› **Control solutions**
Drives ▪ Motors ▪ Systems

REEL

High efficiency motors and regulation equipment for HVAC/R

Efficient and modern solutions for pumps, fans and compressors

The motor speed control and the use of high efficiency electric motors bring many advantages compared to traditional solutions applied in HVAC-R systems:

- significant energy savings
- lower noise level
- reduced maintenance
- increase in system life.

The optimization of production processes and the rationalization of energy consumption are strategic objectives for companies.
In order to obtain satisfactory results, it is not possible to just adopt innovative technologies for the production plants, it is also necessary to act on the structure of buildings, such as on air-conditioning, pumping and refrigeration systems.
This applies to both manufacturing companies and all buildings and commercial, service and residential facilities: hotels, hospitals, airports, sports facilities, shopping malls, exhibition centers...

REEL provides the most suitable control solutions to increase the efficiency of the systems in the HVAC-R sector, thanks to the use of the SuPremE IE5 reluctance motor and our control solutions (speed controllers as standalone or electrical cabinet versions).

Saving energy by ensuring comfort is simple with SuPremE

In all buildings, from hotels to airports, from skyscrapers to shopping malls, from schools to warehouses and industries, it is necessary to use energy efficiently reducing inasmuch as possible the emissions of CO_2 to the atmosphere.
HVAC-R applications and, therefore, heating, ventilation, air conditioning and refrigeration systems use electric motors and variable speed drives.
SuPremE drives do the job more efficiently than existing systems and ensure a reliable and flexible plant control.

Swimming-pools, fountains and spas

The optimal regulation of the water temperature is achieved through a control system managed by first class motors and converters (SuPremE).

Hospitals and clinics

Air conditioning in hospital environments is essential to preserve hygienic conditions.

Schools, universities and offices

The SuPremE drive eliminates temperature fluctuations in study and work environments so that people can carry out their activities in an efficient and calm way.

Hotels and residential and commercial buildings

Feeling at home increases psycho-physical well-being: therefore, it is essential for the HVAC systems to work at their best. Saving energy with SuPremE.

Industries, warehouses and storage centers

The control of temperature and humidity inside industrial plants to both preserve certain types of productions or production processes and store perishable materials, requires motors and inverters to perform their tasks precisely. Always paying utmost attention to energy consumption. Therefore, the ideal solution is the SuPremE drives.

Airports

There are several electric motors deployed in HVAC facilities at airports and the potential energy savings are very high.
REEL solutions modernize existing systems and significantly reduce energy costs.

The products of systems for HVAC-R

High efficiency synchronous reluctance motors - SuPremE

The IE5 efficiency class synchronous reluctance motor without magnets, in accordance with the IEC 60034-30 efficiency standards.
The current range includes powers ranging from 0.55 kW to 450 kW, with IEC standard execution. SuPremE motors are regulated by inverters and allow maximizing efficiency in variable speed applications (compressors, pumps, fans and other rotating machines). SuPremE offers the greatest advantages in terms of efficiency especially at partial load and/or speed, compared to the traditional inverter-controlled asynchronous IE3 and IE4 motors.

Drives for wall or panel mounting - FlexiMova® cm

High-performance inverter line that can be installed on the wall or in an electrical cabinet, available from 0.37 kW to 1400 kW, with protection levels ranging from IP20 to IP66 and a wide range of options.
Suitable for controlling asynchronous, synchronous reluctance, and PM synchronous motors.
With a typical yield of 98%, it allows the plant to maintain very high levels of energy efficiency and performance.

Remote IP55 drive - FlexiMova® mm

The IP55 FlexiMova® mm drive line, available from 0.37 to 55 kW, is ideal for applications requiring installation on the motor or on the machine, making the installation more flexible and compact, maintaining a high system reliability.
This sturdy inverter is suitable for controlling asynchronous motors and synchronous reluctance motors.

Electrical command and control panels

The frequency converters can be enclosed in a control panel, completely customizable according to the customer's needs and the specific application.
Plant supervision and monitoring systems complete the solution.

The achievements

AHUs equipped with SuPremE motors and FlexiMova mm on-board motor converters at Coop Alleanza 3.0 plants

Deaerator circuit command and control panels and pumping system equipped with SuPremE motors for the glycol cooling circuit at the Galbani factory

Command and control panels and SuPremE motors in a pumping plant at a mineral water production factory

Solutions for fans and AHUs

REEL solutions for the efficient control of ventilation systems optimize the performance and energy consumption of the fans thanks to:

- ✔ SuPremE synchronous reluctance motors with IE5/IE4 efficiency class.
- ✔ Frequency converters for optimal control of SuPremE synchronous reluctance motors, in IP55 version for remote or IP20 control systems included in the electrical panel.

Why should you choose REEL solutions?

- **More efficiency**
  Because SuPremE motors feature a very high efficiency especially in partial load applications and allow a significant reduction of electricity consumption.
  Our frequency converters optimize motor speed based on the actual demand.

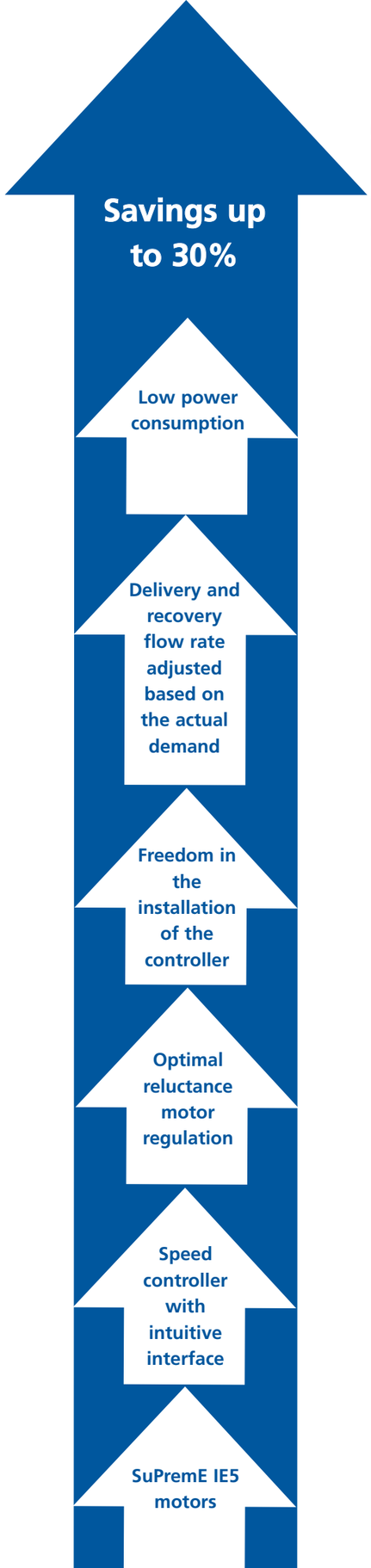
- **Less maintenance**
  Because SuPremE motors are made without magnetic materials (rare earths), have a very low environmental impact and require reduced maintenance, all features extending their life cycle.

- **Optimum adjustment**
  Because our converters perfectly control synchronous reluctance motors throughout the speed range.

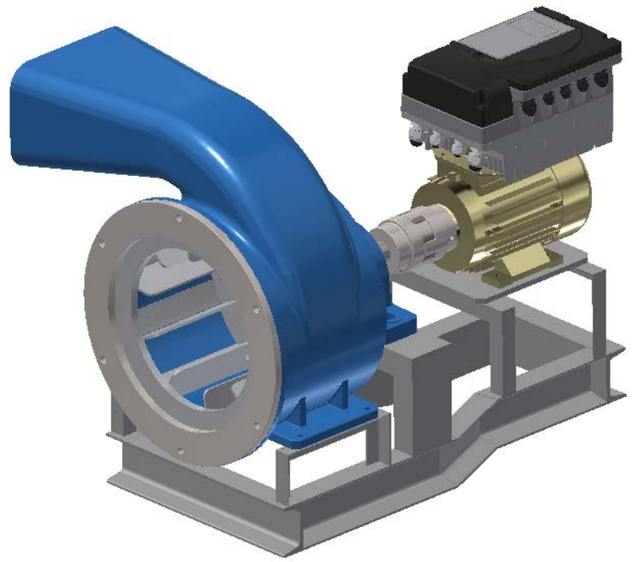
- **Better performance**
  The specific functions for controlling the fans (PID regulators, flying start function, ..) allow to maximize the plant performance.

- **Greater flexibility and customization**
  We offer customized solutions because each plant is different and each customer has different needs.
  Converters in the electrical panel with dedicated functions, inverters located in the installation or on-board on the motor to assure a better usability and maintenance of the systems: each customer has its own solution.

- **Fast payback**
  Whether they are applied for new systems or for modernizing existing systems, our efficient SuPremE motor control solutions ensure a return on investment in a short time... and the savings in the bills do remain!



Energy retrofit on an industrial ventilation system (in a whey production plant).



Example of application on the intake system of the SuPremE motor controlled by an IP55 inverter - FlexiMova mm series - for a reduced footprint, an easier accessibility for maintenance and unparalleled energy savings.

Complete solutions for pumps

Our energy efficiency improvement activities for applications on pumps are not limited to the supply of individual components such as high-efficiency SuPremE electric motors and frequency converters (mounted on-board, next to the machine or in an electrical panel) but are extended to offer the customer a complete "turnkey" package that also includes the design and construction of mechanical and hydraulic components.

Savings monitoring
Once the pumping system has been installed (on new plants or during retrofit activities), we follow and monitor the actual energy savings to provide the customer with a tangible feedback on the performed investment.

Depending on the installation and on the type of plant, potential energy savings vary on average from 10 to 30%.

Advantages of the SuPremE motor solutions

- **High energy savings**
  The use of synchronous reluctance technology by the SuPremE motors in partial load applications significantly reduces energy costs.
  Our frequency converters optimize motor speed based on the actual demand.

- **Reliable operation**
  The specific functions for controlling the pumps of the converters proposed by REEL (characteristic curve control, protection against dry running, automatic adaptation of the PI regulator, pressure dynamic compensation...) ensure operational reliability.

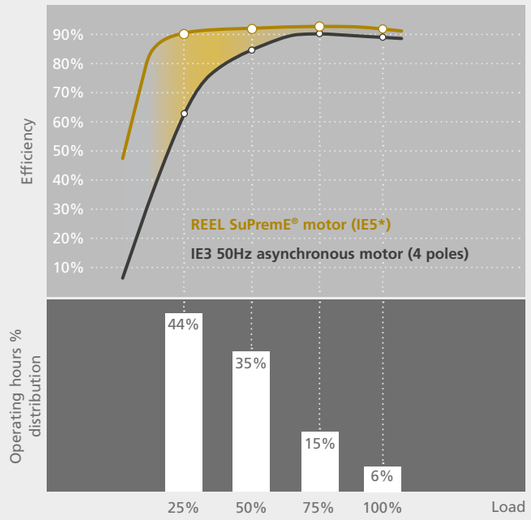
- **Maximum flexibility**
  Our control solutions are always tailored to guarantee maximum energy savings and optimal operation of the pumping system.

- **An investment that is worth**
  Whether it's a new installation or it involves improvements to existing systems, solutions with SuPremE motors are a guarantee of long-lasting high energy savings.

- **Reduced footprint**
  The use of frequency converters mounted directly on-board on the motor reduces the overall dimensions of the installation, making the plant leaner. Likewise, our electrical control panels are custom-made allowing to reduce their dimensions to a minimum.

- **Savings monitoring**
  Through a continuous monitoring, greater long-term efficiency is ensured through frequency converters for a complete transparency of the actual energy savings of the installation.

Unique savings thanks to an extremely high efficiency - especially at partial load



* IE5 according to IEC/TS 60034-30-2

The diagram shows the efficiency variation as a function of the load profile ("Blue Angel") of a REEL SuPremE® motor from 7.5 kW to 1500 rpm compared to an asynchronous 4-pole IE3 motor.

Source: Dipl.-Ing. M. Wiele, Prof. Prof. hc. mult. Dr. Ing. Peter Brosch, Hannover University of Applied Arts and Sciences, Faculty I, Drives and Automation Technology.

* In accordance with IEC/TS 60034-30-2

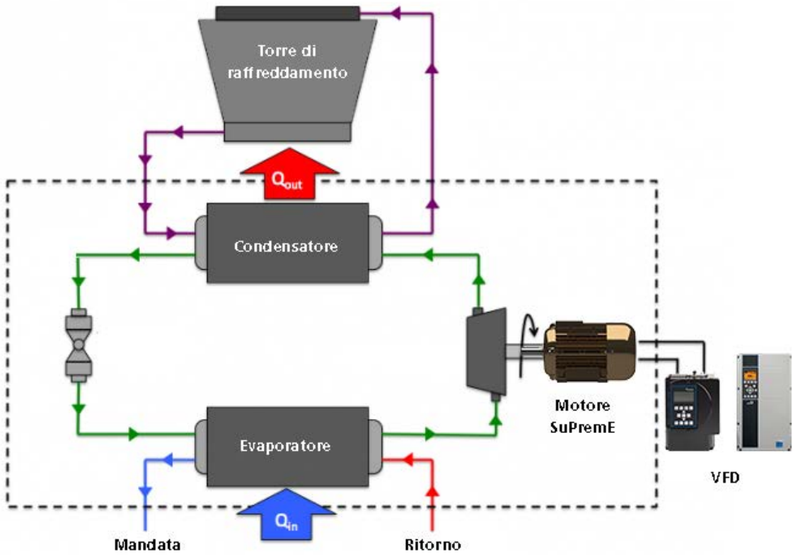
Top efficiency for compressors and cooling assemblies

The energy cost in small and medium power compressors (lower than 30 kW) affects 70% of the total life cycle cost, calculated over five years of operation.
By introducing a speed regulation system using a SuPremE drive, energy savings of up to 50% are achieved on average compared to compressors with load-idle regulation.

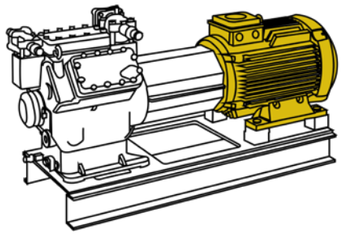
The variable speed control allows a constant adjustment of the pressure adapting the capacity to the actual system needs.
The more the compressor operates for long periods at partial load, the more useful is the application of the speed control system. A lower speed operation based on actual needs reduces operating costs and allows savings in terms of energy consumption. (*)

(*) without neglecting the need for lubrication of the compressor.

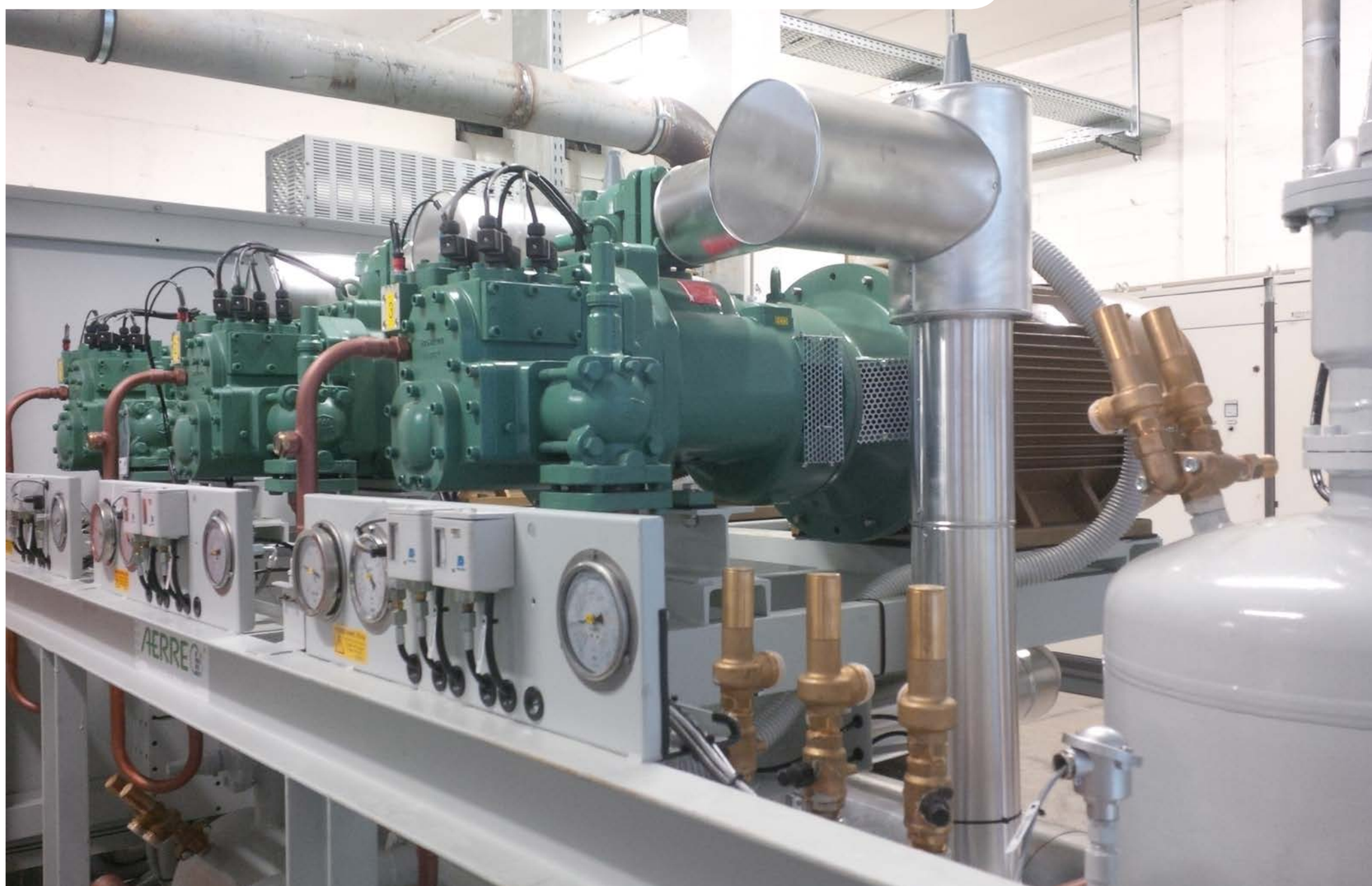
- **Energy savings up to 50%**
  Thanks to the use of speed regulation systems and of the SuPremE IE5 motor
- **Longer cooling system life**
  The SuPremE motors require reduced maintenance as the "cold" rotor extends the life of the bearings.
  Thanks to the frequency converters offered by REEL, fewer starts and stops are performed, thus reducing the mechanical wear and tear of the machine.
- **Quick and easy commissioning**
  The frequency converters proposed by REEL are intuitive and user-friendly.
  The graphic control panel is remotable in order to be more easily accessible and thus to allow an easy access to the system parameters and functions.



Example diagram of a chiller with the application of the high-efficiency SuPremE motor controlled by a REEL inverter



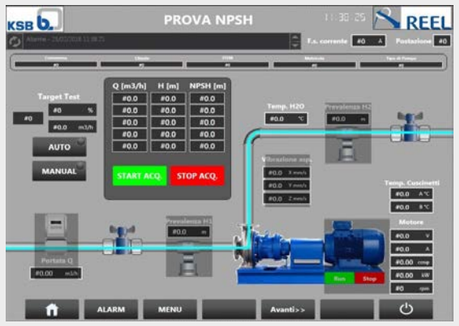
Use of SuPremE reluctance synchronous motors on compressors for immediate energy savings



We provide 360° solutions

As a System Integrator, REEL also takes care of the integration of machine automation and control systems in both the design and the construction stage of the electrical, mechanical and hydraulic components.

Plant monitoring and supervision systems, remote control and tele-control solutions for a correct management of the entire installation complete the mere supply of individual components which, although efficient and reliable in terms of operation, maximize their performance if properly integrated within the "machine system".
All this always in the perspective of offering Industry 4.0 Ready systems.



Supervision and data acquisition system for a pump test bench.

Energy efficiency improvement works at a Galbani plant granting 39% energy savings.

Command and control panel for a CHP plant.

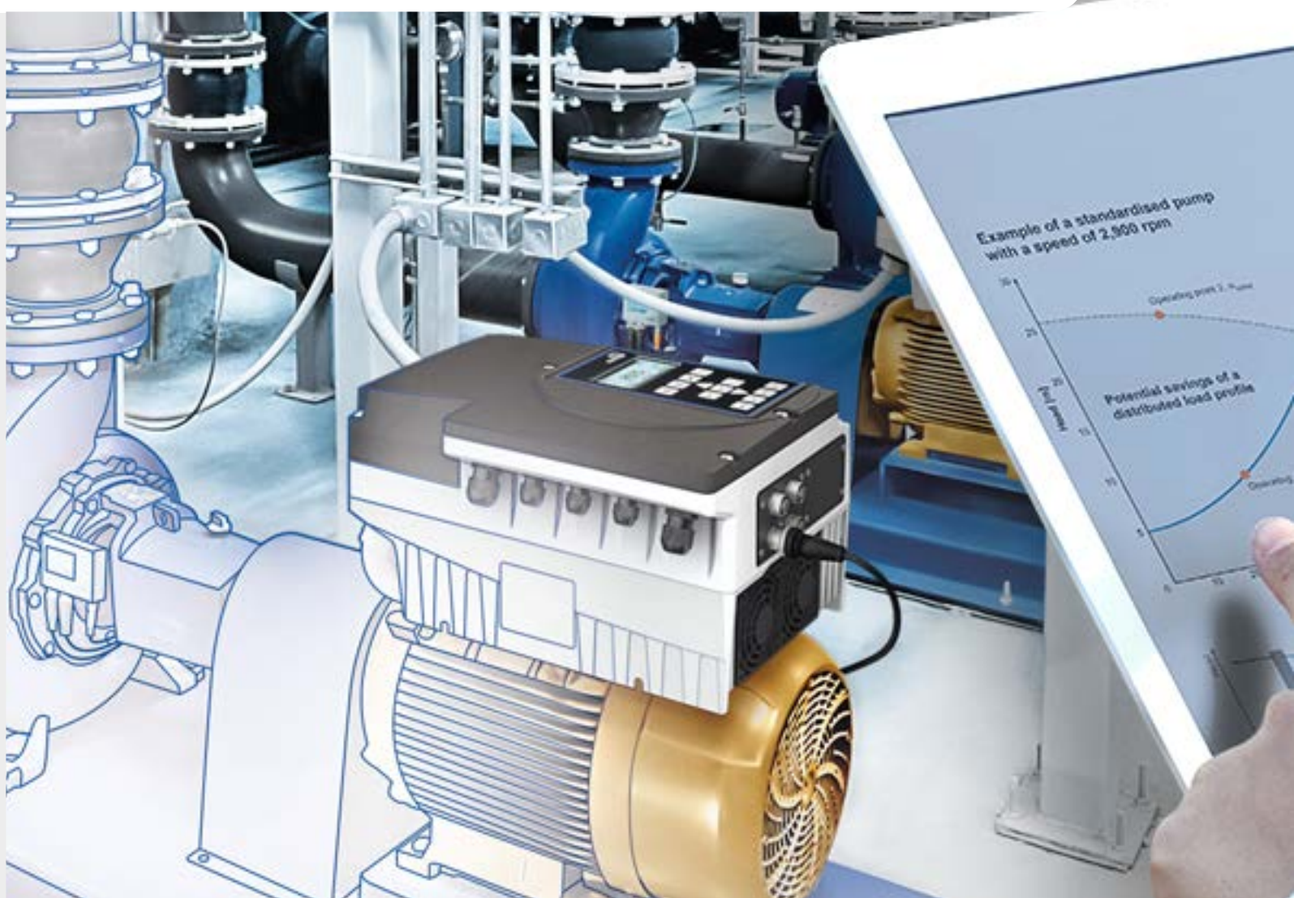
Efficiency improvement of a pump through the installation of the SuPremE motor.

Energy audits

Analyzing the energy consumption of the plants is the first step to understand which improvements could be made to reduce consumption and rationalize energy costs.

The energy audit aims at verifying the existence of potential areas for improving energy use with the aim of reducing consumption without affecting the company's production methods or the performance of the installed HVAC-R systems.

REEL offers on-site energy analyzes to collect data on the plant deemed to be energy-consuming, analyze them and calculate the potential energy savings attainable by applying SuPremE control solutions.



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