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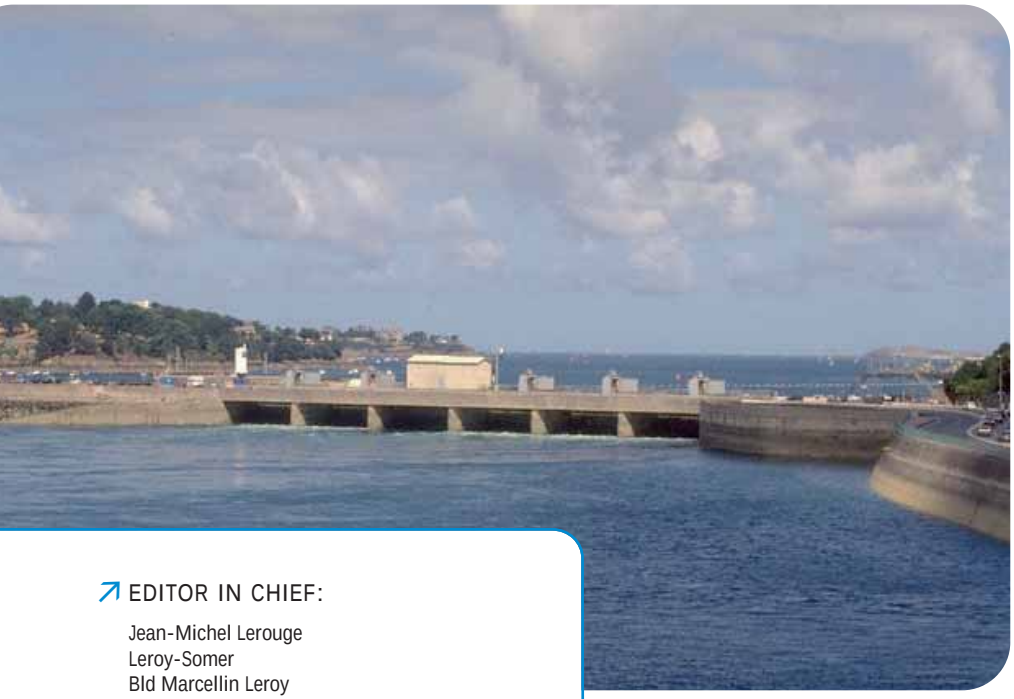
BELGIUM DENMARK FRANCE GERMANY ITALY PORTUGAL THE NETHERLANDS SPAIN SWITZERLAND UNITED KINGDOM

Energy from the ocean !

The oceans still harbour many unexplored riches. Energy is one of these. In a few years time, an increasing share of the electricity used in Europe could come from the natural movements of masses of water.

The ocean, with its perpetually moving masses of water, harbours an immense amount of inexhaustible and clean energy. Tidal energy has already been exploited for several decades. But energy from the waves and marine currents remains to be conquered. The ocean protects it, and designers and constructors must succeed in producing highly robust installations, capable of withstanding corrosion and the most violent storms. Today, thanks to technological advances, there are an increasing number of innovative projects. Leroy-Somer is part of the venture.

Tidal power stations



The movement of the tides, which occurs once or twice a day under the effect of the gravitational forces of the moon and sun, has been exploited for years by tidal power stations.

The principle of these power stations is simple. A barrage, opened when the tide is coming in, is closed when the tide is preparing to go out again. When the difference in level is sufficient, the flow of water trapped in the storage basin drives the turbines of an electricity generator.

The largest electric power station powered by tidal energy was commissioned in 1967. It is situated on a French river, the Rance, which ends in a 10-kilometre estuary where the tides are large. Sites that allow the use of this type of operation are relatively rare.

Wave power stations

A great variety of wave power stations are under development in order to exploit the energy of the swell – the regular oscillation on the surface of the sea, independent of the local wind.

Some of these are based on buoys that rise and fall with the waves, driving a piston that sucks seawater

EDITOR IN CHIEF:

Jean-Michel Lerouge
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.

into a turbine, or compresses air or oil, thus turning a motor.

Another system is based on a series of floating compartments, interconnected by movable joints. The floating tubes rise and fall with the waves; at the joints, this movement pressurises the fluid in a cylinder, which powers a hydraulic motor driving an electricity production turbine.

The first wave power station operated commercially is based on this second technique. It was inaugurated off Portugal in September 2008. Three 150 metre-long "sea snakes", consisting of a series of floating tubes with a circumference of 3.5 metres, supply the electricity necessary for over 1,000 homes. These installations, called Pelamis, were developed by the Scottish company Pelamis Wave Power.

Tidal turbines

To capture the energy of immense masses of moving water, "tidal turbines", truly underwater wind turbines, are under development. The blades of a rotor are driven by marine currents instead of wind, providing the mechanical energy that will be converted into electrical energy by a generator. A stabiliser ensures that the blades are always positioned facing the current. The rotors are mounted on vertical supports anchored on the seabed, or float at mid-depth, held by cables.

The inexhaustible energy of marine currents is regular and predictable, unlike the winds that drive wind turbines. Their energy intensity is four times greater than that of the wind, owing to the greater density of water, which means that the same power can be obtained with installations that are distinctly smaller and therefore less expensive. As the main direction of the currents is constant, tidal turbines can be placed side by side, in a relatively restricted area, without fear of interference. The additional costs related to unusual conditions (such as storms and violent winds for wind turbines) are very limited. And their environmental impact is minimal.

Several university laboratories and several companies are working on the development of tidal turbines, including Tidal Generation, a United Kingdom company which has called upon Leroy-Somer to develop a prototype.

LS is participating in the venture with Tidal Generation Ltd

Since 2005, Tidal Generation Limited (TGL) has been developing underwater turbines designed to generate electricity from marine currents.

Leroy-Somer is involved in the development of a 1 MW tidal turbine which will be installed in water depth of more than 40 metres with the turbine submerged at 20 metres, and for which TGL has developed innovative installation and maintenance concepts. Engineered to have a structure that is both simple and robust, its construction and installation cost is minimised. It is designed to be installed outside the wave area, in order to increase its service life. The transmissions can be removed and replaced quickly, so that maintenance work can be carried out on the surface, in a safe environment.

The 1 MW machine will produce the electricity necessary for 800 homes. A prototype will be installed at the Orkney European Marine Energy Centre, in the north of Scotland. It is the result of close collaboration between TGL and the Leroy-Somer UK project team, which has provided full technical support and been able to offer an integrated "generator and drive" solution to meet the unusual constraints related in particular to the system being submerged. Therefore certain items of equipment have been supplied in a water-cooled version, and the drive has been adapted to have dimensions compatible with the customer's requirements.

Burj Dubai
Reliability for a bold concept

Rising into the sky in Dubai, the tallest tower in the world will soon open to the hundreds of businesses, offices, hotels and residences that will be established there. This is an exceptional project requiring the most modern technologies and the most reliable services, including those of Leroy-Somer.

With a height of over 780 metres, Burj Dubai is indisputably the tallest tower in the world, far exceeding the "Taipei 101" in Taiwan, which reaches 508 metres at its highest point. Designed by the American architects Skidmore, Owings & Merrill of Chicago, it has been built by a consortium led by the South Korean group Samsung Corporation. The developer of the tower is Emaar Properties.

The designer of the tower drew inspiration from the cultural influences of the region. The shape of the tower is modeled after that of a desert flower, the Hymenocallis, that is native to the Middle East. The purpose of this geometry is optimum distribution of the forces caused by the weight of the construction on the structure and the ground.

The tower itself consists of three wings in the shape of a Y arranged around a central axis. This Y shape is especially advantageous for a residential building since it increases the view offered on each floor. The heart of the tower consists of high-strength concrete, and each wing has been designed to reinforce the other two. Together, they form a spiral configuration. Numerous simulations and tests were carried out to refine the structure and final design whilst taking seismic risks and wind effects into account.

The exceptional size of this skyscraper presented the builders with many technological challenges. For example, for the air conditioning, a variation of 8°C between the ground (46°C) and the top of the tower (38°C) had to be taken into account.

The tower has been designed as a town in its own right, with a total surface area of approximately 450,000 m², and a mix of total use. With its residences, offices, businesses and hotels, it will be possible to live in this skyscraper 365 days a year. It will have 160 floors, and 54 lifts will carry the residents and users.

Construction started in February 2005 and will be completely finished by September 2009.

Leroy-Somer in the Gulf States

Leroy-Somer has had a presence in the Middle East for over 20 years. There is a Leroy-Somer subsidiary in Dubai and Saudi Arabia where specialist engineers, technical experts, assistance for product commissioning and a repair shop are available.

Construction is Leroy-Somer's area of excellence in the Gulf States. The company is the leader in industrial HVAC with a 50% market share in local construction. It also partners many European constructors on site. And finally, it is an important player in control electronics for pumps and ventilation systems.

Special attention given to electric motors

For large-scale projects like Burj Dubai, Leroy-Somer is one of a group of manufacturers of subassemblies or major components. Electric motors account for 60% of the power consumption of a tower, i.e. around 30 MW for Burj Dubai. As such, they are given very special attention.

As soon as Burj Dubai project started up, Leroy-Somer approached the main parties concerned, starting with the MEP (Mechanical, Electrical, Plumbing) consultant – this is the one who approves equipment at the technical level and is responsible for design of the equipment incorporating Leroy-Somer products. For Burj Dubai, the main challenge lay in the exceptional size of the tower, for which no precedent existed. Therefore all the equipment had to be defined starting from scratch, for example in order to guarantee that the air conditioning provides an identical temperature on all floors.

The second essential contact was the MEP contractor, responsible for the purchase and installation of equipment according to the consultant's design: pumps, air conditioning installations, lifts, etc. For Burj Dubai, the level of requirement was very high, for example a design capable of operating for 20 years without major maintenance had to be guaranteed.

Finally, Leroy-Somer is in continuous contact with the equipment manufacturers who purchase the motors and who must be stipulated beforehand, i.e. they must be on the lists of equipment manufacturers approved by the consultant. The manufacturer must prove that his products conform to the specifications, and at the best price.

A project won after a hard-fought battle

"In view of the project's prestige, it is undeniable that the competition was tough and we are all the more proud to have won this contract, said David Sonzogni, project manager for Leroy-Somer. In this type of matter, we must give our various contacts precise responses. Thus, during the presentation of our offers, we had to demonstrate that our pump motors fully withstand the harmonics generated by the variable speed drives, and also that our safety motors are certified for operating on variable speed drives, as shown by our certificates of conformity to EN12101-3."

"Subsequently, our engineers were present at each stage to take part, alongside their contacts, in all the technical clarification meetings with the consultant and the contractor, continued David Sonzogni. And finally, thanks to our presence on site and the proximity of our repair shop, located 10 kilometres from the tower, we were able to confirm that the after-sales service for all LS products would be carried out under optimum conditions."

For Leroy-Somer, Burj Dubai will be a reference to the extent of its expertise, its capacity for innovation and its drive.

Leroy-Somer has equipped the following in Burj Dubai:

- 10 MW of motors (292 motors) and 8 MW of standby generators (4 alternators)
- Chilled water pumps for the cooling plant (pump manufacturer: KSB, Germany) - 31 cast iron motors of 45 to 250 kW
- Air circulation fans for the car park (ventilation equipment manufacturer: NOVENCO Denmark) - 206 small high-temperature dual-speed safety motors, 300°C/2h (power: 1.1 kW)
- Main car park ventilation and smoke extract fans (ventilation equipment manufacturer: NOVENCO Denmark) - 50 high-temperature safety motors, 300°C/2h, from 11 to 45 kW
- Standby generators (CATERPILLAR USA generators) - 4 alternators, 2 MW 11,000 V.

Powerdrive and Unidrive SP in the heart of Paris!

A real Success Story in the heart of Paris, Leroy-Somer is participating in an ambitious programme of work initiated by the company Enertherm, the manager of the largest urban heat and air conditioning production network in Europe. During this project, Leroy-Somer has proved its ability to provide solutions for the entire site, whether alternators, variable speed, standard or customised motors are concerned. Each time, the company has replied "Yes, we can do that"!

An urban network for the La Défense district

The La Défense district, in the Paris region, is the largest business district in Europe. It is especially renowned for the high rise buildings it contains. On the other hand, few people know that this district is supplied by the largest urban heat and air conditioning production network in Europe.

A few figures about the La Défense urban network: 210,000 people are supplied by the original Enertherm network. It consists of 324 sub-stations with a pipe diameter sometimes exceeding a metre. The flow rate of chilled water can reach 8000 m3/hour at a pressure of 17 bars. The natural gas-fired power station has a capacity of 180 MW including cogeneration of 12.5 MW. The heat network represents 21 km and that of chilled water 14 km. The energy production capacity is 600 MW.

An ambitious programme of work

Enertherm is the company responsible for managing this vast network. It has undertaken an ambitious programme of work, representing an investment of over 110 million euros aimed at modernising and increasing the production of domestic hot water and cold water over the entire La Défense district and the area round about.

Following close collaboration with the company JP Fauche, with whom Leroy-Somer generally deals for Airbus test bed orders, Leroy-Somer has secured a particularly significant order related to the use of buildings in the commercial sector.

Variable speed, modularity and made-to-measure

At the presentation of the offer, based right from the beginning on 3-D modelling, JP Fauche and Enertherm were particularly attracted by the great modularity of Powerdrive and the responsiveness of the Leroy-Somer teams, faced with their specific requirements as regards size, surroundings and the constraint of reinjection of harmonics onto the network.

The Leroy-Somer design offices have therefore developed a drive fully meeting the customer's specification, using standard sub-assemblies.

The order consists of 18 assemblies, representing 36 MDR 120T (110 kW) Regenerative Powerdrives. These drives power a series of more than 200 metres of overhead blowers (large fans) that cool the flow returning from energy users.

The cooling capacity of these towers is over 40 MW. In addition to this installation, Leroy-Somer has manufactured the largest modular Unidrive SP drives to date, Unidrive SP 800THs (750 kW) using 12-phase 690 V.

These drives, of which there are four, operate on 1720 m3/h pumps designed for cooling the network.

A complete Leroy-Somer offer

In addition to the supply of several standard motor assemblies, Leroy-Somer has also supplied alternators with a power of up to 12,500 kVA and 450 kW water-cooled motors.

TRIAC Services, distributor for Leroy Somer

TRIAC Services have been a leading distributor for Leroy Somer for the past 4 years, covering East Anglia and London with the aim of providing a rapid response to enquiries with total customer focus.

Covering the HVAC market throughout the Country but particularly in London TRIAC are well placed to provide a complete package to their clients as they supply Electric Motors, Inverter Drives, Pumps, Batteries, Valves, Compressors, Alternators and Planned Preventative Maintenance.

TRIAC have a specialist team of engineers who install, repair and maintain Eddy Current Drives, Inverter Drives and develop tailored systems for HVAC applications.
With the acquisition of Lowestoft Rewinds, TRIAC are also able to repair electric motors, alternators, pumps and are authorised to repair all Leroy Somer products.

TRIAC hold in stock a range of EFF1 and EFF2 motors which is supported by "Guaranteed availability" range direct from Leroy Somer.

Mark Hepworth, one of the three directors of TRIAC Services commented that the company is committed to supply Leroy Somer products and appreciate the full backing that a large organisation as Leroy Somer can provide.

For further information:
TRIAC
Unit 45
Colville Road
Lowestoft
NR33 9QS
Tel. 01502 531555

Parkburn
Precision Handling Systems Ltd (PPHS)

has a long heritage in supplying fully integrated offshore & marine handling systems for well over 30 years.

With a team of 65 members (most of whom being graduates of Mechanical/Hydraulic & Electrical control Engineering) located at 2 sites:

Hamilton (Headquarter) – Scotland & Wolverhampton – England, Parkburn designs and manufactures rugged, reliable, efficient and environmentally friendly surface and deepwater marine deployment and retrieval systems for specialist offshore & marine applications.

The company previously known as "Dowty" Precision Handling Systems is a privately owned UK engineering led company, designing, manufacturing mobilising and supporting quality equipment from full deck spread turnkey spreads to simple winch applications, specifically to the customer's expectation.

The product portfolio includes:

-Telecoms / Power Cable, Umbilical and Pipe Handling Systems (Carousels, Reels, Tensioners ...)

-Dive Bell Handling Systems

-Overboarding and deployment (Integrated ROV Handling, passive and active compensators,...)

-Winches for Oceanographic, Seismic, Naval & General purpose

-Integrated Control & drives

Parkburn prides itself as a market leader in the application of variable speed electric drives, having been instrumental in pushing telecoms laying technology from the Dowty developed hydraulically driven systems, to state of the art AC vector controlled systems, now employed on the majority of the world's most modern cableships.

The AC drive technology, utilising compact electric drives and digital controls provides the client precise and smooth speed and tension control capabilities, which significantly reduces the risk of damaging the product whilst increasing the systems operational flexibility.

Other major advantages include greatly reduced installation costs (no pipes or oil cooling systems), fast mobilisation and re-mobilisation of equipment and superior power efficiency.

One of the last completed projects to date was the AC Electric 4000 Te Turntable & Loading Tower System. The design criteria were:

Turntable Design Element	*Turntable Design Criteria*
Outside Diameter	*24m*
Outside Wall Height	*5.5m (extendible)*
Cone diameter	*6.6m (adjustable)*
Cone height	*5.5m (extendible)*
Weight Capacity	*4000 Te*
Max cable diameter	*450mm*
Speed Range	*0-1000 m /hr*
Drive Type	*AC Electric*
Control	*Full suite of hardwired local and remote controls c/w synchronisation capability for, turntable, loading arm and aft tensioner.*

This system used a combination of Unidrive SP (supplied by Control Techniques) and FLSC 315 of 146kW fitted with FCPL brakes.

Parkburn
Precision Handling Systems Limited

Wobaston Road - Wolverhampton - WV9 5EW, UK
Tel: 01902 575 600 - www.parkburn.com

New Electric Motors Result in Significant Savings for Copenhagen Energy

At the Islevbro Water Treatment Plan, Copenhagen Energy has switched to new, hi-tech permanent-magnet electric motors. Energy expenditure savings are already documented and the pay back time for the extra investment is expected to be less than 12 months

Copenhagen Energy is one of the leading utility companies in Denmark. Every day, 365 days a year, it ensures that the citizens of the capital are supplied with town gas, heat and water and that their wastewater is treated.

Copenhagen Energy extracts approx. 60 million m3 of groundwater per year and in addition to supplying Copenhagen, it also provides drinking water to 19 other municipalities via 7 water treatment plants.

At the same time, Copenhagen Energy is a very energy and environmentally conscious company that targets environmental issues and aims for sustainable development by environmental management.

Investing in Energy Savings

Which is why it was natural for Copenhagen Energy to consider Leroy-Somer's new, resource saving and more efficient permanent-magnet electric motors when it had to replace the electric motors at the three pumping stations in the Islevbro Water Treatment Plant.

The replacement was to be carried out at the same time as the pumps were renovated by B. Christensens Maskinfabrik. Project Manager Kaare Klit Johansen is responsible for the project and after a lot of deliberation, he chose to invest in the new high-tech LSRPM electric motors, with Powerdrive control, from Leroy-Somer, a decision he has not regretted.

Better than Expected

"We have made measurements of the relationship between flow and efficiency in the old type of motors and the new LS motors, respectively, and the results shows that we have achieved an average improvement in efficiency of 4 percentage points, which is actually more than Leroy-Somer promised me", Kaar Klit Johansen explains and continues:

"When we make comparative calculations of the total efficiency of the pumping installations and calculate the annual energy expenditure, we arrive at annual energy savings of approx. £ 4560. This is satisfactory, and will give us a payback period of approx. 12 months for the additional investment we incurred by opting for Leroy-Somer's electric motors, instead of an ordinary motor solution.

In addition, there will be annual savings of approx. £ 2850, as the Islevbro Water Treatment Plant will no longer have to consider carbon brush replacements for DC motors, since we have now opted for AC motors. As an added bonus, we are also escape cleaning carbon dust from the machine room."

Motors Specially Designed for the Pumps

By selecting the LS motors, the water treatment plant could continue to use the existing pumps, which, after all, were to be renovated first. The LS motors were namely designed and wound so as to match the DC motors' output and rotational axis. Thereby, the Leroy-Somer's customised solution could match the pumps' optimum duty point.

Clarification of the efficiency classes of asynchronous motors

In LS News No. 21 of September 2008, our article "Europe is turning white" dealt with the subject of energy savings, in Europe generally and a few member states in particular. Of course, electric motors play a leading role in fulfilling the aims of energy consumption reduction.

Many different standards for classifying the energy efficiency of asynchronous motors are already used (NEMA, EPACT, CSA, NRcan, COPANT, AS/NZS, JIS, etc.) and new efficiency classifications are under consideration. It is therefore becoming increasingly difficult for manufacturers to design motors for a global market, and for users to understand the differences and similarities of the standards of different countries.

To simplify all this, on 26 September 2008 the International Electrotechnical Commission (IEC) adopted a standard under reference IEC 60 034-30. The purpose of this standard is to classify motors in 3 efficiency levels (plus maybe a fourth later). The purpose of the table below is to place the new efficiency standards in relation to the classifications that already exist:

IEC 60034-30	Existing classifications
IE1	Eff2
IE2	Eff1 or USA "Energy Efficiency" (EPAct'92)
IE3	New in Europe or USA "Nema Premium" (EPAct'05)

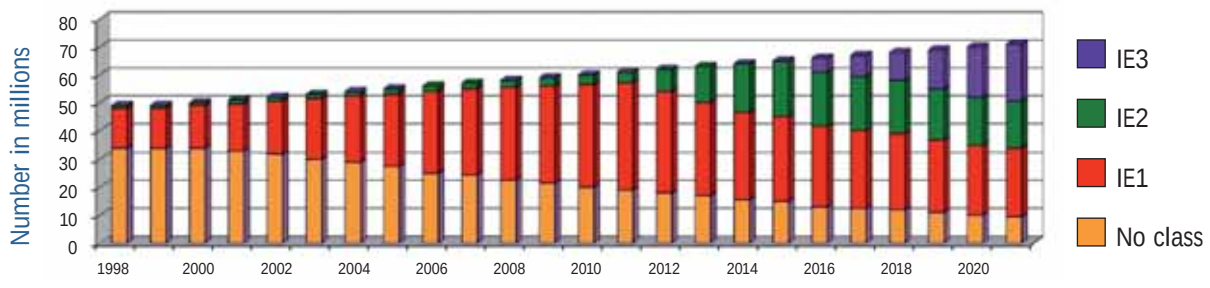
NB: the efficiencies appearing in IEC 60 034-30 must be measured according to IEC 60 034-2-1.

This new measurement method integrates additional losses whereas a fixed value was considered in IEC 60034-2 (0.5% of the input power). The efficiency values displayed with IEC 6 034-2-1 are therefore lower than with IEC 60034-2. For example: the efficiency of a 22 kW 4P motor measured according to the new standard changes from 92.6% to 92.3%.

Based on this new standard, an Eup (Energy-using Products) European Directive will be put in place. It will require member states to dictate the use of motors of efficiency class IE2 from June 2011 and class IE3 (or IE2 + VSD) from January 2015 or 2017 depending on the power. Motors affected by the directive are mainly 2, 4 or 6 pole of 0.75 to 375 kW, IP 2x to IP 6x, general-purpose. Geared motors, motors with accessories such as encoders, forced ventilation, etc. will also be affected.

Leroy-Somer already has ranges of high-efficiency motors conforming to classes IE1 and IE2, and developments are in progress for class IE3. On the other hand it is important to note that the greatest gains in efficiency are obtained by analysing and optimising the entire drive system of a machine. This is the "System Approach" that we have been developing and promoting for a number of years. This procedure allows even more efficiency in order to achieve 60% of the total energy savings potential. Leroy Somer already offers systems of an efficiency class higher than or equal to the future IE4.

Change in the installed base of motors per efficiency class in industry
(www.ecomotors.com)

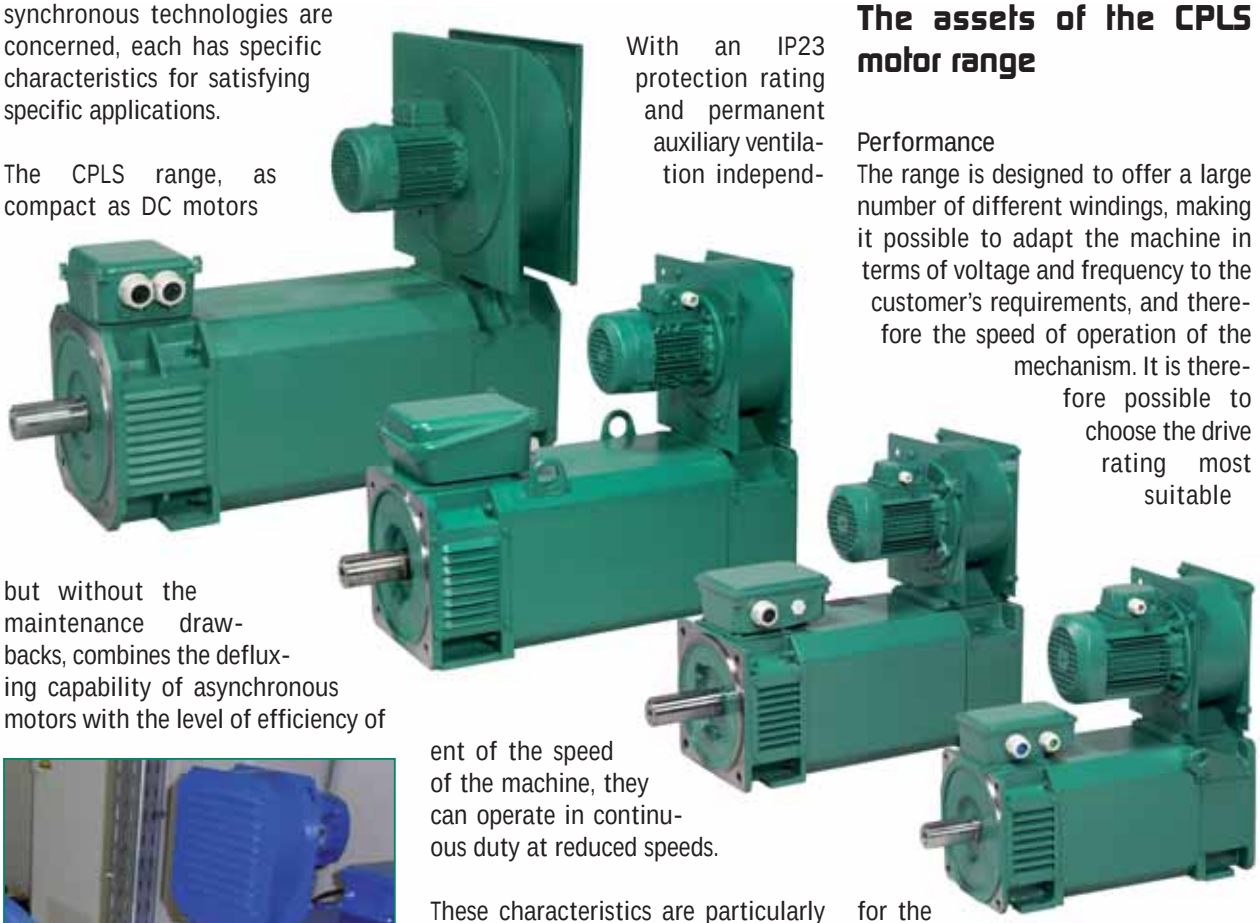


The CPLS motor range – Compactness and variable speed

The CPLS 3-phase asynchronous motors with a square casing are not simply a new range of electric motors. The CPLS brings innovative solutions to many problems encountered in various industrial processes. Designed to operate with Digidrive SK, Unidrive SP or Powerdrive electronic drives, they combine advantages that make them particularly efficient in applications requiring highly compact motors operating at variable speed.

Leroy-Somer already has a great variety of drive systems dedicated to speed control. Whether DC, asynchronous or synchronous technologies are concerned, each has specific characteristics for satisfying specific applications.

The CPLS range, as compact as DC motors but without the maintenance drawbacks, combines the defluxing capability of asynchronous motors with the level of efficiency of permanent-magnet synchronous motors and the high dynamics of brushless motors.



With an IP23 protection rating and permanent auxiliary ventilation independent of the speed of the machine, they can operate in continuous duty at reduced speeds.

These characteristics are particularly advantageous for markets such as machine tools, materials handling, extrusion, winding/unwinding, hoisting, test beds, etc. Above all, they are markets requiring both compactness and variable speed.

A detailed technical catalogue makes it possible to determine the CPLS motor by its torque with the rating of the Leroy-Somer drive most suitable for the application and thus guarantee the overall performance of the motor/drive assembly.

The assets of the CPLS motor range

Performance

The range is designed to offer a large number of different windings, making it possible to adapt the machine in terms of voltage and frequency to the customer's requirements, and therefore the speed of operation of the mechanism. It is therefore possible to choose the drive rating most suitable for the application and reduce the cost of the solution.

Compactness

At identical power, the CPLS motor is one to two frame sizes smaller than a traditional motor. It can therefore be accommodated in restricted locations.

Speed control

Their dedicated design means Leroy-Somer solutions can offer as standard,

over the entire range of devices, a range of operation at constant speed of ratio 2 without having to derate the motor or drive.

For a greater variation range, the CONSTANT POWER SYSTEM (exclusive to Leroy-Somer) makes it possible to achieve speed ratios of 1 to 6 without derating the motor or frequency inverter.

Reduced maintenance

The proven asynchronous motor technology and the simplicity of construction limit the servicing periods of these machines. Gone are the frequent maintenance which, in addition, are sometimes difficult to carry out in restricted locations.

High efficiency

The efficiency of CPLS motors is also a strong point. When the length of the rotors no longer allows the aluminium injection technique to be used, they are made with copper cages.

Dynamics

For the same power, and through their reduced sizes, CPLS motors offer inertias 2 to 3 times lower than those of traditional asynchronous motors. These constructions also allow speeds of rotation much higher than 3000 rpm to be achieved.

Adaptability

A complete range of options enables the product to be adapted to application requirements (roller bearings, high-speed bearings, brakes, remote ventilation, sensors, etc.).

A few areas of application

Hoisting, materials handling.

When on-board equipment, such as for hoisting or materials handling, is concerned, reduction of the weight/power ratio of the machine makes it possible to lighten the weight of the mechanism. The inertia reduced in this way improves the responsiveness of the assembly and increases the productivity of the equipment. The possibility of transferring a safety brake, designed by our specialist PATAY, to the rear of the motor provides a high-performance and homogeneous assembly.

Extrusion

Constant torque at low speed, overload capability and variable speed are the characteristics of the CPLS range essential for driving this type of application, minus maintenance of the brushes.

Machine tool

An application where speed control is essential for optimising the cutting capabilities whilst retaining the necessary constant power. The compactness of the motor, its low inertia, rapid accelerations and reduced maintenance are just so many reasons that make the CPLS range particularly suitable for this technique.

Technical characteristics

- IP23 asynchronous motor
- Steel housing, cast iron endshields
- Torque from 1 to 1550 Nm
- Winding suited to speed and rating of the drive
- Frame size: 112 to 200 mm
- Maximum speed 8000 rpm according to size
- Open or closed loop operation
- Operating range at constant power:
  - 1 to 2 as standard
  - 1 to 6 with the CONSTANT POWER SYSTEM patented device

Leroy-Somer alternators, Orleans site, France

For a number of years, the alternator market has been experiencing high growth, in order to meet the increasing demand for electricity throughout the world. Nine Leroy-Somer factories develop and produce alternators, including the Orleans site which manufactures customised machines of 1.5 to 20 MW.

Despite the economic slowdown that is now under way, the alternator market is still doing well. Small 3 to 100 MW power stations meet a real need, especially since operators are preferring to opt for smaller power stations better suited to the current economic climate. The growing interest in renewable energy such as wind, biomass or hydroelectric is also increasing the current demand.

A global organisation

"Many large international companies ask us to partner them in their development, especially in the developing countries", emphasises François Kusek, Managing Director of the Leroy-Somer factory in Orleans. "This is why our industrial operation comprises no fewer than nine factories, four of which are in Europe, two in the United States, one in Mexico, one in China and one in India. Over the last five years, the alternator division has experienced continuous growth. Today, we are paying close attention to the changes in the international market and are ready to react according to the opportunities that arise."

Orleans: flexibility and made to measure

The Orleans site in France, acquired by Leroy-Somer in 1982, has been producing alternators since 1930. Its engineering section, consisting of around thirty engineers, uses the site's long-standing experience and expertise to good effect in offering alternators suited to each customer constraints. Its in-depth knowledge of the different markets (diesel, gas or steam turbine, wind, hydroelectric, etc.) means it can comply with the most complex specifications.

Leroy-Somer's machines are especially renowned in certain business sectors. For the gas or steam turbine market, for example, the Orleans site develops high-power, high-speed machines (1500 rpm, 4-pole) held in great esteem by the market. For wind power, the factory produces 3 MW customised water-cooled alternators that are compact, efficient and reliable.

Each year the Orleans factory manufactures over 1000 customised alternators of 1.5 to 20 MW, weighing up to 60 tonnes. Alternators with a capacity less than 1.5 MW are mass-produced at other sites of the group.

Leroy Somer guarantees the quality and reliability of its alternators, due to the various centres of excellence, including a laboratory for performance testing of insulation systems. An electronics laboratory is used for operational testing of regulators and validating the developments offered to customers. This laboratory is equipped with a test bed for reproducing all possible operating situations of an alternator in a power plant: parallel running between machines and/or with the network, load increases, etc.

Leroy-Somer alternators have an excellent reputation with assemblers, operators and engineering teams and the company is gradually asserting itself as an indispensable partner for the electricity production of tomorrow.

The challenges of hydroelectric

With the small hydro power plant, which is currently experiencing a revival, sites like Orleans can show their full capabilities. In this field, each alternator must satisfy different requirements, related to the environment of the power station and the head type (flow rate, speed). As the turbine is installed directly on the shaft of the alternator, this must withstand large mechanical stresses (axial or radial forces). Likewise, designers must take account of the risk of racing or over-speed, which can reach 2.8 times the rated speed in the event of disconnection of the network.

There are logistic challenges to be added to the mechanical challenges. The alternator is the largest component of a hydroelectric power station, and the transport and installation conditions can prove very difficult in certain remote or fairly inaccessible operating sites! It is not uncommon for an alternator to be assembled in the Orleans factory in order to undergo the required tests, then dismantled for transport, and reassembled on site by the commissioning team. The installation itself can also represent a real challenge, as the local handling capabilities sometimes prove insufficient.

Leroy-Somer takes the plunge

In six years, in the hydroelectric field alone, Leroy-Somer has manufactured the equivalent of a 1.5 GW power station! The company has a presence in countries where the installation potential of new hydroelectric sites are high, such as Norway, a buoyant market at present, but also Turkey, Canada and Latin America.

A team of specialists, based at Orleans and supported by the Leroy-Somer local network, is in permanent contact with the main turbine manufacturers. This team has collaboration agreements with the world leaders in small hydro power plants such as Andritz VA TECH HYDRO and VOITH SIEMENS Hydro Power Generation, and is eager to join forces, in the form of consortiums, with turbine manufacturers and electrical cabinet manufacturers in order to win new projects.

The success of the small hydro power plant has also increased the company's presence in the market for renovating old sites, in particular in Italy, Switzerland, Germany and Portugal.

For Leroy-Somer alternators, the hydroelectric sector has acted as a spur to innovation and expertise. One alternator out of every three manufactured in the world comes from a Leroy-Somer factory.

The company Småkraft AS manufactures and installs small hydroelectric power stations designed to fit into the natural surroundings and leave minimum traces even when dismantled at the end of their lives. This Norwegian company is part of the Statkraft group, a major player in the field of renewable energy in Europe.

In 2008, the Orleans site supplied three units to Småkraft AS.

Various views of the Ytre Alsåker kraftverk and Årvik power stations in Norway which each include an LSA 58 vertical-axis, 5490 kVA, 6600 V, 600 rpm alternator, with a Pelton 6-jet turbine wheel mounted out-board on the alternator shaft.

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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

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