



**Lower water pumping costs by  
reducing power usage with Danfoss  
Variable Frequency Drive Technology**



United States Department of Agriculture

Natural Resources Conservation Service



Esys® The Energy Control Company™

Authorized Distributor & Warranty Service Provider

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Esys The Energy Control Company has been providing sales and service in Central Southern California from its Bakersfield office, located at 4520 Stine Road, since 1985.

Esys specializes in providing process control instrumentation, process equipment, variable frequency drives systems, process control systems and field services to industries involved in agriculture, food and beverage processing, oil production and oil treating, pipeline transfer systems, chemical processing, water treatment, cogeneration, and manufacturing. Esys provides full service support for the products it sells.

### **Engineering**

The Engineering Department specializes in the design and integration of electronic process control systems, electrical systems, mechanical systems and provides engineering services for industrial clients. Esys personnel possess expertise in flow, level and pressure control, combustion related processes, oil production, water treatment processes, liquid and gas flow transfer systems, and emission monitoring systems. Engineering drawings are generated using AutoCAD computer aided design. Esys also provides turnkey PLC programming services.

### **Construction**

Esys is a State of California licensed C-10, C-8, and C-4, Contractor. The Construction and Service Departments specialize in the installation and service of the process control hardware provided by Esys. The construction and service personnel are trained in the field of process control technology with emphasis on the products which Esys furnishes. Esys provides turnkey installation services from design to startup.

### **Control Panels**

Esys provides a variety of custom designed electronic control panels, variable frequency drive system panels, and electrical panels, which are assembled and tested at the Esys UL-508 panel construction facility in Bakersfield, California. The Construction and Service Departments also provide control panel installation and startup services.

### **Repair**

Esys provides repair services for most products sold from the Esys Bakersfield Woodmere and New Horizon facilities. Repair capabilities include the repair and load testing of variable frequency drives. Instrument repair is performed using NIST traceable test equipment. A large spare parts inventory is available at the Bakersfield New Horizon Esys facility.

## **Why Choose Esys?**

USA Commitment by 100 Skilled and Trained Esys® Direct Employees

31 Years Experience

Certified Welders: B31.3, Section 9

C-4, C-8, & C-10 Licensed Contractor

7 Construction Crews

12 Service Technicians

Extensive On-Site Inventory

California State Licensed Electricians

50,000 ft<sup>2</sup> of Local Facilities

In-House Engineers & Services:

System Engineering • Software Engineering • Project Management • Instrument Repair Shop

Hydraulic Crane Service • Construction Installation

## Energy Enhancement Activity - ENR13 - Variable Speed Motor-Drive Systems



### Enhancement Description

This enhancement activity is for upgrading of existing single speed motors through the addition of variable speed drives. A motor replacement may also be included in some cases. The primary use of this enhancement is for irrigation water pumping. This enhancement is not intended for farmstead or animal housing applications.

### Land Use Applicability

Cropland, Pastureland

### Benefits

Motor-drive systems are matched to the pump or other machinery which performs the work that needs to be done. Each motor-drive system must be sized to meet the maximum expected load even if that maximum load only occurs infrequently. This maximum output

condition is rarely the most efficient operating point of the motor-drive system. A variable speed drive improves the system's energy efficiency under most operating conditions by matching the motor speed to the load. In contrast, the output of a single speed motor-drive system will rarely match the actual demand and is controlled in some way that often wastes a large part of the power it produces. For example, single speed electric motor-drive systems use more electricity during startup and have operating requirements which vary during the run cycle. A variable speed drive can start a motor slowly and ramp up to full speed reducing wear and tear on the motor.

Variable speed drives achieve higher energy savings in applications with long annual run-times and when the system operates outside its best efficiency point for long periods of time. Equipment which operates with frequent on/off cycles or uses some kind of mechanical throttling (dampers on air systems or valves in liquid systems) are typically good candidates for a variable speed drive.

Motor-drive systems which generally operate under steady load conditions are not good candidates for variable speed drives.

### Conditions Where Enhancement Applies

This enhancement applies to only the number of single speed motors without variable speed drives within the selected land use. This enhancement does not apply to single speed motors for farmstead or animal housing applications.

### Criteria

1. Determine current and anticipated requirements in terms of peak and typical load conditions (as the load varies daily and by season, crop, or other appropriate activity).
2. Retrofit single speed motors with a variable speed drive or replace single speed motors with an efficient motor and variable speed drive.

### Adoption Requirements

This enhancement is considered adopted when the selected single speed motor has been retrofitted or replaced with a variable speed motor-drive system.

### Documentation Requirements

Receipts and pictures of the installed variable frequency drive(s).



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