LS news

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Quiet and eco-friendly, the electric vehicle is perfect for city life

After a slow but sure start, electric vehicles now benefit from a range of innovative, reliable and high-performance technologies. They will, without a doubt, be part of the urban mobility of the future.

An action plan for urban mobility

Nearly 60% of the planet's inhabitants live in urban populations of more than 10,000 inhabitants. In cities, traffic jams and pollution peaks are an everyday fact of life. Urban traffic represents 40% of CO_2 emissions relating to road transport. And every year congestion in cities within the European Union costs more than 100 billion Euros – 1% of the Union's GDP.

On 30th September 2009 , to reduce congestion in cities and reduce the environmental and financial costs of traffic jams, the European Commission adopted an ambitious action plan for urban mobility. It is part of an approach which began in 2001 with the publication of the white paper on transport and was extended in 2007 with the adoption of the green paper called "Towards a new urban mobility culture".

The new action plan proposes a series of measures to be taken by cities such as the promotion of integrated policies to encourage more environmentally-friendly travel or the development of a more ecological urban transport system. All these actions are the perfect response to the objectives of combating global warming.

FRIENDLY
Electric vehicle designed for driving in and around town, with a motor rated 10 kW at 9000 rpm, plus a differential gearbox and transmission

The electric vehicle, an answer to this challenge

In this frantic race to reduce CO_2 emissions, does the electric vehicle have a future? There is certainly an extraordinary amount of hype surrounding this topic. Not a single day passes without some new initiative or technological advance appearing in the press. A new spirit of research, innovation and even passion has dawned.

For manufacturers, even though they may still have their doubts , the time has come to make some major decisions and strategic choices. Undeniably, the all-electric vehicle has key strengths on its side, mainly in terms of urban mobility.

This trend is confirmed by the way in which various technologies have come to maturity. Modern lithium batteries are constantly evolving and can produce quite respectable autonomy levels depending on the type of vehicle. Electronic control, miniaturisation of components and the emergence of permanent magnet motors have opened the way to mass production of more compact, reliable and high-performance products.

Finally, markets are gradually developing new habits. And here too, initiatives are constantly popping up to attract the future drivers of electric cars (self-service, subscription, fast charging, etc).

Energy regeneration

At this time when keeping energy costs down is paramount, the electrical solution

EDITOR IN CHIEF:

Philippe Faye
Leroy-Somer
Bld Marcellin Leroy
F-16015 Angoulême

CO-ORDINATION AND LAYOUT:

Im'act

EDITORIAL COMMITTEE:

A. Bondoux, E. Dadda, Ph. Faye, Dr. R. Lamprecht, J.-P. Michel, C. Pegorier, Ph. Piotelat, O. Powis, G. Simatos, G. T. Sørensen, V. Viccaro, T.D.L Walters.

offers another advantage of which people are, as yet, relatively unaware: regeneration of the energy produced by the vehicle (wheels, engine braking, etc) to run systems other than the traction.

Numerous projects are being developed, such as for example replacement of the second diesel engine on a refrigerated lorry with a generator that can produce all the electricity required by the chiller system. Another area of research is the manufacture of all electric - and therefore silent - dustbin lorries for morning collections in town, where the compactor's hydraulic system is also replaced by an electric solution.

GARIA
Top-of-the-range golf buggy. 3 kW induction motor designed to adapt to standard low-voltage electronics.

Other examples which demonstrate the keen interest in new electrical motorisation technologies include air conditioning on buses, skip removal and even boats whose electricity is supplied by photovoltaic panels installed on the roof.

A new department devoted to electric vehicles

Leroy-Somer has long been involved in the electric vehicle business. In 1995, the company participated in the launch of the Peugeot 106 Electric, which had a DC motor and separate excitation. This technology offered the advantage of maximum motor torque at very low speeds. Nearly 8000 of these motors were produced. At the time, in the town of La Rochelle in France, the Peugeot 106 Electric participated in the largest experiment to develop a fleet of self-service electric vehicles in Europe. This was a real large-scale test for manufacturers and equipment fitters.

Since 2006, permanent magnet technologies have offered new prospects in terms of efficiency, performance, compactness and noise levels.

Currently, Leroy-Somer is actively participating in the development of more than 50 customised projects, involving preliminary studies, prototypes, pilot runs and mass production. To meet this challenge, the company has a multi-skilled centre of excellence devoted to electric vehicles, where the design office consists of around fifteen specialists who are fully conversant with the quality standards demanded by the automotive sector. The company can also rely on the acquired experience and know-how of a factory with more than 500 employees.

A consortium of vehicle equipment manufacturers

On the initiative of major industrial companies in the field (Johnson Controls-Saft, Valeo, Michelin, GKN, Leoni and Leroy-Somer) a consortium was created in France. By harnessing the expertise of these manufacturers, this alliance intends to offer customised solutions for low-carbon vehicles to vehicle equipment manufacturers and players in the sector. Leroy-Somer's role is to supply the electric motor for the power train.

According to the consortium's estimations, by 2020 the car population will include 10 to 30 million electric vehicles and 75 to 150 million hybrid vehicles. Its aim is to achieve a global market share of between 10 and 15% of various product lines.

The electric vehicle's story is just beginning, but one thing is sure : Leroy-Somer's experience will be invaluable when it comes to developing more environmentally-friendly vehicles.

A new patent for Catag AG Basel

Catag AG Basel has developed a particularly efficient new +PAT+ pumping system for highly abrasive fluids such as technical ceramics. This new patent is the result of close collaboration between the company and Leroy-Somer over the past twenty years or so.

Pumping highly abrasive fluids

The +PAT+ pumping system, patented by CATAG AG Basel, was designed for pumping abrasive fluids, more specifically highly abrasive fluids such as technical ceramics. For example, this pump will prove very valuable for die-casting a fluidified mixture in a mould or for pumping abrasive cutting fluids when cutting up blocks of silicon. The silicon wafers thus obtained are used in the semi-conductor industry, computer chip production and the photovoltaic industry.

An innovative system

The pumping system consists of a non-clog screw pump (from Catag's HUS range) coupled to a Leroy-Somer permanent magnet synchronous motor. Abrasive liquids are transported by semi-axial displacement through the pump helical gear channel. The motor is fixed directly to the gearwheel, without couplings, and pumping is therefore very efficient at high rotation speeds.

According to the tests conducted, the patented Catag system pumps liquids with 25% more efficiency than other types of pump. This efficiency increases to 50% in the case of abrasive fluids. The pumping capacities range from 0 to 150 m3/hr for a maximum pressure of 5 Bar.

An exemplary collaboration

The collaboration between Catag AG Basel and Leroy-Somer came into being as a result of demand from certain customers for more compact, lighter pump sets, capable of operating at high speeds while conforming to environmental constraints.

With the Dyneo range, Leroy-Somer offers a "drive" solution which exploits the potential of the Catag pump to the maximum. The use of variable speed and optimisation of mechanical systems dramatically improve users' prospects of making savings. The Dyneo range can be used to adapt the motor speed to the pumping speed required by customers, and at the same time, eliminate the whole transmission.

Catag has been a customer and partner of Leroy-Somer for more than 20 years in motorising various pump ranges manufactured in Basle (Switzerland). It was therefore only natural for the company to turn to Leroy-Somer.

After an in-depth study of the request, Leroy-Somer proposed an 8.5 kW permanent magnet motor combined with a Unidrive variable speed drive to conduct a series of tests. Each stage of development was assisted by Leroy-Somer's technological expertise, advice and quick responsiveness.

Catag AG Basel

Catag AG Basel is one of Switzerland's largest companies who manufacture and sell high-efficiency displacement pumps for various environments and industrial sectors. The company therefore has a wide range of technological skills, especially in the field of energy-saving pumps.

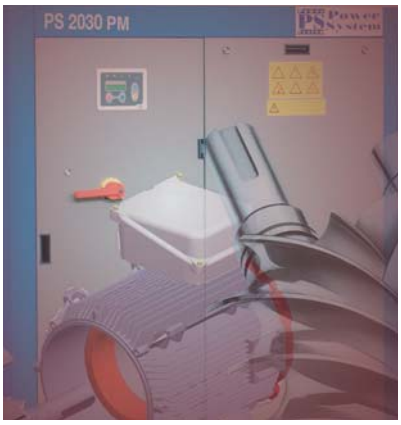
Catag pursues a policy of total quality and constant innovation. It manufactures its products to the very highest standards. Two principles guide the design of its pumping systems: analysis of the Life Cycle Cost, given that the initial purchase price only represents a small part of the overall cost, and eco-design, which aims to minimise the impact on the environment. For example, Catag has developed an original programme which is available on its website: on the basis of criteria entered by the customer, the Eco Pump Selector directly evaluates the most suitable pump for the needs expressed.

As Mr Kämpfer, managing director of Catag, tells us: "We revel in the challenges presented to us by our customers, as these are the basis of our future successes".

For more info :
www.catag.com

New range of Power System screw compressors

Performance, energy savings, compact size and rapid return on investment are the key benefits of the new Power System PS PM screw compressors driven by LSRPM series Dyneo® permanent magnet motors.



Variable-speed screw compressors

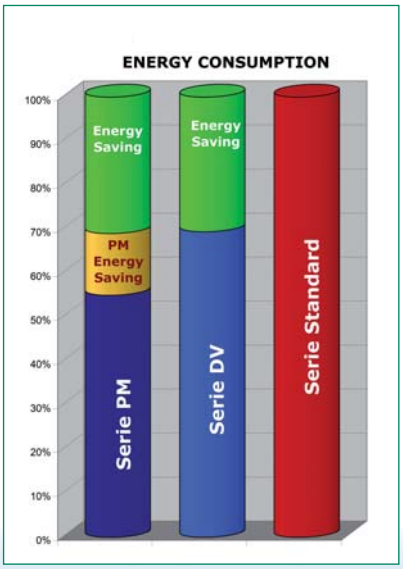
Numerous industrial processes such as manufacturing and packaging use compressed air. This is a flexible, versatile and reliable fluid. To satisfy users' economic imperatives and promote energy saving, Power System offers a new range of air-cooled variable speed screw compressors, the PS PM range. It consists of oil-injected rotary compressors designed to operate in continuous duty and includes the usual control unit equipment.

With conventional fixed-speed compressors, energy is wasted in a number of ways. For example, the fixed-speed compressor requires significant pressure fluctuations outside its optimum performance zone. Furthermore, even when the need for air is non-existent, the compression screw continues to be driven.

As for speed regulation, it is used to distribute the air provided by the compressor in an optimum way, continually adapting air production to suit demand.

PS PM range and LSRPM series Dyneo® permanent magnet motors

Compared to using the conventional induction motor in conjunction with a drive, Power System compressors use a permanent magnet motor from the LSRPM series, an undoubted improvement in terms of performance and efficiency.



In fact, the LSRPM motor can increase the efficiency of the compression system over a wide range of rotation speeds, especially at low speed, improve efficiency thanks to a reduction in rotor losses and reduce the overall dimensions of the motor-compressor unit.

Guidance at every stage

After discovering the performance offered by permanent magnet motors, Power System quickly sets Leroy-Somer the challenge of demonstrating the energy savings that could be achieved on its existing ranges. After an in-depth study, a prototype confirmed the theoretical predictions. Power System then decided to build a new range of compressors offering the end user a return on investment in less than 18 months.

After this initial success, Leroy-Somer is now participating in the launch of this new family of compressors, providing useful information on operation of the permanent magnet motor and the energy savings that can be achieved, and offering end users assistance with testing and calibrating their first machines.

Power System

Based in Vicenza (Italy), Power System is one of the leading European companies in the air compression sector. Since 1992, its ambition has been to provide its customers with high-quality products incorporating technologies with exceptional performance while focusing on energy savings and the use of environmentally-friendly materials.

For more info :
www.powersystem.it

Leroy-Somer alternator helping to push forward the frontiers of European astronomy

©ESO (European Southern Observatory)

The Cerro Paranal astronomical observatory

Cerro Paranal is a mountain 2635 m high located in the Atacama desert, in Northern Chile. This desert is reckoned to be the driest in the world with an average rainfall of 0.8 mm a year. It is an exceptional site for making observations due to the high altitude, extreme drought and the absence of light pollution.

At the summit of Cerro Paranal is the Very Large Telescope (VLT), the most advanced visible-light astronomical observatory in the world. As the ESO website (www.eso.org) says, the VLTs "consist of four Unit Telescopes with main mirrors of 8.2 m diameter and four movable 1.8 m diameter Auxiliary Telescopes. With one such telescope, images of celestial objects as faint as magnitude 30 can be obtained in a one-hour exposure. This corresponds to seeing objects that are four billion (four thousand million) times fainter than what can be seen with the unaided eye.

The telescopes can work together, in groups of two or three, to form a giant 'interferometer', allowing astronomers to see details up to 25 times finer than with the individual telescopes."

The site at Paranal is managed by ESO, the European Southern Observatory, the foremost intergovernmental astronomy organisation in Europe. "By building and operating a suite of the world's most powerful ground-based astronomical telescopes , enabling important scientific discoveries, ESO offers numerous possibilities for technology spin-off and transfer, together with high technology contract opportunities and is a dramatic showcase for European industry."

A winning trio

Turbomach installed the generator which supplies the observatory with electricity. Turbomach and Solar Turbines constitute the industrial gas turbines division of the Caterpillar group, the world's leading manufacturer of construction and mining equipment, diesel and natural gas engines, and industrial gas turbines. The industrial gas turbines division employs over 6000 people and its assets include more than 13,000 turbines worldwide.

Leroy-Somer has supplied Turbomach with the alternator, an LSA 56/4P with 3 MW output, driven by a Solar Turbines gas turbine.

With this combination of expertise, no-one can doubt that astronomy still has a brilliant future in which every day will bring new discoveries, expanding the limits of our knowledge of the universe.

Bradford Armature Winding Company - BAWCO

The Bradford Armature Winding Co Ltd, or BAWCO, was founded in 1919 by members of the Lawn and Smith families. It originally serviced the needs of the local textile industry and quickly grew into a well renowned and respected electrical engineering company.

Today, BAWCO employs 20 people and has bases both in West Yorkshire and Teesside, supplying throughout the UK and overseas, a variety of industries (chemical, pharmaceutical, engineering, textile, elevator and escalator, utilities etc.) with a full range of engineering products and services.

These include:

- The supply of new and repair of existing safe and hazardous area, AC and DC electric motors,
- The manufacturing of new transformers or repair of original units,
- The supply of inverters, gearboxes, pumps, controlgears and other related products,
- Site visits providing application solutions, condition monitoring, energy surveys and much more!

From their purpose built headquarters in Bradford, BAWCO can handle motors, generators and transformers up to 5 tonnes.

In January 2009, an agreement was reached with BAWCO to become a distributor of Leroy Somer DIGIDRIVE SK inverter covering a number of designated postcodes within West Yorkshire.

DIGIDRIVE SK power ranges between 0.25kW to 132kW covering a wide range of voltages from 110V single phase to 690V 3 phase. The product is very simple to use and can be initialised in 90% of the applications with only 9 parameters. Available directly to OEM customers in certain instances, DIGIDRIVE SK is primarily priced for the distribution market, which allows Leroy Somer Partners easy access to their local markets.

BAWCO purchased an agreed stock level, with Leroy Somer offering their own stock as back up when required. BAWCO immediately found that the stock moved quickly while customers recognised the product easy to use and highly reliable.

BAWCO, with assistance from Leroy Somer, have now successfully gained a number of OEM customers, following joint presentations that have proved highly successful. The initial supply of DIGIDRIVE SK has also led to sales of VARMECA and POWERDRIVE products within their OEM and general customer base.

Chris LAWN, *Managing Director of BAWCO,* said of the first year trading:

"The relationship that we have built with Leroy Somer has proved to be most successful in a relatively short period of time. Our decision to form this partnership was taken in line with other strategic changes within the company. For example, we now stock safe area and zone 2 motors up to 132kW and zone 1 motors up to 37kW, a large investment that is paying dividends in growing our customer base.

The Leroy Somer SK Inverter and also the Varmeca product have proved to be a popular addition to our range. The SK unit is 'user friendly' and competitively priced, this coupled with our stock commitment and the support from Leroy Somer has been the basis for this initial success. Over the years, trading our confidence with the product, the level of service and not least the LS staff has grown to a level whereby we are now in a great position to make a strong offer of nationwide 24 hour coverage. When required, we will always endeavour to meet same day requirements, be that with our own vehicles or by courier service.

With the new IE efficiency standards and directives being implemented over the next few years, we are in a good position to take advantage of the up and coming opportunities along side Leroy Somer. We intend to see our initial success continue and grow through 2010 and beyond with further endeavour from both companies".

Bradford Armature Winding Co. Ltd
429 Bowling Old Lane
Bradford
BD5 8HN
Tel: 01274 728379
Fax: 01274 731518
Email: sales@bawco.com

Feedback on the efficiency of Leroy Somer's innovation DYNEO®

With the creation of their newest distribution centre in the UK, Wm Morrison Supermarkets PLC continue with their goal "Fresh food for you" and keep introducing innovations into their refrigeration facilities.

Wm Morrison Supermarkets PLC have placed the environment at the heart of the design, with their overall corporate social responsibility program in mind, this is their most environmentally friendly distribution centre. The 920,000 sq ft site will save 17,000 tonnes of CO_2 emissions per year due to a reduction of 22 million kilometres of road miles travelled, by serving stores in the South East from the new regional base. The site also includes power generation from wind turbines and rain water harvesting used for sprinkler systems and toilet flush. Furthermore, the local environment has been enhanced to accommodate wildlife such as wading birds, marshland ponds and ditches have been created to help maintain and develop the local ecosystem.

J&E Hall, a major supplier of refrigeration equipment, were able with their compressor pack to support the high efficiency strategy of Wm Morrison Supermarkets PLC.

J&E Hall's approach is to combine both the fixed speed refrigeration pack with the variable speed refrigeration pack used to regulate the system depending on the demand.

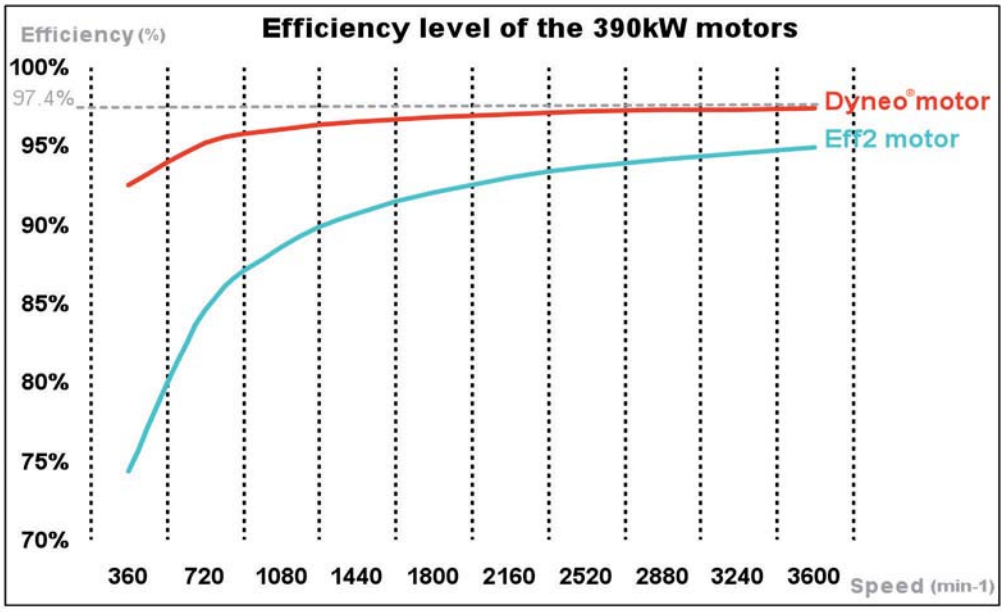
In order to maximise energy savings, J&E Hall worked on two solutions for the variable speed pack: one using existing asynchronous induction motor technology and the other one using the new Leroy Somer innovation Dyneo®.

After having done an analysis (see charts below), it was more beneficial for J&E Hall to use the new Dyneo® concept.

Dyneo® is a variable speed solution combining a permanent magnet motor with an inverter to provide an efficiency level in excess of IE3, where the level remains constant over the speed range.

This gives remarkable results in terms of energy savings compared to a squirrel cage induction motor.

Below is the chart showing the difference between the efficiency of the permanent magnet motor Dyneo® (PM) and the asynchronous induction motor (EFF2) .

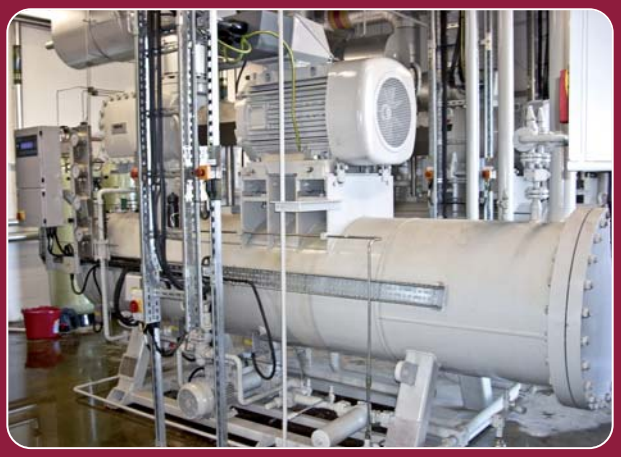


Over a speed range of 3600 rpm down to 1000 rpm, the difference of efficiency level between the motors can be up to 7.5 points.

The installation is running 7 days a week, 365 days per year and below is the energy saving achieved with Dyneo®, based on the customer's duty cycle.

EFF2 MOTOR		DYNEO®		ENERGY SAVED PER YEAR
	–		=	
2.899.243 kwh = £231937	–	2.780.802 kwh = £222464	=	£9473

The total energy consumption of the EFF2 motor includes the 3kW forced ventilation
Calculation based on a cost of 8 p per unit.
Energy saved after 5 years = £36865



Reduction in energy is not the only element where Dyneo® has its advantages over conventional asynchronous motors, i.e. compactness and reduction in weight are significant and maintenance intervals for bearings are increased due to lower running temperatures.

Thanks to its compactness Dyneo® is also ideal for refurbishment projects, as the motor will easily fit within existing space limitations. De-rating or extra options such as forced ventilation are not necessary to assure the torque performances over a large speed range

Duncan ASPINALL, *J&E Hall's project manager* added:

"Our customers are more and more concerned by their energy bill and without doubt, Dyneo® is the right solution. This motor will have a bright future, fitted on J&E Hall's screw compressors."

Dyneo® Permanent Magnet Solutions

TECHNICAL DATA

MOTOR

- IP55 permanent magnet motor
- 10 speed ranges from 375 rpm up to 5500 rpm
- Power from 0.75 kW up to 400 kW
- Reduction in size and weight (up to 3 times)
- High efficiency over the entire speed range
- Reduced maintenance

DRIVE

- Flexibility of either 6 pulses or 12 pulses or regenerative version
- IP00, IP21 or IP54
- air cooled or liquid cooled

J&E Hall International

J & E Hall International (Head office)

Questor House
191 Hawley Road
Dartford
Kent DA1 1PU
England

Tel: + 44 (0) 1322 394420
Fax: + 44 (0) 1322 394421
Email: helpline@jehall.co.uk

Reduction in motor power consumption by switching to PM motors

By: Claus M. Hvenegaard and Mads Peter Rudolph Hansen, the Danish Technological Institute, Energy & Climate

The Danish Technological Institute is an independent non-profit institution. They develop, apply and disseminate research and technology-based knowledge for the Danish and international business sectors. In this capacity, they participate in development projects that are beneficial to society, and they work closely with leading research and educational institutions both in Denmark and abroad.

In cooperation with Aalborg University, Leroy-Somer, Öland, Desmi and Motron, the Danish Technological Institute is putting the finishing touches to a research project allocated under PSO 2008 and administered by Dansk Energi Net. The title is: "Reduction in the power consumption for motor operation by switching to PM motors".

The object of the project is, among other things, to discover the advantages and disadvantages of replacing asynchronous (induction) motors, including EFF1/IE2 motors, with PM motors – as well as the price difference. It is also investigated how great the energy saving potential is nationally by replacing asynchronous motors with PM motors.

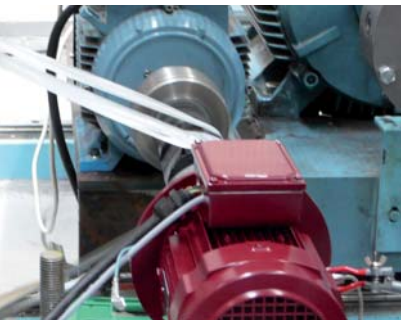


Figure 1 – Set-up of measuring equipment (5.2 kW PM motor, torque meter and generator)

Significantly higher efficiency at low load rates

Leroy-Somer, participating in the project, has supplied motors in different sizes for testing at the Danish Technological Institute's motor test stand.

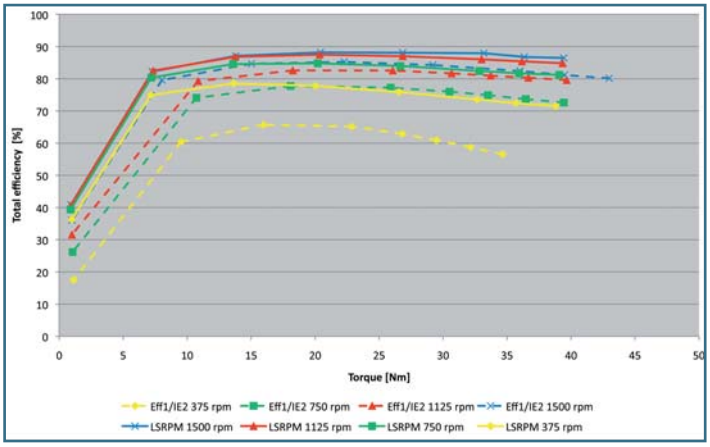


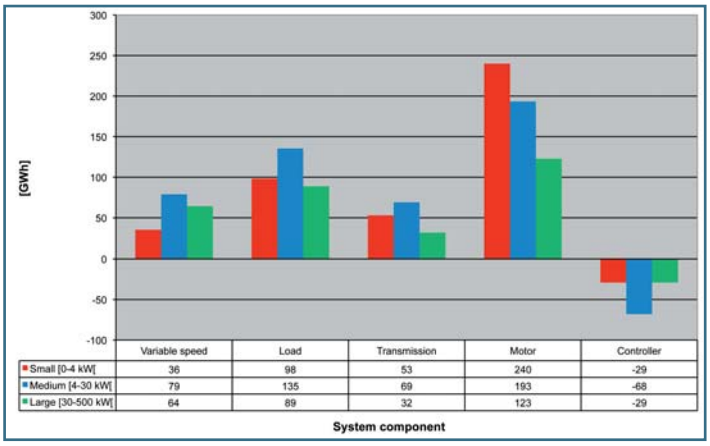
Figure 2 – Efficiency for 5.5 kW asynchronous motor and variable speed drive as well as 5.2 kW PM motor and variable speed drive as a function of the torque

The graph below shows some of the results of these tests. At 50 Hz (nominal rotation speed, 1,500 rpm), we see that the difference in the total efficiency is 3–5% in the range between 1 and 40 Nm. We see the biggest difference at high torques.

At 37.5 Hz (1,050 rpm), we see that the difference in the total efficiency is 5–6% in the range between 11 and 40 Nm. At torques lower than 11 Nm, the difference in efficiency increases. At 1 Nm, the difference is about 10%.

At 25 Hz (700 rpm), we see that the difference in the total efficiency is 8–9% in the range between 11 and 40 Nm. At torques lower than 11 Nm, the difference in the efficiency becomes even greater. At 1 Nm, the difference is about 14%.

At 12.5 Hz (350 rpm), we see that the difference in the total efficiency is 12–14% in the range between 10 and 35 Nm. At torques lower than 10 Nm, the difference in the efficiency increases. At 1 Nm, the difference is about 18%.



	Variable speed	Load	Transmission	Motor	Controller
Small [0-4 kW[	36	98	53	240	-29
Medium [4-30 kW[	79	135	69	193	-68
Large [30-500 kW[	64	89	32	123	-29

Figure 3 – Saving potentials for system components distributed on small, medium and large systems

National saving potential

Figure 3 shows that the saving potential of replacing asynchronous motors with PM motors will amount to 556 GWh. This corresponds to a saving of about 8% of the power consumption for motor operation in the Danish industry.

PM motors are not only relevant to the industrial sector. PM motors could also be used in primarily pump, ventilation and compressed air units in the office, trade, service and education sectors as well as the hotel and restaurant industries, etc. Thus, in total, the saving potential in Denmark is significantly higher than the above-mentioned 556 GWh.

Industrial refrigeration, a challenge for Leroy-Somer

Thanks to its expertise in variable speed control and the development of new permanent magnet synchronous motor technologies, Leroy-Somer can offer installers of refrigeration units and compressor manufacturers high-performance solutions that are both compact and highly efficient.

A complex market

Without our being aware of it, refrigeration insinuates itself everywhere into our daily life. Fresh and frozen products, cheese, meat, ham, butter, etc all require refrigeration at some point in their processing or conservation: in freezing tunnels, distribution warehouses, food product logistics centres. The food industry is the sector most affected by the production of industrial refrigeration. Leroy-Somer is very active in this market and also in the chemical, pharmaceutical and even leisure markets, such as ice rinks.

The industrial refrigeration market is a complex market in which installers (or integrators) and compressor manufacturers are the main players. The installer has two options: either to sell the end customer a complete installation including the compressors, motors and drives, in synergy with a building infrastructure consultant; or to continue to own the installation and sell refrigeration to the user. Some installers are also compressor manufacturers.

The compressor is the main component of the refrigeration system. Depending on requirements, the compressor manufacturer will supply the compressor to the installer with or without the electric motor. It is therefore essential for Leroy-Somer to be in permanent contact with the various players involved in the market.

Energy savings

An industrial refrigeration installation is very energy-intensive and usually involves power ratings from 3 to 10 MW. For example, the entire premises of a meat processing chain will be kept at 2 or 3°C (positive cold) and storage warehouses can be as low as 18°C. Another example is that in a freezing tunnel, fresh vegetables are chilled down to a temperature of -35°C for a few minutes before being sent to large warehouses that may cover an area of more than 100,000 m2.

For some years now, the refrigeration market has been subject to increasingly stringent standards and new European directives targeting the gradual banning of gases likely to affect the ozone layer such as HFC/R22 refrigerant gases or imposing the use of high-efficiency motors. Existing installations must therefore be adapted or replaced. This is a one-off opportunity to improve their performance.

In this context, electric motors are the focus of particular attention because they represent the main source of potential energy savings. For both installers and manufacturers, it is vital to promote technical solutions which improve the efficiency of installations.

The use of variable speed is certainly the first response to this challenge. The size of an installation depends on outdoor temperatures, primarily during the hottest periods. Outside these periods, the installation is oversized. Variable speed can mitigate variations in thermal load, adapt machine operation to actual needs and therefore optimise the installation's overall efficiency.

The Coefficient of Performance (COP) can prove an excellent tool to measure the efficiency of an installation. It expresses the ratio between the refrigerating capacity produced and the electrical power consumption. The higher this ratio, the more efficient the system is.

A complete, customised offer

Not only is Leroy-Somer recognised as the variable speed specialist, the company is also developing new motorisation technologies which are particularly well suited to this market. The Dyneo® range covers all solutions integrating frequency inverters and permanent magnet synchronous motors. This patented technology has very high efficiency over the whole speed range, exceptionally compact dimensions and can thus obtain a higher COP than with traditional solutions.

Leroy-Somer's design office teams have been actively participating for many years now in the launch of new variable-speed compressor ranges equipped with HPM or LSRPM synchronous motors and their control electronics. For the renovation of existing systems, the LSRPM series, whose mechanical construction is identical to that of an induction motor, combined with the Powerdrive enclosed variable speed drive, proves extremely easy to use. In addition to contributing significant energy savings, the return on investment is extremely rapid.

Of course, Leroy-Somer offers an extensive range of asynchronous drives incorporating fixed-speed or variable-speed IE2 high-efficiency motors.

Finally, in its role as an international group, the company offers assistance to installers throughout the world, whether in setting up new plants or maintaining existing plants.

Industrial refrigeration may represent a challenge to motor manufacturers, but Leroy-Somer's response perfectly suits the market's current requirements.

Cooperl is an agricultural cooperative specialising in porcine production and slaughter whose site at Lamballe (France) has a slaughter capacity of 8000 pigs a day. Leroy-Somer was involved in modifying the process in the chiller/freezer room with a refrigerating capacity of 1300 kW.

This new process, designed and implemented by Seriaco (Département IAA, Axima Refrigeration, GDF Suez) produces the same amount of refrigeration with two compressors packs rather than the previous three. By installing an LSRPM series Dyneo® 315 motor (390 kW 3600 min-1) in conjunction with a Powerdrive MDS 470T drive on the first pack, it has been possible to save 23% of the output power with a return on investment of less than 10 months compared to the old configuration.

The second pack operates at 100% capacity at optimum compressor efficiency, with the LSRPM motor taking over at low speed and ensuring excellent efficiency over the whole speed range.

This has significantly improved the COP.

Leroy-Somer's innovative drive for lifts

Improving comfort, space, silence, and above all ensuring optimum user safety, are the main objectives of the major lift suppliers and local installers. For more than 40 years, Leroy-Somer has offered innovative solutions for driving and controlling lift car travel.

Ensuring user safety

People's safety is clearly the major preoccupation for lift manufacturers. It is regulated by European Directive 95/16/EC which defines "essential requirements" with which lifts and safety components must comply.

To release a product onto the market, the manufacturer will usually comply with a harmonised European standard (EN) which translates the requirements of the Directive into technical specifications. But there is no obligation to do this, he is free to choose whichever technical solution he wishes provided it satisfies the objectives set by the Directive. In this case, he himself has to justify the steps taken and their validity to ensure compliance.

Prior to release onto the market, the lifts and their components must be CE marked. The actual conformity assessment should be conducted either by a notified body, or by the manufacturer himself.

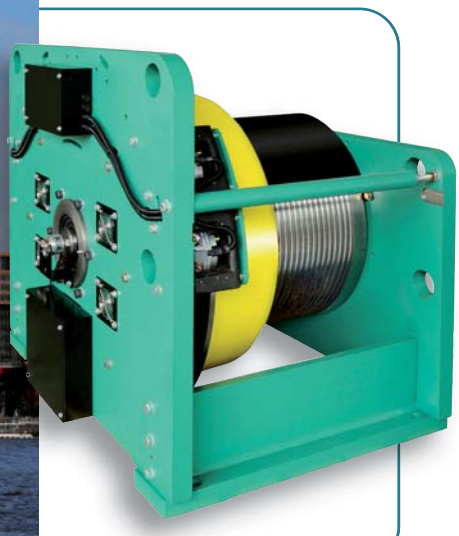
Electrical technologies

At present, alongside hydraulic lifts, two high-performance electrical solutions dominate the market, cable lifts and belt-driven lifts.

The cable lift's main strength is that it has been around since the beginning of the 20th century and a great deal of experience has gone into its manufacture. Harmonised standard EN 81-1 explains the technical solutions to be employed to ensure free circulation of goods within the European Union.

The most common technical solution up to the year 2000 was the use of induction motors with a gearbox driving a large pulley, installed in a machine room with the control system. But there is an issue with this type of lift: the steel cable is rigid and requires a significant bend radius, and therefore the use of large pulleys.

To reduce the size of the machinery, manufacturers have been developing "belt-driven" lifts since the early 2000s. These are non-standard products where each manufacturer



Canary Wharf Tower (London). Z range Gearless motor Z20VL with chassis and secondary pulley.

Machine roomless lift (Bordeaux)
XA range Gearless motor XAP2M

creates his own solution in compliance with European Directive 95/16/EC.

The advantage of the belt is that it is more flexible than the cable and can be mounted directly on the motor shaft. Since the shaft diameter is smaller than that of the pulleys used on gearless cable motors, the belt-driven solution will require less torque than a cable lift, for any given application. And since the motor size is proportional to the torque supplied, this solution proves less expensive.

Lift manufacturers do not all have the necessary expertise to develop belt-driven lifts. They are encouraging motor suppliers to offer machines with ever-smaller pulleys, thus giving a new lease of life to cable lifts.

These days, cable lifts have benefited considerably from the progress brought by new drive technologies and variable speed control. The new, more compact, high-efficiency gearless motors and the control systems are installed directly in the lift shaft.

The belt-driven lift is mainly targeted at the residential market. Although well represented on this market, cable lifts are also suitable for a wider market such as hotels, towers, hospitals, whether for transporting people or goods.
All lifts built or refurbished nowadays have variable speed control. Intelligent control of travel, acceleration, deceleration or even the precision of stopping at different floors is provided by high-performance variable speed drives.

Motors and drives built to work together

Leroy-Somer has been involved in the lift market for more than 40 years. Thanks to its capacity for innovation and industrialisation, whether in developing the lifts of the future with leading international companies, working in partnership with a local lift manufacturer or helping to refurbish existing lifts, Leroy-Somer can suggest the most suitable high-performance solution for every situation.

An additional benefit is that the company offers, in synergy with Control Techniques, complete and complementary ranges of motor-drives from the internationally recognised Emerson group, which is highly thought of by the various market players. To ensure a presence on booming markets and help its lift installer customers to grow, Leroy-Somer has set up industrial sites on every continent.

Innovative solutions for cable lifts

Leroy-Somer offers two main motorisation ranges. The XA range of gearless motors offers high-performance solutions for applications without a machine room. The motors cover requirements up to 2500 kg and 3 m/s in a 2 :1 roping arrangement. The "cigar" type design of these compact, lightweight machines simplifies installation in the lift shaft.

The Z range of gearless motors with external rotor is designed for lifts with a payload of up to 5000 kg and speed of 5 m/s in a 2 :1 roping arrangement. This range can also take loads on the shaft of up to 22 T.

Designed to equip both new lifts and installations under refurbishment, these permanent magnet synchronous motors are ideal for large-capacity lifts or high-speed applications requiring a double wrap.

Innovative solutions for a lasting future

Whether in the form of wind or tidal energy, photovoltaic or hydroelectric energy, industrial or commercial processes, low-carbon vehicles….

….Leroy-Somer designs and supplies ***the most innovative*** *drive and energy-generating solutions to produce "green" energy and reduce electricity consumption.*

Thanks to its ***expertise and continuous innovation****, LEROY-SOMER has established itself as the global market leader* ***in very high-efficiency solutions*** *to restrict CO_2 emissions and protect our environment.*

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Leroy-Somer LTD • 8, The Square Stockley Park• UB11 1FW UXBRIDGE, UNITED KINGDOM
Tél. : (+44) 20 86 10 60 25 - e-mail : motorsales.uksouth@leroysomer.com