Hydro-Brake® Agile Flow Control
Design Data

Hydro-Brake® Agile flow control is a float activated flow control device that is designed to maintain a constant discharge rate without the use of external energy sources.

Ideally suited to sites where there are considerable constraints on the available space for on-site attenuation and stringent discharge consents, the Hydro-Brake® Agile flow control delivers precise flow control over a range of heads.

1. Float arm.
2. Precision engineered control mechanism (beneath guards).
3. Mounting plate.
4. Sliding gate.
5. Outlet orifice.
6. Integral benching guide.
7. Pull cords for manual gate operation (omitted for clarity).

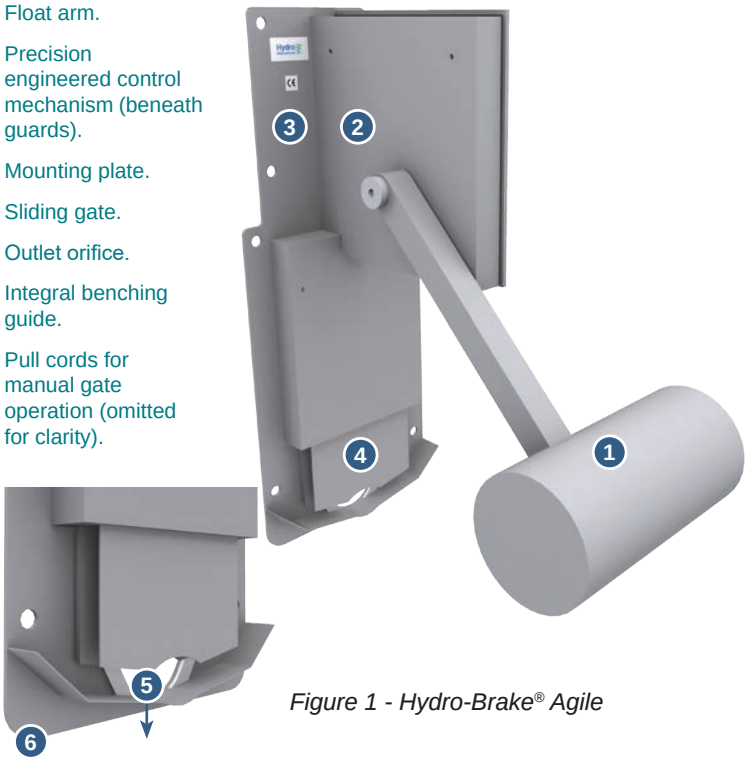


Figure 1 - Hydro-Brake® Agile

Precision Engineered Float Control

The Hydro-Brake® Agile flow control consists of a float arm that is connected via a series of custom configured components to a sliding gate, placed over an outlet orifice.

Manufactured from high grade stainless steel (typically 304L or 316 as appropriate) with durable internal components under our comprehensive Quality Assurance procedures, the Hydro-Brake® Agile Flow control will deliver reliable, repeatable and precise flow rate regulation.

The Hydro-Brake® Agile Flow control has been assessed in accordance with all relevant essential Health & Safety requirements and standards and is CE marked under the EU Machinery Directive (2006/42/EC).

Benefits

- Constant discharge over a wide range of heads.
- Discharge matched to the carrying capacity of the downstream infrastructure.
- Precision engineered components.
- Large cross-sectional outlet area during critical dry weather and first flush flow periods.
- CE marked in accordance with the EU Machinery Directive (2006/42/EC).
- Rapid drain down, providing system resilience for subsequent rainfall events.
- Self-activating.
- No external power or control circuits.
- Future-proof – simple adjustment possible for future changes in operating conditions.

Applications

- Surface water management and SuDS.
- Flood alleviation and prevention.

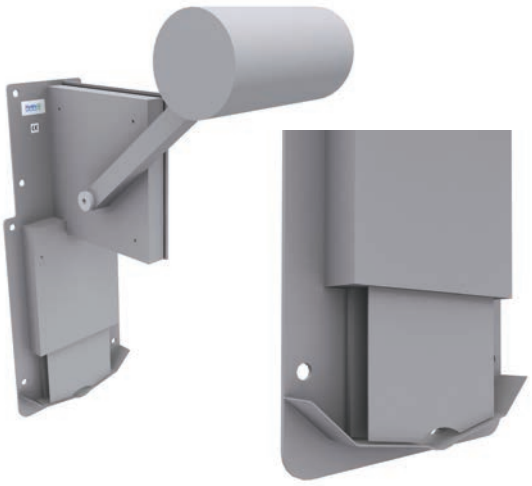
Suitability:	Constrained sites with stringent discharge consents		
Flow Range (l/s)	**Head Range (m)**	**Ability to match greenfield discharge rate**	**On-site water storage requirement**
4.5 – 100	0.4 – 2.4	Good	Very low
Moving Parts?	**External Power?**	**Risk of blockage?**	
Yes	No	Not suited to all sites	

Operating principles

a) Low Flow / Dry Weather Flow

During low flows, the water level remains below the float arm and the gate is in its fully open position. The discharge flow rate is controlled by the outlet orifice.

Under these conditions, the unit remains fully open, allowing any waterborne debris to pass forward almost unimpeded.



b) Attenuating Flows

As the flows increase, the outlet orifice starts to restrict the flows and the water level in the flow control chamber will begin to rise. This will, in turn, cause the float to rise. A precisely configured set of internal components transmits this upward motion of the float to the gate that is positioned in front of and above the outlet orifice and begins to close the gate. As the gate closes, the cross-sectional area of the outlet available for water flow is reduced and a constant discharge rate is maintained even as the water level continues to rise.

The discharge rate will generally be set to the maximum rate that can be accepted without compromising the capacity of the downstream infrastructure.

c) Extreme Flows

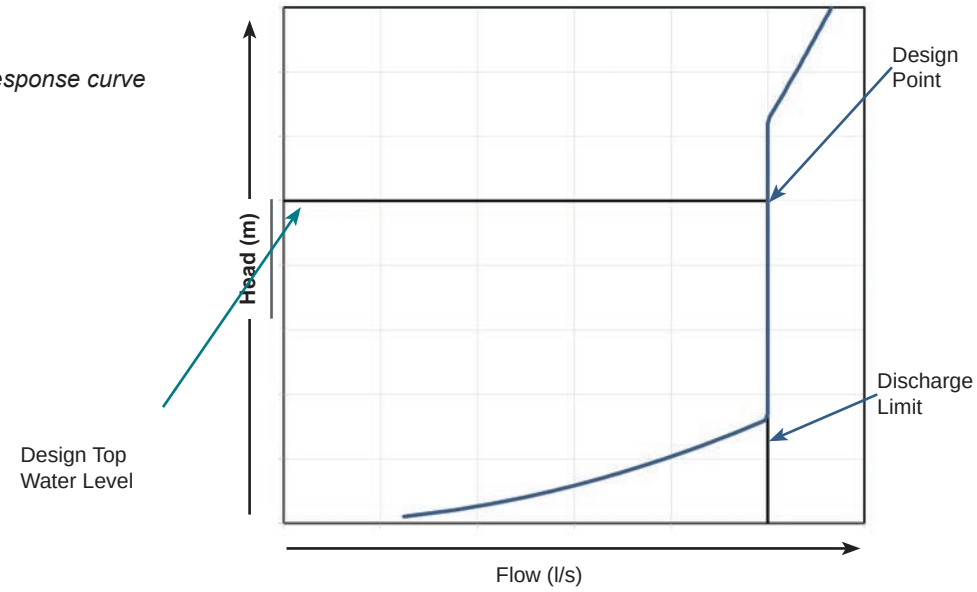
If the upstream water level reaches a predetermined top water level associated with the design storm event, the internal controls will prevent the gate from closing any further. For further increases in head, the discharge will be limited by the outlet orifice at its closed position.

d) Drain Down

As the water level subsides, the float will return to its resting position and the gate will return to its fully open position.

A high discharge rate will be maintained as the water levels subside, rapidly draining the upstream system in readiness for subsequent rainfall events.

Typical head / flow response curve



Weights and dimensions

The Hydro-Brake® Agile is available in 6 different models and with 4 different sized outlet orifices: 150 mm, 200 mm, 250 mm and 300 mm.

Each size has a different set of dimensions and operating values, these are given in the table below:

Model	150	200	250	300	150L	200L
Design head range	0.4-1.2 m	0.4-1.2 m	0.4-1.6 m	0.45-1.9 m	0.4-2.4 m	0.4-2.4 m
Overall height	1320 mm	1320 mm	1720 mm	2060 mm	2520 mm	2520 mm
Maximum protrusion from wall (inc. float)	886 mm	886 mm	1108 mm	1260 mm	1586 mm	1586 mm
Block height	1245 mm	1245 mm	1460 mm	1675 mm	1928 mm	1928 mm
Block width	600 mm	600 mm	700 mm	750 mm	600 mm	600 mm
Chassis thickness	6 mm	6 mm	8 mm	8 mm	6 mm	6 mm
Mass	60 kg	60 kg	100 kg	150 kg	240 kg	240 kg
Flow rate	4.5-25 l/s	26-35 l/s	36-60 l/s	61-100 l/s	4.5-25 l/s	26-35 l/s
Minimum recommended manhole diameter	1.8 m	1.8 m	2.1 m	2.1 m	2.4 m	2.4 m
Minimum outlet pipe	225 mm	225 mm	300 mm	375 mm	225 mm	225 mm

Expert Design Support Services

Hydro International's professional engineers work with you to provide expert technical and aftersales support to ensure your projects meet exacting design requirements and deliver the very best hydraulic controls for your site.

With over 40 years' experience of flow control knowledge and experience, Hydro International's design support team is available to advise on any aspect of water flow management, including detailed modelling of active flow controls.

Easy to Install

The Hydro-Brake® Agile flow control is supplied complete with all mechanical fixings for a quick and easy installation. Units can also be supplied pre-fitted within a pre-cast concrete manhole chamber base to allow for simple plug-and-play installation on site.

No commissioning or in-situ testing or adjustment is required.

Easy to Maintain

The Hydro-Brake® Agile flow control is manufactured from high-grade stainless steel, with long-life, durable components. In the event of a blockage, an integrated release mechanism enables the gate to be fully opened and returned to its operating position from surface level. The precision components are protected from fouling or damage by robust, stainless steel guards, enabling jetting equipment to be used if required.

Technical Details and Further Information

Hydro International will supply detailed hydraulic data and dimensioned installation drawings for each unit.

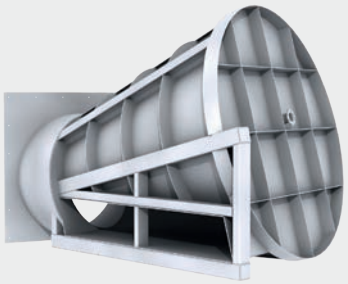
The Hydro-Brake® Flow Control Series

As a brand leader for vortex flow controls for more than 40 years, Hydro International continues to set the standard in flow control management technologies.

The Hydro-Brake® Flow Control Series is a comprehensive and versatile toolbox of precision-engineered devices for flow attenuation and control that can help:

- Deliver compliant schemes with scalable, precision flow control performance.
- Precisely balance flow rates and upstream storage requirements on every project.
- Save land-take and costs with optimised flow control performance.

Hydro-Brake® Optimum



Hydro-Brake® Flood

Hydro-Brake® Agile

Hydro-Brake® Orifice

Features	Hydro-Brake® Flood	Hydro-Brake® Optimum	Hydro-Brake® Agile	Hydro-Brake® Orifice
Suitability	For watercourses; Flood storage reservoirs	Most sites, from very low to very high flow rates	Constrained sites with stringent discharge consents	Unconstrained sites with generous discharge consents
Flow Range (l/s) *	550 – 12,000	0.7 – 550	4.5 – 100	2.5 – 100
Head Range (m) *	1.5 – 10	0.4 – 4.0	0.4 – 2.4	0.25 – 2.0
Ability to Match Greenfield Discharge Rate	n/a	Very good	Good	Not suited to all sites
Moving Parts	No	No	Yes	No
External Power Requirement	No	No	No	No
Constant Discharge	No	No	Yes	No
On-site Storage	Low	Low	Very low	Unconstrained
Risk of Blockage	Very low	Very low	Not suited to all sites	Not suited to all sites

* flows and heads outside of these ranges may be possible (contact Hydro International to discuss)

To find out more about how the Hydro-Brake® Flow Control series can help you deliver optimised drainage designs call 01275 337937 or visit hydro-int.com/hydrobrake-uk

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