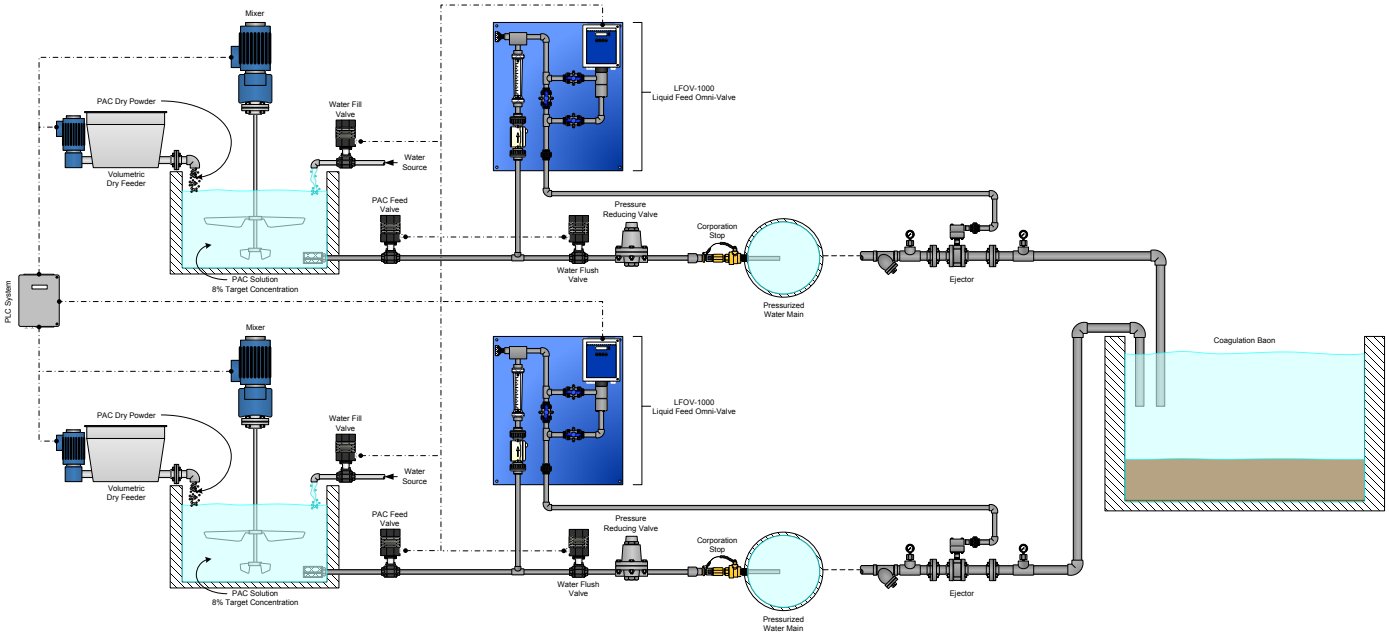
Series LFOV
PAC Solution Feed Systems

The Hydro Instruments Series LFOV Vacuum Feed Systems for Polyaluminum Chloride (PAC) provide reliable automatic delivery of PAC Solution for coagulation. This system brings the reliability, low maintenance, and simplicity of a vacuum system to the delivery of PAC solutions.



Operation

PAC Solution

A complete system includes two identical batch preparation PAC solution mixing tanks. Each PAC solution tank will be filled with a controlled volume of water and weight of PAC powder. It is recommended to maintain the PAC concentration at 8% or less to minimize viscosity and related maintenance issues. During and after filling a continuous mixer will be in operation. A level sensor will be included in each PAC solution tank to monitor fill level. The two tanks will be filled in batches and used alternately.

Liquid Vacuum Feed System

A vacuum liquid feed system shall draw the PAC solution out of the tanks under vacuum and deliver into the coagulation basin together with carrier water. LFOV Automatic control panels will monitor real time feed rate using magnetic flow meters and adjust valve position as needed to maintain the desired PAC solution feed rate. If sufficient water pressure is available, then booster pumps will not be necessary for the ejectors.

Water Flushing System

The vacuum feed piping system shall incorporate an automatic water flushing arrangement for periodic flushing to prevent the build up of PAC deposits inside the piping and equipment.

System PLC

Every installation shall include a dedicated PLC to control the entire process.

Singapore: Hydro Instrument (S) Pte Ltd • Telephone: (65) 822-31377 • Fax: (65) 6725-8388
www.hydroinstrument-sg.com • sales@hydroinstrument-sg.com

PAC Solution Preparation / Storage Tanks

PAC solution will be prepared in batches alternating between two tanks. It is recommended to keep the PAC solution concentration at 8% or less to minimize the viscosity of the solution and therefore reduce the tendency of clogging in the piping system.

Each time a new batch is prepared, the tank will be filled to a set level with water. The filling of water shall be monitored by a dedicated level sensor for that solution tank. Then a dry powder hopper feeder shall deliver a controlled weight of PAC powder to the water. Once the tank has been filled with water and until the PAC solution is emptied, a mixer shall continuously operate in the tank to mix and maintain uniform concentration.

Once the level sensor has indicated that one tank of PAC solution has been drained by the vacuum feed system, the PLC will switch feeding to the other PAC solution tank and start the filling process of the empty tank.

Liquid Vacuum Feed System

Each system shall include two LFOV panels and two ejectors for alternating use and flushing. The PLC will provide pressurized water to the ejector in use to create the vacuum. The PLC will open the PAC Feed Valve for the PAC solution tank in use. The PLC will send 4-20mA or Modbus control signal to the Omni-Valve on the LFOV panel to perform automatic feed rate control for the PAC solution. The Omni-Valve can perform proportional, set point (based on streaming current or other), compound loop (based on water flow and streaming current) and a variety of other automatic control methods. See Omni-Valve literature for more details.

In order to compensate for potential PAC solution inconsistency, the LFOV panel Omni-Valve will continuously calculate the desired chemical feed rate and simultaneously monitor the actual PAC solution feed rate using an integrally mounted magnetic flow meter for PAC solution. The Omni-Valve shall then use this direct feedback to continuously adjust V-notch position as necessary to maintain the actual feed rate (magnetic flow meter reading) at the automatically calculated feed rate.

Water Flushing and Alternating Operation

Each time the PAC solution tank is emptied, the PLC shall shut that PAC feed valve and open the water flushing valve to allow water at 1.5 bar (20 PSI)or less to flow through that vacuum feed system for an additional 5 to 10 minutes in order to completely flush out the system of PAC solution before shutting down.

Further, each time the PAC solution tank is emptied the PLC shall simultaneously open the second PAC solution feed valve and provide water pressure to the second ejector to initiate the feed of PAC solution through the second LFOV panel and ejector set.

System PLC

A dedicated PLC shall be provided for each installation to realize the total system timing, control and all other aspects required for each particular installation.