UV PURE

Pure, safe water. *Always.*

GLOBAL LEADER IN UV WATER PURIFICATION

For Wastewater Applications

Advanced UV Water Purification Systems
For Wastewater Applications
Up to 1MGD (3785 m³/day)

Hallett®

powered by CROSS FIRE TECHNOLOGY

Hallett MODELS FOR WASTEWATER APPICATIONS

Hallett 13

Treat for Discharge	Treat for Non-Detect
13 USGPM (49.2 L/min) (2.95 m^3/h)	5 USGPM (18.9 L/min) (1.14 m^3/h)
30 mJ/cm^2 dose @ 65% UVT	80 mJ/cm^2 dose @ 65% UVT
Total Coliform of < 200 MPN / 100 ml	Total Coliform of < 2 MPN / 100 ml

Hallett 30

Treat for Discharge	Treat for Non-Detect
27 USGPM (102 L/min) (3.61 m^3/h)	10 USGPM (37.9 L/min) (2.27 m^3/h)
30 mJ/cm^2 dose @ 65% UVT	80 mJ/cm^2 dose @ 65% UVT
Total Coliform of < 200 MPN / 100 ml	Total Coliform of < 2 MPN / 100 ml

Hallett 30 4-20mA
Data Output

Treat for Discharge	Treat for Non-Detect
27 USGPM (102 L/min) (3.61 m^3/h)	10 USGPM (37.9 L/min) (2.27 m^3/h)
30 mJ/cm^2 dose @ 65% UVT	80 mJ/cm^2 dose @ 65% UVT
Total Coliform of < 200 MPN / 100 ml	Total Coliform of < 2 MPN / 100 ml

FEATURES

HALLETT® WITH CROSSFIRE® TECHNOLOGY THE MOST EFFECTIVE UV PURIFICATION FOR WASTEWATER

Hallett UV wastewater purification systems, with patented Crossfire Technology, are engineered for simple, efficient multiplex configuration, and treat flows up to 1 MGD (3785 m^3/day) for wastewater and reuse applications.

Hallett LPHO (low pressure high output) wastewater systems outperform all conventional LPHO wastewater systems and most medium pressure systems with the ability to treat very low quality (low UV transmittance) wastewaters trouble free.

Traditionally, low-quality wastewater effluents have required medium pressure systems to reach the required dose. The Hallett wastewater system is the first of its kind and the only LPHO technology that matches and/or beats the performance of conventional medium pressure systems which are significantly more expensive from a capital and operating cost perspective.

Each Hallett system for wastewater is factory sized and programmed to achieve target treatment requirements. Hallett systems are effective in a broad range of pre-treatment wastewater quality. They are also engineered to prevent operator exposure to potentially hazardous wastewater since no manual quartz cleaning is required.

Broadest Range of Pre-treatment Conditions	
Parameter	Pre-Treat Conditions
TSS	< 20 mg/L
BOD	< 20 mg/L
Turbidity	< 4 NTU
UVT	As low as 45%

ACCESSORIES

Flexible stainless steel
hook-up hoses
(Standard on all models)

Automatic Shut-off
Solenoid Valve
(Optional on all models
except Hallett 30 1.5")

Power Conditioner
(Standard on all
120 volt models)

Hallett Diagnostic Tool
(Optional on all models)

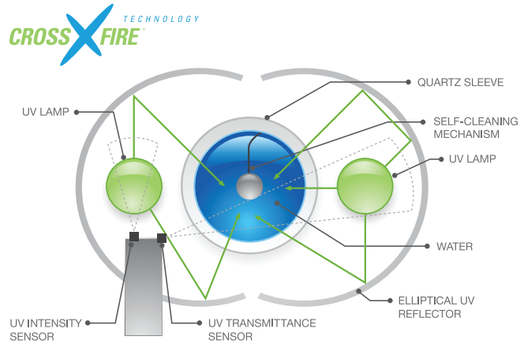
External Purge Valve
(Optional on all models)

THE HALLETT IN ACTION

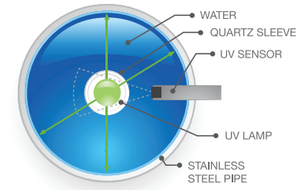
CROSSFIRE® TECHNOLOGY

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 AND BENEFITS OF CORE CROSSFIRE TECHNOLOGY

MOST EFFECTIVE UV TREATMENT

- Validated to reduce pathogens to target levels.
- Effective in very low UVT wastewater and reuse 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 with the same input energy as conventional UV systems.
- 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 and operator exposure to potentially toxic wastewater.
- No risk of false alarms due to fouling.

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).
- 4-20 mA output available.
- Digital monitor, visual, and audible alarms and event notifications.
- On-board data logging and self-diagnostic trouble shooting logic (H15xs and all Upstream models).
- Automatic solenoid shut-off valve.
- 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.
- Automatic self-cleaning means no labor to clean quartz, no quartz breakage costs.
- Quick lamp replacement time reduces labor costs.
- Low energy costs and inexpensive long-lasting LPHO lamps.
- Simple, inexpensive power requirements – single phase 115 or 240 volt.
- No special infrastructure required for mounting.
- 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 (H15xs and all Upstream models).

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.
- Wastewater applications require laborious and dangerous frequent cleaning of quartz tubes.
- Potable water applications 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 sleeve 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 only 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 monitoring is the same as all of the other lamps not being monitored. All lamps except the one the sensor is looking at could be below standard and the sensor would not detect 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 sleeve, water and sensor window. There is no capability to provide discrete UVI and UVT 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 enough clearance 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.

HALLETT® SPECIFICATIONS: MODELS FOR WASTEWATER APPLICATIONS

Multiplexed Flow Capacity - Engineered for multiple systems in parallel, for flow rates up to 1 MGD (696 US gpm) (2629 L/min) (158 m^3/hr)

Model	Hallett 13	Hallett 30 -1" (WW)	Hallett 30-1" (WW) w/ 4-20 mA	Hallett 30-1.5" (WW)	Hallett 30-1.5" (WW) w/ 4-20 mA
PART NUMBER (115 Volt)	E000010	C000010	C000021	C000014	C000019
PART NUMBER (240 Volt)	E000013	C000022	C000023	C000015	C000024
Validation / Certification	Engineered to meet dosing and disinfection requirements of wastewater effluent. Typically a minimum dose of 30 mJ/cm2 to reduce coliform to < 200 counts / 100ml. Higher doses available for re-use and non-detect applications (< 2 counts / 100 ml). In use on Title 22 applications. Approved by the MENV for use in Quebec. Certified to AB 1953.				
UV Dose	Minimum dose of 30 mJ/cm^2 at end of lamp life				
Minimum UV Transmittance	45%				
Max Flow Rate	13 US gpm (49.2 L/min) (3 m^3/hr) @ 65% UVT, 30 mJ/cm^2 dose (flow rates depend on required dose and source water UVT)	28 US gpm (106 L/min) (6.36 m^3/hr) @ 65% UVT, 30 mJ/cm^2 dose (flow rates depend on required dose and source water UVT)			
Water Pressure	0 psi (69 kPa) to 100 psi (690 kPa); units are tested to 240 psi (1.6 MPa)				
Dynamic Flow Restrictor	No internal restrictor installed				
Pressure Drop at 75% of nominal flow capacity	4 psi (27 kPa)	2.5 psi (17 kPa)		1 psi (7 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^3/hr)				
Redundancy	Additional backup systems can be added cost effectively				
Solenoid Shut-Off Valve	Automatic shut-off valve available as option				
Inlet and Outlet Connections	¾" flexible FIP connection for easy installation	1" flexible FIP connection for easy installation		1.5" flexible FIP connection for easy installation	
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	104W	175W			
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; 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); on-board LED's indicate system status: OK, warning or alarm conditions. Optional External digital monitor (HDT) displays above in millivolts.				
4-20 mA Analog Output	Not available	Not installed	Installed as standard. Provides two analog signals (4-20 mA) for both UV Intensity (UVI) and water UV Transmittance (UVT) and allows for dose to be calculated in real time.	Not installed	Installed as standard. Provides two analog signals (4-20 mA) for both UV Intensity (UVI) and water UV Transmittance (UVT) and allows for dose to be calculated in real time.
Dry Contacts	Included as standard for remote alarms, auto-dialer integration, or similar.				
Remote Alarm	Included as standard on all models.				
Dimensions (H, W, D)	24 x 8 x 9" (600 x 200 x 230 mm)	32 x 8 x 9" (810 x 200 x 230mm)		32 x 8 x 10" (830 x 220 x 260 mm)	
Weight – Dry	25 lbs (11.3 kg)	30 lbs (13.6 kg)		32 lbs (14.5 kg)	
Weight – Wet	27 lbs (12.24 kg)	32.5 lbs (14.7 kg)		34.2 lbs (15.5 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				

Hallett systems with patented Crossfire Technology provide microbiological purification of drinking water. With a Hallett 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.