



FESTO

**Highlights
2019**

You want to make your applications more productive.
You are looking for efficient solutions.
We are entering the digital future with you.

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



**Connectivity – the smart link between you and us.
Become a part of our digital network!**

With this NFC tag it couldn't be easier: Activate
NFC mode and place your smartphone on the photo.
Highlights 2019 will then be displayed on your
smartphone.



Dr Ansgar Kriwet, Member of the Management Board, Sales, Festo AG

Dear customers,

With this issue of Highlights 2019, you are holding a kind of compass in your hand. It will show you where the path with Festo might take you this year. Once again, this past year we invested around eight per cent of our turnover in researching and developing new products and solutions, helpful tools and useful services.

You will see the first results in our core product range. Numerous new components like the mini slide DGST or the compact cylinder ADN-S are useful additions to the portfolio. The core product range with its more than 2,200 products covers 80 per cent of automation tasks. All components can be delivered very quickly and are generally on their way to you within 24 hours, even for large quantities.

A central theme for us is connectivity at all possible levels: mechanical, electrical and software. The consistency of the new automation platform with its core electric components, the servo drives CMMT, the servo motors EMMT and the automation system CPX-E simplifies your work. From initial engineering to commissioning and operation, we make you faster and more productive.

The Festo Automation Suite, also new and the only tool of its kind in the world, plays a central role in the quick and easy commissioning of the complete drive package in just five steps. It includes parameterisation, programming and maintenance and is available to download free of charge.

However, this new level of connectivity also presents a new challenge. Products can no longer be developed in isolation: the industrial environment and the interaction between products must be taken into consideration during development. From this point on in the development, the step to digitalisation is just a small one.

For the first time in the history of our highlights, you will therefore find a special chapter dedicated to digital products. These range from configurators, operating software (e.g. for our inspection camera systems) and the digital maintenance manager Smartenance to IoT gateways for the cloud and dashboards. This trend will evolve rapidly. We want to play a leading role in helping to shape this development, but do not want to lose sight of one goal: our developments should help you at every stage of your value chain, make your work easier and deliver greater productivity. Because we are the engineers of productivity. Put us to the test!

I hope you have an informative read and find lots of inspiration on the path to the future of automation!

A handwritten signature in black ink, appearing to read 'Ansgar Kriwet' with a stylized flourish at the end.

Dr Ansgar Kriwet, Member of the Management Board, Sales, Festo AG

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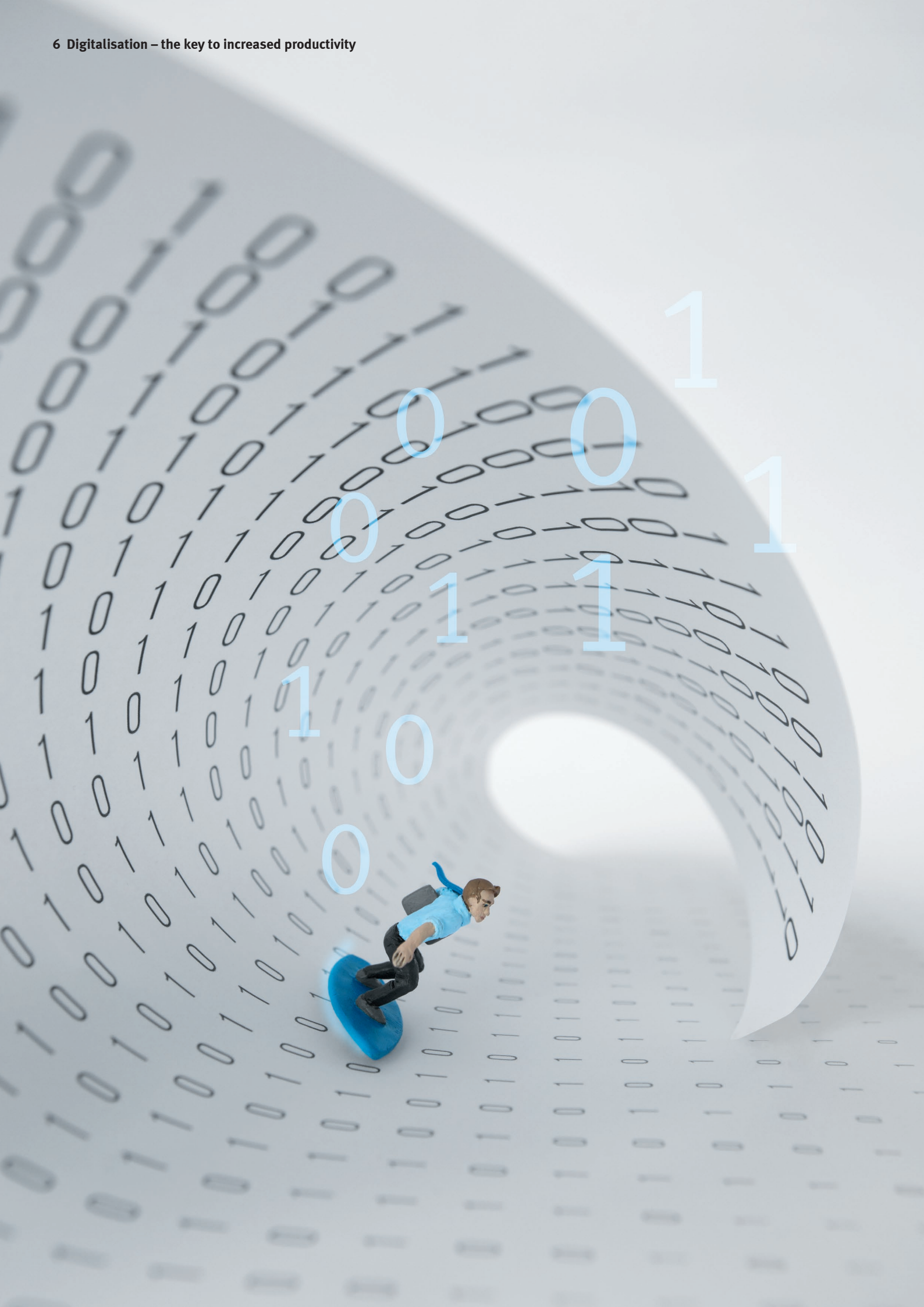
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#higherproductivity – added value through digitalisation

What advantages does digitised automation offer you? How can you benefit from it? The rapid progress in this field raises a lot of questions. The answer from Festo is scalable digital solutions that make it easy for you to get started in digitised automation and a clear plan for the future.

The journey continues

Like most other companies, Festo is standing on the threshold of this digital development. Smart products, connectivity, the mining and interpretation of data, including via the cloud, and dashboards for visualisation are where things are at the moment. Data analytics, machine learning and artificial intelligence will be successively added to the range in the near future. With these methods, this transformation will result in new business models.

Digitalisation already increasing your productivity

Digitalisation is already boosting one thing: your productivity. Precise reproducibility makes your processes more reliable. Condition monitoring opens up completely new possibilities for energy-efficient production. And the flexibility makes you faster, for example if you have to change formats frequently. Everything is ready for when you need to draw on our applied application and digital expertise.

Indispensability of smart products

For digitalisation to advance and a new digital infrastructure to be used, products must be equipped with smart functionality. Sensors collect specific data such as energy consumption, compressed air consumption or operating temperature, which is then evaluated. Products like the energy efficiency module E2M, IO-Link®-capable components, the CPX-IOT gateway or interfaces like OPC-UA contribute to this process.

Consistent connectivity at all levels

Another basic requirement for successful digitalisation is mechanical, electrical and intelligent connectivity through software solutions. The benefit is that everything works together and is compatible. Dimensions, electromechanics, structures, logic circuits, etc. should be consistent, enabling all customers to find their bearings quickly and intuitively. Festo is promoting this with an open automation architecture and a large product portfolio made up of axes, motors and controllers. Standardised software tools are also being developed: configurators for smart engineering, the Festo Automation Suite for easy commissioning and the digital maintenance manager Smartenance for reliable operation.

New perspectives in development

Product development will undergo a fundamental change in the future. Products can no longer be developed purely using a mechanical perspective. IT structures and applications are the new benchmark for machine concepts. Agile development will take place by applying Scrum methods, for example. They not only enable fast corrections in the form of software updates in the event of faults or improvements in the process, but also, if necessary, changes to predefined objectives in the development process. Customers will also be more actively involved in the future through so-called co-creation, which suppliers or scientific institutions can help to shape.

Easy access to products: digital data, digital twin

Product development always culminates in a digital twin. It is a virtual model of a product within an administration shell containing documentation and data sheets, for example for maintenance. This data is especially interesting for teams, as it is available to all authorised employees.

An example is the Festo Motion Terminal controlled via Motion Apps. Digitalisation is raising pneumatics to a new level, with the apps enabling the same piece of hardware to perform different functions. These Motion Apps have been developed in response to customer needs and feedback. They reproduce a variety of conventional functions. However, they also include new functions that can only be implemented via the software. Different processes can thus be implemented sequentially on one valve throughout a machine cycle.

Design and operating data for products and systems helps in all phases of the value chain. In the design process, it makes product searches intelligent and largely intuitive. If changes are made, for example to the size, the other components are automatically adjusted. With a product portfolio of more than 30,000 components, the design process is significantly accelerated by configurators such as the Handling Guide Online HGO. An app like EPLAN Schematic Solutions reduces the time required to document complex valve terminals from several hours to a few minutes.

Purchasing is now also quicker and easier as you can transfer most data from the design directly to the Online Shop.

Tools such as the Festo Automation Suite that have been developed specifically for commissioning make the process quick and intuitive. You can intelligently link and commission everything, from the workpiece to the controller, whether you are using a

Festo controller or one from a third-party. With the controller CPX-E, the number of steps required is reduced from almost one hundred to less than five!

The digital shadows, in other words the data returned from the machine and process during commissioning, can be used for condition monitoring via dashboards and additional automatic process improvements.

In operation, the data collected from the system is particularly useful for optimised production and preventive maintenance. Dashboards, which aggregate data from the cloud in real time or from the archive, help you to make the right decisions to increase your productivity. This not only applies to the individual system – the globally available data can also be compared with other data. A next step involves using data analytics. Finally, selected data can go back to Product Development. It then helps to improve products so that they provide the perfect solution to the task at hand.

The Festo App World

The Festo App World is a separate portal set up by Festo so that you can easily purchase and use the apps, cloud products, software libraries and added value services. You can make purchases directly online here, view the relevant apps for your hardware via your Product Key as well as your order history, and set up subscription models or subscriptions. Simply log in with your Festo account, select the digital product you want, and add it to your basket. You can also simply forward the basket to the appropriate colleagues authorised to make purchases.

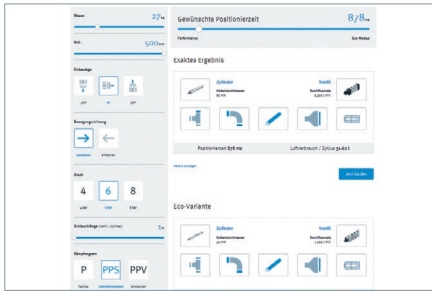


Find out more:

→ www.festo.com/appworld



Pneumatic sizing

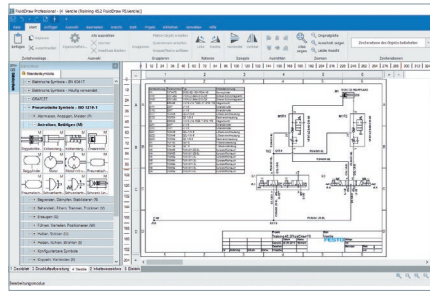


Makes designing your pneumatic control chain child's play.

You simply enter three application parameters such as load, stroke and positioning time. Pneumatic Sizing then calculates at breakneck speed up to three pneumatic functional chains in Eco and Performance variants, offering you the best results for your application. You then benefit from the optimal air consumption or the ideal travel time per cycle. And the direct connection to the Festo Online Shop also makes purchasing quick and easy.

- Quick and easy calculation
- Calculation of three functional chains
- Eco and Performance options
- Automatic transfer of data to the Online Shop

FluidDraw 6 Professional (GSWF)



Pneumatic and electric circuit diagrams made easy.

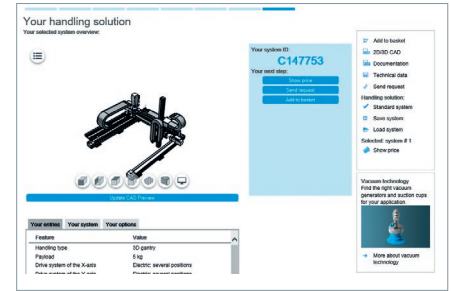
With the new FluidDraw 6 Professional, you can create standard-compliant pneumatic and electric circuit diagrams even more reliably and efficiently. You have direct access to online baskets you save at Festo and databases you imported as well as a standard-compliant symbol library to ISO 1219 and EN 60617. Customisable lists provide automatically generated evaluations at the push of a button. And once you have created a project, you can conveniently save it as a template for other projects.

The new licence models are tailored to your application. And with the annual subscription FluidDraw 365, for example, you always get the latest version, at no extra cost.

New in version 6:

- Access to Festo online basket
- New, built-in drawing frame editor
- Customisable evaluations
- Personal project templates
- Flexible licence models without a hardware dongle

Handling Guide Online



The right handling system in just 20 minutes.

The Handling Guide Online is a configuration and ordering platform in one and is integrated into the online product catalogue. This unique online engineering tool helps you to find the right handling system and helps you to select, configure and order your standard handling system in record time. Now that the Handling Guide Online also includes highly dynamic and compact systems, you have even more choice. And you automatically get the commissioning data with your order.

- Minimum engineering effort, no need for detailed product knowledge
- Immediate net price for reliable cost calculations
- Extended product selection for high requirements for dynamic response and installation space
- Commissioning files to download included
- Access to device information directly from the software

Cabinet Guide Online for water technology



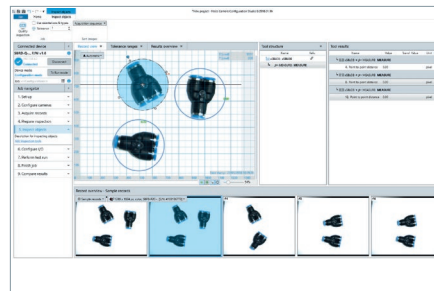
The perfect control cabinet for water technology in just a few minutes.

The Cabinet Guide Online revolutionises the engineering process for individual control cabinet solutions in water technology; from now on, configuring and ordering will be smart and intuitive. The Cabinet Guide Online guides you through the configuration process step by step by asking simple questions about the application, so you do not even need in-depth knowledge of automation technology. It suggests a solution straight away along with the price and delivery time. The control cabinet is delivered fully assembled and tested, with CAD data and EPLAN circuit diagram – this saves time and costs in areas other than just engineering. Everything fits perfectly!

- For actuating 4 ... 20 process valves
- Up to 80 digital and 16 analogue I/Os
- Right housing size, material and equipment for the application and installation location
- Various fieldbus protocols
- With/without filter regulator
- Option of manual operation

→ www.festo.com/cabinets-water

Camera Configuration Studio



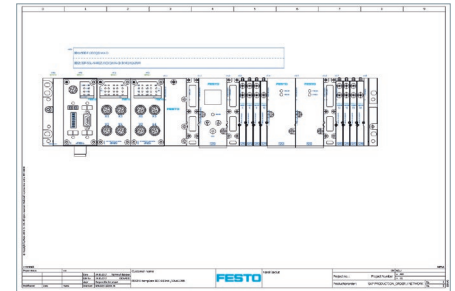
Bring your pictures to life with the Camera Configuration Studio.

The new image processing software Camera Configuration Studio for the smart camera SBRD delivers fast and reliable results for your camera-based inspection tasks. With Camera Configuration Studio, you can configure inspection programs and define, log and adjust all processes from image recording to the input and output parameters – and simulate them in advance on the PC.

- Innovative software for the smart camera SBRD
- Tool CCS xRun specially for pick & place solutions
- Step-by-step commissioning instructions
- Individual adjustment and evaluation of the inspection characteristics – with any number of recordings

→ www.festo.com/machinevision

Schematic Solution for EPLAN projects



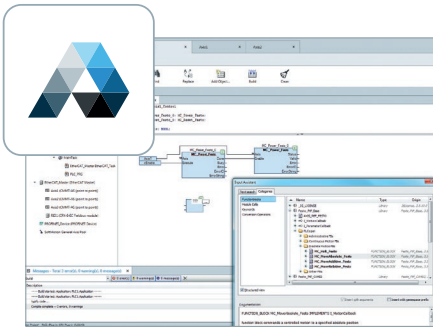
A real time saver! The circuit diagram service for complete EPLAN projects.

This circuit diagram service is unique to Festo. Schematic Solution for EPLAN projects documents your configured solutions comprehensively and in next to no time. Simply enter the order code and receive the complete plan in just a few minutes – error-free and trouble-free. Instead of tediously having to search for, download and piece together individual components, all the hard work is done for you, cutting the amount of time required from several hours to just a few minutes. This service is available in our App World at www.festo.com/appworld. Under Apps, select the Engineering Tools option.

- Intuitive, fast and reliable, error-free documentation at the push of a button
- Already available for the product series CPX, VTSA, MPA
- Securely automated in accordance with the standards IEC 61355, IEC 81346, ISO 1219

→ www.festo.com/eplan

Festo Automation Suite



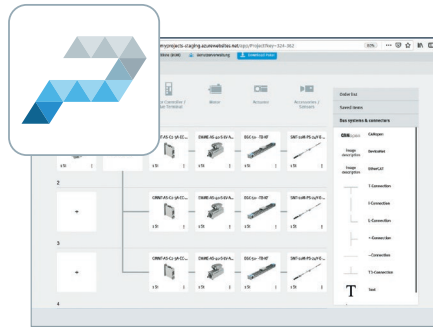
Everything in one piece of seamless commissioning software.

With the Festo Automation Suite you can commission the entire drive package, from the mechanical system to the controller. Perfect as a simple, efficient and seamless approach to automation design. The basic functionalities of all Festo components are already integrated into the software. You customise the software to your exact needs using plug-ins and add-ons that you can install directly from the program. The Festo Automation Suite demonstrates its strengths in particular with the servo drive CMMT-AS and the automation platform CPX-E.

- Parameterisation, programming and maintenance
- Only five steps to get a drive system up and running
- Greatly simplified integration into the control program
- Customisable through device-specific plug-ins
- Optional CODESYS add-on for motion control up to robotic functions
- Access to device information directly from the software

→ www.festo.com/automationsuite

Festo Projects



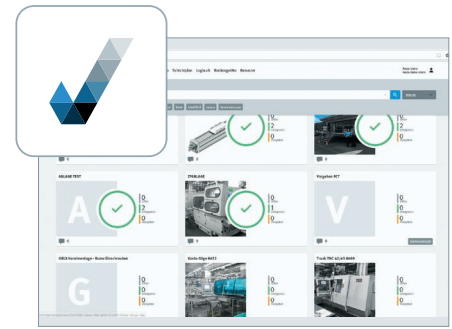
The first lifecycle management platform for your components.

Manage all your projects with Festo and organise your Festo components easily over their entire product lifecycle. Festo Projects provides a quick and clear overview of configuration-specific product data. Your assets are arranged intuitively and clearly in accordance with the relationship between the control system, fieldbus and components. You stay up to date at all times in the event of product changes and updates. In addition, Festo Projects makes collaboration easier: simply invite other participants by e-mail to collaborate on your project.

- Saves time: reuse and configure specific engineering data
- Collaboration platform: centralised project memory with file upload and sharing across departments and between components
- Easy to link: Festo Projects integrates itself into many Festo customer tools like the Handling Guide Online
- Digital twin for Industry 4.0
- Lifecycle management with data that is always up to date

→ www.festo.com/projects

Smartenance – mobile digital maintenance management



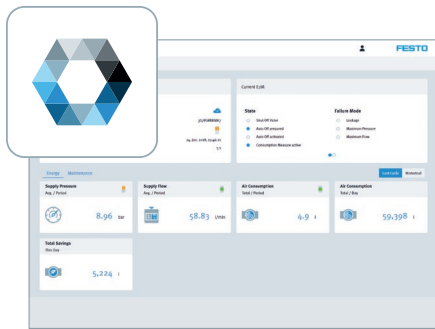
Smartenance makes your maintenance management paperless and efficient.

With the digital maintenance manager, you schedule your system maintenance and then evaluate it. You can create, duplicate and evaluate maintenance tasks and schedules easily and flexibly. The intelligent user management for fast collaboration within the team increases the efficiency of your maintenance management. Smartenance is quick and easy to install, self-explanatory and a simple and cost-effective introduction to digitalisation. Have a look at the Maintenance section at www.festo.com/appworld.

- Digital maintenance management directly on the shop floor
- For auditors: detailed proof at a click
- Cloud-based: mobile access from anywhere
- Feedback function: quick and easy collaboration in the maintenance team
- Smartenance is available in selected countries

→ www.festo.com/smartenance

Dashboard for energy efficiency module MSE6-E2M



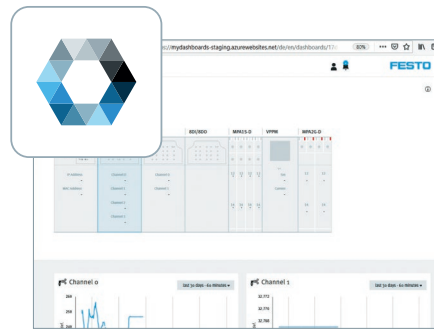
Saving energy is easier than ever before – at the push of a button

MSE6-E2M automates saving energy in compressed air systems. The intelligent module fully automatically monitors and regulates the compressed air supply in new and existing systems. The preconfigured, turnkey dashboard with specific widgets and graphs for energy monitoring shows you immediately what the energy status is and how you can achieve CO₂ savings.

- Access to historical data going back a year
- Preconfigured and ready to start without programming
- No additional software
- Cloud-based web application for fast and efficient analysis of long-term measured values
- Greater transparency

→ www.festo.com/dashboards

Dashboard for valve terminal CPX-MPA



Always be well informed throughout the entire lifecycle of the product.

The cloud solution from Festo is there to support you throughout the entire lifecycle of your system – now also with a dashboard for the CPX-MPA. You can see the following at a glance: asset data, data for preventative maintenance, diagnostic functions, error displays in clear text, simplified process data analysis and fault finding. Try it now!

- Preconfigured and turnkey
- Simplified fault finding/process data analysis with data history going back one year
- Diagnostic information/remove error diagnostics
- Data for preventative maintenance
- Asset data
- Process KPIs

→ www.festo.com/dashboards

Festo Cloud and dashboard Festo IoT gateway CPX-IOT



Dynamic automation solutions from Festo: from the mechanical system to the cloud.

Festo will be introducing a cloud that will allow all suitable Festo devices to be connected via the CPX-IOT gateway, with data visualisation and rapid data analysis via apps in the cloud and the dashboard.

This will boost productivity for machine builders and end users alike thanks to, for example:

- A single view for (sub)systems, electric drives, pneumatic components and a central monitoring unit thanks to cloud-based visualisation
- Simple visual presentation of complex interrelationships in the Festo cloud – worldwide
- Greater transparency, e.g. through condition monitoring online
- Optimisation of applications, preventive maintenance, etc.

Connections to other clouds such as MindSphere on request. The hardware for unlimited communication is provided through the IoT gateway CPX-IOT. This is based on the CPX module format and collects information about Festo devices and their statuses via Ethernet and communication protocols such as OPC UA.

→ www.festo.com/iot

Smaller, better performance, more quickly integrated: 2D linear gantry from Festo

GN Thermoforming Equipment, located in Chester, Canada, is the global market leader for thin, thermoformed plastic objects such as food containers. When requested by customers, GN also installs in-house developed pick & place systems in its machines. These systems are from Festo. The reason: the systems can be designed in no time at all with the Handling Guide Online and integrated in the machine.

The containers that are made by GN's machines using thin plastic and a heat-forming process have a huge variety of applications, including in the food industry. Specially developed tools press the heated plastic into the desired shape. On request from the customer, the engineers at GN also develop pick & place solutions that stack finished products as they come out of the machine – so-called robotic stackers.

When the latest thermoforming system, the GN800, was developed in 2016, GN decided to search for the most up-to-date technologies for the pick & place system and came across Festo and the Handling Guide Online. This online tool makes designing handling systems child's play and delivers suitable results extremely quickly. The proposed solutions enabled GN to achieve the desired increase in productivity as well as the ability to execute at least 45 picks per minute.

Faster engineering, simpler ordering

Thanks to rapid engineering, time-to-market was shorter for the GN800 – even with robotic stacking. Documentation provided by the Handling Guide saves time too. Laborious searching, for example for replacement parts, is no longer necessary. At the same time, development costs are reduced because the design of the linear gantry has already been established and employees can concentrate on other important design elements.

Purchasing also benefits from the decision to design the pick & place solutions using the Handling Guide Online. The fact that there's just one single part number for the entire linear gantry simplifies ordering and data management, and makes them less expensive as well.

Installation and setup time reduced from four days to four hours

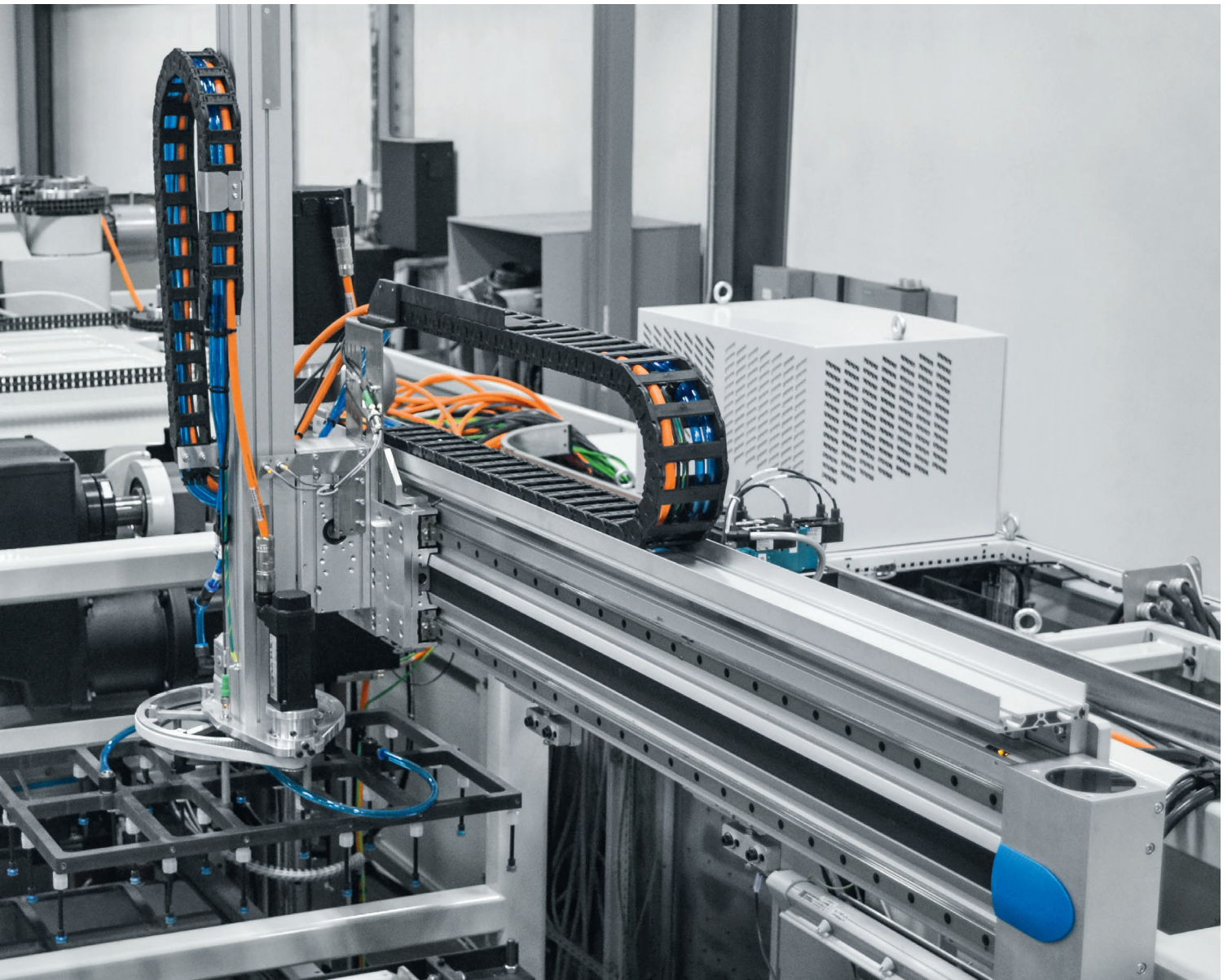
Pre-tested solutions from the HGO are pre-assembled and delivered in one piece to facilitate quick installation and short setup times. This reduces the previously required installation time of four working days to four hours.

More room in production

Last but not least, the automatically optimised sizing feature of the handling systems from Festo means the GN800 is smaller and thus requires considerably less space than the previous solutions. Overhead costs are reduced as a result and there is more space at the production location.

The management team at GN is very satisfied with this solution. Not only do the cost reductions play an important role for GN, but also other factors such as faster time-to-market and potential time savings for the employees of GN and its customers.





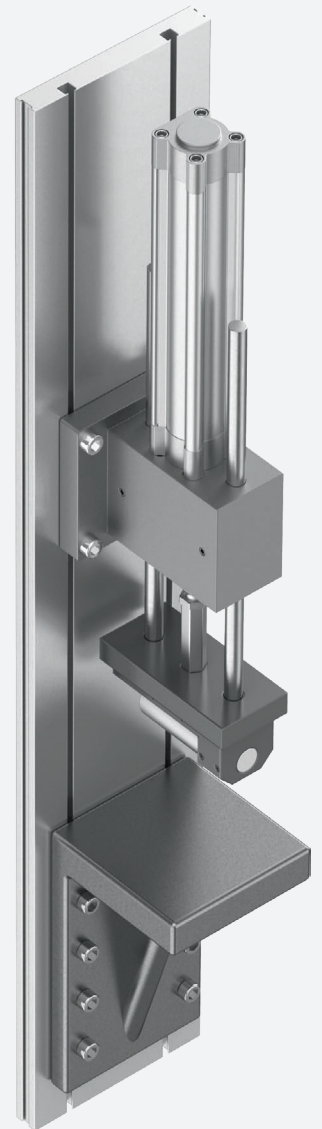
Two axes, two motors, cable management – done: this handling system from Festo functions reliably and efficiently in the GN800.

Motion Terminal: maximum flexibility combined with maximum standardisation

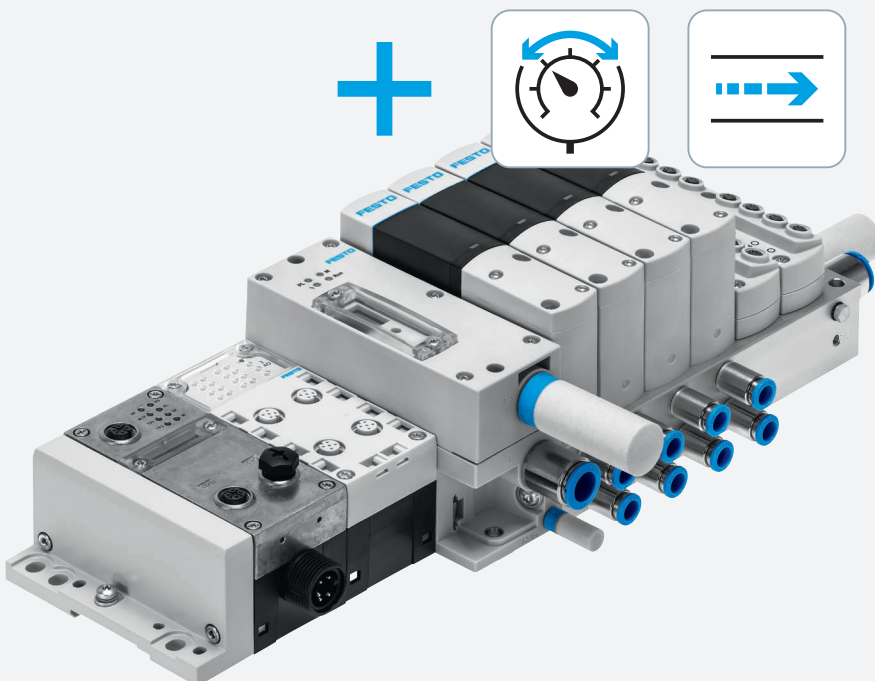
Greater process reliability with digitised pneumatics

Flexibility is becoming more and more important these days. In the future, products will have to adapt quickly, with little effort and at little cost. And how quickly does a system cease to run smoothly or even stops because wear or leakages cost time, vibrations affect process quality, spare parts are not to hand when needed or simple conversions can only be carried out with great effort?

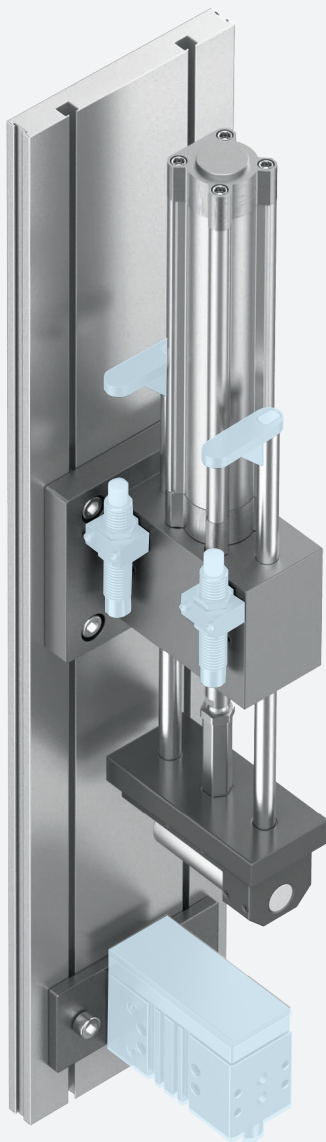
With the Festo Motion Terminal, these challenges are a thing of the past. The new valve technology allows you to model a wide range of pneumatic functions in one valve slice at any time using software algorithms called Motion Apps.



New solution with the Motion Terminal



Thanks to the Festo Motion Terminal VTEM, pneumatics is now even more versatile! By implementing Motion Apps successively on one valve new pneumatic motion sequences can be achieved. This allows you to improve processes in terms of quality, performance and energy efficiency. And replace many components with a single piece of programmable hardware.

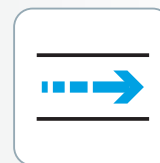


Previous solution

Combination of Motion Apps for optimised processes and fewer components

In the old solution on the left, the pre-positioning of the contact roller based on cycle time was implemented using a cylinder and shock absorbers. The alternating contact pressure from 1 to 2.5 bar was realised by a second cylinder under the contact roller and a proportional pressure regulator.

The Festo Motion Terminal does away with the need for the second cylinder and the shock absorbers. In addition, the cycle time is shortened and there are fewer vibrations. This is made possible by executing two Motion Apps in succession on one valve slice. Positioning is carried out using the Motion App “Motion profile and positioning”. The Motion Terminal then switches to the Motion App “Proportional pressure regulation”.



New Motion App: Motion profile and positioning

Position freely over the entire working stroke and control the cylinder motion. Simply configure a motion profile – with the following parameters: acceleration, speed, travel time and position. (Available Q2/2019 for selected series up to strokes of 300 mm)



Find out more:

→ www.festo.com/motionapps

First-class wallets: designer fashion relies on Industry 4.0

Flexibility, short cycle times and optimum material usage: these were the requirements for the new machine for producing credit card slots for wallets. Autec, a manufacturer of automation systems for shoe and leather goods factories from Pisa, Italy, developed the machine for a prestigious Italian brand. It also included the Festo Motion Terminal as an ideal solution.

“We’ve relied on Festo for a long time,” says Ilario Barsacchi, engineer and project manager at Autec, “not just because of the reliable products, but also the competent customer support all over the world.”

“The design of the new machine is above all the result of our close cooperation with Festo,” explains Giorgio Centola, Industry Manager of the Printing & Plastic segment. “When designing a machine, we always focus on the actual application. For the new machine, Autec needed a component that was easy to reconfigure. The function and flow rate of the valves had to be easy to change – and they also had to be remotely controllable – as with the app-controlled Motion Terminal.”

Software for greater flexibility

The software and apps played a major role in the system implementation. They define the functions of the valves and make a crucial contribution to the flexibility of the machine. In addition, the apps enable various tools and the operation of the machine to be controlled remotely. Barsacchi explains: “Reconfiguring the Festo Motion Terminal is now extremely fast. Instead of ordering, installing and reconfiguring additional proportional valves, all we have to do is activate an app.”

Many functions in a single valve – thanks to apps

Autec’s new machine controls the gluing of two pieces, one made of leather and one made of silk. A servo robot then transfers the glued pieces to a leather folding machine. “In this space-saving, compact solution eight credit card slots can be glued and folded in 14 seconds,” continues Barsacchi.

The Motion Terminal enables a fast change in the tool function from suction gripper head to gripper head with pin terminal as the valves can be used both as proportional valves and as control valves. The system is then just like a reprogrammable piece of hardware and the software content is adapted to the relevant application. The days when a valve only had one function are gone. A piece of administration software for this machine was developed and implemented in a PLC that acts as the interface for controlling the device. The entire process was very simple and did not cause any difficulties.

The error rate associated with manually manufacturing these credit card slots has been eliminated and optimum use is made of the available raw material – thanks to a true Industry 4.0 solution.



The machine developed by Autec is ready for delivery to the customer.



A close-up of the control panel. The system is a true Industry 4.0 component and can be controlled remotely.

Gripping perfected – adaptive shape gripper DHEF

Inspired by nature

The adaptive shape gripper gets its name from its inherent adaptability to different shapes. In nature, this unique combination of force and form fitting is best demonstrated by the tongue of the chameleon when it is hunting for insects. Once the chameleon has its prey in sight, it unfurls its tongue like a rubber band. Just before the tip of the tongue reaches the insect, it retracts in the middle while the edges keep moving forwards. This allows the tongue to adapt to the shape and size of the prey in question and clasp it tightly. The prey sticks to the tongue and is reeled in as if on a fishing line. The first version of the adaptive shape gripper was developed in 2015 in close cooperation with the University of Oslo.

Form-fitting gripping thanks to inversion

The silicone cap folds itself over the object to be gripped, thus creating a tight and secure fit. The elastic silicone allows a precise adjustment to many different geometries.

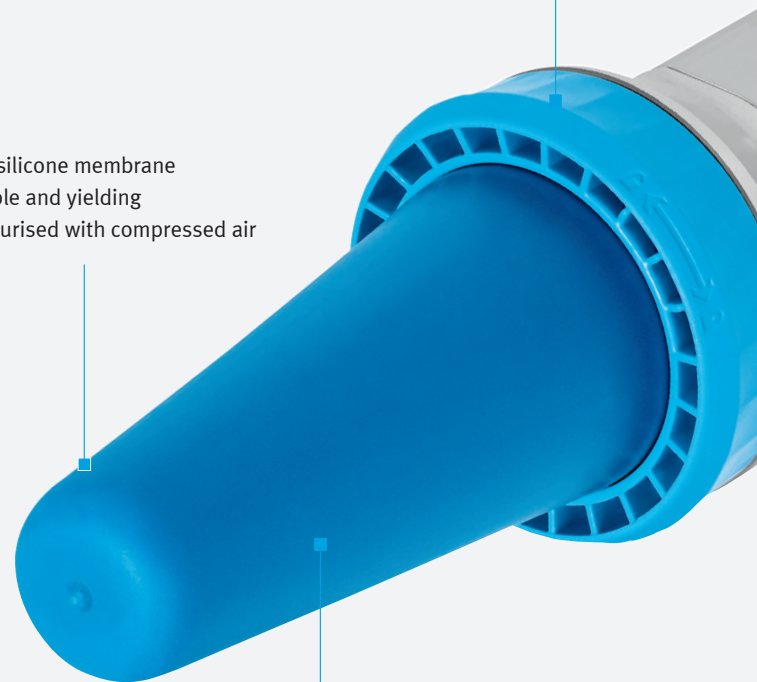
The adaptive shape gripper grips energy-efficiently and reliably in combination with a pneumatic drive. The result is a new insight for the core business of automation.

Bayonet fastening for easy cap replacement

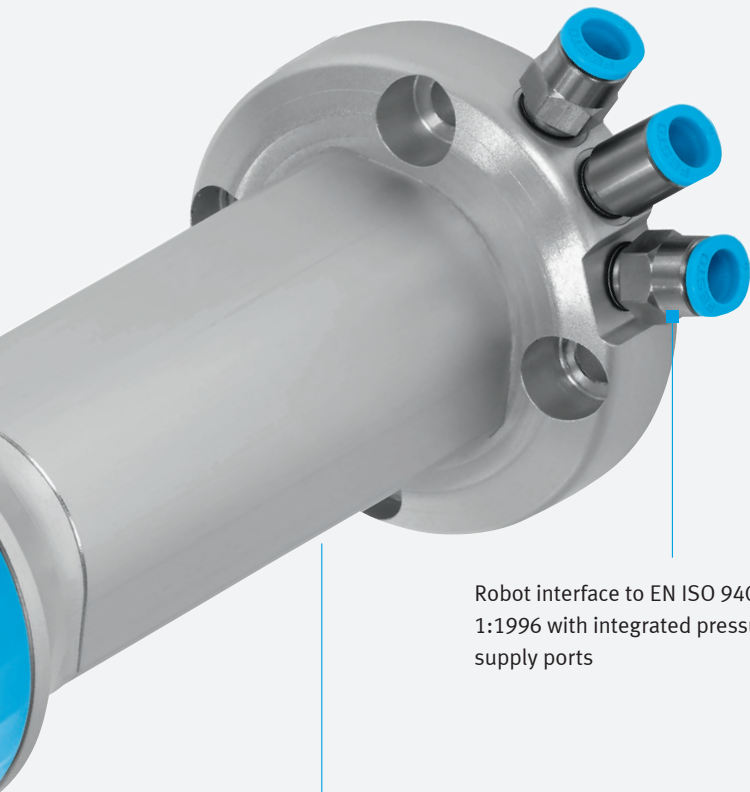
Elastic silicone membrane

- Flexible and yielding
- Pressurised with compressed air

- Gentle gripping of delicate objects
- Gripping of several objects with one gripper
- Gripping of differently aligned objects
- Form-fitting gripping of any shape



Gripping inspired by nature – the working principle of the adaptive shape gripper is based on the tongue of the chameleon. The adaptive shape gripper can grip, collect and place differently shaped objects in one operation, without the need for manual conversion.



Robot interface to EN ISO 9409-1:1996 with integrated pressure supply ports

Slot for standard sensors for positioning sensing

Ideal for the factory of the future

Thanks to its many different gripping options, the adaptive shape gripper is well placed for tomorrow's production scenarios. Its function integration is one way in which systems and components can adapt themselves to different products and tasks in the future. The project also shows how Festo uses examples for nature to gain new insights for the core business of automation.

Benefits and pioneering characteristics

- Adaptability to the object to be gripped
- Flexibility through the ability to handle any object
- Increased productivity through reduced retooling times when changing grippers
- Weight-optimised, sleek design
- Safe human-machine interaction

Find out more:

→ www.festo.com/dhef

The chameleon of grippers: the adaptive shape gripper

For the first time, a number of completely different gripping functions can be realised in one gripper. This makes the new adaptive shape gripper so interesting that Audi's "Technology Development Production Assistance Systems" put it to the test.

Many robots specialise in gripping tasks. But of the grippers in use currently only a few are truly flexible. The Audi Technical Center therefore decided to test a gripper that has perfected flexibility: the adaptive shape gripper from Festo. It can grip and hold objects, pass them to a person or place them in a workpiece carrier.

Inspired by the chameleon

The operating principle of the adaptive shape gripper is based on nature and is reminiscent of a chameleon's tongue. The connection between the piston rod and elastic cap produces a form-fitting grip around the object when the piston rod is retracted. It folds over the object to be gripped and clasps it tightly.

Free shapes, round geometries, delicate objects are no problem!

Unlike today's mechanical grippers that can only grip certain components, the adaptive shape gripper is extremely flexible. It can even handle components with free shapes and round geometries. Since it doesn't have any sharp edges, it is also ideal for gripping delicate objects like air nozzles or trim strips. In principle, the gripper can pick up several parts such as nuts from a bowl in one motion. The functional model isn't yet as versatile as the human hand, but it's not far off.

Audi's Technical Center Production Assistance Systems

The "Technology Development Production Assistance Systems" department at Audi deals with new production technologies that support employees with their work. The team is currently working on the following core issues: human-robot collaboration, supporting assembly workers, new lightweight robots and new sensors and display concepts.

A gripper with numerous applications

In the future, it will be possible to use the adaptive shape gripper in any application where several objects need to be gripped at the same time or objects with different shapes need to be handled. This includes more sectors than the automotive industry, for example small parts handling in classic machine building, feeder units for packaging systems, gripping fruit and vegetables in the food processing industry, service robots in assembly tasks or prosthetic supplements in medical technology.



The adaptive shape gripper offers almost limitless gripping, which makes it interesting to Audi.



Responsible for getting the adaptive shape gripper off the ground:
Stefanie Seiler, Product Manager
Nenja Rieskamp, Development Engineer



Learning from nature: the adaptive shape gripper is inspired by the chameleon's tongue. It can be used to grip objects with completely different contours and shapes.

Simply part of the solution. The Festo core product range

Built-in reliability

Fast ordering, fast delivery, fast installation and fast replacement: the proven technology in every product makes assembly, commissioning and operation simpler and more reliable for OEMs and end customers. See for yourself how the core product range is an investment that always pays off.

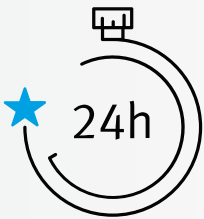
Compact components

Most of the products in the core product range are very compact. This means that you can plan for your machines and systems to be smaller or integrate more technology in the planned space.

Large quantities? Not a problem.

Even if you require large quantities of a product at short notice, you will receive the quantity you need on the advised date. Just ask us!

Our core product range can make you even more productive. More than 2,200 components form every phase of the pneumatic and electrical control chain make your life easier. From compressed air preparation, valves and cylinders to accessories, with the core product range, you can realise around 80% of all applications effortlessly and quickly, even when large quantities are needed. And at a low price.



Quick delivery

Products marked with a full star are held in stock and are available for dispatch just 24 hours after placing the order. Configurable products with the outline star are ready for delivery within five days.



Always in stock worldwide

All these components are available worldwide. Quality remains at a consistently high level thanks to automated production in state-of-the-art plants such as Scharnhausen in Germany, Mason Ohio in the USA and Jinan in China. And our logistics chain is designed to ensure you receive your deliveries quickly.



Attractively priced

A star, a distinction, a promise: the best for your task. Discover the Festo core product range! More than 2,200 products are available worldwide, in top Festo quality and at extremely attractive prices.

Find out more:

→ www.festo.com/kernprogramm

★ Smallest dimensions, maximum precision: mini slide DGST

Integrated sensors and cushioning

The mini slide is fitted with a twin piston. A basic cushioning system decelerates this in the end positions so that smaller loads can be moved without needing external cushioning. In addition to the standard basic cushioning, the mini slide is also available with two other cushioning variants: adjustable polymer cushioning and adjustable shock absorbers.

The cushioning retainers are integrated in the basic design in such a way that the shock absorbers – like the sensors in their slots – do not protrude in the cross section.

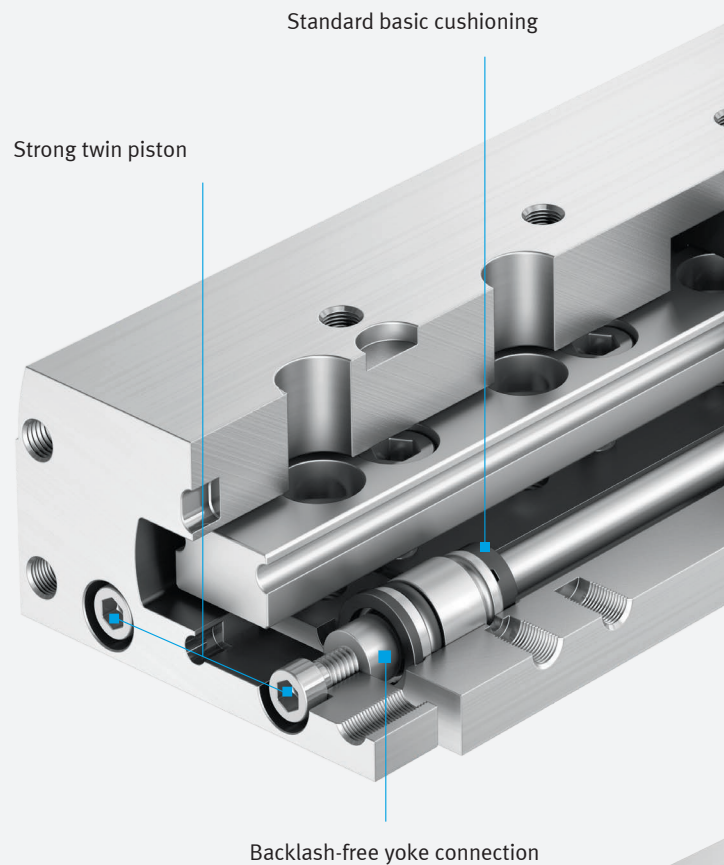
Maximum repetition accuracy

The slide and yoke unit is manufactured as a single part, making it very torsionally rigid. In combination with the backlash-free yoke connection and the ball guide, the end result is a technically optimised system with extremely small tolerances and very high repetition accuracy.

Core product range at an attractive price

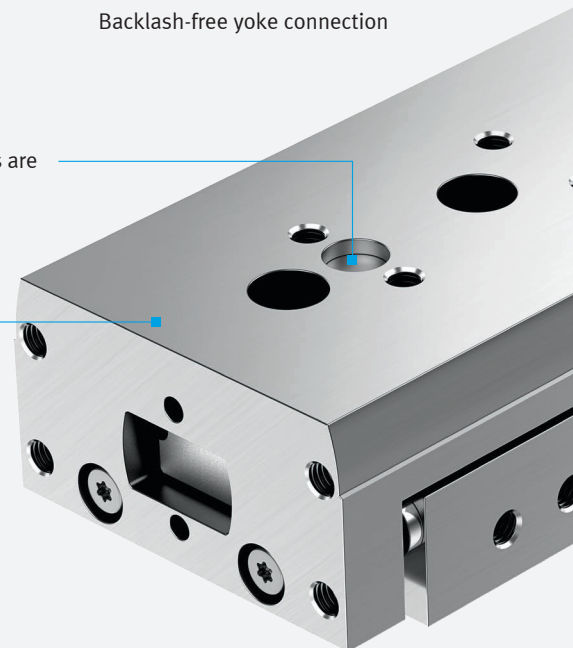
The DGST offers all these characteristics and benefits at an attractive price: 80% of the requirements for simple motions can be covered with the components from our core product range.

Look out for the star that represents our core product range!

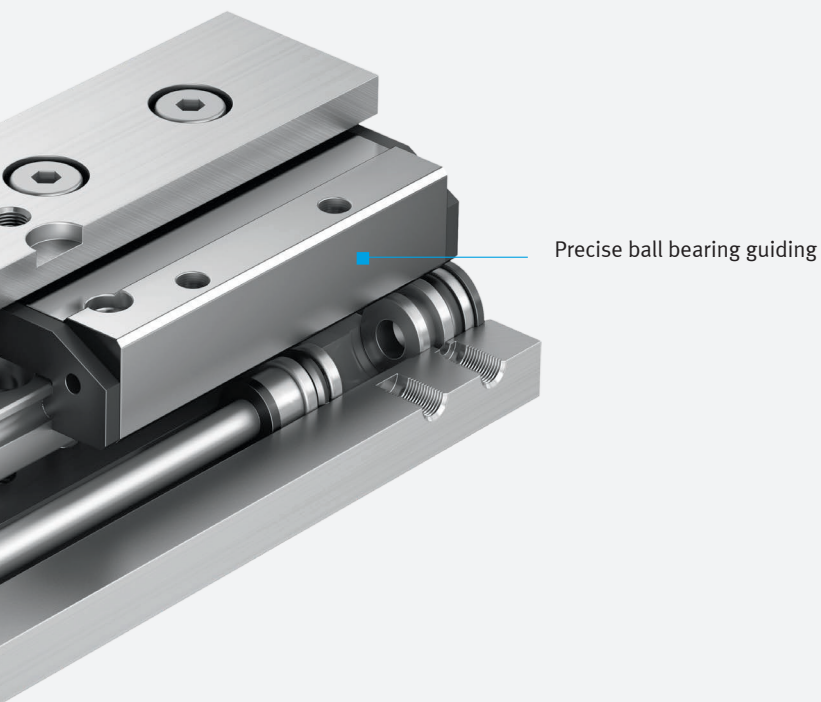


All mounting interfaces are symmetrical

Yoke and slide as a single part for torsional rigidity



Small but strong: the DGST is the smallest of its kind and the shortest slide drive on the market. However, it is strong when it comes to precision, forces, motion control, durability and reliability. For maximum torsional rigidity, the yoke and slide are a single part and the sensors and cushioning are fully integrated.



Even greater in ultra-flat handling systems

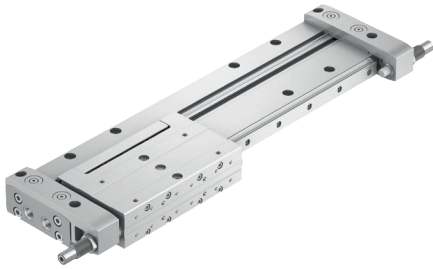
On its own, the DGST is small, powerful and precise. Combine it with the rodless linear drive DLGF and you get an ultra-flat handling system, without needing adapter plates to connect the drives.

It demonstrates its strengths in tasks involving precise pushing, picking, inserting and positioning as well as in press-fitting and clamping operations. This handling system consisting of the DGST and DLGF is also ideal for guided movements of small and large payloads or if large transverse loads have to be absorbed during linear movements.

Find out more:

→ www.festo.com/dgst

Linear drive DLGF



Impressive on its own but also a great team player!

The DLGF is suitable for table mounting. Thanks to its versatile interfaces, it can be compactly combined with cylinders ADN/ADNGF or slide units DGSL, DGST and SLT without any need for adapter plates. This flat drive has no piston rod and is ideal for small part assembly applications.

You can choose from the following drive variants:

- DLGF-G without external guide for simple drive functions in small installation spaces
- DLGF-KF with a standard recirculating ball bearing guide for high torques and heavy loads
 - Very flat design
 - Alternative option: supply connection from below
 - Pneumatic self-adjusting cushioning (PPS)
 - Recirculating ball bearing guide

★ Compact cylinder AEN-S/ADN-S



Even more compact: ideal for very small movements in the tightest of spaces.

Whether pushing buttons or flicking switches, the ADN-S executes small and micro movements reliably in even the tightest of spaces. This makes it ideal for test applications, for example in electronic endurance testing, as well as for easy locating with little force, for instance when aligning workpieces at stops in production processes.

- Extremely space-saving
- Easy to assemble
- Very lightweight

Stopper cylinder DFST



Gentle stopping and separation of transported material at all times.

This helper in the production process is characterised by powerful and yet gentle stopping. The DFST makes a good impression at all stations, whether conveyors, conveyor chains or roller conveyors. It handles light materials just as easily as heavy ones. The stop rollers come in polymer and steel, enabling the stopper cylinder to adapt perfectly to the point of contact for the task in hand.

- Pressure supply ports from underneath
- Various toggle lever logics available and interrogated
- Easy to adjust

Servo-pneumatic drive solution YHBP for all types of balancers

Move heavy loads at the tip of your fingers! Extremely ergonomic, safe and flexible. People who continuously move loads need technical support. Servo-pneumatic balancers allow you to move loads of up to 999 kg ergonomically. At the heart of the balancer lies the safe and powerful drive solution YHBP from Festo.



Makes moving heavy loads child's play: with the innovative handle that generates the control signal to move the balancer system.

The balancer system is controlled with ease using the pneumatically operated handle. It detects whether the user wants to move the load upwards or downwards. Any change in the weight to be moved is recognised automatically and quickly, even if the changes in weight occur while the load is suspended.

Basic variant

The basic variant includes the balancer controller with pre-installed software, the specially developed valve unit and the ergonomically shaped handle. Performance Level b is achieved with pneumatic cylinders and a displacement encoder.

Safety variant

An additional sensor interface and safety relay unit delivers maximum safety up to Performance Level d. These features make it possible to limit and monitor the speed in the system and execute a safe stop if necessary.

Complete solution – saves time and money

The ready-to-install drive solution YHBP saves time at the procurement, design, installation and commissioning stages. All components are precisely coordinated and can be ordered as a kit using just one part number. This completely does away with the laborious process of producing circuit diagrams and pneumatic plans!

The benefits to you

- Very low operating forces down to 10 N
- For loads from 70 to 999 kg
- Extremely fast, automatic weight detection, ideal when dealing with many product variants
- Safety up to Performance Level d for the safety functions SLS and SSC
- Suitable for lifting columns as well as parallel and articulated arm kinematics

Tailored filling and packaging of powders

Bulk goods can often be unpredictable because of their characteristics. But Swiss plant manufacturer Burgener AG has this under control and designed a complex dosing and packaging line for automatically filling pharmaceutical additives. Automation technology from Festo such as cylinders, valve terminals, service unit components and sensors make for a straightforward system.

“The knowledge we have gained from more than 50 years of developing and designing dosing and packaging sealing technology secured us the contract from a global manufacturer of chemical additives for a tailored, fully automatic packaging line,” explains Simon Brantschen, Member of the Management Board of Burgener AG.

The requirements for the system were fully automatic linking of the individual stations, fast throughput times and hygienic design. “The components from Festo play an important role in the successful system concept,” says Brantschen. “They are an essential part of a number of handling units. Stainless steel is crucial to the hygienic system design.”

Plastic bags in boxes.

The first station separates the boxes. In the second station they are lined with a plastic bag that is inflated with air. The required volume of air is measured by a pressure sensor SPAU. IO-Link® ensures a secure connection between the analogue, binary and serial communication devices. The top of the bag is folded over the edge of the box. The handling system for these operations is equipped with a semi-rotary drive DRRD, rodless drives DGC-K and compact cylinders ADN and ADNGF.

Avoiding reverse contamination

The operation to insert and fold over the top of the bag is vital to avoid possible reverse contamination of the chemical additive. The chemical additive is filled at the dosing station, initially with a coarse flow for fast

filling of the powder. The subsequent fine flow doses the required filling quantity with a precision of ± 20 grams.

Hygiene as the top priority

The fourth station seals the filled bag using pulse sealing. Stainless steel round cylinders CRDSNU in a clean design shape the top edges of the bag using a complex spreader system and press them together. After the sealing process, the boxes are closed with a lid in the fifth station. Several drives DGSC and DGC execute their function reliably and straightforwardly in this handling system.

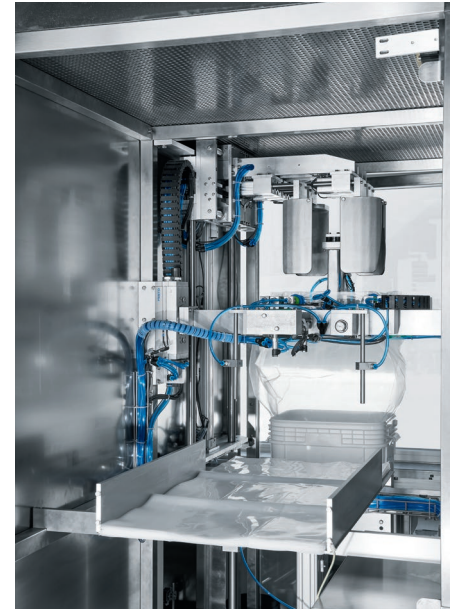
Task successfully accomplished

“The innovative and durable automation components from Festo help us to solve a complex task without any fuss,” reports Brantschen. “And they are available worldwide, which is extremely important for us as a global plant manufacturer.”

“The components from Festo play an important role in the successful system concept.”

Simon Brantschen, Member of the Management Board of Burgener AG.





Vacuum gripper removing a bag for insertion in a prepared box.



Greater productivity in fully automatic filling and hygienic packaging: the complete line developed by Burgener for pharmaceutical additives in powder form performs complex processes in a straightforward way. Components from Festo play an important role here.

Connectivity at all levels is the key to success

Make things easy with first-class engineering support

- Festo Projects: project planning and management of digital twins for global collaborative work.
- Festo Handling Guide Online: Select and size 1D, 2D and 3D handling solutions in just three steps. New: integration of planar surface and linear kinematics.
- Festo Automation Suite: program and design in an environment of “seamless connectivity”. From the workpiece to the controller, you can link and commission everything intelligently, regardless of whether you are using a Festo controller or a one from a third-party.
- Festo Dashboards: visualise your cloud-based data and support big data analytics.

Faster

Design tools from Festo speed up your engineering process, make you more efficient and shorten your time to market.

Better

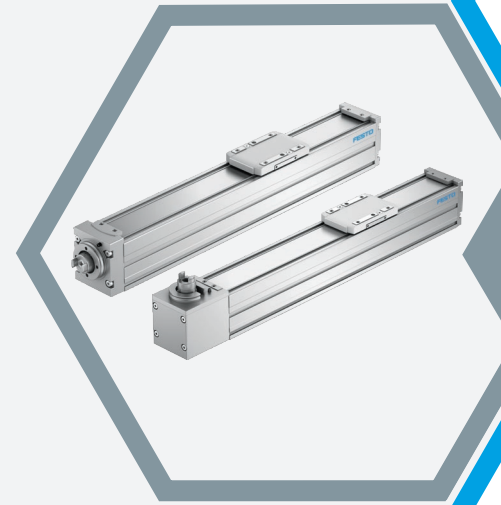
With the broadest portfolio of pneumatic and electric components, we offer you maximum scalability and solutions at all levels without restricting your flexibility – because Festo solutions are compatible with in-house standards.

Connected

Enjoy smooth and seamless automation thanks to mechanical, electrical and intelligent connectivity of hardware and software from Festo – connected directly to common Ethernet controller solutions.

Intelligent connectivity

Use an open automation architecture that enables flexible communication with all partners, for example via the motion control function of the CPX-E. This architecture will usually be compatible with your in-house standard and is easily adapted to other tasks. The interface to digital automation and Industry 4.0 components with cloud solutions, dashboard, etc. is included.

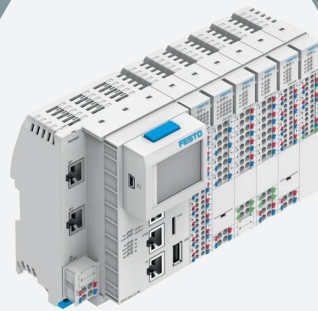


Mechanical connectivity

Our strength is our extremely extensive portfolio of electromechanical components, where you will always find the right automation technology. You can always connect the right axes to your in-house standard – individually or as a system. Take advantage of our expertise!

Festo offers a huge variety of industrial automation solutions based on an automation platform with universal connectivity. The benefit is that everything works together and is compatible. Dimensions, mechanical components, structures, logic circuits, etc. should be consistent so that customers can find their bearings quickly and intuitively.

Intelligent
connectivity

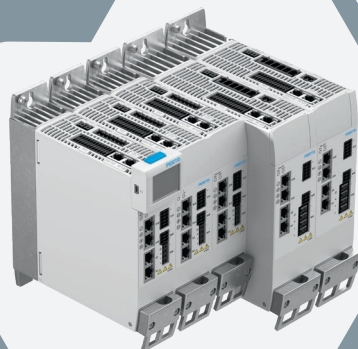


Electrical
connectivity

Electrical connectivity

Connect your mechanical system to your control environment with the perfect combination of servo motors and servo drives from Festo. For example in this perfect solution package: the CPX-E controllers for motion control with EtherCAT® master together with the Festo Automation Suite and the completely new servo drive technology consisting of motors EMMT-AS and servo drives CMMT-AS.

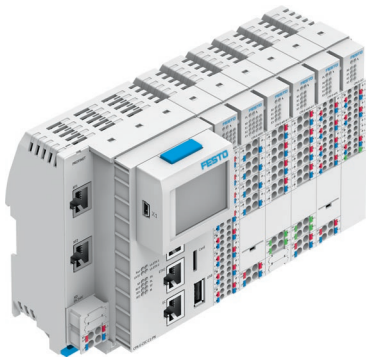
Mechanical
connectivity



Find out more:

→ www.festo.com/ea

Modular control system CPX-E-CEC-M1



The powerful, NE21-certificated system for factory and process automation.

Designed as an EtherCAT® master controller and motion controller with protection to IP20, the CPX-E is the central control system for handling applications. In addition to comprehensive PLC functions and multi-axis applications with interpolation, the CPX-E can be easily integrated into existing host systems with PROFINET or Ethernet/IP.

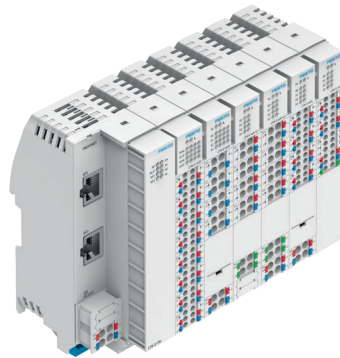
The new automation platform from Festo with hardware and software as well as the Festo Automation Suite enables integrated solutions for a large number of applications, all from a single source. The CPX-E features specific software functions tailored to products and solution packages from Festo, for example:

- Handling technology for parts handling
- Assembly systems
- Palletising
- Gluing, dispensing

Complete automation

- Packaging machines (flow wrappers)
- Palletising systems
- Selective soldering systems
- Wafer handling

Remote I/O series CPX-E



Powerful, compact and cost-effective: the new remote I/O system to IP20!

Several bus modules are available for the universal integration of the remote I/O family CPX-E: PROFINET, Ethernet/IP, EtherCAT®, Modbus/TCP and PROFIBUS.

Depending on the module combination, you can design and use the system as a purely remote I/O system with the bus modules or as a control system with control unit.

Available modules at a glance:

- Digital input modules (16 DI)*
- Digital output modules (8 DO/0.5 A)*
- Analogue input module (4 AI current/voltage)
- Analogue output module (4 AO current/voltage)
- IO-Link® master modules (4 channels)*
- Counter module (single-channel)

The decentralised remote I/O system CPX-AP-I



Easily installed anywhere.

The powerful remote I/O system CPX-AP-I for assembly and handling technology as well as applications involving motion delivers up to 500 modules/valve terminals with the bus of your choice: PROFINET, Ethernet/IP, EtherCAT® and PROFIBUS.

The real time-capable system is ideal for fast and synchronous processes. The CPX-AP-I connects decentralised valve terminals like the MPA-L and VTUG to the IoT to enable predictive maintenance such as condition monitoring of valves or cables.

Scalable architecture in the form of a line/star/tree structure, automatic topology detection and a compact design offer flexibility and ease of installation in applications with little space. Advanced diagnostic functions, a comprehensive engineering package and a cloud connection via CPX-IOT round off the innovative portfolio.

- Real time-capable, bus cycle from 15 µs
- IO-Link® master and engineering tool for convenient integration of IO-Link® devices
- Advanced diagnostics with cloud connection and optional Festo dashboards

* With NE21-specific certifications for process automation.

Servo drive CMMT-AS



The latest generation of servo drive system with optimised prices and sizes.

The CMMT-AS is an integral part of the Festo automation platform. The compact servo drive for point-to-point and interpolating motion is suitable for different Ethernet-based bus systems and can be seamlessly and directly integrated in the system environments of various manufacturers. Commissioning takes just a few minutes with the Festo Automation Suite. The well-thought-out design ensures free and convenient access to the connections: all connections and the control unit CDSB are at the front and on top of the drive. Its compact design and optimised connection technology permits easy and space-saving installation in the control cabinet with much shorter connection times.

- One of the most compact servo drives on the market
- Configure standard safety functions without software
- Auto-tuning supports easy commissioning and automatically optimises the control behaviour of rotary and linear motions
- Optimally with servo motor EMMT-AS

Servo drive CMMT-ST



High efficiency in tasks with low power requirements.

The CMMT-ST is the little brother of the CMMT-AS and ideal for positioning tasks as well as point-to-point and interpolating motion solutions with low power requirements of up to 300 W. It is suitable for different Ethernet-based bus systems and can be seamlessly and directly integrated in the system environments of various manufacturers. Commissioning the CMMT-ST takes just a few minutes with the Festo Automation Suite. Compact and much cheaper than the new CMMT-AS, the connection and communication concept, functional modules and standard safety features remain unchanged. The consistency of the control concept means that you can combine the CMMT-AS and CMMT-ST without any difficulty to drive both large and small axes.

- Power of up to 0.3 kW and technology with 24 ... 48 V
- 50% more compact than the smallest CMMT-AS
- Optimised for use with stepper motors like the proven EMMS-ST

Servo motors EMMT-AS and EMMB-AS



For challenging tasks: EMMT-AS. Extremely economical: EMMB-AS.

The AC synchronous servo motor EMMT-AS for challenging and dynamic applications delivers good controllability and tracking accuracy in positioning tasks thanks to its extremely low standstill torque. The “electronic rating plate” contains all the important motor data. This enables automatic parameterisation of the servo motor.

- OCP (One Cable Plug) one-cable solution for easy, reduced installation and greater clarity
- Single-turn or multi-turn absolute encoder

The compact and particularly economical synchronous servo motor EMMB-AS for simple positioning tasks in the electronics industry and small parts assembly. Perfectly tailored to the modular system of the axes ELGC and mini slide EGSC.

- Digital single-turn absolute encoder system as standard
- Optimised connection with motor and encoder cables of up to 10 m

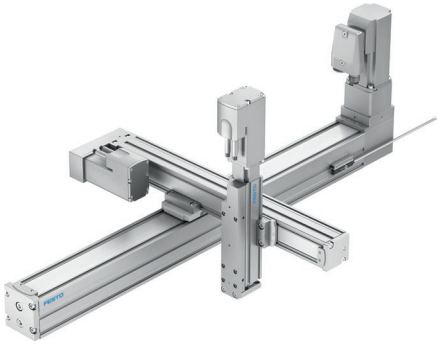


reddot award 2018
winner



reddot award 2018
winner

Spindle and toothed belt axes
ELGC and mini slide EGSC

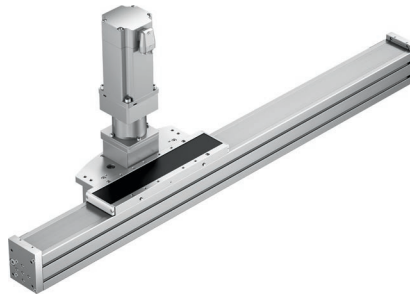


Simple, compact, cost-effective: as an individual axis or a system.

The compact linear axes ELGC and mini slide EGSC offer variety for cost-effective automation. You can combine the axes with the mini slide for an extremely compact handling system with the best use of space. The unique “one-size down” assembly system ensures an optimum ratio of installation space to working space. For applications where compact dimensions are essential: in assembly systems, testing and inspection systems, small parts handling, the electronics industry or desktop applications. And installation? Simply mix and match. You do not need any special expertise or special tools.

- Closely fitting stainless steel cover strip to protect the internal guide
- Diversity through scalable modular systems
- Large working space of up to 2 x 2 x 2 m
- Clean look, weight-optimised design and flexible motor mounting
- Standardised interfaces for rotary modules, grippers and other accessories
- Cost-effective and standardised position sensing

Cantilever axis with toothed belt
ELCC

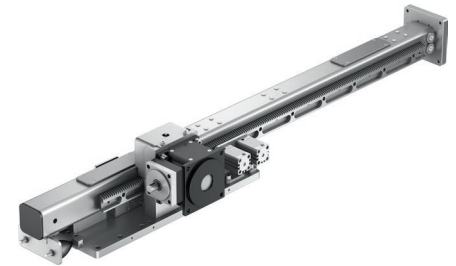


Up to 50% fewer vibrations, up to 30% shorter cycle times.

The signature features of the ELCC are high rigidity, low moving mass and compact design for shorter cycle times and fewer vibrations. Ideally the toothed belt axis is used vertically as a Z-axis, for example for palletising or erecting boxes or in machine tools. However, it can also be operated horizontally or at any other installation angle whenever the axis needs to be removed from the working area. An incremental displacement encoder and inductive proximity sensors provide safety, while sealing air ensures problem-free use in dusty environments or at machine tools.

- Stainless steel cover strip to protect the recirculating ball bearing guide
- Clamping unit for secure retention of the load and as an emergency brake
- Shock absorber prevents damage during axis setup
- Flexible motor mounting – freely convertible at any time

Cantilever axis with gear rack
EHMH



Reliable and highly dynamic: the strong axis for high payloads.

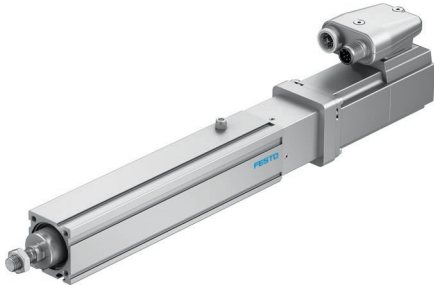
When the focus is on high rigidity and positioning accuracy, rack and pinion technology ensures very dynamic movement of high payloads of up to 200 kg combined with a long service life. With safety included as standard!

Installed in handling systems, the EHMH masters applications such as palletising and stacking in the packaging and automotive industries or unloading and loading machine tools with precision and ease.

The EHMH is only available on request. Get in touch with us and we can prepare an individual offer for you.

- Payload of up to 200 kg
- 2 sizes
- Stroke 250 ... 2,500 mm
- Very high stability and torsional rigidity
- Quiet thanks to helical gearing
- Safety up to PL d

Electric cylinder EPCC

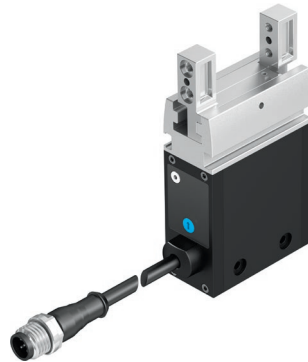


Cost-effective, powerful and very flexible: the EPCC for simple positioning tasks.

The ball screw drive enables the electric cylinder in four sizes to execute precise and fast positioning over a distance of up to 500 mm. Its compact dimensions are ideal if you need to make the best use of the installation space: in assembly systems, testing and inspection systems, desktop applications, small parts handling and the electronics industry. The compact ball screw drive with integrated coupling and double bearing ensures quiet spindle operation and precise positioning combined with reduced installation space. The unique “one-size down” assembly system ensures space-saving mounting of the electric cylinder on the linear axis ELGC – without additional adapters.

- Weight-optimised design ideal for handling systems
- Safety through flexible position sensing
- No emissions, no immissions thanks to optionally ducted pressure compensation connection, screwed-in sintered plate as standard

Electric standard gripper EHPS



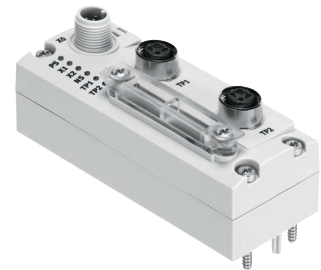
Powerful for simple tasks!

The EHPS is ideal for use in monoenergetic, electric systems or in applications where air is not permitted and a clean environment is required.

In the event of a power failure, the electric gripper EHPS continues to hold the workpiece through automatic retention of the gear unit while the freewheel unit prevents jamming.

- Long stroke for different workpieces
- Brushless DC motor
- Adjustable gripping force
- Controller-free actuation using digital signals
- Stable T-slot guidance of gripper jaws for high torque resistance

Fieldbus node CTEU-VN



Connect the entire world of decentralised valve terminals to VARAN with ease.

The bus node CTEU-VN enables the entire Festo CTEU portfolio to be connected to VARAN, a bus system based on Ethernet technology. VARAN combines the requirements of hard, real-time control and automation in a way that delivers the shortest cycle times and minimal synchronicity jitter. In addition, VARAN offers asynchronous direct access to data.

The following products can be connected to VARAN:

- The valve terminal series VTUG, MPA-C, MPA-L, VTOC, VTUB and CPV
- The product series VPPM, OVEM, CMMO-ST, CTSL and more than seven sensor series via additional electrical connection block CAPC

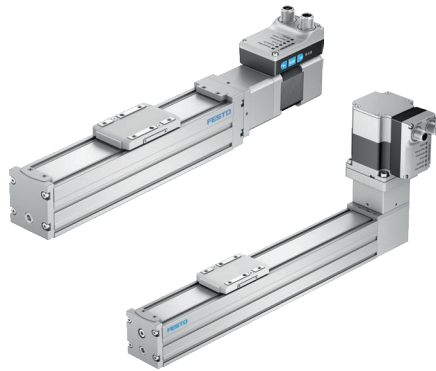
Simplified Motion Series

Simplified Motion Series combines the simplicity of pneumatics with the advantages of electric automation. Are you looking for electric solutions for very simple motion and positioning tasks, but that offer the same ease of commissioning and parameterisation as pneumatics? Without the complex commissioning required by classic electric systems? Then the integrated drive solutions from the Simplified Motion Series are the perfect solution for you! The simplified functionality makes the drives ideal for simple movements between two mechanical end positions without having to sacrifice optimised motion characteristics, gently cushioned advancing and retracting into the end positions or simplified press-fitting and clamping functions.

Operation without any software in accordance with the plug and work principle via digital IO (DIO) includes the basic functionalities of adjusting speed and force for press-fitting/clamping, selecting the reference end position and cushioning path, and manual operation. Advanced functions are available via IO-Link® such as remote adjustment, parameter copy, backup function, process parameter read functions.

- Simplified functionality for simple movements
- Integrated products eliminate the need for a control cabinet
- Quick and easy commissioning without software
- No special expertise required for commissioning

Spindle and toothed belt axes ELGS-BS/-TB



An extremely compact and cost-effective complete solution.

Precise, resilient, powerful: the spindle and toothed belt axes ELGS-BS/-TB with internal, protected recirculating ball bearing guide are ideal for precise XY movements, for example in assembly systems, small parts handling and testing and inspection systems. The unique “one-size down” assembly system ensures an optimum ratio of installation space to working space. This transforms the ELGS into the handling system with the most efficient use of space.

Spindle axis ELGS-BS

- Powerful ball screw drive
- Three sizes 32/45/60, max. 800 mm stroke

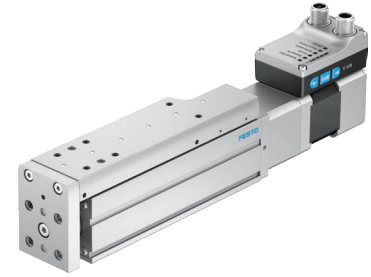
Toothed belt axis ELGS-TB

- Resilient toothed belt with long service life
- Two sizes 45/60, max. 2,000 mm stroke

Spindle and toothed belt axes ELGS-BS/-TB

- Stainless steel cover strip to protect the guide and spindle/toothed belt
- Easy to clean thanks to Clean Look design

Mini slide EGSS

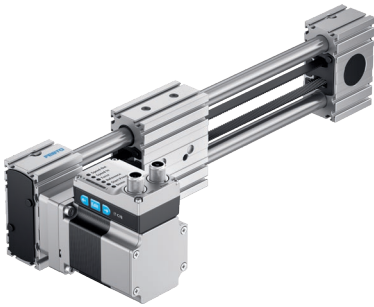


Low price, high power: whenever you need precise Z movements.

The powerful and resilient mini slide with the smooth-running spindle is an extremely cost-effective complete solution for vertical Z movements or guided linear individual movements. Regardless of the mounting position, whether in assembly systems, small parts handling or test and inspection systems. Its unique “one-size down” assembly system ensures an optimum ratio of installation space to working space, ideally in combination with spindle and toothed belt axes ELGS. The resilient and precise internal linear guide of the yoke slide easily absorbs lateral forces and offers the best resistance to torsion at high torques.

- Three sizes 32/45/60, max. 200 mm stroke
- Durable and wear-resistant internal ball screw drive
- Standardised interface for the electric rotary drive ERMS
- Direct mounting without the need for adapters
- High dynamic response and short cycle times thanks to reduction in Z-axis weight

Toothed belt axis ELGE-TB

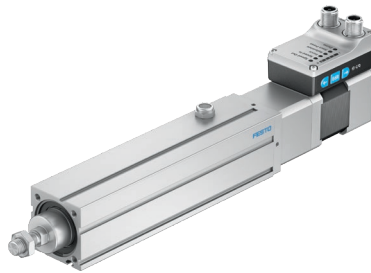


Very economical solution for simple tasks with low requirements.

The toothed belt axis with recirculating ball bearing guide offers very good running performance at medium torque load. As an attractively priced complete solution with a cost-optimised mechanical design, it is ideal as an economical solution for simple tasks with strokes of up to 800 mm and comparatively low requirements for mechanical load, dynamic response and precision.

- Reliable thanks to optional end-position sensing with proximity sensors PNP/NPN
- Running performance of 5,000 km!

Electric cylinder EPCS



Extremely cost-effective, yet powerful and flexible: the electric cylinder EPCS.

The EPCS excels at quick and precise positioning tasks over distances of up to 500 mm thanks to the smooth running ball screw drive. It is perfect for linear individual movements in any mounting position and especially for vertical Z movements in handling systems. Its compact dimensions are ideal if you need to make the best use of the installation space, whether in assembly systems, small parts handling, the electronics industry or testing and inspection systems. The unique “one-size down” assembly system ensures space-saving mounting of the electric cylinder on the linear axis ELGS – without additional adapters.

- Three sizes 32/45/60, max. 500 mm stroke
- Safe movement through flexible position sensing
- Pressure supply port with screwed-in sintered plate as standard
- No emissions and no immissions, reliable operation thanks to ducted pressure compensation connection

Rotary drive ERMS



ERMS makes it easy to swivel and position parts and workpieces.

The rotary drive ERMS is the cost-effective solution package for simple swivel tasks, but it is also used in applications involving higher loads. The sturdy bearing of the rotary table is impressive, particularly when higher forces and torques have to be absorbed. With the standardised mounting interface it can be connected directly to the electric mini slides EGSL, EGSC and EGSS. This is what simple, yet highly economical solution swivelling and positioning of parts and workpieces in industrial applications looks like today!

- Two sizes 25 and 32
- Swivel angle 90° and 180°
- Sealed hollow shaft for integrated through-feed for cables or tubing

Seamless connectivity: everything fits! Even for Industry 4.0

With the modular production system for personalised USB memory sticks, Festo created a demonstration system in which everything fits perfectly, from the mechanical and electric systems to the intelligence, thanks to software. The Festo automation platform provides an integrated and practical system to link all Festo engineering tools, components and solutions in hardware and software.

New from Festo: one automation platform for all steps!

The new automation platform from Festo offers everything for Industry 4.0. In our new production system, USB memory sticks can be personalised in four steps. Our electric products, the mechanical systems for the axes, the electrics and the software are developed in such a way that you get a complete automation platform with seamless connectivity. You will save time, from planning to commissioning, and gain maximum process reliability since everything fits together.

Four stations to a perfectly personalised memory stick

At the first station you create the production order by registering with your name and perhaps a picture. You identify yourself on the machine, e.g. using a QR code. A vision system SBSI registers you and starts the production order. This is followed by stock management. This mechatronic complete solution, made up among other things of a planar surface gantry in size 40 for fast picking and placing of the USB memory stick, offers all the options from stock management and workpiece handling to the cloud.

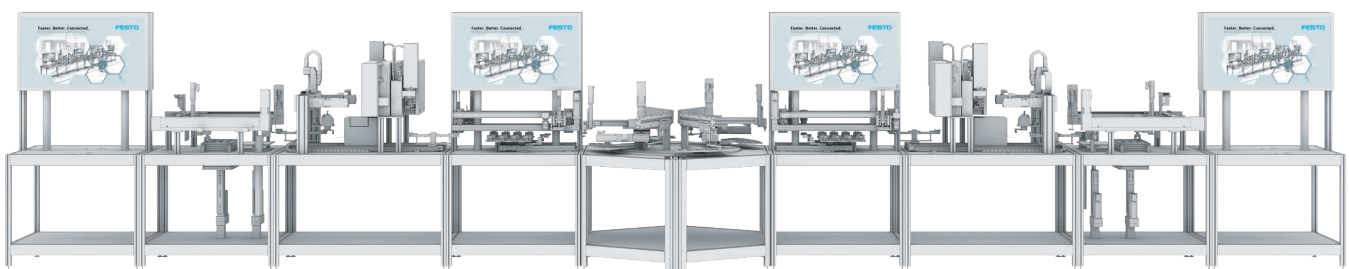
The USB memory stick is then transported, printed, turned over and then passed on. The work steps involved are holding, moving, handling, rotating and positioning, identifying the workpiece position and identifying, separating, gripping and applying labels. Fast transfer to a label printer is carried out by a linear gantry EXCT with dynamic servo motors EMMT-AS and servo drives CMMT-AS. The rotation functions are carried out by electric rotary drives ERMH.

The process is completed in station 4 where files are uploaded to the USB memory stick. This involves holding the workpiece, turning and carefully positioning the cap and press-fitting delicate parts. This is done using the attractively priced electric cylinders EPCO and rotary drives ERMO. Your personalised USB memory stick is then ready for you.

One-of-a-kind connectivity, one-of-a-kind engineering tools

The machine for the USB memory stick was designed in a very short time. This was made possible by the state-of-the-art and standardised Festo engineering environment. Festo Projects simplifies project planning and the

management of digital twins. This enables you to work collaboratively worldwide. With the Festo Handling Guide Online, you can select and size 1D, 2D and 3D gantries in just three steps, including planar surface and linear kinematics. And with the Festo Automation Suite, you can program and configure in one environment and commission the complete drive system quickly and easily. The Festo dashboards and AI algorithms (artificial intelligence) from our partner Resolto are available if you want to visualise your data from the cloud and use big data analytics.





A complete and seamless system for personalising USB memory sticks: the new automation platform from Festo includes everything you need to design and operate such systems, from hardware, electrics and software to standardised engineering tools.

More communication, greater safety: VTSA-F-CB

Serial or parallel? Both!

The benefits are multiple: the previous external cabling is now unnecessary, while the installation space remains the same. This means fewer additional components and reduced wiring. And you can now actuate up to 96 valve addresses, instead of the usual 32, in 4 voltage zones with one valve terminal and a fieldbus node.

The advantages of the VTSA series remain unchanged

The mix of five valve sizes on one valve terminal is unique. And the VTSA is ideal for maximum pneumatic and electrical function integration.

Pilot air switching valve for VTSA-F-CB

For applications with increased safety requirements such as manual work stations.

Soft start/quick exhaust valve for VTSA-F-CB

For slow start-up pressurisation, for example in order to reduce collisions, for quick exhausting and for building up a specific output pressure in a safe and controlled manner.

Pneumatic interface VTSA-F-CB in different versions



Pneumatic interface



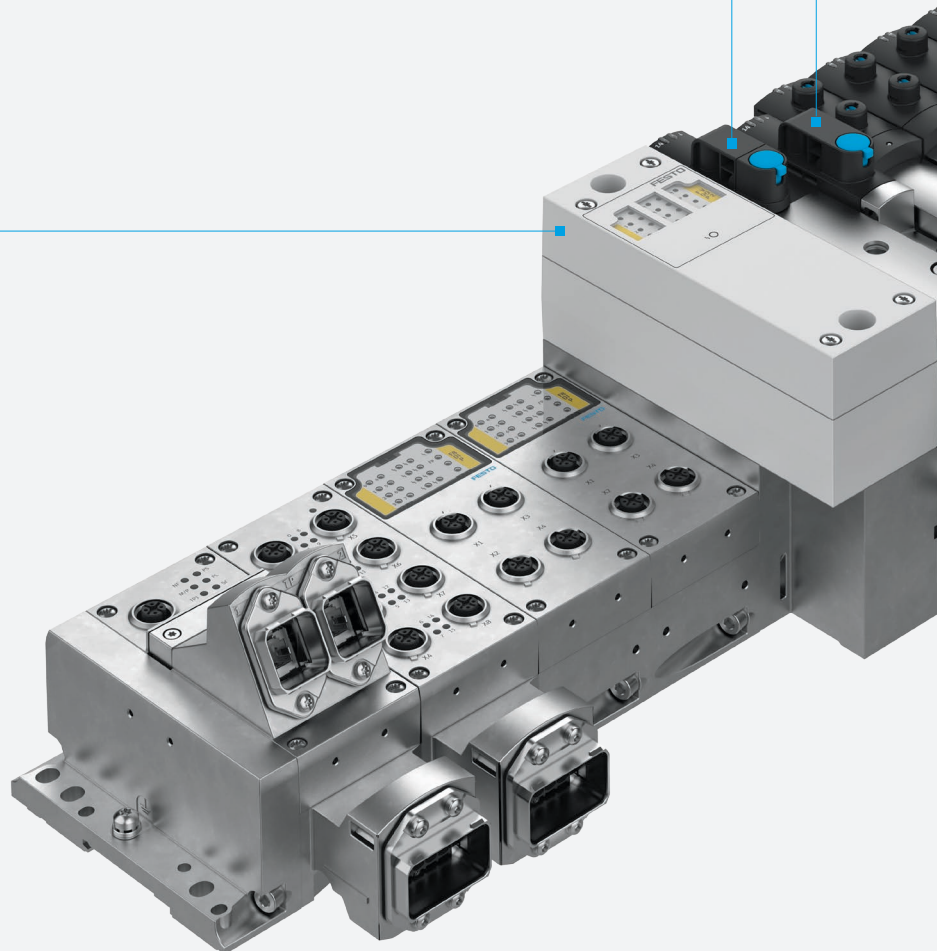
Pneumatic interface with external supply



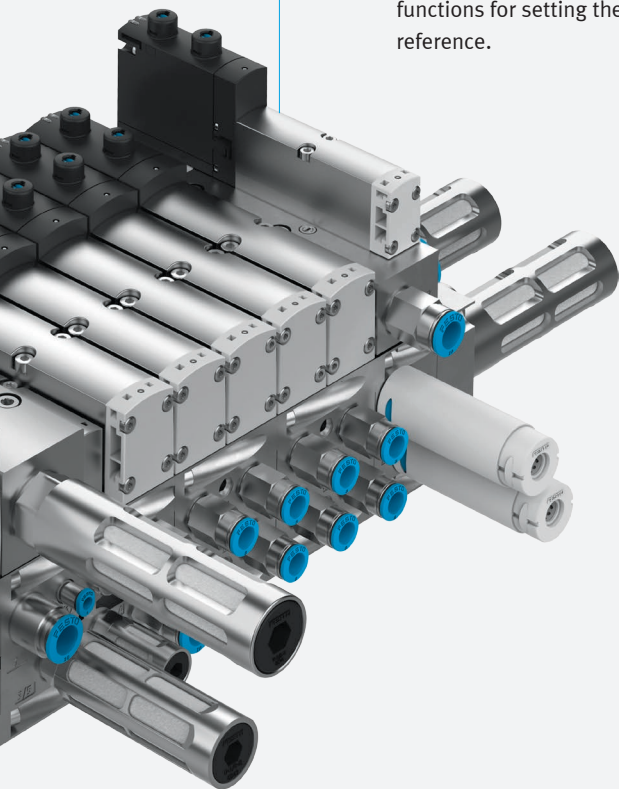
Pneumatic interface with PROFIsafe and an external safe output



Pneumatic interface with PROFIsafe for up to three zones



The new addition to the VTSA series offers considerably more application possibilities thanks to serial and parallel communication. The internal bus system now provides 96 valve addresses and up to 4 voltage zones, of which 3 can be safely disconnected.



Vacuum generator for VTSA-F-CB

Parameterisation is carried out directly via the CPX system and no longer via pushbuttons. This enables teach-in functions for setting the homing reference.

Variety through function integration

The new vacuum generator VTSA-F-VB now has a teach-in functionality that enables you to set the homing reference. Warnings are given if the pre-set times deviate – another tool to support you with process monitoring and preventative maintenance.

You can also change the vacuum limit values for each data record, thus digitising format change-overs on the system. Additional process reliability is also built in as you can block the ejector pulse when safety functions are needed or in the event of a fault.

New:

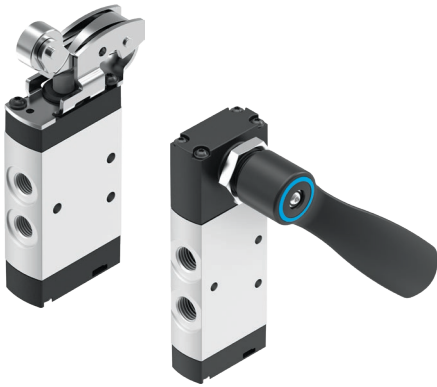
Thanks to the serial linking, external cabling is no longer required for the pilot air switching valve and the soft start/quick exhaust valve.

In addition, with the new manifold sub-base two different valve sizes, 18 and 26 mm, can now be mounted together sub-base.

Find out more:

→ www.festo.com/vtsa

Manually and mechanically actuated valves VHEF/VMEF



VHEF and VMEF – the little powerhouses that can boost your productivity!

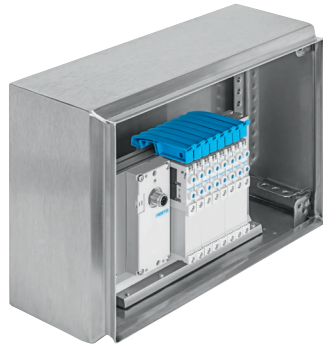
The new manually and mechanically actuated valves VHEF and VMEF provide functions for directly triggering subsequent processes in the system based on touch actuation, e.g. they can be used for clamping or closing safety doors (manually) or can act as a “signal generator” (mechanically).

The valves VHEF and VMEF can be used in all industry segments. Choose from the diverse range of products offered by Festo, whether it's a hand lever valve, roller lever valve, finger lever valve or stem actuated valve.

All are available as 3/2-way and 5/2-way valves and with G1/8 and G1/4 connections, with NPT variants also set to be introduced – and at amazing prices.

- Robust metal housing
- Attractively priced
- Ergonomic and safe operation
- Low actuating forces
- Modern design

Valve terminal VTUG with plug-in in control cabinets



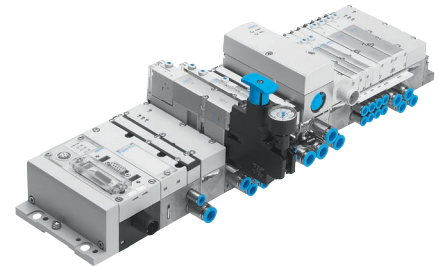
Functionally optimised and space-saving: your all-rounder in the control cabinet.

The universal valve terminal VTUG. Always compact with a high flow rate, it now comes in an optimised and space-saving variant for inside the control cabinet. A wide range of functions and details such as pneumatic connections (including from underneath) make the VTUG with plug-in absolutely ideal.

The new features provide an even more powerful performance. New stainless steel-coated terminal strips make the VTUG extremely resistant to corrosion and suitable for control cabinets and environments up to IP69k. New check valves and fixed flow restrictors ensure high process reliability. The VTUG thus becomes an all-rounder in the control cabinet – and at a very attractive price.

- Hot swap: replace valves during operation
- Explosion protection: new variants
- Convenient access: outlet direction to the front

Valve terminal MPA-S



Continuously expanded – so MPA-S can do even more for you.

First things first: there is now also a dashboard for the CPX/MPA! But Festo is continuously improving its products, even on a small scale. An example is a flow rate of up to 670 l/min with a valve width of just 14 mm. This eliminates the need to fall back on larger sizes. This is double the cost efficiency: lower hardware costs for plant manufacturers and reduced energy costs for plant operators.

The check valves in exhaust ducts 3 and 5 are now also available as individual sales parts. This means they can be retrofitted if you need protection against unwanted movements in the event of an exhaust air blockage.

- Three valve sizes for up to 64 valve positions
- Comprehensive diagnostics, including via dashboard
- Proportional pressure regulators can be multiplexed
- Check valves or fixed flow restrictors can be easily and cost-effectively retrofitted

Proportional flow control valve VEMD



Quiet, precise and energy-saving – ideal for mobile devices.

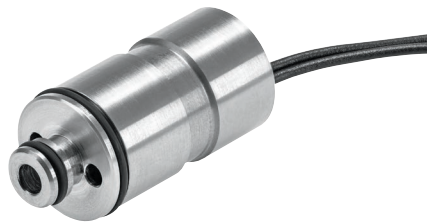
The lightweight and compact mass flow controller (MFC) is very quiet and, thanks to its short response times, very precise. The module with integrated 2/2-way piezo valve, flow sensor and control electronics doses and regulates inert gases such as air, oxygen and nitrogen proportionally.

The integrated control circuit with sensor detects and regulates the actual flow rate and forwards it to the master controller as an analogue signal. The volumetric flow rate at the system's outlet can be adjusted very simply to up to 20 l/min by entering a setpoint between 0.2 and 10 V.

The range of applications is very varied and centres on the life sciences, the process industry and the semiconductor industry.

- Compact module with integrated control electronics
- Dynamic regulation with short response time
- Low power consumption thanks to piezo technology
- Silent: ideal for mobile applications and those close to patients
- Ideal for life sciences applications

Proportional valve VPWS



Lightweight, compact, high flow rate!

The VPWS is a lightweight and compact proportional solenoid valve with a high flow rate. The 15 mm cartridge valve regulates gas flows safely and precisely, whether oxygen, carbon dioxide, air, nitrous oxide or inert gases. It is ideal for applications where flow rates from 10 to 350 l/min have to be regulated, for example in the electronics and semiconductor industries or the biotech/ pharmaceutical industries.

But it is also suitable for medical technology for mixing respiratory gases in respiratory and anaesthesia systems or for dental drills and other pneumatic surgical instruments.

- Proportional flow control valve
- Extremely small, diameter only 15 mm, length only 30 mm
- Made from stainless steel, with FKM seals
- Grease-free
- High flow rate of up to 200 l/min at 2 bar or 350 l/min at 4 bar input pressure

Suction cup OGVM



Makes handling oily and dry sheets really dynamic.

Good news for press-fitting lines, body shops, final assembly in car manufacturing, manufacturers of white goods and wherever sheet metal is moved: the OGVM speeds up your handling processes and makes them safer.

The special structure of the inside of the suction cups enables the suction grippers to absorb the highest transverse forces. The suction ergonomics of the OGVM ensure minimum suction times, high inherent stability in the suction state and the absorption of extreme holding and transverse forces, including on oiled surfaces. And the large stroke of some variants also makes it ideal for workpieces with complex structures.

- Very energy efficient, absorbs very high transverse forces
- Optimum suction ergonomics for maximum process reliability
- Ideal for workpieces with complex contours
- Existing accessories available for a wide range of application

High-tech wood cutting in the world's fastest sawmill

“Our new saw can reach speeds of 150 metres per minute. It is the fastest band saw line in the world,” explains Johan Fredriksson from Swedish timber supplier Norra Timber. The modular line was supplied by the American plant manufacturer USNR. It includes the flexible function terminals CPX/VTSA for actuating the pneumatic and hydraulic systems.

Johan Fredriksson is a production developer in the Sävar Såg sawmill of the Swedish timber supplier Norra Timber. “Given the tough competition in the timber industry, we need to invest in advanced technology in order to increase productivity and therefore yields,” emphasises Fredriksson. Automation technology from Festo supports the modular design in the sawing process with the flexible function terminals CPX/VTSA and the large number of standards-based cylinders DNC.

Higher timber yields

“With the new line, we have increased the timber yield per log from 50% to 56%. The best sawing technology at the moment generates less sawdust and fewer shavings.” With this, Norra Timber wants to increase its annual output to 270,000 m³ of sawn boards by 2020. The distances between the logs along the conveyor section can also be steadily reduced using the line's individual modules, allowing the high belt speed to be used to the full.

Faster commissioning

“The automation platform CPX and the function-integrated valve terminals CPX/VTSA that actuate all drives – regardless of whether they are pneumatic, servo-pneumatic or hydraulic – also play a major role in our modular design,” remarks Jonas Ljung, Design Manager at USNR. The robust valve terminals defy dust, sawdust and shavings.

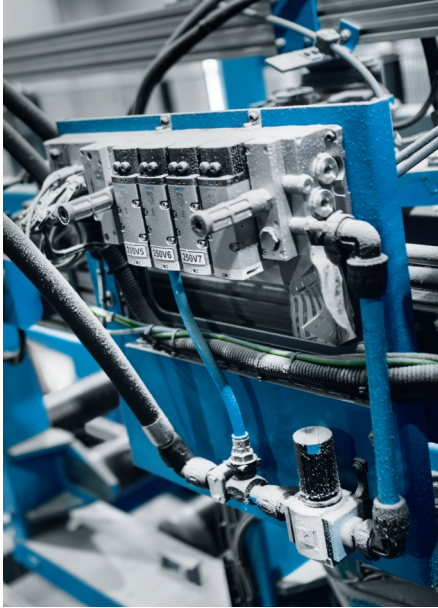
They actuate the many pneumatic cylinders of the type DNC and ADN that carry out positioning, clamping, centring and transport functions. If greater flexibility is required for clamping and centring because of the different dimensions of the logs, the pneumatic cylinders are actuated using the servo-pneumatic module CMAX via the CPX/VTSA. An additional displacement encoder at the pneumatic cylinders DNC enables precise positioning.

International fieldbus modules – less cabling work required

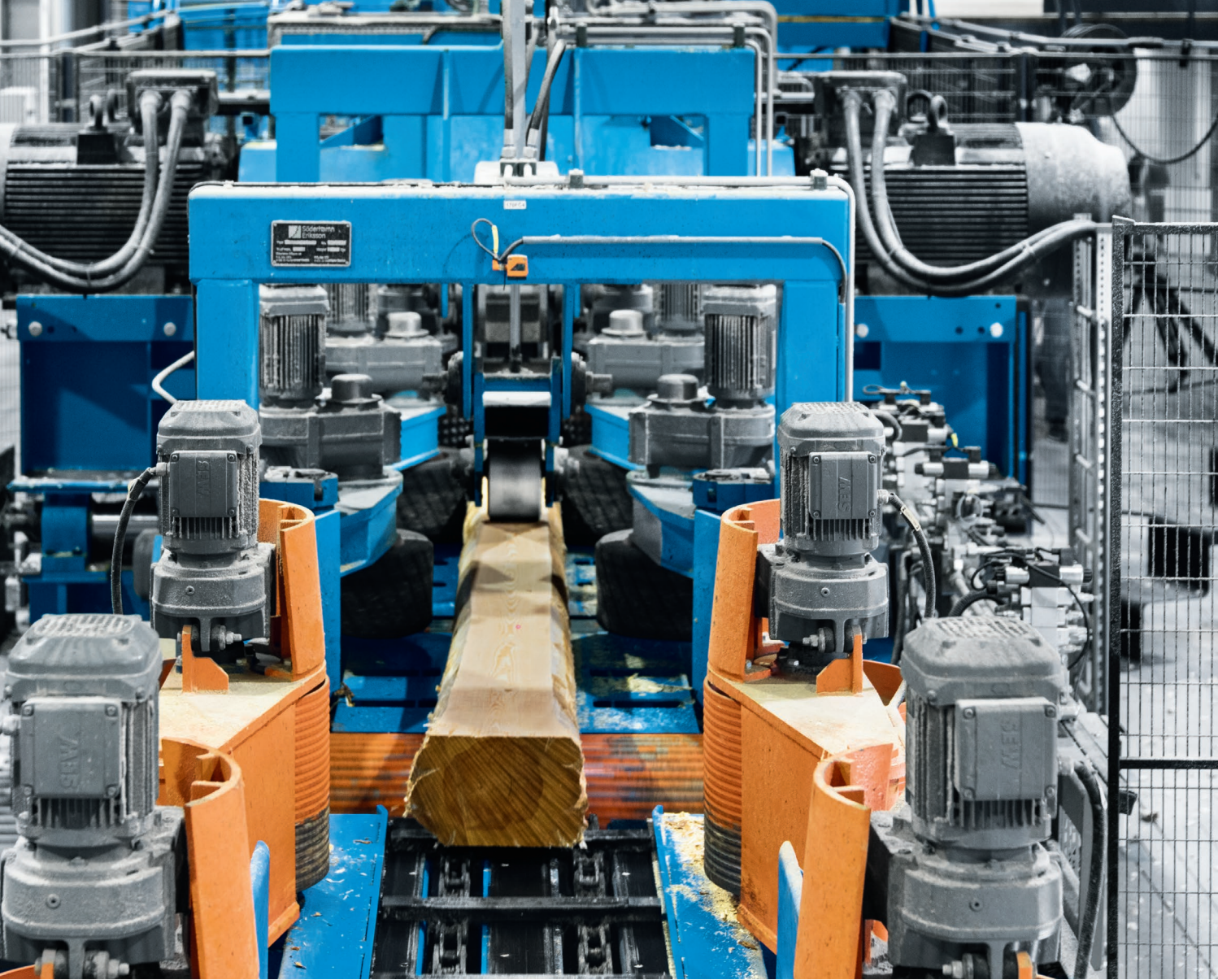
Depending on the region and preferred fieldbuses, PROFINET, Modbus®, Ethernet/IP or DeviceNet modules are available on the CPX thanks to the highly flexible, functionally integrated valve terminals from Festo.

Control cabinet installation isn't necessary with the CPX/VTSA because of the high protection to IP65. This, together with the fieldbus technology, reduces the time for installation and commissioning by 65%. There is less need for wiring, since there are also 80% fewer connection points. “What's also important for us is that Festo has always been on hand with service and advice for over 10 years – worldwide,” says Ljung.





Completely unaffected by the dust from the sawmill: the flexible function terminal CPX/VTSA can be equipped with different fieldbus modules from PROFINET to Ethernet/IP and from Modbus® to DeviceNet®.



One by one: as the logs pass through each station of the modular system, the distance between them becomes shorter.

Compact, lightweight, high flow rate! New regulator and filter regulator MS2

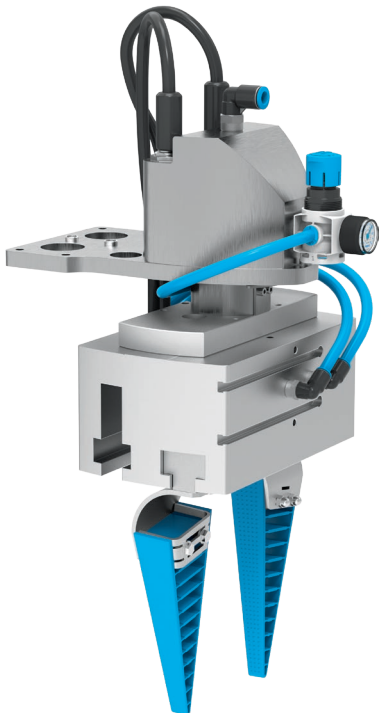
Unrivalled

Advanced polymer materials make the compressed air and filter regulators MS2 up to 50% lighter than competitive products – but extremely sturdy at the same time.

The optimised design provides a very high flow rate performance of up to 350 l/min for the regulator LR and up to 310 l/min for the filter regulator LFR. The precisely adjustable pressure regulation and the stable control behaviour without vibration always ensure smooth processes.



The compact, lightweight MS2 is optimum for installation on the front unit or on end-of-arm solutions.



Compact

Connecting plates or additional fittings are no longer needed for the variants featuring built-in push-in fittings QS6. This offers great cost benefits and space savings of up to 40%.

The regulators and filter regulators MS2 are very compact and extremely light, yet have high flow rates of up to 350 l/min. They can be installed directly in the machine for use close to the process and for end-of-arm applications. These strong, cost-efficient and lightweight components are ideal for small parts assembly and in the electronics industry.



Integrated Z flow rate

Need to reverse flow direction? Not a problem. The regulators and filter regulators MS2 can also be used as standard for reversing the flow direction. Simply install them vertically, turn them 180° and the air will flow from right to left.

Product Key for fast information

If required, the Product Key allows you speedy access to online information, including the operating instructions. Simply scan the data matrix code on the product.

Reliable operation

Thanks to the completely transparent cover, you can always see the condensate level and quickly identify dirty filters. Condensate draining and filter changes are quick to carry out. The bowl can be secured to prevent it coming loose accidentally.

Find out more:

→ www.festo.com/ms2

Stainless steel fittings NPQR



Tailor-made for extreme conditions: the fitting for the food processing industry.

You can use this stainless steel fitting safely and without hesitation in the food contact zone, even if your machines are subjected to the most extreme conditions. The NPQR is EC1935/2004 (in certification) and FDA compliant and is always the right choice for your connection technology. The high pressure and temperature ranges, a reduced number of edges which accumulate dirt and high levels of resistance to most media make this series of fittings an all-purpose tool, especially in the food and beverage industry.

- Very easy to clean thanks to chamfered O-ring and reduced number of edges which accumulate dirt
- Optimal price/performance ratio ideal for applications from a single source

Energy efficiency module MSE6-C2M



Regulating, switching, measuring: complete control of the compressed air supply!

The intelligent MSE6-C2M regulates, switches and measures the compressed air consumption of your system fully automatically. All functions can be controlled digitally via PROFINET. For optimum production, the integrated proportional pressure regulation system regulates the pressure according to your specifications. During system downtime, the pressure level automatically drops to a defined standby level after a waiting time. This saves energy and CO₂. Leakage detection takes place in the standby phase. The digital inputs and outputs on the MSE6-C2M eliminate the need for additional I/O terminals for other devices nearby.

- Automatic standby pressure regulation reduces consumption
- Dynamically regulated output pressure
- Automatic leakage detection
- Recording and preparation of pneumatic measured variables

Energy efficiency module MSE6-D2M



Saving energy is easier than ever before: MSE6-D2M automates saving energy.

The intelligent module monitors and regulates the compressed air supply fully automatically. Automatic shut-off of the compressed air supply in standby, leakage detection and process data recording for condition monitoring: all these functions are integrated into the new MSE6-D2M. The module can be connected to the MSE6-C2M as an extension for a second string or to a CPX terminal. This provides a cost-effective way of implementing further energy efficiency and monitoring functions – without additional fieldbus nodes!

- Zero compressed air consumption in standby mode
- Checks the system for leaks
- Needs-based maintenance in the event of leakage
- Monitors relevant process data

Small, lightweight, with a high flow rate: regulator and filter regulator MS2

Small but superb: with the new service unit MS2, Festo is setting the new standard for compact and lightweight regulators and filter regulators. The products made from modern polymer materials are ideal for regulating the force of grippers, since they increase efficiency with their low weight.

Unrivalled

The new regulators MS2 are already in use at Festo in testing gripping and handling applications. Before the new service unit MS2 was introduced, Festo application engineers put the new compact regulators with high flow rates through their paces. Their conclusion: they passed the quality test! “When I held the MS2 in my hand for the first time, I was truly astounded: despite its compact size, I didn’t expect it to be so light. It’s great especially where moving loads need to be reduced. So light and yet such a high flow rate: a super combination!” is the conclusion of the application experts from Festo.

Wide range of applications

The excellent characteristics of MS2 enable them to be used in a variety of tasks, either directly in the machine or in end-of-arm applications, for example to reduce the force in gripping applications or in front-end applications in the electronics industry. The light weight helps to increase the precision of the movement – and saves energy. It is mounted using mounting brackets and fastening nuts. In the variant with QS6 connection, the tubing with O.D. 6 mm can be connected without any additional push-in fittings, thus saving costs and installation space.



Small, lightweight, with a high flow rate: the regulators and filter regulators MS2 are particularly suitable for use directly in the machine or in end-of-arm applications where low weight is crucial.

Powerful and reliable!

Opto-electronic sensors SOOE and SOOD

Virtually error-free production

With the SOOE you get all the optical functions for object sensing in an identical sensor housing. From through-beam sensing to distance sensing, you benefit from the most innovative technologies and at the same time reduce device variety thanks to universal assembly. The SOOE offers impressively quick and easy commissioning.

Communication right down to sensor level

IO-Link® makes the SOOE suitable for Industry 4.0, for example sensing function reserves, signal quality or operating hours. This enables you to increase throughput and quality.

Functions of SOOE:

- Diagnostic functions
- Diffuse sensor
- Diffuse sensor with background suppression
- Through-beam sensor
- Retro-reflective sensor
- Retro-reflective sensor for transparent objects
- Distance sensor
- Laser contrast sensor



 IO-Link

Highlights of SOOD and SOOE:

- Precise object detection from a distance of 1 mm to 20 m
- Low complexity, since PNP and NPN in one device (push-pull)
- Standardised M8 3-pin electrical connection
- Resistant to external light and not influenced by reflective object surfaces
- Reliable suppression of objects in the background
- Wide range of operating modes in one sensor size
- LED and laser class 1
- Very long service life with LED and laser
- c UL us

The compact housing accommodates a large number of functions: precise object detection from 1 mm to 20 m, resistance to external light and reflective objectives, reliable suppression of objects in the background and long service life of LED and laser. The SOOE and SOOD deliver the best results even in critical and cramped environments.



Engineering in record time!

The opto-electronic sensors SOOD are the perfect solution for a wide variety of object detection tasks, even in very confined application environments. They are fast and cost effective thanks to an integrated concept with standardised sensor functions. The SOOD can be used straightaway without needing to be parameterised first.

Unique laser technology

The eye-safe laser LEDs from laser class 1 are particularly durable. The sensor response time of just 250 μ s and the background suppression increase the throughput – virtually independently of colour.

Functions of SOOD:

- Diffuse sensor with background suppression
- Through-beam sensor
- Retro-reflective sensor

Find out more:

→ www.festo.com/sooe

→ www.festo.com/sood

Flow transmitter SFTE



Lightweight, compact, reliable and with a large number of mounting options: SFTE.

The lightweight and compact flow transmitter SFTE with four flow levels ensures high reliability and flexibility in the production process, even with negative pressure in the vacuum. Its three different pneumatic connection options open up many different mounting options.

The flow transmitter SFTE is suitable for monitoring compressed air and non-corrosive gases. To record the flow rate, the non-linearised sensor signal is output in analogue form as a voltage signal.

This signal can optionally be processed, for example by a controller or signal converter. The SFTE also supplies an output signal during the return flow.

- Wide operating pressure range from $-0.9 \dots 10$ bar
- Available with a short cable length and M8 plug
- Output $0 \dots 10$ V or $1 \dots 5$ V

Flow sensor SFAH



IO-Link

Compact: SFAH monitors the flow rate of compressed air and non-corrosive gases.

Many industrial sectors will appreciate the flexibility it offers in terms of its compact design (20 x 58 mm), numerous installation options and space-saving adjustable QS push-in connections. The bypass construction of the SFAH means that it is less susceptible to particles and moisture. The flow rate value is transmitted to the connected controller as a digital switching signal, an analogue signal or via IO-Link®.

- Switchable electrical outputs
- Eight flow rate measuring ranges from $0.002 \dots 200$ l/min
- Very clear display
- Replicable
- Attractive price and great performance
- Wide operating pressure range $-0.9 \dots +10$ bar

Position transmitter and programmable proximity sensor SDAS-MHS



IO-Link

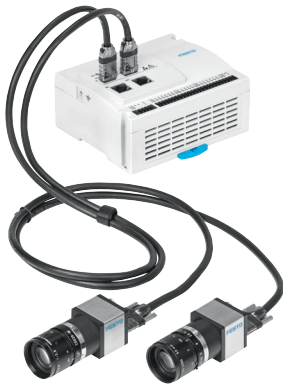
IO-Link® position transmitter or proximity sensor? Both!

The SDAS-MHS serves simultaneously as an IO-Link® position transmitter in proximity sensor size and as a proximity sensor with two programmable switching points. With this dual function, the SDAS-MHS solves space problems for tricky application requirements. In proximity sensor operating mode you can teach in two switching points. Small cylinders and grippers can be more compactly designed because they don't need any space for a second proximity sensor.

You can set up the sensor quickly and reliably using the Teach button. And the possibility to program PNP/NPN directly in the device reduces complexity.

- IO-Link®
- Two programmable switching points
- PNP/NPN programmable
- Continuous position feedback on the piston movement

Smart camera SBRD



The 2-in-1 image processing system for beginners and professionals!

With the high-speed, high-resolution USB cameras, the specially designed machine vision controller and the powerful image processing software, the SBRD opens up new possibilities in automation and robotics. The controller is especially suitable for multi-camera tasks thanks to two camera interfaces. You can now easily carry out inspections from several perspectives or with a large field of view with ease.

The well thought-out SBRD system makes operation easy and intuitive at every stage of the development of an application.

- High-speed and high-resolution USB cameras SBPB
- Space-saving controller with dual-core processor and PROFINET communication
- Two camera interface for multi-camera tasks
- Powerful image processing software for fast and reliable results

Connecting cables NEBB



NEBB is a highly efficient cabling solution for connecting your systems.

The cost-optimised NEBB with a cable sheath made of high-quality PVC offers over 30 variants, high degrees of protection (IP65, IP68 and IP69k), as well as corrosion-resistant, gold-plated pin contacts.

NEBB connects sensors, valves and valve terminals to the PLC or IO modules. It is the most economical solution available for low stress applications. It is quick to assemble, the cable sheath is easy to strip and, together with the inscription label holders, installation and warehousing are really simple.

- M8x1 and M12x1, A-coded
- High-quality PVC cable sheath
- Delivery quantities as low as 1 piece
- Degree of protection IP65, IP68, IP69k
- Easy to assemble, easy to strip (ATEX zone 2, 22)

USB IO-Link® master CDSU-1



 IO-Link

Easy and intuitive product commissioning with IO-Link® from Festo!

The connection to the PC is established via a mini USB socket. For safe operation, the IO-Link® connection in M12 and the USB interface are galvanically isolated.

IO-Link® devices with a low power requirement of up to 80 mA can be operated via the USB port on a PC; devices with a higher power requirement of up to 2.5 A have a standardised 24 V industrial input socket on the master. Port class B IO-Link® devices up to 3.5 A such as valve terminals require a distributor NEDU.

The parameters of IO-Link® devices are visualised and edited using the software "USB IO-Link Master Tool". You can download this free of charge via the Support Portal.

- Compact, cost-effective, powerful
- Universal connections
- Galvanic isolation
- Connecting cables for almost all IO-Link® devices from Festo
- For IO-Link® devices with protocol versions 1.1 and 1.0
- Supports data storage

Loading processes in machine tools is now truly exciting

Loading processes for machine tools offer enormous potential for savings. ZERO CLAMP GmbH based in Bruckmühl, Germany, is exploiting precisely this potential with its flexible automation solution Zerobot 100. The solution also includes the flow sensor SFAH from Festo, which safely and reliably monitors the volume of a component within the machine tool.

Classic automation solutions for loading machine tools include gantry handling systems, articulated arm robots and pallet loading systems. ZERO CLAMP went its own way and developed an automation solution with an extremely flexible loading robot with the Zerobot 100 P and V. “We started by developing the solution for our own use in the production of our zero point clamping system,” explains Marcus Koppenhöfer, Assistant Manager in the rapidly growing company ZERO CLAMP.

Increased productivity

“Automation enabled us to increase our machine capacity by 60%, shorten the time for programming and CAD/CAM by 30% and reduce the machine hour rate by 50%,” adds Koppenhöfer. This makes automation worthwhile even for small and medium series. It takes just four steps to create a new production order.

After the machine and the flexible rack are prepared with the parts or tools to be processed, the machine operator creates the job in the software and teaches the robot by hand to start the production order. The Zerobot 100 has a load capacity of 100 kg and works around the clock. This means that the operators do not have to do monotonous work and can focus on tasks with greater added value.

Clamping system monitored by sensor

The zero point clamping system provides a secure grip for processing a workpiece on the lathe, milling machine, grinding machine or eroding machine. The innovative product from ZERO CLAMP can reduce setup times at the machine table by up to 90%. The precise, compact and dynamic flow sensor SFAH from Festo senses the volumetric flow rate so that the component to be processed can be securely picked up and clamped.

“What we like most is the high measuring speed and precision of the flow sensor SFAH as well as how easy it is to use thanks to the display,” says Koppenhöfer. The display shows the precise volume. If a setpoint value isn’t reached, an e-mail or SMS alert can be sent to the operator via the controller. “Using the compact sensor will get really exciting when we combine it with IO-Link®,” says Koppenhöfer, looking to the future. IO-Link® makes communication with sensors and actuators simple and economical. It uses low-cost connection technology for point-to-point connection – without complex wiring and with minimal material requirements.



The flow sensor SFAH measures the back pressure in the zero point clamping system quickly and precisely.



Zerobot 100 V: automation solution with an astonishingly flexible loading robot for machine tools.

★ The perfect all-rounder: quarter turn actuator DFPD

Suitable for the majority of tasks in the process industry, such as for automating butterfly valves, ball valves and air dampers in the chemical, beverage and pharmaceutical industries as well as in water treatment

Now also in new versions, specially for the chemical industry and for applications that require a high torque.

NAMUR interface to VDI/VDE 3845
Mounting plate for pilot valves in G and NPT thread versions



End position adjustable at both ends

Suitable for extreme temperatures:
-50 ... +150 °C

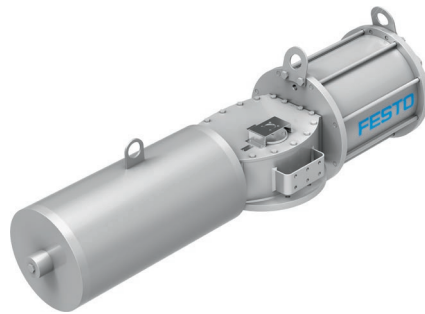
Sizes from 10 to 2300

Single-acting or double-acting:
optimised spring cartridge design for single-acting operation in increments of 0.5 bar

Version for corrosive environments,
steel shaft, housing and cover with epoxy coating



Reliable and secure for all your tasks. The highly modular DFPD provides a wide range of quarter turn actuators. The standard version, the HD version for high torques or DFPD-C for specific requirements in the chemical and petrochemical industries.



Ideal for applications with high torques!

The DFPD-HD

Extremely modular for a variety of uses: three different gear unit sizes, single-acting or double-acting, configurable spring forces, a choice between right or left direction of rotation and mechanical or hydraulic manual override.

- Torque up to max. 32,000 Nm
- SIL3 certified
- Interfaces to VDI/VDE 3845 NAMUR



Ideal for the chemical and petrochemical industries: the DFPD-C

Version with compressed air ducts in the housing: this enables you to attach the positioner and pilot valve directly to the drive – without extra barbed tubing connectors.

- Extended NAMUR interface to VDI/VDE 3847
- Anti-blow-out screws for end-position adjustment
- Hard anodised cover to prevent surface damage
- Non-ferrous metal-free spring sets
- Centring ring for suitable mounting on the process valve



Version with swivel angle 120°, 135°, 180° for sizes 40, 120, 240, 480

SIL certified
according IEC 61508



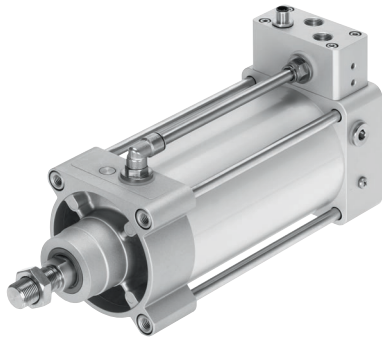
Find out more:
→ www.festo.com/dfpd

Manual or completely automated process valves from a single source

Try our new configurator now:

→ www.festo.com/kvza

Closed-loop-controlled linear actuator DFPI



Easy to install – robust and reliable operation.

Ideal in harsh ambient conditions: corrosion-resistant linear actuator to ISO 15552 with integrated displacement encoder or fully integrated positioner. This ready-to-install unit is extremely space-saving and is easy to incorporate into almost any installation situation thanks to a comprehensive range of accessories.

Suitable for applications with closed-loop controlled linear motion and for swivel motions where lateral forces act on the piston rod.

New are the actuator versions with electrical connection via M12 plug or cable connector and metal air guide on the drive.

- Mounting interface to ISO 15552
- Double-acting
- Sizes Ø 100, 125, 160, 200, 250, 320
- IP65, IP67, IP69K, NEMA4
- Corrosion resistance class 3

Filter regulator PCRP



A tough performer: the robust stainless steel filter regulator.

The extremely corrosion-resistant filter regulator PCRP excels at high flow rates, reliable pressure regulation and is amazingly sturdy. It comes in 1/4" and 1/2" sizes with G or NPT thread. The housing and internal components are made entirely from stainless steel, which means that the PCRP can also withstand adverse ambient conditions.

Thanks to its temperature resistance from -60 to +80 °C, it can also be used without any difficulty in extreme cold or heat. The patented sealing technology protects against return flow and ensures reliable exhausting.

- Fully stainless steel version
- Flow rate of up to 4115 l/min
- Temperature range from -60 ... +80 °C
- UV resistant
- Reliable manual drain
- ATEX-compliant for zones 1/2

Filter regulator LFR-...-EX4



When the going gets tough: robust and with high flow rates – but still attractively priced!

The LFR-...-EX4 is ideal for use in corrosive outdoor environments, for example in the chemical industry or in offshore, salt water applications. The new filter regulator is initially available in sizes 1/4" and 1/2" with a G or NPT thread, either individually or in combination with process valve units.

Die-cast zinc and surface-coated aluminium ensure high levels of corrosion resistance (CRC3), and temperature resistance lies within a range of -40 to +80 °C.

The LFR-...-EX4 easily withstands pressure fluctuations. At low temperatures, leakage is minimal, resulting in good energy efficiency, and maintenance is very easy.

- Sturdy thanks to full metal design
- Flow rate up to 3400 l/min
- For extreme temperatures: -40 to +80 °C
- Corrosion resistance: CRC3
- UV resistant
- Reliable manual drain
- ATEX compliant for zone 1/2/21/22

Analogue CPX module, HART-compatible, 4 channels



Analogue precision meets digital diagnostics and parameterisation.

There is a new addition to the proven CPX platform in IP65/67: the analogue module CPX-HART with 4 channels, each of which can be used as an input or an output. Both 2-wire and 3-wire field devices can be connected to the module. The modes of 0 ... 20 mA, 4 ... 20 mA and 4 ... 20 mA with HART (Highway Addressable Remote Transducer protocol) are freely selectable. This combines the advantages of the simple and robust 4 ... 20 mA interface with the diagnostic and parameterisation capabilities of a digital interface.

Up to 4 HART secondary variables (PV, SV, TV, QV) can be mapped in the cyclic process image of the coupler or controller. Errors are signaled via LEDs and via the general CPX diagnostics.

- Harness the advantages of analogue and digital technology
- Freely selectable modes
- Device driver for connecting the CPX remote I/O to the PROFIBUS, PROFINET and Ethernet/IP coupler

Pinch valve VZQA



Negligible flow resistance, no blockages: a clear run for your media.

The compact 2/2-way valve with integrated NC (normally closed) function controls the flow of substances such as gases, liquids and highly viscous and abrasive media. It is a convenient solution as the valve can be configured individually using different connection and material variants, and maintenance is quick and easy as the sealing cartridge is simple to replace without the need for special tools. Aluminium, POM and stainless steel screw caps with G thread and NPT thread as well as clamp connections to ASME-BPE and EN 32676 in stainless steel for nominal width DN6 (1/8"). The easy-to-clean valve housings are available in corrosion-resistant stainless steel as well as in aluminium. The components that come into contact with the media (pinch valve sleeve and cap) are FDA-compliant.

New: VZQA-NC DN6. Component parts interchangeable as modules.

- Clean design for machine cleaning
- Direct air supply connection – no actuator required
- Diaphragm material EPDM

Ball valve actuator units VZBM



So convenient: no construction, no screws. Just install – everything works!

The actuator units consisting of ball valves VZBM and actuators DFPD come in single-acting and double-acting versions. The brass ball valves VZBM with their low torques can be combined with space-saving and more cost-effective smaller actuators without any loss of function.

The pre-assembled unit eliminates the need for you to design and assemble the individual components. And if you need any reducing sleeves and mounting accessories, everything is already included. All units are function tested. There is no cavitation, even in the open position.

New: The 3/2-way function is now also available as a unit.

- Simple: can be delivered ready to install
- Saves time: pre-assembled ball valve actuator unit
- Cost-effective and reliable: through optimum sizing of the drives

Easier automation with standards

Blood plasma is an essential resource in the production of life-saving medicines and are in high demand on the global markets. To make more efficient use of this valuable commodity, Biotest AG developed a new large-scale plant for plasma fractionation. Standardised components from Festo simplify installation and maintenance.

In order to be able to make the best possible use of this valuable raw material, companies like Biotest AG, based in Dreieich near Frankfurt/Main, Germany, are investing in research and innovative manufacturing methods for more efficient processes. This is also achieved through improved process automation. 6,000 valves and 250 standardised control cabinets from Festo simplify the construction and maintenance of the plants.

Lasting effect of standardisation

Standardisation enables the plant engineers to benefit from easy to purchase, predefined components and favourable terms. For the operator Biotest, the overall cost for spare parts supply is reduced. The training requirement for maintenance and service staff as well as downtimes are also reduced.

Increased capacity and economy

“Expansion of capacity and economy were central aspects when it came to the construction of the modern large-scale plant,” explains Matthias Mahle, Head of Technical Project Management BNL, at Biotest. “We are strengthening our market position on the global stage by obtaining more products from the same amount of plasma.” In the new plant, Biotest will be able to manufacture six instead of the previous three products as well as increase the yield and its purity. Whereas the capacity limit used to be 800,000 litres, the new plant will be able to fraction up to 1.4 million litres of blood plasma.

Early involvement in the engineering process

The plant is expected to be fully commissioned by 2021. Following basic engineering, Festo was involved in the detailed engineering process very early on. Werner Gödel, Head of the EMSR Technology Department, Biotest, insisted on the greatest possible, long-term plant efficiency through standards such as standards-based valve boxes.

Defined down to the smallest detail

Festo played an active role in the definition phase for the new plant, right down to the last detail. Once Festo was defined as the standard, all suppliers were able to order the relevant products and pool components systematically via the electronic platform.

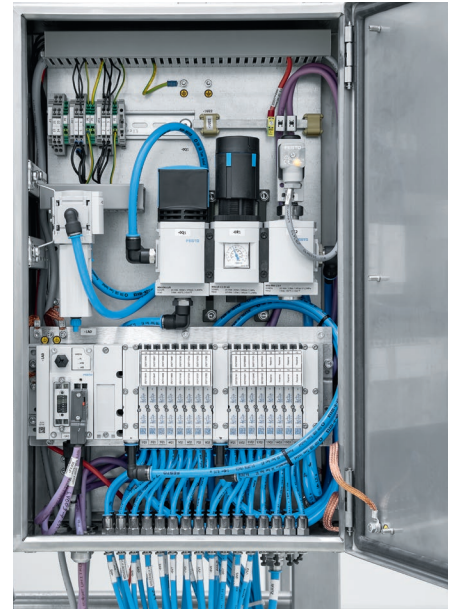
Close coordination from the beginning

For Werner Gödel from Biotest the close coordination with Festo and Biotest’s own maintenance department in the early planning phase was important. “The maintenance and plant engineers were clear in their preference for Festo because of the ease of use, the good support and the long service life,” explains Gödel.

“Limiting the number of standards reduces maintenance workload down the road.”

Werner Gödel Head of EMSR Technology Department, Biotest AG





Simplifies maintenance: the control cabinets from Festo were already defined as the standard in the planning phase.



Incorporated as early as the planning stage: 6,000 components and 250 control cabinets from Festo.

Productivity

Maximum productivity is a question of ambition.

Do you share this attitude? We will be glad to help you achieve this goal – through our four outstanding qualities:

- Security • Efficiency • Simplicity • Competency

We are the engineers of productivity.

Discover new dimensions for your company:

→ www.festo.com/whyfesto