

Types of Pumps

Metering Pumps

Metering pumps provide precision control of very low flow rates. Flow rates are generally less than 1/2 gallon per minute. They are usually used to control additives to the main flow stream. They are also called proportioning or controlled-volume pumps. Metering pumps are available in either a diaphragm or packed plunger style, and are designed for clean service and dirty liquid can easily clog the valves and nozzle connections.

Variable Displacement Vane Pumps

One of the major advantages of the vane pump is that the design readily lends itself to become a variable displacement pump, rather than a fixed displacement pump such as a [spur-gear](#) (X-X) or a [gerotor](#) (I-X) pump. The centerline distance from the rotor to the eccentric ring is used to determine the pump's displacement. By allowing the eccentric ring to pivot or translate relative to the rotor, the displacement can be varied. It is even possible for a vane pump to pump in reverse if the eccentric ring moves far enough. However, performance cannot be optimized to pump in both directions. This can make for a very interesting hydraulic control oil pump.

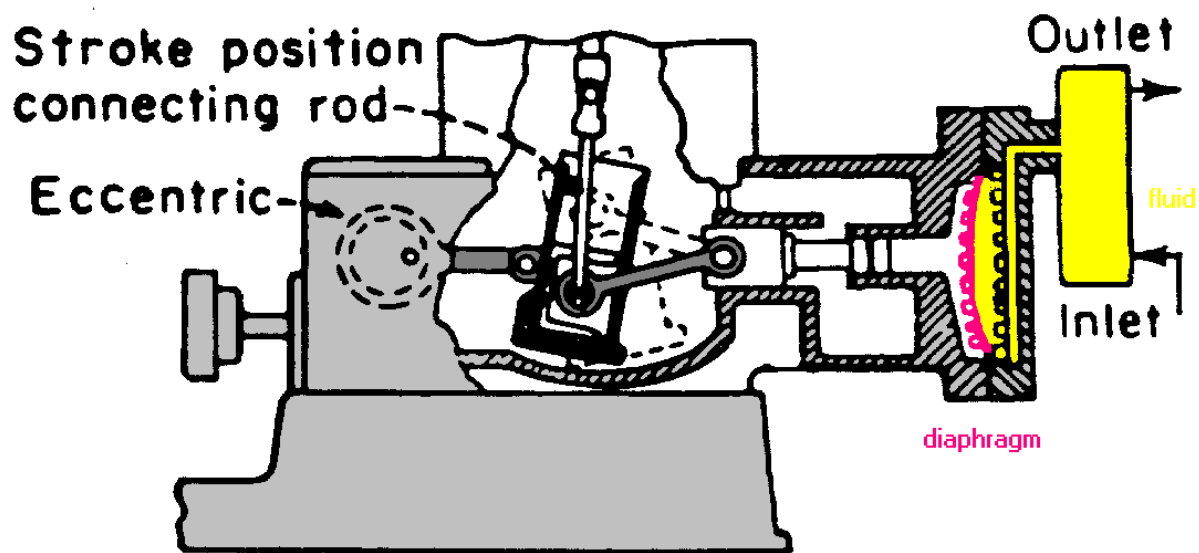
Variable displacement vane pumps are used as an energy savings device, and have been used in many applications, including automotive transmissions, for over 30 years.

Mono Pumps

Browse through the Moyno technical bulletins to see how the rotor turns inside the casing. This is called a "progressing cavity". This pump handles solids beautifully. It is said that they can pump strawberries with little damage to each berry.

Diaphragm pump

The diaphragm pump is an offshoot of a plunger pump. Because of the risk that contamination could travel between the plunger and the cylinder, the diaphragm is safer for microbial processing. This applet is crude but shows how a reciprocating piston (plunger) pump works. The flywheel that moves the plunger can attach the arm to the plunger at various points to change the amplitude of the stroke and thus the pumping rate. The pumping rate can also be changed with a different rotational speed, but variable speed motors or mechanical means of changing rpm are expensive.



Some Advantages of Piston Pumps

- Reciprocating pumps will deliver fluid at high pressure (High Delivery Head).
- They are 'Self-priming' - No need to fill the cylinders before starting.

Some Disadvantages of Piston Pumps

- Reciprocating pumps give a pulsating flow.
- The suction stroke is difficult when pumping viscous liquids.
- The cost of producing piston pumps is high. This is due to the very accurate sizes of the cylinders and pistons. Also, the gearing needed to convert the rotation of the drive motor into a reciprocating action involves extra equipment and cost.

- The close fitting moving parts cause maintenance problems, especially when the pump is handling fluids containing suspended solids, as the particles can get into the small clearances and cause severe wear. The piston pump therefore, should not be used for slurries.
- They give low volume rates of flow compared to other types of pump.

A single acting pump with One cylinder is called a ' Single-acting Simplex ' pump.

A double acting pump with One cylinder is called a ' Double-acting Simplex '.

Source : <http://nprcet.org/e%20content/mech/FMM.pdf>