

VFD-Driven Intelligent Pumping System

A water pumping plant seems to be the heart of a pressurized irrigation system. Since the demand of irrigation water does not meet the optimum point of the performance of the pumping system; typically, it is suffering from the problems like over or under pressure which result in decreased irrigation efficiencies. Among the problems of current systems are mechanical shocks such as water hammer. From an economic perspective, the energy and maintenance costs of such a pumping system are up to 20 times of the initial cost over its life. Nevertheless, it is not generally considered.



The present system has been designed based on VFD (Variable Frequency Drive) technology. From a technical aspect, the best solution of resolving the mentioned problems is to retrofit VFDs to existing electro pumps. The result of employing the set is to save water and energy most efficiently.

The advantages of the system are as the following:



- Maintenance costs are less than conventional pumping systems and booster pumps having pressure tank
- Supplying constant pressure
- No need to operator (intelligent control of pumping)
- Remote control and monitoring
- Eliminating water hammer with the source of pump and minimizing mechanical damages
- Reduction of electrical power consumption up to 40%
- Embedded protection, control, and monitoring algorithms (functions)
- reporting the components performance and type of error occurred in the system

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