



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.**



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

**Dear customers,**

Innovation and speed – these are the two key aspects that best describe the ways in which we will be making you more productive in 2017. One of our exceptional innovations is our Festo Motion Terminal VTEM – a world first that is set to catapult pneumatics into the digital age of Industry 4.0.

The Festo Motion Terminal VTEM is the first valve solution to be controlled by motion apps, and an innovation that transports pneumatics into new dimensions. It is self-diagnosing, self-adapting to external influences, offers transparent processes and is clearly identifiable with a digital map in the form of a product key.

The Festo Motion Terminal combines the best of electronics and pneumatics, is unbelievably flexible, and also helps to promote standardisation in production. Its capabilities include complex movements and variable positioning, a high level of functionality, lower energy consumption and, last but not least, a significant reduction in the number of components required. This is digital simplicity that shortens engineering time and reduces complexity. See for yourself!

The core product range is fast, cost-effective and always available. More than 2200 high-quality products with a star are either held in stock and available for dispatch within 24 hours, or can be configured and shipped within 5 days – wherever you are in the world! Our products are also available in large quantities and always come at a very attractive price. The core product range covers the electrical and pneumatic control chain in full, and it can handle over 80% of applications quickly and easily.

You can be sure that we are always working to boost your productivity – both now and in the future. That is our goal – meeting your challenges quickly, reliably, simply and efficiently with our automation solutions, services and training programmes.

Productivity is our core business – and our passion. That is what makes us engineers of productivity. Why not take advantage of this?

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

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



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You want reduced complexity.  
You require easy running processes.  
We are your route to simplicity.

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



# Simply more productive

Our core product range has been selected by our experts based on customer requirements in order to simplify your work and to make you even more productive. More than 2200 components from every phase of the pneumatic and electrical control chain make your life easier. From air preparation, valves and cylinders to grippers – with the core product range, 80% of all applications can be accomplished effortlessly and quickly, even when large quantities are needed. And at a low price.

## **Fast delivery, available worldwide**

Products marked with a full star are held in stock and are available for dispatch just 24 hours after placing the order. Configurable products with the outline star can be delivered within five days. All these components are available worldwide. Quality remains at a consistently high level thanks to automated production in state-of-the-art plants such as Scharnhausen in Germany, Mason Ohio in the USA and Jinan in China. What's more, our logistics chain is designed to ensure you receive your deliveries quickly.

## **Safety built-in**

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

More information about our ★/☆☆ products:  
→ [www.festo.com/corerange](http://www.festo.com/corerange)



# Digitisation – the megatrend for new productivity

The virtual and real worlds are growing ever closer together – and are leading to Industry 4.0. Increased digitisation is one of the basic prerequisites of this process, which merges modern information and communication technologies with conventional industrial processes and uses them to create cyber-physical systems.

The ever-increasing ability to collect and acquire data in real time is opening up new dimensions for products and production processes. Smart products are becoming new sources of data and supplementing or replacing other data sources. This capability is enabling functions from higher control levels to become decentralised as components are able to perform the tasks themselves. Alongside the existing fully automated production processes, adaptive concepts for individual and economical production down to a batch size of 1 are becoming possible. Their technologies are continually adapting to changing conditions and responding to intervention by people. In new plants such as the Scharnhausen Technology Plant in Germany, Festo is already introducing these principles.

## Smart products for the future

Products from Festo are becoming increasingly intelligent and incorporate more and more software-based applications as well as the ability to integrate embedded functions. Smart products optimise themselves, adapt to external influences, identify themselves and have a digital map in the form of a product key. Integrated sensor technology ensures that processes are transparent and self-diagnosing, thus enabling preventive maintenance.

And when it comes to networking, the availability of universal standards and interfaces is also important. That is why Festo uses the OPC UA common interface. As a rule, smart products are plug-&-produce-compatible as they are able to network intelligently and then configure themselves. It is only through self-organising components that production plants really become flexible – and therefore able to meet constantly changing requirements.

## On the road to Industry 4.0

The automation platform CPX for the valve terminals MPA and VTSA is one of the first products to demonstrate an integrated industry approach and to be equipped with decentralised intelligence. The electrical terminal with diagnostic capabilities can provide condition monitoring functions and make decisions on site. Like the compact controller CECC and the display and operating unit CDPX, it has an OPC UA interface. The energy efficiency module MSE6-E2M is a world first and can also evaluate the measured pressure and flow data as well as initiate suitable measures.

## The next step: digital pneumatics

A genuine Industry 4.0 component that is the first to be launched on the market is the Festo Motion Terminal VTEM. It is the world's first pneumatic automation platform to be controlled by apps and demonstrates how digitisation is making its way into pneumatics.

# 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 the need to change the hardware. This completely 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 until now were restricted to servo-pneumatic 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 functional integration of the Festo Motion Terminal significantly reduces process costs and complexity compared to conventional solutions, in downstream processes too.

## Fit for Industry 4.0

The Festo Motion Terminal is making pneumatics fit for Industry 4.0 thanks to the integrated sensors for transparent processes, the possibility of self-optimisation or self-adaptation to external influences, a digital map in the form of a product key or OPC UA as an optional Industry 4.0 interface.

## Outstanding energy efficiency

The Festo Motion Terminal uses an integrated concept to ensure energy-efficient operation. In addition to apps for saving energy, low-energy piezo valves have been developed for controlling the main valve stages. These reduce the energy consumption for the pilot control by up to 90% – with a service life of up to 300 million switching cycles.

## CPX module

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



## Ethernet WebConfig interface

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

Pneumatics is an easy-to-control technology and is now becoming even more simple, versatile and flexible – with the brand-new Festo Motion Terminal VTEM. Motion apps are moving pneumatics into the age of Industry 4.0. These apps control a single piece of hardware and can replace over 50 individual components.



#### Input module

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

#### Valve

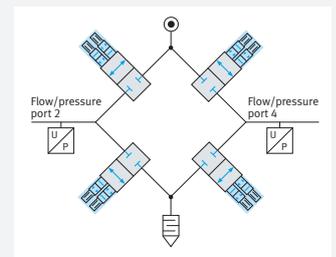
The app-controlled valve comprises 4 2/2 diaphragm poppet valves, which are controlled by 4 piezo pilot valves. The integrated stroke and pressure sensors provide optimal control and transparent condition monitoring. The interplay between the components and the bridge circuit design, which enables independent pressurisation and venting, are what make the valve so flexible.

#### Controller with motion app

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

#### Motion Apps

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



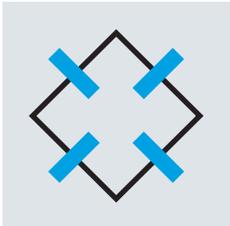
Bridge circuit in the valve

Find out more:

→ [www.festo.com/motionterminal](http://www.festo.com/motionterminal)

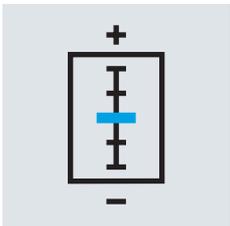
# Flexibility and standardisation hand in hand: 10 motion apps – 1 piece of hardware

The Festo Motion Terminal offers you benefits throughout the entire value chain, from the design to the modernisation of your machine. The motion apps, which control a single piece of hardware, are an integral part. They allow you to standardise your applications while offering unparalleled levels of flexibility. Additional apps are already planned.



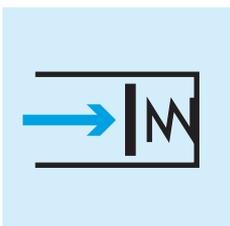
## **Directional control valve functions**

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.



## **Proportional directional control valve**

For the first time at Festo, two proportional flow control functions have been integrated in one valve and on one platform, resulting in an economical and compact solution.



## **Soft Stop**

Shorten your cycle times by up to 70%! With Soft Stop, you can implement highly dynamic yet gentle positioning motion without wear-prone shock absorbers. This reduces maintenance times, increases the service life of your system and thus enhances your productivity.



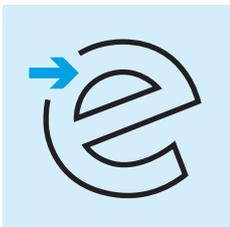
## **Proportional pressure regulation**

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



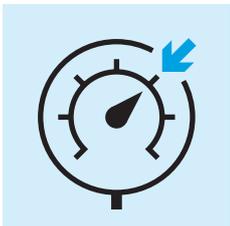
## **Model-based proportional pressure regulation**

With model-based control, there's no need for external sensors. By storing fewer boundary parameters for the system, such as tube length, tube diameter and cylinder size, the anticipatory control system ensures maximum accuracy, as the app can compensate for a drop in pressure and volume using the control technology.



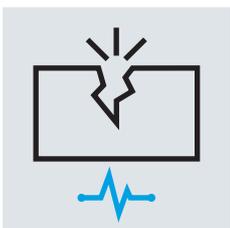
#### ECO drive

Reduce costs by operating your actuator with the minimum pressure necessary for the load. There is therefore no rise in pressure in the drive chamber at the end of the movement. This enables energy savings of up to 70%. With a single DSBC32-100 with a 2 kg load, this is a saving of approx. €100 a year.



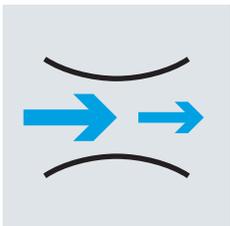
#### Selectable pressure level

Save energy by setting several pressure levels. Simply set the pressure for selected movements to a level of your choice. Additionally, you can control the speed by adjusting the flow control function.



#### Leakage diagnostics

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



#### Supply and exhaust air flow control

Do away with separate flow control valves on the actuator and set tamper-proof travel speeds quickly and conveniently at the touch of a button. There is also an option to implement new motion sequences such as dynamic flow control adjustment.



#### Presetting of travel time

For quick and easy commissioning and stable operation, all you have to do is enter the travel time for the advancing and retracting motion. The exhaust air flow control function adapts itself to the travel time and then maintains it. The system automatically adjusts the values in the case of influences such as increased friction due to wear.

# Cinema 4.0: great movies with the Festo Motion Terminal

Experiencing films with all the senses – this is what cinema audiences can do in one of the world's 18,000 MediaMation cinema seats. With this concept, the whole body participates in the movie. The movements are controlled by a Festo Motion Terminal VTEM. This provides a unique way of combining digitisation and pneumatics.

A chase involving sports cars is unfolding on the screen. On a hairpin bend, the cinema seats tilt to the left – only to swing back to the right when the car is travelling straight ahead again. The cinemagoers feel the unevenness of the road surface, hear the screeching of the tyres when the driver brakes and smell burnt rubber and exhaust fumes. Suddenly water is splashed into the audience's faces as the car drives through a puddle. At the same time, they can feel a draft of air blowing through their hair.

The cinema audience becomes one with the film. In the MX4D Motion EFX seats produced by the Californian company MediaMation, the audience has the feeling that they are actors themselves. The seats incline, shimmy and lift. Effects and synchronised movements with gusts of wind, water splashes, vibration and scents are piped in through the V2 EFX armrests of the cinema seats, while pressure points are incorporated in the backs of the seats.

## Industry 4.0 makes it all possible

Industry 4.0 is delivering “Cinema 4.0” – the Festo Motion Terminal VTEM controls all kinds of motion and triggers all the effects. This versatile pneumatic control system integrates digital functions into a single valve. Preprogrammed function modules and motion apps eliminate the need for costly system structures. The motion apps “Proportional directional control valve” and “Proportional pressure regulation” control the flow rates and pressures to ensure fast and powerful yet gentle and precise motion sequences.

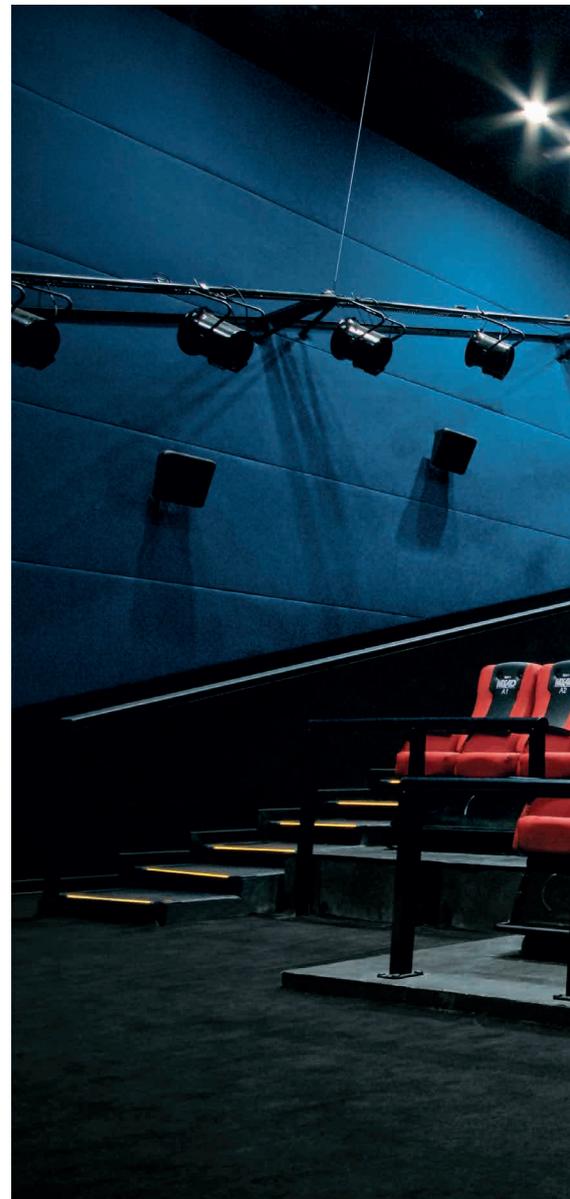
## Compact and simple

The motion profiles for the films are processed in a controller CPX-CEC directly on the Festo Motion Terminal. Many hardware components previously required are now superfluous. Three valves VTEM control the three actuators of each cinema seat, while one valve is responsible for pressure regulation. Inexpensive standard valves VUVG-...-S from Festo's core product range are used for the effects such as the gusts of wind.

“The Festo Motion Terminal makes everything much easier for us. Installation, commissioning, diagnostics and fault-finding can now be realised with far fewer components,” says a very pleased Dan Jamele, CEO of MediaMation.

## Digitisation and apps

As a key contributor to Industry 4.0, VTEM allows many new functions to be integrated thanks to digitisation and piezo technology. “We already have many different apps to choose from, such as proportional pressure regulation, presetting of travel time and selectable pressure level, depending on each individual film scene,” explains Takayoshi Kawakami, Director of Engineering at MediaMation. MediaMation with its fast and intuitive operation is very well received in the age of “Cinema 4.0”.





Digital simplicity: the motion apps make pneumatics go digital. It enables numerous functions, including some completely new ones, to be produced with one valve design.



Right in the middle of the film, the Festo Motion Terminal makes cinema seats very mobile and generates some surprising effects. The audience experiences each scene with all their senses.

# Flexible gripper finger DHAS – light and adaptable

## Bionics – learning from nature

What does it mean? First, we gather inspiration from nature and investigate biological principles. We then use these to extrapolate basic technical principles and create a bionic adaptation or technology platform. The next step is to transfer this to a technical application. Discussions about new technical applications are always started well in advance and influence the automation concepts of tomorrow.

The Fin Ray Effect® is a concrete example of how learning from nature is transferred to automation technology.

## The Fin Ray® principle

The Fin Ray® principle is based on the wavelike movement of a fish's tail fin and applied to an industrial application. Like the fin, a design with the Fin Ray Effect® does not bend away when pressure is applied at the side, but instead wraps around the pressure point. This enables the gripper fingers to gently close around the item and allows fragile and irregularly shaped objects to be gripped safely. Compared with standard gripper fingers, the adaptive gripper's outstanding feature is its significantly lower weight.

**High-performance:** the tapered gripper fingers enable even slim packages to be gripped.

**Safe:** the form-fitting motion of the gripper finger adapts to the shape of the workpiece.

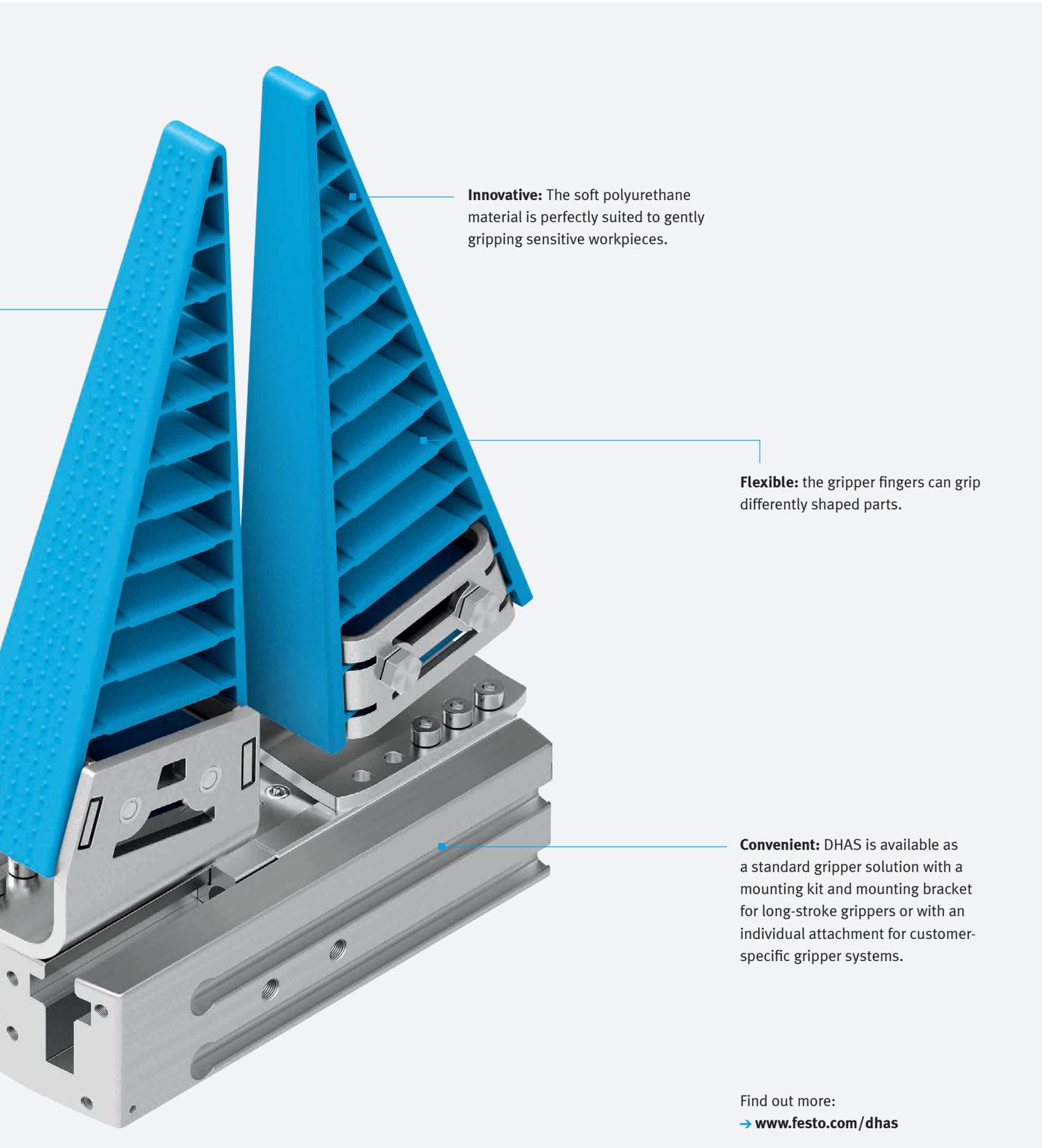
## A captivating solution for form-fitting gripping

Whether you have small or large bottles, tubes or jars, the flexible gripper finger DHAS can pick up virtually any shape extremely gently and without leaving any marks. Find clever solutions to your packaging tasks! We can support you:

→ [www.festo.com/packaging](http://www.festo.com/packaging)



The flexible and sensitive gripper finger offers gentle gripping, low-vibration transport and impact-free placement. Based on a motion principle found in nature, this innovative gripper finger is the ideal solution for all delicate surfaces and sensitive materials.



**Innovative:** The soft polyurethane material is perfectly suited to gently gripping sensitive workpieces.

**Flexible:** the gripper fingers can grip differently shaped parts.

**Convenient:** DHAS is available as a standard gripper solution with a mounting kit and mounting bracket for long-stroke grippers or with an individual attachment for customer-specific gripper systems.

Find out more:

→ [www.festo.com/dhas](http://www.festo.com/dhas)

## Flexible gripper finger DHAS-GF



### The adaptable gripper finger for gentle and safe gripping!

Use two gripping principles in just one product for gentle yet safe gripping! When looking at the cross-section, the gripper's ribs and edges form a mesh-type structure, known as the Fin Ray® principle. These connections produce a wave-like shape when a force is applied to them, which is ideal for form-fitting gripping.

To make the most of the advantages of the blue gripper finger, it is recommended to install it on a long-stroke gripper using a mounting kit. To achieve optimum gripping results, the length of the gripper fingers should roughly correspond to the diameter of the workpieces to be gripped.

- Adapts to the workpiece contour
- Various diameters and shapes can be gripped
- Three different sizes
- Can be integrated into human/robot collaboration concepts

## Standards-based cylinder with low-friction feature DSBC-L1



### Hard work – smooth running: the cylinder for load balancing.

Balancing cylinders should be easy to actuate, need to respond quickly and be moved with low resistance. For example, if an application requires load balancing, the operator should be able to position the (often heavy) workpiece precisely and without exerting any force. The low-friction feature of the DSBC makes it ideal for this task.

Special seals reduce the friction, significantly lowering the break-away pressure. The cylinder responds even at a low operating pressure.

Operating behaviour is optimised through a special low-friction grease which allows the cylinder to respond immediately to the slightest changes in load.

- Simple start-up from the rest position
- No stick-slip effect at low pressures
- Comprehensive range of accessories
- Self-adjusting cushioning PPS makes it easier to install

## Rotary indexing table DHTG with energy throughfeed



### Energy throughfeed for unlimited rotation!

The energy throughfeed is a world first that enables electrical signals or compressed air to be transferred through the hollow shaft, ensuring the parts attached to the rotary table are supplied quickly and easily. There is no limit to the rotation angle.

The pneumatic rotary indexing table DHTG is designed for partially automated systems, equipment buffers, swivel tasks and separation tasks. It offers high load-bearing capacity, precision and cost-effectiveness, and its compact design and user friendliness set new benchmarks.

- Unlimited rotation
- Rigid tubing connection at the connection point
- Internal, protected tubing



★ Semi-rotary vane drive DRVS with position sensor SRBS-Q1/Q12



**Swivel to the left or the right – always ready for action. Top swivelling performance.**

The semi-rotary vane drive DRVS is a compact and high-performance product with reliable, precise and powerful swivelling movements. Its clear and functional design allows it to support swivel motions in the background and be integrated harmoniously into any system. And the new sensor solution SRBS is a perfect fit – it can be assembled in a matter of seconds and is infinitely adjustable.

- Lightweight
- Quick and easy installation
- Sealed and durable shell construction

Push-on flange DARF and flange mounting DAMF for semi-rotary vane drive DRVS



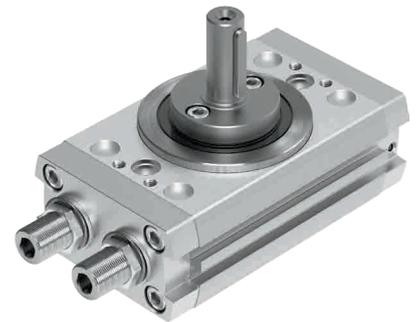
**Comprehensive range of accessories.**

With its compact design, low weight, simple optional sensing and operational performance with forces up to 20 Nm, the DRVS is ideal for use in harsh environments, for example in assembly systems, in tool making and in general machine building. Its range and functionality are now expanded thanks to the addition of new accessories.

The push-on flange DARF is versatile, easy to handle, and quick and easy to mount.

The flange mounting DAMF makes installing the DRVS fast, simple and extremely convenient, saving you valuable time.

Additions to the twin-piston semi-rotary drive DRRD



**A real go-getter! Big performance at a small price.**

Whether you just require speed or also need to be able to handle high loads, the twin-piston semi-rotary drive DRRD is the perfect solution. With elastic or hydraulic internal cushioning, or additional external cushioning, it is suitable for all types of motion paths.

New: the additional attachable drive shaft. For even greater versatility when it comes to designing your connections. Even shorter swivelling cycles can be achieved with the new shock absorber.

- Shorter swivelling cycles
- The right shock absorber variant for every application
- Wide choice of connection options thanks to the new drive shaft



Focus Open 2015  
Special Mention

# Manipulators in automotive assembly – a low-friction solution

Manipulators help workers in automotive plants to handle heavy and bulky vehicle modules. They have to be easy to operate and move with minimum force. With this in mind, EFS has developed a number of smart handling solutions which incorporate special low-friction cylinders from Festo.

Manipulators support the installation process for modular car body assemblies and determine the level of quality. Cockpit, roof and front-unit modules are not intrinsically stable, and have to be incorporated into the mounting fixture, aligned and installed within the cycle time in accordance with customer-specific tolerance requirements. EFS Gesellschaft für Hebe- und Handhabungstechnik mbh, a company specialising in lifting and handling technology from Nordheim near the German city of Heilbronn has 100 employees and is proud of the more than 5000 manipulators it has installed worldwide.

“Almost no two manipulators are alike,” explains EFS Director Christoph Göller. In fact, each new vehicle model requires new equipment.

## Ready for use with multiple vehicle models

Manipulators can handle modules for a large number of vehicle models. “A single assembly line includes an unbelievable range of models,” observes Göller. Compact cars, SUVs or mid-size cars are all mixed together. The assembly stages are precisely defined and demand strict time frames for installing the vehicle modules. Screwdriving, measuring and control technology is often integrated into the mounting fixtures. “When it comes to screwdriving technology in particular, screwdriver times are often a problem. They cannot be influenced and our manipulators have to adapt to the time frame,” explains Göller. “This means that we need to automate many of the functions on handling units.”

## Development partnership

EFS and Festo have formed a strong development partnership. As a result, EFS has designed a manipulator together with Festo, which enables cumbersome, pre-assembled modules to be moved from a carrier to a conveyor. “In order to develop a suitable low-friction cylinder, EFS provided us with a handling unit,” explains Frank Müller, the sales engineer responsible for EFS at Festo.

This low-friction cylinder had to have an extremely small breakaway torque, very little friction and smooth running characteristics. The pneumatic cylinder also has to bear the load while the operator uses the manipulator to lift and move the vehicle module. The aim was to minimise the force exerted on the operator.

## Smooth running guaranteed

The low-friction cylinder DSBC-L1 provided the basis for the solution. By using different seals and a different interior, it runs even more smoothly than before. Thanks to the low breakaway torque and its smooth running characteristics, it couldn't be easier for the operator of the manipulator to take hold of and handle the vehicle modules. The low-friction cylinder DSBC-L1 comes at an attractive price and is ISO-compliant. Handling specialist Göller uses his experience to explain why the Festo low-friction series was an excellent choice. “This EFS manipulator will be well received thanks to its exceptional low-friction characteristics,” he confirms.



The low-friction cylinder DSBC-L1 with its exceptional running characteristics ensures that the manipulator is well received by its operators.



Making light work of heavy loads: with the smooth-running manipulator, vehicle or cockpit systems can be moved to the right place and assembled in a stable manner.

# Versatile, economical, precisely fitting – handling technology from Festo

## Extensive range of standard handling systems

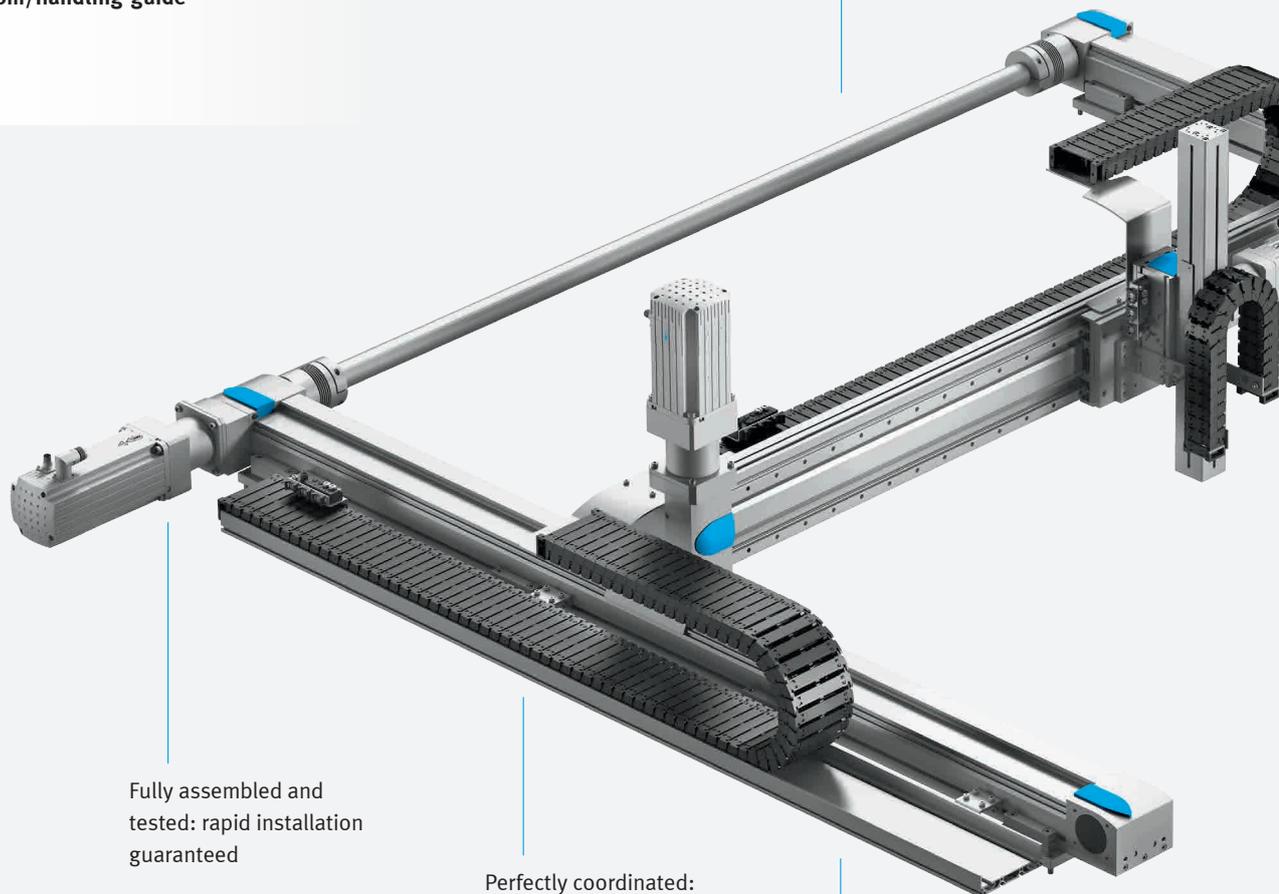
The Festo product range extends from single-axis system and 2D linear and planar surface gantries all the way up to 3D gantries for an exceptionally wide variety of applications.

With the Handling Guide Online, you will find the right standard handling system quickly and easily in just 20 minutes, including the CAD model.

Get started and order now:

→ [www.festo.com/handling-guide](http://www.festo.com/handling-guide)

Configure and order quickly and efficiently online



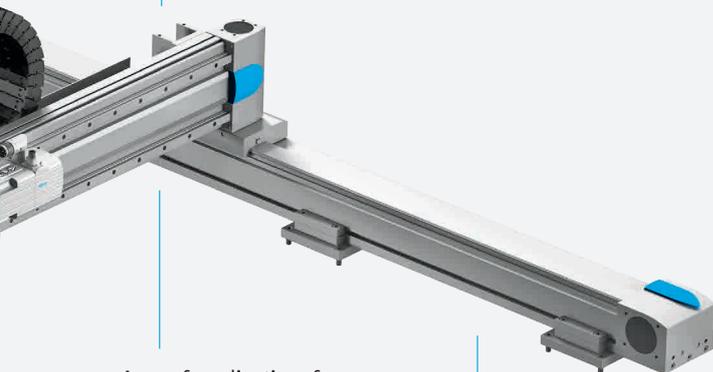
Fully assembled and tested: rapid installation guaranteed

Perfectly coordinated: motor, gear unit, controller and energy chain

Short delivery times

Choose the right solution from the range: use our innovative configurators and greatly speed up your project planning and design processes. With Festo, you can configure your individual handling system in just 20 minutes.

One part number, one delivery date:  
for straightforward order processing  
and reduced logistics



Area of application: for  
low and high payloads

Complete documentation  
incl. CAD model and  
calculation data

**Full flexibility** for load, dynamic response, working space and mechanics are all possible with our high-speed variants or compact handling systems.

#### High-speed handling systems

Complete solution for highly dynamic movement and positioning with high precision and excellent dynamic response for up to 150 picks/min.



#### Compact handling systems

Minimum installation space, maximum coverage of the working space. Compact, flat design. Delivered preparameterised and ready to install.



What's more, if you have specific requirements for a precisely fitting solution for your system, our automation experts will be happy to plan the project for you and provide you with an individual quotation.

Find out more:  
→ [www.festo.com/handling](http://www.festo.com/handling)

## Servo press kit YJKP for electrical press-fitting applications



### The pre-assembled system kit comprising software, controller and hardware.

YJKP gives you just the software functions you need for your press application. The highly precise press system with outstanding repetition accuracy can be configured easily using a Festo modular system, allowing you to adapt it to suit your needs. The modular operating software comes pre-installed in the controller so it's ready to use immediately. No programming skills are required – it's a quick, simple and inexpensive solution. Together with matching standard components from Festo, it can be used for electrical press-fitting applications up to 17 kN. All you have to do is integrate it!

- Always exactly the right configuration
- Less expensive than conventional press-fitting systems
- Very high positioning and repetition accuracy
- Software and hardware from a single source
- Versatile monitoring functions in real time
- Easy to integrate into your own system concept
- Industry 4.0-compatible thanks to OPC UA interface

## Compact handling system YXMx

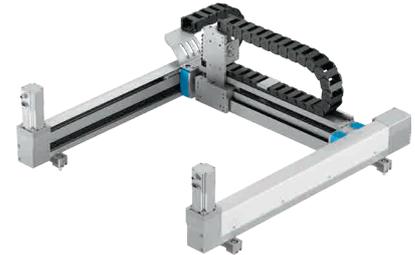


### The flexible basic platform for a wide variety of desktop applications.

The matching, ready-to-use YXMx system is made for tasks such as screwdriving, dispensing, testing, soldering, gripping, opening and closing containers, and much more besides. The system comprises software, a controller and kinematics based on the EXCM. All you have to do is attach a front unit. Thanks to the predefined function elements in the supplied software library, programming and commissioning are quick and easy. This makes it easier to integrate the system into the application environment. 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
- Easy programming and commissioning
- Compact with an optimum installation/working space ratio
- Optionally with mounted Z-axis and camera

## Compact planar surface gantry EXCM-40



### Maximum working space coverage with extremely compact design.

The parallel kinematic drive concept ensures low moving masses: the recirculating toothed belt, driven by fixed motors, moves the slide within a two-dimensional area. The IP20 drive and controller package is preparameterised for easy commissioning. The encoder allows closed-loop servo operation.

The large variety of applications range from laboratory automation to small parts assembly and electronics manufacturing.

The EXCM series offers two further planar surface gantries for smaller working spaces and lower payloads: EXCM-10 and EXCM-30.

- High-performance thanks to 48 V DC supply voltage
- Loads up to 4 kg with maximum dynamic response
- Maximum working space 2000 x 1000 mm
- Stroke scalable in the X- and Y-axes
- Optionally with mounted Z-axis
- In addition: adjusting kit, end position switches

## Linear gantry EXCT



### Dynamic and flexible: the Cartesian high-speed pick & place system EXCT.

The parallel kinematic drive concept used in the linear gantry EXCT has two fixed motors and a recirculating belt. This means that the motor for the Z-axis does not move. Enabling over 90 picks per minute, this compact complete solution is the most dynamic alternative to conventional solutions with free movement. The matching control package ensures precise point-to-point or path-controlled movements. It is both attractively priced and energy efficient, thus keeping costs down. Series components and reduced vibrations ensure a long service life.

- High dynamic response for a large payload
- Three sizes for loads of up to 10 kg
- Scalable strokes for covering a range of working spaces
- Optionally with control system
- Versatile front unit interface for rotating and gripping solutions
- Integrated energy chain concept for easy installation
- Flexible motor assembly

## Toothed belt and spindle axes ELGA-TB/BS-KF



### Powerful, dynamic and protected, the ELGA effortlessly masters your tasks.

The modular ELGA series is now complete with a wide variety of guides! New: the versatile ELGA-KF. It features an internal recirculating ball bearing guide for maximum load capacity and rigidity, as well as a cover band for best possible guide protection. The ELGA-G with plain-bearing guide is perfect for simple positioning tasks, or as a drive axis where an external guide is used. The roller bearing guide variant ELGA-RF is brilliant for highly dynamic tasks or medium-sized loads. The motor can be flexibly mounted on any of four sides, which can be changed at a later date.

- Very high feed forces with toothed belt and spindle drives
- Sturdy stainless-steel cover band for protection against contamination and minimum particle emission
- Optional: food-safe materials and lubricants
- Passive guide axis ELGA-KF in 3 sizes (70, 80 and 120) on request

## 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, with IP65 available as an option, for direct installation in the system
- Activation via CANopen, Ethernet/IP and I/O interface, PROFINET and Modbus®/TCP



reddot award 2016  
winner

# Harwin – State-of-the-art automation

Harwin PLC based in England has been manufacturing electronic connectors for over 60 years. For this family-owned company having end-to-end control of its entire manufacturing process is very important, as that enables them to flexibly supply key markets – from consumer electronics through to aerospace – with high quality connectors.

As part of its continuous investment in automation technology, Harwin recognised the benefit of combining the Festo compact handling system YXMx and the servo press kit YJKP to meet these needs. Connectors and components must have a large number of contacts per area with low weight, enabling high voltages in a very compact space. The extensive operating temperature range from -65°C to +150°C and the vibration resistance require the highest possible quality.

## Precision and flexibility

The response by Harwin to these market requirements has been to launch the Gecko range of connectors. Manufacturing these connectors with a pin pitch of only 1.25 mm in a variety of configurations requires precision, repetition accuracy, flexibility and reliability. The manufacturing process has been constantly refined and further automated to accommodate large quantities. The Gecko assembly line consists of three key stations: inserting, press-fitting and bending the contact pins. The stations have a large number of standardised parts, such as a mounting plate, the compact handling system YXMx for X/Y movements and the servo press kit YJKP for easy-to-configure position and force-controlled movements in the Z plane. All actuators are controlled by a controller CECC-X together with a valve terminal CPX/MPA.

## Dynamic, powerful and gentle

The plates are pre-populated with the moulded connectors and moved into the first station using the handling system YXMx, ready for the contact pins to be inserted.

The compact handling system also positions the connectors in the press-fitting station. Its low moving mass ensures precise and dynamic operation. The individual contact pins are then inserted into the housing which is positioned precisely below the electric servo press. It presses the contact pins accurately, powerfully and gently into the correct position with a continuously monitored insertion force. The handling system YXMx and the servo press kit YJKP are also used for bending the contact pins. The CoDeSys software controls the servo press profile using position and force control. The profile can be easily adapted to the different variants using the graphical user interface. For Paul McGuinness, Operations Director at Harwin, this is the perfect combination. “Using standard modules like the servo press kit and the compact handling system YXMx greatly reduced our development costs.”

“The Festo solutions give us the accuracy, flexibility and reliability we need to produce high-end connectors for the electronics industry.”

Paul McGuinness, Operations Director





The perfect combination for the best results with the compact handling system YXMx and the servo press kit YJKP.



Manufacturing the Gecko connector with a pin pitch of 1.25 mm requires precision, repetition accuracy, flexibility and reliability.

# Precise and economical: proportional control valves with piezo technology

## Low energy consumption – no heat generation

Piezo valves consume up to 95% less power than solenoid valves, as they only need current at the start to charge to piezoceramics and can then maintain an active state with virtually no energy. The valves therefore generate no heat.

## No operating noise

The bender actuator moves freely, without any impact noise. In addition, there is no need for pulse-width modulation which controls the flow rate of a solenoid valve. Piezo valves are therefore much quieter than solenoid valves.

## Long service life

Thanks to their design, the wear-resistant piezo valves can achieve an exceptionally high number of cycles.

## Small installation space and low weight

As they are designed without magnets or electrical coils, piezo valves are small and very light. They are therefore ideal for installation in mobile devices.

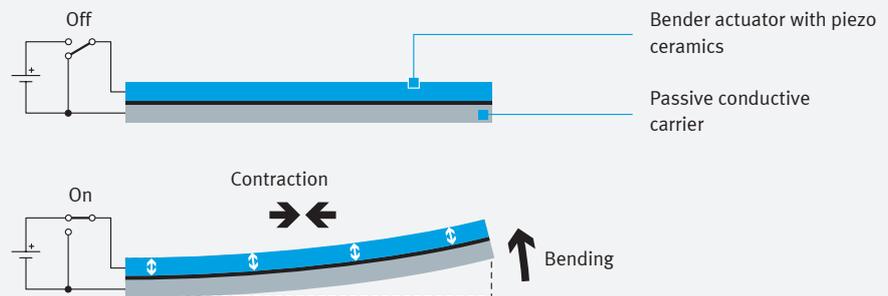
## High level of safety

High level of intrinsic safety, as the current state can be maintained even in the event of a power failure.

## This is how piezo technology works

Festo uses the piezoelectric characteristics of certain ceramics that mechanically deform when a voltage is applied.

In combination with a flow or pressure sensor and control electronics, the piezo valve becomes a proportional control valve.



Function of the bender actuator in piezo valves

For more information on piezo valves in medical technology and laboratory automation, visit → [www.festo.com/medtech](http://www.festo.com/medtech)

For more information on piezo valves in factory and process automation, visit → [www.festo.com/proportional-valve](http://www.festo.com/proportional-valve)

Piezo valves are often a better alternative to conventional solenoid valves, especially in the areas of flow and pressure control and as directly controlled proportional valves. They are small, lightweight, highly precise, very durable, incredibly fast and, above all, they save energy.

#### Proportional pressure regulating valve VEAA/VEAB

The 3/3-way valve with a pressure sensor and control electronics is ideal for many applications where vacuum supply pressure up to 6 bar needs to be regulated. Its short response times of < 10 ms are impressive, as is its highly precise pressure regulation and very low power consumption. Without switching noises! For applications in factory and process automation as well as medical technology.



#### Proportional flow control valve VEMD

The mass flow controller (MFC) is particularly suited to medical applications. The VEMD is very quiet and precise and has short response times. The compact module contains a 2/2-way valve, a flow sensor and control electronics. For applications in medical technology and laboratory automation.



#### Festo Motion Terminal

One component, many apps. In the world's first app-controlled valve, four piezo valves control the diaphragm poppet valves precisely and proportionally. This enables unrivalled function integration.

More information on pages 10 – 15



## Proportional pressure regulating valves VEAA/VEAB



**Piezo technology makes VEAA/VEAB highly precise and quiet.**

Maximum performance in minimum space, and extremely economical when it comes to flow rates of up to 20 l/min. Plus an extremely long service life.

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

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

## Proportional flow control valve VEMD



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

The mass flow controller (MFC) specifically for medical applications is very quiet and, thanks to its short response times, very precise. The compact module with 2/2-way valve, flow sensor and control electronics doses and regulates inert gases proportionally. An integrated sensor records and controls the current flow and transmits this to the higher-order controller as an analogue signal.

The volumetric flow at the output of the system can be adjusted very simply by entering a setpoint between 0 ... 10 V. The VEMD requires little energy to maintain the active state. Its low weight makes it ideal for mobile devices.

- Compact module with integrated control electronics
- Low power consumption thanks to piezo technology
- Silent: ideal for mobile applications and those close to patients
- Particularly suitable for life sciences applications

## Proportional valve VEMP



**The lightweight solution for extremely precise control of gas flows and pressures!**

Thanks to piezo technology, the VEMP with 1 mW requires very little energy to provide extremely precise proportional control of gas flows from 0 ... 30 l/min as well as pressures. In combination with a pressure sensor and control electronics the 3/3-way proportional valve becomes a proportional pressure regulator.

At 20 g it is lightweight, making it ideal for use in mobile devices such as portable oxygen therapy devices, as well as in other medical equipment for ophthalmology and dialysis.

- Unbeatable value for money
- Very low power consumption
- Compact design, minimal weight
- Silent
- No heat build-up
- Long service life

## ★ Sturdy valve VUVS-...-S



**Available for quick delivery and at an attractive price: the new sturdy valve.**

Features such as impact resistance, mounting options and ease of handling make the VS series with its sturdy design ideal for use in harsh environments. An extensive range of mounting accessories provides various options for integrating these valves into your machine concept.

As the new addition to the series, the VUVS-...-S with its essential features is part of Festo's core product range. Always in stock and delivered quickly – at an attractive price. Also available in large quantities. Now also in size 25.

- High flow rate
- Comprehensive range of mounting accessories
- Easy to operate
- Short delivery times

## ★ Compact valve VUVG-...-S



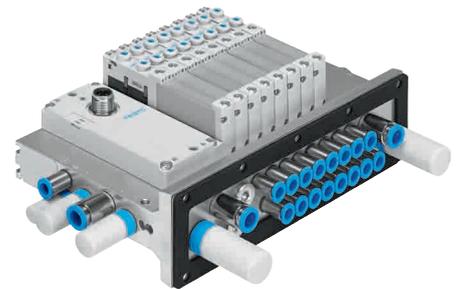
**Attractive price, quickly available worldwide: the new valve in the compact range.**

The VG compact range offers valves and valve terminals for applications where installation space, weight, flow rate and mounting considerations are important. It meets many user requirements thanks to the high level of flexibility offered by the modular system.

As the new addition to the series, the VUVG-...-S with its essential features is part of Festo's core product range. Attractive price, available worldwide and ready for quick delivery even in large quantities.

- Festo quality
- High flow rate
- Short delivery times
- Versatile in use

## Valve terminal VTUG



**Compact, with high flow rates, universal: an all-rounder in the control cabinet too.**

For small control cabinets, an optimum view of the LED indicator and inscription label as well as convenient access to the manual overrides: the new VTUG version with its outlet oriented towards the front. Moreover, the new control cabinet cover providing enhanced corrosion protection is a perfect addition.

Also new are the check valve or fixed flow restrictor options in the exhaust ducts, which provide protection against unwanted movements when there is an accumulation of exhaust air as well as inexpensive and tamper-proof speed regulation. The hot swap function will follow shortly. This means that you will be able to replace the valves during operation, without having to switch off the system.

- Up to 24 valve positions on a single valve terminal
- Suitable for a control cabinet and environment up to IP69K
- For multi-pin, IO-Link and all common fieldbuses thanks to CTEU
- 2 sizes for optimum performance with respect to energy costs
- Short delivery times and an attractive price

## Flow control valve VPCF


**First class: dynamic response, repetition accuracy and linearity of the features.**

Short response times, high repetition accuracy, a compact size, a PWIS-free design and certification for ATEX 3GD make the proportional flow control valve VPCF unique. It is ideal for inert gas applications and for controlling air flow rates and speed in painting and flow-through systems. Unit quantities and output volumes can be increased instantly thanks to shorter cycle times, while the shorter tubes used in applications directly in the Ex zone reduce consumption and enhance dynamic response – resulting in significant cost savings. The lightweight, compact valve can be positioned flexibly and mounted just about anywhere – even in existing applications.

- Long service life even in harsh environments
- IP65, ATEX certification, PWIS-free
- Compact, lightweight, sturdy
- Easy to clean
- Universal installation and mounting position

## Dispense head VTOE

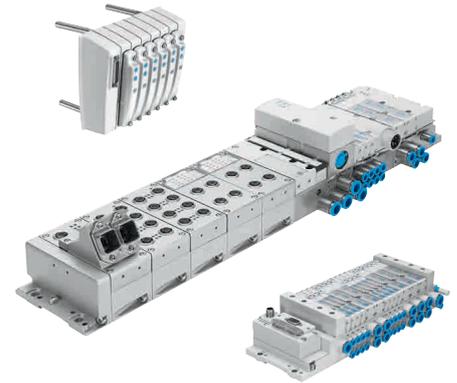

**Perfection in rapid dispensing thanks to the modular complete solution.**

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
- Contactless 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

## Valve terminals MPA-C, MPA-L and MPA-S


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

For all 3 MPA versions, check valves are now available for exhaust ducts 3 and 5, which prevent unwanted movements when there is an accumulation of exhaust air. The fixed flow restrictor already incorporated into the MPA-L is now also available for the MPA-S for valve size 1. This tamper-proof speed control dramatically reduces your installation effort, as you can order the fixed flow restrictor in various nominal widths. Install and you're ready to go! Also new in the MPA-S is the right end plate with a threaded connection (82/84). This enables you to vent the ducted solenoid exhaust air without an additional module!

- Maximum function integration: MPA-S and CPX
- Light, highly modular and inexpensive: MPA-L with polymer base blocks in increments of 1 and fieldbus connection CTEU
- Perfection in clean design: MPA-C
- Check valves for MPA-S, MPA-L and MPA-C
- Inexpensive, tamper-proof fixed flow restrictor for MPA-S and MPA-L

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



**Your recipe for success: decentralised control and intelligent preprocessing.**

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 in accordance with DIN 66025 (G-code). The OPC UA option is taking a giant step towards Industry 4.0 and enables connection to all established clouds.

In combination with the valve terminals MPA and VTSA, there is now a uniform interface for preprocessing 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
- One platform for fluid and motion control with modules for cloud connection via OPC UA
- Simple configuration of the entire system via CODESYS function libraries



ISO-1 valve VSVA with electric timer function



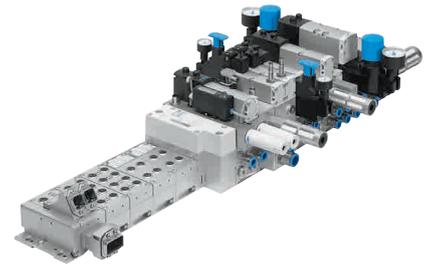
**Simply install and save energy: afterblow module in ISO valve.**

The double-solenoid valve VSVA-ISO1 uses the integrated timer module to switch back independently at the end of the power supply once the set time delay has elapsed. The timer function of between 1 second and 4.5 hours can be adjusted via a rotary switch.

This enables machine tools, for example, to still receive sealing air for a specific period after they have been switched off – without an additional power supply. The afterblow module is easy to integrate into the service units of the MS series. This saves space, makes the system more reliable and lowers your costs. The processors integrated in the valve can be used for solutions with decentralised intelligence, such as pulse blowing.

- Modified manual overrides: covered and non-detenting
- Saves space and lowers costs: easy to integrate in the MS series
- Internal control air block
- 2-channel pressurisation on a valve block possible
- 2-channel switch-off for fire extinguishers possible

Valve terminal VTSA/VTSA-F



**Fit for maximum safety: the tried-and-tested VTSA(-F)!**

Now available in sizes 18 and 26 mm: further safety-related 5/3-way valves, for example with different variants for the mid-positions such as port 4 or 2, as well as both exhausted.

You can now order manual overrides such as non-detenting/heavy-duty to be mounted directly on the valve – making your work easier and faster. All valves now also have unique part numbers! The perfect addition to the VTSA: the new PROFIsafe input module on our automation platform CPX.

- Safety-related ISO valves for lifting and rotary cylinders up to press safety valve category 4, PL e
- PROFIsafe I/O modules can be integrated via CPX
- One part number for manual overrides and valve for each variant
- ATEX valves for gas zone 2, 3G, in control cabinet, etc.

# Play it safe with CPX-F modules

The assembly of servo motors for car wing mirrors is highly complex. To manage this task, ATS has created a fully automated assembly and test system with 50 stations. In facilities of this size, the amount of safety engineering work required is extremely high. With the CPX-F modules from Festo, the engineers from ATS found a solution that would lower the previous safety costs by 80%.

ATS Automation Tooling Systems GmbH, located near Munich, is part of the Canadian ATS Group, a successful global manufacturer of individual, fully automated assembly and test systems for a range of sectors including the automotive industry and its suppliers. The USP of the systems is not just that they skilfully assemble products and components – they also subject them to high-precision testing.

## Highly automated systems

The assembly system for servo motors for car wing mirrors comprises 30 assembly and test stages for fully assembling and testing the mirrors, ready to be installed. For an assembly time of approximately three minutes, 3-shift operation means that the system creates a finished product every 3.5 seconds, or 5 million every year. A whole host of difficult individual steps have to be carried out, such as the automatic insertion of lots of little pins, springs and gears, clipping together the shell, checking that the clip has closed correctly, ultrasonic welding and the testing of operating behaviour, noise and current consumption.

The test modules are disconnected from the system as a whole and rest on a granite plate in order to keep them away from the vibrations of the main system. “Our customers had not seen such sophisticated test systems before. We first had to emphasise to many of them just how important it is to apply high-precision measurement methods,” explains Manfred Zechmann, Operation Manager at ATS.

## Terminal boxes are a thing of the past

In this type of modular system machine safety is a major cost factor. ATS had previously relied on central I/O safety terminals in control cabinets. “This common concept is elaborate and expensive, and requires a lot of space,” explains Heinz-Jürgen Schicke, Control Systems Designer at ATS. The CPX valve terminal with safe inputs and outputs means that these types of solutions are no longer necessary. Every valve terminal can now activate the valve voltage autonomously. The emergency stop impacts one valve terminal at a time. Local, safe inputs on the CPX are processed.

## Machine safety at a much lower cost

The new concept saves up to 80%: “Depending on the size of the system and the number of I/Os, this amounts to savings of between €10,000 and €25,000 in absolute terms.” The installation time is also dramatically reduced – from 30 minutes to just 7 for each safety door. Another advantage is the fact that the system wiring is routed quickly and error-free. Control Systems Designer Steffen Otto: “This is an extremely relevant factor. The wiring for the CPX-F modules used as safety assemblies in the field cannot develop any errors. This system from Festo really complements our strengths.”

“With CPX-F modules, we save a lot of money – and the wiring cannot develop any errors.”

Steffen Otto, Control Systems Designer



Safety built in: CPX-F modules simplify safety in the system – and lower costs.



Safe and reliable production: in over 30 assembly and test stages, more than 5 million servo motors for car wing mirrors are manufactured and fully tested every year.

# A safe and simple connection – transparent tubing PUN-H-T

## Good reasons to choose the right tubing/fitting combination

Having the right tubing/fitting combination is important because that is the only way you can ensure optimal performance of your systems. Selecting the right material ensures high system availability and prevents leaks. Important criteria include:

- Temperature
- Pressure range
- Environment
- Suitability for the food industry
- Hydrolysis resistance
- Weather and UV resistance

The information about pressure resistance ensures that you are selecting the right tubing for your system.

## The Product Finder: the quick and easy way to your goal

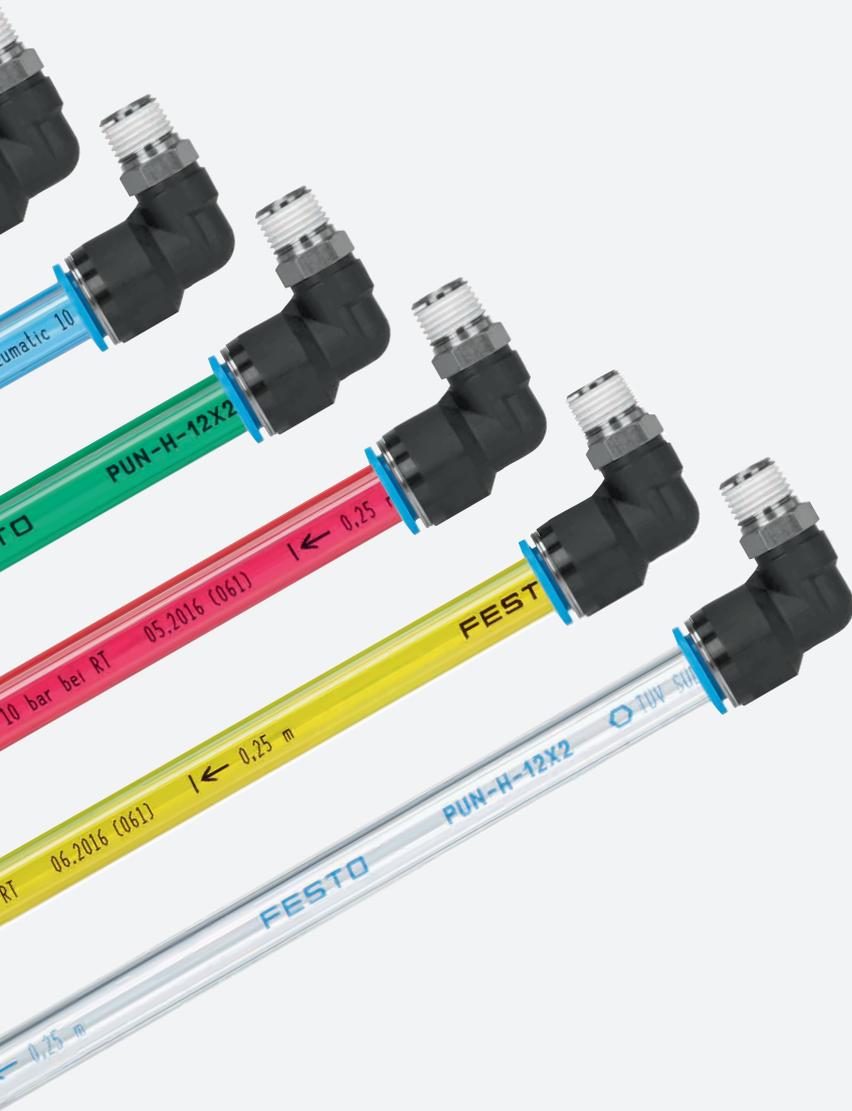
Do you have applications that require chemical or heat-resistant tubing, for example? The Festo Product Finder helps you to find the right tubing for your application. And which fittings match the tubing? With Festo's integrated Product Finders for tubing and fittings in the electronic catalogue, your search couldn't be easier. We ask you all the necessary questions so you can make the right selection.

→ [www.festo.com/productfinder/tubing](http://www.festo.com/productfinder/tubing)

→ [www.festo.com/productfinder/fittings](http://www.festo.com/productfinder/fittings)



Hardly anyone pays any attention to tubing – but it is a very important part of every pneumatic solution. The new, transparent tubing PUN-H-T serves this purpose very well – and lets you know straightaway if everything is OK or whether swift action is needed.



#### The basic variant: PUN-H

A classic hydrolysis-resistant solution made from polyurethane that is ideal for a variety of applications.

- Easy and convenient to route the tubing in the system
- Kink-resistant
- Food-grade\*: FDA listed material
- Hydrolysis-resistant
- Microbe-resistant
- UV-resistant
- Wide range of external diameters (2 – 16 mm)

#### New: the transparent PUN-H-T

The transparent version of the PUN-H tubing provides you with more safety as it enables you to detect solid particles, moisture or oil in the tubing straightaway, and take action if necessary.

#### Customised tubing from the modular tubing system

If you require individualised tubing, our modular tubing system is just what you're looking for.

It allows you to:

- Specify individual lengths and packaging units
- Select your individual printed inscription
- Order customised labelling
- Choose from 7 basic colours The configurator also simplifies selection and ordering.

\* See extended material information

Find out more:

→ [www.festo.com/pun-h-t](http://www.festo.com/pun-h-t)

## Energy efficiency module MSE6-E2M



### Saving energy has never been easier!

The MSE6-E2M does more than just monitoring and analysing – it actively intervenes. The intelligent energy efficiency module MSE6-E2M automatically monitors and regulates the compressed air supply in new and existing systems. It actively shuts off the supply air in standby mode, detects and reports leakages, and can monitor process-related data online. This means that the MSE6-E2M promptly reduces the compressed air consumption by as much as 20%. When the supply air is shut off, pressure drops are used as criteria for evaluating leakages in the downstream pneumatic system.

Now available with PROFINET for the 3 alternative connections M12, RJ45 and SCRJ as well as Ethernet/IP, Modbus<sup>®</sup>TCP/IP and EtherCAT.

### Functions to save you money

- Automatic shut-off of the compressed air in standby mode
- Detection and notification of leakages
- Condition monitoring for process-related data, also for Industry 4.0

## Safety couplings NPHS



### For simple and completely safe decoupling: safety couplings NPHS.

With the safety couplings NPHS, you can decouple 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

## Hand slide valve VBOH



### Convenient switching without pressure drops.

With the ergonomically shaped and superior hand slide valve VBOH, pressure drops during switching can be avoided and potential leaks in the system can be reduced. The easy operation of the energy-efficient VBOH and its strong performance data are impressive.

- Non-overlapping – no pressure drop during switching
- Award-winning ergonomic design
- Up to 12 bar, standard nominal flow rate q<sub>nN</sub> (1 → 2 pressurisation) 0 ... 7700 l/min
- Standard flow rate q<sub>n</sub> (2 → 3 pressurisation) 0 ... 17,000 l/min, temperature –10 ... 80°C
- Easy to clean
- Sizes: M5, G, 1/8, 1/4, 3/8, 1/2, 3/4

## Transparent tubing PUN-H-T



### Detect whether solid particles, moisture or oil are present 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. Now also 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-grade\*: FDA listed material
- Kink-resistant

## PTFE tubing PTFEN



### Ultra-reliable – even in extreme environments.

Process reliability built in: the PTFEN is able to withstand even the most extreme environmental influences and operating conditions. It is resistant to pressure at 6 bar and 130°C – with a test factor 4 times the required safety. It is resistant to heat even at ambient temperatures of 150°C. And it can withstand almost all chemicals. It is also ideal for the pharmaceutical, food and beverage industries, as the material is FDA-listed, TSE-free and hydrolysis-resistant. The extremely smooth surface of PTFE prevents microbes and other active agents and contaminants from sticking to it, making it easier to clean.

- TSE-free
- Resistant to cleaning agents
- Ideal for the pharmaceutical, food and beverage industries
- FDA-listed material
- Highly resistant to temperatures and pressure

## Vacuum generator OVEM



### Straightforward operation and diagnostics: easily controlled from the PLC.

Providing the ultimate in process reliability, the OVEM monitors the set evacuation and ejection time for each cycle. With automatic and timely fault indication. 2 key features have been added to the successful vacuum generator OVEM.

#### New: IO-Link

- The digital setpoint/actual value transfer from point to point ensures convenient parameterisation and accurate diagnostic feedback
- Re-parameterisation takes place automatically whenever the device is replaced
- Minimal installation work
- Simple commissioning – plug & work

#### New: 1PD variant

- Monitoring and visualisation of the vacuum with a vacuum sensor with LCD display
- Its function is similar to the 2P variant except that it has (only) one digital sensor switching output (air-saving function). Instead, it has an additional input for an ejector pulse that can be activated separately

\* See extended material information

# Safe, clean, affordable: the Protection Box for Air Preparation protects service units

Uncovered service units are a familiar sight, and not just in the food and beverage industry. They are often at risk of getting contaminated, becoming defective or suffering mechanical damage. The new Protection Box for Air Preparation now provides protection and is an elegant and affordable solution.

The conditions in many manufacturing areas, such as the splash zone in food production plants, can place a lot of stress on service units. Cleaning agents, extreme temperatures and water jets attack the surfaces, screws and pressure gauges.

In other industry segments too, mechanical damage plays a major role and leads to reduced service life or leakages. That is why service units are often concealed in control cabinet installations. However, not only is this solution very expensive, as it requires complex sealing and locking technology; it also means that the units are even harder to access.

## Unique, safe concept

What the market needs is a safe, clean, yet simple solution! Festo has therefore developed an efficient yet affordable solution to protect your compressed air preparation system: the protection box. The clever stainless-steel housing design means the compressed air supply is now protected against external influences such as splash water, it does not involve complex sealing technology and is easy to access – making it a unique solution from Festo in the world of compressed air supply.

## Easy to handle, easy to install

The box is easy to flip up at the front so the service units can be easily accessed at any time. The stainless-steel box is available in two sizes, specifically adapted to a Festo compressed air supply unit in size MS4 or MS6. An opening at the bottom allows condensed water to drain out of the system.

The Protection Box for Air Preparation is easy to assemble and to retrofit too. The mountings are integrated on the back of the box.

## A complete range – not just for the splash zone

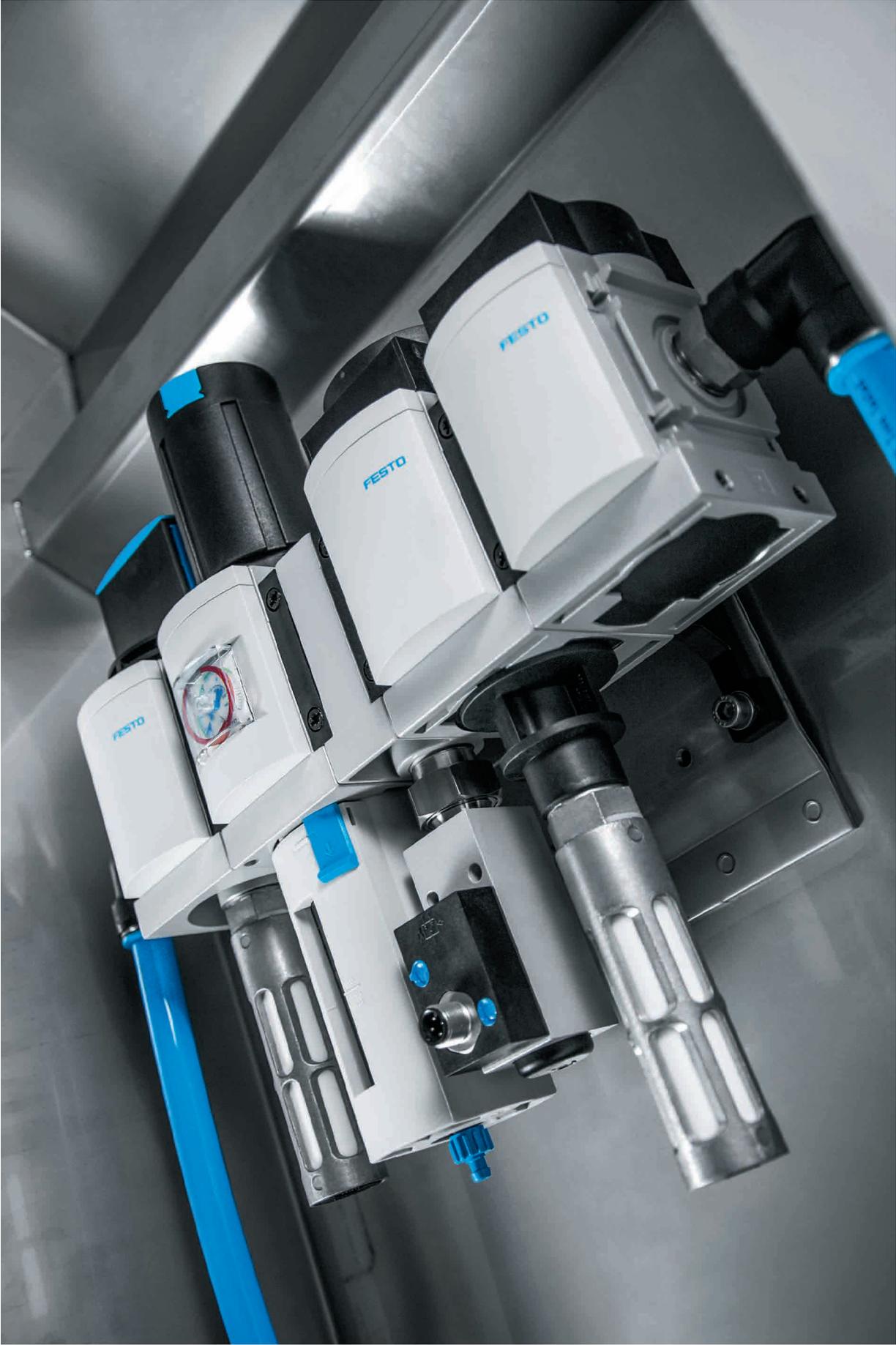
The Protection Box for Air Preparation is latest addition of Festo to its compressed air preparation range. It is a simple, affordable and user-friendly solution that overcomes the problems many industries face with respect to product service life.

“The Protection Box for Air Preparation doesn't just provide effective and affordable protection for service units – it is also easy to use”.

Bernard Villeneuve, Head of Sales for Food and Beverage, Festo France



The service units can be easily accessed at any time: simply unlock the hood from its usual closed position and slide it upwards.



Simple, very sturdy and safe: the Festo stainless-steel protection box for compressed air preparation provides effective protection for service units – and ensures an extended service life for components.

# The new pressure sensor SPAN: extremely compact and versatile!

## Clearly visible

The high-contrast white-on-blue display is easy to see. The relevant information can be read at a glance on the two-line alphanumeric display. The entire display turns red to provide clearly visible, large-scale status feedback.

## Reliable, versatile and simple

- Individual numerical code lock as tamper protection
- Remote maintenance and parameterisation via IO-Link
- Protection class IP40
- Weight-reduced variant QS4 with integrated tubing connection
- Additional pressure sensors SPAN are easy to commission thanks to simple copy function

## More productive with optimum pressure measurement

SPAN measures the pressure of gaseous media and non-corrosive gases. The following functions are available:

- System monitoring (pressure is available)
- Pressure monitoring at the pressure regulator (pressure in setpoint range)
- Vacuum (part picked up)
- Leak testing (pressure drop over time)
- Object sensing (back pressure present)

Electrical compatibility with all controllers, PNP/NPN switchable

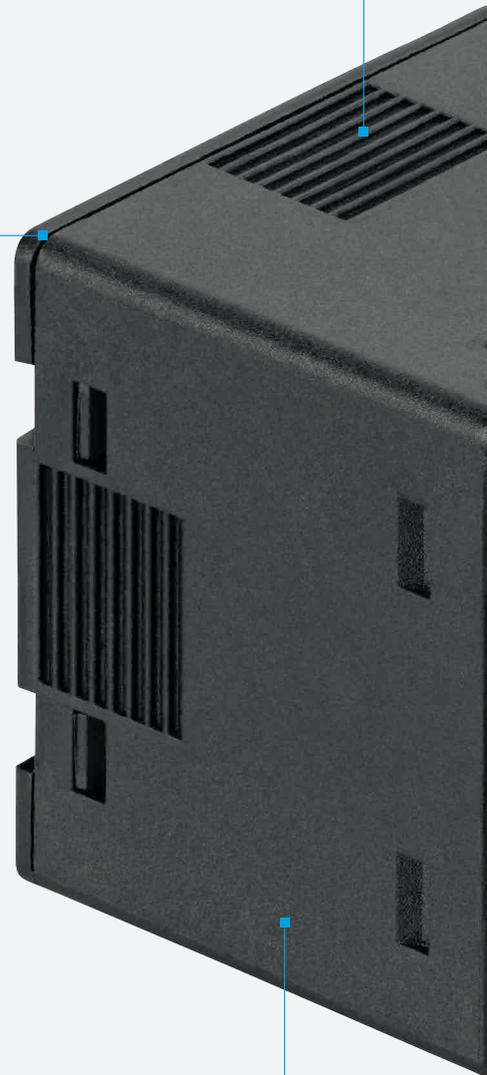
Communication interface



Compact design: 30 x 30 mm

Find out more:

→ [www.festo.com/span](http://www.festo.com/span)



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 range of variants and the intuitive menu navigation make the sensor suitable for a wide variety of applications.

Universal pressure measurement with 13 vacuum and pressure measuring ranges



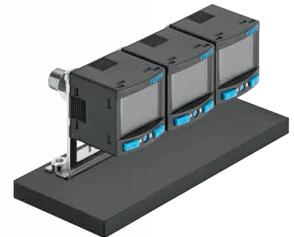
Intuitive menu navigation for effortless configuration and quick commissioning

#### Wide choice of variants and mounting options

**Threaded mounting** with M8 adapter, for example for service units



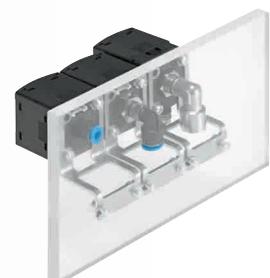
**Manifold mounting** with mounting bracket on horizontal base



**Front panel mounting** for installation in control cabinets, for example



**Wall mounting** for mounting on vertical surfaces



## Sensor/actuator distributor NEDY



### Double the connection options!

NEDY creates connections between two field devices and double-occupied M8/M12 input/outputs on decentralised I/O modules. As a result, it either gathers sensor signals from two sources or splits actuator signals between two actuators. This reduces the installation effort – as well as space and costs as fewer components are needed. The entire distributor is ready to install. Cable lengths are available up to 30 m, and the socket and plug sides can be freely configured in line with the customer's needs.

- Fewer components – lower costs
- Reduced space requirements in energy chains
- Faster installation without the need for assembly
- Eliminates the risk of installation faults
- Freely configurable
- Mounting component for T-slot

## Signal converter SCDN



IO-Link

### Compact, precise and 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 ( $\pm 0.5\%$  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 copying to additional devices via IO-Link

## Flow sensor SFAW



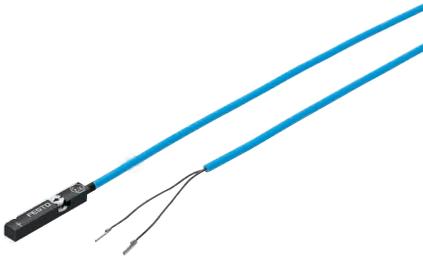
IO-Link

### The easy way to monitor fluids.

Ideal for monitoring cooling circuits, for example in welding guns in the automotive industry or in front-end applications in the semiconductor and electronics industries. The new flow sensor SFAW in IP65 measures the flow rate, consumption and temperature of liquid media within the ranges of 1.8 ... 32 l/min and 5 ... 100 l/min. Its straightforward operation and easy-to-read display provide it with excellent process reliability.

- Uniquely flexible connection concept
- Easy sensor replacement without tools
- IO-Link 1.1
- A great view: the display can be rotated 340°
- Once fitted, the sensor housing can be rotated 360°
- Easy to use, even with your own media connections
- Easy-to-read, three-colour display

## ATEX proximity sensor SDBT-MS...EX6



### The new SDBT-MS ATEX is the perfect addition to the Festo sensor range.

The SDBT-MS...EX6 can be perfectly combined with cylinders from Festo in potentially explosive zones. Proximity sensors from Festo come in a huge range of variants and can be used in virtually any environment and for any task. They can handle standard applications, food and beverage applications, welding applications in the automotive industry, high temperature ranges, outdoor use, or even extreme environments such as those involving acids and cooling lubricants. Our range also includes position sensors with analogue outputs and suitable accessories for mounting the sensors.

- Certification: IECex , EX, Inmetro
- Suitable for ATEX Zone 0, 1, 2, 20, 21, 22
- Suitable for ATEX equipment category 1GD, 2GD, 3GD
- NAMUR output

## Vision sensor SBSx



### The simple, quick and cost-effective way to a stable solution: vision sensor SBS.

New models, new software functions and more accessories: a comprehensive portfolio for a wide range of applications. The new universal vision sensors have high-performance, quality inspection tools, code readers for bar codes and 2D code –and they can also read plain text (OCR).

BLOB, caliper, calibration and filters for image preprocessing are functions from the smart camera range which are now available as user-friendly tools in the vision sensor software. With the new colour sensors colour values and surfaces can be evaluated. Communication to higher-order controllers is via CODESYS, PROFINET, Ethernet/IP or RS232.

- Camera resolutions from VGA to 1.3 megapixels
- Monochrome or colour
- IP65/67 for harsh industrial environments
- Integrated lens and light
- C/CS mount for free lens selection

## Checkbox CHB-C-N



### Proven conveying technology: now with Telnet!

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 with high volumes of workpieces and a large number of workpiece 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 control of parts flow 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
- Now with remote control functions via Telnet commands

# Intelligent pressure measurement with multiple options: the pressure sensor SPAU monitors processes

Improved productivity and process reliability: the new pressure sensor SPAU constantly monitors and senses pressure and keeps every value under control. Czech equipment manufacturer Aktivit from Nový Bor uses the pressure sensor SPAU to control system pressure and contact pressure in an assembly line for fuel filters and airbags.

With a current workforce of 120 employees, the company produces assembly stations and lines, gantry loaders, test apparatus, deburring machines and robots, mainly for the automotive industry. Aktivit offers all the engineering steps, from planning and design to assembly, commissioning and operating services such as maintenance. To achieve this, employees use state-of-the-art technologies.

## Simple, cost-effective, flexible, safe

The pressure sensor SPAU had to meet these four attributes in order to be used at Aktivit. And it did indeed meet all the requirements of the equipment manufacturer. Thanks to the simple input of parameters, versatile electrical outputs, analogue measurement value recording, very flexible pressure measuring ranges – even during vacuum operation – as well as the reduced price and numerous switching options, it is now the product of choice at Aktivit. Other strengths working in its favour were the large, clearly legible display, which provides process reliability at a glance, and the simple and swift installation in a wide range of different positions.

## Safe assembly of fuel filters

The pressure sensors SPAU monitor the assembly process for the fuel filters. The two sensors control the low pressure generated by the ejectors. The parts to be assembled are gripped using vacuum before being transported to where they are needed. Thanks to the large display, employees in assembly are immediately notified about whether the values are correct.

## Reliable installation of airbags

The air pressure in the system can be controlled via the pressure sensor SPAU. They enable the complete system to be monitored visually. The entire display colour changes to red in order to quickly notify employees when pressure values are not right. Both sensors measure the pressure of the fully automatic screwdrivers. This ensures that the screws are tightened precisely so that they are not too tight or too loose.

## Great support, strong technology

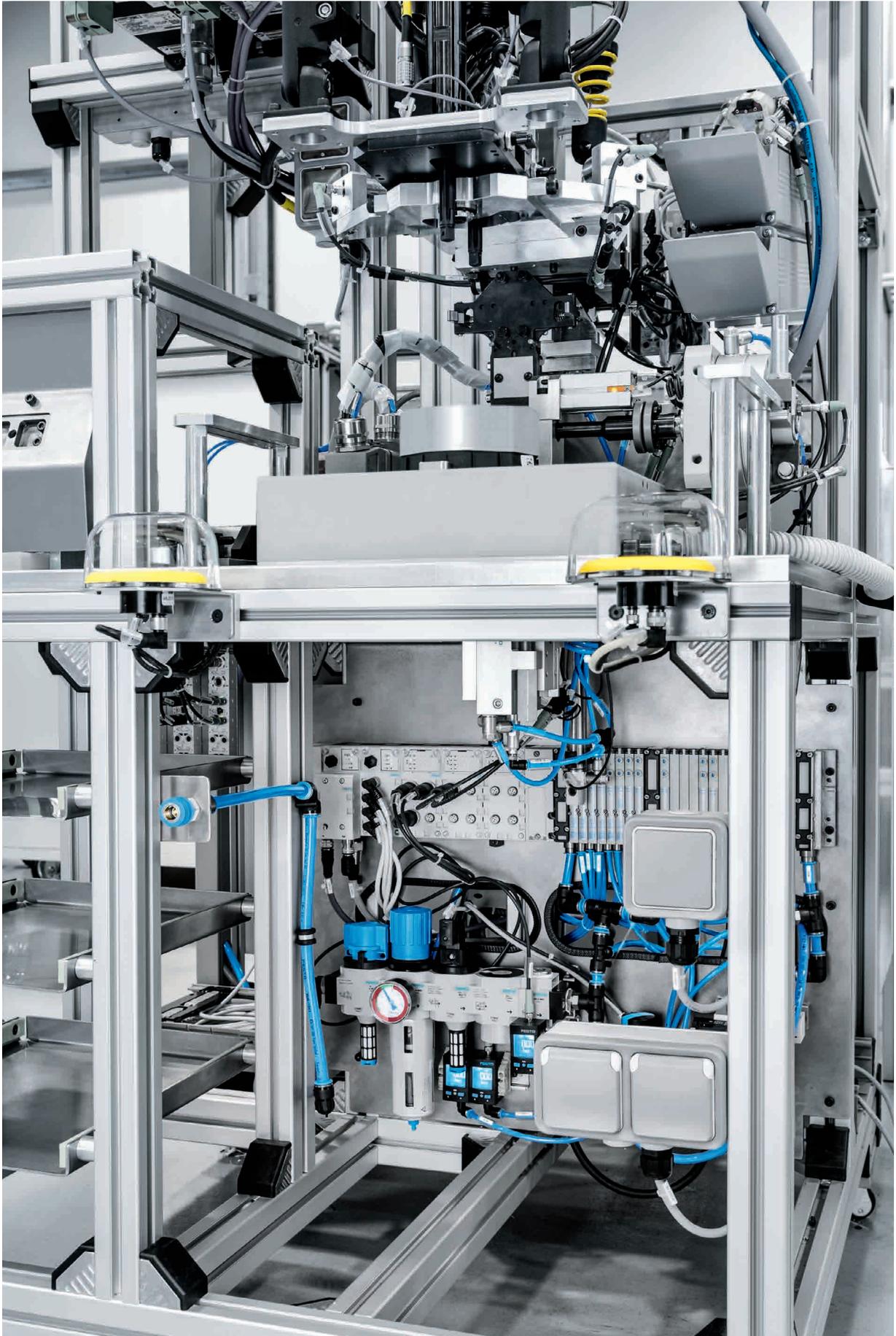
“Other criteria also played a significant role in our decision to use SPAU: Festo's reputation and the good support and advice, the CAD download and the excellent documentation, which is particularly important for our customers. Last but not least, the short delivery times and the option of online parameterisation and data readout via the web also played a part in convincing us,” says Ondřej Válek, Sales Manager at Aktivit. Via IO-Link, parameterisation for other pressure sensors can be easily copied and saves time.

“SPAU is our first choice: product quality, functionality, simple operation, process reliability, price, support and Festo's reputation – everything we are looking for”.

Ondřej Válek, Sales Manager at Aktivit



The two pressure sensors SPAU monitor the assembly of fuel filters safely and reliably.



Multiple functions for SPAU: when assembling airbags, SPAU doesn't just measure the pressure, but can also carry out a visual inspection. Another pressure sensor monitors the pressure of the automatic screwdrivers.

# Very flexible, extremely high flow rates: angle seat valve VZXA

## Extremely high flow rates thanks to flow-optimised design

A range of combinations for a range of requirements: the modular product concept of the process valve series VZXA makes it easier to modify and maintain systems without having to remove the entire valve.

The valve body and actuator modules are self-contained and tested functional units. They can be freely combined thanks to standardised interfaces and are therefore easy to assemble and maintain.

VZXA is also ideally suited for designing customised valve blocks.

## Get there fast with the configurator

The VZXA configurator in the electronic product catalogue enables you to put together a custom order for your angle seat valve in just a few steps.

The display shows the valve position.

This unique interface between the actuator and the valve body means that the actuator can be replaced during maintenance without opening the piping.

The patented sealing system is designed as a compact cartridge, which can be replaced quickly and easily in case of maintenance without using special tools.



Find out more:

→ [www.festo.com/vzxa](http://www.festo.com/vzxa)

Robust, high-performance, and durable – the angle seat valve VZXA from Festo controls media flows quickly and reliably. Its carefully thought-out design and patented interface enable valve bodies and actuators to be freely combined, thus offering even greater flexibility in the configuration of applications.

Sturdy and easy-to-clean stainless-steel process valve.

Durable stainless-steel actuator for extreme working conditions such as high temperatures and aggressive cleaning agents.

High flow rate thanks to optimised bore passages in the valve.

#### Optical position indicator

The large optical position indicator comes as standard. Thanks to the transparent hood made of polyethersulfone (PES), the valves can be used trouble-free in chemically aggressive environments.



#### Actuators

Stainless-steel actuators are available in three sizes (46 mm, 75 mm, 90 mm) and with the control functions NC (normally closed), NO (normally open) and DA (double-acting).



#### Valve bodies

- 2/2-way valve in DN13 (1/2") ... DN65 (2 1/2")
- Connections: threaded, clamp and welded connections in line with American and European standards



## ★ Quarter turn actuator DFPD

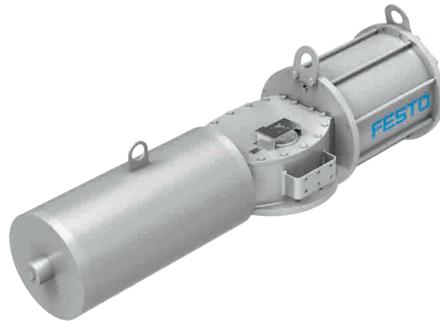


### DFPD – the new benchmark for quarter turn actuators.

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. Its torque range of 10 ... 480, its angle of rotation of up to 180° and its corrosion-resistant variants make the DFPD suitable for most applications – from ball valves, butterfly valves or air dampers in the chemical, beverage and pharmaceutical industries to water treatment solutions.

- Single- or double-acting
- Very compact, particularly the single-acting variant
- Highly modular
- Optimised spring cartridge design for more efficient single-acting operation in steps of 0.5 bar
- Flexible: adjustable at both ends
- For extreme temperatures: -50 ... +150°C
- Mounting plate for pilot valve in EU (G) and US versions (NPT)

## Quarter turn actuator DFPD-HD



### Ideal for heavy load applications!

DFPD-HD is the latest addition to the quarter turn actuator range DFPD. With forces up to 32,000 Nm, the Scotch yoke actuator is ideal for on/off and closed-loop control of ball valves, air dampers and butterfly valves in power stations, the chemical industry and in water treatment applications.

The modular system offers a whole host of different combinations including three different gear unit sizes, single-acting or double-acting versions, configurable spring forces, a choice between left or right direction of rotation, and mechanical or hydraulic manual override. Its VDI/VDE 3845-compliant interface enables direct mounting of sensor boxes or positioners.

- Highly modular for a variety of applications
- Single- or double-acting
- Torque up to max. 32,000 Nm
- Safe: SIL 3-certified
- Long product service life, also thanks to bronze bushings
- Interfaces to VDI/VDE 3845 NAMUR

## Closed-loop-controlled linear actuator DFPI



### Easy to install – robust and safe in use.

Ideal for use in harsh ambient conditions: corrosion-resistant linear actuator to ISO 15552 with integrated displacement encoder or fully integrated positioner. This ready-to-mount unit is extremely space-saving and is easy to incorporate into almost any installation situation thanks to a comprehensive range of accessories. Suitable for applications with closed-loop-controlled linear motion and for swivel motions where lateral forces act on the piston rod.

New: versions with fully integrated positioner DFPI- ... -C1V-NB3P-A.

- Product versions with integrated displacement encoder or fully integrated positioner
- Mounting interface to ISO 15552
- Double-acting
- Sizes: Ø 100, 125, 160, 200, 250, 320
- IP65, IP67, IP69K, NEMA4
- Corrosion resistance class 3

## Ball valve VZBD



### The high-performance ball valve for the pharmaceutical and cosmetics industry.

Stainless-steel ball valves can be widely used with an extremely large variety of media in both process and factory automation. The 3-part, 2-way stainless-steel ball valve VZBD is the ideal partner for the pharmaceutical and cosmetics industry thanks to its seal with minimal dead space. It is compliant with FDA 21 CFR 177.1550, has electropolished surfaces, long welded ends to ASME-BPE and ISO 1127, and clamping sleeves to ASME-BPE and DIN 32676-B.

- CRN approval
- FDA-compliant seal to FDA 21 CFR 177.1550
- With long welded ends or clamping sleeves
- Lockable hand levers
- Blow-out-proof shaft
- Flange hole pattern to ISO 5211
- Electropolished surfaces SFV4 ( $R_a$  15  $\mu$ m, corresponds to  $R_a$  0.4  $\mu$ m)
- PTFE seal with minimal dead space (PTFE half shell)

## Pinch valve VZQA



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

The 2/2-way valve controls the flow of substances such as granulates, liquids containing solid particles and highly viscous and abrasive media. A convenient solution: the valve can be configured individually using different connection and material variants, and maintenance is quick and easy as the sealing cartridge is simple to replace without the need for special tools. Aluminium, POM and stainless-steel screw caps with G thread and NPT thread as well as clamp connections to ASME-BPE and DIN EN 32676 in stainless steel for nominal width DN25 (1"). The easy-to-clean valve housings are available in corrosion-resistant stainless steel as well as in aluminium.

The components that come into contact with the media (pinch valve sleeve and cap) are FDA-compliant. With the silicone pinch valve sleeve, the valve VZQA NO complies with EC Regulation No. 1935/2004.

- New: VZQA-NO DN25
- Modular, interchangeable component parts
- Clean design for machine cleaning
- Direct air supply connection – no actuator required
- Diaphragm material NBR, EPDM and silicone

## 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 (½") ... DN65 (2½")
- 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

# Fresh water for Bursa

Bursa is the fourth biggest city in Turkey and needs approx. 700,000 cubic metres of fresh water every day. That is why BUSKI, the local municipal water company, has modernised one of its water treatment plants. The 28 newly automated filter basins can treat up to 500,000 cubic metres every day.

Five objectives were paramount in this project: enhanced operational safety, reduced consumption of rinsing water and filter sand to lower costs, the ability to quickly identify faults using sensors, preventive maintenance to ensure smooth operation, as well as demand-controlled metering of chemicals. Lastly, BUSKI wanted to simplify and optimise operation of the plant through specific training courses.

## Roadmap towards the goal

Festo, together with the planning engineers at BUSKI, drew up a needs analysis that included all the key stations: the filter basins, the metering system, the clarifier, the sludge thickener and chlorination. The result was a concept that met all the requirements, such as full automation, smooth operation, simple maintenance as well as employee training.

## State-of-the-art technology

All 28 sand filters are now fully automated and each contains a new control panel and a pneumatic control cabinet with modular, electrical CPX terminals. The main electrical control cabinet was also modernised. Pneumatic linear and quarter turn actuators from Festo replaced the obsolete actuator technology. At the same time, the compressed air network was replaced and customised. Each filter basin is controlled using valve terminals.

## Monitoring and control with SCADA

The new SCADA system, which has a redundant design, monitors the entire process, collects the process data and uses this data to automatically create various status reports for preventive maintenance or operational tasks previously carried out manually. A range of parameters such as pressure, level and valve positions can now be read out conveniently from a central point. The entire plant is efficiently monitored from the SCADA control centre.

## Training needed

BUSKI's employees will require 300 hours of training by Festo Didactic to enable them to operate the plant effectively. Theory and practice are combined to create training sessions at the process-relevant stations. Once the training has been completed, employees will receive a certificate from Festo.

## The result: automated quality and economic efficiency

End-to-end automation has met all of BUSKI's requirements for ensuring reliable water treatment. There has been a significant improvement in water quality – as well as in the efficiency of water treatment. Filter sand and rinsing water losses have been reduced to a minimum.





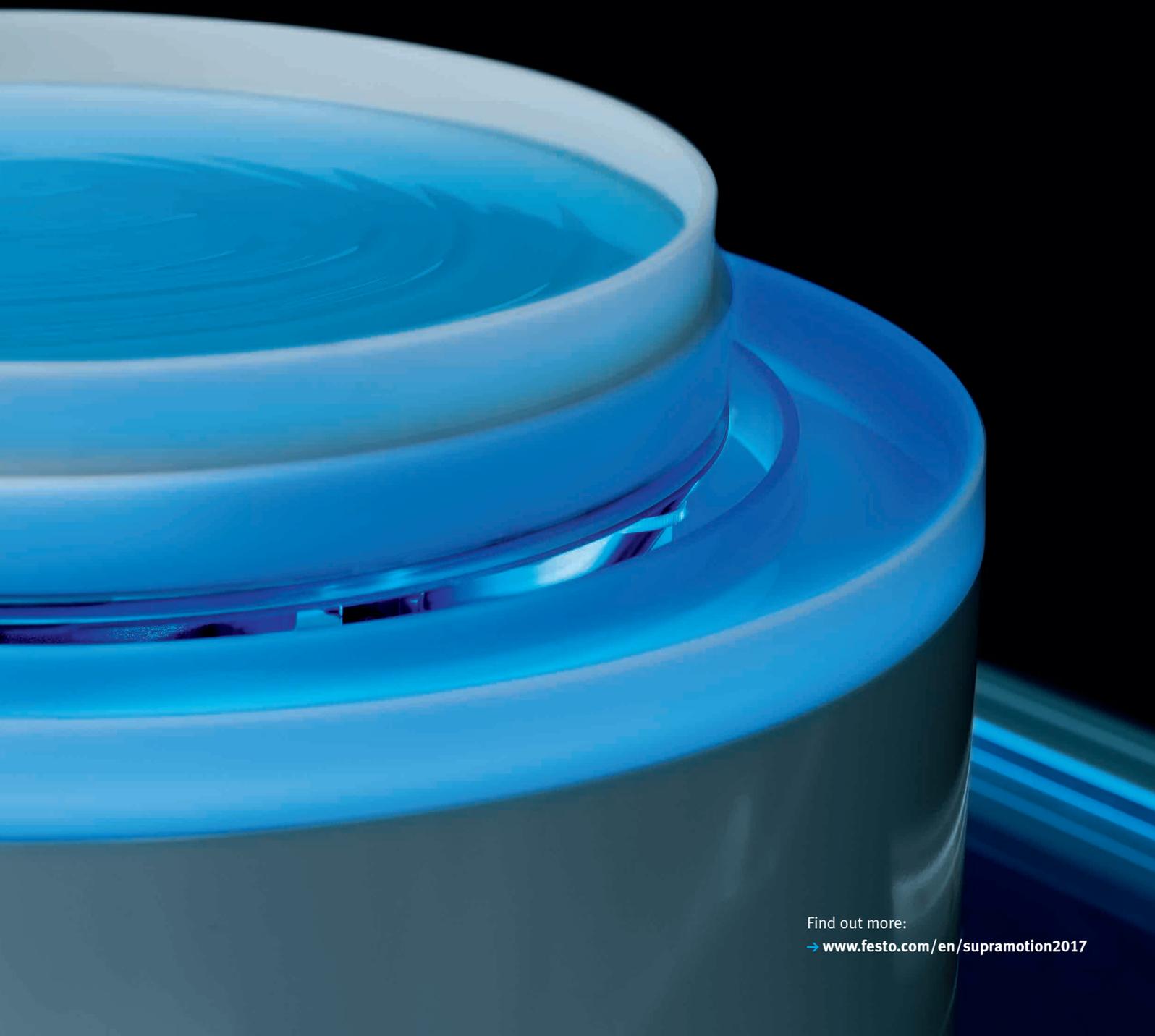
High-performance valves and fittings from Festo replace the obsolete technology.



Full automation of the water purification station in the Turkish city of Bursa makes an important contribution to ensuring clean and affordable water for 2.8 million people.

# New approaches to productivity: automation with superconductors





Find out more:  
→ [www.festo.com/en/supramotion2017](http://www.festo.com/en/supramotion2017)

# Superconductors and levitating motion: the technology of the future

Superconductor technology is the future, as the three new future concept exhibits from Festo demonstrate. Slides made to levitate by superconductors are transported extremely dynamically, a levitating shaker system with tilt function is realised – and superconductor technology is easily combined with other transport systems.

All of the exhibits draw on the unique properties of superconductors, which allow a levitating motion that combines low energy consumption and high efficiency. “The special characteristics of superconductors open up a huge potential wherever contactless positioning or handling is required. Automation can therefore also make inroads into areas where it was previously considered to be impossible or very difficult,” states Georg Berner, Head of Strategic Corporate Development, Festo Group Holding and Project Coordinator for the SupraMotion concepts. “We have now developed 15 different concepts for four core areas of automation: transportation in all spatial positions, transferring levitating objects, handling in separate spaces, and replacing levitating objects and setting them in motion. We are currently working together with customers to get our first pilot projects off the ground.”

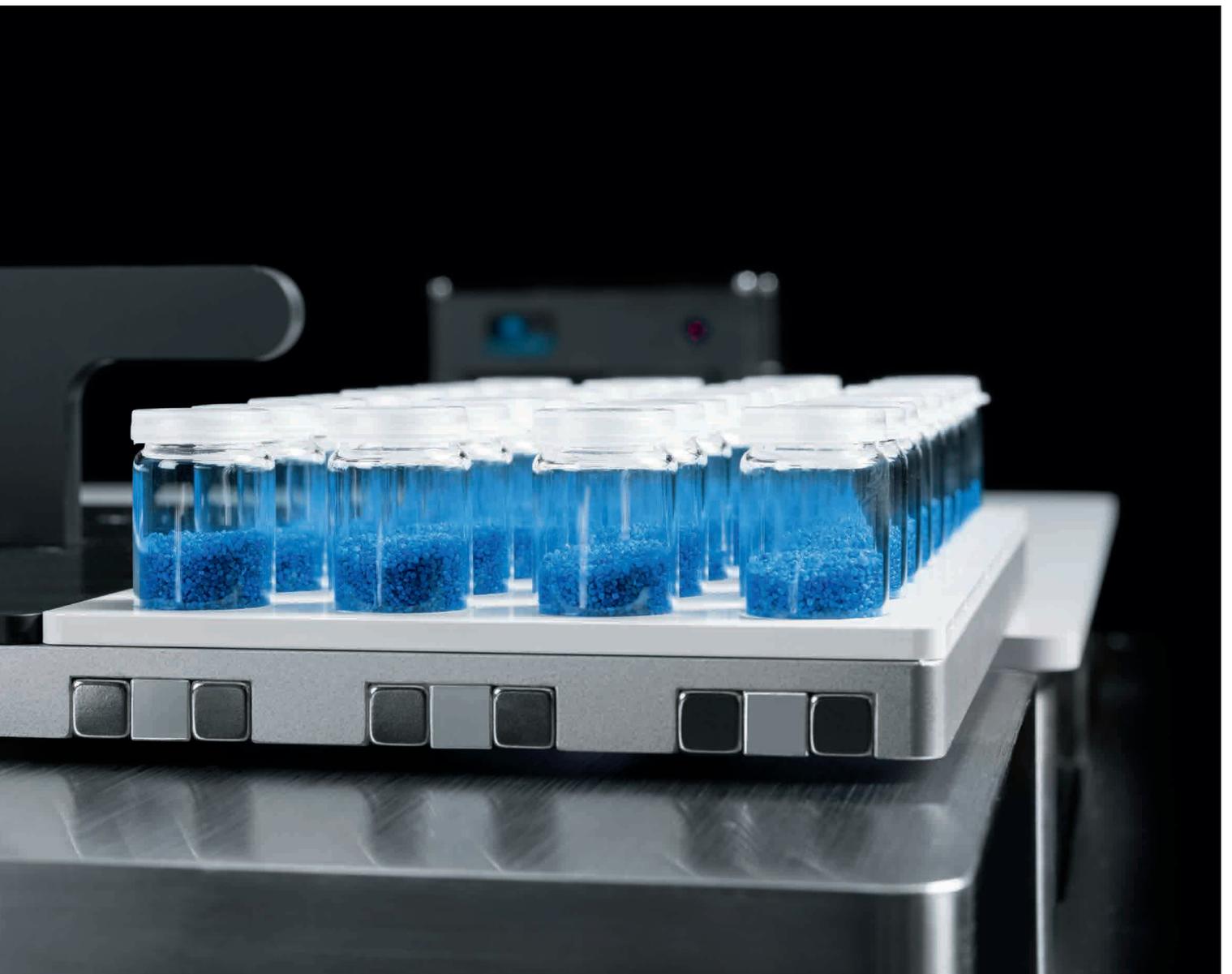
All three exhibits are controlled with the automation platform CPX, which is equipped with an OPC UA interface.

## **SupraDrive: dynamic linear movement**

The SupraDrive exhibit demonstrates how a levitating transporting slide can be moved extremely dynamically and positioned precisely. Three cryostats with superconductors on each side of the route allow the slide to levitate several millimetres above the surface. The drive from Festo's Multi-Carrier-System®, which is installed between the cryostats, takes care of movement and positioning.

In addition to the smooth acceleration and virtually wear-resistant, dynamic movement, this concept also has the advantage that all drive components can be installed beneath a cover. The system is therefore very easy to clean even during transport. As the slide is levitating, it cannot be obstructed or become contaminated by dirt on the surface of the system. This ensures safe process sequences and a hygienic working environment. The slide itself moves silently. The concept can be used in applications which need to be cleaned frequently or during operation, for example in laboratory automation, medical technology, or the food, pharmaceutical or packaging industries.





SupraDrive demonstrates how a levitating transporting slide can be moved extremely dynamically and positioned precisely.

# Shaking and transporting in a new dimension

SupraLoop and SupraShaker open up unimagined solutions when it comes to linear transportation and shaking objects. The integration of SupraLoop into existing, conventional transport systems ushers in new possibilities for conveying in cleanrooms or enclosed areas. The SupraShaker, on the other hand, certainly lives up to its name.

## **SupraLoop: various transport systems combined**

The combination of different transport systems with superconductor technology is demonstrated in the SupraLoop exhibit. A conventional conveyor, the Multi-Carrier-System® from Festo and Siemens and a SupraMotion system are installed in a loop.

Several carriers are transported on the SupraLoop. The magnetisation on the underside of the carriers provides both the magnetic coupling to the contactless drive of the Multi-Carrier-System® and the levitating effect for the SupraMotion system. Via a deflector, a carrier can be transferred from the conveyor to the cryostat containing superconductors and then moved using a levitating motion – even across partitions and walls. One potential application would be to disconnect individual transporting slides from a machining process in order to move them into a cleanroom without touching them or to process objects in an enclosed area involving gases or fluids.



SupraShaker:  
levitating shaker  
system with tilt  
function.

Thanks to reset forces, the magnetic components automatically move back to their stored position.



**SupraShaker: levitating shaker system with tilt function**

In the SupraShaker, a plate levitates above a cryostat containing superconductors. An electric motor with eccentric cam converts this into a shaking motion via a magnetic coupling. In addition, by transferring a magnetic field it can be tilted in any direction. The gap between the plate and the automation system ensures that the tool and the machine are mechanically separated, and prevents vibrations from being transmitted to the entire system. The shaking motion as

seen in vibration feeders is therefore much quieter and more efficient with this type of design. The plate is very easy to replace and clean – a real advantage when used in dusty environments.

**Superconductors – a brief guide**

Superconductors are materials which, below a certain temperature, can store the magnetic field of a permanent magnet at a specified distance. This effect allows objects to be held in position and moved contactlessly. The gap remains constant even through walls. Thanks to their reset forces, the superconducting magnetic bearing components re-assume their stored position by themselves even if one of the components was removed temporarily – without the need for any external control technology.



SupraShaker opens up unimagined possibilities when it comes to shaking objects.





# 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](http://www.festo.com/whyfesto)