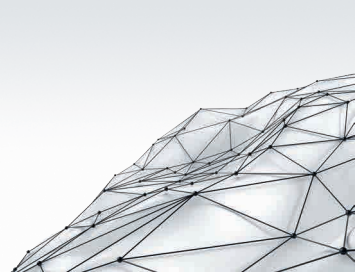
FESTO

Highlights 2018



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

→ WE ARE THE ENGINEERS
OF PRODUCTIVITY.



Automation goes digital – Festo moves ahead.
Become a part of our digital network!
→ **www.festo.com/highlights**



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

Dear customers,

Digitalisation is at the forefront of everybody's mind. Although there are already many advanced technical solutions, we are often quite slow at actually implementing them in factories. That is something we want to change, together with your help, by demonstrating that Industry 4.0 is not just an empty marketing slogan but an approach that offers concrete benefits.

This also explains why digitalisation is a key focus of Highlights 2018. Our App World already offers some digital products, such as the apps for the Festo Motion Terminal and the energy efficiency module E2M, as well as the Condition Monitoring Library for the compact handling system YXMx and Schematic Solution for EPLAN projects. Others will follow in due course to help achieve our aim of making every aspect of the automation world more transparent. In turn, this new level of data transparency will enable you to make your production processes leaner, faster and more productive.

However, we should not forget that digital solutions are always based on powerful hardware components. And when it comes to components too, Festo has many exciting innovations in 2018. Examples are our new, compact and lightweight electric axes ELGC and the electric mini slide EGSC, the simple yet highly efficient safety coupling NPHS, the new versions of the quarter turn actuator DFPD or integrated control cabinet solutions with the new IP20 modular system CPX-E and the valve terminal VTUG that has now been optimised for installation in a control cabinet. All these products are intended to take your automation systems – in the more conventional sense – to the next level.

We would also like to show you some impressive additions to our core range of pneumatic products, such as the powerful and precise guided drive DFM. These are cost-effective products that are available worldwide and generally ready for dispatch in 24 hours, even in the case of large quantities. The 2018 highlights are rounded off by a comprehensive range of complete solutions such as the intuitively operated balancer or the pre-assembled servo press kit YJKP. Because we know that good hardware boosts your productivity.

Join us on this exciting journey as we further explore this new dimension of industry! I would like to invite you to follow us in our footsteps and swap ideas with us.



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

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The digitalisation megatrend – the key to increased productivity

A phenomenon that has become a standard part of our private lives is now also spreading into industry: digitalisation. One thing is for sure: everything that can be digitalised will be digitalised. And that is why Festo is investing resolutely in the digitalisation of the company and its portfolio. But where exactly does Festo stand on a topic that often raises more questions than it answers?

Actively shaping change
Festo is actively leading the way in digitalisation in order to take control of the future, taking an approach that is comprehensive as well as agile and cooperative. Initially, this meant that products had to be compatible with the digital challenge because that is the common basis for all subsequent activities. Come what may, Festo is determined to explore the possibilities that lie between the real production world and the digital world, and to pass this experience on to customers.

Keeping staff on board
Employees are crucial to the success of digitalisation. The Festo Human Resources department has a clear mandate to make sure employees are fit and ready for the company's pursuit of digitalisation. Its job is to optimise processes and support employees as they make the transition to digital working. Throughout the company, employees are to be equipped for new approaches to working, not only in line with the concepts of "new ways of working" and the "workforce of the future", but also so they can engage in agile forms of working such as "design thinking". In this age of information overload, the ability to prioritise and filter information is one of the most important digital skills. There are also plans for a digital employee journey that is similar to the digital customer journey.

From hardware to software-based added value
Data management is all about adding value. That applies just as much to knowledge about products and solutions as it does to knowledge about customers. This is undergoing a dramatic change with the transition from hardware to software-based added value. Although hardware will never stop being important, advances such as digital twin technology are opening up new forms of added value and help to boost productivity through simulations and rapid trials.

As an automation expert, Festo has both the hardware knowledge and the application experience to reap the benefits from new data that will be of value to customers. These are the first steps to introducing greater intelligence into the production environment and to realising the promise of gains in efficiency, competitiveness and productivity. In addition, they are the key to future-proofing your production. At process level, they speed up time to market, and make processes leaner and faster.

Benefits of digitalisation
If the power of digital transformation is harnessed correctly, there are many advantages for everyone:
- Greater productivity in design and production
- Optimised and accelerated processes
- Improvements in overall equipment effectiveness (OEE), primarily through preventive and predictive maintenance concepts
- Traceability of production
- Energy monitoring, and many more



The digitalisation megatrend

Never losing sight of our customers' needs

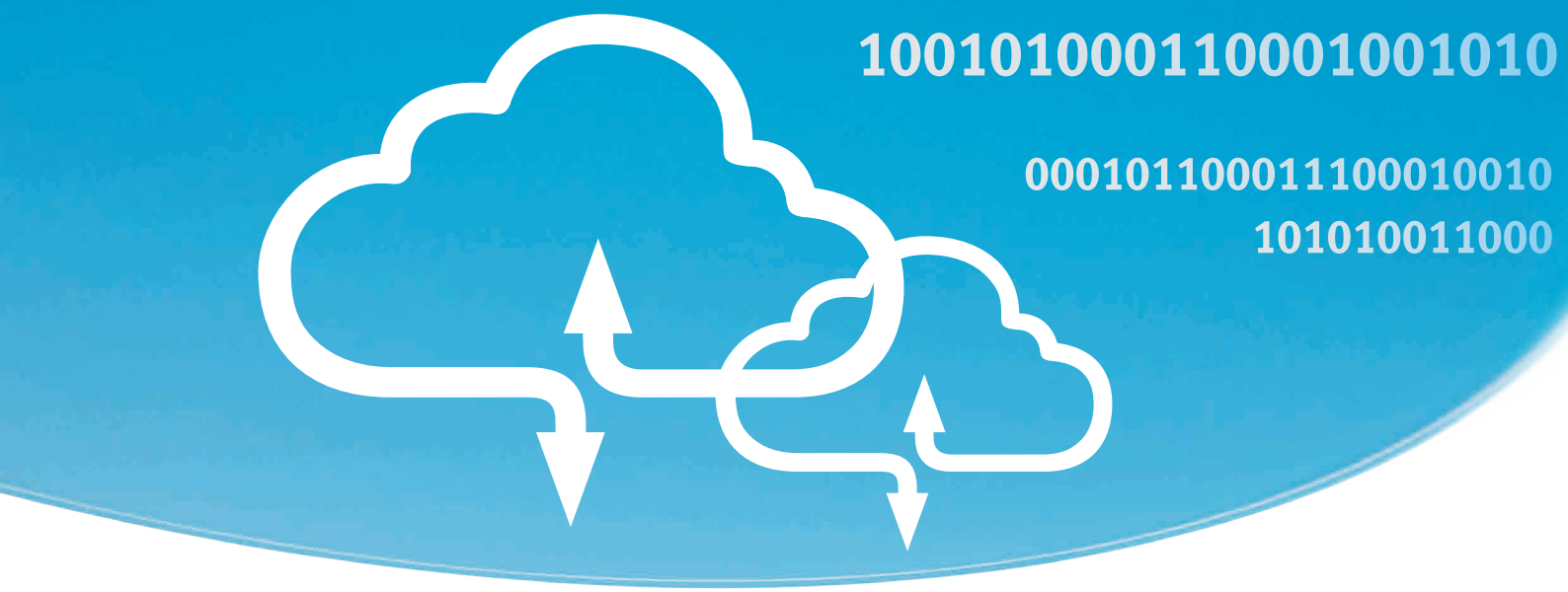
Always keeping sight of our customers' needs is the primary principle for Festo. With this in mind, we have identified four areas that are absolutely vital to maintaining a solid and successful partnership with customers as we journey into the digital age.

The first area is the digital infrastructure of which the Festo Cloud will be an important part. Secondly, digital products and services open up new business models and boost the productivity of the partners involved. The third area, the Internet of Things (IoT) automation platform, links smart and intelligent products to one another, e.g. CPX/MPA with an IoT gateway. And finally, the digital customer journey that will make it much easier for the customer to navigate each process station thanks to the consistent look and feel. The level of complexity associated with these four tasks can only be managed by adopting an interdisciplinary approach.

Digital infrastructure
If we want to shape the transformation into the digital age, the infrastructure has to live up to the technical requirements. First and foremost, this involves having a 360° solution for editing product data, i.e. a cloud structure that permits data to be analysed and reveals how and when products are used. This analysis also calls for extensive platform services. To be able to communicate with the IoT, the cloud has to have a hybrid structure that is scalable. As far as the product world is concerned, a fully consistent Product Key forms a vital part of the digital infrastructure.

Digital products and services
Our tailored digital offer, i.e. software, apps and firmware, is intended to boost productivity for Original Equipment Manufacturers (OEMs) and end users alike. This range is rounded off by operation and maintenance services. Dashboards with condition monitoring and cloud services lead to new added-value business models, which includes networking them with customer IT systems in line with Industry 4.0.





IoT automation platform
Smart and intelligent products – such as CPX/MPA, VTEM or YXMx with the IoT gateway – are connected to the Festo Cloud via the IoT automation platform. As a result, these products get a digital fingerprint and are ready for condition monitoring. Having a digital description for people and machines facilitates access and enables best-in-class engineering, whether in the shell or with digital twin technology.

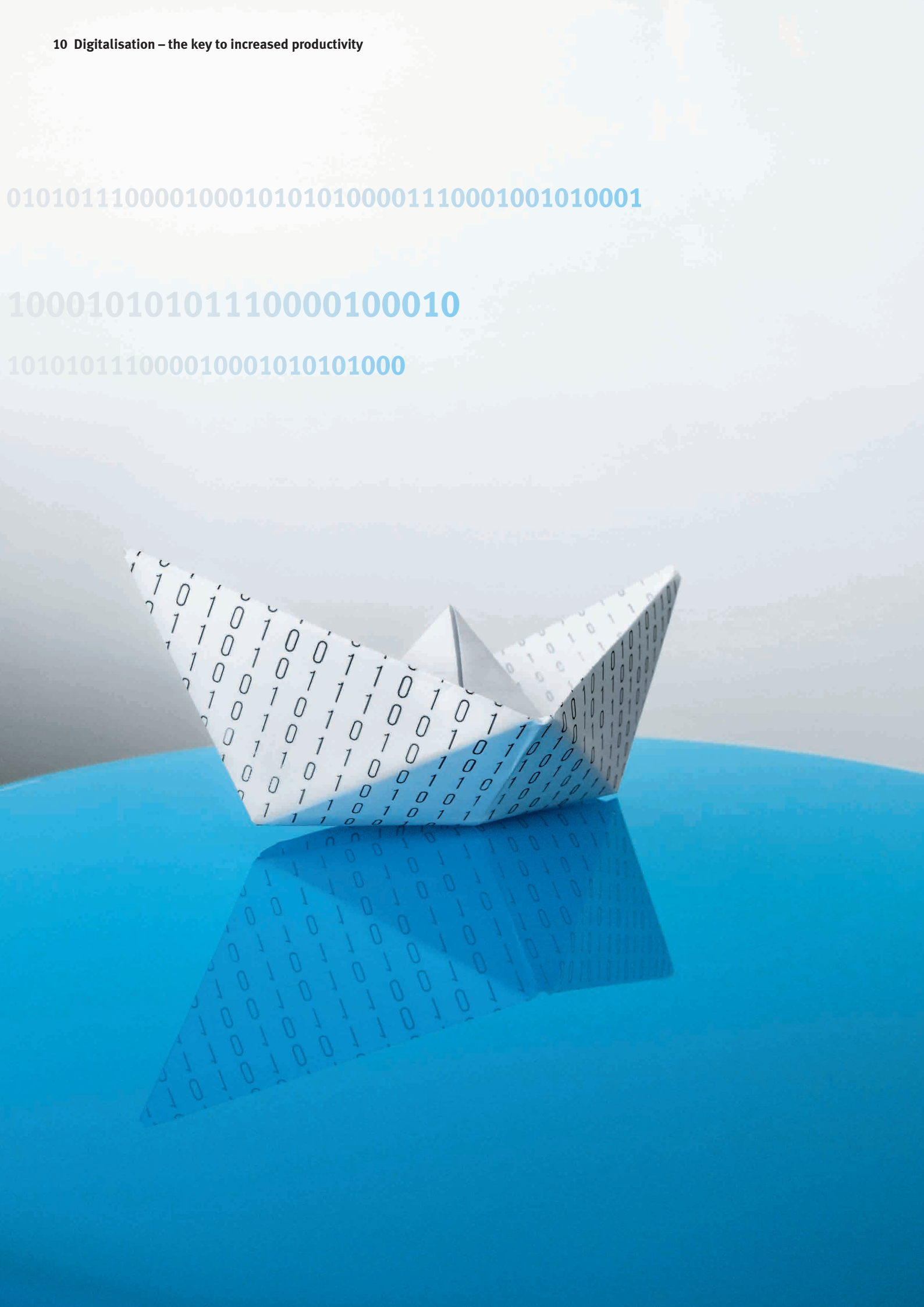
Festo Cloud and dashboard
Festo wants to build IoT capability into a broad range of components so that important supplementary data can be gathered, analysed and made available via standardised interfaces. The IoT gateway CPX-IOT helps to achieve this, as it recognises Festo components and integrates them into the cloud. Through the Festo Cloud, Festo products can then also be connected to the Internet of Things (IoT). Machine builders and operators benefit from the easy plug-and-play approach, as there is no longer a need for extensive configuration. This dramatically improves the transparency and availability of the automation solutions.

At the heart of all this lies the Product Key which provides all the essential information about the Festo components. The collected data is transferred via the CPX IoT gateway to the cloud, which is equipped with the latest IT security mechanisms, i.e. data security is factored in right from the start. To accommodate the connected factory concept, Festo also provides integrated computer interfaces with REST technology (REpresentational State Transfer), allowing automatic data flows to be incorporated into connected factory systems.

Festo has already launched some initial digital products on the market, such as the Motion Terminal VTEM. This first step into the world of app-controlled digital pneumatics is revolutionising pneumatics. Another example is the energy efficiency module E2M. This product, which is a world first, fully automatically monitors and regulates the compressed air supply in new and existing systems, making energy savings easier than ever before. The module also supports the condition monitoring of process-related data for Industry 4.0 For details, see pages 38 and 39.

Up to 99 authorised users can access, view and edit a year's worth of data in the cloud independently via a browser or API interface. The required content is output via dashboards that contain widgets (elements that are preconfigured to display particular information). Here, various parameters can be analysed at a glance, e.g. energy consumption, process control, motion parameters or wear factors and maintenance support.

What's more, Festo has now launched its first ever set of purely digital products, such as EPLAN Schematic Solution, which is a huge help to design engineers when preparing documentation.


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Digital customer journey

Our commitment to our customers is that no matter where they find themselves within digital offer from Festo, they should always experience the same look and feel and be able to find their way around intuitively thanks to consistently presented data. We have therefore divided the customer journey into three phases: learning, building and operating, so that we can support customers throughout the entire lifecycle of a solution, machine or system.

The customer journey is based on specific roles because Festo wants to offer design engineers, purchasers, commissioning engineers and operators exactly the content they need to be able to do their jobs well. When the individual steps were analysed, various possible forms of support emerged.

The first outcome is that our employees need to become more specialised for improved proximity to customers. For instance, we now have an employee in charge of smart engineering who is responsible for providing the customer with uniform tools. Another employee deals with user and data experience and is responsible for standardising data. As a result, even complex data can be presented in a straightforward and consistent manner.

Both these examples illustrate how aligning ourselves with the customer journey inspires a new way of thinking that is even more customer-oriented and how, in light of the digital transformation, customer connections are no longer tied directly to hardware components.

We are well on the way!
We have already taken the first steps and are launching the first digital products on the market with the publication of this Highlights brochure. Our initial objectives are clear: to ensure that our solutions are highly compatible with the digital world and to make sure our employees are ready for fresh challenges. We want to create solutions that make it easier for customers to accommodate this trend and integrate it into their products and production – with the aim of enhancing application knowledge through digital knowledge and making everybody more productive.

Exactly where this adventure will lead is something that nobody knows. And that is because we cannot fully control how the transformation will unfold. Although we cannot yet see the horizon, we are definitely entering this new world. Nothing is hard and fast, but many aspects are starting to take shape. We are stepping into the future – why not join us?

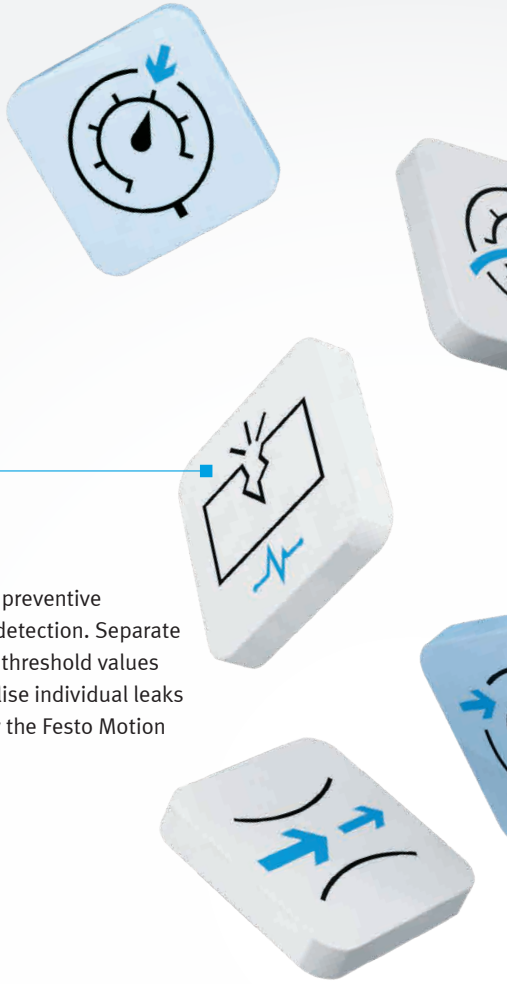
A world first: digitised pneumatics!

Digital simplicity: maximum flexibility combined with high levels of standardisation
For the first time ever, the functions of a valve can be controlled and changed by software without having to modify the hardware. This brand-new intelligent technology, which combines pneumatics, electronics and software control, can be used to realise simple directional control valve functions through to complex motion tasks which were previously restricted to servo-pneumatics or electric automation. Diagnostic functions for condition monitoring and reduced energy consumption can also be implemented more easily.

All in all, the high level of function integration of the Festo Motion Terminal significantly reduces process costs and complexity compared to conventional solutions, in downstream processes too.

Motion Apps: defining the function of the hardware
By the end of 2018, it will be possible to implement 10 functions in one piece of hardware. Further apps are in the pipeline.

- Directional control valve functions
- Proportional directional control valve
- Soft Stop (available Q3/2018)
- Proportional pressure regulation
- Model-based proportional pressure regulation (available Q2/2018)
- ECO drive
- Selectable pressure level
- Leakage diagnostics
- Supply and exhaust air flow control
- Presetting of travel time



Leakage diagnostics
Less system downtime due to preventive maintenance and faster fault detection. Separate diagnostic cycles and defined threshold values enable you to detect and localise individual leaks in the application operated by the Festo Motion Terminal.

Proportional pressure regulation
Save space and hardware costs by combining the functions of two individual and independent proportional pressure regulators in just one valve, including with vacuum!

Important: The Festo Motion Terminal has been available in certain countries since the end of 2017 and is to be launched worldwide in Q3/2018. Please check for availability.

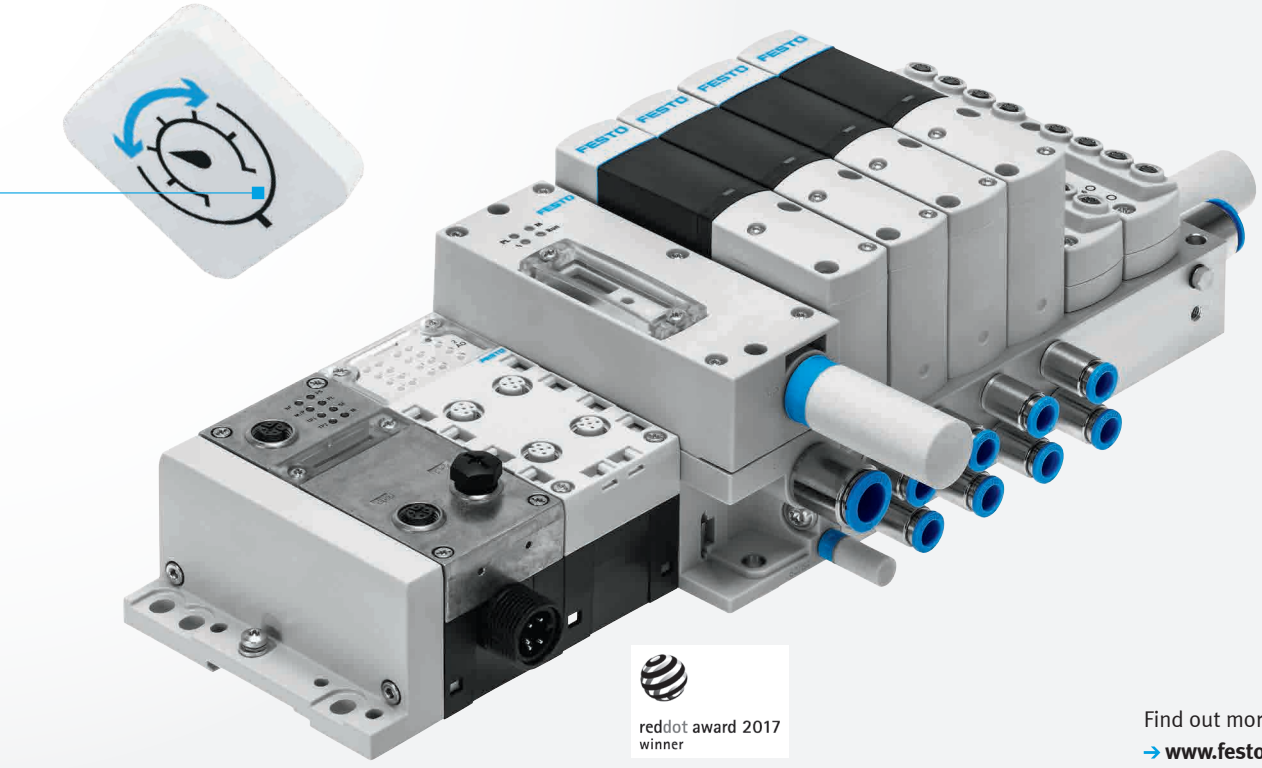
Pneumatics is an easy-to-control technology and is now becoming even more straightforward, versatile and flexible. Thanks to its motion apps, the brand-new Festo Motion Terminal VTEM is propelling pneumatics into the age of Industry 4.0. These apps support a whole host of functions that would have previously required more than 50 individual components.



App World
Whether you want to reload apps for the Motion Terminal, or are looking for additional apps or firmware, you will find what you need in the App World:
→ **www.festo.com/appworld**

App World

Directional control valve functions
Maximum flexibility for special-purpose machines as well as for handling systems in series production. You can modify standard directional control valve functions such as 4/2, 4/3 and 3/2 at any time and as often as necessary, even during operation.
This enables you to respond to a large number of requirements at the touch of a button.



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winner

Find out more:
→ **www.festo.com/motionterminal**

Make the most of process advantages along the entire value chain



The digitised pneumatics of the Festo Motion Terminal quickly pay off along the entire value chain. The benefits range from faster planning and design to simpler procurement and logistics, as well as easier commissioning and parameterisation. More productive operation – thanks to the ability to quickly and easily convert or modernise your system – will also speed up the return on investment.



How much potential is there for change and savings during each phase?

Conceptualise
Design
Procure*
Assemble
Commission
Operate
Modernise

* (without material savings)

Reduced complexity
- Easier to order, fewer spare parts, streamlined storage
- Reduced installation time/no manual adjustments

Reduced time to market
- Flexibility in the engineering process
- Quick adjustment to changes in parameters
- Simplified commissioning

Reliable processes
- Tamper-proof
- High reproducibility
- Know-how protection

Standardisation and flexibility
- Platform concept
- One product, multiple functions
- Motion apps replace hardware

Increased availability
- Robust pneumatics
- Preventive maintenance
- Self-regulating system

Increased profitability and energy efficiency
- ECO functions, leakage detection
- Soft Stop: shorter cycle times and long-lasting components (available Q3/2018)

Find out more in our white paper:
→ **www.festo.com/vtem/contact**

Highly flexible and secure: packaging with motion apps

Coffee, sugar, pharmaceuticals – nowadays, virtually everything is packed in small, low-cost sachets. The new, flexible flat pouch machine Sigpack VPF from Bosch Packaging Technology ensures correct packaging and the precise mixing ratio. The world's first freely scalable sachet machine relies on the flexibility provided by the digital pneumatics of the Festo Motion Terminal.

Food to go is the latest trend. And that is why the Sigpack VPF (Vertical Platform Flat pouch) machine has to offer maximum packing flexibility and be able to cope with rapid format changes and filling quantities of just a few grams. It is a machine that can be easily adapted to the latest market requirements. With a filling capacity of up to 1800 sachets per minute, it offers the best performance per square metre of floor space on the market.

Quick adaptation
The new, decentralised dosing system has a dedicated dosing chamber and stock of product for each lane and supports anywhere between three and twelve lanes. "Thanks to the modular concept, we can now even package different products – such as salt and pepper – on one machine at the same time," explains Rolf Steinemann, Product Manager for Food at Bosch Packaging Systems.

The hygienic and ergonomic design makes the Sigpack VPF easy to access and oversee. Short cleaning and changeover times dramatically increase the overall equipment effectiveness. There are fewer product losses and rejects and the packaging process is more cost-effective.

Precise dosing every time – formats at the push of a button
The filling mechanism has a high-precision auger dosing unit. Together with intelligent trend control, this makes for even more precise dosing. "The Festo Motion Terminal makes the feed process much easier," reports Maik Lamprecht, the project manager who oversaw the Sigpack VPF's development.

Each lane can be adjusted individually at the touch of a button. "We have been able to cut the number of valve slices by 3 and many functions only require minimal design engineering," he adds.

Greater process reliability
The Festo Motion Terminal also allows pressure and vacuum measurement for process monitoring, leakage monitoring to check for contamination of the valve, as well as individual adjustment of the cleaning and drainage pressure of each lane. "We have received a significant boost in terms of process reliability," says Lamprecht.

The Festo Motion Terminal can carry out all these functions. It is the first ever product to put the revolutionary concept of digitised pneumatics into practice. Apps are responsible for controlling the switchover of pneumatic functions and accommodating new formats by changing parameters.
The integrated intelligent sensors for control, diagnostics and self-learning eliminate the need for additional components, reduce complexity and simplify the ordering process.

All developers have to do is create a basic machine type which can then be quickly and easily configured to match customer requirements by selecting the appropriate apps. "The Festo Motion Terminal is providing pneumatics with Industry 4.0 capability. Process data from the Motion Terminal can now be processed on our own condition monitoring platform," explains Rolf Steinemann.



Quick and precise lane adjustment at the push of a button with the new automation platform Festo Motion Terminal VTEM.



Highly flexible Sigpack VPF: the world's first freely scalable flat pouch machine. On the Sigpack VPF, the "Proportional pressure regulation" app uses a vacuum to control the product feed for the multi-lane dosing process.

Move heavy loads – with the tips of your fingers!

At the heart of a servo-pneumatic balancer lies the safe and powerful drive solution YHBP from Festo.

The benefits to you

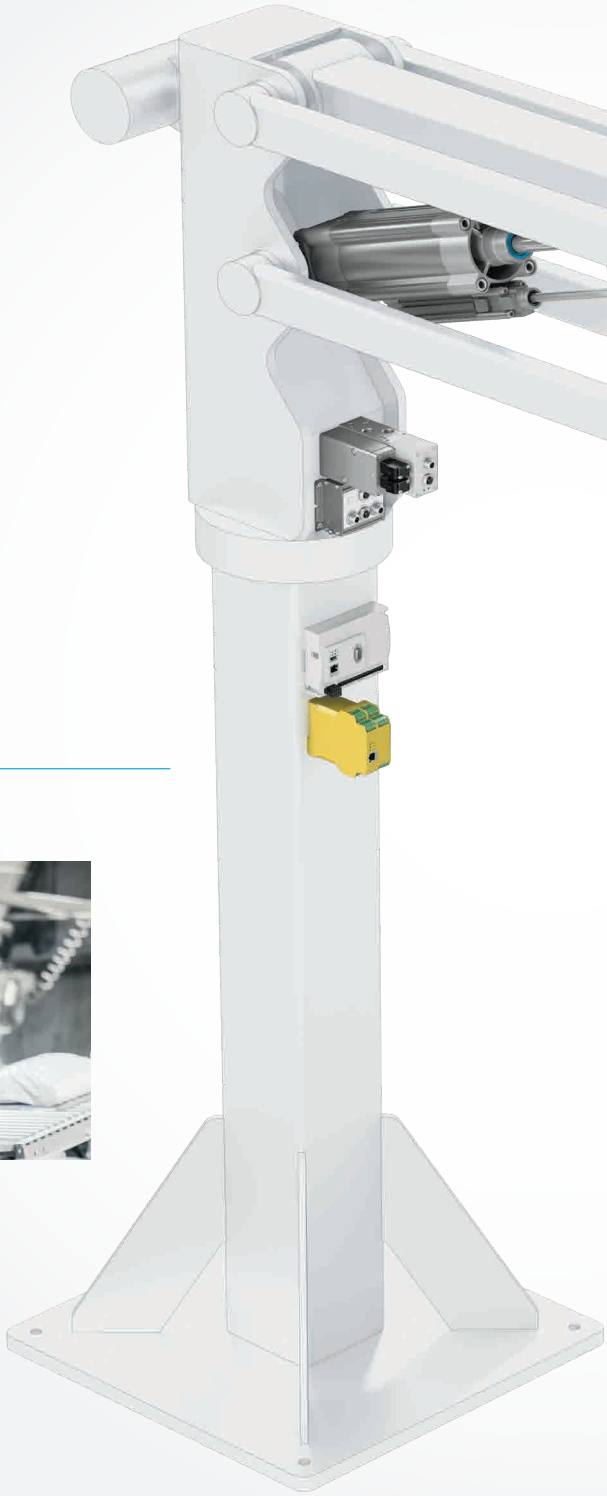
- Very low operating forces of just 10 N
- Extremely fast, automatic weight detection for a wide range of variants
- Safety Performance Level d
- For loads ranging from 70 to 999 kg

Making light work of moving heavy loads with the servo-pneumatic balancer

This product is perfect for applications in all industry segments where heavy loads need to be moved in defined, repeatable sequences. It is suitable for all commercially available balancer kinematic systems such as lifting columns as well as parallel and articulated arm kinematics, even when retrofitting systems.



Loading construction material



People who continuously move loads need technical support. Servo-pneumatic balancers allow you to move loads of up to 999 kg ergonomically with very low operating forces of just 10 N.





Mounting tyres

Complete solution – saves time and money
With the ready-to-install drive solution YHBP you save time at the procurement, design, installation and commissioning stages.

All the necessary components are precisely matched. You can order this solution as a kit with a single part number.

Another huge advantage is that it completely does away with the laborious process of producing circuit diagrams and pneumatic plans! No circuit knowledge is required regardless of the weight you are moving and the type of kinematics you are using.

The solution can be commissioned quickly and easily via an intuitive web visualisation tool which is pre-installed. Thanks to the pre-assembled cables, virtually no wiring is required.

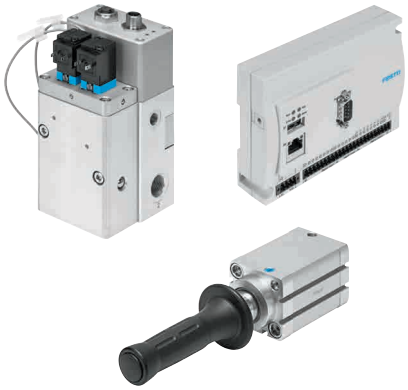


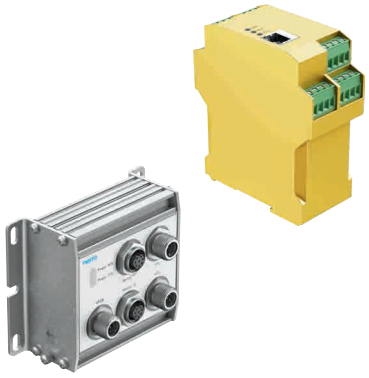
Palletising drums

For further details of this cost-effective alternative to conventional balancer systems see the next page – or have a look on the net:
→ **www.festo.com/YHBP**

Servo-pneumatic drive solution YHBP for all types of balancers







Operating force: 10 N.
Moved load: up to 999 kg!

The balancer system is easy to control with the innovative handle, which tells the system whether the operator wants to move the load up or down. Any change in the weight to be moved is detected automatically and quickly, even if the changes in weight occur while the load is suspended.

Different packages are available from Basic PL b to Safety PL d.
Select the one you need according to your safety requirements!

Basic package – for Performance Level b
Standards-based pneumatic cylinder DSBG
- Piston diameter 80 ... 200 mm
- Stroke 100 ... 1000 mm
- Optionally with running characteristic L1 (balancer) for even easier operation when operated under load

Displacement encoder DNCI-32
- One or two measuring heads (1 or 2 channels), according to the safety Performance Level required

Balancer controller CECC-D-BA
- For controlling the system
- Pre-assigned I/O, e.g. for enable, vacuum/gripping
- With preinstalled WebVisu for easy and intuitive commissioning
- Integrated diagnostic functions

Valve unit VPCB
- 3/3-way proportional pressure regulator
- Two integrated 2/2-way shut-off valves
- Optional switching position sensing

Control component VAOH
- Pneumatic handle with ergonomic grip design
- Generates pressure signal for controlling the balancer

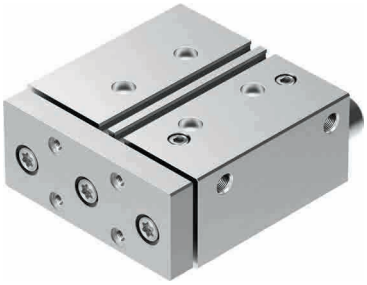
For safe applications involving Performance Level d there are two options:

Safety enabled package
Basic package plus sensor interface CASB as a measurement signal converter. In this case, you will need to obtain an additional safety relay from a supplier of your choice.

Safety package
For maximum safety, it is better to get everything from a single source – Festo. Featuring sensor interface CASB and safety relay for PL d.

This allows a Safely-limited speed (SLS) to be set for the system and monitored accordingly. If this speed is exceeded, the air in the cylinder is shut off in both channels so that the system stops. A voltage or compressed air failure will also prevent the system from moving (SLS, SSC).

★ Guided drive DFM



A true guiding light!

The guided drive DFM knows how to give and take. As robust as it is, it will extend a helping hand whenever you need it to. It can withstand high torques under the toughest of conditions. In fact, its force-to-installation space ratio has been so well designed that it is capable of delivering the same force as other guided drives but in the next size down! This saves money, energy and space. The guided drive DFM has also been incorporated into our new online product configurator: the Festo Design Tool 3D*.

- Resilient: 40% increase in payload
- Precision guidance
- Wide choice of variants
- Excellent mounting flexibility

Flat cylinder 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.

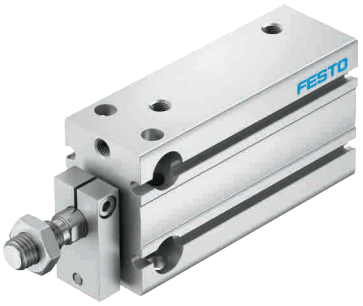
You can choose from the following drive variants:

- 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

DESIGN AWARD 2017

reddot award 2017
winner

Multimount cylinder DPDM



Multi-talented in every position!

This product offers all kinds of mounting options – bolt it on, bolt through it, have it horizontal, have it upright. And this multi-tasker is just as versatile in terms of its functions. Whether used for pushing, clamping or holding, it is absolutely perfect for any application involving linear movements and a short stroke. With guide, with through piston rod, solid or hollow, capable of withstanding high temperatures – a true multi-talent.

- Copper-free
- Robust and resilient
- Suitable for manifold assembly

* https://www.festo.com/FDT-3D-online

Leading the way: the drive DFM

The guided drive DFM is being used in the same factory where it was manufactured: The Festo plant in Rohrbach is using it on its very own production floor. The DFM is extremely robust, powerful and compact, making it perfect for clamping, lifting, stopping, gripping or press-fitting tasks. These characteristics of the new generation DFM are ideal for manufacturing further DFM drives on a production line.

It was the increasing market demand for guided drives that originally prompted a technical overhaul of the DFM. The new design was also intended to help coordinate and simplify DFM production, including shorter cycle times. This aim was successfully achieved because the guided drives DFM are now being produced at one-minute intervals.

Diversity of production on a single line
In order to produce DFMs on one line, the product to be made has to be moved into specific positions at various production stations. This task is performed by the DFM that has already been produced. The challenge lies in bringing together the different sizes of DFM, various stroke lengths and ball and plain bearing variants on a single line. The result was a pioneering solution by the internal tool shop: from production of the piston rod through to final inspection, the entire process is automated on a single line.

Fast and flexible
Every minute, a workpiece carrier enters the line carrying the housing, piston and bearing bushes. At the first rotary indexing unit, the slide bushes are pressed into the housing and calibrated in a single operation. At the same time, the variants with ball bearings are transported to the press unit in the next station. It is here that the ball bearings are pressed in. This is made possible by a simple routine for switching over the type codes in the control programme. Assuming that no further machine modifications are required, the setup time is just 1 minute.

In the next step, the life-time lubrication is added. The grease can be measured out very precisely as a film or a reservoir via spray nozzles and grease lances. Next, the piston is inserted into the housing using a seesaw movement. After that, the cover is mounted so that only the piston rod remains visible.

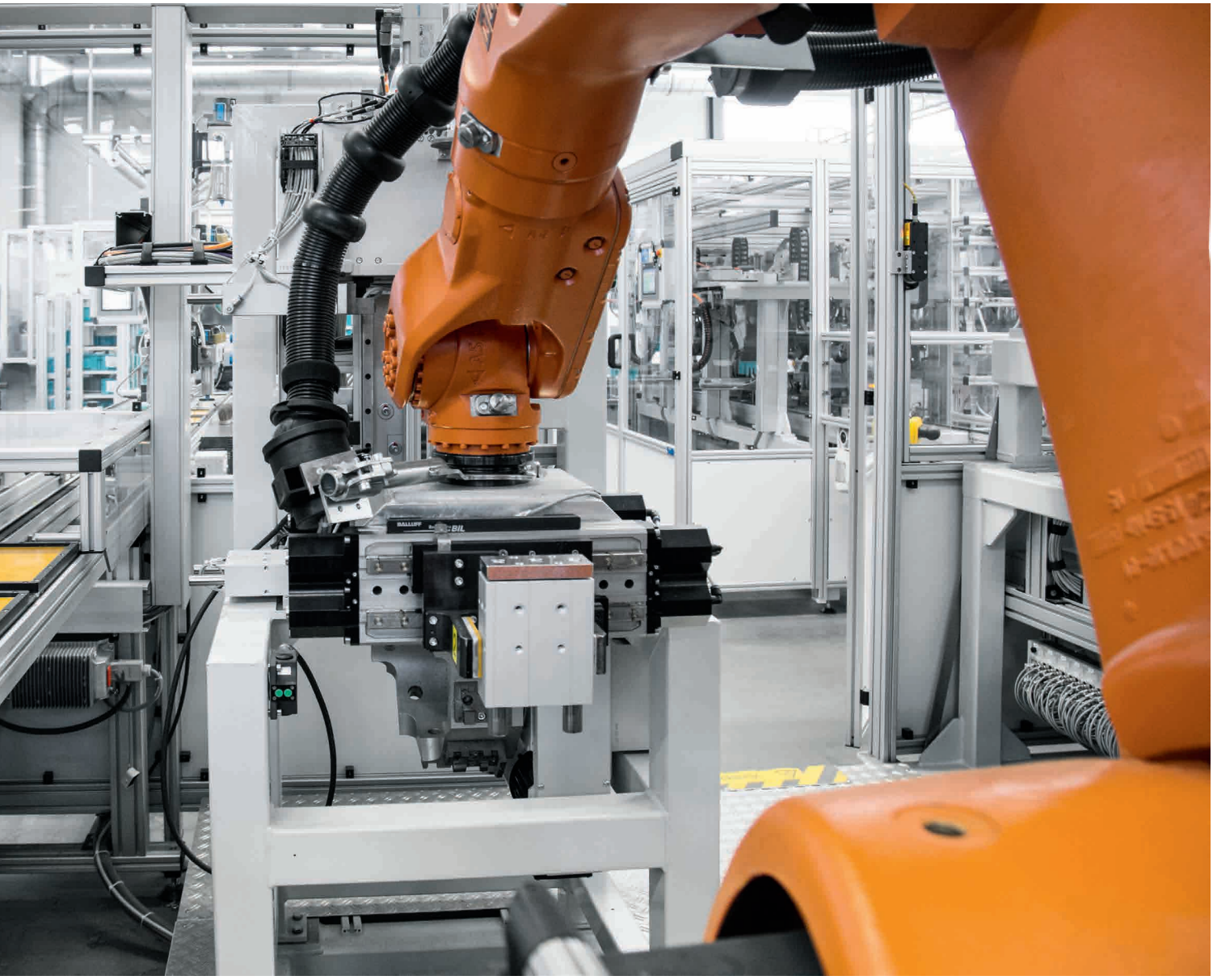
Tests for optimum quality
The DFM is then tested for the first time to ensure it reacts quickly as low-pressure and high-pressure tests and a stroke test reveal whether any corrections are required.

The final stage of the assembly process is to fit the yoke plate. However, the drive is only approved for delivery once it has passed a smooth-running test at minimum operating pressure. At this point, the product label and Festo logo are applied to the drive before it is transferred to the storage boxes in the automatic warehouse. However, its stay there usually only lasts for a few days.





Powerful, fast and precise: the guided drive DFM positions the blanks and holds them in place during the assembly process that turns them into proper DFMs.



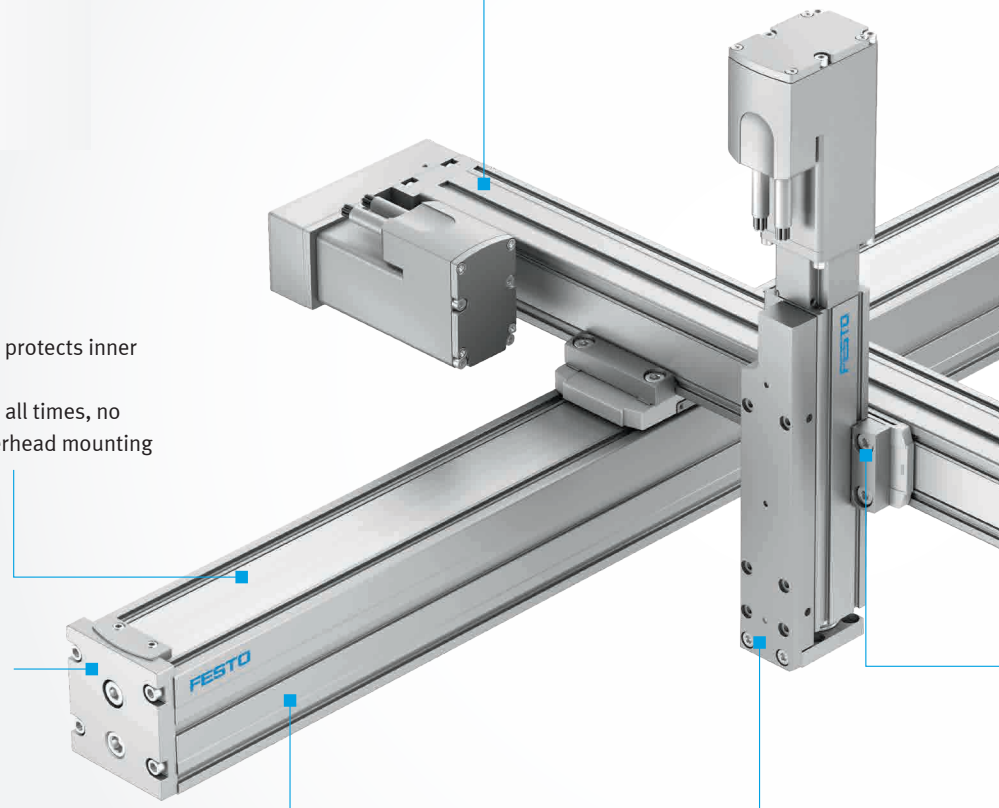
The product is only approved once it has passed the smooth-running test and is capable of performing its intended function reliably.

For perfect connectivity: electric automation from Festo

The smallest of dimensions call for handling systems with an optimum installation/working space ratio, such as the fully optimised and economical linear axes ELGC and mini slides EGSC. These all share the same system approach and platform architecture, and the connections are largely adapterless.

Making life easy for you:
the “one-size-down” assembly system
Our new handling systems are now really easy to combine and assemble without the need for adapter plates, or any special expertise or tools – and it is all thanks to the universal profile mounting attachment that allows you to combine a small structural axis with a large base axis.

Compact, integrated coupling and double bearing



- Stainless steel cover strip protects inner guide and toothed belt
- Remains firmly in place at all times, no sagging in the case of overhead mounting

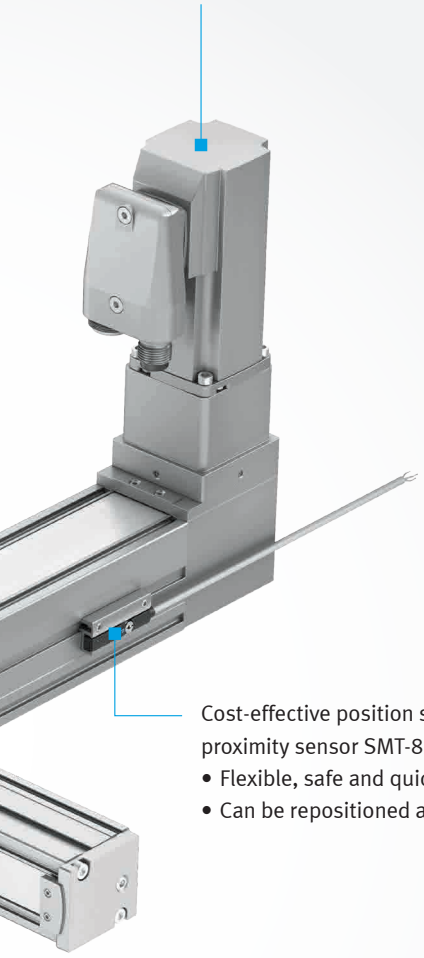
The optional vacuum port prevents particles from being emitted into the environment (sealed as standard)

Clean Look design with smooth surfaces for easy cleaning and to prevent contamination

Standardised interface for direct mounting of the electric rotary drive ERMO without the need for adapters

The more fully integrated your automation solution, the more productive and future-proof it will be. For this, you need to have a perfectly combined mechanical system that can be assembled quickly and easily, and which is capable of interacting intelligently with the appropriate electrical system for individual axes or complete systems.

Freely selectable and flexible motor position with axial and parallel kits



Cost-effective position sensing with proximity sensor SMT-8M:
- Flexible, safe and quickly fitted
- Can be repositioned at any time

Unique and universal:
the “one-size-down” assembly system

Spindle axis ELGC-BS-KF
- Ball screw and recirculating ball bearing guide inside the slide
- Four sizes for speeds of up to 1 m/s at a max. length of 1000 mm



Toothed belt axis ELGC-TB-KF
- Toothed belt and recirculating ball bearing guide inside the slide
- Three sizes for speeds of up to 1.5 m/s at a max. length of 2000 mm



Guide axis ELFC-KF
- Driveless linear guide unit capable of absorbing forces and torques, for increased torsional resistance and fewer vibrations



Mini slide EGSC-BS
- Spindle with low-wearing ball screw and resilient recirculating ball bearing guide on the inside
- Four highly compact sizes for precision positioning at speeds of up to 600 mm/s and with a max. length of 200 mm



Find out more:
→ **www.festo.com/ea**

Festo Cloud and dashboard Festo IoT gateway CPX-IOT



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

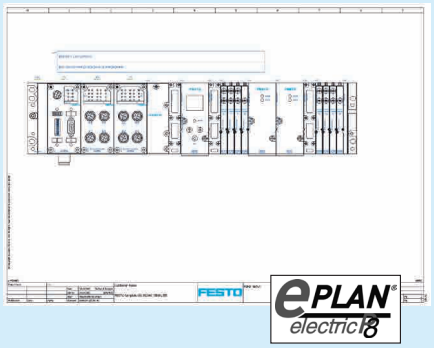
Festo will be introducing a cloud that will allow all suitable Festo devices to be connected via the CPX-IOT gateway – with data visualisation and rapid data analysis via apps in this cloud and the dashboard.

This will boost productivity for machine builders and end users alike, e.g. thanks to the following:

- 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 online condition monitoring
- Optimisation of applications, preventive maintenance, etc.

Connections to other clouds such as MindSphere are available 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.

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
- Gain time for value-adding activities

App World

CODESYS embedded controller CPX-CEC-C1/S1/ M1-V3 with OPC UA and SP10



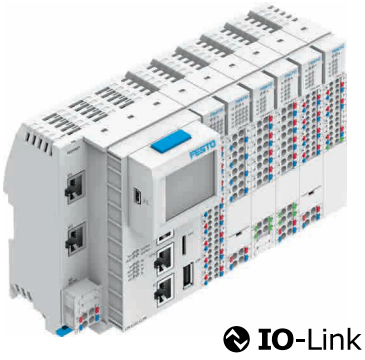
Success in Industry 4.0: decentralised ctrol and intelligent pre-processing.

Thanks to the CPX-CEC-...-V3, IP65 valve terminals with remote I/O now feature, for the first time, complete CODESYS V3 functionality, e.g. with the new 3D CNC editor to DIN 66025 (G-code). The OPC UA (client/server) option brings the reality of Industry 4.0 much closer, enabling a connection to all established clouds.

In combination with the valve terminals MPA and VTSA or the Festo Motion Terminal, there is now a uniform interface for pre-processing factory and process automation processes, pneumatic and electric drives and sensor signals, as well as for extensive condition monitoring.

- Complete control of small machines or complex subsystems
- One platform for electric and pneumatic systems
- A single platform for fluid and motion control
- Straightforward configuration of the entire system via CODESYS function libraries
- A uniform solution from the mechanical system right through to the cloud

Modular control system CPX-E



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

Designed to function as an EtherCAT® master controller and motion controller with protection to IP20, CPX-E is the central control system for handling applications. Several bus modules are available so that it can be configured as a compact and low-cost remote I/O.

The OPC UA client and server functions, as well as the PROFINET or EtherNet/IP device functions ensure easy integration and interoperability in Industry 4.0 host environments with cloud and digitalisation concepts.

Once again, this is a universal solution from the mechanical system right through to the cloud!

- High performance (dual core 766 MHz, 512 MB RAM)
- CODESYS V3 from SP10
- Motion functions such as SoftMotion
- PLCopen Parts 1 and 2
- Robotics (PLCopen Part 4)
- Cam disc editor
- CNC editor (dxf file import)
- Digital/analogue I/O modules
- Counter inputs (encoder)
- IO-Link®

Spindle axis ELGC-BS and toothed belt axis ELGC-TB



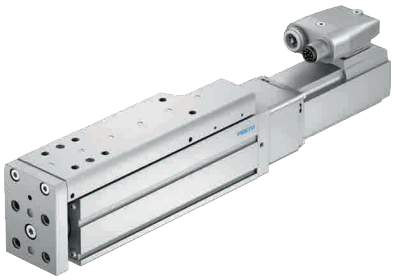
When compact dimensions and optimised installation space are of the essence.

Spindle and toothed belt axes ELGC with protected internal recirculating ball bearing guides are suitable for all horizontal and vertical movements. And when space is tight, they really come into their own: in assembly systems, testing and inspection systems, small parts handling units, in the electronics industry or in desktop applications.

The internal guide and tightly sealed stainless steel cover strip protect the compact ELGC while the wide array of motor mounting options makes it extremely flexible. The unique “one-size-down” assembly system results in an extremely compact and very straightforward system structure that does not require any adapters at all.

- Integrated recirculating ball bearing guide with long service life
- Capable of absorbing high guide forces
- Optional vacuum port
- Clean Look design, easy to clean and less prone to contamination

Mini slide EGSC-BS



Strong, silent and ideal for tight installation spaces – directly in the system.

The powerful and resilient mini slide has a smooth-running spindle and is ideal for vertical Z-movements or guided linear individual movements. It can, for instance, be used in assembly systems, testing and inspection systems, small parts handling units, in the electronics industry or for desktop applications.

Even with heavy loads, the EGSC offers excellent positioning accuracy in any mounting position. It is highly flexible thanks to the wide array of motor mounting options. The unique “one-size-down” assembly system does away with the need for adapters, resulting in an extremely compact and very straightforward system structure.

- The electric rotary drive ERMO can be mounted directly without the need for adapters
- High-grade ball screw
- Rigid and resilient, precise linear guide
- Optional ducted pressure compensation port
- Easy to clean and less susceptible to contamination

Integrated drive EMCA



The perfect solution for positioning drives.

The complete solution EMCA consists of a maintenance-free and wear-resistant EC motor and drive system (motor controller). This drive system also includes integrated power electronics. Integrated monitoring functions ensure reliability and availability. The EMCA senses the absolute position using a single-turn encoder as standard or optionally with a multi-turn encoder. The Festo Configuration Tool (FCT) software makes parameterisation and commissioning quick and easy.

- 64 freely programmable position sets
- Multi-turn encoder with buffering (resolution up to 32 bits or › 4 billion revolutions)
- Degree of protection IP54 as standard, optionally with IP65, for direct installation in the system
- Control via CANopen, Ethernet/IP and I/O interface, PROFINET and Modbus®/TCP

Electric stopper EFSD



Lightening the load: electric stopping functions – easy to install!

The electric stopper can be connected directly to a PLC without the need for an additional motor controller. The power supply, communication and logic processing functions are all integrated in the device itself. This makes life easier for you because you can complete the assembly process in just four tightening operations – two mounting screws and two electrical connections (one for the input signals and one for the output signals).

- Easy to install
- Can be connected directly
- Adjustable cushioning
- Integrated sensor for position feedback

Rotary gripper module EHMD



Considering an electric or hybrid solution for rotating and gripping? The choice is yours!

Infinite electrical rotation and electrical or pneumatic gripping. This module is ideal for small objects in laboratory automation, as a universal handling solution for small specimen vials, for gripping and rotating, and for opening and closing covers. Alternatively, it can be used for handling small components in the electronics industry. The assembly module with Z-compensation automatically compensates for the thread pitch of the cover – without moving the Z-axis.

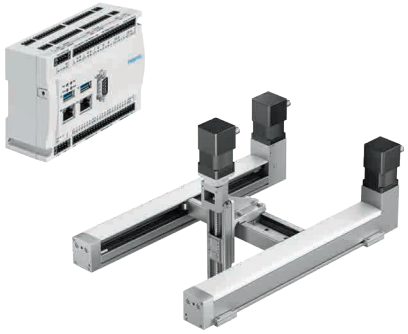
When powered by motor controller CMMO-ST, it allows workpieces of an unknown size to be gripped with variable levels of force.

Rotation: electrical
- Infinite, with encoder for absolute positioning
- Max. torque: 0.3 Nm
- Speed: up to 120 rpm at full torque

Gripping: electrical or pneumatic
- Stroke: 2 x 5 mm
- Opening/closing time: ‹ 0.4 s for 2 x 2 mm stroke
- Electrical: with encoder and gripping force retention

Module:
- For a payload of up to 250 g
- Compact: 48 x 63 x 172/145 mm

Compact handling system YXMx

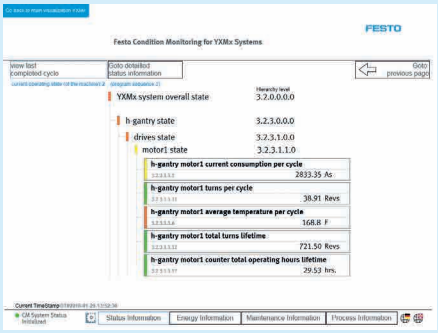


The flexible basic platform for a wide variety of desktop applications.

The fully coordinated, ready-to-use system YXMx is made for tasks such as screwdriving, dispensing, testing, soldering, gripping, opening and closing containers. The software, controller and kinematics are already included. All you have to do is attach a front unit. Motion sequence programming and commissioning are quick and easy thanks to the predefined function elements that are available in the Festo Positioning Desktop Library supplied. With its high processor performance and range of interfaces, the compact controller CECC-X enables numerous functions to be carried out in very small spaces.

- Ready-to-use system
- Operational reliability: matching software and hardware
- Defined interface to the host system
- Industry 4.0-capable thanks to the OPC UA interface
- Optimum ratio of installation space to working space
- Optionally with mounted Z-axis and camera

Festo Condition Monitoring Library for YXMx



One piece of software for maintenance, energy consumption and production.

Nowadays, all equipment and machinery is expected to provide maximum availability and reliability. The condition monitoring software package monitors the operating parameters and current values of the compact handling system YXMx, such as the running performance, supply pressure, air consumption, energy consumption and much more besides. As a result, it can help you plan your maintenance work professionally while at the same time cutting the associated costs. In addition, it allows you to analyse the production process and offers comprehensive energy monitoring.

The software is based on VDMA standard 24582. It includes a basic visualisation component for viewing status signals in the web browser. Using the open interfaces, you can display the data in your own systems, e.g. by connecting to the cloud via OPC UA.

- Easy to integrate into higher-level systems
- Intuitive user interface
- Customised dashboards on request

Reproducible process quality that's fully transparent

System manufacturer MiniTec is using the servo press kit YJKP as part of a solution for a leading manufacturer of exhaust gas and climate control systems. This application is the perfect illustration of how the YJKP can ensure the process quality of exhaust gas and leakage testing systems in the automotive supply industry. The complete press package from Festo is being fitted on several of the customer's test stations by MiniTec.

"The servo press kit YJKP is a complete package comprising software, controller and hardware. It was this combination that won us over really quickly," explains Tobias Cloß, Sales and Planning Engineer at MiniTec. "The pre-assembled system kit saved us a lot of engineering effort as well as a lot of time and money."

Defined press-fitting operation

The solution devised by MiniTec – a workstation specialist and builder of special-purpose machinery – consisted of a standardised workbench with electrical height adjustment, LED lighting, a storage shelf, an information display unit and an aluminium tabletop into which the servo press was integrated. It is used to press-fit a base module into a so-called canning assembly which comprises a pipe with press-fitted ceramics. The travel and force are predefined. "It is absolutely essential to adhere to this predefined travel," explains Cloß.

"In the automotive industry, process traceability plays a very important role," stresses the sales and planning engineer who is responsible for advising end customers. "And that can now be ensured thanks to our testing system," he clarifies. This is because the results of any individual process can be reloaded. The threshold value, windowing and envelope are integrated into the software, thereby enabling the process to be monitored from a quality management perspective.

The servo press kit YJKP can be used to achieve results of consistently high quality in electrical press applications involving a force of up to 17 kN. It comprises modular operating software and carefully coordinated standard Festo components – the electric spindle drive ESBF, the motor EMMS-AS, the motor controller CMMP-AS, the controller CECC-X and a force sensor.

Customisation

"The configurable servo press kits can be individually tailored to user requirements thanks to the numerous variations that are possible," says Cloß. This guarantees a flexible design and reduces investment costs. This is advantageous for users, who say that when they buy a pre-assembled press from an established manufacturer, only 10% of its full capacity is generally used.

The operating software GSAY comes pre-installed on the controller so that it is ready to use immediately. No programming skills are needed and parameterising the press unit is simple and intuitive.

"We were quickly won over by the fact that the servo press kit YJKP is a complete package that includes the software, controller and hardware."

Tobias Cloß, Sales and Planning Engineer at MiniTec.



Press-fitting a base module into a canning assembly – the travel and force are predefined.



Standardised MiniTec workbench with integrated servo press kit YJKP from Festo. It can be used for electrical press-fitting operations with a force of up to 17 kN with consistently high quality.

Greater flexibility inside the control cabinet: VTUG with plug-in

Highlights
- Up to 24 valve positions on a single valve terminal
- Suitable for a control cabinet and environment up to IP69K
- Increased corrosion protection
- Simple valve replacement
- Convenient access to the valve terminal

New features for an even stronger performance
The new manifold rails, check valves and fixed flow restrictors for optimised and space-saving variants mean that the VTUG is now the perfect all-rounder for control cabinets as well. Key features: compact, with high flow rates, suitable for universal use.



Very reliable: the new check valves prevent problems with back pressure



Fixed flow restrictors: for individual, low-cost and reliable speed control

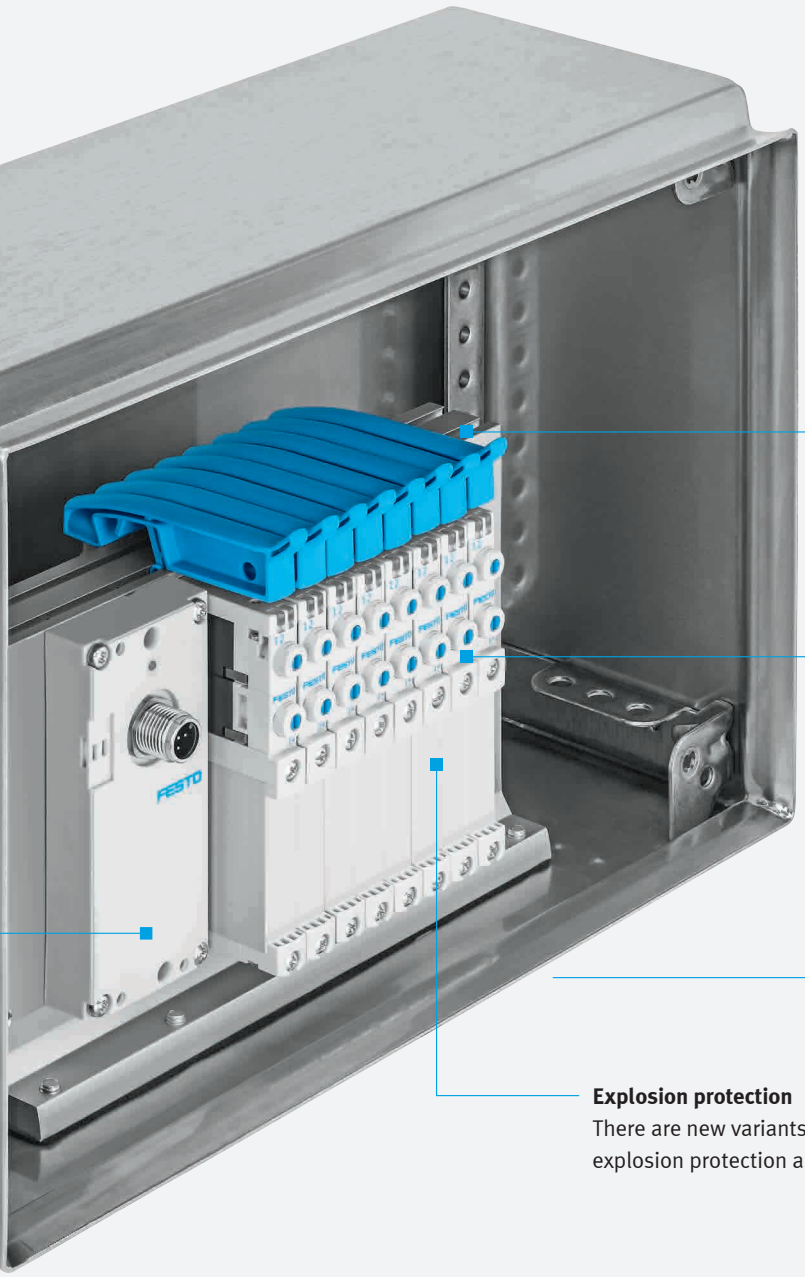


High corrosion resistance: stainless steel coating for manifold rails



Modular: the electric connection block
Converted in less than no time!
Even at a later date.
- Multi-pin Sub-D
- Multi-pin flat cable
- All standard fieldbuses
- IO-Link®

Optimised and space-saving variants for installation inside the control cabinet: a wide range of functions and details such as pneumatic connections (including from underneath) make the universal valve terminal VTUG with plug-in absolutely ideal for this type of installation. And all at a really affordable price.



VTUG with outlet direction to the front
- For compact control cabinets
- Optimum view of LED indicator and inscription label holder

Hot-swap function
The hot-swap function for the new VTUG control cabinet profile lets you replace valves during operation.

Manual override
Choose between: non-detenting non-detenting/detenting, covered.

Different connection variants

Explosion protection
There are new variants for use in explosion protection areas.

Find out more:
→ **www.festo.com/vtug**

Compact valve VUVG-...-WA with CNOMO interface



Now with the electrical CNOMO interface: the compact valve VUVG.

Not only does this bring you in line with the standard, but you also get all the benefits of the entire modular system VUVG.

Two connection variants and various input voltages can be configured based on the I/O parameters. The attractively priced VUVG are bound to impress with their outstanding installation space to flow rate ratio; it makes them a genuine alternative if you need flexibility when there is not much installation space to spare.

- Electrical CNOMO interface
- Can be combined as part of a modular system
- Compact design
- High flow rates

Manually and mechanically actuated valves VHEF/VMEF



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

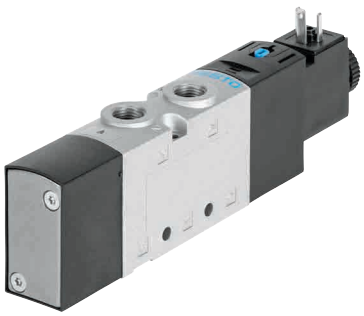
The new manually and mechanically actuated valves VHEF and VMEF provide functions for directly triggering subsequent processes in the system based on touch actuation, e.g. they can be used for clamping or closing safety doors (manually) or can act as a "signal generator" (mechanically).

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

All are available as 3/2- 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, reliable operation
- Minimal actuating forces
- Modern design

Sturdy valve VUVS-LT



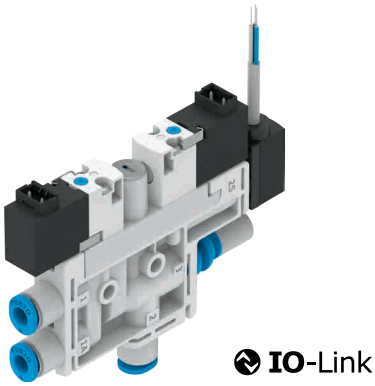
The toughest of the tough!

The valves VUVS are already known for their sturdy design that makes them suitable for use in harsh environments. The new poppet valve is the latest addition to the series and a rather special one at that. Because this valve can take what others can't.

One of the key reasons for its resilience is the design principle that lies behind the seal seat. This poppet valve is the answer for any application where external influences such as particles, vibrations and impacts cannot be ruled out. Opt for an individual valve or a valve terminal arrangement and choose any size you like: small, medium or large.

- Reliable with any type of supply air
- High-density air chambers
- Short and constant switching times
- Meets safety requirements
- Robust valves with a long service life
- Wide range of accessories

Vacuum generator OVEL



The new OVEL is ideal for highly dynamic, decentralised handling applications.

Small, weight-optimised and designed specifically for the electronics industry, the OVEL is the perfect product for direct integration into the front unit. This reduces the evacuation time and increases the operating cycles. The integrated filter and open silencer make the OVEL extremely easy to maintain.

IO-Link® ensures easy commissioning and parameterisation while the electrical connection technology makes installation really easy. As all the functions are integrated into one unit, assembly is extremely fast.

- Low weight for high dynamic response
- All key functions compactly integrated into one unit
- Precisely adjustable ejector pulse thanks to separate compressed air supply
- Choice of analogue or digital switching output
- Can be configured according to your requirements

Dispense head VTOE



Perfection in rapid dispensing thanks to the modular complete solution.

Housed in a compact 9-mm grid, the VTOE has a modular configuration in terms of the number of dispensing channels, the internal diameter of the dispensing nozzles and the wetted materials used. The dispense head is highly precise: the typical coefficient of variation (CV) is < 1% in the range between 10 and 1000 µl with a very high linearity. In order to avoid cross-contamination and maximise rinsability, the dispense head is based on media-isolated solenoid valve VODA with minimal internal volumes.

The VTOE simplifies and speeds up the processing of samples. From the single-channel dispense head, for example for dilutions, adding nutrient solutions or dispensing reagents, to the 8-channel dispense head perfectly tailored to dispensing in microplates thanks to its compact stacking dimension, it opens up many opportunities.

- Configurable complete solution consisting of a channel plate, dosing valves and nozzles
- Non-contact dispensing of very small quantities
- Wetted materials: transparent polycarbonate with FPM seal or highly inert PEEK with FFPM seal, depending on the area of application

Proportional pressure regulators VEAA/VEAB



Piezo technology makes VEAA/VEAB extremely precise and quiet.

Maximum performance combined with an extremely long service life and a highly compact design. Plus, extremely economical when handling flow rates of up to 20 l/min.

The VEAA and VEAB combine innovative piezo technology with digital closed-loop control technology. This makes the pressure regulator with its excellent features very attractive for a wide variety of applications and industries, such as the electronics industry, small part assembly, MedLab and Biotech.

- High control precision (linearity error ≤ 0.5% full scale, 0.8% full scale with 0.2 bar version)
- High repetition accuracy (≤ 0.4% full scale)
- Completely silent – ideal for use in laboratories
- Wide pressure range: –1 to 10 bar

Kitchens rolling off the production line

It was not by chance that nobilia became Europe's largest kitchen manufacturer. So, what is its recipe for success? Efficient kitchen unit production on highly automated assembly systems, many of which are supplied by Hüttenhölscher. As recommended by Festo, automation technology such as IO-Link® was incorporated to ensure maximum flexibility and availability.

Nobilia manufactures around 660,000 kitchens a year, which equates to more than 6.5 million kitchen units. "That calls for a high degree of automation," explains Martin Henkenjohann, Head of Engineering at nobilia. "The individual preferences of consumers often result in a batch size of 1."

High-end solutions for exacting demands

With its cost-effective and reliable production facilities, nobilia is able to meet its own exacting demands in terms of output, speed and performance while ensuring delivery date reliability and high-quality service. Working in close partnership with nobilia, Hüttenhölscher develops high-end custom solutions that frequently rely on innovations from Festo. One of the company's latest machines is a fully automated assembly system that is responsible for drilling and assembling kitchen unit drawers.

Different front panels in a variety of sizes, materials and colours travel along the production line one after another according to the order specifications. "The front panels function as a kind of master in the system," says Henkenjohann. As soon as a front panel is fed in, its exact identity is detected via a bar code. The drilling system then automatically adjusts itself to the required hole pattern. At the same time, the system starts assembling the appropriate drawer box at the bottom part of the machine.

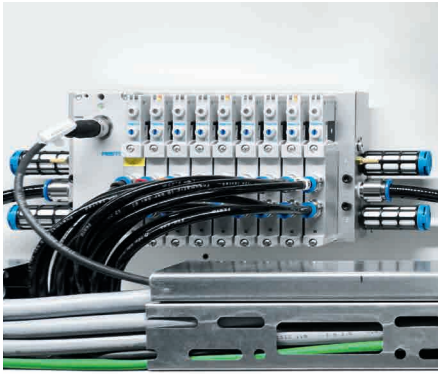
In the final step, the front panel and the box are joined together to create the finished drawer. "Both our customers and us have found the quality and reliability of Festo products to be extremely good. That is why virtually all our customers insist on having Festo as the automation supplier," explains Daniel Hüttenhölscher. For instance, in its latest system specification nobilia stipulated that the IO-Link® interface had to be used.

Increased system availability with IO-Link®

All pneumatic functions are controlled by the valve terminal VTUG with IO-Link®, an installation and wiring technology which – because of its uniform and standardised nature – is highly efficient. "IO-Link® dramatically speeds up troubleshooting, thus reducing downtime," says Hüttenhölscher. To facilitate this, the Festo IO-Link® master has extensive diagnostics options on board. What's more, devices with IO-Link® capability parameterise themselves automatically in the event of replacement, resulting in further dramatic improvements to system availability.

Upgrading systems to get closer to Industry 4.0

Complex diagnostics, coupled with rapid and standardised transmission of the resulting data, are the key to devising machine concepts for predictive maintenance and condition monitoring. According to Daniel Hüttenhölscher: "This modern connection technology is taking us one step closer to achieving Industry 4.0. IO-Link® significantly reduces the amount of electrical installation work required and it also allows the parameterisation settings to be made once and then replicated multiple times."



With IO-Link®, there is no longer any need to separately wire in each valve connection and that seriously reduces the amount of electrical installation work.



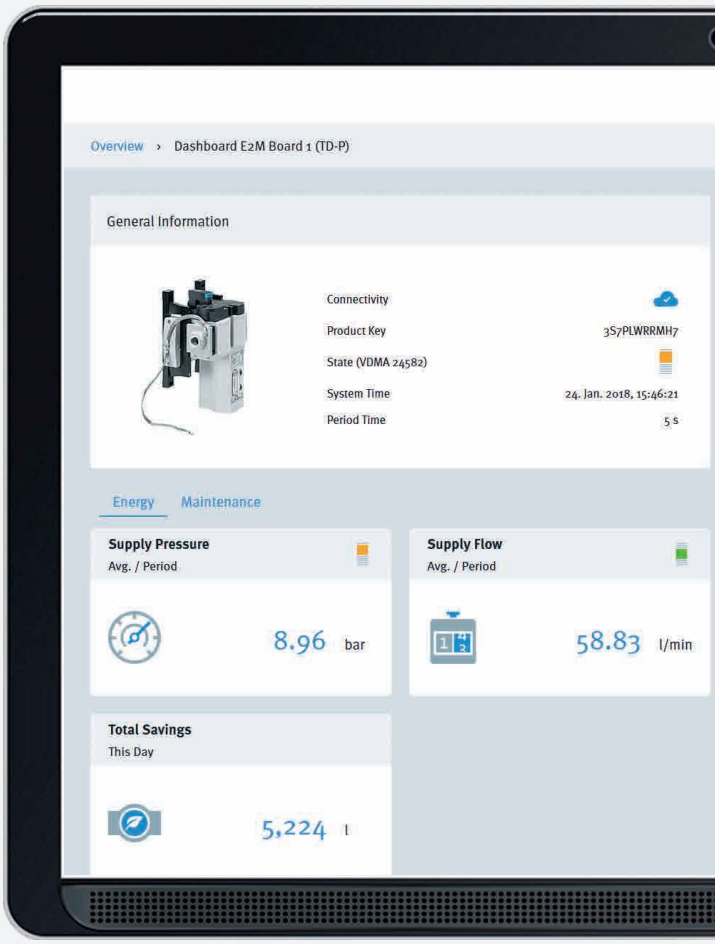
Fully automated assembly systems for manufacturing kitchen unit drawers at the nobilia plant in Verl.

Complete transparency in air consumption and system status

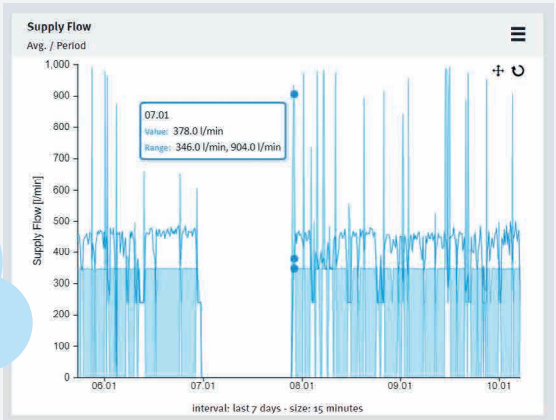
Innovative cloud solution
Modern web-based data analysis ensures greater transparency and improves the availability of the pneumatics within your system. You can immediately see the energy and CO_2 savings that come from using the Festo energy efficiency module. Not only does this save you money, but it can also help answer any questions your company has in relation to certifications, e.g. by providing information about the CO_2 footprint of the products, sustainability and so on.

Predictive maintenance
The new analysis options will help you to identify any changes in your system early on. As a result, service work can be scheduled to take place outside of production hours. That enables you to reduce unplanned downtime and non-productive time thus cutting your costs even further.

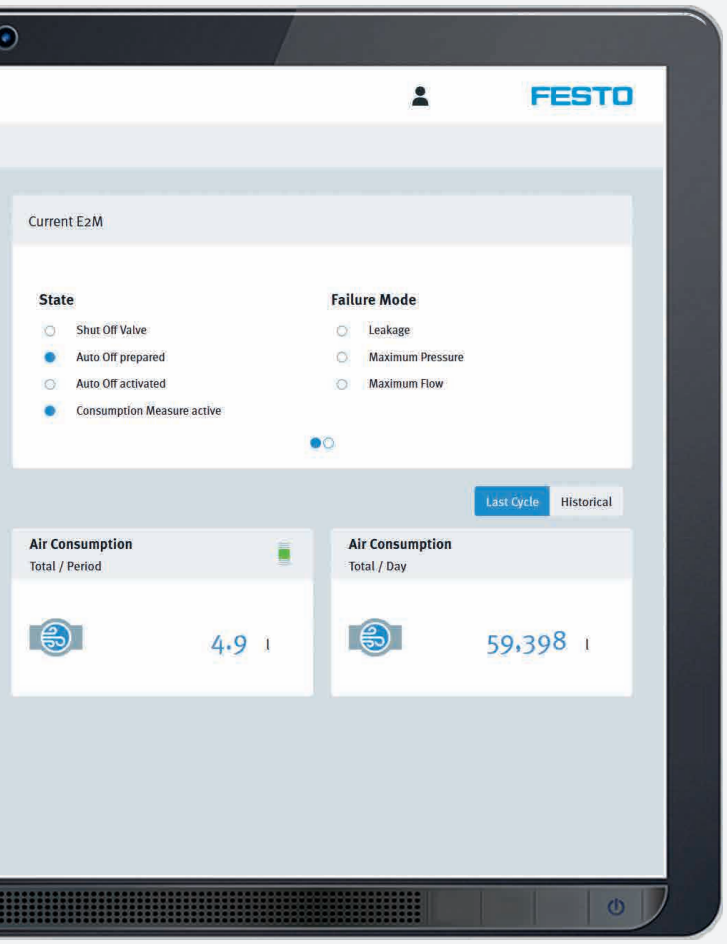
Festo dashboards
The Festo cloud solution is there to support you, as a customer, throughout the entire lifecycle of your system. It also aims to boost your productivity, e.g. through more efficient engineering and all kinds of added-value services. The first step is to access the condition monitoring dashboard for your Festo devices.



Flexible widgets for a wide range of analyses
You can analyse limit values for any periods within a given year. Here, you can clearly see the energy savings that have been automatically made during idle time.



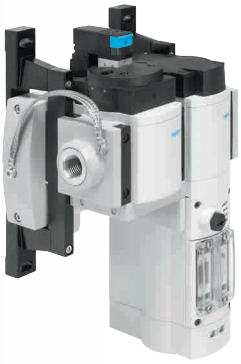
Thanks to cloud-based analysis with the Festo energy efficiency module MSE6-E2M and the Festo dashboard you can now find out exactly how your system is doing.



Live data from the machine

Total values covering defined time ranges

The world's first energy efficiency module MSE6-E2M
Saving energy is easier than ever before thanks to the MSE6-E2M, which automates energy saving in compressed air systems. The intelligent module monitors and regulates the compressed air supply in new and existing systems and does so fully automatically.



IoT gateway CPX-IOT Hardware for unlimited communication
The industrial Internet of Things gateway in the CPX module format collects information about Festo devices and their statuses via Ethernet using a standardised communication protocol. It then sends this information to the cloud via the second Ethernet port. State-of-the-art IT security mechanisms keep the data completely secure.



- New cloud technology with web interface without the need for additional software
- Cloud-based database for fast and efficient analysis of long-term measured values

Find out more:
→ **www.festo.com/e2m**

★ Safety couplings NPHS



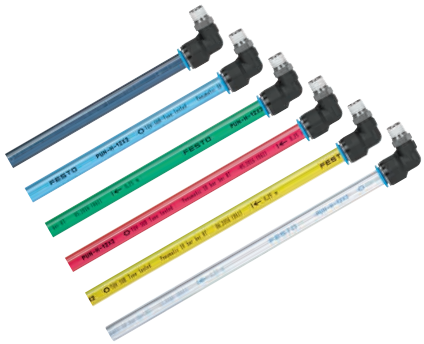
For simple and completely safe decoupling: safety couplings NPHS.

With the safety couplings NPHS, you can disconnect pressurised systems in complete safety. The NPHS are available in two variants: the polymer NPHS-D6-P and the high-performance metal NPHS-D6-M.
The integrated hand slide valve of the metal variant enables pressure-free coupling and decoupling. This helps you to avoid workplace accidents, disconnect pneumatic connections without decoupling and reduce energy costs.

The safety function in the polymer variant is ensured with an optimised push/pull mechanism.

- Simple and intuitive to operate
- Ergonomic: no need to use lots of manual force
- High flow rate
- Pressure range P/M: –0.95 ... 10/–0.95 ... 20 bar
- Temperature range P/M: –10 ... +60/–20 ... +80 °C
- Compatible with KD(M)S6/KSS6, metal variant also with KD4/KS4

★ Transparent tubing PUN-H-T



Detect at once if there are solid particles, moisture or oil in your application.

The transparent tubing PUN-H-T ensures a reliable air supply even in humid environments and allows you to quickly check whether everything is OK. Thanks to its high-quality base material, it is suitable for use both in the food industry and outdoors.

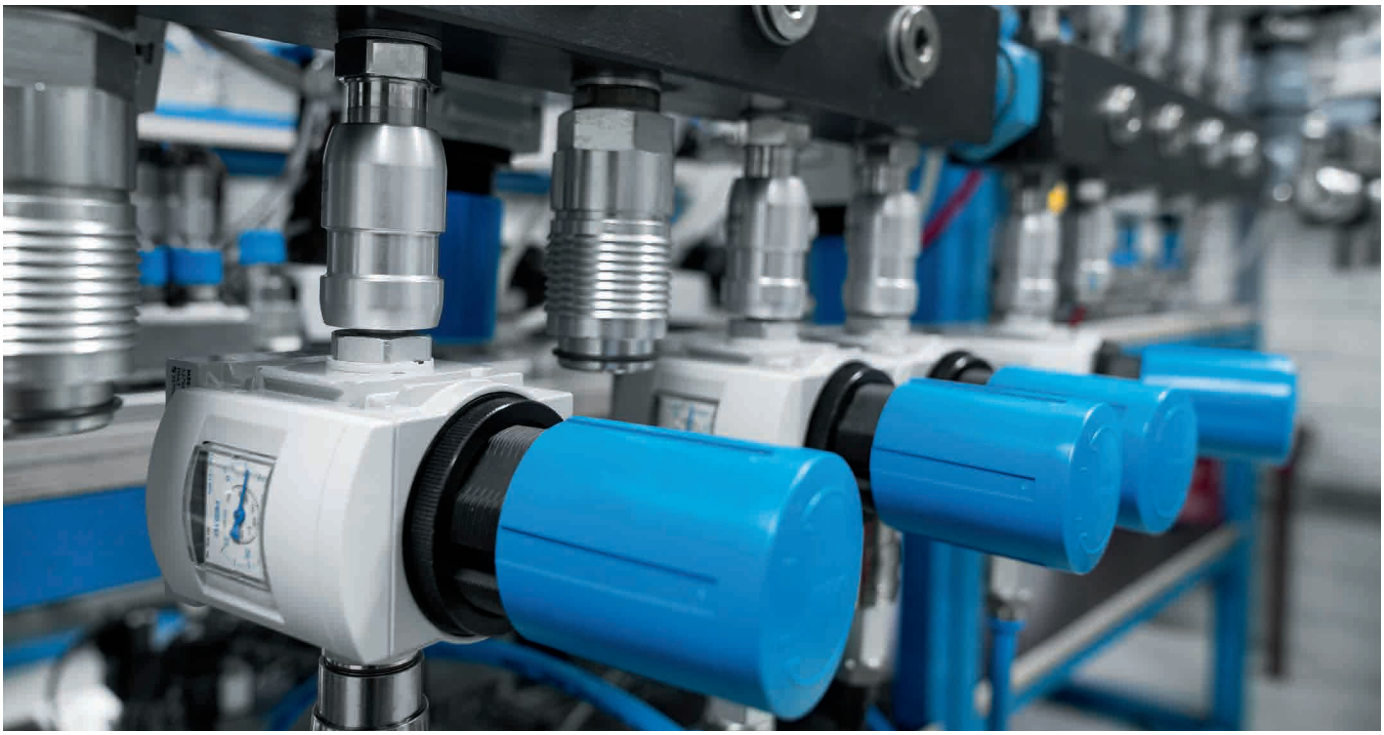
Available in transparent blue, transparent red, transparent green, transparent yellow and transparent black. The releasing ring on the QS fitting means that the tubing is as simple to install as ever.

- Resistant to microbes
- Hydrolysis-resistant
- UV-resistant
- Easy to install
- Food-safe*: FDA-listed material
- Kink-resistant

* See additional information on materials

Safety retrofits – safety couplings NPHS

The in-house testing processes at Festo are now even safer thanks to a tiny component: Test Engineer Reno Eichhorst is using the metal pneumatic safety coupling NPHS-..-M to couple and decouple components to/from the branch line in complete safety, even when the systems are pressurised.



Simple, safe and intuitive: a testing scenario such as this one, which involves a huge number of couplings, is a prime example of how it pays to retrofit the safety couplings.

The new safety couplings to ISO 4414 are now also being used as part of the testing procedures at Festo. These products are like a breath of fresh air. The integrated 3/2-way hand slide valve allows pressureless coupling and, by pushing the releasing sleeve, decoupling. Alternatively, it can simply be used for supplying and exhausting air.

The NPHS also improves safety when used as an on/off valve. Even with a vacuum or pressures of up to 20 bar, it is completely safe and exerts minimal force at flow rates of up to 2100 l/min. The pneumatic connections can be disconnected without any need for decoupling. This puts a stop to workplace accidents and also has a positive impact on energy consumption.

Straightforward and intuitive

Another key feature of the NPHS is that the mechanical system is easy and intuitive to operate. All it takes is a quick tug on the metal sleeve to depressurise the downstream connection. And decoupling is simply a question of pressing the releasing sleeve. That is why Eichhorst is increasingly relying on these safety couplings when testing Festo valves and valve terminals. “They are great and easy to handle. Because the exhaust operation is performed first, it is much safer to couple and decouple the connection between the branch line and the component,” says Reno Eichhorst, Valve Testing Engineer at Festo AG & Co. KG.

Easy retrofitting

Another bonus is that the NPHS-..-M is compatible with the standard couplings KD4/KS4. This makes it really easy to switch your existing installations and systems over to safety couplings.

Powerful vision system: smart camera SBRD

The two camera interfaces allow inspections to be carried out from several perspectives or with a large field of view.

The system SBRD makes operation easy and intuitive at every stage of the development of an application. And the pioneering image processing software CCS provides you with quick and reliable results.

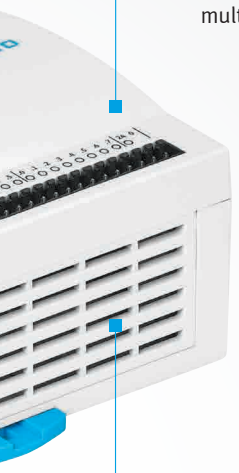


Flexible
Industrial cables that are suitable for energy chains without the need for an additional power supply

For multi-camera tasks
The smart camera system SBRD featuring the fast, high-resolution USB camera SBPB. Colour and monochrome, 1.3 MP to 5 MP. Lightweight and ultra-compact design.

The 2-in-1 vision system SBRD is ideal for inexperienced and professional users alike. The high-resolution cameras and powerful image processing software open up new possibilities in automation and robotics – with the proven performance levels you would expect from Festo.

Powerful
Remote head controller for multi-camera tasks



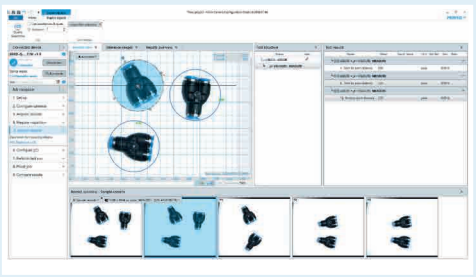
Fanless
The installation space-optimised controller, which features a powerful dual-core processor and PROFINET communication, gets by perfectly well without a fan.



Image processing software
Camera Configuration Studio – CCS

CCS xRun:
This tool has been specially developed for pick-and-place solutions and enables test tools to be parameterised quickly. These settings only have to be made once because they are automatically applied to all objects detected subsequently. This makes program development and maintenance easier and keeps the program structure very neat and tidy.

CCS tool set memory:
Once you have finished defining your tool settings, tool combinations or special task settings, you can easily save them in the tool set memory. This allows you to incorporate tried-and-tested settings for the application solution directly into the program without having to set the same parameters time and time again.



Find out more:
→ **www.festo.com/machinevision**

Flow sensor SFAH



IO-Link

Compact: the 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 elbow 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
- 8 flow rate measuring ranges from 0.002 l/min ... 200 l/min
- Very clear display
- Replicable
- Attractive price and great performance
- Large operating pressure range –0.9 ... +10 bar

★ Pressure sensor SPAN



IO-Link

Extremely compact and versatile!

The attractively priced pressure sensor SPAN is amazingly flexible thanks to switchable electrical outputs and a very wide range of options for pressure measuring ranges and pneumatic connections. The compact design of just 30 x 30 mm, the numerous variants and the user-friendly menu navigation make the sensor suitable for all sorts of application areas.

Relevant information is available at a glance thanks to the high-contrast two-line alphanumeric white-on-blue display. The SPAN's user-friendly menu navigation makes commissioning incredibly quick and easy.

- Just 30 x 30 mm
- Electrically compatible with all controllers
- Wide range of variants with a pressure range of up to 16 bar
- Inspection report available
- IO-Link®
- Tamper protection
- Attractive price and great performance

Signal converter SCDN



IO-Link

Compact, precise, easy to read: SCDN turns analogue signals into digital ones.

Take the pressure off your controller: the fast and decentralised signal processing of the SCDN, which measures just 30 x 30 mm, converts analogue signals into digital ones extremely precisely (±0.5% FS). Analogue inputs on controllers are no longer required. Thanks to the many switching functions and by scaling the measured value indicator, you can use the SCDN in any application. The switching points and threshold values are easy to teach.

IO-Link® enables remote parameterisation, diagnostics, remote visualisation and digitised process values as well as simple replacement thanks to auto-parameterisation – SCDN is ready for Industry 4.0. The high-contrast display ensures excellent visualisation of the process values.

- Compact: 30 x 30 mm
- Quick commissioning
- Can be programmed to change colour to red
- Tamper-proof thanks to security code
- Auto-parameterisation and replication to additional devices via IO-Link®
- Numerous functions, numerous display units

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.
For low mechanical loads, it is the most economical solution available. 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)

Checkbox CHB-C-N



Proven conveying technology: now with Telnet!

Quick, easy, compact and affordable. Welcome to the modern and reliable feed technology solution for all small parts. The Checkbox Compact is an intelligent system with adaptive workpiece flow control and optical workpiece identification. It sorts small parts according to type, position orientation, quality as well as quantity (with quantity preselection).

It is particularly suitable for fault-free feeding of small parts to automatic assembly and production machines, especially when dealing with high workpiece volumes and a large number of different types. Faulty parts are reliably rejected, the assembly of incorrect part types is avoided, and setup times are reduced to a minimum.

- All-in-one: camera technology and parts flow control integrated into a tried-and-tested unit
- Easy integration and teach-in function
- Ethernet, PLC interface, digital I/Os
- Control functions for conveyor unit and buffer zone integrated
- Remote control functions via PLC interface and Telnet commands

High-precision tested semiconductors

Hammermeister, a manufacturer of special-purpose machinery based in Gebenbach near Regensburg, relies on the pressure sensor SPAN from Festo as part of its high-precision semiconductor inspection system. The family-run company, which has around 25 employees, developed the complete special-purpose solution in close collaboration with its customer from the supply industry.

The cleanroom system checks that the semiconductors are OK within the sub-µ range. It consists of a fully automated handling system which feeds the semiconductors to the optical inspection station and positions them. “To achieve the necessary precision, it is essential to have extensive knowledge of handling mechanics, software, image processing and sensors,” says Stefan Schertl, Operations Manager at Hammermeister. “That is the only way we can create added value for our customers. Thanks to this system, our customer is now the technology leader.”

Automation saves time and money

Full automation also reduces process errors. Firstly, a gripper places a support plate with ten semiconductors at the first inspection station. They are roughly positioned and checked for completeness. Then, each semiconductor is gripped individually using vacuum and accurately positioned with a high-precision camera system. They are then optically checked. After the final inspection, the semiconductors leave the customer’s plant. Extremely small tolerances are required because the semiconductors are destined for use in measurement technology. The depth of field required for the optical positioning accuracy is 0.002 mm.

Vacuum inspection with pressure sensors SPAN

The solution uses three pressure sensors SPAN. Two use threshold values to detect if a vacuum has been generated, if the support plates are under suction and have been roughly positioned. The entire display turns red as soon as there is no vacuum. The third sensor reports the proportional analogue value for the vacuum back to the controller. By using an analogue signal, the vacuum value at the suction gripper can be detected much more precisely. Individual semiconductors are picked up by suction before being tested for position and quality in the sub-µ range.

Improvements with every system generation

Further systems have already been ordered by the end customer. Each generation of the machine is further improved with the help of products such as the pressure sensor SPAN from Festo. “We appreciate Festo products because they are reliable, flexible and easy to program. Their appealing design fits in perfectly with the look of the high-tech solution,” explains Stefan Schertl. “And the menu concept is consistent, which both our customers and we appreciate.” SPAN can be flexibly adjusted, is electrically compatible with all controllers and supports switchover between PNP/NPN – as a result, Hammermeister does not need to keep many sensor types in stock.

> “We appreciate Festo products because they are reliable, flexible and easy to program.”
>
> Stefan Schertl, Operations Manager at Hammermeister



Readily visible: you cannot miss the high-contrast white-on-blue display.



Festo right at the centre: on these high-precision semiconductor inspection systems, the pressure sensors SPAN check for a vacuum and make sure the semiconductors are in the correct position.

Quick and easy – the configurator for process valve units

Everything's covered: from searching for a solution right through to delivery
The configurator for process valve units makes your procurement process so much easier. It is a unique tool that ensures quick and successful project management by taking all relevant factors into account: from initial product search, configuration, sizing and documentation right through to ordering and delivery of the process valve unit. With customer-specific requests also factored in, it's everything you could ever need in one tool!

Various combinations to suit your requirements
Perfectly matching components from a single source: butterfly valves, quarter turn actuators, pilot valves, sensor boxes, positioners, adapter kits and hand lever valves. Whatever you are looking for, whether it is the ease of manually actuated combinations, a unit with pilot valves and a sensor box, or a unit with a positioner, the configurator can offer the right solution for virtually all requirements.

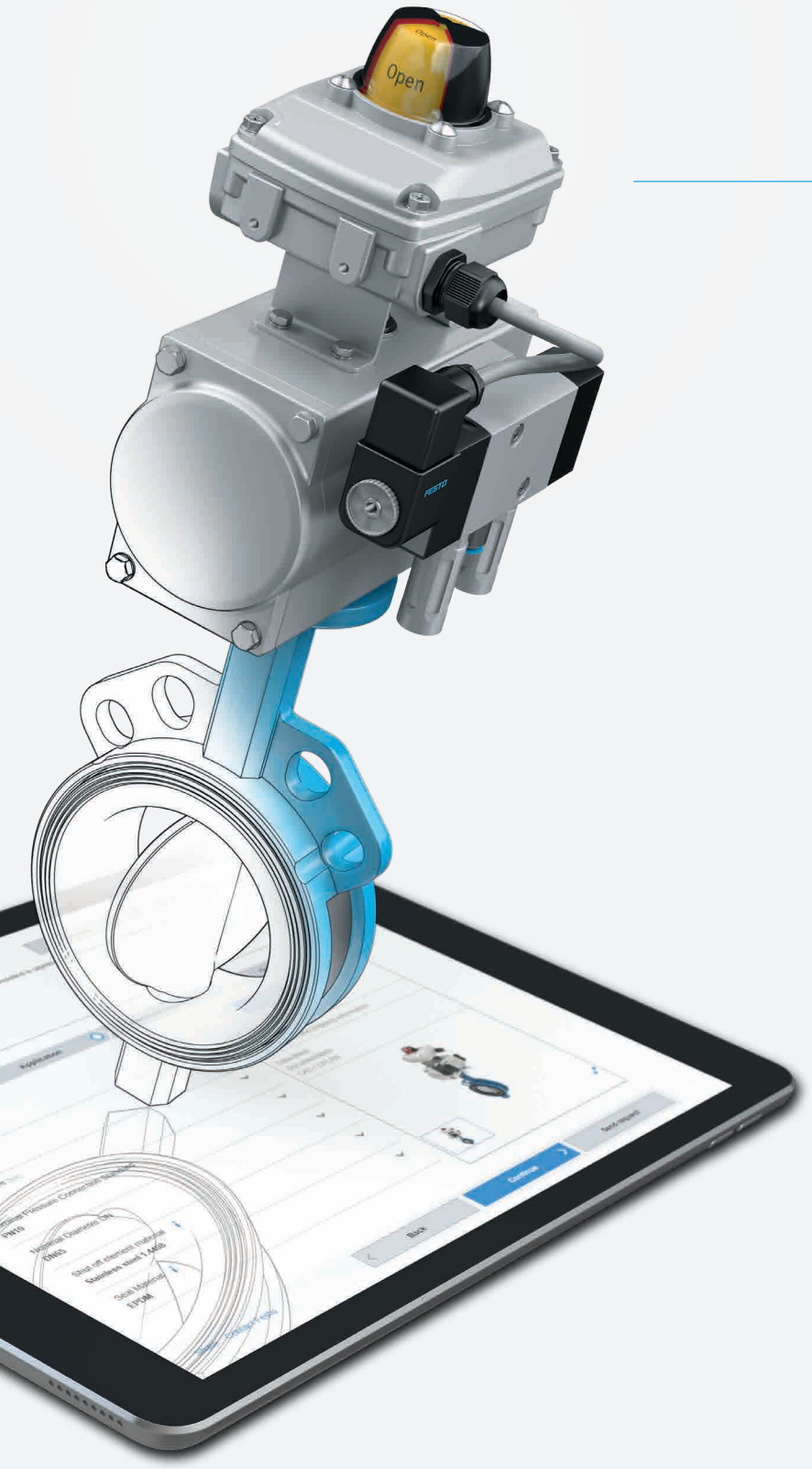
System ID and CAD download included
Together with the proposed solution, the configurator generates a system ID for the complete combination which you can save for future orders. There are also benefits in terms of documentation because the CAD data for the complete module can be downloaded in accordance with the configuration.

Transparent
With immediate access to price and delivery time information, you can make your procurement process more efficient.

Quick and easy
The user-friendly interface and structured data querying take you to the right choice of product with a minimum of engineering effort. Not only do you save time on engineering but also on procurement.



From manually actuated process valves to fully automated ones, the new configurator makes selecting the optimum solution child's play. Select a few parameters and the configurator will immediately start suggesting appropriate combinations. This will make your engineering process faster, easier and more reliable.



Reliable
Benefit from greater reliability when sizing the products for your specific application thanks to perfectly matching products.

A complete solution with just a handful of parameters It couldn't be easier
Simply select the key parameters for the application on the configurator screen and the first set of suggestions will appear straight away.

Try it for yourself:
→ **www.festo.com/kvza**

★ Quarter turn actuator DFPD



DFPD – the new benchmark for quarter turn actuators.

Whether it is used as an individual actuator or as part of a complete Festo process valve unit, the DFPD with its rack-and-pinion mechanism and its modern, simple and compact design sets a new benchmark for quarter turn actuators. Thanks to its torque range of up to 2300 Nm, its rotation angle of up to 180° and its corrosion-resistant variants, the DFPD can be used for all kinds of tasks – from actuating ball valves, butterfly valves or air dampers in the chemical, beverage and pharmaceutical industries right through to water treatment solutions.

- New: now supports a torque of up to 2300 Nm
- Single- or double-acting
- Very compact, particularly the single-acting variant
- Optimised spring cartridge design for more efficient single-acting operation in steps of 0.5 bar
- Flexible: end position is adjustable at both ends
- For extreme temperatures: –50 ... +150°C
- Mounting plate for pilot valve in EU (G) and US versions (NPT)

Angle seat valve VZXA



Maximum flexibility – minimum design effort for your application!

The VZXA easily adapts to the task in hand thanks to its huge range of variants.
The carefully thought-out product architecture with its easy-to-clean design means valve bodies and actuators can be freely combined. The modular product concept makes it easier to modify and maintain systems without having to remove the entire valve.

- Sturdy, stainless-steel process valve
- Flow-optimised design for exceptionally low-resistance flow
- Nominal widths from DN13 (1/2") ... DN65 (2 1/2")
- Actuator modules as piston or diaphragm actuator: single- or double-acting
- Different connection types and standards
- Standard interfaces for a free combination of actuators and valve bodies

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 the sizes 1/4" and 1/2" with a G or NPT thread, either individually or in combination with process valve units.
Zinc die casting ensures high levels of corrosion resistance (CRC3), and temperature resistance is assured 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 simple.

- 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 1/21

Analogue, HART-capable CPX module with 4 channels



Analogue precision meets digital diagnostics and parameterisation.

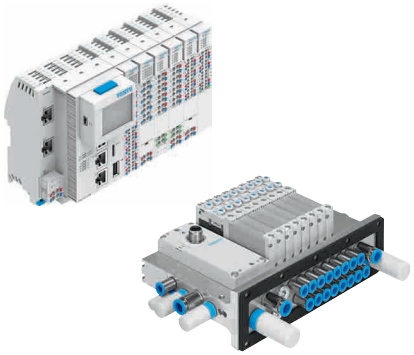
There is a new addition to the proven CPX platform in IP65/67: the analogue module CPX-HART with 4 channels, each of which can be used as an input or an output. Both 2-wire and 3-wire field devices can be connected to the module. The 0 ... 20 mA, 4 ... 20 mA and 4 ... 20 mA modes with HART (Highway Addressable 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 signalled 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 and PROFINET coupler

Integrated control cabinet solution with CPX-E and VTUG





Optimised for control cabinets: more compact and affordable, better performance.

Festo now offers an ideal package for the control cabinet and it's all because the CPX-E and VTUG are the perfect combination. This package is much more compact than other control cabinet solutions, is suitable for zone 2 – and is more attractively priced.

The powerful automation system with NE21-specific certifications

The modular control system CPX-E is based on the CPX but offers much better signal processing performance. Not only that, but it is also more cost-effective. Designed as an EtherCAT® master controller and motion controller, CPX-E forms the central control system. Several bus modules are available so that it can be configured as a compact and low-cost remote I/O. The CPX-E is easy to integrate into existing host systems thanks to the EtherCat® master interface and integrated PROFINET device interface or EtherNet/IP slave interface.

Optimised for control cabinet installation

The universal valve terminal VTUG has been specially optimised for installation in control cabinets and designed to save space. It features new manifold rails, check valves and fixed flow restrictors. Compact and with high flow rates, the VTUG is now the ideal all-rounder for control cabinets too. The vertical variant, for example, considerably reduces tubing connections while enabling an optimum view of the LED indicator and inscription label, as well as convenient access to the manual overrides. The hot-swap function allows individual valve slices to be replaced quickly during operation without any production downtime.

- Compact and space-saving
- Easy mounting plus lower tubing connection costs
- Improved signal processing performance
- NE21-specific certifications
- UL/CSA, C-Tick, IEC Ex certifications
- IO-Link®
- Attractively priced
- Explosion protection: for use in zone 2

Vacuum drying with added value

E. Bachiller B., S.A., a company located near Barcelona, specialises in process equipment and pressure vessels for filtration and vacuum drying. Bachiller uses Festo pneumatic and electric components for all its solutions, including one it devised for an ATEX production line in Russia.

The company specialises in vacuum drying. This technology allows liquids to be separated from solids at low temperatures while their chemical/physical properties remain unchanged.

ATEX project for Russia
E. Bachiller has developed a production line for active pharmaceutical ingredients for a Russian end customer. In the first phase of the project, the company installed two horizontal vacuum dryers with volumes of 50 and 100 litres respectively and appropriate evaporators. These dryers conform to Russian directive EAC TR 012/2011, the equivalent of the ATEX II 3GD directive. Festo supplied the control cabinets for zone 2/22.

The control cabinets were installed directly on the machine frame. All the signals from the explosion-hazard and non-explosion-hazard areas are brought together and processed centrally so that the compressed air from the valve terminals CPX-P/MPA can be routed to the quarter turn actuators DFPB. As a basic principle, the fieldbus cables and tubing are not allowed to cover a distance of more than 50 metres. A service unit from the Festo MS series takes care of air preparation.

One crucial factor for E. Bachiller was the delivery time for the Festo solutions, which was scheduled to fit in with the rest of the project. The flexible configuration of the valve terminal CPX-P/MPA was also an advantage, because it enabled each control cabinet to be equipped with a combination of analogue and digital input and output modules.

Incorporating a large number of NAMUR safety digital inputs (Ex-ia) was less expensive than using conventional digital inputs with additional safety barriers.

The advantages of the Festo solution
“Working abroad means that our machines must be of the highest quality and makes it vital for us to work with reliable partners such as Festo. Customers like it when all the pneumatic and electric solutions are supplied by Festo. This complete package ensures a lower risk of errors and shorter delivery times,” emphasises David Bachiller, General Manager of E. Bachiller.

“The fact that Festo has a worldwide presence was also very important,” he adds. Further factors were the certification of the products – particularly conformity to the ATEX directive – and the ability to order control cabinets produced to individual specifications and with integrated pneumatic and electric components. The technical documentation supplied was another aspect that went in Festo’s favour because it included complete pneumatic and electrical diagrams.

“Thanks to Festo, we can offer a complete package that enables us to reduce the risk of failures and achieve shorter delivery times.”

David Bachiller, General Manager of E. Bachiller B, S.A.



The horizontal vacuum dryer.



The clever solution for explosion-hazard areas: the control cabinet with valve terminals CPX-P/MPA and service unit components MS was mounted directly on the machine frame.

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**

135002 en 2018/02 – Errors and omissions excepted

