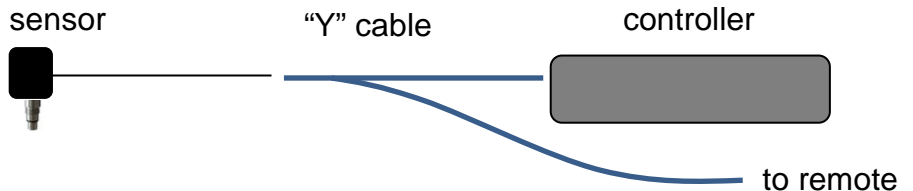
3.4.3 4-20mA Output Remote Capability

An optional “Y” cable is available to transmit the 4-20 mA signal output by the UV sensor to a remote location. The “Y” cable is 65 feet in length.

Typical connection:



Connection with “Y” cable:



3.4.4 Solenoid Output Signal

An optional solenoid connection cable is available to allow the system to be isolated in case of an alarm condition. The solenoid connection cable is 7 feet in length.

4.0 CERTIFICATIONS

All HF systems are tested and certified to UL, CE, RoHS, and Low Lead standards.



5.0 WARRANTY

VIQUA warrants the system components to be free from defects in material and workmanship for the time specified in the table below. During this time, VIQUA will repair or replace, at its option, any defective parts covered by the warranty.

Component	Warranty
UV Chamber	ten (10) years from the date of purchase
Electrical (controller) and Hardware Components	three (3) years from the date of purchase
UV Lamps, Sleeves, and UV Sensors	one (1) year from the date of purchase



VIQUA DECLARATION

VIQUA is a sustainable business that designs and builds industry-leading UV systems. Our products are used worldwide in applications that help improve quality of life.

VIQUA utilizes quality materials and processes to ensure each product meets safety, health and environmental protection requirements. VIQUA's product development process ensures comprehensive product validation and certification.

VIQUA manufactures each UV disinfection system to the highest quality standards. Each system is subjected to rigorous functional testing prior to shipment to guarantee proper operation.

VIQUA is an ISO9001:2008 registered company.

A handwritten signature in black ink, appearing to read "Julian Giggs", written over a horizontal line.

Julian Giggs
Director of Product Development & Engineering
VIQUA

A handwritten signature in blue ink, appearing to read "Frank Profiti", written over a horizontal line.

Frank Profiti
General Manager
VIQUA

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