POSITIVE DISPLACEMENT PUMPS FOR HIGH VISCOSITY LIQUIDS

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HIGH VISCOSITY SOLUTIONS

A Positive Displacement pump (PD pump) is a mechanical device which displaces a known quantity of liquid for every revolution or cycle that the pump completes.

The flow rate through a positive displacement pump is directly proportional to its speed and number of cycles over a given time.

A positive displacement pump works by using a screw, a blade, a vane, a lobe, a gear or diaphragm. It creates a chamber or cavity between the pumping elements and the cavity in which the fluid is temporarily stored is moved by the reciprocating or rotary motion along the pipe to its destination.

What are the types of Positive Displacement Pumps?

The main different types of
Positive Displacement Pumps are;

- Diaphragm Pump
- Gear Pump – Internal & External
- Progressive Cavity Pump (PC Pump)
- Vane Pump (Impeller Pump)
- Rotary Lobe Pump
- Screw Pump
- Peristaltic Pump (Hose pump)

What are the main applications of Positive Displacement pumps?

Positive Displacement pumps are generally used for fluids with a relatively high viscosity. They can be used where high accuracy is required e.g metering or dosing.

They can also be used where high pressures are required i.e high pressure washing. Wastewater Treatment is another application.

Positive Displacement Pumps

MECHANICAL DIAPHRAGM METERING PUMPS

Realizes reciprocating motion under the action of the driving mechanism

CHARACTERISTICS

- Flows from 1 to 3600 LPH
- Pressures from 1 to 12 Bar
- Power 0.03 to 1.1 kW
- Materials PVC/PVDF/S.S.304/ S.S.316

DESIGN FEATURES

- No moving seal, no leakage.
- It can transport high viscosity media, abrasive pastes and hazardous chemicals.
- Cast aluminum housing, high heat dissipation and light overall weight.
- The diaphragm is pressed into a multi-layer composite structure, the first layer of super tough Teflon acid-resistant film, the second layer of EPDM elastic rubber, the third layer of thickness 3.mm SUS304 Supporting iron core, the fourth layer is reinforced with nylon fiber reinforcement, the fifth layer It is fully packaged with EPDM elastic rubber, which can effectively improve the service life of the diaphragm.

PLUNGER TYPE METERING PUMPS

Periodically changes the volume of the working chamber by the plunger

CHARACTERISTICS

- Flows from 1 to 14300 LPH
- Pressures from 6 to 500 Bar
- Power 0.37 to 11 kW
- Materials S.S.304/S.S.316, or other on request

DESIGN FEATURES

- The heart of the liquid end in a plunger metering pump is a high-resistance plunger made from coated stainless steel.
As soon as the plunger is moved into the dosing head, the suction valve closes and the feed chemical flows out of the dosing head through a discharge valve.
- When the plunger moves in the opposite direction, the discharge valve closes due to the negative pressure in the dosing head.
Fresh feed chemical flows through the suction valve into the dosing head.

HYDRAULIC TYPE DIAPHRAGM METERING PUMPS

Using a hydraulic fluid to create back pressure brings the diaphragms very quickly

CHARACTERISTICS

- Flows from 1.5 to 10200 LPH
- Pressures from 5 to 700 Bar
- Power 0.37 to 11 kW
- Materials S.S.304/S.S.316, or other on request

DESIGN FEATURES

- Hydraulic control is very precise and requires only minimal maintenance.
The diaphragms are durable and provide consistently accurate metering.
- The technology also offers a very high standard of safety: there is a pressure relief valve in the hydraulic end as protection against overload.
- The multi-layer diaphragms are equipped with a diaphragm rupture warning system as standard. So you can be sure that the feed chemicals cannot mix with the hydraulic oil.

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INTERNAL GEAR PUMPS

Simple and compact construction for non-abrasive liquids

CHARACTERISTICS

- Flows up to 200 m3/h
- Pressures up to 16 bar
- Viscosity up to 55000 cst
- Temperature up to 200 °C

DESIGN FEATURES

- Pumps in cast iron, for a wide range of viscous, non-corrosive liquids.
- Cast steel, S.S.304, S.S.316 are also available.
- Pumps are specifically designed for difficult applications and those involving high viscosity liquids.
- Flexible sealing options include mechanical seal or packing seal
- Shaft supported by bushing and ball bearing

HELICAL GEAR PUMPS

The helical gears, which are cut on angle to the face of the gear

CHARACTERISTICS

- Flows up to 350 m3/h
- Pressures up to 15 bar
- Viscosity up to 55000 cst
- Temperature up to 350 °C

DESIGN FEATURES

- Pump is designed for pumping light fuel oils.
- Wide range of applications pumping clean fluids, such as pressure lubrication, hydraulic service, fuel supply or general liquid transfer.
- Avoid the unnecessary maintenance and overhung load of internal gear pumps.
- Avoid expensive repairs from delicate vanes in vane pumps.
- It's more simple, more cost-effective, and more versatile than competing technologies.

PROGRESSIVE CAVITY PUMPS

Ideal for handling slurries, viscous, and shear sensitive

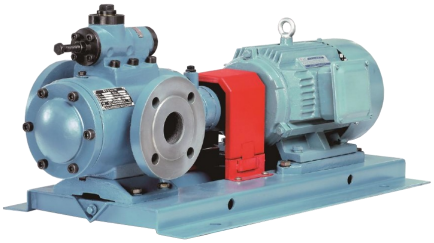
CHARACTERISTICS

- Flows up to 350 m3/h
- Pressures up to 48 bar
- Viscosity up to 1000000 cst
- Temperature up to 150 °C

DESIGN FEATURES

- Ideal for handling slurries, viscous, shear sensitive or two or tri phase mixtures or when applications require, significant suction lift capabilities.
- The pump design is ideally suited for both low to high flow applications and also allows for the development of multi-stage pumps that increase the pressure handling capabilities.
- The large continuous cavities of PC pumps allows suspended solids to be handled with ease.
  The gentle pumping action also ensures delicate solids that have to be kept intact are not damaged.
- Low running speeds - ideal for abrasive applications

Positive Displacement Pumps



ROTA PUMPS

Excellent for handling magma / massecuitte in sugar industry

CHARACTERISTICS

- Flows up to 150 m3/h
- Pressures up to 7 bar
- Viscosity up to 5000 cst
- Temperature up to 90 °C

DESIGN FEATURES

- Magma-massecuitte pumps also known as ROTA Pumps are excellent for handling magma and massecuitte in sugar industry.
- Pumps are especially designed to handle highly viscous abrasive sugar products with high brix containing sugar crystals like A Massecuitte, B Massecuitte, C Massecuitte, A/B/C Magma and seed applications.
- Elliptical rotor, rotating at a very low speed in a circular casing. A swinging flap, with both ends mounted on bush rests on the rotor. The flap scrapes off the rotor and it does not allow the liquid from discharge into the suction. Thus, achieving a positive displacement of the liquid.

SCREW PUMPS

Twin or three screw pumps with special rotor profile

CHARACTERISTICS

- Flows up to 318 m3/h
- Pressures up to 40 bar
- Viscosity up to 1500 cst
- Temperature up to 120 °C

DESIGN FEATURES

- Designed for continuous service in high-viscosity applications. With the design characteristics of positive displacement, pulse-free flow, and high suction lift / self-priming capabilities, it delivers smooth, constant flow across a wide range of viscosities, temperatures, and pressures.
- Higher flow rate and differential pressure capabilities, high efficiency and lower operating noise levels.

ROTARY LOBE PUMPS

Widely used in the hygienic processing industries

CHARACTERISTICS

- Flows up to 100 m3/h
- Pressures up to 15 bar
- Viscosity up to 1000000 cst
- Temperature up to 120 °C

DESIGN FEATURES

- A Positive displacement pump, which has two rotors in the pump head. The two rotors fixed on two shafts and rotate synchronically in counter direction. The rotation creates vacuum volume on the inlet side. The liquid is sucked into the pump head and travels around in the chamber between the rotor and the pump head casing, and is forced out on the outlet side.
- The mechanical seal has stronger reliability and more flexible options: single face, single face with flushing, double faces with flushing.

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- Standardized End Suction Pumps
  EN733/DIN24255, ISO2858/ISO5199
  ASME B73.1, API610
- Split Casing Double Suction Pumps
- Solid Handling Pumps
  Slurry/Vortex/Semi-open/Open/Non clog
- High Pressure Multi-Stage Pumps
- Self-Priming Pumps
- Submersible Pumps
- Close Coupled Pumps
- Vertical Multi-Stage / Immersible Pumps
- Vertical Sump Pumps
- Vertical Turbine Pumps
- Mixed / Axial Flow Pumps
- Liquid Ring Vacuum Pumps
- Chemical Process Plastic Pumps
- Fire Fighting Pump Packages (NFPA20)
- Booster Pump Packages
- Trailer Mounted Pumps

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ROTAMAC can help relieve the stresses and reduce the life cycle costs associated with the most important aspects of plant operation.

Dedicated to delivering the highest quality support, ROTAMAC services and solutions integrates hydraulic, mechanical and materials engineering knowledge with creative solutions to improve equipment reliability and system performance, reduce energy consumption and improve the safety and environmental impact of operations.

Pump Services and Repair

Installation

Commissioning

Laser alignment

Inspection

Overhaul

Testing

Capabilities Overview

Design
- Equipment Selection and Optimization
- Material Selection
- System Design
- System Optimization

Start-up
- Equipment Installation
- Laser Alignment
- Commissioning and Running test
- Operator Training
- On-site Project Supervision
- On-site Troubleshooting

Operation and Maintenance
- Equipment Inspection
- Repair & Overhaul
- Advanced Diagnostics
- Service Maintenance Contracts

Product information is subject to change; consult factory for details.