

The Inlet Works Book

Hydro International's UK Wastewater Services for Inlet Works



Improve operational efficiency, extend plant lifetimes, reduce TOTEX, stay compliant

Our inlet works expertise

We are the country's largest provider of inlet works support, giving vital expertise to wastewater treatment plant owners and operators **24 hours a day, 365 days a year**.

We have been supplying robust and cost-effective equipment solutions and offering support services to the Water Industry since 1997.

We provide water companies with greater opportunities to **improve operational efficiencies and extend the lifetimes** of their key treatment assets, helping them comply with regulated industry standards, the Environment Act and Environment Agency programmes such as Water Industry National Environment Programme (WINEP).

Our teams of skilled engineers and consultants deliver high-quality, reliable maintenance and repair services, and bespoke design and installation services for new and existing equipment, working with technologies that have been developed and improved over more than 40 years.

Products and package solutions include:

- Archimedean screw pumps
- Coarse screens
- Conveyance / screenings handling equipment
- Compacting equipment
- Fine screens
- Grit removal and grit washing
- Sludge screening
- Storm tank screening

The services we offer include:

- Inlet works and sludge screening equipment hire
- Asset repair and refurbishment
- Planned, preventative servicing and maintenance
- Supply of spares and parts for all types of inlet assets
- Lifting and transport
- Installation and commissioning services
- Emergency callout 24/7, 365 days a year
- Control panel design and supply



Our specialist inlet works services

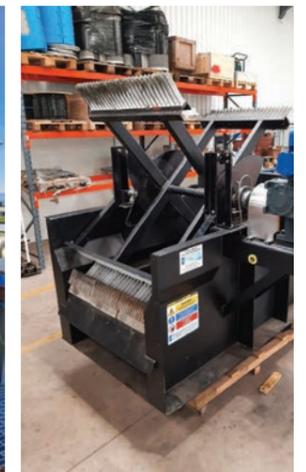
Asset repair and refurbishment

We will undertake a root cause and failure analysis to detect the issue in your inlet works and implement a cost-effective repair and refurbishment programme, specifically designed to suit your operational requirements. Our skilled engineers have the resources and expertise to repair and refurbish your wastewater equipment, including:

- Inlet Screens and Screens handling equipment
- Sludge Screens
- Grit Treatment Equipment
- Control Panels

Benefits:

- Make significant OPEX savings by extending the lifespan of your inlet works assets.
- Save money by repairing or refurbishing existing equipment rather than paying for a complete replacement.
- Rely on high quality on-site repairs by our expert rapid-response engineers.
- Reduce down-time of assets due to readily available spares and parts.



A screen before and after a complete refurbishment at one of our workshops.

Servicing and maintenance

We are the proactive experts in the servicing of your equipment to maintain operational stability for your Inlet Works. A **dedicated team** schedules regular site visits to analyse the efficiency of your Inlet Works assets, carrying out routine maintenance tasks where appropriate to ensure your equipment continues to meet its operational requirements. Our **extensive fleet** of support vans are equipped to handle any eventualities on site with highly skilled engineers on hand around the clock 365 days a year.

We provide water companies with greater opportunities to **improve operational efficiencies** and **extend the lifetimes** of their key treatment assets, helping them comply with regulated industry standards, the Environment Act and Environment Agency programmes such as WINEP.

Our teams of skilled engineers and consultants deliver **high-quality, reliable** maintenance and repair services, and bespoke design and installation services for new and existing equipment, working with technologies that have been developed and improved over more than 40 years.

Benefits:

- Receive accurate asset performance data to enhance operating efficiency.
- Help prevent downtime by undertaking timely routine maintenance.



As part of a Service & Maintenance contract you will receive regularly scheduled site visits to check the efficiency of your inlet works and carry out routine maintenance.

Equipment hire

We have one of the largest fleets of **specialist inlet works equipment** available for hire across the UK, which can be **rapidly deployed** when you need a hire unit, including:

- Inlet Screens
- Compactors
- Sludge Screens
- Digester Cleaning Screening Units
- Custom built screenings removal solutions

Benefits:

- Minimise operational downtime with rapid deployment.
- Ensure that works continue to operate efficiently whilst repair or refurbishment is undertaken.
- Rely on rapid response to unexpected equipment failure.
- Timeframes to suit your immediate needs.
- Get a rapid increase in capacity to handle additional screening requirements.
- Supplement existing screening capabilities short or long term.



A large fleet of specialist inlet works equipment is available for hire for planned or rapid response to cover for equipment downtime.

OEM spares

Our refurbishment engineers can get your Inlet Works assets back to work in record time with our readily available and comprehensive supply of **quality-assured branded spares** across an extensive network of operational hubs.

Benefits:

- Quick access to OEM spares and highly skilled specialists within a 24-hour timeframe.
- Significant savings on equipment replacement.
- We can produce parts no longer available from OEMs and create specialist parts, cutting costs on replacements and maximising equipment performance.
- We can create bespoke components to specification with access to quality-controlled, in-house design and manufacturing capability.

Lifting and transport

Our specialists are on hand 24/7, 365 days a year to complete complex lifts, removals, and installations, as well as on site serving and repairs. Site location, screen length and difficult removal angles are common challenges in the wastewater industry. Our **dedicated lorry mounted cranes** enable us to carry out high impact lifts in the most challenging environments.

Benefits:

- Access to rapid repair with a fleet of vehicles suited to a diverse range of operational objectives.
- Avoid costly unplanned, emergency expenditure and create significant OPEX savings.
- Self-contained – we are not reliant on third party support in order to react

To find out more about our specialist inlet works services, or if you would like to arrange an inspection, please call 01305 821142 or email ukwws@hydro-int.com.



From high impact, complex lifting and transportation tasks to proactive on-site equipment servicing and repair, we have a fleet of vehicles suited to a diverse range of operational objectives.

Inlet works equipment supply

We provide advanced and robust products to help improve water management processes, **increase operational performance**, and **reduce environmental impact**. We pride ourselves on providing products that we know will do the job, and as a result, are always researching and developing new products to bring to market.

We design, supply, install, service and repair:

- Archimedean screw pumps
- Coarse screens
- Conveyance / screenings handling equipment
- Compacting equipment
- Fine screens
- Grit removal and grit washing equipment
- Sludge screening
- Storm tank screening

Kuhn Archimedean Screw Pump KWS

A durable and reliable screw pump for conveying wastewater with no loss of suction power or pressure. The screw pump is robust enough for conveying raw wastewater with coarsest solids but also gentle enough to convey biological cultures with no adverse effect on the sedimentation properties and floc structure.

Benefits:

- Low maintenance solution cuts downtime and maintenance costs.
- Gentle conveyance of biological cultures prevents breakdown of floc structures and sedimentation properties.
- Resistant to blockage and robust enough to convey raw wastewater containing very coarse solids.



Inlet works screens

Our range of inlet works screens remove more screening solids and **reduce TOTEX and OPEX** with small, packaged inlet works and larger escalator inlet screens. Upgrading or **increasing the capacity** of WwTWs can be done easily with our inlet works packages which deliver screening, washing, transport, compaction and de-watering in a single, stand-alone package.

MNSS Combined Screen

The MNSS Combined Screen is a robust, reliable inlet works system that combines screening, washing, transport, compaction, and dewatering in a single cost-effective standalone solution. The MNSS Combined Screen is designed for smaller plants and those facilities that require a more cost-effective screening solution. It is easy to install and ideal for use in municipal or industrial applications that require a simple and robust solution to remove fine solids from a flow. Can be tank mounted or installed in a concrete channel.

Benefits:

- Prevent screenings from clogging up the treatment plant, improving efficiency.
- Screening of storm flows at WwTWs and Combined Sewer Overflows (CSOs) to ensure no unscreened sewage is released to watercourses.
- Long component lifetimes and reduced maintenance creating significant savings.
- Packaged plant system available.
- Reduce maintenance and downtime with the patented bottom end bearing which supports the auger and greatly extends the life of the brush.



The MNSS Combined Screen combines screening, washing, transport, compaction, and dewatering in a single cost-effective standalone solution.

Kuhn GmbH

As their sole representatives within the UK, we have enjoyed a long-standing partnership with Kuhn GmbH over many years. We supply, install, service, and maintain their range of wastewater and industrial solutions, including: screw pumps, rakes, washing and screw presses, spiral screen, spiral conveyors and complete plants. Our most popular products in the range are:

Kuhn Wash Press

The Kuhn Wash Press is designed for washing out organic soluble material from coarse or fine screening. Its multifunctional capability transports, dewateres and compresses wastewater, delivering a degree of washout of up to 95% and dewatering up to 50% of dry matter.

Benefits:

- Reduction of disposal costs resulting in overall efficiency and savings
- Perfect for smaller plants thanks to its small dimensions and compact design.
- Reduced costs due to the use of high-quality materials and a long service life.



The Kuhn Wash Press transports, dewateres and compresses wastewater screenings.



Kuhn KHU multi-rake screen

The KUHN KHU multi-rake screen was developed by practitioners for practitioners - the stable and robust design principle makes the KUHN KHU multi-rake screen ideally suitable for the most difficult applications. These include plants characterised by high volumes of disturbance material, such as stones and sand.

Oversizing of stress-related elements ensures that components and the entire system enjoy a long service life. The design of our KUHN KHU multi-rake screen ensures optimum ecological and economical operation and secures your investment in the long term.

Benefits:

- Maximum separation capacity and designed for the largest conveying levels and channel widths.
- Simple retrofitting in existing plants.
- Cuts costs with simple maintenance and overload protection that safeguards the machine against damages.

FSM Frankenberger GmbH & Co. KG

FSM Frankenberger has been manufacturing market leading wastewater screening solutions since 1970 from its Pohlheim, Germany headquarters. We are the sole UK and Ireland sales channel for FSM Frankenberger's range of inlet works screening solutions. Our most specified screens in this range are:

FSM Filterband Screen

The FSM Filterband screen is reliable fine screen that is ideally suited to pre-treatment of sewage and sludge screening. It is a robust construction designed to eliminate the need for upstream coarse screening with standard screening dimensions available from 2 to 12 mm perforations.

Benefits:

- To reduce the risk of blockage, the filter elements have been designed to optimise cleaning capabilities.
- The filter screen will allow the passage of grit without malfunctioning.
- Robust by design with low maintenance costs, and an excellent cost/performance ratio helps to reduce OPEX.
- Protects the efficiency of downstream equipment with an average capture rate of 85%.



The robust FSM Filterband Screen delivers fine screening of sewage and sludge with no requirement for coarse screening upstream.



FSM Alpha Beta Escalator Screen

The FSM Alpha Beta Escalator screen is an innovative inlet screen and storm screen which allows higher hydraulic flows to pass through a fixed channel when compared to a conventional escalator screen. The 30° angle of the screen below the water level provides nearly double the screen surface available for screening, enabling an increase in flow throughput through existing channels.

Removing more solids than conventional screens, the FSM Frankenberger Alpha Beta screen can improve the efficiency of ferric dosing plants, and protect Membrane Bioreactor (MBR) processes, helping to reduce the amount of phosphorus that needs to be removed before discharge to a watercourse.

Benefits:

- The 30° angled screen delivers up to 93% more screening surface when compared to a 75° FSM Filterband screen, and enables higher throughput with the same footprint.
- Ideal for retrofit into existing channels, significantly reducing civils costs.
- Reduced through flow speed increases screening performance.



The FSM Alpha Beta Escalator Screen can screen higher flows than a conventional escalator screen in the same footprint, saving space and cutting the costs of civils works.



Hydro-Dyne® Engineering

We are Hydro-Dyne® Engineering Inc's sole UK representatives for their range of heavy duty, custom-built wastewater screening applications to maximise workflows. The range includes Great White screens, Bullshark screens and Sand Shark grit removal equipment.

Bull Shark Through Flow Screen

The Bull Shark Through Flow Screen comes with a variety of grid types, opening sizes and models available and is ideal in a wide range of environments. The screen's extremely strong stainless-steel grid reduces headlosses to well below industry standards. All stainless-steel construction and UHMWPE wear surfaces provide years of trouble-free operation.

Benefits:

- Extremely reliable and adaptable screen series.
- Strong and versatile with all 304 or 316 stainless steel fabrication.
- Heavy-duty, high-capacity, continuous band screen.
- Coarse or fine screening.
- Directly retrofits into existing channels and can pivot for bypass.



To find out more about our inlet works screening solutions, or if you would like to hire an inlet works screen, please call 01275 878371 or email enquiries@hydro-int.com.

Sludge screening

Hydro-Sludge™ Screen

A small-footprint, low-maintenance system designed to work early in the sludge management process, the Hydro-Sludge™ Screen can handle dry solids of up to 9% and delivers screenings at up to 40% total solids - enabling operators to protect valuable equipment, reduce blockages and increase the efficiency of downstream treatment processes.

The Hydro-Sludge™ Screen is perfect for smaller works with no inlet screens or where tankered sludge is received and requires screening. It generates a drier output that is easier and cheaper to handle and transport, whether for disposal or as a higher-value biosolids product for energy generation.

Benefits:

- Improves downstream process efficiency.
- Cuts maintenance costs.
- Generates significant savings on solids handling.
- An easy-maintenance design with a reverse function hatch, inlet access and extended discharge area making routine inspection, cleaning and maintenance activities quick, simple and safe.



The small-footprint, low maintenance Hydro-Sludge™ Screen is ideal for small works with no inlet screens or for screening of tankered sewage.

To find out more about how our Hydro-Sludge™ Screen can help you prevent clogging caused by rag or if you would like to hire a unit, please call 01275 878371 or email enquiries@hydro-int.com.

For Product Sales call: 01275 878371
Email: enquiries@hydro-int.com

Grit removal

Grit King®

The Grit King® is a compact, unpowered advanced grit management system that removes 95% of 106 µm particles or larger, protecting wastewater treatment plants from the expensive impacts of grit abrasion and deposition.

Delivering exceptional separation in a single unit with no moving parts and no external power requirements, the Grit King® provides superior grit removal with low operational and maintenance requirements. Capable of handling flows as low as 11 l/s with a single unit and virtually any flow with multiple units, Grit King® is ideal for small, medium or large facilities.

Available in free-standing or in-situ configurations, the Grit King® can be easily linked to existing processes.

Benefits:

- Improves downstream process efficiency.
- Cuts maintenance costs.
- Generates significant savings on solids handling.
- An easy-maintenance design with a reverse function hatch, inlet access and extended discharge area making routine inspection, cleaning and maintenance activities quick, simple and safe.



With no power requirement for separation and no moving parts the Grit King® has OPEX and is easy to maintain.

Visit: hydro-int.com/products

HeadCell®

HeadCell® is a stacked tray grit separator that retains 95% of all grit 75 micron and larger. With a small footprint, no electrical requirements and no moving parts, HeadCell® delivers exceptional and economical solids removal for small, medium or large wastewater treatment plants.

HeadCell® enables plants to meet stringent environmental requirements with less odour. It can be installed in a poured-in-place concrete basin above or at grade, with a footprint much smaller than conventional grit removal systems.

Benefits:

- Large surface area in a small footprint.
- No moving parts or external power source.
- Less than 30 cm of headloss to operate.
- Double treatment capacity in the same footprint as conventional grit removal equipment.
- Economical to operate, contributing to lower OPEX.
- Easily accommodates high turndown ratios.
- Reduced manual intervention and easy to maintain.



The HeadCell® will deliver removal of 95% of all grit down to 75 microns, reducing wear on conveyancing equipment and preventing clogging of treatment processes.

To find out more about how our grit removal systems can help protect and extend the life of your treatment processes, please call 01305 821142 or email ukwws@hydro-int.com.

For Product Sales call: 01275 878371
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For Services call: 01305 821142
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Our work in action

MNSS Combined Screen protects Greenham Common STW from rag carry over

The untreated wastewater that Thames Water's Greenham Common Sewage Treatment Works (STW) receives has a high rag content and repeated carry over was affecting the full treatment process and overall performance of the site. There was a risk that the site would go out of compliance and ultimately result in pollution of the waterways and fines from the regulator.

We supplied and installed an MNSS Combined Screen to capture larger influent materials at the front end of the wastewater treatment process, protecting and improving the efficiency of the downstream treatment system. An innovative wash water system was also designed and built using the effluent from the Primary Settlement Tank on site.



The MNSS Combined Screen at the inlet works protects the downstream processes from clogging by removing the rag and large solids from the inflow.

"We needed a suitable solution that was effective and within budget, and the team delivered that. We are very happy with the work undertaken on this site and will be using it as an example to our other Thames Water teams who may encounter the same issues."

Henry Crompton, Lead Project Engineer at Thames Water Utilities Ltd

Visit: hydro-int.com

MNSS Combined Screen helps Southern Water meet increasing flow rates at Isle of Grain WwTW

Until 2018, Southern Water's Isle of Grain treatment works featured a screen and macerator configuration struggling to keep up with operational demands and in need of refurbishment or replacement.

Increasing flow rates and hydraulic challenges at Southern Water's Isle of Grain WwTW meant that instead of a like-for-like replacement, a new Inlet Works solution that could handle the increased capacity was required.

We designed a modular pre-fabricated 'Turn Key' Inlet Works package that could be brought to site ready for installation by the contractor; eliminating the need for costly civil adjustments to the channel width. We were able to design a fabricated steel structure, housing the entire Inlet Works package that could be fitted directly into the channel.

Featuring two MNSS5 Combined Spiral Brush Screens, a hand rake bypass screen and dedicated control panel, this "lift & fit" unit was able to deliver screening, washing, transport, compaction and de-watering in a single "stand-alone" package.

Isle of Grain's 'Turn Key' Inlet Works package was operational in just 8 weeks and the solution provides both OPEX and TOTEX savings; including low power consumption, hard wearing components and easy access for routine maintenance as both screens were mounted to pivotal frames.



The MNSS Combined Screen inlet works package fitted directly into the existing channel, eliminating the need for costly civils works.

Inlet Works solution cuts OPEX costs and carbon footprint at Carbarns WwTW

The 6 mm fine inlet screens at Carbarns WwTW were failing regularly as the plastic screen panels were very prone to breaking, particularly following storm events when flows were higher and contained more debris.

The biggest impact of this inlet issue was the financial and carbon implications. Normally sewage sludge was sent directly to the Daldowie fuel plant to be processed into a renewable, low carbon form of biomass fuel pellet. However, because of the high content of rag in the sludge caused by the inlet screen failures, the sewage sludge first had to be tankered to Shieldhall WwTW, some 20 miles away, for further processing, before being pumped over to Daldowie. With up to 23 tankers a week transporting sludge, the associated costs were considerable.

Scottish Water worked with Hydro International's UK Wastewater Services team to find a solution. The team installed a Kuhn KHU-S Multirake Boomerang 70mm screen to remove coarse screenings and protect the two FSM FRS111 escalator screens which provide fine screening. The FSM screens were fitted at 60°, giving an impressive maximum flow capacity of 770 l/s each.

Each of the screens has capacity to take the full flow to treatment, should one need to be taken off-line for maintenance or repair, and the screen panels are stainless steel so able to withstand storm flows. A launder system was installed to transport rag to two Kuhn KWP-HD 400/1200 wash presses to process, wash and compact the rags.

"Knowing the team for over 20 years, we were confident that they would provide a solution that works exceptionally to meet our needs. Since the project's completion in September 2020, there has been a significant reduction in costs and carbon use now that the sludge can be transported directly to Daldowie Fuel Plant for processing. The amount of reactive time that operation staff previously needed to spend dealing with chokes and cleaning up has dramatically reduced, with a knock-on effect that morale has improved, providing more time to spend on proactive tasks."

Stephen Heatley, WW Operations Team Leader at Scottish Water.

The new FSM FRS111 escalator screens installed at the Carbarns WwTW site, providing robust, and reliable screening.





Contact us:

To find out more about our UK wastewater solutions:

Services enquiries:

call **01305 821142**
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