Why Regulate Pressure?

Pressure regulation is utilized in the design of solid set, mechanical move and low volume irrigation systems. The basic reasoning for controlling system pressure is similar in all types of system design.

Distribution Uniformity

System distribution uniformity is one of the primary reasons that regulators are used. A standard design objective is to take a predetermined amount of water and apply it uniformly over a predetermined area. Independent of the system or method of irrigation selected, pressures within a system effect the system flow rate. Consequently, it is important to keep system pressures somewhat constant in order to expect uniform distribution of water throughout an irrigation system.



Mechanical move systems have the potential to experience elevation and pressure changes causing flow fluctuations on unregulated systems.

System pressures will vary throughout the system due to pressure loss through pipe and fittings as well as pressure fluctuations induced by elevation changes in undulating terrain. Once the system is installed, pipe diameters are constant and topography does not change. The predictability of these pressure variations makes it possible for a designer to adjust for them on stationary systems. Mechanical move systems have the potential to experience elevation and pressure changes as they operate. This scenario could easily cause flow fluctuations in excess of plus or minus 5%, in which case, pressure regulators are recommended.

More difficult to forecast and design for on all systems, are some of the factors that cause system pressures to change during operation. Classic examples of such factors are a center pivot system's end gun or corner arm valves turning on and off. These changes in system flow demand may also cause significant fluctuations in pressure. Solid set and low volume systems may have block or zone valves being turned on and off, creating the same concerns with system pressure.

Pressure variations may also be induced from the water source. Large projects with multiple wells supplying water for the system frequently turn wells on and off as system demand changes. The modifications made at the source are rarely proportional to the system demand, which result in an overall change in system pressure. Many parts of the world have wells that experience fluctuating water levels in the aquifer system. The result of a change in water level is a fluctuating pumping pressure.