



HydroGienic®

Pure Water Distribution Systems

Pure Water Storage & Distribution Systems

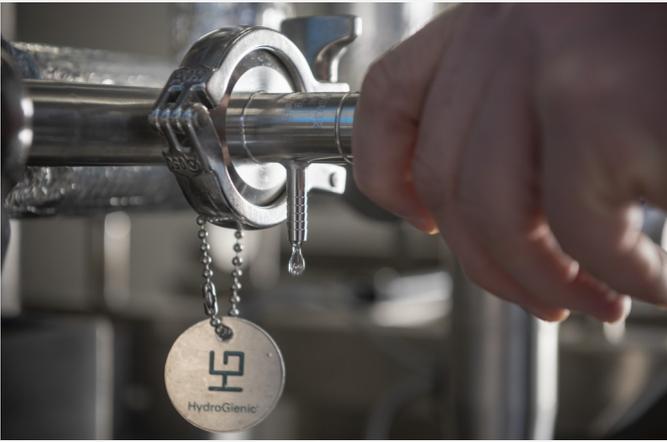
REDUCE DOWNTIME, IMPROVE YOUR BOTTOM LINE



THE QUEEN'S AWARDS
FOR ENTERPRISE:
INNOVATION
2018

About HydroGienic®

Offered exclusively by the Honeyman Group, the award winning HydroGienic® is an innovative, proven and patented pure water distribution system, delivering Purified Water or WFI to each point of use directly from the storage tank through PTFE hoses in a parallel delivery, rather than the conventional way via a stainless steel ring mains.



The HydroGienic® distribution skid and PTFE hoses are suitable for **all grades of pure water**, and can be sanitised by heat, ozone and chemicals.

True Innovation

The innovative part is the way that high volumes of water can be delivered to each user point through small bore PTFE hoses, thanks to a patented dual manifold system, allowing water to continuously circulate and deliver flow to each user as and when required.

The use of PTFE hoses leads to simple installation from the plant room to each point of use, and does not require hot welding.

Each user point is connected in parallel, so additional user points can be added without disrupting other user points, unlike conventional stainless steel

Traditional systems are based upon welded, stainless steel ring mains which connect user points together in series around a recirculating loop. However, these conventional 'daisy chain' systems have many limitations and constraints which make them increasingly ineffective and inefficient in today's manufacturing environment.

Until recently, system owners and users have simply had to tolerate all the disadvantages and inefficiencies of conventional ring main systems as there was no effective alternative.

In 2018, the Honeyman Group was awarded the **Queen's Awards for Enterprise: Innovation** for HydroGienic® in recognition of the benefits it brings to the industry.



systems where the complete loop has to be drained prior to cutting into the loop.

HydroGienic® removes the need of draining the distribution loop, thus keeping production output as normal. This minimises disruption to the facility and offering potential cost savings of £ hundreds of thousands in lost revenue.

With a HydroGienic® system there is no need to use and dispose of harmful chemicals, needed to passivate stainless steel pipes after welding, making HydroGienic® a more environmentally friendly system.

Flexible in design and in nature

HydroGienic® is cost effective and makes installation simple, thanks to utilising small bore virgin PTFE hoses as part of the hygienic piping system.

Used extensively in pharma and biotech process applications, PTFE has excellent physical and mechanical properties, and can be sanitised using all normal methods such as ozone, chemicals, and heat.

These features make it ideal for medium or high purity water delivery.

Hose installation with the HydroGienic® system, requires no hot working in

production areas, thus significantly reducing certification and simplifying materials handling, unlike stainless steel welded ring main installations.

Thanks to its patented parallel hose configuration, HydroGienic® can deliver large volumes of water through small bore PTFE hoses.

Typically, the site installation time for a HydroGienic® system would be half that of an equivalent welded stainless steel ring main and installation time from plant room to the user-points is typically reduced by 75%.



Offers a wide temperature range up to +230°C



Is significantly cheaper to install, maintain and modify



Is chemically inert & non-leaching



Is environmentally friendly, no hazardous chemicals needed for passivation



Has an extremely low friction coefficient, non-stick!



Is FDA / MHRA approved & meets US Pharmacopeia Class VI



Is significantly quicker to install, reducing disruption to existing facilities



Is heat, ozone and chemically sanitisable

Peace of mind

All HydroGienic® systems are custom made to suit your requirements and needs.

Each system is designed to ensure it is:

- ✓ Cost effective
- ✓ Easy to operate
- ✓ Easy to manage
- ✓ Easy to maintain
- ✓ Easy to modify as needs change

Depending on your needs, output and water quality can be measured, stored and viewed in real-time.

All data is securely managed to meet FDA 21CFR part 11.

A detailed and easy to operate Human Machine Interface (HMI) can be installed as part of your HydroGienic® system whilst data from HydroGienic® can be connected to existing site management systems for full traceability.



HMI unit on a HydroGienic® system.

How HydroGienic® works

The first new and novel feature of HydroGienic® is that it delivers high purity water to each point of use in a system via a parallel piping system.

Effectively, this may be thought of as an individual recirculating loop serving each user point via a manifold. Though simple in principle, this change in arrangement is very significant for water system owners and users.

Each offtake is individual and separate from the other user points, resulting in:

- ✓ User points can be added, removed or modified on an individual basis – without the need to stop the rest of the loop
- ✓ The installation project of a new system can begin with a validated distribution system being installed in the plant room with NO users connected.
- ✓ Offtake points can be added singly or in multiples when required – a unique and truly modular installation capability.



This is a significant advancement beyond recirculating loops, where all users are impacted during any modifications. Invariably, this means a lengthy system shutdown whenever the conventional loop system is modified or altered.

This is extremely costly and inefficient as is described later, but it has been a fact of life for most pharmaceutical and

biotech manufacturers before the advent of HydroGienic®.

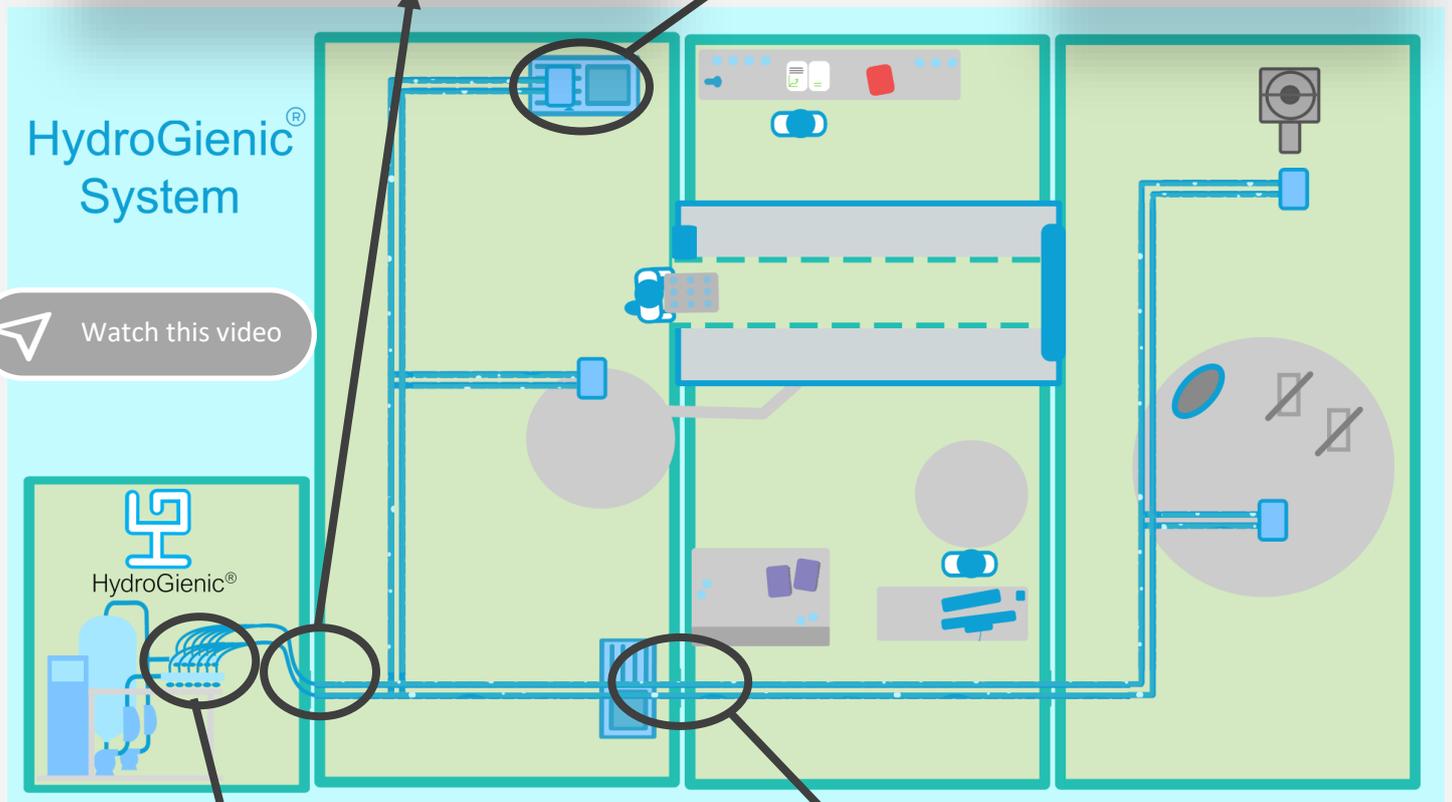
In comparison, a unique feature of HydroGienic® is that if modifications are being carried out involving a break-in or invasion to the system, all other user points are unaffected and able to remain operable. This translates into potentially huge cost savings.



Top view showing virgin PTFE hoses leaving the plant room.



Stainless steel hygienic offtake example with aseptic valves, fully draining.



Stainless steel manifold with outgoing flow to offtakes.



Virgin PTFE hoses installed on stainless steel trays throughout the manufacturing plant.

The business case for HydroGienic®

When considering a new pure water distribution system, it is important to consider all cost implications such as:

- ✓ Capital costs
- ✓ Facility downtime costs
- ✓ Life time operational costs

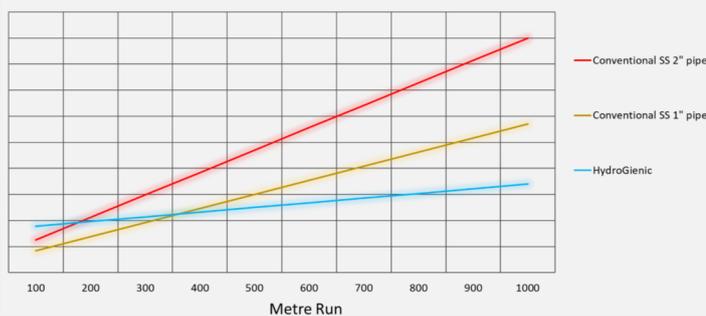
Capital costs

The HydroGienic® system requires a skid and manifold distribution centre and once out into the facility, HydroGienic® PTFE hose arrangement will be significantly quicker and cheaper to install than welded stainless steel.

Thus, the greater the number of user points and/or distance of pipe runs, the cheaper HydroGienic® will become compared to conventional systems.

The graph below shows a typical capital cost comparison example between a conventional stainless steel ring main and a HydroGienic® system.

Capital cost comparison based on total loop length



Facility downtime costs

Installation of the HydroGienic® PTFE hoses requires standard cable trays to each user point which can be installed by any approved supplier, with knowledge of the facility, making the installation relatively more straightforward and less time consuming.

Typical installation time is **75% less** from plant room to offtakes, ensuring

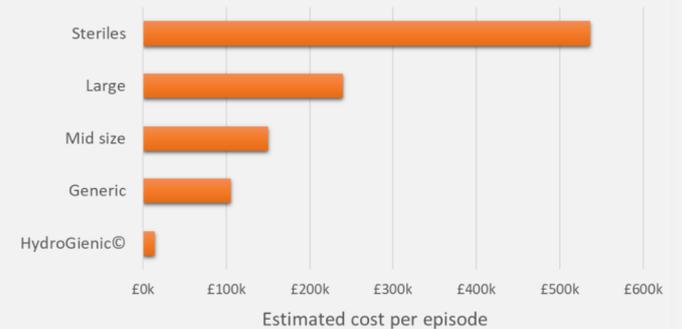
production can continue longer, and potentially saving significant amounts of money.

Life time operational costs

One can assume that a pure water distribution system will be altered over a typical life span of 20 years.

Each time an offtake is moved or added, a conventional system will have to be drained, cut into, modified, passivated if welds are used, and validated. During this time, there is a complete stop in production, thus incurring significant costs in lost revenue.

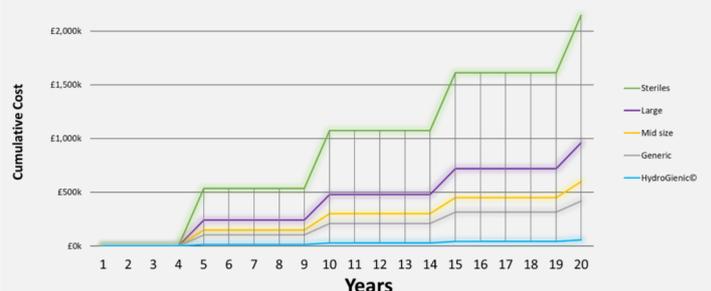
Comparative cost per break-in



Thanks to its parallel nature, HydroGienic® user points can be added or moved, without impacting on other offtakes, until the final moment when connecting the offtakes to the manifold. Validation is also vastly reduced and simplified. Production downtime is limited to days, not weeks or months.

The graph below shows a typical scenario based on 1 modification every 5 years, and at different rates of lost revenue;

Cost of Ownership - modifying user points



Key features and benefits of HydroGienic®

In summary, the unique features of the patented HydroGienic® parallel configuration and PTFE hose combination provides the following technical and operational advantages and benefits over conventional stainless steel loops -:

- ✓ HydroGienic® can provide **capital savings in the order of 25%** on systems typical for the industry
- ✓ **90% lifetime cost reduction** compared to conventional stainless steel loop
- ✓ Suitable for **all grades of pure water** including PW and WFI, in hot and cold loops
- ✓ Can be **sanitised by ozone, heat chemicals** in the same way as conventional loops
- ✓ HydroGienic® has passed **stringent MHRA and FDA site inspections** in working facilities, meets all cGMP requirements and standards
- ✓ **Delivers 100% diversity** i.e. all users can draw water at the same time without impacting upon individual user pressures and flowrates
- ✓ Significantly **reduces the risk of rouge formation** (PTFE will not rust)
- ✓ **75% reduction** in installation time from plant room to user-points, minimising disruption to existing production areas
- ✓ **50% reduction** in total installation time, reducing overall production down time, project time and cost
- ✓ **Vastly reduces and simplifies validation effort and cost**, as NO hot working is installed in production areas
- ✓ **No need to degrease and passivate** the piping system – no harmful chemicals to dispose of
- ✓ **“Plug and play”** addition of user-points, whilst remaining offtakes remain available
- ✓ **Easy to install** along existing conventional water systems when requiring new or additional users

Interested to hear more about HydroGienic® or just curious to find out how HydroGienic® can work for your facility?

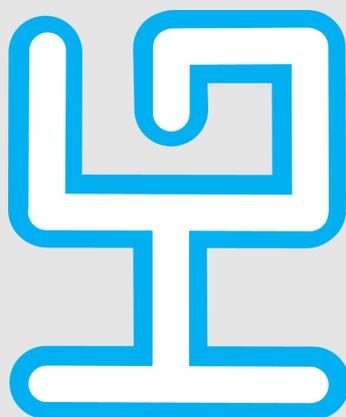
Why not contact us today? Our experts are available for a free, no obligation and open discussion to understand your needs.



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