GRUNDFOS ECADEMY

MONITORING AND CONTROLS

USING CONTROLS AND MONITORING TO OPTIMISE THE PUMP OPERATION

be
think
innovate

GRUNDFOS

Variable Frequency Converter or Variable Frequency Drive (VFD)

Variable Frequency Drive (VFD) is a device used to change the frequency of electric Alternating Current (AC) supplied to an electric motor.

Regulating the pump speed is advantageous because irrigation conditions will change from year to year, season to season and even on a daily basis.

Benefits of VFD

VFD:

- Converts input frequency of 50 Hz or 60 Hz to an output frequency that can vary from zero to its maximum frequency. A change in the frequency changes the speed of the motor and pump.
- Can be used as an over-frequency drive when pump performance needs to be increased, if the motor has enough reserve power.

Benefits of VFD (Continued)

VFD:

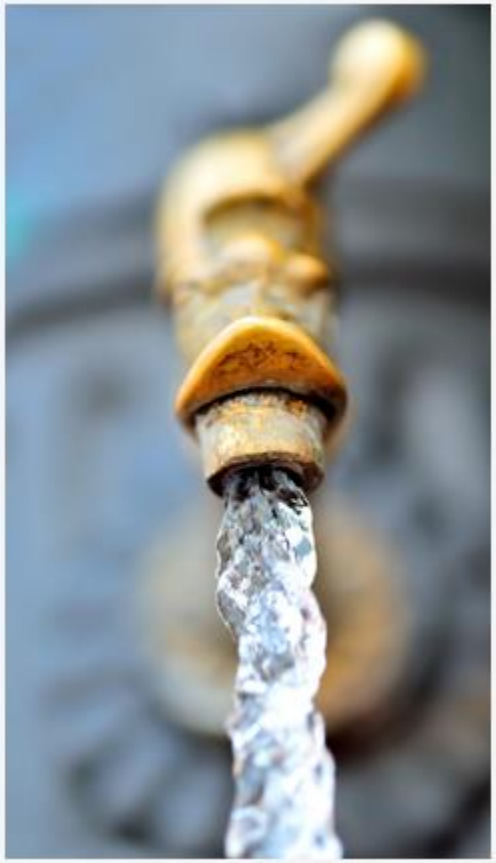
- Provides soft start and soft stop, thereby minimizing the risk of water hammer in the system.
- Eliminates the need for further motor overload protection.

Note that not every application benefits from the addition of a VFD. For example, filling an open reservoir or pond from groundwater source simply requires running the pump at full speed until the reservoir or pond is full.

Using VFDs to save cost of energy and water

Adjusting the speed of the pump to the actual performance requirements is largely beneficial in:

- Adding or shutting down irrigation zones.
- Pivots with corner section and end gun.
- Pumps with varying inlet pressure.



Opening and closing irrigation zones

A VFD is typically used when there is more than one irrigation zone, and every zone has different water requirements. By closing or opening one zone the condition for the pump is changed dramatically.

A pressure sensor notifies the VFD installed with a pump to reduce the pressure, and thereby speed of the pump when a zone is shut off.

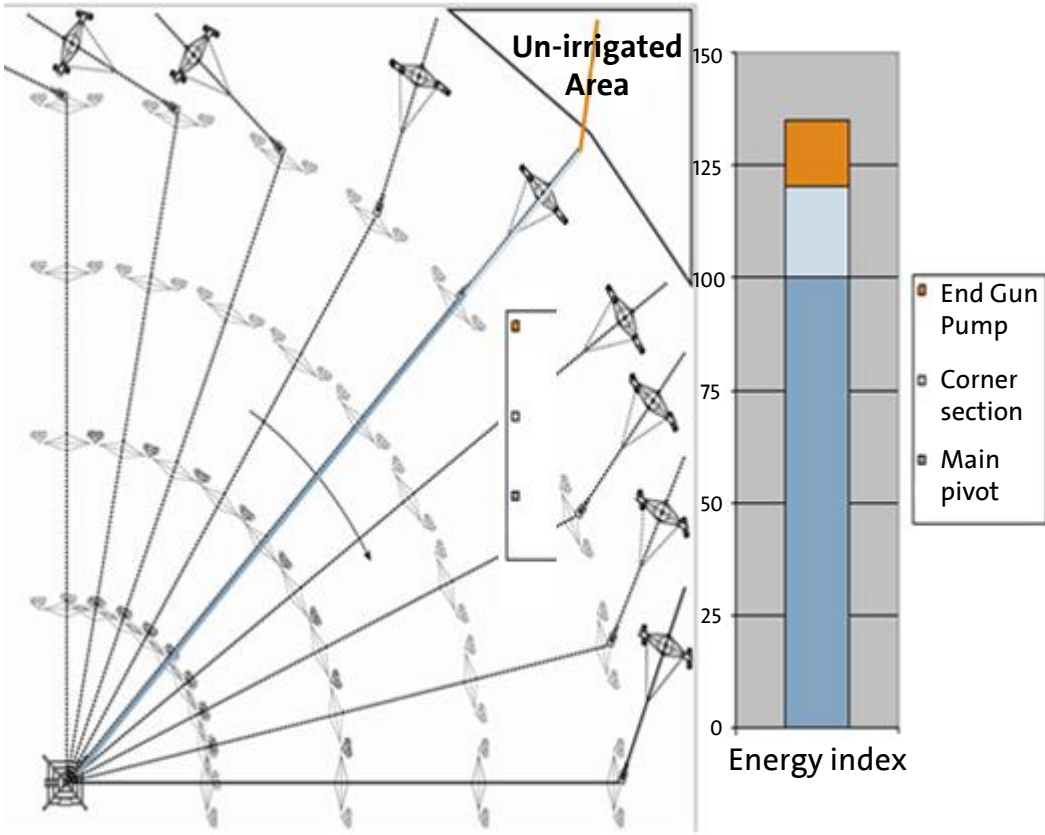
This ensures that the same pressure is maintained in the zone that is open. This also reduces power consumption by almost 50% than when both zones are open.

Pivots with corner section and end gun

A pivot equipped with a corner section or an end gun requires more pressure and flow when it is on than when it is off.

Installing a VFD with the main pivot saves minimum 20% of the energy.

The VFD also ensures that the pressure at the sprinklers remains constant, thereby maintaining high irrigation uniformity.

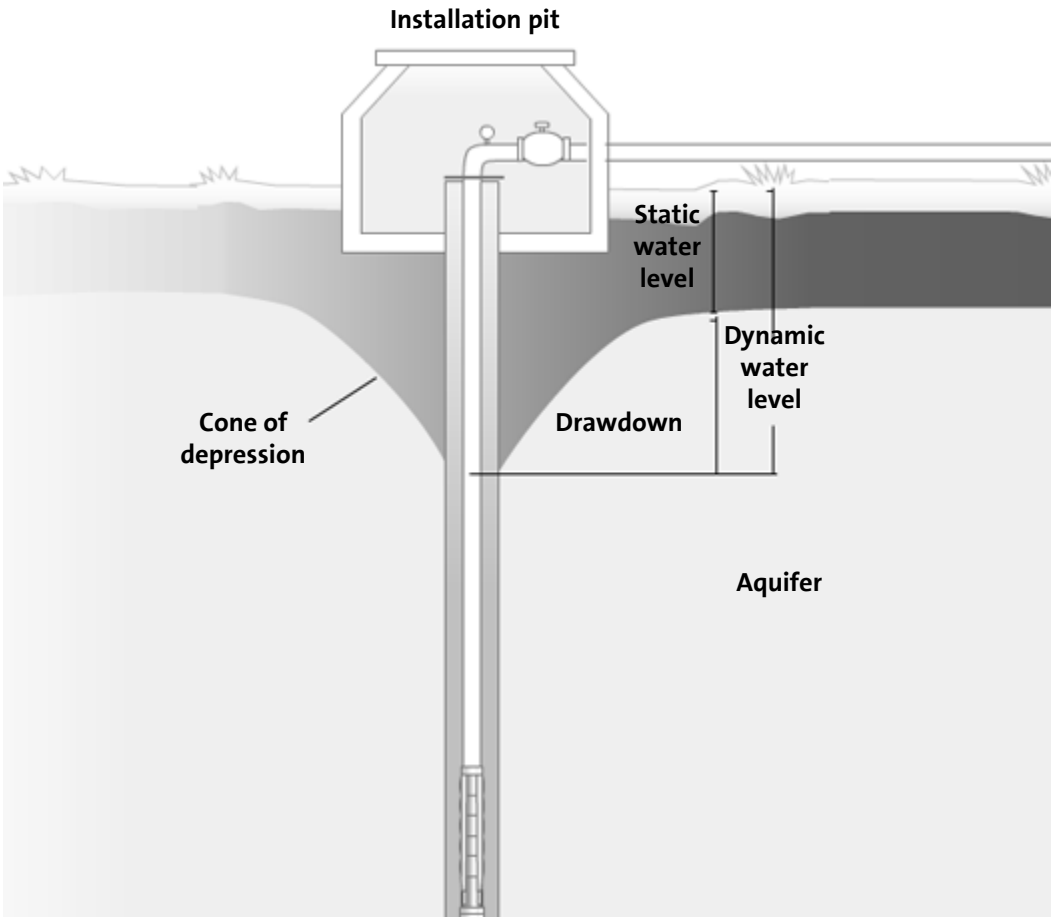


Pumps with varying inlet pressure

Pump inlet pressure can vary significantly, especially for deep-well submersible pumps. Also, the water table typically varies over a season or from one year to another.

Installing a VFD with the pump regulates the performance of the pump and maintains the outlet pressure at a constant level.

This type of regulation helps maintain an optimal irrigation process.



Monitoring and data transmission

Monitoring devices help maintaining a high efficient irrigation process.

Remote monitoring via data transmission devices helps manage alerts, diagnostics and reporting for the pump and pump system. Integration with remote monitored data from the irrigation system enable the user to monitor and control the entire irrigation system from one single screen.

Today, many solutions offer the farmer remote management, diagnostics and reporting through web-enabled devices.

GRUNDFOS ECADEMY

www.grundfos.com