Cheshire Pump Company Ltd

Positive Displacement Pumps

High viscosity fluids generally need more energy to move them than low viscosity fluids

Dynamic Viscosity is stated in Centipoise (cP) it is commonly used because water at a temperature of 20°C has a viscosity of 1.002 Centipoise, most published pump test and performance data is stated "in water"

Below about 300cP, and dependant on fluid type and system detail, roto-dynamic (RD) pumps are generally used eg centrifugal pumps, submersible pumps
Generally, RD pumps quantity / head (Q/H) curves go from zero flow at maximum pressure (closed valve) to maximum flow at minimum pressure. Depending on impeller design, the greater the flow, the greater power is required

Positive displacement (PD) pumps are used for fluids with viscosities usually greater than about 300 centipoise

Positive Displacement (PD) pumps are available in a number of forms. Rotary PD pumps such as gear pumps, progressing cavity pumps,rotary lobe pumps. Reciprocating PD pumps such as plunger piston pumps, mechanical diaphragm and hydraulic diaphragm pumps

Reciprocating PD pumps provide a constant pressure irrespective of flow, this is why they are ideal for dosing and most importantly metering applications (see next page)

Metering pumps should be considered as precision instruments, used to accurately feed a predetermined volume of liquid into a process or system

Metering pump flow-rates can be varied by changing the stroke length and / or speed. Crucially, such flow-rates can be predetermined accurately, with repeatable and consistently maintained (within ± 1%) flows

Ideally, a metering pump should be capable of handling a wide range of liquids, including toxic, corrosive,dangerous, volatile, and abrasive ones, as well as those containing concentrations of suspended solids. In addition, a metering pump should be able to generate sufficiently high discharge pressures to allow injection of liquids into processes

To accomplish this wide range of requirements, many options in design must be available, capacity, method of regulation, liquid-end materials, valve styles, primary drive characteristics, protection and environmental conditions

Cheshire Pump Company are suppliers of precision metering pumps for your chemical and process applications

Contact us including the reference **CMSS1**
Tel 0151 355 3666, e-mail, enq@cheshirepumpcompany.co.uk

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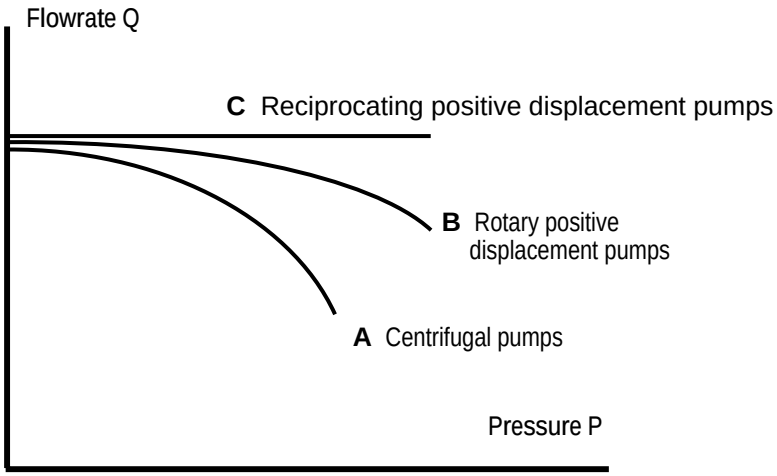
RECIPROCATING PD METERING PUMPS

To understand metering pumps, we must investigate their place in the pump world; the diagram below shows the method used by three typical pumps to transfer energy to the delivered fluid

A - Centrifugal pump **B** - Rotary positive-displacement pumps **C** - Reciprocating positive-displacement pumps



A constant output at all pressures makes reciprocating pumps superior to meter flow

The reciprocating pump is the most suitable to work as a metering pump, as it can be seen by comparing the flow (Q) and pressure (P) curves of the three types

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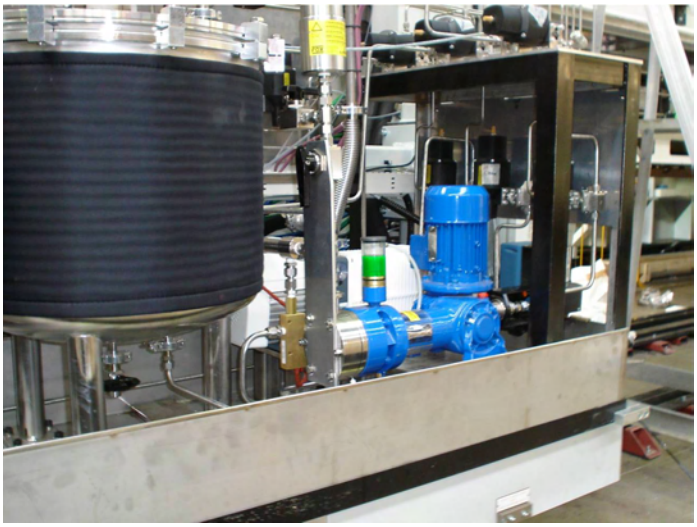
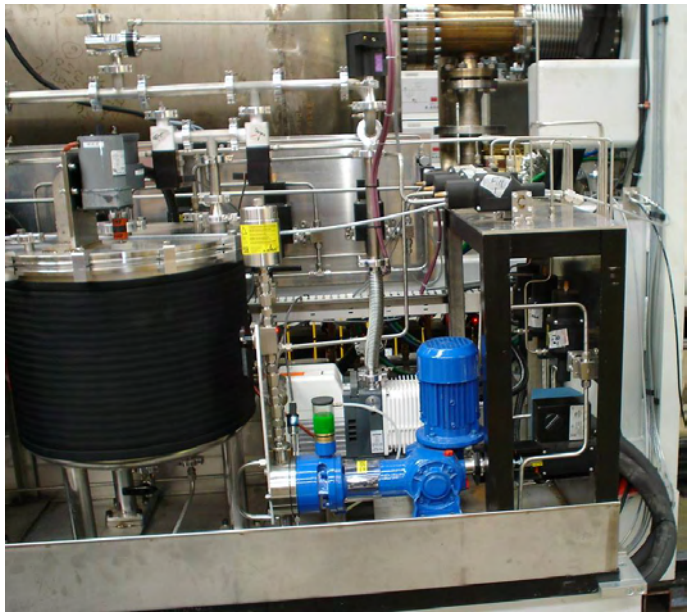
Hydraulic Diaphragm Metering Pumps



In Novenmber 2007 we supplied these metering pumps to **Sigma Technologies USA** (http://www.sigmalabs.com/sigma)

The pumps are part of a large Momomer vacuum coating system developed for a major North American corporation for their new European manufacturing lant

These pumps are Reciprocating Postive Displacement type They use a fully ATEX approved design, for use in potentially explosive environments and compliant with API 675



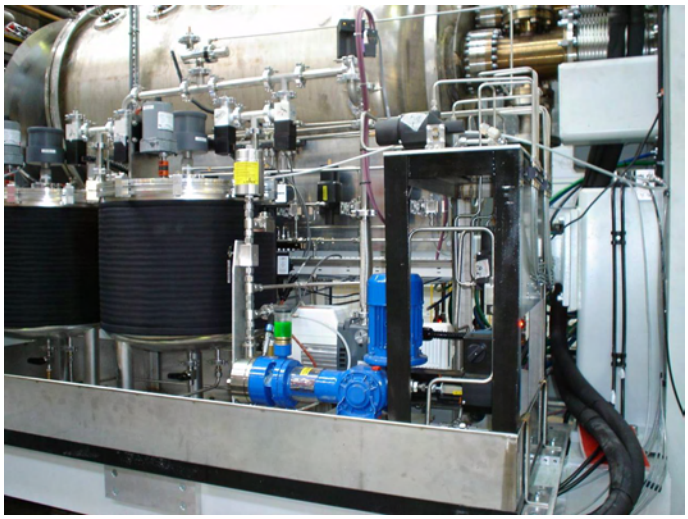
A TEFV, IP55 motor drives an integral gearbox, this operates a stroke adjustable piston onto a barrier fluid and double diaphragm

The diaphragm assembly has a vacuum central section, failure in this section is displayed with a gauge or electronically monitored

As the diaphragms have very low hydraulic pressure differential between them, they have very long service life

In the unlikely event of either the product or driver side diaphragm failing, the pumps can continue in operation until repaired

The pumps were supplied with over-presure valves and pulsation dampers



Material specifications are cast iron with 316 Stainless Steel hydraulic components

Pumps Expertise Service

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