

Calculating Potential Savings

Power savings through variable speed drives

Links on the topic:
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Two thirds of the power consumption in industrial installations are caused by electrical drives. Using efficient drive technology can therefore result in substantial savings. Now, these savings can be calculated simply with SinaSave, the free "energy saving program" for Siemens drive systems.

Energy costs of several billion Euros could be saved in Germany alone by using energy-efficient motors and frequency converters. Siemens energy-efficient motors of the highest efficiency class EFF1 for example have up to 40% fewer losses. Frequency converters like Sinamics G150 or Micromaster reduce the energy consumption by up to 50% especially in fluid applications such as pumps, fans and compressors by regulating the motor speed. Using the SinaSave program it is now possible to simply calculate how much can be saved by purchasing an energy-efficient motor and how soon the investment pays off compared to a drive system with fixed speed or a frequency converter for variable speed systems. The program calculates the costs saving for the energy-efficient motors and the amortization of the extra cost of purchasing Siemens energy-efficient motors

of the highest efficiency class EFF1 in comparison with the Siemens energy-efficient motors EFF2, individually selected known motors or known motors within a complete plant analysis.

Plant profile decisive

When dealing with the question of the potential savings and the amortization of frequency converters, unlike other programs, SinaSave does not base its calculation on the drive data, which are often not yet known in detail in the decision phase, but on the plant. Such fundamental data are for example pump flows and pump height in pumps, mass flow and total pressure difference in fans, the density of the transported medium, the number of workdays and shifts and the transport profile in the course of day and year, which is decisive for the extent of the energy-saving potential. If the dimensions entered by the user do not correspond to the standard, the program converts the values into the appropriate unit; the flow in pumps for example from l/s to m³/s or m³/h, in fans from bar to Pascal. The program first derives the drive system with the appropriate performance and the price of the most suitable frequency converter from the plant-specific basic data.

In a next step, the program determines the energy requirement of the variable-speed drive system for the specific applica-

tion case and compares this with the values of all possible alternative concepts which are also calculated, for example throttle valves, bypass, prerotation regulation or switchable pole motors. The difference yields the energy saving in kilowatt hours, which the program converts into hard cash based on the energy purchasing price currently valid for the plant. Added to this, there are other cost-reducing effects of the variable-speed operation such as omission of mechanical regulation, improved power factor, improved process control, reduced motor load and reduced maintenance for the machine. SinaSave calculates the amortization time from the total saving and the total investment, which includes planning, engineering, plant integration and commissioning in addition to the mere purchase price. Typically, amortization is in the range of just a few months.

Analysis as a service

A universal energy saving analysis, for example for all drives of a complete plant, is also available as a service package. The result of such an analysis: the energy saving potential for the whole plant and suitable measures to utilize it. An important tool for this is again SinaSave.

With the start of the Hanover Fair, SinaSave is also available in seven other languages apart from German and English including Russian and Chinese. ■

Energy-efficient motors and frequency converters hold great savings potential, especially in flow machines. SinaSave makes the potential visible

