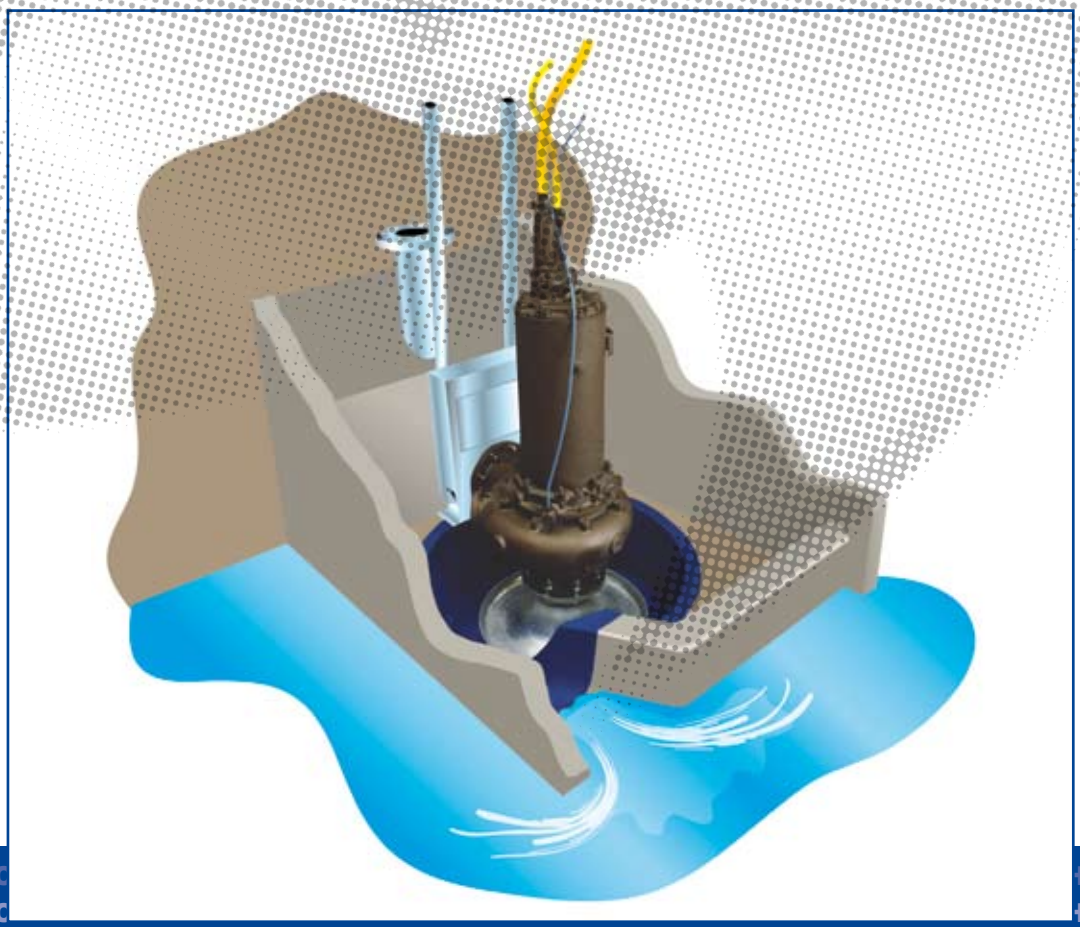
Prerostal Systems

for Automatic Flow Matching and Removal of Floating Materials

Typical Applications for Prerostal ™

- **Sewage Inlet and storm pumping stations**
- **Activated sludge pump stations**
- **Oily water pump stations**
- **Wash down systems**
- **Pump sumps with a high fat and grease inflow**
- **Pump sumps with floating materials**
- **Pump stations where stored volume is limited**
- **Where a shallow construction is a benefit**



THE HIDROSTAL PREROTATION PUMPING SYSTEM

WHAT IS PREROSTAL™?

Prerostal™ is a unique system developed by Hidrostal. It provides the pump user with:

1] A method of matching pump outflow to pump station inflow without the need for any additional items of moving plant or additional electrical equipment such as inverter drives

2] A highly effective sump cleaning system without the need for any additional items of moving plant.

It is a simple and economical solution for handling variable flow applications with large or troublesome solids that really does work!

Floating material is entrained and pumped from the wet-well

Self-cleaning action occurs at end of pump cycle

HOW DOES PREROSTAL™ WORK?

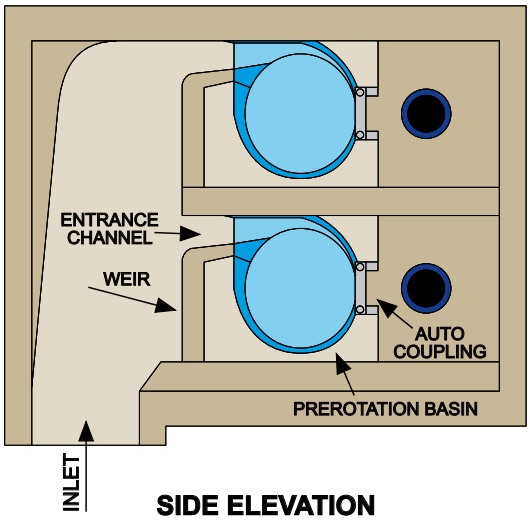
The Prerostal system consists of a Hidrostal guide rail mounted screw centrifugal pump fitted with a specially profiled bellmouth located centrally in a moulded prerotation basin. The basin is constructed with a partial weir in front to direct flow to the integral entrance channel. It is the geometry of the sump formed by the basin and bellmouth working in conjunction with the open ended weir which causes the flow entering the basin to rotate in a prescribed manner in the same direction as the pump.

The rotation speed of the prerotating flow in the basin varies according to sump level and reaches a maximum at the lower levels. It is the variable rotational speed of the flow entering the pump which ensures the output varies to match sump inflow. As the level in the sump rises, due to increased flow, then the speed of prerotation decreases and the pump progressively regains its maximum output.

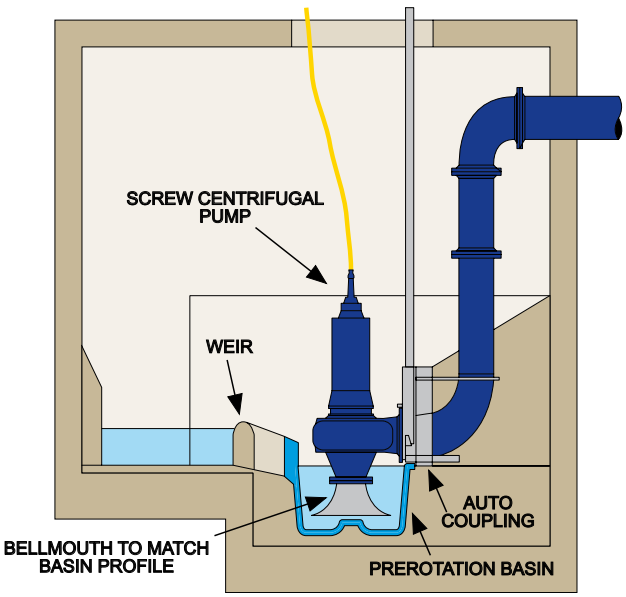
With the proper design of weir height, entrance channel width, basin and bellmouth geometry; automatic matching of discharge flow rate to the influent flow rate can be established while keeping the pump speed constant.

WET PIT VERSIONS

PLAN BELOW COVER SLAB



SIDE ELEVATION



The sump geometry has been designed to work in conjunction with Hidrostal's screw centrifugal pumps. It's smooth contours and large free passages permits the pumping of liquids containing bulky solids and fibrous materials reliably and with minimum energy consumption.

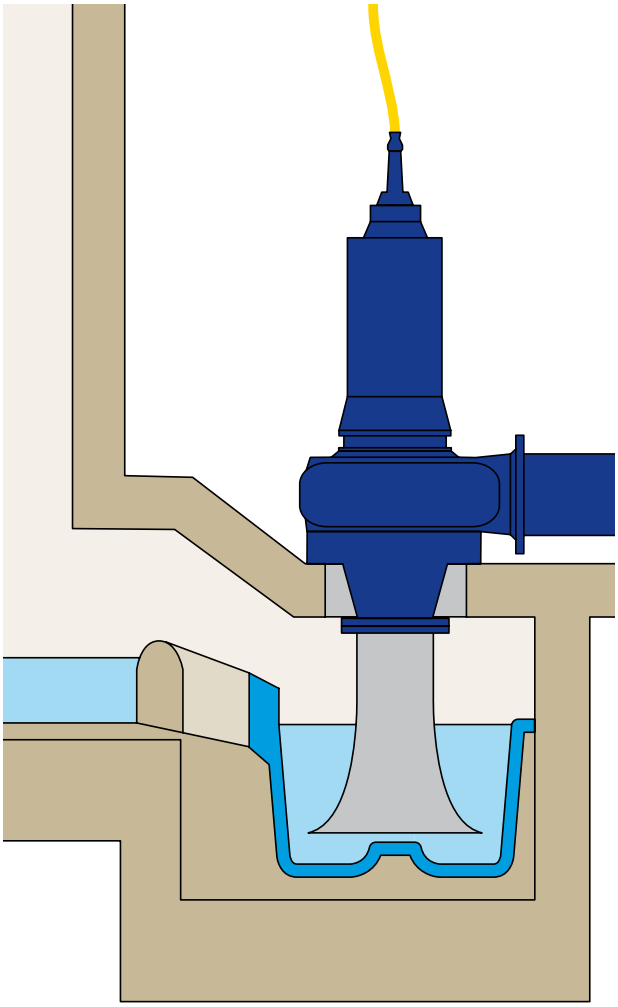
A dry well/wet well system is possible if required using Hidrostal immersible motors or standard fan cooled motors.

THE HIDROSTAL PREROTATION PUMPING SYSTEM

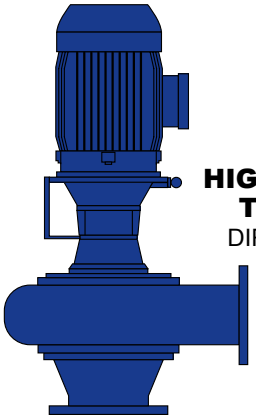
PREROSTAL™ has been developed to reduce costs at pumping stations that encounter highly varying inflows. Examples are sewage lift stations, activated sludge, stormwater, water treatment plants and industrial process pumping. Hidrostal offer several standard station designs to satisfy most applications.

DRY PIT VERSIONS

DRY INSTALLED IMMERSIBLE PUMP

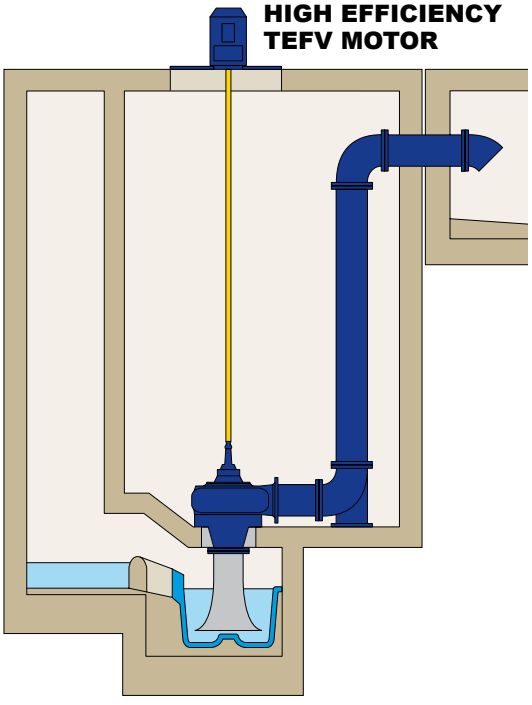


ALTERNATIVE DRIVE ARRANGEMENT



HIGH EFFICIENCY TEFV MOTOR
DIRECT MOUNTED ON PUMP

LINE SHAFT



Traditional layout with cardan shaft drive and pipe discharge

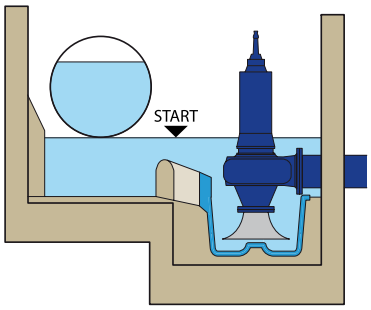
If the above layouts do not satisfy your application requirement we welcome the opportunity to make recommendations for special designs.

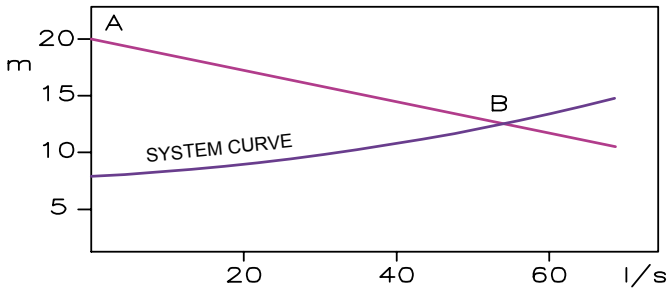
HOW FLOW MATCHING IS ACHIEVED

HOW FLOW MATCHING IS ACHIEVED

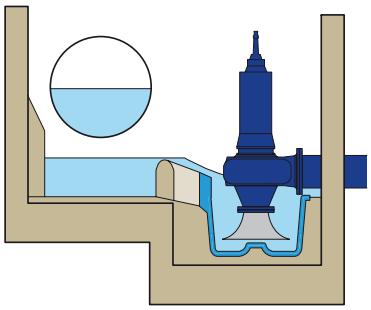
Generally, pumping stations consist of two or more pumps, however, to show how the PREROSTAL™ system is able to automatically achieve self-regulation by matching the out-flow to the in-flow a single pump has been used in the description below.

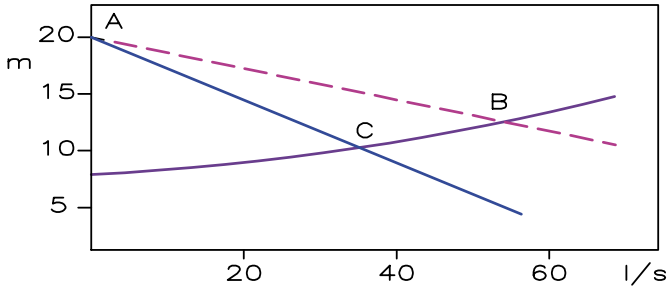
1] At this level inflow matches standard pump curve AB



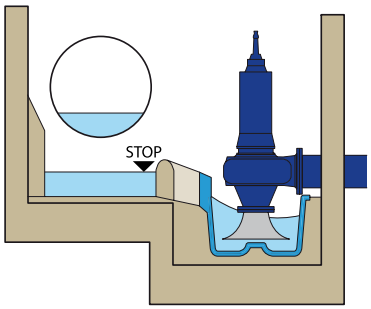


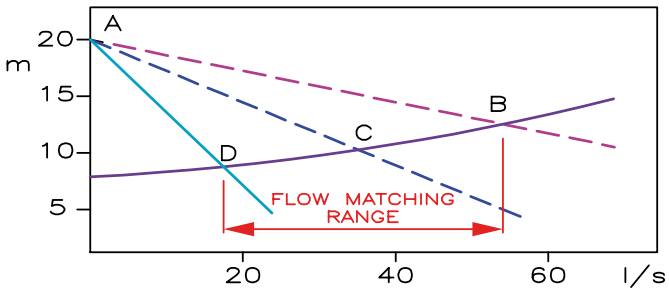
2] Inflow rate less than pump capacity. Small amount of prerotation in basin gives new curve A-C so pump output matches inflow.





3] Inflow continues to fall. High degree of prerotation to give curve A-D so pump matches inflow.





The principles are the same for both wet and dry pit versions.

EFFECT ON PUMP PERFORMANCE

Hidrostal engineer each installation to give optimum performance. When operating with prerotation control, stable performance of the pump is achieved by using the Hidrostal Screw Centrifugal impeller and the correct proportion of the inlet weir and entrance channel.

Hidrostal can offer a wide range of pumps from 80 mm – 700 mm branches with prerotation control.

With multiple pump PREROSTAL ™ systems flow rates from 10 l/s to well in excess of 6,000 l/s can be achieved. The pumping head depends to a certain extent on the size of pump selected. Generally PREROSTAL ™ systems can be offered for heads as low as 2 m. Typical schemes fall in the range of 4 - 10 m, the maximum heads being in the region of 20 m which is well in excess of the upper limits of Archimedean screw pumps.

System will flow match using fixed speed screw centrifugal pumps without the need for complex control or variable frequency drives.

ADVANTAGES & BENEFITS OF PREROSTAL

REMOVAL OF FLOATING MATERIALS

A primary benefit of the PREROSTAL™ system is its effectiveness as a skimming device. Every time the system goes into its prerotation mode, floatables such as oil, hydrocarbons, floating sludges, grease, fats and bulky light solids are automatically drawn into the basin, where they are pumped into the downstream process and can be recovered if required to do so.

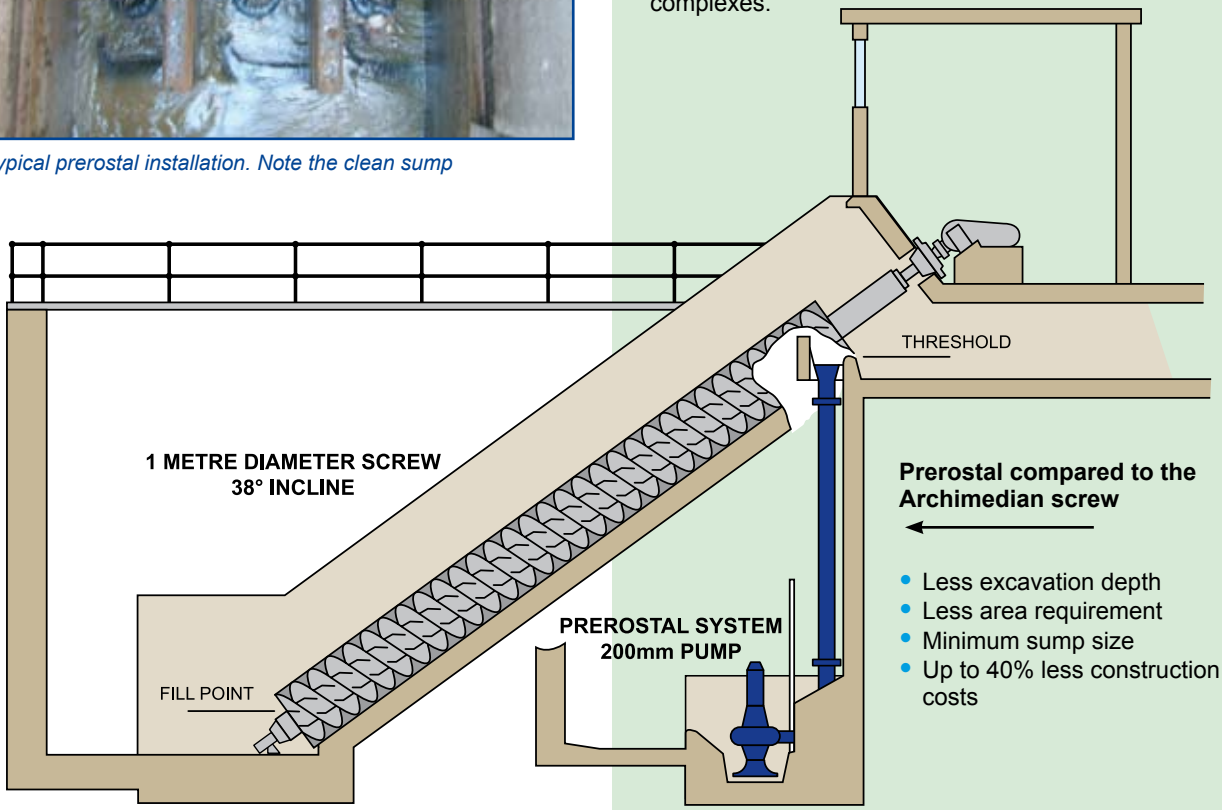
A typical prerostal installation. Note the clean sump

SIMPLE & RELIABLE

The self-regulating feature and simplicity of the PREROSTAL™ system keeps operation and maintenance costs low. The whole system uses standard pump starters and level controls which can easily be maintained by any qualified mechanical/ electrical engineer; unlike the alternative method of flow control that uses variable frequency drivers which are complex and expensive to maintain as they require servicing by specialist engineers.

INSTALLATION / DESIGN APPLICATIONS

PREROSTAL™ systems are in use worldwide in a variety of applications, in industries as diverse as municipal sewage treatment plants to petrochemical complexes.



Prerostal compared to the Archimedian screw

- Less excavation depth
- Less area requirement
- Minimum sump size
- Up to 40% less construction costs

REDUCED CAPITAL & CONSTRUCTION COSTS

Compared to pumps with screw or variable speed drives installations the PREROSTAL™ systems can offer savings of up to 40% on construction costs.
The excavation depth and area requirement is much less than with the Archimedean screw and on-off systems as the PREROSTAL system requires minimum sump size. Variable speed pumping systems have high initial capital as well as high maintenance costs.

USER BENEFITS

Simple System *- Automatic flow matching uses gravity and unique prero wet well to control output (flow) of pump. No complicated variable speed controls which are subject to failure.*

Self Cleaning *- This system cleans wet wells by automatically removing floating materials each time the pump goes through its operating cycle.*

Reduced Air Pollution *- Reduces odour and eliminates the need for frequent cleaning.*

Maximum Efficiency *- The Prerostal system can be fine tuned to provide maximum efficiency to the operating conditions.*

Highest Reliability *- Clog-free performance that is reliable and simple.*

Prerostal is perfect for operations staff - simple & straight forward

PIONEERS IN PUMP TECHNOLOGY

THE HIDROSTAL PUMP

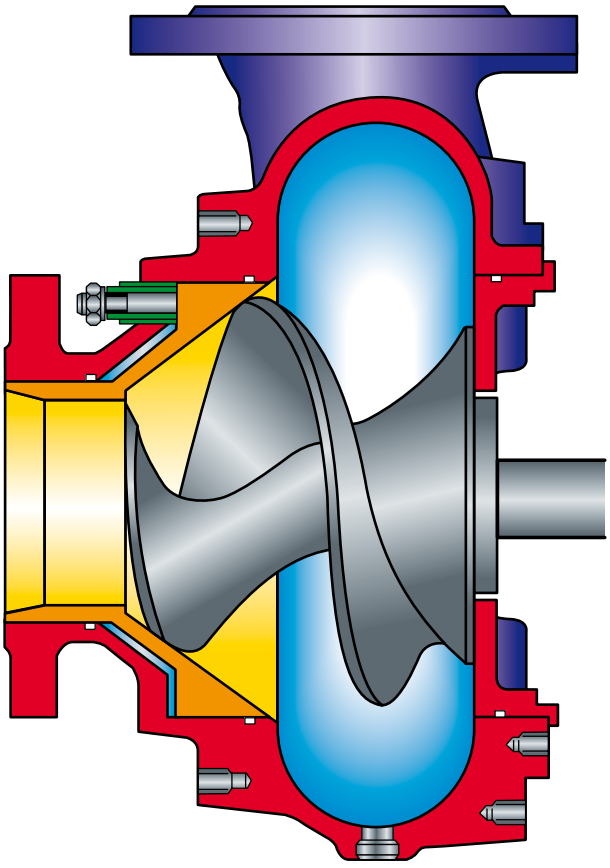
At heart of the PREROSTAL™ system is the Hidrostal pump with its unique screw centrifugal impeller. Extremely versatile in its applications, the impeller provides efficient handling of a range of liquids, often highly abrasive or corrosive in nature. It is ideal for:

- Solids Handling
- Pumping Viscous Sludges
- Handling Delicate or Low Shear Products

Unique to all Hidrostal pumps is the ability to handle the above in combination.

Many applications too arduous for other types of centrifugal pumps can usually be handled by the Hidrostal screw centrifugal impeller. The impeller comprises a single spiral vane, having large open passages, which makes a long slow turn from the axial inlet to the radial outlet. The design provides optimum hydraulic performance giving:

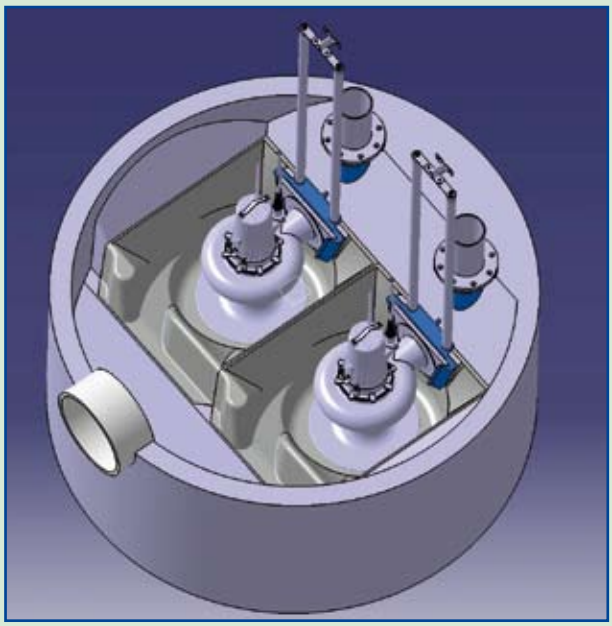
- High efficiencies
- Steep and stable hydraulic curve
- Non-overloading power curve
- Low NPSH
- Non-clog pumping



THE PREROCLEAN SELF CLEANING SUMP

The PreroClean Self Cleaning Sump is a simplified version of the PREROSTAL™ and is designed for applications where the primary aim is maintaining clean sumps without the need for flow matching. This option works on the same principles as the PREROSTAL™ but the weir height and tangential channel dimensions are fixed for each pump size allowing these features and the basin to be moulded into a single-piece, simplifying the civil construction.

For more details refer to PreroClean brochure or visit website **www.hidrostal.co.uk**



KEY BENEFITS & FEATURES OF PREROSTAL™

- Matches Station outflow to inflow using fixed-speed motors
- No special technology is required [i.e. Variable Frequency Drives]
- Automatically removes floating and settled solids
- Shallower Pump Stations [compared to submersibles with On-Off controls]
- Alternative to Archimedean Screw Pumps
- Station Flows 10 l/s to 6000 l/s
- Heads 2.0 to 25.0m

Each system is designed specifically to meet your requirements by Hidrostal's Engineering team. They will work with you to ensure that the system solves your pumping problems and operates efficiently.

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