

Case Study

Cuncumén, Chile

A.R.I. air valves provide combined vacuum and surge protection solution

Background

The Cuncumén valley is located within the coastal mountain range, about 20 km south west of the city of Melipilla, and about 40 km south east of the city of San Antonio, Valparaíso Region. Its location gives it characteristics of a microclimate, suitable for growing fruit trees and agricultural plantations, which have seen their sustainability and expansion limited due to the lack of water.

The Cuncumén Irrigation System captures the water from the Maipo River, taking it through a canal to a floating, raft-based pumping station. From there, the water is driven to a desander, and then directed towards a number of water accumulation reservoirs before being distributed to the local population.



Challenges Poor positioning

The Cuncumén irrigation project, managed by BFS Chile in the Valparaíso region of Chile, is located in the middle of hills, with slopes of up to 200 meters.

The problem with pump station 1 is that the pressure was falling below the recommended levels for the pipes, because the pump manifold with the non-return valves was located 3-5 meters above the level of the floating pumps.

Solution A perfect combination of air valves

A VB-060 vacuum breaker and D-060 NS air valve was considered for each pump, with two of each for the pump manifold.

In the first (and largest) pumping station model, 12-inch VB-60 vacuum breakers and 2-inch D-060 NS non-slam combination air valves were installed, combining a 12-inch uni-directional vent valve, with a 2-inch tri-functional valve with non-slam anti-hammer devices. This unique combination enables a huge amount of air to enter the system, both during the initial filling and while the system is pressurized, minimizing negative pressure ruptures and line emptying.

In the gravitational distribution network, D-43 valves and D-46 combination air valves were installed, in diameters of 2 and 3 inches. These allow air venting during filling, emptying and permanent speed to distribute water to the different premises, minimizing energy losses produced by air in the line.



Results Consistently optimal flow

Since the installation of the various air valves, the Cuncumén Irrigation System has been working efficiently, with adequate hydraulic protection against ruptures, vacuum and transient water hammer, facilitating optimal flow management through the entire pipeline.

