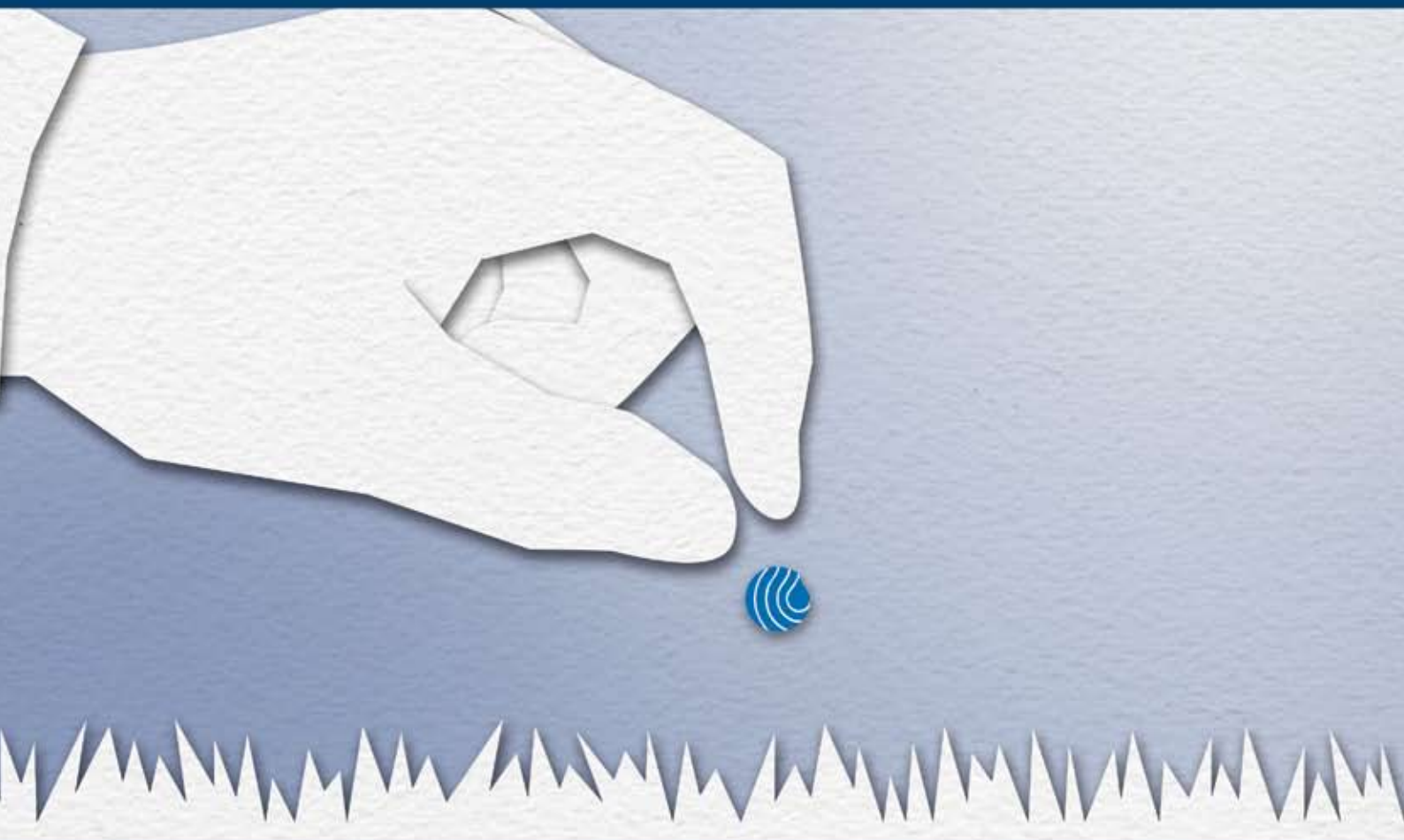
LOWARA

Every day, we sow technology for life

The EU Eco design directive in the Lowara world



ITT

2020.
We have a big target to reach

Eco design directive

In 2005, the European Union approved the new 2005/32/EC Directive with requirements on the environmental design of energy-using products. This has been known as the EuP (Energy using products) or Ecodesign Directive. On 20 November 2009, it was replaced by the new 2009/125/EC Directive. The most significant modification is that the scope of "Energy-using Products" was expanded to include "Energy-related Products" and is now shortened to the "ErP Directive".

The scope of the Ecodesign Directive is to reduce energy consumption and other negative environmental impacts. The target by 2020 is a 12% reduction of the 2007 years consumption meaning a totally saving of 341TWh (terra watt hours).

The Lowara products affected by the Ecodesign Directive are

- **Electrical motors used in surface pumps**
- **Circulators**

Motors: new levels of efficiency

The EU MEPS (European Minimum Energy Performance Standard) scheme sets mandatory minimum efficiency levels for electric motors introduced into the European market. The European Community (EC) directive n. 640/2009 was set up in July 2009 as part of the EU's eco-design project. The EU legislation is basically based on the standard IEC 60034-30: 2008 and uses the classes and testing methods defined within.
The legislation is valid for single speed, squirrel cage induction motors, with 2, 4 or 6 poles, rated voltage up to 1000V, 3-Phase motors from 0.75kW to 375kW (rating based on continuous duty). The regulation that now becomes active within EU as a first step only allows minimum IE2 motors to be sold. *(The important dates*)*

Circulators

The eco-design directive also calls for more efficient wet rotor circulators used in heating systems. They are already today energy efficiency labelled, but the so called EEI index (the index that determines the energy class) will change and demand more efficient circulators. The index is calculated based on the overall efficiency of the circulator and a duty simulating the variance in a heating system; the lower index, the more efficient pump. Today, the EEI index has to be below 0,4 for an A-classed circulator.
The European Community (EC) directive n. 641/2009, set up in July 2009 describes the new index levels and from 2013, it will only be allowed to sell A-classed circulators. Also the formula to calculate the index will change, so it's not possible to compare old and new EEI index. *(The important dates**)*

From 16 June, 2011*
Motors must meet the IE2 efficiency level

From 1 January, 2013**
Circulators must be A-classed. The EEI-index for A-class will change from 0,4 to 0,27

From 1 January, 2015*
Motors with a rated output of 7.5 – 375 kW must meet either IE3 efficiency level or IE2 level if fitted with a variable speed drive

From 1 August, 2015**
The EEI index will change to 0,23

From 1 January, 2017*
The regulation now covers also the smaller sizes and now motors with a rated output of 0.75 – 375 kW must meet either IE3 efficiency level or IE2 level if fitted with a variable speed drive

Our way there

Technical solutions

The efficiency of an induction motor depends on how well losses are kept low in the motor. The main types of losses are electrical, mechanical and magnetically losses. Mechanical losses are mainly due to bearings or sealing systems in the motor. Electrical losses are due to resistance in the windings. Magnetically losses are due to hysteresis and eddy current losses.

Since there are a number of different types of losses, the ways of reaching higher efficiencies will vary with the type of motor you start with. In general actions like adding more copper to motor, using higher grade materials in the stator and rotor or equipping the motor with low friction bearings are common ways to reach a more efficient motor. Unfortunately all these ways usually also increase the motor cost.

Another way to increase the motor efficiency is to change the technology to electronically commutated (EC) motors with permanent magnet rotors. This technology is more costly, mainly because of the permanent magnets and that it requires electronic control of the motor to work. It's also more difficult to service an EC motor as the magnets are very strong. Service will require an environment free from metal particles and only non magnetic tools can be used. This technology is mainly used for wet rotor circulators where a failed motor is replaced instead of being repaired.

Lowara solution and offer

Standard electrical motors
After 16 June 2011, Lowara will deliver IE2 motors and IE2 motors with Hydrovar drivers.
IE3 alternatives will be available on request.

Wet rotor circulators
Lowara use a special designed EC motor with a spherical rotor. This design adds the advantage of the EC technology with a mechanical design without shaft and bush bearings to reduce the losses in the motor. From January 2012, the Ecocirc circulators will be in compliance with the 2013-level.

But green life is more than motors

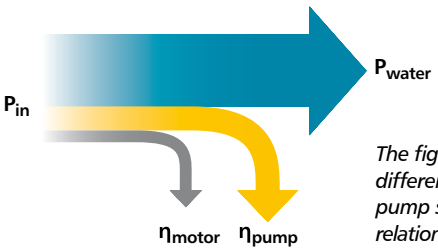
Holistic approach

Motors are important, but to be true green it's important to have a holistic approach. In a pump system, the motor is one of the components contributing to the total efficiency of the system and the possibilities to save energy are much greater when looking at the whole picture. The base line is set by the pump system design (pipe diameter, components, pipe layout etc). The energy required is determined by the formula

$$P = Q \times H \times g \times \rho$$

P= Power - Q= Flow - H= Head - g= gravity - ρ= density

So, the lower the friction losses are kept in the system, the less head the pump need to produce to give a certain flow and the less energy is needed to move the water in the pipe system. When the system is set, it's about choosing the most energy efficient solution to pump the water in system.



The figure shows the different losses in the pump system and the relation between them.

The **first factor** is to choose a pump as close to it's best efficiency point as possible. Here it can easily differ 5-10% in efficiency in available alternatives (see ill. A).

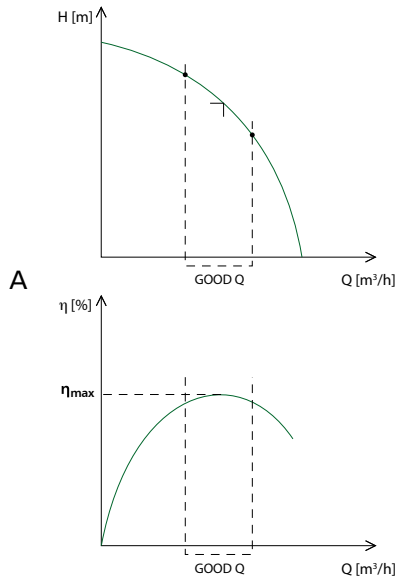
The **second factor** is to determine if the pump system has big enough variations in the flow to justify a speed controller like Hydrovar. This can make really big savings (up to 75%) in some systems. This is also acknowledged by the EU commission as an IE2 motor with VSD is allowed to sell also after 2015 (see ill. B).

The **third factor** is the motor efficiency. Here we talk about differences of 1-3% in efficiency. It's not unimportant, but the big potential lies in he other factors. In systems with long running hours, it could make sense to use an IE 3 motor as the payback time becomes more reasonable.

A holistic perspective represents the best means to reduce energy bills while at the same time minimizing the overall ecologic impact. At Lowara, we fully realize the importance of those goals, from designing efficient pumps to help finding optimal solutions for every pump system.

We can sow for life together

A



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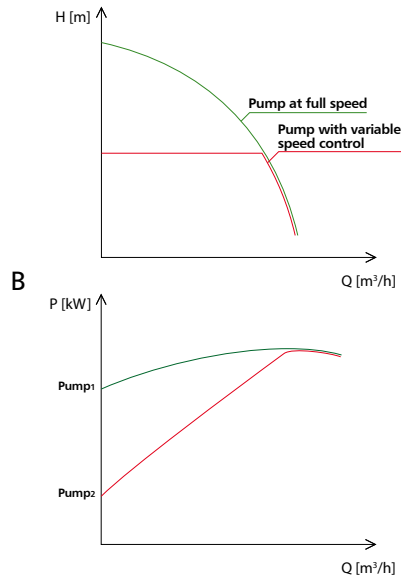

ITT Lowara part of ITT Corporation and headquarters of "Residential and Commercial Water - EMEA".
World leading in offering high reliable fluid handling solutions for Building Services, Irrigation and Industrial applications. We provide a complete range of high quality pumps, packaged systems and controls and are specialized in engineering and manufacturing stainless steel products.
ITT Lowara is headquartered in Vicenza, Italy and operates in more than 80 countries across the world with own plants in Italy, Austria, Poland and Hungary. The company has 1.600 employees and generated 2010 sales exceeding $400 million. ITT Lowara is wholly owned by the ITT Corporation of White Plains, New York, and is the EMEA headquarter of ITT's Residential and Commercial Water division. ITT Corporation is a high-technology engineering and manufacturing company operating on all seven continents in three vital markets: water and fluids management, global defense and security, motion and flow control. ITT Corporation generated 2010 sales of $11 billion

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