UV PURE

Pure, safe water.
*Always:*

## GLOBAL LEADER IN UV WATER PURIFICATION

Advanced UV Water Purification Systems
For Wastewater, Reuse, Rainwater and Potable Applications
Factory Integrated in NEMA® Cabinets Treat Up to 137 GPM (519L/min, 747 $m^3$/day)



Hallett Multiplex
powered by CROSSFIRE TECHNOLOGY

## Hallett Multiplex FOR WASTEWATER AND POTABLE APPLICATIONS

Factory Integrated in NEMA Up to 137 GPM (519 L/min, 747 m³/day)

Multiple parallel Hallett® systems to handle Wastewater and Potable applications with flow rates of up to 137 GPM (519 L/min, 747 m³/day).

Simple “in and out connections”, the benefits of the NEMA® cabinet enclosures with forced air ventilation and the minimal labor cost to install and commission make the Hallett Multiplex as effective as it is economical.

55GPM Hallett Multiplex For Potable Applications
(H60” x W36” x D12”)

NSF/ANSI 55 Class A Certified

110 GPM Hallett Multiplex For Wastewater Applications
(H60” x W60” x D12”)

## FEATURES

### HALLETT MULTIPLEX IN NEMA CABINETS

Hallett Multiplex for wastewater, reuse, rainwater and potable applications come with everything connected and ready to commission. It’s simply plug and play.

UV Pure® builds substantial value-add into the Multiplex. In addition to Crossfire® Technology’s self-cleaning, dual smart-sensors, and reliable operation, UV Pure supplies the NEMA housing with all products installed. Every Multiplex is fully tested before delivery and all technical support is fully integrated.

Housed in NEMA 4x cabinets, Multiplex have the benefit of extra protection making them ideal for hazardous or wet environments. Other NEMA rated cabinets and equipment configurations are also available from UV Pure by special order.

Factory integration from two to five Hallett 30 potable water purification systems in a NEMA 4X Cabinet will treat up to 137 GPM (519 L/min, 747 m³/day) flow rate.

Hallett potable treatment systems are the world’s only NSF/ANSI 55 Class A Certified UV water purification systems with patented Crossfire Technology. They are engineered to reduce e-coli, bacteria, cysts like cryptosporidium and giardia, legionella and most viruses to safe levels – a minimum of 99.99% reduction.

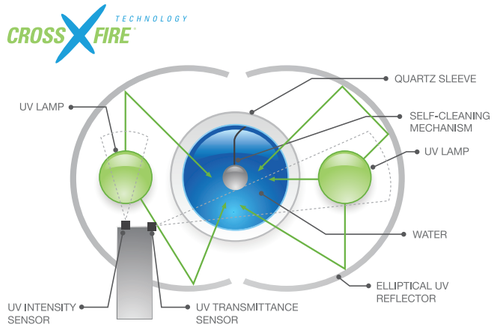
| Pre-treatment Conditions for Multiplex Systems | |
|---|---|
| Hallett Potable System | Hallett Wastewater System |
| Hardness (855 mg/L Max) | TSS (20 mg/L Max) |
| Iron (3 mg/L Max) | BOD (20 mg/L Max) |
| UV Transmittance (75 % Min) | UV Transmittance (45% Min, 65% Nominal) |
| Turbidity (1 NTU Max) | Turbidity (4 NTU Max) |



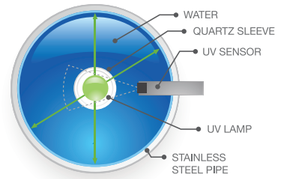
## CROSSFIRE® TECHNOLOGY

### 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 safe levels – minimum of 99.99% reduction, in real world conditions - not just in a test lab.
- Effective in very low UVT wastewater 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 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.
- 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).
- 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.
- 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 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, 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 (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.

## MULTIPLEX SPECIFICATIONS: MODELS FOR WASTEWATER AND POTABLE APPLICATIONS

Factory Integrated in NEMA® Cabinets Treat Up to 137 GPM (519 L/min, 747 $m^3$/day)

| Model | | 2 x H30 | 2 x H30 w/4-20 mA | 3 x H30 | 3 x H30 w/4-20 mA | 4 x H30 | 4 x H30 w/4-20 mA | 5 x H30 | 5 x H30 w/4-20 mA |
|---|---|---|---|---|---|---|---|---|---|
| PART NUMBER (115 Volt) | Wastewater | C51 | C51FT | C52 | C52FT | C53 | C53FT | C34 | C34FT |
| | Potable | C39 | C39FT | C40 | C40FT | C41 | C41FT | C42 | C42FT |
| PART NUMBER (240 Volt) | Wastewater | C58 | C58FT | C59 | C59FT | C60 | C60FT | C61 | C61FT |
| | Potable | C54 | C54FT | C55 | C55FT | C56 | C56FT | C57 | C57FT |
| Validation / Certification | Wastewater | 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). | | | | | | | |
| | Potable | NSF/ANSI 55 Class A: minimum dose of 40 mJ/cm2 – 4 Log (99.99%) reduction of viruses; 6 log (99.9999%) reduction of bacteria; 8 log (99.999999%) reduction of cysts | | | | | | | |
| UV Dose | Wastewater | Minimum dose of 30 $mJ/cm^2$ at end of lamp life | | | | | | | |
| | Potable | 40 $mJ/cm^2$ at end of lamp life | | | | | | | |
| Minimum UV Transmittance | Wastewater 65% (Can go down to 45%) | Refer to Hallett Wastewater/Potable specs for details | | | | | | | |
| | Potable | 75% | | | | | | | |
| Max Flow Rate | Wastewater | 50 US gpm (189 L/min) (11.4 $m^3$/hr) | | 75 US gpm (284 L/min) (17.0 $m^3$/hr) | | 100 US gpm (378 L/min) (22.7 $m^3$/hr) | | 125 US gpm (473 L/min) (28.4 $m^3$/hr) | |
| | Potable | 54.8 US gpm (207 L/min) (12.4 $m^3$/hr) | | 82.2 US gpm (311 L/min) (18.7 $m^3$/hr) | | 109.6 US gpm (415 L/min) (24.9 $m^3$/hr) | | 137 US gpm (519 L/min) (31.1 $m^3$/hr) | |
| Water Pressure | | 10 psi (69 kPa) to 100 psi (690 kPa); units are tested to 200 psi (1.4 MPa) | | | | | | | |
| Dynamic Flow Restrictor | | Installed as standard | | | | | | | |
| Pressure Drop at 75% of nominal flow capacity | Wastewater | 2 psi (14 kPa) | | | | | | | |
| | Potable | 20 psi (138 kPa) | | | | | | | |
| Redundancy | | Additional backup systems can be added cost effectively | | | | | | | |
| Solenoid Shut-Off Valve | Wastewater | Automatic shut-off valves available as option | | | | | | | |
| | Potable | Automatic shut-off valves available as option | | | | | | | |
| Inlet and Outlet Connections | Wastewater | 1.5” female NPT connection for easy installation | | | | | | | |
| | Potable | 1” female NPT connection for easy installation, 1.5” available | | | | | | | |
| Voltage | | North American Models: 115V, Global Models: 115V or 240V | | | | | | | |
| Protection from Power Fluctuations | | 115V Models include power conditioner that meets UL 1449 | | | | | | | |
| Maximum Power Consumption | | 464W | | 680W | | 928W | | 1140W | |
| Electrical Certification | | Intertek ETL (UL, ULC and CE equivalent) | | | | | | | |
| Lamps | | Low pressure, high output proprietary lamps contain 30 mg of mercury (Hg); rated for one year of continuous use | | | | | | | |
| Maintenance | | Onboard and remote system indicates when to change bulbs – every 12 months (9000 hours). Quartz sleeve is self-cleaning and requires no outside 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 monitor lamp output (UVI) and water transmittance (UVT) continuously | | | | | | | |
| 4-20 mA Analog Output | | N/A | Installed as standard | N/A | Installed as standard | N/A | Installed as standard | N/A | Installed as standard |
| Dry Contacts | | Included as standard for applications that require remote alarming, auto-dialer integration, or similar. | | | | | | | |
| Remote Alarm | | Included as standard on all models. | | | | | | | |
| Warranty | | 1 year limited warranty on bulbs and sensor probes on a prorated basis; 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 | | | | | | | |

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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.