The Ever-Efficient Motor

New Technology Focuses on Performance

Nord Drivesystems

SUPPLIES STROS WITH DRIVE TECHNOLOGIES FOR INTERNATIONAL PROJECTS

Stros, the largest manufacturer of construction hoists in the Czech Republic, supplies customers all over the world. Three systems ship per week. Eight of the high-rises at "Moscow City," a major construction project in Russia, are being built or have already been completed with Stros hoists. The hoists reach heights of 300 m or more and have to withstand wind speeds of up to 20 m/s. Safety is therefore fundamental. Stros has been working with Nord Drivesystems as its single-source drive supplier for more than 15 years.

Stros specializes in rack-and-pinion mast-climbing equipment, which allows for extended service heights and can be quickly installed. The gearbox output shaft is fitted with a gear that meshes with a rack attached to the guide mast. This robust drive method withstands extreme environmental conditions over long time periods. Apart from building construction companies, Stros frequently supplies power plants, industrial plants, and offshore facilities. Completed projects include locations beyond the Arctic Circle and in the tough climatic conditions of the tropics. The NOV series of personnel and material hoists reaches maximum lifting speeds of 100 m/min and load capacities up to 3,200 kg.

Moscow City construction project

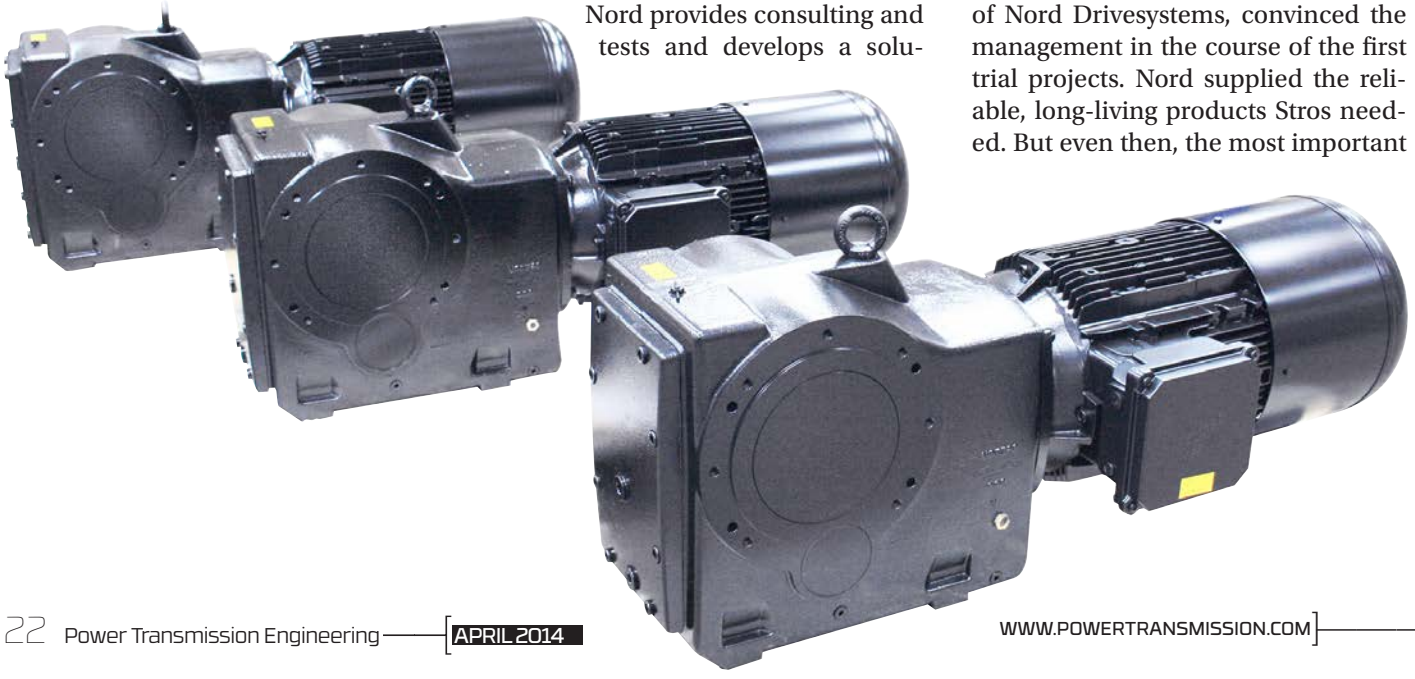
The highest hoist to date was erected at the "Moscow City" construction site. The complex consists of several high-rise buildings, eight of which are equipped with Stros hoists. One of the hoists serves the Mercury City Tower, which at 340 m is currently the tallest building in Europe. The NOV 2032 hoist has a 350 m lifting height, a 2-ton load capacity and a 70 m/min rating. With a control panel that allows the operator to select the floor number, the hoist provides the same level of control comfort as a standard elevator in an apartment block. The drive unit consists of three helical bevel geared motors with external braking resistors. "The motors are equipped with electromagnetic disc brakes which can be released by hand," says Zdenek Coubal, chairman of Stros. "This is a custom solution from Nord Drivesystems. And it exemplifies our cooperation: whatever new challenges we meet, Nord provides consulting and tests and develops a solution." A control cabinet inverter with hoist function controls all three motors. It enables soft starts and stops and high leveling precision. Coubal says, "We are working very closely with the construction companies. They say that our technology saves time and money."

Patented safety device

The Stros engineering team has designed a mechanism to safely stop hoist cages in the event of a failure. If the nominal lowering speed is exceeded, the safety device will trip and engage its pinion with the rack to gradually stop the hoist cage. The centrifugal mechanism is individually set for each machine model. The Stros safety device is certified by the internationally recognized German technical testing authority TÜV SÜD.

Cooperation with Nord

The cooperation with Nord as their sole drive supplier began in 1997. At that time, Stros' predecessor company made the first serious foray into international markets. Nord Pohánecí Technika, s.r.o., the Czech subsidiary of Nord Drivesystems, convinced the management in the course of the first trial projects. Nord supplied the reliable, long-living products Stros needed. But even then, the most important



factor for Stros was Nord's ability to guarantee service even in remote locations. Coubal says, "Nord is very good as a one-stop supplier. They suggest the best solution for any application that crops up in our everyday business. For example, we are not limited to standard gearboxes. The units are assembled exactly to fit the requirements. And Nord customizes drives for us when we need it, supplying reinforced bearings or special gear case materials, or ATEX and NEC-compliant drives for refinery applications."

Higher requirements

Initially, Stros only used geared motors. As the manufacturer built only relatively slow hoists at that time, start and stop control via the motor switch was fully sufficient at speeds up to 40 m/min. But with the growth of the customer list, the projects grew accordingly. Stros started building hoists for higher and higher buildings. Consequently, the cages had to travel faster to decrease waiting times. New models have rated speeds of 55 to 100 m/min and are always equipped with variable frequency drives. In addition to geared motors, Nord supplies control cabinet inverters that control motor speed and enable precise braking. Sophisticated positioning and safety functions such as STO and SS1 for safety requirements up to SIL3 are also available.

Another diversification: special and permanent elevators

The 2008 collapse of the construction industry severely affected suppliers such as Stros. To survive, the company sought applications for its technology apart from construction hoists and branched into hoists for permanent use on buildings, chimneys, or technological equipment. This new field makes up a large part of Stros projects today. For example, the company built a 150 m high permanent elevator on a chimney at the Siekierki power station in Poland's capital Warsaw. The NOV 514 elevator has a load capacity of 500 kg and a rated speed of 46 m/min. The elevator was equipped with a frequency inverter, which ensures soft starting and braking and includes a POSICON position control. The project was immediately followed by a contract for a second, 200 m high elevator for another chimney at the same plant.

Conclusion

If a hoist does not work, the entire construction site will come to a standstill. Therefore, the drive must never break down under any circumstances. The Nord concept for Stros hoisting equipment with up to three autonomously working drives prevents costly downtimes. Looking back on 15 years with Nord as their sole drive supplier, Stros Chairman Coubal says, "Nord technology is reliable, and the service is excellent." And how is the outlook? "According to the trend in the USA, Canada, and Russia, we can expect more demand for greater-performance drives and inverters due to increasingly larger cages, load capacity, and speed. We have our work cut out for us."

For more information:
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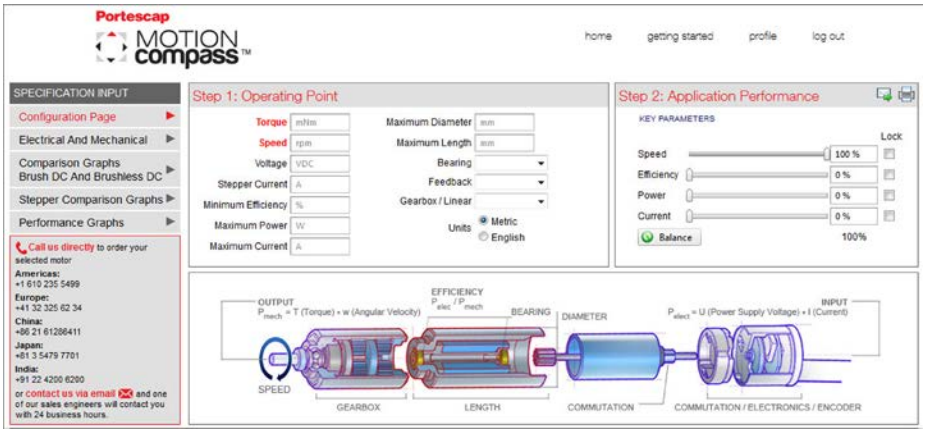
www.nord.com

Portescap

RELEASES MINI MOTOR APP



Portescap has released the *MotionCompass*, a web-based application designed to provide mini motor solutions based on unique motion requirements for various applications. The input parameters (speed and torque) generate motor recommendations across multiple product technologies. A wealth of self-contained data is available on recommended options, including electrical and mechanical specifications, speed vs. torque curves and performance charts. All data is dynamically generated in real-time and provides the ability to select a solution based on specific application needs. Users can choose product(s), review performance metrics and confirm the optimum solution for the application.

A unique feature of the *MotionCompass* is the ability to assign weights to four key performance parameters (speed, efficiency, power and current), which directly impact motor recommendations. The intelligent algorithm, developed based on years of experience and application know-how, recommends a set of ideal motor solutions to maximize application performance. Additional motor parameters, such as diameter, bearing type, efficiency and current requirements, feedback options, etc., are available to further narrow down recommended options that meet specific application needs.

"The *MotionCompass* puts the power of product configuration and selection in the hands of the user. Real-time product recommendations based on user inputs provide the ability to evaluate a multitude of options and determine the optimal motor for the application. Users can fine tune application parameters and evaluate performance impact online without ordering samples to test in live application – eliminating the iterative qualification process. Hours of pouring through catalog data has been replaced by minutes of time spent online, with a depth of data not previously available, to enable faster decision making," says Dave Beckstoffer, project manager at Portescap.

Portescap provides local application support and expertise to assist customers in optimizing motor selection for their applications.

For more information:

Portescap
Phone: (610) 235-5499
www.motioncompass.com

ETEL

OFFERS CAGELESS, HIGH PEAK TORQUE MOTORS

ETEL is proud to offer cageless and high peak torque motors — called the TML and TMM series — within its line of high performance, zero maintenance motor technologies. Both series provide the advantages of direct drive technology, an ETEL specialty, while being offered in a low weight, low-priced package with diverse and easy to utilize mounting options.

When an application does not require a motor to be in a caged structure, the TML and TMM motors are lighter, lower cost alternatives to ETEL's better known TMB model, yet still provide a direct drive technology option. And mounting is easy with both series as the TML has the lugs located along its outer diameter which provide a simple mounting method contributing to its lower cost. The TMM is even lighter and is designed to be directly glued into the machine structure.

The TML/TMM motor series is an ideal solution for any applications that have less demanding continuous torque requirements. Despite this, they are able to provide the same peak torque as the famous TMB range with up to 5,000 N-m and reach speeds of up to 2,100 rpm. The TML/TMM both come in multiple standard sizes which vary in diameter, length and power, and each model offers different types of coil winding providing more performance variations.

The TML/TMM motors are design specifically for direct drive applications which offer the following advantages over transmission-based devices including fewer parts requiring lower overall costs, stable performance all along machine lifetime due to zero maintenance required on the motors, no backlash, allowing for better accuracy and repeatability, smooth, precise, and efficient motions and compact design.

For more information:

ETEL
Phone: (877) 565-9151
www.etelusa.com

NEMA

PUBLISHES MOTORS AND GENERATORS STANDARDS

The National Electrical Manufacturers Association (NEMA) published three standards in its MG series: NEMA MG 2-2014 Safety Standard for Construction and Guide for Selection, Installation and Use of Electric Motors and Generators; NEMA MG 3-1974 (R1995, R2000, R2006, R2012) Sound Level Prediction for Installed Rotating Electrical Machines; and NEMA MG 10-2013 Energy Management Guide for Selection and Use of Fixed Frequency Medium AC Squirrel-Cage Polyphase Induction Motors.

NEMA MG 2-2014 gives recommendations for the selection, installation, and use of rotating electric machines as it applies to the practical safeguarding of persons and property. It may be downloaded at no cost or purchased in hardcopy for $91 on the NEMA website.

NEMA MG 3-1974 (R1995, R2000, R2006, R2012) delivers a method for estimating sound pressure levels of installed rotating electrical machines. It may be downloaded at no cost or purchased in hardcopy for $54 on the NEMA website.

National Electrical Manufacturers Association

NEMA MG 10-2013 conveys practical information concerning proper selection and application of polyphase induction and synchronous motors, including installation, operation, and maintenance. It may be downloaded at no cost or purchased in hardcopy for $77 on the NEMA website.

For more information:
NEMA
Phone: (703) 841-3200
www.nema.org

Maxon

DESIGNS EC-4POLE 32 FOR OPERATION IN AIR OR OIL

Deep drilling technology (called "downhole drilling" in the field of oil and gas exploration) makes it possible to recover oil and gas from depths of more than 2,500 m. By combining deep drilling with directional drilling (dynamic position alignment of a bore in the earth), previously unreachable oil reserves are being opened up, with drilling depths of approx. 5,000 m and drill lengths of up to 11,000 m. The development of specialized electronics and drives has made it possible to better monitor and control many functions across the entire drilling process. For instance, it is now possible to dynamically measure and adjust the position of the drill head during the drilling process. Diverse deep drilling tools also use hydraulic valves or flaps that are operated by electromechanical drives. The temperatures and pressures at these depths, combined with the strong vibrations that occur during the drilling work, present unique challenges for the use of electronic drives.

The different versions of the EC-4pole 32 HD are designed for operation in air or in

oil (flooded in hydraulic oil). The power rating depends on the surrounding medium and amounts to 220 W in air and, due to the much higher heat flow, 480 W in oil. They are designed for ambient temperatures of more than 200°C and atmospheric pressures of up to 1700 bar. The Ø32 mm motors must also be able to withstand vibrations of up to 25 G_{rms} as well as impacts of up to 1,000 G (1,000 times the acceleration due to gravity at the earth's surface). As an example, a Formula 1 vehicle is exposed to approximately 2 G and fighter jets are exposed to approximately 13 G. The motors feature high efficiency (up to 89% in air, more than 80% in oil), making them ideal for use in battery-operated applications. With their detent-free running properties, they have excellent control characteristics and are suitable for high-precision positioning tasks in outer space, even at low speeds.

The EC-4pole 32 HD is ideal for use in environments with extreme temperatures, subject to high vibration, or under ultra-high vacuum. This means the motors can also be used in aerospace applications, e.g. for gas turbine starters, for the generators of jet engines, for regulating combustion engines, or for exploration robots. For the use of the motor in conjunction with a gearhead, maxon offers the GP 32 HD, a powerful and robust planetary gearhead.

For more information:
Maxon Precision Motors
Phone: (508) 677-0520
www.maxonmotorusa.com

Siemens

REDUCES LEAD TIMES WITH GENERATION II SIMOTICS 1FK7 SERVOMOTOR

In response to increased market needs and always seeking to exceed customer expectations, Siemens Industry, Inc. announces a further reduction in lead times for Generation II of its Simotics 1FK7 servomotors. Highly-configurable to suit a wide variety of applications, this popular line features seven shaft heights, Quick-Connect power connectors and high-accuracy 20- and 24-bit field replaceable encoders in 10 styles, all combined with a three-week lead time, that began January 1, 2014. This new Siemens service applies to all motor models in the line, when ordered without gearbox.

The 1FK7 Generation II servomotors offer three inertia versions — standard, high-dynamic for rapid acceleration jobs and high-inertia for maximum smooth running. These motors are designed for operation without external cooling, and the heat is dissipated through the motor surface. With 10 styles of field-replaceable encoders, the 1FK7 Generation II servomotors provide easy maintenance in the field, with reduced downtime and operating cost savings. A 10 percent improvement in continuous (S-1) power is achieved, since the encoders are mechanically and thermally decoupled from the motor. The mechanical decoupling also means the encoder is more resistant to vibration conditions on the machine. In addition, there is no need for battery back-up on the absolute encoders.

Further, these 1FK7 Generation II servomotors provide users with 3x overload, 2.5 percent torque ripple, cross profiling for easier mounting, Siemens Drive-Cliq interface for easier field commissioning and unit recognition with the Siemens Sinamics S120 drive family, plain shaft or keyway design, three IP ratings and are supplied with or without holding brake. The full application engineering assistance and service of the global Siemens network supports this new line of servomotors.

For more information:
Siemens Industry, Inc.
Phone: (847) 952-4158
www.usa.siemens.com/simotics-s