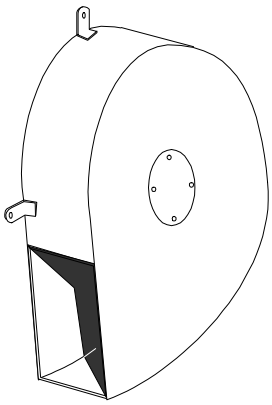
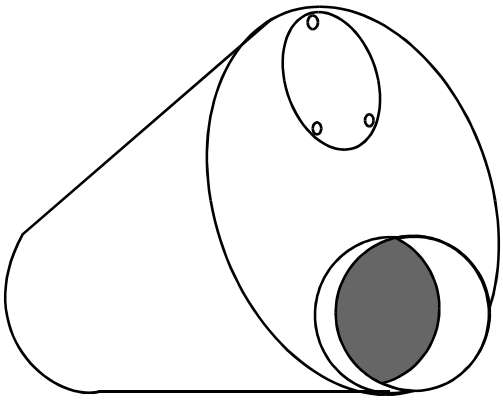
Types of Vortex Flow Control Unit

Flow Control units Fall into Three Main Categories

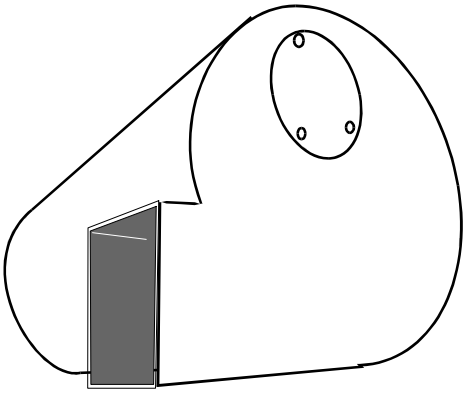
Within each Category the Vortex Chamber and the inlet and Outlet Dimensions are varied to give a vide variety of flow control units with differing characteristics



Radial Type Flow Control unit
Surface Water Only



Conical Type Flow Control unit
Rear Inlet



Conical Type Flow Control unit
Side inlet

Performance Characteristic

The Discharge curve of a flow control unit has a bistable characteristic. At low heads the *Discharge Coefficient* is relatively large allowing water to flow comparatively freely.

At a predetermined head the vortex begins to form within the *Vortex Chamber* causing a reduction in the *Discharge Coefficien*t. There is a short transitional phase where the *coefficient* is reduced as the vortex becomes fully formed. This is represented by the classic "kickback"in the curve.

Once Formed the vortex establishes a reduced but stable discharge coefficient

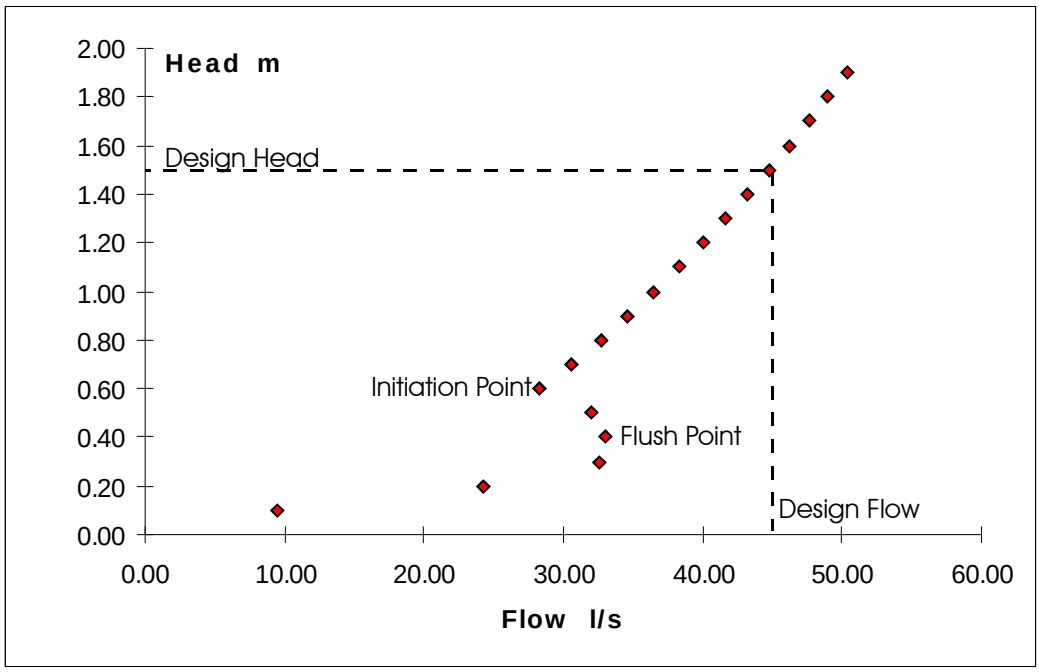
The significant points to note on the curve are :

1) The *Flush Point*. The point at which the initial flow peaks. For optimum performance this should be as close as practical to the *Design Flow* without exceeding it.

2) The *Initiation Point.* The point at which the vortex becomes fully formed and the discharge coefficient is stabilized.

3)The *Design Head*. The head at which the Design Flow is to be archived. This should always be above the *Initiation Point*

4) The *Design Flow*. The maximum discharge rate required for the system. This should always be in the stable region above the *Initiation Point*



The construction of the vortex flow control unit is varied to alter the head at which the flush point and initiation point occur
This gives rise to a number of different types and many variations within each type
For example reducing the cone angle of a conical unit or reducing the casing diameter of a radial type will lower the head required for initiation

Examples Follow

Emergency Drain down

A flow control unit is a choke point in the network and there is potential for a blockage. Consideration should be given to dealing with a blockage.

In the event it is likely that the chamber will be full of water and the flow control will probably be inaccessible. An alternate means of draining the chamber is highly recommended.

The emergency Drain down MUST BE CAPABLE OF BYPASSING THE ENTIRE FLOW CONTROL UNIT.

A blockage can occur at the inlet but it may equally well be inside the vortex chamber or obstructing the outlet. The drain down should be independent of the flow control unit.

We have always advocated the use of an entirely separate drain down pipe in the control chamber controlled by a penstock or disc valve.

Where there is only a single outlet pipe from a chamber there should be a branch off this pipe inside the chamber to allow for independent drain down. We offer a preformed stainless steel assembly which enables the contractor to install this branch pipe and drain valve quickly and simply before bolting on a vortex flow control unit or other flow control device.

We do not advocate siting the drain down valve on the upstream face of the flow control unit This arrangement bypasses only the inlet and may be ineffective if there is an internal blockage (such as a plastic bin bag) in the vortex chamber.