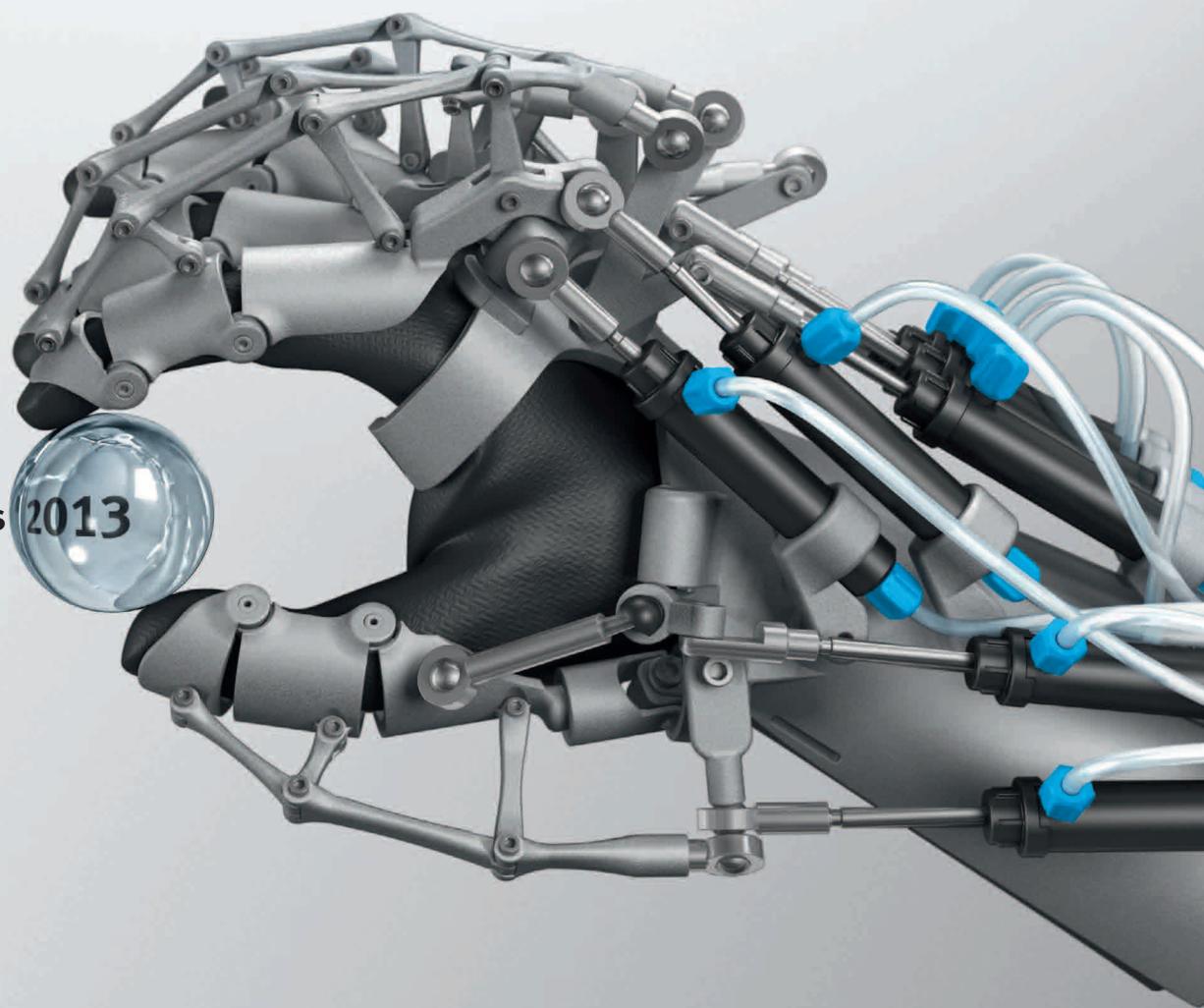
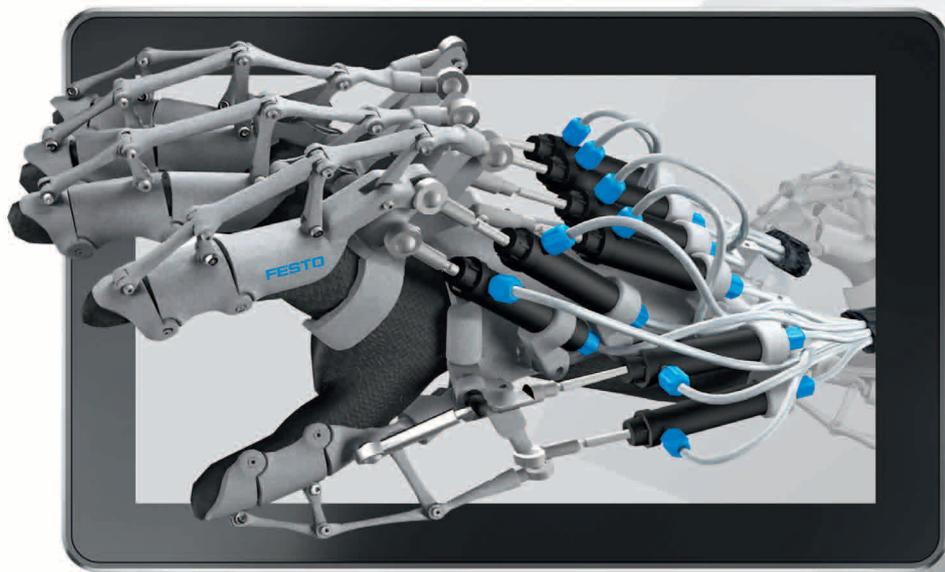


**FESTO**

Highlights **2013**







### It's so easy

Load the Festo Automation App at → [www.festo.com/app](http://www.festo.com/app). Then select the "Augmented Reality" item. If the junaio AR browser is already installed on your device, you can immediately get started and point your device's camera at the marked image. If junaio is not installed, the App Store or Google Play is started and the application is loaded from there.

Have fun discovering new worlds!



This will take you directly to the app from Festo

[ar] augmented  
[ ] reality

### See more – with augmented reality.

You will find more than just new products in our "Highlights 2013" brochure. Wherever you see this symbol, you will find more details thanks to augmented reality. This new technology provides you with additional information that is hidden in an image. To experience this augmented reality, you need a smartphone or tablet and the corresponding app from Festo.

### Try it out:

On the **title page**, you will see the ExoHand in action.



We are pneumatic.  
We are electric.  
We are 30,000 technology-neutral solutions.

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

**Dear reader,**

**What will make you even more productive?** This question is central to our thoughts and actions. In this “Highlights 2013” brochure, you will find the answers.

Each year, we apply for more than 100 patents and bring pioneering innovations to the market.

One example of our **expertise**: the combination of → **valve terminal VTUG with plug-in with installation system CTEL**. With its highly flexible design, intuitive installation and wide variety of pneumatic and electrical functions, it is ideal for simple applications.

You can also achieve additional **efficiency** with our drive solutions → **Optimised Motion Series EPCO**. Because it ensures you always have the right combination. Everything fits, nothing is oversized, and the parameterisation is child’s play. Your **safety** is also of great concern to us. With their first-class exhaust rates at low cost, the → **safety valves MS6-/9-SV-C and -E** make an important contribution to industrial safety.

If you want **simplicity** in your processes and want to streamline them, then take a look at our new → **standard cylinder DSBC**. The self-adjusting, time-saving PPS cushioning not only makes commissioning easier for you, but it also makes your processes more productive.

Let our solutions for industrial automation inspire you. Our solutions make your everyday automation work simpler and provide inspiration that increases your productivity.



Dr. Eberhard Veit,  
Chairman of the Management Board  
and Member of the Management Board,  
Technology and Market Positioning Festo AG

You will find detailed descriptions for:

- **VTUG with plug-in and CTEL** on p. 28
- **Optimised Motion Series EPCO** on p. 22
- **Safety valves MS6-/9-SV-C and -E** on p. 36
- **Standard cylinder DSBC-PPS** on p. 14



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We know you have high goals.  
We want you to achieve more.  
We show you new ways forward.

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



## Our Highlights for 2013

The industrial evolution is in full swing: processes are becoming more complex, time is becoming more precious and costs and cost structures are becoming more important. With our Highlights, we show you in black and white how Festo is effectively keeping up with this evolution.

As a driver of industrial automation, we are proud to present our contribution on the following pages. It demonstrates that, for decades, we have, together with you, our customer, taken the right direction: that of the greatest productivity.



We are a continuous flow of goods.  
We are a production accelerator.  
We are keeping your conveyor belt moving.

## → WE ARE THE ENGINEERS OF PRODUCTIVITY.

### What makes us engineers of productivity?

We have a very big goal: your productivity. Our motivation is to achieve this goal together with you. We take advantage of everything possible to make you more successful: our knowledge, our capabilities, our performance, our products and our services. We achieve this goal with four outstanding qualities for which we stand: **security, efficiency, simplicity and competency**. And this makes us what we are. Experts who don't give up. Professionals who make the working day easier for you. Technicians who always manage to get a bit more out of components and systems.

In a word, this makes us engineers of productivity.

#### Security

You are on the safe side with Festo. Whether it is about new machinery directives and their implementation or quick, professional problem-solving support, at any time and in any situation, you can always rely on our experienced, global company network. This increases not only your satisfaction, but your productivity as well.

#### Efficiency

We give our all for you – in customer support as well as for your technical solution. You have faith in the technical experts and the efficient technologies which ensure that your systems consume less material and energy. Not only are CO<sub>2</sub> emissions reduced, the operating costs of the machines and systems also fall. Above all, this increases one thing: your productivity.

#### Simplicity

Those who focus on central tasks are productive. We make it as easy as possible for you in your process chain, from selection, configuration and operation to documentation, commissioning, service and repair. Because we know your requirements, you can calmly concentrate on your core business. This saves you time and money.

#### Competency

We have experts working at Festo. Experts who know your challenges. Experts who smooth the way to greater productivity for you with dedication, technical and economical know-how and experience – and who are always nearby! These experts and their knowledge are our potential for success – for you! You will notice this from support and development to commissioning and training.

#### Productive facts & figures:

---

More than	<b>300,000</b>	industrial customers
	<b>30,000</b>	components
	<b>10,000</b>	customer-specific solutions annually
	<b>24</b>	-hour delivery service
	<b>16,000</b>	experts
On-site in	<b>176</b>	countries
	<b>250</b>	branch offices
	<b>60</b>	national companies
	<b>100</b>	patents annually
	<b>40</b>	years of Festo Didactic

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**Worldwide availability? No problem.**

Always available and absolutely reliable: we offer innovative products, solutions and services around the world. With over 250 branch offices in 176 countries, we ensure that we are always in close proximity to our customers. That is why experts from Festo can work in close cooperation with you.



We learn from nature.  
 We unite biology and technology.  
 We provide inspiration for automation.

## → WE ARE THE ENGINEERS OF PRODUCTIVITY.

### Expanded scope of action for greater efficiency.

Natural movements, perfectly imitated by technology. The force of a machine combined with human abilities. An intelligent robotic hand that learns. What sounds as if it is from a science fiction film is called “Future Concepts”. And they are anything but dreams of the future. The ExoHand from Festo improves the strength and endurance of hands. It expands the human scope of action. It can be safely manipulated from a distance. This is extremely useful, especially for medical applications and industry. And it is one of the results of the 20-year history of the Bionic Learning Network at Festo.

### A practical system that lends a hand.

There are still many tiring tasks to be carried out in assembly. These can quickly become a daily challenge for older workers. The ExoHand is there to help. It provides force support and thereby prevents injury. And it can do much more. In the growing market for service robots, this system with its eight pneumatic actuators offers exactly what is needed: precise movements and thus extreme efficiency. It comprises Festo components that are already produced in large quantities and are available at low cost.

### Force feedback for precision and safety.

With the ExoHand, complex tasks can be performed from a large distance. And they can be performed extremely accurately: as a force feedback system, it is both a user interface and a robotic hand. This means that the forces can be transmitted to the hand in such a way that the user has the sensation of feeling the shape. Thus, the human sense of touch can be used even over long distances and at the interface between the real and virtual worlds. The benefit to medicine and industry is immense – from surgical procedures over thousands of kilometres to the safe handling of hazardous substances. And that is just the beginning ...

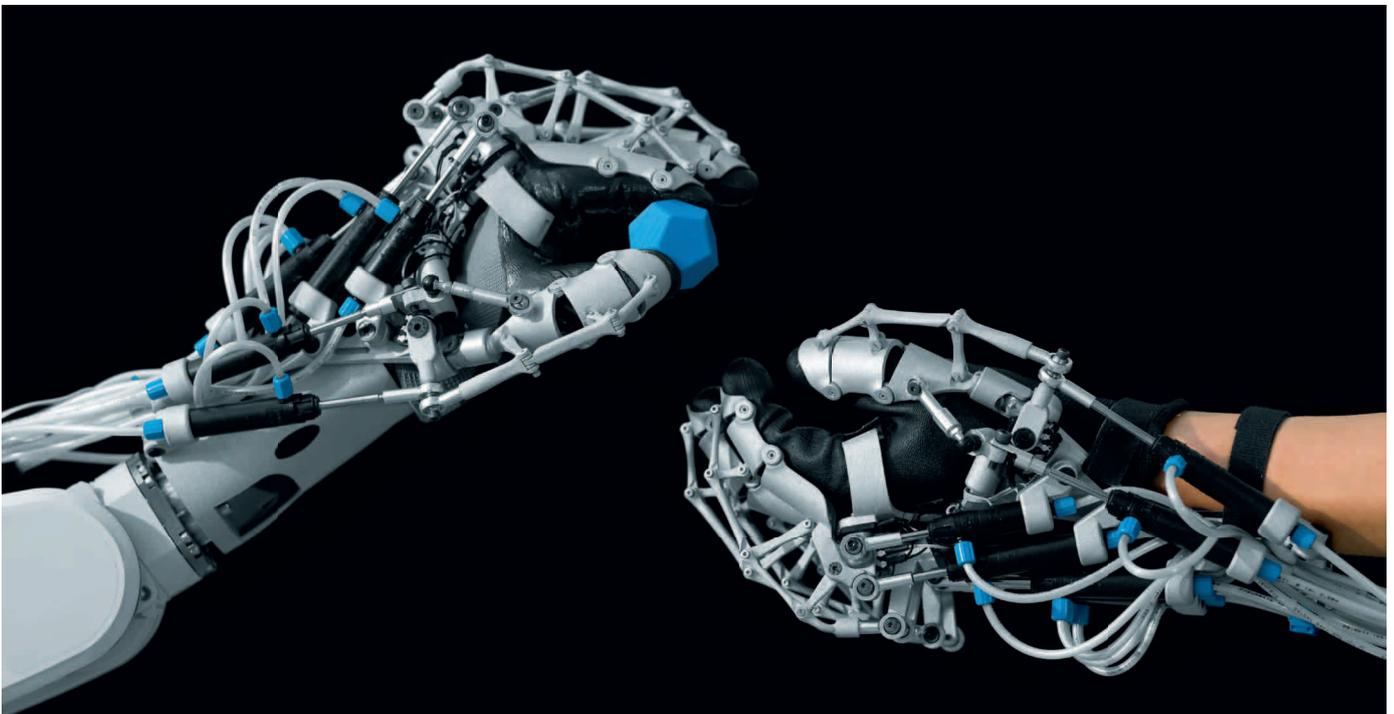
### Nothing is as efficient as nature.

Festo therefore founded the Bionic Learning Network – a research network with universities, institutes and development companies. The goal is to create innovative prototypes and products by applying biological principles to technology. Automated motion sequences can thus be made even more energy-efficient and productive – with completely new solutions for practical problems. The focus is on three goals:

- The biomechatronic footprint for applying natural efficiency strategies to automation technology
- New technologies and manufacturing methods as an inspiration for customer innovations
- Development of energy-efficient and biomechatronic products to the production stage

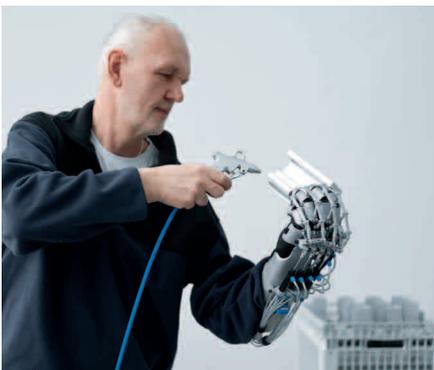
For detailed information and the results of our bionic projects, see

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



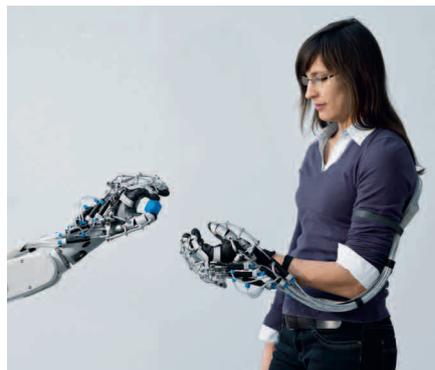
#### **Sensitive and with the ability to learn**

With the teaching function, the ExoHand learns to grip fragile products with exactly the right amount of force – again and again.



#### **Very powerful**

Pneumatic actuators provide enhanced holding forces, which protect against fatigue especially during monotonous movements.



#### **Force feedback**

Feeling and moving without direct contact. Nevertheless, all finger joints are precisely positioned.



#### **Festo technology used in bionics**

The CODESYS controller with compact valve terminal MPA-L together with integrated controller CPX-CEC and I/O modules are part of the ExoHand.

# Clever cushioning – saves adjustment time: greater productivity made by Festo

## Superior technology, long service life

Its unique features make the DSBC a technically superior cylinder with extremely low wear.

- Quick in operation because there is no need to adjust the cushioning
- Perfectly adjusted cushioning at all times, even with changing loads
- Virtually without shock, a relief for man and machine
- Cushioning is always the same for identical requirements
- No adjustment = no incorrect adjustment: reduces the error rate
- Easy installation, easy replacement
- Ideal for inaccessible locations
- Inexpensive and cost-saving

### ■ Self-adjusting cushioning PPS

Saves time and money, protects the material

### ■ Weight-optimised design

Optimal for use on moving components and machines

### ■ Fits every time!

Uniform accessories

### ■ Range of variants

For example, for dynamic movements or constant slow travel

## Variable application

Many piston rod variants in the modular system

## Grease-free operation possible

Unlubricated operation thanks to seal variant A3

## Large modular sealing system

Seals and scraper rings for all individual requirements and protection against contamination



[ar] augmented reality



Innovations for more productivity: the new standard cylinder DSBC with the unique self-adjusting pneumatic end-position cushioning PPS adapts perfectly to changes in load and speed. As a result, you gain time and flexibility and your process reliability increases. Another plus: the large modular system for all requirements.



**Well placed sensor slots**  
Connections and settings on one side

**Powerful 3K piston**  
Higher cushioning energy in the end position

#### Everything from a single source

Optimally harmonised, correctly dimensioned, quickly installed and with reduced complexity in the entire supply chain: the advantages when everything comes from a single source.

Then your perfect pneumatic solution looks like this:

- Standard cylinder DSBC with the unique PPS cushioning
- Proximity sensor SMT-8M-A from the modular system p. 44
- Small, extremely high-performance valves VUVG p. 33
- QS fittings
- Flow sensor SFAM-90 p. 44
- Tubing according to special requirements, standard, heat resistant, hydrolysis resistant...
- One-way flow control valves VFOF or GRLSA with scale p. 39 and 40

### Standard cylinder DSBC to ISO 15552



#### **Clever cushioning – saves adjustment time!**

The DSBC with the self-adjusting pneumatic end-position cushioning PPS adapts perfectly to changes in load and speed. As a result, you gain time and flexibility and your process reliability increases. Its many variants, its adaptation to ambient conditions and the individual design make it flexible. The DSBC: economical, convenient and reliable.

- High process reliability
- Extremely low wear
- Time-saving installation
- Very easy product selection
- Switching from DNC and DNCB is trouble-free
- Many variants: unrivalled number of features and combinations of features in standard series
- PPS variant with time-saving, self-adjusting pneumatic cushioning

### Standard cylinder with tie rods DSBG to ISO 15552



#### **Powerful, economical and designed for a long life: DSBG.**

This member of the DSBx series has some brilliant technical highlights to offer: the DSBG is self-adjusting thanks to the unique PPS cushioning. Because of the 3-K piston, it has almost 5 times the cushioning energy in the end position and is quieter than its predecessor DNG. With the modular seal and scraper ring system, the DSBG can be adapted to most environmental conditions.

- Available in sizes 32 ... 125
- Extensive range of variants
- PPS variant with time-saving, self-adjusting pneumatic cushioning
- Variant with unlubricated operation has longer service life than competitive products
- 3D configurator for simple product selection
- Trouble-free switch from DNG to DSBG

### Standard cylinder DDPC to ISO 15552



#### **Accelerates and brakes high masses and speeds in a controlled manner.**

Ideal for servopneumatic positioning with an accuracy of up to 0.2 mm. This is ensured by the integrated non-contacting displacement encoder of the robust, simple and compact piston rod drive DDPC in combination with Soft Stop. The measuring head is in the bearing cap, and the strain gauge is in the piston rod.

- No interfering external attachments
- Long life thanks to wear-resistant displacement encoder and IP65
- Extremely simple installation and assembly
- Optional: clamping unit and guide unit
- DDPC in sizes 80 and 100
- Also available in sizes 32, 40, 50, 63 as standard cylinder DNCI

Rodless drives DGC  
Compact drive DGC-K

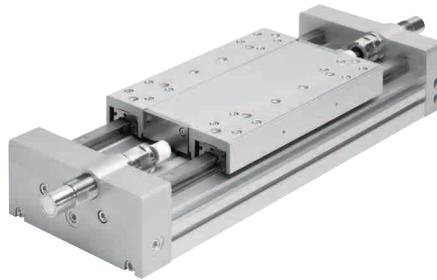


**The most compact in its class:  
DGC-K without external guide!**

Ideal for simple drive functions when installation space is limited: it is significantly more compact than the DGC-G – with strokes up to 8500 mm! The reliable DGC sealing band increases its reliability and significantly reduces leakage. And it is fully interchangeable with its predecessor model DGP.

- Significantly more compact than the DGC-G
- Very low moving dead weight
- Fully interchangeable with the DGP
- Sizes  $\varnothing$  18 ...  $\varnothing$  80 mm
- Safe: ATEX certification EX2 and EX3
- NSF-H1 grease as an option for use in the food and beverage industry

Rodless drives DGC  
Heavy-duty guide DGC-HD

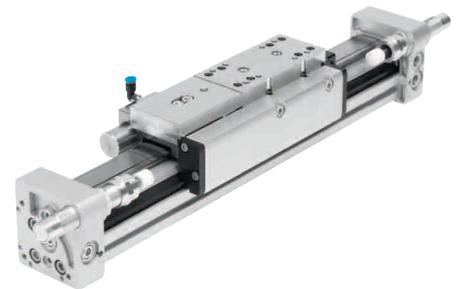


**Excels at palletising, loading and unloading,  
transporting and pushing.**

The pneumatic rodless drive DGC-HD can really flex its muscles whenever there are high loads and torques. Suitable for applications in general and special machine building, the food and beverage industry and packaging and materials handling.

- Powerful: two recirculating ball bearing guides in an integrated profile
- Convenient: external design and mounting points are identical to the EGC-HD
- Guide with reduced noise
- Long relubrication intervals
- Long service life
- Value for money
- Easy assembly and installation
- ATEX certification EX2

Rodless drives DGC/DGCI  
with clamping unit/1HPN



**Clamping unit 1HPN holds the position and  
provides safety at work.**

For safety-oriented applications with mechanical hazards, e.g. crushing and impacts, or as a drop guard for vertical axes. The pneumatically controlled clamping unit is also ideal when a DGC/DGCI must be held in a particular position. The clamping unit clamps directly onto the guide rail.

- Part of the DGC and DGCI modular system
- Diameter 25, 32, 40 and 50
- Strokes up to max. 8 m
- Mechanically locked, pneumatically unlocked
- Long service life
- Low operating costs
- Easy assembly and installation
- Any mounting position

## Parallel gripper DHPS



### Perfect when you need a powerful grip in a tight space.

Slim, precise and powerful: the design of the new standard parallel gripper allows it to be used as an external or internal gripper. It really stands out with its high load bearing, very precise T-slot guide and the high gripping force of the gripper jaws. No interfering contours – minimal space required.

- Single- and double-acting
- Gripping force backup and support
- Gripper jaw centring options
- Max opening stroke 25 mm

## Three-point gripper DHDS



### Make the standard your benchmark: DHDS.

Its small size and minimal space requirements provide a stark contrast to its high gripping force. It includes the high load bearing T-slot guide for precise gripping movement and the sturdy lever actuator for a long service life and a high level of process reliability. Suitable for internal and external gripping.

- Max. gripping diameter 50 mm
- Gripping force of up to 840 N
- Single- and double-acting
- Gripping force backup and support

## Radial gripper DHRS, angle gripper DHWS



### More grip on the production line!

Slim, powerful and with great repetition accuracy, just like its cousins. Suitable for situations where space is limited. Another plus: the DHRS has lateral gripper jaw support for high torques, while the link guided DHWS has optimised gripper jaw bearings with synchronised jaw movement.

- Single- and double-acting
- Gripping force backup and support
- Self-centring gripper jaws with additional centring option
- Total opening angle DHRS 180°, DHWS 40°

## Swivel modules DSM



### **Robust, precise, powerful: continuous swivelling up to 270°.**

The members of the DSM family tackle any swivelling task reliably and without trouble. New: the small semi-rotary drives DSM-T with tandem vanes for double the torque up to 80 Nm in sizes 6, 8 and 10. The heavy-duty version has up to 8 times the capacity of the standard version.

- Safely swivel heavy loads, even in small installation spaces
- Flexibly and easily adaptable thanks to continuous adjustment
- Extremely precise thanks to adjustable cushioning with fixed stop
- Excellent repetition accuracy over its complete service life

## Semi-rotary drive DRRD



### **Excellent performance at a small price: the new semi-rotary drive DRRD.**

The optimised design of the housing and the piston drive gives the DRRD its high load capacity and extreme precision. Thanks to its stability and the outstanding maximum mass moment of inertia, a smaller size can often be selected.

- Compact dimensions
- Precise positioning even with a long lever arm
- Space-saving internal or external cushioning options for maximum torque in the end position
- Optionally for size 16 and above: end-position locking and completely sealed variant

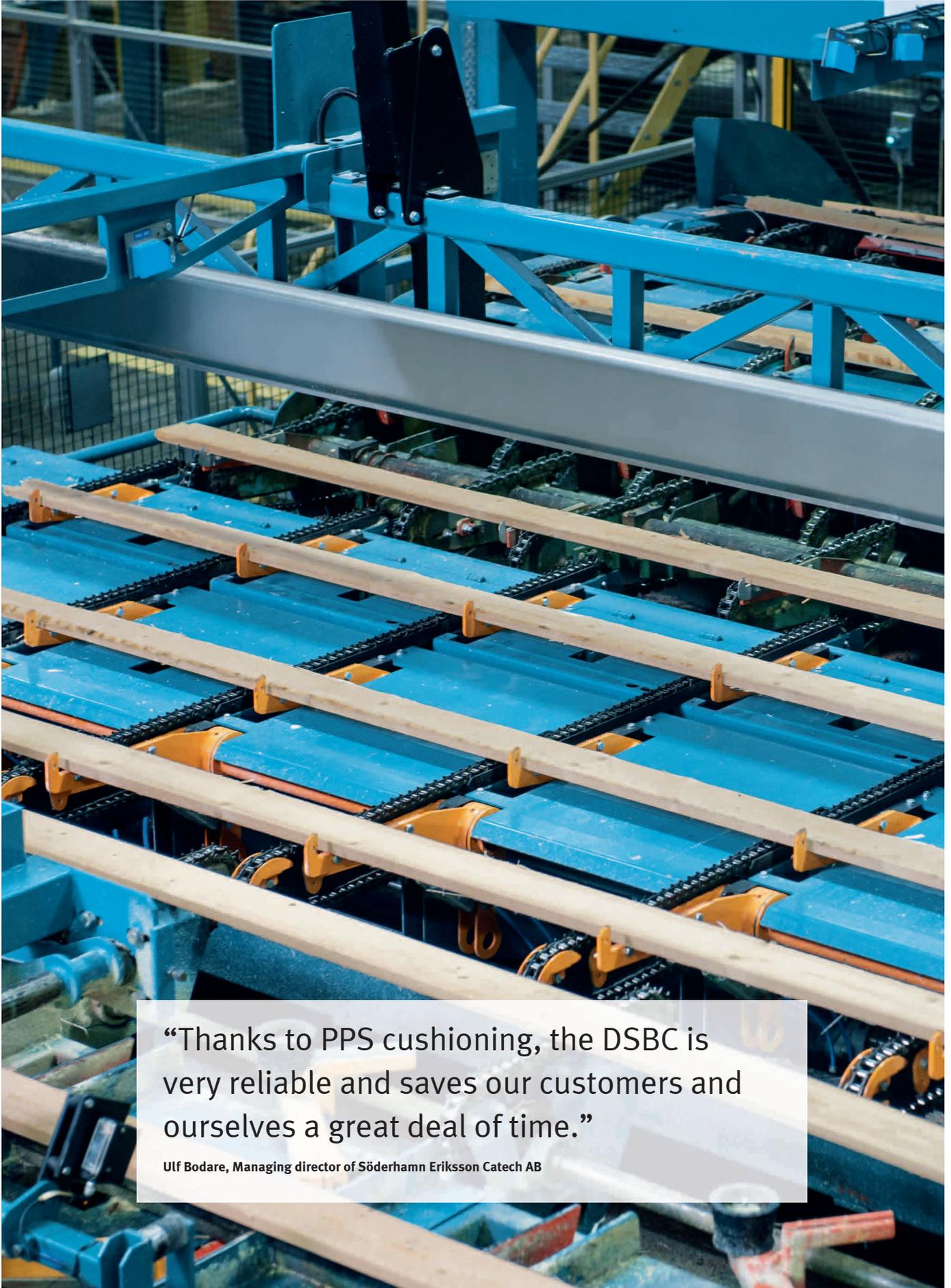
## Intermediate position module DADM-EP for mini slide DGSL



### **DGSL – the outstanding slide series.**

Unique in its precision, load capacity, compactness and installation. New: intermediate position module with through-travel DADM-EP – freely positionable along the entire stroke range, including precision adjustment for high accuracy when moving to the intermediate position. Expanded with shock absorber and retainer on the DGSL for greater flexibility, even under high loads.

- For DGSL 10 to 25
- Stroke direction can be selected without modifying the module
- Additional safety thanks to optional position sensing directly on the module
- Symmetric design with mounting and air connections on the side



“Thanks to PPS cushioning, the DSBC is very reliable and saves our customers and ourselves a great deal of time.”

Ulf Bodare, Managing director of Söderhamn Eriksson Catech AB

# Always correctly adjusted: DSBC-PPS

The sawing machines from Söderhamn Eriksson Catech AB in Sweden process up to 75 boards per minute. They scan the boards at high speed to check that they are optimally positioned, thereby keeping waste to a minimum. At the same time, they inspect board quality. A central element of the machine is the standard cylinder DSBC with PPS cushioning.



Fast, and no readjustment: the unique, self-adjusting PPS cushioning for standard cylinders DSBC always moves the board stopper arms into the right position.

## High-tech for top quality

The complete high-tech package for these high-performance edgers includes valuable optical and sensor technology with measuring heads. These are responsible for the quick inspection, positioning and quality control process. Profile lasers scan the wood during machining in order to ensure that the quality specifications stipulated by the sawmills are strictly adhered to. Boards with too many or excessively large knotholes are not released for sale.

## Impressive in harsh environments: standard cylinder DSBC

The standard cylinders DSBC, installed at numerous locations on the edger, prove their worth in the extremely dusty environment, above all for controlling the movable arms. They forward the boards for processing, stop them or eject the rejects from the belt.

## Less work, more productivity with PPS cushioning

The Swedish company decided quickly in favour of the DSBC. The reason: its self-adjusting pneumatic PPS cushioning,

which eliminates the need to adjust the end-position cushioning. The mechanics no longer have to reach for their screwdriver. "PPS cushioning speeds up our production process because it always adjusts itself perfectly," says Ulf Bodare, Managing director of Söderhamn Eriksson Catech AB. "And it saves our customers time because readjustment of the numerous cylinders, which frequently used to be required, is no longer necessary. Beyond this, it's simple and the price is right."

The self-adjusting cushioning always reacts perfectly, resulting in less shock. This increases the service life of the cylinders because of lower wear – and also keeps noise levels under control. And the planning effort in selecting the right cylinder is reduced since there is no need to think about the right cushioning.

PPS cushioning: ideal – not only in the wood processing industry. Find out more here: [→ www.festo.com/pps](https://www.festo.com/pps)

Learn about DSBC technology in detail here: [→ www.festo.com/dsbc](https://www.festo.com/dsbc)

# A complete system: Optimised Motion Series

## Data from the parameter cloud!

Controller-specific IP address for downloading data from the Festo parameter cloud via the Internet and the server



[ar] augmented reality



- **Configuration with**
  - Web-Config in the Optimised Motion Series system or
  - FCT software – Festo Configuration Tool for fast, limitless flexibility

- **Cables for power supply (load) and encoder**
  - Pre-assembled, up to 10 m long
  - Suitable for use with energy chains
  - IP54 connection technology at the motor

Why make things more difficult than they need be? Our Optimised Motion Series with EPCO makes your life easier. You only have to select the required size, and you get a positioning package in which everything fits. As a complete system.

It consists of the electric cylinder EPCO including motor, pre-assembled cables suitable for use with energy chains and the ServoLite controller CMMO-ST.

#### 1 order code = 1 system

It doesn't get any more convenient than that: just enter the order code and you receive the complete drive package precisely where you want to install it. As a result, the workload in your purchasing department is reduced, warehousing and logistics are simplified and you save time, because the individual parts no longer have to be assembled – ideal for more than just series machine building.

#### Simpler and easier than ever before.

Very simple and quick configuration with Web-Config and the parameter cloud on the server. Predefined, tested combinations are included in the catalogue with all of the necessary data or can be found using PositioningDrives. You're finished in no time flat and travel is possible to as many as 7 freely definable positions.

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



#### ■ Electric cylinder EPCO

- 3 sizes: 16, 25 and 40
- Feed force: max. 650 N
- Speed: up to 500 mm/s
- Protection class: IP40

#### ■ CleanLook with smooth surfaces

- Minimum susceptibility to contamination
- Easy to clean

#### ■ Motor connection with IP54 rating

- Short, compact design
- Freely selectable outlet direction for motor cables: 4 x 90°
- Standard outlet: up

#### ■ Encoder connection

For closed-loop operation (ServoLite)

## Electric cylinder ESBF



### Fast, precise, powerful: free positioning with the ESBF.

The powerhouse with ball screw drive boasts maximum feed forces up to 17 kN, is extremely precise and is fast at up to 1.35 m/s. So the big brother of the DNCE can handle any positioning tasks, whether in the automotive industry, in assembly and packaging technology or for pressing in, clamping, gripping and cutting.

- CleanLook with smooth surfaces
- Non-rotating piston rod with plain bearing guide
- Optional: IP65, high corrosion protection or FDA-approved lubricating grease for the food and beverage industry
- Flexible motor attachment, many variants for assembly

## Electric cylinder DNCE



### Always flexible for positioning and adjusting tasks.

All three sizes of this electric cylinder with piston rod and with lead screw or ball screw are now optimally equipped for harsh environments thanks to high protection class IP65 for the recirculating ball spindle, increased corrosion protection and new, food-approved lubrication.

- IP65 for dusty and wet environments, with connection for the “venting hole” for pressure compensation and suitably sealed motor mounting kits
- Ideal in combination with optional bellows, which protects the piston rod, seal, and bearing

## Electric cylinder EPCO



### With EPCO, you always get the right combination.

EPCO with ball screw drive and the permanently attached, optimally adapted motor is a completely assembled unit. Its end-position cushioning makes it very quiet and reduces the impact energy during homing.

As part of the Optimised Motion Series, the EPCO with its permanently attached motor can be easily expanded with pre-assembled cables suitable for use with energy chains and with stepper motor controller CMMO-ST. Easy to configure and to order appropriately by means of type code. Quickly parameterised for simple positioning tasks with Web-Config and web server/browser concept.

- Fully assembled, perfectly harmonised
- 2 operating modes
  - ServoLite: closed-loop operation with optional encoder
  - Cost-optimised: open-loop operation without encoder
- 4 possible motor positions
- Many mounting and assembly options
- Easy cleaning thanks to CleanLook

## Motor controller CMMO-ST



### **ServoLite: a closed-loop servo controller as a position controller for stepper motors.**

Includes smooth running motor, monitored safe positions and low heat generation. Supports Safe Torque Off (STO) for Performance Level e (PL e).

In combination with the cylinder EPCO with permanently attached motor and pre-assembled cables, the CMMO-ST can be expanded into an Optimised Motion Series package. Easy to configure and to order appropriately by means of type code. Quickly parameterised for simple positioning tasks with Web-Config and web server/browser concept.

- 2 parameterisations
  - Integrated web server for up to 7 freely programmable positions
  - Festo Configuration Tool FCT for up to 31 motion steps with free setting of acceleration, speed, etc.
- “ServoLite operation” (closed loop) without step losses

## Motor controller CMMP-AS..M3



### **Do you have demanding tasks? No problem!**

In addition to classic positioning tasks, this premium servo controller also masters demanding path interpolations, electrical curve control and master-slave synchronisation of the “flying saw” type. And it is ideal for clamping and press-fitting processes thanks to enhanced torque control.

- For all servo motors EMMS-AS
- Optimised controller for greater precision
- Higher peak currents
- Optional: Performance Level e (PL e) and parameterisable Safe Motion
- On-board Ethernet for parameterisation and diagnostics
- SD memory card – start again immediately when replacing devices

## Safety system CMGA

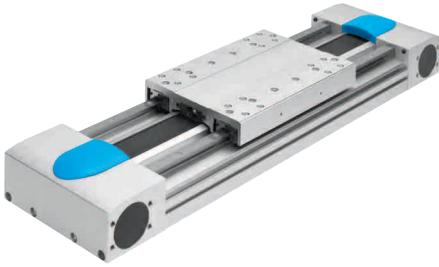


### **Simple or complex safety solutions – the compact CMGA can do both.**

Mostly used as an individual component, e.g. for Safe Operating Stop (SOS), Safely Limited Speed (SLS), Safely Limited Position (SLP) or Safe Direction (SDI). The large range of functions is certified according to EN 61800-5-2. Pre-configured modules for drive monitoring are included.

- Suitable for Performance Level e (PL e)
- For one- or two-channel safety requirements such as emergency stop
- Easy to adapt to system requirements
- For up to 65 safe I/Os
- Freely configurable for complex solutions

## Toothed belt and spindle axes EGC-HD



### The powerhouse in the EGC range of axes.

With a double guide for extremely high lateral forces and torques, the heavy-duty version has twice the load capacity of the standard axis. Specially developed profiles provide maximum rigidity and load capacity. As a toothed belt drive (TB) or spindle drive (BS), it is ideal for handling systems and cantilever systems.

- Less installation space, easier commissioning, lower costs than dual axes
- Freely selectable motor connection with EGC-HD-TB on 4 sides
- Subsequent conversion possible at any time
- Axis/motor/motor controller ideally dimensioned with PositioningDrives

## Toothed belt and spindle axes EGC Measuring and clamping units



### EGC now offers you maximised safety.

With new safety elements for creating a safety-oriented handling axis. The linear measurement system directly monitors the position of the axis slide. The 1- or 2-channel clamping unit acts directly on the guide rail of the axis. Together with safety system CMGA, this forms a complete safety solution.

- Detects all drive train elasticity with absolute accuracy
- Optimally corrects inaccuracies
- Optional 1- or 2-channel clamping unit for holding function or as a drop guard
- Clamping unit can be used with all sizes (80, 120 and 185) and as an emergency brake with sizes 120 and 185

## Electric toothed belt axis with roller bearing guide ELGA-TB-RF



### Sturdy and very fast:

#### ELGA-TB as a perfect extension of the EGC.

For simple positioning and handling tasks or as a drive axis for applications with an external guide: ELGA-TB-G with plain-bearing guide. Thanks to its roller bearing guide and high feed forces, ELGA-TB-RF is optimised for highly dynamic handling, even of large workpieces.

- Flexible motor connection at 4 positions, can be changed at a later date
- Protective cover strip made of stainless steel
- Easy to configure and commission with PositioningDrives and the Festo Configuration Tool (FCT)



reddot design award  
honourable mention 2011

Saarländischer  
Staatspreis für Design 2011  
Preis

# High-speed production and inspection of relays

“The parallel kinematics of the Tripod requires less space and design effort than a gantry handling unit and is faster than a SCARA,” says Gerd Ulmer, General Manager of G. Ulmer Automation GmbH, summarising the advantages of the new handling system. He just installed two of them in an assembly system for automotive suppliers.



Highly dynamic thanks to the low moving mass, very rigid thanks to the pyramid-shaped, closed structure and more easily accessible than a Cartesian handling system or a SCARA robot: the parallel kinematics of the Tripod.

In the assembly of safety relays for diesel engines, two delta robots equip the plastic main body of the relays with seven to nine contacts. The system comprises 24 stations. For better quality, the parts have to be manufactured on a fully automatic system with automatic inspection stations.

## Quality conscious

The system is studded with stations for inspecting component parts, performing continuity tests and high-voltage tests, monitoring the dosing of soldering paste, monitoring temperature and measuring the installed contacts. “The inspection stations are an essential part of the assembly cells where four cameras are integrated,” says Ulmer.

After just 90 seconds, the relays have passed through all 24 assembly stations and the relay housings are fully assembled and inspected – including coating – and printed with the current production date. “Strictly

speaking, there are four finished modules every 30 seconds,” explains Ulmer.

## Flexible and easy to teach

The system processes about one million relays per year. The easy programming of the kinematics using the Festo Configuration Tool FCT is a huge benefit: “The intuitive programming has helped us greatly to make quick changes to the functional sequence and the installation position.”

## Tripod high-speed system with CMXR

The low moving mass and the high rigidity make the handling highly dynamic. The Tripod is controlled by robotic controller CMXR. The controller can spatially position tools and grippers, ensuring they are always on the programmed path.

“With our shift operation, we manufacture about one million relays per year in three variants – the parallel kinematics contributes significantly to that.”

Gerd Ulmer,  
General Manager of G. Ulmer  
Automation GmbH

How does parallel kinematics work? And how can it make your company more productive? Click here to find the answers:

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

# Innovative technology for greater performance and more functions

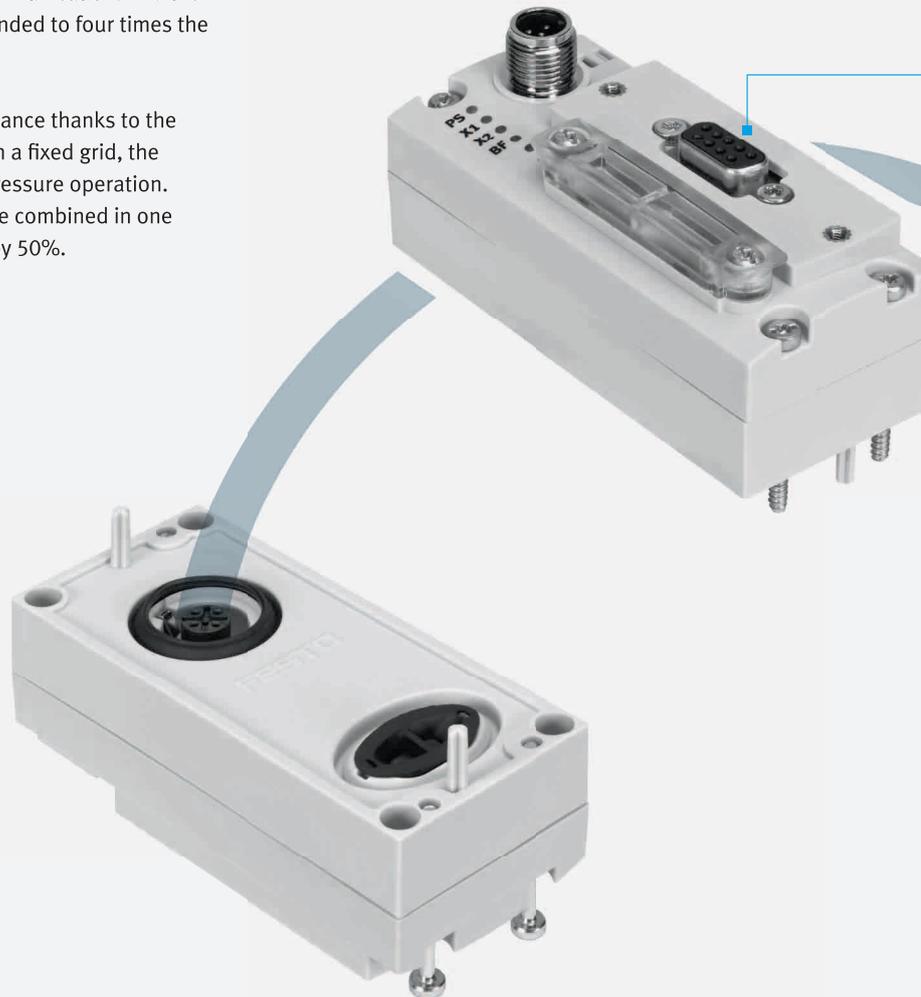
VTUG with plug-in is the perfect valve terminal for universal use. It is simple, but has an unbelievable number of electrical and pneumatic options. It is ideal when combined with the installation system CTEL, which makes valve terminals fieldbus compatible at a low cost – and in a smart and intuitive manner.

The electrical connections are highly modular. From multi-pin to all common fieldbuses and IO-Link, VTUG with plug-in can be converted in just seconds – even at a later date! The installation system CTEL also makes the VTUG with plug-in extremely versatile when it comes to communication. And the installation system CTEL can be cost-effectively expanded to four times the communication capacity.

This combination also offers high pneumatic performance thanks to the patented cartridge principle, the 24 valve positions in a fixed grid, the pressure zones and the simultaneous vacuum and pressure operation. With the 2x3/2-way valves, two functions can even be combined in one valve position, which reduces the number of valves by 50%.

#### Pneumatic highlights at a glance:

- Up to 24 valve positions in a fixed grid
- 2 sizes
- Vacuum and pressure on one valve terminal
- Several different pressure zones on one valve terminal
- 2x3/2-way valves for two functions in one valve position – at the same time!
- Patented cartridge principle for maximum quality and sturdiness



Simple applications deserve simple, cutting-edge solutions. Do you agree? Then why not purchase pneumatic and electrical components from a single source? For example, the cost-optimised valve terminals VTUG with plug-in and the installation system CTEL.

Switch easily and quickly depending on the fieldbus – ideal for OEMs



**Installation system CTEL**  
**Basic installation:**

- Fieldbus node CTEU
- Electric communication interface I-Port



**Installation expansion:**

- Adapter CAPC for expansion to include digital inputs and additional valve terminals
- Input module CTSL
- Connecting cable NEBU



**Various manual overrides:**  
Non-detenting, non-detenting/detenting, covered

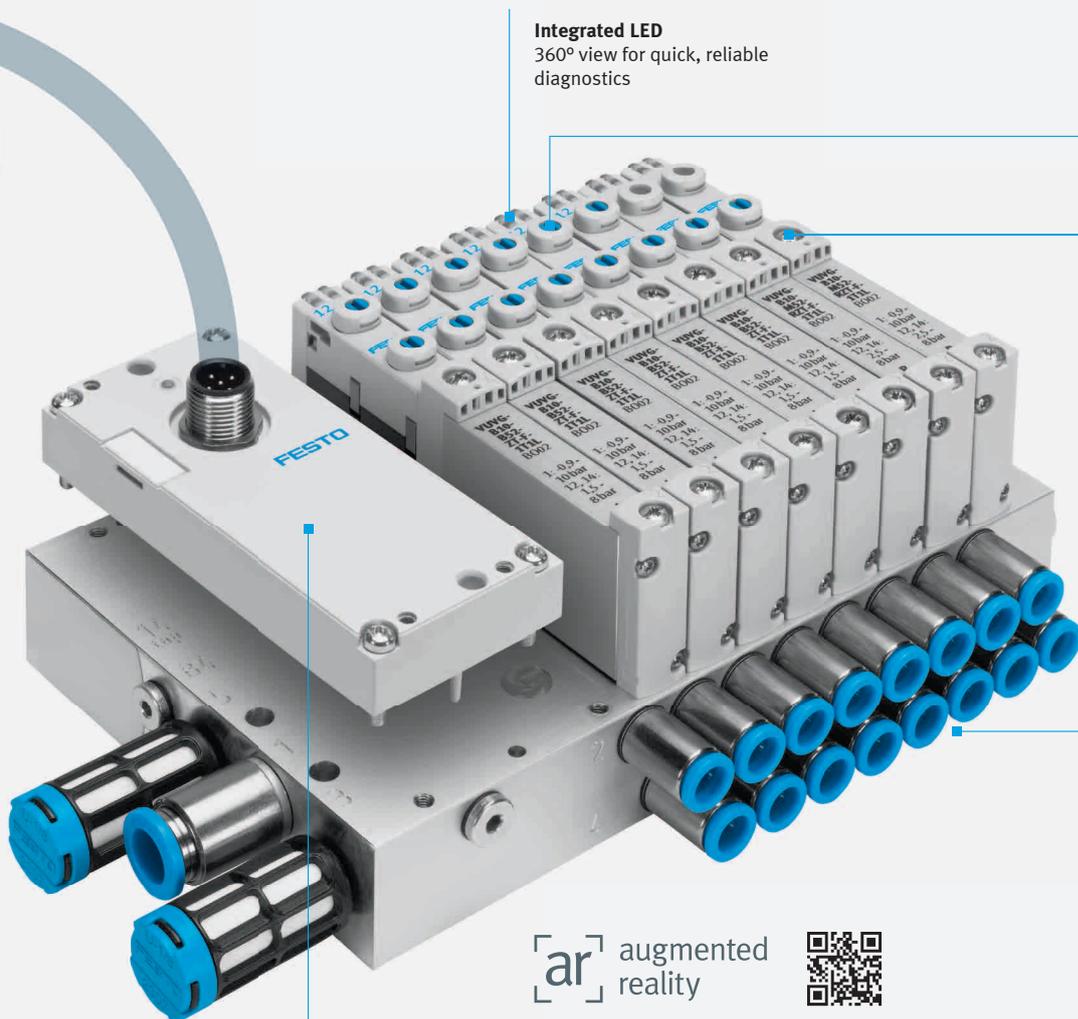
**Inscription label holder**  
for reliable identification at a glance. Each valve is individually labelled.

**Captive**  
screws and seals

**Freely selectable**  
The sizes of the QS fittings can be selected individually, per valve position!

**I-Port connection**  
The Festo-standardised communication interface – simply screw it on:  
• For all common fieldbuses  
• For IO-Link

**Integrated LED**  
360° view for quick, reliable diagnostics



[ar] augmented reality



Electrical terminal CPX  
Control cabinet expansions



**Gets your control cabinet in shape.  
And makes it more cost-effective.**

New: system expansions in a second row. For large installations, the CPX electrical system can be divided into two rows – with only one fieldbus node. This saves space, reduces costs by approx. 30% and increases flexibility. Also for used in the field with IP65.

**New I/O modules CPX-L:**

Simple and very inexpensive modules optimised for control cabinets, with a large number of channels in IP20 and with unique triple wiring.

- Major advantages for you: CPX-L as an IP20 remote I/O with harmonised valve terminals from Festo
- CPX-L-16DE-16-KL-3POL: 16 digital inputs, CPX-L-8DE-8DA-16KL-3POL: 8 digital inputs and outputs
- Diagnostics: short circuit/overload per module, undervoltage outputs

Electrical terminal CPX  
CPX-CTEL as master for  
installation system CTEL

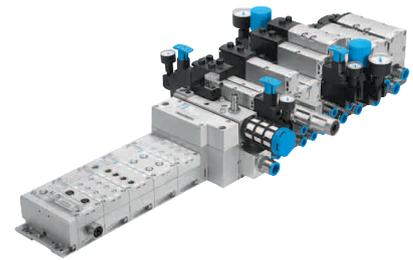


**The master for an economical and  
productive electro-pneumatic control chain!**

CPX-CTEL with four M12 connections can be integrated multiple times on a CPX terminal. Up to 4 I-Port participants can be connected per module. The extremely versatile I-Port communication interface from Festo cost-effectively integrates intelligent decentralised participants into an automation environment via autoconfiguration.

- Inexpensive: fieldbus connection at the price of multi-pin interfaces
- Perfectly configurable, extremely economical
- Standardised M12 connections reduce cost, installation time and logistics complexity
- Good diagnostic capability increases availability
- Range of I-Port participants is continually expanded

Valve terminals VTSA/VTSA-F  
Valve expansions



**Did you expect our champion to get even  
better?**

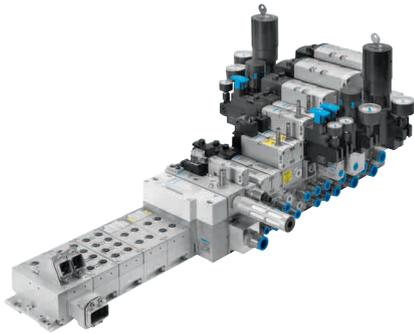
New: ISO size 3 makes the VTSA a one-of-a-kind, universal, pneumatic solution package. Suitable for new tasks in the automotive industry, raw materials processing and heavy machine building.

New: more versatile, compact pressurising and exhausting with slow start-up pressurisation.

New for the VTSA-F: valves and manifold blocks in 4 sizes that can be combined into cost-optimising control chains – no adapter required!

- ISO size 3 up to 4000 l/min flow rate, plus all previously available functions
- Combinable with all valve sizes, from 02, 01, 1 to 2!
- Unique, for perfectly designed pneumatic control chains: vertical stacking in all 5 ISO sizes!
- VTSA-F: up to 30% more flow!

Function integration  
Safety engineering  
for ISO valves VSVA/  
valve terminal VTSA



**Set new standards by combining safety engineering and economic efficiency – with Safety@Festo.**

Functional integration of comprehensive electro-pneumatic safety functions on valve manifolds and valve terminals in accordance with EN 13849-1 saves you engineering and installation time – not to mention money.

What is more, it can all be combined with the PROFIsafe shut-off module on the CPX terminal and the existing valve sizes 02, 01, 1, 2 and 3.

- Safe venting up to cat. 4, PL e with safety valve block VOFA-3/2, ISO size 01 (26 mm)
- Safe reversing up to cat. 4, PL e with press safety valve block VOFA-5/2, ISO size 01 (26 mm)
- Protection against unexpected start-up up to cat. 3, PL d with pilot air switching valve VSVA/VTSA ISO size 01 (26 mm) or 02 (18 mm) with built-in sensor
- Comprehensive diagnostics either via position sensor or pressure switch
- Soft-start and exhaust valve VABF for controlled, safe pressurising up to cat. 3, PL d

Valve terminals  
MPA-S/MPA-F/MPA-L  
Valve expansions



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

New for MPA-S: larger proportional-pressure regulator VPPM-MPA 1/4" for precise control of pressure, force, pressure zones or individual pressures.

New for all valve terminals MPA:

- Directional control valves for low pressure between -1 and 3 bar, e.g. for holding, pressing in or use in safety engineering.
- Polymer poppet valves for new applications: corrosion resistant, light, constant switching times, inexpensive

Specific new MPA products:

- VPPM-MPA in nominal diameter 8 for 380 ... 1650 l/min and on the spot diagnostics for MPA-S
- 2x2/2-way, 2x3/2-way and 5/2-way valves with combined mechanical spring return and pneumatic spring, 5/2-way function in size MPA1 and MPA2
- MPA1 polymer poppet valves, 5/2-way and 2x3/2-way versions, spring return, flow rate approx. 200 l/min

Proportional pressure  
regulator VPPM



**When high-tech meets user-friendliness.**

The VPPM has everything you need for reliable, precise control: 3 presets and a sturdy multi-sensor control system with a multi-level control circuit. Display and operation are made easy thanks to the LED or LCD with a wide range of editing functions. New to the modular system: the slim 1/4" variant and the 1/2" variant capable of high flow rates.

- Inline or flange version, current or voltage controlled
- Flow rates:
  - 1/4" (nominal diameter 8) 380 ... 2,750 l/min
  - 1/2" (nominal diameter 12) 1,950 ... 7,000 l/min
- Pressure range: 0.02 ... 2 bar, 0.06 ... 6 bar, 0.1 ... 10 bar
- Connection sizes:
  - 1/4" (nominal diameter 8) G 1/8, G 3/4, NPT or flange
  - 1/2" (nominal diameter 12) G 1/4, G 1/2, NPT

## Installation system CTEL



### Impressively simple and inexpensive.

The new, decentralised installation system CTEL makes valve terminals fieldbus capable and is the new standard communication platform for all price-sensitive applications. It is smart and intuitive, easy to configure and install and extremely flexible thanks to the simple module change, making it ideal for OEMs.

#### Basic installation:

- Fieldbus node CTEU – for all common fieldbuses
- Electric communication interface I-Port – for extreme plug & work

#### Installation expansion:

- Adapter CAPC doubles the communication capacity: 1 bus node for two participants
- Input module CTSL
- Low-cost connecting cable NEBU

## Fieldbus node CTEU



### Switch to a low-cost fieldbus technology.

The fieldbus node CTEU makes changing fieldbuses or upgrading from multi-pin solutions easier than ever before thanks to the extremely flexible “I-Port” communication interface from Festo, which is also compatible with IO-Link. Just screw on the CTEU module, and the fieldbus-capable valve terminal is ready.

- Excellent value for the money
- For CANopen, PROFIBUS, DeviceNet, CC-Link, Ethercat, plus IO-Link
- 1 fieldbus node CTEU, several valve terminals: minimised inventory levels, optimised logistics
- Can be expanded to a small installation system with 2 participants
- Suitable for CPX with CTEL master



## Valve terminal MPA-L



### Maximum modularity meets top pneumatic performance.

Low cost, highly modular, very flexible and easy to expand electrically – from a simple fieldbus to connection to the CPX world. And modular in single steps! More flexible, lighter and less expensive per component: all in all, ideal for special machine building and process automation.

- Sizes 10, 14 and 20 mm in combination
- Intelligent thanks to connection to the CPX world
- Easily and inexpensively expandable to a small installation system with fieldbus connection CTEU
- Forms a low-cost control cabinet solution with CPX-L
- Valves and manifold rail in polymer design: light and corrosion resistant



## Valves VUVG



### Simply the best valve in its class!

Amazingly high flow rates and very compact design. And as a member of the VG series, it has many functions and variants that only the VUVG offers – not least because of the proven, patented cartridge principle. The lightweight aluminium housing is ideal for direct mounting on robot arms or cylinders.

- Low-cost
- Can be expanded to form a valve terminal with an individual connection
- 2x 3/2 – one valve, two functions
- Simple installation
- Electrically (VUVG) and pneumatically (VUWG) actuated valves
- E-box: numerous connection options, clipped on with a click and easily exchanged
- 3 widths

## Valve terminal VTUG with plug-in



### Multi-pin or low-cost fieldbus!

VTUG with plug-in stands out because of its outstanding price/performance ratio. It has many multi-pin variants and a very simple connection for all standard fieldbuses and IO-Link. It is also quick to install and configure. This member of the VG family is especially attractive for OEMs and all those who appreciate high pneumatic functionality and electric modularity.

- Unrivalled: 24 valve positions
- Parallel use of vacuum and pressure on one valve terminal
- Fieldbus plug & work: unique modularity with bus node CTEU
- IO-Link
- 2 widths
- Ideal for control cabinet installation



2012



## Manually/mechanically actuated valves VMEM/VHEM



### Flexible in application, universal and capable of high flow rates: VMEM/VHEM.

The directional control valve series for manual and mechanical actuation of pneumatic drives. Ideal for manual assembly stations: the external pneumatic spring acts as a pneumatic signal input for individual clamping and simultaneous opening of the clamping devices.

#### Mechanically actuated valves

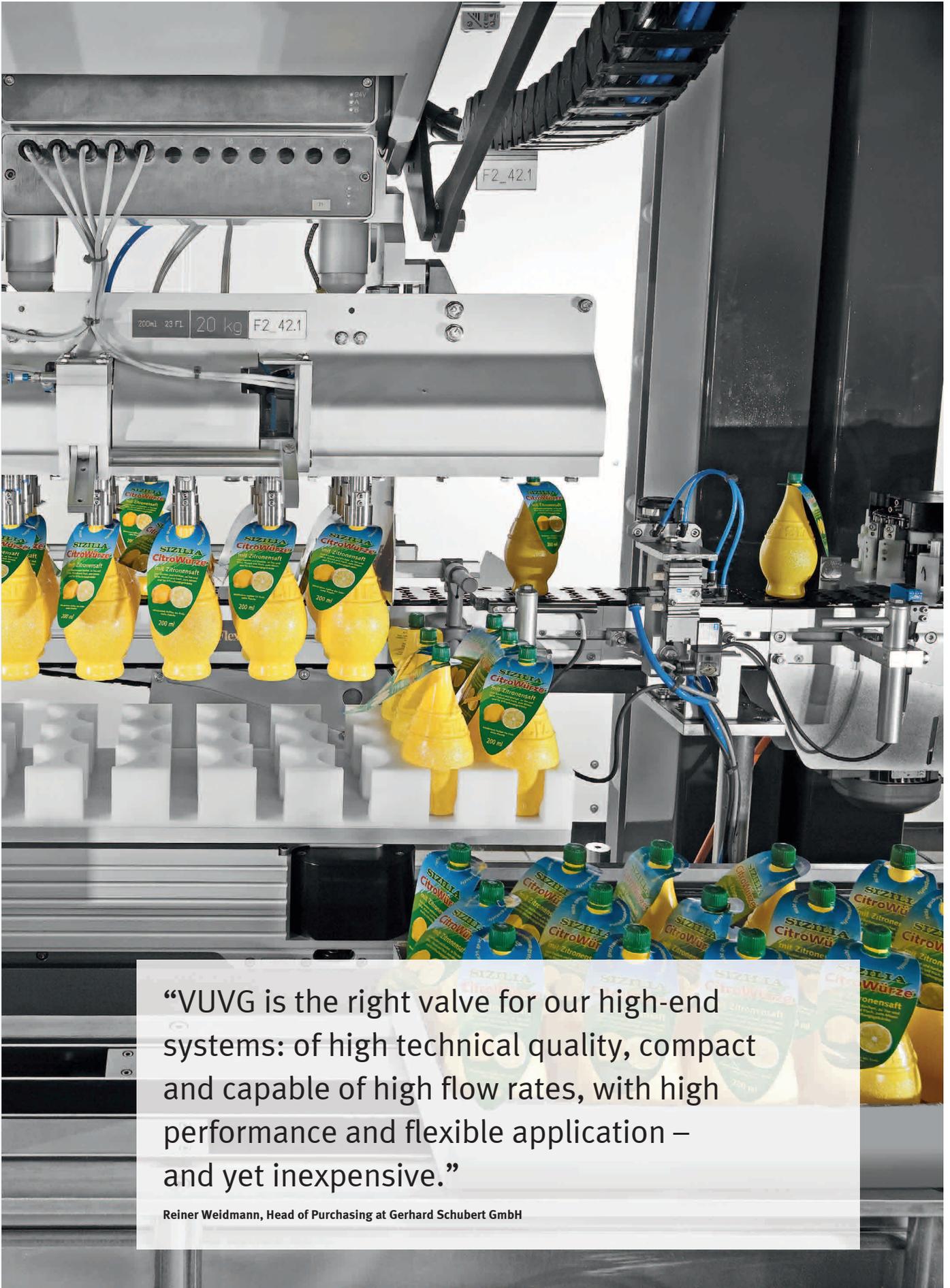
Stem actuated valves, roller actuated valves

#### Ball actuated valves

Manually operated valves

Finger lever valves, pushbutton valves

- Versatile thanks to a wide range of actuating elements
- Bistable pushbutton valves with locking function
- External spring return with external connection
- Robust metal housing
- Uniform, ergonomic and modern design
- Available as poppet valves and piston spool valves

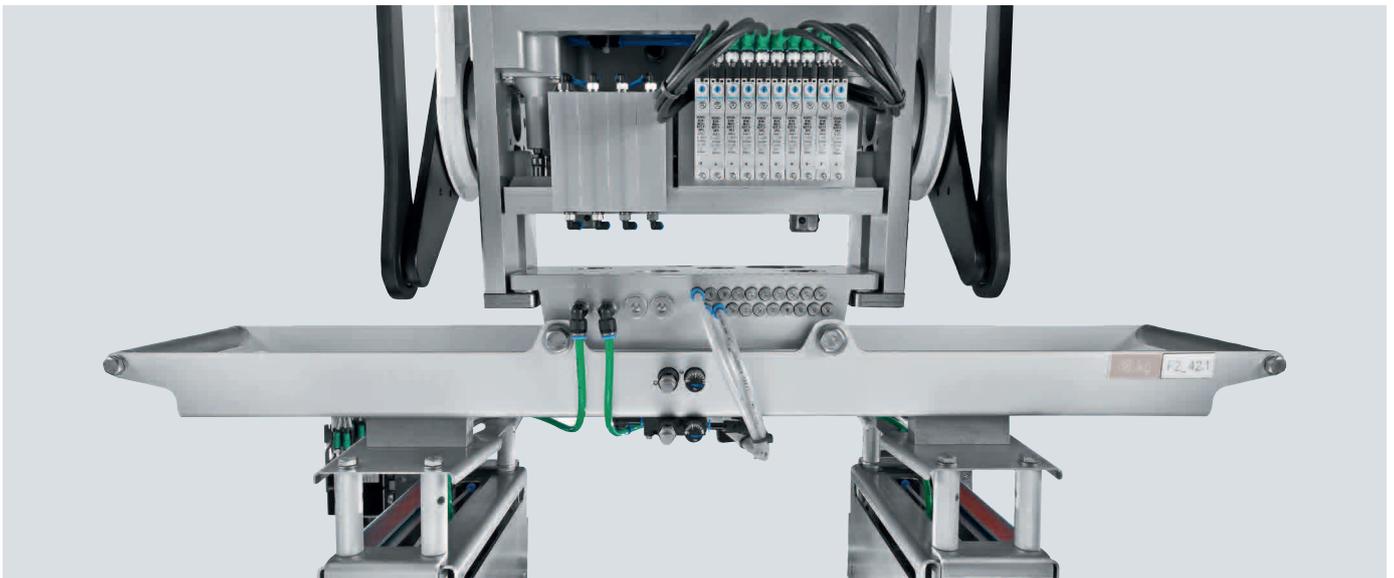


“VUVG is the right valve for our high-end systems: of high technical quality, compact and capable of high flow rates, with high performance and flexible application – and yet inexpensive.”

Reiner Weidmann, Head of Purchasing at Gerhard Schubert GmbH

# Automatically changing tools – with VUVG

As the first of its kind, the tool changer from Gerhard Schubert GmbH automatically changes robot tools for packaging installations. And one of the central components is the valve series VUVG from Festo. With the valve series VUVG, the TLM packaging machines achieve a hitherto unattained level of efficiency.



Top values, also thanks to the VUVG: positioning accuracy of up to  $\pm 0.1$  mm, acceleration of up to  $0.5g$  and removal and transport of the tools in only approx. 40 seconds.

Food packaging today is more diverse than ever. This is due to stricter hygiene requirements and the use of packaging for the branding of products and companies.

## Transport in seconds

To handle this variety cost-effectively, Gerhard Schubert GmbH uses fully automated format changes at high speed, with great flexibility and compact dimensions. A new format is started on the high-quality packaging machines after only four minutes. As the first transrobot in the world, the transmodule can move freely on the track system.

## Advantage due to minimal footprint

The central interface is the valve series VUVG, which transmits energy and control pulses quickly and reliably. And it is extremely small – important for a compact unit that is installed directly on the cylinder. Up to 100% greater flow rate than with conventional

valves ensures high energy density at pressures of up to 10 bar. The high modularity is also attractive: the base plate can be easily converted and adapted to the required functions. Individual valves can be replaced with blanking plates. This is how Schubert creates up to 30 variants on the basis of three components.

## Low consumption, high availability

These characteristics make the top loading packaging machines much more flexible. Short retooling times, reduced energy consumption and high availability are a decisive competitive edge for the global leader in food packaging machines.

Listen to Erich Messerschmidt, Head of Tool Construction at Gerhard Schubert GmbH, explain why he chooses VUVG: [→ www.festo.com/vuvg](http://www.festo.com/vuvg)

# Simply safe: protection for man and machine



**New: MS6-SV-E-ASIS**  
Performance Level e with direct connection to AS-Interface Safety at Work. The standard for the most stringent monitoring demands.

- **Integrated pressure build-up function**  
For gentle, slow system pressurisation
- **Always capable of high flow rates**  
For very quick exhaust
- **Flexible installation and ordering**  
As part of an MS service unit combination or as an individual device

**New: space-saving silencer UOS-1-LF for MS6-SV-E**  
Saves up to 8 cm of installation space.

[ar] augmented reality



Safety regulations? Festo makes it easy for you to comply with them, thanks to the sophisticated range of safety valves MS-SV. They provide reliable, safe exhausting in pneumatic systems.

Accidents are one of the most frequent causes of machine downtime and often result in delivery problems and rising insurance premiums. In addition, the law requires that machines and systems are designed to be safe. These are good reasons for safety measures and safety functions. A central safety function is the safe exhausting of pneumatic systems.

Our soft-start/quick exhaust valve MS6-SV-E has established itself as a market standard in safety-oriented pneumatic systems thanks to its excellent reliability, certification up to Performance Level e and the high exhaust rate.

The new products for 2013 expand our product range so that you can find the right product for every application and every safety level: Performance Level c, AS-Interface and the space-saving silencer for Performance Level e.



**New: MS6-/MS9-SV-C**

For medium safety requirements up to Performance Level c. Good, inexpensive and high performing.



**A range of service units for every requirement**

From a simple standard product through to application-specific solutions with the very strictest requirements for compressed air quality

**Multiple advantages: pre-assembled modules**

Simpler purchasing, increased process reliability, greater productivity

**Easier to design with the free configurator**

Configure and order easily and quickly in the electronic catalogue: everything fits

### Safety valves MS6/MS9 with Performance Level c



**Good, low-cost, high-performing: certified safety, tailor-made for you!**

Ideal for applications with Performance Level a, b or c: safety valves MS6-SV-C or MS9-SV-C. The simple, single-channel design enables safe, fast exhausting without residual pressure – and is also very cost-effective.

- Meets Performance Level c (PL c) to DIN EN ISO 13849-1
- Standard nominal flow rate (1 → 2)  $q_{nN}$ : MS6-SV-C: 5,700 l/min, MS9-SV-C: 16,500 l/min
- Exhaust rate (2 → 3)  $q_n$ : MS6-SV-C: 7,600 l/min, MS9-SV-C: 20,000 l/min
- Pressure range: MS6-SV-C: 3 ... 18 bar, MS9-SV-C: 3.5 ... 16 bar

### Safety valve MS6-SV-E with AS-Interface Safety at Work



**Three important functions in a unique safety valve: gradual pressure build-up, safe exhausting and direct connection to the AS-Interface.**

The redundant safety valve was specially developed for the highest safety level cat. 4, Performance Level e (PL e) and is officially certified to DIN EN ISO 13849-1. The integrated AS-Interface makes additional safety relays unnecessary.

- For safe exhausting with no residual pressure
- Standard nominal flow rate (1 → 2)  $q_{nN}$ : 4,300 l/min
- Exhaust rate (2 → 3)  $q_n$ : 9,000 l/min
- Pressure range 3.5 ... 10 bar
- Convenient access to various diagnostic functions and upstream and downstream pressure at the valve via the bus

### Water separator MS9-/MS12-LWS



**99% condensate separation – you could never achieve this top value with a conventional filter.**

The secret: the water separator MS9- and MS12-LWS separates the condensate with an optimised centrifugal separator. The product is maintenance-free, economical and energy-efficient.

- Small size, great performance! Flow rate: MS9-LWS: 15,000 l/min at  $\Delta p=1$  bar, MS12-LWS: 25,000 l/min at  $\Delta p=0.5$  bar
- Pressure range 2 ... 12 or 0.8 ... 16 bar
- Fully automatic condensate drain, also with electrical actuation

Service units DB-MINI  
Manual on-off valve HE  
and distributor FRZ



**One part number, pre-assembled and tested: service units DB-Mini now with on-off valve and distributor.**

The complete combination for all the core functionalities of compressed air preparation. With the high-strength, light polymer housing, it can be used reliably and economically in uncritical environments.

- New: manual on-off valve HE and distributor FRZ
- Only one part number for the complete combination
- Tested and pre-assembled unit – more quickly deployed
- Manual switch-off possible

One-way flow control valve  
VFOF



**Gives you valuable installation space and additional flexibility.**

The clever new one-way flow control valve lies flat and tight on the cylinder. The changeable actuation direction ensures that flow rates can be set flexibly, quickly and easily.

- Up to 30% space savings
- Set functions easily with standard tool
- Quickly mounted without additional mounting components
- Flexible actuation direction of the function
- Additional functions planned in combination: e.g. stopping the motion and manual exhaust
- Sizes: G $\frac{1}{8}$ , G $\frac{1}{4}$

Quick exhaust valve  
VBQF



**Higher cylinder speed and improved noise emission.**

Quiet and quick exhaust of the cylinder exhaust air is always recommended when you need fast cycle times on machines and systems. The new quick exhaust valve VBQF for direct mounting on the drive does just that. And it is sturdy and reliable too.

- Low noise emission according to EC directive on physical agents (noise) (2003/10/EC)
- Easy to install and rotatable even after installation
- Sizes: G $\frac{1}{8}$ , G $\frac{1}{4}$



2013 ■

One-way flow control valve  
GRLSA with scale



**Simple, fast and with reproducible flow, saving you time.**

Clear and comprehensible, ideal for total productive maintenance: the scale defines and documents the values clearly and reliably. It ensures precise, simplified flow rate regulation and quick and easy commissioning, also thanks to QS fittings.

- Standard flow rate  $q_n$  in direction of flow control (2 → 1) 0 ... 700 l/min
- Standard flow rate  $q_n$  in blocked direction (1 → 2) 0 ... 930 l/min
- Simple handling, fast connection
- Fixed offset with digital and analogue function in one component
- Sizes: G $\frac{1}{8}$ , G $\frac{1}{4}$   
Further sizes available upon request

Hand slide valve VBOH



**Convenient switching without pressure drops.**

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

- Non-overlapping design – no pressure drop during switching
- Remarkable for its ergonomic shape
- Up to 12 bar, standard nominal flow rate  $q_n$ N (1 → 2) 0 ... 7,700 l/min, standard flow rate  $q_n$  (2 → 3) 0 ... 17,000 l/min, temperature -10 ... 80 °C
- Easy to clean
- Sizes: M5, G $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$

Suction gripper OGGB



**Transports your delicate workpieces safely, quickly and gently.**

The gripper with built-in vacuum generator operates on the Bernoulli principle and is virtually contactless. The workpiece floats on an air cushion and only comes into contact with the gripper at the few stops. The stops are made of elastomer for higher lateral forces.

- Low-contact, low-impression handling of delicate, fragile, thin, pliable workpieces
- Quiet operation



# Extra safety: safety valve MS9-SV-C

The modular assembly systems of the prestigious Austrian company STIWA are reliable and high performing. The modular service units MS9 with safety valve MS9-SV-C are also reliable and high performing. They are used by machine and system builders – now with extra safety.



Setting new standards: the new module of the MS9 series, the MS9-SV-C from Festo, combines compressed air build-up with exhaust in one component.

The Austrian STIWA Group with headquarters in northern Austria employs 1,100 employees and is a leader in product and assembly automation in Europe. The production of complex, high-quality system assemblies and the manufacture of transmission components for the automotive industry are also part of STIWA Group's core business.

“For us, using innovations from automation technology is standard in system planning,” says Stefan Baier, responsible for electrical engineering and pneumatics development at STIWA. The same is true of the new safety valve MS9-SV-C. It provides greater performance, improves machine safety and increases the service life of central components.

#### Compact combination

The main reason why STIWA chose the MS9 series is the new safety valve MS9-SV-C. The core functionality is an electrical on-off

and exhaust valve combined with a soft-start valve, which exhausts machines and systems reliably and quickly. It is characterised by its relatively small size with very high pressurisation and exhaust flow rates as well as exhausting without residual pressure. Because of its sturdy and reliable design, it is optimally suited for demanding applications.

The MS9-SV-C provides greater safety and protects central pneumatic components as well as axes and shock absorbers, including during commissioning. The MS9-SV-C enables a gentle pressure to be built up in line with each system and switches to full capacity after the set pressure has been reached.

#### The flow rate increases

With a flow rate of over 16,000 l/min, the MS-9-SV-C is ideal for systems that need extremely high flow rates. For especially large machines, it can even eliminate the need for a service unit.



“The intensive dialogue between STIWA and Festo accelerates processes on both sides. MS9-SV-C suits our demanding systems perfectly.”

Stefan Baier,  
Electrical engineering and  
pneumatics development

# Everything from a single source: the whole world of sensors



**Air gap sensor SOPA** for exact air gap monitoring in the micrometer range



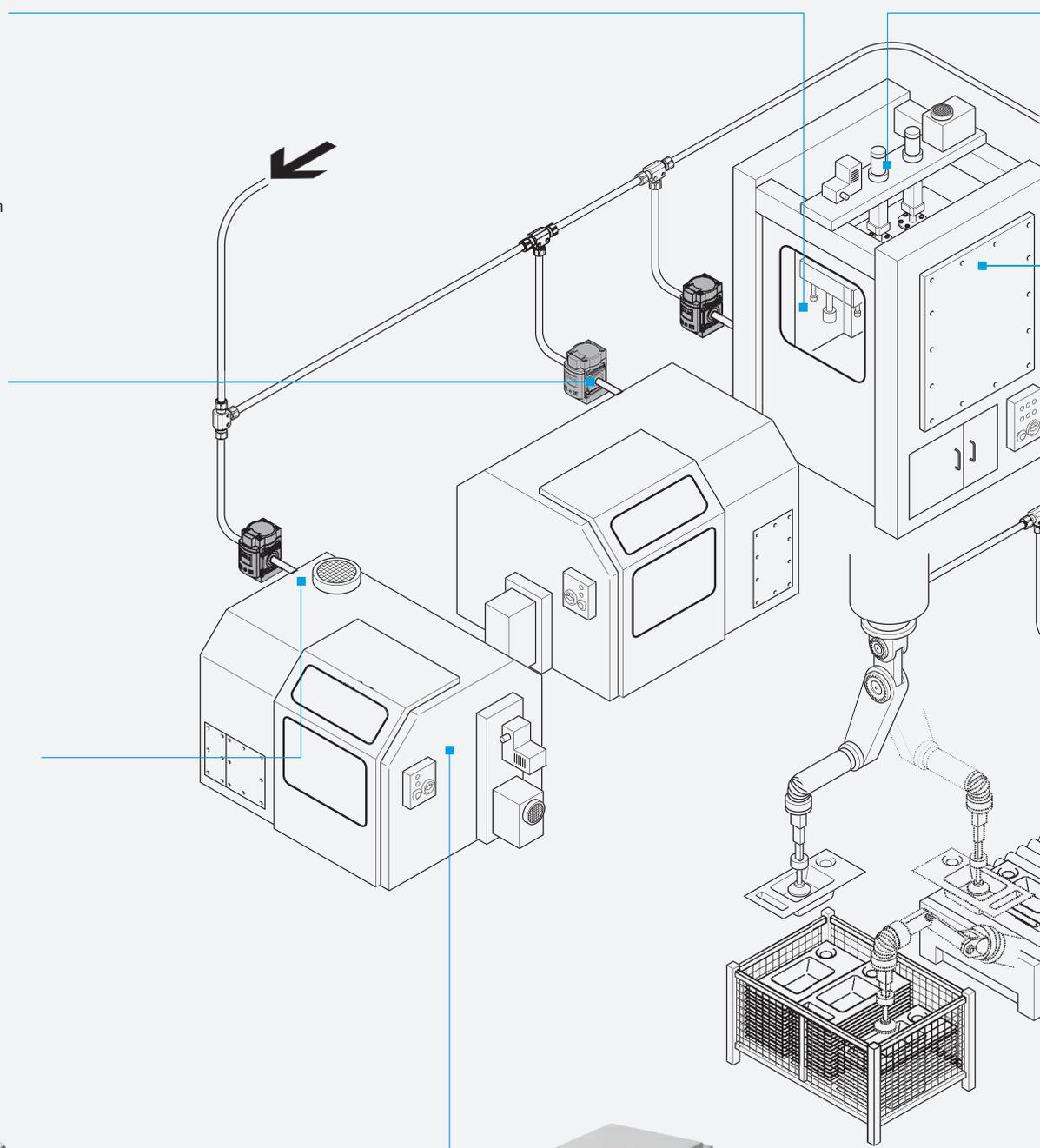
**Flow sensor SFAM** for detecting air consumption rate and flow rate. For individual operation or in combination with service unit MS6/MS9.



**Connecting cables from the NEBU modular system** with standard connection technology M8 and M12



**Inductive and optoelectronic sensors SIEN and SOEG** for object detection



**Checkbox CHB-C** for orientation detection, quality inspection and sorting during small parts feeding

Sensors and intelligent vision systems from Festo provide important information for condition monitoring, diagnostics, consumption, quality inspection, process, function and position monitoring. It is always best when you connect the sensors to cylinders, valve terminals or controllers from Festo.



**Proximity sensor SMT-8M-A**  
for binary position feedback  
of the piston position in  
pneumatic cylinders



**Signal converter SVE4**  
for converting analogue  
signals into switching  
points. Ideal when the  
sensors are difficult to  
reach.



**Position transmitter  
SMAT-8E** for analogue  
position feedback of  
the piston position in  
pneumatic cylinders



**Pressure sensor SDE1**  
for detecting pressure  
(e.g. clamping/pressing  
process) and vacuum  
(e.g. gripping process)



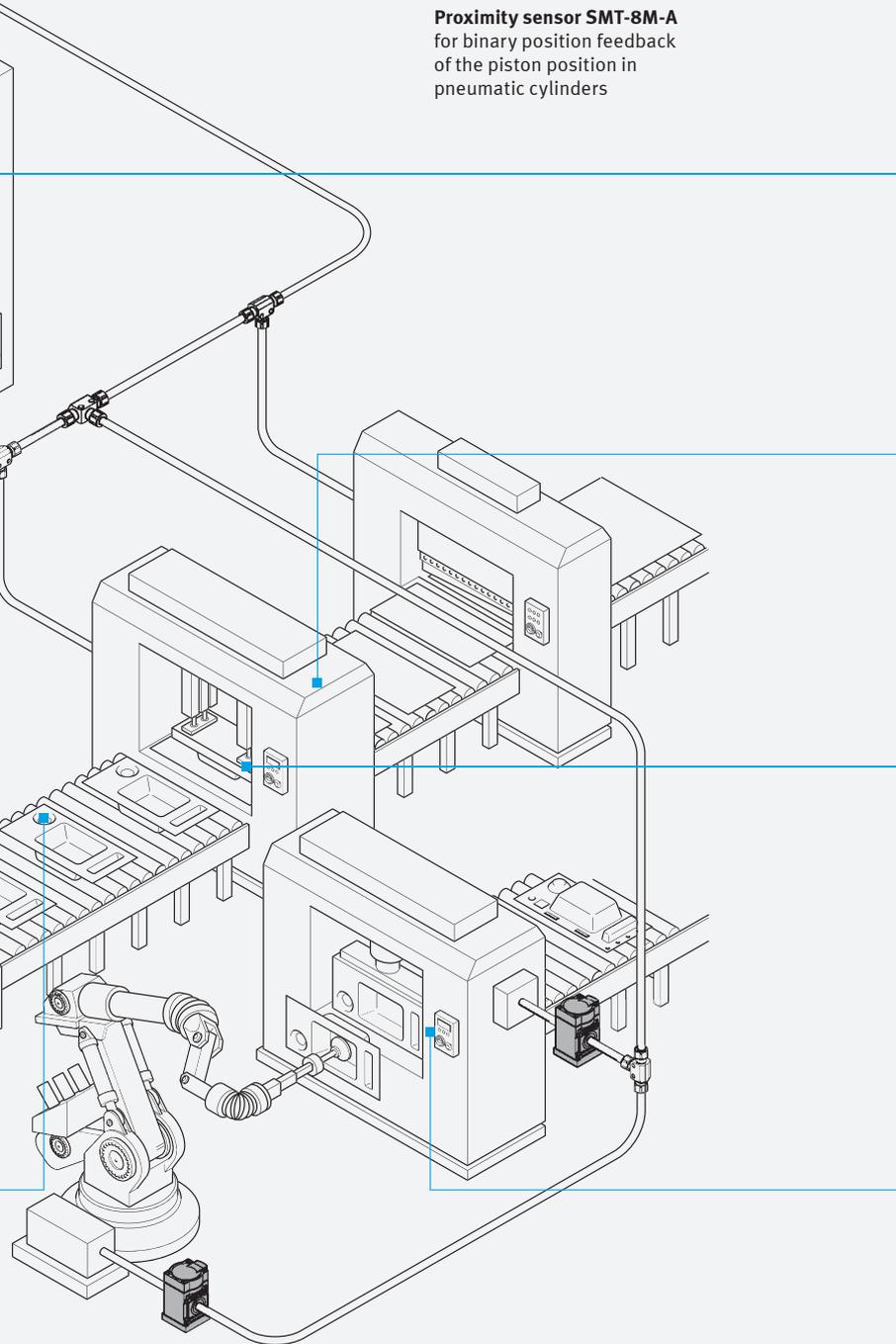
**Compact vision system  
SB01**  
for monitoring position  
and quality and for analys-  
ing fast processes

With our sensors, you  
always know exactly  
what is happening:

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

The right cable for each  
task: the modular cable  
system NEBU makes it  
possible

→ [www.festo.com/electrical\\_connection](http://www.festo.com/electrical_connection)



## Modular proximity sensor system SMT-8M-A



### Always works: on the safe side with the SMT-8M-A.

Drives from Festo and the modular proximity sensor system SMT-8M-A have been perfectly harmonised and are easy and safe to install. ATEX included: with a cable length of up to 30 m, the SMT-8M-A can be freely configured as an EX2 sensor (3GD).

- Installation aid via second LED
- No time-consuming re-ordering of special variants and expensive warehousing
- IP65, IP68 and IP69k
- Uniquely frost-proof down to -40°C!

## Proximity sensor CRSMT-8M



### You can expect a lot from proximity sensor CRSMT-8M with FDA approval.

Not only is it suitable for the food industry, but it is also optimally suited for use in harsh environments. Included in the product range: mounting components for Clean Design drives with sensor rail – always quick, easy and stable to install.

- Suitable for the food industry and resistant to cooling lubricant, acids and bases
- IP65, IP68 and IP69k
- Cable length up to 10 m
- Connection technology: M8 or M12 with rotatable thread; open end

## Flow sensor SFAM-90



### High flow rate, compact – and quick to start.

Used either as a stand-alone unit or with service units MS9, the SFAM-90 can be adapted perfectly to suit your application. The broad spectrum of flow ranges – from 50 ... 5,000 or 150 ... 15,000 l/min – offers a huge array of measuring values. And the large measuring range always supplies absolute flow information with threshold values.

- Unidirectional: choice of fluid flow via modular system
- Fast installation: with innovative prism clamping technology
- Convenient, bright LED display with adjustable colour change

## Intelligent compact vision system SBOC-M



### High production speeds are under control with the intelligent compact vision system SBOC-M-R1B-H.

Monitors fast motion sequences and supports diagnostics and commissioning. The new image sensor sets the standard: significantly higher light sensitivity, higher dynamics for images with richer detail and a higher frame rate.

- Higher frame rate: 240 ... 2,100 frames/s
- Several cameras can be networked and synchronised
- Integrated recording and storage
- Easy commissioning using a PC, multiple recording modes
- Very small and light
- Protection class IP65/67

## Connecting cables NEBU



### Making life easy for you: the rotatable NEBU socket.

Tight fitting spaces? No problem! The infinitely rotatable NEBU socket allows maximum flexibility when electrically connecting sensors or actuators.

- Convenient: very easy electrical connection
- Flexible: cable outlet in any direction
- Application-orientated: e.g. for re-adjusting inductive sensors at a later date

## Compact controller CECC

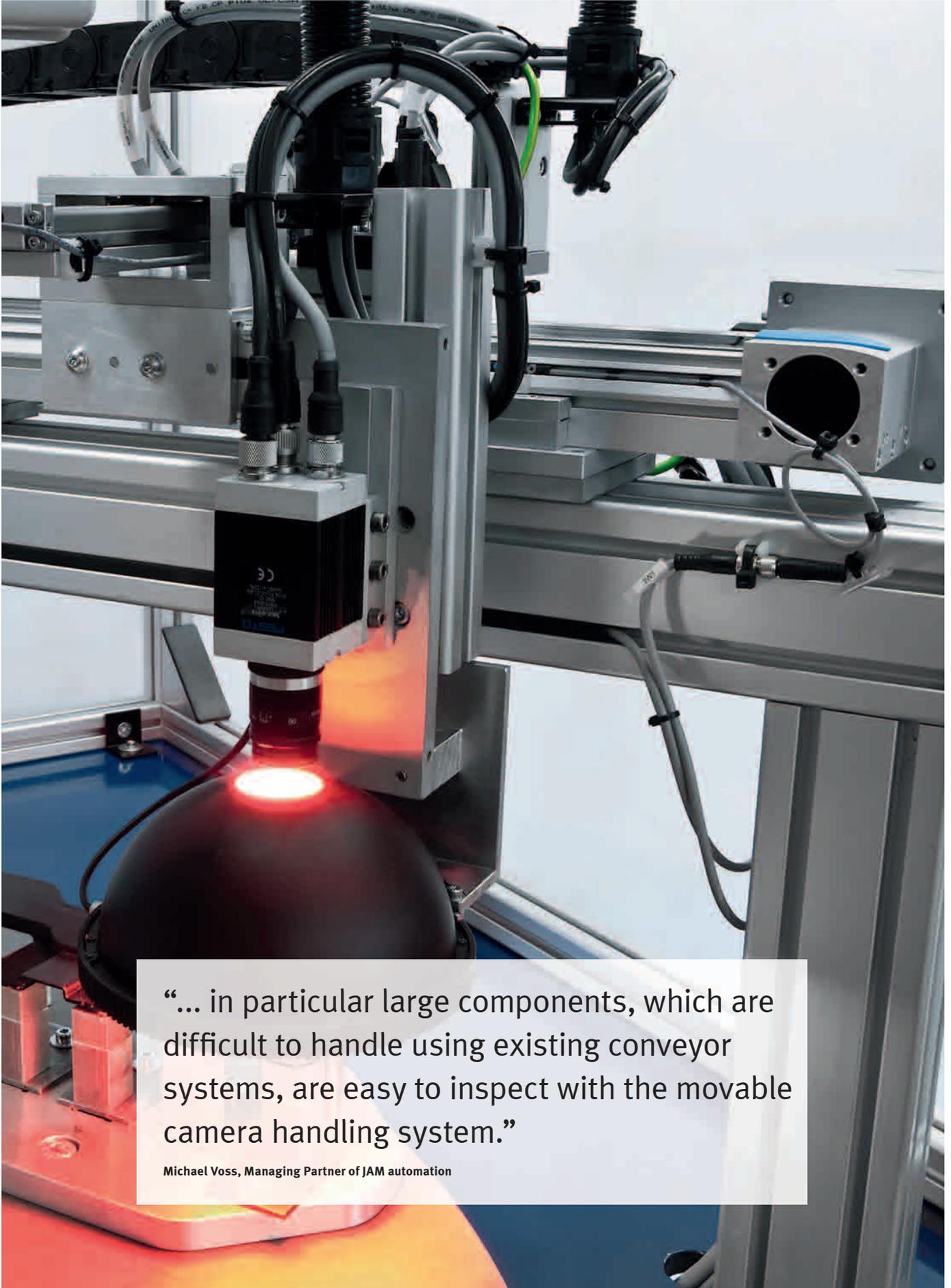


 IO-Link

### When you want a compact mini control system with more functions.

The CECC enables simple activation of electric or pneumatic drives, especially for small tasks. It can be used as a stand-alone unit or conveniently integrated into mechatronic solutions via the platform CODESYS V3 provided by Festo. Simple programming and navigation to IEC 61131-3.

- Hybrid: control electric and pneumatic drives and connect valve terminals directly with CANopen master or integrated IO-Link
- Communicative: easy to integrate into higher-level systems via Modbus TCP
- Convenient: USB interface for simple data handling



“... in particular large components, which are difficult to handle using existing conveyor systems, are easy to inspect with the movable camera handling system.”

Michael Voss, Managing Partner of JAM automation

# Intelligent camera finds the inspection position itself

For the first time in automation technology, the component to be inspected does not move to the camera, but instead the camera moves to the component. Thanks to an integrated CODESYS controller on an intelligent camera from Festo and the linking to an axis gantry unit, the images are now learning to move.



JAM automation created an especially economical assembly and inspection cell for the automotive industry.

## Full inspection

The vision system integrator JAM automation in Western Germany developed an assembly and inspection cell for an automotive supplier. The system presses nine sockets made of soft plastic into a plate made of harder plastic. During subsequent inspection, the camera moves independently to each individual position of the plastic sockets.

## Camera as controller

Even with complex inspection sequences, the camera takes complete control of the handling system thanks to the integrated CODESYS PLC with CANopen master functionality. An additional controller is not necessary. “Until now, such inspection processes were carried out only manually and visually – which took much more time and resulted in a higher error rate,” explains Michael Voss, Managing Partner of JAM automation. The production processes are thoroughly documented and statistics are evaluated.

## Ready-to-install handling system

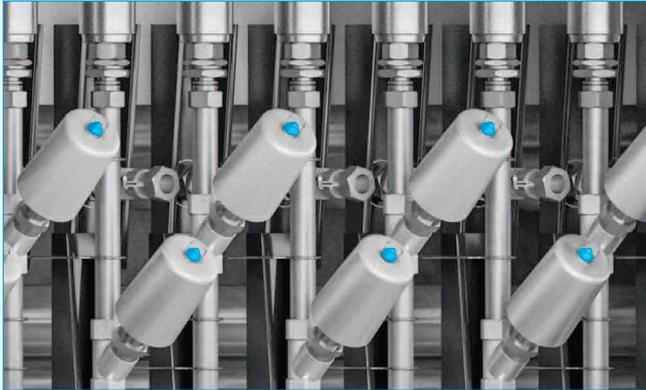
Festo delivered the ready-to-install and inspected cantilever handling system right to the machine – with design data, circuit diagrams and a comprehensive functional and fixed-price guarantee. The complete solution reduced the workload for technical staff, kept engineering expenses to a minimum, simplified the procurement process and reduced the process costs.

And it provided new perspectives. “In particular large components, which are difficult to handle using existing conveyor systems, are easy to inspect with the movable vision system handling unit, possibly even in a flexible standard inspection cell,” says Voss.

Optimal quality with intelligent compact vision systems – learn how you can achieve a zero-error rate with intelligent vision systems:

→ [www.festo.com/machine\\_vision](http://www.festo.com/machine_vision)

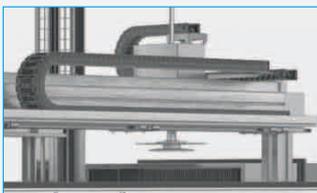
# Expertise from a single source – fluid technology meets factory automation



**Fluid technology from Festo**  
Whether for gases, highly viscous fluids, pastes or granulates, Festo has the right media and process valves for any requirements.



**Engineering support from the start**  
Your design processes remain as lean as possible, because we provide you with detailed advice and engineering support right from the start.



**Mechatronic Motion Solutions**  
This unique platform strategy with free combination of technologies is the only one of its kind in the world. It meets your requirements for linear and rotary motion with pneumatic and electrical components, either individually or in a system, and for mechanical gripping and vacuum.



[ar] augmented reality



Fluid technology – another area of expertise at Festo. Get twice the benefit with fluid and motion control from a competent partner. Whether combined with Mechatronic Motion Solutions or Integrated Automation, you will save even more on processes, time and money in the future with Festo as a partner.

**Plan your success strategically!**

If you combine the two procurement channels, which are usually separate, you will greatly increase your competitiveness. And not only in your own country, because worldwide availability, our replacement service and engineering service are central factors for successful operations globally.

**Advantages: technology from a single source and an optimised supply chain**

Our product range is optimally suited to supplementing the automation solutions in your machine with Integrated Automation, Mechatronic Motion Solutions, fluid technology and all peripherals, either individually or as ready-to-install solutions.



**Integrated Automation**

Valves, valve terminals, proportional pneumatics, servopneumatics, electronic components, safety engineering plus integrated motion control: you benefit from the comprehensive function integration with simpler, faster and more reliable processes on the unique automation platform CPX.

## Proportional media valve VZQA



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

The 2/2-way valve controls flows of substances such as granulates, liquids containing solid particles and highly viscous and abrasive media. The housing has high corrosion resistance with CRC4. Maintenance is quick and convenient thanks to easily replaceable sealing cartridges – no special tools required.

- Modular interchangeable component parts
- Clean design for machine cleaning
- Direct air supply connection – no drive required
- Diaphragm material NBR, and new: EPDM

## Angle seat valve VZXF



### Incredibly sturdy and resistant – a valve you can rely on.

The universal VZXF for process automation is ideal for controlling gaseous or liquid media flows in closed or open circuits, whether heavily contaminated media up to max. 22 mm<sup>2</sup>/s viscosity, highly viscous media up to 600 mm<sup>2</sup>/s or steam.

- Extremely heat-resistant, stainless steel design
- Closes reliably when pressure drops thanks to N/C function
- Gas “with the media flow”, liquids “closing against the media flow”

## Ball valve drive units with 2/3-way ball valves VZBA



### Optimise your engineering, purchasing and logistics.

And increase your process reliability, with the pre-assembled VZBA. Uniform design, optimised torque curve and nominal pressure, accurate mounting for cavitation-free opening without offset. Operationally tested, with just one part number. And full ATEX compliance, including for the new VZBA for ATEX zone 1, 21 and 2, 22.

- Many variants thanks to the rack-and-pinion or scotch yoke design
- Single-acting or double-acting
- Optimised design reduces the need for adapter accessories
- Fast installation
- Complete documentation available on the support portal → [www.festo.com](http://www.festo.com)

## Servo-controlled solenoid valve VZWP



### Open the door to new applications with a greater operating pressure range – of up to 40 bar.

VZWP is the latest addition to the solenoid valve series VZWM. The VZWP uses a sealing piston instead of a diaphragm, allowing it to control high pressures with large nominal diameters. It is ideal for use with gaseous and fluid substances up to a viscosity of max. 22 mm<sup>2</sup>/s in production and process automation.

- Brass valves with selectable NBR and FKM seals
- N/C function closes solenoid valve on loss of power
- For open media circuits with a differential pressure of at least 0.5 bar

## Force pilot operated solenoid valve VZWF



### Small and energy-efficient: simply use the energy of the medium.

The force pilot operated VZWF can thus control high pressures with high nominal diameters using relatively small solenoids – even in closed media circuits with no differential pressure. It activates even at 0 bar and automatically closes when the pressure drops, thanks to the N/C function.

- For gaseous and liquid media with a max. viscosity of 22 mm<sup>2</sup>/s
- For water, air and neutral media
- For filling systems (secondary circuit), water treatment, heating circuits, etc.

## Directly actuated solenoid valve VZWD



### Doesn't let you down, even with high pressures and low flow rates.

VZWD even works in closed media circuits with no differential pressure up to 90 bar, making it ideal for high-pressure cleaning and dosing, gas supply to DIN EN 161 or safety shut-off functions. As it does not have any control boreholes, it even works when slightly contaminated.

- Valve switching from 0 to 90 bar; vacuum technology to 100 mbar
- Works with water, air and neutral media up to a maximum viscosity of 22 mm<sup>2</sup>/s
- Integrated N/C function

## Pulse valve VZWE



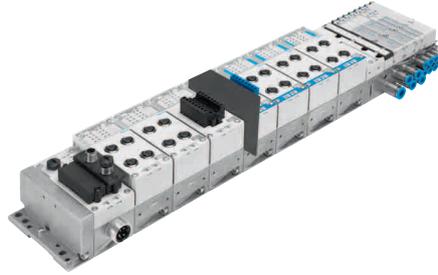
### Ideal for dust removal systems:

#### **VZWE eliminates the risk of blockages.**

Reliably cleans the dust filters of the cement, mining, aluminium, chemical, paper, cellulose and wood industries with a short blast of air. Several bistable valves are often actuated simultaneously for the short, high-volume air blast.

- High flow rate thanks to angled housing
- Sturdy for long service life
- Extremely fast opening and closing thanks to special piston unit
- Attractively priced

## NAMUR remote I/O Terminal CPX-P



### Save time during installation – with CPX-P.

Valve terminal and remote I/O for control cabinets in zone 2. Integrated, time saving and completely supplied by a single source. Available in protection class IP20 or IP65. When combined with MPA valves, CPX-P becomes a process interface for sensor signals as per NAMUR.

- Highly modular: up to 9 modules on one terminal
- Versatile: in a control cabinet for ATEX zone 2 or outside for non-explosive atmospheres with M12 connection technology
- For PROFIBUS DP, PROFINET, Modbus TCP, DeviceNet and Ethernet/IP

## Closed-loop controlled linear actuator DFPI



### Automate your water or wastewater treatment plant robustly and reliably.

The DFPI with integrated displacement encoder, valve manifold, positioner and analogue feedback signal is ideal for all linearly actuated process valves and fittings – even in harsh environments. New: the integrated, perfectly fitting connecting cable and the analogue feedback signal.

- Low maintenance
- Quick installation
- Self-initialisation
- Fast integration into the existing control architecture
- Simple operation, flexible settings
- ATEX II 2D completely integrated or ATEX II 3D with external positioner
- IP65/67/69k

# Pneumatic actuator DFPI controls complex media flows reliably

Regulating the complex media flows in the process industry not only requires intelligent control, but above all reliable positioning actuators like the DFPI. This is why the DFPI is used in water and wastewater treatment plants as well as in ore processing, bulk-goods systems, and the control of ventilation flaps.



Step-by-step opening, closing in one motion: the controlled pneumatic actuator DFPI reliably prevents the discharge of filter particles and also saves rinsing water and time.

## Regulating sludge discharge with weir gates at fixed-bed filters

Fixed-bed filters are an important part of water treatment in water and wastewater treatment plants, usually requiring five to eight process valves for control. In the case of an open design and a large basin, gate valves without housing or weir gates are frequently specified for the inlet and for sludge discharge.

Weir gates – more precisely overflow weir gates – offer process advantages for controlling sludge discharge during backwashing. Because they can be opened step by step, there is no suction effect on the filter bed. This means that the discharge of filter particles is reliably avoided. Closing at the end of the backwashing process is performed quickly and in a single step in order to keep idle time as short as possible.

The DFPI is perfect for this application: the speed of this pneumatic actuator can be individually adjusted for opening and closing motion by means of exhaust air flow control valves. Slow travel to any intermediate positions is possible during opening, and the closing motion can be executed very quickly. This saves rinsing water and time.

## Created for harsh environments

Actuators with external control attachments cause big problems in harsh environments, for example due to corrosion and dust deposits. Therefore, the actuators of the DFPI series from Festo have the system components required for control integrated all in one place. The cylinder, the displacement encoder, the valve manifold, the positioner and (new) the analogue feedback signal are enclosed in a single housing in the DFPI. So the DFPI can withstand the toughest conditions.

The DFPI: one of many components for water technology. Festo offers complete automation solutions for several industry segments. Learn how you can save time and money in water treatment: [→ www.festo.com/water](https://www.festo.com/water)



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