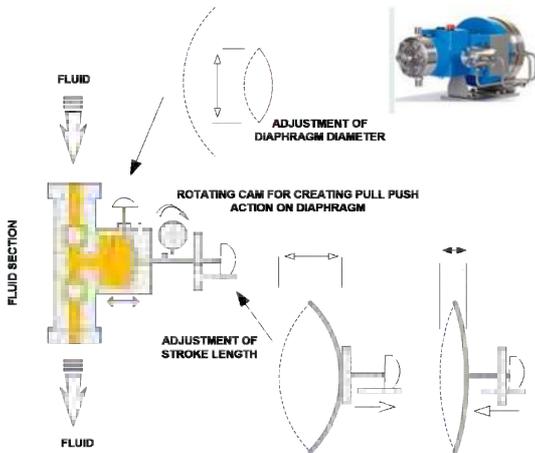


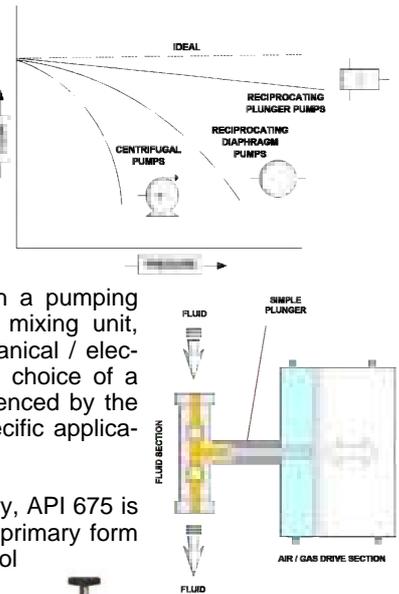
OIL, GAS & PETROCHEMICAL INDUSTRY

CHEMICAL INJECTION SYSTEMS

The pumps that are generally used for "metering or transferring" chemicals are Reciprocating type (API 674), Positive Displacement Control Volume type (API 675) and Rotary type (API 676). The first two types can be Plunger type or Diaphragm type. Chemical injection on the other hand involves not only metering and transferring the fluid, but also injecting it into a process, at a marginally higher pressure than the process (line) pressure. Therefore, flow as well as pressure, besides density / viscosity of the fluid, are critical to the chemical injection process and it is usually achieved through a pumping system that generally consists of a tank, mixing unit, pump (s), pulsation damping device, mechanical / electronic control and safety systems etc. The choice of a pump for chemical injection is usually influenced by the pressure as well as flow required for a specific application.



In Oil, Gas & Petrochemical (OGPC) industry, API 675 is a bench mark for chemical injection. In its primary form (API 675), the 'Positive Displacement Control Volume Pumps' are generally those which can control (or change) the volume of fluid that is displaced during each stroke of the pump, which means having a stroke length adjustment mechanism (on constant speed pumps). Some Diaphragm as well as Plunger type pumps have such mechanism. There are also some diaphragm pumps on which one can change not only the stroke length but also the diameter of the diaphragm to control the volume per stroke. All these complex variations of pump technology (pump speed and displaced volume) is to primarily to qualify the same pump for achieving a larger range of pressure and flow, in effect the "Turn Up & Turn Down" characteristic of the pump. These types of pumps can either be electrically driven or compressed air / gas driven (any gas under pressure, even natural gas with H₂S content, generally called "Sour Gas"). On the other extreme, the simplified one, there are less complicated air / gas driven pumps (technically API 674 variety), which control the displaced volume by just varying the cycling speed. They too then can qualify as API 675 (2nd Edition, clause 2.12). Choosing what sort of drive to have, and which pump to use for a specific application is mostly a matter of "habit interference", and not by due diligence !!! Customers in the OGPC industry prefer to go by precedence, proven track record and suffer the reluctance and lethargy for trying something different !!! Electrically driven pumps are generally the norm when the pressure required is low and the flow high. They have their own set of disadvantages, mostly that of fitting an explosion proof motor for class - I area, gear trains, variable speed motor, large size, weight and foot print, etc. When the injection pressure is high, with proportionately high flow, a plunger type air / gas driven pump becomes more pragmatic. These are comparatively safer, less expensive, very small and light weight compared to the electrically driven pump equivalent and their advantages outweigh other types.



generally those which can control (or change) the volume of fluid that is displaced during each stroke of the pump, which means having a stroke length adjustment mechanism (on constant speed pumps). Some Diaphragm as well as Plunger type pumps have such mechanism. There are also some diaphragm pumps on which one can change not only the stroke length but also the diameter of the diaphragm to control the volume per stroke. All these complex variations of pump technology (pump speed and displaced volume) is to primarily to qualify the same pump for achieving a larger range of pressure and flow, in effect the "Turn Up & Turn Down" characteristic of the pump. These types of pumps can either be electrically driven or compressed air / gas driven (any gas under pressure, even natural gas with H₂S content, generally called "Sour Gas"). On the other extreme, the simplified one, there are less complicated air / gas driven pumps (technically API 674 variety), which control the displaced volume by just varying the cycling speed. They too then can qualify as API 675 (2nd Edition, clause 2.12). Choosing what sort of drive to have, and which pump to use for a specific application is mostly a matter of "habit interference", and not by due diligence !!! Customers in the OGPC industry prefer to go by precedence, proven track record and suffer the reluctance and lethargy for trying something different !!! Electrically driven pumps are generally the norm when the pressure required is low and the flow high. They have their own set of disadvantages, mostly that of fitting an explosion proof motor for class - I area, gear trains, variable speed motor, large size, weight and foot print, etc. When the injection pressure is high, with proportionately high flow, a plunger type air / gas driven pump becomes more pragmatic. These are comparatively safer, less expensive, very small and light weight compared to the electrically driven pump equivalent and their advantages outweigh other types.



Peculiar problems associated with chemical injection are inadequate NPSH (creating insufficient flow, cavitation, pump running dry etc), over pressure (due to inadequate safety systems on the pump skid), pulsating flow (lack of, or inadequacy of, pulsation dampers), inadequate turn up and turn down (beyond usual range 1/10), compatibility of wetted section components and seals with chemical to be pumped etc. A good CIP skid is one in which all these have been looked into with due diligence.

Gem Pressure Systems (India) Pvt Ltd, located at Hyderabad (India), can indigenously design, develop & fabricate fully tested and certified CIP skids that comply with API 675 standards. Our range of motor and air /gas driven pumps, with variable displacement (diaphragm as well as plunger) from five different world class OEMs, comply with a wide variety of wetted section material and seals (including HBBR and Carlez), other piping, safety and automation systems to handle practically all fluids used in the OGPC industry. Our products include the following. For details please write / speak to us.

DRUM TRANSFER PUMPSKIDS

CONDENSATE
OCI, GCI, OTHER INHIBITORS
GLYCOL & METHANOL
DIESEL, LUBE OIL, KEROSENE & ATF
(Please see our catalogue on Drum Transfer Pumps)

CHEMICAL INJECTION & METERING PUMP SKIDS

OCI, GCI & ASPHALTINE INHIBITORS
ANTI FOAMING, ANTI SCALE, DEULSIFIER FLUIDS,
DIESEL & DOWN HOLE EQUALISATION
GLYCOL & METHANOL INJECTION, IRCDS etc.

MISC PUMP SKIDS

BIOCIDE PUMPS (HP&LP)
CAISON PUMPS
PUMPS FOR RECYCLED OIL
FILTER AID PUMPS
FLOTATION AID PUMPS
OPEN DRAIN PUMPS
POUR POINT PUMPS
OXYGEN SCAVENGER PUMPS
POLYELECTROLITE PUMPS
HIGH PRESSURE LUBRICATING PUMPS



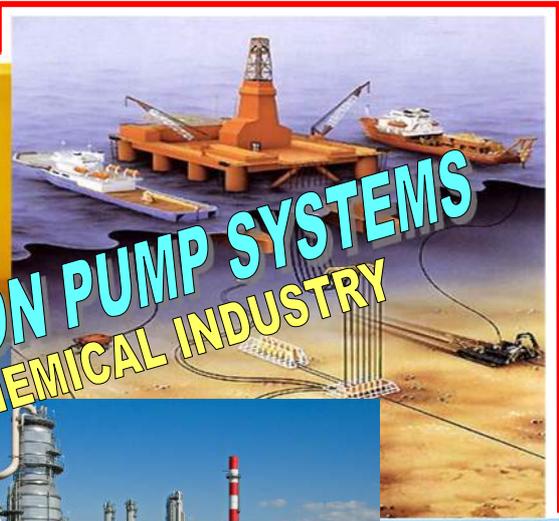
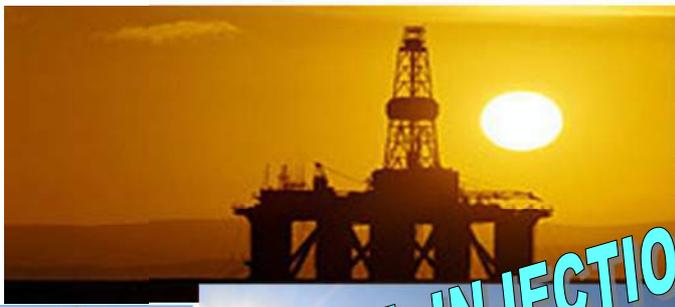
Gem Pressure Systems (India) Pvt.Ltd

4-2-245 TO 250/4, 4th FLOOR, OLD BHOIGUDA, RANIGUNJ, SECUNDERABAD 500003, INDIA

Ph. No: +91-40-27711742, Fax No: +91-40-27700326.

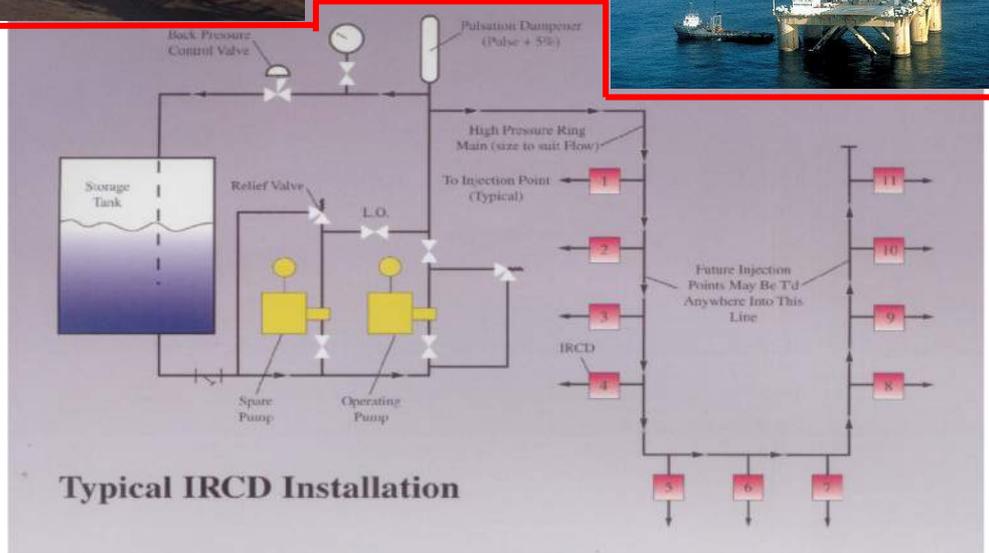
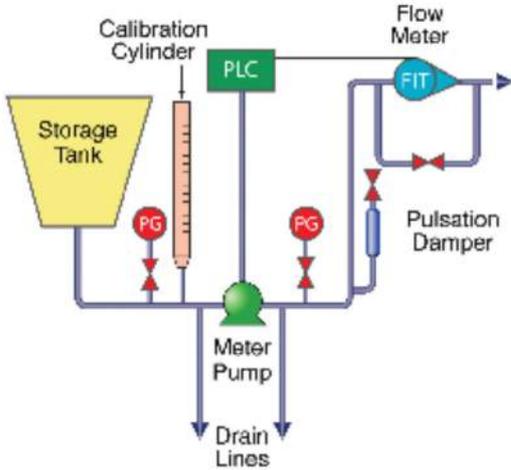
E: kartha@gemengg.com or info@gemengg.com





CHEMICAL INJECTION PUMP SYSTEMS

OIL, GAS & PETROCHEMICAL INDUSTRY



Typical Chemical Injection Skid



15,000 psi Glycol Injection Skid



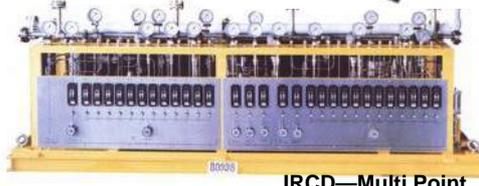
Solar Panel Powered Injection Skid



IRCD Control Panel



OCI Injection Skid



IRCD—Multi Point Injection Skids



Simple CIP Package