

THE TECHNOLOGY AND PEOPLE AT LEINE & LINDE

Impulse

No. 2 2011

DIAGNOSTICS IN REAL-TIME

– with new ADS Online

Page 6

**700
SERIES**

**Encoders
for drives**

Page 3

Express orders

**DELIVERY WITHIN
24 HOURS**

Page 5

Safety

**FULL SPEED WITH
EXACT ENCODERS**

Page 8

Testing

**THOROUGH TESTING
OF NEW PRODUCTS**

Page 10

An eventful year

WE ALWAYS TRY TO MEET OUR CUSTOMERS on their home grounds. In this way we can learn more about how our products are used, what we need to become better at and the development necessary to meet our customers' needs. Contacts are via our sales offices in Europe and Asia. We participate in trade shows around the world and have daily contact with our customers and other concerned parties on all continents. Solving problems and creating solutions that improve our customers' processes and make them more efficient is probably the most rewarding aspect of what we do. That's why it's especially nice to have introduced as many new products as we have this year. During my time as the company's CEO, I cannot recall a year as eventful as this.

THIS YEAR'S NEWS includes the launch of the updated diagnostics tool ADS Online, the new 700 series for tight spaces and an entirely new design strategy for our products. The new look of our products is the result of an extensive project in which industrial designers have worked side by side with our engineers. Our products now have a consistent expression, a common identity throughout the product line, where design, quality and function go hand in hand.

Also new this year is the inductive 600 series, which is probably the most robust encoder ever for its size – 58 mm. We've even strengthened our line of complementing electronics and software with functions that further widen the capabilities of our products.

I believe you'll appreciate the results of our work.

Strängnäs, November 2011
Björn Zetterlund
CEO Leine & Linde



NEW PRODUCT OVERVIEW AVAILABLE

LEINE & LINDE'S robust encoders provide many years of reliable service with high quality down to the smallest detail. To meet the demands of the future, Leine & Linde sets stringent quality requirements and strives for continual improvements. We adapt the products to the application-specific characteristics of each order. You can now get a good look at our broad product range in a practical overview. Here you can find basic technical data and all the information you need about our products.

Ordering the product overview

Telephone: +46-(0)152-265 00

E-mail: info@leinelinde.se

(Type "Order for product overview" on the subject line. Be sure to include your name and address.)

Internet: The link for downloading the overview is under Products at www.leinelinde.com. ■

Upcoming trade shows

Leine & Linde has an ambitious programme for participating in upcoming trade shows.

TRADE SHOWS provide unique opportunities to personally meet our customers and others in the industry. Through talks and discussions, we obtain feedback and opinions about our products, and we're also able to follow the latest developments and trends in the industry. Please stop by for a visit at Leine & Linde's booth.

Trade shows:

EuroExpo, Larvik, Norway, 30 November–1 December.

Paperex, New Delhi, India, 10–13 December.
Booth 7C:7334

Elecrama, Mumbai, India, 18–22 January.
Booth H6Q97

SPS/IPC/DRIVES, Parma, Italy, 22–24 May 2012. ■

THINNER ENCODER BROADENS ASSORTMENT FOR DRIVES

Leine & Linde is now complementing its broad assortment of encoders for drives. The new 700 series is constructed with a more compact design for use in tight spaces.



700-SERIES An encoder is mounted at the rear of a motor and therefore affects the motor's overall length. In tight spaces, the build length can be restricted. That's why Leine & Linde has developed a new thinner encoder series.

Compact design

The 700 series is compact and robust. The series features large hollow shafts up to 25.4 mm, which means that they can often be mounted directly on motor shafts without an intermediate adapter for shaft reduction. This characteristic contributes to minimising the overall build length, and at the same time facilitates mounting.

Despite its compactness, the encoder is designed for the tough envi-

ronments where a typical Leine & Linde product is used. Mechanically it features a dual set of heavy duty bearings and a well-encapsulated enclosure. Electronically it is built for reliability in tough environments where it is subjected to vibrations and electrical disturbances.

Modules

Leine & Linde offers a wide range of electrical interfaces to choose among, each adapted to different frequencies, temperatures and cable lengths. This is why there is always a solution optimised for the particular application where the encoder is needed. The signals can consist of square waves, sinus waves or even be optical with the help of a gateway for OptoLink transmission.

On the mechanical side, there is multitude of different shaft variants that cover the market's standards for both inch- and millimetre-based dimensions.

Complete assortment

The 700 series complements Leine & Linde's previous assortment of encoders for drives. With respect to robustness, it is positioned midway between the established models in the 500 and 800 series. The 500 series covers the industry's standard options for Ø58 mm encoders, while the 800 series is larger and especially adapted for heavy duty applications. Regardless of the demands your motor places on encoder size, robustness and function, there is a solution. ■

A heavy duty encoder for installation in tight spaces.



More room. The compact 700 series is designed for medium-high mechanical stress, such as on construction cranes.

A TOUGH ENCODER, IN AN ATTRACTIVE PACKAGE

More durable and robust – in a new design. Leine & Linde's new 600 series for inductive encoders is ready to take on heavy mechanical stresses and high shaft loads.

DURING THE PAST YEARS Leine & Linde has developed a new series of absolute encoders – the inductive 600 series. Absolute encoders are mainly used to position singleturn or multiturn motion. The biggest news with this new product series is that it is based on inductive scanning.

"Historically, we've only produced encoders based on optical scanning, so this has been a very enriching and exciting experience for us," says Peter Kjellqvist, who heads development at Leine & Linde.

The inductive scanning method used entails that internal signal generation is insensitive to impact and soiling, for example. Moreover, the new encoder is equipped with robust ball bearings, which provide long encoder service life.

"The selection of ball bearings is the most important factor when it comes to service life for rotating encoders, because it's the ball bearings that wear out first," says Peter Kjellqvist.

New design

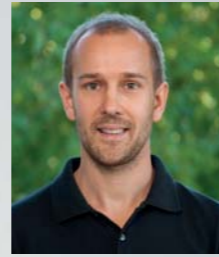
The inductive 600 series will be available in both solid and hollow shaft versions and with certain interfaces, even in a through hollow shaft configuration.

"The many different mechanical variants have been developed to meet our customers' demands for mechanical installation," says Tobias Lindh, product manager at Leine & Linde.

All models in the new series are clear anodised to stand up against external effects in the tough installation environments that the encoders are subjected to on a daily basis. The inductive encoders designated ISA 608 and IHA 608 have even received a facelift in the form of an entirely new design. The inductive 600 series is the first product series in which the company's new design guidelines have been implemented.

Flexibility and performance

The inductive 600 series is extremely flexible when it comes to mechanical configuration.



Product manager Tobias Lindh is responsible for absolute encoders.

"AMONG THE MOST ROBUST Ø58 MM ENCODERS ON THE MARKET"

"We can deliver the encoder with cable outputs or a number of different connector types," says Tobias Lindh.

When it comes to electrical interfaces, the inductive 600 series offers several alternatives. Everything from serial interfaces such as EnDat and SSI to the most common field bus interfaces on the market.

"The inductive 600 series can be advantageously used in tough applications where an absolute encoder is required by a particular motion and where robustness and service life are essential," says Tobias Lindh. ■

INTERFACE OPTIONS

The encoders in the 600 series can be connected via advanced field bus interfaces such as PROFIBUS, PROFINET and CAN. Communications interfaces such as SSI and EnDat are also supported. The robust construction of the shaft or hollow shaft design means that these encoder models are easy to install and commission.



Up and running at express speed

Sometimes it happens – an encoder suddenly stops working as it should. That's why Leine & Linde offers the opportunity to place express orders with delivery from the factory within 24 hours.



EXPRESS ORDERS The normal delivery time for Leine & Linde's encoders is ten working days from the order date, plus the time needed for shipping from the factory to the customer. This means that products are usually delivered within two or three weeks from when an order was placed, depending on where in the world the products are to be delivered. To help customers who cannot wait that long, Leine & Linde has developed an express service system.

"A customer usually gets in touch by phone or e-mail to find out how soon a specific encoder can be delivered. We then inform them of the opportunity of placing an express order," says Sinikka Okko, office manager at Leine & Linde's local branch just outside of Helsinki, Finland.

In Finland, customers have the benefit of being relatively close to production in Sweden. This means that transport from the factory does not take all that much time.

"If you place your order on a Monday, Tuesday or Wednesday, your new encoder will be on site within

no more than 48 hours. For orders placed on a Thursday or Friday, the weekend has to be added in."

The opportunity to place express orders is much appreciated. Situations sometimes arise when waiting is just not an option. An unplanned stop in production due to a malfunctioning encoder or a missing spare part can create big problems, with major financial consequences as a result. Leine & Linde has developed a special process for quickly handling faster deliveries, but this entails an extra charge corresponding to how quickly a product is needed.

"This extra charge is also related to how many encoders you order, so it can be good to consider how many you really need to be shipped as express orders," says Sinikka Okko.

For deliveries up to 48 hours, the number of encoders is limited to five per order. Deliveries within five days are limited to ten per order. But most often it's a matter of one or two encoders that customers need, according to Sinikka Okko.

The process for handling express orders has been refined and further developed over the years. The team at Leine & Linde always does its utmost to ensure that the products are shipped at the appointed time.

"I've worked at Leine & Linde for almost 14 years. During this time, it's only happened once, maybe twice, that the factory hasn't been able to deliver promised express order within 24 hours. Our delivery precision is extremely high." ■



Sinikka Okko has handled many express orders over the years from the office in Finland.

EXPRESS ORDERS

Leine & Linde offers three levels of express orders:

- **Delivery from the factory within 24 hours.** Maximum of five encoders per order.
- **Delivery from the factory within 48 hours.** Maximum of five encoders per order.
- **Delivery from the factory within five days.** Maximum of ten encoders per order.

Because express shipments do not leave the factory on weekends or holidays, orders received late in the week are shipped on the following weekday. Delivery within 24 hours is possible for most of Leine & Linde's products. For some absolute encoders, the production process requires more time and the fastest delivery time is then 48 hours.

WANTED
DEAD OR ALIVE

DO YOU RECOGNIZE THIS COMPONENT?
It is an encoder often installed on electrical motors or drives and can be found in heavy-duty applications.

REWARD

If you can find an encoder in your application, please report its serial or part number and you will be rewarded with a gift.

LEINE & LINDE
www.leinelinde.com
or contact us by phone:
+46 (0)152 265 00

VALUE OF CONDITION-BASED MAINTENANCE

No chain is stronger than its weakest link. In industry, this statement should always be followed by two questions. Which link is weakest? And how do I find it? With condition-based maintenance, you can identify the bad links and avoid potential component failures before it's too late.

A COMPONENT FAILURE inevitably entails problems. It often leads to stops in production, a feverish hunt for spare parts and not the least, increased costs. To avoid unnecessary production stops, you can work with condition-based maintenance, a method for conducting service and maintenance of components and machine parts only when needed. This requires a system for continual equipment diagnostics.

Maintenance methods

The usual way of avoiding breakdowns is to work with preventive maintenance. At a predefined interval, the targeted process is stopped, the equipment opened, inspected and then reassembled. Any deficiencies discovered are corrected. Bad parts are replaced. But as we've all seen before, maintenance often creates new problems, usually due to the human factor. Another method of lengthening preventive maintenance intervals is a form of status-based maintenance in which the components' operating times determine when they are inspected. But besides the process being stopped and production time lost, new weak links can subsequently occur in the chain. The inspections must also be sufficiently frequent to detect impending problems in time.

With condition-based maintenance, a system is created that continually measures and identifies changes to a component's performance. It provides an invaluable warning system that indicates when degradation has begun. There are many ways of identifying changes to equipment condition. A few common ways are changes related to vibrations, power consumption, operative performance, temperatures and noise. What is most important is detecting the symptoms as early as possible so that you can prepare and organise a scheduled production stop. The benefits are obvious. With condition-based maintenance, production and operating capacities are increased through fewer and shorter stops.

Effective tool

During development of the new condition-based diagnostics tool ADS Online, Leine & Linde worked with the engineering consultants at Addiva. Their experience in diagnostics systems and condition-based maintenance has been very important in developing a product that satisfies industrial requirements. With ADS Online, there is now an effective tool for rapid diagnostics that makes life easier for maintenance personnel and management. ■

WORLD PREMIER FOR ADS ONLINE

Encoders with built-in diagnostics system. The new ADS Online system entails diagnostics in real-time, wherever you may be. The new system was presented at the end of November at the international SPS/IPS/Drives convention in Nuremberg, Germany.

NEW ADS ONLINE After 10 years of dependable service, an updated version of the popular ADS has now been launched. The new ADS Online is an advanced diagnostics tool that is tailored to supporting condition-based maintenance. The system analyses encoder condition and warns of impending faults before they occur. In this way, service can be performed only as necessary and planned in ample time to avoid unforeseen stops in production.

An encoder is often used in large complex machinery, such as wind power turbines or paper-making machines. It constitutes a central component for speed feedback, with the entire system being dependent on its function, and it is of the utmost importance that it is reliable at all times. The encoder is subjected to wear under use and must therefore

be replaced at some point. But the exact service life is difficult to predict due to it being highly dependent on parameters in the encoder's environment. Temperature, operating speed and vibration are examples of factors that affect service life and that are unique for each installation. Depending on the ambient environment, an encoder's service life can consequently vary from a couple of years to a couple of decades.

A wind turbine is often difficult to access, and in many cases is located far out to sea. Unscheduled service is therefore extremely disadvantageous. High demands are placed on paper-making machines being in continual

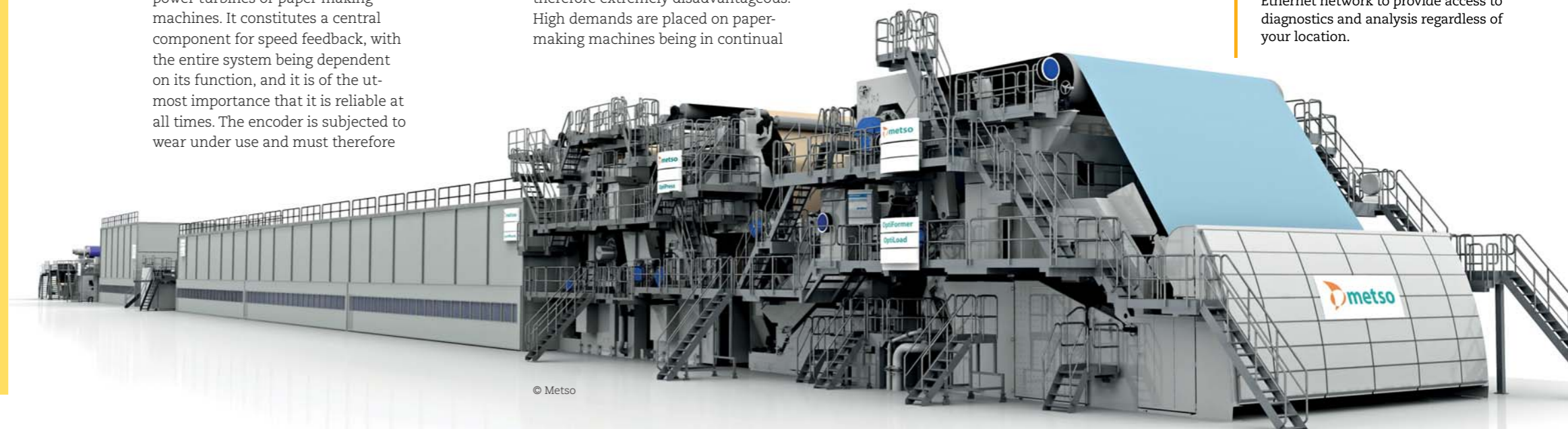
operation and any standstills cost a considerable amount of money. In both of these examples, the goal is to conduct maintenance during scheduled service, when the entire machine is inspected on a single occasion.

The new system has been developed in collaboration with Leine & Linde's customers. With the help of constructive feedback and common experiences from the previous version, a knowledge bank has been built up that has shaped the foundation of the new ADS Online. ■



WHAT IS NEW ADS ONLINE?

- A diagnostics system that constantly monitors the encoder's key functions, fully integrated into each encoder.
- A warning is immediately sent when an impending fault is detected – automatic fault interpretation determines the seriousness of the fault and categorizes it into various status levels.
- Monitoring of ambient environmental parameters to ensure that the encoder is not subjected to detrimental conditions.
- Continual storage of detailed operational data – analyse trends for vibration, temperature and more.
- Associated PC software with the capability to set custom warning levels and conduct graphical analysis of the environmental parameters during operation.
- The encoder may be connected to an Ethernet network to provide access to diagnostics and analysis regardless of your location.



MAURER SÖHNE

The family-owned company was founded in Munich by Friedrich Maurer in 1876. The company is leading in steel-making, and the manufacture of machinery and other equipment, and has about 500 employees at three locations in Germany, with production in Turkey, China and India. The group has a total of 900 employees and is active in more than 60 countries worldwide. In 2010, Maurer had annual sales of more than EUR 130 million with an export percentage of 70 percent.



DIZZYING SAFETY

Exact control and high reliability are of the greatest importance when riders speed through twists and turns on breathtaking amusement park attractions the world over. Leine & Linde has delivered encoders to Maurer Söhne, Germany's largest manufacturer of roller coasters, since 2006.

SINCE 1992 the reputable firm of Maurer Söhne has produced specially ordered ride attractions for amusement parks all over the world. Acceleration, high speeds and surprises interact to give amusement park visitors an overwhelming experience. Maurer Söhne is also the manufacturer behind the Skyloop, the world's highest inverted roller coaster.

A ride on the Skyloop begins with the chain-driven lift pulling two full cars with a total of twelve persons from the station to a height of 46.2 metres. At a speed of 3.5 metres per second, the trip up takes 20 seconds.

The heart of the drive station is an asynchronous 300 kW three-phase motor from Siemens. On the motor's shaft end is an incremental 861 series encoder from Leine & Linde. The encoder, located under the fan housing, provides the requisite control and reliability. Monitoring of the preset speeds is very important because the configuration and capacity level for the ride are largely determined by the lifting speed.

"What I appreciate about the optical incremental encoders from Leine & Linde is their high reliability and long service life," says Theo Fehsenmayr, designer at Maurer Söhne.

Precision control

The use of frequency converters and encoders to control three-phase motors has strongly increased in recent years. The converters are not only characterised by low operating costs and high performance, but also contribute to energy savings.

The accuracy of the signals from the Skyloop's encoder has a major influence on the exactness of the frequency converter. This is very important, especially when the tandem cars are lifted. For the application in the drive station, the high enclosure class IP66 prevents moisture from forcing its way in. An installation can cost over EUR 10 million and Maurer Söhne exports roller coasters all over the world. It is therefore especially important with inter-

"THE ENCODERS HAVE BEEN PROBLEM-FREE SINCE INSTALLATION 5 YEARS AGO"

national approval of the encoders. Leine & Linde's encoders are approved by the SP Technical Research Institute of Sweden. Since Maurer Söhne's first installation in 2006, not a single Swedish encoder has malfunctioned.

Moment of weightlessness

After the coupled cars have left the lift upside down, they rush through a 360-degree corkscrew and then continue at high speed down the roller coaster's tracks. The passengers pass the starting point at a speed of more than 100 km/h. They are then turned upside down again in the vertical lift until the cars have lost all speed and the riders momentarily experience weightlessness. The ride concludes in the vertical position where the cars are held in place with special brakes. In this position, correct control is required of the lifting drive, which quickly and safely must back the heavy train of 5.5 tons from the vertical position to the starting station where the passengers can climb out.

European safety directives

The roller coasters are inspected and approved per international standards. As a part of the process, the installations also undergo a risk analysis. The safety functions in the control unit are presently classified and regulated based on various safety integrity levels (SIL) or performance levels (PL). New safety directives will go into effect in 2012 and apply throughout Europe. By integrating Leine & Linde's



Theo Fehsenmayr from Maurer Söhne and Klaus Korger from Leine & Linde discuss usage of the encoder behind a section of track for the Skyloop roller coaster.

encoders in a corresponding safety circuit, users can have applications up to SIL 3 or at least up to PLd. ■

INCREMENTAL ENCODERS IN 861 SERIES

The encoders in Leine & Linde's 861 series are characterised by a robust aluminium housing in compliance with enclosure class IP66, which fulfils the requirements from heavy industries. They have either three or six short-circuit-proof outputs and an electrically insulated hollow shaft with a diameter of 12 or 16 mm. The encoders are designed for a supply voltage of 5 V or 9-30 V and are available with the advanced diagnostics system ADS™.

The number of lines per revolution can be selected in small steps from 500 to 10,000 or tailored to the customer's requirements. The total number of measurement steps corresponds to four times the number of lines and there can be up to a maximum of 40,000 measurement steps per revolution. The operating temperature is between -20°C and +80°C. The specified vibration resistance is 10 g and resistance to impact is 100 g. With the various climate zones where the roller coasters are installed, entirely problem-free operation is thus assured at temperatures between 0 and 40°C.



THOROUGH TESTING ENSURES QUALITY

During the past year, Leine & Linde has launched several new product platforms. But before new products are ready to meet reality, they must first pass a tough battery of tests and inspections – all to ensure that they deliver what they promise.



Martin Lundgren, testing engineer.

TESTING & VERIFICATION During 2011, Leine & Linde has put major focus on product development. This has resulted in several new product platforms – namely ADS Online, the 700 series and the inductive 600 series. They are all the result of extensive development work and new advanced technology.

"It's exciting with so many new products," says Martin Lundgren at Leine & Linde's development department. He is a testing engineer and is responsible for verifying the products' function and quality.

"I ensure that new designs live up to the rigorous quality requirements that characterize all of our development," says Martin Lundgren.

Experienced engineers have designed the products, but to verify that

everything works as it should, there is only one alternative – testing.

"No product is finished until we are completely sure that it lives up to what we promise. We must be able to guarantee function in the field, where the surroundings are often incredibly tough."

Do not disturb, do not be disturbed
An important parameter to check is electromagnetic compatibility – EMC.

"Do not disturb, do not be disturbed is what EMC is all about. Our customers must be able to depend on the encoder functioning in a complex machine, where it is surrounded by lots of other electronics. It has to provide a reliable signal even if there are interfering electromagnetic fields close by. At the same time, you have to be able to rely on the encoder itself not producing interference that causes problems for the machine," says Martin Lundgren.

EMC compatibility has been tested with the assistance of the Delta test lab in Västerås. Delta has ultra-modern equipment that is built to screen electromagnetic fields. Testing is conducted in a reflection-free room with walls configured so that they dampen and counteract the echo from any interference. At the same time, the entire room is enclosed in a metal structure to shut out adjacent fields. With this test chamber, any interference from the encoder can be isolated so as to be able to analyse and understand the reason for it.

"Delta is an independent partner that verifies our products' proper compliance with all EMC requirements. They examine the products with fresh eyes and see them from a neutral perspective. This ensures that we haven't missed anything," says Martin Lundgren.

CE labelling

EMC verification mainly concerns CE labelling of the products. There are

extensive legal requirements that must be fulfilled before CE labels can be put on products.

"But in many cases, we conduct more exhaustive tests than what the legal requirements specify. Our customers often have especially stringent requirements in their specific applications. It can be for example, a matter of marine requirements for use of the products on ships."

Martin Lundgren has previously worked with testing and verification of significantly larger products than encoders – namely buses.

"Such complex machines contain very many sensors of various types and other electronics that must work together. So I know from my own experience that it is a major advantage to choose components that are already verified by the supplier. This eliminates a factor of uncertainty when testing the entire system."

Equipped for the field

Many encoders will be used in very hostile environments. During development, many other parameters are therefore verified besides EMC. Tests are made for example, that verify that the encoder works even in applications where it is subjected to powerful vibrations and impact. Verification of the encoder's IP class for sealing, protracted salt-spray tests to assure resistance to corrosion and tests during which the temperature is changed up and down between -40 and +100 degrees Celsius in recurring cycles are just some of the other tests conducted. A datasheet value from Leine & Linde is thus backed by meticulous testing and documentation.

"Before we engineers are satisfied with our work, we want to be sure that the design delivers what it promises. Our encoders must always be equipped for the challenges they will face in the field," says Martin Lundgren. ■



The future looks good

PRODUCT DESIGN Is it important that an encoder's appearance reflects its inner qualities? Yes, it goes without saying according to Leine & Linde, which has realised the significance of product design. Because design from an aesthetic perspective is often associated with consumer products, many companies in the manufacturing industries do not invest in design – even though it can be exceedingly valuable.

For Leine & Linde, it is of major significance that an encoder's exterior signals the quality that is hidden on the inside. Moreover, it is important that all products in the product family are designed so that they consistently radiate a clear affiliation.

"We've had cases in which encoders from competitors have been sent to our product support. We naturally do not want to be confused with similar products, but instead have a design that clearly signals that this is a Leine & Linde product," says Håkan Eriksson, marketing manager at Leine & Linde.

Close collaboration

To achieve these goals, the company has recently put major effort into improved product design from an aesthetic perspective. Development of the new encoder in the 600 series was carried out in close collaboration with Avalon Innovation, a company that specialises in product development and industrial design, and that will also assist Leine & Linde with

design in future product development.

Mathias Stavervik is an industrial designer at Avalon Innovation and emphasises the importance of a design strategy.

"Companies that produce industrial products often have very good control over the technical and financial conditions. Quite often however, a strategy is lacking for handling the aesthetic and ergonomic aspects – either consciously because it is felt that the products aren't seen anyway after installation, or unconsciously by just not thinking of it," says Mathias.

Design work creates added value

The risks of lacking a design strategy are many. Beyond the difficulty of differentiating one's products from those of others and design that does not communicate high technical quality, the products can be difficult to use, install and maintain. Protection against patent infringement and design rights are naturally also important aspects.

Mathias Stavervik emphasises the importance of integrating product design from the very beginning of projects, and to involve as many parts of the organisation as possible. In developing the new encoders, work with design has involved engineers, marketing staff, economists and employees at other units. This has created a high degree of participation, which in turn produces added value for the entire organisation.

Industrial design improves functionality, strengthens brand identity and provides more attractive products. When Leine & Linde began developing the new 600 series, Avalon Innovation's industrial designers were along from the start.

"Seriously involving design in a development project is a process that entails challenges," says Håkan Eriksson. "It's not enough with a fashionable sketch. But it is from this work that creativity flows, when eyes are opened to new technical solutions."

Successful results

Anna Granlund, quality manager at Leine & Linde, agrees that it has been stimulating to discuss form and design.

"The engineers naturally have a very technical approach and it has been exciting to work with Avalon Innovation to see things from a different perspective. This applies to processing methods, assembly procedures and usability."

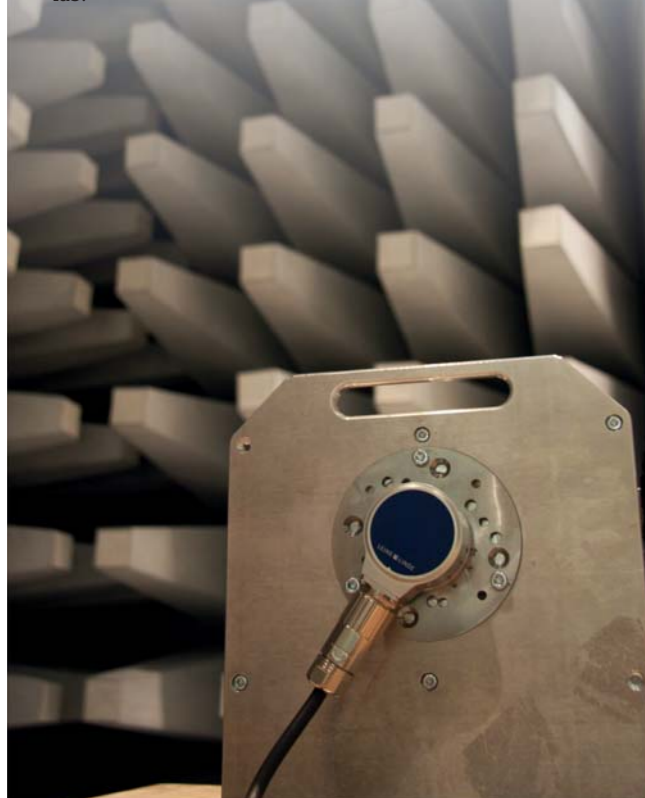
The results of the project are convincing. The new encoder has an attractive form that reflects the product's sturdiness and provides a clear sense of identity. Design work has also produced functional changes, such as the capability to interact via light and buttons by utilising the intelligence on the encoder's surface.

"Leine & Linde is a fantastic example of an industrial company that through its good understanding of product design, has increased product value. We see without exception that our customers who wholeheartedly invest in product design greatly appreciate the results," says Atle Andersen, managing director for Avalon Innovation. ■

AVALON INNOVATION

Is an industry-independent consulting company that provides solutions in product and business development. The company has 260 employees and 15 offices in Sweden, Norway and Denmark.

A new encoder model being tested in Delta's lab.



With full control

It began with a summer job. Peter Wendel has now been with Leine & Linde for six years. Together with his colleagues, he makes sure that the encoders are delivered in the right way and on time.

PETER WENDEL works at Leine & Linde's shipping department. He and his colleagues are responsible for customers receiving their encoders at the appointed times. The company has quality-assured both production and the entire distribution chain to maintain the quality of its deliveries. An important part of the chain is final inspection and shipping. Peter Wendel describes how work is carried out at the department:

"We receive the finished encoders from the clean room. Thereafter, they undergo a careful final inspection. We test signals and that trimming and centring are correct. After this, the encoders are sent over to customisation for any adjustments and accessories."

Customisation can entail mounting torque rods or any other accessory the customer has ordered. Peter Wendel and his colleagues also make sure that the right manual is included with each delivery.

If an encoder does not comply with the quality requirements, it goes back to production for adjustment. Peter Wendel points out that this very rarely occurs. But the quality control system is nonetheless necessary to discover any faults in time.

Shipping

Once the encoders have passed through customisation, they are returned for shipping. The encoders are packed, packing slips, waybills and address labels are printed, and the shipment is labelled.

Because Leine & Linde delivers to approximately one-hundred markets in all parts of the world, the selection of shipping company is based on the destination. The goal is to minimise the risk of problems and delays.

After six years at Leine & Linde, Peter Wendel does his job quickly and efficiently, which is important in holding delivery schedules. He started at Leine & Linde with a summer job and has stayed on ever since.

"I guess I'd have to put the blame on my friendly workmates," says Peter Wendel with a laugh. ■



NAME: Peter Wendel

POSITION: Shipping clerk and electronics assembler

AGE: 28

HOME: Härad, just outside Strängnäs

FAMILY: Girlfriend, cat, guinea pig and mice

MISCELLANEOUS: Alongside his job at Leine & Linde, Peter Wendel is studying to become a sound technician. He is very interested in music, plays the guitar and sometimes even the drums, and has among other things produced the background music for one of Leine & Linde's information videos. You can listen to the results here: www.youtube.com/user/leinelinde