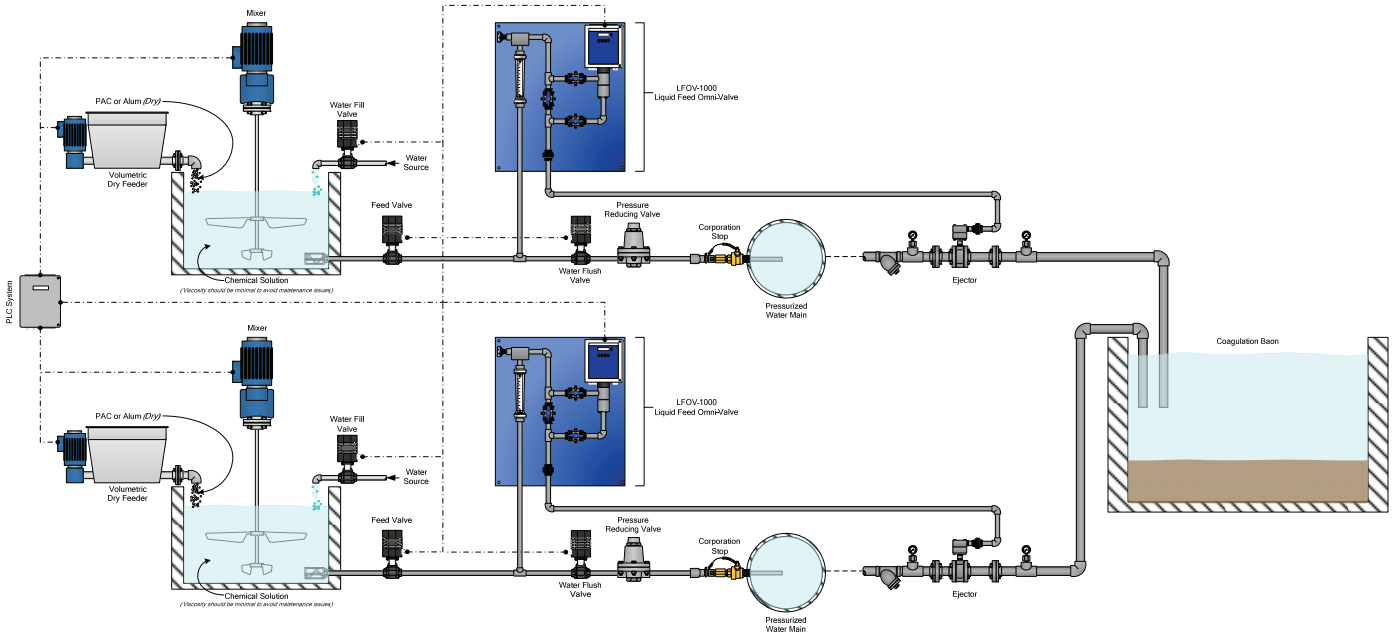
Series LFOV

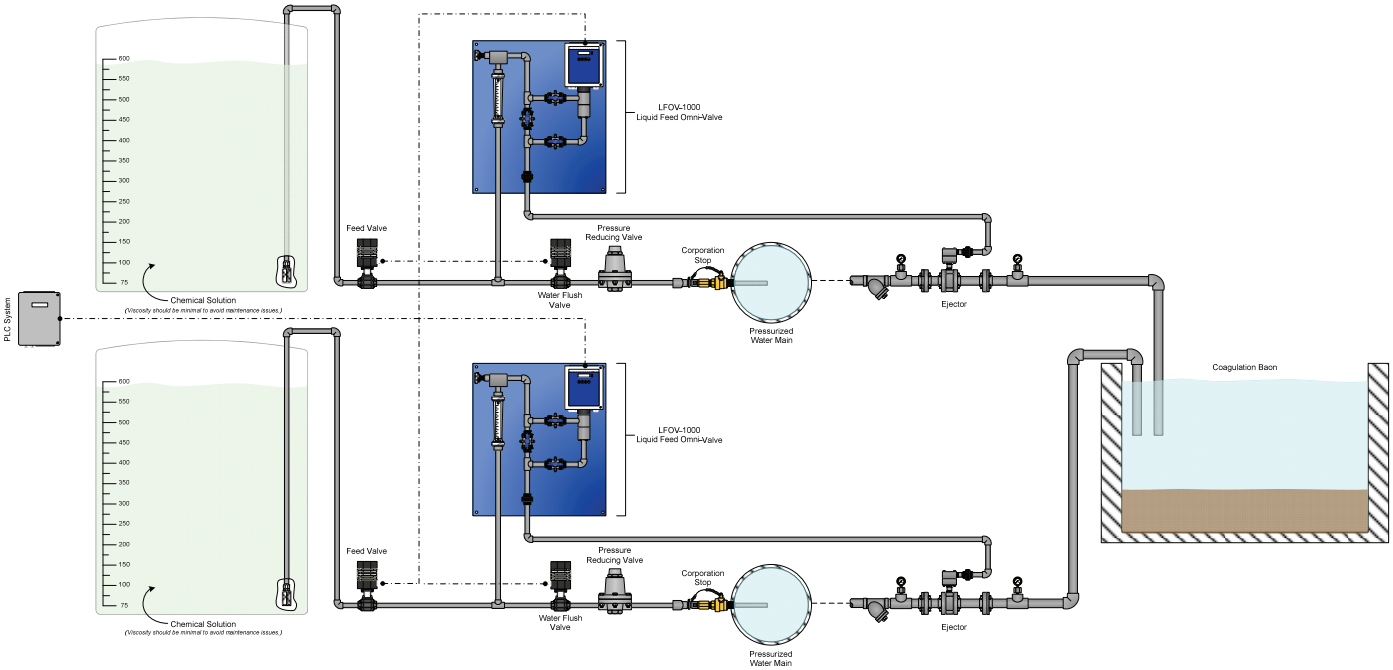
PAC or Alum Solution Feed Systems

The Hydro Instruments Series LFOV Vacuum Feed Systems for Polyaluminum Chloride (PAC) or Alum provide reliable automatic delivery of such solutions for coagulation. This system brings the reliability, low maintenance, and simplicity of a vacuum system to the delivery of PAC and Alum solutions. Systems can be designed for dry feed or premixed neat liquid solution feed.

Dry powder mixing and feed system layout



Premixed neat liquid solution feed system layout



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PAC or Alum Solution Preparation / Storage Tanks

Systems feeding premixed neat liquid solutions do not require the dry feeders and mixers described in this document. PAC or Alum solution will be prepared in batches alternating between two tanks. It is recommended to minimize solution concentration to minimize the viscosity of the solution and thereby 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 dry powder to the water. Once the tank has been filled with water and until the 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 solution has been drained by the vacuum feed system, the PLC will switch feeding to the other 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 solution feed valve for the 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 solution. The Omni-Valve can perform proportional, set point (based on turbidity, streaming current or other), compound loop (based on water flow and turbidity or streaming current) and a variety of other automatic control methods. See Omni-Valve literature for more details.

The Omni-Valve includes a self flushing feature where it can be set to automatically move to full open and return to original position periodically. This feature is helpful to maintain accurate control and avoid clogging of the v-notch.

Water Flushing and Alternating Operation

Each time the solution tank is emptied, the PLC shall shut that solution 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 solution before shutting down.

Further, each time a solution tank is emptied the PLC shall simultaneously open the second solution feed valve and provide water pressure to the second ejector to initiate the feed of PAC or Alum 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.