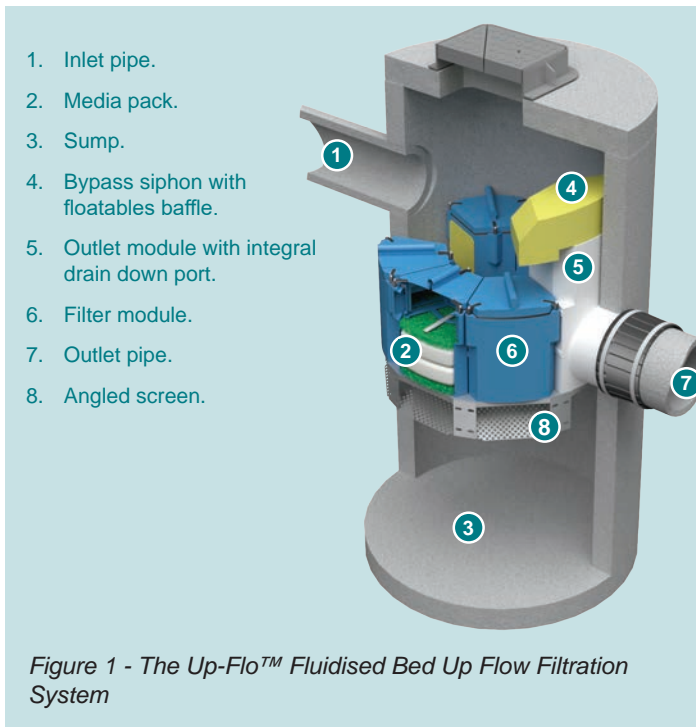


## Up-Flo™ Filter

### Fluidised Bed Up Flow Filtration System

The Up-Flo™ Filter is an innovative surface water filtration technology that delivers a high performance multi-stage treatment train within a single device. The Up-Flo™ Filter combines sedimentation and screening with fluidised bed filtration technology to deliver high levels of performance.



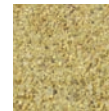
### Components and Filter Media

The Up-Flo™ Filter packs a 4-5 stage treatment train into a single device that can be fitted into a standard manhole. Settleable solids are collected in the chamber sump, whilst floatable material gathers in the central chamber.

An angled 4 mm perforated screen prevents coarse material from reaching the filter media. The media itself can be tailored to target specific pollutant groups and, where required, promote reactive filtration. The fluidised bed technology prevents blinding, clogging and compaction of the media surface, whilst ensuring that no wormholes can form to short-circuit the treatment process.

Filter media options include:

**Filter Sand:**  
A good all-round media to target sediment and sediment-bound pollutants.



**CPZ™ Mix:**  
An engineered media to promote reactive filtration for enhanced treatment of metals, nutrients and organics.



Watch a short video showing the Up-Flo™ Filter operation at:

<http://www.hydro-int.com/uk/products/flo-filter>

### Repeatable, Reliable Performance

The Up-Flo™ Filter combines multiple sequential treatment processes to deliver sedimentation, screening and filtration all in one compact unit to remove a wide variety of pollutants including:

#### Very Fine Particles



Greater than 80% removal of fine sand and silt particles to a mass-median particle size of 22 µm.

See Technical Abstract: Performance Verification of Sediment Removal with Sil-Co-Sil 106 for your media of choice.

#### Gross Pollutants



Inclusion of the angled screen and protected bypass syphon effectively removes gross pollutants, including litter and leaf debris.

#### Liquid and Sediment Bound Hydrocarbons



Removal of various forms of hydrocarbons, including polycyclic aromatic hydrocarbons (PAHs).

#### Heavy Metals



Greater than 70% removal of metals commonly found in surface water runoff.

See Technical Abstract: Field Evaluation of Metals Removal.

#### Nutrients



Greater than 70% removal of phosphorus and other nutrients.

See Technical Abstract: Field Evaluation of Phosphorus Removal.

# Design Data

## Up-Flo™ Filter

### Fluidised Bed Up Flow Filtration System

## Sizing

The modular design of the Up-Flo™ Filter ensures that project specific treatment goals are easily met. Intended for intercepting pollutants at or close to source, the modular components are standardised for installation into a standard 1.2 m diameter manhole. For larger catchment areas, custom built vaults can be created to accommodate additional filter modules.

For design purposes, the selected number of modules required should be such that the total Treatment Flow Rate is greater or equal to the site's Water Quality Flow Rate.

The hydraulic capacity of the system should be considered with respect to the peak discharge flow rate from the site or pipe full flow rate.

Model	Chamber Size (m)	Number of Filter Modules	Treatment Flow Rate (l/s) <sup>a)</sup>	Hydraulic Capacity (l/s) <sup>b)</sup>	Operating Head (mm) <sup>c)</sup>	Oil Storage Capacity (l)	Sediment Storage Capacity (m <sup>3</sup> )
Manhole	1.2 m diameter	1-6	1.3 - 7.8	170	750	190	0.7
Vault	Site specific	7-19	7.8 - 24.7	170	750	Site specific	Site specific

#### Notes:

- a) Treatment flow rates based on >80% removal of Sil-Co-Sil 106 fine sand and silt ( $D_{50} = 22 \mu\text{m}$ ).
- b) Maximum flow rate that can pass through the chamber without surcharge to the upstream network.
- c) Driving head for filter media.

Table 1 - Up-Flo™ Filter design information.



## Expert Design Service

Hydro's professional engineers are on hand to provide free support with the correct sizing and application of the Up-Flo™ Filter within in each drainage design.

We can also provide estimated maintenance intervals, whole life cost estimates and predicted pollutant removal performance.

**Call the StormTrain® Hotline on: 01275 337955 or email [stormtrain@hydro-int.com](mailto:stormtrain@hydro-int.com)**

# Design Data

## Up-Flo™ Filter

### Fluidised Bed Up Flow Filtration System

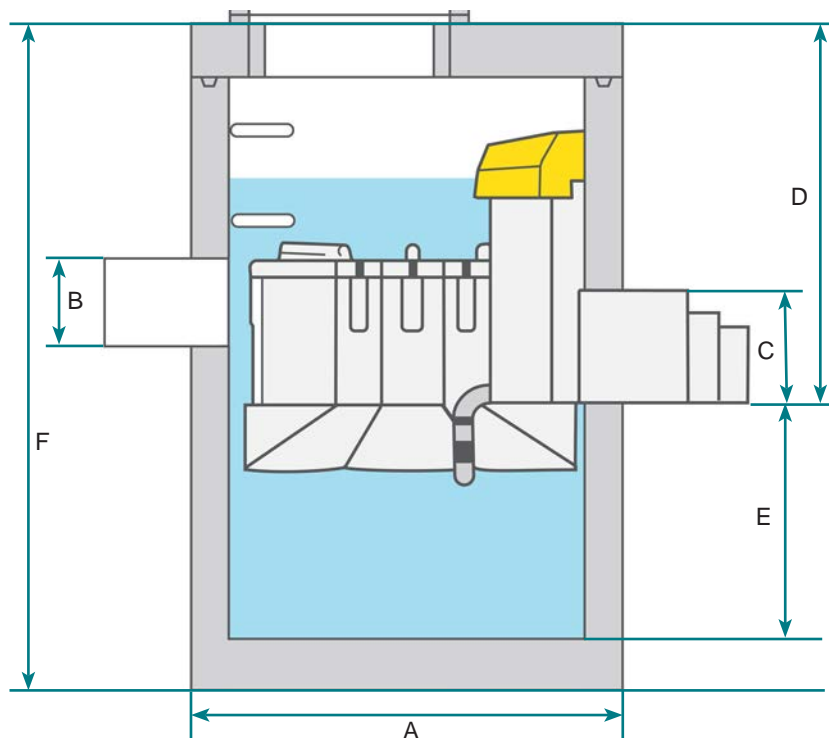
### Easy Installation for Trouble-free Construction

The Up-Flo™ Filter is typically delivered to site as a pre-cast concrete manhole, complete with innovative manhole sealing system and internal components already installed. Installation is therefore similar to any other manhole installation on site.

The relative position of the filter modules and the inlet / outlet pipes can be adjusted to suit site conditions.

The outlet adapter allows a variety of different outlet pipe sizes to be easily connected (see Table 2).

Full installation guidelines are available.



### Dimensions and Weights

The dimensions in Table 2 are given as a guide for standard manhole configurations. Vault configurations are site specific.

Detailed general arrangement drawings are available for download from <http://www.hydro-int.com/uk/products/flo-filter>

Unit	External Diameter of Unit (mm) (A)	Inlet Pipe Diameter (mm) <sup>c)</sup> (B)	Outlet Pipe Diameter (mm) <sup>c)</sup> (C)	Depth (m)			Lift Weight (t)
				Depth to Outlet Invert (m BGL) (D)	Sump Depth (m) (E)	Component Depth <sup>a)</sup> (m) (F)	
<b>1.2 m Sealed Manhole System with HD Cover Slab</b>	1460	300	225-375	1.150	1.100	2.560	n/a
HD Cover Slab <sup>b)</sup>						0.230	0.60
Base Section						1.145	1.85
Top Section						1.330	1.60

**Notes:**

- a) Base and Top Section component depths are shown as the total height during transportation / before assembly on site. The total depth is the depth of the assembled unit.
- b) Cover slabs are heavy duty, suited for highways loading and are supplied with one or two access openings for maintenance.
- c) Stub pipes are provided.

Table 2 - Up-Flo™ Filter dimensions and weights.

# Design Data

## Up-Flo™ Filter

### Fluidised Bed Up Flow Filtration System

## Simple and Cost-effective Maintenance

The gentle and effective action of the Up-Flo™ Filter ensures the filtration media have a much longer life than comparable media filters, so maintenance is infrequent, cost-effective and simple, with just three easy steps:

- 1) Floatable debris and litter is skimmed from the water surface.
- 2) Sediment collected in the sump is removed with a standard vacuum tanker.
- 3) Filter media packs are exchanged with no specialist lifting or handling equipment required.

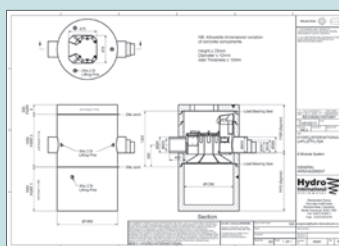
## Up-Flo™ Filter Technical Guidance



Case Studies



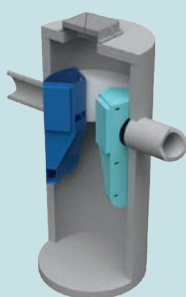
Installation and Maintenance Guidelines



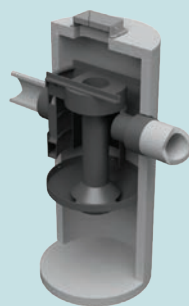
General Arrangement Drawings

## The Hydro StormTrain® Series of Surface Water Treatment Devices

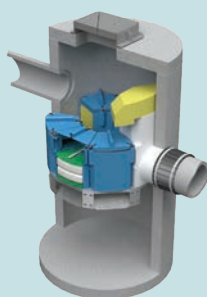
The Up-Flo™ Filter is one of the Hydro StormTrain® Series of surface water treatment devices. Each device delivers proven, measureable and repeatable surface water treatment performance. Each can be used independently to meet the specific needs of a site or combined to form a management train. They can be used alongside natural SuDS features to protect, enable or enhance them.



First Defense®  
Vortex Separator



Downstream Defender®  
Advanced Hydrodynamic  
Vortex Separator



Up-Flo™ Filter  
Fluidised Bed Up Flow  
Filtration System



Hydro Biofilter™  
Biofiltration System

Patent: [www.hydro-int.com/patents](http://www.hydro-int.com/patents)