

E-Save Technology® Three Phase Motor Efficiency Controller

Nomination for “Andromeda” Star of Energy Efficiency Award

E-Save Technology® 3-Phase is Power Efficiency Corporation’s proprietary technology platform for improving the efficiency of three-phase AC (alternating current) electric motors operating at a constant speed. Three phase motors are found in commercial and industrial equipment. E-Save Technology typically reduces energy consumption by 15-40% on variable or lightly loaded applications, such as escalators, MG set elevators, conveyors, granulators, crushers, shredders, grinders, saws and many more types of equipment.

There are tens of millions of motors sold every year throughout the world. According to the U.S. Department of Energy (DOE), motor-driven equipment comprises by far the largest single category of electricity end use in the American economy. Electric motors operate most efficiently – meaning they efficiently translate electricity into useful work – when they are fully loaded. However, when motors are lightly loaded, they become very inefficient at translating energy into work. All constant speed AC induction motors operating at light loads are candidates for energy savings with E-Save Technology.

E-Save Technology utilizes patent pending algorithms and digital signal processing to monitor various characteristics of the voltage and current going to the motor, enabling E-Save Technology to provide the minimum power the motor requires to continue operating at a constant speed. Power Efficiency has one patent and three patents pending on inventions related to E-Save Technology.

Power Efficiency is working with various original equipment manufacturers (OEMs), including makers of escalators and granulators, to include Motor Efficiency Controllers (MECs) with E-Save Technology on their new equipment worldwide. Although negotiations are not yet complete, two of the four largest escalator manufacturers have completed testing and appear likely to sign OEM contracts soon. This will help spread the benefits of E-Save Technology on a global scale. Power Efficiency is also pursuing similar contracts with OEMs of industrial equipment.

Potential Savings

Industrial Sector: According to the Energy Information Administration (EIA), the U.S. industrial sector used 1,027,000 million kWh in 2007. DOE studies show that motors constitute 69% of industrial electricity usage and that 44% of all industrial motors are lightly loaded (operating on average at 40% or less of full load). That means just under half of all motors in industry are operating inefficiently. Since E-Save Technology only operates on constant speed motors, we estimate that 50% of these lightly loaded motors are truly candidates for savings with E-Save Technology. With an average estimated savings of 15%, the potential energy savings for the industrial sector is 2.3% of the total industrial electrical use, or 23,385 million kWh.

Commercial Sector: According to the EIA, the U.S. commercial sector used 1,336,000 million kWh in 2007. Data for motor use and motor loads (and therefore efficiency) is not available for the entire commercial sector. However, E-Save Technology has been proven to save energy on various commercial building applications, such as escalators and MG Set elevators. If we therefore assume E-Save Technology has the same potential for total energy saving in the commercial sector as it does in the industrial sector (2.3%), then E-Save Technology has the potential to save the commercial sector 30,728 million kWh.

Case Studies

Power Efficiency’s products based on E-Save Technology are called Motor Efficiency Controllers (MECs). MECs are solid state devices that should last for 10-15 years. Installations of MECs with E-Save Technology typically provide users a payback of 3 years or less, with internal rates of return on investment of usually 30% or higher. Over the life of the product, MEC’s with E-Save Technology often provide users a cost of power of 3 cents / kWh or less.

Berry Plastics Corporation – MECs with E-Save Technology were installed on 24 granulators at a facility owned by Berry Plastics, a large plastics company. Berry Plastics has 67 facilities. In an analysis by Anaheim Public Utilities, MECs with E-Save Technology saved 40% of the energy used by the granulators, reducing the annual energy consumption of this one facility by over 195,000 kWh. This will save Berry Plastics \$17,600 a year, providing a payback of less than two years and an internal rate of return on investment of 74%. A CO2 reduction over 300,000 lbs is projected, equivalent to 26 cars off the road.

Denver International Airport (DIA) - DIA retrofitted 160 escalators and moving walkways with E-Save Technology. Xcel Energy estimated a 30-40% savings of electrical use, a reduction of over 2 million kWh per year, which will reduce carbon dioxide emissions by four million pounds per year. DIA’s operating costs will be reduced by more than \$100,000 per year, allowing DIA to recover their investment in 3 years with an additional savings for another 7-12 years.