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**Energy efficiency**

Industrial processes require a great deal of energy. In Austria, manufacturing companies alone account for 28% of all energy consumption, with an upward trend. This is not only an environmental issue, but it also places high demands on the power grid and costs companies a lot of money, since energy is expensive. Therefore, taking steps to improve energy efficiency makes sense not just from an ecological perspective, but for business reasons as well.

**Why do we pay so little attention to energy efficiency?**

* Power is sold in units of kWh, but it is not immediately apparent how it is actually used
* Energy prices do not reflect the real costs, since external costs are often not considered

Internal areas of a company, such as production and building management, are often not coordinated

That is why it makes sense to take a close look at the actual energy costs within a company and ask questions about how energy is used for routine needs. But where can we save money?

**More efficient drives**

Industrial production is one area where a great deal can be saved. For example, there may be a large number of electric motors with obsolete energy efficiency classes running at a constant speed, making them inefficient. As of January 2015, all motors sold in Europe with an output range of 7.5 to 375 kW must be of the IE3 energy efficiency class. In spite of this, many systems continue to use old motors with lower energy efficiency classes. These should be replaced with IE3 motors. Their energy and cost efficiency increases even more when combined with a soft starter. Thyristor-based soft starters are used for the soft starting of asynchronous motors in three-phase operation.

**Soft starters minimize impact loads**

IE3 motors offer the highest efficiency within the 80-100% rated output range. They achieve their highest efficiency through a reduction of armature resistance and higher magnetic induction, manifested by a better cos φ and lower slip. During direct starting, the motor would draw about 30% higher starting current, which results in elevated impact loads in the power grid. If it is operated with continuous control electronics (e.g., frequency converter), this continuous power loss will also be consumed by these electronics and the efficiency gain of approximately 2% is largely lost. In these cases, the soft starter is the ideal combination to increase energy efficiency.  
  
During the starting phase, the soft starter supplies the motor with precisely the amount of power to overcome the required starting torque and suppresses the maximum starting torque through an adjustable starting ramp. An internal current limiter prevents impact loads and network load peaks. In this way, both mechanical loads as well as nominal voltage dips can be reliably prevented.

After the starting process, which usually lasts between 0.1 and 30 seconds, the soft starter's electronics are shorted with bridging contactors and put into a standby status. This maximizes energy efficiency during continuous operation.

**How the TELE soft starter provides for energy efficiency:**

* *Greater motor efficiency during continuous operation*
* *Avoidance of load peaks*
* *Lower power losses during operation*
* *Impact-free starting - adapted torque*

**More efficient industrial heaters**

Even fast-reacting industrial high-output heaters and shortwave infrared radiators require a great deal of power. So when their operation is optimized, the potential for savings is high. Thyristor controllers control the electric power flow through two different thyristor ignition methods. First, as phase control for all heaters, whereby the current and power consumption is reduced; and secondly for inductive-ohmic consumers with fast-reacting heating elements such as infrared lamps, industrial heaters, or ballast heaters of PV, wind, and hydroelectric power plants. In this way, a thyristor controller starts up industrial heaters and short-wave infrared radiators with virtually no impact, using controlled voltage and nominal current. This prevents mechanical loads at the heating elements and mains voltage dips.

**How the TELE thyristor controller provides for energy efficiency:**

* *Greater efficiency of the industrial heater or infrared radiator*
* *Avoidance of load peaks*
* *Lower power losses during operation*
* *Impact-free starting - adapted heating current*

**Power-hungry pumps**

In addition to motors and heaters, it's worth taking a look at a company's pumps. According to the Austrian Energy Agency, pump systems account for about one-quarter of global power consumption. So there is an enormous potential to save power in detailed analyses of operating data and long-term optimization of pump dimensioning. Also, failure to detect disturbances in a timely manner causes approximately 70% of a pump's lifecycle costs and often results in production stoppage and enormous production downtime expenses. Worn out pumps no longer operate efficiently. This hazard can be eliminated with the right kind of monitoring, which detects performance losses early and triggers an alarm or countermeasures. TELE has a complete series of true power monitors that are ideal in these situations. These units detect all types of unfavorable operating conditions in pumps, such as wear, but also blockages, reverse running, dirty filters, hot running, cavitation, temperature, and dry-running. The load monitors also have integrated temperature monitoring that detects elevated motor temperatures, which may be caused by phase failure, frequent starting, or blockages. Fault states are reported immediately, enabling timely maintenance so secondary damage to the system and costly production downtime can be avoided.

**Optimized capacity utilization in parallel operation**

When direct pump control is required, TELE has a fill level monitoring device for conductive liquids as well as soft starters for starting and stopping pumps and alternators for switching between pumps. In pumping systems, pumps are usually configured for redundancy so the system remains functional in the event of mechanical damage and brief load peaks can be covered through parallel operation. In these situations, TELE's G2ASMA20 pump alternator provides for alternating operation of both pumps so the reserve pump remains ready for operation and will not fail when it is needed.

**How TELE improve the energy efficiency of pumps:**

* *Pump efficiency in continuous operation*
* *Optimize starting and stopping*
* *Avoidance of failure and reduction of downtime*
* *Optimized capacity utilization in parallel operation*

**Energy efficiency in control cabinets**

Industrial production lines use a very large number of control cabinets. Power losses from integrated components for power supplies, drive engineering, and automation produce a great deal of heat that must be dissipated as efficiently as possible in order to avoid overheating. Aside from oversized compressor cooling units, which consume a great deal of power, the proper arrangement of components and avoidance of hot-spots within the control cabinet contribute to a significantly better energy balance. But it is particularly important that selected components use, and therefore emit, less energy from the very start.  
TELE has developed cutting-edge switching power supplies for its VEO series in order to address this need. They provide plenty of power and emit very little heat. As a result, energy consumption was reduced significantly. The units typically consume 0.35 W of power, so they generate two-thirds less heat than conventional components. The low operating temperature results in greater reliability and a long service life. At the same time, they reduce expenses for controlling the temperature and ventilation in the control cabinet.

**Hoe TELE improves energy efficiency control cabinets:**

* *Components use less power*
* *Less waste heat*
* *Smaller cooling units can be used*