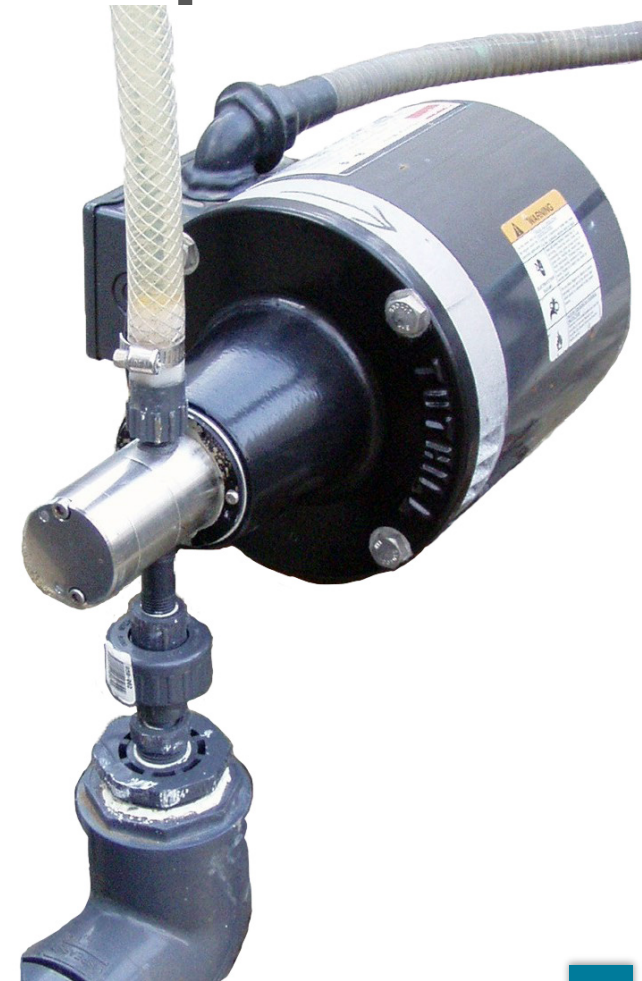


Chemical Dosing

Miniature Magnetically Coupled Pumps



Application

Chemical Metering Injection



- D Series Pump
- Fluid: Sodium Hypochlorite
- Hastelloy C276
- AC Motor
- AC Inverter Drive
- Peek Gears
- Peek Bearings
- Welded Magnet
- Replaced Pulsafeeder Pump

Application

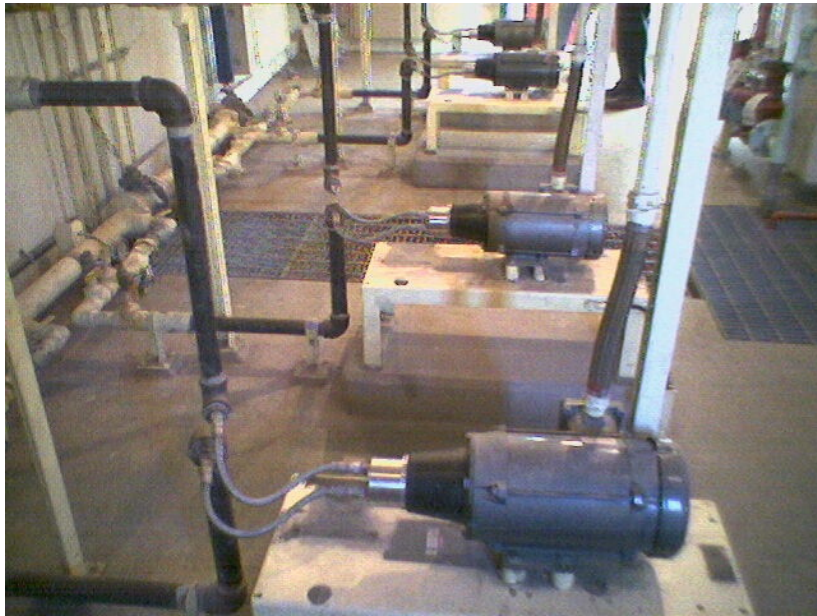
Chemical Metering Injection



- T Series Pump
- Fluid: Sodium Bisulfide
- 316 Stainless Steel
- AC Motor
- AC Inverter Drive
- PPS Gears
- PPS Bearings
- Replaced Pulsafeeder Pump

Application

Chemical Metering Injection



- T Series Pump
- Fluid: Methanol
- 316 Stainless Steel
- AC Motor
- AC Inverter Drive
- PPS Gears
- PPS Bearings

Chemical Dosing Opportunity

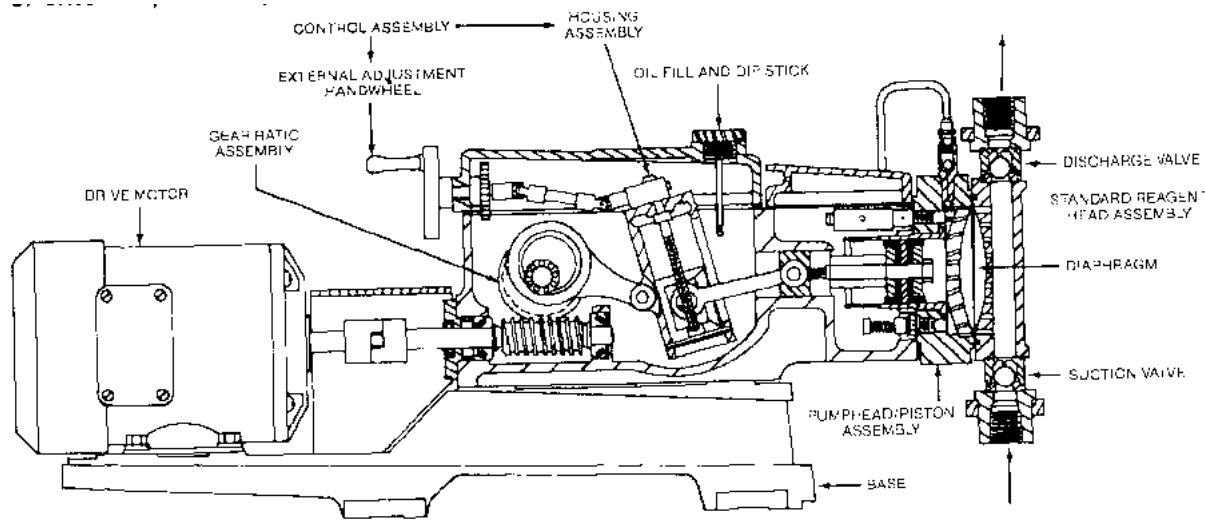


Fig 2

Hydraulically Actuated Metering Pump

- Design Dates Back to 1920's
- Low Flow/Adjustable Flow Chemical Dosing Pumps
- Water Treatment Chemical Treatment Coming of Age in 1920's
- Betz, Nalco early major customers

Waste Water Treatment

Rotary Motion to Reciprocating Motion

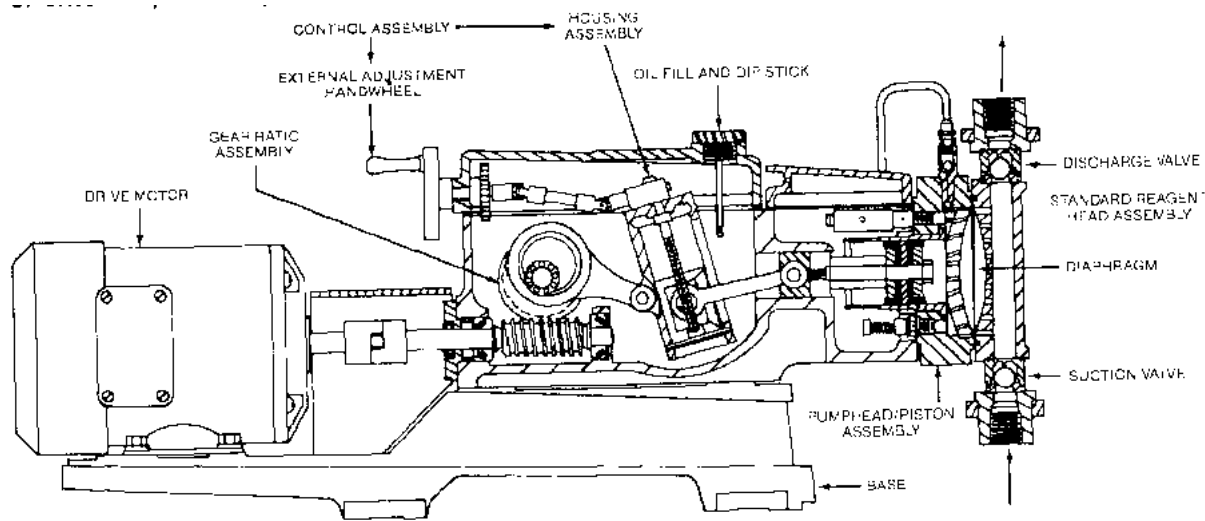


Fig 2

Reciprocating Motion Design

- Drive Box and Oil Sump
- Requirement for Check Valves
- Pulsation
- Generally Higher NPSHR

Hydraulic Actuation

- Different Fluid Than Oil Sump
- Three Adjustments
 - Bleed Valve
 - Refill Valve
 - Relief Valve

Hydraulically Actuated Metering Pumps

- Complicated Design
- Many Parts
- Tends to Be Expensive to Maintain
- Not Known to Be Operator or Maintenance Friendly
- Sold on Accuracy

Accuracy

- Accuracy is Repeatability
- Precise Flow Requires Calibration Column
 - Many chemical dosing operations really on downstream measurement of variable to control dispensing rate
 - Control loop with feedback

Accuracy

- Customers very concerned about precise dosing will have a Coriolis Mass Flow Meter installed downstream of the metering pump
- Pulsations distort the accuracy of the Coriolis Mass Flow Meter

Miniature Magnetically Coupled Pumps

Details and Features

- Coupled with VFD provide an excellent dosing pump
- Linear Speed vs. Flow Curve
- Simple and Compact
- No Pump Lubrication Required
- No Pulsations
- Direct Acting Quick Response
- Saves Chemicals by not under and over reacting due to time delays
- Maintenance is Simple
- Relatively Inexpensive with Repair Kit



Excellence at work. Excellence in life.

