

FESTO

**Highlights
2016**



We drive automation for your success.
We are your partner to inspire you.
We shape the future together.

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



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

Dear customer,

If your aim is to successfully achieve maximum productivity, you need to demand the highest level of performance. That also applies to what you should expect from your partners. At Festo, we are continuously developing our products and our services so that, as our customer, you can count on the best possible support.

Our new core product range is one example of how we are doing this. It consists of 2000 components which cover as much as 80 per cent of all automation tasks. These products are ready for dispatch in just 24 hours, are attractively priced, and are available worldwide, even in large quantities. One feature that has not changed is of course the quality that Festo is known for. Find out more on pages 12 and 13 - just look for the star!

Modularity and standardisation also play their part in the drive towards leaner, faster and more reliable production environments – whether in process automation or factory automation. The solutions we offer create maximum productivity in both areas.

These solutions, as well as many other products and offerings, are summarised in this Highlights 2016 brochure.

New for the core product range are the additions to the individual valve series, VUVG-...-S and VUVS-...-S, offering Festo quality at an attractive price and available worldwide.

The compact, highly modular handling systems YXMx create a flexible basic platform for a wide variety of desktop applications. And with the new range of sensor boxes SRBx you can choose the right sensor box for your operating conditions, whether indoors or outdoors.

Last but not least, the perfect combination of the semi-rotary vane drive DRVS and position sensor SRBS-Q1/Q12 provides top swivelling performance and is easy to use, reliable and cost-effective.

With the Product Finder in the electronic catalogue, choosing products is now even easier and more reliable, while our numerous engineering tools enable you to create added value in every phase. Or take advantage of our system solutions to tap into the potential for boosting productivity. We will be happy to advise you.

As you can see, 2016 is a year when once again your productivity is our top priority. Because finding the right solution, the right service or the right training to suit your needs is what motivates us and what we are passionate about. And that is what makes us engineers of productivity.

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 that feeling of security.
You require uninterrupted production.
We bring you safety and reliability.

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



Greater productivity worldwide! Future-proof plants for the highest demands.

How can we make you even more productive? One of our answers to this question is to make our own in-house production fit for the future – and ensure that the connections between our customers and ourselves are as short as possible. That is precisely the goal of our plants in Scharnhausen, Germany; Mason in Ohio, USA; and Jinan in China.

Anticipating future trends

An ability to adapt, maximum added value, the best possible quality, speed, delivery reliability and short routes to the customer are the key ingredients for creating production environments that are fit for the future.

Meeting customer needs

One of the biggest trends in production today is enhancing flexibility – so that every new plant can be quickly adapted to the latest requirements. Flexible production is needed to manage changing orders, fluctuating batch sizes, large numbers of product variants, or the integration of new products. A smooth workflow that avoids bottlenecks in the value stream keeps production processes highly efficient and very reliable. Additionally, the majority of customers benefit from our plants' proximity to their own production sites – ensuring delivery is fast and direct.

The same standards worldwide

All Festo plants continuously exchange information and learn from each other. This so-called Festo Value Production concept ensures the highest possible standards globally - for the benefit of our customers. The ongoing development of employees is also part of this concept and fits in with Festo as a learning company too.

Keeping Industry 4.0 constantly in mind

The comprehensive approach that Festo takes to Industry 4.0 and the Internet of Things (IoT) sets it apart. Customised products demand completely networked plants, intelligent automation components and the development of intuitive interfaces between people and machines. However, these are not the only factors. The role played by people in planning and production, and ensuring they have the right training and competencies are just as important. Furthermore, engineering process will need to be implemented faster and more intuitively in the future.

Close to you, worldwide: three adaptable plants

Take a whistle-stop tour of our three plants to find out what makes them adaptable and fit for the future. In the brief profiles below, we explain what the keys to success are in each of these flexible production sites.

Smooth production: The Scharnhausen Technology Plant in Germany

Thanks to new approaches to its value streams, the processes, information and materials in the Scharnhausen Technology Plant flow smoothly, making production fast, flexible and reliable. Lean production that eliminates bottlenecks also enables suppliers to be more closely involved in the processes.

This means that production can be geared to both highly automated, series-produced products as well as complex customer-specific products. Opened in 2015, the plant can handle everything from machining and electronics production to the assembly of finished products.

On an area of around 66,000 m², it is also home to a process development department that develops, tests and implements pioneering technology for series production. Another integral part of the plant is its training factory, a 220 m² facility where employees can gain qualifications on site and receive practical, needs-based training. Many of the aspects of Industry 4.0 – such as human-machine interaction and mobile maintenance using tablet PCs – are already a reality in The Scharnhausen Technology Plant.

Energy efficiency is another focal point, with the plant producing 20% of the electricity it needs itself. Using energy as a link between the building and the production area will cut down on consumption, costs and emissions in the future.





**A central position in the Midwest:
Mason, Ohio**

The new plant in Mason, Ohio, marks another milestone for Festo. Relocating from the country's East Coast to the Midwest has made logistics much easier for all the NAFTA countries (the USA, Mexico and Canada): now, 70% of customers are situated within a 1000-kilometre radius.

Covering 18,600 m² in total, the new plant is an efficient product supply organisation comprising logistics, production, purchasing and engineering. The premises include a 9000 m² logistics area featuring a highly automated distribution centre. On peak days, the fully automatic packaging installations, equipped with seven high-performance picking stations and packing stations, can pack as many as 500 customer packages per hour without errors and deliver them on time.

Cylinders, valves and customer-specific solutions are produced in a manufacturing area measuring 7000 m². Mason is thus able to guarantee short delivery times as well as excellent delivery date reliability. In the future, the aim will be to deliver directly to our customers from the plant in Mason.



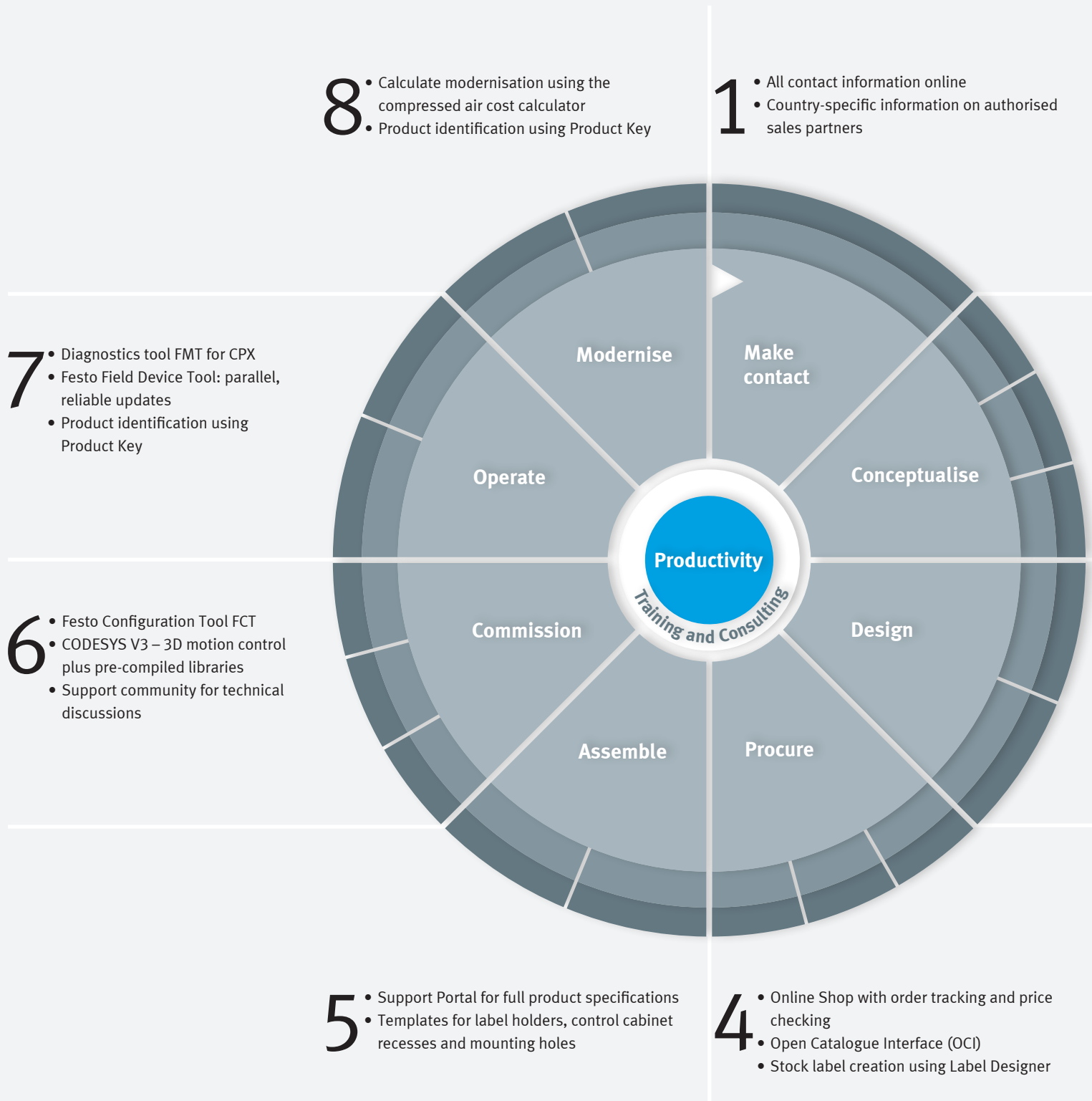
In the region for the region: Jinan, China

The Asian automation market demands fast response times, outstanding flexibility and proximity to customers. Today, the Jinan plant manufactures finished parts for China and several surrounding countries as well as components for Europe. The products currently manufactured by the 1000 employees are drives, valves and service units as well as complete automation systems in a manufacturing area of 46,000 m². The Jinan location is now also the site of the Logistics Centre for the APAC region. An industrial hub, Jinan is one of the few stopping points on the high-speed rail link between Beijing and Shanghai. To improve the plant's competitive advantage in the future, a dedicated Training Centre has been set up in Jinan, providing training to German standards. Since 2013, the Technical Engineering Centre in Shanghai has been responsible for developing and adapting products in line with the regional market's needs.



The Scharnhausen
Technology Plant,
Germany

We're there for you – during every phase of your project.



We're always there to help you on your way to success. To meet your needs even more effectively, we have analysed project workflows and the value creation process. We then defined eight phases and allocated our software tools and services to the appropriate phase. You benefit by being able to find the right support quickly and easily.

- 2**
- Product Finder and Engineering Tools
 - QuickSearch Plus – one click to your goal
 - Handling Guide Online – find the right standard handling system in just 3 steps

- 3**
- Festo Design Tool 3D – complete CAD assemblies in all native formats
 - Tools and macros for circuit diagram design: FluidDraw/EPLAN macros
 - FHPP: uniform programming and control of motor controllers

QuickSearch Plus

Do you know what the Festo product portfolio has to offer? Would you like to be just a mouse click away from everything we have to offer online, like Engineering Tools, our Product Finder, technical information, CAD data and so on? QuickSearch Plus gives you access to all the information you need quickly and efficiently.

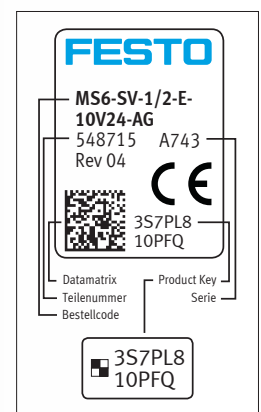
Support Portal and support community

Our Support Portal packs as much information as possible into one location. It is home to all Festo's documents, whether they relate to product information, user documentation, certificates, software, expert knowledge or our training content. The support community provides quick, specific answers to any questions you may have.



Product Key in data matrix format

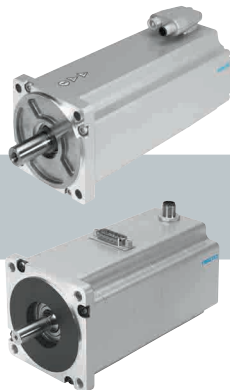
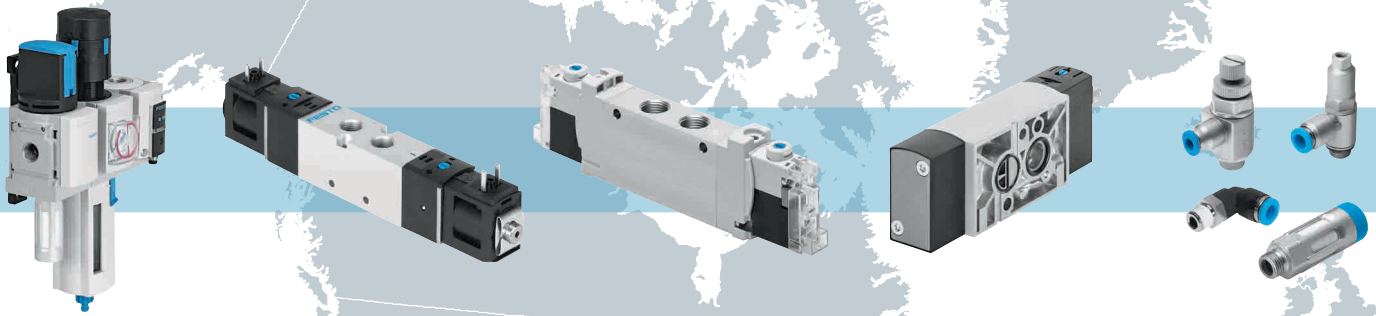
More and more products have a data matrix code on the rating plate. Using a mobile phone and any standard app, you can read these codes to get all the key information about the product – wherever you are. You can now also send the information to your purchasing department in an email to create repeat orders of products.



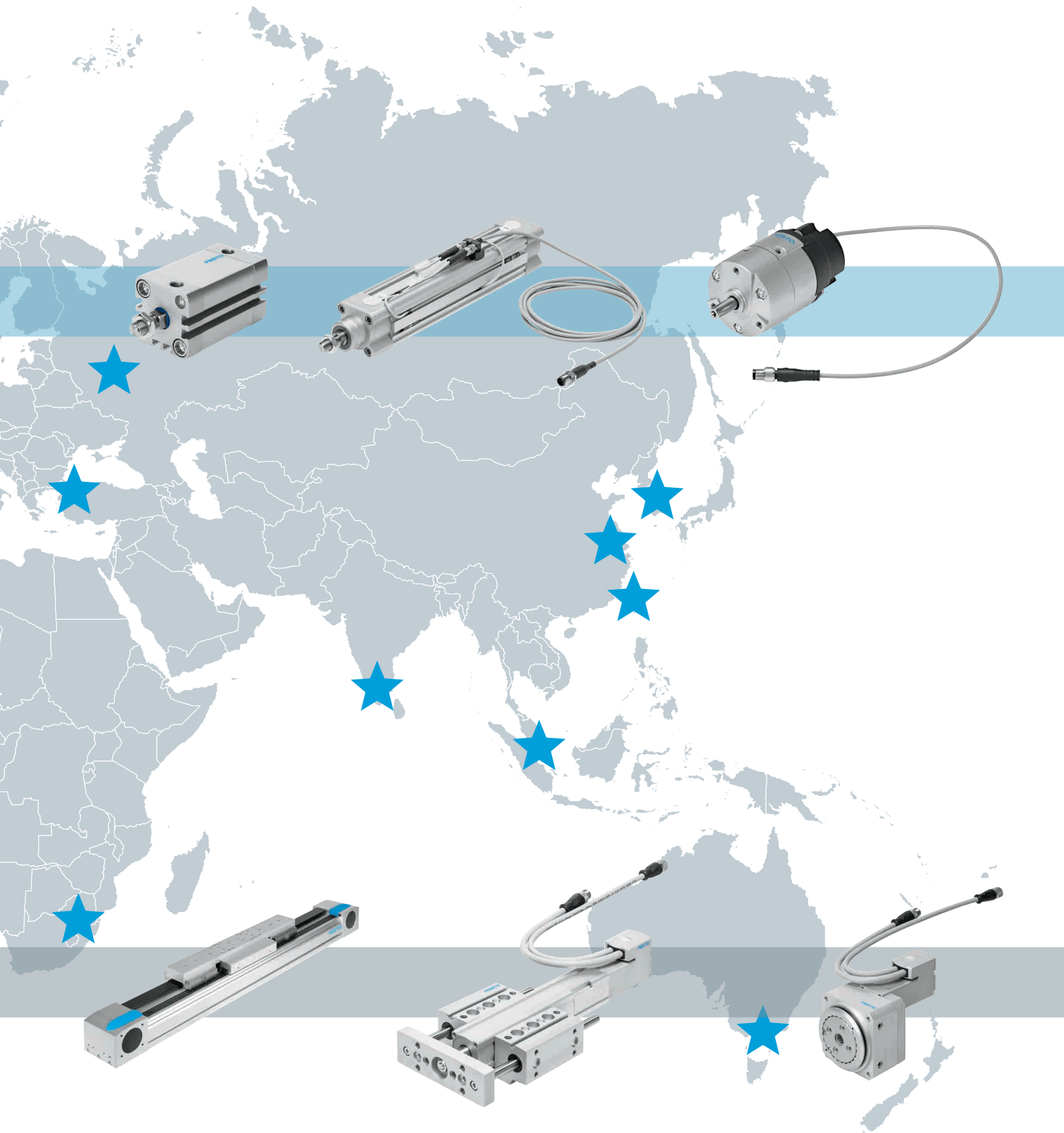
This page shows just a small selection of the tools we have to offer. To find out more about the tools you could be using, simply get in touch with us.

Visit our website. You can find all our tools at a glance at
 → www.festo.com/support

Stars of automation: the core product range from Festo



★ Marked with a star! More than 2200 products in our core product range are ready for dispatch from the Festo plant within 24 hours – from drives to accessories, for factory automation as well as process automation. Available from 13 service centres around the world!



Pure swivelling: ★ semi-rotary vane drive DRVS with position sensor SRBS-Q1/Q12

Made for rotation

Compact and sealed, low weight, optional sensing and high torque ratings of up to 20 Nm are what make the DRVS powerful, even in harsh environments. It is easy to install and its rotation can be infinitely adjusted as required – 90°/180° or 270°.

Position sensing made easy

Fitting semi-rotary drives with sensors has never been so easy, reliable, uncomplicated and error-free – thanks to the installation and teach-in of switching points with the position sensor SRBS-Q1/Q12. These sealed, encapsulated units can be quickly screwed into place and switching points can be taught in electronically by just pressing a button. And you're ready to go! DRVS and SRBS – a powerful combination.

Highlights

- Simple and compact design
- Great performance at an attractive price
- Optional: infinitely adjustable swivel angle
- Innovative sensing, without the need for mechanical adjustment

Economical: attractively priced rotary drive with a focus on the essentials

Convenient: easy assembly with or without foot mounting

High-performance: compact and sealed drive with a torque of up to 20 Nm

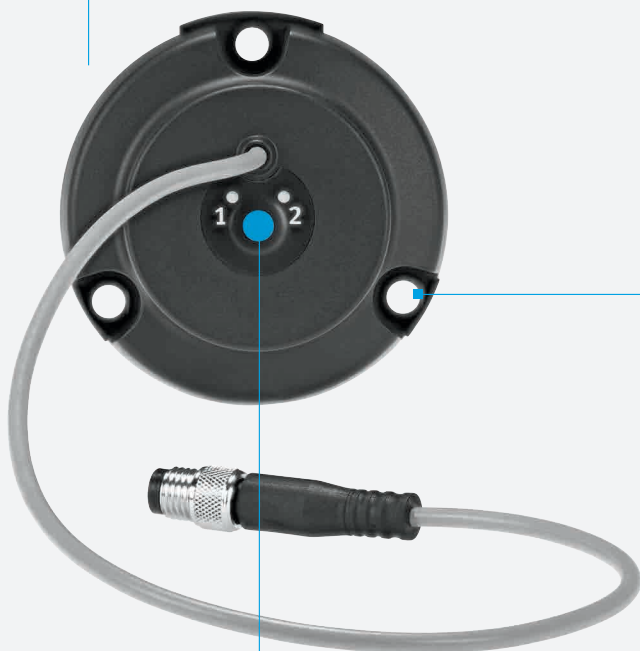


The attractively priced semi-rotary vane drive DRVS focuses on the essentials and has everything you would expect from a semi-rotary drive – with powerful rotation and a highly innovative design. The new sensor solution SRBS can be assembled in a matter of seconds and is infinitely adjustable. That saves time and money.

Reliable: sturdy, contactless and encapsulated position sensor with a long service life

Benefits of the position sensor SRBS-Q1/Q12

- Contactless position sensing without mechanical adjustment
- Quick and easy assembly without the need to search for switching points
- Encapsulated design, long service life and reliable operation



Economical: the sensor is quick to assemble without the need to search manually for switching points

Convenient: easy, reliable operation using just one button directly on the device with the following programming options: two switching points, PNP/NPN, NO/NC

Find out more:
→ www.festo.com/drvs

★ ISO cylinder DSBC and position sensor SDAT-MHS for T-slot



The perfect pair: DSBC and SDAT-MHS.

Thanks to its many variants, ability to adapt to ambient conditions and individual design, the DSBC is highly versatile. With its cleverly designed cushioning PPS, it adapts perfectly to changes in load and speed. As the laborious process of adjusting the cushioning is no longer necessary, the DSBC also saves time. Together with the analogue SDAT-MHS, the DSBC becomes even more flexible as it can sense the entire piston stroke of the five most important standard strokes. This paves the way for much simpler solutions in many applications. Only Festo offers this unique combination.

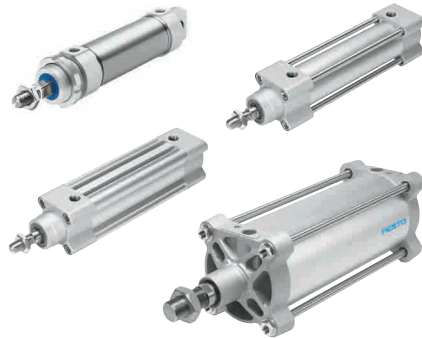
DSBC

- Sizes 32 ... 125
- Easy product selection
- Many variants: unrivalled number of features and combinations of features in standard series

SDAT-MHS

- < 0.1 mm repetition accuracy
- Analogue output 4 ... 20 mA, programmable IO-Link/switching output
- 5 sensing ranges for the most important standard strokes
- Sensor function and mechanical mounting suitable for all Festo drives

Cylinders DSBCx DSNU with metal scraper

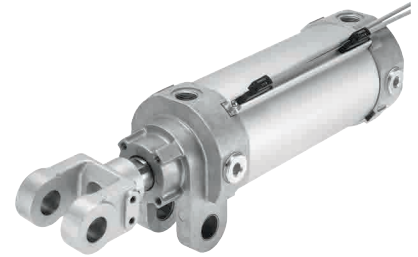


Protects the piston rod against deposits and makes your processes more reliable.

The new and extremely sturdy scraper for cylinders DSBC/DSBG/DSNU prevents particles from adhering to the piston rod. This is especially useful when ambient conditions make life tough for cylinders – in welding applications, outdoors or in the wood-processing industry. The scraper is an integral part of the standard modular system – making this an inexpensive standard solution.

- Sturdy design
- Long service life
- New option in standard modular system and therefore available worldwide
- Profile cylinder DSBC: 32 ... 125
- Tie-rod design DSBG: 32 ... 200
- Round cylinder DSNU: 32 ... 63

The new generation of hinge cylinders DFAW

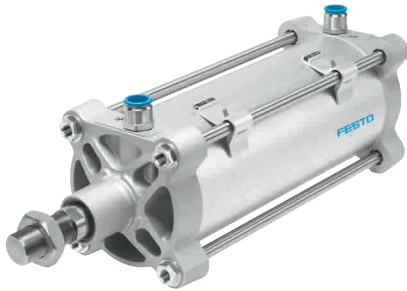


Get the weld exactly where it should be: DFAW and proximity switch SDBT-BSW.

The DFAW clamps components during welding processes. The swivel bearing on the bearing cap makes installation easy and reliable. Included in the accessories are the sensor rail DASP with T-slot and the new, welding splash-proof proximity switch SDBT-BSW, which is fully installed and adjusted on the sensor rail. The rail can be mounted at 3 different positions. Just screw it on and it's ready to go! Special features include integrated, adjustable flow control valves for speed control and high-performance, self-adjusting end-position cushioning PPS. The metal scraper protects the piston rod seal against welding spatter.

- Integrated, self-adjusting end-position cushioning PPS
- Low-friction, sintered bronze bushes on the rod clevis and the hinge on the bearing cap
- Adjustable, integrated flow control valves at both ends for speed control
- Fully adjusted sensor

Large cylinder DSBG



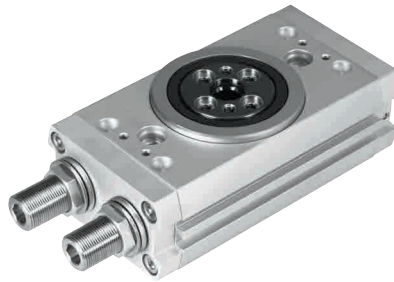
Power that takes you further: DSBG in sizes 160, 200, 250 and 320.

The new large cylinders of the DSBG are powerful, economical, durable and well engineered. They have P or PPV cushioning as standard as well as many optional features from the modular system. Suitable for use up to 150 °C, and available as ATEX variants or with stud bolts for easier vertical or horizontal mounting.

The modular seal and scraper system allows the DSBG to be adapted to most ambient conditions – ideal for machine building, mining, the steel industry and process automation. Last but not least, it comes with the sensor technology to match.

- P or PPV cushioning as standard
- Lighter and with higher load capacity than its predecessor
- Easy to switch from DNG to DSBG
- More variants for tubing and fittings than its predecessor

★ Twin-piston rotary drive DRRD



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

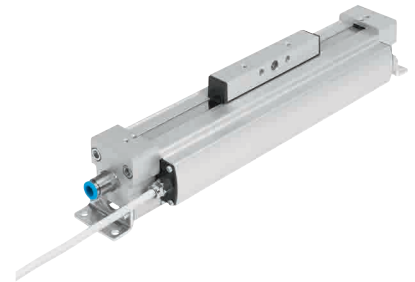
The optimised design of the housing, flange and bearings increases its load capacity and precision. Thanks to its high stability and the absorption of high mass moments of inertia, you can usually opt for one size smaller. And the cushioning is always perfect: elastic for short cycle times, hydraulic for high mass moments of inertia or external hydraulic for full torque in the end position.

- New: now in 11 sizes from 8 ... 63 mm
- More powerful and with a higher load capacity than ever before
- Energy throughfeed for simple and quick supply connections
- Safe: mechanical end-position locking
- Completely sealed variant for harsh environments



Focus Open 2015
Special Mention

Linear drive DDLI



Dynamic response and force with precise positioning. Festo servopneumatics!

High power density and a contactless, absolute displacement encoder combine dynamic response, force and flexibility in servopneumatics with positioning accuracy of up to ± 0.2 mm. For mounting on the user's own guide: the moment compensator DARD with almost no mechanical backlash.

As system solution in combination with:

- Axis controller CPX-CMAX
- End-position controller CPX-CMPX
- Measuring cylinder CPX-CMIX



DESIGN
AWARD
2015



reddot award 2015
winner

An acquired taste: smoke generator with standard pneumatic components

It is an art in itself to achieve precisely and continuously all the standards of taste, colour and consistency for each product type when you are producing 100,000 smoked sausages every day. Böisinger Fleischwaren achieves this using smoke generators and smoke houses from Germos. In the latest product generation, standard components from Festo are increasing system availability.

Whatever type of German sausages are popular with customers – Pfefferbeißer, Landjäger or the hearty Krakauer – high quality and a consistent flavour are guaranteed to keep them satisfied. That is why Böisinger Fleischwaren GmbH, one of the leading producers of smoked sausages, is consistently working to standardise its processes. This is the only way in which this traditional company can position its brand products – some 6000 tonnes of speciality sausage and ham per year – on the market with continuing levels of success. The smoking process has a decisive influence on the taste of the products and the speed with which they are produced. For more than 20 years, Böisinger has relied on the high-quality vapour-smoke generators and smoke houses from Germos GmbH & Co. KG. In its latest generation of smoke generators, Germos is using standard components from Festo for the first time, throughout the entire pneumatic control chain. The components' long service life ensures a high level of plant availability and, thanks to short delivery times, sustainably reduces warehousing costs.

Perfect process quality

The smoke generators have now been in service for a good 20 years. "Maintaining a high level of plant availability and a long service life is as important for our customers as keeping the flavour and colour at a consistently high level," explains Bernd Wurster, Managing Director of Germos. Böisinger plants work round the clock. "It is important for our high-performance production system that we have stable,

sturdy machines with high-quality components on which we can rely completely," says Guido Meurer, Managing Director of Böisinger, about the requirements of his machines. Equipped with the ISO cylinder DSBC from Festo, the smoke generator ensures full smoking performance within a matter of seconds. Thanks to its self-adjusting cushioning PPS, it controls the supply valve of the smoke generator and creates significant time savings during both commissioning and operation – without requiring additional maintenance. The innovative cushioning principle, patented by Festo, constantly adjusts itself automatically to the speed of the valves.

Standard provides reliability

The low complexity of the components, which are mainly from the new core product range from Festo, makes them easy to operate for production workers and they can get spare parts from Festo stores within 24 hours. Because production can only run at full blast when the smoke generator has a full head of steam.

"The move to using standard components from Festo across the entire pneumatic control chain gives us greater certainty of a long service life for our smoke generators."

Bernd Wurster, Managing Director of Germos GmbH & Co. KG



The smoke generator supplies the smoke houses with hot smoke around the clock.



ISO cylinders DSBC with self-adjusting pneumatic cushioning PPS control the hot steam valves between the smoke generator and the smoke house.

Platform strategies and modularisation for greater productivity

The aim: faster, less expensive production and increased profit

According to a study conducted by the German Engineering Federation (VDMA)*, machine builders who focus on standardised components or solutions can boost their profits by up to 1.5%. This is not just down to the economies of scale achieved by purchasing and using more components with a similar design. Almost twice this amount can be saved by reducing the time spent on each process step – from project planning to simpler ordering processes, and from easier logistics to commissioning.

Modularisation and standardisation offer the biggest potential for savings when it comes to developing and engineering mechanical, pneumatic and electrical motions for a system as well as programming software.

*Source: VDMA-McKinsey Study 2014, The future of German mechanical engineering

Three steps towards modularisation

There are three indispensable steps for any company creating its own platform strategy:

- 1 Identify standardised machine functions in the manufacturing process.
- 2 Develop modules that can be used as frequently as possible and for as many machine functions as possible.
- 3 Decide on production depth and which modules to outsource.

Compact handling system YXMx with software

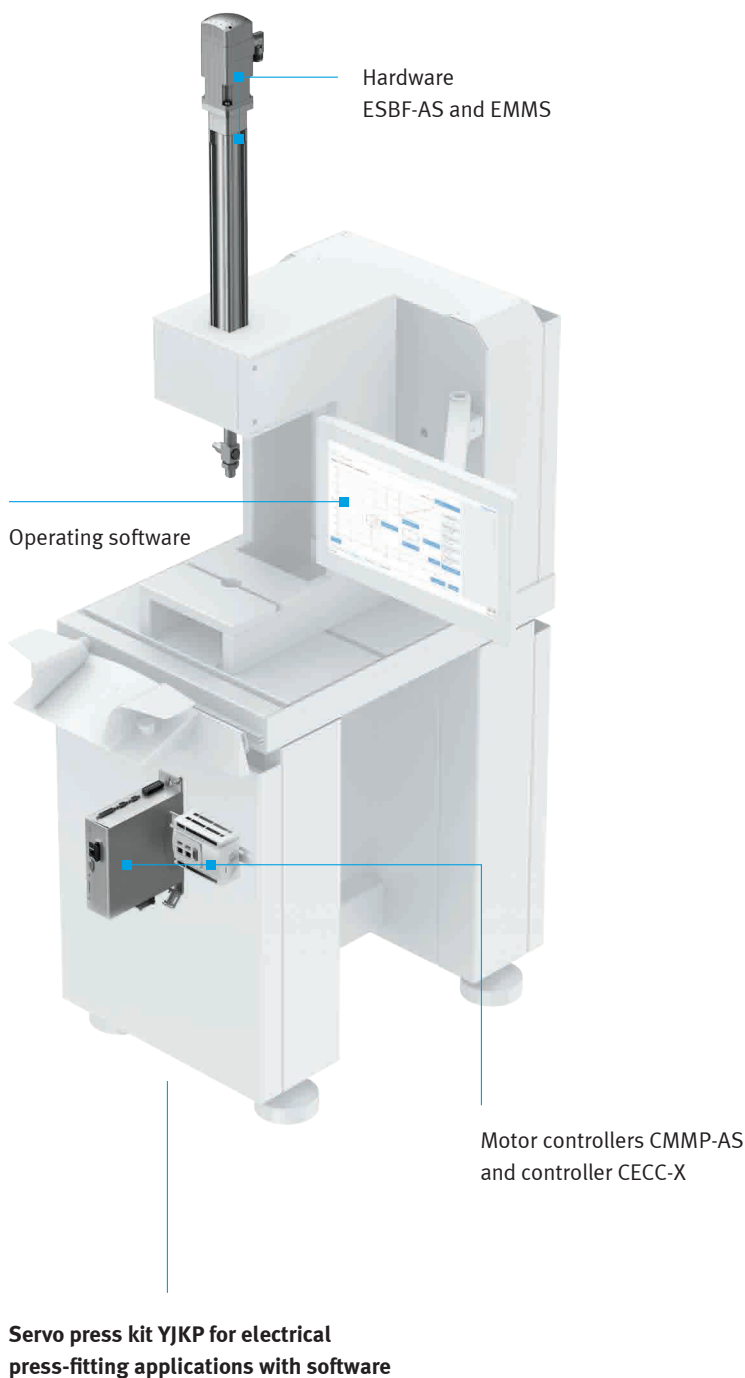
Hardware EXCM



Controller CECC-X with operating software



Industry segments like the watchmaking and automotive industries, but also the consumer electronics industry, have been using platform strategies and modularisation for years as a way of reducing costs and increasing profitability. Now, Festo is applying these principles to the world of automation.

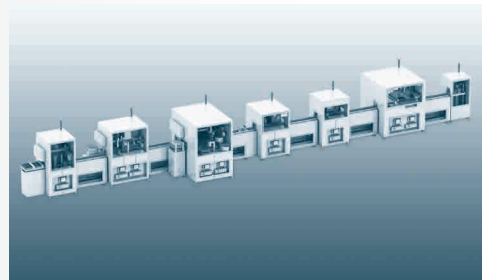


Modular products from Festo

Festo offers a wide range of modular system solutions and kits in this area.

The compact handling system YXMx, for example, constitutes the basic platform for a wide variety of applications. The ready-to-use system kits, comprising software with predefined function elements, controller and kinematics, are ideally suited to applications such as screwdriving, dispensing, testing, soldering, moving, gripping as well as opening and closing containers.

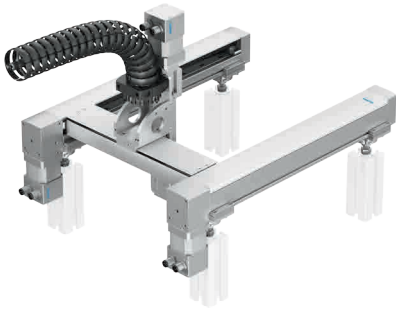
The servo press kit YJKP for electrical press-fitting applications is also highly modular – and has exactly the software functions, the appropriate standard drive components from Festo and the controller you need. The end result is an extremely precise press-fitting system with a high level of repetition accuracy and an excellent price/performance ratio.



Find out more:

→ www.festo.com/handling

Planar surface gantry EXCM system extension



An outstanding working/installation space ratio.

The flat, compact EXCM now boasts some new features for sizes 30 and 40 that make it even more appealing, including the Clean Look cover, the Y-stroke extension, the option of connecting a third axis, and the flexible energy chain concept. But some things haven't changed: the equipment's straightforward integration thanks to the matching drive and controller package, the low moving mass with the parallel kinematic drive concept, and the scalable stroke of the X- and Y-axis.

EXCM-30 extensions:

- Clean Look design: clean and elegant
- Z module connection for several drives using a universal flange
- Additional tie-rod: for more rigidity, improved precision, a longer stroke and a higher load at the front unit

EXCM-40 extensions:

- Increased working range and higher load possible
- Improved dynamic response thanks to 48 V connection

Compact handling system YXMx

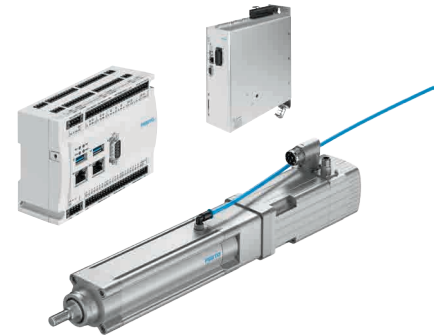


The flexible basic platform for a wide variety of desktop applications.

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 contains software, a controller and kinematics based on EXCM. All you have to do is attach a front-end. Thanks to the predefined function elements in the supplied software library, programming and commissioning are quick and easy – simplifying integration 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

Servo press kit YJKP for electrical press-fitting applications



The preassembled 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 preinstalled 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 of up to 17 kN. All you have to do is integrate it!

- Always exactly the right configuration
- Less expensive than conventional press 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

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 all kinds 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

Integrated drive EMCA

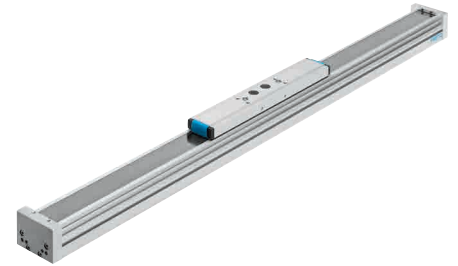


Your ideal solution for positioning drives.

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, while built-in monitoring functions ensure safety and reliability. 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, EtherCAT and PROFINET

Guide axis ELFA



Powerful, precise and protected: ELFA effortlessly masters your tasks.

Now available – the modular ELGA range in its entirety! Introducing the versatile ELFA, a guide axis in 3 sizes: 70, 80 and 120. The internal recirculating ball bearing guide ensures maximum load capacity and rigidity, while the cover band provides guide protection. ELGA drives with toothed belts and spindles feature yet another advantage: extremely high feed forces, optionally with food-grade materials and lubricants.

- Sturdy stainless steel cover band to protect the guide against contamination and ensure minimum particle emissions
- ELGA-KF with recirculating ball bearing guide for high loads
- ELGA-G with plain-bearing guide for simple positioning tasks
- ELGA-RF for highly dynamic tasks or medium-sized loads

Dispensing casting resin: perfect curves in the smallest of spaces

From car parking sensors to smartphones, sensitive electronic components need protection against undesirable influences. This is where special casting resins come in. The new mini-dis desktop machine from bdtronic now enables high-precision dispensing processes in the smallest of spaces.

Casting resins protect electronic components against unwanted contamination and moisture. Precise and reliable dispensing technology is essential for the automatic application of these resins. bdtronic GmbH, a company located in Weikersheim, Germany, is one of the world's leading suppliers of dispensing systems, including complete systems for automating the assembly and production of electronic components. bdtronic has now worked with Festo on a groundbreaking project to open up a new field of application: the new mini-dis micro-dispenser from bdtronic, based on the compact handling system YXMx, enables front-end processing of electronic and telecommunications products. The YXMx system is made up of the planar surface gantry EXCM, the electrical Z-axis EGSK and the controller CECC-X – plus appropriate software from Festo. This space-saving, flexible desktop application is able to produce even extremely short production runs at a low cost.

Precision and reliability

Microdispensing is used in applications such as the production of semiconductors, printed circuit boards and electronic components, as well as in the field of sensing, smartphone production and medical technology. The mini-dis processes single- or two-component materials with an epoxy, polyamide, silicon or acrylate base as well as soldering pastes in the μl range. With several thousand different materials being used in these applications, the mini-dis has to be extremely adaptable.

Compact and highly flexible

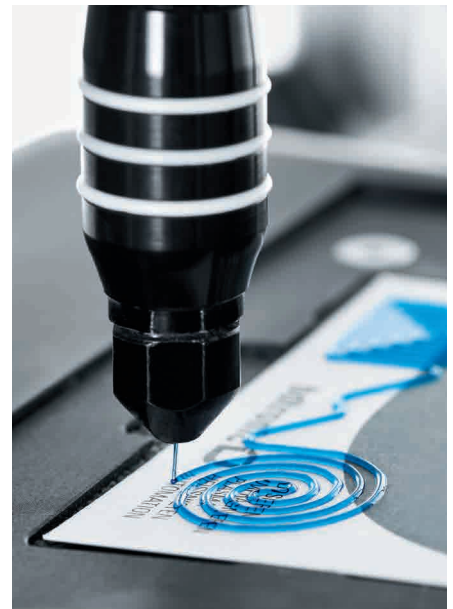
Handling systems for dispensing require an interpolated actuator control system which allows travel along radii and thus flexible contours. This is the only way to define precise dispensing points, create intricate patterns and fully encapsulate components of different shapes and sizes. This is made possible with the CECC-X with SoftMotion – which can be integrated using the CODESYS programming language, already familiar to bdtronic. The controller is a perfect match for the EXCM-30, which offers a whole range of functions for payloads of up to 3 kg in extremely small spaces. It is able to approach any position within the working space.

Competency from a single source

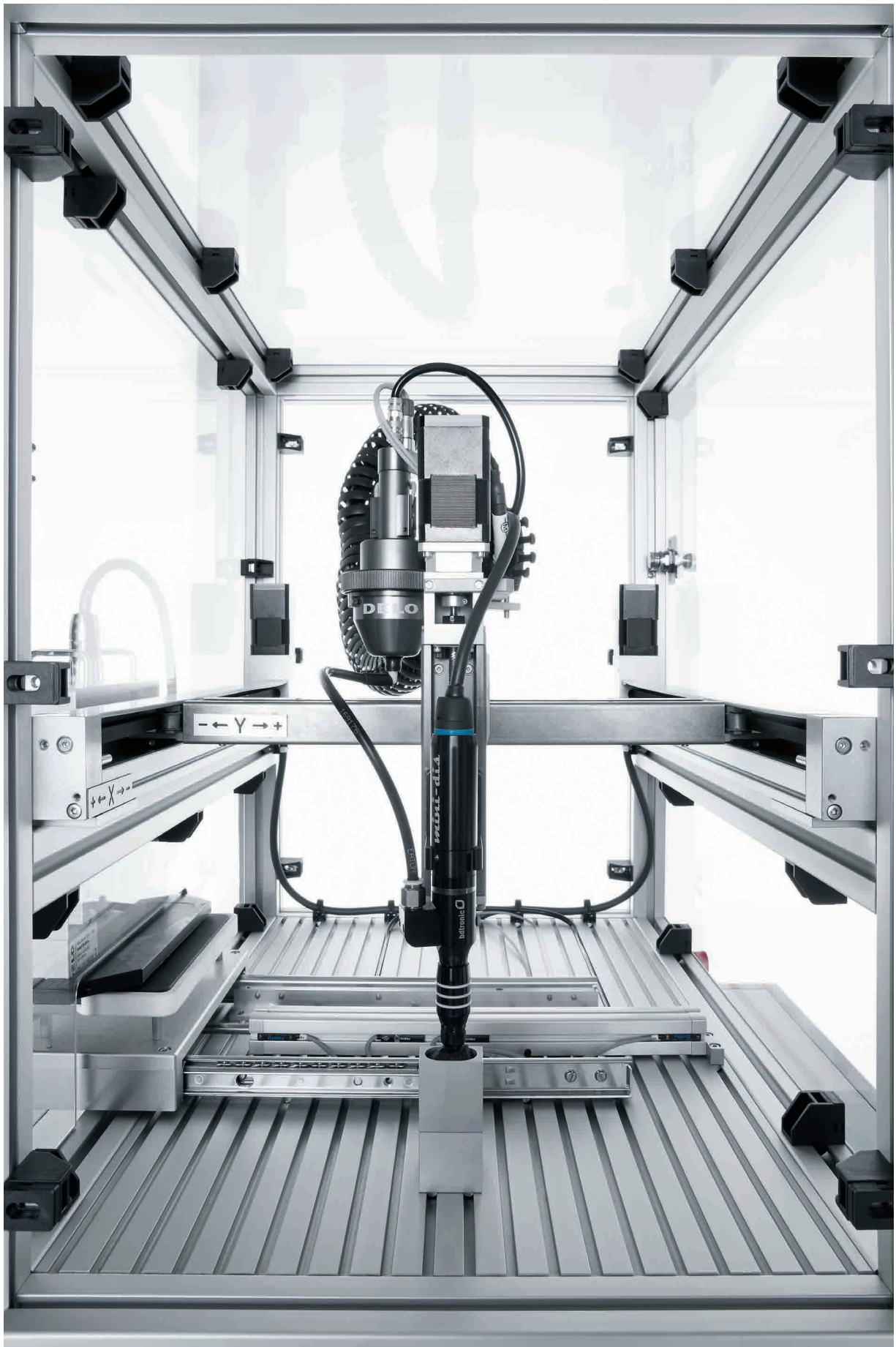
The compact handling system YXMx came to bdtronic as a complete solution with perfectly matching standard components. The system as a whole operates with outstanding efficiency and makes exceptional time and cost savings.

“With the compact handling systems from Festo, we have a complete solution consisting of kinematics, a controller and software from a single source. This saves us time and money.”

André Hellinger, Head of Development,
Dispensing Technology, bdtronic



Precise and flexible: The new microdispenser with the interpolating controller CECC-X is able to apply even the finest adhesive beads.



Compact and high-performance: the handling system YXMx, together with the planar surface gantry EXCM-30 and the controller CECC-X, is supplied by Festo as a complete, ready-to-install solution for bdtronic microdispensers.

Compact or sturdy? It's your choice!

Valve series VUVS and VUVG

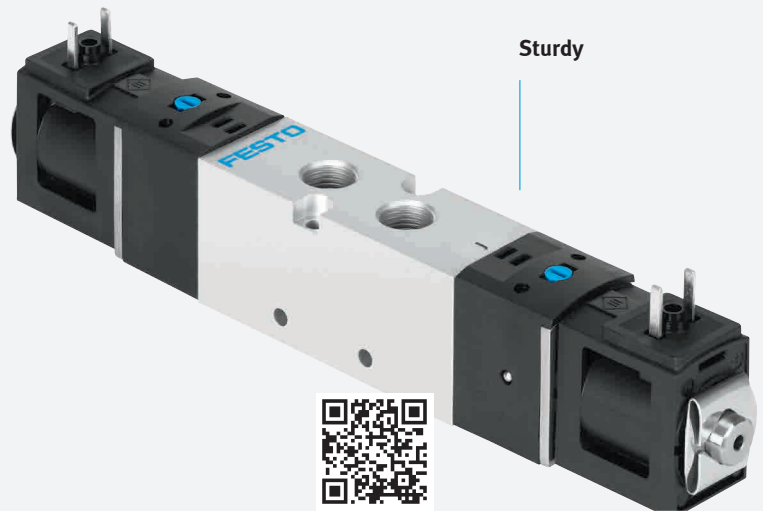
New addition to the series VUVS

Essential features with the same Festo quality – at an attractive price!

It is our recommendation for a good, sturdy, universal valve! You will notice that its features will meet the requirements of almost 80% of all applications.

With versatile accessories, numerous mounting options and easy operation, it is now part of our core product range.

Just look for the star!



Technical data for VUVS-...-S		
Valve function:	3/2, 5/2	<input type="checkbox"/>
Flow rate [l/min]:	550, 1000	<input type="checkbox"/>
Pressure range [bar]:	2 ... 8	<input type="checkbox"/>
Temperature range [°C]:	-5 ... +50	<input type="checkbox"/>
Voltage [V DC]:	24	<input type="checkbox"/>
Degree of protection:	IP65	<input type="checkbox"/>
Part of the core product range Our recommendation: Look for the star	★	

Ticks all the boxes? Then take advantage of this opportunity to reduce your costs.

Find out more:

→ www.festo.com/vuvg-vuvs

★ Festo core product range

covers 80% of your automation tasks

Worldwide: Always in stock

Superb: Festo quality at an attractive price

Easy: Just a few clicks to place an order online

Fast: Ready for dispatch from the Festo factory in 24 hours

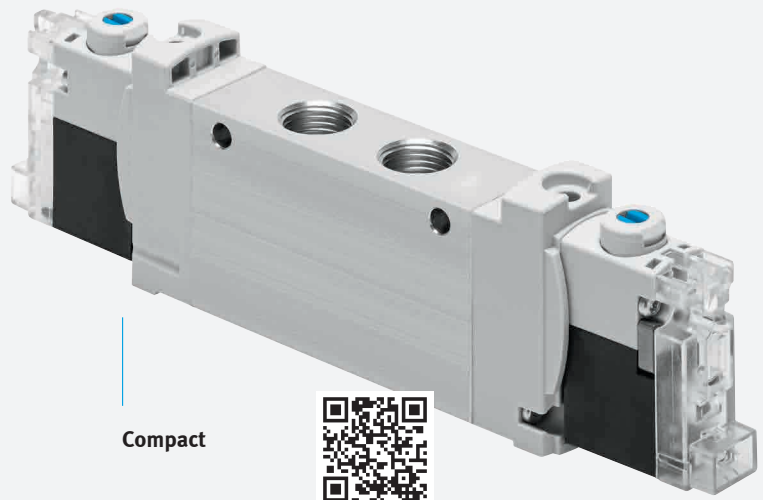
Compact and capable of high flow rates: the VG range. Sturdy, durable and able to be used anywhere: the VS range. These attractive ranges of individual valves can always be relied on to fulfil virtually all your requirements. The new members of the VG and VS series offer essential features with the same high quality standards from Festo.

New addition to the series VUVS

Essential features with the same Festo quality – at an attractive price!

Get more power from a smaller design. Inexpensive, impressive and installed in a flash. Perfect for all high-speed applications requiring a particularly high flow rate combined with a compact size.

Just make sure the technical features are right for your tasks. You'll find that they will cover almost 80% of all applications.



Compact

Technical data for VUVG-...-S		
Valve function:	2x 3/2, 5/2, single, pulse	<input type="checkbox"/>
Flow rate [l/min]:	150, 360, 660	<input type="checkbox"/>
Pressure range [bar]:	1.5 ... 7	<input type="checkbox"/>
Temperature range [°C]:	-5 ... +50	<input type="checkbox"/>
Voltage [V DC]:	24	<input type="checkbox"/>
Degree of protection:	IP40, IP65	<input type="checkbox"/>
Part of the core product range Our recommendation: Look for the star	★	

Ticks all the boxes? Then take advantage of this opportunity to reduce your costs.



Always available! Production for the VS and VG series is now in full swing – and that includes high-volume series.

The result is delivery and process reliability. Our state-of-the-art production facilities in Scharnhausen, Germany, needs just 13 seconds to produce a valve from the VG range. That adds up to 2.6 million VG valves produced every year – so you can be sure you will get what you need, whatever the order quantity.

★ Sturdy valve VUVS

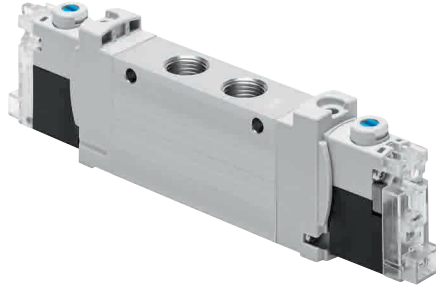
**The sturdy valve for harsh environments.**

VUVS – flexible, modern, sturdy and durable quality. There is no limit to its performance data – with up to 100% more flow provided at a higher level of energy density. Proven technologies and materials. A comprehensive range of accessories. Numerous mounting options and easy operation. Pre-assembled or on a rail according to the customer's specifications. That is what today's valves should be!

With essential features, the new addition to the VUVS-...-S series is part of the Festo core product range. Always in stock and delivered quickly, it also comes at an attractive price.

- High flow rates
- Suitable for a broad range of applications
- Wide range of accessories
- External pilot air supply via manifold rail
- Degree of protection IP65 and IP67
- Easy to create pressure zones

★ Compact valve VUVG

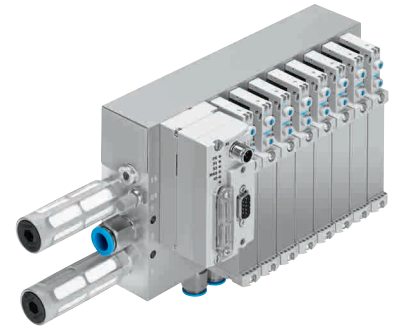
**The compact valve – get more power from a smaller design.**

Individual valves VUVG are inexpensive, high-performance and installed in a flash. They're the perfect choice for all high-speed applications requiring a particularly high flow rate combined with a compact size, e.g. in small parts assembly and the electronics industry or in the food and packaging industry.

The new VUVG-...-S offers essential features at an attractive price and with the proven Festo quality. As part of the core product range, it is readily available worldwide from stock in large quantities and ready for dispatch in 24 hours.

- Attractive price
- Compact design
- Festo quality
- High flow rate
- Short delivery times
- Pressure range of up to 7 bar for VUVG-...-S, 10 bar for other valves VUVG
- Many more variants

Valve terminal VTUG

**Compact, with high flow rates, and universal in use: a real all-rounder.**

The valve terminal VTUG with plug-in really stands out with its numerous multi-pin plug and fieldbus variants, as well as up to 24 valve positions on a single valve terminal. It is now also available in size 18 with a flow rate of 1200 l/min – for short cycle times even with high-volume cylinder strokes. Thanks to the modular terminal strip for multi-pin plugs, IO-Link and all standard fieldbuses, the VTUG can be converted in a matter of seconds. Take advantage of our VG range Quick Order Sheet for an overview of all components available from stock for quick delivery – so you can assemble them in no time at all.

- New: valve size 18 and bus node CTEU for EtherNet/IP
- Several pressure zones on a single valve terminal
- An appealing solution for control cabinet installation, involving less tubing work
- DXF contour templates available to download for control cabinet openings and mounting holes
- Interlocking connection for additional safety-related applications at the fieldbus

Proportional pressure regulator VPPX



Achieve new levels of performance and process quality.

The freely parameterisable PID controller, the external sensor input and the Festo Configuration Tool (FCT) make it possible to implement customer-specific tasks in complex controlled systems quickly and easily with VPPX from the VPPM series. Now, the FCT for VPPX features pressure curve displays for the internal or external sensor as well as inverted setpoint value specifications: 0 V equates to 10 bar and 10 V to 0 bar. The external sensor input substantially increases the process quality by providing an easy way of controlling all the influences and interference in the controlled system. All in all, it offers maximum flexibility and top process quality for users.

- New: VPPX and all VPPM are UL-certified – making them ideal for the US market
- FCT plug-in for easy, optimised parameterisation
- Higher process quality thanks to actual value input for external sensors
- With NG12, now also up to 7000 l/min

Flow control valve VPCF

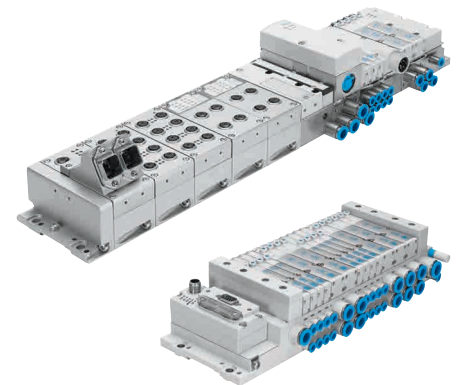


First class: dynamic response, repetition accuracy and linearity of the features.

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 tubing used in applications directly in the Ex zone reduces consumption and enhances dynamic response – resulting in significant cost savings. The lightweight, compact valve can be arranged 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

Valve terminals MPA-S and MPA-L



Systematically expanded – so MPA can do even more for you.

The new “non-return valves” option in exhaust ducts 3 and 5 for the individual sub-bases provides protection against unwanted movements when there is an accumulation of exhaust air. The mechanical spring return on all MPA directional control valves provides safety if the compressed air supply fails, while the PROFIsafe module CPX-FVDA-P2 ensures the valve voltage is safely switched off. Another new feature is the cost-optimised 4-way electrical interlinking module for MPA-L, tamper-proof fixed flow restrictors, plus end plates with a ducted exhaust (82/84) for the MPA-S pilot air. This does away with the need for an additional supply module.

- Intelligent: maximum electrical functionality with CPX
- Maximum safety for valves
- Simple and inexpensive: fieldbus connection CTEU for MPA-L
- Fixed flow restrictors – simple and tamper-proof
- New end plate with ducted exhaust air for MPA-S
- Valve manifold rails: polymer (MPA-L), now also with 4-way electrical interlinking, or metal (MPA-S)

Clean Design valve terminal MPA-C

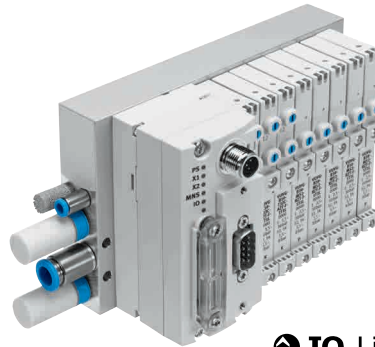


Get to know perfect Clean Design: MPA-C.

Very easy to clean, highly corrosion-resistant, extremely sturdy – and extremely functional: that's what the MPA-C is all about. With more valve functions, individual modular sub-bases, FDA-compliant materials, IP69K degree of protection, multi-pin plug or fieldbus/Ethernet via CTEU or CTEL. Nothing is left to be desired, even where the accessories are concerned: the connecting cable NEBV-C-S1WA... in IP69K and the Clean Design fittings NPCK are a perfect match for the MPA-C.

- New: bus node CTEU for EtherNet/IP
- New: more safety when exhaust air builds up thanks to non-return valves option
- New: electrical outlet at the top and optional X lengths
- Clean Design, FDA-compliant materials and NSF-H1 lubrication
- Degree of protection IP69K with redundant sealing system
- Outstanding pneumatic performance

Fieldbus node CTEU



 IO-Link

Make the switch to a simple, low-cost fieldbus technology.


The fieldbus node CTEU makes it easier than ever before to upgrade from multi-pin to fieldbus solutions, or to change between different fieldbuses. All thanks to the extremely flexible I-Port communication interface from Festo, which is also compatible with IO-Link.

It is smart and intuitive, easy to configure and install, and extremely flexible thanks to easy module replacement, making it ideal for OEMs.

- Outstanding value for money
- For CANopen, PROFIBUS, DeviceNet, CC-Link, EtherCAT, plus IO-Link
- New: PROFINET and AS-Interface
- 1 fieldbus node CTEU, compatible with valve terminals VTUG, MPA-L, MPA-C, VTUB-12, CPV and VTOC for minimised inventory levels, optimised logistics
- From fieldbus node to compact installation system: with a single bus node, up to 2 I-Port devices can be connected using an adapter CAPC

Installation system CTEL



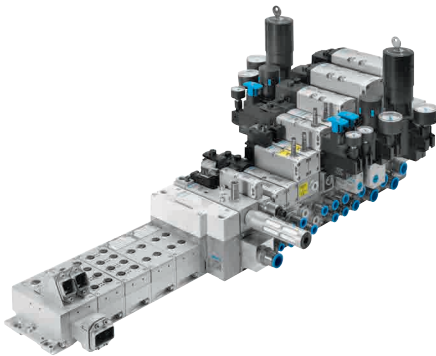
 IO-Link

Simplify your connection to the world of CPX!

With the installation system CTEL plus the I-Port technology developed by Festo, it's now easier to get connected to the world of CPX. And it comes at a low price – you can use a single bus node to operate multiple CPX-CTEL masters with up to 4 I-Port devices each. Compared to the variant with CTEU bus nodes, this reduces the number of bus interfaces to a minimum when several I-Port devices are used. Another advantage is the standard hybrid cable which provides both communication and a power supply simultaneously. Perfect function integration plus easy diagnostics in the CPX world – that's what the integration system CTEL is all about.

- Save up to 3 additional bus nodes with just one CTEL-4-M12-5POL
- CTEL-2-M12-5POL-LK for 2 non-proprietary IO-Link devices
- One standard cable for power supply and communication

Valve terminals VTSA/ VTSA-F, control block VOFA



The proven VTSA(-F) – now even more compact and safer!

The new, compact sintered silencers AMTE save lots of space when things are getting cramped. And the hot-swap vertical stacking module (vertical pressure shut-off plate for valve replacement during operation) is now available in a tamper-proof version on request. The VTSA(-F) now also has ATEX valves for the first time. The new tested control block VOFA-L26-T32C-... now also provides a 3/2-way solution for safe, decentralised venting.

- Compact sintered silencer
- Tamper-proof vertical pressure shut-off plate eliminates unplanned machine stoppages
- Easy selection and unequivocal identification of ATEX valves
- Extremely safe: VOFA-L26-T32C-... control block optionally up to Category 4, PL e
- Tubing sizes: 22 and 28 mm diameter for fitting QS, size G3/4

PROFIsafe input module CPX-F8DE-P



Monitors all your safety sequences on site.

With the new safe inputs, the entire safety sequence is integrated simply and directly on a single valve terminal: inputs – logic via PROFIsafe – outputs for safety-relevant mechanical or electronic switching devices, e.g. for safety sensors typically found in car body production and heavy machine building such as locking devices, light barriers, emergency stop inputs and roller levers.

- Compact and sturdy, 8-channel
- For devices or OSSDs with contacts
- Very safe: 4/8 failsafe type 2 digital inputs, PL e/Cat. 4/SIL3
- Simple: preprocessing at the module and reliable parameter data via a process map
- Efficient, individual passivation for each channel
- Firmware update via PROFINET

CODESYS V3 embedded controller CPX-CEC-C1/S1/ M1-V3



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.

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
- A single platform for electrical functions and pneumatics
- A single platform for fluid and motion control
- Simple configuration of the entire system via CODESYS function libraries



A model for the future: robotics without a control cabinet!

Robotics on the way to Industry 4.0 with a study into high-speed handling with CPX/EMCA. CPX control technology from Festo for an IP65/67 environment and the numerous functions included in the new “integrated drive” EMCA facilitate robotic functionality without a control cabinet that is close to revolutionary.

This model benefits from the very latest Festo hardware and software. It also provides pioneering technology, with virtual commissioning, OPC-UA interfaces and CODESYS V3 SoftMotion transformation models with calibration options. Highly dynamic, it features delta kinematics with free movement in space.

Light, compact, agile

The extremely lightweight and compact kinematics can be integrated in a way that saves space in integration and is very economical. All components are above the working space, wiring is minimised and the control cabinet-free IP65 design makes it quick to install.

Virtual modelling and commissioning

The virtual behaviour model is configured using CIROS software from Festo Didactic. By predicting how the real-life system will operate before it has been produced, the software makes it possible to develop and test the entire control system in advance. Its functions meet the criteria of the upcoming standard for Industry 4.0: Automation Markup Language or AML, which enables virtual modelling and commissioning. AML is able to map the geometry, kinematics, behaviour and sequence of programs, as well as represent hierarchies. Conveyor belts and delta kinematic systems are synchronised and operated by linking the real and virtual worlds.

Function integration EMCA and CPX

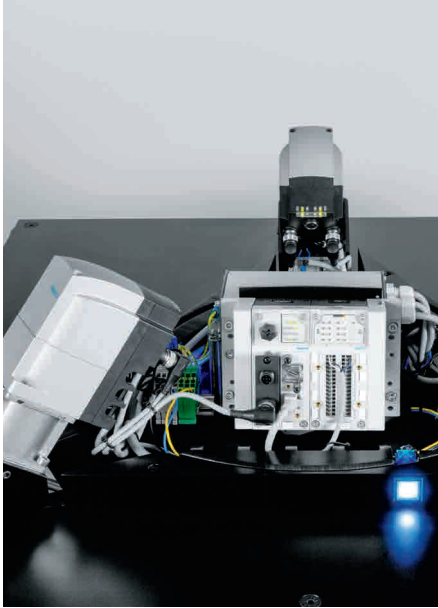
The new, intelligent electric drives are maintenance-free, very easy to use and efficient: with EC motors with absolute position sensing, an integrated controller, power electronics and absolute encoders in IP54/65. The integrated CODESYS V3 controller with SoftMotion enables on-site robot path control. The system is networked via Ethernet in the Internet of Things (IoT), and OPC-UA is integrated for vertical and horizontal networking as part of Industry 4.0. The motors for the EMCA as well as all remote I/Os and pneumatic functions for pick & place are controlled directly by CPX via CANsync – allowing the entire subsystem to be controlled using the automation platform CPX. Available on request.

“At Festo, Industry 4.0 and the Internet of Things are already here – in our products, our solutions as well as our training and professional development.”

Eberhard Klotz, Head of the Industry 4.0 campaign at Festo



Decentralised automation with the Festo terminal CPX and an integrated CODESYS controller with IP65/67 protection enable flexible, autonomous subsystems.



Linking and testing the virtual world and real-life applications reduces errors, improves the quality of processes and simplifies programming.

Safety for people and machines – at an attractive price

The extremely high flow rate and exhaust values of 4300 l/min or 9000 l/min make the MS6-SV-D the right choice for a wide variety of applications. The safety valve can be used as an individual module or in service units. What's more, the integrated soft-start function ensures the system is able to restart gently and safely.

Upgrading from PL d to PL e made easy

The standard variant, MS-SV-D, is designed for Performance Level d but can be upgraded to PL e with the addition of a sensor which is available to order from the factory. It is already integrated in the safety valve on delivery. The sensor can also be retrofitted at any time should upgrades be needed at later stage.

Integrated soft-start function

For gentle, slow system pressurisation

Consistently high flow rate

For extremely fast venting

Flexible installation and ordering

As part of a service unit MS or as an individual device



Find out more:

→ www.festo.com/ms6-sv-d

The safety valves MS6-SV-D offer unparalleled protection for people and machines alike. This low-cost safety valve is ideal for manufacturers of series-produced machines with high safety requirements up to PL d and optionally up to PL e. Simply program the safety PLC and you're ready to go!

New: MS6-SV-D

Low-cost alternative to MS6-SV-E with Performance Level d to e



The alternative to standard silencers

Space-saving silencer UOS-1-LF for MS6-SV-D and -E. Saves as much as 8 cm of installation space

A complete range for optimum safety

Common to all safety devices: a high flow rate, unbeatable venting, integrated soft-start function, plus seamless integration into the service units MS.

Excellent performance at an attractive price: MS6-SV-C or MS9-SV-C

Perfect for applications with average safety requirements up to Performance Level c. The single-channel design ensures safe, fast venting – and is very cost-effective as well.



Great price/performance ratio: MS6-SV-D

Ideal for manufacturers of series-produced machines with high safety requirements up to PL e. In contrast to the MS6-SV-E, the relevant programming needs to be carried out on the safety PLC.



Unique and ready for immediate use: MS6-SV-E

Just install and go: Performance Level e is achieved immediately without any additional, time-consuming programming of the controller – this only possible with the MS6-SV-E. Approved by the German Institute for Occupational Safety and Health to DIN EN ISO 13849-1, Category 4, Performance Level e. Certified so that you can be sure the machine operator is protected in case of emergency.



Vacuum generator OVEM



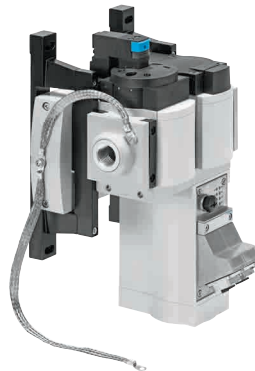
Easy operation and diagnostics: can be controlled easily from the PLC using IO-Link.

Providing the ultimate in process reliability, the OVEM monitors the set evacuation and ejection time for each cycle. With automatic and timely fault indication. During operation, the vacuum level can be read off numerically or as a bar graph from the LCD display and then analysed.

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. The ejector pulse is fast, precise and reliable – and, with IO-Link, can even be controlled separately.

- Configurable: many functions
- Clearly laid out: control elements on one side
- Optimised for installation space: all functions integrated into one unit
- Practically maintenance-free
- Easy installation
- Sensor with display
- 2P variant function in SIO mode

Energy efficiency module MSE6-E2M



A world first: saving energy has never been so easy!

The MSE6-E2M does more than just monitoring and analysis – 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.

Three functions to save 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

Precision pressure regulator LRP-1/8



Small and highly precise – keeping your p2 outlet pressure stable.

The new LRP-1/8 is an addition to the LRP-1/4, a larger model with a higher flow rate. It is an ideal choice in any application where space is tight. The LRP regulates compressed air downstream to the set outlet pressure p2 and compensates for fluctuations in the inlet pressure within the 0.1 ... 6 bar range, eliminating them almost entirely. It's the very definition of an optimised control characteristic.

- Can be used as a stand-alone device or in series
- Pressure hysteresis for characteristic flow rate curves < 0.02
- Good response characteristics in the case of rapid changes in pressure and flow rate
- Precise pressure setting in both static and dynamic conditions
- Pneumatic connection G1/8 or connecting plate



One-way flow control valves
VFOH made from solid metal



Inexpensive and universal.

Process reliability built in: the new one-way flow control valve VFOH. It has a chemical nickel plating which gives a uniform and wear-resistant surface and makes it suitable for use in the food industry. Thanks to its temperature resistance of up to 150 °C, the range of additional applications in which it can be used is virtually endless. With its outstanding quality, sturdy design and excellent process reliability, the VFOH represents an inexpensive alternative to stainless steel versions.

- Suitable for use in the food industry, resistant to cleaning agents
- Resistant to high temperatures of up to 150 °C
- Sturdy and highly resistant to corrosion
- Anti-static thanks to metal release ring

★ Tubing PAN-R 22 + 28 mm,
fitting QS G3/4



Ideal for applications requiring high flow rates.

Everything from a single source, even when flow rates of over 10,000 l/min are required. The O.D. tubing PAN-R in 22 and 28 mm versions, plus the matching fitting QS with connection size G3/4, provide you with an easy way to combine large valve terminals such as the VTSA or drives DSBG, which are often used in machine building and the mining, woodworking and steel industries.

- Complete solution from a single source
- Tubing/fitting combination more flexible than rigid piping
- Easy installation thanks to push-pull principle for fittings

Clip fix tool AGTC



A world first that reduces your employees' workload!

Physical stress and strain is a thing of the past for employees who have to install clips. The clip fix tool AGTC does away with strenuous manual fitting of clips, for example in automotive assembly when attaching internal door panels or clips to hold cables in place. Previously, excessive ergonomic stress often led to compensation time, as well as absenteeism.

- Ergonomic
- Intuitive
- Universal
- Reproducible

An ergonomic model of success

Fitting clips in automotive assembly is an exhausting task that exerts significant stress on the finger and hand joints. Thanks to the innovative clip fix tool AGTC from Festo, all that is a thing of the past as this ergonomically strenuous task has now been made much easier.

Clip and plug connectors are increasingly replacing conventional screw connections in assembly tasks as they reduce production times. These clips, which are normally provided in the form of expanding nuts and rivets, are used in automotive assembly to secure covers and hold cables in place. They are inserted either by hand or using a manual press-in tool – a process that exerts significant strain on the hands of employees. Thumbs and the heels of the hand can be exposed to press-in forces of around 100 newtons, several hundred times per shift.

Development in partnership

It was for these reasons that Festo together with Volkswagen AG developed a pneumatic assembly tool to relieve the strain on employees during assembly, but also to create a tool that would be easy to operate. Operators do not need to receive elaborate instructions in how to use the clip fix tool.

“Operation is really intuitive,” explains Heike Zacharias from the Integrated Ergonomics Strategy department in the Production Control/Logistics division of Volkswagen AG in Wolfsburg, Germany.

A further advantage of the clip fix tool AGTC is that it can be used with a wide variety of clips. “The tool heads can be swapped easily to accommodate all kinds of different clips – in the same way as you would change the bits on a screwdriver,” says Dr Günther Schmauz, Head of Product Management Air Supply and Sensors at Festo.

Simple and intuitive

Inside the clip fix tool is a pneumatic drive based on the round cylinder DSNU, which generates a mounting pulse when the tool is activated. The pulse is effortlessly transferred via the AGTC’s head piece and the clip is pressed into the opening in question. The tool is then available again very quickly for the next clip. This significantly reduces the amount of force that is exerted on the body. In addition, the work can be done with greater precision and repetition accuracy than with manual operation.

The pneumatically operated clip fix tool has proven to be a true ergonomic model of success compared to any other mechanical or electrical prototypes that have been tested in this area: operators enjoy its ease of use, while plant managers appreciate its attractive purchase price and longevity. A clip fix tool can easily exceed a million switching cycles – the equivalent of around two years of continuous use if 3000 clips are fitted each working day.





Easier automotive assembly: the clip fix tool AGTC reduces ergonomic strain on finger and hand joints.



An ergonomic model of success: operators enjoy the ease of use they find in the clip fix tool AGTC from Festo, while plant managers appreciate its attractive purchase price and longevity.

For maximum productivity: flexible pressure measurement

Intelligent pressure measurement with multiple options

The SPAU is an intelligent pressure sensor with a freely programmable threshold value or window comparator. It has a wide range of functions for non-corrosive gases, consisting of:

- Network monitoring – pressure present
- Regulator monitoring – pressure in desired range
- Vacuum monitoring – part picked up
- Leak tests – pressure drop over time
- Object sensing – back pressure present

Remote maintenance and parameterisation, as well as easy sensor replacement, are also possible via IO-Link.

Unique flexibility

The unique flexibility of the pressure adapter guarantees quick and easy mounting in all installation scenarios.

Easy to use

The large, easy-to-read, blue/red LCD display makes it immediately apparent whether the pressure level is acceptable. The clear 3-key menu navigation ensures quick commissioning and can be taught using simple pressure switching point setting.

Switchable PNP/NPN current and voltage outputs, for use with any control system

Find out more:

→ www.festo.com/spau

Improved productivity and process reliability: the new pressure sensor and transmitter SPAU for pressure measurement, monitoring and sensing, keeps every value permanently under control. It is quick and easy to mount and commission, and gets the system up and running in no time at all.



Pressure status at a glance:

Visual pressure status indicator. Blue: pressure OK, red: pressure not OK

IP65 for use in aggressive environments

Uniquely flexible connection concept:

Pressure outlet direction at the back or at the bottom, outlet direction of the M8/M12 plug at the top, bottom or back



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 installation costs – as well as space and costs thanks to the need for fewer components. The entire distributor is ready to install. Cable lengths of up to 30 m, plus the socket and connector 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

★ Position sensor
SRBS-Q1/Q12 for rotary
drives DRVS and DSM

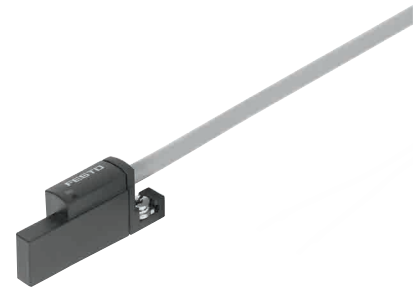


It has never been easier or safer to monitor semi-rotary drives.

If you use the rotary drives DRVS or DSM from Festo for automation, we have good news for you: tedious, time-consuming and error-prone assembly during setup and locating the sensor switching points is now a thing of the past. The SRBS is simply screwed onto the semi-rotary drives as a closed, encapsulated unit in Clean Design, and the switching points are easily and reliably taught in electronically by pushing a button. Done!

- For DRVS 6, 8, 12, 16, 25, 32, 40 and DSM 6, 8, 10
- Quick and easy installation
- Encapsulated design, long service life and reliable operation
- Freely programmable: PNP, NPN and NO, NC
- Just 1 cable for 2 switching points in a single device
- Easier to order, reduces inventory

Welding field immune
proximity sensor SDBT-BSW
for hinge cylinder DFAW



Absolutely reliable welding included in the package with the DFAW.

The SDBT-BSW is unique as it is welding field immune for medium frequency welding at 1000 Hz MFDC. And it functions reliably with 50 Hz AC welding as well. Together with hinge cylinders DFAW, for example, it does its job in the automotive industry extremely reliably and indicates the mid or end position of the piston.

- Standardised package solution, safe both mechanically and electrically
- Sensor and cylinder DFAW, ADN or DSBC from a single source
- Immune to magnetic fields generated by typical welding applications
- Cable and housing materials resistant to welding spatter

Checkbox CHB-C-N



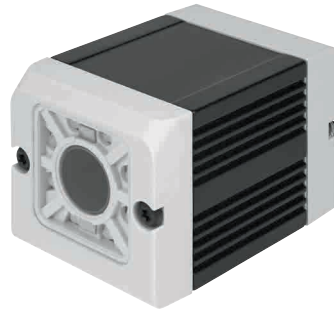
Proven conveying technology redefined!

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

Vision sensor SBSI



The fast and inexpensive way to create simple vision system applications.

The new vision sensors SBSI are available as high-performance code readers for 1D/2D codes, including hard-to-read data matrix codes, or as object sensors for simple quality inspections such as completeness checks.

The optics with various focal lengths are built in, as is lighting in different colours. Its spectrum makes it perfect for the automotive industry and electronics manufacturing or machine building, for example, in packaging technology for food and pharmaceuticals.

New: PROFINET interface.

- Small, light and with IP65/67 protection for tough industrial environments
- 3 steps and around 30 minutes to reach a solution: simple and intuitive vision system
- All-in-one: built-in lens system and light

Flow sensor SFAW



The easy way to monitor fluids.

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

- Connection concept with unique flexibility
- 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

Intuitive vision system: reading 2D codes with vision sensors

It was the simple and intuitive operation of the vision sensor SBSI that impressed the automation experts at IMI Electronics in Bulgaria. They use well over 100 vision sensors in test systems in order to ensure traceability of electronic components and PCBs during the assembly process.

Integrated Micro-Electronics, Inc., also known as IMI, is a leading global supplier of electronics manufacturing services (EMS), as well as semiconductor assembly and test services (SATS). Products from IMI Bulgaria are used by the automotive industry and its suppliers, for example in wiper systems, steering wheel controllers and instrument panels, as well as in consumer goods such as washing machine controllers and coffee machines.

Highly accurate

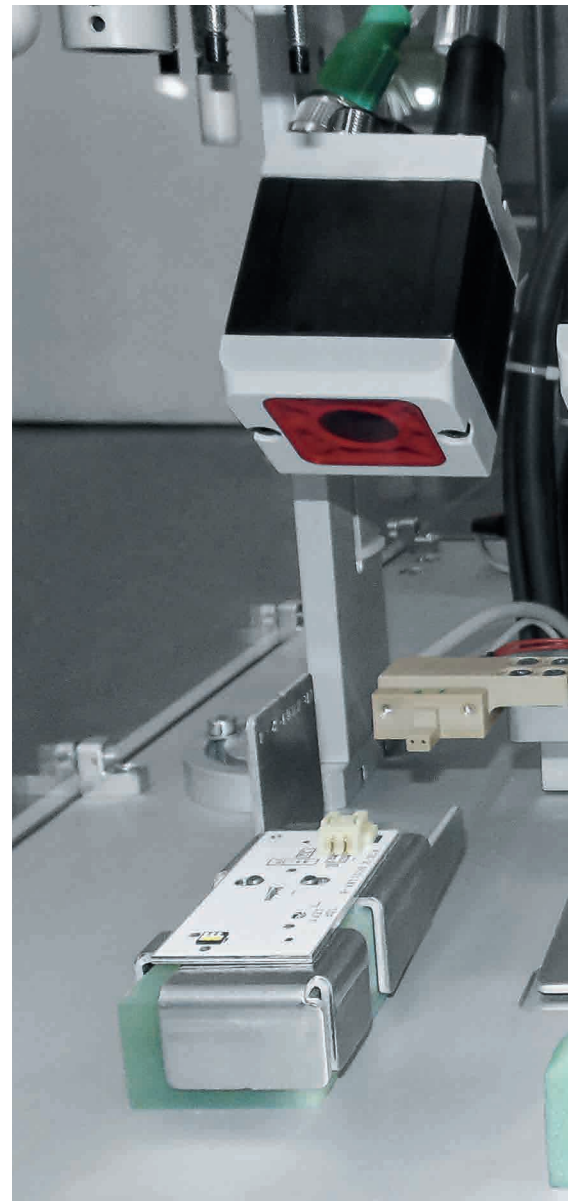
The vision sensor SBSI comes into its own as a high-performance 2D code reader even for difficult-to-read, directly marked, dot-peened or laser-inscribed data matrix codes. The 2D codes used in IMI Electronics' test system are indeed very small and complex, and in many cases are covered by adhesive. This prevents a fast and stable reading process when using conventional code readers.

Limited installation space is typical for the application, and thus the vision sensors used have to be compact, with integrated optics and lighting. Lead-time for the barcode readers has to be short too so that customer projects can be finished on time. Last but not least, the attractive price of the barcode readers also influences the competitiveness of the customer solutions offered by IMI Electronics.

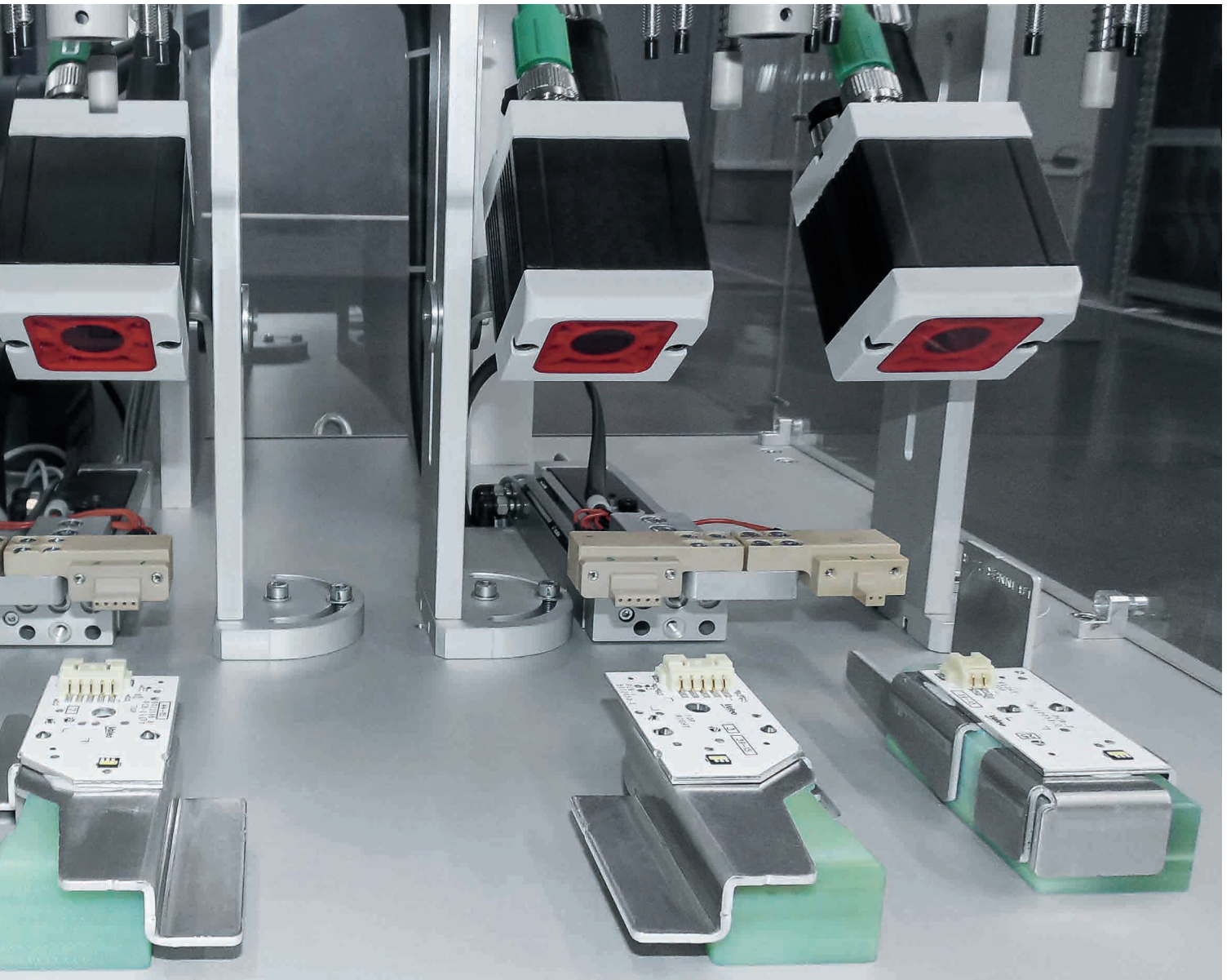
Uncomplicated use

Even without expert knowledge, the vision sensor SBSI is simple and easy to use. Thanks to uncomplicated, intuitive operation using the Vision Sensor Configuration Studio, it provides a user-friendly and cost-effective entry-level solution for an industrial vision system – saving valuable time during commissioning.

Depending on the model, the vision sensor SBSI has various focal lengths and lighting colours. Its spectrum makes it perfect for the automotive industry and electronics manufacturing, as well as for packaging in the food and beverage industry or the pharmaceutical industry.



High-performance code reader for 2D codes: the vision sensor SBSI reliably detects even difficult-to-read, directly marked, dot-peened or laser-inscribed data matrix codes.



The vision sensor SBSI in the test system: automation experts at IMI Electronics use well over 100 of these sensors to ensure traceability.

Save time and money by standardising and automating process valves

Until recently, planning, purchasing and operating fully automated process valves in the biotech, pharmaceutical and cosmetic industries, as well as the food and beverage and fine chemicals industries, required significant amounts of time and effort. But by joining forces with the right partner who has the right expertise and a product portfolio to match, all this work can be considerably reduced. Festo offers the perfect automation package for virtually any process valve.

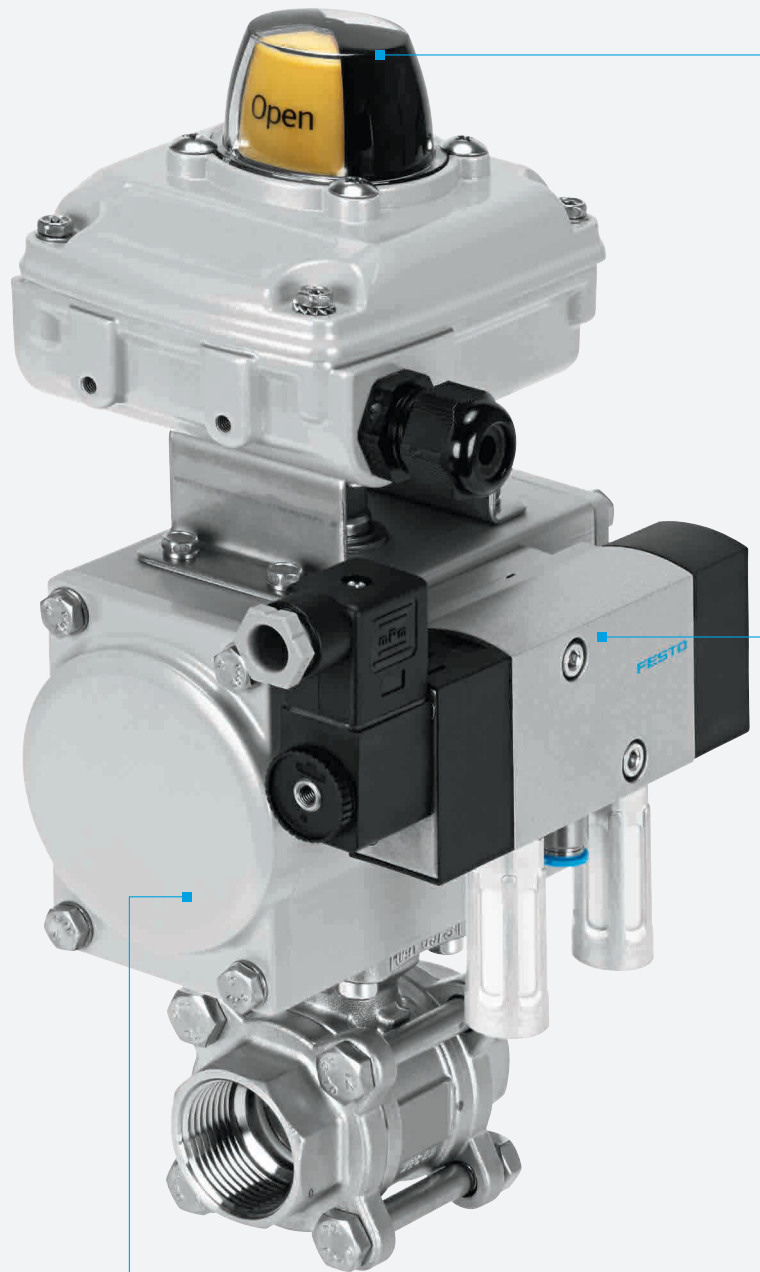
A full-scale automation range

Having the right process automation components on offer means less time searching for the right suppliers. That's why Festo offers a matching range of positioners, control actuators, sensor boxes and actuators for process valve automation. We also coordinate the search for parts such as quarter-turn actuators to suit your specifications.

Project management at Festo

Festo can provide you with the following services:

- Research, calculation and procurement for process valves based on customer specifications
- Actuator configuration based on the required torque and safety factors
- Identification of appropriate mounting accessories
- 2D or 3D drawings of each process valve
- Coordination of deliveries
- Uniform preparation and presentation of all documents in a single package



Quarter turn actuator DFPD

The new benchmark for quarter turn actuators. Its range of variants and standardised hole patterns in line with NAMUR VDI/VDE 3845 for pilot valves open up a wide variety of possible applications.



Fully automated process valves from a single source make planning, procurement and commissioning significantly easier and cost effective. It eliminates a considerable amount of project management work, reduces warehousing costs for spare parts, and speeds up service and maintenance.

The new sensor box SRBC for digital control

A reliable solution when it comes to electronic position sensing and optical position indication. Ideal for indoor and outdoor operation – even in aggressive and corrosive environments.

Sensor boxes SRBE/SRBG

The sensor box SRBE with worldwide certification is ideal for use in potentially explosive atmospheres. The compact inductive double sensor SRBG is perfectly suited to tight installation spaces and can be mounted directly on quarter turn actuators without accessories.



An alternative to the sensor box: the reliable positioner CMSX for analogue control

It enables the positions of quarter turn actuators to be accurately sensed. For single and double-acting actuators.

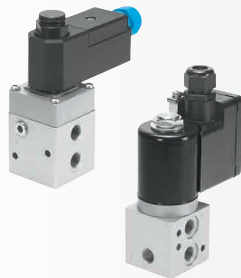


Standard NAMUR valve VSNC

Controls quarter turn actuators and linear actuators with a VDI/VDE3845 interface. Globally certified in accordance with current Ex standards. Now also available with poppet valve technology.

Pilot valves VOFC/VOFD

An extremely sturdy alternative to the valve VSNC. Ideal for outdoor areas and potentially explosive atmospheres. The extremely sturdy VOFC/VOFD can control valve actuators in the chemical, petrochemical and pharmaceutical production lines of leading companies worldwide.



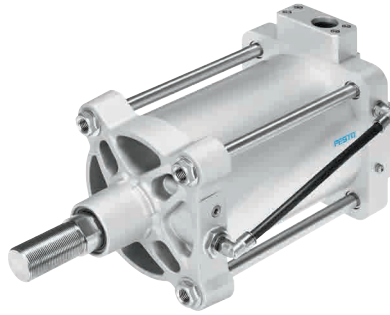
★ Quarter turn actuator DFPD

**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, the rack-and-pinion combination of the DFPD with 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 as well as solutions for water treatment.

- Single or double-acting
- Very compact, particularly the single-acting variant
- Highly modular
- Optimised spring 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)

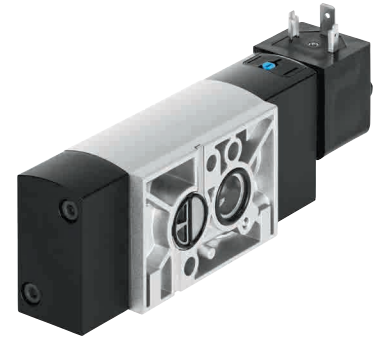
Closed-loop-controlled linear actuator DFPI

**Easy to install – robust, reliable operation.**

Ideal for use under harsh ambient conditions: corrosion-resistant linear actuator to ISO 15552 with integrated displacement encoder and sturdy flange socket for protected pneumatic and electrical connections. 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. Now also available in diameters 250 and 320 mm.

- Integrated potentiometric displacement encoder
- Easy connection to external positioners
- IP65, IP67, IP69K, NEMA4
- ATEX 2GD certification
- Temperature range -20 ... 80 °C
- Double-acting

★ NAMUR valve VSNC

**The new NAMUR generation.**

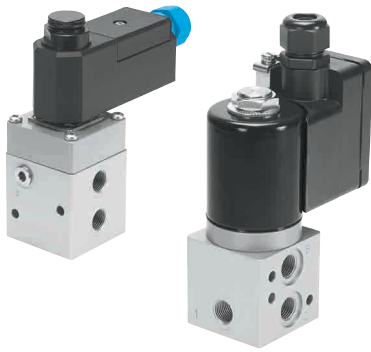
The standard NAMUR valve VSNC is certified worldwide in accordance with current Ex standards. This and the new variants with sturdy poppet valve technology make the VSNC suitable for many industry segments and industrial applications – even under the harsh conditions in wastewater treatment and the chemical industry. Its distinguishing features are its modern design, durable quality and fully tested technology and materials. It also offers outstanding value for money. This is what modern NAMUR valves should be!

- Versatile Ex solenoid systems: IECEx-certified for zones 1 and 2, CL I-Div. I to NEC 500
- Rotatable seal for 3/2-way or 5/2-way function
- Sturdy and with high flow rates
- Suitable for a broad range of applications
- Extended temperature range -20 ... +60 °C



reddot award 2015
winner

Solenoid valves VOFC/VOFD



VOFC/VOFD - make your processes very reliable and your systems more productive.

Ideal for installation outdoors and in areas with potentially explosive atmospheres: the piloted VOFC and the directly actuated VOFD. Both are very sturdy and have hard-emetallised housings. This provides long-term protection against corrosion and mechanical stress. New variants made of stainless steel, with manual override, additional solenoids, a low-temperature variant and larger ports up to 1/2", make this valve series even more attractive.

VOFC/VOFD can control valve actuators in the chemical, petrochemical and pharmaceutical production lines of leading companies worldwide. They also operate extremely reliably and safely in fail-safe applications. The solenoid coils for use in areas with a potentially explosive atmosphere are available with standard types of ignition protection.

- Extremely corrosion-resistant for a long service life
- New variants of the stainless steel designs
- Types of ignition protection Ex-em, Ex-d, Ex-ia
- Tested by the German Technical Control Board (TÜV)
- International certification to IEC Ex, ATEX, Inmetro, Nepsí, UL, Gost
- SIL 3 certified in accordance with IEC 61508

Sensor boxes SRBC ★/SRBE/SRBG for quarter turn actuators



A complete world of sensor boxes.

The new sensor boxes SRBx: choose the right sensor box for your operating conditions. Ideal for use indoors or outdoors. The weatherproof SBRC is a cost-optimised, high-performance and reliable series with many switch variants. Ideal for use in areas with potentially explosive atmospheres: SBRE with worldwide certifications. The compact, inductive double sensor SRBG can be mounted on quarter turn actuators directly, quickly and neatly without mounting components.

SRBC

- Weatherproof aluminium housing
- Mechanical, inductive or magnetic switch variants
- Intrinsically safe version in accordance with ATEX

SRBE

- Explosion-proof certification in accordance with ATEX, IECEx, cCSAus
- Mechanical, inductive or magnetic sensor variants

SRBG

- Inductive double sensor
- Direct mounting on quarter turn actuators to VDI/VDE 3845
- Intrinsically safe version in accordance with ATEX

★ Positioner CMSX



Makes very little impact on your budget, but is absolutely reliable.

Great in zones without potentially explosive atmospheres. This positioner for single-acting and double-acting drives offers outstanding value for money, energy-efficient operation and high process reliability thanks to analogue and digital feedback signals as standard. The end position can be flexibly defined via the freely configurable analogue signal. This means that the CMSX is ideal for dispensing applications in, for example, the food and beverage industry, the paper and pharmaceutical industries, and water treatment.

- Also suitable for linear actuators
- Very energy-efficient: no compressed air consumption at standstill
- Increased flow rate up to 130 l/min
- Pre-definable safety position in the event of power failure
 - Travel to end position
 - Hold last position

When the chemistry is right: controlling inert gases with proportional valves

Proportional valve technology in process automation offers a high level of flexibility and produces high-quality control results – as illustrated by the complete system being used in Boehringer Ingelheim’s new technical centre. The close communication between experts from the pharmaceutical company and the Festo team enabled the project to move forward quickly.

In Biberach, Germany, at Boehringer Ingelheim’s largest research and development location in the world, a new technical centre is safeguarding the production of innovative pharmaceutical active ingredients. A total of 15 chemical reactors supply the required quantities of substances within the 2700 m² pilot plant. The size of the technical centre is illustrated by the products supplied by Festo: 12 inert gas stations, 40 valve terminals CPX-MPA to control the process valves, and around 200 automated ball valves and butterfly valves.

Gases regulated proportionately

The use of flammable solvents requires many of the processes to operate in inert atmospheres. In the new plant, compact proportional pressure regulators VPPM provide a highly efficient way of dealing with this task, thanks to their extensive control range and two pressure levels. In the past, this required three pressure levels, each with its own piping networks, control valves and flow meters.

The proportional pressure regulators VPPM are integrated on a valve terminal MPA and, together with the automation platform CPX, form a complete solution. A pressure measurement module CPX measures the gas input pressure. This innovative, comprehensive monitoring solution opens up a variety of new diagnostic options.

Processes permanently in view

Festo proportional valves in combination with flow meters and pressure sensors are used to supply the mechanical seals. The valve terminal MPA monitors the gas consumption of the seals from a central location – and regulates the pressure based on the internal tank pressure. This continuous condition monitoring reduces maintenance costs. The multi-sensor control of the VPPM produces high-quality control results and robust control behaviour. The fact that the control cabinet is installed in the technical corridor instead of the reactor room saves money on explosion protection.

Functional, flexible, low-cost

The installation can now be controlled much more flexibly and easily – and with lower installation costs. Developed and supplied as a complete solution, Festo proportional valve technology also ensures that inertisation processes are more flexible and efficient in the long term.

“In each phase of the project, we felt that everyone involved was completely committed to its success. For us, this was the difference between having a supplier and having a partner.”

Boehringer Ingelheim






Festo quarter turn actuators DAPS control ball valves and butterfly valves on the reactor.



Complete solution: ready-to-install control cabinet with pneumatic automation technology saves time and costs.



New approaches to productivity: automation with superconductors

Find out more:

→ www.festo.com/en/supramotion2016



SupraMotion: levitating transportation and gripping

For 2016, Festo is presenting three new, promising concepts for using superconductor technology in industrial applications. Superconductors enable contactless transfer of carrier plates across the horizontal plane and allow them to be transported in water. They also enable the use of a levitating gripper and can move an object within an enclosed, liquid-filled tube.

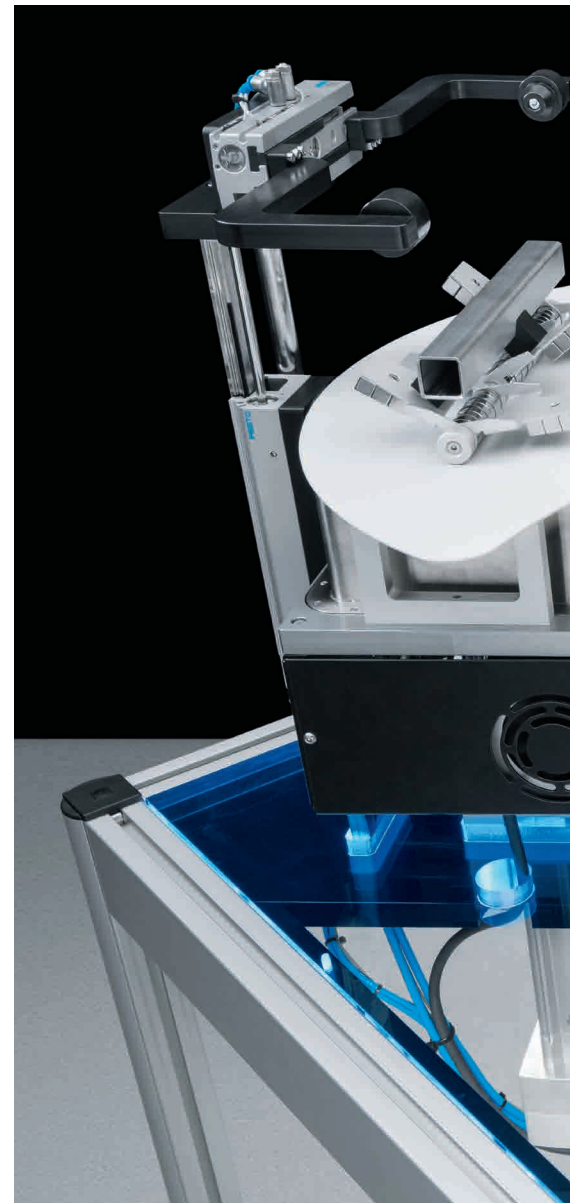
Unique properties

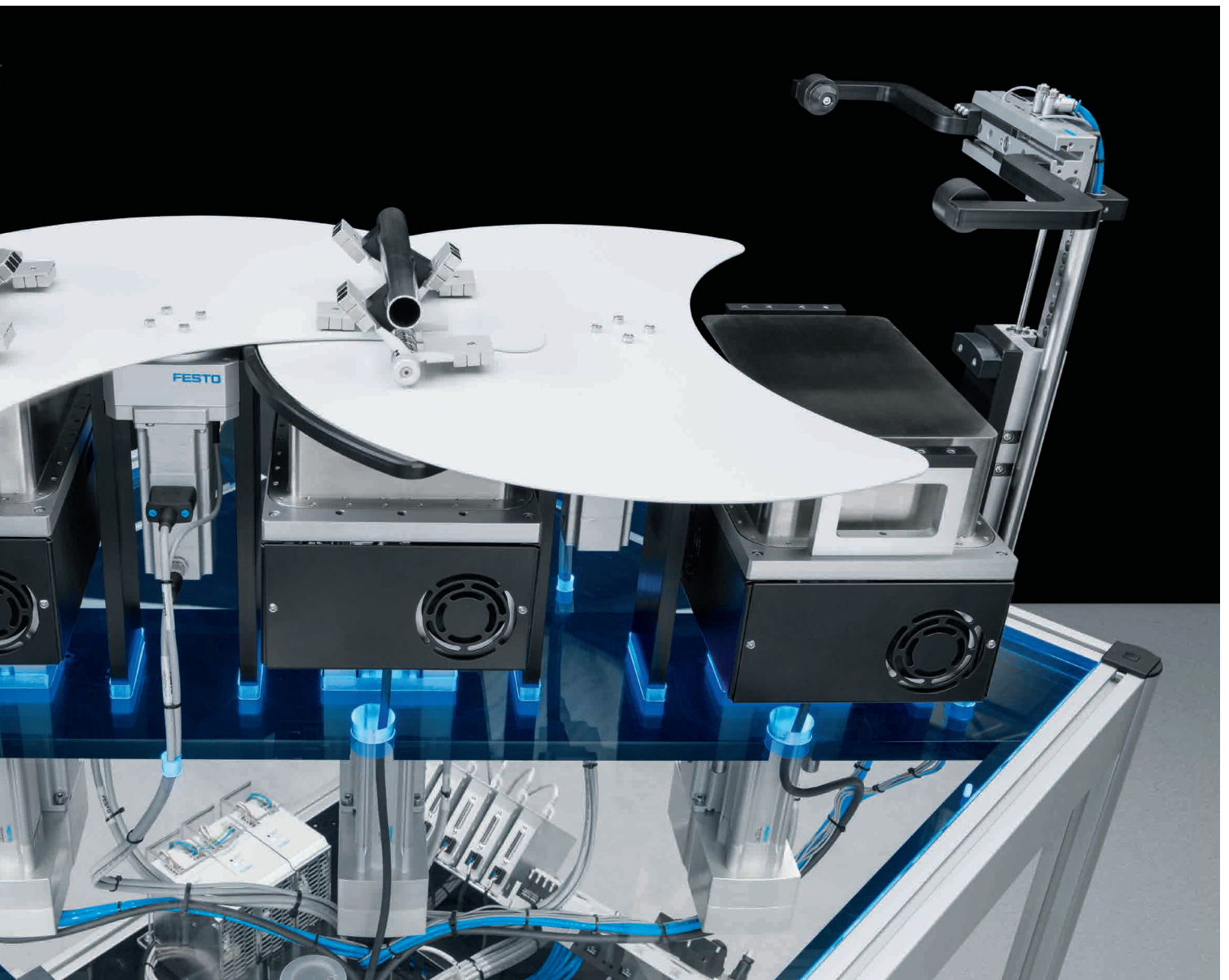
Superconductors enable a levitating motion that combines low energy consumption and efficiency – even through walls or media. Below a certain temperature, they can “freeze” the magnetic field of a permanent magnet at a specified distance and thus cause it to levitate. The resulting gap remains stable in any three-dimensional position. Objects can thus be held in position contactlessly without any control technology and be moved using only a very small amount of energy. After several years of intensive research, Festo is now meeting with partners and customers to discuss and explore their specific ideas for application.

“With superconductors, we can produce completely new forms of motion. We have now created twelve different concepts that have really inspired our customers and given them lots of ideas for new applications. We are currently working on getting the first pilot projects off the ground,” says Georg Berner, Head of Strategic Corporate Development, Festo Group Holding and Project Coordinator for the SupraMotion concepts.

Three new applications

With these three latest examples SupraMotion exhibits, Festo has once again extended the range of options that have so far been available for positioning and motion. All three applications feature electrically regulated coolers with a maximum power rating of 80 watts. “As soon as we get below the transition temperature of around -180 °C , we can precisely determine the necessary cooling temperature based on the system requirements – so if the superconductor needs to carry a higher load, for example, we can cool it down to a lower temperature,” explains Georg Berner.





Ideal for cleanrooms or working with gases, vacuums and fluids: the SupraGripper can be used to grip and transport objects which are behind a partition or located in enclosed rooms.

Fascinating movements with SoftMotion – the applications in detail

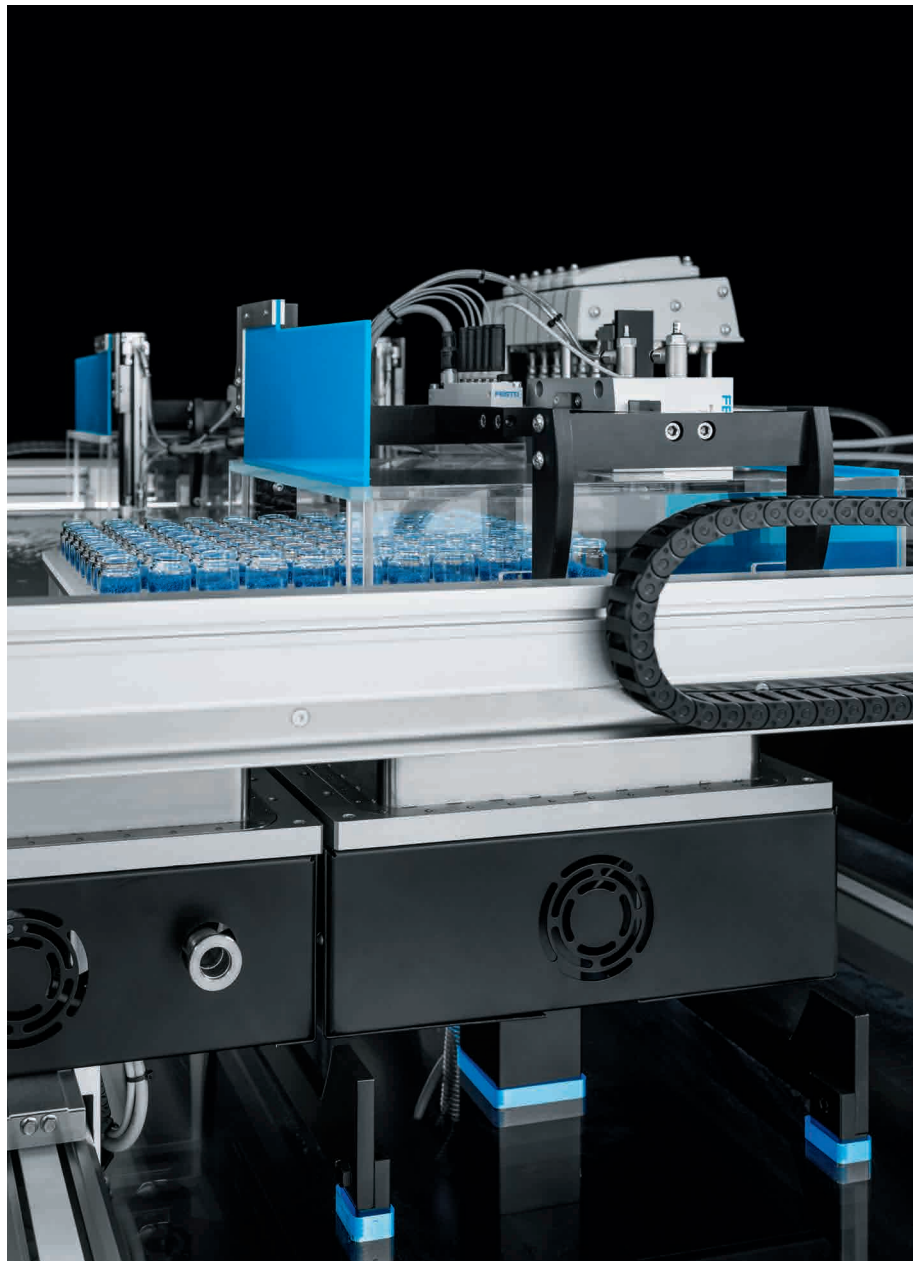
New approaches to productivity with Future Concepts for superconductivity. Festo's aim is to use them in order to expand its experience with kinetics. SupraJunction, SupraGripper and SupraTube are answering some exciting questions about linear and rotary motion as well as gripping in separate spaces.

SupraJunction: horizontal transfer of levitating carrier plates beyond system limits

SupraJunction demonstrates the contactless transport of objects across enclosed surfaces and through sluice gates. Two carrier plates levitate above the superconductors and transport small glass containers around a circuit, transferring them from one superconductor element to another on a different handling system.

An electromagnet pulls the carrier plate in the active direction of the magnetic rails to the next cryostat. Festo has thus for the first time realised automated, contactless transfer from one system to another in the horizontal plane, and is making suspended transport possible in long process chains and across system limits.

Throughout this process, the plates hover over a shallow basin of water; the carrier system and the automation technology are completely separated from one another. This prevents contamination and makes cleaning extremely easy – is ideal for applications in the packaging industry, laboratory automation, medical technology, or the food and pharmaceutical industries.



Contactless transfer of levitating carrier plates beyond system limits: SupraJunction.

With SupraTube spiral motions in a tube can be controlled from an external location.

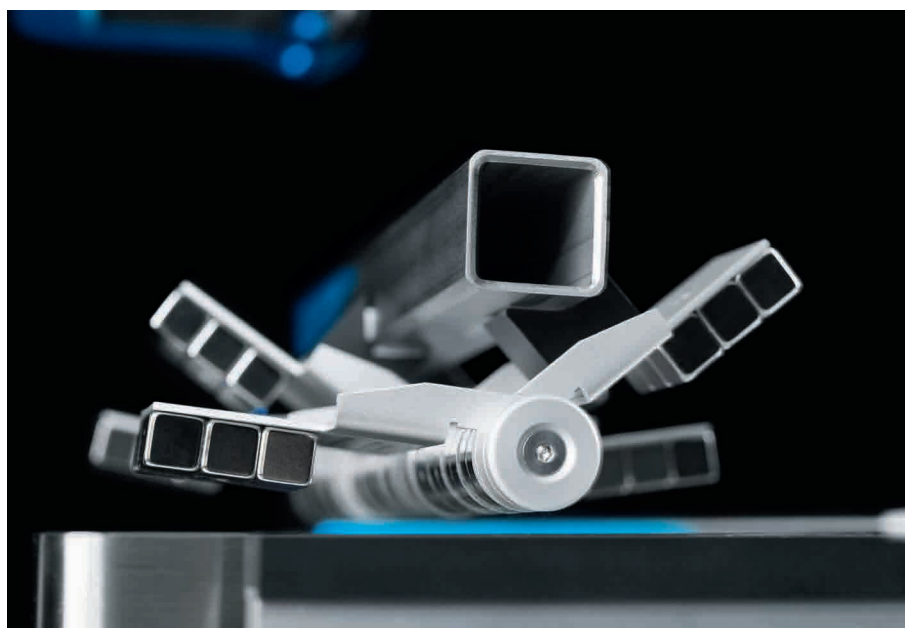


SupraGripper: mechanical gripping in separate spaces

With SupraGripper, two grippers – each with three gripper fingers – levitate freely above two semicircular plates. This technology can be used to grip and transport objects which are located in separate spaces or in enclosed rooms, for example, making it ideal for clean-rooms or work involving gases, vacuums and liquids.

The levitating effect is generated by three cryostats, which can be driven up or down. The grippers thus levitate above the plates or are placed on them. In addition, the plates can be rotated and precisely positioned so that the two grippers can be transported from one cryostat to the next.

In order to grip an object, electrical coils fitted on the cryostats emit a pulse, which either severs the stored connection to the magnetic gripper elements or restores it as required. The pulse causes the individual finger elements to fold upwards or downwards, making the grippers open or close.

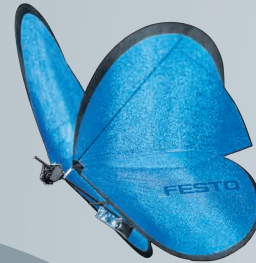


SupraTube: rotation in an enclosed tube

A round cryostat with superconductors is attached to the outside of each end of a liquid-filled glass tube. Inside the vertical tube is a magnetic puck that is virtually tethered to the two cryostats with a levitation gap of around five millimetres. A ring magnet around the cryostats is made to rotate and transfers this rotary motion to the suspended magnet. The magnet is repelled from the cryostat by an electrical pulse and drifts downwards in a spiral motion. At the lower end, it is caught by the superconductor on the other cryostat and centred. As a result, motion inside a tube can be controlled from the outside. This makes it possible to install drive units along the longitudinal axis of the tube with a superconductor magnetic coupling so that a cleaning unit can be drawn through it, entirely free of contact. It may also be possible to get hazardous substances or explosive gases in enclosed containers to make a rotary motion.

Gripping without limits: SupraGripper.

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