

trends in automation

The Festo customer magazine 1.2017

FESTO

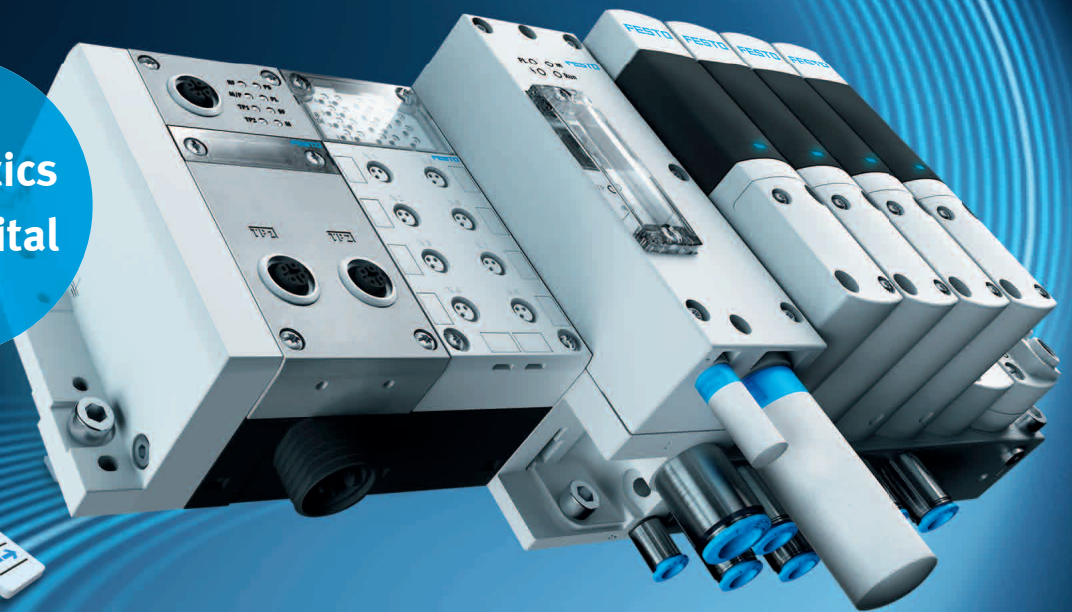
In focus

Flexibility

Compass
SupraMotion
First-hand insight
and outlook

Impulse
Digital pneumatics
World first Festo Motion Terminal:
fit for Industry 4.0

Synergies
Modular concept
Precise assembly of high-end
plug connectors

The Festo logo is displayed in a bold, blue, sans-serif font in the upper right corner of the advertisement. The background features a dynamic blue and white wave pattern that flows across the page, creating a sense of motion and digital connectivity.A blue circular graphic containing the text "Pneumatics goes digital" in white, sans-serif font. The graphic is positioned on the left side of the image, overlapping the Festo Motion Terminal VTEM device.

You rely on maximum flexibility.
You are looking for intelligent and intuitive solutions.
We are making pneumatics go digital.

→ **WE ARE THE ENGINEERS
OF PRODUCTIVITY.**

Pneumatics goes digital: world first Festo Motion Terminal VTEM

The Festo Motion Terminal VTEM is opening up new dimensions in the world of automation. It's the world's first valve to be controlled by apps. It combines the advantages of electrics and pneumatics. Thanks to the fusion of mechanics, electronics and software, this technology incorporates the functionality of over 50 individual components.

www.festo.com/motionterminal



Dr. Ansgar Kriwet,
Member of the Management Board, Sales

Dear reader,

Flexibility – this term applies to all aspects of life and business, as indicated by more than 14 million search results in Google; it is also a common theme throughout this magazine. The cover image shows how flexibility in the animal kingdom is an advantage during the growth phase. Examples like this are a source of inspiration for scientists. They learn from them and then apply this knowledge to technical disciplines. Architects are also inspired by nature when they want to create flexible objects and the materials to support them. Take bamboo, for example, which is extremely flexible yet incredibly strong, as you will see on page 6.

As for flexibility and automation, the Bionic Learning Network has used nature to develop a number of objects that have found their way into the world of automation, such as the adaptive gripper system based on the movement of a fish's tail. Instead of the apple adapting to the gripper, the gripper adapts to the apple. The research that is being carried out into the superconductor-magnet combination focuses on the world of automation. Developments such as the SupraShaker can be tilted in any direction and, despite its shaking motion, prevents vibration from being transferred to the entire system. Flexibility is equally important in industry. Flexible and modular automation concepts from Festo help to enhance competitiveness. Flexibility makes it possible to have batch sizes as small as one with virtually no retooling times.

The changes brought about by digitalisation are an important issue for companies as well as for automation. It is making us faster and more flexible and demands new solutions if we are to remain successful in the market. One such solution is the Festo Motion Terminal VTEM. With this latest development from Festo, the hardware remains the same, only the software changes – just like in the smartphones that we all use every day. 10 Festo motion apps replace over 50 individual components. It can even live up a trip to the cinema. How? Find out more in this issue.

A handwritten signature in black ink, appearing to read 'Ansgar Kriwet'. The signature is stylized and fluid.

Ansgar Kriwet

Photo: © Amelia Moore,
www.ameliamoore.com



In focus Flexibility Snakes are virtually unique in the animal kingdom in terms of their flexibility of movement and adaptability. In this issue, we show how customer applications in industrial installations can be made more flexible with enhanced modularity and rapid changeovers. The new Festo Motion Terminal VTEM makes pneumatics simpler, more versatile and more flexible.

trends in automation 1.2017

Editorial → 3
Panorama → 6
Compact → 40
Soft Stop → 42
About this magazine → 43



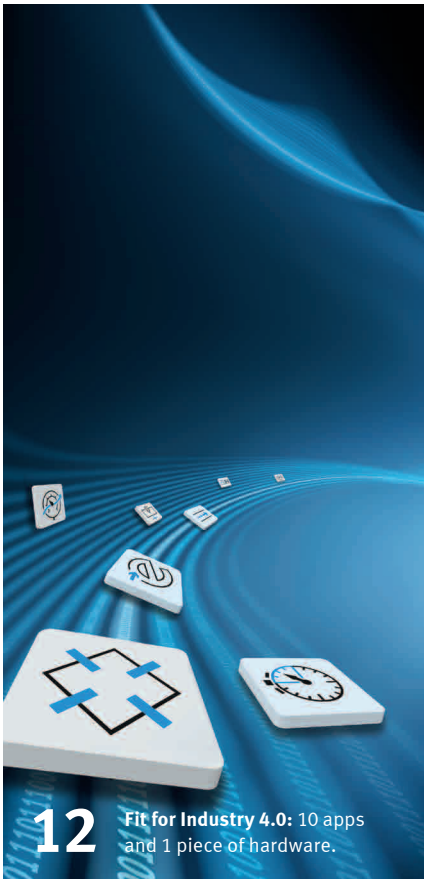
8 Superconductor technology:
we talk to the experts.

Compass

SupraMotion

Festo presented three new future concepts at Hannover Messe. Project managers Dr. Susanne Krichel and Stephan Schauz talk about the challenges and the potential of superconductor technology. → 8





12 Fit for Industry 4.0: 10 apps and 1 piece of hardware.

Impulse

Revolution in automation

World first: the Festo Motion Terminal VTEM catapults pneumatics into the age of Industry 4.0 – with apps that can replace over 50 individual components. → 12



The ultimate cinematic experience: the Festo Motion Terminal generates some surprising effects. → 19



26 Compact forces for flow drilling.

Synergies

Land of tradition and modernity

Poland, the partner country for this year's Hannover Messe, has many different facets. Festo has been a reliable partner to its customers here for many decades. → 20

Interaction of forces

Always to the point: the proportional valve VPPM ensures precision during flow drilling. The compact cylinder ADNH demonstrates its strength. → 26

Batch size 1 – setup time 0

Highly flexible: the integrated automation solution and the fully automated tool changer reduce setup times for the mill-turn centres from Stama. → 30

A perfect combination

Close cooperation: the automated installation of air intake controls is the result of joint development work and the optimal combination of cylinders, valve terminals and other components. → 33

Flexible, yet standardised

Modular concept: the assembly line for high-end plug connectors delivers impressive results with the handling system YXMx and the servo press kit YJKP. → 36



A new departure

Terminal 4 at Madrid-Barajas Airport offers travellers a unique sense of space. The striking roof design resembling birds' wings covers a total of 200,000 square metres extending over 1.2 kilometres, making the interior feel light and airy. The choice of bamboo as the material for lining the curved structure is also unusual. Its properties make it the ideal choice: hard on the outside, hollow on the inside and extremely flexible, while at the same time durable and strong.

The wood itself is 25 per cent harder than oak. The outer layers of the bamboo poles are the hardest and provide the stability. The hollow insides are what give the material its elasticity and low weight. Bamboo can grow up to a height of 40 metres, with a pole circumference of up to half a metre. A member of the grass family, it is one of the fastest growing plants in the world.





Supra

Festo has been demonstrating the effect of the superconductor-magnet combination with a wide range of motion and handling units at trade fairs since 2013. This year, the company presented three new future concepts for automation with superconductor technology. Dr. Susanne Krichel and Stephan Schauz head a development team that is exploring the exciting possibilities and characteristics of this technology. They talk to trends in automation about the challenges and the potential of their work.



Stephan Schauz and Dr. Susanne Krichel
head the SupraMotion project team.

► **trends in automation:** What attracted you both to this technology – how did you first come into contact with it?

Dr. Susanne Krichel: The first time I saw a superconductor was at an open day hosted by the physics institute at my university. It was wrapped in a cooling nitrogen package and moved contactlessly over a magnetic rail. At the time I could never have imagined that one day I would be working with this technology at Festo, with the aim of actually developing a product. So I am delighted to have the opportunity to exploit the potential of this technology together with my colleagues.

Stephan Schauz: Before SupraMotion, my department was working on new processes in technical ceramics, among other things. Because the semiconductors we were using at the time are also made of a ceramic material, preparing a study of this technology became part of my responsibilities, which now also include other areas of superconductivity and magnet technology.

► **trends in automation:** What are the technical characteristics of this technology and what is the development goal? What types of products are you hoping to create?

Schauz: SupraMotion utilises the effect of saving spatial fields, specifically in the case of so-called second-generation superconductors. The position of any magnetic field relative to the superconductor can thus be saved by the superconductor and used without the need for additional sensors or controllers. The development goal is to provide our customers with products and functional units that enable them to enjoy the benefits of this technology in new applications without having to understand its complexity. They should in principle be able to integrate our SupraMotion products into their automation environment just as they could any other product from Festo. →



Schauz: In addition to getting to grips with the actual SupraMotion technology – which is a challenge in itself – we have to meet requirements for industrial use. Because saving magnetic fields is an area with many as yet unknown applications, it is important that the basic modules be kept as multi-functional, compact and efficient as possible so they can then be joined and combined in different ways to create function modules with specific characteristics. We could use this technology to provide our customers with linear or rotary axes with defined characteristics, for example.

Krichel: The exhibits demonstrate very realistically how the effect of a superconductor-magnet combination can be used in various applications. However, we are still some way off from the technology being used in industry. At the end of the day, our customers want reproducible data and reliable components and modules. We are therefore currently working out the fundamental relationships of this technology and using them to create system models. Although we are still at a very early stage in the product development process, we are already engaged in detailed discussions with pilot customers about applications in current and future generations of systems. This will help us to assess market potential and to develop our technology accordingly.

“Our challenge is to take the most promising ideas and to develop them into the automation products of tomorrow.”

Dr. Susanne Krichel,
Portfolio Management Business Opportunities, Festo

► **trends in automation:** You are doing a lot of development in cooperation with (future) users of the technology. Why? What input do you receive from them?

Krichel: In product development, focussing on the needs of the customer is extremely important, particularly in the case of new technologies, as it ensures that the development process is steered in the right direction from the very beginning. This is much easier to

do with pilot customers, as they provide us, as developers, with clear guidance and direct feedback on the progress of the project. This in turn leads to the technologies being accepted more easily, both internally and externally.

► **trends in automation:** What are the possible application areas for this technology? What potential does Festo see in superconductivity for automation technology?

Krichel: There are both advantages and disadvantages to using a completely new technology. Right now, it is difficult to predict with complete accuracy what applications will develop – it varies significantly depending on the industry. Having said that, the technology has opened up a whole new world of possibilities, and it is exciting to be involved in working out the requirements and a possible product portfolio. In the biotechnology/pharmaceutical or food industries, for example, handling systems that can intervene in processes without any abrasion or contact would be of enormous benefit. In other areas, complete electrical insulation is very exciting, while the frictionless and therefore low-energy transport of heavy loads would be useful in traditional machine building.

► **trends in automation:** How are you dealing with these challenges and what do you see as the key task in the development of superconductor technology?

► **trends in automation:** What are the main challenges when developing products based on superconductivity?

Schauz: In automation technology, having control over the object to be manipulated is crucial. We must therefore be able to precisely determine and directly influence the levitating state of objects. In addition to ensuring that the levitating objects are securely held in place, we also want to supply suitable sensors and drives. The six possible degrees of freedom of a levitating system mean that specific parameters become important or must even be redefined, such as spring stiffness or maintaining a position during acceleration.

► **trends in automation:** Is cooling not expensive?

Krichel: We are often asked this question at trade fairs. Temperatures in the region of -200 °C may initially sound like they require a lot of energy consumption. It's always great to be able to pleasantly surprise customers, as one of our milestones in recent years has been the switch from nitrogen-cooled to electrically cooled cryostats, which can easily be integrated into existing processes.

SupraShaker, SupraLoop, SupraDrive

At Hannover Messe 2017, Festo presented three exciting new concepts for using superconductor technology in industrial applications. In these concepts, superconductivity supports the highly dynamic operation of a levitating slide as well as a levitating vibration system with tilting option. They also show how superconductor technology can be easily combined with other transport systems. All of the exhibits draw on the unique properties of superconductors, which allow a levitating motion that combines low energy consumption and high efficiency.



SupraShaker: one of three new future concepts

In the SupraShaker (see picture), a plate levitates above a cryostat containing superconductors. An electric motor with eccentric cam converts this into a shaking motion via a magnetic coupling. In addition, by transferring a magnetic field it can be tilted in any direction. The gap between the plate and the automation system ensures that the tool and the machine are mechanically separated, and prevents vibrations from being transmitted to the entire system. More information about the individual concepts can be found at www.festo.com/supramotion.



The power consumption of the coolers that we use is 80 W in full-load operation. When the required temperature of $-180\text{ }^{\circ}\text{C}$ is reached, however, power consumption can be reduced.

► **trends in automation:** What has been your most surprising moment in the project so far?

Krichel: I always enjoy touching a levitating magnetic puck and feeling the forces that hold it in place. That's why I try to bring customers directly into contact with our systems, although you do have to be careful when handling the magnets – the forces are immense. You have to experience it for yourself to truly appreciate it.

“Levitation implies freedom – whereas automation requires maximum control.”

Stephan Schauz,
Product Concept Evaluation, Festo

Schauz: If you were to tell an engineer that he can only work with electric currents and cannot use electric voltage or resistance, his initial reaction would be one of shock. Superconductors operate in a very demanding physical range, which differs enormously from the real world that we live in. We suddenly find ourselves in an entirely unfamiliar branch of physics, and the approaches that we are adopting in product development are extremely exciting.

► **trends in automation:**
So what happens next?

Krichel: We have countless ideas that we could spend years working on in our development laboratory. Our challenge is to take the most promising ideas and to develop them into the automation products of tomorrow. That is why we are asking customers who are interested to contact us. We look forward to receiving their suggestions and the opportunity to exchange ideas. ■

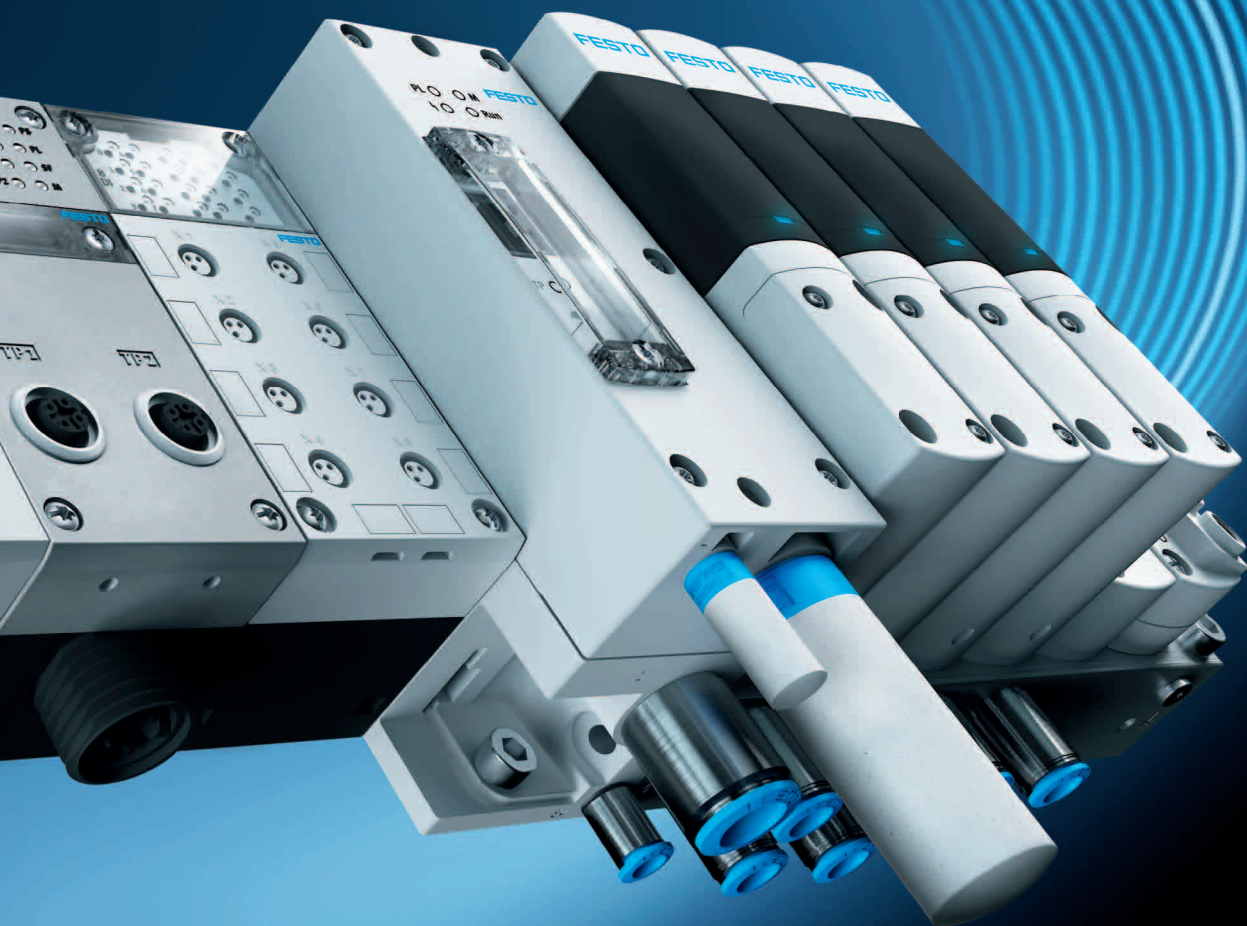
Further information and animations can be found at www.festo.com/supramotion

Digital pneumatics: Festo Motion Terminal VTEM

Revolution in automation

Pneumatics is intrinsically a user-friendly technology. And it is set to become even more straightforward, versatile and flexible as the brand-new Festo Motion Terminal VTEM catapults pneumatics into the era of Industry 4.0 – with apps that can replace over 50 individual components. And all this is thanks to the latest developments in piezo technology and software.







“The Festo Motion Terminal
is making pneumatics fit for
Industry 4.0.”

Dr. Julia Duwe, Head of Future Motion Solutions Management, Festo

Just as the smartphone turned the mobile communication market on its head a decade ago, so too the Festo Motion Terminal is set to revolutionise automation technology. A new type of function integration combined with software apps will simplify the entire value chain, from engineering and procurement to warehousing, all the way to downstream processes such as maintenance. Beneath the somewhat unassuming exterior and classic Festo product design lies technical refinement based on state-of-the-art information technology.

True Industry 4.0

Piezo technology, integrated stroke and pressure sensors together with control using motion apps will enable machinery and plant manufacturers to venture into new areas. The fusion of mechanics, electronics and software featured in the Festo Motion Terminal transforms a pneumatic product into a true Industry 4.0 component and facilitates flexible production. Pneumatic functionality as well as adaptation to new formats are controlled via apps by changing parameters. The integrated intelligent sensors for control, diagnostics and self-learning eliminate the need for additional components. The product key acts as a digital map, providing product information quickly and making traceability easier. Parameterisation is performed via web server without additional configuration software and Industry 4.0 interface standards such as OPC UA can, of course, also be integrated.

Motion apps

When the VTEM is launched, ten functions will be available via motion apps: from basic modification of the directional control valve functions to energy-efficient motion, and from proportional behaviour to different motion profiles. Thanks to the fast activation of new functions via apps, machine developers can create a basic machine type and then select the relevant apps to equip it with different functions and features as per the customer requirements. Further apps are in development.

With the new automation platform functions can be selected and modified at the touch of a button – without tedious installation and without having to change the hardware or install additional components. This makes it easy to produce customised consumer goods – even in batch sizes of 1.

Intrinsic energy efficiency

The new automation platform is based on an integrated approach to energy efficiency. The specially developed motion apps and the leakage diagnostic function for condition monitoring ensure energy is saved during operation. However, the energy-saving piezo technology for the proportional valve's preliminary stage also plays its part. The air consumption can be flexibly adapted to the requirements using the apps "Selectable pressure level" and "ECO drive". With a digitally selectable pressure level the pneumatic force can be limited to the level required for the application – and can thus be flexibly adapted to the advance and return movements as well as different loads.

ECO drive reduces the compressed air consumption to the required minimum level, provided no pressing and holding forces are needed in the end position. Depending on the application, savings of up to 70% compared with standard operation can be achieved.

Reduced costs and complexity

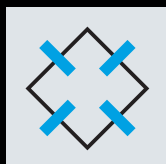
The Festo Motion Terminal permits both fast and powerful movement and leakage testing at much lower costs than current solutions. This means, for example, that fewer controllers are required compared with electrical solutions as one controller can control up to eight movements with the VTEM. New applications such as pneumatic pre-positioning with a subsequent force-dependent press-fitting operation will also be possible in the future. Energy consumption is also reduced and the required installation space is decreased by up to 65%. When compared with electric drive technology, solutions with the Festo Motion Terminal represent real low-cost alternatives, even for pneumatic functions. →

Stay one step ahead

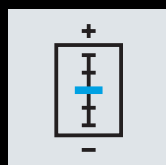
The Festo Motion Terminal offers enormous advantages for machinery and plant manufacturers whose machines and systems have the following requirements:

- Frequent format changes (pressure, travel time, speed)
- Acceleration and/or speed profiles
- Movement of large loads (see Soft Stop)
- Restricted access to drives ("built-in")
- High pressure regulation requirements
- Energy efficiency (short and fast or slow and long movements)
- Constant cycle times (self-adjusting)
- Designs that are gentle on components and minimise vibration (soft, controlled)
- High diagnostics requirements (e.g. leakage)
- Knowledge protection

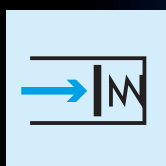
10 motion apps* – 1 piece of hardware



Directional control valve functions



Proportional directional control valve



Soft Stop



Proportional pressure regulation



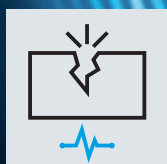
Model-based proportional pressure regulation



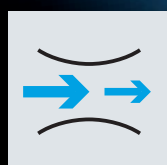
ECO drive



Selectable pressure level



Leakage diagnostics



Supply and exhaust air flow control



Presetting of travel time

CPX module

With CPX, you have the option of using many different control systems and end user specifications, as well as all the usual digital and analogue I/O modules.



Ethernet WebConfig interface

When it comes to efficient parameterisation the choice is yours: you can either use an intuitive WebConfig user interface via the PC's web browser or easily access the (PLC) machine control system as usual – without the need for additional configuration software.

*Further apps for additional functions are already planned.

Detailed descriptions of all motion apps can be found at www.festo.com/motionterminal

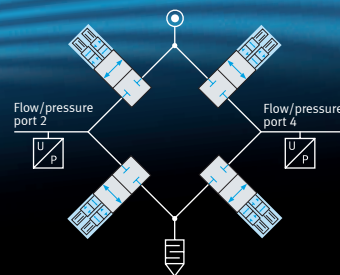


Input module

Up to 16 analogue or digital inputs for direct control applications such as Soft Stop.

Valve

The app-controlled valve comprises four 2/2-way diaphragm poppet valves, which are controlled by four piezo pilot valves. The integrated stroke and pressure sensors provide optimal control and transparent condition monitoring. The interplay between the components and the bridge circuit design, which enables independent pressurisation and venting, are what make the valve so flexible.



Bridge circuit in the valve

Controller with motion apps

The core of the Motion Terminal offers decentralised intelligence and rapid control. From here, the motion apps are assigned to the individual valves.





“The Festo Motion Terminal allows the flexible adaptation of a machine over its entire life cycle.”

Marcio Lopes da Silva, Product Management Motion Terminal, Festo

Instead of a valve, a pressure regulator and a pressure sensor, in other words three components, only one single technology – a valve – is needed.

Greater overall equipment effectiveness

Transparent diagnostic data and self-optimising algorithms, which autonomously counteract wear and external influences, contribute to greater overall equipment effectiveness. The ability to change data on the fly and to optimise processes at the touch of a button makes improvements and identical standard equipment a reality. This is a huge leap forward from flow control valves which up to now had to be adjusted manually to control speed.

Assigning functions via software has the added benefits of protecting against tampering and protecting know-how, as well as greatly simplified maintenance without long lists of spare and wearing parts. You only need to keep one component in stock, which can be mounted immediately and doesn't have to be re-set because the parameter data function is transmitted to the valve by the Motion Terminal controller. Another benefit is the piezo technology with increased service life.

Simplification for the factory of the future

The Festo Motion Terminal VTEM is based on integrating digitisation and pneumatics. This amazing innovation combines the

strengths of pneumatics, such as robustness and easy commissioning and operation, with benefits that until now were restricted to servopneumatics or electric automation for complex motion tasks. This means that in the future this development can replace dedicated pneumatic and electric applications. ■

Additional information on the 2017/2018 market launch can be found at www.festo.com/motionterminal



The ultimate cinematic experience: the Festo Motion Terminal makes cinema seats very mobile and generates some surprising effects.

Cinema 4.0

A chase involving a sports car on an alpine pass is unfolding on the screen. On a hairpin bend, the cinema seats tilt to the left – only to swing back to the right when the car is travelling straight ahead again. The cinemagoers feel the unevenness of the road surface, hear the screeching of the tyres when the driver brakes and smell burnt rubber. But that’s not the end. Suddenly water is splashed into the audience’s faces as the car drives through a puddle. At the same time, they can feel a draught of air blowing through their hair. This is experiencing cinema with all the senses in one of the 18,000 MX4D Motion EFX cinema seats worldwide provided by Californian company MediaMation. Hidden in the seat, the Festo Motion Terminal VTEM controls the movements and triggers all the effects. This versatile pneumatic control system integrates digital functions into a single valve. The motion apps “Proportional directional control valve” and “Proportional pressure regulation” control the flow rates and pressures to ensure fast and powerful yet gentle and precise motion sequences.

The motion profiles for the films are processed in a controller CPX-CEC directly on the Festo Motion Terminal. Many of the hardware components previously required are now superfluous. Three valves of the VTEM control the three actuators of each cinema seat, while one valve regulates the pressure. Inexpensive standard valves VUVG-...-S from Festo’s core product range are used for the effects such as the gusts of wind. “The Festo Motion Terminal makes everything much easier for us. Installation, commissioning, diagnostics and fault-finding can now be realised with far fewer components,” says Dan Jamele, CEO of MediaMation. As a key contributor to Industry 4.0, VTEM allows many new functions to be integrated thanks to digitisation and piezo technology. MediaMation with its fast and intuitive operation is very well received in the age of “Cinema 4.0”. ■

www.mediamation.com

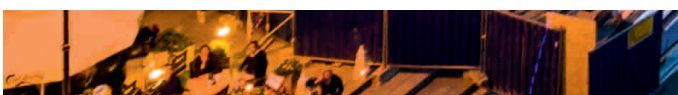
Land of tradition and modernity

Poland is the sixth largest country in the European Union. It is a country that is characterised by strong economic growth, a highly educated young population and a diverse landscape. It also maintains a strong connection with history and tradition. This year, the spotlight has been on Poland as the partner country of Hannover Messe. And with good reason.

In mid-January, ratings agency Fitch announced a positive “A-” rating for Poland on account of its “solid macroeconomic fundamentals, including a stable banking system and sound fiscal policy”. Moody’s rating also remained unchanged at “A2 negative”. The country’s steady economic growth helped it to withstand the effects of the global financial crisis in 2008. Poland is ranked 25th in the world in terms of GDP. Growth is in excess of three per cent. In 2016, around 80 exhibitors from Poland showcased their potential and innovation capabilities at the world’s largest industrial trade fair in Hanover. This year there are 100. Poland ranks as one of the top countries in Central and Eastern Europe among investors. In the industrial and automotive sectors in particular, Poland, as the hub between Western and Eastern Europe, records steady growth. Another good reason for the partnership with Hannover Messe in 2017 is the fact that Poland is a major trading partner of Germany, while Germany is Poland’s biggest purchaser and supplier of goods.

Education with a long tradition

For centuries, Poles have made new homes for themselves all over the world, working as sailors, as miners in France or as industrial workers in the USA. According to statistics, there are 1.7 million people of Polish ancestry in the Chicago metropolitan area – the same number of people as in Poland’s capital, Warsaw. Over the centuries, the search by Poles for better-paid work around the →





Warsaw Old Town was completely rebuilt after the Second World War and was listed as a UNESCO World Heritage Site in 1980.



“The activities of Festo Poland are an excellent example of how it cooperates with Polish industry.”

Marcin Zygadło, General Manager of Festo Poland



Modern office buildings have transformed the Warsaw skyline. Warsaw is now one of the top ten cities with the most skyscrapers in Europe.

world has also broadened the horizons of their family members who remain at home. For many young Poles speaking other languages, especially English, is a matter of course. This helped the country when the IT sector in America began to spread its influence around the globe. Polish mathematicians were able to read new specialist publications in their original language – unlike their colleagues in other countries who had insufficient knowledge of English.

Poland has a population of 38 million people, and around two million young Poles study at the country’s 420 universities. In Warsaw, 20 per cent of people have a university background. This highly motivated young generation wants to prove that it is not just good, but in many cases even better. Education played a pivotal role at an early stage in Poland’s history. In 1364, King Casimir III founded Jagiellonian University in Kraków. It is Poland’s oldest university and the second oldest in Central Europe. Notable alumni include Nicolaus Copernicus and Pope John Paul II.

Today, extensive knowledge of computer hardware and software is something that young Poles take for granted. With 1,500 mobile phones per 1,000 inhabitants, Poland is a country that has embraced modernity. Having joined the EU on 1 May 2004, Poland is one of the nations that has made the most of the

Customised solutions

The Application Centre of Festo Poland develops and tests over 90 customised solutions every year, including a highly dynamic handling system for the packaging of car lights. The automation solution for an international company that supplies products to numerous industries, including the automotive, electrical and electronics sectors, is based on two Festo tripods EXPT with robotic functionality for movement in three dimensions. The handling system also exemplifies precision in movement and positioning combined with a high dynamic response of up to 150 picks per minute. The replaceable grippers of the two tripods support the picking and placing of eight different types of lights. In addition to the robotic controller CMXR with the operator unit CDPX, the system is equipped with electric slides EGSL.



Highly dynamic: tripods type EXPT ensure a fast packaging process for car lights.



opportunities presented by the shift from a communist planned economy to a free market economy following the fall of the Iron Curtain in 1989.

Changing history, key personalities

Despite being a forward-looking country, Poland still maintains strong links to its past. On 3 May 1791, Poland's first constitution was drafted – the first democratic constitution to be enacted in Europe. Time and again, Poles have demonstrated their desire for freedom. Polish aristocrat Tadeusz Kościuszko fought in the American Civil War between 1777 and 1783 on the side of George Washington and was committed to the abolition of slavery. During the Second World War, the Polish underground movement successfully smuggled a German Enigma machine to Britain, making an important contribution to the Allied victory in 1945. The independent trade union “Solidarność” (Solidarity) played a pivotal role in the collapse of communism in Eastern Europe. Poles are proud of the great historical figures that their country has produced, including world-renowned composer and pianist Frédéric Chopin and mathematician and astronomer Nicolaus Copernicus. Warsaw native Marie Curie became the first woman to win the Nobel Prize for Physics, which she was awarded along with her husband, Pierre Curie, in 1903. She also won the Nobel Prize for Chemistry in 1911. Pope John Paul II had a lasting effect on the Catholic Church during his 26-year papacy. And Adam Małysz was

one of the best ski jumpers of all time. Art and culture, science and history, sport and religion are areas that have traditionally defined the image of Poland and the Poles, and continue to do so today.

Centres of progress

Nowhere are the signs of the success of modern Poland more evident than they are in the capital Warsaw/Warszawa. More than 250,000 companies are based in Warsaw, and the city's unemployment rate of 1.9 per cent is among the lowest in Europe. Kraków is one of Poland's most beautiful cities, and was largely unscathed by the impact of the Second World War. Its beautifully preserved medieval city centre has earned it the names “Florence of the North” or the “Rome of Poland”. In recent years, Wrocław has emerged as an important cultural centre. In 2016, the city was named “European Capital of Culture”. Centres such as Gdańsk, Łódź, Katowice, Poznań and Szczecin also attract many visitors from home and abroad.

Mushrooms – the nation's passion

Poland has a diverse landscape, ranging from the sandy beaches of the North Sea coastline to the Masurian Lake District with its countless lakes, and the peaks of the Carpathian Mountains, of which the Tatras are the highest. The large number of natural parks – over 20 in total – reflects Poland's closeness to nature. →





The Białowieża Forest in eastern Poland, on the border with Belarus, is a UNESCO World Heritage Site. It has over 12,000 animal species, including 9,000 insect species and is home to the European bison. In the south-west of the coal-mining area of Upper Silesia lies the Błędowska Desert. This conservation area is Europe's largest desert, and is often referred to as the "Polish Sahara". Around 30 per cent of Poland's land area of 312,679 km² is covered by forests. In terms of forestry, Poland is the most important of the 10 accession states that joined the European Union in 2004. It is also the biggest producer of copper, silver and coal in the EU. The forests of Poland provide plenty of opportunity for Poles to indulge in one of the nation's favourite pastimes – mushroom picking. Once a year, the small town of Węgliniec on the border between Germany and Poland hosts "Święto Grzybów", the European mushroom picking contest.

Steady economic growth

The patience and stamina that are required for mushroom picking are features that have also benefited the Polish economy, which has performed well in recent years. Poland has an annual growth rate of 3.6 per cent (compared with 3.3 per cent in 2014 and 2015), ranking it among the five most dynamic economies in Europe. As the eighth largest economy in the EU in terms of GDP, Poland accounts for 37 per cent of the economic output of the 11 CEECs (Central and Eastern European Countries).

In 2016, gross domestic product was 434.4 billion euros, and a figure of 450 billion euros is forecast for 2017. The industrial sector grew by an impressive 6.5 per cent in 2015. The IT and communication sectors performed even better, with both recording 8.8 per cent growth, while mining and manufacturing grew by 7.7 and 7.5 per cent respectively. The country's consistently strong economy has benefited car manufacturers and the machinery and plant construction sectors. In 2015, machinery imports rose by 12 per cent compared with the previous year, while new car and commercial vehicle registrations rose by 14 and 40 per cent respectively.

Symbol of the new Poland

Poland is showing the world what it can do and proving that it will not settle for second best, while at the same time remaining true to its traditions – just like one of the country's most ambitious and successful athletes, football star Robert Lewandowski. One of the best goal scorers in his field, he embodies Poland's spirit of endurance and dynamism. This unassuming young man from Warsaw dedicated himself to developing his footballing skills and is now recognised as one of the best footballers in the world. ■

On the border between Poland and Belarus in Białowieża National Park, Europe's last primeval forest, you can see wisent (European bison) in the wild. Once threatened by extinction, these impressive animals have been successfully re-introduced here.

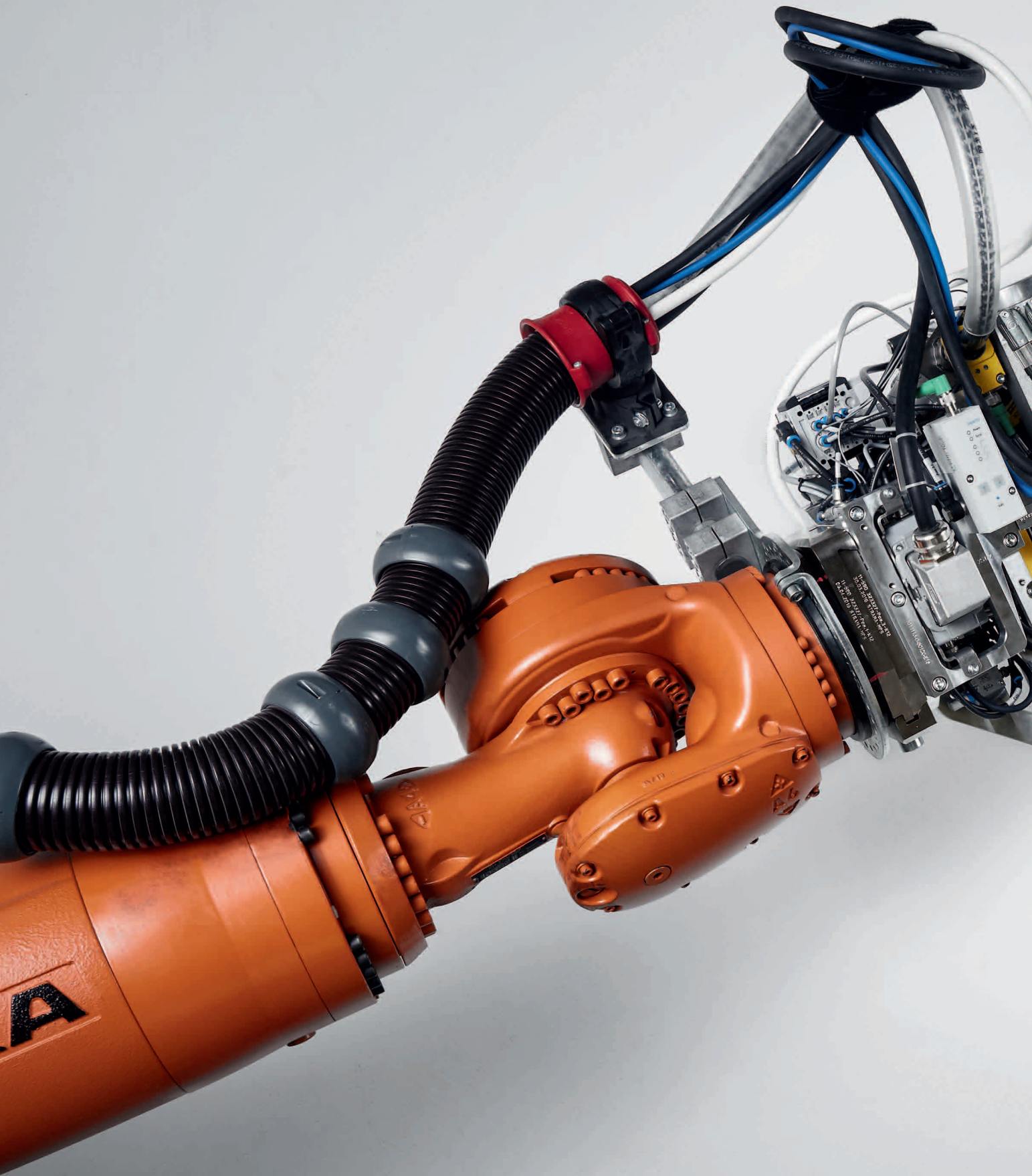


Festo in Poland

Festo Poland, based in Warsaw, has an extremely impressive track record. In the 1960s, Festo began its first training programmes in the country, including courses in schools and technical universities. In 1975, a small engineering information office was founded, followed by a sales office in 1985. Festo Sp. z o.o. was officially founded in December 1989. Today, 130 employees support around 6,500 customers. The local Regional Engineering Centre (REC) produces and assembles cylinders, control cabinets and handling systems for the domestic market, various CEECs as well as for the REC Europe. The automation solutions are primarily aimed at the automotive, food, packaging, water technology, electronics and machinery construction sectors. Learning systems from Festo Didactic are used in around 600 educational establishments in Poland. Festo is currently working together with Polish educational institutions to develop basic and further training programmes for Training 4.0 for both students and professionals in Poland.



The office of Festo Poland in Warsaw.



Compact forces: proportional valve VPPM, valve terminal CPV, compact cylinder ADN and swivel module DSM work together in the smallest of spaces.

Fast and secure joining of different materials

Interaction of forces

Along with traditional methods such as clinching and riveting, flow drilling is gaining in importance as a joining technology. Even steel sheets can be joined in a single processing step without pre-drilling. The flexible parameterisation of pressure and speed play a key role here, as demonstrated by the KFLOW joining tool from Klingel featuring pneumatics from Festo.

Less moving mass, lower emissions and increased stability mean that lightweight construction is becoming increasingly important in car production. Crucial to its success is a mix of materials, incorporating steel, aluminium and carbon fibre-reinforced plastics. Aluminium cast parts are also playing an ever greater part. An example is the Space Frame construction with an integrated aluminium ladder frame which is around 40 per cent lighter than conventional steel self-supporting bodies. These new constructions present designers with new challenges. How can materials be joined quickly and reliably? Flow drilling provides the answer to this question. This joining technology allows different materials that are only accessible from one side to be joined without pre-drilling.

One company leading the way in joining systems for flow drilling is Klingel GmbH. Its joining systems are based on pneumatic components from Festo. Compact, reliable and powerful, the flow drilling systems do their job with the help of Festo cylinders, valves and valve terminals.

Fluid transition

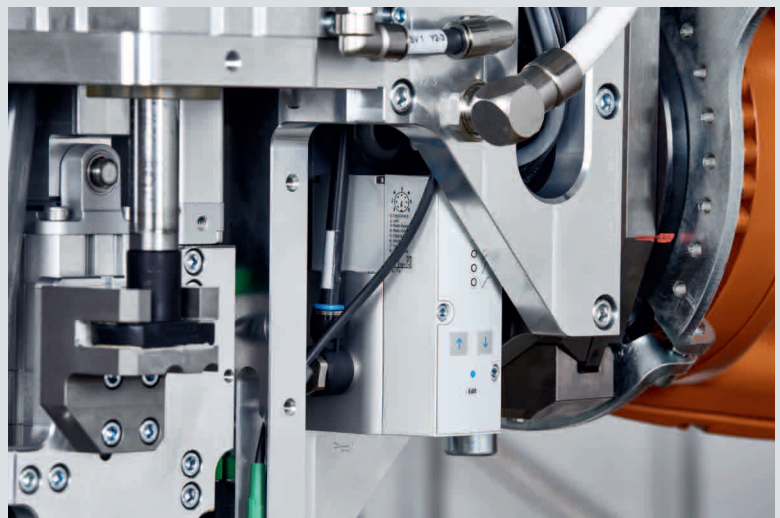
The flow drilling process is a series of seamlessly merged steps. First, the flow drill heats the material to be joined at high speed and with great force. Once the material has reached the correct temperature, the screw penetrates it and forms a cylindrical hole. It then creates a nut thread and drives through the material. Finally, the screw is tightened with the prescribed torque. While this may sound like a time-consuming process, joining tools from Klingel can complete it in 1.5 to 2 seconds. The tool of choice is the flow drill system. It has four zones: a hardened tip, a thread forming zone, the screw thread and the screw head with a recess under the head for capturing the discharged material. The insertion of the screw into the heated material and the resulting friction/positive locking make it more secure after cooling. To loosen the screw, a higher torque than that used to tighten it is required. →





“Working with a flow drill is almost like an art form. Flexibility and precision require a great deal of experience and expertise. Festo is therefore the perfect partner.”

Reinhard Totzauer, Project Manager at Klingel GmbH



Always to the point: thanks to the proportional valve VPPM, the screw-in parameters can be adapted flexibly and precisely.

Precision-controlled process

The KFLOW system from Klingel relies on the interaction between the servo motor and two compact cylinders for inserting the screws into the material to be joined. The process is continuously monitored by displacement encoders which check the strokes of the pneumatic cylinders, their position and thus the screw-in depth. The holding stroke fixes the component in place and positions the screw. The main stroke transmits the process force to the screw and the material. While the cylinder ADN is sufficient for the maximum holding stroke of 1.4 kN, the higher force of the main stroke of up to 3 kN requires the cylinder ADNH, which has a higher flow rate. Both are controlled using Festo proportional

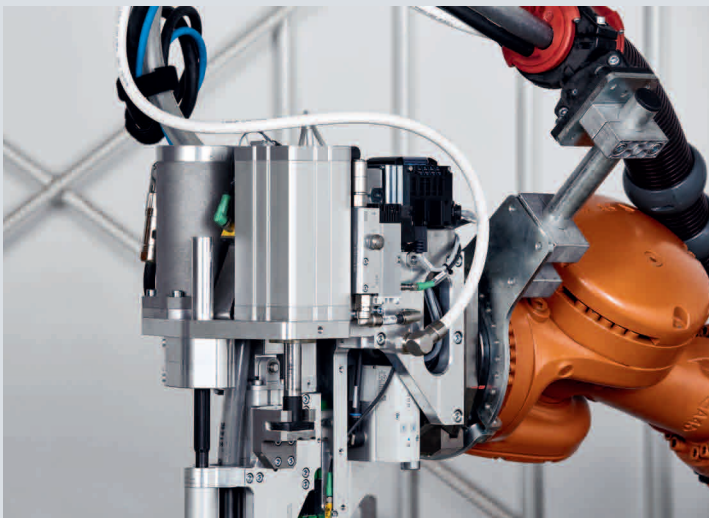
valves VPPM – VPPM-8 for the main stroke and VPPM-6 for the holding stroke. Proportional valves are ideal for the high level of flexibility required for the screw-in parameters. The KFLOW joining tool initially operates at a lower speed and with a lower force for position detection with displacement encoder. Subsequent penetration requires a higher main force and speed. Forming the thread needs a lower force and spin. To tighten the screw with the correct torque, both parameters are reduced further.

Flexible regulation of the lifting force

The art of flow drilling lies in achieving the right combination of force and speed for every screw. “In automotive manufacturing,

if we use our systems to insert 20 flow drilling screws in parallel, we generally need to have different force and speed parameters for each individual screw,” explains Reinhard Totzauer, Project Manager at Klingel GmbH. “If there is a weld next to a connection point or the material temperature changes during the screwing-in process, the processing parameters have to be adapted accordingly.” Different materials also demand different parameters.

High-quality steel requires a lower speed and high joining force to minimise heat generation, while aluminium requires high speeds with a lower joining force. Pre-drilling is useful for reducing the number of influencing variables.



Controlled flow: the cylinder ADNH from Festo transmits up to 3 kN to the flow drill.



Functional performance: flow drilling joins a wide variety of materials in a matter of seconds without pre-drilling.

The upper material is pre-drilled so that the focus is on the parameters of the lower material.

Precision and reliability

With KFLOW, the screw supply is replenished in a matter of seconds as the screws are fed through a plastic tube using a stream of air – head first for wear and safety reasons. Once they reach the joining tool, the screws are rotated 90 degrees by a swivel module with Festo swivel and locking cylinder DSM. All the pneumatic components are controlled using a valve terminal type CPV. Powerful and compact, they can be easily accommodated on the joining tool. Along with their outstanding performance, the Festo components offer

excellent precision and reliability – key selection criteria for the automotive industry. As a special machine builder, Klingel values consistent maximum process reliability even when conditions change. ■

🌐 www.festo.com/catalog/adn

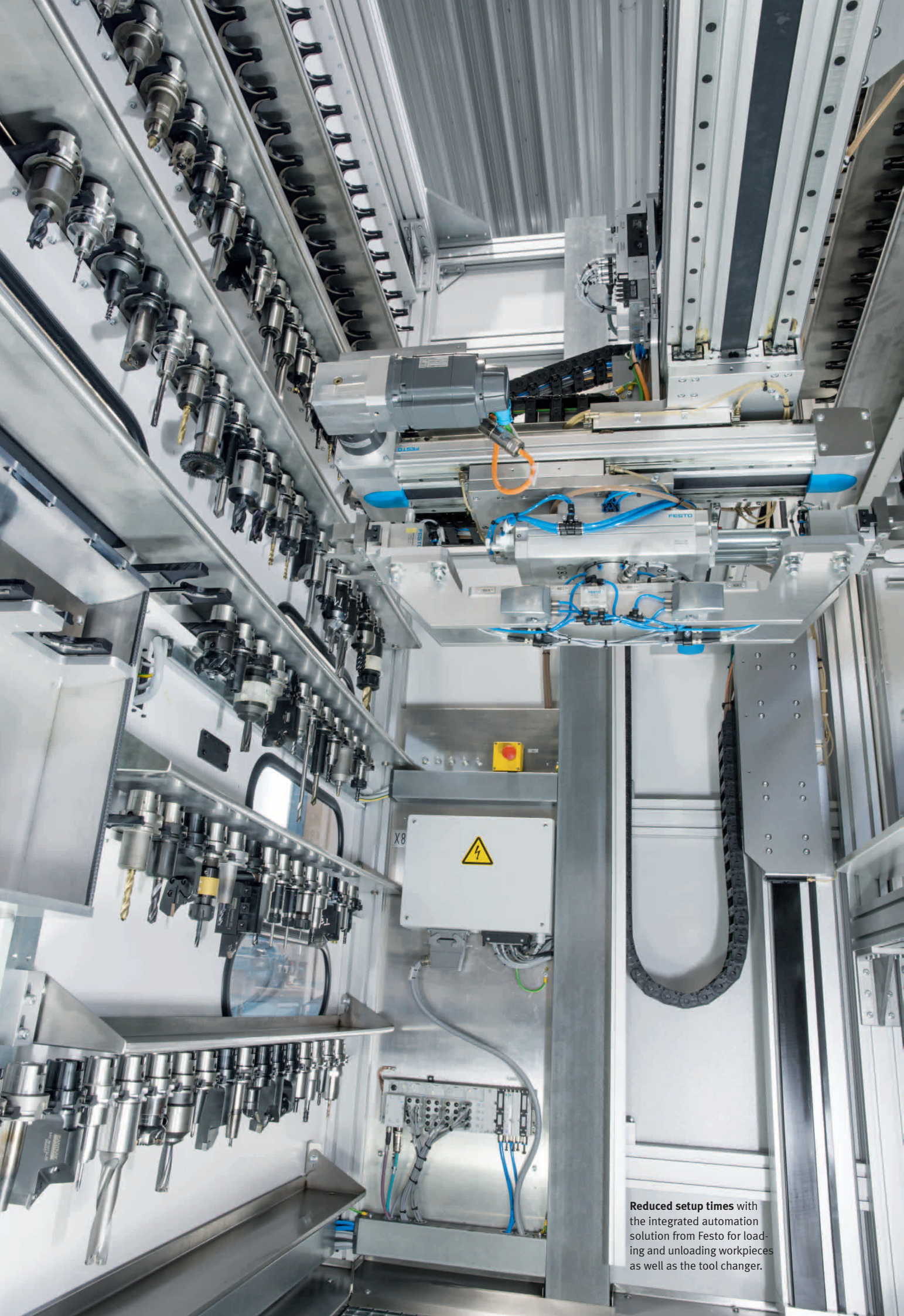
🌐 www.festo.com/catalog/vppm



Klingel GmbH

Joining Technology Division
Bürgermeister-Graf-Ring 21
82538 Geretsried
Germany
www.klingel-gmbh.de

Area of business:
Development and manufacture
of joining systems with a focus
on flow drilling (FDS)



Reduced setup times with the integrated automation solution from Festo for loading and unloading workpieces as well as the tool changer.

Highly flexible mill-turn centres

Batch size 1 – setup time 0

Many users of mill-turn centres from Stama are reporting time savings of up to 70% and unit cost reductions of 50%. This is all thanks to the high flexibility of the machines and their virtually negligible setup times. The integrated automation solution from Festo for loading and unloading the workpieces as well as the tool changer in the additional magazine contribute to this success.

The big advantage of machine tools from Stama is that small batch sizes and high-volume series can be processed one after the other in almost any combination. “What makes our mill-turn centres stand out is the fact that workpieces can be fully milled, turned, drilled, reamed, ground, deburred and polished on all six sides in one operating cycle,” explains Gerhard Schweicker, Sales Engineer at Stama. “With our 5-axis processing unit, the workpiece and tool are freely positioned and swivelled in the working space,” adds the machine expert.

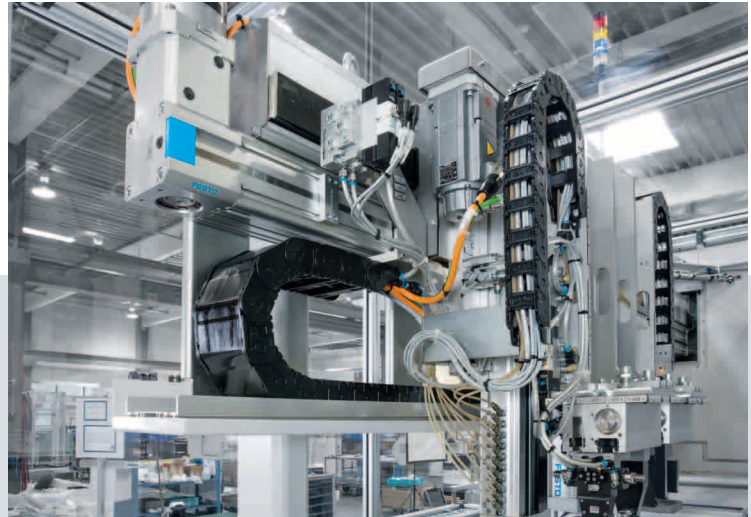
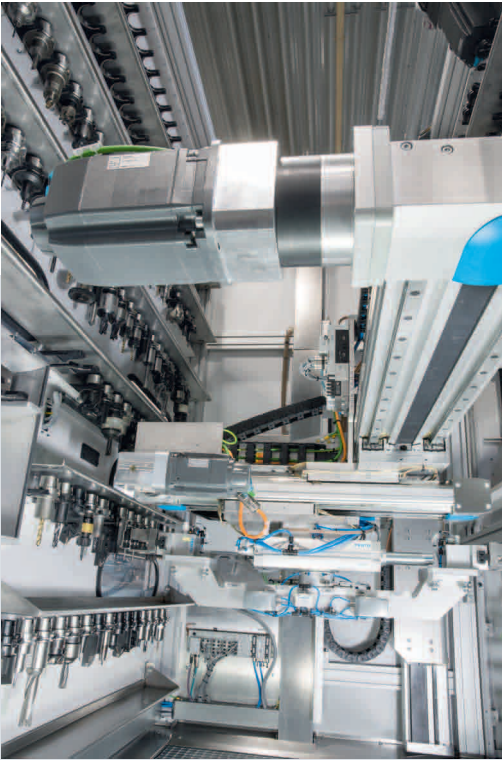
Vertical part loading

“The machines from the MT series MT726-2C and MT734-2C use two tools independently in parallel. The rotating spindles enable parts to be loaded vertically,” according to Schweicker. “The parts are loaded by the integrated automation solution, a linear gantry from Festo with suitable grippers,” says Jochen Boscher from the project management team at Stama. The loader and unloader places the workpiece at the processing station where it is automatically clamped. This enables optimum use of the operating cycles: while one workpiece is still being processed, the integrated automation solution can move into the processing area, unload parts and remove them once they

have been processed, all independently of the other workpiece. The result is shorter unit times and lower unit costs, since loading no longer needs to be done manually. Instead, the ready-to-install linear gantry is opening up new perspectives. A 4.5-metre long horizontally placed axis DGE as well as two independently working vertical axes EGC with grippers HGPL from Festo enable the workpieces to be transported directly to the working space for processing, and to be simultaneously loaded and unloaded. Festo delivers the loader and unloader to the machine complete and ready-to-install.

Tool changer reduces setup times

Stama mill-turn centres from the MT726 and MT734 series are also available with an additional magazine for holding further tools in order to significantly reduce setup times when frequent component changes are required. Here too, fully automated tool changes are carried out by a complete and ready-to-install handling solution from Festo. This tandem gripper/rotary unit comprises axes EGC, the pneumatic semi-rotary drive DRRD and the heavy-duty tool gripper HGPT. “It’s a big advantage to be able to get all the solutions we need for workpiece and tool handling from a single source during the project planning process,” emphasises Boscher. →



Integrated automation: part loading is carried out by a linear gantry from Festo with suitable grippers. (above)

Tool changer reduces setup times: this tandem gripper/rotary unit comprises axes EGC, the pneumatic semi-rotary drive DRRD and the heavy-duty tool gripper HGPT. (left)



“The integrated automation solution with the loader and unloader as well as the tool changer from Festo helps to achieve a space-saving machine layout.”

Gerhard Schweicker, Sales Engineer at Stama

“In Festo, we have a competent development partner for all of our machine automation needs.”

Ready-to-install system solutions

When designing the system solutions for the mill-turn centres, the specialists from the Festo Technology and Application Centres were able to call on a wealth of experience gained while designing thousands of ready-to-install handling solutions. This experience is hugely valuable in projects of this kind, as it ensures the trouble-free integration of various bus systems or the I/O interface in the machine controller. Customer-specific solutions for installation interfaces and disconnection points are adapted to the requirements. In this case, the loader and unloader as well as the tool changer in the additional magazine provide a highly flexible solution as the front end can be adapted to the customer's requirements.

“The integrated automation solution with the loader and unloader as well as the tool changer from Festo help to achieve a space-saving machine layout,” says Schweicker.

“Since three quarters of our machines are used around the world, it is even more important that we work with a global partner like Festo with its extensive sales and service network. This is particularly true for China, where we as a machine tool manufacturer are experiencing especially strong growth,” adds Boscher from Stama. ■

- www.festo.com/catalog/dge
- www.festo.com/catalog/egc
- www.festo.com/catalog/drrd
- www.festo.com/grippers

Stama Maschinenfabrik GmbH

Siemensstraße 23
73278 Schlierbach
Germany
www.stama.de

Area of business:
Manufacture and distribution of
vertical CNC machining centres,
devices, tools and measuring
technology



Automated assembly of air intake controls

A perfect combination

Two small, innovative companies have been leading suppliers to the automotive industry for many years. Their success has been built on using the latest technology as well as close cooperation. The jointly developed production system for air intake control for petrol and diesel engines is a perfect example.

Vögele Industriesteuerungen and LTW Automatisierungstechnik were founded almost simultaneously in 2003. Since 2007, both companies have been working closely together. The specialists in special machine construction, control and automation technology develop and implement solutions for major companies in the automotive, electronics, dispensing and distillation technology industries.

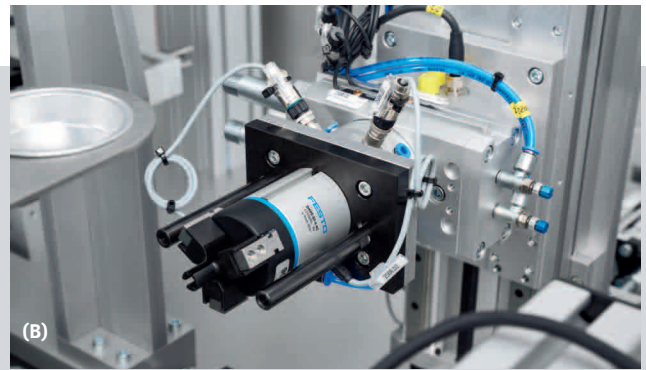
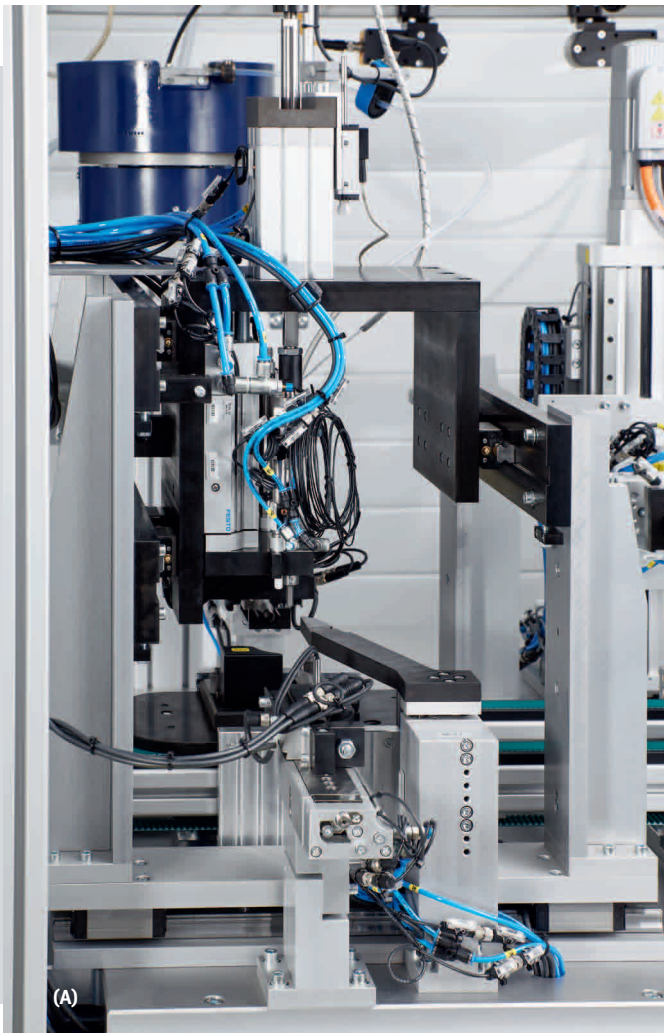
One of the reasons for their successful partnership is the use of innovative technologies. “We always try to integrate the latest technology into our systems, as standing still means going backwards,”

says Martin Wolf of LTW. “By making our machines amongst the most powerful and efficient available, we are securing our position in the market despite being a small company – and we really enjoy working with the latest technological advances. A new system for producing air intake controls for petrol and diesel engines is proof that cooperation with a complete solution provider such as Festo can benefit both companies. The successful mix of electric and pneumatic components means that they can concentrate on their core business in design, assembly, commissioning and maintenance. The components, which are used in the smallest of installation spaces,

include the service unit MS, motor controller CMMP-AS, electric linear axis EGC, semi-rotary drive DRVS and mini slide DGSL with intermediate stop.

Manual and automated

On a new system from LTW and Vögele that is integrated in a production line for the manufacture of air intake controls for one of the world’s biggest automotive suppliers, the housing, shaft and throttle valve as well as the locating pins are joined. Air intake controls regulate the supply of combustion air for diesel and petrol engines and consist of a plastic or metal housing with an integrated, shaft-mounted control flap. The system comprises a →



(A) The first of the three fully automated workstations rotates the workpiece carrier 180 degrees using a cylinder DRSL and fixes it in place using a holding unit controlled by a mini slide DGSL.

(B) Twin-piston semi-rotary drive DRRD with three-point gripper DHDS for picking up the workpiece for machining.

(C) A semi-rotary drive DRVS moves two drip trays below the dosing nozzle, thus protecting the system against contamination.

semi-automatic manual workstation and a fully automated module with three workstations. As the air intake controls come off the conveyor, a rotary and swivel unit first rotates the workpiece carrier 180 degrees so that the information from the reading head can be analysed. A compact cylinder ADN designed as a holding unit fixes the plastic housing of the air intake control in place. A worker then inserts the shaft for the throttle valve, which is added later in the process. An electric linear axis EGC moves the workpiece carrier into the correct position for the shaft length, which varies depending on the type. The pneumatic linear drive DGC moves a pilot mandrel into the end position. The shaft is then pushed into the component with the pilot mandrel by pressure switching. After the joining process, the worker manually inserts the throttle valve into the fitting holes of the shaft.

Precision fixing

At the first of the three fully automated workstations, the workpiece carrier is rotated 180 degrees using a cylinder DRSL and then fixed in place using a holding unit controlled by a mini slide DGSL. The next step involves checking the presence of the needle bearing case and needle bearing, which enclose the throttle valve shaft on both sides. At the same time, they are correctly aligned and positioned so the locating pin can then be pressed in. To ensure that the pin can be inserted at different points, a round cylinder DSNU moves the complete workpiece carrier into position.

The second automated workstation first removes the workpiece from the conveyor using semi-rotary drive DRRD with three-point gripper DHDS, so that the machining forces do not have a negative impact

on the conveyor. After being moved to the machining position, the ends of the locating pins are drizzled with a synthetic resin. To reach the pin ends on both sides of the air intake control, the workstation swivels the workpiece 180 degrees and then back into the initial position. Meanwhile, a semi-rotary drive DRVS moves two drip trays below the dosing nozzle to protect the system against contamination.

Intelligent time savings

At the third workstation for curing the adhesive using UV light, two workpieces can be machined at the same time. After one workpiece has been gripped, rotated 180 degrees and transported to the UV station, the next one can be picked up and taken for curing. With a system cycle time of just 13 seconds, the curing time can be doubled. The intermediate stop of the mini slide DGSL ensures optimum



“Thanks to the use of new Festo products and our close cooperation with Festo, we are always up-to-date with the latest technology.”

Albin Vögele, Vögele Industriesteuerungen



“When it comes to quality, we make no compromises. As a small company, we need to focus our resources and keep potential repair and maintenance costs to a minimum.”

Martin Wolf, LTW Automatisierungstechnik

positioning of the upper of the two UV lights. The slide DGSL is equipped with short shock absorbers for space reasons. Once all adhesive points have been cured, the air intake control is placed back on the workpiece carrier and transported to the next machining line. The valve terminal MPA/CPX together with the service unit MS and the new motor controller CMMP-AS M3

with safety plug-in card ensure good performance, high energy efficiency and maximum safety. ■

www.festo.com/catalog/drvs

www.festo.com/catalog/dgsl



The new system from LTW and Vögele mounts the housing, the shaft and the throttle valve as well as a locating pin in just 13 seconds.

Vögele Industriesteuerungen


Sudetenlandstraße 3
88677 Markdorf
Germany
www.voegele-industriesteuerungen.de

Area of business:
Control and automation technology

LTW Automatisierung- stechnik

Mühlbachstraße 23
88697 Bermatingen/Ahausen
Germany
www.ltw-automatisierungstechnik.de

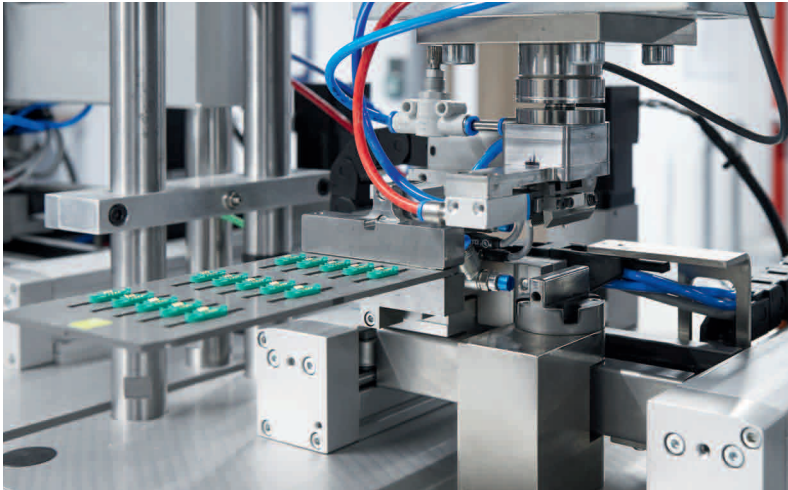
Area of business:
Special machine construction
and automation



Servo presses and handling systems for connector assembly

Flexible, yet standardised

Just as PCBs have successfully managed to pack an increasing amount of power into a smaller space, developers of plug connectors are working to accommodate more power and a higher contact density into smaller, lighter plug connectors. The family owned British manufacturer Harwin plc relies on Festo automation to safeguard the quality and flexibility of its production using equipment such as the servo press kit YJKP and the compact handling system YXMx.



Dynamic and precise: the compact handling system YXMx takes care of the XY movement of the connectors below the servo press

Harwin's connectors are high quality, reliable and durable and can thus be used in harsh ambient conditions. They don't only fit the bill for customers in industry sectors such as cost conscious consumer electronics, but also in the ultimate performance seekers such as aerospace, motor sports and the automotive industry, where extreme operating temperatures between $-65\text{ }^{\circ}\text{C}$ and $+150\text{ }^{\circ}\text{C}$ as well as severe vibrations are the order of the day. This means the connectors have to consistently be made to very high standards.

High standards

The response by Harwin to these market requirements has been to launch the Gecko range of connectors. These advanced connectors have a pin pitch of only 1.25 mm and are half the size and 75% lighter than micro D connectors. Their robust screw connection makes them extremely safe and reliable and able to withstand countless mating operations without damage.

The Gecko connector manufacturing process has been continuously refined from an initially manual process to today's highly automated solution, capable of producing hundreds of thousands of connectors a year with a wide range of connector configurations ranging from 4 to 50 pins per connector and many PCB mounting options.

Modular concept

Harwin started developing a new production line with the aim of making the production of the Gecko series more efficient. Both a high level of automation and a high degree of flexibility were needed to be able to produce differently shaped and sized connectors on one assembly line. "That is why we developed a modular concept together with Festo," explains Paul McGuinness, Operations Director at Harwin.

The new assembly lines at Harwin are built around the servo press kit YJKP and the compact handling system YXMx from Festo. The handling system takes care of the XY movements of the workpiece carriers and the plastic housings assembled in several of the system stations. The servo press kit, which provides easy-to-configure position- and force-controlled movement along the Z-axis, is used for press-fitting and bending the contact pins.

Standard parts

In all stations, the electric and pneumatic drives are each controlled by their own controller CECC-X together with a valve terminal CPX/MPA. "These Festo systems enable maximum standardisation and modularisation, as standard parts are used everywhere. This makes commissioning and maintenance easier," explains McGuinness. One of the assembly lines →



“The modular concept developed together with Festo future-proofs our assembly lines.”

Paul McGuinness, Operations Director at Harwin



Everything for the servo press kit YJKP is available from a single source: drive package, controller and application software.

Setting standards

The new assembly lines for electric connectors are not just setting high standards from a technical point of view, they are also a modular and scalable automation concept. The three main stations for inserting the pin contacts into the connector housings, press-fitting the pins and bending the pins are based on modules with as many standard parts as possible:

- All three stations have a common base plate.
- The moulded connector bodies are moved using the compact handling system YXMx.
- All the electric and pneumatic actuators are controlled by a controller CECC-X in combination with a valve terminal CPX/MPA.
- The press-fitting and bending stations use the servo press kit YJKP.



Modular design: the three stations of the Gecko assembly line for inserting, press-fitting and bending the contact pins – designed using standard components from Festo.

for manufacturing the connectors consists of three central stations: for inserting, press-fitting and bending the contact pins. In the first station, the workpiece carriers are equipped with the connector housings and are positioned using the compact handling system YXMx so the contact pins can be inserted. In the second station, the servo press presses the contact pins into the connector housing. The precision gripper HGPT from Festo locates the workpiece carriers holding the connector housings while the pins are fitted.

Dynamic and precise

The kinematics of the compact handling system enable dynamic and precise movement and ensure the connectors are precisely placed under the press-fitting tool. This works flawlessly thanks to the low moving mass.

The modular servo press kit YJKP consists of a closed-loop servo motor, a mechanical axis, a motion controller, force detection as well application software. The result is precise, powerful and gentle movement of the pins to the correct position. Evaluation functions such as insertion or block force monitoring by the application software supplied detect whether the fit is within tolerance.

Modular and reliable

The handling system and the servo press kit are also used in the last station for bending the contact pins to the required

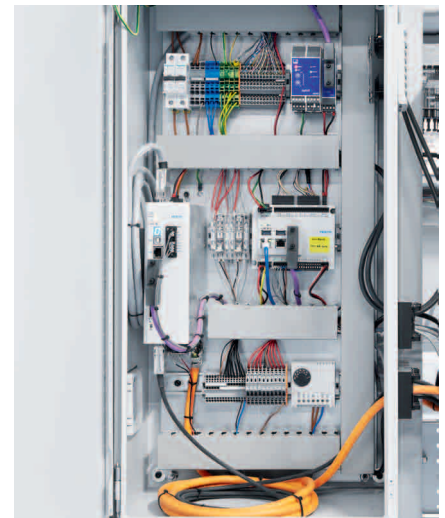
angle. The CoDeSys software in the controller CECC-X allows comprehensive control of the servo press profile, providing position and force control throughout the cycle.

The application software supplied with the servo press makes programming extremely easy thanks to an intuitive graphical user interface. It makes it easy to adapt the press profile to the different connector variants without the need for special programming skills. Three valve terminals CPX controlled by the master controller CECC-X actuate the numerous electric and pneumatic grippers and actuators.

“The automated modular concept ensures low production costs and high reliability, precision, repetition accuracy and flexibility,” explains automation expert McGuinness. ■

www.festo.com/yjkgp

www.festo.com/yxmxx



Everything under control with the servo press kit YJKP: controller CECC-X and motor controller CMMMP including application software.

Harwin plc Europe

Fitzherbert Road, Farlington
Portsmouth, PO6 1RT
United Kingdom
www.harwin.com

Area of business:
Manufacturer of electric
connectors and mechanical
components for PCBs

[Compact]

News from around the world

Suzhou, China

In a joint initiative, Festo Didactic SE and Suzhou Industrial Park Human Resources Development Co., Ltd. (SIPHRD) have developed a learning centre for providing training to specialists from the China-Singapore Suzhou Industrial Park (SIP). There are 5,000 companies based at the SIP. Half of them are international companies – among them global players including Audi, Logitech, Apple and Bosch. A total of 710,000 specialists and managers work at the SIP.

Youtube, worldwide

With the new YouTube video series “service2see”, Festo is providing a support tool for service technicians and engineers in the areas of maintenance, commissioning and configuration.



The online tutorials show, for example, how to replace the toothed belt of an ECG axis or how to update the firmware of the Festo Configuration Tool. The channel was launched with around two dozen tutorials in German and English and will be gradually extended. The objective is to create a YouTube library that covers the topics and questions that the Festo Technical Customer Hotline are asked most frequently.

👉 www.festo.com/youtube/service2see



At your fingertips: on our YouTube channel Festo Service, you will find practical and user-friendly video tutorials on frequently asked questions and topics.



Photo: © EM-Technik

Perfectly polished

Austria // Cleaning the inside of tall, narrow glasses or bottles is not an easy task. Polishing and deburring the insides of narrow pipes is even trickier. Tyrolean company EM-Technik has developed the ideal solution, which features components from Festo at every processing step. Semi-rotary drive DRRD, stroke cylinder DGSL and parallel gripper HGPD are used to feed the pipes.

To process the pipes, small brass brushes are picked up automatically using three-jaw grippers and guided through the pipe with vertical movements. They are then alternately rotated in a clockwise and anticlockwise direction. At this and all downstream processing stations, electric toothed belt axes ELGR with stepper motors EMMS ensure perfect precision in motion sequences along the Z-axis. An additional station is reserved for smaller quantities for special designs. With these variants, part of the outer contour also needs to be processed. An electric cylinder type EPCO ensures that the tool is precisely tilted until it reaches the required angle. A toothed belt axis ELGA aligns the entire station to compensate for the tilting movement.



Axes DGC feed the brush magazine from the magazine set-up to the processing station.

🌐 www.em-technik.co.at

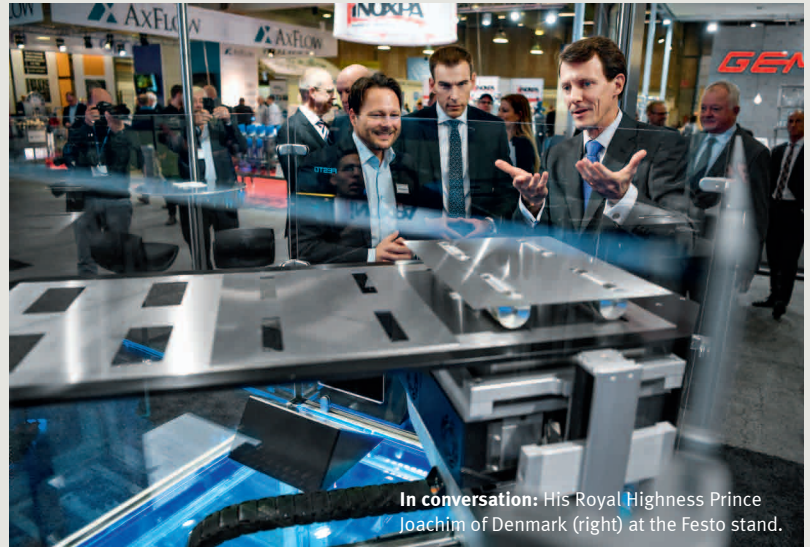


Festo Training and Consulting

Industry 4.0 features prominently in the new seminar plan 2017. Along with traditional basic and advanced seminars in various technical subjects, there is also a wide range of training options

aimed at developing skills for the production of the future. The seminars on offer include network technology for Industry 4.0, human-machine interaction for the next generation, and planning and simulation in virtual and augmented reality.

www.festo-tac.com



In conversation: His Royal Highness Prince Joachim of Denmark (right) at the Festo stand.

Royal visit

Denmark // FoodTech in Herning is the most important trade event for Scandinavian food producers and their suppliers. The industry's biggest trade fair in Northern Europe takes place every two years and is open to trade visitors only. The fair was officially opened by Prince Joachim of Denmark in November of last year.

His visit attracted a large media presence. During his guided tour of the trade fair, he visited the Festo stand where he learned about the latest innovations in superconductor technology. Visitors who were interested in this topic were able to attend a presentation on "Festo Future Concepts: Superconductors and a new world of automation in the food industry".

The intelligent glove

Germany // For the tigger train drivers who supply material to the assembly stations at the Scharnhausen Technology Plant, the routine task of loading and unloading boxes, sorting them, and then scanning each one using a scanning device was a laborious and tedious procedure. Relief is now on the way in the shape of a glove featuring an integrated scanner. Following successful completion of a test phase, the ProGlove is now being used for all tigger trains.

At first glance, the ProGlove looks just like any glove you might find in a DIY store. However, beneath the glove's surface lies sophisticated technology in the form of sensors that trigger a scanner on the back of the hand. These sensors automatically detect containers as the tigger train is loaded and unloaded and throughout the processing steps. Thanks to the glove, the tigger train driver can use both hands to grip the boxes. The glove also protects against injury. Another advantage is that workers can work



more quickly. It takes much less time to scan using the glove than with a separate scanning device.

www.proglove.de



The ProGlove allows bar codes to be read quickly and easily.

What was it like in Rio, Ms Wiesner?

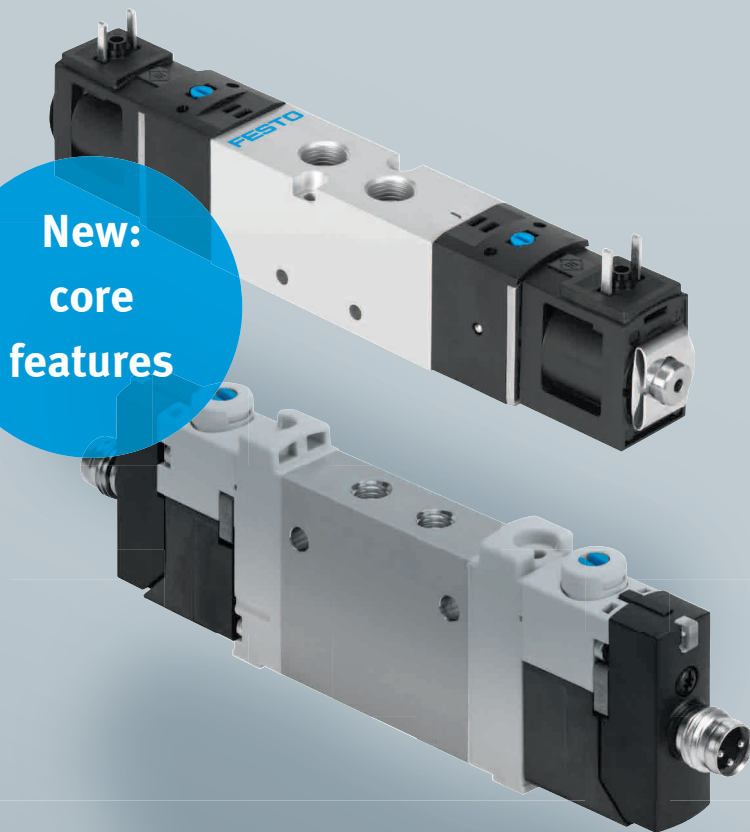
“ Being a referee at the 2016 Paralympics was an amazing experience; it really was a once-in-a-lifetime opportunity. I've been fencing since I was 12 years old. In my club, both able-bodied and wheelchair fencers train together. I was 16 and 18 when I obtained my trainer and referee licences in épée and foil fencing. My first major experience as a referee was at the World Cup competitions in wheelchair fencing. The camaraderie, the coming together of different nationalities and the opportunity to experience and to demonstrate inclusion on such a high-profile stage have inspired me ever since.

When I was nominated as a referee for Rio last March, I accepted immediately. I got to spend ten unforgettable days in the Paralympic Village and attending competitions. Brazil is a country that is crazy about sport. My own personal highlight was being the main referee for the Men's Épée Team Final between France and China. I'll never forget the amazing atmosphere in the packed hall. Wheelchair fencers rarely get a chance to compete in front of so many spectators as at the Paralympics.

My experience as a trainer also helps me in my job at Festo. However, I'm not training myself. My colleagues and I in the Product Training department provide product trainers with organisational, methodological and educational support and assist with the creation of learning media and training hardware. I also organise major events such as International Product Training (IPT), two one-week events for 300 Festo colleagues from Europe, Asia and America. IPT also provides the participants – product marketing managers and technical support experts from all over the world – with a platform for sharing experience and information. My job is to ensure that all the trainers have everything they need to share their expertise and experience in presentations, workshops and small group sessions. Of course this doesn't require any referees, because in product training everyone's a winner.



FESTO



Quality at an attractive price

The sturdy VUVS-...-S for when the going gets tough.
The compact VUVG-...-S for when space is at a premium.
Two valves with core features for your everyday tasks. Both are part of the “Stars in Pneumatics” core range and are therefore extremely attractively priced, available worldwide and ready for dispatch in 24 hours.

www.festo.com/vuvs
www.festo.com/vuvg

About this magazine

trends in automation 1.2017
April/May 2017

Publisher

Festo AG & Co. KG
Ruiter Straße 82
73734 Esslingen, Germany
Phone ++49 (0) 711 347 0
Fax ++49 (0) 711 347 2628
service_international@festo.com

Manager Customer Magazine

Silke Gartenmeier,
Market Media Creation
silke.gartenmeier@festo.com
Phone ++49 (0) 711 347 3902

Responsible for content

Dr. Guido Purper,
Head of Market Communication
guido.purper@festo.com
Ralf Sohn, Head of Direct Marketing
ralf.sohn@festo.com

Please note

All terms such as customer, user, specialist or sales engineer refer to both men and women.

Copyright 2017 Festo AG & Co. KG
All rights reserved.

All images, graphics and texts are protected by copyright law or other intellectual property rights. Any reproduction, modification or use in other print or electronic publications is prohibited without the express consent of Festo AG & Co. KG.

 www.festo.com/facebook

 www.festo.com/twitter

 www.festo.com/youtube

 www.festo.com/linkedin



Flexible snake armour

Snakes are a classic example in terms of their flexibility of movement and adaptability. However, because they are limbless, their bodies have to permanently endure friction forces. A snake's skin must last two to three months until it is shed. It was these properties that prompted researchers at Kiel University, Germany, to explore the idea of snake skin as a model for wear-resistant materials. So they decided to examine the skin of four snake species with very different habitats.

They discovered that although the thickness and structure of snake skin vary depending on the species, the skin of all species has a stiff and hard outside, and becomes softer and more flexible towards the inside. A material that changes from being stiff on the outside to more flexible on the inside can distribute an impact force over a larger area. This combination of hard and soft creates a "flexible armour". The frictional properties of snake skin are an important model for the bionics research being conducted at Kiel University for the development of new and the optimisation of already existing materials.

Festo AG & Co. KG

P.O. Box
D-73734 Esslingen
Phone ++49 (0) 711 347 0
Fax ++49 (0) 711 347 2628
service_international@festo.com
www.festo.com