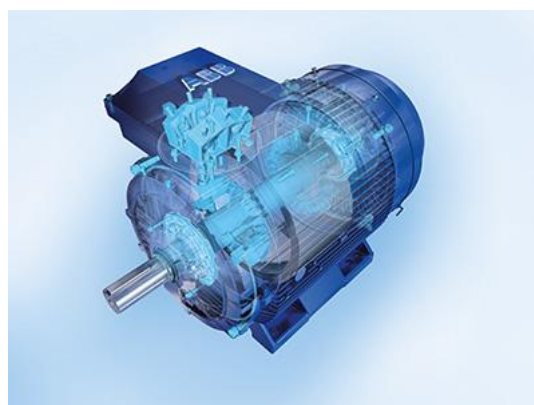

VAASA, FINLAND, APRIL 05, 2017

EU MEPS – everything you need to know

The final stage of EU MEPS of new European Commission (EC) regulation came into force January, 2017 to support targets for energy savings and carbon dioxide emissions from low voltage motors. Read below what is Minimum Energy Performance Standard (MEPS), what needs to be done now and what does the future hold if you want to stay ahead of the regulation.



Since the start of the year, new electric motors sized 0.75 to 375 kilowatt (kW) in Europe must now meet the IE3 efficiency level or the IE2 level if fitted with a variable speed drive (VSD). As operators of industrial motors gradually replace their assets, the regulation will deliver annual energy savings of 5.5 billion kilowatt-hours (kWh) and 3.4 million tonnes of carbon dioxide emissions.

While regulations can seem daunting, MEPS can improve productivity, reduce overall costs and enable buyers of motors to compare like with like. The key is that the higher purchase price of energy efficient motors is worth paying as energy represents up to 99 percent of the overall lifecycle costs.

Consider a 200 kW motor running for 8,000 hours per year with energy cost of 0.1 euros per kWh. An IE2 motor would consume energy worth 169,521 euros per year, compared to 167,945 for the IE3 motor. The difference of more than 1,500 euros per year gives a payback of less than two years.

What buyers should expect from motor manufacturers

The responsibility is on manufacturers to define and prove the reliability and efficiency, not just of motors and drives but the power drive system (PDS), made up of the motor and drive combination.

The ideal is to find the optimum combination for customers' applications to reduce energy consumption as well as the purchase costs, footprint and cooling requirements that arise from over-dimensioning of motors and drives. Recognizing this, we recently opened a laboratory to evaluate the performance of our customers' motor/drive combinations.

Under the regulations, motor manufacturers must also provide rating plates marked with IE class, year of manufacture and nominal efficiency at 100, 75 and 50 percent of the rated load.

Lastly, manufacturers should also be introducing new technology for greater efficiencies. For example, synchronous reluctance motors (SynRM) do not have conventional rotor windings, leading to less build-up of heat. This means power losses are typically 40 percent lower than in induction motors and motors experience fewer stoppages from bearing failures.

SynRMs offer the same performance as permanent magnet motors but at a similar price to equivalent induction motors, and when twinned with a VSD, they can handle the type of high torque application found in food and beverage, cement and mining.

OEMs and machine builders

Original equipment manufacturers (OEMs) and machine builders should now be using IE3 motors as standard in their applications. The challenge to industry is that IE3 motors often have larger frame sizes than their IE2 equivalents, which can have major implications to OEMs, which may need to redesign products.

While some will turn to an IE2 motor with a VSD, the overall cost to the end user can be higher than an IE3 motor. In some cases, it's even possible to find IE3 motors with an identical shaft height to their IE2 equivalents, so it is worth pursuing with motor manufacturers.

System integrators

With an eye on future energy consumption, system integrators often naturally turn to energy efficient motors and VSDs, possibly using motor starters in fixed speed, constant load or low duty applications.

The rule of thumb is to use VSDs whenever there is a need to regulate the speed of a motor and in applications where drives enable savings in maintenance or energy costs.

End users

Minimizing overall costs is a top priority for end users and the improved energy efficiency under MEPS can help achieve this. The first step to take is to review procurement policies to ensure that all motors meet the new legal minimum requirements.

Second, it is worth putting in place contingency plans for the hardest working motors that run for more than 7,000 hours per year.

Third, end users should analyze their fleet of motors and spares. This means checking rating plates for compliance with the Eco-design Directive 2009/125/EC and Regulation 640/2009. Rating plates also display the efficiency values and efficiency class – either IE2 if the motor is to be used with a VSD or IE3. This will inform a decision on whether to upgrade motors.

It's worth knowing that repair or rewinding of motors is not affected by MEPS, so operators might see this as a low-cost option. However, there are hidden costs as rewinding reduces a motor's efficiency by as much as 3 percent and can reduce performance.

In summary, a new high efficiency motor is generally the best alternative when aiming for optimized total lifecycle costs.

Supporting the supply chain

Despite MEPS being embraced globally, the scope and exclusions vary between countries, which is challenging for OEM and motor manufacturers. Recognizing this, ABB can supply motors to suit every country and help its customers stay on the right side of the law.

Many operators see MEPS as just the start and have the long-term goal to optimize the cost of ownership of the motors. In support of this, we have developed an online tool called Optimizer to help select the right motor based on country of operation, running hours, energy cost and CO2 emissions.

As one of the few companies that makes both VSDs and low voltage AC motors, we offer packages of drives and motors for specific applications such as HVAC pump and fan installations. For bespoke applications, we have a testing laboratory to support the matching process.

Another tool that can help is ABB's EnergySave calculator, which identifies the energy saving potential of installing a VSD for driven applications such as pumps, fans and compressors.

Future outlook

Looking ahead, the EC has ambitious environmental targets for 2030. It has estimated potential energy savings of 22.3 TWh per year by extending energy efficiency regulations further.

Options include covering larger motors above 375 kW and smaller motors down to 120 W. They may also remove the current option of using an IE2 motor with a VSD and remove low efficiency VSDs from the market. A final option is to extend regulations to cover explosion proof and brake motors or motors rated at more than 1,000 V.

Whatever the direction of future regulation, energy efficiency should be a top priority for the supply chain.

For more information please visit:

www.abb.com/motors-generators/energy-efficiency

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