



Pump Action Screen - PAS

(Patented)



General Overview:

Combined Storm/Sewage systems carry both rainwater and sewage in a common pipe. During periods of heavy rainfall, the capacity of the system can be exceeded and an overflow (CSO) is required to prevent surcharge of the system. It is desirable and in certain countries, a legal requirement, to prevent the discharge of sewage related debris and gross solids greater than 6mm in two directions from polluting the receiving water course or coastal water.

The Pump Action Screen (PAS) is a simple and robust CSO mechanical screen which consists of a half round Stainless Steel basket with 6mm perforations, submersible pump, distribution pipework and a venturi. It is designed to prevent the discharge of non-biodegradable solids greater than 6mm in two directions. The screening debris is scoured from the underside of the screen basket and punched passed the end of the screen eliminating potential representation.



▲ Twin screen arrangement



▲ Pump mounted on a guide rail for Easy above chamber maintenance



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There are two potential pump options to accommodate most applications which are located in the flow side of the chamber.

There are no mechanical moving parts within the screen basket itself. The pump can be installed on a guide rail for easy access and therefore eliminating the need for hazardous man entry into the chamber during maintenance.

Benefits:

- 6mm screening in two directions
- High Solids Retention Value (SRV) of 58%
- Robust proven technology
- Minimal maintenance
- No moving parts
- Modular system for retrofitting through existing manholes
- Improved screening efficiency due to scour system's reduction of presented screenings
- No hazardous man entry necessary
- Introduction of air reduces oxygen demand of the spill and pass forward flow.



▲ Scouring Action



▲ Underside of 6mm perforated basket



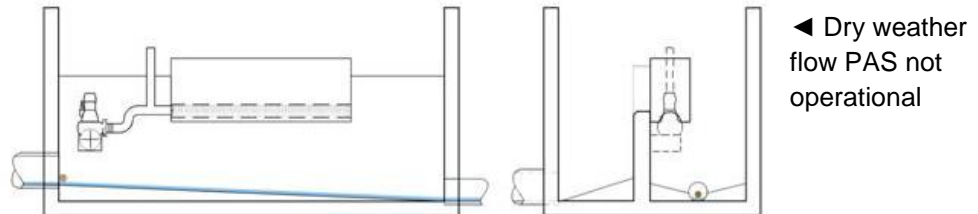
▲ Underside of a 6mm perforated basket



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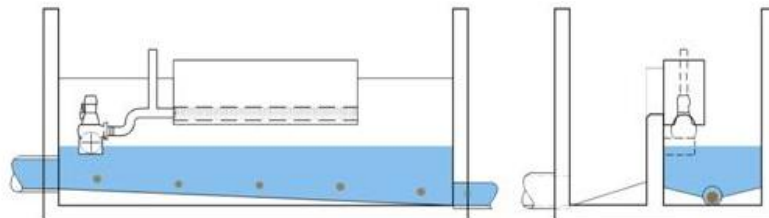
Operational Description:

The PAS is installed on the flow side of the overflow weir.

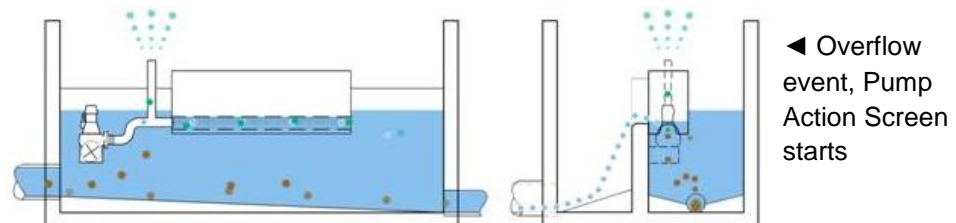


As the water level rises to the underside of the screen, an ultrasonic head detects the level and sends a signal via the control panel to start the pump.

Storm flow ► commences PAS not operational



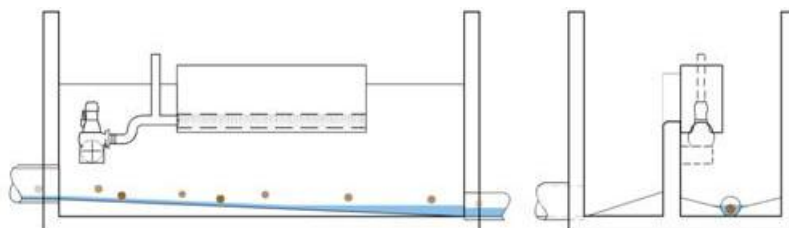
Once the pump has started it then drives the water passed a Venturi that entrains air into the flow. The air and water are combined in the mixing section, prior to entering the screen basket. The air/water mixture scours the underside of the screen removing debris and preventing the screen for blinding.



The power of the scouring action transports the screening debris passed the end of the screen keeping them in the continuation flow.

Once the flow has subsided, a second signal from the ultrasonic unit switches the pump off.

End of ► storm event PAS not operational



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There are two pump options available for the Pump Action Screen:

Option 1:

Low Level Pump



Submersible pump is cooled by the surrounding water.

Option 2:

Inline Pump



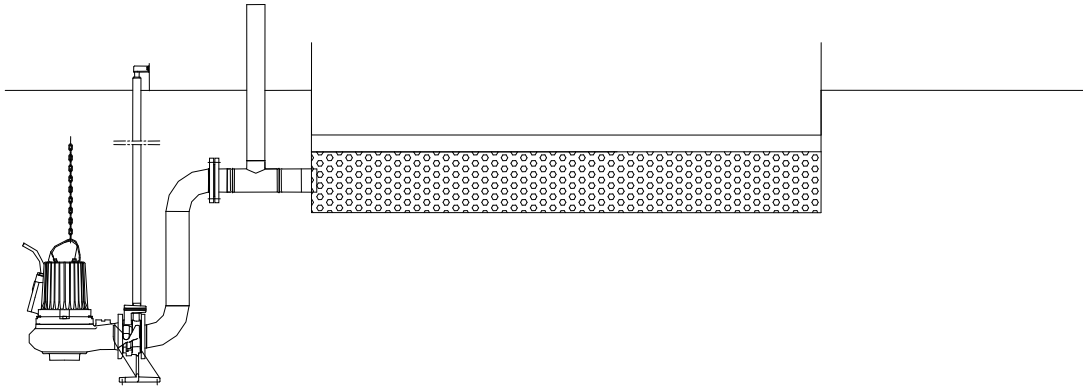
The inline pump is cooled by air / oil and is suitable for very shallow chambers.



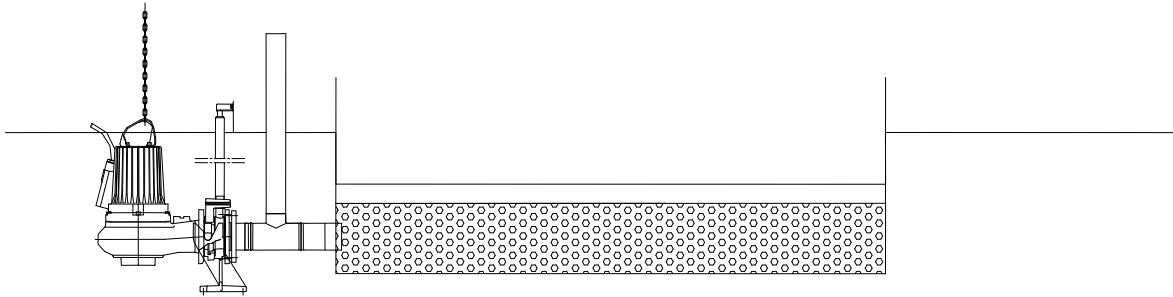
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Generic Installation Layouts:

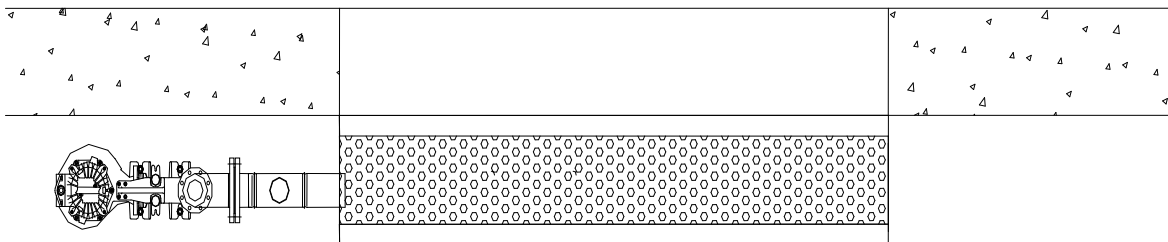
Option 1: Low Level Pump



Option 2: Inline Pump



Plan View





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Applications:

The PAS is designed to be installed on the flow side of a CSO chamber, wet well or storm tank. The flow rises up through the screen and then over the weir to the water course.

The PAS is currently available in two screen diameters: 300mm and 500mm, however it is possible to provide multiple screens together to handle higher flow rates.

There are also two pump options: a submersible pump for storm tank and chamber applications where there is a minimum 1000mm available between the invert level and the weir level, or alternatively an air/oil cooled pump where chamber depth is minimal. Both pumps are available with guide rail systems which enable the pump to be lifted out to the surface whilst maintenance is being carried out. The guide rail system eliminates the need for hazardous man entry into a confined space. Both pumps are designed to handle raw sewage and are mounted on the continuation flow side of the chamber or storm tank.

The screen basket can be supplied in modular lengths for insertion through existing man access ways if required.

Capacity Tables:

The design tables listed below will help in sizing the screen and chamber requirements.

Note: Pump power requirements for any screen are between 2.2kW and 5kW.

Pump Action Screen 300		
Screen Length Effective m	Screen Length Overall m (min)	Maximum Capacity l/s
1	2	195
1.5	2.5	293
2	3	391
2.5	3.5	489
3	4	587
3.5	4.5	685
4	5	782
4.5	5.5	880
5	6	978
5.5	6.5	1076
6	7	1174

All capacity figures assume a blinding rate of 50%. Standard pumps are tested and supplied with the PAS design are: KSB, FLYGT and EMU



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Pump Action Screen 500		
Screen Length Effective m	Screen Length Overall m (min)	Maximum Capacity l/s
1	2	282
1.5	2.5	423
2	3	564
2.5	3.5	705
3	4	846
3.5	4.5	987
4	5	1129
4.5	5.5	1270
5	6	1411
5.5	6.5	1552
6	7	1693

For flows in excess of those details given above, please contact us.

WaPUG Design Guide: The WaPUG design guide 2006 is available free of charge from the WaPUG website at www.wapug.org.uk

The PAS screen conforms with the latest WIMES 5.04 specification

National CSO Test Facility, Wigan – Test Results:

Test Date:	April 2003
Testing Company:	Thompson RPM
Screenings Retention Value	58%
Test Report Number	TRPM-REP094



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Design Information:

In order to provide you with a complete proposal please provide us with the following information:

Design spill flow rate:	l/s
Maximum permissible head over the weir:	mm
Available weir length:	mm
WaPUG Design Chamber:	Yes/No (delete as appropriate)
Is the chamber new or existing:	New / Existing
What is the inlet diameter:	mm
What is the outlet diameter:	mm
What is the chamber length:	mm
What is the screen chamber width:	mm
What is the overall chamber width:	mm
What is the invert level:	AOD
What is the weir level:	AOD
What is the underside roof slab level:	AOD

Please also provide a CAD drawing of your chamber.

Name:.....

Company:.....

Telephone No:.....

Fax No:.....

Email:.....

Please fax this form back to : +44 (0) 1732 701050

or

Email to: sales@csotechnik.com



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Materials of Construction:

Screen basket	Stainless Steel 304, (316TI Option) Electro polished
Ejector	Stainless Steel 304, (316TI Option)
Pipe work	Stainless Steel 304, (316TI Option)
Pump casing	Cast Iron

Maintenance:

After every storm event, the screen should be visually inspected to insure the pump is operational and the screen basket has been cleaned effectively.

In the event of a power failure during operation the screen should be power washed to remove any built up debris.

The screen has no moving or maintainable parts. The pump is installed on a guide rail system for easy maintenance outside the chamber.

The pump should be maintained by a manufacturer approved or trained supplier and carried out in accordance with the manufacturer's instructions.

Technical Data:

Diameters:	300mm & 500mm
Length:	6m
Power:	400/50/3
Rating:	To suit application
Motor:	IP68

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