SOUTHERN CALIFORNIA EDISON®
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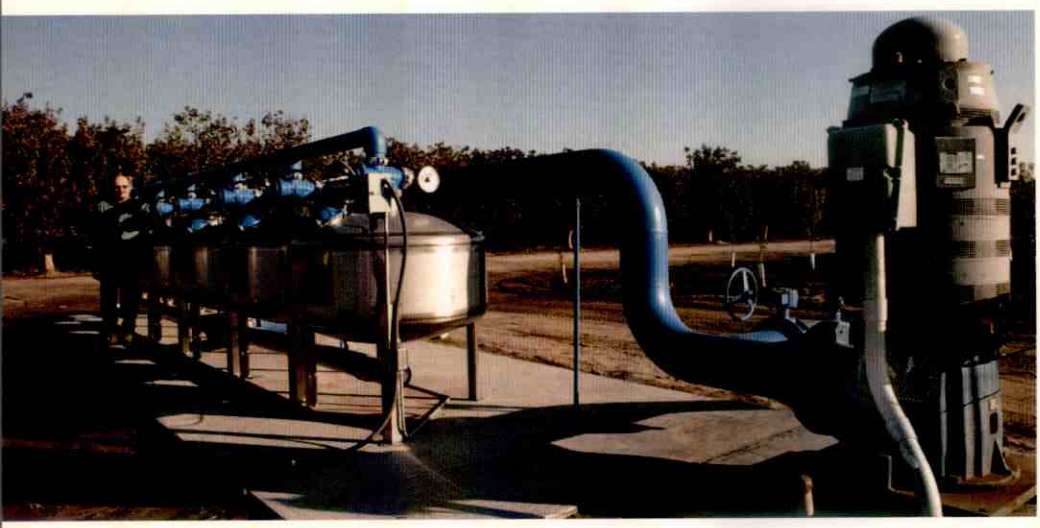
Variable Frequency Drives For Water Pumping



Variable Frequency Drive (VFD)

A VFD is a solid-state electrical device used to change the frequency of AC electric energy supplied to a motor. Varying the frequency of the AC power will vary the speed and the power of the motor. As the amount of power used varies with the cube of speed (the Affinity laws), running the pump at half speed will result in considerable energy savings. VFD's are used in situations where operations are not constant but vary on a regular basis.

Reduce Pumping Energy Cost

You can reduce pumping energy and cost by using a VFD to control pressure and flow. A VFD controlled pump can maintain constant pressure when the flow is changing. It can also be used to keep a constant flow when the pressure is changing. In either case, the result is optimum productivity with reduced energy use and cost.

With traditional control techniques, the motor always runs at a fixed speed selected to pump at designed volumetric flow. Excess pumped volume is reduced by using mechanical actuators, such as closed-loop throttle controls, orifices or bypass systems. By using a VFD system, the speed is adapted to the actual operational requirements, reducing the amount of energy used. The motor only draws the power needed precisely at that particular operating point with power factor and efficiency remaining almost constant over a wide range. By changing the rotational speed, the pump characteristic is shifted to an optimum for the specific process.

The overall result is that VFD pumps use significantly less energy at partial load than fixed-speed drives of the same power rating using mechanical controls.

Energy savings can be projected for a pump by comparing the estimated energy consumption of a fixed-speed pump to a VFD model, taking into account the flow and head of the pumping site.

Training Opportunities:

To learn more about energy efficient technologies, attend an Energy Education Center seminar today! Visit sce.com/workshops to view the quarterly calendar and register online or call 1-800-336-2822.

Energy Efficiency Information and Incentives:

California Energy Efficiency: energy.ca.gov/efficiency.

SCE Hydraulic Pump Test Products and Services

Southern California Edison's free pump test offers you these valuable advantages:

- Increased energy efficiency
- Reduced costs
- Improved system reliability

SCE has performed free efficiency tests of water pumping systems for our customers since 1911, and today's efficiency test program continues to be offered at no cost. We've evolved to incorporate the latest in fluid flow and electronics measurement instrumentation to test thousands of pumps annually.