



Pure, safe water.

*Always:*

GLOBAL LEADER IN UV WATER PURIFICATION

Advanced UV Water Purification Systems  
for Potable, Reuse and Rainwater Applications  
Up to 1MGD (3785 m<sup>3</sup>/day)



UPSTREAM<sup>®</sup>  
powered by 

# UPSTREAM® FOR POTABLE, REUSE AND RAINWATER APPLICATIONS - 10 GPM TO 1 MGD

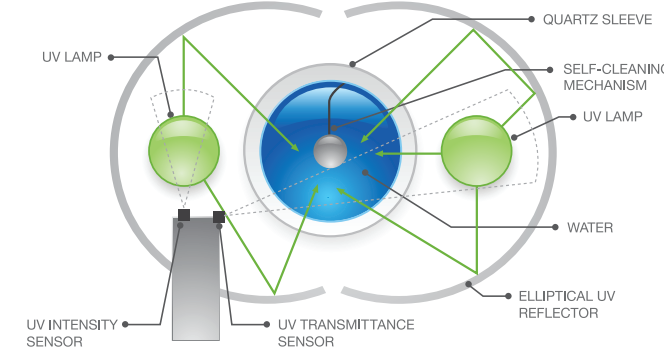


<b>NC 10-75</b> 10 USGPM (37.9 L/min) (2.27 m³/h) 40 mJ/cm² Dose @ 75% UVT	<b>NC 10-50</b> 10 USGPM (37.9 L/min) (2.27 m³/h) 40 mJ/cm² Dose @ 50% UVT	<b>NC 15-75</b> 15 USGPM (56.8 L/min) (3.41 m³/h) 40 mJ/cm² Dose @ 75% UVT	<b>NC 15-50</b> 15 USGPM (56.8 L/min) (3.41 m³/h) 40 mJ/cm² Dose @ 50% UVT	<b>NC 30-75,1"</b> 30 USGPM (114 L/min) (6.81 m³/h) 40 mJ/cm² Dose @ 75% UVT
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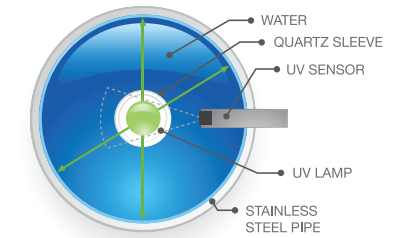


## UV PURE'S PATENTED CROSSFIRE® TECHNOLOGY IS AT THE CORE OF ALL OUR SYSTEMS

- It is a better mousetrap. Proven since 1998 in over 12,000 applications, globally.
- It means effective treatment in conditions 10 times worse than conventional "light in a pipe" UV systems can handle.
- It means a disinfection dose 2.4 times greater than conventional UV systems for the same energy input and cost.
- It means no fouled quartz, no messy, costly, manual cleaning, and no broken quartz.
- It means easy lamp changes.
- It means no false alarms from overheating.
- It means no operator exposure to the water stream.
- It means Pure safe water. Always®.



## CONVENTIONAL UV SYSTEM



## FEATURES

## ACCESSORIES

## THE UPSTREAM IN ACTION

### UPSTREAM® WITH CROSSFIRE® TECHNOLOGY THE MOST EFFECTIVE UV PURIFICATION FOR WATER

Upstream Systems with patented Crossfire Technology are validated to achieve the same standards as NSF/ANSI 55 Class A, but are not certified, where regulations do not require it. Field-tested and proven with over a decade of demanding municipal, industrial and commercial applications.

Dissolved organics and high tannin content are the primary contributors to the reduction of UV Transmittance (UVT) in surface waters. Tannin content and low UVT render conventional UV technology ineffective. Our Upstream units are engineered specifically for these types of cases where others fail.

Upstream is engineered to reduce e-coli, bacteria, cysts like cryptosporidium and giardia, legionella and most viruses to safe levels – a minimum of 99.99% reduction. Upstream systems are effective for the broadest range of pre-treatment water quality with UVT as low as 50%.

Upstream Systems are for Potable, Reuse and Rainwater applications and are effective even on surface water from lakes, streams, cisterns and dug wells.



Broadest Range of Pre-treatment Conditions		
	Conventional "Light in a Pipe" Systems	Current Hallett and Upstream Systems
Hardness	<85mg/L (grains)	Up to 855mg/L (grains)
Iron	<.3 mg/l	Up to 3 mg/l
No/Low Flow	Overheating - lower UV intensity	No Effect - 100% UV intensity
UVT	Must be 75% to over 90% to achieve advertised dose	As low as 50% for surface water and reuse applications
Flow Control	Flow Restrictor is an option - may not be safe	All UV Pure potable water systems have flow restrictors - Safe!

## FEATURES AND BENEFITS OF CORE CROSSFIRE TECHNOLOGY

### MOST EFFECTIVE UV TREATMENT

- Validated to reduce pathogens to safe levels – minimum of 99.99% reduction, in real world conditions - not just in a test lab.
- Effective in very low UVT and surface water treatment applications.
- Effective in a water ten times harder than conventional UV systems.
- Elliptical reflectors focus energy 360° - ending UV shadowing.
- Reflective technology reuses energy with elliptical reflectors means 2.4 times more efficiency.
- Lamps are air cooled, do not overheat meaning no loss of dose in no-flow or low-flow conditions.
- Lamp output optimized for a broad range of air and water temperatures.

### CROSSFIRE TECHNOLOGY IS SELF-CLEANING

- Automatic mechanical self-cleaning.
- Eliminates quartz fouling from minerals and bio-film wastewater.
- No risk of false alarms due to fouling.
- No need for water softeners ahead of the UV system in potable applications like conventional UV requires.

### SMART TECHNOLOGY ENGINEERED TO BE FAIL SAFE AND RISK FREE

- Dual smart UV sensors continuously monitor UV Dose, Lamp Intensity (UVI), and net UV Transmittance (UVT).
- Digital monitor, visual, and audible alarms and event notifications.
- On-board data logging and self-diagnostic trouble shooting logic.
- Automatic solenoid shut-off valve (optional).
- Hard contacts for remote start/stop and remote alarm.

### ENGINEERED TO BE VIRTUALLY MAINTENANCE FREE

- Simple and easy lamp changes.
- Engineered to eliminate nuisance alarms.
- Standard power conditioner protects against surges and brown-outs (115 volt models).

### LOW OPERATING AND TOTAL LIFETIME COSTS

- Industry leading Warranty.
- No cost of water softening equipment for effective treatment like conventional UV systems.
- Automatic self-cleaning means no labor to clean quartz, no quartz breakage costs.
- Quick and easy lamp replacement reduces labor costs.
- Low energy costs and inexpensive LPHO lamps lasts one year of continuous use.
- Simple, inexpensive power requirements – single phase 115 or 240 volt.
- No special infrastructure required for mounting, template included.
- Redundancy incorporated in multiplexed higher flow applications – no extra unit(s) needed.

### QUICK AND EASY TO INSTALL

- Small footprint and compact size minimizes cost per square foot.
- Standard Stainless Steel flexible hoses mean no hard piping.
- No extra, wasted space required for lamp removal.
- 24 hour initialization programming manages first time use minimizing commissioning wait time.

## THE CHALLENGES OF CONVENTIONAL UV SYSTEMS THAT CROSSFIRE TECHNOLOGY WAS DESIGNED TO SOLVE

### INEFFECTIVE UV TREATMENT

- Validation standards vary, potable systems often based on levels not up to real world conditions.
- Not effective in low UVT water.
- UV Shadowing allows pathogens to transit alive.
- Potable water applications may require expensive and complex water softeners upstream of the UV system to keep quartz tubes from fouling, thereby reducing dose and causing alarms.
- Only one path length of disinfecting energy – inefficient as most turns to heat.
- Lamps overheat in no-flow or low-flow conditions causing drop in output and alarms.
- Very cold water causes lamps to cool resulting in a drop in UV output and alarms.

### QUARTZ FOULING A COMMON OCCURRENCE THAT REDUCES EFFECTIVENESS

- Caused by minerals and biofilm in the water - can happen frequently.
- Means a drop in UV intensity and dose, therefore ineffective treatment.
- Requires decommissioning, disassembly, manual cleaning with acid and frequently results in broken quartz.
- If quartz breaks there is a risk of quartz shards in the water channel and requires replacement with a new quartz tube.

### EVEN THE MOST ADVANCED SYSTEMS WITH A UV SENSOR ARE "DUMB"

- A single sensor looks through a quartz window, the water channel, the quartz tube protecting the lamp, at the UV lamp. If it sees a drop in energy below a set point it alarms...but does not know what caused it.
- When in alarm, an operator must decommission the system, disassemble the system, clean the sensor window, clean the quartz, replace the lamp and reassemble, hoping that one or more actions fixed the problem; there is no diagnostic capability – the sensor is "dumb".
- Even in multiple lamp systems, there is on one sensor. In this case, in addition to the problems caused by being "dumb" there is a leap of faith that the condition of the lamp the single sensor is looking at is the same as all of the other lamps in the system that are not monitored by any sensor. All lamps except the one the sensor is looking at could be below standard and the sensor would not see that.
- Because the sensors in these systems are immersed in water, egress of water into their housings is a common occurrence causing failure.
- There is no capacity to measure UVI or UV transmittance with a single sensor – only the combined effect of lamp, quartz tube, water and sensor window. There is no capability to provide discrete UVI, UVT and UV Dose data like Crossfire Technology with multiple smart sensors.
- Automatic solenoid valves, if installed, are prone to shutting down the water in false alarm conditions caused by quartz fouling or overheating.

### ONGOING MAINTENANCE AND FALSE ALARMS ARE A FACT OF LIFE

- Fouling is common requiring manual cleaning with acid or an expensive water softener to prevent it in potable treatment applications.
- Lamp changes are finicky, require as much outboard room as the length of the system and often result in broken quartz or lamps.
- Often systems are not installed with room to change lamps and then have to be decommissioned and removed just to change lamps.
- Over-heating in no-flow and low conditions or hot water applications and fouling cause false alarms.
- Cold water can also cause alarms.
- No power conditioner included so ballast and microprocessor are subject to failure in power surges and brown out situations – warranties may not cover this failure mode.

## UPSTREAM® SYSTEM SPECIFICATIONS

Model	Upstream NC 10-75	Upstream NC10-50	Upstream NC 15-75	Upstream NC 15-50	Upstream NC 30-75 (1")
PART NUMBER (115 Volt)	R000001	R000002	R000003	R000004	R000005
PART NUMBER (240 Volt)	R000033	R000034	R000035	R000036	R000037
Validation / Certification	Engineered to meet the same standards as NSF/ANSI 55 Class A certified UV systems. Validated to achieve 40 mJ/cm <sup>2</sup> at maximum specified flow rates and minimum specified UVT. Certified to AB 1953.				
UV Dose	minimum dose of 40 mJ/cm <sup>2</sup> – 4 Log (99.99%) or greater reduction of bacteria, cysts and most viruses. Please refer to dose charts.				
Minimum UV Transmittance	75%	50%	75%	50%	75%
Max Flow Rate	11 US gpm (41.6 L/min) (2.5 m <sup>3</sup> /hr)		16.5 US gpm (62.5 L/min) (3.75 m <sup>3</sup> /hr)	14.6 US gpm (55.3 L/min) (3.3 m <sup>3</sup> /hr)	28.5 US gpm (108 L/min) (6.47 m <sup>3</sup> /hr)
Water Pressure	0 psi (69 kPa) to 100 psi (690 kPa); units are tested to 240 psi (1.6 MPa)				
Dynamic Flow Restrictor	Installed as standard				
Pressure Drop at 75% of nominal flow capacity	10 psi (69 kPa)		15 psi (103.5 kPa)	10 psi (69 kPa)	10 psi (69 kPa)
Multiplexed Flow Capacity	Engineered for multiple systems in parallel, for flow rates up to 1 MGD (696 US gpm) (2629 L/min) (158 m <sup>3</sup> /hr)				
Redundancy	Additional backup systems can be added cost effectively				
Solenoid Shut-Off Valve	Automatic shut-off valve available as option on all models				
Inlet and Outlet Connections	1" NPT				
Voltage	Models available in either 115V or 240V configurations (please see different part numbers above)				
Protection from Power Fluctuations	115V Models include power conditioner that meets UL 1449. External power conditioner recommended on 240V models				
Maximum Power Consumption	135W	175W		200W	
Electrical Certification	Intertek ETL (UL, ULC and CE equivalent)				
Lamps	Low pressure, high output proprietary lamps contain up to 30 mg of mercury (Hg); rated for 9000 hours (1 year) of continuous use				
Maintenance	Onboard 9000 hour lamp life with lamp hour countdown to end of life. Automatic self-cleaning device prevents quartz sleeve from fouling and requires no maintenance				
Electronic Ballast	Auto power-regulated smart ballast is integrated with micro-processor control system; protected from power fluctuations				
Self-Cleaning	Stainless Steel patented automatic wiper-blade system keeps quartz free from scaling or bio-film				
On-Board Micro-Processor and Monitor	Patented dual smart UV sensors continuously monitor UV dose, lamp intensity (UVI) and water transmittance (UVT); three thermistors continuously monitor air temperature and water temperature; on board LCD displays system performance, lamp hours, data logged operating events, and self-diagnosis including when to change lamps and troubleshooting assistance for service issues; on board LEDs indicate system status: OK, caution or alarm conditions.				
4-20 mA Analog Output	Not available on Upstream models. Refer to Hallett specification page.				
Dry Contacts	Included as standard for applications that require remote alarming, auto-dialer integration, or similar.				
Wireless Remote Monitor	Available as option: RF 2.4 GHz remote monitor with LCD displays system status; operates up to 150 feet (50 meters) away from the main system				
Remote Alarm Start / Stop	Included as standard on all models. Allows units to be remotely started / stopped.				
Dimensions (H, W, D)	32 x 7.5 x 9.3" (812 x 190 x 236mm)	35.8 x 7.5 x 9.3" (908 x 190 x 236mm)		39.8 x 7.5 x 9.3" (1010 x 190 x 236mm)	
Weight – Dry	23 lbs / 10.4 kg	25 lbs / 11.3 kg		30 lbs / 13.6 kg	
Weight – Wet	26 lbs / 11.7 kg	28 lbs / 12.7 kg		33 lbs / 14.9 kg	
Warranty	1 year limited warranty on bulbs and sensor probes; 3 year limited warranty on electrical components and quartz sleeve; 5 year limited warranty for structural, hardware and mechanical components				
EPA FIFRA Certified	EPA Est. No. 075213-CAN-001				
Patents	Patented in US 6,707,048, Canada 2,463,503, Australia 2002333084, Mexico 248805, Patents pending in Europe, Eurasia, Japan, UK				
Recommended Application or Source Water	Drilled wells or pre-treated water	Unprotected water Sources: surface water, cisterns, rainwater, dug wells	Drilled wells or pre-treated water	Unprotected water Sources: surface water, cisterns, rainwater, dug wells	Drilled wells or pre-treated water

Upstream systems with patented Crossfire Technology provide microbiological purification of drinking water. With a Upstream system properly installed, fail-safe engineering ensures that no potentially dangerous microorganisms can enter a drinking water distribution system. UV Pure recommends the use of other filtration systems to treat chemical and other non-microbiological contaminants. To find out everything, visit [www.uvpure.com](http://www.uvpure.com). UV Pure®, Pure Safe Water. Always® and Crossfire® Technologies are registered trademarks of UV Pure Technologies Inc. Boeing® and Dreamliner® are registered trademarks of The Boeing Company.