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Motion, Drive and Automation

INTERNATIONAL EDITION

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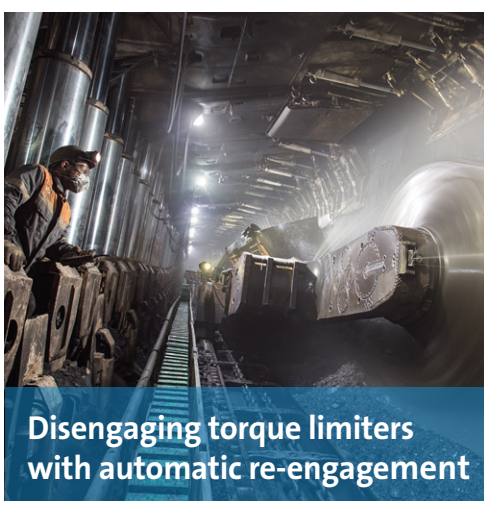
Lubrication systems to reduce the total cost of machine ownership

Mumbai: the nerve center of India's industry and economy



Disengaging torque limiters with automatic re-engagement

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Can India meet expectations?

Dear reader,

The expectations placed on the secondmost populous country on earth are high. That's also the reason why India is one of the BRIC countries – countries for which a strong future in international trade is forecast. But do current industrial figures tell a different story? For example, a significant surge in German machine exports to India last year was followed in the first half of 2016 by a downturn in deliveries of about 8.5 % compared to the previous year. The German Mechanical and Plant Engineering Association is counting on growth this year only in the areas of drive technology, construction machinery, and pumps and systems. All other sectors in Indian business are currently experiencing a difficult environment. "We're going to have to adapt to more short-lived positive and negative economic cycles in the machine manufacturing market in India in the future," VDMA President Dr. Reinhold Festge said recently.
But the German machine tool industry is still expecting a more positive trend in the future in India: While its greatest successes in India came in 2007 and 2008 with export sales of just under 300 million, the worldwide financial crisis led to a drop of 25 % in the two following years. Currently a reversal of the trend to positive can be observed. The machine tool market is expected to grow by 9 to 10 % in 2016 and 2017. Companies are therefore focusing primarily on the automotive industry and its suppliers in India. Significant growth is expected in this sector in the future.
Nevertheless, numerous problems remain which must be ironed out in the next few years and State Premier Modi has promised to devote his personal attention to the issue. That includes above all better investment opportunities for foreign companies, improvements in the training situation and implementing the solution touted by an extensive advertising campaign: "Make in India," which encapsulates everything India is hoping for: jobs, fewer barriers to investment, the development of industry and foreign investment.
The upcoming WIN India trade fair will be another indicator for exhibitors and visitors alike of the progress India has made along the path to the future. You can find out more about the trade fair, new products and India itself in this edition.
It remains to be seen whether India can fulfill expectations. We are certainly hoping it does!

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Motion, Drive and Automation

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7th year (2016)

The nerve center of India's industry

NSK to the rescue

A 3D printed house?

Venturing into newer pastures

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Diffusers to the rescue

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Author:
Sushen Doshi, correspondent India for MDA TECHNOLOGIES

Photograph: fotolia

India: all geared up for a bullish growth cycle

Sushen Doshi

With decisive government reforms, strong bureaucratic support, industry's appetite to compete globally, the demographic advantage and the ever increasing demand, the short term as well as long term opportunities for growth in India are now more robust than ever.

With more than a $ 2 trillion GDP, India is the 7th largest economy in the world. The country is classified as a newly industrialized country, one of the G-20 major economies and a developing economy with an average growth rate of approximately 7 % over the last two decades. India's economy became the world's fastest growing major economy in the last quarter of 2014 replacing the People's Republic of China. The country of over a billion people has the potential to become the world's 3rd largest economy by the next decade and one of the largest economies by mid-century. The country's long term prospects are surely positive and promising but even the outlook for short-term growth is also good as according to the IMF, the Indian economy is the "bright spot" in the global landscape. India also topped the World Bank's growth outlook for 2015-16 with the economy having grown 7.6 % in 2015-16 and expected to grow more than 8.0 % in 2016-17.

Traditionally, many countries at India's level of development have had the largest share of GDP being contributed by the manufacturing sector. In India, even though it is a $ 2 trillion economy the manufacturing accounts for around 15 % of the GDP. The services sector has a far more weightage in India's economy than manufacturing. Therefore India is a services giant, but not a manufacturing power as yet. This is exactly what the Prime Minister Modi led government in India is trying to address. Modi's objective through his various government schemes and initiatives, particularly the 'Make in India' campaign is to drive the manufacturing sector from 15 % to 25 % of GDP, in the process creating millions of jobs and adding real value to the economy.

So the question in front of Modi is what is impeding India's manufacturing growth? The PM and his team has narrowed it down to 3 main issues: infrastructure, regulation and skills. Finding solutions to these problems will be of great advantage to India. On infrastructure, there are enormous new plans already set in motion. Just as an example, we have the Delhi-Mumbai Industrial Corridor that is going to link Delhi and Mumbai with a 1,500 kilometers of six-lane highway, high speed railway freight line, and nine industrial zones; where land will be acquired, infrastructure will be created, power will be assured, and companies can set up operations there. Many similar such projects all over the country will create the infrastructure that a rising India needs. The second is regulation. India needs to reduce the regulatory burden on firms. There are a number of initiatives underway to do this and in these new industrial zones there will be experiments at reducing the regulation enough so that small and medium enterprises can set up without a huge burden. In addition, many government organizations are moving to do more IT (Information Technology), and enabling those processes that will help increase government efficiency and reduce the redundancy. The third element is skills. With 65 % of India's 1.2 billion people are below 35 years and more than 50 % of India's population is barely 25 years old. This constitutes an enormous demographic advantage, in terms of labor supply and also for generating demand for all sorts of products and services. But with such a large labor force, what they lack is the skill. In higher education, the expansion has been tremendous in recent years. But India is now keenly focusing on improving the quality of vocational education – of skills like plumbers, electricians, technicians, etc. A combination of engineers, management specialists, etc. with moderate but specialized education in areas like vocations, will help provide the labor force for manufacturing. So in each of the three main issues concerning the manufacturing sector, there is a lot more work to be done. But the work is underway and I think that in the next few years, you will see the fruits emerge.

GST: the game changer

In the story of modern India, i.e. post liberalization of the Indian economy in 1991, the GST is the biggest reform in the country yet. GST is the "Goods and Services Tax", a comprehensive indirect tax on manufacture, sale and consumption of goods and services throughout India. This is now set to replace the various taxes levied by the regional and the central government. The introduction of GST is a significant step for the government as well as the business and industry. This creates a more efficient, neutral and a systematic tax system through out the country. Basically under the GST system, all the taxes from the central government to the state government are amalgamated into one. This would mitigate cascading or double taxation, facilitating a common national market. The simplicity of the tax should lead to easier administration and enforcement. From the consumer point of view, the biggest advantage would be in terms of a reduction in the

overall tax burden on goods, which is currently estimated at 25 to 30 %, free movement of goods from one state to another without stopping at state borders for hours for payment of state tax or entry tax.

The government aims at reducing the overall tax rates through out the country without causing a loss of revenue, it therefore needs to focus on widening the tax base. Modi aims to achieve this goal by creating the tax system that is attractive and hassle free for the tax payer and GST is just the start. GST would replace most indirect taxes currently in place such as:

CENTRAL GOVERNMENT TAXES	STATE GOVERNMENT TAXES
Central Excise Duty	Value Added Tax
Service tax	Octroi and Entry Tax
Customs Duty	Purchase Tax
Central Sales Tax	Luxury Tax
Central surcharges	Sales Tax

Low hanging fruits

In the short term, India faces different issues as compared to some of the industrial countries. In the west, countries are mostly facing the problem of huge debts and very weak growth, with Germany as an obvious exception. India is currently tackling the issues concerning macroeconomic stabilization like controlling the inflation and bringing the government deficit under control etc, but at the same time, the growth potential is greater than industrial countries by a mile. And if India plays its cards right, then it could even harvest this opportunity not just for the short term but for the next 20 years. In India, the fruits are low hanging in many ways. Just building the infrastructure creates an enormous amount of growth. Add to that the manufacturing that utilizes and benefits from this infrastructure; you will get additional growth. Add to that the young population, which is entering the labor force; you get further more growth. And add to that the capacity to move up the skill chain or the value added chain – all these factors add up to give India multi-dimensional growth. But again, it is important for India's policy makers and industry personnel to remember that they don't become complacent and deliver the right policies and good execution to it. If we do the right things at the right times, there is no doubt that in the next 10 years, India will be the largest growth driver for many sectors of industry all over the world.

Focus on engineering sector

The engineering sector, being closely associated with the manufacturing and infrastructure sectors, is of strategic importance to India's economy. This sector in India attracts immense interest from foreign players as it enjoys a competitive advantage in terms of manufacturing costs, technology and innovation. According to the government statistics, FDI in India witnessed an increase of 29 % and reached $ 40 billion during April 2015 – March 2016 as compared to $ 31 billion in the same period last year, indicating that government's effort to improve ease of doing business and relaxation in FDI norms is yielding results. India has also overtaken China as world's top foreign direct investment destination in 2015 including high-value project announcements across the coal, oil and natural gas, and renewable energy sectors.

In the recent past there have been many major investments and developments in the Indian engineering and design sector:

- Volvo Penta, a marine and industrial power system manufacturer, plans to produce five and eight litre industrial engines at the VE Powertrain (VEPT) plant in Pithampura near Indore from 2017.
- Honeywell Turbo Technologies partnered with Tata to develop their first ever petrol turbocharged engine. Honeywell's engineering teams in Pune and Bangalore leveraged local capabilities and global expertise in petrol turbo technologies to address the specific needs of a local customer.
- Leading aircraft maker Airbus announced it has begun sourcing components for almost all its jets from India and it aims to take its cumulative sourcing from India to $ 2 billion by 2020.
- E-commerce giant Amazon plans to set up its second largest global delivery centre outside the US, in Hyderabad, which will be 2.9 million square feet in size and employ 13,500 people, compared to 1,000 Amazon employees across different offices currently.
- US-based General Electric (GE)'s multi-billion dollar project for Indian Railways to set up a diesel locomotive factory at Marhowra, and French company Alstom's electric locomotive factory in Bihar.
- Foxconn has signed an agreement with the government to invest $ 5 billion over the next 3 years for setting up a manufacturing unit between Mumbai and Pune.
- Germany-based ThyssenKrupp group is aiming to double its revenue from India to $ 1 billion in next 3-4 years while the group's elevator unit, ThyssenKrupp Elevator, plans to invest $ 50 million to set up a manufacturing plant in Pune.

Mumbai: the nerve center of India's industry and economy

WIN INDIA

Being the nation's capital, New Delhi obviously has much more significance and importance amongst all Indian cities. But talking plainly in terms of economy and industry, it's Mumbai that has more muscle than any other city. Probably this is why the international industrial trade fair WIN-India shall be hosted in Mumbai from 1st -3rd December this year.

For last few years the international trade show WIN-India, under the flagship of Germany's Hannover Messe, was being hosted in the national capital New Delhi. New Delhi and the region surrounding it are no doubt one of the highly industrialized areas in the country, manufacturing everything from automobiles, engineering equipments and machinery to pharmaceuticals and even IT. But this year, the world of industries has shifted its focus from north of India to the west and probably the biggest market within the country.

Mumbai, located on the west coast of India is often looked as India's gateway to the western world. With a GDP of more than $ 275 billion, it is one of the world's top 10 centers in terms of global financial flow. Mumbai accounts for more than 6 % of India's economy, contributing 10 % of factory employment, 30 % of income tax collections and billions of dollars in foreign trade. Mumbai is the headquarters for a number of conglomerates like the Tata group ($ 100 billion), Reliance Industries ($ 75 billion), Aditya Birla group ($ 40 billion) and many more. Officially the city has a population of more than 23 million, but any Indian and a frequent visitor to Mumbai can confirm that this city is home to more than 30 million people. With a large number of people being young and educated, the city offers huge demographic advantage for various industry sectors. Mumbai's industrial and economic base is extremely diversified with sectors like petrochemicals, automobiles, auto components manufacturing, metals, electronics, textiles, food processing and other fast moving consumer goods being the most important ones. Apart from the city of Mumbai itself, the region of Ahmedabad-Baroda in north of Mumbai and Pune in the south of Mumbai are also extremely important centers of industry, engineering and manufacturing. The city of Pune, just 160 km from Mumbai has the highest concentration of German companies in India representing various industry sectors from automobiles to automation.

Hosting an international trade show in the engineering heartland of India provides the exhibitors plenty of opportunities to acquire new customers, to introduce and promote new products, new innovations and value added services. As India's weight in the global economy and industry increases, it is important for foreign companies to gain knowledge and information about Indian customer's requirements and expectations. WIN-India provides a unique opportunity to gather this market intelligence and also to demonstrate their presence in the Indian market. For German and other foreign companies in the motion, drives and industrial automation sector who are searching for new markets to act as growth driver, WIN-India offers an unparalleled access to the Indian market with high growth prospects for immediate as well as long term future. This international trade fair attracts visitors from all parts of the country creating a great chance to broaden their customer base, strengthen relations with their existing customers and also find local distributors and sales partners. This is particularly important for small and middle sized companies who are targeting India as a growth market but are cautious about investing in operations and promoting sales activities in the country.

Motion; Drives and Automation India

The trade show 'Motion, Drives and Automation' serves as a perfect platform for international as well as Indian exhibitor companies to display their products, technologies and services for electrical and mechanical power transmission, pneumatics and hydraulics etc. The product category at MDA India include linear motion systems, gears, electric motors and frequency drives, mechanical transmission systems like chain and belt transmission, other vital engineering components like couplings, brake systems, fasteners, springs and bearings. MDA also covers a broad range of hydraulic and pneumatic components and equipment, pumps, valves, sealing technology related products, various lubricants and lubrication systems. Western India has traditionally been a big market for manufacturing of mechanical power transmission systems, it is no surprise that equipment required for manufacturing of power transmission products, gears, motors and bearings has also made its way to the exhibit. At MDA India 2016, also making an impactful presence is the compressed air and vacuum technology with a dedicated zone to showcase this sector's technological strengths and expertise. Product category at this zone includes various types of compressors and its components, air dryers, axial flow compressors, centrifugal compressors, compressed air filters, vacuum pumps, vacuum measurement and calibration instruments, gauges and leak detection devices etc.

Author: *Sushen Doshi, correspondent India for MDA Technologies*

For visitors coming from all over India as well as many parts of Asia including China, South Korea, Japan and European countries mainly Germany and Italy, this trade fair and the various conferences, seminars and specially designed interactive sessions offer a complete and neutral information regarding evolving trends, demand structures and growth prospects. For Indian visitors it provides a good opportunity for exchanging ideas and networking with distinguished panelists from across the industry. For the section of visitors representing the management and purchase departments, it acts as an excellent location to compare the offers from cost to after sales and technical superiority of product suppliers.

Industrial Automation India

The demand for industrial automation, both factory and process automation products has been increasing consistently over the last few years. Everyone, from corporate to small and medium sized companies, government owned industries to private conglomerates have been steadily increasing the level of automation in all divisions of the factory from production and packaging to logistics. Considering India's high demand for automation systems the trade fair Industrial Automation India aims to bridge the gap and fulfill India's automation needs. IA-India has a strong line-up of companies from India as well other parts of Asia, Europe and North America with wide range of products and systems on display including linear positioning systems, assembly and handling systems, industrial image processing systems, control systems, PLC, Scada, sensors, actuators, industrial PCs, communication network and field bus systems, embedded systems, measurement and testing technology, data capturing and identification systems. Apart from industrial automation this trade fair also covers a wide range of electrical systems like generators, transformers, accumulators and uninterruptible power supplies, cables and cabling accessories, electric switchgear and equipments for electric control systems, electronic and opto-electronic components. Industrial software and IT systems like database management systems, program development and manufacturing execution systems (MES), software for product lifecycle management (PLM), enterprise resource planning (ERP), customer relationship management (CRM) are also on display in Mumbai.

Industrial Automation India also features the 2nd edition of 'Automation Training Zone', a 3 day training program which aims to realize India's vision of skill development in manufacturing sector and educate the end user sectors with latest automation technologies. This training zone consists of modules representing the automation systems engineering, digital simulation, energy management, industrial networking, integrated robotics, quality management and safety practices. This program enables the attendees to gain exposure and hands-on experience with the latest technologies and equipments on display.

Need for India centric solutions

India is a country of 1.2 billion people and tremendous diversity and this also reflects in the way its industries function. The challenges that India's industries face are unique and sometimes very different from the ones faced by western countries. Just because a certain technology or a product is successful in improving the productivity in German factories doesn't mean it can do the same in Indian ones. So companies who aim to succeed in Indian markets need to develop products and solutions that make perfect sense to the Indian end-user. This premier industrial exhibition provides a good opportunity to test the market response of your company's products and can possibly be a starting point for further changes in your company's product development strategy for India and south-east Asian markets.

The personal interaction with potential customers on the trade fair grounds will have a much more lasting effect on both, the buyer and the seller. When it comes to influencing a buyer's decision, a face-to-face interaction followed by a short question-answer based conversation, helps you best in closing the deals. In Mumbai, WIN-India provides you exactly this opportunity to engage and get the deal.

Photograph: *lead fotolia*

www.win-india.com

Worldwide News

Bonfiglioli to expand operations in India

Bonfiglioli Transmissions Pvt Ltd, the Indian subsidiary of Bonfiglioli Riduttori S.p.A. is expanding its operations in India with improvements to existing facilities in Chennai and construction of a new facility in Pune (Chakan area), for a total investment of 11.3 million euro. The current plant in Chennai covers an area of 180,000 sq.ft., the Mannur plant located close to Sriperumbudur covers an area of 100,000 sq.ft. These plants are highly integrated facilities that manufacture gearboxes and gearmotors for mobile machinery, wind turbines and industrial processes. A new facility of 140,000 sq.ft will be built, adjacent to the current plant at Chennai. The expected production capacity is 75,000 units per year and will enable Bonfiglioli to serve markets in off-highway, construction, mining, agriculture and material handling applications. Another completely new facility will be built in Pune (Chakan area, western India). This new facility will be approximately 45,000 sq.ft., and will contain 11 assembly centres and 2,000 storage locations. The expected capacity is 150,000 units per year to serve customers in food, packaging, cement, steel, pharmaceutical, textile, material handling, sugar, power generation.

www.bonfiglioli.com

Hannover Trade Fair: The profitable side of Industry 4.0

To make the factory of the future more than a pipe dream, the concrete benefits for industry, employees and society in general must take center stage. That is the theme of the 2017 Hannover trade fair: "Integrated Industry – Creating Value." Companies are confronted with technological possibilities with effects that are often difficult to assess. The trade fair will point out ways to tap the potential of digitization even with limited resources. Another presentation shows how digitization is changing the energy market, for example with "prosumers" and virtual power plants. Supplier companies will also be showing that they can be faster, more innovative and more individualized. And yet the human factor remains the fundamental criterion for the success of a company: Industry 4.0 technologies will make activities of factory workers more exciting and varied, thereby enhancing the value of their working time.

www.hannovermesse.de/home

Phoenix Contact acquires stake in cybersecurity company

Effective September 21, 2016, Phoenix Contact Innovation Ventures has acquired a minority holding in Dutch company Security Matters, a provider of cybersecurity solutions. Security Matters markets the Silent Defense platform for network monitoring and detection of anomalies. Applications include the production, transmission and distribution of energy, water supply, infrastructure solutions, chemistry, oil and gas as well as industrial production technology. Other investors are Robert Bosch Venture Capital, Dutch KPN Ventures and Swiss Emerald Technology Ventures. The Swiss company previously held a majority share. Phoenix Contact Innovation Ventures is part of the Phoenix Contact Group, which manufactures components and systems for electrical connections and industrial automation. The company invests in startups related to the business segments of the Group.

www.phoenixcontact.com

Pirtek protective glove wins industry award

The Pirtek "Fluid Power Glove" was recognized with the Industry Award in the category for drive and fluid power technology as "Best of 2016," competing in a field of over 2000 applications for the best innovative products. The glove is designed to provide protective functions beyond common hazards such as scratches, cuts and puncturing, also offering protection against dangerous entrapment of liquids, for example hydraulic oil. Several protective layers of an innovative material made of a type of Kevlar ensure high protection and resistance for the glove. Independent tests from British labs verify a protective effect up to a pressure of 700 bar. Huber Verlag has offered the prize annually throughout Germany since 2006. The goal of the event is to honor new products and innovations in the industry.

www.pirtek.com

Turck opens new sales and marketing headquarters

Automation specialist Turck has opened new sales and marketing headquarters in Mülheim an der Ruhr (Germany). On a lot next to company headquarters on Witzlebenstrasse, an architectonically impressive building has arisen over the last two years with about 4,200 m^2 of office and representational area, surrounded by a campus-like park. Architectural office Eller + Eller was responsible for planning and implementation. Investment for the construction came to 13 million euros. The building is part of a series of investments the company has made in the last four years totaling 100 million euros. Also included were the expansion of manufacturing and development sites in Halver and Beierfeld (Germany), Delémont (Switzerland), Minneapolis (USA) and Saltillo (Mexico).

www.turck.com

B&R gains market share through innovation

B&R, the Industrial automation specialist has posted impressive numbers in comparison with the overall machine manufacturing sector, which witnessed a 2 % increase in revenue in the first of 2016. To achieve this, B&R has supported its customers by not only providing innovative products, but also with support in implementing advanced manufacturing strategies for mass customization. Particularly in demand are the intelligent SuperTrak transport system, powerful ACOPOS P3 servo drives and the web-based mapp View HMI solution. The SuperTrak transport system is a step towards mass production of customized items. It's advanced linear motor technology and independent shuttles provide highly responsive transport for efficient production at any batch size. In 2016, B&R added the web-based mapp View HMI solution to its mapp Technology software. Since it functions independently of the operating system, mapp View can run on any smartphone, increasing the productivity and keeping downtime to a minimum. Over the past 12 months, B&R has responded to increasing demand for its solutions by opening new offices in Valencia, Strasbourg and Mumbai, as well as a new subsidiary in Finland, more new locations are being planned all around the world.


Peter Gucher, General Manager, B&R Automation

www.br-automation.com

Worldwide News

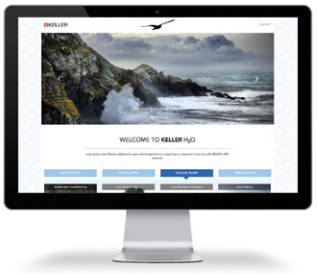
Lapp acquires Italian manufacturer for data transmission systems

The Lapp Group of Stuttgart, a leading provider of integrated solutions and brand products in cable and connection technology, has acquired CEAM Cavi Speciali S.p.A. The company with 110 employees in Monselice, Italy, is one of the leading European manufacturers of services for industrial Ethernet and fieldbus. Lapp is also acquiring S.C. Fender Cables with 20 employees in Cluj-Napoca, Romania. The company specializes in cables for alarm and fire protection systems and like CEAM belonged to COFIMA Holding. "By acquiring CEAM, Lapp strengthens its leading role in industrial data transmission systems," says Andreas Lapp, Chairman of Lapp Holding. "In this way Lapp acquires additional knowhow and manufacturing capacities in the rapidly growing markets for industrial Ethernet and fieldbus systems."

www.lappkabel.com

Keller AG with application-based website

Keller AG develops and produces pressure measurement technology for a wide range of applications. In addition to oil and gas, aeronautics, automobiles and aviation, the water industry plays an important role. Reason enough for Keller to be recognized with a dedicated, application-based online presence. The company's website presents various approaches to solutions and how to implement them successfully so that water industry customers can benefit through collaboration with Keller.
Keller AG für Druckmesstechnik develops and produces various pressure measurement technology products for the water industry including remote transmission units, level sensors and data loggers. The different application reports give a broad overview, while highlighting the productive collaboration between Keller and its customers. The website, which is also optimized for mobile terminal devices, can be found at the address below.



www.keller-h2o.com

Schaeffler builds new logistics center

Ground was broken at the beginning of October for the new logistics center for the industrial division of Schaeffler in Kitzingen. Customers throughout Europe will be supplied from this central warehouse beginning in mid-2018. About 200 employees will work here. The company invested roughly 120 million euros. The total warehouse space will be approximately 22,000 m². The high-bay warehouse and automatic container storage space are connected by an in-floor conveyor system with combined workstations. This will make it possible to deliver standard products within 24 to 48 hours after an order is received. Earth moving and excavation will continue in the coming months. The roofing ceremony is slated for May 2017. Kitzingen is the last component in the modernization of logistics in the industrial division. The group of European distribution centers already has a warehouse for Northern Europe in Arlandastad, Sweden and one for Southern Europe in Carisio, Italy.

www.schaeffler.com

50th anniversary of Zeppelin in Cologne

The Zeppelin branch in Cologne, which focuses on sales and service of construction machinery, opened in 1966. A few weeks ago the company celebrated the 50th anniversary of the branch in Cologne, which is directed by Stefan Lanio (**right in the picture**). The speaker for the occasion was Wolfgang Clement, former Minister President of North Rhine-Westphalia (**left in the picture**). "The success story of the last 50 years makes us very proud," beams Lanio. "In the last year alone, together with our local employees, we have generated 71 million Euros in sales. We will also continue to count on collaborative partnerships with our customers and the high quality of our entire team."

www.zeppelin.com

EPSG holds Europe-wide student competition

For the fourth time, the Ethernet POWERLINK Standardization Group (EPSG) is holding a competition calling for innovative projects and automation concepts based on the open industrial Ethernet protocol POWERLINK. All students at European universities and technical colleges are eligible to participate.
Applicable projects range from mechatronic applications to the creation of solutions for industrial applications by developing new devices with POWERLINK interfaces and even implementation of new features in the openPOWERLINK stack. The projects should have relevance to the topics of Industry 4.0 and the Internet of Things. Submissions will be accepted until the end of 2016 and must be implemented by June of 2017.

ETHERNET POWERLINK Standardization Group
4th European Industrial Ethernet Award 2016/2017

www.ethernet-powerlink.org

European construction machinery sector embraces digital transformation as driver of success

"We can only be competitive long-term, sustainably, if we make sure we are the best. The European construction equipment industry is an example of technology leadership. Increasingly, our machines are 'digitised' and there is no escape from that." This was the main message from CECE President Bernd Holz, addressing the CECE Congress 2016 in Prague, Czech Republic, gathering close to two hundred leaders from the construction equipment industry in Europe.
Industry confidence is supported by the performance of the European market, where a stable development at high levels in Northern and Western Europe underpins a continuing yet slowing recovery in Southern Europe, and fairly weak growth in Central and Eastern Europe. "Construction equipment sales in Europe recorded sound double-digit growth in the first half of 2016 compared to the same period in 2015", said Holz. Despite the strong demand in the first half of the year, the industry sentiment looking forward is more subdued. The CECE business climate index was back at positive levels in September, having digested a steep dip in July following the Brexit vote, and after eight months of gradual improvement since the autumn of 2015. Holz: "Provided that the general conditions within the sector and its customer industries do not change substantially in the coming months, CECE expects full-year growth of the European market of between 5 and 10 %."

www.cece-congress.eu

our big picture

GEARBOXES AND LINEAR AXES MASTER HANDLING OF LIGHTWEIGHT BUILDING BOARD

A new lightweight construction material offers up to 70 % weight reduction compared to conventional wooden composite board. The requirements for the automated handling system of the production facility were anything but "light." Extensive engineering support and servo transmissions from Wittenstein alpha with performance-focused design ensure a high level of flexibility and availability.

Photograph: *Wittenstein AG*

www.wittenstein.de/en-en


Igersheim

Lubrication systems to reduce the total cost of machine ownership

Inadequate lubrication for bearings is a frequent cause for machine breakdowns. Here, lubrication experts can add an extra edge in terms of reliability and operating life of bearings in any sort of application.

70 µ, that's the approximate diameter of a human hair. The distance between the rolling element and the raceway in a rolling bearing is typically only 1 to 3 µ. This small gap is extremely vital because this is the space that contains the lubricating film that prevents steel-to-steel contact, thus minimizing friction and wear. With the right lubrication system, run time for the rolling bearings increases significantly and thus machine downtime is reduced. But it is important to define what the "right" lubrication is. Does it mean the more lubricant the better? Does it mean expensive lubricants are a better choice?

The answer to these questions depends on the system requirements that the lubricant has to fulfil in a rolling bearing, a linear unit or a bush. These requirements are based on the bearing design, the mounting position and the operating conditions. Three examples show how different the result of such an analysis can be:

- A simple electric motor widely used in production facilities often has two deep groove ball bearing supports. Even with 24/7 operation, 90 % of the motors reach their maximum run time, which can be several years, with a simple grease and without re-lubrication.
- The bearing supports of dry cylinders in paper machines are faced with greater challenges: The factor that limits the life of these double-row rolling bearings, most of which have angular adjustment, is the lubricant. Often, oil lubrication is the only way to reach the required bearing life of 20 years. Given the high speeds and temperatures in this application, oil is primarily used for heat reduction in order to protect the bearing from overheating.
- Wind turbines demand a service life of 20 years for bearing supports. Their operating conditions include low rotary frequencies, particularly on the main bearing and on the gearbox input side, dynamic loads and large differences in temperature all require specially developed greases.

These requirements that are specific to an industry and sometimes even to an application are something that rolling bearing manufacturers know well because they are also the parameters that decide the bearing design. Well established companies, like Schaeffler have a line-up of experts to offer support with lubrication problems and develop lubrication systems customized for a specific application.

Ensuring high machine availability

The interaction of the bearing and the lubricant is what ultimately determines the life of a bearing and also essentially defines machine availability. Schaeffler has researched this interaction for years and continuously develops its range of lubricants. Over time, thousands of test stand runs used to test greases in rolling bearings with regard to service life, friction and wear, have resulted in a tried-and-tested grease program that has been established on the market under the "FAG Arcanol" brand. This program distinguishes between multipurpose greases that are suitable for a wide range of applications, heavy-load greases (used, for instance, in main bearings in wind turbines), high-temperature greases (up to 200 °C) and special greases developed for specific applications (e.g. for spindle bearings in machine tools). Complex applications such as rolling bearings, in particular, require lubricants that deliver proven and consistently

MULTIMEDIA CONTENT

An overview about the Arcanol rolling bearing greases

01 FAG Concept2 and Concept8 automatic re-lubrication systems

high performance. The ever increasing requirements for bearing supports - such as the more compact design of accessory drives, higher loads and speeds - environmental aspects and constant changes on the commodity markets require the continuous advancement of lubricants. In 2015 alone, Schaeffler carried out over 50,000 hours worth of tests on its in-house FE8 and FE9 test stands.

Automatic re-lubrication systems

Besides the initial selection of a suitable lubricant, re-lubrication is also a vital aspect of a lubrication system: When and how much do you need to re-lubricate? Once this has been defined for an application, lubricant dispensers or systems can ease the maintenance staff's workload considerably. Automatic re-lubrication devices provide fresh lubricating grease to the contact points of the rolling bearing in the desired quantity and at the right time. These devices follow predefined lubrication and maintenance intervals and avoid the use of too little or too much grease.

Overall machine downtime and maintenance costs are reduced as a result. Re-lubrication devices are selected for specific bearing positions. They can be used for a wide range of applications, including electric motors, gearboxes, pumps, compressors and ventilators, linear systems, conveyor equipment, and machine tools. The "FAG Concept2" and "FAG Concept8" lubricant dispensers can supply up to 2 and 8 lubrication points respectively. If the Concept2 is equipped with 2 pump bodies, it can supply 2 lubrication points with different requirements. For instance, electric motors often include cylindrical roller bearings and ball bearings - but a cylindrical roller bearing requires an average of 4 times more grease than a ball bearing. The Concept8 allows connection of up to 4 pump bodies that supply 2 lubrication points each with the same requirements. The lubrication devices are supplied with voltage via a power supply unit (Concept2 can also run on a battery) and work autonomously. They can also be controlled externally and are easy to integrate into machine operation. For maintenance personnel, automated re-lubrication devices mean considerably less work, improved operating reliability and often reduced maintenance costs.

Photographs: *Schaeffler AG*

www.schaeffler.com

02 FAG Concept2 re-lubrication device on an electric motor

About Schaeffler AG

The Schaeffler group is a leading integrated automotive and industrial supplier. The company based in Herzogenaurach, Germany, generated revenues of approximately Euros 13 billion in 2015. With around 85,000 employees, Schaeffler is one of the world's largest family owned companies. The technology group has more than 170 locations in 50 countries with a worldwide network of manufacturing plants, research and development centers and sales subsidiaries. The Schaeffler group makes key contributions towards "mobility for tomorrow" with precision components and systems in engines, transmission, bearings - rolling and plain, along with expert lubricants and lubrication systems for industrial applications.

Disengaging torque limiters with automatic re-engagement

Today's machines are becoming increasingly compact and making it harder to access the drives. And yet these are the exact machines that require reliable overload protection. A new, dis-engaging torque limiter re-engages automatically by rotating backwards slowly.

In applications where hard rocks and stones are burst into pieces or machines that cut their way through rock, only robust and solid torque limiters can survive this extreme levels strain. The frequently tough operating and ambient conditions in heavy mechanical engineering such as dust, water spray, heat or cold, not only places the strain on the workers in these plants, but also on the individual components of the drive line. In particular due to these rough ambient conditions, the drive lines in these machines are frequently encapsulated and therefore hard to access. The company, Mayr power transmission, as an expert on clutches and brakes, has developed a robust torque limiter 'the EAS-reverse', which is able to cope with such high strains and also re-engages automatically – ideal for drives which cannot be accessed for re-engagement purposes. These torque limiters protect large machines permanently and reliably against damage due to overload, and thus ensure the operational safety and maximum productivity of these large systems.

Patented technology and unique functional principle

Norbert Vogl, developer at Mayr power transmission explains "On the new EAS-reverse torque limiter, all functional processes can be automated via the drive. This is a disengaging clutch which automatically re-engages simply by rotating backwards slowly, without the use of pneumatics or hydraulics". Double cylindrical rollers function as torque transmission elements on the EAS-reverse. They ensure an exceptionally robust torque transmission and favourable contact conditions. On re-engagement, the double rollers are characterised by high rolling contact and therefore low friction contact. "Due to the low friction contact, the clutch has a favourable service factor. This service factor is also positively influenced in that the EAS-reverse works with a direct torque transmission mechanism of high rigidity, which means that an additional disengagement mechanism is not required" says Norbert Vogl. The torque transmission is conducted with exceptionally low backlash (< 0.05 °). All functional parts of the clutch are hardened.

Instant disengagement, immediate drop in torque

In case of overload, if the torque exceeds the value set on the clutch, the EAS-reverse disconnects the input and output with high switch-off and repetitive accuracy within split seconds nearly residual torque-free. The kinetic energy of the rotating masses stored in the system can run out freely. Through the use of cup springs with a negative characteristic curve, the torque drops immediately. The

Mayr power transmission's new robust torque limiter which is able to withstand high levels of strain and tough ambient conditions, and also re-engage automatically – ideal for drive lines in heavy mechanical engineering which are hard to access

so-called pumping or breathing of the clutch is thus excluded, and the wear on the disengagement mechanism is low. The EAS-reverse torque limiter can withstand long drive run-out times after being triggered. When defining the permitted run-out time, only the robust double bearing on the clutch must be considered. It is necessary to switch off the drive soon after disengagement of the clutch, but targeted braking of the motors is not required. The overload signal, for example, is supplied by a contactless limit switch, which permanently monitors the operating condition of the clutch. Due to the complete disconnection of the input and output, no engagement impacts occur during the over-travel time, which might have a negative effect on the drive line. The clutch is re-engaged by reversing the direction of rotation at a speed of < 10 rpm.

Flexible and customizable with various possible combinations

Mayr's new EAS-reverse torque limiter is easy to handle and has numerous versions and additional features for tailored, branch-optimised solutions. For example, the combination with an elastomer clutch permits simple disconnection of the drive line by loosening a few screws, without having to displace the motor or gears. In addition, a combination with brake disk can be provided for load-holding output applications. The EAS-reverse can also be easily integrated into a solid housing with Standard IEC or NEMA-dimensions, thus rendering it dust and spray proof, water-proof, and protecting it effectively against adverse ambient conditions. The standard series EAS-reverse can be used within a temperature range of -20 to +40 °C, extensions to temperatures from -30 to +80 °C are possible. The new torque limiter has up to now with its initial three construction sizes covered a torque range of 80 to 2,500 Nm, and is about to be extended by a fourth construction size up to 5,000 Nm and a bore diameter up to 100 mm.

About Mayr power transmission

Founded in 1897, Mayr power transmission is a family-run company based in Mauerstetten, in the Allgäu region of Germany. Mayr is leading manufacturer of safety brakes, torque limiters and shaft couplings. These products are primarily designed for application in electrically driven machines and systems. They can be found, for example, in filling plants, in machine tools, in packaging and printing machines as well as in elevators, in wind power plants and in stage technology. Currently, approximately 600 employees work at its headquarters in Germany. Worldwide, Mayr power transmission has more than 1000 employees. With production plants in Poland and China, sales subsidiaries in the USA, in France, Great Britain, Italy, Singapore and in Switzerland as well as 36 additional country representatives.

Before a clutch leaves the Mayr power transmission factory in Mauerstetten, it is comprehensively tested and set precisely to the required value. The company has diverse, modern testing equipment and profits from decades of experience. An electronic database in which the measurement values are archived together with the associated serial number of the product guarantees 100 % traceability.

Photographs: *Chr. Mayr GmbH + Co. KG, lead: shutterstock/weareone*

www.mayr.com

01 The EAS-reverse with patented disengagement mechanism – ideal for drives which cannot be accessed for re-engagement

02 The EAS-reverse: easy to handle, permits long run-out times and resistant to dust or water spray

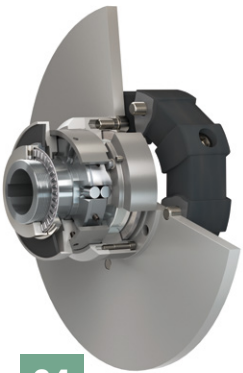
03 Combining the EAS-reverse with an elastomer coupling permits easy separation of the drive line by loosening a few screws without having to displace the motor or gears

04 With its various versions and features, the EAS-reverse is extremely customizable. For example, in combination with a brake disk


01


02


03


04

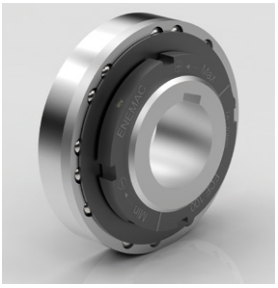
A compact motion controller with no cabinet cooling system required

With modern machines becoming more flexible and increasingly modular, the company Lenze has upgraded its 3200C controller platform. The performance of the new DIN rail mounted motion control units has been boosted with new processors. Up to double the processing speed which means higher computing power for the control of more co-ordinated axes. Because the new controllers use less current than before, heat losses are minimal so the control cabinets can be made without expensive cooling systems. The 3200C platform is a range of controller for PLC logic, motion and visualization. The upgraded Intel Atom processors run at a frequency of 1.91 GHz allowing faster processing of more complex motion systems. However the extra performance comes without any increase in costs. The 3200C has control panels with compact dimensions and no cooling fans. As the heat generated is minimal, cabinet cooling systems are not required, saving on size and cost. Furthermore the absence of cooling fans, and no batteries for the 3200C controllers, means no maintenance is required.

www.lenze.com

Torque limiter with robust design and high precision

Torque Limiters react to even the smallest increase of torque and disconnect the drive in a split second. The disconnection is forced, that means it is unaffected by electrical power outages. The ECE type torque limiter has a short axial design, which requires a very small installation space. Its functional principle is robust, reliable and needs just few parts. Its special disc springs offer high precision over a wide range of torque. The torque between the drive and the machine is cut within a few angle degrees. It offers couplings with a fixed switching point which means one switching point per turn. This in turn is important to retain the reference point of the machine. In case of a torque overload, the signal from proximity switch, located near the disc spring, can be used to stop the drive entirely. ECE has a keyway for the torque transmission between drive and torque limiter. Chain wheels, belt pulleys etc. are mounted on the drive shaft and screwed on the flange ring of the ECE for the torque transmission. The torque limiter ECE is available in 28 sizes, and torque ranges from 2 to 900 Nm.



www.enemac.de/en

High precision measurement with eddy current displacement sensors

Non-contact eddy current sensors from Micro-Epsilon are designed for the measurement of displacement, distance, position, oscillation and vibration. They are suitable for harsh industrial environments since, they are resistant to factors such as dirt, pressure and fluctuating temperatures. Their eddy current measuring principle allows them to measure through non-conductive materials, hence are resistant to media such as plastics, dirt and oil. Micro-Epsilon, with its new NCDT 3001 and 3005 series, offers sensors that are compact and robust. The eddyNCDT 3001 sensors are housed in an M12 body. They are used, for example, in the monitoring of the oil gap in hydrostatic bearings. As the sensor is resistant to oil and water splash, as well as high temperatures, in combination with its compact design, these sensors are ideal for integration into restricted installation space. The eddyNCDT 3005 model is a temperature compensated, i.e. even at high temperatures or temperature fluctuations from -30 to 180 °C, these sensors achieve extraordinary measurement accuracy. Its high accuracy, combined with a favorable price/performance ratio, make these sensors suitable for high volume applications and for integration into plant, equipment and machinery.

www.micro-epsilon.com

V-Drive servo worm gearheads: Upgrade and extended portfolio

Wittenstein alpha, the specialist in mechatronic drive technology, extends its portfolio of servo worm gearheads in its V-Drive Basic series. The V-Drive Basic is now also available in sizes 50 and 63 with hollow or solid shaft output and a total of 5 different reduction ratios. At just 7.4 and 12 kg respectively, the V-Drive is definitely lightweight: its smaller mass helps save energy when the gearhead is used in moving machine axes. The special geometry of the teeth provides high efficiency and a very quiet running, with a maximum of 65 dBA at full load. Designed for ambient temperatures between -15 and + 40 °C and featuring IP64 protection, the V-Drive Basic is ideally suited for price sensitive applications with no specific requirements of maximum torsional backlash. At the same time, other 2 versions in the V-Drive series have been upgraded in regards to torque and torsional backlash. The V-Drive Value and V-Drive Advanced upgraded versions offer extra torque – about 20 % more – but it is the significantly lower torsional backlash that is especially convincing: only 6 arcmin with the V-Drive Value and 2 arcmin with the V-Drive Advanced. The optimized design of the input seal guarantees these V-Drive versions a service life 25 to 50 % better than the current market standard.

www.wittenstein.de/en

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NSK to the rescue

Due to the age of lathe and the fact that the original manufacturer had changed ownership, meant that the Austrian ropeway maker faced a challenge when wear and tear dictated that the main spindle's roller bearings required replacement. A reverse engineering operation was the need of the hour.

01 Cylindrical roller bearings used as high precision bearings for the spindle

The demand for ropeways, which are seen as an economic and rapid alternative to conventional ground transport systems, in both, inaccessible terrains and highly urban landscapes is globally increasing. Owing to this rising demand, the business at the Doppelmayr/Garaventa Group has seen the manufacture of more than 14,600 ropeway systems for customers in 89 countries to date. The Doppelmayr/Garaventa Group in Wolfurt, Austria, is a specialist in the manufacture of surface and aerial ropeways. The company makes all of the required components for its ropeways in-house, including the large sheaves at the top and bottom stations which guide the main drive cable. The bearing surface of the sheaves must be

manufactured with very high precision to ensure smooth operation and secure cable guidance.

The sheaves are machined on a large surface wheel lathe that was rebuilt from an original longitudinal lathe produced many years ago by Zerbt. Although the machine, which has a face plate weighing 30 tonnes, gives good service, Doppelmayr faced a challenge when wear and tear dictated that the main spindle's roller bearings required replacement.

The principal problem in replacing the bearings was the machine's age and the fact that the original manufacturer had changed ownership. This meant there was no documentation relating to the main spindle assembly. For this reason, the Austrian ropeway maker Doppelmayr turned to NSK, which was able to support the company in a reverse engineering project that would help identify the bearing locations and assembly parameters, including the bearing clearance and spacer ring width. NSK also helped develop strategies for replacing the bearings. By characterizing the installed bearings through reverse engineering, NSK was able to replace them in the central bearing positions with high precision double row cylindrical roller bearings in the correct sizes. The replacement took place during a planned maintenance period so that production schedules were unaffected. For the axial bearings, spacer rings were measured after setting the clearance and new ones manufactured in the required width. Post-installation, NSK technicians checked the clearance to make sure it was correct. This was facilitated by conducting a dynamic lift test, allowing the loading conditions to be simulated with the bearings installed. The process confirmed that the previously measured value of 0.005 mm had been successfully maintained.

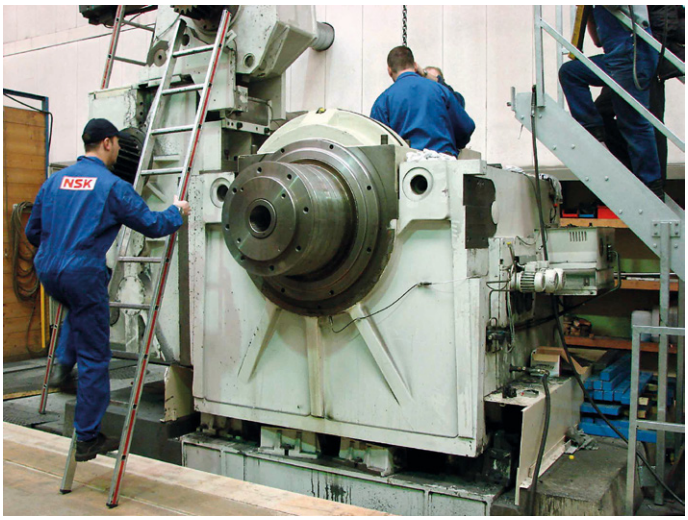
With the project now on the verge of completion and the surface wheel lathe ready to re-commence its operations, Doppelmayr's maintenance team was given instructions by experts at NSK to monitor the temperature of the bearings during the initial start-up phase. No irregularities were observed and the lathe is now back in full sheave production.

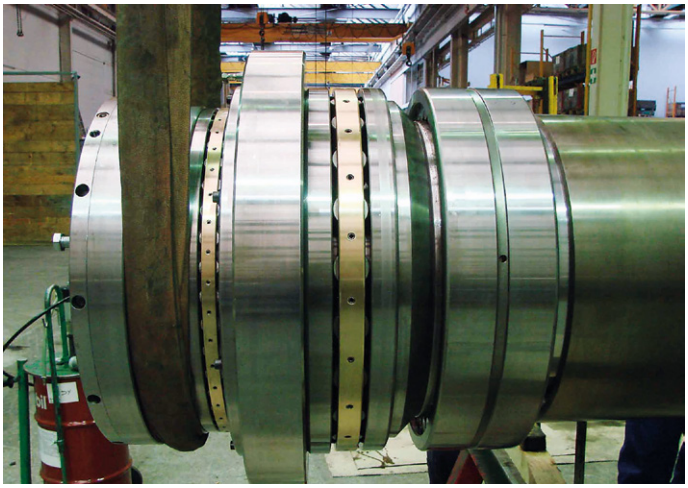
Photographs: *lead Doppelmayr/Garaventa, others NSK Deutschland GmbH*

www.nskeurope.com

About NSK

Established 100 years ago, NSK (Nippon Seiko Kabushiki Kaisha) is a Japanese-listed company that has evolved from a regional ball bearing supplier to a roller bearing specialist and automotive supplier with a global market presence. Today, NSK employs more than 31,000 employees in 30 countries. As per March 2015 NSK achieved a turnover of 975 billion Yen. In addition to a complete rolling bearing portfolio, NSK develops and manufactures precision components and mechatronic products, as well as systems and components for the automotive industry, including wheel bearing units and electric power-steering systems. In 1963, NSK's first European subsidiary, Düsseldorf, Germany, was opened and in 1976, the first European production facility in Peterlee, England. Today, NSK Europe supports pan-European sales with production locations and technology centres in England, Poland and Germany.





02 Experts from NSK supporting Doppelmayr's maintenance personnel with the replacement of the main spindle bearing

03 The bearings in installed state

A 3D printed house? Now a reality

Alexander Mühlens

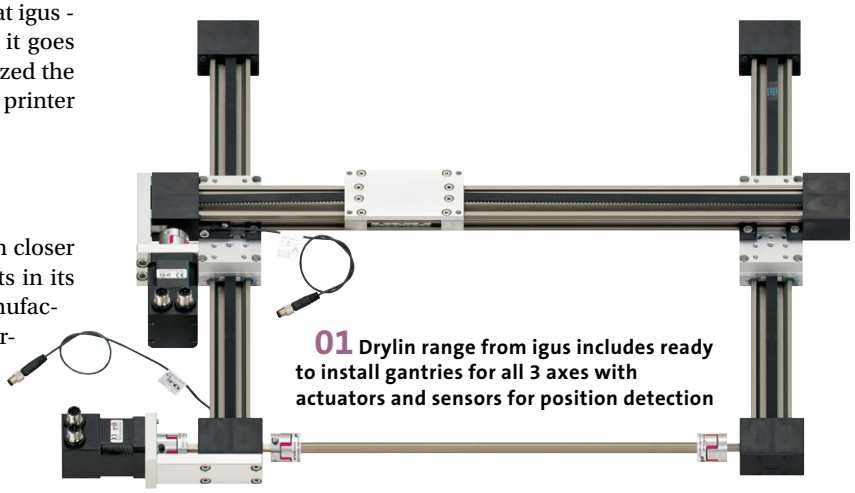
In Amsterdam's Marine Quarter, the façade of the "Europe Building" was partly built by 3D printing. For the production of the façade elements, the architects used the gantry systems and the engineering support of the motion plastics specialist igus.

Everything starts small - even the 3D printing technology. This applies not only to the market share of this production technology, but also for the size of the printed components. Initially, there were small prototypes, orthodontic aids, and designer jewellery, which were manufactured with generative processes. Today the 3D printer already produces motor vehicle components and - at igus - customised highly wear-resistant Tribo-components. And it goes even bigger: the Dutch architecture firm DUS has materialized the idea of building entire houses in this way – with a mobile 3D printer in XXL format, which is housed in a shipping container.

Sensible, flexible and eco-friendly

What seems an exotic marketing gimmick at first glance, on closer inspection is not only charming but has a lot of arguments in its favour. In this way the load-bearing structures can be manufactured from plastic recyclate, which is also a sustainable enterprise. Logistics at the construction site are also considerably simplified: The elements are printed on site, placed on the spot and filled with concrete. And while cost-effective pre-fabricated architecture has almost always looked boring and uniform so far, now a great freedom of design has opened up. In addition, the architects of DUS say, this process can be used very well for the quick construction of new houses in disaster areas.

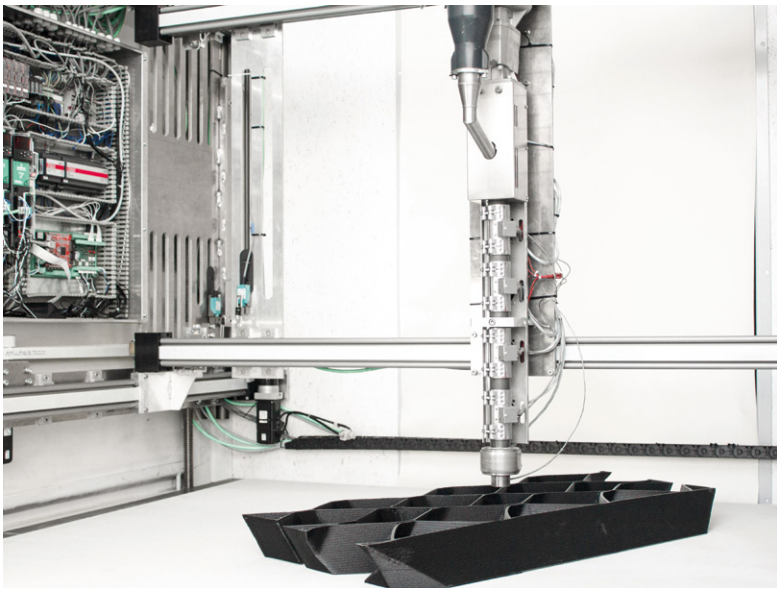
To transform the idea into reality, DUS founded the company 'Actual'. The aim of 'Actual' is to enable the owner to select and customize building components on a digital platform, which are then manufactured on site using XXL 3D printers. Under the term "Kamer Maker 2.0" (literally 'Room Builder' 2.0) this idea is very popular in the Dutch media. It was even reported worldwide, and presented to the US President Barack Obama himself in person during a visit to Amsterdam.



01 Drylin range from igus includes ready to install gantries for all 3 axes with actuators and sensors for position detection

Author: *Alexander Mühlens, Product Manager drylin drive technology, igus GmbH, Cologne, Germany*

02 Insides of the mobile 3D printer; The print head moves on a drylin axis with toothed belt drive



03 Components of the house of the EU Presidency were produced by 3D printers

Technological partner for 3D printed homes

To experience how the new way of building homes looks like in practice, a visit to the Europe Building in the Amsterdam Marine Quarter is a must. The building was built for the duration of the Dutch Presidency of the EU. The airy facade of this house is reminiscent of historic sailing ships, which were previously produced in this very district. Under the sails, appear 3D printed elements made of biodegradable plastic which can be recycled at the end of the presidency. The 3D printed façade elements are accompanied by 3D printed seating elements which have also been created by Actual.

To make the "Kamer Maker 2.0" an instant success, Actual has sought for technological partners. As one of these partners, the motion plastics specialist igus has helped with optimizing the design of the mobile 3D printer. The first generation of the 3D printer had a separate room for the controls and therefore could produce only parts up to a size of 2.00 × 2.00 × 3.00 meters. Thus, there was need for improvement, both in precision and in the printing speed.

Developing new axes for the Print head

The engineers at igus co-developed the new axes on which the print head moves. In this process they used their expertise in additive manufacturing: Conventional 3D printers of several manufacturers use igus linear axes, and in its manufacturing facility igus operates its own 3D printer to produce customized sliding elements from its iglidur filaments. In the planning the engineers made use of the modular system of the igus multi-axis gantries. They are available as line, flat and room gantries for one, two and three axes, and depart from predefined surfaces and spaces. In this case, a room gantry is used, in which the x- and y-axis have been implemented with drylin toothed belt units and the z-axis with drylin lead screw / nut systems. The print head moves precisely on the self-lubricating linear systems via ready to install complete toothed belt systems, supplied by igus. Even for the lead screw units, which position the gantry vertically, drives from igus equipped with position detection are used.

As a technology partner igus provided support with proposals for the integration of the printer – which now prints the structural elements up to 5 metres high – in the shipping container and also assisted Actual during the commissioning of second generation "Kamermaker" on site. In addition, other components from the igus construction kit for plain bearings and linear systems were also installed, for example, the igubal pillow block bearings and the igus energy chains for safely guiding the signals and electrical current via cables to the print head.

Now a 3D printed Canal house in Amsterdam

With the second generation of the "Kamer Maker 2.0", the company 'Actual' can print larger elements with high precision and greater speed. The igus gantry system is extremely instrumental in this. Among the projects undertaken by Actual at present is the "3D printed Canal House", which is currently being built on a town canal in Amsterdam. The construction site is public and has had more than 40,000 visitors so far. If you want to see a 3D printer building a house "live" in the XXL format, you can do so in Amsterdam at Asterweg 49. (please make a reservation beforehand: infoa@3dprintcanalhouse.com)

Photographs: *01-02 igus GmbH, 03 Actual*

www.igus.com

About igus

igus GmbH, a family-run company based in Cologne is a leading manufacturer of energy chain systems and polymer plain bearings. The company is represented in 35 countries and employs over 2,950 people worldwide. In 2015, igus generated a turnover of 552 million Euros with motion plastics, plastic components for moving applications. The company's test laboratories and factories, one of the largest in its sector offers its customers quick turnaround times on innovative solutions tailored to their needs.

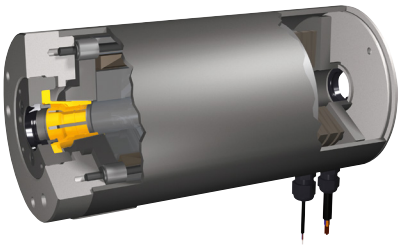
Drive solutions with explosion protection from Nord

The company, Nord drive systems, a developer and manufacturer of drive technology supplies explosion-proof motors worldwide. Drawing on an extensive SAP-managed modular product range, the German manufacturer is able to quickly and comfortably configure drives for hazardous areas with absolute safety. Depending on the zone – whether 1 or 2 for gas, or 21 or 22 for dust atmospheres – optional external fans, backstops, and brakes are fitted as required to suit the application. Vector controlled operation with a frequency inverter is also possible on request. The motors are suitable for operation at ambient temperatures up to +60 °C. In addition, the drive manufacturer supplies gas and dust-explosion-proof gear units. These comply with EN 13463 and feature ignition protection type Ex-c (constructional safety). The motor can often be mounted directly on the gear unit. NORD, a certified manufacturer since 2003, has immense experience in explosion protection for drive technology. The current products meet the 2014/34/EU Directive, which came into effect on 20th April, 2016, and the provisions of IECEx.

www.nord.com

Linear brakes for vertical axes

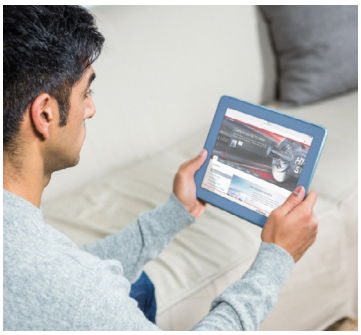
Mayr power transmission, the specialist in braking technology has designed a fluid-free electromagnetic version of the Roba-linear-stop brakes. In case of power failure or emergency stop, these brakes hold the axes reliably in any position, protecting both people and machines from injury or damage. For applications, in which no compressors or compressed air/oil hydraulics are wanted, for example in the medical technology, food or pharmaceutical processing, mayr's electromagnetic version of roba-linearstop offers a clean braking solution. For the electromagnetic version, expensive components of the braking system such as direction control valves and quick release valves are no longer required. The brake designs in this series work in accordance with the fail-safe principle; this means, they are closed in de-energised condition and the braking force is generated through the pressure springs. Before a brake leaves the company's factory in Mauerstetten, the required force is adjusted to an appropriately safe setting. This value is checked, recorded and assigned to every serial number. The electronic database, in which the measurement values are archived together with the associated product serial numbers, guarantees 100 % traceability.



www.mayr.com

Online platform for customizing high-end drives within minutes

Choosing the right DC motor has become more crucial than ever especially in situations with time constraint. With Maxon motor's online configurator the process of selecting the drives and evaluating various possibilities becomes quick and convenient. The online platform has thousands of drive options to choose from. Brushed and brushless DC motors with diameters from 8 to 35 mm form the basis of the offering. Maxon has recently expanded significantly its range of ECX drives, as a result ECX Speed drives are now available in a variety of sizes, including the high-power versions. Apart from ECX drives also on offer are the suitable planetary gearheads (GPX Speed). All of the drive's interfaces can be adapted at will in the online configurator: shafts, flanges, electrical connections, etc. This gives users a whole new range of possibilities to put together a customized high-end drive including the gearheads and encoder in only a few minutes. The electronic data goes directly to Maxon motor's production facilities, where the drives are put together in automated processes. No later than 11 days after placing the order, will the drive leave Maxon's factory in Switzerland.



www.maxonmotor.com

Smart actuators for intelligent positioning

The latest Siko Ethernet and fieldbus equipped actuators AG25 and AG26 offer a systematic answer for positioning machine axes smartly and automatically. Despite their high functionality and performance, Siko's actuators require space not more than a 0.33 liter beverage can (AG25). Thus, the actuators are ideally suited for machines that have space limitations. The AG26 is built slightly larger but also has more power – up to 13 Nm – despite its ultra-compact frame size. The drives have a hollow shaft with a clamping ring for easy installation. High-precision multi-turn absolute encoder that detects the position of the drive shaft and the rotation of the shaft in the de-energized state of the actuator is integrated in the actuator. In addition to the Profibus and CAN data interfaces, Siko has also implemented the most common industrial Ethernet fieldbus interfaces into the actuators: Profinet, EthernetIP, EtherCAT and Powerlink. The actuators AG25 and AG26 can be configured and parameters can be set directly via the master PLC. 4 The actuators are available up to protection class IP65, which is also guaranteed during the traverse operation.

www.siko-global.com

Drive solutions with explosion protection from Nord

The company, Nord drive systems, a developer and manufacturer of drive technology supplies explosion-proof motors worldwide. Drawing on an extensive SAP-managed modular product range, the German manufacturer is able to quickly and comfortably configure drives for hazardous areas with absolute safety. Depending on the zone – whether 1 or 2 for gas, or 21 or 22 for dust atmospheres – optional external fans, backstops, and brakes are fitted as required to suit the application. Vector controlled operation with a frequency inverter is also possible on request. The motors are suitable for operation at ambient temperatures up to +60 °C. In addition, the drive manufacturer supplies gas and dust-explosion-proof gear units. These comply with EN 13463 and feature ignition protection type Ex-c (constructional safety). The motor can often be mounted directly on the gear unit. NORD, a certified manufacturer since 2003, has immense experience in explosion protection for drive technology. The current products meet the 2014/34/EU Directive, which came into effect on 20th April, 2016, and the provisions of IECEx.

www.nord.com

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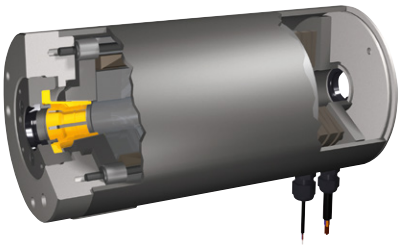

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www.siko-global.com

Magnetic direct drive for high velocity industrial scanning applications

Magnetic direct drives offer less friction, play, and therefore more precision over the classical motorized, spindle-based drives. For high-velocity industrial scanning applications, the company Physik Instrumente, a global player for precision positioning technology supplies the drive and positioning systems which make use of magnetic direct drives. With its friction-free magnetic drives PIMag series offers linear travels ranging from 5 to 20 mm, which reach the highest velocities up to 250 mm/s and scanning frequencies of some 10 Hz.

These drives are particularly suitable for applications that require 24/7 operation, for example, in metrology, photonics, for image stabilization systems, in semiconductor and flat-screen inspection. Due to its crossed roller guides, the linear stage attains a travel accuracy of 1 µm. Its optical linear encoder allows a reliable position control and repeatability of ±500 nm. The sensor resolution is less than 10 nm; the minimum incremental motion is 20 nm. This direct drive series is also only 80 mm in width and 26 mm in height.

www.pi.ws

Optical encoder with high precision

Hengstler's 'Acuro-AX73' series of optical encoders carries international certification for gas and dust explosion protection which makes it suitable for use in hazardous environments. Apart from safety, precision is another beneficial characteristic of the Acuro AX73. The optical scanning system provides a highly accurate, 22-bit resolution sensor signal for areas wherever precision or smooth speed regulation is necessary. However, despite its accuracy, the encoder is of robust design, with impressive resistance to shock, vibration and external magnetic fields. In addition, the unit provides users with IP67 protection class rating for the stainless steel housing, with an ambient temperature range of -40 to +70 °C. AX73 has a housing diameter of 76 mm, which proves valuable to system designers seeking space-saving solutions. Available immediately, the AX73 can be ordered with SSI, BiSS-B, BiSS-C and Profibus interfaces. This advanced optical encoder offers significant cost and time savings during installation. The introduction of the AX73 completes the company's comprehensive family of ATEX-rated absolute rotary encoders, both optical and magnetic.

www.hengstler.de/en

Venturing into newer pastures

Christof Kirsch

Continental, the German giant in automotive industry is venturing into newer areas of business. Aiming to create new technologies, adding value to current ones and also securing its medium to long term stream of revenue generation.

Continental, the tech company specializing in the automotive sector is now intensifying its activities outside its core areas and further expanding its industrial business. In the days to come, Continental will increasingly be focusing on technologies for construction, agriculture, and material handling equipment. With this in mind, the company based in Hannover, Germany is consistently working toward its strategic aim of achieving a more balanced customer portfolio across the automotive sector and other industries. In doing so, it also safeguards the future viability of the company in the face of possible economic fluctuations. Based on current forecasts, the company sees great opportunities and is targeting a sales potential in the higher triple-digit million Euros by 2020.

The off-highway product portfolio, which the company is aiming to strengthen, ranges from electronic control units and instrumentation to solutions for telematics, display systems as well as technologies for drive and exhaust-gas after treatment, conveyor belts, vibration and hose technology, air spring systems, and interior materials.

About Continental

As an international automotive supplier, Continental, in 2015, generated sales of € 39.2 billion with its 5 divisions, Chassis & Safety, Interior, Powertrain, Tyres, and ContiTech. As a division in the Continental group, ContiTech is one of the world's leading industrial specialists. Its customers can be found in key industries such as machine and plant engineering, mining, the agricultural industry, and the automotive industry. With around 43,000 employees in 44 countries and sales of € 5.4 billion in 2015, the ContiTech division, uses its expertise for products and systems made of rubber, plastic, metal, textile, and electronic components to combine these with individual services.

Extremely flexible and high-temperature hose

Applying its engineering expertise on hose technologies, for example, ContiTech has been able to develop an extremely flexible high-temperature hose 'Conti Excelsus' with external reinforcement for truck and off-highway applications. Its flexibility allows it to be used even in especially tight and complex installation situations – and that includes the very high temperatures encountered there. Depending on the particular finish, the hose can withstand temperatures of up to 250 °C. This makes it ideal for use in extremely hot environments. It can also withstand operating pressures of up to 15 bar. It supplies the turbocharger with cooling water and lubricating oil, and is also used in its control system. The hose is also suitable for transporting air in the exhaust systems such as a diesel particulate filter or as a fuel return line.

ContiTech's new development gets its flexibility from a special braid made of a various new and highly sophisticated textile materials which is resistant to high temperatures and chemicals. This encloses the inner lining made of rubber especially adapted for the application which is highly stretchable. The tight bending radii which are possible as a result are an ideal response to the trend towards downsizing in engines and the associated ever tighter installation spaces. As a result of its rigorously lightweight design, this cost-optimized solution also offers a significant weight advantage over the traditional PTFE pipes enclosed in a stainless-steel braid used hitherto for these tasks. The new hose therefore contributes to reducing fuel consumption and thus also CO_2 emissions. Another advantage for the customer is that it is part of a modular package from which the user can select the right product for the particular application. This yields further cost benefits for him.

Advanced telematics for off-highway vehicles

Thanks to a new telematics solution, fleet managers, drivers, and maintenance teams are always informed about relevant tyre-related data.

Author: *Christof Kirsch, Head of R&D and Product Engineering, Engine Drivetrain of ContiTech Mobile Fluid Systems*

01 Christof Kirsch, Head of R&D and Product Engineering, Engine Drivetrain of ContiTech Mobile Fluid Systems

02 ContiTech's new, extremely flexible and high-temperature hose with external reinforcement

In combination with the tyre pressure monitoring system, the solution facilitates the efficient management of vehicle fleets. On a central server, information is collected, made available, and then transmitted. The system informs the user when the tyre pressure has to be corrected, for example. Vehicle downtimes are thus reduced as the danger of tyre damage is minimized, and the outlay for regular, time-consuming maintenance work is lessened. The right choice of tyre also makes a significant contribution to vehicle safety. Continental has a comprehensive range of pneumatic and solid tyres for various areas of application. Heavy devices such as pickups, road construction equipment and tractors also move safely on rubber tracks. In addition, integrated and retrofit-able camera systems enable 360-degree monitoring of the vehicles. Products equipped with vibration isolation and noise reduction dampen the vibrations and structure-borne noise, isolates machinery oscillations and noticeably increase riding comfort. Components can be safely lifted, powered, and controlled using high-pressure hydraulic hoses. Electrically conductive fuel hoses ensure a reliable media supply.

Improving work and transportation efficiency

With its wide variety of instrumentation solutions that range from the dial-type gauge to the fully programmable 12-inch terminal, Continental is following the trend toward connected vehicles that make drivers' lives considerably easier by displaying information clearly. The display and terminal solutions improve everyday working life, from maneuvering on the construction site to the targeted management of agricultural areas. An on-board telematics unit transmits data from and to the vehicle. This sees Continental play a supporting role in saving time and making work more efficient. Furthermore, when it comes to machinery leasing, data about the duration and place of use can be stored for billing purposes.

Continental's components and systems for construction, agriculture, and material handling equipment

Low on emission, high on comfort

To ensure low emissions, manufacturers are using high-activity catalytic converters and efficient SCR systems. To meet the high legal requirements in the future as well, Continental offers emission-relevant modules of the engine and exhaust system control unit, fuel injection technology, sensors, SCR systems and injectors, catalytic converters, filters, tanks, and hoses, and obviously software and engineering support. From 2019 onwards, additional particulate filters, combination filters with an SCR coating to remove the nitrogen oxide, will be provided for this purpose for Stage 5 of exhaust system cleaning as applicable for engines from 130 to 560 kW.

Whether in construction or agricultural machines or cranes, manufacturers are equipping the cabins of their vehicles and machines with increasingly high-quality fittings and placing a growing emphasis on the highest possible level of comfort. The modular design of Continental's driver workstation ensures an extremely flexible, user-friendly workstation with fittings that can be adapted for numerous applications and customer requirements. All switches are positioned within reach, while overhead switches can also be replaced by additional panels, if required. The cockpit fittings can therefore be as minimalist or as high-end as desired. Sleeve air springs also increase comfort in the driver's seat. Surface materials for the interior of off-highway vehicles withstand the tough conditions of an average working day on a construction site or agricultural land. Particularly scratch-resistant materials and products with easy-to-clean soft-touch surfaces are available.

The uniform 'One Continental' presence allows the company to draw attention to its overall portfolio. Now the customers have all the contacts for various applications in one place and can gain a clear overview of the broad range of products, extending from basic technologies to advanced solutions.

Photographs: *ContiTech, Continental*

www.contitech.de/index_en.html

Diffusers to the rescue

For operational issues like fluid aeration, foaming and noise arising in the hydraulic systems, hydraulic accessories like diffusers, return line filters and breathers offer simplistic yet effective solutions.

About Stauff

The company Walter Stauffenberg Co & KG, located in Werdohl in Germany's Sauerland region, is now an internationally leading developer, manufacturer and supplier of hydraulic systems and components, pipework equipment under the brand name Stauff. The company has a comprehensive range of products which includes clamps, filtration technology, diagtronics, hydraulic accessories, valves and tube fittings. Hydraulic accessories includes fluid level and temperature indicators, tank filler breathers, suction line accessories and filter line accessories, pipe tube and hose cleaning systems. Stauff is represented by a tight network of distributors and wholly-owned manufacturing facilities, distribution bases and warehouses in 18 countries worldwide.

One of the basic pre-requisites for the smooth operation of hydraulic systems is the selection of a well-designed hydraulic reservoir based on the application requirements. Traditionally the function of the hydraulic reservoir is to supply the system with sufficient fluid at specified pressures that vary according to the system's needs. Today's reservoirs are much more than just storage tanks for pressurized fluid, as they designed also to provide a surface area for transfer of heat from the fluid to the surrounding environment. The size of the reservoir is designed by also considering the volume required to let the returning fluid slowdown from a high entrance velocity. This also lets the heavier contaminants settle and the entrained air to escape. An ideally sized reservoir provides a considerable air space above the fluid to accept the air that bubbles out of the fluid, space for hot-fluid expansion, gravity drain-back from a system during shutdown, and storage of large volumes needed intermittently during peak periods of an operating cycle. A physical barrier or a baffle is provided to separate the fluid entering the reservoir from the pump suction line. While designing the hydraulic reservoir an access to remove used fluid and contaminants from the system and to add new fluid is also thought about. While designing, suitable measures such as filler breathers and sufficient tank pressurisation are also taken to prevent solids, water and air from entering the system, contaminating the oil and affecting the function of sensitive components, which quite often results in expensive downtimes and unplanned oil changes.

Undesirable foaming

Another factor that should not be underestimated is surface foaming which can form through uncontrolled return flow of hydraulic oil from the return line into the tank. Foam is a collection of small

bubbles of air that accumulate on or near the surface of the fluid. As an air-in-oil dispersion, this can cause a number of operating problems throughout the system. In severe cases, the foam can leak out of the machine through breathers and sight glasses. Foam is an efficient thermal insulator, so the temperature of the oil can become difficult to control. This can cause efficiency losses for the energy used, operational malfunctions and a reduced service life of the oil. The presence of air bubbles in the fluid can lead to excessive oxidation, cavitation, the reduction of lubricating properties of the oil and hydraulic system failure. Cavitation in the pump also increases noise generation in the system drastically, which in extreme cases can lead to a total breakdown and therefore to a system standstill.

01 Diffusers from SRV series

02 Return line filter from SRV series

Diffusers to the rescue

Diffusers effectively reduce the aeration, foaming, turbulence and noise caused by return lines. Reservoirs, baffles, and return lines should be designed to prevent the formation of foam and bubbles. But for added protection, a diffuser can be positioned near return lines to break up foam bubbles as they enter the reservoir. The German company Stauff manufactures diffusers along with various other hydraulic products and systems. The design of its SRV series diffusers is based on two concentric steel tubes where the perforated outlet sections are offset to each other. Due to the offset in the 2 concentric steel tubes the oil in the return flow slows down and effectively settles down. This prevents the formation of oil foam and permanently reduce noise generated in hydraulic reservoirs. It also effectively prevents the raising of sedimentation and soil deposits from the bottom of smaller tanks. Diffusers are an ideal supplement to return-line filters with threaded outlets. They are connected directly to the return line or to the filter bowl of the filter housing using BSP or NPT internal threads. The diffusers are positioned fully underneath the minimum liquid level of the reservoir, ideally with the closed surface of the outer steel tube facing the suction end of the pump.

Flow diffusers are becoming more popular as reservoirs become smaller. In the past, large reservoirs were specified to provide plenty of time for entrained air to rise to the fluid surface. With smaller reservoirs, however, fluid spends less time in the reservoir, so there is less time for air to rise to the surface.

Stauff's extensive product range offers diffusers for a maximum operating pressure up to 20 bar (in the return line) and the operating temperature range of –20 to +100 °C, covering the complete spectrum of required flow rates up to 950 l/min.

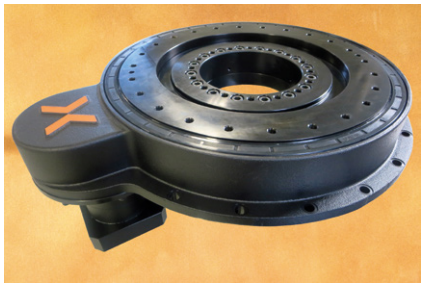
Photographs: *Walter Stauffenberg GmbH & Co. KG*

www.stauff.com

03 Open reservoir with oil foam

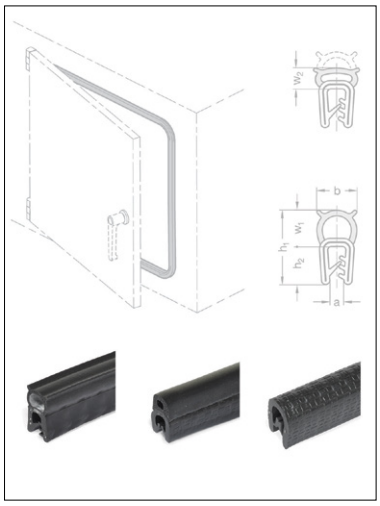
Precision ring drive system for high speed and high torque

USA based Nexen Group, introduces the Compact Ring Drive (CRD) system with precision grade bearing and drive mechanism in a sealed housing. The freely programmable and 3-drive design configurations allow the CRD system to be optimized for high speed and high torque, both, depending on the application. With a 250 or 350 mm dial plate bolt circle diameter and a large open center, users can even optimize the performance in a small space. The combination of Nexen's roller pinion technology with integrated bearing and motor/gearhead (drive mechanism) deliver a smooth system with zero backlash options from the motor through the driven load. The CRD is ideal for applications including cutting systems, gantry systems, medical products, robotics, aerospace, machine tool, semiconductor and material handling. Nexen's Compact Precision Ring Drive system offers indexing precision up to ± 30 ArcSec and repeatability up to ± 5.1 ArcSec. The CRD system is smooth in motion and has a high output load capacity of up to 108 kN, and can handle speeds of up to 225 rpm. Nexen produces roller pinion systems, industrial brakes, clutches, torque limiters, overload protection devices and control systems.



www.nexengroup.com

Edge protection profiles with and without sealing function



Edge protection and sealing profiles from Ganter ensure reliable front closure, for example on flaps. They also speed up the production phase because deburring and handling the edges can practically be eliminated. GN 2184 is available in two sizes and is made of extruded PVC.
Edge protection sealing profiles GN 2180 and GN 2182 provide both edge protection and sealing. Consisting of a clamping profile and co-extruded hollow chamber sealing profile featuring soft design, they are available in various sizes. The clamping insert in this case is made of a combination of steel wire and polyester. The sealing profile is arranged on the top or side of the clamping profile. The profiles are made of EPDM or NBR or from a combination of PVC and EPDM. The materials used are designed to be permanently elastic and feature excellent resilience, which ensures that sealing properties are retained long-term. All profiles meet the requirements of RoHS and REACH. The EPDM profiles of GN 2180 are also certified to UL 50 and UL 94-HB.

www.ganter-griff.de/en/home

Frequency converter series with variable drive solutions

Schneider Electric has added two frequency converters with variable and intelligent drive solutions to its portfolio. The company offers specialized solutions for machine construction and industrial applications. The Altivar Machine series supports the needs of machine manufacturers and covers the complete range – from simple to high-technology applications. The manufacturer focuses especially on a simple, user-friendly product in the Altivar Machine series and therefore offers a wide range of communication interfaces and protocols such as Modbus Serial, CANopen, Modbus TCP & Ethernet/IP, EtherCAT, Profinet and Powerlink. The Altivar Process series is specially designed for water management, the oil and gas industry as well as mining and the food industry. Typical applications include pumps, fans and compressors in systems that convey gases or liquids. Environmental compatibility was especially important in the design of Altivar Process. Thus 70 % of its components are recyclable.

www.schneider-electric.com

Vibration sensor makes it possible to stop the power plant with a precise setting

In a wind power plant that has to be shut down due to a hazardous situation, the phase position of the tower vibration in which the power plant is stopped, zero crossing or maximum, may be crucial. This point can be set with the SIL2 vibration sensor type NVA115 from TWK. If the tower vibrations exceed the permitted limit value, the two safety contacts open and the safety chain is interrupted. The sensor records vibrations from 0.1 to 60 Hz and protects the system against damage caused by vibrations. The measured value is analyzed by an adjustable frequency filter and directed to three types of interfaces: Two analog, for example for the x and y axis, CANopen Safety and two secure switching contacts. The measured value of the acceleration can be exported and further processed as an instantaneous or peak value, an RMS average or as an integrated value. The NVA115/S3 also features a Fourier frequency analysis that determines the frequency spectrum.

www.twk.de/contend/en/main_.html

Contact protection for HDSCS pin housing

The GPN 365 protective cap from Pöppelmann Kapsto is a special contact protection for pin housings of the Heavy Duty Sealed Connector Series (HDSCS). It is suitable for transport and paint protection or other applications with high requirements for sturdiness. Made of heat-resistant, plasticizer-free TPE plastic, it can withstand temperatures up to 150 °C. Color and material variants, individual dimensions and special designs are available on request. As part of the standard program the end cap is available from stock. The delivery quantity can be specified by the customer.

www.poeppelmann.com

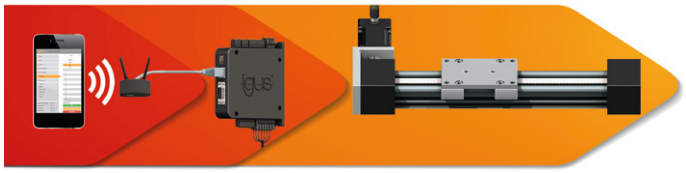
Sensors for the plastics processing industry

Gefran produces solutions for automation, drives and sensor systems for the plastics and rubber industry. A highly innovative system consisting of compact sensors, magnetic adapters and a display device allow for direct measurement and display of nozzle pressure (IN sensor) and nozzle contact force (DAK sensor) in plastic injection molding machines – without any complicated conversions at all. A sensor is also available that can simultaneously measure both the closing force and the internal tool pressure in addition to monitoring mold protection via the tie bars. The manufacturer uses environmentally compatible materials for all products. Mass pressure sensors are available with different RoHS-compliant filling media, for example, and the Impact series has no filling medium at all. The sensors are PL 'c'' and SIL2 certified and therefore meet the criteria of the Machinery Directive and production standards such as the Extruder Standard EN 1114-1. When combined with the manufacturer's new controllers, all machine data can be recorded via Ethernet ports and made generally accessible via the internet.

www.gefran.com

Controlling linear axes intuitively via web browser

The intuitive dryve controller is now available from Igus for maintenance-free DryLin electric linear axes for stepper and DC motors. No software or app is needed to enter data. Everything is integrated directly into the motor control. Values can be entered or changed live in the web browser using a PC or mobile terminal devices. Access can be password-protected. All data and program steps are saved on the controller and can optionally be saved externally as a parameter file. The controller connected with the axis motor can be mounted in control cabinets on a top-hat rail. Then it can be connected via a WLAN router so that the system can be controlled wirelessly. The user interface is available in German and English with other languages to be offered soon.



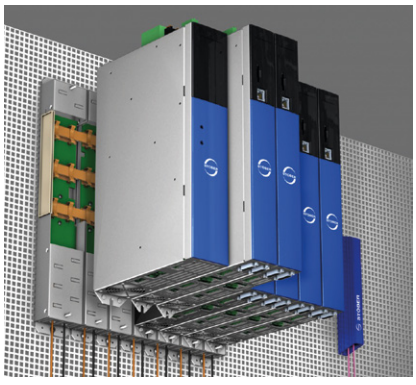
www.igus.com

Spring pressure single-disc brakes for servo drives

Kendrion presents the new Servo-Line series. Spring pressure single-disc brakes are available in eleven different sizes with holding torques from 0.3 to 130 Nm. To boost performance, the rated air gap tolerance was limited to just a few hundredths of a millimeter by a new manufacturing process. The service life of the brakes can be designed for the relevant requirements depending on the temperature and torque. This makes it possible to cover the temperature range from -15 to 120 °C. In the standard version the brakes can be installed on the flange side or front. Mounting in the engine housing or externally on the bearing plate is also possible. Toothed carrier friction disc connections minimize torsional backlash. The brakes are thus suitable for almost all areas of servo drive applications, for example in automation and robotics, packaging and conveyor technology or in production lines, storage systems and wind power plants.

www.kendrion-ids.com

Compact drive controller with lots of equipment



Measuring just 45 mm in width, the SI6 drive controller from Stöber needs very little space in a control cabinet but is still equipped with numerous features. The controllers do not require redundant supply units – the entire series of drive controllers is connected with one central supply module. That also eliminates the fuses and wiring for each individual axis. The controllers are connected with each other via Quick DC-Link modules. With double axis modules, unused power reserves from one axis can be used for other axes. In combination with the EZ401 synchronous servo motor, the controller goes from 0 to 3 000 rpm in 10 ms. It processes encoder information up to 64 bits and calculates without rounding errors.

www.stoeber.de/en/stoeber_global/home.html

Innovative drive systems
for underwater oil pumping operations

Stefan Obst

Tailored for complex application requirements like the ones in underwater pumping of oil, the high-tech and customizable drive system from Siemens offers one of the most efficient drive designs, featuring interchangeable modules.

The oil and gas industry is continuously on the search for ever increasingly efficient processes. Tar sands, fracking, deep-sea drilling – the demand for reliable solutions grows as the demand for energy increases. In 2015, the Norwegian company, Aker Solutions embarked on an underwater pumping pilot project, with Siemens as its technology partner to provide a reliable drive system well suited for oil and gas industry's complex application requirement.

Six MW installed 1 000 meters below the water surface to pull through one of the most important raw materials in the world. To pump oil from the ocean floor, powerful pumps operated from large oil rigs are required. These floating high-tech islands are indispensable when it comes to pumping oil from the seabed. The Johann Sverdrup oilfield is the largest in the North Sea. Exploitation of this oil field is to start in 2019 – and Aker Solutions is incharge to equip the rigs. This Norwegian company developed the 'MultiBooster' underwater pump, which is also suitable for use in deep-sea drilling operations. "With this project, our customers will be able to achieve a higher degree of efficiency and reduce their costs", explained Jarle Skjetne, Project Manager for the new Aker Solutions test station. "One of the new pumps can replace two existing ones, and further, reduce the pressure in the borehole", continued Skjetne.

Author: *Stefan Obst, Process Industries and Drives, Siemens AG*

A new milestone for underwater drive systems

The pump is driven from a liquid-cooled motor, which must provide 6 MW at a speed of 6 000 rpm – representing a new milestone for underwater drive systems. The pressure-power combination – which has not been possible up until now – means that these pumps can be used in deep-sea environments. Aker Solutions is developing the motor and pump prototype for its customers – large international oil corporations. "This pump not only allows customers to pump a mixture of oil and gas to a rig, but also to land. What's more, it can also be used to inject water in order to increase the pressure in the bore hole and increase the rate at which oil is pumped", explains Skjetne.

The motor and pump prototype was tested in Aker's new test station in Tranby, Norway. Here, solutions are put through their paces to address some of the most complex challenges in the oil and gas domain. The new Sinamics SM120 CM converter from Siemens is an important component of the station. "In order to carry out tests with a motor as load, a motor that can handle this load is required. The most effective way of testing the system is to have a test stand equipped with two converters", explained Skjetne. "We are using the Perfect Harmony GH180 converter from Siemens as drive for our submersible motor – and the new Sinamics SM120 CM, to simulate the pump load." The power generated by the Sinamics

01 Aker Solutions Engineering Project Manager Jarle Skjetne and the Siemens commissioning team

02 Sinamics SM120 CM showing the cell frame for uninterrupted operation

SM120 CM converter can be injected back into the supply line. The energy recovery capability of the Sinamics SM120 CM means that Aker can operate the test stand with low associated losses.

Tackling the most difficult challenges in the sector

With its new Sinamics SM120 CM converter, Siemens has simultaneously addressed several challenges for one of the most innovative suppliers to the oil and gas industry. The converter has enjoyed considerable interest in the oil and gas industry as a result of its low weight when compared to other models and its compact dimensions. The transformer and control unit of the Sinamics SM120 CM are not integrated in the converter itself, which allows them to be separately mounted. This boosts the degree of flexibility for applications where space and weight represent critical factors. The transformer can be located outside engine rooms that tend to be narrow. Besides saving space, this has another advantage – expensive measures to cool the room are not required as the transformer is placed outside.

The Sinamics SM120 CM has a modular design, employing multilevel converter technology (M2C) where several low-voltage cells are connected in series. The customer decides how many of these cells are connected in series. The concept is scalable and can be adapted to the power required. The modular design also facilitates a redundant configuration. If one of the cells develops a fault, then it is automatically bypassed and can be replaced the next time maintenance is carried out. This means that a sudden defective cell does not negatively impact converter functionality. Further, Sinamics S120 CM is equipped with modular multilevel technology. The voltages are superimposed on one another so that the output voltage waveform is similar to a sinusoidal waveform. This results in low-line harmonics and reduces the load and stress on the motors and cables.

03 Sinamics SM120 Cabinet Modules frequency converter

Three weeks of testing in Tranby, Norway

The commissioning of the Tranby Technology Manufacturing Center was scheduled for summer 2015 – and checking out the various systems was completed on time before the actual test was to commence. Jarle Skjetne, the project test manager at Aker Solutions, explained that preparations for the test represented a real challenge. It had to be ensured that everything functioned satisfactorily before the actual test could commence. “Commissioning was successful. We carried out an extensive test program for the motor: Vibration levels, torques, motor power and temperatures were measured to ensure that none of the limit values were violated”, explained Skjetne. The test lasted three weeks. Several customers, who were also involved in the development project itself, participated in the test.

Based on this test, Aker was able to demonstrate to customers that the company can supply the solutions that it had committed to. “The positive feedback clearly indicated that with Sinamics SM120 CM, we are on the right track. The next development steps will mean that this drive will perfectly supplement our medium voltage portfolio”, explains, Stefan Obst, Product Manager for Sinamics SM120 CM in Germany.

Photographs: *lead Aker solutions*

www.siemens.com

About Siemens

Siemens is a global powerhouse focusing on the areas of electrification, automation and digitalization. One of the world’s largest producers of energy-efficient, resource-saving technologies, Siemens is a leading supplier of systems for power generation and transmission as well as medical diagnosis. In infrastructure and industry solutions the company plays a pioneering role. As of September 30, 2015, Siemens had around 348,000 employees in more than 200 countries. In fiscal 2015, the company generated revenues more than € 75 billion.

Non return valves with advanced design and higher performance

As Aristotle in his writing on metaphysics said "The whole is greater than the sum of its parts." In the context of machine and their individual components, this is all the more true in today's world of globalised competition and high cost pressures.

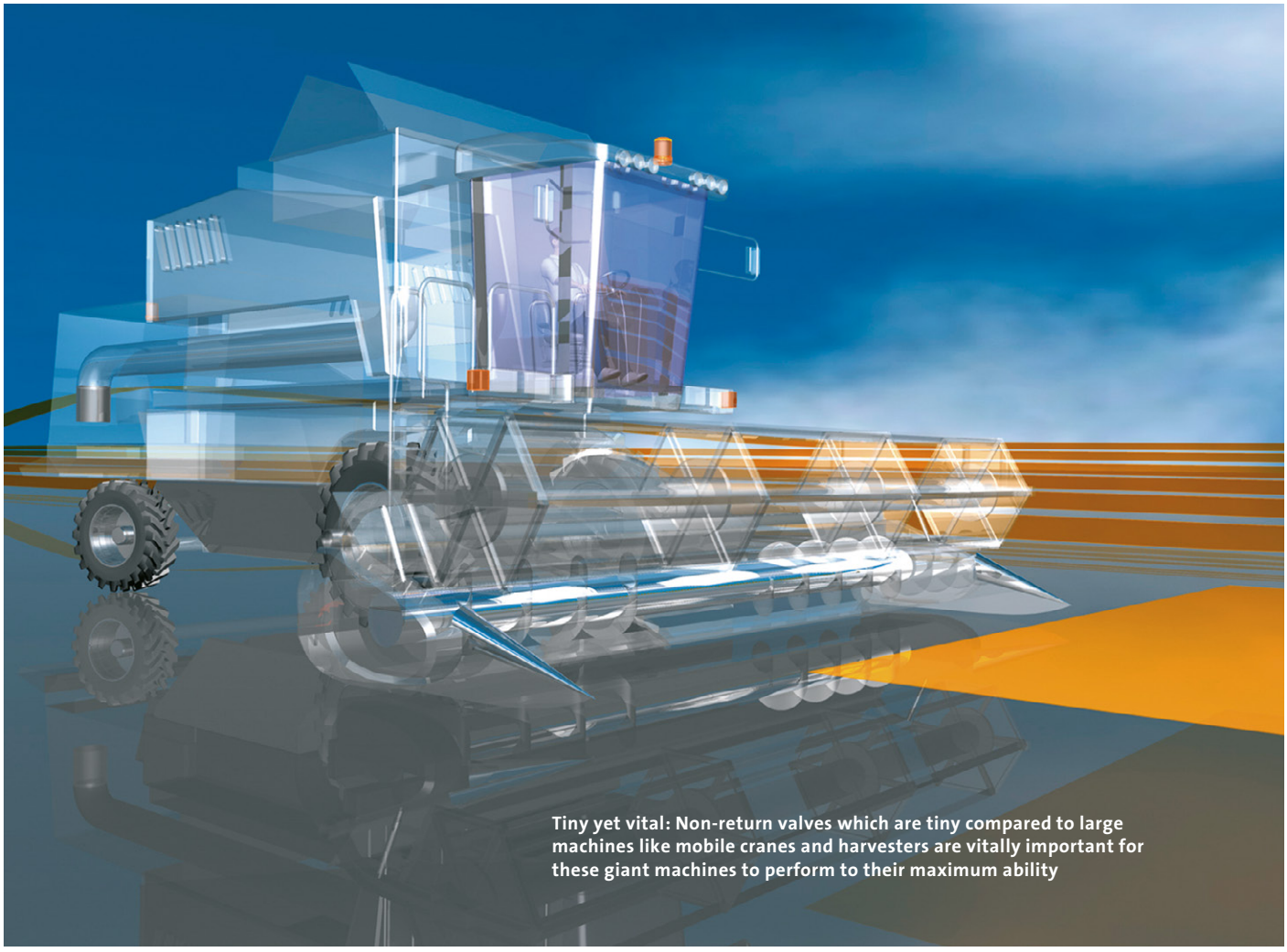
Today components are no longer viewed as just individual parts of the system that only have to meet the technical requirements. Instead, their impact on the cost effectiveness, availability and energy efficiency of the entire system comes into play. To optimize the total cost of ownership, even the smallest elements of the system such as non-return valves need to work reliably over a long period with high performance.

Non-return valves, also known as check valves, allow flow in only one direction and prevent return flow in the opposite direction. What looks quite simplistic – a "one-way flow principle" – is actually a sophisticated technology that has been refined over time. In developing the new series of these valves, the specialists at Bucher Hydraulics had clear objectives: to increase the performance without changing the pressure differential, and to optimize the cost. Bucher's expertise was crucial for creating a new design of screw-in non-return valve. Focussing on customer requirements, the company undertook an in-depth exploration of the technical possibilities in the non-return valve technology for producing improved performance, increased availability of the complete machine and energy efficiency.

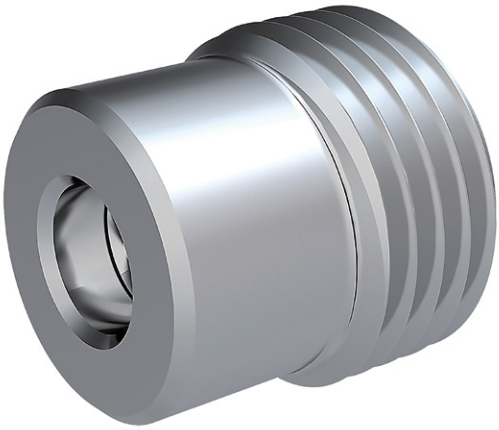
Usually incorporated into hydraulic control blocks, check valves are used in both industrial and mobile applications. From excavators to injection moulding machines – all application requirements today are characterised by comparatives such as smaller, more economical, and more powerful. For this reason, it is a distinct advantage for system integrators and end-users if they can incorporate smaller valves with a higher performance.

Small design modifications deliver big impact

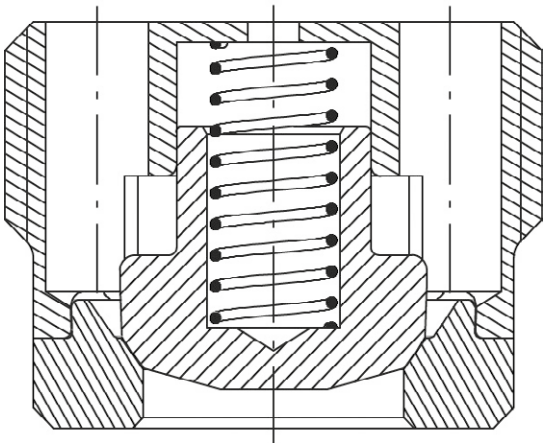
The developers at Bucher Hydraulics put the previous series of check valves on the test stand and questioned its cross-sections, its



Tiny yet vital: Non-return valves which are tiny compared to large machines like mobile cranes and harvesters are vitally important for these giant machines to perform to their maximum ability



01 The new generation of hydraulic check valves from Bucher Hydraulics offers 50 % higher flow rates for the same pressure differential



02 The new check valve is distinguished by its guided valve poppet with internal spring. The stroke was increased to optimise the valve's Delta P values. The body and seat are press-fitted together and, like the poppet, are hardened.

stroke and the design and manufacture of the valve poppet. In poppet check valves of this type, the valve poppet is pressed against the valve seat with help of a spring and thus prevents flow of the medium. To obtain a larger outflow area and thus a higher flow rate, the designers initially reduced the diameter of the valve poppet. At the same time the stroke was increased, which ensures optimum 'Delta P' values in the valve. The result of attacking the valve's design gave rise to a new generation of hydraulic check valves that offer up to 50 % higher flow rates for the same pressure differential. The larger flow rate saves energy and in many cases allows a smaller valve to be used, which in turn has a positive effect on costs and installation space.

Also under attack in the previous design were its specific safety features. A broken spring occurs only under extreme conditions, the consequent risk is now significantly reduced: the new series of check valves with spring-loaded valve poppets now features enclosed springs, so that even in the event of breakage the spring remains within the valve.

Broader application range, lower manufacturing costs

In modifying the designs, the designers also included the sealing technology. In the smaller check valves from nominal sizes 04 to 16, the valves have a screw-in design and a cutting edge for metal-to-metal sealing. The soft seals previously used had to be carefully selected to suit the temperature and type of medium, and sometimes required special solutions, but soft seals have now been completely eliminated in the smaller sizes. This therefore widens the spectrum of possible applications, allowing users of the standard version of the new check valves to employ them at temperatures ranging from - 30 to + 120 °C. The inherent metal-to-metal sealing also minimises the risk of valve failure, as there is no possibility of selecting the wrong sealing material. Based on positive experience with the check valves in sizes 04 to 16 (12 to 120 l/min), Bucher Hydraulics is now complementing the range with valves in nominal sizes 25 to 40 with flow rates from 210 to 540 litres per minute.

The new generation with thread sizes from G1/8" to G3/4" can be fitted in 118 ° cavities; with thread sizes from G1" to G1½", the valves can be fitted in 180 ° cavities. All corresponding previous series can therefore be completely exchanged. By using the same installation cavity for valves that open in the screw-in direction (RKVG valve series) and, conversely, for valves that close in the screw-in direction, users need only one tool, which in turn reduces tool costs.

Extensive tests increases system reliability

During the development stage, Bucher Hydraulics places each series on the test stand and tests at maximum pressure, i.e. the valves are put through an endurance test with 1.5 times the flow rating at a pressure of 350 bar. They must withstand 2 million cycles with an in-circuit accumulator before they are released. In addition, Bucher Hydraulics carries out 100 % checks for leak-tightness before valves leave the factory. This new range of check valves, where thought has been given to every detail, is based on the company's extensive product and application knowledge. Although this small component is only a tiny proportion of a control block, it is continuously and highly stressed. The availability of the hydraulic system or equipment is therefore directly dependent on the reliability of the check valve that is used. In this context, a high quality standard ensures long life and minimises expensive and time-consuming-repairs in points in the system that are usually difficult to access. In terms of 'Total Cost of Ownership', high-quality check valves pay dividends for block manufacturers and end users alike.

Photographs: *Bucher Hydraulics GmbH*

www.bucherhydraulics.com

About Bucher Hydraulics

The company Bucher Hydraulics located in Klettgau-Griessen, Germany is an international manufacturer of advanced hydraulic systems and products including pumps, motors, valves, power units, elevator drives and control systems with integrated electronics. The company has manufacturing facilities and distribution companies in Europe, Asia, the USA and Brazil. The Dachau location is part of a Bucher Hydraulics global competence centre with its own design and production facilities. Built on extensive technological know-how, Bucher's product spectrum covers check valves in cartridge design as well as flange-mounting check valves.

Machines should not pose risks

A number of different standards and guidelines regulate the assessment of machine related hazards and how they should be dealt with by manufacturers and operators. SMC products can be used to support the objective of reducing risks and ensuring machine safety with a range of intelligent products.

Machines should not pose any significant risks to people. Functions that are commonly used by machine builders to reduce risk in pneumatics are "Safe venting", "safe stop", "two-hand actuation" and "protection against unintentional start-up". SMC has products which can be used to help fulfil these principles.

About SMC

The company SMC is a manufacturer of pneumatic and electrical automation technology and also a partner for individual solutions. The more than 12,000 product groups include air treatment, valves and throttles, actuators (pneumatic and electrical), screw fittings and hoses as well as vacuum and instrumentation components. Headquartered in Tokyo, SMC has a total of 400 sales offices in 82 countries and offers automation solutions on all five continents.

In Europe, Machinery Directive 2006/42/EC in conjunction with EN ISO 13849 standard requires that, for example, pneumatic drives must be in a safe state when opening protective enclosures. As a second example, when manually removing parts from a conveyor belt, safety precautions must be taken to ensure that all the drives in the hazardous area are in a safe state. Often a light barrier will be used which issues a signal to the control system which is responsible for performing the stop and ensuring that no unintentional machine start-up may occur within the danger area while personnel are present.

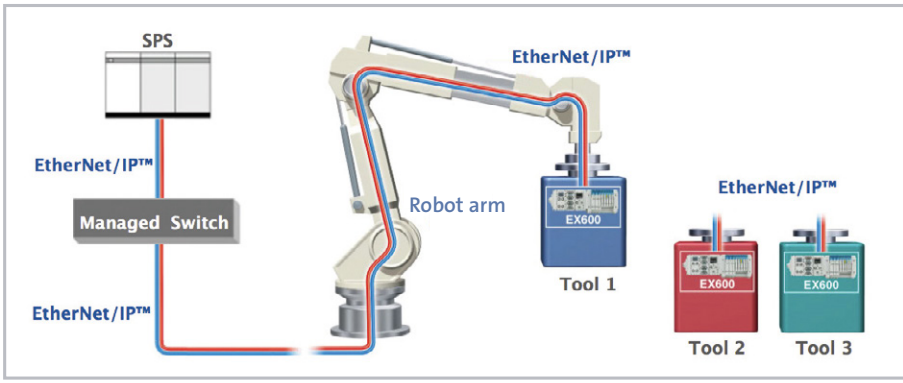
Secured position

The SMC solenoid valve series VQC2000-X27, VQC4000-X17 as well as the SY3000/5000/7000 series are compatible with the "secured position" safety principle. The valves satisfy the requirements of EN ISO 13849 for use in safety related control systems. Both series have a soft-sealing, bistable valve with detent option (VQC-X77 and SY-X25). Systems that rely purely on friction do not satisfy the requirements of the standard. Important practical considerations for ensuring safe application are that the pneumatic valves and the pressure switch is assembled close to the valve to detect the pressure in the circuit. For diagnostics SMC has a range of different pressure sensors and in addition a range of position switches to detect the cylinder piston position.

Safe venting

If the guard doors are opened while a system is in operation, or a person accesses a defined hazardous area in which, for example, a robot arm is in operation, the pneumatic system and the robot must be safely stopped. In this case venting of the pneumatic system is advisable. Furthermore, no unintentional machine or robot start-up may occur within the hazardous area during maintenance

activities. SMC valves in the VP-X536, VP-X538, VP-X555 and VG342-X87 series can be used to provide protection when part of the safety related control system by venting the air. As safety components, they satisfy the requirements of Machinery Directive 2006/42/EC. An integrated limit switch achieves a diagnostic coverage of 99%. This fulfils the requirements of EN ISO 13849. In addition the VR51 two-hand control valve is available for some cases where it is necessary to ensure the operator's hands are clear from the hazardous area. It can be used in purely pneumatic control systems.



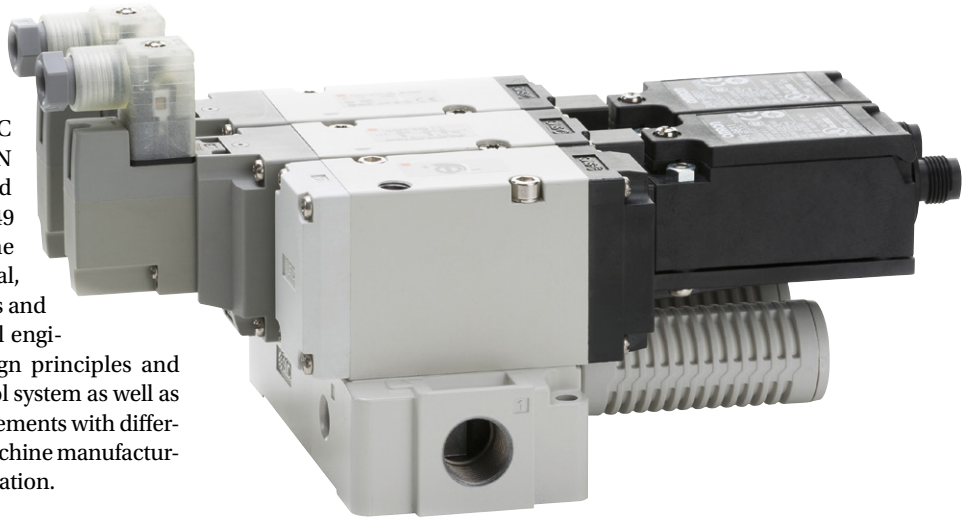
01 **The EX600 dual port fieldbus systems with QuickConnect function are perfect for applications with frequent tool changes. This minimises start-up and connection times to EtherNet/IP networks**

Strong partner

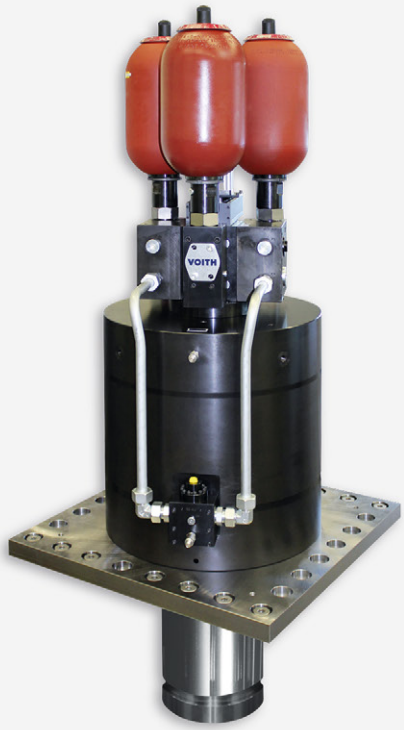
In Europe, a range of standards and regulations ensure a high level of safety for the workforce when using machinery. Machinery Directive 2006/42/EC requires a risk assessment in accordance with EN ISO 12100 to identify the risks that must be evaluated and mitigated. Harmonised standard EN ISO 13849 describes a probabilistic method for reducing the risks of control systems. It applies for mechanical, pneumatic, hydraulic and electrical control systems and has become an established method in mechanical engineering. EN ISO 13849-1 describes general design principles and EN ISO 13849-2 defines the validation of the control system as well as the components. SMC meets this package of requirements with different products, which provide optimal support for machine manufacturers and operators in their efforts to ensure safe operation.

Photographs: *SMC Pneumatik*

www.smc.eu



02 **The VP-X555 venting valve series has a direct monitoring and soft-start function**



Complete hydraulic system for punching and shearing applications

Punching and shearing operations in the metal works industry require an extremely lean and robust drive system. To create an ideal system delivering large output forces yet providing significant energy savings and high machine availability requires the combination of expert engineering, hydraulics and detailed understanding of the application. The BWIL drive Voith combines all these expertises in a single unit.

The company Voith Turbo H+L Hydraulic, a subsidiary of the Voith group, with its expertise in intelligent drive solutions has developed a new hydraulic drive system BWIL especially for punching and shearing applications that delivers forces upto 2,500 kN. Hydraulic drive systems for punching and shearing applications are compact, short-stroke valve cylinder units. The multi-pressure circuits and accumulator charging technology of the system make it highly energy efficient. Due to its compact design and modular construction, the system provides flexibility in its application. Hydraulic drive systems in roll form units are usually compact in design. To minimize the number of interfaces and ensure short cycle times, Voith has optimally synchronized the hydraulic power pack, control unit, actuator, control electronics and application software in the BWIL drive. The close connection between the machine and drive system provides operators with the benefit of high reliability and availability.

According to respective machine requirements, proven components are combined in a modular structure. As a result, the BWIL-drive requires a shorter development time and is available faster. The programmable high-performance drives are equipped with extremely simple and safe process control, consisting of hydrodynamic servo valves. These also facilitate complex forming processes and positioning tasks. Apart from the high quality of the produced parts, the BWIL drive also impresses with its performance data. The application-optimized electrohydraulic drive allows punching forces of up to 2,500 kN in pressing applications, with a cycle time of 400 ms and 20 mm stroke. In shearing applications, forces of 1,000 kN with 200 mm stroke and cycle times of up to 3 seconds are possible.

Design and function

The electrohydraulic servo drive BWIL is a free programmable high performance drive. The ram cylinder operates in the hydromechanical control loop and delivers high ram performance in punching or shearing operations and precision work during forming operations. HS4 is the electronic link between servo drive

BWIL and machine control PLC/CNC. The machine control communicates all the parameters, like stroke positions and speed, using the data interface. After the cycle has started, all management and monitoring of hydraulic actuators and sensors is done by HS4. A robust position feedback with digital interface is used to monitor the closed loop ram operation. In a compact design, all valves are placed on a manifold directly on the cylinder. This provides ease of installation and maintenance along with an improved hydraulic response.

Principle of operation

The servo motor specifies the set-point via a toothed belt drive to the control valve. In the control valve, the rotational movement is converted into linear motion and is amplified by the hydraulic cylinder many times. The actual position of the working piston is guided directly on these back through the mechanical connection between the hydraulic cylinder and control valve. Thus, the hydro-mechanical control loop is closed. When switched, the attached high holding valve will keep the cylinder and the mass attached to it in the starting position.

Energy savings

For driving the internal gear pump, Voith equips the unit with the latest IE3 motor technology. The delivery capacity of the pump is 2×125 litres. In combination with the accumulator charging technology and an additional three 50-liter accumulators, this delivery capacity is sufficient to realize even long dynamic strokes if necessary. The combination of Voith's well-known accumulator charging systems and the highly efficient internal gear pump provides significant energy savings compared to conventional drives.

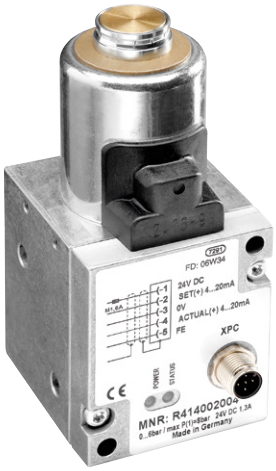
Photographs: *Voith GmbH*

www.voith.com

About Voith Turbo H + L Hydraulic and Voith GmbH

Voith Turbo H + L Hydraulic is a subsidiary of Voith Turbo. Voith Turbo, a Group Division of Voith GmbH, is a specialist for intelligent drive solutions. Customers from highly diverse industries such as oil and gas, energy, mining and mechanical engineering, ship technology, rail and commercial vehicles rely on advanced technologies from Voith Turbo.
Voith sets standards in the markets for energy, oil & gas, paper, raw materials, transport & automotive. Founded in 1867, Voith employs more than 20,000 people, generates € 4.3 billion in sales, operates in over 60 countries around the world and is one of the largest family-owned companies in Europe.

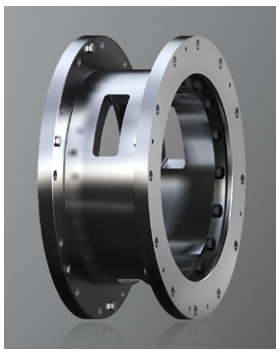
Pressure regulators introduced to trains



ED05 series pressure regulators from Aventics combine control electronics, pressure sensor, and direct drive via a proportional solenoid in a single closed unit. The ED05 pressure regulators were originally developed for use in commercial vehicles. In addition, they have been reliably applied in mobile work machines. In trains, the pressure regulators from Aventics reliably control brake cylinders for comfortable braking or are used as air spring control valves for adjusting the access height to any station platform. With sturdy components made of die-cast aluminum and steel, the ED05 series complies with the fire protection and shock and vibration resistance requirements of the railway industry. Their operating temperature ranges from -40 to + 70 °C. The ED valves process pressure regulation tasks in a decentralized manner without additional parameter adjustment based on the set points of the superordinate train control. They dynamically and precisely control the movement and force without additional control settings. Integrated pneumatic return lines automatically compensate disturbance variables. The intelligent actuators communicate with the superordinate train control either directly via an analog interface or via a bus module.

www.aventics.com

Flexible torque arm for an optimum assembly of torque motors



KTR developed a torque arm for torque motors the use of which may increase the service life of the motor bearings by up to 50 %. RADEX-N FNZ compensates for axial and radial misalignment, transmits torques up to 12,000 Nm and can be used up to a temperature of 250 °C. It ensures a torsionally rigid connection of the motor while compensating for axial and radial motions resulting from misalignment, manufacturing inaccuracies or thermal expansion. It allows for reducing the load on the bearing while increasing the service life of the motor bearings. At the same time the special structure of the torque arm ensures a highly torsionally rigid torque transmission. As a result the torque motors connected are able to transmit the full performance regarding dynamics and control accuracy to the machine axis. By using the RADEX-N FNZ the user generates a detachable screw connection with the torque motor whereby necessary maintenance work such as replacement of bearing or gaskets is easy to perform. The shaft connection, e. g. clamping elements, can be assembled via the assembly window in the spacer when the torque arm is installed. The RADEX-N FNZ is fully made of steel.

www.ktr.com

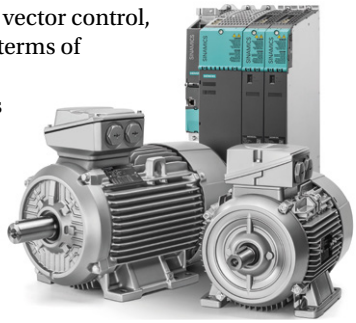
The future of automation: the modular X90 control

B&R continues to open up new possibilities in mobile automation with its X90 product line for mas-tering mobile control and I/O tasks. The comprehensive set of standardized components is perfect for imple-menting flexible automation concepts.
The heart of the X90 system is a controller with a powerful ARM processor and 48 multifunction I/O chan-nels. Basic features include interfaces for CAN, USB, Ethernet and the real-time POWERLINK bus system. The extremely robust cast aluminum housing provides space for up to four expansion cards. These can add additional I/O channels, interfaces and even a full-fledged safety controller with safe I/O. Additional expan-sion cards for WLAN, Bluetooth and GPS interfaces are in planning. All products in the X90 family are designed for use in harsh industrial environments. They can handle operat-ing temperatures from -40 to 85°C as well as strong vibrations or shocks in addition to being resistant to salt, UV light and oil.

www.br-automation.com/en

Synchronous reluctance motors combined with high-performance converters

The new firmware version 4.8 allows Sinamics S120 high-performance low-voltage converters to be combined with Simotics synchronous reluctance motors. This connection is suited for drive solutions in which the dynamic response of induction motors is no longer sufficient but the high performance of permanently excited synchronous motors would be excessive. Typical applications include winders, extruders or servo pumps. Control has also been optimized in terms of efficiency for generator operation, opening up additional scope for other regenerative applications. The modular system comprising Sinamics S120 lowvoltage converters and Simotics synchronous reluctance motors enables customized high-performance machine concepts to be implemented with the utmost speed and flexibility in industrial machinery and plant engineering. The synchronous reluctance motors achieve this by offering optimized vector control, generator operation optimized in terms of energy efficiency and dynamic response, as well as safety features and technology functions. Profibus and Profinet interfaces enable integration into the Totally Integrated Automation landscape.



www.siemens.com

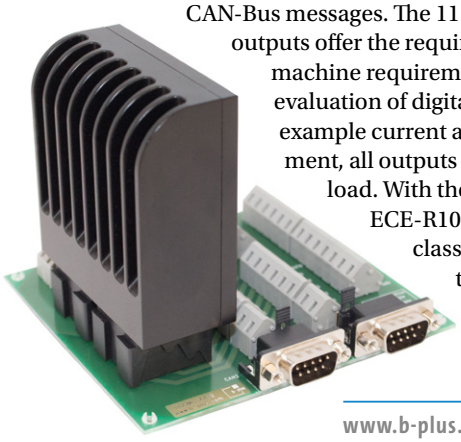
Particularly compact and compliant with standards: TMSx tank series

The developers of Bosch Rexroth have realized a compact design with a diameter of just 330 mm and a height of 480 mm. The new oil tank complies with all relevant standards of the European railway industry and offers an uncomplicated and versatile solution. The TMSx tank is particularly designed for application in rotary drives like hydrostatic traction, fan, generator or compressor drives. A cyclone spiral guarantees highly favorable degassing behavior of hydraulic fluids. Its functional capability was verified at flows of up to 350 l/min. The TMSx-16 frame size has a filling volume of just 10,6 l and can be used for applications with a system volume of up to 70 l. Thanks to a reduced oil filling, less oil is required per oil exchange. The reservoir is made of steel and offers various options for level monitoring of the fluid. Medium temperatures between -30 to + 90 °C are admissible. The TMSx tank series extends the Rexroth modular system solution of pumps, motors, hydraulic blocks, valve technology and RC control systems for railway vehicles.

www.boschrexroth.com

Minimal dimensions with a wide range of interfaces

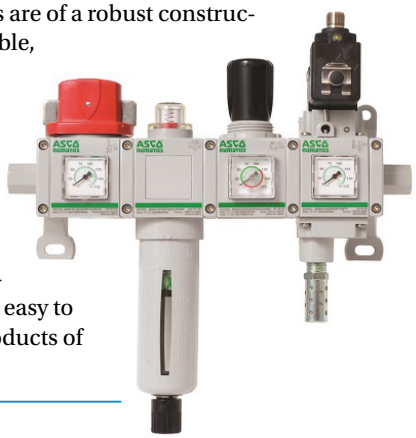
b-plus offers a flexible and powerful controller b-CANCubeMini especially designed for the application in mobile machines. Apart from the application as stand-alone, C-programmable controller, the b-CANCubeMini can also be used as a generic CANopen® Slave E-/A-Module (CiA DSP401). To benefit from the decentralized control structure, it is also possible to use it as CAN-J1939-Slave for processing the in- and outputs over parametrizable CAN-Bus messages. The 11 multifunctional in- and outputs offer the required flexibility for reacting to machine requirements. Apart from the evaluation of digital and analog signals, for example current and resistance measurement, all outputs can take up to 4 ampere load. With the test according to the ECE-R10 regulation, the protection class IP54 and an operating temperature range from -40 up to 85 °C, the controller is perfect for the use in mobile machines.



www.b-plus.com

High flow rate with small size

Emerson has introduced the ASCO Numatics 651 Series filter, regulator, and lubricator (FRL) line of air preparation products. This new FRL line broadens the company's high flow-rate 650 Series family to include products with G1/8 and G1/4 port sizes. The 651 Series FRLs require less space and are designed to fit in compact applications and in machines that require a high volume of air.The 651 Series extended high and low temperature capabilities (-40 to 80° C) enable them to be used in applications across a broad range of industries, including those in harsh environments. The modular FRL products are of a robust construction and are easy to assemble, mount, and position. The new manifold endplate flanges allows the maintenance engineer to remove the manifold assembly out of service without disconnecting from the piping. Front-facing, low-profile gauges are easy to read and are unique in products of this type.



www.asconumatics.eu

Rolling bearings: effective protection against electroerosion

The undesirable passage of an electric current and spontaneous discharge can cause severe damage in electric motor rolling bearings. It is with a view to these applications that Klüber Lubrication has developed the new, electroconductive Klüberlectric BQ 72-72. Due to an innovative lubricant design involving dissolved chemical additives, bearings run smoothly and the grease's conductivity is considerably increased to attain specific electrical resistance characteristics resembling those of semiconductors.
In rolling bearings, currents passing through them can provoke considerable damage to the inner and outer ring as well as the rolling elements. Additionally, there is a risk that the lubricant might be damaged and its performance impaired by the energetic impact. The innovative lubricant additives used in Klüberlectric BQ 72-72 not only contribute to better conductivity, but they also protect the components against wear for a longer bearing life. This was proven by positive results of bench tests and subsequent tribological component and used lubricant analyses.

www.klueber.com

RENOLD | Tooth Chain

Inverted Tooth Chain Drives
Made in Germany

Rainer Albes, General Manager Renold Tooth Chain, is still fascinated even today by the versatility and added customer value of “Made in Gronau” inverted tooth chains.

Modern machinery production requires drives that offer a high degree of economic efficiency and reliability. Inverted tooth chain drives have unmatched characteristics to meet these needs. When it comes to precise, fast, and silent drives, Renold inverted tooth chains are the ideal choice – even for the high demands of the automotive industry. The advantages: long service life, simple assembly, high speeds, extremely quiet running, and high torques.

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