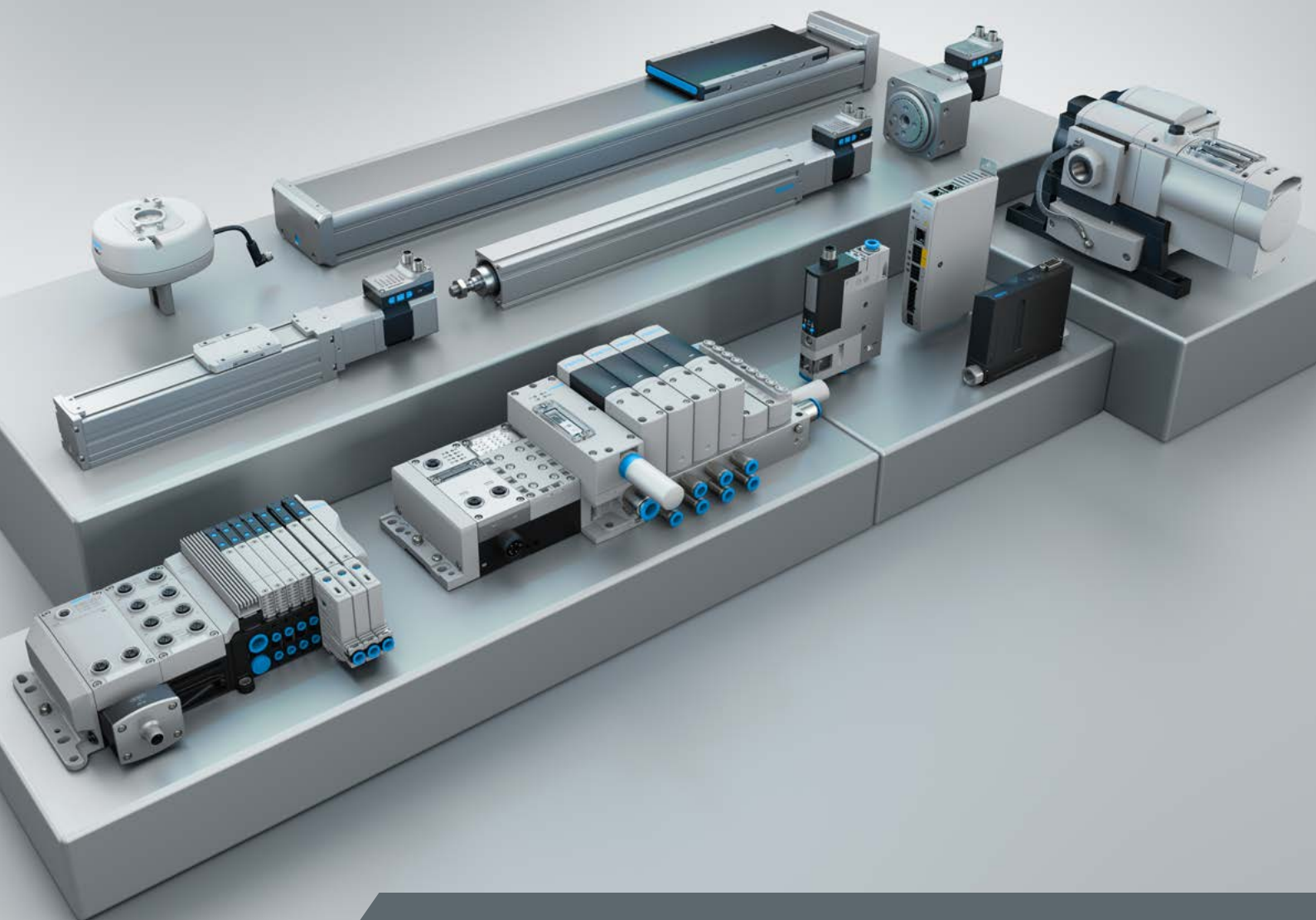


**FESTO**

Product overview 2025/26





Product overview 2025/26






















Issue 2025/10

All technical data are correct at the time of going to print.

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All technical data are subject to change according to technical updates.

Festo SE & Co. KG  
Postfach  
73726 Esslingen  
Ruiter Strasse 82  
73734 Esslingen  
Germany

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Preface

Editorial



**100** years

**Automation for a world in motion.**

Dear customers,

We are pleased to be able to present our new catalogue for 2025 – a very special year for us. We are celebrating **100 years of Festo!** This catalogue is full of innovations. We combine the strengths of pneumatics and electrics with digital applications and artificial intelligence, rounded off by comprehensive training courses. Regardless of the kind of industrial motion you are planning, as an innovation leader, we will find the right solution for your requirements.

Our **seamless automation** provides you with special added value. Thanks to the open system architecture, electric and pneumatic systems can be controlled in one solution and seamlessly integrated into your machines and systems. You choose the technology you need to increase the efficiency of your production, and Festo, as a one-stop shop, offers you everything from a single source.

Digitalisation and AI are used to optimise design, operation and maintenance. And software solutions, tools and services are available for the entire automation pyramid, from predictive maintenance and digital twins to Festo AX Industrial Intelligence. This results in shorter downtimes, fewer rejects, reduced leakage, while also adding a valuable contribution to quality assurance and energy efficiency.

But technological innovation alone is not enough. It needs requires people to further develop and apply it. Festo Didactic is a global leader in basic and further technical training and your strong partner for developing technical competencies. Be it with customised learning packages, digital platforms or complete training centres, Festo Didactic stands for **lifelong learning**.

We are also setting the standards in terms of **sustainability**: As part of the Science Based Targets initiative (SBTI), we are committed to climate targets that are in line with the Paris Agreement. We are continuously working to reduce CO<sub>2</sub> and create resource-saving solutions at all our sites and along the entire supply chain. Together with our customers, we are making an active contribution to a sustainable and circular economy, making automation a driving force for climate protection.

100 years of Festo represent our motivation to continue making automation simpler and more efficient for you in the future. We invite you to: Discover our comprehensive product portfolio in the new catalogue and use our digital engineering tools to make your projects even more efficient. If you have any questions or are interested in more information, please do not hesitate to contact us.

I hope you enjoy looking through it!



Frank Notz  
Member of the Management Board Sales at Festo SE & Co. KG

## Digital products and services

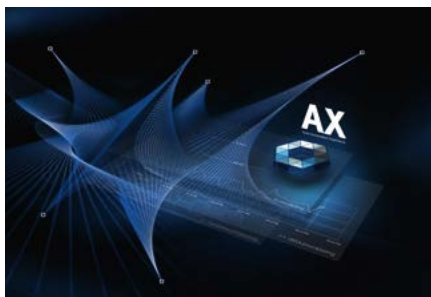
### Comprehensive digitalisation concepts: AI becomes the new standard

All our development activities for digitalised automation revolve around one question: how can we make you more productive along the entire value chain?

From initial engineering, procurement and commissioning to maintenance and operation? At Festo you will find the right digital offer for your needs.

Below you will see a selection that we have compiled for you.

### AI and industrial intelligence in production



Do you want to avoid unplanned downtime, ensure product quality and reduce energy costs? With Festo AX Industrial Intelligence, companies can record real-time production data and analyse it with the help of artificial intelligence (AI). By using artificial intelligence, you can carry out predictive maintenance, ensure product quality (predictive quality) and utilise resources more efficiently (predictive energy).

You can reduce downtimes by 25%, cut rejects by 20% and decrease leakages by up to 65%, all thanks to Festo AX.

The Festo AX AI software helps you with:

- Predictive maintenance to reduce unplanned downtime
- Predictive quality to ensure product quality
- Predictive Energy to minimise energy costs

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

### Pneumatic Simulation



You may have already asked yourself if there's a quicker and more accurate way to calculate the optimal pneumatic control chain. Yes, there is! Pneumatic Simulation doesn't just offer you one design version that is suitable for your application, but up to three. By entering three application parameters such as load, stroke and positioning time, you will get up to three suggestions: the precise result as well as the performance and eco versions.

Pneumatic Simulation allows you to benefit from:

- Optimal air consumption
- The ideal travel time per cycle
- Direct connections to the Festo Online Shop.

→ [www.festo.com/x/pneumatic-simulation](http://www.festo.com/x/pneumatic-simulation)

### Festo Design Tool 3D



Festo Design Tool 3D is a 3D product configurator for generating Festo-specific CAD product combinations. It will make your search for matching accessories for standard products with fast delivery, such as the pneumatic cylinder series DSBC, DSNU and ADN, faster, more reliable and easier in the future. At the same time documentation requires less effort and traceability is easy.

The benefits for design, purchasing and commissioning:

- Quick and easy automated generation of product combinations
- Shorter bills of materials, fewer sources of error and optimised ordering processes
- Native CAD models for retaining CAD/component links (CAD Constraints, CAD Mates)
- Simplified, accelerated warehousing and assembly processes

→ [www.festo.com/fdt-3D](http://www.festo.com/fdt-3D)

### CO2 & TCO Guide



Before choosing the technology for your system, you should make sure you know how high the CO2 consumption will be during operation and what you can expect the total cost of ownership (TCO) to be in the future.

Our CO2 TCO tool enables you to compare electric and pneumatic drives from our product portfolio. It provides a clear comparison of the energy consumption, CO2 emissions, the procurement costs and the

total cost of ownership and thus provides you with all the key factors as a valuable decision-making support.

- Guide for selecting the right technology
- Comparison of pneumatic and electric drives
- Comparison of energy consumption, CO2 emissions, procurement costs and total cost of ownership

→ [www.festo.com/x/co2-tco](http://www.festo.com/x/co2-tco)

## Simplified Motion Series – Solution Finder



The simplicity of pneumatics is now combined for the first time with the advantages of electric automation thanks to the Simplified Motion Series. These integrated drives are the perfect solution for all users who are looking for an electric alternative for very simple movement and positioning tasks, but don't want the commissioning process for traditional electric drive systems that can often be quite complex.

- Configure the right product for any simple linear or rotary movement.
- Select the product and order it in the Online Shop.

→ [www.festo.com/x/simplified-motion-series](http://www.festo.com/x/simplified-motion-series)

## Schematic Solution for EPLAN projects



This circuit diagram service is only available from Festo: Schematic Solution for EPLAN projects documents your configured solutions completely and in no time at all! Simply enter the order code and you will receive the complete plan in just a few minutes - error-free and secure. No more tedious searching, downloading and assembling of individual parts, reducing the effort from several hours to just a few minutes.

- Intuitive, fast and reliable: error-free documentation at the push of a button
- Complete mechatronic display of configured products like CPX, VTSA, MPA
- Reliably automated according to the standards IEC 61355, IEC 81346, ISO 1219

→ [www.festo.com/x/eplan-app](http://www.festo.com/x/eplan-app)

## FluidDraw – circuit diagrams for complete systems



Planning and documenting electric and pneumatic components in your system have never been easier. FluidDraw gives you direct access to the catalogue and any online baskets you saved at Festo, as well as letting you import additional databases and use a standardised symbol library. For maximum convenience choose the FluidDraw 365 software subscription with regular updates and the latest upgrades.

- IMX and Eplan interfaces
- Tubing lengths, wire and cable lengths
- Standardised hydraulic symbols to ISO 1219

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

## Configurator for process valve units and quarter turn actuator units



The configurator for process valve units (KVZA and KVZB) and quarter turn actuator units (KDFP-DFPD) significantly simplifies engineering and procurement processes. The tool ensures quick and successful project management by taking all relevant factors into account: from initial product search, configuration, sizing and documentation right through to ordering and delivery of the ready-to-install units – everything is combined in one tool, including customer-specific requests.

- Tailored and ready-to-install solutions
- Increased reliability for your specific application
- CAD data for configuration and documentation for direct download
- The system ID can also be used for subsequent orders
- Reliable planning with immediate price and delivery time information

All components come from a single source, are pre-assembled and perfectly compatible with each other.

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

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

→ [www.festo.com/catalogue/kdfp-dfpd](http://www.festo.com/catalogue/kdfp-dfpd)

You can find more tools in our overview

→ [www.festo.com/engineering-tools](http://www.festo.com/engineering-tools)

## VTUX valve terminal – the adaptable valve

Modern design and seamless integration into the AP platform enable unprecedented flexibility. The high-performance and future-oriented valve terminal platform VTUX is the right choice from the outset.

- Highly modular and with Festo AP communication technology – the new standard for higher performance and lower costs
- All requirements for predictive maintenance, security features, and data exchange are integrated in the cloud (IIOT)
- Compact and lightweight – saves time, space, and weight in the machine
- Ideal for centralized and decentralized machine concepts

“Our new valve terminal VTUX is a milestone.”

Dr. Ansgar Kriwet, Member of the Management Board Research and Development, Festo



# Electrics

Infrastructure for technology modules – the new remote I/O system CPX-AP-A

### Serial modular remote I/O in protection class IP65/67

- Real-time communication with Ethernet-based fieldbus and internal AP communication
- Direct connection of input and output signals (digital and analog) with connection technology for every application (M8, M12, terminal strip)
- Wide range of options for voltage supply and power transmission
- Interface for application programming



Integrated, space-saving switching position feedback directly assigned to the valve position

**Digital inputs with internal serial links**

- Detachable M8 plug adapter (IP6x) for extremely high packing density and easy installation, alternatively terminal strip (IP40)
- PNP or NPN
- 2 inputs per valve position
- For manifold sub-base with four valves

# Pneumatics

Vacuum solutions with air saving function

**Complete vacuum integration for individual configuration**

- Vacuum and ejector pulse can be individually controlled
- Solutions for high vacuum or high vacuum flow
- Two power levels with a grid size of 12.5 mm:  
nominal width 0.7 mm / 1.0 mm
- Vacuum only terminal or mixed with pressure switching valves

You can find more information at:

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

## Sustainable Automation

# Reducing CO<sub>2</sub> Emissions for Climate Protection

**Thinking about future generations and responsible, long-term management are deeply ingrained in the family-owned company that is Festo.**

Festo has been pushing the issue of energy efficiency in all areas for decades – in Festo itself, through research projects, in cross-industry committees, and with a range of solutions geared towards sustainability.

Sustainability at Festo includes areas of action such as reducing the carbon footprint, initiating a capability shift, and facilitating technical education, and further training. It is an integral component of the corporate strategy, and a clear guiding principle for all our actions.

## Reducing the carbon footprint

Sustainability is the work of many hands at Festo. It is something that is relevant for all areas of the company, as well as our suppliers and customers.

**Since 2024, the entire Festo Group has been CO<sub>2</sub>-compensated in Scope 1 and already CO<sub>2</sub>-neutral in Scopes 2 and 3.8 – two years earlier than planned.** Festo also plans to reduce around 30% of Scope 1 emissions by around 2030 and to achieve the net-zero target by 2040.

95% of all carbon emissions are generated during the operating phase of products. The right portfolio with CO<sub>2</sub>-optimized products together with needs-based advice throughout the operating phase are the key to securing a sustainable future for Festo and for our customers.



The **Festo Sustainability Report** provides annual information on the sustainable development of the company. Scan the code to read the latest edition.  
 → [www.festo.com/sustainability-report](http://www.festo.com/sustainability-report)

## Capability Shift

**Megatrends such as sustainability, demographic change, and digitalization are leading to changes in market needs, and will also change the way companies work.**

Festo is engaged in a continuous learning process together with its employees in order to remain an attractive employer for new talent, and to systematically train employees at an early stage.

The social skills of employees are just as important as their technical skills. Respect for human rights throughout the Festo Group is therefore a crucial component of the sustainability strategy at Festo.



“By working together with our employees, we will continue to be a company driven by technology and innovation in the future, and promote sustainable change for ourselves and for our customers.”

**Dr. Sebastian Beck**, Member of the Management Board Finance and Human Resources, Festo



Find out more about our **Capability Shift** area of action in the video: → [www.festo.com/peopleatfesto](http://www.festo.com/peopleatfesto)



“Only by working with our customers can we make production CO<sub>2</sub>-neutral in the future.”

Julia Bikidis, Head of Corporate Sustainability, Festo



More on the area of action  
**Reducing the carbon footprint**  
can be found in this video:  
→ [www.festo.com/sustainability](http://www.festo.com/sustainability)



**CO<sub>2</sub> savings worldwide** Festo has been investing in generating its own electricity using photovoltaic (PV) systems since 2004. PV systems were added at 20 further locations in 2023.

The total PV output at Festo has thus increased by over 60% and now amounts to 13.8 megawatts peak. At the end of 2023, all PV systems around the world generated a total of 15,651 megawatt hours of electricity.

This translates into 10,600 fewer tons of CO<sub>2</sub> per year that are emitted by the electricity suppliers.

## Technical Education

**Environmentally friendly skills – green skills – will be relevant for all professions in the future.** Technical professionals in all industries need to develop an environmentally conscious mindset that will have a positive impact on the ecological footprint of their employers, partners, and customers.

The training activities offered by Festo Didactic provide sustainable training solutions, all the way from vocational training to university and into the professional world. Festo Didactic supports customers in building a well-qualified and environmentally aware workforce, especially in areas such as water management, sustainable production, renewable energy generation, and the production of electric vehicles and batteries.



“With our new innovative teaching and learning concepts, we help our customers to build and shape a sustainable future.”

Dr. Oliver Niese, Member of the Board at Festo Didactic



More on the **Technical education and further training** area of action can be found in this video: → [www.festo.com/sustainableeducation](http://www.festo.com/sustainableeducation)

## Product Shopping Basket for Reducing CO<sub>2</sub>

**Machine and system builders can generally use pneumatic and electromechanical automation solutions to implement an automation task.**

By bringing together pneumatics and electrics using smart innovations, it is possible to provide technology-neutral advice, design customer applications efficiently, and minimize carbon emissions wherever possible. In addition, relevant services are available throughout the operating phase. You can opt for a particular solution, or you can combine pneumatics and electrics to create a solution that is precisely tailored to your requirements, while also taking into consideration energy efficiency and costs for the entire operating phase.

**Festo supports its customers in four core areas to achieve greater sustainability in automation:**

### 1. Engineering for greater energy efficiency

It is the design of a machine or system that lays the foundation for the smallest possible carbon footprint. The free engineering tools from Festo such as “Pneumatic sizing” and the “CO<sub>2</sub> & TCO Guide” support the customers with their selection of the right components in the right sizes. The tools provide transparent information about energy consumption during operation of the product, and thus enable the optimum design of a machine or system.

### 2. Products for sustainable operation

It is part of the Festo strategy to make product-specific assessments available that evaluate the CO<sub>2</sub> emissions produced by the products. The continuous further development of products with innovative solutions is seen by Festo as the key to a CO<sub>2</sub>-neutral future.

## The blue path to higher efficiency

Your way to zero emissions



**Festo Energy Saving Services:** In 2023, 425 projects were implemented worldwide with a total savings potential of 20,974 tons of CO<sub>2</sub>.

### 3. Saving more energy with Festo Services

In the operating phase of a product, it is all about keeping energy consumption at an optimum level in the long term and identifying deviations in good time. Digital solutions for energy monitoring and Festo Energy Saving Services, a compressed air energy efficiency audit that is carried out worldwide and is TÜV-certified, help the manufacturing industry to do this.

### 4. Sustainability in basic and further training

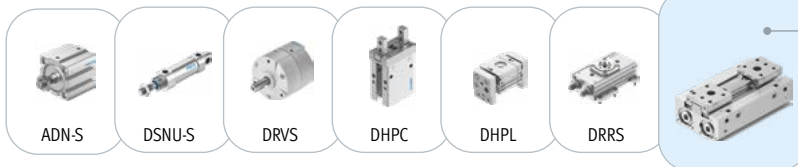
As a leading specialist in technical training, Festo Didactic provides the specialists of today and tomorrow with the knowledge and skills they need to identify potential savings in their work and systematically implement them.



**Product shopping basket for reducing CO<sub>2</sub>:**  
You can find the product selection in the Online Shop using the filter "Specific catalogs > Sustainability".

### Examples of...

#### ...lighter weight products



Parallel gripper

**HPPF**

**Sustainable in production** thanks to a reduced use of materials and in operation thanks to integrated control, leading to energy savings of up to 80%.

#### ...products with energy-saving function



Vacuum generator

**OVEM**

**Up to 60% less energy consumption:** The intelligent vacuum generator OVEM ensures a safe shut-off and avoids permanent air consumption thanks to an air-saving circuit.

Energy efficiency module

**MSE6-C2M**

**Regulates the compressed air supply when the system is in stand-by mode,** prevents waste caused by possible leaks, monitors the flow rate and pressure, and enables predictive energy management in combination with the AI software solution "Festo AX" for energy savings of up to 70%.

#### Optimizing the pressure level

On the Festo website, you will find energy-saving tips for pneumatic and electric automation solutions such as "Optimizing the pressure level". Energy savings of up to 10% can be achieved by reducing system pressure by 1 bar. The **new pressure regulator MS-LR-B** (p. 36) – lightweight and robust thanks to modern polymer materials – is also part of the product range. If individual applications require higher pressure levels, this can be done decentrally, for example, with the pressure booster DPA.

Wide range of industry segments – one competent partner.

## Food, drink and packaging industry



From continuous processes, and food and splash zones to end line packaging:

- Solutions for controlling special media flows
- Automation components in easy-to-clean design and with food-safe materials
- Handling systems with suitable gripper solutions
- Technology mix: electric, pneumatic and servo-pneumatic

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

## Automotive industry and Tier 1 suppliers



- Flexible automation solutions for electromobility
- Intelligent and energy-efficient technologies
- Safety-related concepts and components
- Matching product portfolio – electric, pneumatic, servo-pneumatic
- Engineering and industry competencies along the entire process chain

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

## Small parts assembly and electronics industry



Expertise along the entire process chain:

- From wafer production at the front end to finished chips at the back end
- For quality inspection and assembly of the finished products
- In small parts assembly, electronics or non-electronics

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

Wide range of industry segments – one competent partner.

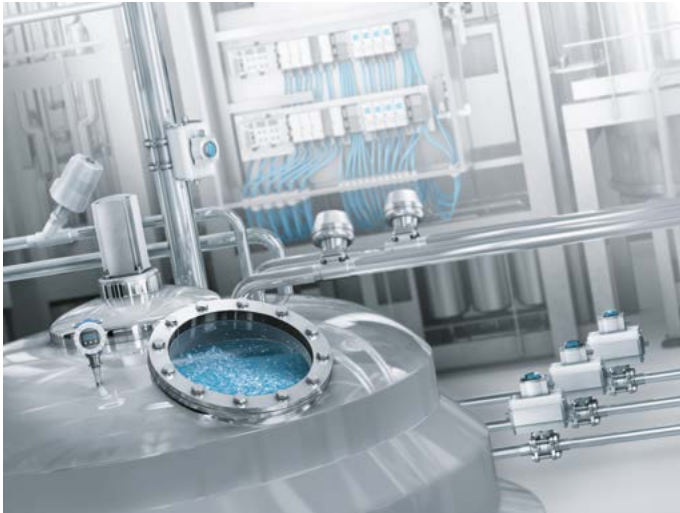
## LifeTech – technologies for the life sciences



- Delivery of automation components for key processes:
  - Laboratory automation
  - Medical technology
  - In vitro diagnostics
  - Point-of-care applications
- Kinematics for sample handling
- Liquid handling with dispensing and pipetting systems
- Precise regulation of medical gases

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

## Biotech, pharma and cosmetics industry



- Delivery of automation components for key processes:
  - API manufacturing
  - Manufacturing pharmaceuticals, cosmetics and personal care products
  - Filling and packaging
- Customer-oriented consulting and engineering
- Compressed air quality analyses
- Energy Saving Services

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

## Water treatment



- Delivery of automation components for key processes:
  - Water treatment
  - Wastewater treatment
- Customer-oriented consulting and engineering
- Compressed air quality analyses
- Energy Saving Services

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

Wide range of industry segments – one competent partner.



Product overview

01 Software tools

Pneumatic cylinders

**Pneumatic sizing**



Size pneumatic control loop systems quickly and energy-efficiently. In order to survive in a tough competitive environment, many companies are looking for ways to make savings in their production.

Such savings can often be found in their existing compressed air systems, which have generally been in place for years. Up to 60% of energy costs can be saved through optimisation at both the production facility and system level.

This tool can be found at  
 → [www.festo.com/x/pneumatic-sizing](http://www.festo.com/x/pneumatic-sizing)

**Air consumption of cylinders**



Calculate your system's air consumption. Calculate your system's air consumption quickly and conveniently. Simply enter all the drives and tubing, set the cycle times and working pressure and the air consumption per minute and per day will be calculated for you. The input table including the result can be exported directly to Excel.

This tool can be found at  
 → [www.festo.com/x/air-consumption](http://www.festo.com/x/air-consumption)

**Pneumatic simulation**



Perfect simulations replace expensive real-life tests! The tool is an expert system that supports you in the selection and configuration of the entire pneumatic control chain. If one parameter is changed, the program automatically adapts all the others.

This tool can be found at  
 → [www.festo.com/x/pneumatic-simulation](http://www.festo.com/x/pneumatic-simulation)

**Festo Design Tool 3D**



Festo Design Tool 3D is a 3D product configurator for generating specific CAD product combinations from Festo. The configurator makes your search for the right accessory quicker, easier and more reliable.

You can then order the module you designed as a single order item, either completely pre-assembled or as individual parts in a box. This significantly reduces your bill of materials, and simplifies downstream processes such as product ordering, order picking and assembly.

You can find this tool at  
 → [www.festo.com/fdt-3D](http://www.festo.com/fdt-3D)

**CO2 values and TCO Guide**







CO2 values and TCO for your application.

Take a quantum leap in automation technology. By using suitable components from Festo in an intelligent way, you can reduce the energy consumption of your systems and thus specifically lower your production's carbon emissions.

You will find this tool at  
 → [www.festo.com/x/co2-tco](http://www.festo.com/x/co2-tco)

Piston rod cylinder >




Round cylinders

	 <b>Standards-based cylinder DSNU</b>	 <b>Round cylinders DSNU</b>	 <b>Round cylinders DSNU-S</b>	 <b>Standards-based cylinder CRDSNU, CRDSNU-B</b>
<b>Mode of operation</b>	Double-acting	Double-acting	Double-acting	Double-acting
<b>Piston diameter</b>	8 mm, 10 mm, 12 mm, 16 mm, 20 mm, 25 mm	32 mm, 40 mm, 50 mm, 63 mm	8 mm, 12 mm, 16 mm, 20 mm, 25 mm	12 mm, 16 mm, 20 mm, 25 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	23 ... 295 N	482.5 ... 1870.3 N	30.2 ... 294.5 N	68 ... 295 N
<b>Stroke</b>	1 ... 500 mm	1 ... 500 mm	1 ... 200 mm	1 ... 500 mm
<b>Cushioning</b>	Elastic cushioning rings/plates at both ends, Self-adjusting pneumatic end-position cushioning, Pneumatic cushioning, adjustable at both ends	Elastic cushioning rings/plates at both ends, Self-adjusting pneumatic end-position cushioning, Pneumatic cushioning, adjustable at both ends	Elastic cushioning rings/plates at both ends, Self-adjusting pneumatic end-position cushioning	Elastic cushioning rings/plates at both ends, Self-adjusting pneumatic end-position cushioning, Pneumatic cushioning, adjustable at both ends
<b>Description</b>	<ul style="list-style-type: none"> <li>• ISO 6432</li> <li>• Wide range of variants for customised applications</li> <li>• Good running performance and long service life</li> <li>• Self-adjusting pneumatic end-position cushioning saves time during commissioning and adapts optimally to load and speed changes</li> <li>• Piston rod with female or male thread</li> <li>• For position sensing</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> </ul>	<ul style="list-style-type: none"> <li>• Wide range of variants for customised applications</li> <li>• Good running performance and long service life</li> <li>• Self-adjusting pneumatic end-position cushioning saves time during commissioning and adapts optimally to load and speed changes</li> <li>• Piston rod with female or male thread</li> <li>• For position sensing</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> </ul>	<ul style="list-style-type: none"> <li>• Short variant of ISO cylinder DSNU</li> <li>• Quick and easy installation, even in tight spaces</li> <li>• Light weight</li> <li>• Self-adjusting pneumatic end-position cushioning saves time during commissioning and adapts optimally to load and speed changes</li> <li>• Piston rod with male thread</li> <li>• For position sensing</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> <li>• Sustainable in production thanks to reduced use of materials</li> </ul>	<ul style="list-style-type: none"> <li>• ISO 6432</li> <li>• Corrosion resistant against aggressive ambient conditions</li> <li>• Easy-to-clean design</li> <li>• Suitable for direct contact with food according to European Regulation (EC) No. 1935/2004</li> <li>• FDA-compliant seal and NSF-H1 lubrication</li> <li>• Wide range of variants for customised applications</li> <li>• Long service life thanks to optional dry-running seal</li> <li>• Self-adjusting pneumatic end-position cushioning saves time during commissioning and adapts optimally to load and speed changes</li> <li>• For position sensing</li> </ul>
<b>online:</b> →	<a href="#">dsnu</a>	<a href="#">dsnu</a>	<a href="#">dsnu</a>	<a href="#">crdsnu</a>

Product overview



Piston rod cylinder >

Round cylinders

	 <b>Round cylinders CRDSNU, CRDSNU-B</b>	 <b>Standards-based cylinder ESNU</b>	 <b>Round cylinders ESNU</b>
<b>Mode of operation</b>	Double-acting	Pushing, Single-acting	Pushing, Single-acting
<b>Piston diameter</b>	32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm	8 mm, 10 mm, 12 mm, 16 mm, 20 mm, 25 mm	32 mm, 40 mm, 50 mm, 63 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	483 ... 4712 N	19 ... 271 N	406 ... 1765 N
<b>Stroke</b>	1 ... 500 mm	1 ... 50 mm	1 ... 50 mm
<b>Cushioning</b>	Elastic cushioning rings/plates at both ends, Self-adjusting pneumatic end-position cushioning, Pneumatic cushioning, adjustable at both ends	Elastic cushioning rings/plates at both ends	Elastic cushioning rings/plates at both ends
<b>Description</b>	<ul style="list-style-type: none"> <li>• Corrosion resistant against aggressive ambient conditions</li> <li>• Easy-to-clean design</li> <li>• Suitable for direct contact with food according to European Regulation (EC) No. 1935/2004</li> <li>• FDA-compliant seal and NSF-H1 lubrication</li> <li>• Wide range of variants for customised applications</li> <li>• Long service life thanks to optional dry-running seal</li> <li>• Self-adjusting pneumatic end-position cushioning saves time during commissioning and adapts optimally to load and speed changes</li> <li>• For position sensing</li> </ul>	<ul style="list-style-type: none"> <li>• ISO 6432</li> <li>• Wide range of variants for customised applications</li> <li>• Good running performance and long service life</li> <li>• Piston rod with female or male thread</li> <li>• For position sensing</li> </ul>	<ul style="list-style-type: none"> <li>• Wide range of variants for customised applications</li> <li>• Good running performance and long service life</li> <li>• Piston rod with female or male thread</li> <li>• For position sensing</li> </ul>
<b>online: →</b>	<a href="#">crdsnu</a>	<a href="#">esnu</a>	<a href="#">esnu</a>




Piston rod cylinder >

Round cylinders

	 <b>Round cylinders CRHD</b>	 <b>Round cylinders EG-PK</b>
<b>Mode of operation</b>	Double-acting	Pushing, Single-acting
<b>Piston diameter</b>	32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm	2.5 mm, 4 mm, 6 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	483 ... 4712 N	1.9 ... 11.8 N
<b>Stroke</b>	10 ... 500 mm	5 ... 25 mm
<b>Cushioning</b>	Pneumatic cushioning, adjustable at both ends	On one side, Not adjustable, No cushioning
<b>Description</b>	<ul style="list-style-type: none"> <li>• Corrosion resistant against aggressive ambient conditions</li> <li>• Easy-to-clean design, optimised for very exacting demands</li> <li>• Flexible design thanks to different end caps</li> <li>• Piston rod with male thread</li> <li>• For position sensing</li> </ul>	<ul style="list-style-type: none"> <li>• Micro cylinder</li> <li>• Barbed fitting for plastic tubing with standard I.D.</li> <li>• Without position sensing</li> </ul>
<b>online: →</b>	<a href="#">crhd</a>	<a href="#">eg-pk</a>

Piston rod cylinder >

Profile and tie rod cylinders

	 <b>Standards-based cylinders pre-configured DSBC</b>	 <b>Standards-based cylinders CRDNG, CRDNGS</b>	 <b>Standards-based cylinders, Clean Design DSBF</b>
<b>Mode of operation</b>	Double-acting	Double-acting	Double-acting
<b>Piston diameter</b>	32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm, 125 mm	32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm, 125 mm	32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm, 125 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	415 ... 7363 N	483 ... 7363 N	415 ... 7363 N
<b>Stroke</b>	1 ... 2800 mm	10 ... 2000 mm	1 ... 2800 mm
<b>Cushioning</b>	Elastic cushioning rings/plates at both ends, Self-adjusting pneumatic end-position cushioning, Pneumatic cushioning, adjustable at both ends	Pneumatic cushioning, adjustable at both ends	Elastic cushioning rings/plates at both ends, Self-adjusting pneumatic end-position cushioning, Pneumatic cushioning, adjustable at both ends
<b>Description</b>	<ul style="list-style-type: none"> <li>• Self-adjusting pneumatic end-position cushioning saves time during commissioning and adapts optimally to load and speed changes</li> <li>• ISO 15552 (ISO 6431, VDMA 24562)</li> <li>• Sustainable thanks to extended life cycle and easier repairs</li> <li>• Standard profile with two sensor slots</li> <li>• Wide range of variants for customised applications</li> <li>• Comprehensive range of mounting accessories for just about every type of installation</li> <li>• For position sensing</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> </ul>	<ul style="list-style-type: none"> <li>• ISO 15552 (ISO 6431, VDMA 24562)</li> <li>• Corrosion resistant against aggressive ambient conditions</li> <li>• Easy-to-clean design</li> <li>• Variants: through piston rod, heat-resistant design</li> <li>• Threaded mounting, mounting via accessories</li> <li>• For position sensing</li> </ul>	<ul style="list-style-type: none"> <li>• ISO 15552</li> <li>• Increased corrosion protection</li> <li>• Easy-to-clean design</li> <li>• FDA-approved lubrication and sealing on the basic version</li> <li>• Long service life thanks to optional dry-running seal</li> <li>• Self-adjusting pneumatic end-position cushioning saves time during commissioning and adapts optimally to load and speed changes</li> <li>• For position sensing</li> <li>• Sustainable thanks to extended life cycle and easier repairs</li> </ul>
<b>online: →</b>	<a href="#">dsbc</a>	<a href="#">crdng</a>	<a href="#">dsbf</a>

## Product overview

### Piston rod cylinder >

## Profile and tie rod cylinders

Pneumatic cylinders



**Standards-based cylinders**  
**DSBG**







**Standards-based cylinders**  
**DSBG**

	<b>Standards-based cylinders</b> <b>DSBG</b>	<b>Standards-based cylinders</b> <b>DSBG</b>
<b>Mode of operation</b>	Double-acting	Double-acting
<b>Piston diameter</b>	32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm, 125 mm	160 mm, 200 mm, 250 mm, 320 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	415 ... 7363 N	11310 ... 48255 N
<b>Stroke</b>	1 ... 2800 mm	1 ... 2700 mm
<b>Cushioning</b>	Elastic cushioning rings/plates at both ends, Self-adjusting pneumatic end-position cushioning, Pneumatic cushioning, adjustable at both ends	Elastic cushioning rings/plates at both ends, Pneumatic cushioning, adjustable at both ends
<b>Description</b>	<ul style="list-style-type: none"> <li>• ISO 15552 (ISO 6431, VDMA 24562)</li> <li>• Sturdy tie rod design</li> <li>• Self-adjusting pneumatic end-position cushioning saves time during commissioning and adapts optimally to load and speed changes</li> <li>• Comprehensive range of mounting accessories for just about every type of installation</li> <li>• For position sensing</li> <li>• Variants to EU Explosion Protection Directive (ATEX)</li> </ul>	<ul style="list-style-type: none"> <li>• ISO 15552 (ISO 6431, VDMA 24562)</li> <li>• Sturdy tie rod design</li> <li>• Pneumatic end-position cushioning adjustable at both ends</li> <li>• Optionally without pneumatic end-position cushioning, adjustable at both ends, and position sensing, resulting in a price advantage</li> <li>• Optionally with spacer bolt attachment</li> <li>• For position sensing</li> <li>• Variants to EU Explosion Protection Directive (ATEX)</li> </ul>
<b>online:</b> →	<a href="#">dsbg</a>	<a href="#">dsbg</a>

Piston rod cylinder >




Compact, short-stroke and flat cylinders

	 <b>Compact cylinder ADN-S</b>	 <b>Compact cylinders AEN-S</b>	 <b>Compact cylinders ADN</b>	 <b>Compact cylinders AEN</b>
<b>Mode of operation</b>	Double-acting	Pushing	Double-acting	Pushing, Single-acting, Pulling
<b>Piston diameter</b>	6 mm, 10 mm, 12 mm, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm	6 mm, 10 mm, 12 mm, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm	12 mm, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm, 125 mm	12 mm, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	17 ... 1870 N	13 ... 1780 N	51 ... 7363 N	54 ... 4416 N
<b>Stroke</b>	5 ... 50 mm	5 ... 25 mm	1 ... 500 mm	1 ... 25 mm
<b>Cushioning</b>	Elastic cushioning rings/plates at both ends, No cushioning	Elastic cushioning rings/plates at both ends, No cushioning	Elastic cushioning rings/plates at both ends, Self-adjusting pneumatic end-position cushioning	Elastic cushioning rings/plates at both ends
<b>Description</b>	<ul style="list-style-type: none"> <li>• Minimal installation space</li> <li>• Very lightweight</li> <li>• Ideal for small movements</li> <li>• Piston rod with female or male thread</li> <li>• For position sensing</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> <li>• Sustainable in production thanks to reduced use of materials</li> </ul>	<ul style="list-style-type: none"> <li>• Minimal installation space</li> <li>• Very lightweight</li> <li>• Ideal for small movements</li> <li>• High forces in a compact size</li> <li>• Piston rod with female or male thread</li> <li>• For position sensing</li> </ul>	<ul style="list-style-type: none"> <li>• ISO 21287</li> <li>• Up to 50% less installation space than comparable standards-based cylinders to ISO 15552</li> <li>• Good running performance and long service life</li> <li>• Wide range of variants for customised applications</li> <li>• For position sensing</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> <li>• Sustainable thanks to extended life cycle and easier repairs</li> </ul>	<ul style="list-style-type: none"> <li>• ISO 21287</li> <li>• Up to 50% less installation space than comparable standards-based cylinders to ISO 15552</li> <li>• Good running performance and long service life</li> <li>• Wide range of variants for customised applications</li> <li>• For position sensing</li> </ul>
<b>online:</b> →	<a href="#">adn-s</a>	<a href="#">aen-s</a>	<a href="#">adn</a>	<a href="#">aen</a>

## Product overview




### Piston rod cylinder >

## Compact, short-stroke and flat cylinders

	 <b>Compact cylinders, multimount DPDM</b>	 <b>Compact cylinders ADN-EL</b>	 <b>Compact cylinders, Clean Design CDC</b>
<b>Mode of operation</b>	Double-acting, Pushing, Single-acting, Pulling	Double-acting	Double-acting
<b>Piston diameter</b>	6 mm, 10 mm, 16 mm, 20 mm, 25 mm, 32 mm	20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm	20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm, 80 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	9 ... 483 N	188 ... 4712 N	141 ... 3016 N
<b>Stroke</b>	5 ... 50 mm	10 ... 500 mm	1 ... 500 mm
<b>Cushioning</b>	Elastic cushioning rings/plates at both ends	Elastic cushioning rings/plates at both ends	Elastic cushioning rings/plates at both ends
<b>Description</b>	<ul style="list-style-type: none"> <li>• Mounting using through-hole and female thread</li> <li>• Compact design</li> <li>• Piston rod variants</li> <li>• For position sensing</li> <li>• Sustainable in production thanks to reduced use of materials</li> </ul>	<ul style="list-style-type: none"> <li>• ISO 21287</li> <li>• With end-position locking at both ends, front or rear</li> <li>• Piston rod with female or male thread</li> <li>• For position sensing</li> </ul>	<ul style="list-style-type: none"> <li>• ISO 21287</li> <li>• Up to 50% less installation space than comparable standards-based cylinders to ISO 15552</li> <li>• Easy-to-clean design</li> <li>• Increased corrosion protection</li> <li>• Wide range of variants for customised applications</li> <li>• Piston rod with female or male thread</li> <li>• For position sensing</li> </ul>
<b>online: →</b>	<a href="#">dpdm</a>	<a href="#">adn-el</a>	<a href="#">cdc</a>



### Piston rod cylinder >

## Compact, short-stroke and flat cylinders

	 <b>Flat cylinders DZF</b>	 <b>Flat cylinders DZH</b>	 <b>Flat cylinders EZH</b>
<b>Mode of operation</b>	Double-acting	Double-acting	Pushing, Single-acting
<b>Piston diameter</b>	Equivalent diameter, 12 mm, 18 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm	Equivalent diameter, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm	Equivalent diameter, 3 mm, 6 mm, 12 mm, 22 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	51 ... 1870 N	104 ... 1870 N	3.8 ... 205 N
<b>Stroke</b>	1 ... 320 mm	1 ... 1000 mm	10 ... 50 mm
<b>Cushioning</b>	Elastic cushioning rings/plates at both ends	Pneumatic cushioning, adjustable at both ends	No cushioning
<b>Description</b>	<ul style="list-style-type: none"> <li>• Extremely flat design</li> <li>• Protected against rotation thanks to special piston shape</li> <li>• Ideal for manifold assembly</li> <li>• Wide variety of mounting and attachment options</li> <li>• Piston rod with female or male thread</li> <li>• For position sensing</li> </ul>	<ul style="list-style-type: none"> <li>• Flat design</li> <li>• Protected against rotation thanks to special piston shape</li> <li>• Ideal for manifold assembly</li> <li>• Wide variety of mounting and attachment options</li> <li>• Piston rod with male thread</li> <li>• For position sensing</li> </ul>	<ul style="list-style-type: none"> <li>• Extremely flat design</li> <li>• Protected against rotation thanks to special piston shape</li> <li>• Wide variety of mounting and attachment options</li> <li>• For position sensing</li> </ul>
<b>online: →</b>	<a href="#">dzf</a>	<a href="#">dzh</a>	<a href="#">ezh</a>




Piston rod cylinder >

Multimount and cartridge cylinders

	 <b>Compact cylinders, multimount DPDM</b>	 <b>Cartridge cylinders EGZ</b>
<b>Mode of operation</b>	Double-acting, Pushing, Single-acting, Pulling	Pushing, Single-acting
<b>Piston diameter</b>	6 mm, 10 mm, 16 mm, 20 mm, 25 mm, 32 mm	6 mm, 10 mm, 16 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	9 ... 483 N	13.9 ... 109 N
<b>Stroke</b>	5 ... 50 mm	5 ... 15 mm
<b>Cushioning</b>	Elastic cushioning rings/plates at both ends	No cushioning
<b>Description</b>	<ul style="list-style-type: none"> <li>• Mounting using through-hole and female thread</li> <li>• Compact design</li> <li>• Piston rod variants</li> <li>• For position sensing</li> <li>• Sustainable in production thanks to reduced use of materials</li> </ul>	<ul style="list-style-type: none"> <li>• Minimal installation space</li> <li>• Installation with or without mounting components</li> <li>• Piston rod with male thread</li> </ul>
<b>online:</b> →	<a href="#">dpdm</a>	<a href="#">egz</a>

Piston rod cylinder >




Cylinders with clamping unit

	 <b>Standards-based cylinders with clamping unit DSBC-C</b>	 <b>Round cylinders with clamping unit DSNU-KP</b>	 <b>Round cylinders with clamping unit DSNU-KP</b>
<b>Mode of operation</b>	Double-acting	Double-acting	Double-acting
<b>Piston diameter</b>	32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm, 125 mm	8 mm, 10 mm, 12 mm, 16 mm, 20 mm, 25 mm	32 mm, 40 mm, 50 mm, 63 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	415 ... 7363 N	23 ... 295 N	483 ... 1870 N
<b>Stroke</b>	1 ... 2800 mm	1 ... 500 mm	1 ... 500 mm
<b>Cushioning</b>	Elastic cushioning rings/plates at both ends, Self-adjusting pneumatic end-position cushioning, Pneumatic cushioning, adjustable at both ends	Elastic cushioning rings/plates at both ends, Self-adjusting pneumatic end-position cushioning, Pneumatic cushioning, adjustable at both ends	Elastic cushioning rings/plates at both ends, Self-adjusting pneumatic end-position cushioning, Pneumatic cushioning, adjustable at both ends
<b>Performance level (PL)</b>			
<b>Description</b>	<ul style="list-style-type: none"> <li>• The piston rod can be held in any position</li> <li>• Piston rod can be held in position for long periods even with alternating loads, fluctuating operating pressure or leaks in the system</li> <li>• Mounting hole pattern to ISO 15552</li> <li>• Piston rod with female or male thread</li> <li>• For position sensing</li> </ul>	<ul style="list-style-type: none"> <li>• Based on ISO 6432</li> <li>• The piston rod can be held in any position</li> <li>• The piston rod can also be held for long periods with alternating loads, fluctuating operation pressure or loss of pressure</li> <li>• For position sensing</li> </ul>	<ul style="list-style-type: none"> <li>• The piston rod can be held in any position</li> <li>• The piston rod can also be held for long periods with alternating loads, fluctuating operation pressure or loss of pressure</li> <li>• For position sensing</li> </ul>
<b>online:</b> →	<a href="#">dsbc-c</a>	<a href="#">dsnu-kp</a>	<a href="#">dsnu-kp</a>

Product overview





Piston rod cylinder >

Cylinders with clamping unit

	 <b>Compact cylinders with clamping unit ADN-KP</b>	 <b>Cylinders with holding brake DFLC</b>	 <b>Cylinders with holding brake DFLG</b>
<b>Mode of operation</b>	Double-acting	Double-acting	Double-acting
<b>Piston diameter</b>	20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm	40 mm, 63 mm, 100 mm	160 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	188 ... 4712 N	754 ... 4712 N	12064 N
<b>Stroke</b>	10 ... 500 mm	10 ... 2000 mm	10 ... 2000 mm
<b>Cushioning</b>	Elastic cushioning rings/plates at both ends	Pneumatic cushioning, adjustable at both ends	Pneumatic cushioning, adjustable at both ends
<b>Performance level (PL)</b>		Stopping, holding, blocking a movement/ category 1, Performance Level c	Stopping, holding, blocking a movement/ category 1, Performance Level c
<b>Description</b>	<ul style="list-style-type: none"> <li>The piston rod can be held in any position</li> <li>The piston rod can also be held for long periods with alternating loads, fluctuating operation pressure or loss of pressure</li> <li>Mounting hole pattern to ISO 21287</li> <li>Piston rod with female or male thread</li> <li>For position sensing</li> </ul>	<ul style="list-style-type: none"> <li>Combination of holding brake and standards-based cylinder based on ISO 15552</li> <li>Holding function: retains the piston rod by clamping with frictional locking</li> <li>Emergency braking function: stops the movement of the piston rod by clamping with frictional locking</li> <li>With safety functions</li> <li>Variants to EU Explosion Protection Directive (ATEX)</li> <li>Optional: high level of corrosion protection</li> <li>For position sensing</li> </ul>	<ul style="list-style-type: none"> <li>Combination of holding brake and standards-based cylinder based on ISO 15552</li> <li>Holding function: retains the piston rod by clamping with frictional locking</li> <li>Emergency braking function: stops the movement of the piston rod by clamping with frictional locking</li> <li>With safety functions</li> <li>Variants to EU Explosion Protection Directive (ATEX)</li> <li>Optional: high level of corrosion protection</li> <li>For position sensing</li> </ul>
<b>online:</b> →	<a href="#">adn-kp</a>	<a href="#">dflc</a>	<a href="#">dflg</a>

## Piston rod cylinder &gt;




## Stainless steel cylinders

	 <b>Standards-based cylinder CRDSNU, CRDSNU-B</b>	 <b>Round cylinders CRDSNU, CRDSNU-B</b>	 <b>Standards-based cylinders CRDNG, CRDNGS</b>	 <b>Round cylinders CRHD</b>
<b>Mode of operation</b>	Double-acting	Double-acting	Double-acting	Double-acting
<b>Piston diameter</b>	12 mm, 16 mm, 20 mm, 25 mm	32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm	32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm, 125 mm	32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	68 ... 295 N	483 ... 4712 N	483 ... 7363 N	483 ... 4712 N
<b>Stroke</b>	1 ... 500 mm	1 ... 500 mm	10 ... 2000 mm	10 ... 500 mm
<b>Cushioning</b>	Elastic cushioning rings/plates at both ends, Self-adjusting pneumatic end-position cushioning, Pneumatic cushioning, adjustable at both ends	Elastic cushioning rings/plates at both ends, Self-adjusting pneumatic end-position cushioning, Pneumatic cushioning, adjustable at both ends	Pneumatic cushioning, adjustable at both ends	Pneumatic cushioning, adjustable at both ends
<b>Description</b>	<ul style="list-style-type: none"> <li>• ISO 6432</li> <li>• Corrosion resistant against aggressive ambient conditions</li> <li>• Easy-to-clean design</li> <li>• Suitable for direct contact with food according to European Regulation (EC) No. 1935/2004</li> <li>• FDA-compliant seal and NSF-H1 lubrication</li> <li>• Wide range of variants for customised applications</li> <li>• Long service life thanks to optional dry-running seal</li> <li>• Self-adjusting pneumatic end-position cushioning saves time during commissioning and adapts optimally to load and speed changes</li> <li>• For position sensing</li> </ul>	<ul style="list-style-type: none"> <li>• Corrosion resistant against aggressive ambient conditions</li> <li>• Easy-to-clean design</li> <li>• Suitable for direct contact with food according to European Regulation (EC) No. 1935/2004</li> <li>• FDA-compliant seal and NSF-H1 lubrication</li> <li>• Wide range of variants for customised applications</li> <li>• Long service life thanks to optional dry-running seal</li> <li>• Self-adjusting pneumatic end-position cushioning saves time during commissioning and adapts optimally to load and speed changes</li> <li>• For position sensing</li> </ul>	<ul style="list-style-type: none"> <li>• ISO 15552 (ISO 6431, VDMA 24562)</li> <li>• Corrosion resistant against aggressive ambient conditions</li> <li>• Easy-to-clean design</li> <li>• Variants: through piston rod, heat-resistant design</li> <li>• Threaded mounting, mounting via accessories</li> <li>• For position sensing</li> </ul>	<ul style="list-style-type: none"> <li>• Corrosion resistant against aggressive ambient conditions</li> <li>• Easy-to-clean design, optimised for very exacting demands</li> <li>• Flexible design thanks to different end caps</li> <li>• Piston rod with male thread</li> <li>• For position sensing</li> </ul>
<b>online:</b> →	<a href="#">crdnsu</a>	<a href="#">crdsnu</a>	<a href="#">crdng</a>	<a href="#">crhd</a>

## Product overview



### Rodless cylinders >

## Mechanically coupled cylinders

	 <b>Linear drives</b> <b>DLGF</b>	 <b>Linear drives</b> <b>DGC-K</b>	 <b>Linear drives</b> <b>DGC-G, DGC-GF, DGC-KF</b>
<b>Mode of operation</b>	Double-acting	Double-acting	Double-acting
<b>Piston diameter</b>	20 mm, 25 mm, 32 mm, 40 mm	18 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm, 80 mm	8 mm, 12 mm, 18 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	188 ... 754 N	153 ... 3016 N	30 ... 1870 N
<b>Stroke</b>	50 ... 1000 mm	1 ... 8500 mm	1 ... 8500 mm
<b>Cushioning</b>	Self-adjusting pneumatic end-position cushioning	Pneumatic cushioning, adjustable at both ends	Elastic cushioning rings/plates at both ends, Pneumatic cushioning, adjustable at both ends, Shock absorber, hard characteristic curve, Shock absorber, soft characteristic curve
<b>Position sensing</b>	Via proximity switch	Via proximity switch	Via proximity switch
<b>Description</b>	<ul style="list-style-type: none"> <li>Extremely flat design</li> <li>Choice of two types of cushioning: self-adjusting pneumatic end-position cushioning or external hydraulic shock absorbers</li> <li>Supply port on the left or right or at both ends or alternatively from below</li> <li>Loads and devices can be directly mounted on the slide</li> <li>Basic design DLGF-G without external guide for simple drive functions in small installation spaces</li> <li>Recirculating ball bearing guide DLGF-KF with a standard recirculating ball bearing guide for high torques and heavy loads</li> <li>Sustainable thanks to extended life cycle and easier repairs</li> </ul>	<ul style="list-style-type: none"> <li>Compact design: 30% smaller than basic design DGC-G</li> <li>Basic drive without guide, for simple drive functions</li> <li>Low moving dead weight</li> <li>Symmetrical design</li> </ul>	<ul style="list-style-type: none"> <li>All settings accessible from one side</li> <li>Available with variable end stops and intermediate position module</li> <li>Sustainable thanks to extended life cycle and easier repairs</li> <li>Optional: NSF-H1 lubricant for the food zone (see <a href="http://www.festo.com/certificates/DGC">www.festo.com/certificates/DGC</a>)</li> <li>Optional: clamping unit for holding loads</li> <li>Sustainable operation thanks to leakage reduction at sealing points</li> </ul>
<b>online:</b> →	<a href="#">dlgf</a>	<a href="#">dgc-k</a>	<a href="#">dgc</a>



Rodless cylinders >

Mechanically coupled cylinders

	 <p><b>Linear drives with heavy-duty guide DGC-HD</b></p>	 <p><b>Linear drives SLG</b></p>
<b>Mode of operation</b>	Double-acting	Double-acting
<b>Piston diameter</b>	18 mm, 25 mm, 40 mm	8 mm, 12 mm, 18 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	153 ... 754 N	30 ... 153 N
<b>Stroke</b>	1 ... 5000 mm	100 ... 900 mm
<b>Cushioning</b>	Shock absorber, hard characteristic curve, Shock absorber, soft characteristic curve	Elastic cushioning rings/plates at both ends, Shock absorber, hard characteristic curve
<b>Position sensing</b>	Via proximity switch	Via proximity switch
<b>Description</b>	<ul style="list-style-type: none"> <li>• For maximum loads and torques thanks to duo guide rail</li> <li>• Very good operating performance under torque load</li> <li>• Long service life</li> <li>• Ideal as a basic axis for linear gantries and cantilever axes</li> <li>• Wide range of adaptation options on the drives</li> </ul>	<ul style="list-style-type: none"> <li>• Extremely flat design</li> <li>• Highest precision thanks to integrated recirculating ball bearing guide</li> <li>• Adjustable end stops</li> <li>• Wide range of supply ports</li> <li>• Available with intermediate position module</li> </ul>
<b>online: →</b>	<a href="#">dgc-hd</a>	<a href="#">slg</a>

Rodless cylinders >

Magnetically coupled cylinders

	 <p><b>Linear drives DGO</b></p>	 <p><b>Linear drive units SLM</b></p>
<b>Mode of operation</b>	Double-acting	Double-acting
<b>Piston diameter</b>	12 mm, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm	12 mm, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	68 ... 754 N	68 ... 754 N
<b>Stroke</b>	10 ... 4000 mm	10 ... 1500 mm
<b>Cushioning</b>	Elastic cushioning rings/plates at both ends, Pneumatic cushioning, adjustable at both ends	Elastic cushioning rings/plates at both ends, Shock absorber, hard characteristic curve
<b>Position sensing</b>	Via proximity switch	Via proximity switch, Via inductive sensors
<b>Description</b>	<ul style="list-style-type: none"> <li>• Magnetic power transmission</li> <li>• Pressure-tight and zero leakage</li> <li>• Dirt-proof and dust-proof</li> <li>• Sustainable operation thanks to leakage reduction at sealing points</li> </ul>	<ul style="list-style-type: none"> <li>• Magnetic power transmission</li> <li>• Recirculating ball bearing guide: combination of slide unit and rodless linear drive</li> <li>• Individual choice of end-position cushioning and sensing</li> </ul>
<b>online: →</b>	<a href="#">dgo</a>	<a href="#">slm</a>

Product overview

01 Software tools

Pneumatic cylinders

**Mass moment of inertia**






Juggling pencils and pocket calculators is now a thing of the past. No matter whether you have discs, blocks, push-on flanges, grippers, etc., this tool does the job of calculating all the mass moments of inertia. Just save, send or print and you're finished.

This tool can be found at  
[→ www.festo.com/x/mass-moment-of-inertia](http://www.festo.com/x/mass-moment-of-inertia)



Semi-rotary drives >

Semi-rotary vane drives

	 <b>Semi-rotary drives DRVS</b>	 <b>Semi-rotary drives DSM</b>	 <b>Semi-rotary drives DSM-B, DSM-HD-B</b>
<b>Size</b>	6, 8, 12, 16, 25, 32, 40	6, 8, 10	12, 16, 25, 32, 40, 63
<b>Theoretical torque at 0.6 MPa (6 bar, 87 psi)</b>	0.15 ... 20 Nm	0.15 ... 1.7 Nm	1.25 ... 80 Nm
<b>Permissible mass moment of inertia</b>	6.5 ... 350 kgcm <sup>2</sup>	6.5 ... 26 kgcm <sup>2</sup>	50 ... 5000 kgcm <sup>2</sup>
<b>Position sensing</b>	Via proximity switch	Via proximity switch, Without	Via proximity switch, Without
<b>Swivel angle</b>	0 ... 270 deg	0 ... 240 deg	0 ... 270 deg
<b>Description</b>	<ul style="list-style-type: none"> <li>• Double-acting semi-rotary drive with rotary vane</li> <li>• Lighter than other semi-rotary drives</li> <li>• Fixed swivel angle, adjustable swivel angle possible with the help of accessories</li> <li>• Housing protected against splash water and dust</li> <li>• Sustainable in production thanks to reduced use of materials</li> </ul>	<ul style="list-style-type: none"> <li>• Double-acting semi-rotary drive with rotary vane or with tandem rotary vane</li> <li>• Fixed or infinitely adjustable swivel angle</li> <li>• With spigot shaft or hollow flange shaft</li> <li>• With elastic cushioning rings/plates at both ends</li> </ul>	<ul style="list-style-type: none"> <li>• Double-acting semi-rotary drive with rotary vane, with tandem rotary vane or with heavy-duty bearing</li> <li>• Swivel angle is infinitely adjustable over the entire swivel range</li> <li>• With elastic cushioning rings/plates at both ends, adjustable or with shock absorbers at both ends, self-adjusting</li> </ul>
<b>online: →</b>	<a href="#">drvs</a>	<a href="#">dsm</a>	<a href="#">dsm</a>


Semi-rotary drives >

Semi-rotary drives with rack and pinion

		
	<b>Quarter turn actuators DRRS</b>	<b>Semi-rotary drives DRRD</b>
<b>Size</b>	12, 16, 20, 25	8, 10, 12, 16, 20, 25, 32, 35, 40, 50, 63
<b>Theoretical torque at 0.6 MPa (6 bar, 87 psi)</b>	0.9 ... 6.6 Nm	0.2 ... 112 Nm
<b>Permissible mass moment of inertia</b>	50 ... 600 kgcm <sup>2</sup>	15 ... 420000 kgcm <sup>2</sup>
<b>Position sensing</b>	Via proximity switch	Via proximity switch
<b>Swivel angle</b>	180 deg	180 deg
<b>Description</b>	<ul style="list-style-type: none"> <li>• Twin-piston drive, power transmission via rack and pinion principle</li> <li>• Attractively priced semi-rotary drive for standard energy consumption (load capacity + speed)</li> <li>• For torque requirements up to 33 Nm at 0.6 MPa</li> <li>• Recommended for production plants for the manufacture of Li-ion batteries (F1A)</li> <li>• Sustainable in production thanks to reduced use of materials</li> </ul>	<ul style="list-style-type: none"> <li>• Twin-piston drive, power transmission via rack and pinion principle</li> <li>• Premium drive for very high energy absorption (load capacity and speed)</li> <li>• Very high precision and long service life</li> <li>• Many additional features such as mid-position or air and energy through-feed can be adapted</li> <li>• Sustainable thanks to extended life cycle and easier repairs</li> <li>• Sustainable in production thanks to reduced use of materials</li> </ul>
<b>online: →</b>	<a href="#">drrs</a>	<a href="#">drrd</a>

Semi-rotary drives >



Swivel/linear drive units

	
	<b>Swivel/linear units DSL-B</b>
<b>Piston diameter</b>	16 mm, 20 mm, 25 mm, 32 mm, 40 mm
<b>Theoretical torque at 0.6 MPa (6 bar, 87 psi)</b>	1.25 ... 20 Nm
<b>Permissible mass moment of inertia</b>	0.35 ... 40 kgcm <sup>2</sup>
<b>Position sensing</b>	Via proximity switch
<b>Swivel angle</b>	0 ... 272 deg
<b>Description</b>	<ul style="list-style-type: none"> <li>• Rotary and linear motion can be controlled individually or simultaneously</li> <li>• High repetition accuracy</li> <li>• With plain or recirculating ball bearing guide</li> <li>• Through piston rod</li> </ul>
<b>online: →</b>	<a href="#">dsl</a>

## Product overview


### Pneumatic special cylinders >

## Tandem and high-force cylinders

	 <b>High-force cylinders</b> <b>ADNH</b>	 <b>Tandem cylinders</b> <b>DNCT</b>
<b>Mode of operation</b>	Double-acting	Double-acting
<b>Piston diameter</b>	25 mm, 40 mm, 63 mm, 100 mm	32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm, 125 mm
<b>Stroke</b>	5 ... 150 mm	2 ... 500 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	1036 ... 18281 N	898 ... 14244 N
<b>Cushioning</b>	Elastic cushioning rings/plates at both ends	Pneumatic cushioning, adjustable at both ends
<b>Description</b>	<ul style="list-style-type: none"> <li>• Max. 4 cylinders can be combined</li> <li>• Increased thrust force</li> <li>• Only 2 connections are required to pressurise all cylinders</li> <li>• Piston rod with female or male thread</li> <li>• For position sensing</li> <li>• Mounting hole pattern to ISO 21287</li> </ul>	<ul style="list-style-type: none"> <li>• Max. 2 cylinders can be combined</li> <li>• Thrust and return force increase</li> <li>• Piston rod with male thread</li> <li>• For position sensing</li> <li>• Mounting hole pattern to ISO 15552</li> </ul>
<b>online: →</b>	<a href="#">adnh</a>	<a href="#">dnct</a>




### Pneumatic special cylinders >

## Multi-position cylinders

	 <b>Multi-position cylinders</b> <b>ADNM</b>
<b>Piston diameter</b>	25 mm, 40 mm, 63 mm, 100 mm
<b>Potential stroke of intermediate positions</b>	1 ... 400 mm
<b>Possible stroke of the last cylinder position</b>	1 ... 2000 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	295 ... 4712 N
<b>Max. total of all individual strokes</b>	1000 mm, 2000 mm
<b>Description</b>	<ul style="list-style-type: none"> <li>• Mounting hole pattern to ISO 21287</li> <li>• Piston rod with female or male thread</li> <li>• 2 ... 5 cylinders can be combined</li> <li>• Max. 5 positions can be approached</li> <li>• For position sensing</li> </ul>
<b>online: →</b>	<a href="#">adnm</a>

## Drives with guides &gt;




## Linear slides

	 <b>Mini slide DGSS</b>	 <b>Mini slides DGST</b>	 <b>Mini slides DGSL</b>
<b>Piston diameter</b>	6 mm, 10 mm, 16 mm, 20 mm	6 mm, 8 mm, 10 mm, 12 mm, 16 mm, 20 mm, 25 mm	6 mm, 8 mm, 10 mm, 12 mm, 16 mm, 20 mm, 25 mm, 32 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	17 ... 188 N	34 ... 589 N	17 ... 483 N
<b>Stroke</b>	5 ... 60 mm	10 ... 200 mm	10 ... 200 mm
<b>Cushioning</b>	Elastomer cushioning, double-sided, stroke not adjustable	Short elastic cushioning rings/pads at both ends, Elastomer cushioning, double-sided, stroke not adjustable, Elastic cushioning rings/plates at both ends, Elastic cushioning rings/pads at both ends with fixed stop, External hydraulic cushioning	Short elastic cushioning rings/pads at both ends, No cushioning, Elastic cushioning rings/plates at both ends, Elastic cushioning rings/pads at both ends with fixed stop, Self-adjusting, progressive shock absorber at both ends, with reducing sleeve, Progressive shock absorber at both ends
<b>Position sensing</b>	Via proximity switch	Via proximity switch	Via proximity switch
<b>Description</b>	<ul style="list-style-type: none"> <li>• Slim design</li> <li>• Excellent positioning accuracy</li> <li>• Precise and resilient roller bearing guide</li> <li>• Optimum price/performance ratio</li> <li>• Slide and yoke plate from one component</li> <li>• Can be operated without additional cushioning elements</li> <li>• Optional: stroke adjustment and external cushioning using accessories</li> <li>• Recommended for production plants for the manufacture of Li-ion manifolds (F1A)</li> </ul>	<ul style="list-style-type: none"> <li>• Powerful twin-piston drive</li> <li>• Shortest mini slide on the market</li> <li>• Precise recirculating ball bearing guide</li> <li>• Versatile mounting options</li> <li>• Version with mirrored supply port configuration and sensor slots for compact assembly available to order using the configurator</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> <li>• Sustainable in production thanks to reduced use of materials</li> </ul>	<ul style="list-style-type: none"> <li>• High load capacity and positioning accuracy</li> <li>• Maximum movement precision thanks to ground-in ball bearing cage guide</li> <li>• Maximum flexibility thanks to 8 sizes and a large selection of cushioning variants</li> <li>• Variants with clamping unit or end-position locking for fixing the guide slide</li> <li>• Wide variety of mounting and attachment options</li> <li>• Compact design</li> </ul>
<b>online:</b> →	<a href="#">dgss</a>	<a href="#">dgst</a>	<a href="#">dgsl</a>

## Product overview





### Drives with guides >

## Linear slides

	 <b>Mini slides</b> <b>DGSC</b>	 <b>Mini slides</b> <b>SLF</b>	 <b>Mini slides</b> <b>SLS</b>
<b>Piston diameter</b>	6 mm	6 mm, 10 mm, 16 mm	6 mm, 10 mm, 16 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	17 N	17 ... 121 N	17 ... 121 N
<b>Stroke</b>	10 mm	10 ... 80 mm	5 ... 30 mm
<b>Cushioning</b>	Elastic cushioning rings/plates at both ends	Elastic cushioning rings/plates at both ends	Elastic cushioning rings/plates at both ends
<b>Position sensing</b>	Without	Via proximity switch	Via proximity switch
<b>Description</b>	<ul style="list-style-type: none"> <li>• Smallest guided slide unit on the market</li> <li>• Precision ball bearing cage guide for a reliable and high-quality process</li> <li>• Long service life thanks to housing made from high-alloy steel</li> <li>• Low break-away pressure and uniform movement thanks to minimal friction of guide and seal</li> </ul>	<ul style="list-style-type: none"> <li>• Flat design</li> <li>• Ball bearing cage guide</li> <li>• Versatile mounting options</li> <li>• Easy adjustment of end positions</li> </ul>	<ul style="list-style-type: none"> <li>• Slim design</li> <li>• Ball bearing cage guide</li> <li>• Versatile mounting options</li> </ul>
<b>online:</b> →	<a href="#">dgsc</a>	<a href="#">slf</a>	<a href="#">sls</a>

Drives with guides >





Drives with guide rods

	 <b>Guided drive DGRC</b>	 <b>Twin cylinder DGTZ</b>	 <b>Guided drives DFM, DFM-B</b>	 <b>Guided drives DGRF</b>
<b>Piston diameter</b>	12 mm, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm	6 mm, 10 mm, 16 mm, 20 mm, 25 mm, 32 mm	6 mm, 10 mm, 12 mm, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm	20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	68 ... 1178 N	18.6 ... 966 N	17 ... 4712 N	189 ... 1870 N
<b>Stroke</b>	5 ... 100 mm	10 ... 200 mm	5 ... 400 mm	10 ... 400 mm
<b>Cushioning</b>	Elastic cushioning rings/plates at both ends	Elastic cushioning rings/plates at both ends	Elastic cushioning rings/plates at both ends, Pneumatic cushioning, adjustable at both ends, Shock absorber, soft characteristic curve	Elastic cushioning rings/plates at both ends, Self-adjusting pneumatic end-position cushioning, Pneumatic cushioning, adjustable at both ends
<b>Position sensing</b>	Via proximity switch	Via proximity switch	Via proximity switch	Via proximity switch
<b>Description</b>	<ul style="list-style-type: none"> <li>• Minimised product weight and reduced installation space</li> <li>• Drive and guide unit in a single housing</li> <li>• Recommended for production plants for the manufacture of Li-ion batteries (F1A)</li> <li>• Food grade lubrication</li> <li>• High resistance to torques and lateral forces</li> <li>• Variable stroke</li> </ul>	<ul style="list-style-type: none"> <li>• Minimal space requirement</li> <li>• Minimal mounting time</li> <li>• High resistance to torques and lateral forces</li> <li>• High rigidity thanks to its guide rods with large diameter and two plain-bearing bushes</li> <li>• Wide range of mounting options</li> <li>• Drive and guide unit in a single housing</li> <li>• Plain bearing</li> </ul>	<ul style="list-style-type: none"> <li>• Drive and guide unit in a single housing</li> <li>• High resistance to torques and lateral forces</li> <li>• Plain or recirculating ball bearing guide</li> <li>• Wide variety of mounting and attachment options</li> <li>• Wide range of variants for customised applications</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> </ul>	<ul style="list-style-type: none"> <li>• Easy-to-clean design</li> <li>• Increased corrosion protection</li> <li>• FDA-approved lubrication and sealing on the basic version</li> <li>• Hygienic mounting of the sensors possible</li> <li>• Compact design with high guide precision and load capacity</li> <li>• Long service life thanks to optional dry-running seal</li> <li>• Self-adjusting pneumatic end-position cushioning saves time during commissioning and adapts optimally to load and speed changes</li> </ul>
<b>online:</b> →	<a href="#">dgrc</a>	<a href="#">dgtz</a>	<a href="#">dfm</a>	<a href="#">dgrf</a>

## Product overview




### Drives with guides >

### Drives with guide rods

	 <b>Compact cylinders ADNGF</b>	 <b>Mini guided drives DFC</b>	 <b>Twin cylinders DPZ</b>	 <b>Twin cylinders DPZJ</b>
<b>Piston diameter</b>	12 mm, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm	6 mm, 10 mm	10 mm, 16 mm, 20 mm, 25 mm, 32 mm	10 mm, 16 mm, 20 mm, 25 mm, 32 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	68 ... 4712 N	17 ... 47 N	60 ... 966 N	60 ... 724 N
<b>Stroke</b>	1 ... 400 mm	5 ... 30 mm	10 ... 100 mm	10 ... 100 mm
<b>Cushioning</b>	Elastic cushioning rings/plates at both ends, Self-adjusting pneumatic end-position cushioning	Elastic cushioning rings/plates at both ends	Elastic cushioning rings/plates at both ends	Elastic cushioning rings/plates at both ends
<b>Position sensing</b>	Via proximity switch	Via proximity switch	Via proximity switch	Via proximity switch
<b>Description</b>	<ul style="list-style-type: none"> <li>• ISO 21287</li> <li>• Piston rod secured against rotation by a guide rod and yoke plate</li> <li>• Plain bearing</li> <li>• Optionally with through piston rod</li> <li>• Higher load capacity thanks to guide rod and yoke plate</li> <li>• For position sensing</li> </ul>	<ul style="list-style-type: none"> <li>• Smallest guided drive</li> <li>• Precise and resilient</li> <li>• Minimal space requirement</li> <li>• Drive and guide unit in a single housing</li> <li>• Plain or recirculating ball bearing guide</li> <li>• Sustainable thanks to extended life cycle and easier repairs</li> </ul>	<ul style="list-style-type: none"> <li>• Twin pistons provide twice the force in half the space</li> <li>• Plain or recirculating ball bearing guide</li> <li>• Precision stroke adjustment in the end position</li> </ul>	<ul style="list-style-type: none"> <li>• With yoke plate on rear of cylinder for higher lateral forces and precision</li> <li>• Twin pistons provide twice the force in half the space</li> <li>• Plain or recirculating ball bearing guide</li> <li>• Precision stroke adjustment in the end position</li> </ul>
<b>online:</b> →	<a href="#">adngf</a>	<a href="#">dfc</a>	<a href="#">dpz</a>	<a href="#">dpzj</a>

Stopper cylinders and feed separators >

Stopper cylinders

	 <b>Stopper cylinders DFSP</b>	 <b>Stopper cylinders DFST-G2</b>	 <b>Stopper cylinders STAF</b>
<b>Piston diameter</b>	16 mm, 20 mm, 32 mm, 40 mm, 50 mm	32 mm, 50 mm, 63 mm, 80 mm	80 mm
<b>Permissible impact force on the advanced piston rod</b>	710 ... 6280 N	1000 ... 6000 N	13300 ... 14600 N
<b>Stroke</b>	5 ... 30 mm	20 ... 40 mm	30 ... 40 mm
<b>Position sensing</b>	Via proximity switch	Via proximity switch	Via proximity switch
<b>Toggle lever position sensing</b>		Via inductive sensors	
<b>Description</b>	<ul style="list-style-type: none"> <li>• Trunnion version with/without protection against rotation, with/without female thread</li> <li>• Roller version with protection against rotation</li> <li>• Compact design</li> <li>• Sensor slots on 3 sides</li> <li>• Long service life thanks to very good cushioning characteristics and sturdy piston rod guide</li> <li>• Safe stopping of workpiece carriers, pallets and packages weighing up to 90 kg</li> </ul>	<ul style="list-style-type: none"> <li>• Toggle lever design</li> <li>• Integrated, adjustable shock absorber for smooth and adapted stopping</li> <li>• Up to 800 kg impact load</li> <li>• For position sensing on the piston</li> <li>• Adjustable active direction thanks to rotatable toggle lever set-up (90°, 180°, 270°)</li> <li>• Lever locking mechanism</li> <li>• Toggle lever deactivator</li> <li>• Roller version made of polyamide or steel</li> </ul>	<ul style="list-style-type: none"> <li>• Roller version</li> <li>• Absorption of high lateral forces</li> <li>• Direct mounting of solenoid valves on flange plate</li> </ul>
<b>online:</b> →	<a href="#">dfsp</a>	<a href="#">dfst</a>	<a href="#">staf</a>

Product overview

01 Software tools

Pneumatic cylinders

**Feed separator selection program**



This tool helps you to select the right feed separator type HPV from Festo for your application. Let yourself be guided by the program – enter the general parameters and you will receive at least one suggestion for the product that is best suited to your application.

You will find this tool at [www.festo.com/x/feed-separator-selection-tool](http://www.festo.com/x/feed-separator-selection-tool)

Stopper cylinders and feed separators >

Feed separators



**Feed separators  
HPVS**



**Feed separators  
HPV**

<b>Mode of operation</b>	Double-acting	Double-acting
<b>Piston diameter</b>	10 mm, 14 mm, 22 mm	10 mm, 14 mm, 22 mm
<b>Stroke</b>	10 ... 60 mm	10 ... 60 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	45 ... 225 N	45 ... 225 N
<b>Description</b>	<ul style="list-style-type: none"> <li>• Version with one plunger</li> <li>• With non-rotating piston rod</li> <li>• Proximity sensor SME/SMT-8 can be integrated in the housing</li> </ul>	<ul style="list-style-type: none"> <li>• Version with two plungers</li> <li>• With twin piston, non-rotating piston rod and locking mechanism</li> <li>• Cost-effective: replaces at least two drives in the feed process</li> <li>• Proximity sensor SME/SMT-8 can be integrated in the housing</li> </ul>
<b>online: →</b>	<a href="#">hpvs</a>	<a href="#">hpv</a>

Clamping cylinders >

Clamping modules



**Clamping modules  
EV**

<b>Clamping area</b>	10x30, 15x40, 15x63, 20x75, 20x120, 20x180, Ø16 mm, Ø20 mm, Ø25 mm, Ø32 mm, Ø40 mm, Ø50 mm, Ø63 mm, Ø12 mm
<b>Stroke</b>	3 ... 5 mm
<b>Description</b>	<ul style="list-style-type: none"> <li>• Compact rodless cylinder with diaphragm</li> <li>• Single-acting, with reset function</li> <li>• Flat design</li> <li>• Hermetically sealed</li> <li>• Pressure plates and foot mounting as accessories</li> </ul>
<b>online: →</b>	<a href="#">ev</a>

Clamping cylinders >

Linear/swivel clamps



**Linear/swivel clamps**  
**CLR**

<b>Piston diameter</b>	12 mm, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm
<b>Theoretical clamping force at 0.6 MPa (6 bar, 87 psi)</b>	51 ... 1682 N
<b>Clamping stroke</b>	10 ... 50 mm
<b>Swivel angle</b>	90° +/- 2°, 90° +/- 3°, 90° +/- 4°
<b>Description</b>	<ul style="list-style-type: none"> <li>• Swivelling and clamping in one step</li> <li>• Adjustable swivel direction</li> <li>• Available with clamping fingers as accessories</li> <li>• Available with dust and welding spatter protection</li> <li>• Double-acting</li> <li>• For position sensing</li> </ul>
<b>online:</b> →	<a href="#">clr</a>

Clamping cylinders >

Hinge cylinders



**Hinge cylinders**  
**DWA, DWB, DWC**

<b>Piston diameter</b>	50 mm, 63 mm, 80 mm
<b>Stroke</b>	10 ... 200 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	1178 ... 3016 N
<b>Position sensing</b>	Via proximity switch, Without
<b>Cushioning</b>	Pneumatic cushioning, adjustable at both ends
<b>Description</b>	<ul style="list-style-type: none"> <li>• For clamping components during the welding process</li> <li>• Double-acting</li> <li>• Easy to mount thanks to swivel bearing on the bearing cap</li> <li>• Integrated flow control</li> <li>• Integrated end-position cushioning</li> <li>• Rod wiper seal to protect against welding spatter</li> <li>• Asian automotive standard for car body production</li> </ul>
<b>online:</b> →	<a href="#">dw</a>

## Product overview

### Diaphragm actuators & pneumatic spring systems >

## Bellows actuators



**Bellows cylinder**  
**EB**

<b>Size</b>	80, 145, 165, 215, 250, 325, 385
<b>Stroke</b>	20 ... 230 mm
<b>Description</b>	<ul style="list-style-type: none"> <li>• Use as a spring element or for reducing oscillations</li> <li>• Single- or double-bellows cylinder</li> <li>• High forces with a short stroke</li> <li>• Friction-free movement: no stick-slip effect</li> <li>• Use in dusty environments or in water</li> <li>• Maintenance-free</li> </ul>
<b>online: →</b>	<a href="#">eb</a>

### Diaphragm actuators & pneumatic spring systems >

## Fluidic muscles



**Fluidic muscles**  
**DMSP**

<b>Size</b>	5, 10, 20, 40
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi)</b>	140 ... 6000 N
<b>Nominal length</b>	30 ... 9000 mm
<b>Max. contraction</b>	20% of nominal length, 25% % of the nominal length
<b>Description</b>	<ul style="list-style-type: none"> <li>• Single-acting, pulling</li> <li>• 10 times the initial force of a comparable pneumatic cylinder</li> <li>• Friction-free movement: no stick-slip effect</li> <li>• Hermetically sealed design offers protection against dust, dirt and moisture</li> <li>• Outstanding force/weight ratio</li> </ul>
<b>online: →</b>	<a href="#">dmsp</a>

## Software tools

**Rotary indexing table  
selection**

This tool helps you to select the right rotary indexing table type DHTG from Festo for your application.  
Let yourself be guided by the program – enter the general parameters and you will receive at least one suggestion for the product that is best suited to your application.

You will find this tool at  
[→ www.festo.com/x/rotary-indexing-table-selection](http://www.festo.com/x/rotary-indexing-table-selection)

## Rotary indexing tables &gt;

## Rotary indexing tables



**Rotary indexing tables  
DHTG**


<b>Size</b>	65, 90, 140, 220
<b>Theoretical torque at 0.6 MPa (6 bar, 87 psi)</b>	2.1 ... 58.9 Nm
<b>Cushioning</b>	Shock absorber, hard characteristic curve, adjustable
<b>Position sensing</b>	Via inductive sensors
<b>Indexing stations</b>	2 ... 24
<b>Description</b>	<ul style="list-style-type: none"> <li>• For swivelling or separating tasks</li> <li>• Sturdy mechanical system</li> <li>• Easy planning and commissioning</li> <li>• Rotary table diameters: 65, 90, 140, 220 mm</li> <li>• Free control of rotational direction</li> <li>• Sustainable thanks to extended life cycle and easier repairs</li> </ul>
<b>online:</b> →	<a href="#">dhtg</a>

Product overview

01 Software tools

Pneumatic cylinders





**Shock absorber selection**






Whether diagonal or vertical, curved or straight, or as a lever or a disc, all types of cushioned movements are taken into account. The tool always suggests the best shock absorber.

You will find this tool at  
[→ www.festo.com/x/shock-absorber-selection-tool](http://www.festo.com/x/shock-absorber-selection-tool)




Industrial shock absorbers

	 <b>Shock absorber DYSD</b>	 <b>Shock absorbers DYSS</b>	 <b>Shock absorbers DYSR</b>	 <b>Shock absorbers YSR-C</b>
<b>Size</b>	4, 5, 7, 8, 12, 16, 20, 25, 32	2, 3, 4, 5, 7, 8, 10, 12	8, 12, 16, 20, 25, 32	4, 5, 7, 8, 10, 12, 16, 20, 25, 32
<b>Stroke</b>	4 ... 25 mm	4 ... 12 mm	8 ... 60 mm	4 ... 60 mm
<b>Max. energy absorption per stroke</b>	0.6 ... 270 J	0.1 ... 10 J	4 ... 384 J	0.6 ... 380 J
<b>Cushioning</b>	Self-adjusting	Self-adjusting	Adjustable	Self-adjusting
<b>Description</b>	<ul style="list-style-type: none"> <li>Hydraulic shock absorber with path-controlled flow control function</li> <li>Especially for applications in the pressure chamber</li> <li>Short cushioning stroke</li> <li>Suitable for rotary drives</li> <li>Maintenance-free</li> <li>Rapidly increasing cushioning force curve</li> <li>Through mounting thread</li> <li>With fixed stop on the housing and hexagon socket for stroke adjustment</li> <li>With additional return spring for compensation in the pressure chamber</li> </ul>	<ul style="list-style-type: none"> <li>Hydraulic shock absorber with path-controlled flow control function</li> <li>Rapidly increasing cushioning force curve</li> <li>Short cushioning stroke</li> <li>Suitable for low-vibration operation</li> <li>Variants recommended for production systems for manufacturing lithium-ion batteries</li> </ul>	<ul style="list-style-type: none"> <li>Hydraulic shock absorber with spring return</li> <li>Adjustable cushioning hardness</li> </ul>	<ul style="list-style-type: none"> <li>Hydraulic shock absorber with path-controlled flow control function</li> <li>Rapidly increasing cushioning force curve</li> <li>Short cushioning stroke</li> <li>Suitable for rotary drives</li> </ul>
<b>online:</b> →	<a href="#">dysd</a>	<a href="#">dyss</a>	<a href="#">dysr</a>	<a href="#">ysr-c</a>

## Industrial shock absorbers

	 <b>Shock absorbers YSRW</b>	 <b>Shock absorbers YSRW-DGC</b>	 <b>Shock absorbers DYEF-Y1, DYEF-Y1F</b>
<b>Size</b>	5, 7, 8, 10, 12, 16, 20	8, 12, 18, 25, 32, 40, 50, 63	M10, M12, M14, M16, M22, M4, M5, M6, M8
<b>Stroke</b>	8 ... 34 mm		0.9 ... 7 mm
<b>Max. energy absorption per stroke</b>	1.3 ... 70 J		0.005 ... 1.2 J
<b>Cushioning</b>	Self-adjusting, Soft characteristic curve	Self-adjusting, Soft characteristic curve	Elastic cushioning rings/pads at both ends with metal fixed stop, Elastic cushioning rings/pads at both ends without metal fixed stop
<b>Description</b>	<ul style="list-style-type: none"> <li>Hydraulic shock absorber with path-controlled flow control function</li> <li>Gently increasing cushioning force curve</li> <li>Long cushioning stroke</li> <li>Suitable for low-vibration operation</li> <li>Short cycle times possible</li> </ul>	<ul style="list-style-type: none"> <li>For linear drives DGC</li> <li>Gently increasing cushioning force curve</li> </ul>	<ul style="list-style-type: none"> <li>Mechanical shock absorber with flexible rubber buffer</li> <li>Flexible rubber buffer allows a defined metal end position</li> <li>Adjustable cushioning hardness</li> <li>Ideal for cushioning low energy</li> <li>With precise metal end position</li> <li>Variants recommended for production systems for manufacturing lithium-ion batteries</li> </ul>
<b>online:</b> →	<a href="#">ysrw</a>	<a href="#">ysrw-dgc</a>	<a href="#">dyef</a>



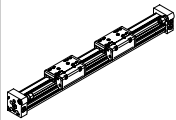

## Industrial shock absorbers

	 <b>Shock absorbers DYSC</b>	 <b>Shock absorbers DYSW</b>	 <b>Hydraulic cushioning cylinders DYHR</b>
<b>Size</b>	4, 5, 7, 8, 12, 16, 20, 25	4, 5, 7, 8, 10, 12	16, 20, 25, 32
<b>Stroke</b>	4 ... 25 mm	6 ... 20 mm	20 ... 60 mm
<b>Max. energy absorption per stroke</b>	0.6 ... 100 J	0.8 ... 12 J	32 ... 384 J
<b>Cushioning</b>	Self-adjusting	Self-adjusting, Soft characteristic curve	Adjustable
<b>Description</b>	<ul style="list-style-type: none"> <li>Hydraulic shock absorber with path-controlled flow control function</li> <li>Rapidly increasing cushioning force curve</li> <li>Short cushioning stroke</li> <li>Suitable for rotary drives</li> <li>With metal fixed stop</li> </ul>	<ul style="list-style-type: none"> <li>Hydraulic shock absorber with path-controlled flow control function</li> <li>Gently increasing cushioning force curve</li> <li>Long cushioning stroke</li> <li>Suitable for low-vibration operation</li> <li>Short cycle times possible</li> <li>With metal fixed stop</li> </ul>	<ul style="list-style-type: none"> <li>Hydraulic cushioning cylinder for constant, slow braking speeds across the entire stroke</li> <li>Braking speed can be precisely adjusted</li> <li>A built-in compression spring returns the piston rod to the initial position</li> <li>Suitable for slow feed speeds in the range up to 0.1 m/s</li> </ul>
<b>online:</b> →	<a href="#">dysc</a>	<a href="#">dysw</a>	<a href="#">dyhr</a>

## Product overview





### Cylinder mounting parts and accessories

#### Accessories for pneumatic drives

	 <b>Mounting components</b>	 <b>Piston-rod attachments</b>	 <b>Guide axes DGC-FA</b>	 <b>Guide units FEN, FENG</b>
<b>Size</b>	6, 8, 12, 16, 18, 20, 25, 30, 32, 40, 50, 63, 80, 100, 125, 160, 200, 250, 320, 100/125, 12/16, 12/18, 160/200, 18/25, 20/25, 25/32, 32/40, 40/50, 50/63, 63/80, 8/10, 8/12, AA 1 to VDI/VDE 3845, AA 2 to VDI/VDE 3845, AA 3 to VDI/VDE 3845, M10x1, M18x1.5, M22x1.5, M30x1.5, M8	6, 8, 10, 12, 16, 20, 25, 32, 35, 40, 50, 63, 10x30, 15x40, 15x63, 20/25, 20x120, 20x180, 20x75, 32/40, 50/63, M10, M10x1.25, M12, M12x1.25, M16, M16x1.5, M20x1.5, M27x2, M36x2, M4, M42x2, M48x2, M5, M6, M8		20, 25, 32, 40, 50, 63, 80, 100, 12/16
<b>Stroke</b>			1 ... 8500 mm	1 ... 500 mm
<b>Description</b>	<ul style="list-style-type: none"> <li>• Mounting kits</li> <li>• Direct mountings</li> <li>• Foot mountings</li> <li>• Flange mountings</li> <li>• Swivel mountings</li> <li>• Clevis feet, trunnion supports</li> <li>• Multi-position kits</li> <li>• Slot nuts</li> <li>• Centring pins/sleeves</li> </ul>	<ul style="list-style-type: none"> <li>• Rod clevises</li> <li>• Rod eyes</li> <li>• Coupling pieces</li> <li>• Self-aligning rod couplers</li> <li>• Adapter</li> </ul>	<ul style="list-style-type: none"> <li>• Without drive</li> <li>• With recirculating ball bearing guide</li> <li>• With guide and freely movable slide unit</li> <li>• High torsional resistance</li> <li>• Reduced vibrations with dynamic loads</li> <li>• For supporting forces and torques in multi-axis applications</li> </ul>	<ul style="list-style-type: none"> <li>• For protecting standards-based cylinders against rotation at high torque loads</li> <li>• Plain or recirculating ball bearing guide</li> <li>• High guide precision for workpiece handling</li> </ul>
<b>online:</b> →	<a href="#">n_015001</a>	<a href="#">n_03150</a>	<a href="#">dgc-fa</a>	<a href="#">fen</a>

### Cylinder mounting parts and accessories

#### Accessories for pneumatic drives

	 <b>Clamping cartridges KP</b>	 <b>Clamping units KPE</b>	 <b>Clamping units, clamping components DADL</b>	 <b>Holding brakes DACS</b>
<b>Size</b>			16, 20, 25, 32, 35, 40, 50, 63	
<b>Stroke</b>				
<b>Description</b>	<ul style="list-style-type: none"> <li>• For in-house assembly of clamping units</li> <li>• Not certified for use in safety-related control systems</li> </ul>	<ul style="list-style-type: none"> <li>• Ready-to-install combination of clamping cartridge KP and housing</li> <li>• Wide range of mounting options</li> </ul>	<ul style="list-style-type: none"> <li>• Clamping unit DADL-EL for semi-rotary drive DRRD, for mechanical locking in the end positions to prevent unwanted movement when unpressurised</li> <li>• Clamping component DADL-EC: for semi-rotary drive DRRD, for securing an intermediate position in combination with the clamping unit DADL-EL</li> <li>• Without drive</li> </ul>	<ul style="list-style-type: none"> <li>• Holding function: retains the piston rod by clamping with frictional locking</li> <li>• Emergency braking function: stops the movement of the piston rod by clamping with frictional locking</li> <li>• With safety functions</li> <li>• Compact design</li> <li>• Optional: high level of corrosion protection</li> <li>• For position sensing</li> </ul>
<b>online:</b> →	<a href="#">kp</a>	<a href="#">kpe</a>	<a href="#">dadl</a>	<a href="#">dacs</a>

## Customised components – for your specific requirements



### Drives with customised designs

Can't find the pneumatic drive you need in our catalogue?

We can offer you customised components that are tailored to your specific requirements.

Common product modifications:

- Materials for special environmental conditions
- Customised dimensions
- Special strokes
- Customised mounting options
- Implementation of special cylinder functions (cylinder/valve combinations, single-acting principle, etc.)

Many additional variants are possible.

Ask your Festo sales engineer, who will be happy to help you:

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

## Telescopic cylinder



**Festo can also supply special variants like telescopic cylinders on request – please contact us.**

## Product overview

01




Pneumatic cylinders



## Product overview



Drives with displacement encoder >

### Linear actuators with displacement encoder

	 <b>Linear drives with displacement encoder DDLI</b>	 <b>Standards-based cylinders with displacement encoder DDPC</b>	 <b>Standards-based cylinders with displacement encoder DNCI</b>
<b>Piston diameter</b>	25 mm, 32 mm, 40 mm, 63 mm	80 mm, 100 mm	32 mm, 40 mm, 50 mm, 63 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	295 ... 1870 N	3016 ... 4712 N	415 ... 1870 N
<b>Max. load, horizontal</b>		300 ... 450 kg	45 ... 180 kg
<b>Max. load, vertical</b>		100 ... 150 kg	15 ... 60 kg
<b>Stroke</b>	100 ... 2000 mm	10 ... 2000 mm	10 ... 2000 mm
<b>Description</b>	<ul style="list-style-type: none"> <li>Based on linear drive DGC-K</li> <li>Without guide</li> <li>With displacement encoder for contactless measurement</li> <li>Suitable for positioning with axis controller CPX-CMAX</li> <li>Suitable for end-position control with end-position controller CPX-CMPX or SPC11</li> <li>Measures absolute values</li> <li>Can be used as a measuring cylinder</li> <li>Degree of protection IP67</li> <li>For attachment to customer's own guide</li> <li>Supply ports on end face</li> </ul>	<ul style="list-style-type: none"> <li>Standards-based cylinder to ISO 15552</li> <li>With displacement encoder for contactless measurement</li> <li>Suitable for positioning with axis controller CPX-CMAX</li> <li>Suitable for end-position control with end-position controller CPX-CMPX or SPC11</li> <li>Can be used as a measuring cylinder</li> <li>Piston rod variants</li> <li>Fixed cushioning</li> <li>With optional recirculating ball bearing guide, clamping unit</li> </ul>	<ul style="list-style-type: none"> <li>Standards-based cylinder to ISO 15552</li> <li>With integrated displacement encoder for relative analogue, contactless measurement</li> <li>Suitable for servo-pneumatic applications with axis controller CPX-CMAX, end-position controller CPX-CMPX or SPC11 and measuring module CPX-CMIX</li> <li>Piston rod with male thread</li> <li>Piston rod variants</li> <li>With optional recirculating ball bearing guide, clamping unit</li> </ul>
<b>online: →</b>	<a href="#">ddli</a>	<a href="#">ddpc</a>	<a href="#">dnci</a>

Drives with displacement encoder >

### Linear actuators with displacement encoder

	 <b>Linear drives with displacement encoder DGCI</b>	 <b>Linear drives with displacement encoder DFPI</b>
<b>Piston diameter</b>	18 mm, 25 mm, 32 mm, 40 mm, 63 mm	100 mm, 125 mm, 160 mm, 200 mm, 250 mm, 320 mm
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi), advancing</b>	153 ... 1870 N	4712 ... 48255 N
<b>Max. load, horizontal</b>		
<b>Max. load, vertical</b>		
<b>Stroke</b>	100 ... 2000 mm	40 ... 990 mm
<b>Description</b>	<ul style="list-style-type: none"> <li>With guide</li> <li>With displacement encoder for absolute, contactless measurement</li> <li>Suitable for servo-pneumatic applications with axis controller CPX-CMAX, end-position controller CPX-CMPX or SPC11 and measuring module CPX-CMIX</li> <li>Choice of supply ports on end face or front</li> </ul>	<ul style="list-style-type: none"> <li>Mounting interfaces to ISO 15552 on bearing and end caps</li> <li>Sturdy tie rod design</li> <li>Integrated air supply</li> <li>Optionally with integrated displacement encoder or fully integrated positioner</li> <li>IP65, IP67, IP69K, NEMA4</li> <li>To EU Explosion Protection Directive (ATEX)</li> </ul>
<b>online: →</b>	<a href="#">dgci</a>	<a href="#">dfpi</a>

Drives with displacement encoder >

## Swivel modules with displacement encoder



**Semi-rotary drives with angular displacement encoder  
DSMI-B**

<b>Piston diameter</b>	40 mm
<b>Theoretical torque at 0.6 MPa (6 bar, 87 psi)</b>	20 Nm
<b>Max. mass moment of inertia, horizontal</b>	0.12 kgm <sup>2</sup>
<b>Max. mass moment of inertia, vertical</b>	0.12 kgm <sup>2</sup>
<b>Position sensing</b>	Via proximity switch, Via integrated angular displacement encoder
<b>Swivel angle</b>	0 ... 272 deg
<b>Cushioning</b>	Elastic cushioning rings/plates at both ends
<b>Description</b>	<ul style="list-style-type: none"> <li>• With rotary vane</li> <li>• Integrated rotary potentiometer</li> <li>• Suitable for servo-pneumatic applications with axis controller CPX-CMAX, end-position controller CPX-CMPX or SPC11 and measuring module CPX-CMIX</li> <li>• Compact design</li> </ul>
<b>online: →</b>	<a href="#">dsmi</a>

## Axis controllers



**Axis controllers  
CPX-CMAX**






**End-position controllers  
SPC11**

<b>No. of axis strings</b>	1	
<b>Axes per string</b>	1	
<b>Digital inputs</b>		8, To IEC 61131-2, Positive logic (PNP), No galvanic isolation
<b>Digital outputs</b>		5
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Axis controller as CPX module, supports pneumatic drives with piston rod, rodless drives and semi-rotary drives</li> <li>• Force and position control</li> <li>• Use with all fieldbuses/Ethernet and controllers CEC available on CPX</li> <li>• Easy commissioning thanks to auto identification function</li> <li>• Rapid commissioning and comprehensive diagnostics with FCT configuration software (Festo Configuration Tool)</li> </ul>	<ul style="list-style-type: none"> <li>• Quickly and smoothly into the end position with 2 additional intermediate positions</li> <li>• Electronic end-position cushioning</li> <li>• Quick and easy commissioning: configure, teach, done</li> <li>• Supports pneumatic drives with piston rod, rodless drives and semi-rotary drives</li> </ul>
<b>online: →</b>	<a href="#">cpx-cmax</a>	<a href="#">spc11</a>





## Product overview

### Displacement encoders



			
	<b>Displacement encoders MLO-POT-TLF</b>	<b>Displacement encoders MLO-POT-LWG</b>	<b>Displacement encoders MME-MTS-TLF</b>
<b>Stroke</b>	225 ... 2000 mm	100 ... 750 mm	225 ... 2000 mm
<b>Measuring principle of displacement encoder</b>	Analogue	Analogue	Digital
<b>Output signal</b>	Analogue	Analogue	CAN protocol type SPC-AIF
<b>Displacement resolution</b>	0.01 mm	0.01 mm	<0.01 mm
<b>Description</b>	<ul style="list-style-type: none"> <li>Conductive plastic potentiometer</li> <li>Absolute measurement with high resolution</li> <li>High travel speed and long service life</li> <li>Plug-in connections</li> </ul>	<ul style="list-style-type: none"> <li>Connecting rod potentiometer</li> <li>Absolute measurement with high resolution</li> <li>Long service life</li> <li>Degree of protection IP65</li> <li>Plug-in connections</li> </ul>	<ul style="list-style-type: none"> <li>Measuring principle: magnetostrictive</li> <li>Contactless with absolute measurement</li> <li>High travel speed</li> <li>System product for servo-pneumatic positioning technology and Soft Stop</li> <li>Degree of protection IP65</li> </ul>
<b>online:</b> →	<a href="#">mlo</a>	<a href="#">mlo</a>	<a href="#">mme</a>

### Proportional directional control valves

### Proportional valves

				
	<b>Proportional directional control valves VPWI</b>	<b>Proportional directional control valves VPWP</b>	<b>Proportional directional control valves MPYE</b>	<b>Proportional directional control valves VPWS</b>
<b>Valve function</b>	3-way proportional directional control valve	5/3-way proportional directional control valve, closed	5/3 closed	2/2 proportional directional control valve, closed
<b>Pneumatic connection 1</b>	G1/8	G1/4, G1/8, G3/8	G1/4, G1/8, G3/8, M5	Cartridge 7.5 mm, Cartridge 8 mm, Cartridge 15 mm
<b>Operating pressure for positioning/Soft Stop</b>		4 ... 8 bar		
<b>Operating pressure [MPa]</b>	0 ... 1.3 MPa	0 ... 1 MPa	0 ... 1 MPa	0 ... 1 MPa
<b>Operating pressure</b>	0 ... 13 bar	0 ... 10 bar	0 ... 10 bar	0 ... 10 bar
<b>Standard nominal flow rate</b>	490 l/min	350 ... 2000 l/min	100 ... 2000 l/min	
<b>Description</b>	<ul style="list-style-type: none"> <li>Dynamic range up to a maximum of 180Hz</li> <li>Full graphic display</li> <li>Stroke limitation</li> <li>Adjustable incline</li> <li>Actual value for pressure or stroke</li> <li>Food grade grease NSFH1</li> </ul>	<ul style="list-style-type: none"> <li>Controlled piston spool valve</li> <li>Digitally actuated</li> <li>Integrated pressure sensors for monitoring function and force control</li> <li>With auto identification</li> <li>Diagnostic function</li> <li>Integrated digital output, e.g. for a clamping/brake unit</li> <li>Suitable for servo-pneumatic applications with axis controller CPX-CMAX and end-position controller CPX-CMPX</li> </ul>	<ul style="list-style-type: none"> <li>Controlled piston spool valve</li> <li>Analogue actuation</li> <li>Setpoint input as analogue voltage signal (0 ... 10 V)</li> <li>Suitable for servo-pneumatic applications with end-position controller SPC11</li> </ul>	<ul style="list-style-type: none"> <li>Directly actuated poppet valve</li> <li>Operating medium: air, oxygen, inert gases</li> <li>Extremely small and lightweight</li> <li>Compact and cost-effective</li> <li>Mounting: on sub-base</li> </ul>
<b>online:</b> →	<a href="#">vpwi</a>	<a href="#">vpwp</a>	<a href="#">mpye</a>	<a href="#">vpws</a>

Sensor interfaces

	 <b>Sensor interfaces</b> <b>CASB</b>	 <b>Measured-value transducers</b> <b>DADE</b>
<b>Diagnostic function</b>	Display via LED	Display via LED
<b>Nominal operating voltage DC</b>	24 V	24 V
<b>Degree of protection</b>	IP65	IP65, IP67
<b>Electrical connection, output, connection type</b>	Plugs	
<b>Electrical connection, output, connection technology</b>	M12x1, A-coded to EN 61076-2-101	
<b>Electrical connection, output, number of pins/cores</b>	8	
<b>Electrical connection, displacement encoder</b>		Socket, 8-pin, M12
<b>Type of mounting</b>	Via through-hole for M4 screw	With through-hole
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electro-mechanical actuators, motors, servo drives and control systems</li> <li>• For controlling pneumatic positioning drives with the latest servo-pneumatic systems such as CPX-CMAX, CPX-CMPX and CPX-CMIX</li> <li>• Short cables for analogue signals, secure digitised bus transmission</li> <li>• Convenient plug and work concept with auto identification and comprehensive diagnostics</li> <li>• High degree of protection IP67</li> </ul>	<ul style="list-style-type: none"> <li>• For standards-based cylinders DNCI and DDPC</li> <li>• Converts sensor signals into voltage or current signals</li> <li>• Mounting via through-holes</li> </ul>
<b>online:</b> →	<a href="#">casm</a>	<a href="#">dade</a>

## Product overview

### Cables and accessories >

## Connecting cables for valves



**Connecting/plug sockets with cable**  
**KMPYE-AIF, KMPYE-5**

<b>Electrical connection, connection type</b>	Socket, Cable, Plugs
<b>Electrical connection, cable outlet</b>	Straight
<b>Electrical connection, design</b>	Round
<b>Electrical connection, connection technology</b>	M12x1, A-coded to EN 61076-2-101, M9x0.5, Open end
<b>Electrical connection, number of pins/wires</b>	4, 7
<b>Cable length</b>	0.3 ... 5 m
<b>Description</b>	<ul style="list-style-type: none"> <li>• For solenoid coils with thread M12x1 A-coded according to EN 61076-2-101</li> <li>• For connecting proportional directional control valves MPYE with end-position controller SPC11</li> <li>• Cable length 0.3 ... 5 m</li> <li>• With PVC or PUR cable</li> <li>• Ambient temperature -25 ... +80 °C</li> </ul>
<b>online: →</b>	<a href="#">kmpye</a>

### Cables and accessories >

## Plugs for control systems



**Plug connectors**  
**FBS-SUB-9-WS**

<b>Fieldbus interface</b>	Sub-D, 9-pin, socket, Sub-D, 9-pin, plug
<b>Electrical connection 1</b>	Socket, sub-D, 9-pin, Sub-D plug, 9-pin
<b>Electrical connection 2</b>	Screw terminal
<b>Degree of protection</b>	IP20
<b>Description</b>	<ul style="list-style-type: none"> <li>• Plug connector for CAN bus and PROFIBUS bus connection</li> <li>• Cable connection 2x horizontal or 2x vertical</li> <li>• PCB terminal block with screw connector</li> </ul>
<b>online: →</b>	<a href="#">fbs-sub-9-ws</a>



Product overview

Software tools

03 Electromechanical actuators

**Electric Motion Sizing**



Find the right electric or electromechanical servo drive. This is how you can quickly and easily find the right electromechanical drive solution for your application: Electric Motion Sizing, the online sizing and simulation tool for electric drives (servo drives and motors = servo drive package) as well as for electromechanical drive solutions (= electromechanical servo drive package consisting of servo drives and motors as well as mechanics) helps you do this. This tool can be found at [→ www.festo.com/x/electric-motion-sizing](http://www.festo.com/x/electric-motion-sizing)

**Simplified Motion Series – Solution Finder**



The simplicity of pneumatics is now combined for the first time with the advantages of electric automation thanks to the Simplified Motion Series. These integrated drives are the perfect solution for all users who are looking for an electric alternative for very simple movement and positioning tasks, but don't want the commissioning process for traditional electric drive systems that can often be quite complex. This tool can be found at [→ www.festo.com/x/simplified-motion-series](http://www.festo.com/x/simplified-motion-series)

**CO2 values and TCO Guide**




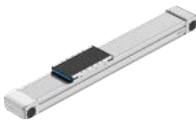

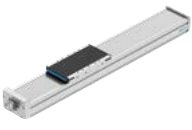
CO2 values and TCO for your application. Take a quantum leap in automation technology. By using suitable components from Festo in an intelligent way, you can reduce the energy consumption of your systems and thus specifically lower your production's carbon emissions. You will find this tool at [→ www.festo.com/x/co2-tco](http://www.festo.com/x/co2-tco)

**Connectivity Finder**



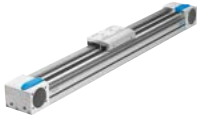



This tool can be used to find the optimum way to connect a Festo solution to your preferred (non-Festo) controller. You will also be provided with expert knowledge for your selected connection option, making the integration of the Festo solution into your machine really easy. You will find this tool at [→ www.festo.com/x/connectivity-finder](http://www.festo.com/x/connectivity-finder)

## Electric linear drives





	 <b>Toothed belt axis ELGD-TB-KF</b>	 <b>Toothed belt axis ELGD-TB-KF-WD</b>	 <b>Ball screw axis ELGD-BS-KF</b>	 <b>Ball screw axis ELGD-BS-KF-WD</b>
<b>Size</b>	60, 80, 120	100, 120	60, 80, 120	100, 120
<b>Max. feed force F<sub>x</sub></b>	350 ... 1300 N	240 ... 500 N	1550 ... 3520 N	110 ... 1880 N
<b>Repetition accuracy</b>	±0.04 mm, +/-0.1 mm	±0.04 mm, +/-0.1 mm	±0.01 mm, +/-0.01 mm	±0.01 mm, +/-0.01 mm
<b>Working stroke</b>	50 ... 8500 mm	50 ... 8500 mm	50 ... 2500 mm	50 ... 1500 mm
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• For applications requiring a high dynamic response and short positioning times</li> <li>• For long strokes</li> <li>• Excellent rigidity and load capacity of the guide for greater load in the same installation space</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Reduced profile heights offer smaller installation dimensions for handling systems and applications that do not require such high feed forces</li> <li>• For applications requiring a high dynamic response and short positioning times</li> <li>• For long strokes</li> <li>• 30% lighter, while rigidity and guide load capacity are still similar to the axis in the standard design</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• For applications requiring precision</li> <li>• High reliability and long service life</li> <li>• For high loads</li> <li>• Excellent rigidity and load capacity of the guide for greater load in the same installation space</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Reduced profile heights offer smaller installation dimensions for handling systems and applications that do not require such high feed forces</li> <li>• For applications requiring precision</li> <li>• High reliability and long service life</li> <li>• For high loads</li> <li>• 30% lighter, while rigidity and guide load capacity are still similar to the axis in the standard design</li> </ul>
<b>online:</b> →	<a href="#">elgd-tb</a>	<a href="#">elgd-tb-kf-wd</a>	<a href="#">elgd-bs</a>	<a href="#">elgd-bs-kf-wd</a>

Product overview

Electric linear drives


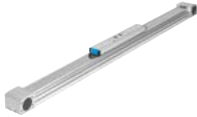


	 <b>Toothed belt axes</b> <b>EGC-TB-KF</b>	 <b>Spindle axes</b> <b>EGC-BS-KF</b>	 <b>Toothed belt axes</b> <b>EGC-HD-TB</b>	 <b>Spindle axes</b> <b>EGC-HD-BS</b>
<b>Size</b>	50, 70, 80, 120, 185	70, 80, 120, 185	125, 160, 220	125, 160, 220
<b>Max. feed force F<sub>x</sub></b>	50 ... 2500 N	400 ... 3000 N	450 ... 1800 N	400 ... 1500 N
<b>Repetition accuracy</b>	+/-0.08 mm, +/-0.1 mm	+/-0.02 mm		+/-0.02 mm
<b>Working stroke</b>	50 ... 8500 mm	50 ... 3000 mm	50 ... 5000 mm	50 ... 2400 mm
<b>Description</b>	<ul style="list-style-type: none"> <li>Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>Axis for high speeds and acceleration</li> <li>Recirculating ball bearing guide for high loads and torques</li> <li>Optionally with clamping unit, at one or both ends</li> <li>Profile with optimised rigidity</li> <li>The motor can be flexibly mounted on 4 sides</li> <li>22 types in stock with short delivery times and modular products for custom variants</li> <li>Long strokes of up to 8.5 m possible</li> </ul>	<ul style="list-style-type: none"> <li>Axis for high repeat accuracy</li> <li>Recirculating ball bearing guide for high loads and torques</li> <li>Optionally with clamping unit, at one or both ends</li> <li>Profile with optimised rigidity</li> <li>Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>The motor can be flexibly mounted on 2 sides</li> <li>34 types in stock with short delivery times and modular products for custom variants</li> <li>Strokes of up to 3 m possible</li> </ul>	<ul style="list-style-type: none"> <li>Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>With heavy-duty guide</li> <li>Axis for high speeds and acceleration</li> <li>For high loads and torques, high feed forces</li> <li>Precise and resilient DUO guide rail</li> <li>Motor can be mounted on 4 sides</li> <li>For maximum lateral load up to 900 Nm</li> </ul>	<ul style="list-style-type: none"> <li>Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>With heavy-duty guide</li> <li>Axis for high repeat accuracy</li> <li>With integrated ball screw</li> <li>For maximum loads and torques</li> <li>Precise and resilient DUO guide rail</li> <li>For maximum lateral load up to 900 Nm</li> <li>Ideal as a basic axis for linear gantries and cantilever axes</li> <li>The optional spindle support enables maximum travel speed</li> </ul>
<b>online:</b> →	<a href="#">egc</a>	<a href="#">egc</a>	<a href="#">egc</a>	<a href="#">egc</a>

## Electric linear drives


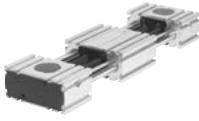


	 <b>Toothed belt axes ELGC-TB-KF</b>	 <b>Spindle axes ELGC-BS-KF</b>	 <b>Spindle axes ELGT-BS</b>	 <b>Toothed belt axes ELGA-TB-G</b>
<b>Size</b>	45, 60, 80	32, 45, 60, 80	90, 120, 160	70, 80, 120
<b>Max. feed force F<sub>x</sub></b>	75 ... 250 N	40 ... 350 N	805 ... 1575 N	350 ... 1300 N
<b>Repetition accuracy</b>	+/-0.1 mm	+/-0.01 mm, +/-0.015 mm	+/-0.02 mm	+/-0.08 mm
<b>Working stroke</b>	200 ... 2000 mm	100 ... 1000 mm	50 ... 1400 mm	50 ... 8500 mm
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Precision guide rail with high load capacity</li> <li>• Internal guide and toothed belt</li> <li>• Flexible motor mounting</li> <li>• The toothed belt axes, spindle axes ELGC and mini slides EGSC form a scalable modular system for compact automation</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Internal guide and ball screw drive</li> <li>• Space-saving position sensing</li> <li>• Flexible motor mounting</li> <li>• The toothed belt axes, spindle axes ELGC and mini slides EGSC form a scalable modular system for compact automation</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Great resilience and rigidity due to double-acting guide</li> <li>• Compact design</li> <li>• With ball screw drive</li> <li>• Optimal ratio between installation space and working space due to the optimised axis design</li> <li>• Simple integration of motors with mounting kits</li> <li>• Optimised for use in the electronics and automotive industry</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Integrated plain-bearing guide</li> <li>• For small and medium loads</li> <li>• Low guide backlash</li> <li>• Drive component for external guides</li> <li>• Speeds up to 5 m/s with high acceleration up to 50 m/s<sup>2</sup></li> <li>• Flexible motor mounting</li> <li>• Motor can be mounted on 4 sides</li> </ul>
<b>online:</b> →	<a href="#">elgc-tb</a>	<a href="#">elgc-bs</a>	<a href="#">elgt</a>	<a href="#">elga</a>

Product overview

Electric linear drives





	 <b>Toothed belt axes ELGA-TB-KF</b>	 <b>Toothed belt axes ELGA-TB-RF</b>	 <b>Spindle axes ELGA-BS-KF</b>	 <b>Toothed belt axis units ELGE-TB</b>
<b>Size</b>	70, 80, 120, 150	70, 80, 120	70, 80, 120, 150	35
<b>Max. feed force F<sub>x</sub></b>	260 ... 2000 N		650 ... 6400 N	50 N
<b>Repetition accuracy</b>	+/-0.08 mm	+/-0.08 mm	+/-0.02 mm	+/-0.1 mm
<b>Working stroke</b>	50 ... 8500 mm	50 ... 7400 mm	50 ... 3000 mm	50 ... 800 mm
<b>Description</b>	<ul style="list-style-type: none"> <li>Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>Recirculating ball bearing guide for high loads and torques</li> <li>High feed forces</li> <li>Precision guide rail with high load capacity</li> <li>Speeds up to 5 m/s with high acceleration up to 50 m/s<sup>2</sup></li> <li>Optional: Food-safe (for further information, see <a href="http://www.festo.com/certificates/ELGA_KF">www.festo.com/certificates/ELGA_KF</a>)</li> <li>The motor can be flexibly mounted on 4 sides</li> <li>Guide and toothed belt protected by cover band</li> <li>22 types in stock with short delivery times and modular products for custom variants</li> <li>Long strokes of up to 8.5 m possible</li> </ul>	<ul style="list-style-type: none"> <li>Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>Integrated roller bearing guide</li> <li>High speeds up to 10 m/s with high acceleration up to 50 m/s<sup>2</sup></li> <li>Guide backlash = 0 mm</li> <li>Very good operating performance under torque load</li> <li>Sturdy alternative for the recirculating ball bearing guide</li> <li>As an actuator for external guides, especially for high speeds</li> <li>Motor can be mounted on 4 sides</li> </ul>	<ul style="list-style-type: none"> <li>Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>Internal, precision recirculating ball bearing guide with high load capacity for high torque loads</li> <li>Axis for high repeat accuracy</li> <li>For the highest requirements in terms of feed force and accuracy</li> <li>Guide and ball screw protected by cover strip</li> <li>Speeds up to 2 m/s with high acceleration up to 15 m/s<sup>2</sup></li> <li>Space-saving position sensing</li> <li>Flexible motor mounting</li> <li>34 preconfigured types and modular product system for custom variants</li> <li>Strokes of up to 3 m possible</li> </ul>	<ul style="list-style-type: none"> <li>Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>Complete solution consisting of drive mechanics, motor and servo drive</li> <li>Cost-optimised design for simple moving and positioning tasks</li> <li>Ready-to-install unit for quick and easy installation</li> <li>Product of the Simplified Motion Series: doesn't need any external servo drive or any control cabinet for the installation</li> <li>Two control options integrated as standard: digital I/O and IO-Link</li> </ul>
<b>online:</b> →	<a href="#">elga</a>	<a href="#">elga</a>	<a href="#">elga</a>	<a href="#">elge-tb</a>

## Electric linear drives




	 <b>Toothed belt axes ELGG</b>	 <b>Toothed belt axes ELGR-TB</b>	 <b>Cantilever axes ELCC-TB-KF</b>	 <b>Electric slides EGSK</b>
<b>Size</b>	35, 45, 55	35, 45, 55	60, 70, 90, 110	15, 20, 26, 33, 46
<b>Max. feed force F<sub>x</sub></b>	50 ... 350 N	50 ... 350 N	300 ... 2500 N	19 ... 392 N
<b>Repetition accuracy</b>	+/-0.1 mm	+/-0.1 mm	+/-0.05 mm	+/-0.003 - +/-0.004 mm, +/-0.003 - +/-0.01 mm, +/-0.01 mm
<b>Working stroke</b>	50 ... 1200 mm	50 ... 1500 mm	50 ... 2000 mm	25 ... 840 mm
<b>Description</b>	<ul style="list-style-type: none"> <li>• Toothed belt axis with two opposing slides</li> <li>• With low-cost plain bearing and precise ball bearing guide</li> <li>• Optional central support improves the rigidity</li> <li>• Motor can be mounted on 4 sides</li> </ul>	<ul style="list-style-type: none"> <li>• Optimum price/performance ratio</li> <li>• Ready-to-install unit for quick and easy design</li> <li>• With plain or recirculating ball bearing guide</li> <li>• Motor can be mounted on 4 sides</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Axis for high speeds and acceleration</li> <li>• Very low moving mass thanks to fixed drive head</li> <li>• High rigidity thanks to innovative design principle</li> <li>• Toothed belt drive with recirculating ball bearing guide</li> <li>• Able to move high loads of up to 100 kg vertically</li> <li>• Long strokes of up to 2 m possible</li> <li>• Sustainable thanks to extended life cycle and easier repairs</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Electromechanical linear axis with ball screw drive</li> <li>• Recirculating ball bearing guide and ball screw without caged ball bearings</li> <li>• Standardised mounting interfaces</li> <li>• Compact design</li> <li>• High rigidity</li> <li>• 22 types in stock with short delivery times and modular products for custom variants</li> </ul>
<b>online:</b> →	<a href="#">elgg</a>	<a href="#">elgr</a>	<a href="#">elcc</a>	<a href="#">egsk</a>

## Product overview




### Electric cylinders and slides

	 <b>Electric cylinder EPCC-BS</b>	 <b>Electric cylinders ESBF</b>	 <b>Mini slides EGSC-BS-KF</b>	 <b>Mini slides EGSL-BS</b>
<b>Size</b>	25, 32, 45, 60	32, 40, 50, 63, 80, 100	25, 32, 45, 60	35, 45, 55, 75
<b>Max. feed force F<sub>x</sub></b>	75 ... 1000 N	600 ... 17000 N	20 ... 250 N	75 ... 450 N
<b>Repetition accuracy</b>	+/-0.02 mm	+/-0.01 mm, +/-0.015 mm, +/-0.05 mm	+/-0.015 mm	+/-0.015 mm
<b>Stroke</b>	25 ... 500 mm	30 ... 1500 mm	25 ... 200 mm	50 ... 300 mm
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Low-cost: optimum price/performance ratio</li> <li>• Flexible: wide range of mounting options for the motor</li> <li>• Dynamic: lower internal friction</li> <li>• Non-rotating piston rod with plain-bearing guide, stroke up to 500 mm</li> <li>• Weight-optimised design – ideal for handling systems</li> <li>• Unique: “One-size-down” assembly system for the best use of space in combination with toothed belt/spindle axis ELGC</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Available with ball screw drive (size 32 ... 100) or lead screw (size 32 ... 50)</li> <li>• Ball screw: with three spindle pitches for selecting the optimal force-speed ratio</li> <li>• Optional: high corrosion protection, degree of protection IP65, food-safe (see <a href="http://www.festo.com/certificates/ESBF">www.festo.com/certificates/ESBF</a>), piston rod extension</li> <li>• Axial or parallel motor mounting</li> <li>• 68 types in stock with short delivery times and modular products for custom variants</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Precise guide and ball screw drive</li> <li>• Compact dimensions</li> <li>• Flexible motor mounting</li> <li>• The toothed belt axes, spindle axes ELGC and mini slides EGSC form a scalable modular system for compact automation</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Very high rated slide load, ideal for vertical applications such as press-fitting or joining</li> <li>• Reliable: the completely closed spindle stops dirt or stray small parts getting into the guide area</li> <li>• Axial or parallel motor mounting</li> </ul>
<b>online:</b> →	<a href="#">epcc</a>	<a href="#">esbf</a>	<a href="#">egsc-bs</a>	<a href="#">egsl</a>

## Integrated electromechanical actuators



	 <b>Mini slide units</b> <b>EGSS-BS-KF</b>	 <b>Toothed belt axis units</b> <b>ELGS-TB-KF</b>	 <b>Spindle axis units</b> <b>ELGS-BS-KF</b>
<b>Size</b>	32, 45, 60	45, 60	32, 45, 60
<b>Max. feed force Fx</b>	60 ... 250 N	65 ... 75 N	40 ... 200 N
<b>Repetition accuracy</b>	+/-0.015 mm	+/-0.1 mm	+/-0.01 mm, +/-0.015 mm
<b>Working stroke</b>	25 mm, 50 mm, 75 mm, 100 mm, 125 mm, 150 mm, 200 mm	50 mm, 200 mm, 300 mm, 500 mm, 600 mm, 800 mm, 1000 mm, 1200 mm, 1500 mm, 1800 mm, 2000 mm	100 mm, 200 mm, 300 mm, 400 mm, 500 mm, 600 mm, 800 mm
<b>Description</b>	<ul style="list-style-type: none"> <li>Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>Complete solution consisting of drive mechanics, motor and servo drive</li> <li>Increased protection against rotation and absorption of lateral forces thanks to rigid, resilient and precise linear guide</li> <li>Precise positioning thanks to smoothly running ball screw drive</li> <li>Product of the Simplified Motion Series: doesn't need any external servo drive or any control cabinet for the installation</li> <li>Two control options integrated as standard: digital I/O and IO-Link</li> </ul>	<ul style="list-style-type: none"> <li>Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>Complete solution consisting of drive mechanics, motor and servo drive</li> <li>Dynamic XY movements thanks to the slide with resilient toothed belt and recirculating ball bearing guide</li> <li>Protected against external influences by internal guide</li> <li>Product of the Simplified Motion Series: doesn't need any external servo drive or any control cabinet for the installation</li> <li>Two control options integrated as standard: digital I/O and IO-Link</li> </ul>	<ul style="list-style-type: none"> <li>Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>Complete solution consisting of drive mechanics, motor and servo drive</li> <li>Precise XY movements thanks to the slide with powerful ball screw and resilient recirculating ball bearing guide</li> <li>Protected against external influences by internal guide</li> <li>Product of the Simplified Motion Series: doesn't need any external servo drive or any control cabinet for the installation</li> <li>Two control options integrated as standard: digital I/O and IO-Link</li> </ul>
<b>online:</b> →	<a href="#">egss</a>	<a href="#">elgs-tb</a>	<a href="#">elgs-bs</a>

## Integrated electromechanical actuators

	 <b>Rotary drive units</b> <b>ERMS</b>	 <b>Electric cylinder units</b> <b>EPCS-BS</b>	 <b>Electric cylinder units</b> <b>EPCE-TB</b>
<b>Size</b>	25, 32	32, 45, 60	45, 60
<b>Max. feed force Fx</b>		150 ... 900 N	85 ... 150 N
<b>Repetition accuracy</b>	+/-0.05°, +/-0.1 deg	+/-0.02 mm	+/-0.05 mm
<b>Working stroke</b>			
<b>Description</b>	<ul style="list-style-type: none"> <li>Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>Complete solution consisting of drive mechanics, motor and servo drive</li> <li>Absorption of lateral forces and torques thanks to sturdy, backlash-free and precise ball bearings on the rotating plate</li> <li>Integrated through-feed for cables and tubing through sealed hollow shaft</li> <li>Product of the Simplified Motion Series: doesn't need any external servo drive or any control cabinet for the installation</li> <li>Two control options integrated as standard: digital I/O and IO-Link</li> </ul>	<ul style="list-style-type: none"> <li>Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>Precise positioning thanks to smoothly running ball screw drive</li> <li>Complete solution consisting of drive mechanics, motor and servo drive</li> <li>Easy to implement pressing-in and clamping applications for forces up to 900 N</li> <li>Two control options integrated as standard: digital I/O and IO-Link</li> <li>Product of the Simplified Motion Series: doesn't need any external servo drive or any control cabinet for the installation</li> </ul>	<ul style="list-style-type: none"> <li>Complete solution consisting of drive mechanics, motor and servo drive</li> <li>Innovative interpretation of toothed belt technology for maximum dynamic response and minimal positioning times</li> <li>Perfect for use in applications where space is critical thanks to minimal zero stroke and extremely compact design</li> <li>Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>Product of the Simplified Motion Series: doesn't need any external servo drive or any control cabinet for the installation</li> <li>Two control options integrated as standard: digital I/O and IO-Link</li> </ul>
<b>online:</b> →	<a href="#">erms</a>	<a href="#">epcs</a>	<a href="#">epce</a>


## Product overview

### Electric semi-rotary drives



	 <b>Rotary drives</b> <b>ERMO</b>	 <b>Rotary modules</b> <b>ERMB</b>
<b>Design</b>	Electromechanical rotary drive, With integrated gear unit	Electromechanical rotary module, With toothed belt
<b>Size</b>	12, 16, 25, 32	20, 25, 32
<b>Max. driving torque</b>	0.15 ... 5 Nm	0.7 ... 8.5 Nm
<b>Max. input speed</b>		900 ... 1350 rpm
<b>Rotation angle</b>	Infinite	Infinite
<b>Repetition accuracy</b>	+/-0.05°, +/-0.1 deg	±0.03°
<b>Gear ratio</b>	7:1, 9:1	3:1, 4:1, 4.5:1
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electro-mechanical actuators, motors, servo drives and control systems</li> <li>• Integrated motor with gear stage for a compact design</li> <li>• Motor control with encoder to achieve high angular accuracy</li> <li>• Sturdy output bearings for absorbing high forces and torques</li> <li>• Backlash-free, pre-stressed rotating plate with very good axial eccentricity and concentricity properties</li> <li>• Quick and accurate installation</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electro-mechanical actuators, motors, servo drives and control systems</li> <li>• Electromechanical rotary module with toothed belt</li> <li>• Compact design</li> <li>• Mounting interfaces on all sides</li> <li>• Stable output shaft bearings</li> <li>• Unlimited and flexible rotation angle</li> </ul>
<b>online:</b> →	<a href="#">ermo</a>	<a href="#">ermb</a>

### Electric stoppers

#### Electric stopper cylinders


	 <b>Stopper cylinders, electric</b> <b>EFS</b>
<b>Design</b>	Electric stopper cylinder
<b>Size</b>	20, 50, 100
<b>Position sensing</b>	With Hall sensor
<b>Cushioning length</b>	11.5 ... 18.2 mm
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fast and simple set-up of transfer systems without compressed air</li> <li>• For stopping conveyed goods weighing between 0.25 kg and 100 kg</li> <li>• Status and error messages for visual error diagnostics</li> <li>• Controlled via digital I/O of a higher-order controller, e.g. terminal CPX, makes commissioning easier</li> <li>• Mounting interface for ease of mounting on transfer systems</li> <li>• Adjustable cushioning power</li> </ul>
<b>online:</b> →	<a href="#">efsd</a>

## Electric handling modules

	 <b>Rotary/lifting modules</b> <b>EHMB</b>	 <b>Rotary gripper modules</b> <b>EHMD</b>
<b>Size</b>	20, 25, 32	40, 50
<b>Stroke per gripper jaw</b>		5 mm, 15 mm
<b>Working stroke</b>	0 ... 200 mm	
<b>Max. output torque</b>	3.15 ... 20 Nm	0.3 ... 1 Nm
<b>Max. driving torque</b>	0.7 ... 6.7 Nm	
<b>Max. input speed</b>	900 ... 1350 rpm	
<b>Max. speed</b>	1.5 m/s	0.025 m/s, 0.07 m/s
<b>Rotation angle</b>	Infinite	Infinite
<b>Repetition accuracy</b>	±0.03°	
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electro-mechanical actuators, motors, servo drives and control systems</li> <li>• Complete module with combined and configurable rotary/lifting movement</li> <li>• Dynamic, flexible, economical thanks to the modular drive concept for the linear movement</li> <li>• Hollow axis with large internal diameter makes laying power supply lines easy, convenient and safe</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electro-mechanical actuators, motors, servo drives and control systems</li> <li>• Ideal for small objects in laboratory automation</li> <li>• Infinite electrical rotation and electrical or pneumatic gripping</li> <li>• Gripping and turning to open and close covers on vials</li> <li>• Optional: mounting with Z-compensation compensates for the thread pitch of covers on vials during opening and closing</li> </ul>
<b>online:</b> →	<a href="#">ehmb</a>	<a href="#">ehmd</a>

### Electric grippers >

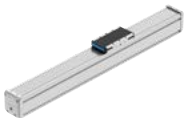


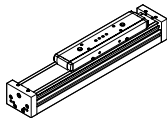
## Parallel grippers

	 <b>Parallel grippers, electric</b> <b>EHPS</b>
<b>Size</b>	16, 20, 25
<b>Stroke per gripper jaw</b>	10 ... 16 mm
<b>Max. force on gripper jaw Fz, static</b>	200 ... 450 N
<b>Gripper repetition accuracy</b>	0.01 mm, 0.03 mm
<b>Position sensing</b>	Via proximity switch, With Hall sensor, With integrated displacement encoder, Via IO-Link interface
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Electric version of the standard parallel gripper DHPS</li> <li>• Ideal for use as a front-end actuator thanks to its low dead weight</li> <li>• Controller-free actuation using digital signals</li> <li>• Gripping force (4 settings) adjustable via ratchet switch or via IO-Link® interface</li> <li>• RA1 version with robot connection, enables fast integration in lightweight robot environments</li> </ul>
<b>online:</b> →	<a href="#">ehps</a>

## Product overview

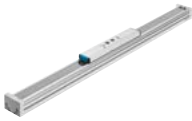


Accessories for electric drives >

### Linear guides

	 <b>Guide axes ELFD</b>	 <b>Guide axes ELFC</b>	 <b>Guide units EAGF</b>	 <b>Guide axes ELFA-KF</b>
<b>Size</b>	60, 80, 120	32, 45, 60, 80	32, 40, 45, 50, 60, 63, 80, 100	70, 80, 120
<b>Stroke</b>	50 ... 5000 mm	100 ... 2000 mm	1 ... 550 mm	50 ... 8500 mm
<b>Guide</b>	Recirculating ball bearing guide	Recirculating ball bearing guide	Recirculating ball bearing guide	Recirculating ball bearing guide
<b>Description</b>	<ul style="list-style-type: none"> <li>• For ball screw/toothed belt axes with recirculating ball bearing guide ELGD-BS-KF/ELGD-TB-KF (drive axes)</li> <li>• Driveless linear guide unit with guide and freely movable slide unit</li> <li>• For supporting forces and torques in multi-axis applications</li> <li>• High torsional resistance</li> <li>• Reduced vibrations with dynamic loads</li> </ul>	<ul style="list-style-type: none"> <li>• Toothed belt axes with recirculating ball bearing guide ELGA-BS-KF/ELGA-TB-KF (drive axes)</li> <li>• Driveless linear guide unit with guide and freely movable slide unit</li> <li>• For supporting forces and torques in multi-axis applications</li> <li>• High torsional resistance</li> <li>• Reduced vibrations with dynamic loads</li> </ul>	<ul style="list-style-type: none"> <li>• For electric cylinders EPCC, EPCO and ESBF</li> <li>• For absorbing high process forces and torques</li> <li>• High guide precision</li> </ul>	<ul style="list-style-type: none"> <li>• Toothed belt axes with recirculating ball bearing guide ELGA-BS-KF/ELGA-TB-KF (drive axes)</li> <li>• Driveless linear guide unit with guide and freely movable slide unit</li> <li>• For supporting forces and torques in multi-axis applications</li> <li>• High torsional resistance</li> <li>• Reduced vibrations with dynamic loads</li> </ul>
<b>online:</b> →	<a href="#">elfd</a>	<a href="#">elfc</a>	<a href="#">eagf</a>	<a href="#">elfa</a>

Accessories for electric drives >

### Linear guides

	 <b>Guide axes ELFA-RF</b>	 <b>Guide axes ELFR</b>	 <b>Guide axes EGC-FA</b>
<b>Size</b>	70, 80	35, 45, 55	70, 80, 120, 185
<b>Stroke</b>	50 ... 7000 mm	50 ... 1500 mm	50 ... 8500 mm
<b>Guide</b>	Roller bearing guide	Plain-bearing guide, Recirculating ball bearing guide	Recirculating ball bearing guide
<b>Description</b>	<ul style="list-style-type: none"> <li>• For toothed belt axis with roller bearing guide ELGA-TB-RF (drive axes)</li> <li>• Driveless linear guide unit with guide and freely movable slide unit</li> <li>• For supporting forces and torques in multi-axis applications</li> <li>• High torsional resistance</li> <li>• Reduced vibrations with dynamic loads</li> </ul>	<ul style="list-style-type: none"> <li>• For toothed belt axes ELGR-TB (drive axes)</li> <li>• For spindle/toothed belt axes ELGA (drive axes)</li> <li>• For supporting forces and torques in multi-axis applications</li> <li>• High torsional resistance</li> </ul>	<ul style="list-style-type: none"> <li>• For spindle/toothed belt axes ELGA (drive axes)</li> <li>• For supporting forces and torques in multi-axis applications</li> <li>• High torsional resistance</li> </ul>
<b>online:</b> →	<a href="#">elfa</a>	<a href="#">elfr</a>	<a href="#">egc</a>

## Customised components – for your specific requirements



### Drives with customised designs

Can't find the electromechanical drive you need in our catalogue?

We can offer you customised components that are tailored to your specific requirements.

Common product modifications:

- Special strokes
- Design for special environmental conditions
- Design optimised for the installation space
- Design with opposing carriages
- Design with absolute encoder

Many additional variants are possible.

Ask your Festo sales engineer, who will be happy to help you:

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

## Product overview

03

Electromechanical actuators



## Product overview

## Software tools

### Configurator for quarter turn actuator units KDFP






Choose just an actuator unit without process valve for automating existing process valves. Simply enter the required parameters on the input screen and the configurator will suggest suitable solutions.

You can find the configurator at  
→ [www.festo.com/process](http://www.festo.com/process)

Rotary actuators for process valves >



Quarter turn actuators for process valves

	 <b>Quarter turn actuator units KDFP-DFPD</b>	 <b>Quarter turn actuators DFPD</b>	 <b>Quarter turn actuators DFPD-C</b>
<b>Design</b>	Rack and pinion	Scotch yoke system, Rack and pinion	Rack and pinion
<b>Mode of operation</b>	Double-acting, Single-acting	Double-acting, Single-acting	Single-acting
<b>Size of valve actuator</b>	10, 20, 40, 80, 120, 160, 240, 300, 480, 700, 900, 1200, 2300	10, 20, 40, 60, 80, 120, 160, 240, 300, 480, 700, 900, 1200, 2300, 3500, 4500, 6500, 9500	20, 40, 80, 120, 160, 240, 300, 480, 700, 900, 1200, 2300
<b>Flange hole pattern</b>	F03, F04, F05, F07, F10, F12, F14, F16	F03, F04, F05, F07, F10, F12, F14, F16, F0507, F0710, F1012, F1216, F1625	F05, F07, F10, F12, F14, F16
<b>Swivel angle</b>	90 deg	90 deg, 120 deg, 135 deg, 180 deg	90 deg
<b>Operating pressure [MPa]</b>	0.2 ... 0.8 MPa	0.2 ... 0.8 MPa	0.2 ... 0.8 MPa
<b>Operating pressure</b>	2 ... 8 bar	2 ... 8 bar	2 ... 8 bar
<b>Operating pressure [psi]</b>	29 ... 116 psi	29 ... 116 psi	29 ... 116 psi
<b>Ambient temperature</b>	-50 ... 150°C	-50 ... 150°C	-20 ... 80°C
<b>Safety function</b>		The safety function consists of the drive switching to the defined safety switching position. This switching movement is realised by pressurising the relevant pressure chamber with compressed air. The value of the torque generated depends on the pressure difference between the two pressure chambers separated by the piston. The safety function consists of the drive switching to the defined safety switching position when the compressed air is switched off and the spring chamber is exhausted. This switching movement is realised by the spring force of the spring assembly.	The safety function consists of the drive switching to the defined safety switching position when the compressed air is switched off and the spring chamber is exhausted. This switching movement is realised by the spring force of the spring assembly.
<b>Safety integrity level (SIL)</b>		To SIL 2 Low Demand mode, Up to SIL 3 in a redundant architecture, Up to SIL 1 high demand mode	To SIL 2 Low Demand mode, Up to SIL 3 in a redundant architecture, Up to SIL 1 high demand mode
<b>Description</b>	<ul style="list-style-type: none"> <li>• Quarter turn actuator unit comprising quarter turn actuator DFPD and accessories</li> <li>• Select, size and order quickly, easily and reliably with the configurator</li> <li>• Optionally with pilot valve</li> <li>• Optionally with positioner</li> <li>• Optionally with position indicator</li> <li>• Optionally with end position feedback</li> <li>• Optionally with the required mounting adapters or reducing sleeves for mounting on the valve body</li> </ul>	<ul style="list-style-type: none"> <li>• Uniform torque characteristic across the entire rotation angle of 90° with the double-acting version</li> <li>• Process valve connection to ISO 5211</li> <li>• Mounting hole pattern to VDI/VDE 3845</li> <li>• Sturdy, non-slip and easy-to-clean aluminium housing</li> <li>• Long service life, low wear</li> <li>• Version with swivel angle 120°, 135°, 180° for the sizes 40, 120, 240, 480, double-acting</li> <li>• Variants with safety functions</li> <li>• To EU Explosion Protection Directive (ATEX)</li> </ul>	<ul style="list-style-type: none"> <li>• Suitable for process automation in the chemical and petrochemical industries</li> <li>• Extended NAMUR interface to VDI/VDE 3847</li> <li>• Anti-blow-out screws for end-position adjustment</li> <li>• Hard anodised cover to prevent surface damage</li> <li>• Non-ferrous metal-free spring sets</li> <li>• Version with compressed air ducts in the housing for direct attachment of positioner and pilot valve on the actuator, without extra barbed tubing connectors</li> </ul>
<b>online:</b> →	<a href="#">kdfp</a>	<a href="#">dfpd</a>	<a href="#">dfpd</a>

## Product overview




### Rotary actuators for process valves >

## Quarter turn actuators for process valves

	 <p><b>Quarter turn actuators with heavy-duty guide DFPD-HD</b></p>	 <p><b>Quarter turn actuators DAPS</b></p>
<b>Design</b>	Scotch yoke system	Scotch yoke system
<b>Mode of operation</b>	Double-acting, Single-acting	Double-acting, Single-acting
<b>Size of valve actuator</b>	9000, 18000, 32000	0008, 0015, 0030, 0053, 0060, 0090, 0106, 0120, 0180, 0240, 0360, 0480, 0720, 0960, 1440, 1920, 2880, 3840, 4000, 5760, 8000
<b>Flange hole pattern</b>	F25, F30, F35	F03, F04, F05, F07, F10, F12, F14, F16, F25
<b>Swivel angle</b>	90 deg	90 deg, 92 deg
<b>Operating pressure [MPa]</b>	0.1 ... 0.85 MPa	0.1 ... 0.84 MPa
<b>Operating pressure</b>	1 ... 8.5 bar	1 ... 8.4 bar
<b>Operating pressure [psi]</b>	14.5 ... 123.25 psi	
<b>Ambient temperature</b>	-20 ... 80°C	-50 ... 150°C
<b>Safety function</b>		
<b>Safety integrity level (SIL)</b>		Up to SIL 2 High Demand mode, To SIL 2 Low Demand mode
<b>Description</b>	<ul style="list-style-type: none"> <li>• Ideal for applications with high torques up to max. 32,000 Nm</li> <li>• Extremely modular for a variety of uses: configurable spring forces, a choice between right or left direction of rotation and mechanical or hydraulic manual override</li> <li>• With safety functions</li> <li>• Namur connection pattern to VDI/VDE 3845</li> <li>• Variants to EU Explosion Protection Directive (ATEX)</li> </ul>	<ul style="list-style-type: none"> <li>• High breakaway torques</li> <li>• Sustainable thanks to extended life cycle and easier repairs</li> <li>• Flange hole pattern to ISO 5211</li> <li>• Mounting hole pattern to VDI/VDE 3845</li> <li>• Optionally with handwheel as a manual emergency override</li> <li>• Corrosion-resistant version made from stainless steel</li> <li>• To EU Explosion Protection Directive (ATEX)</li> <li>• With safety functions</li> </ul>
<b>online: →</b>	<a href="#">dfpd</a>	<a href="#">daps</a>

Linear actuators for process valves>




Linear actuators for process valves

	 <b>Piston drives DFPK</b>	 <b>Linear actuators DFPC</b>	 <b>Linear drives with displacement encoder DFPI</b>
<b>Design</b>		Piston, Piston rod, Tie rod, Cylinder barrel	Piston, Piston rod, Tie rod, Cylinder barrel
<b>Mode of operation</b>		Double-acting	Double-acting
<b>Piston diameter</b>		80 mm, 100 mm, 125 mm, 160 mm, 200 mm, 250 mm, 320 mm	100 mm, 125 mm, 160 mm, 200 mm, 250 mm, 320 mm
<b>Size of valve actuator</b>	46, 75	80, 100, 125, 160, 200, 250, 320	100, 125, 160, 200, 250, 320
<b>Stroke</b>	17 ... 20 mm	10 ... 1600 mm	40 ... 990 mm
<b>Operating pressure [MPa]</b>	0.5 ... 1 MPa	0.2 ... 0.8 MPa	0.3 ... 0.8 MPa
<b>Operating pressure</b>	5 ... 10 bar	2 ... 8 bar	3 ... 8 bar
<b>Operating pressure [psi]</b>	72.5 ... 145 psi	29 ... 116 psi	43.5 ... 116 psi
<b>Ambient temperature</b>	0 ... 60°C	-20 ... 80°C	-20 ... 80°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• Stainless steel design</li> <li>• Available as a valve actuator with angle seat valve VZX A and as a valve block solution</li> <li>• Linear actuating motion</li> <li>• High actuating forces</li> <li>• To EU Explosion Protection Directive (ATEX)</li> </ul>	<ul style="list-style-type: none"> <li>• Robust and corrosion-resistant tie-rod design</li> <li>• Ideal for use in harsh ambient conditions</li> <li>• Numerous configuration options</li> <li>• Variants with fastening interface in accordance with ISO 5210 or ISO 15552 with extended tie rods</li> </ul>	<ul style="list-style-type: none"> <li>• Mounting interfaces to ISO 15552 on bearing and end caps</li> <li>• Sturdy tie rod design</li> <li>• Integrated air supply</li> <li>• Optionally with integrated displacement encoder or fully integrated positioner</li> <li>• IP65, IP67, IP69K, NEMA4</li> <li>• To EU Explosion Protection Directive (ATEX)</li> </ul>
<b>online: →</b>	<a href="#">dfpk</a>	<a href="#">dfpc</a>	<a href="#">dfpi</a>

## Product overview




### Accessories

## Limit switch attachments

	 <b>Limit switch attachments</b> <b>SRBK</b>	 <b>End switch attachments</b> <b>SRBC</b>	 <b>End switch attachments</b> <b>SRBG</b>
<b>Information on housing materials</b>	PA, PA66, electrically conductive	Die-cast aluminium	PBT
<b>Operating voltage range AC</b>	0 ... 230 V	0 ... 230 V	
<b>Operating voltage range DC</b>	0 ... 175 V	0 ... 175 V	6 ... 60 V
<b>Measuring principle</b>	Inductive, Magnetic reed, Mechanical/ electrical	Inductive, Magnetic reed, Mechanical/ electrical	Inductive
<b>Switching element function</b>	N/O contact, Toggle switch, single-pole	N/C contact, N/O contact, Toggle switch, single-pole	N/C contact, N/C or N/O contact, switchable, N/O contact
<b>Safety integrity level (SIL)</b>	Safety Integrity Level 3	Safety Integrity Level 3	SIL 2
<b>Description</b>	<ul style="list-style-type: none"> <li>Sturdy polymer housing with UV resistance</li> <li>Different switch variants – mechanical, inductive and reed switches</li> <li>Multifunctional mounting adapter for adaptations on the ISO3845 interface</li> <li>Variants with M12 plug connection for easy installation (plug&amp;play)</li> </ul>	<ul style="list-style-type: none"> <li>Pre-assembled mounting adapter for ease of installation</li> <li>The trip cams can be easily set without additional tools</li> <li>Sturdy, corrosion-resistant design, ideal for use in harsh ambient conditions</li> <li>Clearly visible 3D position indicator allows the current position of the quarter turn actuator to be quickly detected</li> <li>With safety functions</li> <li>Variants to EU Explosion Protection Directive (ATEX)</li> </ul>	<ul style="list-style-type: none"> <li>Compact housing with M12 plug connection</li> <li>Direct mounting on quarter turn actuators to VDI/VDE 3845</li> <li>For quarter turn actuators for process automation with position indicators</li> <li>AS-Interface version with extended addressing options</li> <li>LED status indicator for switching status, supply voltage and solenoid valve output</li> <li>With safety functions</li> <li>Variants to EU Explosion Protection Directive (ATEX)</li> </ul>
<b>online:</b> →	<a href="#">srbk</a>	<a href="#">srbc</a>	<a href="#">srbg</a>


Accessories

Limit switch attachments

	 <b>End switch attachments SRBE</b>	 <b>Limit switch attachments SRAP</b>	 <b>Limit switch box SRBI</b>
<b>Information on housing materials</b>	Painted die cast aluminium	Wrought aluminium alloy	PBT
<b>Operating voltage range AC</b>	0 ... 240 V		
<b>Operating voltage range DC</b>	0 ... 60 V	15 ... 30 V	10 ... 30 V
<b>Measuring principle</b>	Inductive, Magnetic reed, Mechanical/electrical, Via proximity switch	Magnetic Hall	Inductive
<b>Switching element function</b>	N/C contact, N/O contact, Toggle switch, single-pole, Toggle switch, double-pole		N/O contact
<b>Safety integrity level (SIL)</b>	Safety Integrity Level 3		
<b>Description</b>	<ul style="list-style-type: none"> <li>• The trip cams can be easily set without additional tools</li> <li>• Sturdy, corrosion-resistant design, ideal for use in harsh ambient conditions</li> <li>• Clearly visible 3D position indicator allows the current position of the quarter turn actuator to be quickly detected</li> <li>• With safety functions</li> <li>• To EU Explosion Protection Directive (ATEX)</li> </ul>	<ul style="list-style-type: none"> <li>• Based on standard VDI/VDE 3845 (NAMUR)</li> <li>• Analogue</li> <li>• For monitoring the position of quarter turn actuators</li> <li>• Sensors based on 2D Hall technology</li> <li>• Variants to EU Explosion Protection Directive (ATEX)</li> </ul>	<ul style="list-style-type: none"> <li>• Compact housing with M12 plug connection</li> <li>• Direct mounting on quarter turn actuators to VDI/VDE 3845</li> <li>• For quarter turn actuators for process automation with position indicators</li> <li>• LED status indicator for switching status and supply voltage</li> </ul>
<b>online:</b> →	<a href="#">srbe</a>	<a href="#">srap</a>	<a href="#">srbi</a>

Accessories




Accessories for limit switch attachments

	 <b>Position indicators SASF</b>
<b>Setting range of swivel angle</b>	0 ... 360 deg
<b>Ambient temperature</b>	-40 - 80°C
<b>Type of mounting</b>	To VDI/VDE 3845
<b>Description</b>	<ul style="list-style-type: none"> <li>• For limit switch attachments SRBG, SRBI, SRBC</li> <li>• Variants for mounting on drive shafts of standard drives according to VDI/VDE 3845</li> <li>• Variants with adjustable swivel angle</li> <li>• Variants for clockwise and anticlockwise rotating actuators with 90° and 180° rotation</li> <li>• Variants with position indicator in yellow/red, I-, T-, L-design or with 180° arrow</li> </ul>
<b>online:</b> →	<a href="#">sasf</a>

## Product overview




### Accessories

## Positioners

	 <b>Positioner CMSH</b>	 <b>Manifold block CAPS</b>	 <b>Positioners CMSX</b>
<b>Mode of operation</b>	Double-acting, Single-acting	Double-acting, Single-acting	Double-acting, Single-acting
<b>Standard nominal flow rate</b>		270 ... 380 l/min	50 ... 130 l/min
<b>Ambient temperature</b>	-40 ... 80°C		-5 ... 60°C
<b>Operating voltage range DC</b>			21.6 ... 26.4 V
<b>Operating pressure [MPa]</b>	0.14 ... 0.8 MPa		0.3 ... 0.8 MPa
<b>Operating pressure</b>	1.4 ... 8 bar		3 ... 8 bar
<b>Operating pressure [psi]</b>	20.3 ... 116 psi		43.5 ... 116 psi
<b>Design features</b>	Safety position - pneumatic outlets closed, Safety pneumatic output 2 exhausted, Safety pneumatic output 4 pressurised	Safety position - pneumatic outlets closed, Safety pneumatic output 2 exhausted, Safety pneumatic output 4 pressurised	Safety position – pneumatic outlet 4 exhausted, Safety position – pneumatic outlet 2 pressurised, Safety position - pneumatic outlets closed
<b>Degree of protection</b>	IP66, IP67		IP65
<b>Type of mounting</b>	With accessories, To VDI/VDE 3845, To VDI/VDE 3847-2	To VDI/VDE 3845, To VDI/VDE 3847-2	With accessories
<b>Information on housing materials</b>	Aluminium, powder-coated	Aluminium, powder-coated	PC-reinforced
<b>Description</b>	<ul style="list-style-type: none"> <li>• Intelligent, digital electropneumatic positioner with HART communication</li> <li>• Fast and precise position control of single- and double-acting pneumatic rotary and linear drives</li> <li>• With integrated or external path/angular detection</li> <li>• Commissioning, operation, maintenance and diagnostics on the local display via the user-friendly software menu or via remote access with EDD-based (Electronic Device Description) or FDT-based (Field Device Tool) transmission</li> <li>• 2-conductor technology</li> <li>• Perfect interaction with the pneumatic extension modules VTOP</li> <li>• Variants with safety functions</li> <li>• Sustainable operation thanks to efficient control</li> </ul>	<ul style="list-style-type: none"> <li>• Prepared for positioner CMSH-V-SD with the mechanical interface for the sub-base version and switchable with mode of operation in the single-acting/double-acting version</li> <li>• Determines the operating mode of the positioner CMSH-V-SD</li> <li>• Variants with mechanical interface to VDI/VDE 3845 or to VDI/VDE 3847-2</li> <li>• Variants with or without pressure gauge connection</li> <li>• With safety functions</li> </ul>	<ul style="list-style-type: none"> <li>• Digital, electropneumatic positioner</li> <li>• Simple and efficient position control of single- and double-acting pneumatic rotary and linear drives</li> <li>• Sustainable thanks to extended life cycle and easier repairs</li> <li>• With integrated or external path/angular detection</li> <li>• Simple commissioning through automatic initialisation function</li> <li>• Intuitive menu navigation</li> <li>• 4-conductor technology</li> <li>• Variants with safety functions</li> </ul>
<b>online:</b> →	<a href="#">cms</a>	<a href="#">caps</a>	<a href="#">cmsx</a>

Accessories



Pilot valves

	 <b>Solenoid valves VSNC</b>	 <b>Solenoid valves VSNC-G1/8</b>	 <b>Solenoid valves VOFC</b>
<b>Valve function</b>	5/2 bistable, 5/2-way or 3/2-way, convertible, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed	3/2-way, closed, monostable, 5/2-way, monostable, Connections swapped	3/2-way, closed, monostable, 5/2 bistable, 5/2-way, monostable
<b>Operating pressure [MPa]</b>	0.15 ... 1 MPa	0.25 ... 0.8 MPa	0 ... 1 MPa
<b>Operating pressure</b>	1.5 ... 10 bar	2.5 ... 8 bar	0 ... 10 bar
<b>Ambient temperature</b>	-20 ... 60°C	-20 ... 50°C	-25 ... 60°C
<b>Pneumatic connection 1</b>	1/4 NPT, G1/4, QS-1/4, QS-10, QS-3/8, QS-5/16, QS-6, QS-8	G1/8	1/4 NPT, 1/2 NPT, NAMUR port pattern, G1/2, G1/4, M5
<b>Standard nominal flow rate</b>	800 ... 1350 l/min	400 l/min	595 ... 2794 l/min
<b>Explosion prevention and protection</b>	Class I, Div. 1 (US), Class I, Div. 2 (US), Class II, Div. 1 (US), Class II, Div. 2 (US), Class III, Div. 1 (US), Class III, Div. 2 (US), Zone 0 (IEC-EX), Zone 0 (KR), Zone 1 (ATEX), Zone 1 (IEC-EX), Zone 1 (KR), Zone 2 (ATEX), Zone 2 (KR), Zone 20 (IEC-EX), Zone 21 (ATEX), Zone 21 (IEC-EX), Zone 21 (KR), Zone 22 (ATEX), Zone 22 (KR)		Zone 1 (ATEX), Zone 1 (IEC-EX), Zone 1 (KR), Zone 2 (ATEX), Zone 21 (ATEX), Zone 21 (IEC-EX), Zone 21 (KR), Zone 22 (ATEX)
<b>Safety integrity level (SIL)</b>			Up to SIL 3 High Demand mode, To SIL 3 Low Demand mode
<b>Description</b>	<ul style="list-style-type: none"> <li>Namur connection pattern to VDI/VDE 3845</li> <li>Rotatable seal for 3/2- or 5/2-way valve</li> <li>Wide choice of EX solenoid systems</li> <li>Sturdy and powerful</li> <li>Extended temperature range</li> <li>Excellent value for money</li> <li>All solenoid coils can be used on an armature tube</li> <li>The VSNC-...FN variant achieves greater energy efficiency with reduced power consumption</li> </ul>	<ul style="list-style-type: none"> <li>Namur connection pattern to VDI/VDE 3845</li> <li>Compact, cost-effective, powerful</li> <li>Especially suitable for rotary actuators DAPS and DFPD with connection pattern according to VDI/VDE 3845</li> <li>Extended temperature range</li> <li>Electrical connection with plug pattern type form C, according to EN 175301-803</li> <li>Solenoid coil 24 V integrated</li> <li>Excellent value for money</li> </ul>	<ul style="list-style-type: none"> <li>Suitable for process automation in the chemical and petrochemical industries</li> <li>Suitable for outdoor use under harsh ambient conditions</li> <li>Especially suitable for quarter turn actuators thanks to NAMUR flange pattern</li> <li>Valve can switch between internal and external pilot air</li> <li>Variants with safety functions</li> <li>Variants to EU Explosion Protection Directive (ATEX)</li> </ul>
<b>online:</b> →	<a href="#">vsnc</a>	<a href="#">vsnc</a>	<a href="#">vofc</a>

## Product overview


### Accessories

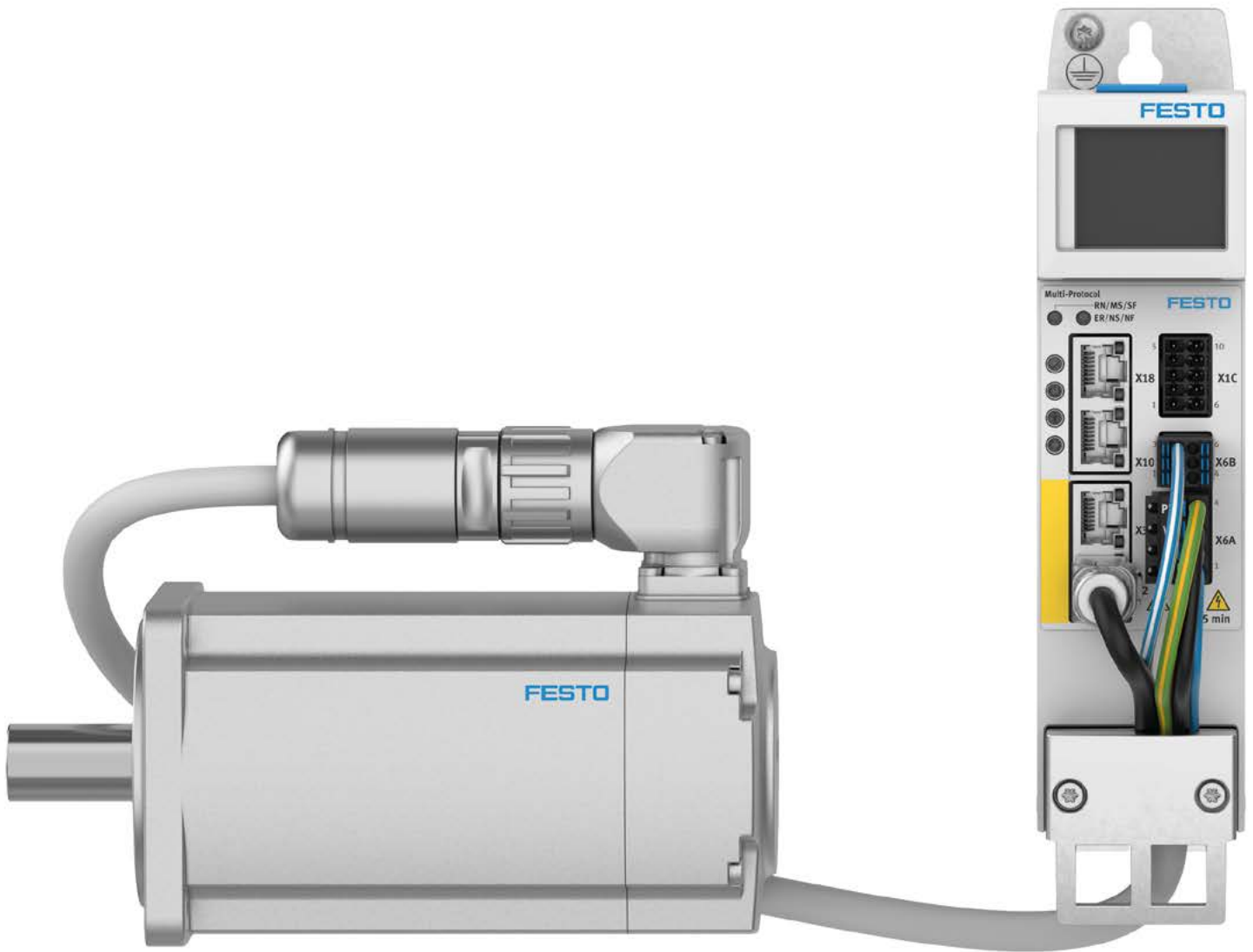
## Pilot valves

	 <p><b>Solenoid valves</b> <b>VOFD</b></p>	 <p><b>Pilot valves</b> <b>VOFX</b></p>
<b>Valve function</b>	3/2-way, closed, monostable, semi-automatic, 3/2-way, closed, monostable	3/2-way, closed, monostable
<b>Operating pressure [MPa]</b>	0 ... 1.2 MPa	-0.09 ... 0.8 MPa
<b>Operating pressure</b>	0 ... 12 bar	-0.9 ... 8 bar
<b>Ambient temperature</b>	-50 ... 60°C	-10 ... 50°C
<b>Pneumatic connection 1</b>	1/4 NPT, NAMUR port pattern, G1/4, M5	G1/8
<b>Standard nominal flow rate</b>	52 ... 1900 l/min	50 l/min
<b>Explosion prevention and protection</b>	Zone 1 (ATEX), Zone 2 (ATEX), Zone 21 (ATEX), Zone 22 (ATEX)	Zone 1 (ATEX), Zone 1 (BR), Zone 2 (ATEX), Zone 21 (ATEX), Zone 21 (BR), Zone 21 (CN), Zone 21 (IEC-EX), Zone 22 (ATEX)
<b>Safety integrity level (SIL)</b>	Up to SIL 3 High Demand mode, To SIL 3 Low Demand mode	
<b>Description</b>	<ul style="list-style-type: none"> <li>• Suitable for process automation in the chemical and petrochemical industries</li> <li>• Suitable for outdoor use under harsh ambient conditions</li> <li>• Especially suitable for quarter turn actuators thanks to NAMUR flange pattern</li> <li>• Variants with safety functions</li> <li>• Variants to EU Explosion Protection Directive (ATEX)</li> </ul>	<ul style="list-style-type: none"> <li>• For angle seat valves VZXF and VZXA</li> <li>• For use wherever valve terminals are not economically or technically viable</li> <li>• Manual override, detenting</li> </ul>
<b>online:</b> →	<a href="#">vofd</a>	<a href="#">vofx</a>

### Accessories

## Application-specific valve terminals

	 <p><b>Valve terminals</b> <b>VTOP</b></p>
<b>Size</b>	100 mm
<b>Variants</b>	Manifold block for safety functions, HFT0 prepared for exhaust, VDI/VDE 3845, Manifold block for safety functions, HFT0 prepared for exhausting, VDI/VDE 3847, Manifold block for safety functions, HFT1 prepared for exhausting, VDI/VDE 3847, End plate, double-acting, active direction can be switched, Filter regulator, pressure range 0.5 ... 12 bar, grade of filtration 40 µm, Filter regulator, pressure range 0.5 ... 12 bar, grade of filtration 5 µm, Module for reaching a specific end position in case of a pressure failure, Volume booster, double-acting, Volume booster, single-acting
<b>Operating pressure [MPa]</b>	0 MPa, 0.9 MPa
<b>Operating pressure</b>	0 bar, 9 bar
<b>Operating pressure [psi]</b>	0 psi, 130.5 psi
<b>Pneumatic connection</b>	Sub-base design, airing
<b>Description</b>	<ul style="list-style-type: none"> <li>• Innovative, modular, compact complete solution for control applications</li> <li>• Modules such as fail-safe, volume booster and filter regulator can be combined with one another as required, are easy to install, and can be extended and retrofitted without any problems</li> <li>• Patented integrated air duct to supply all modules as well as actuator and positioner, without leak-prone, external piping</li> <li>• Standardised mounting interface for direct attachment of a positioner according to VDI/VDE 3847-2</li> <li>• Optimised for positioner CMSH for controlling single- and double-acting quarter turn and linear actuators</li> <li>• Suitable for quarter turn actuators DFPI-C with mechanical interface to VDI/VDE 3847-2 and for linear actuators DFPI-NB3 based on ISO 15552</li> <li>• Sustainable operation thanks to leakage reduction at sealing points</li> </ul>
<b>online:</b> →	<a href="#">vtop</a>



## Product overview

## Software tools

### Festo Configuration Tool (FCT)



The „Festo Configuration Tool“ is a configuration and parameterisation software program that supports all Festo devices, in particular motor controllers.

The software is extremely flexible, provides full support for the device properties and is simple and intuitive to operate.

The user is guided step-by-step through the commissioning process while each individual step is checked.

The „Festo Configuration Tool“ parameterisation software can be found at [www.festo.com/fct](http://www.festo.com/fct) > section „Other useful tools for the first start“

### Electric Motion Sizing



Find the right electric or electromechanical servo drive.

This is how you can quickly and easily find the right electromechanical drive solution for your application:

Electric Motion Sizing, the online sizing and simulation tool for electric drives (servo drives and motors = servo drive package) as well as for electromechanical drive solutions (= electromechanical servo drive package consisting of servo drives and motors as well as mechanics) helps you do this.

This tool can be found at [www.festo.com/x/electric-motion-sizing](http://www.festo.com/x/electric-motion-sizing)

### Simplified Motion Series – Solution Finder





The simplicity of pneumatics is now combined for the first time with the advantages of electric automation thanks to the Simplified Motion Series.



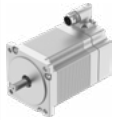
These integrated drives are the perfect solution for all users who are looking for an electric alternative for very simple movement and positioning tasks, but don't want the commissioning process for traditional electric drive systems that can often be quite complex.

This tool can be found at [www.festo.com/x/simplified-motion-series](http://www.festo.com/x/simplified-motion-series)

## Servo motors

		
	<b>Servo motors EMMT-AS</b>	<b>Servo motors EMMB-AS</b>
<b>Nominal torque</b>	0.21 ... 82.4 Nm	0.32 ... 2.39 Nm
<b>Nominal rotary speed</b>	1000 ... 7000 rpm	3000 rpm
<b>Nominal motor power</b>	96 ... 8629 W	100 ... 750 W
<b>Peak torque</b>	0.83 ... 183.3 Nm	0.96 ... 7.17 Nm
<b>Max. rotational speed</b>	1654 ... 15600 rpm	5000 ... 6000 rpm
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electro-mechanical actuators, motors, servo drives and control systems</li> <li>• Technology series for demanding positioning tasks</li> <li>• A selection of 6 motor sizes in up to 4 lengths</li> <li>• Brushless, permanently magnetized synchronous servo motor</li> <li>• Digital absolute displacement encoder, single turn or multi-turn</li> <li>• Reliable, highly dynamic, extremely precise</li> <li>• Extremely low cogging torque – supports high synchronisation even at low rotational speeds</li> <li>• One motor connection (OCP: one cable plug) – one connecting cable for supply and encoder, with rotatable plug</li> <li>• Degree of protection IP67 (for motor housing and connection technology) and up to IP65 (on the motor shaft with shaft seal)</li> <li>• Optionally with holding brake</li> <li>• Optionally with absolute safety encoder, multi-turn</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electro-mechanical actuators, motors, servo drives and control systems</li> <li>• Basic series – for cost-sensitive, simple positioning tasks</li> <li>• A selection of 3 motor sizes in up to 2 lengths</li> <li>• Brushless, permanently magnetized synchronous servo motor</li> <li>• Digital absolute displacement encoder, single turn; multi-turn optional</li> <li>• Sturdy, dynamic, accurate</li> <li>• Optimised connection technology</li> <li>• Degree of protection IP65 (for motor housing and cable connections (without plug connectors)) and up to IP54 (on the motor shaft with shaft seal)</li> <li>• Optionally with holding brake</li> </ul>
<b>online:</b> →	<a href="#">emmt</a>	<a href="#">emmb</a>

## Stepper motors

			
	<b>Stepper motors EMMS-ST</b>	<b>Stepper motor EMMB-ST</b>	<b>Stepper motor EMMT-ST</b>
<b>Nominal motor current</b>	1.4 A	1.8 ... 7.5 A	1.8 ... 8.4 A
<b>Max. rotational speed</b>	6000 rpm	600 ... 3200 rpm	430 ... 3200 rpm
<b>Motor holding torque</b>	0.09 Nm	0.25 ... 6.6 Nm	0.25 ... 9.4 Nm
<b>Description</b>	<ul style="list-style-type: none"> <li>• Small increments and high driving torques thanks to 2-phase hybrid technology</li> <li>• Optimised connection technology</li> <li>• Four sizes with flange sizes 28, 42, 57 and 87</li> <li>• 28 types in stock</li> <li>• With incremental encoder for closed-loop operation</li> <li>• Degree of protection IP40 (motor shaft), IP54 (sizes 42, 27, 87: motor housing and plug connection), IP65 (size 28: motor housing and plug connection)</li> <li>• Optionally with holding brake</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Motor in IP20 (IP40 for motor shaft)</li> <li>• Absolute encoder, single or multiturn (without battery)</li> <li>• 3 flange sizes MH: 0.22 Nm ... 6.6 Nm</li> <li>• Optionally with holding brake</li> <li>• Automatic motor detection via 'electronic rating plate' with motor correction table</li> <li>• Can be used in applications down to -15 °C</li> <li>• OCP cable (one cable plug) with space-saving plug, can be positioned to the front or rear</li> <li>• Cable length up to 25 m</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Motor in IP65 (IP40 for motor shaft)</li> <li>• Absolute encoder, single or multiturn (without battery)</li> <li>• 3 flange sizes MH: 0.25 Nm ... 9.4 Nm</li> <li>• Optionally with holding brake</li> <li>• Automatic motor detection via 'electronic rating plate' with motor correction table</li> <li>• Can be used in applications down to -15 °C</li> <li>• OCP cable (one cable plug) with solid M17 plug, can be rotated 310°</li> <li>• Cable length up to 25 m</li> </ul>
<b>online:</b> →	<a href="#">emms</a>	<a href="#">emmb</a>	<a href="#">emmt</a>

## Product overview

## Software tools

### Commissioning software Automation Suite



Quickly and reliably to a ready-to-use drive system – the Festo Automation Suite combines the parameterisation, programming and maintenance of complete drive systems, from the mechanical to the control system, in just one software program. Perfect for making industrial automation simple, efficient and seamless.

#### Servo drive plug-in CMMT-AS

- An operational drive system in just 5 steps – parameterisation is almost fully automatic with the commissioning wizard
- Advanced editing with the expert view gives you full access to all device parameters
- Conveniently install the plug-in using the software

You will find this tool at

➔ [www.festo.com/AutomationSuite](http://www.festo.com/AutomationSuite)

### Connectivity Finder






You can use this tool to find the optimum way to connect a Festo solution to your preferred (non-Festo) controller. In addition, you will be provided with expert knowledge for your selected connection option, making the integration of the Festo solution into your machine extremely easy.

This tool can be found at

➔ [www.festo.com/x/connectivity-finder](http://www.festo.com/x/connectivity-finder)

Electric servo drives >


Servo drive

	 <b>Servo drives CMMT-AS</b>	 <b>Motor controllers CMMP-AS</b>	 <b>Servo drive CMXL-ST6</b>
<b>Nominal current</b>		2 ... 13 A	
<b>Nominal operating voltage AC</b>	230 ... 400 V	230 ... 400 V	
<b>Nominal operating voltage phases</b>	Single-phase, 3-phase	Single-phase, 3-phase	
<b>Operating voltage</b>			20.4 - 30 V DCV DC
<b>Rated output controller</b>	350 ... 12000 VA	500 ... 9000 VA	
<b>Fieldbus coupling</b>	EtherCAT, EtherNet/IP, Modbus/TCP, PROFINET	CANopen, DeviceNet, EtherCAT, EtherNet/IP, Modbus/TCP, PROFINET, PROFIBUS DP	Ethernet
<b>Safety function</b>	Safe brake control (SBC), Safe torque off (STO), Safely limited speed (SLS), Safe Operating Stop (SOS), Safe Stop 1 (SS1), Safe Stop 2 (SS2), Safe maximum speed (SMS)	Safe torque off (STO), Safe Stop 1 (SS1)	
<b>Performance level (PL)</b>	Safe brake control (SBC)/category 3, performance level e, Safe Torque Off (STO)/category 4, performance level e	Safe Torque Off (STO)/category 4, performance level e	
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• One of the most compact servo drives on the market</li> <li>• Precise force, speed and position control</li> <li>• The new multiprotocol variant (CMMT-...-MP) has all fieldbuses (PROFINET, EtherCAT®, EtherNet/IP, Modbus®) integrated in one servo drive hardware</li> <li>• Auto-tuning supports easy commissioning and automatically optimises the control behaviour of rotary and linear motions</li> <li>• The latest generation of servo drive systems with optimised prices and sizes</li> <li>• Configure standard functional safety functions (STO, SBC) without software</li> <li>• Extended functional safety functions (SS1, SS2, SLS, SOS, SMS,...) can be controlled via fieldbus or I/O with guided commissioning and validation</li> <li>• Optimally with servo motor EMMT-AS</li> <li>• Universal applications</li> <li>• Sustainable operation thanks to energy recovery</li> </ul>	<ul style="list-style-type: none"> <li>• Many interfaces and functions for decentralised motion functions (flying saw, flying measurement, modulo function, etc.)</li> <li>• Optional: integrated cam disk controllers and highly dynamic movements</li> <li>• Standardised interfaces allow seamless integration in mechatronic multi-axis modular systems</li> <li>• Reliable and easy commissioning and parameterisation with the Festo Configuration Tool (FCT)</li> <li>• Optionally with 3 slots for extension modules</li> <li>• Variants with safety functions</li> <li>• 255 positioning records</li> </ul>	<ul style="list-style-type: none"> <li>• 6-axis low-voltage servo drive for stepper motors, open-loop, no encoder inputs</li> <li>• Open circuit board for integration in desktop devices (without control cabinet)</li> <li>• Digital interface Ethernet, USB – positioning via G-code commands</li> <li>• Digital inputs for connecting the microswitches for homing</li> </ul>
<b>online:</b> →	<a href="#">cmmt-as</a>	<a href="#">cmmp</a>	<a href="#">cmxl-st6</a>





## Product overview

Electric servo drives >

### Stepper motor controllers




	<b>Servo drives CMMT-ST</b>
<b>Nominal current load supply</b>	8 A
<b>Nominal voltage, load supply DC</b>	24 V, 48 V
<b>Fieldbus coupling</b>	EtherCAT, EtherNet/IP, Modbus/TCP, PROFINET
<b>Performance level (PL)</b>	STO/Cat. 3, PLd (EC motor without diagnostics), STO/Cat. 3, PLe (stepper motor/EC motor with diagnostics)
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Space-optimised servo drive for operating stepper motors, brushless DC motors (BLDC motors) and EC motors</li> <li>• Ideal for positioning tasks and point-to-point and interpolating motion solutions</li> <li>• The new multiprotocol variant (CMMT-...-MP) has all fieldbuses (PROFINET, EtherCAT®, EtherNet/IP, Modbus®) integrated in one servo drive hardware</li> <li>• A servo drive for direct fieldbus integration for controllers from the major manufacturers with associated function blocks</li> <li>• Integrated safety functions STO (safe torque off) – Cat 3, Ple / SIL 3 / SILCL 3 ensure safe operation</li> <li>• For extremely economical applications with low power requirements of 150 W at 24 V DC, 300 W at 48 V DC and a peak power of 800W</li> <li>• Energy recovery and energy management ensure sustainable operation and increased efficiency</li> <li>• Auto-tuning makes commissioning of rotary and linear motions easier</li> <li>• Very efficient for tasks with low power requirements</li> <li>• 50% more compact than the smallest servo drive CMMT-AS</li> <li>• Ideal for use with stepper motors such as the EMMB-ST and EMMT-ST, BLDC motors and EC motors</li> </ul>
<b>online:</b> →	<a href="#">cmmt-st</a>

### Industrial gear units

			
<b>Gear unit EMGA-A</b>	<b>Gear units EMGA-P-EAS</b>	<b>Gear units EMGA-P-SAS</b>	<b>Gear units EMGA-P-SST</b>
<b>Gear ratio</b>	3:1, 5:1, 8:1, 12:1, 20:1	3:1, 5:1, 8:1, 12:1, 20:1	3:1, 5:1, 8:1, 12:1
<b>Continuous output torque</b>	4.5 ... 120 Nm	6 ... 120 Nm	6 ... 120 Nm
<b>Max. drive speed</b>	7000 ... 18000 rpm	7000 ... 18000 rpm	7000 ... 18000 rpm
<b>Torsional rigidity</b>	0.7 ... 5.1 Nm/arcmin	0.85 ... 10.4 Nm/arcmin	0.8 ... 10.4 Nm/arcmin
<b>Torsional backlash</b>	0.22 ... 0.41 deg	0.12 ... 0.31 deg	0.12 ... 0.31 deg
<b>Mass moment of inertia, gear unit</b>	0.032 ... 1.409 kgcm <sup>2</sup>	0.015 ... 0.77 kgcm <sup>2</sup>	0.015 ... 0.77 kgcm <sup>2</sup>
<b>Max. efficiency</b>	92%, 93%, 94%, 95%	96%, 97%, 98%	96%, 97%, 98%
<b>Description</b>	<ul style="list-style-type: none"> <li>• Bevel gear for servo motors EMME-AS, EMMT-AS, EMMS-AS</li> <li>• Life-time lubrication</li> <li>• Degree of protection IP54</li> </ul>	<ul style="list-style-type: none"> <li>• Planetary gear unit, straight, for servo motors EMME-AS, EMMT-AS</li> <li>• Eco AC synchronous interface</li> <li>• Life-time lubrication</li> <li>• Degree of protection IP54</li> </ul>	<ul style="list-style-type: none"> <li>• Planetary gear unit, straight, for stepper motors EMMS-ST</li> <li>• Life-time lubrication</li> <li>• Degree of protection IP54</li> </ul>
<b>online:</b> →	<a href="#">emga</a>	<a href="#">emga</a>	<a href="#">emga</a>

Accessories for servo drives >

Accessories for servo drives

	 <b>Safety modules</b> <b>CAMC-G-S1</b>	 <b>Safety modules</b> <b>CAMC-G-S3</b>	 <b>Starter Kit</b> <b>CMMT-ST</b>
<b>Safety function</b>	Safe torque off (STO)	Safe brake control (SBC), Safe Speed Range (SSR), Safe Speed Monitor (SSM), Safe torque off (STO), Safely limited speed (SLS), Safe Operating Stop (SOS), Safe Stop 1 (SS1), Safe Stop 2 (SS2)	
<b>Safety integrity level (SIL)</b>	Safe torque off (STO)/SIL 3/SILCL 3	Safe stop 2 (SS2)/SIL 3, Safe stop 1 (SS1)/SIL 3, Safe brake control (SBC)/SIL 3, Safely limited speed (SLS)/SIL 3, Safe operating stop (SOS)/SIL 3, Safe speed monitor (SSM)/SIL 3, Safe Speed Range (SSR)/SIL 3, Safe torque off (STO)/SIL 3	
<b>Characteristics of logic inputs</b>	Galvanically isolated	4 safe, 2-channel inputs Equivalent/antivalent switching Test pulses configurable Function configurable, 6 safe, 1-channel inputs Test pulses configurable	
<b>No. of digital logic inputs</b>	2	10	
<b>Digital output design</b>	Potential-free signal contact	Potential-free signal contact, 3 safe, 2-channel semiconductor outputs	
<b>Description</b>	<ul style="list-style-type: none"> <li>• With safety functions</li> <li>• For motor controller CMMP-AS-M3</li> <li>• Plug-in module</li> </ul>	<ul style="list-style-type: none"> <li>• With safety functions</li> <li>• For motor controller CMMP-AS-M3</li> <li>• Plug-in module</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Starter kit contents: Servo drive controller CMMT-ST with multi-protocol function, stepper motor EMMT-ST and matching motor and encoder cables as one cable plug.</li> <li>• Just test: develop solutions for individual automation tasks and test possible applications in projects with the Starter Kit at a special price.</li> <li>• Easy to use: intuitive and easy to install with the Festo Automation Suite and provides the full range of functions.</li> </ul>
<b>online:</b> →	<a href="#">camc</a>	<a href="#">camc</a>	<a href="#">cmmt-st</a>

## Product overview

### Accessories for servo drives >

## Power supply units



**Power supply units**  
**CACN**

<b>Nominal output voltage DC</b>	24 ... 54 V
<b>Nominal output current</b>	2 ... 20 A
<b>Input voltage range AC</b>	100 ... 500 V
<b>Power failure buffering</b>	15 ... 100 ms
<b>Description</b>	<ul style="list-style-type: none"> <li>• H-rail mounting</li> <li>• Mounting position: free convection</li> </ul>
<b>online:</b> →	<a href="#">cacn</a>



Product overview

Software tools



The gripper sizing application is a product selection tool that provides you with specific products for your gripper requirements.





You can find your ideal gripper system by entering parameters such as object mass, surface finish and gripper jaw length.

Configure and compare gripper solutions quickly, easily and precisely according to your specifications.

You will find these tools at  
[→ www.festo.com/x/gripper-sizing](http://www.festo.com/x/gripper-sizing)





Parallel gripper

Parallel grippers

	 <b>Parallel gripper HPPH</b>	 <b>Parallel gripper HEPP</b>	 <b>Parallel gripper HPPF</b>	 <b>Parallel grippers DHPL</b>
<b>Size</b>	16	28, 36, 42	8, 12, 16, 20	10, 16, 20, 25, 32, 40
<b>Stroke per gripper jaw</b>	8 mm	15 ... 28 mm	4 ... 40 mm	10 ... 100 mm
<b>Total gripping force at 0.6 MPa (6 bar, 87 psi), closing</b>	278 ... 302 N		54.44 ... 346.6 N	38 ... 992 N
<b>Max. force on gripper jaw Fz, static</b>	176 N	680 ... 1100 N	60 ... 320 N	40 ... 750 N
<b>Gripping force backup</b>	During closing		None	None
<b>Gripper repetition accuracy</b>	0.06 mm	0.02 mm, 0.04 mm	0.02 mm, 0.03 mm, 0.06 mm	0.03 mm
<b>Position sensing</b>	With integrated displacement encoder	Motor encoder	Via proximity switch	Via proximity switch
<b>Description</b>	<ul style="list-style-type: none"> <li>• For safe human-robot collaboration up to 0.5 MPa</li> <li>• Gripper/valve combination with integrated sensors and low overall height</li> <li>• Reduces cycle times and saves up to 75% on compressed air compared to using individual components</li> <li>• TÜV certification for grippers with fingers to ISO 15066</li> <li>• Can be used with many different cobots and robots thanks to the mechanical robot interface to ISO 9409-1-50-4-M6</li> <li>• Gripping force backup for safe handling, even in emergency off mode</li> <li>• Versatile control via digital I/O (PNP/NPN) or IO-Link®</li> <li>• Sustainable in production thanks to reduced use of materials</li> <li>• Sustainable operation thanks to integrated control</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Powerful and flexible</li> <li>• Dynamic motor for adjustable motion response</li> <li>• Easy, adjustable parameterisation</li> <li>• Compact thanks to integrated controller</li> <li>• High precision thanks to cross-roller guide</li> <li>• Control via PROFINET®, EtherNet/IP®, EtherCat®</li> <li>• Sustainable in production thanks to reduced use of materials</li> </ul>	<ul style="list-style-type: none"> <li>• Optimal: compact and flat design</li> <li>• Durable: integrated guide and sturdy design</li> <li>• Economical: best price/performance ratio</li> <li>• Can be combined: available in many sizes and strokes</li> <li>• Sustainable thanks to reduced material use and maintenance-free over the entire service life.</li> </ul>	<ul style="list-style-type: none"> <li>• High torque resistance due to guided gripper jaw</li> <li>• Compact and sturdy design</li> <li>• Ideal for gripping larger parts</li> <li>• Double-acting piston drive</li> <li>• Suitable for external and internal gripping</li> <li>• Mounting: direct fastening via thread, with through-hole</li> <li>• For position sensing with proximity sensor for T-slot and for C-slot</li> <li>• Sustainable in production thanks to reduced use of materials</li> </ul>
<b>online:</b> →	<a href="#">hpph</a>	<a href="#">hepp</a>	<a href="#">hppf</a>	<a href="#">dhpl</a>

Parallel gripper





Parallel grippers

	 <b>Parallel grippers DHPS</b>	 <b>Parallel gripper DHPC</b>	 <b>Parallel grippers HGPD</b>	 <b>Parallel grippers HGPT-B</b>
<b>Size</b>	6, 10, 16, 20, 25, 35	6, 10, 16, 20, 25, 32, 40	16, 20, 25, 35, 40, 50, 63, 80	16, 20, 25, 35, 40, 50, 63, 80
<b>Stroke per gripper jaw</b>	2 ... 12.5 mm	2 ... 15 mm	3 ... 20 mm	1.5 ... 25 mm
<b>Total gripping force at 0.6 MPa (6 bar, 87 psi), closing</b>	25 ... 910 N	7.8 ... 717.2 N	94 ... 3716 N	106 ... 6300 N
<b>Max. force on gripper jaw F<sub>z</sub>, static</b>	10 ... 450 N	22 ... 351.5 N	150 ... 6000 N	200 ... 7000 N
<b>Gripping force backup</b>	During opening, During closing, None	During opening, During closing, None	During opening, During closing, None	During opening, During closing, None
<b>Gripper repetition accuracy</b>	0.02 mm	0.02 mm	0.03 mm, 0.04 mm, 0.05 mm	0.03 mm, 0.04 mm, 0.05 mm
<b>Position sensing</b>	Via Hall sensor, Via proximity switch	Via proximity switch	Via proximity switch	Via proximity switch
<b>Description</b>	<ul style="list-style-type: none"> <li>• Sturdy and precise T-slot guidance of the gripper jaws</li> <li>• High gripping force and compact size</li> <li>• Max. repetition accuracy</li> <li>• Can be used as a double- and single-acting gripper</li> <li>• Single-acting variant or with gripping force backup, normally open (NO) or normally closed (NC)</li> <li>• Suitable for external and internal gripping</li> <li>• Wide range of adaptation options on the drives</li> </ul>	<ul style="list-style-type: none"> <li>• Resilient and precise ball guide</li> <li>• High gripping force and compact size</li> <li>• Max. repetition accuracy</li> <li>• Can be used as a double-acting or single-acting gripper</li> <li>• Single-acting variant or with gripping force retention normally open (NO) or normally closed (NC)</li> <li>• Suitable for external and internal gripping</li> <li>• Wide variety of mounting and attachment options</li> <li>• Sustainable in production thanks to reduced use of materials</li> </ul>	<ul style="list-style-type: none"> <li>• Ideal for very harsh environments</li> <li>• Precise gripping even at high torque load</li> <li>• Max. gripping force at optimum installation space/force ratio</li> <li>• 8 sizes with total stroke of up to 40</li> <li>• Can be used as a double- and single-acting gripper</li> <li>• Single-acting variant or with gripping force backup, normally open (NO) or normally closed (NC)</li> <li>• Suitable for external and internal gripping</li> </ul>	<ul style="list-style-type: none"> <li>• Sturdy and powerful</li> <li>• With T-slot guide</li> <li>• Gripper jaw guide protected by sealing air against dust</li> <li>• High-force variant available</li> <li>• Can be used as a double- and single-acting gripper</li> <li>• Single-acting variant or with gripping force backup, normally open (NO) or normally closed (NC)</li> <li>• Suitable for external and internal gripping</li> </ul>
<b>online:</b> →	<a href="#">dhps</a>	<a href="#">dhpc</a>	<a href="#">hgpd</a>	<a href="#">hgpt</a>

## Product overview




### Parallel gripper

## Parallel grippers

	 <b>Parallel grippers HGPL-B</b>	 <b>Parallel grippers HGPP</b>	 <b>Parallel grippers HGPM</b>	 <b>Parallel grippers, electric EHPS</b>
<b>Size</b>	14, 25, 40, 63	10, 12, 16, 20, 25, 32	8, 12	16, 20, 25
<b>Stroke per gripper jaw</b>	20 ... 150 mm	2 ... 12.5 mm	2 ... 3 mm	10 ... 16 mm
<b>Total gripping force at 0.6 MPa (6 bar, 87 psi), closing</b>	158 ... 2742 N	80 ... 830 N	16 ... 35 N	
<b>Max. force on gripper jaw F<sub>z</sub>, static</b>	500 ... 9000 N	40 ... 720 N	10 ... 30 N	200 ... 450 N
<b>Gripping force backup</b>	None	During opening, During closing, None	None	
<b>Gripper repetition accuracy</b>	0.03 mm	0.02 mm	0.05 mm	0.01 mm, 0.03 mm
<b>Position sensing</b>	Via proximity switch	Via Hall sensor, Via inductive sensors	Without	Via proximity switch, With Hall sensor, With integrated displacement encoder, Via IO-Link interface
<b>Description</b>	<ul style="list-style-type: none"> <li>• Space-saving, high forces and torques</li> <li>• Controlled, precise and centred gripping</li> <li>• Long stroke: long guide length for the gripper jaws</li> <li>• By reducing the stroke, the opening stroke can be adjusted to optimise time</li> <li>• Double-acting gripper with two pistons operating in parallel and in opposite directions</li> <li>• Suitable for external and internal gripping</li> </ul>	<ul style="list-style-type: none"> <li>• High-precision gripper jaw guide</li> <li>• Very flexible thanks to versatile attachment, mounting and application options</li> <li>• Can be used as a double- and single-acting gripper</li> <li>• Single-acting variant or with gripping force backup, normally open (NO) or normally closed (NC)</li> <li>• Sustainable thanks to extended life cycle and easier repairs</li> <li>• Suitable for external and internal gripping</li> </ul>	<ul style="list-style-type: none"> <li>• Micro gripper: compact, handy design</li> <li>• Versatile thanks to externally adaptable gripper fingers</li> <li>• Single-acting gripper, optionally with open (NO) or closed (NC) gripper jaws</li> <li>• Mounting options with clamping flange, with flange mounting, with Z-stroke compensation</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Electric version of the standard parallel gripper DHPS</li> <li>• Ideal for use as a front-end actuator thanks to its low dead weight</li> <li>• Controller-free actuation using digital signals</li> <li>• Gripping force (4 settings) adjustable via ratchet switch or via IO-Link® interface</li> <li>• RA1 version with robot connection, enables fast integration in lightweight robot environments</li> </ul>
<b>online:</b> →	<a href="#">hgpl</a>	<a href="#">hgpp</a>	<a href="#">hgpm</a>	<a href="#">ehps</a>

Three-point gripper




Three-point grippers

	 <b>Three-point grippers DHDS</b>	 <b>Three-point grippers HGDD</b>	 <b>Three-point grippers HGDT</b>
<b>Size</b>	16, 32, 50	35, 40, 50, 63, 80	25, 35, 40, 50, 63
<b>Stroke per gripper jaw</b>	2.5 ... 6 mm	4 ... 12 mm	1.5 ... 10 mm
<b>Total gripping force at 0.6 MPa (6 bar, 87 psi), closing</b>	87 ... 750 N	336 ... 2745 N	207 ... 2592 N
<b>Gripping force backup</b>	During closing	During opening, During closing	During opening, During closing
<b>Gripper repetition accuracy</b>	0.04 mm	0.03 mm, 0.05 mm	0.03 mm
<b>Position sensing</b>	Via Hall sensor, Via proximity switch	Via proximity switch	Via proximity switch
<b>Description</b>	<ul style="list-style-type: none"> <li>• Sturdy and precise T-slot guidance of the gripper jaws</li> <li>• High gripping force and compact size</li> <li>• Max. repetition accuracy</li> <li>• Can be used as a double- and single-acting gripper</li> <li>• Single-acting variant or with gripping force backup, normally closed (NC)</li> <li>• Suitable for external and internal gripping</li> <li>• Wide range of adaptation options on the drives</li> <li>• Sustainable thanks to extended life cycle and easier repairs</li> </ul>	<ul style="list-style-type: none"> <li>• Precise gripping with centric movements despite high torque loads</li> <li>• Ideal for very harsh environments</li> <li>• 5 sizes with stroke/jaw of up to 12 mm</li> <li>• Can be used as a double- and single-acting gripper</li> <li>• Single-acting variant or with gripping force backup, normally open (NO) or normally closed (NC)</li> <li>• Suitable for external and internal gripping</li> </ul>	<ul style="list-style-type: none"> <li>• Synchronous movement of the gripper jaws</li> <li>• Gripper jaw guide protected by sealing air against dust</li> <li>• High-force variant available</li> <li>• With T-slot guide</li> <li>• Can be used as a double- and single-acting gripper</li> <li>• Single-acting variant or with gripping force backup, normally open (NO) or normally closed (NC)</li> <li>• Suitable for external and internal gripping</li> </ul>
<b>online:</b> →	<a href="#">dhds</a>	<a href="#">hgdd</a>	<a href="#">hgdt</a>

## Product overview




### Angle gripper

## Angle grippers

	 <b>Angle gripper DHWC</b>	 <b>Angle grippers DHWS</b>	 <b>Angle grippers HGWM</b>
<b>Size</b>	6, 10, 16, 20, 25, 32	10, 16, 25, 32, 40	8, 12
<b>Total gripping torque at 0.6 MPa (6 bar, 87 psi), closing</b>	5.4 ... 578.6 Ncm	30 ... 1362 Ncm	22 ... 64 Ncm
<b>Max. opening angle</b>	30 deg	40 deg	14 ... 18.5 deg
<b>Gripping force backup</b>	During opening, None	During closing	None
<b>Gripper repetition accuracy</b>	0.1 mm	0.04 mm	0.02 mm
<b>Position sensing</b>	Via proximity switch	Via Hall sensor, Via proximity switch	Without
<b>Description</b>	<ul style="list-style-type: none"> <li>• Lateral gripper jaw support for high torque loads</li> <li>• Max. repetition accuracy</li> <li>• Can be used as a double-acting or single-acting gripper</li> <li>• Single-acting variant with gripping force backup, normally open (NO)</li> <li>• Suitable for external and internal gripping</li> <li>• Wide range of adaptation options on the drives</li> <li>• Sustainable in production thanks to reduced use of materials</li> </ul>	<ul style="list-style-type: none"> <li>• Improved gripper jaw guide</li> <li>• Internal fixed flow control, does away with the need for external flow control in 80% of applications</li> <li>• Slotted guide</li> <li>• Max. repetition accuracy</li> <li>• Can be used as a double- and single-acting gripper</li> <li>• Single-acting variant or with gripping force backup, normally closed (NC)</li> <li>• Suitable for external and internal gripping</li> <li>• Wide range of adaptation options on the drives</li> </ul>	<ul style="list-style-type: none"> <li>• Micro gripper: compact, handy design</li> <li>• Versatile thanks to externally adaptable gripper fingers</li> <li>• Single-acting gripper, optionally with open (NO) or closed (NC) gripper jaws</li> <li>• Suitable for external and internal gripping</li> <li>• Mounting options with clamping flange, with flange mounting, with Z-stroke compensation</li> </ul>
<b>online:</b> →	<a href="#">dhwc</a>	<a href="#">dhws</a>	<a href="#">hgwm</a>

Radial gripper

Radial grippers

	 <b>Radial gripper DHRC</b>	 <b>Radial grippers DHRS</b>	 <b>Radial grippers HGRT</b>
<b>Size</b>	6, 10, 16, 20, 25, 32	10, 16, 25, 32, 40	16, 20, 25, 32, 40, 50
<b>Total gripping torque at 0.6 MPa (6 bar, 87 psi), closing</b>	4.8 ... 600.1 Ncm	15 ... 660 Ncm	158 ... 7754 Ncm
<b>Max. opening angle</b>	180 deg	180 deg	180 deg
<b>Gripping force backup</b>	During opening, None	During closing	During closing
<b>Gripper repetition accuracy</b>	0.1 mm	0.1 mm	0.02 mm
<b>Position sensing</b>	Via proximity switch	Via Hall sensor, Via proximity switch	Via proximity switch, Via inductive sensors
<b>Description</b>	<ul style="list-style-type: none"> <li>• Lateral gripper jaw support for high torque loads</li> <li>• Can be used as a double-acting or single-acting gripper</li> <li>• Single-acting variant with gripping force backup, normally open (NO)</li> <li>• Suitable for external and internal gripping</li> <li>• Wide range of adaptation options on the drives</li> <li>• Sustainable in production thanks to reduced use of materials</li> </ul>	<ul style="list-style-type: none"> <li>• Lateral gripper jaw support for high torque loads</li> <li>• Self-centring</li> <li>• Internal fixed flow control</li> <li>• Max. repetition accuracy</li> <li>• Slotted guide</li> <li>• Can be used as a double- and single-acting gripper</li> <li>• Single-acting variant or with gripping force backup, normally closed (NC)</li> <li>• Wide range of adaptation options on the drives</li> </ul>	<ul style="list-style-type: none"> <li>• Sturdy and precise kinematics for very high torque resistance and long service life</li> <li>• Secure gripping thanks to precise, polished plain-bearing guide</li> <li>• Slotted guide</li> <li>• Optimum cycle times thanks to freely adjustable opening angle up to a maximum of 90° per gripper finger. This prevents possible collisions due to the gripper jaws opening too far</li> <li>• Can be used as a double- and single-acting gripper</li> <li>• Single-acting variant or with gripping force backup, normally closed (NC)</li> <li>• Suitable for external and internal gripping</li> <li>• Wide range of adaptation options on the drives</li> </ul>
<b>online:</b> →	<a href="#">dhrc</a>	<a href="#">dhrs</a>	<a href="#">hgrr</a>

Product overview

Swivel/gripper units



**Swivel/gripper units  
HGDS**

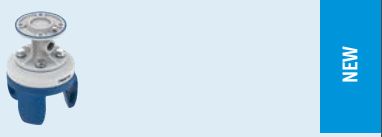




**Rotary gripper modules  
EHMD**



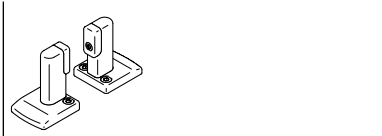
	Swivel/gripper units HGDS	Rotary gripper modules EHMD
<b>Design</b>	Semi-rotary drive, With parallel gripper and gripper drive	Electric rotary drive, Electric gripper, Electric gripper drive, Pneumatic gripper
<b>Size</b>	12, 16, 20	40, 50
<b>Total gripping force at 0.6 MPa (6 bar, 87 psi), closing</b>	74 ... 168 N	
<b>Stroke per gripper jaw</b>	2.5 ... 7 mm	5 ... 15 mm
<b>Swivel angle</b>	210 deg	
<b>Position sensing, gripper</b>	Via proximity switch	
<b>Description</b>	<ul style="list-style-type: none"> <li>• Combination of parallel gripper and swivel module</li> <li>• Swivel angle infinitely adjustable</li> <li>• Precise end stop with elastic cushioning or integrated shock absorber</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electro-mechanical actuators, motors, servo drives and control systems</li> <li>• Ideal for small objects in laboratory automation</li> <li>• Infinite electrical rotation and electrical or pneumatic gripping</li> <li>• Gripping and turning to open and close covers on vials</li> <li>• Optional: mounting with Z-compensation compensates for the thread pitch of covers on vials during opening and closing</li> </ul>
<b>online: →</b>	<a href="#">hgds</a>	<a href="#">ehmd</a>

Bellows gripper

Bellows grippers

	 <b>Soft gripper</b> <b>HPSX</b>	 <b>Adaptive shape gripper</b> <b>DHEF</b>	 <b>Bellows grippers</b> <b>DHEB</b>
<b>Size</b>	40, 70, 100	20	8, 10, 12, 14, 18, 22, 27, 33, 41, 51, 63
<b>Stroke</b>		66 mm	
<b>Bellows stroke</b>			3.5 ... 25 mm
<b>Max. operating frequency of gripper</b>	5 Hz	1 Hz	≤4 Hz
<b>Min. diameter to be gripped</b>	30 ... 80 mm	12 mm	8 ... 66 mm
<b>Max. diameter to be gripped</b>	55 ... 110 mm	38 mm	11 ... 85 mm
<b>Position sensing</b>		Via proximity switch	Via proximity switch, Without
<b>Description</b>	<ul style="list-style-type: none"> <li>• Suitable for direct contact with food according to European Regulation (EC) No. 1935/2004</li> <li>• Soft fingers for gently gripping sensitive objects</li> <li>• Less machine downtime, maintenance and cleaning effort thanks to the clean design and simple installation</li> <li>• Flexible gripper thanks to the different sizes and number of gripper fingers</li> <li>• Collaborative: Suitable for use on cobots and industrial robots thanks to its soft design</li> <li>• Quick and easy to install thanks to ISO-standardised interface ISO50 with defined positioning</li> </ul>	<ul style="list-style-type: none"> <li>• Gripping of parts with undefined positions and shapes</li> <li>• Form-fitting gripping of products with different geometries</li> <li>• Form-fitting gripping with suction cup effect</li> <li>• Gentle gripping of delicate products of varying sizes</li> <li>• RA1 version with robot connection, enables fast integration in lightweight robot environments</li> <li>• Sustainable thanks to extended life cycle and easier repairs</li> </ul>	<ul style="list-style-type: none"> <li>• 11 sizes for gripping diameter from 8 to 85 mm</li> <li>• Direction of movement: bellows upwards or downwards</li> <li>• Different bellows materials: EPDM or silicone</li> <li>• Air connection on the side or from above</li> <li>• Optimised process sequence with increased quality: prevents the workpieces from being scratched</li> <li>• Additional reliability: optional sensing via proximity or position sensor</li> <li>• For gentle internal gripping of delicate workpieces</li> </ul>
<b>online:</b> →	<a href="#">hpsx</a>	<a href="#">dhef</a>	<a href="#">dheb</a>

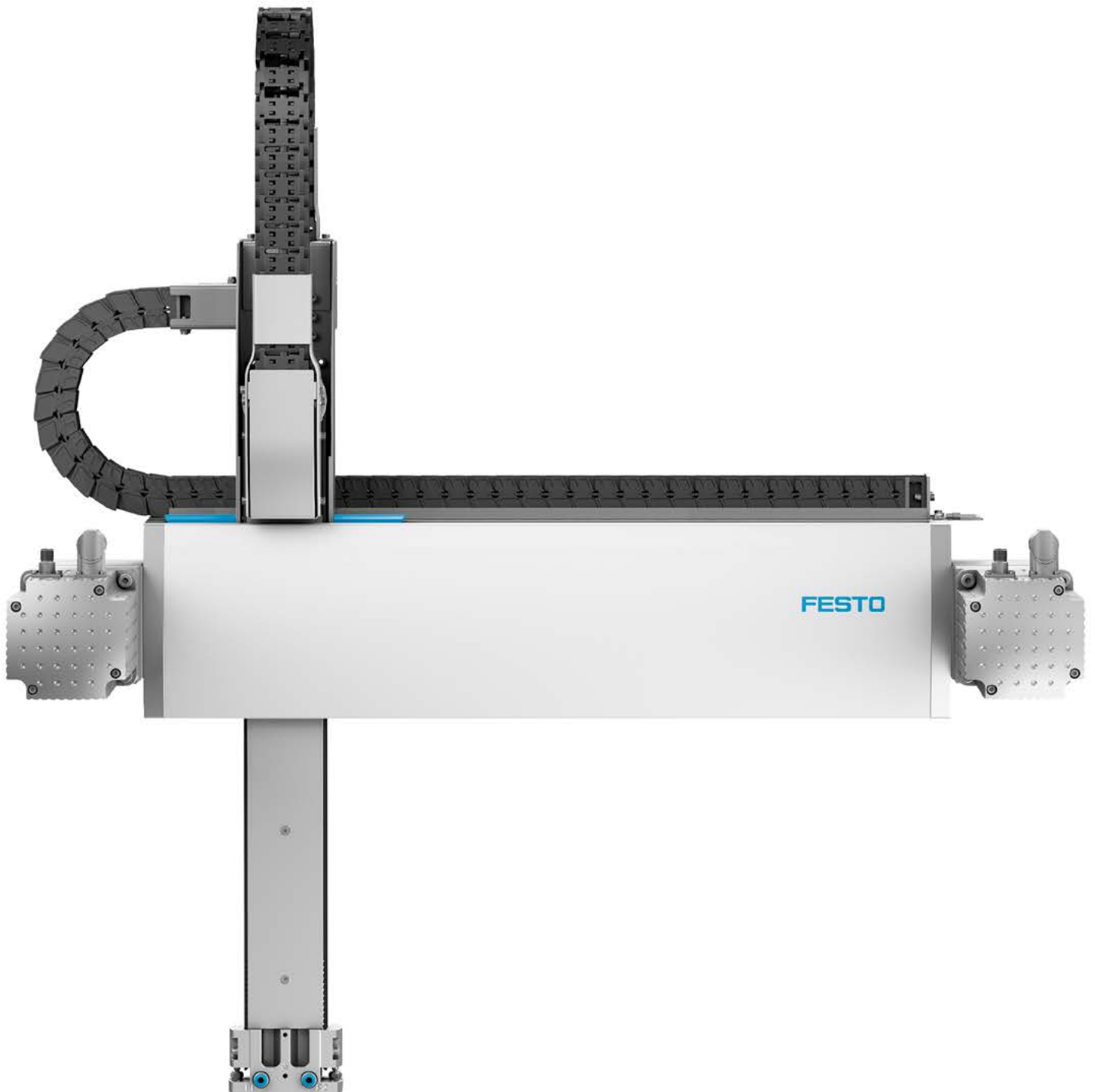
Accessories for grippers

	 <b>Adaptive gripper fingers</b> <b>DHAS-GF</b>	 <b>Gripper jaw</b> <b>DHAS-GG</b>	 <b>Gripper fingers</b> <b>HAFH</b>
<b>Size</b>	60, 80, 120	16 mm	16
<b>Description</b>	<ul style="list-style-type: none"> <li>• Self-adapting to different workpiece shapes</li> <li>• Adaptive gripper fingers for gentle and flexible gripping using the Fin Ray Effect® modelled on a fish's tail fin</li> <li>• For workpiece diameters from 6 to 120 mm</li> </ul>	<ul style="list-style-type: none"> <li>• Process-reliable gripping formicrowell plates in the life sciences sector</li> <li>• Easy assembly</li> </ul>	<ul style="list-style-type: none"> <li>• Suitable for human-robot collaboration to ISO 15066</li> <li>• Easy to replace the gripper finger pads in the event of wear</li> <li>• Can be mounted on pneumatic gripper/valve combination HPPH</li> </ul>
<b>online:</b> →	<a href="#">dhas</a>	<a href="#">dhas</a>	<a href="#">hafh</a>

## Product overview



06

Gripper





Product overview

Pneumatic handling systems




	 <b>Handling modules HSP</b>	 <b>Handling modules, pneumatic HSW-AP, HSW-AS</b>
<b>Size</b>	12, 16, 25	10, 12, 16
<b>Y-stroke</b>	52 ... 170 mm	
<b>Z-stroke</b>	20 ... 70 mm	80 ... 100 mm
<b>Repetition accuracy</b>	+/-0.01 mm, +/-0.02 mm	
<b>Min. cycle time</b>	0.6 ... 1 s	0.6 ... 1 s
<b>Theoretical force at 0.6 MPa (6 bar, 87 psi)</b>	40 ... 65 N	30 ... 55 N
<b>Description</b>	<ul style="list-style-type: none"> <li>• Function module for automatically repositioning, feeding and removing small parts in extremely confined spaces</li> <li>• Guided vertical and horizontal motion sequence</li> <li>• High precision and rigidity</li> <li>• Compact design</li> <li>• Extremely short cycle times</li> <li>• Cost-optimised</li> <li>• Stroke adjustment along Y- and Z-axes</li> </ul>	<ul style="list-style-type: none"> <li>• Function module for automatically repositioning, feeding and removing small parts in extremely confined spaces</li> <li>• Guided swivel and linear motion</li> <li>• High precision and rigidity</li> <li>• HSW-AP: pneumatic, with swivel module DSM; HSW-AS: without drive, with drive shaft</li> <li>• Fast and compact</li> <li>• Low cost and ideal for universal use</li> </ul>
<b>online:</b> →	<a href="#">hsp</a>	<a href="#">hsw</a>

## Software tools

<b>Configurator</b>		<p>Design a product with numerous features reliably and quickly with the help of the configurator.</p> <p>Select all the required product features step-by-step. The use of logic checks ensures that only correct configurations are available for selection.</p> <p>You will find the configurator for the required product</p> <ul style="list-style-type: none"> <li>• at <a href="http://www.festo.com/catalogue/handling">www.festo.com/catalogue/handling</a></li> <li>• Select the product you want</li> <li>• Click on the blue „Configure product“ button</li> </ul>
<b>Handling Guide Online</b>		<p>Planning and designing complex handling systems, e.g. for pick &amp; place applications, generally takes a lot of time.</p> <p>With the innovative Handling Guide Online (HGO) you can design a tailor-made system in just a few steps. Simply enter your application data such as the load mass, travel path and cycle time.</p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>• 1D- ... 3D kinematics</li> <li>• Customised system solutions within just a few minutes</li> <li>• CAD model available immediately</li> <li>• Fully automatic selection of all relevant components</li> <li>• Fully automatic processing including ordering function</li> <li>• Fully assembled or unassembled systems</li> </ul> <p>You will find this tool at  → <a href="http://www.festo.com/x/handling-guide-online">www.festo.com/x/handling-guide-online</a></p>

## Cartesian robots &gt;




## Linear gantries

	 <b>Linear gantry, highly dynamic YXML</b>	 <b>Two-dimensional linear gantries YXCL</b>	 <b>Linear gantries EXCT</b>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Parallel kinematic drive concept for maximum dynamic response</li> <li>• Ready-to-install complete system including energy chain for cables or tubing as well as suitable motor and servo drive package</li> <li>• Flexible working area due to scalable strokes in the Y and Z directions</li> <li>• Based on linear gantry EXCT</li> <li>• Maximum dynamic response and efficient operation up to mx. 95 picks/min.</li> <li>• For rapid processes with high cycle rates like pick &amp; place, feeding parts, stacking, packaging tasks</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Ready-to-install complete system including energy chain for cables or tubing as well as suitable motor and servo drive package</li> <li>• For two-dimensional movements in vertical working areas</li> <li>• Flexible working area due to scalable strokes in the Y and Z directions</li> <li>• Serial kinematic drive concept based on toothed belt and spindle axes</li> <li>• Choice of vertical axis – pneumatic or electric</li> <li>• High mechanical rigidity and sturdy design</li> <li>• Ideal for long gantry strokes and heavy loads</li> </ul>	<ul style="list-style-type: none"> <li>• Axis mechanism based on parallel kinematic operational principle</li> <li>• Very high dynamic response enables extremely short cycle times</li> <li>• For two-dimensional movements in vertical working areas</li> <li>• Flat system design and low moving dead weight</li> <li>• The motor can be flexibly mounted on 4 sides</li> </ul>
<b>online:</b> →	<a href="#">yxml</a>	<a href="#">yxcl</a>	<a href="#">exct</a>

## Product overview



### Cartesian robots >

## Planar surface gantries

	 <p><b>Planar surface gantry, compact</b> YXMF</p>	 <p><b>Planar surface gantry, highly dynamic</b> YXMF</p>	 <p><b>Two-dimensional planar surface gantries</b> YXCF</p>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Parallel kinematic drive concept with minimal space requirements</li> <li>• Ready-to-install complete system including energy chain, suitable motors and dual servo drive</li> <li>• For two-dimensional movements in horizontal working areas</li> <li>• Flexible working area due to scalable strokes in the X and Y directions</li> <li>• Based on the planar surface gantry EXCM</li> <li>• For extremely small working areas</li> <li>• For desktop applications in small parts assembly, electronics manufacturing and laboratory processes</li> </ul>	<ul style="list-style-type: none"> <li>• Parallel kinematic drive concept for maximum dynamic response</li> <li>• Ready-to-install complete system, including energy chain and suitable motor and servo drive package</li> <li>• For two-dimensional movements in horizontal working areas</li> <li>• Flexible working area due to scalable strokes in the X and Y directions</li> <li>• Based on the planar surface gantry EXCH</li> <li>• Maximum dynamic response and efficient operation up to max. 100 picks/min.</li> <li>• For rapid processes with high cycle rates like pick &amp; place, feeding parts, stacking, packaging tasks</li> <li>• Cost-saving alternative to two Scara robots due to large working area and high dynamic response</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Ready-to-install complete system including energy chain for cables or tubing as well as suitable motor and servo drive package</li> <li>• For two-dimensional movements in horizontal working areas</li> <li>• Serial kinematic drive concept based on toothed belt and spindle axes</li> <li>• Flexible working area due to scalable strokes in the X and Y directions</li> <li>• Particularly suitable for very long strokes and heavy payloads</li> </ul>
<b>online:</b> →	<a href="#">yxmf</a>	<a href="#">yxmf</a>	<a href="#">yxcf</a>


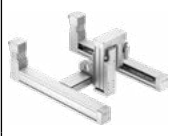


### Cartesian robots >

## Planar surface gantries

	 <p><b>Two-dimensional planar surface gantries</b> EXCM</p>	 <p><b>Two-dimensional planar surface gantries</b> EXCH</p>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electro-mechanical actuators, motors, servo drives and control systems</li> <li>• Axis mechanism based on parallel kinematic operational principle</li> <li>• Excellent functionality in small installation spaces</li> <li>• Low moving dead weight and flat system design</li> <li>• Ideal in combination with stepper motors</li> <li>• With recirculating ball bearing guide</li> <li>• Sustainable operation due to weight-optimised axes</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electro-mechanical actuators, motors, servo drives and control systems</li> <li>• Axis mechanism based on parallel kinematic operational principle</li> <li>• Optimal dynamic response when compared with other Cartesian gantry systems</li> <li>• Drive concept with low moving dead weight and large workspace</li> <li>• High accelerations in both axis directions in combination with servo motors</li> <li>• Sustainable operation due to weight-optimised axes</li> <li>• The motor can be flexibly mounted on 2 sides</li> </ul>
<b>online:</b> →	<a href="#">excm</a>	<a href="#">exch</a>


Cartesian robots >

### Three-dimensional gantries

	 <b>Three-dimensional gantries EXCL</b>	 <b>Three-dimensional gantry, compact YXMR</b>	 <b>Three-dimensional gantry, highly dynamic YXMR</b>	 <b>Three-dimensional gantries YXCR</b>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Multi-axis gantry with small footprint</li> <li>• With one or 2 Z-axes (or as a planar surface gantry X/Y without Z-axes)</li> <li>• X, Y workspace configurable in 1 mm increments up to 1000 mm x 700 mm</li> <li>• Z-axis stroke can be selected between 50, 100, 150 and 200 mm</li> <li>• Optional 6-axis motion controller, programmable via G-code</li> <li>• Stepper motors, reference switches and cables always included</li> </ul>	<ul style="list-style-type: none"> <li>• Parallel kinematic drive concept with minimal space requirements</li> <li>• Ready-to-install complete system including energy chain, suitable motors and dual servo drive</li> <li>• For three-dimensional movements in horizontal working areas</li> <li>• Flexible working area due to scalable strokes in the X and Y directions</li> <li>• Based on the planar surface gantry EXCM</li> <li>• Choice of vertical axis – pneumatic or electric</li> <li>• For extremely small working areas</li> <li>• For desktop applications in small parts assembly, electronics manufacturing and laboratory processes</li> </ul>	<ul style="list-style-type: none"> <li>• Parallel kinematic drive concept for maximum dynamic response</li> <li>• Ready-to-install complete system, including energy chain and suitable motor and servo drive package</li> <li>• For three-dimensional movements in horizontal working areas</li> <li>• Flexible working area due to scalable strokes in the X and Z directions</li> <li>• Based on the planar surface gantry EXCH</li> <li>• Maximum dynamic response and efficient operation up to max. 100 picks/min.</li> <li>• Choice of vertical axis – pneumatic or electric</li> <li>• For rapid processes and high cycle rates e.g. assembling, packaging and sorting</li> </ul>	<ul style="list-style-type: none"> <li>• Ready-to-install complete system including energy chain for cables or tubing as well as suitable motor and servo drive package</li> <li>• For three-dimensional movements in horizontal working areas</li> <li>• Flexible working area due to scalable strokes in the X, Y and Z directions</li> <li>• Serial kinematic drive concept based on toothed belt and spindle axes</li> <li>• Choice of vertical axis – pneumatic or electric</li> <li>• High mechanical rigidity and sturdy design</li> <li>• For universal use</li> <li>• Especially suitable for long strokes in all directions</li> </ul>
<b>online:</b> →	<a href="#">excl</a>	<a href="#">yxmr</a>	<a href="#">yxmr</a>	<a href="#">yxcr</a>

Cartesian robots >



### 3D cantilever systems

	 <b>Cantilever system YXCA</b>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Extremely space-saving 3D system with attractive price-performance ratio</li> <li>• Self-supporting Y-axis enables freely accessible working area with few interfering contours</li> <li>• Pneumatic and electric components can be freely combined</li> <li>• For horizontal installation position</li> <li>• For simple assembly tasks and small parts handling in the electronics industry</li> <li>• Ideal for use in line assembly processes or desktop applications</li> </ul>
<b>online:</b> →	<a href="#">yxca</a>


## Product overview

### Dosing and pipetting heads

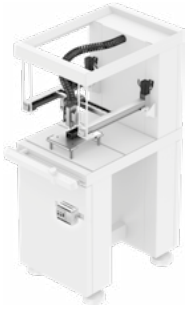
#### Dispense heads

	 <b>Dispense heads</b> <b>VTOE</b>	 <b>Dispense heads</b> <b>VTOI</b>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Basic function: dosing</li> <li>• Ready-to-install dosing solution saves time and costs</li> <li>• Compact 9 mm grid dimension</li> <li>• Suitable for sensitive and aggressive liquids</li> <li>• Ideally suited to non-contact dispensing of liquid media</li> <li>• Maximum dosing precision down to the microlitre range</li> <li>• Small internal volume makes it easy to rinse</li> <li>• 1- or 8-channel dispense head</li> <li>• Typical coefficient variation (CV): &lt; 1% at 10 to 1000 µl</li> </ul>	<ul style="list-style-type: none"> <li>• One valve controller for distributing to 8 dispensing channels</li> <li>• Grid dimension 9 mm – ideal for microwell plates</li> <li>• Simple design with side-by-side mounting for increased throughput</li> <li>• Only a few components are needed to form a complete system</li> <li>• Suitable for aggressive liquids</li> </ul>
<b>online:</b> →	<a href="#">vtoe</a>	<a href="#">vtoi</a>

#### Control cabinets

	 <b>Control systems</b> <b>CMCB</b>
<b>Design</b>	Mounting plate, Control cabinet, Built-in safety relay unit
<b>Electrical connection</b>	Spring-loaded terminal, Push-in
<b>Mains frequency</b>	50 ... 60 Hz
<b>Performance level (PL)</b>	Category B, Performance Level b, Category 3, Performance Level d
<b>Description</b>	<ul style="list-style-type: none"> <li>• Ready-to-install control system</li> <li>• Available on a mounting plate with or without control cabinet housing</li> <li>• Variants with safety functions</li> <li>• Adapted for balancer kit YHBP</li> <li>• With connecting cables for balancer kit YHBP connected</li> </ul>
<b>online:</b> →	<a href="#">cmcb</a>

## Customised components – for your specific requirements



### Compact handling system for desktop applications

- Modular system kit comprising operating software and planar surface gantry EXCM-30
- Quick and easy programming and commissioning using the predefined function elements from the Positioning Desktop Lib
- One basic platform for a wide range of applications (screwing in, dispensing, testing, soldering, gripping, machine vision and much more)
- Predefined function elements from the software library make for easy programming and commissioning
- Easy integration, even in the most compact of installation spaces
- Fit for Industry 4.0 thanks to the OPC UA interface at the controller

Many additional variants are possible.

Ask your Festo sales engineer, who will be happy to help you:


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

## Product overview







Product overview




Software tools

<b>Vacuum design</b>		<p>Which suction cup is used for which surface and which movement? Don't experiment – calculate!</p> <p>The vacuum selection program helps you select the right suction cups, tubing and venturi nozzles. It also calculates the distribution of the forces acting on the individual suction cups, as well as the evacuation time.</p> <p>This software tool even enables a distinction to be made between linear and rotary movements.</p> <p style="text-align: right;">This tool can be found at  <a href="http://www.festo.com/x/vacuum-sizing">➔ www.festo.com/x/vacuum-sizing</a></p>
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Vacuum generators

	 <b>Vacuum generator OVEH</b>	 <b>Vacuum generators OVTL</b>	 <b>Vacuum generators OVEL</b>	 <b>Vacuum generators OVEM</b>
<b>Nominal width of Laval nozzle</b>	0.7 ... 0.95 mm	0.45 ... 0.95 mm	0.45 ... 0.95 mm	0.45 ... 3 mm
<b>Ejector characteristics</b>	High suction rate, High vacuum, Standard	High suction rate, High vacuum, Standard	High suction rate, High vacuum, Standard	High suction rate, High vacuum, Standard
<b>Integrated function</b>	Electric ejector pulse, Pressure sensor, Electric on-off valve, Filter, Silencer closed	Electric ejector pulse, Flow control, Pressure sensor, Pressure transmitter, Electric on-off valve, Filter, Open silencer	Electric ejector pulse, Flow control, Pressure sensor, Pressure transmitter, Electric on-off valve, Filter, Open silencer, Silencer closed	Electric ejector pulse valve, Flow control, Electric on-off valve, Filter, Air saving function, electrical, Check valve, Open silencer, Vacuum switch
<b>Max. suction rate with respect to atmosphere</b>	15 ... 30 l/min	4 ... 45 l/min	4 ... 21 l/min	6 ... 348 l/min
<b>Description</b>	<ul style="list-style-type: none"> <li>• Compact vacuum generator/valve combination with integrated sensors</li> <li>• Can be used with many different cobots and robots thanks to the mechanical robot interface to ISO 9409-1-50-4-M6</li> <li>• Vacuum level monitoring with integrated pressure sensor SPAE</li> <li>• Versatile control via digital I/O (PNP/NPN) or IO-Link®</li> <li>• Valve-controlled ejector impulse for secure handling</li> <li>• For applications with either high vacuum or high suction volume flow</li> <li>• Adapter plate for different applications</li> <li>• For safe human-robot collaboration</li> </ul>	<ul style="list-style-type: none"> <li>• Module consisting of vacuum generator OVEL, manifold rail and accessories</li> <li>• Select, size and order quickly, easily and reliably with the configurator</li> <li>• Supplied fully assembled</li> </ul>	<ul style="list-style-type: none"> <li>• Low-cost, compact vacuum generator</li> <li>• Light weight</li> <li>• Various performance levels and vacuum types</li> <li>• Short switching times thanks to integrated solenoid valves</li> <li>• Quick, precise and safe placement of the workpiece via the ejector pulse</li> <li>• Easy assembly</li> <li>• Minimal installation costs</li> <li>• Sustainable operation thanks to reduced pressure level</li> <li>• RA1 version with robot connection, enables fast integration in lightweight robot environments</li> </ul>	<ul style="list-style-type: none"> <li>• Compact design</li> <li>• Monitoring with vacuum sensor with IO-Link®</li> <li>• Central electrical connection via an M12 plug</li> <li>• Maintenance-free operation and reduced noise level through an integrated, open silencer</li> <li>• Integrated filter with inspection window</li> <li>• Optionally with air-saving function and LCD display</li> <li>• Short switching times thanks to integrated solenoid valves</li> <li>• Adjustable ejector pulse: precise and safe depositing of the workpiece</li> <li>• Sustainable operation with air-saving circuit</li> </ul>
<b>online:</b> ➔	<a href="#">oveh</a>	<a href="#">ovtl</a>	<a href="#">ovel</a>	<a href="#">ovem</a>

## Vacuum generators





	 <b>Vacuum generator OVPN</b>	 <b>Vacuum generators, pneumatic VN</b>	 <b>Vacuum generators, electropneumatic VN</b>
<b>Nominal width of Laval nozzle</b>	1.4 ... 2.6 mm	0.45 ... 3 mm	0.45 ... 3 mm
<b>Ejector characteristics</b>	High suction rate	High suction rate, High vacuum, Standard, Inline, High negative pressure, High suction volume	Standard, High negative pressure, High suction volume
<b>Integrated function</b>	Open silencer	Ejector pulse valve, pneumatic, Pressure sensor, Open silencer	Ejector pulse valve, pneumatic, Electric on-off valve, Open silencer
<b>Max. suction rate with respect to atmosphere</b>	160 ... 960 l/min	6.1 ... 339 l/min	7.2 ... 186 l/min
<b>Description</b>	<ul style="list-style-type: none"> <li>• Vacuum generator with very high suction capacity ideal for porous materials</li> <li>• Nozzle technology with maximum energy efficiency</li> <li>• High initial suction rate</li> <li>• Reduced sound pressure level thanks to an integrated, open silencer</li> <li>• Can be used flexibly for centralised or decentralised vacuum generation</li> <li>• Very lightweight</li> <li>• Sustainable operation thanks to optimised air consumption</li> </ul>	<ul style="list-style-type: none"> <li>• Can be used directly in the work space</li> <li>• Available as straight type (in-line: vacuum port in line with the supply port) or T-shape (standard: vacuum port at 90° to the supply port)</li> <li>• Compact and cost-effective</li> <li>• Maintenance-free operation and reduced noise level through an integrated, open silencer</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> </ul>	<ul style="list-style-type: none"> <li>• Can be used directly in the work space</li> <li>• Low cost</li> <li>• Maintenance-free operation and reduced noise level through an integrated, open silencer</li> <li>• With solenoid valve vacuum on/off</li> </ul>
<b>online:</b> →	<a href="#">ovpn</a>	<a href="#">vn</a>	<a href="#">vn</a>

## Vacuum generators




	 <b>Vacuum generators for valve terminals CPV CPV10-M1H, CPV14-M1H, CPV18-M1H</b>	 <b>Vacuum generator cartridges VN</b>
<b>Nominal width of Laval nozzle</b>	0.7 ... 1.4 mm	0.45 ... 2 mm
<b>Ejector characteristics</b>	High vacuum	Standard, High negative pressure, High suction volume
<b>Integrated function</b>		
<b>Max. suction rate with respect to atmosphere</b>		7.2 ... 184.4 l/min
<b>Description</b>	<ul style="list-style-type: none"> <li>• Combinations of switching valves with vacuum generators are possible on a valve terminal</li> <li>• With solenoid valve vacuum on/off</li> <li>• Available with ejector pulse</li> </ul>	<ul style="list-style-type: none"> <li>• For fitting into customised housing for decentralised vacuum generation</li> </ul>
<b>online:</b> →	<a href="#">cpv10-m1h</a>	<a href="#">vn</a>

## Product overview

### Suction cup with connection


	 <b>Suction cup OGVM</b>	 <b>Bernoulli grippers OGGB</b>	 <b>Suction grippers ESG</b>	 <b>Suction cups ESS</b>
<b>Suction cup size</b>	16x55 mm, 20x60 mm, 20x65 mm, 30x65 mm, 30x80 mm, 30x95 mm, 40x85 mm, 40x90 mm, 50x105 mm, 55x115 mm, 60x125 mm, 70x145 mm, 20x60 mm		4x20 mm, 6x10 mm, 6x20 mm, 8x20 mm, 8x30 mm, 4x10 mm, 10x30 mm, 15x45 mm, 20x60 mm, 25x75 mm, 30x90 mm	4x20 mm, 6x10 mm, 6x20 mm, 8x20 mm, 8x30 mm, 4x10 mm, 10x30 mm, 15x45 mm, 20x60 mm, 25x75 mm, 30x90 mm
<b>Gripper diameter</b>		60 ... 140 mm		
<b>Suction cup diameter</b>	20 ... 125 mm		2 ... 200 mm	2 ... 200 mm
<b>Holding force at nominal operating pressure</b>	15 ... 630 N	6 ... 10 N		0.1 ... 1610 N
<b>Design</b>			Vacuum port on top, Vacuum port on side, With height compensator, With long height compensator	Round, bell-shaped
<b>Information on suction cup materials</b>	NBR		BR, FPM, NBR, PUR, VMQ (silicone), Vulkollan	FPM, NBR, PUR, VMQ (silicone), Vulkollan
<b>Spacer material</b>		NBR, POM		
<b>Description</b>	<ul style="list-style-type: none"> <li>Extremely energy efficient, very high transverse forces, minimal suction times</li> <li>Optimum suction ergonomics for maximum process reliability</li> <li>Ideal for workpieces with complex contours</li> <li>Accessories available for a wide range of applications</li> <li>Suction cup shape round or oval, in various designs</li> </ul>	<ul style="list-style-type: none"> <li>Ideally suited to transporting thin, extremely delicate and brittle workpieces</li> <li>Minimised workpiece contact, gentle workpiece handling</li> <li>Low energy costs thanks to minimised air consumption</li> <li>The ideal solution for low-contact gripping and for gripping pliable, porous and brittle workpieces</li> </ul>	<ul style="list-style-type: none"> <li>Modular system of suction cup holders and suction cups with over 2000 variants</li> <li>Optionally with angle compensator, height compensator, filter</li> <li>Suction cup shape round or oval, in various designs</li> <li>6 suction cup designs</li> <li>15 suction cup diameters</li> <li>Suction cup volume: 0.002 ... 245 cm<sup>3</sup></li> <li>Min. workpiece radius: 10 ... 680 mm</li> <li>Vacuum connection: push-in connector or barbed fitting for plastic tubing, threaded connection</li> </ul>	<ul style="list-style-type: none"> <li>Suction cup consisting of the suction cup itself, plus the support plate with mounting</li> <li>Suction cup volume: 0.002 ... 245 cm<sup>3</sup></li> <li>Min. workpiece radius: 10 ... 680 mm</li> <li>Mounting for suction cup holder: female thread, male thread, push-in connector</li> <li>Suction cup with mounting thread</li> </ul>
<b>online:</b> →	<a href="#">ogvm</a>	<a href="#">oggb</a>	<a href="#">esg</a>	<a href="#">ess</a>

## Suction cup with connection

	 <b>Suction cups ESV</b>	 <b>Suction cups VAS, VASB</b>	 <b>Suction cup with connection OGVN</b>
<b>Suction cup size</b>			
<b>Gripper diameter</b>			
<b>Suction cup diameter</b>	20 ... 200 mm	2 ... 125 mm	20 ... 75 mm
<b>Holding force at nominal operating pressure</b>	8.2 ... 1610 N	0.14 ... 700 N	14.5 ... 173 N
<b>Design</b>	Bellows, Round, bell-shaped		
<b>Information on suction cup materials</b>	FPM, NBR, PUR, VMQ (silicone), Vulkollan	NBR, PUR, TPE-U(PU), VMQ (silicone)	PUR
<b>Spacer material</b>			
<b>Description</b>	<ul style="list-style-type: none"> <li>• Wearing part for suction cup</li> <li>• Easily interchangeable</li> <li>• Suction cup volume: 0.318 ... 245 cm<sup>3</sup></li> <li>• Min. workpiece radius: 10 ... 680 mm</li> </ul>	<ul style="list-style-type: none"> <li>• Sturdy and reliable</li> <li>• Suction cups with fixed connecting thread</li> <li>• 11 suction cup diameters</li> <li>• Round suction cup, bellows</li> <li>• Vacuum connection on top, on side</li> <li>• Screw-in thread</li> <li>• Variants suitable for battery production according to F1A</li> </ul>	<ul style="list-style-type: none"> <li>• Ideal for workpieces with uneven surfaces</li> <li>• Easy to replace the suction cup material without the need for tools</li> <li>• Made from wear-resistant polyurethane</li> <li>• Easy to mount, even when the installation space is limited, thanks to hex socket</li> <li>• Recommended for production plants for the manufacture of Li-ion batteries (F1A)</li> </ul>
<b>online:</b> →	<a href="#">esv</a>	<a href="#">vas</a>	<a href="#">ogvn</a>

### Accessories for vacuum >





## Assembly and connecting components

	 <b>Suction cup holders ESH</b>
<b>Design</b>	Vacuum port on top, Vacuum port on side, With height compensator
<b>Description</b>	<ul style="list-style-type: none"> <li>• With or without height compensator</li> <li>• 6 holder sizes</li> <li>• 8 holder types</li> <li>• 3 different types of vacuum connections: push-in connection, barbed fitting, threaded connection</li> </ul>
<b>online:</b> →	<a href="#">esh</a>

## Product overview





### Accessories for vacuum >

## Vacuum-specific accessories

	 <b>Inline filter</b> <b>Oafa</b>	 <b>Length compensator</b> <b>Val</b>	 <b>Angle compensators</b> <b>Eswa</b>	 <b>Vacuum gauges</b> <b>Vam, Fvam</b>
<b>Vacuum connection</b>		Female thread G1/8, Female thread G1/4, Female thread G3/8, Female thread M5		
<b>Pneumatic connection</b>	For tubing O.D. 4 mm, For tubing O.D. 6 mm, For tubing O.D. 8 mm		M10, M4, M6	G1/4, G1/8, R1/4, R1/8
<b>Type of mounting</b>	In-line installation	With male thread M16x1, With male thread M22x1.5, With male thread M25x1.5, With male thread M26x1.5	Via male thread	Front panel mounting, Screw-in
<b>Grade of filtration</b>	10 µm, 40 µm			
<b>Description</b>	<ul style="list-style-type: none"> <li>• Inline filters for overpressure and vacuum applications</li> <li>• For tubing connections in various sizes</li> <li>• Grade of filtration: optionally 10 or 40 µm</li> <li>• Transparent housing to determine the contamination level</li> <li>• Replaceable filter element</li> <li>• Recommended for production plants for the manufacture of Li-ion batteries (F1A)</li> <li>• Optional: Mounting component OAMM</li> </ul>	<ul style="list-style-type: none"> <li>• For suction cup VAS/VASB</li> <li>• Vacuum port M5, G1/8, G1/4</li> <li>• To compensate for a possible excess stroke of the handling device</li> <li>• To compensate for tolerance differences in the workpiece thickness</li> <li>• Variants suitable for battery production according to F1A</li> </ul>	<ul style="list-style-type: none"> <li>• For suction gripper ESG</li> <li>• Vacuum port M4x0.7, M6x1, M10x1.5</li> <li>• For mounting between suction cup holder and suction cup</li> </ul>	<ul style="list-style-type: none"> <li>• Designs based on DIN EN 837-1, available with red-green range</li> <li>• Pneumatic connection via R or G thread</li> <li>• Double or single scale</li> <li>• Display units bar, in Hg, psi</li> </ul>
<b>online:</b> →	<a href="#">oafa</a>	<a href="#">val</a>	<a href="#">eswa</a>	<a href="#">vam</a>

Accessories for vacuum >

Vacuum-specific accessories

	 <b>Vacuum filters</b> ESF, VAF, OAFF	 <b>Vacuum security valves</b> ISV	 <b>Silencers</b> UO	 <b>Silencers</b> UOM, UOMS
<b>Vacuum connection</b>	M4, M6, G1/4, G3/8, G1/2			
<b>Pneumatic connection</b>	G1/2, G1/4, G3/8, M4, M6, PK-3 Via union nut, PK-4 Via union nut, PK-6 Via union nut		G1/4, G1/8, M5, M7	G1/4, G3/8
<b>Type of mounting</b>	In-line installation, Push-on, Snapping in, Via male thread, Via wall/surface bracket, Via vacuum port	Screw-in		Snapping in, Screw-in
<b>Grade of filtration</b>	10 µm, 40 µm, 50 µm, 80 µm			
<b>Description</b>	<ul style="list-style-type: none"> <li>• Vacuum filter ESF: for suction gripper ESG</li> <li>• Vacuum filter VAF: with transparent housing or bowl to allow users to assess contamination level</li> <li>• Vacuum filter OAFF: for vacuum generators OVEL</li> </ul>	<ul style="list-style-type: none"> <li>• For maintaining the vacuum when using multiple suction cups and one fails</li> <li>• Gripping of randomly placed products</li> <li>• Saves compressed air and energy</li> <li>• Variants suitable for battery production according to F1A</li> </ul>	<ul style="list-style-type: none"> <li>• Special open minimal resistance silencer</li> <li>• For vacuum generators</li> <li>• Facilitates trouble-free operation of the vacuum generator</li> <li>• Operating medium compressed air</li> </ul>	<ul style="list-style-type: none"> <li>• Special open minimal resistance silencer</li> <li>• For vacuum generators</li> <li>• Facilitates trouble-free operation of the vacuum generator</li> <li>• Silencer extension for extending the silencer for further noise reduction</li> <li>• Operating medium compressed air</li> </ul>
<b>online:</b> →	<a href="#">vaf</a>	<a href="#">isv</a>	<a href="#">uo</a>	<a href="#">uom</a>

## Product overview



## Product overview

## Software tools

### Pneumatic sizing







Size pneumatic control loop systems quickly and energy-efficiently. In order to survive in a tough competitive environment, many companies are looking for ways to make savings in their production.

Such savings can often be made in their existing compressed air systems, which have generally been in use for years. By optimising the compressed air supply at both plant and system level, up to 60% of energy costs can be saved.

This tool can be found at  
→ [www.festo.com/x/pneumatic-sizing](http://www.festo.com/x/pneumatic-sizing)

Electrically and pneumatically actuated directional control valves >





Standards-based directional control valves

	 <b>Solenoid valves VSNC</b>	 <b>Solenoid valves VSNC-G1/8</b>	 <b>Standards-based valves with central plug VSVA-R5, VSVA-R2</b>	 <b>Standards-based valves with individual plug VSVA-C1, VSVA-P1</b>
<b>Actuation type</b>	Electric	Electric	Electric	Electric
<b>Pneumatic connection 1</b>	1/4 NPT, G1/4, QS-1/4, QS-10, QS-3/8, QS-5/16, QS-6, QS-8	G1/8	Sub-base Size 1 ISO 5599-1, Size 2 ISO 5599-1	Sub-base Size 1 ISO 5599-1, Size 18 mm ISO 15407-1, Size 26 mm ISO 15407-1
<b>Operating pressure [MPa]</b>	0.15 ... 1 MPa	0.25 ... 0.8 MPa	-0.09 ... 1.6 MPa	-0.09 ... 1.6 MPa
<b>Operating pressure</b>	1.5 ... 10 bar	2.5 ... 8 bar	-0.9 ... 16 bar	-0.9 ... 16 bar
<b>Standard nominal flow rate</b>	800 ... 1350 l/min	400 l/min	400 ... 2800 l/min	400 ... 1400 l/min
<b>Valve function</b>	5/2 bistable, 5/2-way or 3/2-way, convertible, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed	3/2-way, closed, monostable, 5/2-way, monostable, Connections swapped	2x2/2-way, monostable, closed, 2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 5/2 bistable, 5/2-way, bistable, dominant, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed	2x2/2-way, monostable, closed, 2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 5/2 bistable, 5/2-way, bistable, dominant, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed
<b>Electrical connection</b>	3-pin, Type A, Type B, Cable connector M20x1.5, M12x1, A-coded to EN 61076-2-101, Plugs, To EN 175301-803, To industry standard (11 mm)	Type C	3-pin, 4-pin, Central plug, Round design, M8x1, M12x1	Type B, Type C, With protective earth conductor, To DIN EN 175301-803, To EN 175301-803, To industry standard (11 mm), Without protective earth conductor
<b>Description</b>	<ul style="list-style-type: none"> <li>Namur connection pattern to VDI/VDE 3845</li> <li>Rotatable seal for 3/2- or 5/2-way valve</li> <li>Wide choice of EX solenoid systems</li> <li>Sturdy and powerful</li> <li>Extended temperature range</li> <li>Excellent value for money</li> <li>All solenoid coils can be used on an armature tube</li> <li>The VSNC-...FN variant achieves greater energy efficiency with reduced power consumption</li> </ul>	<ul style="list-style-type: none"> <li>Namur connection pattern to VDI/VDE 3845</li> <li>Compact, cost-effective, powerful</li> <li>Especially suitable for rotary actuators DAPS and DFPD with connection pattern according to VDI/VDE 3845</li> <li>Extended temperature range</li> <li>Electrical connection with plug pattern type form C, according to EN 175301-803</li> <li>Solenoid coil 24 V integrated</li> <li>Excellent value for money</li> </ul>	<ul style="list-style-type: none"> <li>Conforms to ISO 5599-1</li> <li>Electrical connection with central plug</li> <li>Robust metal housing</li> <li>Manifold assembly with mixed sizes possible</li> </ul>	<ul style="list-style-type: none"> <li>Corresponds to ISO 15407-1 and to ISO 15218 for pilot valve with interface</li> <li>Electrical connection via plug type C</li> <li>Robust metal housing</li> <li>Manifold assembly with mixed sizes possible</li> </ul>
<b>online:</b> →	<a href="#">vsnc</a>	<a href="#">vsnc</a>	<a href="#">vsva</a>	<a href="#">vsva</a>

## Product overview




### Electrically and pneumatically actuated directional control valves >

### Standards-based directional control valves

	 <p><b>Standards-based valves, plug-in VSVA-T1</b></p>	 <p><b>Pneumatic valves to ISO 15407-1 VSPA</b></p>	 <p><b>Solenoid valves to ISO 5599-1 MN1H, MFH, MDH, MEBH, JMN1H, JMN1DH, JMFH, JMFHDH, JMDH, JMEBH, JMEBDH, JMDDH</b></p>	 <p><b>Pneumatic valves to ISO 5599-1 VL, J, JD</b></p>
<b>Actuation type</b>	Electric	Pneumatic	Electric	Pneumatic
<b>Pneumatic connection 1</b>	Sub-base Size 1 ISO 5599-2, Size 2 ISO 5599-2, Size 18 mm ISO 15407-2, Size 26 mm ISO 15407-2	Sub-base Size 18 mm ISO 15407-1, Size 26 mm ISO 15407-1	Sub-base size 3 to ISO 5599-1, Sub-base Size 1 ISO 5599-1, Size 2 ISO 5599-1, Size 3 ISO 5599-1, Size 4 ISO 5599-1	Sub-base size 1 to ISO 5599-1, Sub-base size 2 to ISO 5599-1, Sub-base Size 3 ISO 5599-1, Size 4 ISO 5599-1
<b>Operating pressure [MPa]</b>	-0.09 ... 1 MPa		-0.09 ... 1.6 MPa	-0.09 ... 1.6 MPa
<b>Operating pressure</b>	-0.9 ... 10 bar	-0.9 ... 16 bar	-0.9 ... 16 bar	-0.9 ... 16 bar
<b>Standard nominal flow rate</b>	125 ... 2900 l/min	400 ... 1100 l/min	1200 ... 6000 l/min	4100 ... 6000 l/min
<b>Valve function</b>	2x2/2-way, monostable, closed, 2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 3/2-way, closed, monostable, 5/2 bistable, 5/2-way, bistable, dominant, 5/2-way, monostable, 5/3-way, pressurised 1 to 2, 4 to 5 closed, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed, 5/3-way, port 2 pressurised, 4 exhausted, 5/3-way, port 4 pressurised, 2 exhausted	2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 5/2 bistable, 5/2-way, bistable, dominant, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed	5/2 bistable, 5/2-way, bistable, dominant, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed	2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 5/2 bistable, 5/2-way, bistable, dominant, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed
<b>Electrical connection</b>	2-pin, 4-pin, Plug-in, Plugs, To ISO 15407-2, To ISO 5599-2		Central plug, To DIN EN 175301-803, Round design, Via F coil, to be ordered separately, Via N1 coil, to be ordered separately, M12x1	
<b>Description</b>	<ul style="list-style-type: none"> <li>• For valve terminal VTSA/VTSA-F</li> <li>• Robust metal housing</li> </ul>	<ul style="list-style-type: none"> <li>• Conforms to ISO 15407-1</li> <li>• Pneumatic control</li> <li>• Manifold assembly with mixed sizes possible</li> </ul>	<ul style="list-style-type: none"> <li>• Conforms to ISO 5599-1</li> <li>• Robust metal housing</li> <li>• Manifold assembly with mixture of ISO sizes 1, 2 and 3 possible</li> <li>• Extensive range of electrical connection options</li> <li>• Wide range of vertical stacking modules: pressure regulator, flow control valve, vertical pressure shut-off plate, etc.</li> <li>• Also available as a valve terminal</li> </ul>	<ul style="list-style-type: none"> <li>• Conforms to ISO 5599-1</li> <li>• Pneumatic control</li> </ul>
<b>online:</b> →	<a href="#">vsva</a>	<a href="#">vspa</a>	<a href="#">iso 5599-1</a>	<a href="#">iso 5599-1</a>

Electrically and pneumatically actuated directional control valves >





Standards-based directional control valves

	 <b>Pilot valves, ISO 15218 (CNOMO) MDH, MGXDH, MGXIAH</b>	 <b>Standards-based valves to ISO 15218 (CNOMO) VSCS</b>	 <b>Standard valve with valve pilot control VSVA</b>
<b>Actuation type</b>	Electric	Electric	Electric
<b>Pneumatic connection 1</b>	Sub-base	Sub-base	Sub-base size 1 to ISO 5599-1, Sub-base size 2 to ISO 5599-1
<b>Operating pressure [MPa]</b>	-0.09 ... 1.6 MPa	0 ... 1 MPa	-0.09 ... 1.6 MPa
<b>Operating pressure</b>	-0.9 ... 16 bar	0 ... 10 bar	-0.9 ... 16 bar
<b>Standard nominal flow rate</b>	50 l/min	13.5 ... 34 l/min	
<b>Valve function</b>	3/2-way, closed, monostable	3/2-way, closed, monostable	2/2-way, closed, monostable, 2x2/2-way, monostable, closed, 2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 5/2 bistable, 5/2-way, bistable, dominant, 5/2-way, monostable, 5/3-way, pressurised 1 to 2, 4 to 5 closed, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed, 5/3-way, port 2 pressurised, 4 exhausted, 5/3-way, port 4 pressurised, 2 exhausted
<b>Electrical connection</b>	Type A, To DIN EN 175301-803	Type C, Plug pattern type C to industry standard, 9.4 mm, To DIN EN 175301-803, To IEC 61076-2-101, M12x1	Type A, Type B, Type C, M12x1, A-coded according to DESINA, M12x1, A-coded to EN 61076-2-101, To EN 175301-803
<b>Description</b>	<ul style="list-style-type: none"> <li>• CNOMO connection pattern, to ISO 15218</li> <li>• Detenting or non-detenting manual override</li> <li>• Variants to EU Explosion Protection Directive (ATEX)</li> </ul>	<ul style="list-style-type: none"> <li>• Valve actuator for electrical actuation of valve bodies</li> <li>• CNOMO connection pattern, to ISO 15218</li> <li>• Detenting or non-detenting manual override</li> </ul>	<ul style="list-style-type: none"> <li>• Conforms to ISO 5599-1</li> <li>• Robust metal housing</li> <li>• Comprehensive valve functions: 5/2, 5/3, 2x3/2, 2x2/2</li> <li>• Extensive range of electrical connection options</li> <li>• Wide variety of voltage variants, direct and alternating voltages</li> <li>• Wide range of vertical stacking modules: pressure regulator, flow control valve, vertical pressure shut-off plate, etc.</li> <li>• Convenient valve configurator for selecting the required valve type</li> <li>• Manifold assembly with mixture of ISO sizes 1, 2 and 3 possible</li> </ul>
<b>online:</b> →	<a href="#">iso 15218</a>	<a href="#">VSCS</a>	<a href="#">vsva</a>

## Product overview




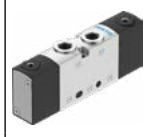
### Electrically and pneumatically actuated directional control valves >

## Universal directional control valves

	 <b>Solenoid valves, for individual connection VUVG</b>	 <b>Solenoid valves, plug-in VUVX-T1</b>	 <b>Solenoid valves, plug-in VUVG-T1</b>	 <b>Solenoid valves, plug-in VUVG-B-F1A</b>
<b>Actuation type</b>	Electric	Electric	Electric	Electric
<b>Pneumatic connection 1</b>	G1/4, G1/8, M3, M5, M7	Sub-base		
<b>Pneumatic working port</b>	Flange, G1/4, G1/8, M3, M5, M7, QS-1/4, QS-1/8, QS-10, QS-3, QS-3/16, QS-3/8, QS-4, QS-5/16, QS-5/32, QS-6, QS-8		Flange, G1/4, G1/8, M5, M7	Flange
<b>Operating pressure [MPa]</b>	-0.09 ... 1 MPa	-0.09 ... 0.7 MPa	-0.09 ... 1 MPa	-0.09 ... 1 MPa
<b>Operating pressure</b>	-0.9 ... 10 bar	-0.9 ... 7 bar	-0.9 ... 10 bar	-0.9 ... 10 bar
<b>Standard nominal flow rate</b>	80 ... 1380 l/min		130 ... 1200 l/min	130 ... 510 l/min
<b>Valve function</b>	2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 5/2 bistable, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed	2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 5/2 bistable, 5/2-way, monostable, 5/3 closed, 5/4 exhausted	2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 3/2-way, closed, monostable, 3/2 open, monostable, 5/2 bistable, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed	2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 5/2 bistable, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed
<b>Electrical connection</b>	2-pin, 3-pin, Plug pattern H, horizontal connection, M8x1 A-encoded to EN 61076-2-104, Plugs, Via electrical sub-base, Via electric pilot valve	Plug-in	Via sub-base	Via sub-base
<b>Description</b>	<ul style="list-style-type: none"> <li>• Compact universal valve</li> <li>• Connection technology via electrical connection box (E-box)</li> <li>• High flow rate relative to its size</li> <li>• In-line valves can be used as individual valves or manifold valves</li> </ul>	<ul style="list-style-type: none"> <li>• For valve terminal VTUX</li> <li>• Compact design with low height and width</li> </ul>	<ul style="list-style-type: none"> <li>• Sub-base valve, semi in-line valve</li> <li>• For valve terminal VTUG with multi-pin, fieldbus interface</li> <li>• Variants to EU Explosion Protection Directive (ATEX)</li> </ul>	<ul style="list-style-type: none"> <li>• Sub-base valve</li> <li>• For valve terminal VTUG with multi-pin, fieldbus interface</li> <li>• Recommended for production plants for the manufacture of Li-ion manifolds (F1A)</li> </ul>
<b>online:</b> →	<a href="#">vuvg</a>	<a href="#">vuvx</a>	<a href="#">vuvg</a>	<a href="#">vuvg_t1_f1a</a>

Electrically and pneumatically actuated directional control valves >




Universal directional control valves

	 <b>Solenoid valves VUVG-L-F1A</b>	 <b>Pneumatic valves VUWG</b>	 <b>Solenoid valves VUVS</b>	 <b>Pneumatic valves VUWS</b>
<b>Actuation type</b>	Electric	Pneumatic	Electric	Pneumatic
<b>Pneumatic connection 1</b>	G1/4, G1/8, M5, M7	G1/4, G1/8, M3, M5, M7	G1/4, 1/8 NPT, 1/4 NPT, G1/4, G1/8, G3/8	G1/4, G1/8, G3/8
<b>Pneumatic working port</b>	G1/4, G1/8, M5, M7	G1/4, G1/8, M3, M5, M7, QS-1/4, QS-1/8, QS-10, QS-3, QS-3/16, QS-3/8, QS-4, QS-5/16, QS-5/32, QS-6, QS-8	G1/4, 1/8 NPT, 1/4 NPT, 3/8 NPT, G1/4, G1/8, G3/8, QS-1/2, QS-1/4, QS-10, QS-12, QS-3/8, QS-4, QS-5/16, QS-5/32, QS-6, QS-8	1/8 NPT, 1/4 NPT, 3/8 NPT, G1/4, G1/8, G3/8, QS-1/4, QS-10, QS-3/8, QS-4, QS-5/16, QS-5/32, QS-6, QS-8
<b>Operating pressure [MPa]</b>	-0.09 ... 1 MPa		-0.09 ... 1 MPa	-0.09 ... 1 MPa
<b>Operating pressure</b>	-0.9 ... 10 bar	-0.9 ... 10 bar	-0.9 ... 10 bar	-0.9 ... 10 bar
<b>Standard nominal flow rate</b>	125 ... 1380 l/min	80 ... 1380 l/min	500 ... 2400 l/min	500 ... 2400 l/min
<b>Valve function</b>	2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 5/2 bistable, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed	2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 5/2 bistable, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed	2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 3/2-way, closed, monostable, 3/2 open, monostable, 5/2 bistable, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed	2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 3/2-way, closed, monostable, 3/2 open, monostable, 5/2 bistable, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed
<b>Electrical connection</b>	2-pin, Plug pattern H, horizontal connection, Plugs		3-pin, Socket, Type B, Type C, Screw terminal, To EN 175301-803, To industry standard (11 mm)	
<b>Description</b>	<ul style="list-style-type: none"> <li>• Compact universal valve</li> <li>• Connection technology via electrical connection box (E-box)</li> <li>• High flow rate relative to its size</li> <li>• In-line valves can be used as individual valves or manifold valves</li> <li>• Recommended for production plants for the manufacture of Li-ion manifolds (F1A)</li> </ul>	<ul style="list-style-type: none"> <li>• Compact universal valve</li> <li>• Pneumatically actuated</li> <li>• High flow rate relative to its size</li> <li>• In-line valves can be used as individual valves or manifold valves</li> <li>• Can be combined on manifold rail with electric individual valves</li> </ul>	<ul style="list-style-type: none"> <li>• Universal valve, sturdy and durable</li> <li>• Low cost with no performance limitations</li> <li>• Can be used as individual valves or manifold valves VTUS</li> </ul>	<ul style="list-style-type: none"> <li>• Universal valve, sturdy and durable</li> <li>• Pneumatically actuated</li> <li>• Can be used as individual valves or manifold valves VTUS</li> </ul>
<b>online:</b> →	<a href="#">vuvg_s_f1a</a>	<a href="#">vuwg</a>	<a href="#">vuvs</a>	<a href="#">vuws</a>

## Product overview




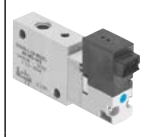
### Electrically and pneumatically actuated directional control valves >

## Universal directional control valves

			
	<b>Solenoid valves</b> VMPA1, VMPA14, VMPA2	<b>Solenoid and pneumatic valves, Tiger Classic</b> MCH, MFH, MOFH, MOCH, JMFH, JMFDH, VL/O, VL, JH, JDH	<b>Solenoid valves, supplementary product range</b> BMCH, BMFH, MC, MCH, MFH, MOCH, MOFH
<b>Actuation type</b>	Electric	Electric, Pneumatic	Electric
<b>Pneumatic connection 1</b>	Internal, G1/8, M7	G1/2, G1/4, G1/8, G3/4	G1/4, G1/8, M5
<b>Pneumatic working port</b>	G1/8, M7	G1/2, G1/4, G1/8, G3/4	G1/8, M5
<b>Operating pressure [MPa]</b>	-0.09 ... 1 MPa	-0.095 ... 1 MPa	-0.095 ... 0.8 MPa
<b>Operating pressure</b>	-0.9 ... 10 bar	-0.95 ... 10 bar	-0.95 ... 8 bar
<b>Standard nominal flow rate</b>	140 ... 870 l/min	500 ... 7500 l/min	46 ... 300 l/min
<b>Valve function</b>	2x2/2-way, monostable, closed, 2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 3/2-way, closed, monostable, 3/2 open, monostable, 5/2 bistable, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed	3/2-way, closed, monostable, 3/2 open, monostable, 3/2-way, monostable, open/closed, 5/2 bistable, 5/2-way, bistable, dominant, 5/2-way, monostable	2/2-way, closed, monostable, 2x3/2-way, monostable, closed, 3/2-way, closed, monostable, 3/2 open, monostable, 3x3/2-way, monostable, closed
<b>Electrical connection</b>	4-pin, Plugs, To EN 60947-5-2, M8x1	Via F coil, to be ordered separately	Plugs
<b>Description</b>	<ul style="list-style-type: none"> <li>• For valve terminal MPA</li> <li>• As individual valve mounted on sub-base</li> <li>• Comprehensive range of valves</li> </ul>	<ul style="list-style-type: none"> <li>• Sturdy and reliable</li> <li>• Poppet valve</li> <li>• All-metal version</li> <li>• Principle with armature tube</li> <li>• Variants to EU Explosion Protection Directive (ATEX)</li> </ul>	<ul style="list-style-type: none"> <li>• Manifold mounting or individual valve</li> <li>• Valves for special applications</li> <li>• With or without manual override</li> </ul>
<b>online:</b> →	<a href="#">vmpa1</a>	<a href="#">tiger classic</a>	<a href="#">bmch</a>

Electrically and pneumatically actuated directional control valves >





Application-specific directional control valves

	 <b>Control blocks VOFA</b>	 <b>Solenoid valves VOFC</b>	 <b>Solenoid valves VOFD</b>	 <b>Solenoid valves VOVG</b>
<b>Design</b>	Piston gate valve	Piston gate valve, Piloted piston poppet valve	Directly actuated poppet valve	Piston gate valve
<b>Valve function</b>	3/2-way, closed, monostable, 5/2-way, monostable	3/2-way, closed, monostable, 5/2 bistable, 5/2-way, monostable	3/2-way, closed, monostable, semi-automatic, 3/2-way, closed, monostable	3/2-way, closed, monostable, 3/2 open, monostable, 5/2-way, monostable
<b>Operating pressure [MPa]</b>	0 ... 1 MPa	0 ... 1 MPa	0 ... 1.2 MPa	-0.09 ... 0.8 MPa
<b>Operating pressure</b>	0 ... 10 bar	0 ... 10 bar	0 ... 12 bar	-0.9 ... 8 bar
<b>Ambient temperature</b>	-5 ... 50°C	-25 ... 60°C	-50 ... 60°C	-5 ... 50°C
<b>Pneumatic connection 1</b>	G1/4	1/4 NPT, 1/2 NPT, NAMUR port pattern, G1/2, G1/4, M5	1/4 NPT, NAMUR port pattern, G1/4, M5	Sub-base, M5, M7
<b>Standard nominal flow rate</b>	950 ... 1050 l/min	595 ... 2794 l/min	52 ... 1900 l/min	180 ... 200 l/min
<b>Description</b>	<ul style="list-style-type: none"> <li>• Redundantly designed valve block for safe reversing of a hazardous movement or for safely exhausting pneumatic drives</li> <li>• Can be selected as a decentralised individual connection variant with electrical and pneumatic individual connection or as a feature integrated in the valve terminal VTSA/VTSA-F</li> <li>• Equipped with valves VSVA</li> <li>• Switching position sensing by sensors</li> <li>• With safety functions</li> <li>• Suitable for use as a press safety valve in accordance with ISO 16092-4</li> </ul>	<ul style="list-style-type: none"> <li>• Suitable for process automation in the chemical and petrochemical industries</li> <li>• Suitable for outdoor use under harsh ambient conditions</li> <li>• Especially suitable for quarter turn actuators thanks to NAMUR flange pattern</li> <li>• Valve can switch between internal and external pilot air</li> <li>• Variants with safety functions</li> <li>• Variants to EU Explosion Protection Directive (ATEX)</li> </ul>	<ul style="list-style-type: none"> <li>• Suitable for process automation in the chemical and petrochemical industries</li> <li>• Suitable for outdoor use under harsh ambient conditions</li> <li>• Especially suitable for quarter turn actuators thanks to NAMUR flange pattern</li> <li>• Variants with safety functions</li> <li>• Variants to EU Explosion Protection Directive (ATEX)</li> </ul>	<ul style="list-style-type: none"> <li>• Very compact valve for solutions with high component density</li> <li>• For soft-start/quick exhaust valves MS6-SV, MS series</li> <li>• In-line, semi in-line and sub-base valve</li> <li>• Manifold rail for 2 ... 10 valves</li> </ul>
<b>online:</b> →	<a href="#">vofa</a>	<a href="#">vofc</a>	<a href="#">vofd</a>	<a href="#">vofg</a>

## Product overview


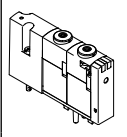

### Electrically and pneumatically actuated directional control valves >

### Application-specific directional control valves

	 <p><b>Solenoid valves</b> <b>MHA1, MHP1</b></p>	 <p><b>Solenoid valves</b> <b>MHE2, MHP2, MHA2, MHE3, MHP3, MHA3, MHE4, MHP4, MHA4</b></p>	 <p><b>Solenoid valves</b> <b>CDVI5.0</b></p>	 <p><b>Fast-switching valves</b> <b>MHJ9, MHJ10</b></p>
<b>Design</b>	Poppet valve with spring return	Pressure-relieved poppet valve	Piston gate valve	Poppet valve without spring return
<b>Valve function</b>	2/2-way, closed, monostable, 2x2/2-way, monostable, closed, 3/2-way, closed, monostable, 3/2 open, monostable	3/2-way, closed, monostable, 3/2 open, monostable, 5/2-way, monostable	2/2-way, closed, monostable, 2/2 open, monostable, 2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 3/2-way, closed, monostable, 3/2 open, monostable, 5/2 bistable, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed	2/2-way, closed, monostable
<b>Operating pressure [MPa]</b>	-0.09 ... 0.8 MPa	-0.09 ... 0.8 MPa	-0.9 ... 10 bar	0.05 ... 0.8 MPa
<b>Operating pressure</b>	-0.9 ... 8 bar	-0.9 ... 8 bar	-0.9 ... 10 bar	0.5 ... 8 bar
<b>Ambient temperature</b>	-5 ... 50°C	-5 ... 60°C	-5 ... 50°C	-5 ... 60°C
<b>Pneumatic connection 1</b>	Sub-base, Prepared for QSP10, QS-3, QS-4	Sub-base, G1/4, G1/8, M7, QS-4, QS-6, QS-8	Sub-base	Sub-base, QS-4, QS-6
<b>Standard nominal flow rate</b>	10 ... 30 l/min	90 ... 400 l/min	300 ... 650 l/min	50 ... 160 l/min
<b>Description</b>	<ul style="list-style-type: none"> <li>• Directly actuated poppet valve</li> <li>• Miniature valve: grid dimension 10 mm</li> <li>• Switching times down to 4 ms</li> <li>• Sub-base valve</li> <li>• Manifold block for 2 ... 10 valves</li> <li>• Use as a pilot valve</li> <li>• UL certification; same connections and cables as for the VUVG</li> </ul>	<ul style="list-style-type: none"> <li>• Directly actuated poppet valve</li> <li>• Fast-switching valve: switching times down to 2 ms</li> <li>• Direct mounting, individual sub-base, manifold assembly</li> <li>• Manifold block for 2 ... 10 valves</li> </ul>	<ul style="list-style-type: none"> <li>• Clean design sub-base valve</li> <li>• Easy-to-clean design</li> <li>• Individual valve for clean design</li> <li>• Can be used in the food zone (based on standard EN 1672-2)</li> </ul>	<ul style="list-style-type: none"> <li>• Directly actuated poppet valve</li> <li>• Identical basic valves for direct mounting or manifold installation</li> <li>• Individual valve with integrated plug connection</li> <li>• Switching frequencies up to 1000 Hz</li> <li>• Very good reproducibility</li> <li>• MHJ9: Valve manifold assembly with individual outputs or with air nozzle output</li> <li>• MHJ9: Electrical connection via connecting cable MHJ9-KMH with integrated control electronics</li> <li>• MHJ10: Valve manifold assembly with individual outputs</li> <li>• MHJ10: Electrical connection via moulded-in cable, control electronics included in the valve</li> </ul>
<b>online:</b> →	<a href="#">mh1</a>	<a href="#">mh2</a>	<a href="#">cdvi5.0</a>	<a href="#">mhj9</a>

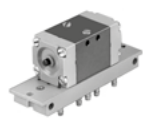
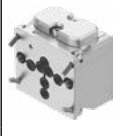
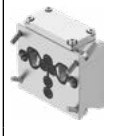
Electrically and pneumatically actuated directional control valves >

Application-specific directional control valves

	 <b>Solenoid valves VOVK</b>	 <b>Solenoid valves VOVC</b>	 <b>Pilot valves VOFX</b>
<b>Design</b>	Connection direction downwards, Connection orientation forwards, Poppet valve with spring return	Poppet valve with spring return	Directly actuated poppet valve
<b>Valve function</b>	3/2-way, closed, monostable	2x3/2-way, monostable, closed	3/2-way, closed, monostable
<b>Operating pressure [MPa]</b>	-0.1 ... 0.7 MPa	0 ... 0.8 MPa	-0.09 ... 0.8 MPa
<b>Operating pressure</b>	-1 ... 7 bar	0 ... 8 bar	-0.9 ... 8 bar
<b>Ambient temperature</b>	5 ... 50°C	-5 ... 50°C	-10 ... 50°C
<b>Pneumatic connection 1</b>	Sub-base, For tubing I.D. 1.5 mm, For tubing I.D. 2 mm	Sub-base	G1/8
<b>Standard nominal flow rate</b>	5.5 l/min		50 l/min
<b>Description</b>	<ul style="list-style-type: none"> <li>• Very narrow: 5.9 mm grid dimension</li> <li>• Extremely small and lightweight</li> <li>• Very low power consumption</li> <li>• Variable connection concepts: flanged connection underneath or at the front, barbed fitting connection at the front</li> <li>• Ideal for control of small air flows</li> </ul>	<ul style="list-style-type: none"> <li>• For valve terminal VTOC</li> <li>• Optimal use of the installation space yet maximum performance</li> <li>• Detenting or non-detenting manual override</li> </ul>	<ul style="list-style-type: none"> <li>• For angle seat valves VZXF and VZXA</li> <li>• For use wherever valve terminals are not economically or technically viable</li> <li>• Manual override, detenting</li> </ul>
<b>online:</b> →	<a href="#">vovk</a>	<a href="#">vovc</a>	<a href="#">vofx</a>

Electrically and pneumatically actuated directional control valves >




Application-specific directional control valves

	 <b>Solenoid and pneumatic valves, M5 Compact System J, JD, JMFH, MFH, VD, VL, VL/O, VLL</b>	 <b>Pneumatic valves VOGM</b>	 <b>Pneumatic valves VOGI</b>
<b>Design</b>	Piston gate valve, Poppet seat	Sub-base valve, Diaphragm valve, Piloted piston poppet valve	Sub-base valve, Piloted piston poppet valve
<b>Valve function</b>	3/2 bistable, 3/2 open, monostable, 5/2 bistable, 5/2-way, bistable, dominant, 5/2-way, monostable	Proportional 3/3-way valve	4/2-way, monostable, Fail safe
<b>Operating pressure [MPa]</b>	0 ... 0.8 MPa	0.14 ... 0.8 MPa	0.33 ... 0.8 MPa
<b>Operating pressure</b>	-0.9 ... 8 bar	1.4 ... 8 bar	3.3 ... 8 bar
<b>Ambient temperature</b>	-10 ... 60°C	-40 ... 80°C	-20 ... 80°C
<b>Pneumatic connection 1</b>	PK-3		G1/2
<b>Standard nominal flow rate</b>	100 ... 105 l/min	1240 l/min	1093 l/min
<b>Description</b>	<ul style="list-style-type: none"> <li>• Control elements with all functions for pneumatic sequence controls</li> <li>• For control cabinet installation</li> <li>• Fast replacement of components</li> </ul>	<ul style="list-style-type: none"> <li>• Pneumatic extension module for valve terminal VTOP</li> <li>• Volume booster for shortening the actuating times of the process valve</li> <li>• Precise positioning of the pneumatic actuator even with fast positioning times through direct integration into the control loop</li> </ul>	<ul style="list-style-type: none"> <li>• Pneumatic extension module for valve terminal VTOP</li> <li>• Fail-safe modules for approaching a defined end position in the event of pressure failure</li> </ul>
<b>online:</b> →	<a href="#">m5-compact</a>	<a href="#">vogm</a>	<a href="#">vogi</a>

## Product overview




### Manually actuated directional control valves >

#### Swivel lever valves

	 <p><b>Hand lever valves</b> <b>VHEF-H</b></p>	 <p><b>Hand lever valves</b> <b>VHER</b></p>	 <p><b>Hand lever valves</b> <b>H-3, H-5</b></p>
<b>Valve function</b>	3/2 bistable, 3/2-way, monostable, open/closed, 5/2 bistable, 5/2-way, monostable, 5/3 exhausted, 5/3 closed	4/3-way, pressurised, 4/3 exhausted, 4/3 closed	3/2 bistable, 5/2 bistable
<b>Type of control</b>	Direct	Direct	Direct
<b>Standard nominal flow rate</b>	530 ... 1200 l/min	170 ... 3800 l/min	550 ... 600 l/min
<b>Pneumatic working port</b>	G1/4, G1/8	G1/2, G1/4, G1/8, M5	G1/4
<b>Operating pressure [MPa]</b>	-0.095 ... 1 MPa		
<b>Operating pressure</b>	-0.95 ... 10 bar	0 ... 10 bar	-0.95 ... 10 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• With hand lever at the side</li> <li>• Durable thanks to tried-and-tested piston slide and disc seat valve technology</li> <li>• Robust metal housing</li> <li>• Attractive price</li> <li>• Ergonomic and safe operation</li> <li>• Minimal actuating forces</li> <li>• Modern design</li> <li>• Reverse operation possible</li> </ul>	<ul style="list-style-type: none"> <li>• Lever in metal or polymer design</li> <li>• Front panel mounting, through holes or mounting holes</li> </ul>	<ul style="list-style-type: none"> <li>• Die-cast aluminium design</li> </ul>
<b>online: →</b>	<a href="#">vhf</a>	<a href="#">vher</a>	<a href="#">n_v14</a>



### Manually actuated directional control valves >

#### Pushbutton valves

	 <p><b>Pushbutton valves</b> <b>VHEF-P</b></p>	 <p><b>Pushbutton valves</b> <b>K/O-3</b></p>	 <p><b>Pushbutton valves</b> <b>K-3</b></p>
<b>Valve function</b>	3/2 bistable, 3/2-way, monostable, open/closed, 5/2 bistable, 5/2-way, monostable	3/2-way, monostable, open/closed	3/2-way, closed, monostable
<b>Type of control</b>	Direct, Pilot actuated	Direct	Direct
<b>Standard nominal flow rate</b>	750 ... 1200 l/min	80 l/min	80 l/min
<b>Pneumatic working port</b>	G1/4, G1/8	PK-3	M5
<b>Operating pressure [MPa]</b>	-0.095 ... 1 MPa		
<b>Operating pressure</b>	-0.95 ... 10 bar	0 ... 8 bar	-0.95 ... 8 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• With button switch</li> <li>• Durable thanks to tried-and-tested piston slide and disc seat valve technology</li> <li>• Robust metal housing</li> <li>• Attractive price</li> <li>• Ergonomic and safe operation</li> <li>• Minimal actuating forces</li> <li>• Modern design</li> <li>• Reverse operation possible</li> </ul>	<ul style="list-style-type: none"> <li>• With button switch</li> <li>• Polymer design</li> <li>• Ducted exhaust air</li> </ul>	<ul style="list-style-type: none"> <li>• With button switch</li> <li>• Suitable for vacuum operation</li> <li>• Sturdy die-cast zinc design</li> </ul>
<b>online: →</b>	<a href="#">vhf</a>	<a href="#">k</a>	<a href="#">k-3</a>





Manually actuated directional control valves >

Pushbutton valves

	 <b>Pushbutton valves</b> <b>T-5/3</b>	 <b>Pushbutton valves</b> <b>F-3</b>
<b>Valve function</b>	5/3 closed	3/2-way, closed, monostable
<b>Type of control</b>	Pilot actuated	Direct
<b>Standard nominal flow rate</b>	680 l/min	80 l/min
<b>Pneumatic working port</b>	G1/4	M5
<b>Operating pressure [MPa]</b>	0.2 ... 1 MPa	
<b>Operating pressure</b>	2 ... 10 bar	-0.9 ... 8 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• With pushbutton</li> <li>• For positioning, for stopping in the event of an emergency stop and for holding double-acting cylinders in any position</li> <li>• Aluminium design</li> </ul>	<ul style="list-style-type: none"> <li>• With pedal</li> <li>• Suitable for vacuum operation</li> <li>• Sturdy die-cast zinc design</li> </ul>
<b>online: →</b>	<a href="#">n_msv</a>	<a href="#">f-3-m5</a>

Manually actuated directional control valves >




Finger lever valves

	 <b>Finger lever valves</b> <b>VHEF-L</b>	 <b>Finger lever valves</b> <b>TH/O-3</b>	 <b>Finger lever valves</b> <b>TH-3, THO-3, TH-5</b>	 <b>Finger lever valves</b> <b>H-4/3</b>
<b>Valve function</b>	3/2-way, monostable, open/closed, 5/2-way, monostable	3/2-way, monostable, open/closed	3/2-way, closed, monostable, 3/2 open, monostable, 5/2-way, monostable	4/3 exhausted
<b>Type of control</b>	Direct	Direct	Direct	Pilot actuated
<b>Standard nominal flow rate</b>	750 ... 1200 l/min	80 l/min	80 ... 600 l/min	125 l/min
<b>Pneumatic working port</b>	G1/4, G1/8	PK-3	G1/4, M5	M5
<b>Operating pressure [MPa]</b>	-0.095 ... 1 MPa			
<b>Operating pressure</b>	-0.95 ... 10 bar	0 ... 8 bar	-0.95 ... 10 bar	0 ... 8 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• With finger lever</li> <li>• Durable thanks to tried-and-tested piston slide and disc seat valve technology</li> <li>• Robust metal housing</li> <li>• Attractive price</li> <li>• Ergonomic and safe operation</li> <li>• Minimal actuating forces</li> <li>• Modern design</li> <li>• Reverse operation possible</li> </ul>	<ul style="list-style-type: none"> <li>• With finger lever</li> <li>• Polymer design</li> <li>• Ducted exhaust air</li> </ul>	<ul style="list-style-type: none"> <li>• With finger lever</li> <li>• Die-cast zinc or die-cast aluminium design</li> </ul>	<ul style="list-style-type: none"> <li>• With detenting finger lever</li> <li>• Front panel mounting or mounting on sub-base</li> <li>• Aluminium design</li> </ul>
<b>online: →</b>	<a href="#">vhf</a>	<a href="#">th</a>	<a href="#">th-3-m5</a>	<a href="#">h-4</a>

## Product overview



### Manually actuated directional control valves >

#### Toggle lever valves

	 <b>Toggle lever valves</b> <b>VHEF-V</b>	 <b>Toggle lever valves</b> <b>KH/O-3</b>	 <b>Toggle lever valves</b> <b>H-5/3</b>
<b>Valve function</b>	3/2 bistable, 3/2-way, monostable, open/closed, 5/2 bistable, 5/2-way, monostable	3/2-way, monostable, open/closed	5/3 closed
<b>Type of control</b>	Direct	Direct	Pilot actuated
<b>Standard nominal flow rate</b>	750 ... 1200 l/min	80 l/min	680 l/min
<b>Pneumatic working port</b>	G1/4, G1/8	PK-3	G1/4
<b>Operating pressure [MPa]</b>	-0.095 ... 1 MPa		0.2 ... 1 MPa
<b>Operating pressure</b>	-0.95 ... 10 bar	0 ... 8 bar	2 ... 10 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• With toggle lever</li> <li>• Durable thanks to tried-and-tested piston slide and disc seat valve technology</li> <li>• Robust metal housing</li> <li>• Attractive price</li> <li>• Ergonomic and safe operation</li> <li>• Minimal actuating forces</li> <li>• Modern design</li> <li>• Reverse operation possible</li> </ul>	<ul style="list-style-type: none"> <li>• With toggle lever</li> <li>• Polymer design</li> <li>• Ducted exhaust air</li> </ul>	<ul style="list-style-type: none"> <li>• With toggle lever</li> <li>• For positioning, for stopping in the event of an emergency stop and for holding double-acting cylinders in any position</li> <li>• Aluminium design</li> </ul>
<b>online: →</b>	<a href="#">vhf</a>	<a href="#">kh</a>	<a href="#">n_msv</a>



### Manually actuated directional control valves >

#### Foot valves

	 <b>Foot valves</b> <b>F-3, FO-3, F-5</b>	 <b>Foot valves with detent</b> <b>FP-3, FPB-3, FP-5, FPB-5</b>
<b>Valve function</b>	3/2-way, closed, monostable, 3/2 open, monostable, 5/2-way, monostable	3/2 bistable, 5/2 bistable
<b>Type of control</b>	Direct	Direct
<b>Standard nominal flow rate</b>	550 ... 600 l/min	550 ... 600 l/min
<b>Pneumatic working port</b>	G1/4	G1/4
<b>Operating pressure</b>	-0.95 ... 10 bar	-0.95 ... 10 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• With foot pedal</li> <li>• Sturdy die-cast zinc design</li> </ul>	<ul style="list-style-type: none"> <li>• With foot pedal with detent</li> <li>• Sturdy die-cast zinc design</li> </ul>
<b>online: →</b>	<a href="#">fo-3</a>	<a href="#">fpb-3</a>




Manually actuated directional control valves >

Selector switches

	 <b>Selector valves</b> <b>VHEF-E</b>	 <b>Selector switches</b> <b>HW-6-38</b>
<b>Valve function</b>	3/2 bistable, 3/2-way, monostable, open/closed, 5/2 bistable, 5/2-way, monostable, 5/3 exhausted, 5/3 closed	8/6 bistable
<b>Type of control</b>	Direct	Direct
<b>Standard nominal flow rate</b>	530 ... 1200 l/min	180 l/min
<b>Pneumatic working port</b>	G1/4, G1/8	M5
<b>Operating pressure [MPa]</b>	-0.095 ... 1 MPa	
<b>Operating pressure</b>	-0.95 ... 10 bar	0 ... 8 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• With selector switch on the side or on top</li> <li>• Durable thanks to tried-and-tested piston slide and disc seat valve technology</li> <li>• Robust metal housing</li> <li>• Attractive price</li> <li>• Ergonomic and safe operation</li> <li>• Minimal actuating forces</li> <li>• Modern design</li> <li>• Reverse operation possible</li> </ul>	<ul style="list-style-type: none"> <li>• With rotary knob and arrow</li> <li>• Front panel mounting or mounting on sub-base</li> <li>• With six switching positions</li> </ul>
<b>online: →</b>	<a href="#">vhf</a>	<a href="#">hw-6</a>

Manually actuated directional control valves >





Front panel valves

	 <b>Front panel valves</b> <b>SV/O-3</b>	 <b>Front panel valves</b> <b>SVS-3, SVS-4, SVOS-3</b>	 <b>Front panel valves</b> <b>SV-3, SV-5</b>
<b>Valve function</b>	2x3/2-way, monostable, closed	3/2-way, closed, monostable, 3/2 open, monostable, 4/2-way, monostable	3/2-way, closed, monostable, 5/2-way, monostable
<b>Type of control</b>	Direct	Direct, Pilot actuated	Direct
<b>Standard nominal flow rate</b>	70 l/min	120 l/min	65 ... 95 l/min
<b>Pneumatic working port</b>	PK-3	G1/8	M5
<b>Operating pressure [MPa]</b>		0.35 ... 0.8 MPa	-0.095 ... 0.8 MPa
<b>Operating pressure</b>	0 ... 8 bar	3.5 ... 8 bar	-0.95 ... 8 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• For actuator attachments such as toggle and selector switches</li> <li>• Reliable coupling system for quick mounting and dismounting</li> <li>• Polymer design</li> </ul>	<ul style="list-style-type: none"> <li>• For actuator attachments such as pushbutton actuators, mushroom pushbuttons, selector switches, toggle switches, key actuators</li> <li>• Reliable coupling system for quick mounting and dismounting</li> </ul>	<ul style="list-style-type: none"> <li>• For actuator attachments such as pushbutton actuators, mushroom pushbuttons, mushroom pushbuttons with detent, selector switches or toggle switches</li> <li>• Reliable coupling system for quick mounting and dismounting</li> <li>• Polymer design</li> </ul>
<b>online: →</b>	<a href="#">sv</a>	<a href="#">svos</a>	<a href="#">sv-3</a>

## Product overview




### Mechanically actuated directional control valves >

#### Stem actuated valves

	 <b>Stem actuated valves VMEF-S</b>	 <b>Stem actuated valves V/O-3</b>	 <b>Stem actuated micro valves S-3, SO-3</b>	 <b>Stem actuated valves VS-3, VS-4, VOS-3</b>
<b>Valve function</b>	3/2-way, closed, monostable, 5/2-way, monostable	3/2-way, closed, monostable, 3/2-way, monostable, open/closed	3/2-way, closed, monostable, 3/2 open, monostable	3/2-way, closed, monostable, 3/2 open, monostable, 4/2-way, monostable
<b>Type of control</b>	Direct, Pilot actuated	Direct	Direct	Pilot actuated
<b>Standard nominal flow rate</b>	750 ... 1200 l/min	80 ... 140 l/min	60 l/min	140 ... 161 l/min
<b>Pneumatic working port</b>	G1/4, G1/8	G1/8, M5, PK-3	PK-3	G1/8
<b>Operating pressure [MPa]</b>	-0.095 ... 1 MPa			0.35 ... 0.8 MPa
<b>Operating pressure</b>	-0.95 ... 10 bar	-0.95 ... 8 bar	-0.95 ... 8 bar	3.5 ... 8 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• Durable thanks to tried-and-tested piston slide and disc seat valve technology</li> <li>• Robust metal housing</li> <li>• Outstanding pneumatic performance</li> <li>• Attractive price</li> <li>• Ergonomic and safe operation</li> <li>• Minimal actuating forces</li> <li>• Modern design</li> <li>• Reverse operation possible</li> </ul>	<ul style="list-style-type: none"> <li>• Through-holes in housing</li> <li>• Polymer, aluminium or die-cast zinc design</li> </ul>	<ul style="list-style-type: none"> <li>• Dimensions to DIN 41635, type A</li> <li>• Polymer design</li> <li>• Various actuator attachments</li> </ul>	<ul style="list-style-type: none"> <li>• Aluminium design</li> <li>• Minimal actuating force with pilot control</li> </ul>
<b>online: →</b>	<a href="#">vmef</a>	<a href="#">v/o</a>	<a href="#">so</a>	<a href="#">vos</a>





### Mechanically actuated directional control valves >

#### Stem actuated valves

	 <b>Stem actuated valves V-3, V-5, VO-3</b>	 <b>Limit switches with push-in connector SDK, SVK</b>	 <b>Limit stop signal generators with push-in connector SDV</b>
<b>Valve function</b>	3/2-way, closed, monostable, 3/2 open, monostable, 5/2-way, monostable	3/2-way, closed, monostable	
<b>Type of control</b>	Direct	Direct	
<b>Standard nominal flow rate</b>	550 ... 600 l/min	16 ... 50 l/min	8 ... 16 l/min
<b>Pneumatic working port</b>	G1/4	PK-3	PK-3
<b>Operating pressure [MPa]</b>			
<b>Operating pressure</b>	-0.95 ... 10 bar	-0.9 ... 8 bar	0 ... 8 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• Die-cast aluminium design</li> </ul>	<ul style="list-style-type: none"> <li>• For end-position sensing and position control</li> <li>• High accuracy</li> <li>• Stainless steel design</li> </ul>	<ul style="list-style-type: none"> <li>• For end-position sensing and position control</li> <li>• High precision and low actuating forces</li> <li>• Sturdy design</li> </ul>
<b>online: →</b>	<a href="#">vo-3</a>	<a href="#">sdk</a>	<a href="#">sdv</a>




Mechanically actuated directional control valves >

Roller lever valves

	 <b>Roller lever valves</b> <b>VMEF-R</b>	 <b>Roller lever valves</b> <b>R/O-3-PK-3</b>	 <b>Roller lever valves</b> <b>RS-3, RS-4, ROS-3</b>	 <b>Roller lever valves</b> <b>R-3</b>
<b>Valve function</b>	3/2-way, monostable, 5/2-way, monostable	3/2-way, monostable, open/closed	3/2-way, closed, monostable, 3/2 open, monostable, 4/2-way, monostable	3/2-way, closed, monostable, 3/2 open, monostable, 5/2-way, monostable
<b>Type of control</b>	Direct	Direct	Pilot actuated	Direct
<b>Standard nominal flow rate</b>	750 ... 1200 l/min	80 l/min	128 ... 169 l/min	80 ... 600 l/min
<b>Pneumatic working port</b>	G1/4, G1/8	PK-3	G1/8	G1/4, M5
<b>Operating pressure [MPa]</b>	-0.095 ... 1 MPa		0.35 ... 0.8 MPa	-0.095 ... 1 MPa
<b>Operating pressure</b>	-0.95 ... 10 bar	0 ... 8 bar	3.5 ... 8 bar	-0.95 ... 10 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• Durable thanks to tried-and-tested piston slide and disc seat valve technology</li> <li>• Robust metal housing</li> <li>• Outstanding pneumatic performance</li> <li>• Attractive price</li> <li>• Ergonomic and safe operation</li> <li>• Minimal actuating forces</li> <li>• Modern design</li> <li>• Reverse operation possible</li> </ul>	<ul style="list-style-type: none"> <li>• With roller lever</li> <li>• Polymer design</li> <li>• Ducted exhaust air</li> </ul>	<ul style="list-style-type: none"> <li>• With roller lever</li> <li>• Aluminium design</li> <li>• Minimal actuating force with pilot control</li> </ul>	<ul style="list-style-type: none"> <li>• With roller lever</li> <li>• Die-cast aluminium design</li> </ul>
<b>online:</b> →	<a href="#">vmef</a>	<a href="#">r/o</a>	<a href="#">ros-3</a>	<a href="#">ro-3</a>

Mechanically actuated directional control valves >





Roller lever valves

	 <b>Roller lever valves</b> <b>VMEF-K</b>	 <b>Toggle lever valves</b> <b>L/O-3</b>	 <b>Roller lever valves with idle return</b> <b>L-3, L-5, LO-3</b>
<b>Valve function</b>	3/2-way, monostable, 5/2-way, monostable	3/2-way, monostable, open/closed	3/2-way, closed, monostable, 3/2 open, monostable, 5/2-way, monostable
<b>Type of control</b>	Direct	Direct	Direct
<b>Standard nominal flow rate</b>	750 ... 1200 l/min	80 l/min	80 ... 600 l/min
<b>Pneumatic working port</b>	G1/4, G1/8	PK-3	G1/4, M5
<b>Operating pressure [MPa]</b>	-0.095 ... 1 MPa		
<b>Operating pressure</b>	-0.95 ... 10 bar	0 ... 8 bar	-0.95 ... 10 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• Durable thanks to tried-and-tested piston slide and disc seat valve technology</li> <li>• Robust metal housing</li> <li>• Outstanding pneumatic performance</li> <li>• Attractive price</li> <li>• Ergonomic and safe operation</li> <li>• Minimal actuating forces</li> <li>• Modern design</li> <li>• Reverse operation possible</li> </ul>	<ul style="list-style-type: none"> <li>• With roller lever with idle return</li> <li>• Polymer design</li> <li>• Ducted exhaust air</li> </ul>	<ul style="list-style-type: none"> <li>• With roller lever</li> <li>• Die-cast aluminium design</li> </ul>
<b>online:</b> →	<a href="#">vmef</a>	<a href="#">l/o</a>	<a href="#">lo-3</a>

## Product overview


### Mechanically actuated directional control valves >

## Swivel lever valves

	 <b>Swivel lever valves</b> VMEF-V	 <b>Swivel lever valves</b> RW/O-3	 <b>Pneumatic limit valves</b> RWN/O-3	 <b>Swivel lever valves</b> RW-3
<b>Valve function</b>	3/2-way, monostable, 5/2-way, monostable	3/2-way, monostable, open/closed	3/2-way, monostable, open/closed	3/2-way, closed, monostable
<b>Type of control</b>	Direct	Direct		Direct
<b>Standard nominal flow rate</b>	750 ... 1200 l/min	80 ... 140 l/min	120 l/min	80 l/min
<b>Pneumatic working port</b>	G1/8, G1/4	G1/8, PK-3	G1/8	M5
<b>Operating pressure</b>	-0.95 ... 10 bar	-0.95 ... 8 bar	-0.95 ... 8 bar	-0.95 ... 8 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• Variants with switching range on both sides, left or right</li> <li>• Compact design</li> <li>• Durable thanks to tried-and-tested piston slide and disc seat valve technology</li> <li>• Robust metal housing</li> <li>• Attractive price</li> <li>• Ergonomic and safe operation</li> <li>• Minimal actuating forces</li> <li>• Modern design</li> <li>• Reverse operation possible</li> </ul>	<ul style="list-style-type: none"> <li>• Basic valve for actuator attachments such as short or long swivel lever, swivel lever rod</li> <li>• Aluminium design</li> </ul>	<ul style="list-style-type: none"> <li>• Directly actuated in one direction</li> <li>• Aluminium design</li> </ul>	<ul style="list-style-type: none"> <li>• With swivel lever</li> <li>• Sturdy die-cast zinc design</li> <li>• Various actuator attachments</li> </ul>
<b>online:</b> →	<a href="#">vmef</a>	<a href="#">rw</a>	<a href="#">rwn</a>	<a href="#">rw-3</a>





### Mechanically actuated directional control valves >

## Whisker valves

	 <b>Whisker valves</b> FVS-3, FVSO-3
<b>Valve function</b>	3/2-way, closed, monostable, 3/2 open, monostable
<b>Type of control</b>	Pilot actuated
<b>Standard nominal flow rate</b>	146 ... 175 l/min
<b>Pneumatic working port</b>	G1/8
<b>Operating pressure [MPa]</b>	0.35 ... 0.8 MPa
<b>Operating pressure</b>	3.5 ... 8 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• With whisker</li> <li>• For sensing dissimilar workpieces or workpieces not precisely positioned</li> <li>• Aluminium design</li> <li>• Minimal actuating force with pilot control</li> </ul>
<b>online:</b> →	<a href="#">fvs-3</a>

Pneumatic shut-off valves >



Check valves

	 <b>Check valves, piloted HGL</b>	 <b>Manual override tools HAB</b>	 <b>Check valves, piloted VBNF</b>	 <b>Non-return valves H, HA, HB</b>
<b>Pneumatic connection 1</b>	G1/2, G1/4, G1/8, G3/8, M5, QS-10, QS-12, QS-4, QS-6, QS-8	G1/2, G1/4, G1/8, G3/8	QS-4, QS-6, QS-8	G1/2, G1/4, G1/8, G3/4, G3/8, M5, QS-10, QS-12, QS-4, QS-6, QS-8, R1/2, R1/4, R1/8, R3/8
<b>Standard nominal flow rate</b>			120 ... 260 l/min	115 ... 2230 l/min
<b>Standard nominal flow rate, exhaust 0.6-&gt;0.5 MPa (6-&gt;5 bar, 87-&gt;72.5 psi)</b>		165 l/min		
<b>Standard nominal flow rate 1-&gt;2 (0.6-&gt;0.5 MPa, 6-&gt;5 bar, 87-&gt;72.5 psi)</b>	130 ... 1600 l/min		130 ... 620 l/min	1000 ... 5900 l/min
<b>Operating pressure [MPa]</b>	0.05 ... 1 MPa		0.02 ... 1 MPa	0.04 ... 1.2 MPa
<b>Operating pressure</b>	0.5 ... 10 bar	0 ... 10 bar	0.2 ... 10 bar	-1 ... 12 bar
<b>Operating pressure for entire temperature range</b>			0.2 ... 10 bar	
<b>Description</b>	<ul style="list-style-type: none"> <li>Valve function: piloted non-return function</li> <li>Screw-in with male thread</li> <li>Pneumatically piloted</li> <li>Pilot air connection: M5, G1/8, G1/4, G3/8, QS-4</li> <li>Manually actuated exhaust possible with separate accessory</li> </ul>	<ul style="list-style-type: none"> <li>Valve function: exhaust component</li> <li>For check valve HGL</li> <li>For manual exhausting air trapped in a cylinder</li> </ul>	<ul style="list-style-type: none"> <li>Valve function: piloted non-return function</li> <li>Minimal height</li> <li>High flow rate</li> <li>Can be rotated horizontally through 360° in assembled state</li> <li>Manually actuated exhaust possible</li> </ul>	<ul style="list-style-type: none"> <li>Valve function: non-return function</li> <li>Screw-in or in-line installation</li> <li>With connecting thread at both ends, push-in connector at both ends, thread/push-in connector</li> </ul>
<b>online:</b> →	<a href="#">hgl</a>	<a href="#">hab</a>	<a href="#">vbnf</a>	<a href="#">h-qs</a>

## Product overview




### Pneumatic shut-off valves >

## Quick exhaust valves

	 <b>Quick exhaust valves</b> <b>VBQF</b>	 <b>Quick exhaust valves</b> <b>SE, SEU</b>
<b>Pneumatic connection 1</b>	G1/4, G1/8, QS-6, QS-8	G1/2, G1/4, G1/8, G3/4, G3/8
<b>Standard nominal flow rate, exhaust 0.6-&gt;0.5 MPa (6-&gt;5 bar, 87-&gt;72.5 psi)</b>	850 ... 2500 l/min	550 ... 7500 l/min
<b>Standard nominal flow rate, pressurisation 0.6-&gt;0.5 MPa (6-&gt;5 bar, 87-&gt;72.5 psi)</b>	350 ... 960 l/min	300 ... 4560 l/min
<b>Operating pressure</b>	0.2 ... 10 bar	0.2 ... 10 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• Minimal height</li> <li>• High flow rate</li> <li>• Reduced noise emission</li> <li>• Available with silencer</li> <li>• Available with ducted or unducted exhaust air</li> <li>• For higher cycle times</li> </ul>	<ul style="list-style-type: none"> <li>• Valve function: quick exhaust</li> <li>• Shut-off valve, piloted</li> <li>• Screw-in</li> <li>• With or without silencer</li> </ul>
<b>online: →</b>	<a href="#">vbqf</a>	<a href="#">se</a>



### Pneumatic shut-off valves >

## Shut-off valves and ball valves

	 <b>Shut-off valves</b> <b>VBOC</b>	 <b>Hand slide valves</b> <b>VBOH</b>	 <b>Shut-off valves</b> <b>HE</b>
<b>Valve function</b>	2/2-way, closed, monostable	3/2 bistable	2/2 bistable, 3/2 bistable
<b>Pneumatic connection 1</b>	G1/2, G1/4, G1/8, G3/8	G1/2, G1/4, G1/8, G3/4, G3/8, M5	QS-10, QS-12, QS-6, QS-8, R1/2, R1/4, R1/8, R3/8
<b>Standard nominal flow rate</b>		236 ... 7691 l/min	256.5 ... 834.3 l/min
<b>Operating pressure [MPa]</b>	0.05 ... 1 MPa	-0.095 ... 1.2 MPa	-0.095 ... 1 MPa
<b>Operating pressure</b>	0.5 ... 10 bar	-0.95 ... 12 bar	-0.95 ... 10 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• 2/2-way valve for direct mounting on the cylinder with switching position monitoring</li> <li>• Suitable for safety functions according to DIN 13849</li> <li>• Extremely sturdy in the event of pressure surges from the cylinder</li> <li>• Optional: fully integrated additional functions</li> <li>• Pneumatically actuated</li> </ul>	<ul style="list-style-type: none"> <li>• Used as a shut-off function for pressurising and exhausting compressed air systems, for example upstream of service units, for air guns and also for exhausting pneumatic cylinders</li> <li>• Non-overlapping, so no pressure losses when switching</li> <li>• Minimal installation effort</li> </ul>	<ul style="list-style-type: none"> <li>• Shut-off valve, manually operated</li> <li>• Connection: thread at both ends, push-in connector at both ends, thread/push-in connector</li> <li>• Different mounting options</li> </ul>
<b>online: →</b>	<a href="#">vboc</a>	<a href="#">vboh</a>	<a href="#">he</a>




Pneumatic shut-off valves >

## Shut-off valves and ball valves

	 <b>Ball valves</b> <b>QH-QS, QHS-QS</b>	 <b>Ball valves</b> <b>QH</b>
<b>Valve function</b>	2/2 bistable	2/2 bistable
<b>Pneumatic connection 1</b>	QS-4, QS-6, R1/8	G1, G1 1/2, G1/2, G1/4, G3/4, G3/8
<b>Standard nominal flow rate</b>	148 ... 560 l/min	3400 ... 84000 l/min
<b>Operating pressure [MPa]</b>	-0.1 ... 1 MPa	
<b>Operating pressure</b>	-1 ... 10 bar	
<b>Description</b>	<ul style="list-style-type: none"> <li>Shut-off valve, manually operated</li> <li>In-line installation, can be screwed in, bulkhead fitting</li> <li>Variants: thread at both ends, push-in connector at both ends, thread/push-in connector</li> </ul>	<ul style="list-style-type: none"> <li>Shut-off valve, manually operated</li> <li>In-line installation</li> <li>Female thread at both ends</li> <li>With hand lever</li> <li>Pipe thread to ISO 2281</li> </ul>
<b>online:</b> →	<a href="#">qh</a>	<a href="#">qh</a>



Pneumatic shut-off valves >

## Logic valves

	 <b>Logic components</b> <b>OS</b>	 <b>Amplifier modules</b> <b>VK</b>	 <b>Logic components</b> <b>ZK</b>
<b>Valve function</b>	OR function		AND function
<b>Pneumatic connection 1</b>	G1/2, G1/4, G1/8, PK-3	M5	G1/8, PK-3
<b>Standard nominal flow rate</b>	100 ... 5000 l/min	80 l/min	100 ... 550 l/min
<b>Operating pressure</b>	1 ... 10 bar	0.001 ... 6 bar	1 ... 10 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>Pneumatic control system</li> <li>Mounting via through-holes</li> </ul>	<ul style="list-style-type: none"> <li>For pneumatic sensors</li> </ul>	<ul style="list-style-type: none"> <li>Dual-pressure valve</li> <li>Connects two input signals in the AND function</li> <li>Mounting via through-holes</li> </ul>
<b>online:</b> →	<a href="#">os</a>	<a href="#">vk</a>	<a href="#">zk</a>





Product overview

Pressure regulators

	 <p><b>Differential pressure regulators</b> <b>LRL, LRLl</b></p>	 <p><b>Pressure regulator</b> <b>VRPA</b></p>
<b>Design</b>	Directly actuated piston regulator, With through compressed air supply	
<b>Pressure regulation range</b>	2 ... 6 bar	1 ... 8 bar
<b>Standard nominal flow rate</b>		80 ... 130 l/min
<b>Nominal flow rate, closed</b>	30 ... 730 l/min	
<b>Nominal flow rate, open</b>	30 ... 760 l/min	
<b>Pneumatic connection 1</b>	R1/8, R1/4, R3/8, R1/2, M5	M5, QS-4, QS-6, QS-8, R1/4, R1/8
<b>Pneumatic connection 2</b>	QS-10, QS-12, QS-4, QS-6, QS-8	QS-4, QS-6, QS-8
<b>Ambient temperature</b>	0 ... 60°C	0 ... 60°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• Piston regulator with through pressure supply</li> <li>• Constant pressure differential between the input and output</li> <li>• Connections: thread/push-in connector on top or on side</li> <li>• Without secondary exhaust</li> <li>• Without pressure gauge</li> </ul>	<ul style="list-style-type: none"> <li>• Regulates the operating pressure independently of the fluctuating inlet pressure</li> <li>• With secondary exhaust and with return flow function</li> <li>• Piston regulator with through pressure supply</li> <li>• Greater energy efficiency thanks to movement-specific pressure adjustment</li> <li>• Directly actuated</li> <li>• Available with pressure gauge</li> <li>• Connections: push-in connector at both ends, thread/push-in connector</li> <li>• Sustainable operation thanks to reduced pressure level</li> </ul>
<b>online: →</b>	<a href="#">lrl</a>	<a href="#">vrpa</a>

Flow control valves >





One-way flow control valves

	 <b>One-way flow control valves VFOE-L</b>	 <b>One-way flow control valves GRLA, GRLZ, GRLSA, CRGRLA</b>	 <b>One-way flow control valves VFOH</b>	 <b>One-way flow control valves VFOF</b>
<b>Valve function</b>	Exhaust air one-way flow control function, Supply air one-way flow control function	Exhaust air one-way flow control function, One-way flow control function, Supply air one-way flow control function	Exhaust air one-way flow control function	Exhaust air one-way flow control function
<b>Pneumatic connection 1</b>	QS-4, QS-6, QS-8, QS-10, QS-10, QS-4, QS-6, QS-8	Female thread G1/4, For barbed connector I.D. 4 mm Via union nut, 6 mm Via union nut, G1/2, G1/4, G1/8, G3/4, G3/8, M3, M5, PK-3, PK-3 Via union nut, PK-4, PK-4 Via union nut, PK-6 Via union nut, QS-10, QS-12, QS-3, QS-4, QS-6, QS-8	QS-10, QS-4, QS-6, QS-8	QS-4, QS-6, QS-8
<b>Standard nominal flow rate in flow control direction</b>	85 ... 750 l/min	0 ... 4320 l/min	180 ... 530 l/min	120 ... 590 l/min
<b>Adjusting element</b>	Rotary knob with detent	Internal hexagon, Knurled screw, Slotted head screw	External hex	Internal hexagon
<b>Description</b>	<ul style="list-style-type: none"> <li>• Low-cost solution for standard applications</li> <li>• Simple and reliable adjustment of pneumatic cylinder speed</li> <li>• Extremely easy assembly</li> <li>• Fast commissioning</li> <li>• Compact dimensions</li> </ul>	<ul style="list-style-type: none"> <li>• Functional combination of one-way flow control valve and piloted check valve</li> <li>• Flow control valve, flow control at one end</li> <li>• Polymer, metal or stainless steel design</li> <li>• Standard, mini, in-line variants with different flow rates</li> <li>• Connections: thread at both ends, push-in connector at both ends, thread/push-in connector</li> </ul>	<ul style="list-style-type: none"> <li>• Easy-to-clean design</li> <li>• Increased corrosion protection</li> <li>• Can be rotated horizontally through 360° in assembled state</li> </ul>	<ul style="list-style-type: none"> <li>• Functional combination of one-way flow control valve and piloted check valve</li> <li>• High flow rate</li> <li>• Can be rotated horizontally through 360° in assembled state</li> <li>• Compact and can be operated from the side</li> </ul>
<b>online: →</b>	<a href="#">vfoe</a>	<a href="#">grla</a>	<a href="#">vfoh</a>	<a href="#">vfof</a>

## Product overview




### Flow control valves >

## One-way flow control valves

	 <b>One-way flow control valves GR, GRA</b>	 <b>One-way flow control valves GG, GGO, GRR</b>	 <b>Precision one-way flow control valves GRP</b>	 <b>One-way flow control valves, M5 Compact System GRF</b>
<b>Valve function</b>	One-way flow control function	One-way flow control function	One-way flow control function	One-way flow control function
<b>Pneumatic connection 1</b>	Female thread G1/4, G1/2, G1/4, G1/8, G3/4, G3/8, M3, M5, QS-3, QS-4, QS-6, QS-8	G1/2, G1/4	G1/8, PK-3, PK-4	PK-3
<b>Standard nominal flow rate in flow control direction</b>	29.5 ... 3300 l/min	870 ... 1300 l/min	3.8 ... 75.8 l/min	45 l/min
<b>Adjusting element</b>	Knurled screw	Roller lever	Rotary knob with scale	Knurled screw
<b>Description</b>	<ul style="list-style-type: none"> <li>• Non-return and flow control valve</li> <li>• In-line installation</li> </ul>	<ul style="list-style-type: none"> <li>• Non-return and flow control valve</li> <li>• With roller lever</li> </ul>	<ul style="list-style-type: none"> <li>• Non-return and flow control valve</li> <li>• Mounting on sub-base or for front panel mounting</li> </ul>	<ul style="list-style-type: none"> <li>• Complete system offering control components with all the functions required for pneumatic sequence control</li> <li>• For control cabinet installation</li> <li>• Fast replacement of components</li> </ul>
<b>online:</b> →	<a href="#">gra</a>	<a href="#">gg</a>	<a href="#">grp</a>	<a href="#">m5-compact</a>



Flow control valves >

Flow control valves

			
	<b>Flow control/silencers VFFK</b>	<b>Flow control valves GRLO</b>	<b>Flow control valves, barbed Y-connector with restrictor GRO, Y-PK3</b>
<b>Valve function</b>	Sound pressure control function	Flow control function	Flow control function
<b>Pneumatic connection 1</b>	M5, M7, R1/4, R1/8	M3, M5	G1/4, G1/8, M5, PK-3, QS-3, QS-4, QS-6
<b>Standard flow rate in flow control direction 6 -&gt; 0 bar</b>		33 ... 169 l/min	
<b>Standard nominal flow rate in flow control direction</b>		18 ... 95 l/min	85 ... 350 l/min
<b>Standard flow rate 0.6-&gt;0 MPa (6-&gt;0 bar, 87-&gt;0 psi)</b>	0 ... 420 l/min		
<b>Adjusting element</b>	Knurled screw	Slotted head screw	Knurled screw
<b>Description</b>	<ul style="list-style-type: none"> <li>• With polymer silencer</li> </ul>	<ul style="list-style-type: none"> <li>• Flow control valve, flow control at both ends</li> <li>• Standard or mini flow control valve</li> <li>• Precision adjustment for low and medium speeds</li> <li>• Connections: thread at both ends, thread/push-in connector</li> <li>• Connections: L-outlet</li> <li>• Metal version</li> </ul>	<ul style="list-style-type: none"> <li>• Flow control valve, flow control at both ends</li> <li>• In-line flow control valve</li> <li>• Connections: push-in connector at both ends</li> <li>• Connections: in-line, Y-shape</li> <li>• Polymer design</li> </ul>
<b>online: →</b>	<a href="#">vffk</a>	<a href="#">glo</a>	<a href="#">gro</a>

Flow control valves >

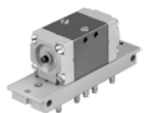

Flow control valves

		
	<b>Precision flow control valves GRPO</b>	<b>Exhaust air flow control valves, flow control/silencers GRE, GRU</b>
<b>Valve function</b>	Flow control function	Sound pressure control function
<b>Pneumatic connection 1</b>	G1/8, PK-3, PK-4	G1/2, G1/4, G1/8, G3/4, G3/8
<b>Standard flow rate in flow control direction 6 -&gt; 0 bar</b>	5.2 ... 129 l/min	
<b>Standard nominal flow rate in flow control direction</b>	3.8 ... 75.8 l/min	520 ... 3600 l/min
<b>Standard flow rate 0.6-&gt;0 MPa (6-&gt;0 bar, 87-&gt;0 psi)</b>		0 ... 8000 l/min
<b>Adjusting element</b>	Rotary knob with scale	Slotted head screw
<b>Description</b>	<ul style="list-style-type: none"> <li>• Connections: threaded connection at both ends, push-in connector at both ends</li> <li>• Metal version</li> </ul>	<ul style="list-style-type: none"> <li>• Exhaust air flow control valve GRE: sintered metal</li> <li>• Flow control/silencer GRU: polymer</li> </ul>
<b>online: →</b>	<a href="#">grpo</a>	<a href="#">gre</a>

## Product overview





### Flow control valves >

### Time delay valves

		
	<b>Solenoid and pneumatic valves, M5 Compact System</b> J, JD, JMFH, MFH, VD, VL, VL/O, VLL	<b>Time delay valves, M5 Compact System</b> VLK, VZ, VZO
<b>Pneumatic connection</b>		PK-3
<b>Standard nominal flow rate</b>	100 ... 105 l/min	60 ... 90 l/min
<b>Adjustable delay time</b>		0.25 ... 5 s
<b>Operating pressure</b>	-0.9 ... 8 bar	2.5 ... 8 bar
<b>Type of mounting</b>	Either:, On sub-base, On mounting frame, With through-hole	Either:, Front panel mounting, On mounting frame
<b>Description</b>	<ul style="list-style-type: none"> <li>Control elements with all functions for pneumatic sequence controls</li> <li>For control cabinet installation</li> <li>Fast replacement of components</li> </ul>	<ul style="list-style-type: none"> <li>Complete system offering control components with all the functions required for pneumatic sequence control</li> <li>For control cabinet installation</li> <li>Fast replacement of components</li> </ul>
<b>online:</b> →	<a href="#">m5-compact</a>	<a href="#">m5-compact</a>





### Proportional valves >

### Flow control valves

				
	<b>Proportional directional control valves</b> VPWI	<b>Proportional directional control valves</b> MPYE	<b>Proportional directional control valves</b> VPWP	<b>Proportional directional control valves</b> VPWS
<b>Valve function</b>	3-way proportional directional control valve	5/3 closed	5/3-way proportional directional control valve, closed	2/2 proportional directional control valve, closed
<b>Pneumatic connection 1</b>	G1/8	G1/4, G1/8, G3/8, M5	G1/4, G1/8, G3/8	Cartridge 7.5 mm, Cartridge 8 mm, Cartridge 15 mm
<b>Flow rate control range</b>				
<b>Operating pressure [MPa]</b>	0 ... 1.3 MPa	0 ... 1 MPa	0 ... 1 MPa	0 ... 1 MPa
<b>Operating pressure</b>	0 ... 13 bar	0 ... 10 bar	0 ... 10 bar	0 ... 10 bar
<b>Standard nominal flow rate</b>	490 l/min	100 ... 2000 l/min	350 ... 2000 l/min	
<b>Description</b>	<ul style="list-style-type: none"> <li>Dynamic range up to a maximum of 180Hz</li> <li>Full graphic display</li> <li>Stroke limitation</li> <li>Adjustable incline</li> <li>Actual value for pressure or stroke</li> <li>Food grade grease NSFH1</li> </ul>	<ul style="list-style-type: none"> <li>Controlled piston spool valve</li> <li>Analogue actuation</li> <li>Setpoint input as analogue voltage signal (0 ... 10 V)</li> <li>Suitable for servo-pneumatic applications with end-position controller SPC11</li> </ul>	<ul style="list-style-type: none"> <li>Controlled piston spool valve</li> <li>Digitally actuated</li> <li>Integrated pressure sensors for monitoring function and force control</li> <li>With auto identification</li> <li>Diagnostic function</li> <li>Integrated digital output, e.g. for a clamping/brake unit</li> <li>Suitable for servo-pneumatic applications with axis controller CPX-CMAX and end-position controller CPX-CMPX</li> </ul>	<ul style="list-style-type: none"> <li>Directly actuated poppet valve</li> <li>Operating medium: air, oxygen, inert gases</li> <li>Extremely small and lightweight</li> <li>Compact and cost-effective</li> <li>Mounting: on sub-base</li> </ul>
<b>online:</b> →	<a href="#">vpwi</a>	<a href="#">mpye</a>	<a href="#">vpwp</a>	<a href="#">vpws</a>

Proportional valves >





Flow control valves

	 <b>Proportional flow control valves VPCF</b>	 <b>Proportional flow control valves VEMD</b>	 <b>Valve units VPCB</b>	 <b>Mass flow controller VEFC</b>
<b>Valve function</b>	3-way proportional flow control valve	2-way proportional flow control valve	3-way proportional pressure regulator	2-way proportional flow control valve
<b>Pneumatic connection 1</b>	G3/8	Female thread G1/4, Female thread M5	G3/8	G1/4, R1/4, QS-10, Front metal seal 1/4"
<b>Flow rate control range</b>	20 ... 1500 l/min	0 ... 200 l/min		5 ... 200 l/min
<b>Operating pressure [MPa]</b>	0.1 ... 1 MPa	0 ... 0.6 MPa	0.4 ... 0.8 MPa	0.6 MPa
<b>Operating pressure</b>	1 ... 10 bar	0 ... 6 bar	4 ... 8 bar	6 bar
<b>Standard nominal flow rate</b>		50 ... 200 l/min	725 l/min	
<b>Description</b>	<ul style="list-style-type: none"> <li>• Linear characteristic curve for easy programming</li> <li>• To EU Explosion Protection Directive (ATEX)</li> <li>• Highly dynamic</li> <li>• Piston spool with integrated sensor</li> <li>• Electrical connection via M12x1 plug, 8-pin</li> </ul>	<ul style="list-style-type: none"> <li>• Mass flow controller (MFC) with thermal flow rate sensor and integrated control electronics</li> <li>• Dynamic regulation with short response time</li> <li>• Operating medium: air, oxygen, nitrogen, argon, CO2</li> <li>• The current flow rate value is available via the interface</li> <li>• Ideal for many applications where inert gases or oxygen need to be controlled</li> <li>• Sustainable operation thanks to efficient control</li> </ul>	<ul style="list-style-type: none"> <li>• Valve unit for controlling a pneumatic cylinder in balancer applications</li> <li>• Comprising 3/3-way proportional pressure regulator with special pressure control and shut-off valve actuation as well as two 2/2-way stop valves</li> <li>• Diagnostic display for fast error detection</li> </ul>	<ul style="list-style-type: none"> <li>• Very compact: only 24 mm wide</li> <li>• Directly controlled, dynamic piezo valve</li> <li>• Very flexible thanks to customisable control parameters</li> <li>• Excellent value for money</li> </ul>
<b>online:</b> →	<a href="#">vpcf</a>	<a href="#">vemd</a>	<a href="#">vpcb</a>	<a href="#">vefc</a>

## Product overview




### Proportional valves >

## Pressure regulators

	 <b>Proportional pressure regulators MPPES</b>	 <b>Proportional pressure regulators VPPE</b>	 <b>Proportional pressure regulators VPPM</b>	 <b>Proportional-pressure regulators, NPT VPPM</b>
<b>Valve function</b>	3-way proportional-pressure regulator, closed	3-way proportional pressure regulator, 3-way proportional-pressure regulator, closed	3-way proportional pressure regulator	3-way proportional pressure regulator
<b>Pneumatic connection 1</b>	G1/2, G1/4, G1/8	G1/8	Sub-base, G1/2, G1/4, G1/8	1/8 NPT, 1/4 NPT, 1/2 NPT
<b>Pressure regulation range [MPa]</b>	0 ... 1 MPa	0.002 ... 1 MPa	0.002 ... 1 MPa	0.006 ... 1 MPa
<b>Pressure regulation range</b>	0 ... 10 bar	0.02 ... 10 bar	0.02 ... 10 bar	0.02 ... 10 bar
<b>Operating pressure [MPa]</b>	≤1.2 MPa	0.8 MPa		
<b>Operating pressure</b>	≤12 bar	8 bar		
<b>Standard nominal flow rate</b>		310 ... 1250 l/min	380 ... 7000 l/min	380 ... 7000 l/min
<b>Description</b>	<ul style="list-style-type: none"> <li>• Directly actuated (G1/8), pilot actuated (G1/4, G1/2)</li> <li>• Setpoint value input as analogue voltage or current signal</li> <li>• Choice of pressure regulation ranges</li> <li>• Available with setpoint module</li> <li>• Electrical connection via plug, round design to DIN 45326, M16 x 0.75, 8-pin</li> <li>• With proportional solenoid</li> </ul>	<ul style="list-style-type: none"> <li>• Piloted pressure regulator</li> <li>• Setpoint input as analogue voltage signal (0 ... 10 V)</li> <li>• Electrical connection via M12x1 plug, 4 or 5-pin</li> <li>• Available with setpoint module</li> <li>• Variant with display with three retrievable presets and digital controller electronics</li> <li>• For simple control tasks</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Piloted pressure regulator</li> <li>• Multi-sensor control (cascade control)</li> <li>• Three default presets for fast commissioning</li> <li>• Integration in valve terminal MPA</li> <li>• User interface with LED displays, LCD display, adjustment/selection buttons</li> <li>• Integrated pressure sensor</li> <li>• Electrical connection via plug connector, round design, 8-pin, M12 or terminal linking</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Piloted pressure regulator</li> <li>• Multi-sensor control (cascade control)</li> <li>• Three default presets for fast commissioning</li> <li>• Integration in valve terminal MPA</li> <li>• User interface with LED displays, LCD display, adjustment/selection buttons</li> <li>• Integrated pressure sensor</li> <li>• Electrical connection via plug connector, round design, 8-pin, M12 or terminal linking</li> </ul>
<b>online:</b> →	<a href="#">mpps</a>	<a href="#">vppe</a>	<a href="#">vppm</a>	<a href="#">vppm</a>

Proportional valves >




Pressure regulators

	 <b>Proportional pressure regulators VPPX</b>	 <b>Proportional pressure regulator VPPL</b>	 <b>Proportional-pressure regulators VEAB</b>
<b>Valve function</b>	3-way proportional pressure regulator	3-way proportional-pressure regulator, closed	3-way proportional pressure regulator, 3-way proportional-pressure regulator, closed
<b>Pneumatic connection 1</b>	Sub-base, G1/2, G1/4, G1/8	Flange, G1/4	Flange, QS-4, QS-4
<b>Pressure regulation range [MPa]</b>		0.02 ... 4 MPa	
<b>Pressure regulation range</b>	0.1 ... 10 bar	-0.8 ... 60 bar	
<b>Operating pressure [MPa]</b>		≤5 MPa	
<b>Operating pressure</b>		≤50 bar	
<b>Standard nominal flow rate</b>	1400 ... 7000 l/min	245 l/min	≥4.5 l/min
<b>Description</b>	<ul style="list-style-type: none"> <li>• Pressure regulator with additional sensor input</li> <li>• Programmable, freely adjustable PID controller</li> <li>• Multi-sensor control (cascade control)</li> <li>• Control characteristic adjustable via software FCT (Festo Configuration Tool)</li> <li>• Integrated pressure sensor with separate output</li> <li>• Pressure is maintained if the controller fails</li> </ul>	<ul style="list-style-type: none"> <li>• For high-pressure applications</li> <li>• Directly actuated piston regulator</li> <li>• Available in three variants: flanged valve, flanged valve with external pilot air supply, in-line valve</li> </ul>	<ul style="list-style-type: none"> <li>• Control vacuum and/or overpressure with a single valve</li> <li>• Highly dynamic pressure control for low flow rates</li> <li>• Maximum performance and optionally available with IO-Link® interface</li> <li>• Available as an in-line valve or sub-base valve</li> <li>• Additional IO-Link® features: customisable control parameters, diagnostics, 2-point calibration, etc.</li> <li>• Silent operation and low heat generation</li> <li>• Very short switching times</li> <li>• Sustainable operation thanks to reduced pressure level and efficient control</li> </ul>
<b>online:</b> →	<a href="#">vppx</a>	<a href="#">vppl</a>	<a href="#">veab</a>

## Product overview





### Proportional valves >

## Pressure regulators

	 <b>Proportional-pressure regulators</b> <b>VEAA</b>	 <b>Proportional-pressure regulators</b> <b>VPPI</b>	 <b>Valve terminal</b> <b>VTEP</b>
<b>Valve function</b>	3-way proportional pressure regulator	3-way proportional pressure regulator	3-way proportional-pressure regulator, closed
<b>Pneumatic connection 1</b>	Flange, QS-4	G1/8	For tubing O.D. 8 mm
<b>Pressure regulation range [MPa]</b>		-0.1 ... 1.2 MPa	-0.1 ... 0.6 MPa
<b>Pressure regulation range</b>		-1 ... 12 bar	-1 ... 6 bar
<b>Operating pressure [MPa]</b>			0.2 ... 0.7 MPa
<b>Operating pressure</b>		0 ... 13 bar	2 ... 7 bar
<b>Standard nominal flow rate</b>	≥7 l/min	150 ... 1630 l/min	
<b>Description</b>	<ul style="list-style-type: none"> <li>• High precision up to 10 bar</li> <li>• Very compact size</li> <li>• Highly dynamic pressure control for very low flow rates</li> <li>• Available as an in-line valve or sub-base valve</li> <li>• Silent operation and low heat generation</li> <li>• Very short switching times</li> <li>• Sustainable operation thanks to reduced pressure level and efficient control</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Select between three predefined and one customer-specific controller preset</li> <li>• With or without display</li> <li>• Low-noise, flexible and highly dynamic</li> <li>• Precise and stable changeover, rapid switching of setpoint by high-performance moving coil actuator</li> <li>• Control via analogue current or voltage signal, digital pattern for adjustable setpoint values or pulse-width modulation signal</li> </ul>	<ul style="list-style-type: none"> <li>• Proportional valve terminal with piezo technology</li> <li>• Very compact: 10 channels on an overall width of less than 120 mm</li> <li>• Extremely dynamic and precise control of pressure and vacuum</li> <li>• Very flexible thanks to customisable control parameters</li> <li>• Digital communication interface EtherCAT</li> <li>• Very low power consumption</li> <li>• No wear and tear, no particle abrasion</li> <li>• Silent operation</li> <li>• Sustainable operation thanks to efficient control</li> </ul>
<b>online:</b> →	<a href="#">veaa</a>	<a href="#">vpqi</a>	<a href="#">vtep</a>

Process valves >




Ball valves

	 <b>Ball valves VZBD</b>	 <b>Ball valves VZBE</b>	 <b>Ball valves VZBF</b>	 <b>Ball valves VAPB</b>
<b>Design</b>	2-way ball valve	2-way ball valve, 2-way ball valve with hand lever, 3-way ball valve, L-hole, T-hole	2-way ball valve	2-way ball valve
<b>Actuation type</b>	Mechanical	Mechanical	Mechanical	Mechanical
<b>Nominal size DN</b>	15, 20, 25, 32, 40, 50, 65, 80, 100	8, 10, 15, 20, 25, 32, 40, 50, 65, 80, 100	15, 20, 25, 32, 40, 50, 65, 80, 100, 150, 200	8, 10, 15, 20, 25, 32, 40, 50, 65
<b>Process valve connection</b>	Clamp to ASME-BPE, Clamp to DIN 32676 series B, Weld-on end to ASME-BPE, Weld-on end to ISO 1127	1/4 NPT, 3/8 NPT, 1/2 NPT, 3/4 NPT, 1 NPT, 1 1/4 NPT, 1 1/2 NPT, 2 NPT, 2 1/2 NPT, 3 NPT, 4 NPT, Weld-on end according to ASME B16.11	Flange to ANSI B16.5 class 150	Rp1, Rp1 1/2, Rp1 1/4, Rp1/2, Rp1/4, Rp2, Rp2 1/2, Rp3/4, Rp3/8
<b>Flow rate Kv</b>	13 ... 1641 m3/h	5.1 ... 1637 m3/h	32 ... 7816 m3/h	5.9 ... 535 m3/h
<b>Temperature of medium</b>	-20 ... 200°C	-20 ... 200°C	-20 ... 200°C	-20 ... 150°C
<b>Nominal pressure process valve PN</b>	16	63	20	25, 40
<b>Description</b>	<ul style="list-style-type: none"> <li>• Electropolished surfaces SFV4</li> <li>• PTFE seal with little dead space</li> <li>• The high-performance ball valve for the pharmaceutical and cosmetics industry</li> <li>• FDA-compliant seal to FDA 21 CFR 177.1550</li> </ul>	<ul style="list-style-type: none"> <li>• 2-way manual, with lockable hand lever</li> <li>• 2- and 3-way with ISO 5211 head flange, with optional lockable hand lever</li> <li>• Stainless steel design</li> <li>• Pipe thread according to ASME B1.20.1 or welded end according to ASME B16.11</li> <li>• Optionally with pre-assembled hand lever</li> </ul>	<ul style="list-style-type: none"> <li>• Flanged connections to ANSI B 16.5. class 150</li> <li>• Static discharge ensured</li> <li>• API 607 Fire Safe certification</li> <li>• Stainless steel design</li> <li>• Easy to service</li> <li>• Optionally with pre-assembled hand lever</li> </ul>	<ul style="list-style-type: none"> <li>• Automatable 2-way ball valve</li> <li>• Brass design</li> <li>• Blow-out proof shaft</li> <li>• Manual operation possible using hand lever</li> <li>• Connecting thread to EN 10226-1</li> <li>• Mounting flange to ISO 5211</li> </ul>
<b>online:</b> →	<a href="#">vzbd</a>	<a href="#">vzbe</a>	<a href="#">vzbf</a>	<a href="#">vapb</a>

## Product overview



### Process valves >

## Ball valves

	 <b>Ball valves</b> <b>VZBM</b>	 <b>Ball valves</b> <b>VZBA</b>	 <b>Ball valves</b> <b>VZBC</b>
<b>Design</b>	2-way ball valve, 3-way ball valve, L-hole, T-hole	2-way ball valve, 3-way ball valve, L-hole, T-hole	2-way ball valve
<b>Actuation type</b>	Mechanical	Mechanical	Mechanical
<b>Nominal size DN</b>	8, 10, 15, 20, 25, 32, 40, 50	8, 10, 15, 20, 25, 32, 40, 50, 65, 80, 100	15, 20, 25, 32, 40, 50, 65, 80, 100
<b>Process valve connection</b>	Rp1, Rp1 1/2, Rp1 1/4, Rp1/2, Rp1/4, Rp2, Rp3/4, Rp3/8	Weld-on ends/weld-on ends, Rp1, Rp1 1/2, Rp1 1/4, Rp1/2, Rp1/4, Rp2, Rp2 1/2, Rp3, Rp3/4, Rp3/8, Rp4	Ring housing with threaded flange
<b>Flow rate Kv</b>	6 ... 156 m <sup>3</sup> /h	7 ... 1414 m <sup>3</sup> /h	19.4 ... 1414 m <sup>3</sup> /h
<b>Temperature of medium</b>	-20 ... 130°C	-10 ... 200°C	-10 ... 200°C
<b>Nominal pressure process valve PN</b>	25, 40, 50	63	16, 40
<b>Description</b>	<ul style="list-style-type: none"> <li>• Brass design</li> <li>• Pipe thread to EN 10226-1</li> </ul>	<ul style="list-style-type: none"> <li>• Automatable 2-way or 3-way ball valve</li> <li>• Stainless steel design</li> <li>• Blow-out proof shaft</li> <li>• Manual operation possible using hand lever</li> <li>• Connecting thread to EN 10226-1</li> <li>• Mounting flange to ISO 5211</li> <li>• Use in zone 1, 21, 2, 22</li> </ul>	<ul style="list-style-type: none"> <li>• Automatable 2-way compact flanged ball valve</li> <li>• Stainless steel design</li> <li>• Short installation length</li> <li>• Blow-out proof shaft</li> <li>• Manual operation possible using hand lever</li> <li>• Flange to DIN 1092-1</li> <li>• Mounting flange to ISO 5211</li> <li>• Use in zone 1, 21, 2, 22</li> </ul>
<b>online:</b> →	<a href="#">vzbm</a>	<a href="#">vzba</a>	<a href="#">vzbc</a>

Process valves >

Angle seat valves

	 <b>Angle seat valves</b> <b>VZXA</b>	 <b>Angle seat valves</b> <b>VZXF</b>
<b>Design</b>	Poppet valve with piston drive, Poppet valve with diaphragm actuator	Poppet valve with piston drive
<b>Drive size</b>	46 mm, 75 mm, 90 mm	
<b>Valve function</b>	2/2	2/2-way, closed, monostable
<b>Control function</b>	Closed via reduced spring force, N/C, Double-acting, Opened via spring force, N/O, Closed via spring force, N/C	
<b>Actuation type</b>	Pneumatic	Pneumatic
<b>Flow rate Kv</b>	4.6 ... 77.9 m <sup>3</sup> /h	3.3 ... 43 m <sup>3</sup> /h
<b>Medium pressure [MPa]</b>	0 ... 3 MPa	-0.09 ... 4 MPa
<b>Medium pressure</b>	0 ... 30 bar	-0.9 ... 40 bar
<b>Temperature of medium</b>	-30 ... 230°C	-40 ... 200°C
<b>Nominal pressure process valve PN</b>		16, 40
<b>Description</b>	<ul style="list-style-type: none"> <li>• Highly flexible, extremely high flow rates</li> <li>• Long service life</li> <li>• Stainless steel or Ecobross process valves with stainless steel or polymer actuators</li> <li>• Modular design</li> <li>• Hygienic design, insensitive to dirt</li> <li>• Quick and easy maintenance</li> <li>• Simple and sturdy: an ideal choice for virtually all media with a viscosity of 600 mm<sup>2</sup>/s</li> <li>• High chemical and thermal resistance</li> <li>• Sustainable thanks to extended life cycle and easier repairs</li> <li>• Sustainable in production thanks to the use of alternative materials</li> </ul>	<ul style="list-style-type: none"> <li>• Sturdy design</li> <li>• Stainless steel and gunmetal process valves with stainless steel, brass or aluminium actuators</li> <li>• Different actuator sizes and housing materials</li> <li>• Selection of different seat and shaft seals</li> <li>• For liquids, gases and other easily contaminated media</li> <li>• Easy-to-clean design</li> </ul>
<b>online:</b> →	<a href="#">vzxa</a>	<a href="#">vzxf</a>

## Product overview

### Process valves >

## Pinch valves



**Pinch valves  
VZQH**







**Pinch valves  
VZQA**

<b>Design</b>	Pinch valve	Pinch valve, pneumatically actuated
<b>Actuation type</b>	Manual	Pneumatic
<b>Valve function</b>	2/2-way, closed, monostable	2/2-way, closed, monostable, 2/2 open, monostable
<b>Nominal size DN</b>	6	6, 15, 25, 50
<b>Process valve connection</b>	Clamp to ASME-BPE, type A, Clamp to DIN 32676 series A, 1/4 NPT, G1/4	Clamp to ASME-BPE, type A, Clamp to ASME-BPE, type B, Clamp to DIN 32676 series A, 1/4 NPT, 1/2 NPT, 1 NPT, 2 NPT, G1, G1/2, G1/4, G2
<b>Flow rate Kv</b>	0.7 m3/h	0.7 ... 72 m3/h
<b>Medium pressure [MPa]</b>	0 ... 0.6 MPa	0 ... 0.6 MPa
<b>Medium pressure</b>	0 ... 6 bar	0 ... 6 bar
<b>Medium pressure [psi]</b>	0 ... 87 psi	0 ... 87 psi
<b>Temperature of medium</b>	-5 ... 100°C	-5 ... 150°C
<b>Nominal pressure process valve PN</b>	10	10
<b>Description</b>	<ul style="list-style-type: none"> <li>Manually operated 2/2-way valve for liquid, powdery media, solids and mixtures</li> <li>Closed at 90° lever position, secured by locking the blue locking element</li> <li>Automatic return to closed position (NC) when the hand lever is released by spring force</li> <li>Engages every 15° via blue locking element for even media flow</li> <li>Can be secured against unintentional operation</li> <li>Suitable for direct food contact in accordance with European Regulation (EC) No. 1935/2004</li> </ul>	<ul style="list-style-type: none"> <li>Modular design</li> <li>Quick and easy replacement of the diaphragm</li> <li>Sustainable thanks to extended life cycle and easier repairs</li> <li>For critical, abrasive and viscous media</li> <li>Easy-to-clean design</li> <li>Flow direction is freely selectable</li> <li>Versions with end-position sensing</li> </ul>
<b>online:</b> →	<a href="#">vzqh</a>	<a href="#">vzqa</a>

Process valves >





Solenoid-actuated media valves

	 <b>Solenoid valves VZWD-B</b>	 <b>Solenoid valves VZWD</b>	 <b>Solenoid valves VZWF</b>	 <b>Solenoid valves VZWM</b>
<b>Design</b>	Directly actuated poppet valve	Directly actuated poppet valve	Diaphragm valve, Force pilot operated	Diaphragm valve, servo-controlled
<b>Actuation type</b>	Electric	Electric	Electric	Electric
<b>Nominal size</b>	1 ... 6.4 mm	1 ... 6 mm	13.5 ... 50 mm	13 ... 50 mm
<b>Process valve connection</b>	G1/8, G1/4, 1/8 NPT, 1/4 NPT	1/8 NPT, 1/4 NPT, G1/4, G1/8, NPT1/4	1/4 NPT, 3/8 NPT, 1/2 NPT, 3/4 NPT, 1 NPT, 1 1/4 NPT, 1 1/2 NPT, 2 NPT, G1, G1 1/2, G1 1/4, G1/2, G1/4, G2, G3/4, G3/8	G1, G1 1/2, G1 1/4, G1/2, G1/4, G2, G3/4, G3/8
<b>Flow rate Kv</b>	0.04 ... 0.64 m <sup>3</sup> /h	0.06 ... 0.4 m <sup>3</sup> /h	1.8 ... 28 m <sup>3</sup> /h	1.6 ... 39 m <sup>3</sup> /h
<b>Medium pressure [MPa]</b>	0 ... 10 MPa	0 ... 9 MPa	0 ... 1 MPa	
<b>Medium pressure</b>	0 ... 100 bar	0 ... 90 bar	0 ... 10 bar	
<b>Medium pressure [psi]</b>	0 ... 1450 psi	0 ... 1305 psi	0 ... 145 psi	
<b>Temperature of medium</b>	-10 ... 140°C	-10 ... 80°C	-10 ... 80°C	-10 ... 60°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• Function-optimised</li> <li>• Extensive pressure range</li> <li>• No differential pressure required</li> </ul>	<ul style="list-style-type: none"> <li>• Extensive pressure range</li> <li>• Directly actuated poppet valve</li> <li>• No differential pressure required</li> <li>• Can also be used in vacuum technology</li> </ul>	<ul style="list-style-type: none"> <li>• High flow rates</li> <li>• Large nominal diameters with relatively small solenoids</li> <li>• No differential pressure required</li> <li>• Can also be used in vacuum technology</li> </ul>	<ul style="list-style-type: none"> <li>• Brass or stainless steel casting design</li> <li>• Electrical connection via solenoid armature tube</li> <li>• Comprehensive range of coils</li> <li>• Coil can be ordered separately</li> </ul>
<b>online:</b> →	<a href="#">vzwd</a>	<a href="#">vzwd</a>	<a href="#">vzwf</a>	<a href="#">vzwm</a>

## Product overview



### Process valves >

## Solenoid-actuated media valves

	 <b>Solenoid valves VZWP</b>	 <b>Media separated solenoid valves VYKA</b>	 <b>Media separated solenoid valves VYKB</b>	 <b>Media separated solenoid valves VYKC</b>
<b>Design</b>	Piloted piston poppet valve	Rocker valve with diaphragm seal	Electrical connection at top, Electrical connection at the side, Rocker valve with diaphragm seal	Electrical connection at the side, Rocker valve with diaphragm seal
<b>Actuation type</b>	Electric	Electric	Electric	Electric
<b>Nominal size</b>	13 ... 25 mm	1.2 mm	1.6 ... 2 mm	1.6 ... 2 mm
<b>Process valve connection</b>	1/4 NPT, 3/8 NPT, 1/2 NPT, 3/4 NPT, 1 NPT, G1, G1/2, G1/4, G3/4, G3/8			
<b>Flow rate Kv</b>	1.5 ... 11.5 m3/h	0.013 ... 0.021 m3/h	0.034 ... 0.056 m3/h	0.026 ... 0.048 m3/h
<b>Medium pressure [MPa]</b>	0.05 ... 4 MPa	-0.05 ... 0.2 MPa	-0.075 ... 0.3 MPa	-0.075 ... 0.3 MPa
<b>Medium pressure</b>	0.5 ... 40 bar	-0.5 ... 2 bar	-0.75 ... 3 bar	-0.75 ... 3 bar
<b>Medium pressure [psi]</b>	7.25 ... 580 psi	-7.25 ... 29 psi	-10.875 ... 43.5 psi	-10.875 ... 43.5 psi
<b>Temperature of medium</b>	-10 ... 80°C		0 ... 50°C	0 ... 50°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• For all applications with a differential pressure of min. 0.5 bar</li> <li>• For high pressures and high flow rates with relatively small solenoids</li> <li>• For controlling gaseous and liquid media in open circuits</li> </ul>	<ul style="list-style-type: none"> <li>• Maximum power density and precision in the smallest of spaces (1.2 mm nominal width, with a width of only 7 mm)</li> <li>• High repeat accuracy and precision in dosing processes, even for the smallest volumes</li> <li>• Very good rinsability and minimised media consumption thanks to optimised fluid chamber and small internal volume</li> <li>• FDA-listed materials (PEEK, EPDM, FKM, FFKM) also suitable for aggressive media</li> <li>• Also ideal for gas applications thanks to minimal leakage values</li> <li>• Optionally with push-on E-box VAVE-K1 with holding current reduction as an accessory to minimise heat input</li> <li>• Developed according to ISO 13485</li> <li>• Sustainable operation thanks to efficient control and active air shut-off</li> </ul>	<ul style="list-style-type: none"> <li>• Compact width of 10 mm and 12 mm for large nominal widths (1.6 mm and 2.0 mm)</li> <li>• For dosing, aspirating and for continuous flow applications</li> <li>• Very easy to clean thanks to media separation</li> <li>• High-quality materials, therefore also suitable for aggressive media</li> <li>• Developed according to ISO 13485</li> <li>• Sustainable operation thanks to efficient control and active air shut-off</li> </ul>	<ul style="list-style-type: none"> <li>• Flexible nominal widths (1.2 mm/1.6 mm/2.0 mm) with the same size (16 mm)</li> <li>• High-quality materials, therefore also suitable for aggressive media</li> <li>• Minimised heating effect thanks to intelligent holding current reduction</li> <li>• FDA-listed materials</li> <li>• Visual feedback via two LEDs simplifies use</li> <li>• Optionally with holding current reduction</li> <li>• Low energy consumption thanks to efficient actuation</li> </ul>
<b>online:</b> →	<a href="#">vzwp</a>	<a href="#">vyka</a>	<a href="#">vykb</a>	<a href="#">vykc</a>

Process valves >

Pneumatically actuated media valves

	 <b>Pneumatic valves</b> <b>VLX</b>	 <b>Media separated pneumatic valves</b> <b>VZDB</b>
<b>Design</b>	Diaphragm valve	Rocker valve with diaphragm seal
<b>Valve function</b>	2/2-way, closed, monostable	2/2-way, closed, monostable, 3/2-way, monostable, open/closed
<b>Actuation type</b>	Pneumatic	Pneumatic
<b>Nominal size</b>	13 ... 25 mm	1.6 mm
<b>Process valve connection</b>	G1, G1/2, G1/4, G3/4, G3/8	Male thread/male thread
<b>Flow rate Kv</b>		0.034 m <sup>3</sup> /h
<b>Standard nominal flow rate</b>	2400 ... 14000 l/min	
<b>Temperature of medium</b>	-10 ... 80°C	0 ... 50°C
<b>Medium pressure</b>	1 ... 10 bar	
<b>Operating pressure</b>		-0.75 ... 1 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• Poppet valve</li> <li>• Indirectly actuated</li> <li>• Brass design</li> <li>• In-line mounting</li> </ul>	<ul style="list-style-type: none"> <li>• Compact width of 10 mm</li> <li>• Very easy to clean thanks to media separation</li> <li>• High-quality materials, therefore also suitable for aggressive media</li> <li>• For dosing, aspirating and for continuous flow applications</li> <li>• Developed according to ISO 13485</li> </ul>
<b>online: →</b>	<a href="#">vlx</a>	<a href="#">vzdb</a>

Product overview

Software tools

**Configurator for ball valve units KVZB**



Size and order your custom ball valve units quickly, easily and reliably via the configurator – without waiting times. You will receive configuration-specific datasheets and the relevant CAD data or CAD models.

You can find the configurator at [→ www.festo.com/process](http://www.festo.com/process)

Process valve units >

Ball valve units






**Ball valve units KVZB**

<b>Description</b>	<ul style="list-style-type: none"> <li>• Manually actuated with hand lever</li> <li>• Automatically actuated with quarter turn actuator</li> <li>• Controlled operation with quarter turn actuator and valve positioner</li> <li>• Variants to EU Explosion Protection Directive (ATEX)</li> </ul>
<b>online:</b> <a href="#">→</a>	<a href="#">kvzb</a>

Process valve units >




Ball valve actuator units

	 <b>Ball valve units VAPB</b>	 <b>Ball valve units VZBE</b>	 <b>Ball valve actuator units VZBM</b>
<b>Design</b>	2-way ball valve, Semi-rotary drive	2-way ball valve, Semi-rotary drive	3-way ball valve, Semi-rotary drive
<b>Actuation type</b>	Pneumatic	Pneumatic	Pneumatic
<b>Nominal size DN</b>	15, 20, 25, 32, 40, 50, 63	8, 10, 15, 20, 25, 32, 40, 50, 65, 80, 100	8, 10, 15, 20, 25, 32, 40, 50
<b>Process valve connection</b>	Rp1/4, Rp3/8, Rp1/2, Rp3/4, Rp1, Rp1 1/2, Rp1 1/4, Rp2, Rp2 1/2	1/4 NPT, 3/8 NPT, 1/2 NPT, 3/4 NPT, 1 NPT, 1 1/4 NPT, 1 1/2 NPT, 2 NPT, 2 1/2 NPT, 3 NPT, 4 NPT	Rp1, Rp1 1/2, Rp1 1/4, Rp1/2, Rp1/4, Rp2, Rp3/4, Rp3/8
<b>Flow rate Kv</b>	5.9 ... 535 m <sup>3</sup> /h	19 ... 1637 m <sup>3</sup> /h	
<b>Temperature of medium</b>	-10 ... 200°C	-10 ... 200°C	-20 ... 130°C
<b>Nominal pressure process valve PN</b>	25, 40	63	25
<b>Description</b>	<ul style="list-style-type: none"> <li>• Ball valve actuator unit with double-acting quarter turn actuatorDFPD</li> <li>• Brass ball valve</li> <li>• NAMUR connection pattern for solenoid valves/limit switch attachments to VDI/VDE 3845</li> <li>• Flow is fully opened or closed in both directions</li> </ul>	<ul style="list-style-type: none"> <li>• Ball valve actuator unit with double-acting quarter turn actuatorDFPD</li> <li>• Stainless steel ball valve</li> <li>• NAMUR connection pattern for solenoid valves/limit switch attachments to VDI/VDE 3845</li> <li>• Flow is fully opened or closed in both directions</li> </ul>	<ul style="list-style-type: none"> <li>• Ball valve actuator unit with double-acting or single-acting quarter turn actuator DFPD</li> <li>• Brass ball valve</li> <li>• 2-way ball valve actuator unit with pipe thread to EN 10226-1</li> <li>• 3-way ball valve actuator unit with drilled L-hole and pipe thread to EN 10226-1</li> <li>• 3-way ball valve actuator unit with drilled T-hole and pipe thread to EN 10226-1</li> <li>• Flow is fully opened or closed in both directions</li> </ul>
<b>online:</b> →	<a href="#">vapb</a>	<a href="#">vzbe</a>	<a href="#">vzbm</a>

## Product overview

### Process valve units >

## Ball valve actuator units

	 <b>Ball valve actuator units</b> <b>VZBC</b>	 <b>Ball valve actuator units</b> <b>VZBA</b>	 <b>Ball valve actuator units</b> <b>VZPR</b>
<b>Design</b>	2-way ball valve, Semi-rotary drive	2-way ball valve, 3-way ball valve, L-hole, Semi-rotary drive, T-hole	2-way ball valve, Semi-rotary drive
<b>Actuation type</b>	Pneumatic	Pneumatic	Electric, Pneumatic
<b>Nominal size DN</b>	15, 20, 25, 32, 40, 50, 65, 80, 100	8, 10, 15, 20, 25, 32, 40, 50, 65, 80, 100	15, 20, 25, 32, 40, 50, 63
<b>Process valve connection</b>	Ring housing with threaded flange	Weld-on ends/weld-on ends, Rp1, Rp1 1/2, Rp1 1/4, Rp1/2, Rp1/4, Rp2, Rp2 1/2, Rp3, Rp3/4, Rp3/8, Rp4	Rp1, Rp1 1/2, Rp1 1/4, Rp1/2, Rp1/4, Rp2, Rp2 1/2, Rp3/4, Rp3/8
<b>Flow rate Kv</b>	19.4 ... 1414 m <sup>3</sup> /h	7 ... 1414 m <sup>3</sup> /h	
<b>Temperature of medium</b>	-10 ... 200°C	-10 ... 200°C	-20 ... 150°C
<b>Nominal pressure process valve PN</b>	16, 40	63	25, 40
<b>Description</b>	<ul style="list-style-type: none"> <li>• Ball valve actuator unit with double- or single-acting quarter turn actuator DAPS</li> <li>• Stainless steel ball valve in compact design</li> <li>• NAMUR connection pattern for solenoid valves/limit switch attachments to VDI/VDE 3845</li> <li>• Flow is fully opened or closed in both directions</li> <li>• Use in zone 1, 21, 2, 22</li> </ul>	<ul style="list-style-type: none"> <li>• Ball valve actuator unit with double- or single-acting quarter turn actuator DAPS</li> <li>• Stainless steel ball valve</li> <li>• NAMUR connection pattern for solenoid valves/limit switch attachments to VDI/VDE 3845</li> <li>• Flow is fully opened or closed in both directions</li> <li>• Use in zone 1, 21, 2, 22</li> </ul>	<ul style="list-style-type: none"> <li>• Ball valve actuator unit with double-acting quarter turn actuator DAPS</li> <li>• Brass ball valve</li> <li>• NAMUR connection pattern for solenoid valves/limit switch attachments to VDI/VDE 3845</li> <li>• Flow is fully opened or closed in both directions</li> </ul>
<b>online:</b> →	<a href="#">vzbc</a>	<a href="#">vzba</a>	<a href="#">vzpr</a>

## Software tools

### Configurator for butterfly valve units KVZA



Size and order your custom butterfly valve units quickly, easily and reliably via the configurator – without waiting times. You will receive configuration-specific datasheets and the relevant CAD data or CAD models.

You can find the configurator at  
 → [www.festo.com/process](http://www.festo.com/process)

### Process valve units >

## Butterfly valve units



### Butterfly valve units KVZA

#### Description

- For versatile use in various industry sectors
- Manually actuated with hand lever
- Automatically actuated with quarter turn actuator
- Controlled operation with quarter turn actuator and valve positioner
- Butterfly valve type: wafer or lug
- Nominal width DN25 ... DN200
- Connection standard DIN EN 1092-1 or ANSI CLASS 150

online: →

[kvza](#)

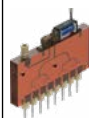
## Product overview

### Dispense and pipette heads >

## Dispense heads



**Dispense heads  
VTOE**




**Dispense heads  
VTOI**

	<b>Dispense heads VTOE</b>	<b>Dispense heads VTOI</b>
<b>Valve function</b>	2/2-way, closed, monostable	2/2-way, closed, monostable
<b>Grid dimension</b>	9 mm	9 mm
<b>Operating pressure</b>	0 bar, 0.5 bar	-0.2 bar, 0 bar, 0.65 bar, 1 bar
<b>Internal volume</b>	113 µl valve with fluid connections	10 µl fluid space valve, 178 µl distributor block with valve, needle and fittings
<b>Fluid connection</b>	8x UNF1/4-28, UNF1/4-28	Female thread 1/4-28 UNF-2B
<b>Medium</b>	Liquid media	Liquid media, Gaseous media
<b>Materials in contact with the media</b>	ETFE, FPM, FPM, PC, PEEK, PPS, High-alloy stainless steel	ETFE, FPM, PEI, PPS, High-alloy stainless steel
<b>Nominal width of dosing needle</b>	0.32 mm, 0.6 mm, 1 mm	0.3 mm
<b>Ambient temperature</b>	5 ... 40°C	5 ... 40°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• Basic function: dosing</li> <li>• Ready-to-install dosing solution saves time and costs</li> <li>• Compact 9 mm grid dimension</li> <li>• Suitable for sensitive and aggressive liquids</li> <li>• Ideally suited to non-contact dispensing of liquid media</li> <li>• Maximum dosing precision down to the microlitre range</li> <li>• Small internal volume makes it easy to rinse</li> <li>• 1- or 8-channel dispense head</li> <li>• Typical coefficient variation (CV): &lt; 1% at 10 to 1000 µl</li> </ul>	<ul style="list-style-type: none"> <li>• One valve controller for distributing to 8 dispensing channels</li> <li>• Grid dimension 9 mm – ideal for microwell plates</li> <li>• Simple design with side-by-side mounting for increased throughput</li> <li>• Only a few components are needed to form a complete system</li> <li>• Suitable for aggressive liquids</li> </ul>
<b>online: →</b>	<a href="#">vtoe</a>	<a href="#">vtoi</a>



Dispense and pipette heads >

Accessories for dispense heads

	 <p><b>Valve control modules</b> <b>VAEM</b></p>
<b>Dimensions (W x L x H)</b>	92 mm x 100 mm x 28 mm
<b>Parameterisation</b>	Parameter setting per output
<b>Max. no. of outputs</b>	8
<b>Inrush current, per output</b>	20 ... 1000 mA
<b>Holding current, per output</b>	20 ... 400 mA
<b>Inrush current, total</b>	4 A
<b>Holding current, total</b>	1.8 A
<b>Trigger level</b>	Level 14 V ... 24 V
<b>Time resolution</b>	0.2 ms
<b>Communication interface, protocol</b>	ASCII via RS232
<b>Ethernet interface, protocol</b>	Modbus® TCP
<b>Description</b>	<ul style="list-style-type: none"> <li>• Electronic actuation with integrated, adjustable holding current reduction for controlling up to 8 solenoid valves</li> <li>• Parameterisation, diagnostics and control via graphical user interface (GUI), Ethernet and RS232 interface as well as external 24 V trigger input</li> <li>• Graphical user interface (GUI) for the extremely easy operation and clear visualisation</li> <li>• Very fast valve control with a temporal resolution of 0.2 ms</li> <li>• Easy setting of a calibration factor between the individual channels (opening times per valve)</li> </ul>
<b>online:</b> →	<a href="#">vaem</a>




Dispense and pipette heads >

Accessories for dispense heads



	 <p><b>Dosing elements</b> <b>VAVN</b></p>	 <p><b>Disposable tips</b> <b>DHAP</b></p>
<b>Design</b>		Pipette tip holder for 20...1000 µl disposable tips from Festo
<b>Operating pressure [MPa]</b>	0 ... 0.4 MPa	
<b>Flow rate Kv</b>	0.003 ... 0.039 m³/h	
<b>Medium</b>	Liquid media, Gaseous media	
<b>Materials in contact with the media</b>	High-alloy stainless steel	
<b>Ambient temperature</b>	5 ... 60°C	5 ... 40°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• For dosing applications with the highest precision</li> <li>• Length of dosing needle 30 mm or 60 mm</li> <li>• Outside diameter 1.6 mm</li> <li>• Nominal width 0.3 mm, 0.6 mm or 1.2 mm</li> <li>• High corrosion resistance (corrosion resistance class CRC 3 to Festo standard 940 070) and chemical resistance</li> <li>• Design with chamfer and/or with taper</li> <li>• Pack of 10</li> </ul>	<ul style="list-style-type: none"> <li>• Volume: 20, 300, 1000 µl</li> <li>• Disposable tip material: polypropylene (clear, not coloured)</li> <li>• Filter material: polyethylene (white)</li> <li>• Optional: sterile packaging</li> <li>• Delivered stacked or in racks</li> <li>• Packaging unit: 960 pieces</li> </ul>
<b>online:</b> →	<a href="#">vavn</a>	<a href="#">dhap</a>

## Product overview

### Piezo valves





	 <b>Piezo valve VEVP</b>	 <b>Proportional flow control valves VEMD</b>	 <b>Proportional-pressure regulators VEAA</b>
<b>Valve function</b>	3-way proportional-pressure regulator, closed	2-way proportional flow control valve	3-way proportional pressure regulator
<b>Standard nominal flow rate</b>		50 ... 200 l/min	≥7 l/min
<b>Operating pressure [MPa]</b>	0.2 ... 0.7 MPa	0 ... 0.6 MPa	
<b>Operating pressure</b>	2 ... 7 bar	0 ... 6 bar	
<b>Pneumatic connection 1</b>	Flange	Female thread G1/4, Female thread M5	Flange, QS-4
<b>Nominal size</b>	4 mm	1.4 ... 6 mm	
<b>Nominal operating voltage DC</b>	24 V	12 ... 24 V	24 V
<b>Control range</b>		0 ... 200 l/min	0.001 ... 1 MPa
<b>Description</b>	<ul style="list-style-type: none"> <li>• Developed for valve terminal VTEP</li> <li>• High precision with very low power consumption</li> <li>• Valve status indication via LED</li> <li>• 4 piezo valves in a bridge circuit for precise control</li> <li>• Available in two versions: Standard and low pressure</li> <li>• Easy to replace thanks to screw mounting on the connecting plate</li> </ul>	<ul style="list-style-type: none"> <li>• Mass flow controller (MFC) with thermal flow rate sensor and integrated control electronics</li> <li>• Dynamic regulation with short response time</li> <li>• Operating medium: air, oxygen, nitrogen, argon, CO<sub>2</sub></li> <li>• The current flow rate value is available via the interface</li> <li>• Ideal for many applications where inert gases or oxygen need to be controlled</li> <li>• Sustainable operation thanks to efficient control</li> </ul>	<ul style="list-style-type: none"> <li>• High precision up to 10 bar</li> <li>• Very compact size</li> <li>• Highly dynamic pressure control for very low flow rates</li> <li>• Available as an in-line valve or sub-base valve</li> <li>• Silent operation and low heat generation</li> <li>• Very short switching times</li> <li>• Sustainable operation thanks to reduced pressure level and efficient control</li> </ul>
<b>online:</b> →	<a href="#">vevp</a>	<a href="#">vemd</a>	<a href="#">veaa</a>

## Piezo valves

	 <b>Proportional-pressure regulators</b> <b>VEAB</b>	 <b>Valves</b> <b>VEVM</b>
<b>Valve function</b>	3-way proportional pressure regulator, 3-way proportional-pressure regulator, closed	Can be allocated using the Motion App
<b>Standard nominal flow rate</b>	≥4.5 l/min	
<b>Operating pressure [MPa]</b>		0.3 ... 0.8 MPa
<b>Operating pressure</b>		3 ... 8 bar
<b>Pneumatic connection 1</b>	Flange, QS-4, QS-4	G3/8
<b>Nominal size</b>		4.2 mm
<b>Nominal operating voltage DC</b>	24 V	24 V
<b>Control range</b>	-0.1 ... 0.6 MPa	
<b>Description</b>	<ul style="list-style-type: none"> <li>• Control vacuum and/or overpressure with a single valve</li> <li>• Highly dynamic pressure control for low flow rates</li> <li>• Maximum performance and optionally available with IO-Link® interface</li> <li>• Available as an in-line valve or sub-base valve</li> <li>• Additional IO-Link® features: customisable control parameters, diagnostics, 2-point calibration, etc.</li> <li>• Silent operation and low heat generation</li> <li>• Very short switching times</li> <li>• Sustainable operation thanks to reduced pressure level and efficient control</li> </ul>	<ul style="list-style-type: none"> <li>• Functionality can be assigned via Motion app</li> <li>• For Motion Terminal VTEM</li> <li>• Consisting of 4 wired piezo pilot-controlled piston seat valves</li> <li>• Extremely long service life</li> <li>• Very low power consumption</li> <li>• Low leakage with the function of a proportional-pressure regulator</li> </ul>
<b>online:</b> →	<a href="#">veab</a>	<a href="#">vevm</a>



## Product overview

### Pneumatic control systems

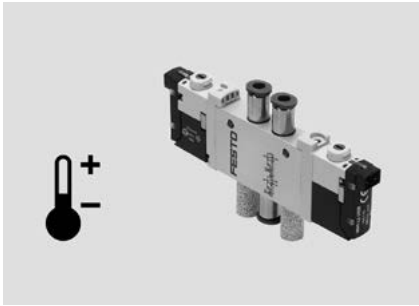
	 <b>Control blocks for two-hand start</b> <b>ZSB</b>	 <b>Pneumatic counters, M5 Compact System</b> <b>PZA, PZV</b>	 <b>Timers, M5 Compact System</b> <b>PZVT</b>	 <b>Electrical counters</b> <b>CCES</b>
<b>Design</b>		Mechanical sequence counter with pneumatic drive	Mechanical sequence counter with pneumatic drive	Electric adding counter with battery
<b>Actuation type</b>	Pneumatic			
<b>Pneumatic connection</b>		M5	Female thread M5	
<b>Pneumatic connection 2</b>	G1/8			
<b>Type of mounting</b>	Either., With through-hole, Via female thread	Front panel mounting, With through-hole	Front panel mounting	Front panel mounting
<b>Operating pressure</b>	4 ... 8 bar	2 ... 8 bar	2 ... 6 bar	
<b>Performance level (PL)</b>	Two-hand operation/category 1, Performance Level c			
<b>Description</b>	<ul style="list-style-type: none"> <li>Used wherever manual actuation poses a risk of accident to operating personnel</li> <li>With safety functions</li> </ul>	<ul style="list-style-type: none"> <li>Complete system offering control components with all the functions required for pneumatic sequence control</li> <li>For control cabinet installation</li> <li>Fast replacement of components</li> <li>Available with protective cap</li> </ul>	<ul style="list-style-type: none"> <li>Complete system offering control components with all the functions required for pneumatic sequence control</li> <li>For control cabinet installation</li> <li>Fast replacement of components</li> <li>Mechanical sequence counter with pneumatic drive</li> <li>Adjustable delay time</li> <li>Available with protective cap</li> </ul>	<ul style="list-style-type: none"> <li>8-digit LCD display</li> <li>Independent power supply</li> <li>Connection via terminal strip</li> <li>Reset button</li> </ul>
<b>online:</b> →	<a href="#">zsb</a>	<a href="#">pza</a>	<a href="#">pzvt</a>	<a href="#">cces</a>

Accessories for valves >

### Function components

	 <b>Vacuum blocks</b> <b>VABF-S4-1-V2B1</b>	 <b>Vacuum generators</b> <b>VABF-S4-2-V2B1</b>
<b>Width</b>		35 mm
<b>Nominal width of Laval nozzle</b>	2 mm	1.4 mm, 2 mm, 3 mm
<b>Ejector characteristics</b>	High vacuum, Standard	High suction rate, High vacuum, Standard
<b>Integrated function</b>	Electric ejector pulse valve, Flow control, Electric on-off valve, Air saving function, electrical, Check valve, Open silencer, Vacuum switch	Electric ejector pulse, Flow control, Electric on-off valve, Air saving function, electrical, Power ejector pulse valve, electric, Check valve, Open silencer, Vacuum switch
<b>Max. vacuum</b>		0.092 MPa
<b>Display type</b>		LED, LED indicator, 2-digit
<b>Description</b>	<ul style="list-style-type: none"> <li>In conjunction with a suction gripper to pick up, hold and place components</li> <li>Can be integrated in valve terminal VTSA, VTSA-F</li> <li>With air-saving function and adjustable ejection pulse</li> </ul>	<ul style="list-style-type: none"> <li>In conjunction with a suction gripper to pick up, hold and place components</li> <li>Can be integrated in valve terminal VTSA-F-CB</li> <li>With air-saving function and adjustable ejection pulse</li> <li>Variants with high vacuum or high suction volume flow</li> <li>Variants with energy- and air-saving power ejector pulse</li> </ul>
<b>online:</b> →	<a href="#">vabf-s4</a>	<a href="#">vabf-s4</a>

## Customised components – for your specific requirements



### Valves with customised designs

Can't find the valve you need in our catalogue?

We can offer you customised components that are tailored to your specific requirements.

Common product modifications:

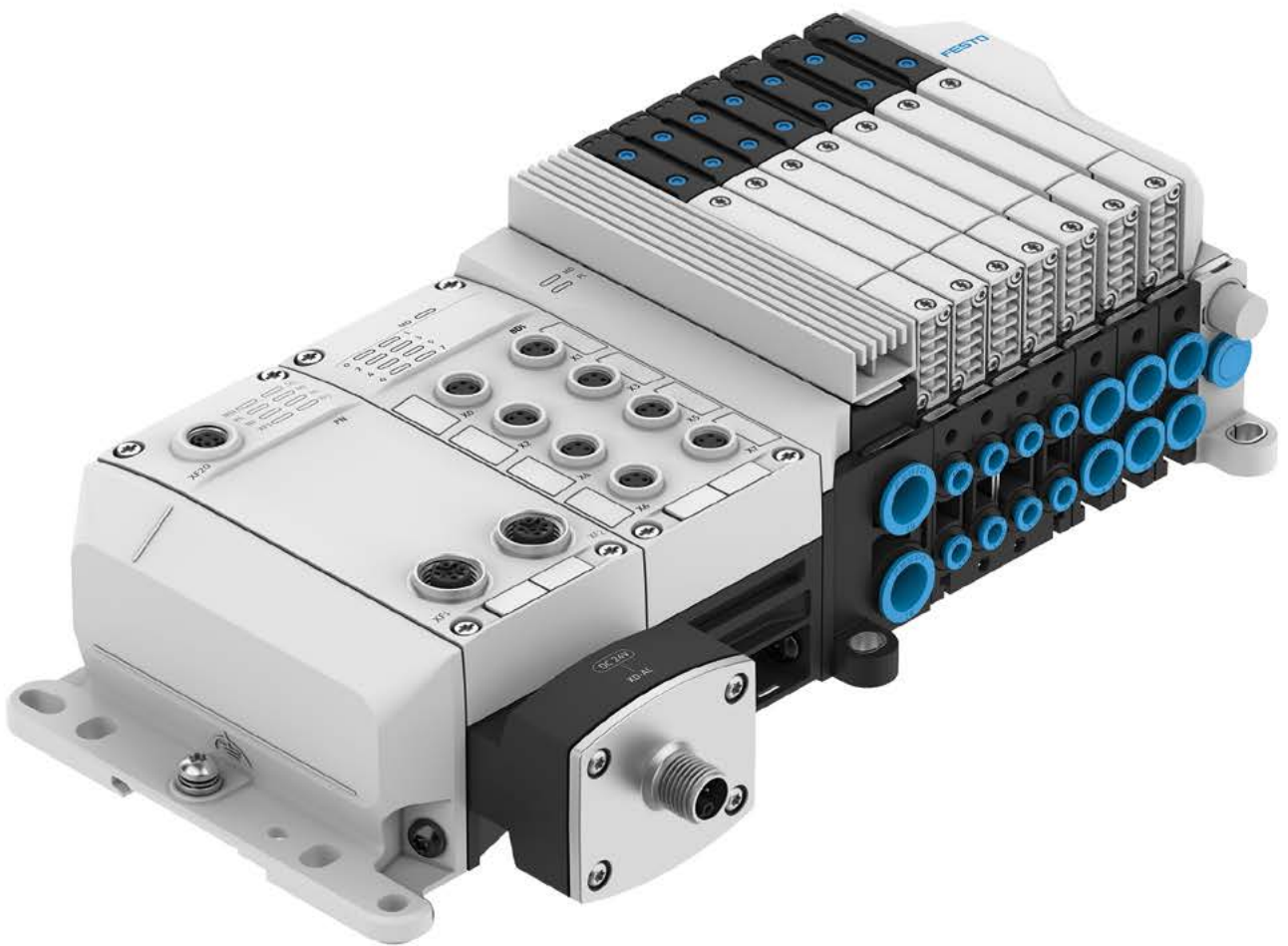
- Coatings for special ambient conditions
- Customised cables: length, pin allocation, pre-assembled with plug
- Modified actuating elements
- Modified connecting thread
- Modified valve sub-bases

Many additional variants are possible.

Ask your Festo sales engineer, who will be happy to help you:

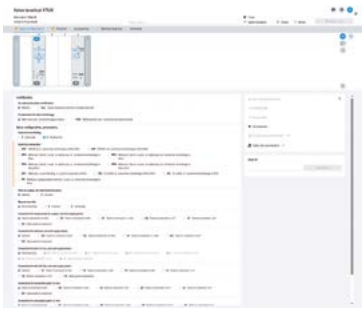
→ [www.festo.com/contact](http://www.festo.com/contact)

## Product overview






## Product overview





## Software tools

<p><b>Configurator for valve terminals</b></p> 	<p>Design a product with numerous features reliably and quickly with the help of the configurator.</p> <p>Select all the relevant product features step-by-step. The use of logic checks ensures that only correct configurations are available for selection.</p> <p>A dynamic graphic, which is generated based on the configuration, provides you with a visual aid for selecting the correct product features.</p> <p>You will find the configurator for your product at</p> <ol style="list-style-type: none"> <li>1. <a href="http://www.festo.com/catalogue">www.festo.com/catalogue</a> &gt; Valves and valve terminals &gt; Valve terminals</li> <li>2. Select the product you require</li> <li>3. Click on the blue „Configure product“ button</li> </ol>
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## Standards-based valve terminals





	 <b>Valve terminals VTSA</b>	 <b>Valve terminals VTSA-NPT</b>	 <b>Valve manifolds to ISO 15407-1 VTIA</b>
<b>Valve size</b>	18 mm, 26 mm, 42 mm, 52 mm, 65 mm	18 mm, 26 mm, 42 mm, 52 mm, 65 mm	18 mm, 26 mm
<b>Pneumatic working port</b>	1/8 NPT, 1/4 NPT, 3/8 NPT, 1/2 NPT, G1, G1/2, G1/4, G1/8, G3/8, QS-1/2, QS-10, QS-12, QS-14, QS-16, QS-3/8, QS-5/16, QS-6, QS-8	1/8 NPT, 1/8 NPTF, 1/4 NPT, 3/8 NPT, 1/2 NPT, 1 1/2 NPT, QS-10, QS-12, QS-16, QS-6, QS-8	G1/2, G1/4, G1/8, G3/8, QS-10, QS-12, QS-16, QS-8
<b>Valve function</b>	2x2/2-way, monostable, closed, 2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 5/2 bistable, 5/2-way, bistable, dominant, 5/2-way, monostable, 5/2-way, monostable, safety function, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed, 5/3-way, port 2 pressurised, 4 exhausted	2x2/2-way, monostable, closed, 2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 5/2 bistable, 5/2-way, bistable, dominant, 5/2-way, monostable, 5/2-way, monostable, safety function, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed, 5/3-way, port 2 pressurised, 4 exhausted	2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 5/2 bistable, 5/2-way, bistable, dominant, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed
<b>Max. standard nominal flow rate</b>	550 l/min at 18 mm, 700 l/min at 18 mm, 1100 l/min at 26 mm, 1300 l/min at 42 mm, 1350 l/min at 26 mm, 1860 l/min at 42 mm, 2900 l/min at 52 mm, 4000 l/min at 65 mm	550 l/min at 18 mm, 1100 l/min at 26 mm, 1300 l/min at 42 mm, 2900 l/min at 52 mm, 4000 l/min at 65 mm	550 l/min at 18 mm, 1100 l/min at 26 mm
<b>Max. no. of valve positions</b>	32	32	16
<b>Max. no. of pressure zones</b>	32	32	3
<b>Electrical actuation</b>	AP interface, Ethernet, Fieldbus, IO-Link®, Multi-pin plug, Integrated controller	AP interface, Ethernet, Fieldbus, IO-Link®, Multi-pin plug, Integrated controller	Individual connection
<b>Valve terminal design</b>	Modular, valve sizes can be mixed	Modular, valve sizes can be mixed	Modular, valve sizes can be mixed
<b>Description</b>	<ul style="list-style-type: none"> <li>• Conforms to ISO 15407-2/ISO 5599-2</li> <li>• Multi-pin plug connection or fieldbus connection via the CPX system</li> <li>• Five valve sizes can be combined on one valve terminal</li> <li>• Integratable safety functions</li> </ul>	<ul style="list-style-type: none"> <li>• Conforms to ISO 15407-2/ISO 5599-2</li> <li>• Multi-pin plug connection or fieldbus connection via the CPX system</li> <li>• Five valve sizes can be combined on one valve terminal</li> <li>• Integratable safety functions</li> </ul>	<ul style="list-style-type: none"> <li>• Conforms to ISO 15407-1</li> <li>• Wide range of individual electrical connections</li> <li>• Standardised electrical connection: square plug type C or individual connection with M8/M12 central plug</li> </ul>
<b>online:</b> →	<a href="#">vtsa</a>	<a href="#">vtsa</a>	<a href="#">vtia</a>

## Universal valve terminals

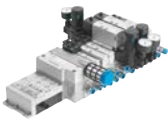


	 <b>Valve terminals VTUX-A-P</b>	 <b>Valve manifolds VTUG-S</b>	 <b>Valve terminals with multi-pin plug/fieldbus connection VTUG</b>	 <b>Valve terminal VTUG-EX with multi-pin, fieldbus interface VTUG-EX</b>
<b>Valve size</b>	10 mm	10 mm, 14 mm, 18 mm	10 mm, 14 mm, 18 mm	10 mm, 14 mm, 18 mm
<b>Valve function</b>	2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 5/2 bistable, 5/2-way, monostable, 5/3 closed, 5/3-way valve with holding function, for vacuum switching unit, 5/4-way valve with holding function, for vacuum generator, 5/4 closed, 2 or 4 exhausted	2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 5/2 bistable, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed	2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 3/2-way, closed, monostable, 3/2 open, monostable, 5/2 bistable, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed	2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 3/2-way, closed, monostable, 3/2 open, monostable, 5/2 bistable, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed
<b>Max. standard nominal flow rate</b>		380 l/min at 10 mm, 780 l/min at 14 mm, 1380 l/min at 18 mm	330 l/min at 10 mm, 630 l/min at 14 mm, 1200 l/min at 18 mm	330 l/min at 10 mm, 630 l/min at 14 mm, 1200 l/min at 18 mm
<b>Max. no. of valve positions</b>	32, 64	16	24	24
<b>Max. no. of pressure zones</b>	16	9	13	13
<b>Electrical actuation</b>		Individual connection	AP interface, Individual connection, Fieldbus, I-Port, IO-Link®, Multi-pin plug	Fieldbus, I-Port, IO-Link®, Multi-pin plug
<b>Valve terminal design</b>	Modular and expandable	Fixed grid	Fixed grid	Fixed grid
<b>Description</b>	<ul style="list-style-type: none"> <li>• Flexible for centralised and decentralised installation</li> <li>• Compact, lightweight yet robust</li> <li>• Modular and cost-effective</li> <li>• High flow rates</li> <li>• Versatile options for creating pressure zones</li> </ul>	<ul style="list-style-type: none"> <li>• Compact with small VUVG valves</li> <li>• Connection technology easy to change via the E-box</li> <li>• Wide range of valve functions</li> <li>• Also with semi in-line valves</li> </ul>	<ul style="list-style-type: none"> <li>• Low-cost fixed grid</li> <li>• Extremely easy assembly</li> <li>• Exchangeable electrical control</li> <li>• IO-Link® capable</li> <li>• Valves VUVG with individual electrical connection can be integrated</li> <li>• Also available with pneumatic multiple connector plate</li> <li>• Part of the VG series</li> <li>• Energy-efficient thanks to reverse operation and targeted pressure reduction</li> <li>• Optimised and space-saving variant available for installation in control cabinets</li> <li>• Variants with hot-swap connections: valves can be replaced during operation</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> </ul>	<ul style="list-style-type: none"> <li>• To EU Explosion Protection Directive (ATEX)</li> <li>• Stainless-steel-coated terminal strips for extreme corrosion resistance, suitable for control cabinets and environments up to IP69k</li> </ul>
<b>online:</b> →	<a href="#">vtux</a>	<a href="#">vtug</a>	<a href="#">vtug</a>	<a href="#">vtug</a>

## Product overview

### Universal valve terminals




	 <b>Valve terminal with multi-pin, fieldbus interface VTUG-F1A</b>	 <b>Valve manifolds VTUS</b>	 <b>Valve terminals MPA-L</b>	 <b>Valve terminals MPA-S</b>
<b>Valve size</b>	10 mm, 14 mm	21 mm, 26.5 mm, 31 mm	10 mm, 14 mm, 20 mm	10 mm, 14 mm, 20 mm
<b>Valve function</b>	2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 3/2-way, closed, monostable, 3/2 open, monostable, 5/2 bistable, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed	2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 3/2-way, closed, monostable, 3/2 open, monostable, 5/2 bistable, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed	2/2-way, closed, monostable, 2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 3/2-way, closed, monostable, 3/2 open, monostable, 5/2 bistable, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed	2/2-way, closed, monostable, 2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 3-way proportional pressure regulator, 3/2-way, closed, monostable, 3/2 open, monostable, 5/2 bistable, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed
<b>Max. standard nominal flow rate</b>	330 l/min at 10 mm, 630 l/min at 14 mm		360 l/min at 10 mm, 670 l/min at 14 mm, 870 l/min at 20 mm	360 l/min at 10 mm, 550 l/min at 14 mm, 700 l/min at 20 mm
<b>Max. no. of valve positions</b>	24	16	32	24, 64, 8
<b>Max. no. of pressure zones</b>	13	9	20	3, 7, 17
<b>Electrical actuation</b>	AP interface, I-Port, IO-Link®, Multi-pin plug	Individual connection	Fieldbus, I-Port, IO-Link®, Multi-pin plug	AP interface, AS-Interface, Fieldbus, Multi-pin plug
<b>Valve terminal design</b>	Fixed grid	Fixed grid	Valve sizes can be mixed	Modular, valve sizes can be mixed
<b>Description</b>	<ul style="list-style-type: none"> <li>Recommended for production plants for the manufacture of Li-ion manifolds (F1A)</li> <li>Low-cost fixed grid</li> <li>Extremely easy assembly</li> <li>Exchangeable electrical control</li> <li>IO-Link® capable</li> <li>Part of the VG series</li> <li>Energy-efficient thanks to reverse operation and targeted pressure reduction</li> </ul>	<ul style="list-style-type: none"> <li>Sturdy valves VUVS with long service life</li> <li>Individual electrical connection</li> <li>Pilot air supply in the manifold rail</li> <li>Comprehensive range of accessories</li> </ul>	<ul style="list-style-type: none"> <li>Maximum modularity</li> <li>System can be extended as required with individual sub-bases and modular tie rods</li> <li>Polymer sub-bases</li> <li>3 valve sizes</li> <li>Tamper-proof fixed flow restrictor</li> <li>Fieldbus interface via CPX</li> <li>IO-Link® capable</li> </ul>	<ul style="list-style-type: none"> <li>Valve terminals for universal applications</li> <li>High-performance valves in a sturdy metal housing</li> <li>Metal linking</li> <li>Two valve sizes can be combined</li> <li>Excellent communication thanks to serial linking</li> <li>Fieldbus interface via CPX</li> <li>Max. 128 valves</li> </ul>
<b>online:</b> →	<a href="#">vtug-f1a</a>	<a href="#">vtus</a>	<a href="#">mpa-l</a>	<a href="#">mpa-s</a>

## Universal valve terminals




	 <b>Valve terminals VTSA-F</b>	 <b>Valve terminals VTSA-F-CB</b>	 <b>Valve terminals VTSA-F-NPT</b>
<b>Valve size</b>	18 mm, 26 mm, 42 mm, 52 mm, 65 mm	18 mm, 26 mm, 42 mm, 52 mm	18 mm, 26 mm, 42 mm, 52 mm, 65 mm
<b>Valve function</b>	2x2/2-way, monostable, closed, 2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 5/2 bistable, 5/2-way, bistable, dominant, 5/2-way, monostable, 5/2-way, monostable, safety function, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed, 5/3-way, port 2 pressurised, 4 exhausted	2x2/2-way, monostable, closed, 2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 5/2 bistable, 5/2-way, bistable, dominant, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed, 5/3-way, port 2 pressurised, 4 exhausted	2x2/2-way, monostable, closed, 2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 5/2 bistable, 5/2-way, bistable, dominant, 5/2-way, monostable, 5/2-way, monostable, safety function, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed, 5/3-way, port 2 pressurised, 4 exhausted
<b>Max. standard nominal flow rate</b>	700 l/min at 18 mm, 1350 l/min at 26 mm, 1860 l/min at 42 mm, 2900 l/min at 52 mm, 4000 l/min at 65 mm	700 l/min at 18 mm, 1350 l/min at 26 mm, 1860 l/min at 42 mm, 2900 l/min at 52 mm	700 l/min at 18 mm, 1350 l/min at 26 mm, 1860 l/min at 42 mm, 2900 l/min at 52 mm, 4000 l/min at 65 mm
<b>Max. no. of valve positions</b>	32		32
<b>Max. no. of pressure zones</b>	16		16
<b>Electrical actuation</b>	AP interface, Ethernet, Fieldbus, IO-Link®, Multi-pin plug, Integrated controller	Ethernet, Fieldbus, Integrated controller	AP interface, Ethernet, Fieldbus, IO-Link®, Multi-pin plug, Integrated controller
<b>Valve terminal design</b>	Modular, valve sizes can be mixed	Modular, valve sizes can be mixed	Modular, valve sizes can be mixed
<b>Description</b>	<ul style="list-style-type: none"> <li>• Flow rate-optimised valve terminal VTSA</li> <li>• Linking with increased flow rates</li> <li>• Functions like standard valve manifolds VTSA</li> </ul>	<ul style="list-style-type: none"> <li>• Valve terminal VTSA optimised for flow rate and communication</li> <li>• Extended diagnostic functions via CBUS and LED display</li> <li>• Previous external cabling is now unnecessary, while the installation space remains the same</li> <li>• Up to 96 valve addresses and up to four voltage zones, three of which can be safely shut off</li> <li>• For applications with increased safety requirements such as manual work stations</li> <li>• Control via CPX pneumatic interface with serial communication</li> <li>• Five valve sizes can be combined on one valve terminal</li> </ul>	<ul style="list-style-type: none"> <li>• Flow rate-optimised valve terminal VTSA</li> <li>• Linking with increased flow rates</li> <li>• Functions like standard valve manifolds VTSA</li> </ul>
<b>online:</b> →	<a href="#">vtsa</a>	<a href="#">vtsa-f</a>	<a href="#">vtsa</a>

## Product overview

### Universal valve terminals



	 <b>Valve terminals CPV-SC</b>	 <b>Valve terminals, Compact Performance CPV10, CPV14, CPV18</b>	 <b>Valve manifold assemblies, Compact Performance CPV10-EX-I</b>
<b>Valve size</b>	10 mm	10 mm, 14 mm, 18 mm	10 mm
<b>Valve function</b>	2/2-way, closed, monostable, 3/2-way, closed, monostable, 3/2 open, monostable, 5/2 bistable, 5/2-way, monostable	2x2/2-way, monostable, closed, 2x2/2-way, open/closed, monostable, 2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 5/2 bistable, 5/2-way, monostable, Vacuum generator, Vacuum generator + 2/2-way, closed, monostable	2x2/2-way, monostable, closed, 2x2/2-way, open/closed, monostable, 2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 5/2 bistable, 5/2-way, monostable, 5/3 closed
<b>Max. standard nominal flow rate</b>	170 l/min at 10 mm	400 l/min at 10 mm, 800 l/min at 14 mm, 1600 l/min at 18 mm	400 l/min at 10 mm
<b>Max. no. of valve positions</b>	16	8	8
<b>Max. no. of pressure zones</b>	8	2	2
<b>Electrical actuation</b>	CPI installation system, Individual connection, Multi-pin plug	AS-Interface, CPI installation system, Individual connection, Fieldbus, Multi-pin plug	Individual connection
<b>Valve terminal design</b>	Fixed grid	Fixed grid	Fixed grid
<b>Description</b>	<ul style="list-style-type: none"> <li>• Small and compact</li> <li>• High flow rate even with a compact design</li> <li>• Suitable for vacuum</li> <li>• Multi-pin or fieldbus control</li> </ul>	<ul style="list-style-type: none"> <li>• Maximum performance in the smallest of spaces</li> <li>• Three sizes</li> <li>• Wide range of connection and mounting options</li> <li>• Multi-pin or fieldbus control</li> <li>• IO-Link® capable</li> </ul>	<ul style="list-style-type: none"> <li>• Intrinsically safe valve manifold assembly to ATEX category 2 (zone 1)</li> <li>• Optimised for control cabinet assembly</li> <li>• Optimal for pilot control of process valves</li> </ul>
<b>online:</b> →	<a href="#">cpv-sc</a>	<a href="#">cpv</a>	<a href="#">cpv10-ex</a>

## Application-specific valve terminals



	 <b>Valve terminals MPA-C</b>	 <b>Valve terminals VTOC</b>	 <b>Valve terminals MH1</b>
<b>Valve size</b>	14 mm	10 mm	10 mm
<b>Grid dimension</b>	26.8 mm		
<b>Valve function</b>	2/2-way, closed, monostable, 2x3/2-way, monostable, closed, 2x3/2-way, open, monostable, 2x3/2-way, open/closed, monostable, 3/2-way, closed, monostable, 3/2 open, monostable, 5/2 bistable, 5/2-way, monostable, 5/3-way, pressurised, 5/3 exhausted, 5/3 closed	2x3/2-way, monostable, closed	2/2-way, closed, monostable, 3/2-way, closed, monostable, 3/2 open, monostable
<b>Max. standard nominal flow rate</b>	780 l/min at 14 mm	10 l/min at 10 mm	10 l/min at 10 mm
<b>Operating pressure [MPa]</b>	-0.09 ... 0.8 MPa	0 ... 0.8 MPa	
<b>Operating pressure</b>	-0.9 ... 8 bar	0 ... 8 bar	-0.9 ... 8 bar
<b>Operating pressure [psi]</b>	-13.05 ... 116 psi	0 ... 116 psi	
<b>Electrical actuation</b>	I-Port, IO-Link®, Multi-pin plug	I-Port, IO-Link®, Multi-pin plug	Individual connection, Multi-pin plug
<b>Nominal operating voltage DC</b>	24 V	24 V	5 V, 12 V, 24 V
<b>Max. no. of valve positions</b>	32	24	24
<b>Valve terminal design</b>	Modular and expandable	Fixed grid	Fixed grid
<b>Description</b>	<ul style="list-style-type: none"> <li>• Valve terminal in clean design</li> <li>• Easy-to-clean design</li> <li>• High corrosion resistance</li> <li>• Degree of protection IP69K</li> <li>• FDA-compliant materials</li> <li>• Redundant sealing system</li> </ul>	<ul style="list-style-type: none"> <li>• Compact pilot valves</li> <li>• Compact assembly</li> <li>• Greater safety thanks to interlock function</li> <li>• Multi-pin or fieldbus control</li> <li>• IO-Link® capable</li> </ul>	<ul style="list-style-type: none"> <li>• Miniaturised poppet valves</li> <li>• Multi-pin or electrical individual connection</li> </ul>
<b>online:</b> →	<a href="#">mpa-c</a>	<a href="#">vtoc</a>	<a href="#">mh1</a>

Product overview

Application-specific valve terminals

	 <b>Dispense heads VTOE</b>	 <b>Dispense heads VTOI</b>
<b>Grid dimension</b>	9 mm	9 mm
<b>Valve function</b>	2/2-way, closed, monostable	2/2-way, closed, monostable
<b>Nominal size</b>	0.8 mm	0.8 mm
<b>Nominal width of dosing needle</b>	0.32 ... 1 mm	0.3 mm
<b>Length of dosing needle</b>	30 mm	30 mm
<b>Operating pressure [MPa]</b>	0 ... 0.05 MPa	-0.02 ... 0.1 MPa
<b>Operating pressure</b>	0 ... 0.5 bar	-0.2 ... 1 bar
<b>Operating pressure [psi]</b>	0 ... 7.25 psi	-2.9 ... 14.5 psi
<b>Electrical connection</b>	2-wire, 9-pin, Cable, Plugs, Sub-D, Open end	2-wire, 2x single wires, Open end
<b>Nominal operating voltage DC</b>	24 V	24 V
<b>Description</b>	<ul style="list-style-type: none"> <li>• Basic function: dosing</li> <li>• Ready-to-install dosing solution saves time and costs</li> <li>• Compact 9 mm grid dimension</li> <li>• Suitable for sensitive and aggressive liquids</li> <li>• Ideally suited to non-contact dispensing of liquid media</li> <li>• Maximum dosing precision down to the microlitre range</li> <li>• Small internal volume makes it easy to rinse</li> <li>• 1- or 8-channel dispense head</li> <li>• Typical coefficient variation (CV): &lt; 1% at 10 to 1000 µl</li> </ul>	<ul style="list-style-type: none"> <li>• One valve controller for distributing to 8 dispensing channels</li> <li>• Grid dimension 9 mm – ideal for microwell plates</li> <li>• Simple design with side-by-side mounting for increased throughput</li> <li>• Only a few components are needed to form a complete system</li> <li>• Suitable for aggressive liquids</li> </ul>
<b>online:</b> →	<a href="#">vtoe</a>	<a href="#">vtoi</a>

## Application-specific valve terminals

	 <p><b>Valve terminal VTEP</b></p>	 <p><b>Valve terminals VTOP</b></p>
<b>Size</b>		100 mm
<b>Grid dimension</b>	16 mm	
<b>Variants</b>		Manifold block for safety functions, HFT0 prepared for exhaust, VDI/VDE 3845, Manifold block for safety functions, HFT0 prepared for exhausting, VDI/VDE 3847, Manifold block for safety functions, HFT1 prepared for exhausting, VDI/VDE 3847, End plate, double-acting, active direction can be switched, Filter regulator, pressure range 0.5 ... 12 bar, grade of filtration 40 µm, Filter regulator, pressure range 0.5 ... 12 bar, grade of filtration 5 µm, Module for reaching a specific end position in case of a pressure failure, Volume booster, double-acting, Volume booster, single-acting
<b>Operating pressure [MPa]</b>	0.2 MPa, 0.7 MPa	0 MPa, 0.9 MPa
<b>Operating pressure</b>	2 bar, 7 bar	0 bar, 9 bar
<b>Operating pressure [psi]</b>	29 psi, 101.5 psi	0 psi, 130.5 psi
<b>Pneumatic connection</b>		Sub-base design, airing
<b>Description</b>	<ul style="list-style-type: none"> <li>• Proportional valve terminal with piezo technology</li> <li>• Very compact: 10 channels on an overall width of less than 120 mm</li> <li>• Extremely dynamic and precise control of pressure and vacuum</li> <li>• Very flexible thanks to customisable control parameters</li> <li>• Digital communication interface EtherCAT</li> <li>• Very low power consumption</li> <li>• No wear and tear, no particle abrasion</li> <li>• Silent operation</li> <li>• Sustainable operation thanks to efficient control</li> </ul>	<ul style="list-style-type: none"> <li>• Innovative, modular, compact complete solution for control applications</li> <li>• Modules such as fail-safe, volume booster and filter regulator can be combined with one another as required, are easy to install, and can be extended and retrofitted without any problems</li> <li>• Patented integrated air duct to supply all modules as well as actuator and positioner, without leak-prone, external piping</li> <li>• Standardised mounting interface for direct attachment of a positioner according to VDI/VDE 3847-2</li> <li>• Optimised for positioner CMSH for controlling single- and double-acting quarter turn and linear actuators</li> <li>• Suitable for quarter turn actuators DFPD-C with mechanical interface to VDI/VDE 3847-2 and for linear actuators DFPI-NB3 based on ISO 15552</li> <li>• Sustainable operation thanks to leakage reduction at sealing points</li> </ul>
<b>online:</b> →	<a href="#">vtep</a>	<a href="#">vtop</a>

## Product overview

## Software tools

### Commissioning software Automation Suite



A quick and reliable way to a ready-to-use drive system, the Festo Automation Suite combines the parameterisation, programming and maintenance of complete drive systems from the mechanics to the control system – and all with just one software. Perfect for making industrial automation simple, efficient and consistent.

#### Plug-in automation system CPX-E

- Controller programming in CODESYS as a system expansion for applications ranging from SoftMotion to robotics
  - Just 2 mouse clicks instead of 100: greatly simplified integration of the servo drive CMMT-AS into the control program with CPX-E-CEC
  - Conveniently install the plug-in using the software
- You can find this tool on the Internet at

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

### Connectivity Finder





This tool can be used to find the optimum way to connect a Festo solution to your preferred (non-Festo) controller. You will also be provided with expert knowledge for your selected connection option, making the integration of the Festo solution into your machine really easy.

You will find this tool at



→ [www.festo.com/x/connectivity-finder](http://www.festo.com/x/connectivity-finder)

## Electrical peripherals




	 Terminal CPX	 Remote I/O systems CPX-AP-A
<b>Protocol</b>		ACD (Address Conflict Detection), AP, DLR (Device Level Ring), EtherCAT®, EtherCAT CoE, EtherCAT Distributed Clocks (DC), EtherCAT EoE, EtherCAT FoE, EtherCAT Modular Device Profile (MDP), EtherNet/IP, EtherNet/IP QoS, EtherNet/IP Quickconnect, LLDP, MRP, MRPD (ring redundancy), Modbus/TCP (Modbus/UDP), PROFINET FSU, PROFINET I&MO .. 3, PROFINET IRT, PROFINET RT, PROFINET shared device, S2 system redundancy, SNMP
<b>Electrical actuation</b>	Fieldbus, Integrated controller	AP interface, Ethernet
<b>Max. address capacity, inputs</b>	64 byte	1024 ... 4096 byte
<b>Maximum address volume for outputs</b>	64 byte	1024 ... 4096 byte
<b>Parameterisation</b>	Diagnostic behaviour, Fail-safe response, Forcing of channels, Signal setup	
<b>Degree of protection</b>	IP65, IP67	IP65, IP67
<b>Nominal operating voltage DC</b>	24 V	
<b>Operating voltage range DC</b>	18 ... 30 V	
<b>Description</b>	<ul style="list-style-type: none"> <li>Automation platform</li> <li>Open to all common fieldbus protocols and Ethernet</li> <li>Integrated diagnostic and maintenance functions</li> <li>Can be used as stand-alone remote I/O or with valve terminals MPA-S, MPA-L, VTSA/VTSA-F</li> <li>Choice of polymer or metal interlinking block with individual linking</li> <li>Analogue inputs and outputs, 2-way/4-way, with optional HART protocol</li> </ul>	<ul style="list-style-type: none"> <li>Modular and lightweight IO system in IP65/IP67</li> <li>Highly flexible remote IO system with maximum performance</li> <li>Can be expanded and easily combined with CPX-AP-A and CPX-AP-I to form an integrated system</li> <li>Seamless connectivity along with advanced diagnostics option increase the machine availability and productivity</li> <li>Easy to integrate into the controller of your choice: PROFINET, PROFIBUS, EtherCAT®, EtherNet/IP, ModbusTCP, PROFIBUS</li> <li>Module for IO-Link® available</li> <li>Fits perfectly into our comprehensive product portfolio of electro-mechanical actuators, motors, servo drives and control systems</li> <li>Powerful remote I/O system that flexibly links 80 modules at a data rate of 200 Mbaud in real time</li> <li>Sustainable operation thanks to energy shut-off</li> </ul>
<b>online:</b> →	<a href="#">cpx</a>	<a href="#">cpx-apa</a>

## Product overview

### Electrical peripherals



	 <p><b>Automation systems</b> <b>CPX-AP-I</b></p>	 <p><b>For automation systems</b> <b>CPX-AP-I</b></p>
<b>Protocol</b>		EtherCAT®, EtherNet/IP, IO-Link®, PROFIBUS DP-V1, PROFINET IRT, PROFINET RT
<b>Max. address capacity, inputs</b>		244 ... 2048 byte
<b>Maximum address volume for outputs</b>		244 ... 2048 byte
<b>Degree of protection</b>		IP65, IP67
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electro-mechanical actuators, motors, servo drives and control systems</li> <li>• Powerful remote I/O system that flexibly links 80 modules at a data rate of 200 Mbaud in real-time</li> <li>• Seamless connectivity along with advanced diagnostics option increase the machine availability and productivity</li> <li>• Easy to integrate into the controller of your choice: PROFINET, EtherCAT®, EtherNet/IP, ModbusTCP</li> <li>• Real-time capability and deterministic system behaviour enable cycle times of up to 250 µs</li> <li>• Cable lengths of up to 50 m between every module enable vast system dimensions</li> <li>• The IO-Link master and parameterisation software enable simple integration of any IO-Link® devices</li> <li>• Ethernet performance up to the valve terminal and digital as well as analogue input/output modules</li> <li>• Sustainable operation thanks to energy shut-off</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electro-mechanical actuators, motors, servo drives and control systems</li> <li>• Decentralised and lightweight I/O system in IP65/IP67</li> <li>• Highly flexible remote IO system with maximum performance</li> <li>• Can be expanded and easily combined with CPX-AP-I and CPX-AP-A to form an integrated system</li> <li>• Seamless connectivity along with advanced diagnostics option increase the machine availability and productivity</li> <li>• Easy to integrate into the controller of your choice: PROFINET, EtherCAT®, EtherNet/IP, ModbusTCP</li> <li>• Module for IO-Link® available</li> <li>• Powerful remote I/O system that flexibly links 80 modules at a data rate of 200 Mbaud in real-time</li> <li>• Cable lengths of up to 50 m between every module enable vast system dimensions</li> </ul>
<b>online:</b> →	<a href="#">cpx-api</a>	<a href="#">cpx-api</a>

## Electrical peripherals

	 <b>Automation systems CPX-E</b>	 <b>Electrical interfaces CPX-CTEL</b>	 <b>Measuring modules CPX-CMIX</b>
<b>Protocol</b>		I-Port, IO-Link®	
<b>Electrical actuation</b>	Fieldbus, Integrated controller		
<b>Max. address capacity, inputs</b>	64 byte	32 byte	
<b>Maximum address volume for outputs</b>	64 byte	32 byte	
<b>Parameterisation</b>		Diagnostic behaviour, Fail-safe per channel, Forcing per channel, Idle mode per channel, Module parameters, Tool-change mode	
<b>Degree of protection</b>	IP20	IP65, IP67	IP65, To IEC 60529
<b>Nominal operating voltage DC</b>		24 V	24 V
<b>Operating voltage range DC</b>		18 ... 30 V	18 ... 30 V
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Modern control system with high performance</li> <li>• Fieldbus master interfaces, EtherCAT® master, fieldbus slave interfaces, PROFINET, EtherNet/IP, PROFIBUS, EtherCAT® digital input modules (16DI), digital output modules (8DO/0.5A)</li> <li>• Analogue input modules (current, voltage), analogue output modules (current, voltage)</li> <li>• Modern programming with CoDeSys V3 to IEC 61131-3</li> <li>• Integration of SoftMotion functions (SoftMotion)</li> <li>• Compact I/O assembly</li> <li>• Easy mounting of the control system</li> </ul>	<ul style="list-style-type: none"> <li>• CPX-CTEL master module with 4 I-Port connections</li> <li>• Decentralised pneumatic components and sensors for fast processes</li> <li>• Standardised M12 connections</li> </ul>	<ul style="list-style-type: none"> <li>• Pneumatics and electrics – movement and measurement on one platform</li> <li>• Innovative measurement technology for piston rod drives, rodless drives, rotary drives</li> <li>• Control via fieldbus</li> <li>• Remote maintenance, remote diagnostics, web server, SMS and e-mail alerts are all possible via TCP/IP</li> <li>• Modules can be quickly exchanged and expanded without altering the wiring</li> </ul>
<b>online:</b> →	<a href="#">cpx-e</a>	<a href="#">cpx-ctel</a>	<a href="#">cpx-cmix</a>

## Product overview

### Electrical peripherals

	 <b>Fieldbus modules</b> <b>CTEU</b>	 <b>AS-Interface® module</b> <b>ASI</b>
<b>Protocol</b>	AS-Interface, CANopen, CC-Link, CC-LINK®, DeviceNet, EtherCAT, EtherNet/IP, EtherCAT®, PROFINET, PROFIBUS DP, PROFINET RT, VARAN, Modbus® TCP, PROFIBUS DP	
<b>Electrical actuation</b>		
<b>Max. address capacity, inputs</b>	2 ... 64 byte	
<b>Maximum address volume for outputs</b>	2 ... 64 byte	
<b>Parameterisation</b>	Activate diagnostics, Diagnostic behaviour, Fail-safe and idle response, Fail-safe response, IO-Link mode, Watchdog disable, Watchdog enable	
<b>Degree of protection</b>	IP65, IP67	
<b>Nominal operating voltage DC</b>	24 ... 30 V	
<b>Operating voltage range DC</b>	18 ... 31.6 V	
<b>Description</b>	<ul style="list-style-type: none"> <li>• For valve terminals VTUG, MPA-L, VTOC</li> <li>• Can be expanded into the installation system CTEL</li> <li>• Fieldbus-typical LEDs, interfaces and switching elements</li> <li>• Isolated power supply for electronics and valves</li> </ul>	<ul style="list-style-type: none"> <li>• Accessories for the AS-Interface installation system</li> <li>• Compact I/O modules (IP65, IP67)</li> </ul>
<b>online: →</b>	<a href="#">cteu</a>	<a href="#">as-interface</a>

### Customised components – for your specific requirements



#### Valve terminals with customised designs

Can't find the valve terminal you need in our catalogue?

We can offer you customised components that are tailored to your specific requirements.

Common product modifications:

- Coatings for special ambient conditions
- Customised cables: length, pin allocation, pre-assembled with plug
- Modified actuating elements
- Modified connecting thread
- Modified valve sub-bases

Many additional variants are possible.

Ask your Festo sales engineer, who will be happy to help you:

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



## Product overview

## Software tools

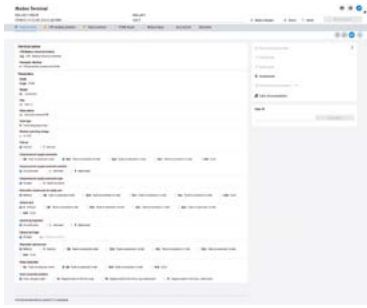
### Connectivity Finder



You can use this tool to find the optimum way to connect a Festo solution to your preferred (non-Festo) controller. In addition, you will be provided with expert knowledge for your selected connection option, making the integration of the Festo solution into your machine extremely easy.

This tool can be found at  
→ [www.festo.com/x/connectivity-finder](http://www.festo.com/x/connectivity-finder)

### Configurator



Design a product with numerous features reliably and quickly with the help of the configurator.

Select all the required product features step-by-step. The use of logic checks ensures that only correct configurations are available for selection.

You will find the configurator

- at [www.festo.com/catalogue/vtem](http://www.festo.com/catalogue/vtem)
- Click on the product
- Click on the blue „Configure product“ button

## Motion Terminal




**Motion Terminal  
VTEM**

<b>Valve terminal design</b>	Fixed grid
<b>Grid dimension</b>	28 mm
<b>Max. no. of valve positions</b>	8
<b>Valve function</b>	Can be allocated using the Motion App
<b>Standard nominal flow rate, exhaust 6-&gt;5 bar</b>	480 l/min
<b>Pneumatic connection 1</b>	G3/8
<b>Operating pressure [MPa]</b>	0.3 ... 0.8 MPa
<b>Operating pressure</b>	3 ... 8 bar
<b>Operating pressure [psi]</b>	43.5 ... 116 psi
<b>Note on operating pressure</b>	0 - 8 bar with external pilot air, Vacuum operation at connection 3 only
<b>Pilot pressure [MPa]</b>	0.3 ... 0.8 MPa
<b>Pilot pressure</b>	3 ... 8 bar
<b>Pilot pressure [psi]</b>	43.5 ... 116 psi
<b>Motion Apps</b>	Leakage diagnostics, Flow control, ECO drive, Positioning, Proportional pressure regulation, Proportional directional control valve, Soft Stop, Presetting of travel time, Directional control valve functions, Supply and exhaust air flow control, Model-based proportional pressure regulation, Selectable pressure head
<b>Actuation type</b>	Electric
<b>Nominal operating voltage DC</b>	24 V
<b>Temperature of medium</b>	5 ... 50°C
<b>LABS (PWIS) conformity</b>	VDMA24364 zone III
<b>Description</b>	<ul style="list-style-type: none"> <li>• Many functions for movement, pressure and flow in one component – thanks to apps</li> <li>• Maximum repeat accuracy thanks to digital parameter sets</li> <li>• Easy to trace – ideal for the Industry 4.0</li> <li>• Easy to duplicate the parameters</li> <li>• Increased energy efficiency</li> <li>• Reduced complexity and time to market</li> <li>• Increasing profitability and know-how protection</li> <li>• Predictive maintenance</li> <li>• Minimal installation effort</li> <li>• Sustainable operation with pressure-reduced return stroke and leakage detection</li> </ul>
<b>online:</b> →	<a href="#">vtem</a>


## Product overview

### Motion Apps

	 <p><b>Motion Apps GAMM</b></p>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Open and closed-loop control programs for valves VEVM</li> <li>• A new dimension in flexibility thanks to Motion Apps – a single valve with a wide range of different functions</li> <li>• Accelerated engineering processes</li> <li>• Short response times without the need to adapt the hardware</li> <li>• Reduced system complexity</li> <li>• Shorter time to market for your application</li> </ul>
<b>online:</b> →	<a href="#">gamm</a>

#### Accessories for the Motion Terminal >

### Piezo valves

	 <p><b>Valves VEVM</b></p>
<b>Valve function</b>	Can be allocated using the Motion App
<b>Standard flow rate 0.8-&gt;0 MPa (8-&gt;0 bar, 116-&gt;0 psi)</b>	1000
<b>Operating pressure [MPa]</b>	0.3 ... 0.8 MPa
<b>Operating pressure</b>	3 ... 8 bar
<b>Pneumatic connection 1</b>	G3/8
<b>Nominal size</b>	4.2 mm
<b>Nominal operating voltage DC</b>	24 V
<b>Description</b>	<ul style="list-style-type: none"> <li>• Functionality can be assigned via Motion app</li> <li>• For Motion Terminal VTEM</li> <li>• Consisting of 4 wired piezo pilot-controlled piston seat valves</li> <li>• Extremely long service life</li> <li>• Very low power consumption</li> <li>• Low leakage with the function of a proportional-pressure regulator</li> </ul>
<b>online:</b> →	<a href="#">vevm</a>

Accessories for the Motion Terminal >

Position sensors



**Position transmitters**  
**SDAP-MHS**

<b>Design type</b>	For T-slot
<b>Sensing range</b>	0 ... 160000 µm
<b>Analogue output</b>	4 - 20 mA
<b>Electrical connection, connection type</b>	Cable with plug
<b>Electrical connection, connection technology</b>	M8x1, A-coded, to EN 61076-2-104
<b>Electrical connection, occupied pins/wires</b>	4
<b>Description</b>	<ul style="list-style-type: none"> <li>• Only for use with Festo Motion Terminal VTEM</li> <li>• Analogue sensor for VTEM input module CTMM</li> <li>• Measuring principle: magnetic Hall</li> <li>• Insertable in the slot from above, screw-clamped</li> <li>• LED status indicator</li> <li>• Cable length 0.3 m</li> <li>• Suitable for T-slot</li> </ul>
<b>online:</b> →	<a href="#">sdap</a>

Accessories for the Motion Terminal >

Input modules



**Input modules**  
**CTMM**

<b>Electrical connection, input, function</b>	Analogue input, Digital input
<b>Electrical connection, input, connection type</b>	8x socket
<b>Electrical connection, input, connection technology</b>	M8x1, A-coded to EN 61076-2-104
<b>Electrical connection input, number of pins/wires</b>	3, 4
<b>Number of inputs</b>	8
<b>Nominal operating voltage DC</b>	24 V
<b>Signal range</b>	4 - 20 mA
<b>Diagnostics via LED</b>	Errors per module, Status per channel
<b>Degree of protection</b>	IP65, IP67
<b>Description</b>	<ul style="list-style-type: none"> <li>• For connecting analogue and digital sensors to the Motion Terminal</li> <li>• Digital module with PNP logic or analogue module for 4 ... 20 mA</li> <li>• Input signals can be transmitted to a higher-order controller by the Motion Apps</li> </ul>
<b>online:</b> →	<a href="#">ctmm</a>

## Product overview



## Product overview

## Software tools

### Festo Design Tool 3D



The Festo Design Tool 3D is a 3D product configurator for generating specific CAD product combinations from Festo.





The configurator makes your search for the right accessory quicker, easier, and more reliable.

You can then order the module that has been created as a single order item, either completely pre-assembled or as individual parts in one box. This considerably reduces your bill of materials, and downstream processes such as product ordering, order picking and assembly are significantly simplified.

You will find this tool at  
[→ www.festo.com/fdt-3D](http://www.festo.com/fdt-3D)





### Proximity switches >

## Proximity switches for T-slot

	 <b>Proximity sensors SMT-8M-A</b>	 <b>Proximity sensors SDBT-MSX</b>	 <b>Proximity sensors SDBT-BSW</b>	 <b>Proximity sensors SDBT-MS-EX6</b>
<b>Electrical connection, connection type</b>	Cable, Cable with plug	Cable, Cable with plug	Cable, Cable with plug	Cable
<b>Electrical connection, connection technology</b>	M12x1, A-coded to EN 61076-2-101, M8x1, A-coded, to EN 61076-2-104, Open end	M12x1, A-coded to EN 61076-2-101, M8x1, A-coded, to EN 61076-2-104, Open end	M12x1, A-coded to EN 61076-2-101, Open end	Open end
<b>Operating voltage range DC</b>	5 ... 30 V	10 ... 30 V	10 ... 30 V	7.5 ... 18 V
<b>Switching element function</b>	N/C contact, N/O contact	N/C or N/O contact, switchable	N/O contact	NAMUR
<b>Switching output</b>	NPN, PNP, Non-contacting, 2-wire	PNP/NPN, switchable	NPN, PNP, Non-contacting, 2-wire	NAMUR
<b>Description</b>	<ul style="list-style-type: none"> <li>Measuring principle: magneto-resistive</li> <li>For universal use</li> <li>Individually configurable or pre-assembled</li> <li>Inserted in the slot from above, flush with the cylinder profile</li> <li>LED switching status indication</li> <li>LED operating reserve indication</li> <li>Cable length 0.1 ... 30 m</li> </ul>	<ul style="list-style-type: none"> <li>Measuring principle: magnetic Hall</li> <li>Auto teach-in: automatic teach-in of the switching point at system start-up</li> <li>Programmable: PNP/NPN, NO/NC and switching window range between 2 ... 15 mm</li> <li>Insertable in the slot from above, screw-clamped</li> <li>LED status indicator</li> <li>Cable length 0.3 ... 5 m</li> </ul>	<ul style="list-style-type: none"> <li>Measuring principle: magneto-resistive</li> <li>Welding field immune</li> <li>Resistant to welding spatter</li> <li>For contactless piston-rod position sensing on Festo pneumatic cylinders, in particular the hinge cylinder DW/DWA/DWB/DWC for AMI</li> <li>Insertable in the slot from above, screw-clamped</li> <li>LED switching status indication</li> <li>Cable length 0.3 ... 5 m</li> </ul>	<ul style="list-style-type: none"> <li>Measuring principle: magneto-resistive</li> <li>To EU Explosion Protection Directive (ATEX)</li> <li>Insertable in the slot from above, screw-clamped</li> <li>LED switching status indication</li> <li>Cable length 2.5 ... 20 m</li> </ul>
<b>online:</b> →	<a href="#">smt-8m</a>	<a href="#">sdbt</a>	<a href="#">sdbt</a>	<a href="#">sdbt</a>

Proximity switches >


Proximity switches for T-slot

	 <b>Proximity sensors SMT-8-SL</b>	 <b>Proximity sensors SMT-8G</b>	 <b>Proximity sensors CRSMT-8M</b>	 <b>Proximity switch SME-8</b>
<b>Electrical connection, connection type</b>	Plugs	Cable, Cable with plug	Cable, Cable with plug	Cable
<b>Electrical connection, connection technology</b>	M8x1, A-coded, to EN 61076-2-104	M8x1, A-coded, to EN 61076-2-104, Open end	M12x1, A-coded to EN 61076-2-101, M8x1, A-coded, to EN 61076-2-104, Open end	Open end
<b>Operating voltage range DC</b>	10 ... 30 V	10 ... 30 V	5 ... 30 V	0 ... 230 V
<b>Switching element function</b>	N/O contact	N/O contact	N/O contact	N/O contact
<b>Switching output</b>	PNP	NPN, PNP	PNP	Contacting, bipolar
<b>Description</b>	<ul style="list-style-type: none"> <li>• Measuring principle: magneto-resistive</li> <li>• SMT-8-SL: sturdy thanks to long guides and plug directly on the sensor</li> <li>• Insertable in the slot lengthwise or from above</li> <li>• LED switching status indication</li> <li>• Cable length 0.3, 2.5, 5 m</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring principle: magneto-resistive</li> <li>• SMT-8G: design ideal for gripper sensing</li> <li>• Insertable in the slot lengthwise or from above</li> <li>• LED switching status indication</li> <li>• Cable length 0.3, 2.5, 5 m</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring principle: magneto-resistive</li> <li>• Corrosion-resistant design</li> <li>• Food-safe (see <a href="http://www.festo.com/certificates/CRSMT_8M">www.festo.com/certificates/CRSMT_8M</a>), resistant to acids and cooling lubricants</li> <li>• Inserted in the slot from above, flush with the cylinder profile</li> <li>• LED switching status indication</li> <li>• Cable length 0.3, 5 m, 10 m</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring principle: magnetic reed</li> <li>• Insertable in the slot lengthwise</li> <li>• LED switching status indication</li> <li>• Cable length 0.3, 2.5, 5, 7.5, 0.2 ... 10 m</li> </ul>
<b>online:</b> →	<a href="#">smt-8</a>	<a href="#">smt-8G</a>	<a href="#">crsmt-8m</a>	<a href="#">sme-8</a>

## Product overview




### Proximity switches >

## Proximity switches for T-slot

	 <b>Proximity switch SME-8M</b>	 <b>Proximity sensors SMT0-8E</b>	 <b>Proximity sensors SMP0-8E</b>	 <b>Proximity sensors SMTSO-8E</b>
<b>Electrical connection, connection type</b>	Cable, Cable with plug	Plugs		Plugs
<b>Electrical connection, connection technology</b>	M8x1, A-coded, to EN 61076-2-104, Open end	M12x1, A-coded to EN 61076-2-101, M8x1, A-coded, to EN 61076-2-104		M12x1, A-coded to EN 61076-2-101
<b>Operating voltage range DC</b>	5 ... 30 V	10 ... 30 V		10 ... 30 V
<b>Switching element function</b>	N/O contact	N/O contact		N/O contact
<b>Switching output</b>	Contacting, bipolar	NPN, PNP		NPN, PNP
<b>Description</b>	<ul style="list-style-type: none"> <li>• Measuring principle: magnetic reed</li> <li>• Individually configurable or pre-assembled</li> <li>• Inserted in the slot from above, flush with the cylinder profile</li> <li>• LED switching status indication</li> <li>• Cable length 0.3, 2.5, 5, 7.5, 0.2 ... 10 m</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring principle: magneto-resistive</li> <li>• Sturdy sensor in block design</li> <li>• Plug integrated in housing</li> <li>• LED switching status indication</li> <li>• Inserted in the slot from above</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring principle: magnetic</li> <li>• Pneumatic proximity sensor</li> <li>• Function: 3/2-way valve, normally closed</li> <li>• Pneumatic connection via female thread M5</li> <li>• Visual switching status indication</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring principle: magneto-inductive</li> <li>• Welding field resistant design</li> <li>• Sturdy sensor in block design</li> <li>• Inserted in the slot from above</li> <li>• Plug integrated in housing</li> <li>• LED switching status indication</li> </ul>
<b>online:</b> →	<a href="#">sme-8m</a>	<a href="#">smt0</a>	<a href="#">smpo</a>	<a href="#">smtso</a>

Proximity switches >


Round slot proximity switch

	 <b>Proximity switch SMT-10M</b>	 <b>Proximity switch SMT-10G</b>	 <b>Proximity switch SME-10M</b>
<b>Electrical connection, connection type</b>	Cable, Cable with plug	Cable, Cable with plug	Cable, Cable with plug
<b>Electrical connection, connection technology</b>	M12x1, A-coded to EN 61076-2-101, M8x1, A-coded, to EN 61076-2-104, Open end	M8x1, A-coded, to EN 61076-2-104, Open end	M8x1, A-coded, to EN 61076-2-104, Open end
<b>Electrical connection, number of pins/wires</b>	2, 3	3	3
<b>Operating voltage range DC</b>	5 ... 30 V	10 ... 30 V	5 ... 30 V
<b>Switching element function</b>	N/O contact	N/O contact	N/O contact
<b>Switching output</b>	NPN, PNP, Non-contacting, 2-wire	NPN, PNP	Contacting, bipolar
<b>Description</b>	<ul style="list-style-type: none"> <li>• Measuring principle: magneto-resistive</li> <li>• For universal use</li> <li>• Individually configurable or pre-assembled</li> <li>• Inserted in the slot from above, flush with the cylinder profile</li> <li>• LED switching status indication</li> <li>• Cable length 0.3, 2.5 m</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring principle: magneto-resistive</li> <li>• SMT-10G: design ideal for gripper sensing</li> <li>• Insertable in the slot lengthwise or from above</li> <li>• LED switching status indication</li> <li>• Cable length 0.3, 2.5 m</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring principle: magnetic reed</li> <li>• Individually configurable or pre-assembled</li> <li>• Inserted in the slot from above, flush with the cylinder profile</li> <li>• LED switching status indication</li> <li>• Cable length 0.3, 2.5 m</li> </ul>
<b>online:</b> →	<a href="#">smt-10M</a>	<a href="#">smt-10</a>	<a href="#">sme-10m</a>

## Product overview


### Proximity switches >

## Proximity switches with block design





	 <p><b>Proximity sensors</b> <b>SMT-C1</b></p>
<b>Electrical connection, connection type</b>	Cable, Cable with plug
<b>Electrical connection, connection technology</b>	M12x1, A-coded to EN 61076-2-101, M8x1, A-coded, to EN 61076-2-104, Open end
<b>Electrical connection, number of pins/wires</b>	3
<b>Operating voltage range DC</b>	10 ... 30 V
<b>Switching element function</b>	N/O contact
<b>Switching output</b>	PNP
<b>Description</b>	<ul style="list-style-type: none"> <li>• Measuring principle: magneto-inductive</li> <li>• Easy-to-clean design</li> <li>• Food grade see <a href="http://www.festo.com/certificates/SMT_C1">www.festo.com/certificates/SMT_C1</a></li> <li>• For clean design, standards-based cylinder DSBF with mounting rail for sensors</li> <li>• LED switching status indication</li> </ul>
<b>online: →</b>	<a href="#">smt-c1</a>

### Proximity switches >




## Cylinder signal generators

	 <p><b>Cylinder signal generators</b> <b>PPL</b></p>
<b>Description</b>	<ul style="list-style-type: none"> <li>• For contactless pneumatic signal generation at the end of cylinder strokes</li> <li>• Function: 3/2-way valve, normally open</li> <li>• Can be screwed directly into the supply port of the cylinder using a hollow bolt</li> </ul>
<b>online: →</b>	<a href="#">ppl</a>

## Inductive sensors

	 <b>Proximity switch SIEN</b>	 <b>Proximity switch SIED</b>	 <b>Proximity switch SIEF</b>	 <b>Proximity switch SIEH</b>
<b>Size</b>	4 mm, 6.5 mm, M12, M12x1, M18, M18x1, M30, M30x1.5, M5x0.5, M8x1	M12, M18, M30	40x40x65 mm, M12, M18, M30, M8	3 mm, M12, M18
<b>Switching output</b>	NPN, PNP	Non-contacting, 2-wire	NPN, PNP	NPN, PNP
<b>Switching element function</b>	N/C contact, N/O contact	N/O contact	Antivalent, N/O contact	N/C contact, N/O contact
<b>Electrical connection</b>	3-wire, Cable	2-wire, 2-pin, Cable, Plugs, M12x1	3-wire, 3-pin, 4-pin, Fixcon, Cable, Plugs, M8x1, M12x1	
<b>Operating voltage range DC</b>	10 ... 30 V	10 ... 320 V	10 ... 65 V	10 ... 30 V
<b>Description</b>	<ul style="list-style-type: none"> <li>• With standard switching distance</li> <li>• For DC voltage</li> <li>• Round design</li> <li>• Metric thread</li> <li>• Flush or non-flush mounting</li> <li>• LED switching status indication</li> <li>• Design with metal or polyamide housing</li> </ul>	<ul style="list-style-type: none"> <li>• With standard switching distance</li> <li>• For DC and AC voltage</li> <li>• Metric thread</li> <li>• Flush or non-flush mounting</li> <li>• LED switching status indication</li> <li>• Design with metal or polyamide housing</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction factor 1 for all metals</li> <li>• Welding field immune</li> <li>• Design with housing resistant to welding spatter</li> <li>• Flush, partially flush or non-flush mounting</li> <li>• LED switching status indication</li> </ul>	<ul style="list-style-type: none"> <li>• With increased sensing distance</li> <li>• Flush mounting</li> <li>• Metric thread</li> <li>• LED switching status indication</li> <li>• Design with stainless steel housing</li> </ul>
<b>online:</b> →	<a href="#">sien</a>	<a href="#">sied</a>	<a href="#">sief</a>	<a href="#">sieh</a>




## Inductive sensors

	 <b>Proximity switch SIES-Q</b>	 <b>Proximity switch SIES-8M</b>	 <b>Distance sensor SOIA</b>
<b>Size</b>	8x8x59 mm, 15x20x30 mm, 40x40x120 mm, 5x5x25 mm, 8x8x40 mm	Slot 8	M8, M12, M18, M30, Q40
<b>Switching output</b>	NPN, PNP	NPN, PNP	PNP/NPN, switchable, Push-pull
<b>Switching element function</b>	Antivalent, N/C contact, N/O contact	N/C contact, N/O contact	Switchable
<b>Electrical connection</b>	Screw terminal		
<b>Operating voltage range DC</b>	10 ... 30 V	10 ... 30 V	10 ... 30 V
<b>Description</b>	<ul style="list-style-type: none"> <li>• Block design</li> <li>• Flush mounting</li> <li>• LED switching status indication</li> </ul>	<ul style="list-style-type: none"> <li>• Ideally suited for position sensing for electric axes and grippers with T-slot</li> <li>• Flush mounting</li> <li>• Switching status indication with 2 LEDs for better visibility regardless of the direction from which it is approached</li> <li>• Single inductive sensor for 8 slot with patented LED status indicator</li> </ul>	<ul style="list-style-type: none"> <li>• Inductive distance, speed and acceleration sensor</li> <li>• Sensor for monitoring pneumatic, hydraulic and elastic cushioning</li> <li>• IO-Link® 1.1 Smart sensor profile</li> <li>• Sizes: M8, M12, M18, M30, Q40</li> <li>• Enables predictive maintenance and prevents expensive production downtime</li> </ul>
<b>online:</b> →	<a href="#">sies</a>	<a href="#">sies</a>	<a href="#">soia</a>

## Product overview



### Position sensors >

## Position transmitter

	 <b>Position transmitter SDAC-MHS</b>	 <b>Position transmitters SDAT-MHS</b>	 <b>Position transmitters SDAS-MHS</b>
<b>Design type</b>	For C-slot	For T-slot	For T-slot
<b>Sensing range</b>	25000 ... 35000 µm	0 ... 160000 µm	≤52000 µm
<b>Analogue output</b>	0 - 10 V	0 - 10 V, 4 - 20 mA	
<b>Electrical connection, connection type</b>	Cable, Cable with plug	Cable with plug	Cable, Cable with plug
<b>Electrical connection, connection technology</b>	M8x1, A-coded, to EN 61076-2-104, Open end	M8x1, A-coded, to EN 61076-2-104	M8x1, A-coded, to EN 61076-2-104, Open end
<b>Electrical connection, occupied pins/wires</b>	3, 4	4	4
<b>Description</b>	<ul style="list-style-type: none"> <li>• Measuring principle: magnetic Hall</li> <li>• Sensing range up to 35 mm</li> <li>• IO-Link®, 2 programmable switching outputs</li> <li>• Analogue output 0 ... 10 V</li> <li>• Very compact design makes the unit especially well suited to work with grippers, compact cylinders and any application in a tight space</li> <li>• LED status indicator</li> <li>• Cable length 0.3, 2.5 m</li> <li>• Suitable for round slot</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring principle: magnetic Hall</li> <li>• Analogue output 0 ... 10 V or 4 ... 20 mA</li> <li>• Programmable IO-Link®/switching output</li> <li>• Insertable in the slot from above, screw-clamped</li> <li>• LED status indicator</li> <li>• Cable length 0.3 m</li> <li>• Suitable for T-slot</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring principle: magnetic Hall</li> <li>• IO-Link®, 2 programmable switching outputs</li> <li>• Inserted in the slot from above</li> <li>• Very compact design makes the unit especially well suited to work with grippers, compact cylinders and any application in a tight space</li> <li>• LED status indicator</li> <li>• Cable length 0.3, 2.5 m</li> <li>• Suitable for T-slot</li> </ul>
<b>online: →</b>	<a href="#">sdac</a>	<a href="#">sdat</a>	<a href="#">sdas</a>


### Position sensors >

## Position transmitter

	 <b>Position transmitter SMAT-8M</b>	 <b>Position transmitters SDAP-MHS</b>
<b>Design type</b>	For T-slot	For T-slot
<b>Sensing range</b>	≤52000 µm	0 ... 160000 µm
<b>Analogue output</b>	0 - 10 V, 0 - 10 V	4 - 20 mA
<b>Electrical connection, connection type</b>	Cable, Cable with plug	Cable with plug
<b>Electrical connection, connection technology</b>	M8x1, A-coded, to EN 61076-2-104, Open end	M8x1, A-coded, to EN 61076-2-104
<b>Electrical connection, occupied pins/wires</b>	3, 4	4
<b>Description</b>	<ul style="list-style-type: none"> <li>• Measuring principle: magnetic Hall</li> <li>• Analogue output 0 ... 10 V</li> <li>• Very compact design makes the unit especially well suited to work with grippers, compact cylinders and any application in a tight space</li> <li>• Insertable in the slot from above, screw-clamped</li> <li>• LED status indicator</li> <li>• Cable length 0.3 m</li> <li>• Suitable for T-slot</li> </ul>	<ul style="list-style-type: none"> <li>• Only for use with Festo Motion Terminal VTEM</li> <li>• Analogue sensor for VTEM input module CTMM</li> <li>• Measuring principle: magnetic Hall</li> <li>• Insertable in the slot from above, screw-clamped</li> <li>• LED status indicator</li> <li>• Cable length 0.3 m</li> <li>• Suitable for T-slot</li> </ul>
<b>online: →</b>	<a href="#">smat-8m</a>	<a href="#">sdap</a>




Position sensors >

## Position sensors for rotary drives

	 <p><b>Position sensors</b> <b>SRBS</b></p>
<b>Design type</b>	Round
<b>Sensing range</b>	270 deg
<b>Max. output current</b>	50
<b>Electrical connection 1, connection type</b>	Cable with plug
<b>Electrical connection, connection technology</b>	M8x1, A-coded, to EN 61076-2-104
<b>Electrical connection 1, number of pins/wires</b>	4
<b>Description</b>	<ul style="list-style-type: none"> <li>• Used to detect rotation of the shaft on rotary drives DRVS and DSM</li> <li>• Simple and reliable operation using just one pushbutton directly on the device</li> <li>• Switching output 2x PNP or 2x NPN, switchable</li> <li>• Sensor can be quickly mounted without having to manually search for switching points</li> </ul>
<b>online:</b> →	<a href="#">srbs</a>





Position sensors >

## Displacement encoders





	 <p><b>Displacement encoders</b> <b>MME-MTS-TLF</b></p>	 <p><b>Displacement encoders</b> <b>MLO-POT-TLF</b></p>	 <p><b>Displacement encoders</b> <b>MLO-POT-LWG</b></p>
<b>Stroke</b>	225 ... 2000 mm	225 ... 2000 mm	100 ... 750 mm
<b>Measuring principle of displacement encoder</b>	Digital	Analogue	Analogue
<b>Output signal</b>	CAN protocol type SPC-AIF	Analogue	Analogue
<b>Displacement resolution</b>	<0.01 mm	0.01 mm	0.01 mm
<b>Electrical connection</b>	6-pin, Plugs, To DIN 45322, Round design	4-pin, Type A, Plugs, To DIN 43650, Square design	4-pin, Plugs, Square design, 16 mm
<b>Description</b>	<ul style="list-style-type: none"> <li>• Measuring principle: magnetostrictive</li> <li>• Contactless with absolute measurement</li> <li>• High travel speed</li> <li>• System product for servo-pneumatic positioning technology and Soft Stop</li> <li>• Degree of protection IP65</li> </ul>	<ul style="list-style-type: none"> <li>• Conductive plastic potentiometer</li> <li>• Absolute measurement with high resolution</li> <li>• High travel speed and long service life</li> <li>• Plug-in connections</li> </ul>	<ul style="list-style-type: none"> <li>• Connecting rod potentiometer</li> <li>• Absolute measurement with high resolution</li> <li>• Long service life</li> <li>• Degree of protection IP65</li> <li>• Plug-in connections</li> </ul>
<b>online:</b> →	<a href="#">mme</a>	<a href="#">mlo</a>	<a href="#">mlo</a>

## Product overview

### Pressure and vacuum sensors





	 <b>Pressure sensors SPAF</b>	 <b>Pressure sensors SPAE</b>	 <b>Pressure sensors SDE5</b>	 <b>Pressure sensors SPAN, SPAN-B</b>
<b>Pressure measuring range [MPa]</b>	-0.1 ... 1 MPa	-0.1 ... 1 MPa		-0.1 ... 1.6 MPa
<b>Pressure measuring range</b>	-1 ... 10 bar	-1 ... 10 bar	-1 ... 10 bar	-1 ... 16 bar
<b>Pressure measuring range [psi]</b>	-14.5 ... 145 psi	-14.5 ... 145 psi		-14.5 ... 232 psi
<b>Switching element function</b>	N/C or N/O contact, switchable	N/C contact, N/O contact, Switchable	N/C contact, N/O contact, Switchable	N/C or N/O contact, switchable
<b>Switching output</b>	PNP/NPN, switchable	PNP/NPN, switchable	NPN, PNP	2 x PNP or 2 x NPN, switchable, PNP/NPN, switchable
<b>Pneumatic connection</b>	Male thread G1/8, QS-4, QS-6	Flange, Cartridge 10 mm, Push-in sleeve QS-4, QS-6, QS-3, QS-4	QS-1/4, QS-4, QS-5/32, QS-6	Male thread 1/8 NPT, Female thread G1/8, M5, For tubing O.D. 4 mm, Male thread G1/8, R1/8
<b>Electrical connection</b>		3-wire, Cable, Open end	3-wire, 3-pin, Cable, Plugs, To EN 60947-5-2, Round design, M8x1	
<b>Electrical connection 1, connection type</b>	Plugs			Plugs
<b>Display type</b>	Illuminated LCD blue, LED indicator	LED indicator, 2-digit		Illuminated LCD
<b>Description</b>	<ul style="list-style-type: none"> <li>• IO-Link® communication interface</li> <li>• Degree of protection IP65</li> <li>• Versions with display or LED switching status indication</li> <li>• Replication function for quickly transferring settings</li> <li>• Switching output (PNP / NPN; NO / NC) adjustable via software</li> <li>• Teach-in of the switching point setting with one button</li> </ul>	<ul style="list-style-type: none"> <li>• Electronic pressure sensor with piezoresistive pressure measuring cell, integrated signal processing, numeric pressure indicator in percent, operating key and a switching output, PNP/NPN switchable</li> <li>• Display of minimum and maximum measured value</li> <li>• All parameters entered can be transferred to other SPAEs (replicating function)</li> <li>• Communication interface IO-Link®</li> </ul>	<ul style="list-style-type: none"> <li>• Programmable and configurable pressure switch for simple pressure sensing tasks</li> <li>• Threshold/window comparator</li> <li>• Switching point adjustment via teach-in function</li> <li>• Integrated microprocessor</li> <li>• Switching status indicated by an LED visible from all sides (OL), C-Tick</li> </ul>	<ul style="list-style-type: none"> <li>• For monitoring compressed air and non-corrosive gases</li> <li>• For network monitoring, regulator monitoring, leak testing, object detection</li> <li>• Relative measurement method based on a piezoresistive measuring cell</li> <li>• Serial communication integrated using IO-Link® 1.1</li> <li>• Compact design 30x30 mm</li> <li>• High-contrast display with blue backlight</li> </ul>
<b>online:</b> →	<a href="#">spaf</a>	<a href="#">spae</a>	<a href="#">sde5</a>	<a href="#">span</a>

Pressure and vacuum sensors




	 Pressure sensors <b>SPAU</b>	 Pressure sensors <b>SPAW</b>	 Pressure sensors <b>SDE3</b>	 Pressure switches <b>SPBA</b>
<b>Pressure measuring range [MPa]</b>	-0.1 ... 1.6 MPa	-0.1 ... 10 MPa	-0.1 ... 1 MPa	
<b>Pressure measuring range [bar]</b>	-1 ... 16 bar	-1 ... 100 bar	-1 ... 10 bar	
<b>Pressure measuring range [psi]</b>	-14.5 ... 232 psi	-14.5 ... 1450 psi	-14.5 ... 145 psi	
<b>Switching element function</b>	N/C or N/O contact, switchable	Switchable	Switchable	Antivalent, Changeover switch
<b>Switching output</b>	2 x PNP or 2 x NPN, switchable, 2xPNP	2xNPN, 2xPNP	2xNPN, 2xPNP	2xPNP, Contacting
<b>Pneumatic connection</b>	Flange, G1/8, 1/8 NPT, QS-6, G1/8, M5, M7, QS-4, QS-5/32, QS-6, R1/4, R1/8	Female thread G1/4, Male thread G1/2	QS-4, QS-5/32	G1/8
<b>Electrical connection</b>				4-pin, Plugs, To EN 60947-5-2, Round design, M12x1
<b>Electrical connection 1, connection type</b>	Plugs	Plugs	Cable, Cable with plug, Plugs	Plugs
<b>Display type</b>	Illuminated LCD, LED	4-place alphanumeric, LED indicator	Illuminated LCD	
<b>Description</b>	<ul style="list-style-type: none"> <li>• For monitoring compressed air and non-corrosive gases</li> <li>• With or without display</li> <li>• Transfer of the pressure value as switching signal, analogue signal or via IO-Link® to the connected control system</li> <li>• Maximum versatility thanks to a wide range of pneumatic adaptations and switchable electrical outputs</li> </ul>	<ul style="list-style-type: none"> <li>• Extremely sturdy</li> <li>• For liquid and gaseous media</li> <li>• Quick and easy adjustment of the switching outputs using three pushbuttons</li> <li>• Optimal legibility: display housing rotatable 320°, display at an angle of 45°</li> </ul>	<ul style="list-style-type: none"> <li>• 5 pressure measuring ranges</li> <li>• Measurement of relative or differential pressure or 2 independent supply ports</li> <li>• Switching output 2x PNP or 2x NPN</li> <li>• Numerical and graphical pressure indication</li> <li>• Mounting: via H-rail, via wall/surface bracket, front panel mounting, with through-holes</li> <li>• Certification: C-Tick, ATEX, c UL us Listed (OL)</li> </ul>	<ul style="list-style-type: none"> <li>• Pressure sensor with permanently set switching point</li> <li>• For solenoid valve VSVA</li> <li>• Mounting: screw-in</li> </ul>
<b>online:</b> →	<a href="#">spau</a>	<a href="#">spaw</a>	<a href="#">sde3</a>	<a href="#">spba</a>

## Product overview

### Pressure and vacuum sensors

	 <b>Pressure switches, vacuum switches PEV, VPEV</b>	 <b>Pressure transmitters SPTE</b>	 <b>Pressure transmitters SPTW</b>	 <b>PE converters PEN, PE, VPE</b>
<b>Pressure measuring range [MPa]</b>		-0.1 ... 1 MPa	-0.1 ... 10 MPa	
<b>Pressure measuring range</b>		-1 ... 10 bar	-1 ... 100 bar	
<b>Pressure measuring range [psi]</b>		-14.5 ... 145 psi	-14.5 ... 1450 psi	
<b>Switching element function</b>	Changeover switch			N/O contact, Changeover switch
<b>Switching output</b>				PNP, Contacting
<b>Pneumatic connection</b>	G1/4, G1/8, M5	Flange, Cartridge 10 mm, Push-in sleeve QS-4, QS-6, QS-3, QS-4	G1/4	G1/8, M5, PK-4
<b>Electrical connection</b>	4-pin, Type A, Plugs, To DIN 43650, To EN 60947-5-2, Round design, Square design, M12x1	3-wire, Cable, Open end		3 connector leads, 3-wire, 4-wire, Cable, Open end
<b>Electrical connection 1, connection type</b>	Screw terminal, Plugs		Plugs	Cable
<b>Display type</b>				
<b>Description</b>	<ul style="list-style-type: none"> <li>Mechanical pressure and vacuum switch</li> <li>Adjustable switching point</li> <li>Mounting: screw-in, via through-holes or on an H-rail</li> <li>Visual scale for pressure adjustment</li> <li>Certification: CCC, c UL us – Recognized (OL), RCM</li> </ul>	<ul style="list-style-type: none"> <li>Piezoresistive pressure sensor</li> <li>Measured variable: relative pressure</li> <li>Cable length 2.5 m</li> <li>Compact: 8-bracket wall mount for manifold mounting</li> </ul>	<ul style="list-style-type: none"> <li>Sensor versions: piezoresistive pressure sensor or metal thin-film pressure sensor</li> <li>Measured variable: relative pressure</li> <li>Operating medium: liquid media and gaseous media</li> <li>Seal-free: pressure measuring cell and interfaces in stainless steel</li> <li>Degree of protection IP67</li> </ul>	<ul style="list-style-type: none"> <li>Pneumatic/electric differential pressure switch</li> <li>Pneumatic/electric pressure transducer</li> <li>Design for vacuum</li> <li>Mounting via through-hole, on mounting frame 1n, on mounting frame 2n</li> <li>Splash-proof design</li> <li>Certification: CCC, RCM</li> </ul>
<b>online:</b> →	<a href="#">pev</a>	<a href="#">spte</a>	<a href="#">sptw</a>	<a href="#">pen</a>

## Flow sensors

	 <b>Flow transmitters SFTE</b>	 <b>Flow sensors SFAH</b>	 <b>Flow sensors SFAW</b>
<b>Flow measuring range</b>	0 ... 10 l/min	0.002 ... 200 l/min	1.8 ... 100 l/min
<b>Operating medium</b>	Nitrogen, Compressed air ISO 8573-1:2010 [6:4:4]	Argon, Nitrogen, Compressed air ISO 8573-1:2010 [6:4:4]	Liquid media, Water, Neutral fluids
<b>Operating pressure</b>	-0.9 ... 10 bar	-0.9 ... 10 bar	0 ... 12 bar
<b>Pneumatic connection</b>	Female thread M5, For push-in connector O.D. 3 mm, 4 mm	Female thread G1/4, G1/8, For tubing O.D. 4 mm, 6 mm, 8 mm	
<b>Switching output</b>		2 x PNP or 2 x NPN, switchable	2 x PNP or 2 x NPN, switchable
<b>Electrical connection, connection type</b>	Cable, Cable with plug	Plugs	Plugs
<b>Electrical connection, connection technology</b>	M8x1, A-coded, to EN 61076-2-104, Open end	Connection pattern L1J, M8x1, A-coded, to EN 61076-2-104	M12x1, A-coded to EN 61076-2-101
<b>Electrical connection</b>			
<b>Description</b>	<ul style="list-style-type: none"> <li>• Compact design</li> <li>• Universal flow detection</li> <li>• Simple installation</li> <li>• Reliable pick &amp; place application for extremely small workpieces</li> </ul>	<ul style="list-style-type: none"> <li>• Process air, compressed air, forming gas consumption and pneumatic object monitoring, handling ultra-small parts, leak test</li> <li>• Compact design 20x58 mm</li> <li>• Clear 2-line display</li> <li>• Mounting: H-rail mounting, wall or surface mounting, front panel mounting</li> <li>• Serial communication integrated using IO-Link® 1.1</li> </ul>	<ul style="list-style-type: none"> <li>• Cooling circuit monitoring, leakage or line break monitoring, process water monitoring, fill level monitoring</li> <li>• Input connection: clamped terminal connection DN15, DN20, barbed hose fitting 13 mm, female thread G1/2, G3/4, G1, user-specific connection</li> <li>• With optional integrated temperature sensor</li> <li>• Connection to higher-level systems via 2 switching outputs, an analogue output and/or an IO-Link® interface</li> <li>• Certification: RCM, c UL us Listed (OL)</li> <li>• Rotatable display, 90° anticlockwise and 180° clockwise</li> </ul>
<b>online:</b> →	<a href="#">sfte</a>	<a href="#">sfah</a>	<a href="#">sfaw</a>

## Product overview

### Flow sensors







**Flow sensors  
SFAB**



**Flow sensors  
SFAM**





<b>Flow measuring range</b>	0.1 ... 1000 l/min	10 ... 15000 l/min
<b>Operating medium</b>	Argon, Carbon dioxide, Nitrogen, Compressed air ISO 8573-1:2010 [7:4:4], ISO 8573-1:2010 [6:4:4]	Argon, Compressed air to ISO 8573-1:2010 [7:4:4], Carbon dioxide, Nitrogen, Compressed air ISO 8573-1:2010 [7:4:4]
<b>Operating pressure</b>	0 ... 10 bar	16 bar
<b>Pneumatic connection</b>	For tubing O.D. 1/4 ", 10 mm, 12 mm, 3/8 ", 5/16 ", 6 mm, 8 mm	Manifold module, 1/2 NPT, 1 NPT, 1 1/2 NPT, G1, G1 1/2, G1/2
<b>Switching output</b>	2 x PNP or 2 x NPN, switchable	2 x PNP or 2 x NPN, switchable
<b>Electrical connection, connection type</b>	Plugs	Plugs
<b>Electrical connection, connection technology</b>	M12x1, A-coded to EN 61076-2-101	M12x1, A-coded to EN 61076-2-101
<b>Electrical connection</b>		5-pin, Straight plug, M12x1
<b>Description</b>	<ul style="list-style-type: none"> <li>• Flow sensor with integrated digital display</li> <li>• With unidirectional flow input</li> <li>• Mounting: H-rail, wall or surface mounting</li> <li>• Certification: C-Tick</li> <li>• Sustainable operation with system consumption monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• IO-Link® communication with efficient remote parameterisation and replication function</li> <li>• All-in-one solution with integrated pressure and temperature measurement</li> <li>• As a stand-alone device or as a space-saving version in the service unit components of the MS series</li> <li>• Supplies absolute flow information and accumulated air consumption measurements</li> <li>• High accuracy, even at compressed air quality [7:4:4] to ISO 8573</li> <li>• Reliable measurement even of high flow rates</li> <li>• Sustainable operation with system consumption monitoring</li> </ul>
<b>online:</b> →	<a href="#">sfab</a>	<a href="#">sfam</a>

## Opto-electrical sensors

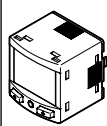
	 <b>Retro-reflective sensors, diffuse sensors, light barriers</b> <b>SOOD</b>	 <b>Retro-reflective sensors, diffuse sensors, distance sensor, light barriers</b> <b>SOOE</b>	 <b>Sensors</b> <b>SOEG-RT, SOEG-RS</b>	 <b>Through-beam sensors</b> <b>SOEG-E, SOEG-S</b>
<b>Method of measurement</b>	Retro-reflective sensor, Through-beam sensor, Transmitter, Receiver, Diffuse sensor with background clipping	Retro-reflective sensor, Distance sensor, Through-beam sensor, Transmitter, Receiver, Diffuse sensor with background clipping, Laser contrast sensor, Retro-reflective sensor for transparent objects, Diffuse sensor	Retro-reflective sensor, Diffuse sensor, Diffuse sensor with background suppression	Through-beam sensor, Receiver, Transmitter
<b>Working range</b>	0 ... 10000 mm	0 ... 20000 mm	10 ... 2000 mm	20000 mm
<b>Size</b>			M12, M12x1, M18, M18x1	M18x1
<b>Setting options</b>		IO-Link®, Potentiometer, Teach-in	Potentiometer	
<b>Type of light</b>	Laser, Red, LED	Laser, Red, LED	Red, Red polarised	Red
<b>Switching output</b>	Push-pull	Push-pull	NPN, PNP	NPN, PNP
<b>Description</b>	<ul style="list-style-type: none"> <li>• Simple operation</li> <li>• Fast commissioning</li> <li>• Reliable and stable detection</li> <li>• Attractive price/performance ratio</li> </ul>	<ul style="list-style-type: none"> <li>• Simple operation</li> <li>• Fast commissioning</li> <li>• Reliable and stable detection</li> <li>• Attractive price/performance ratio</li> </ul>	<ul style="list-style-type: none"> <li>• Round design</li> <li>• Electrical connection via open cable end or plug connector</li> </ul>	<ul style="list-style-type: none"> <li>• Round design</li> <li>• Electrical connection via open cable end or plug connector</li> </ul>
<b>online:</b> →	<a href="#">sood</a>	<a href="#">sooe</a>	<a href="#">soeg</a>	<a href="#">soeg</a>

Product overview

Opto-electrical sensors

	 <b>Colour sensors</b> <b>SOEC</b>	 <b>Fibre-optic units</b> <b>SOE4</b>	 <b>Fork light barriers</b> <b>SOOF</b>	 <b>Fibre-optic cables</b> <b>SOEZ, SOOC</b>
<b>Method of measurement</b>	Colour sensor	Fibre-optic unit	Fork light barrier	Through-beam sensor, Fork light barrier, Light guide, Diffuse sensor
<b>Working range</b>	12 ... 32 mm			5 ... 400 mm
<b>Size</b>	50x50x17 mm		Clevis 120x60 mm, 30x35 mm, 50x55 mm, 80x55 mm	M4, M6
<b>Setting options</b>	Teach-in, Teach-in via electrical connection	Teach-in, Teach-in via electrical connection	IO-Link®, Potentiometer, Teach-in	
<b>Type of light</b>	White	Red	Red	
<b>Switching output</b>	PNP	NPN, PNP	Push-pull, NPN, PNP	
<b>Description</b>	<ul style="list-style-type: none"> <li>• Diffuse sensor</li> <li>• Block design</li> <li>• Electrical connection via M12x1 plug, 8-pin</li> <li>• Display via 7 LEDs</li> </ul>	<ul style="list-style-type: none"> <li>• Use for precise and space-saving position sensing in the electronics and light assembly industry</li> <li>• Switching frequencies of up to 8000 Hz</li> <li>• Operational with fibre-optic cable SOOC as accessory</li> <li>• Variants: LED or LED display, timer function</li> <li>• Mounting: H-rail mounting or via through-holes</li> <li>• With protection against mutual interference</li> </ul>	<ul style="list-style-type: none"> <li>• Through-beam sensor with minimal installation effort</li> <li>• Design: polymer or metal</li> <li>• Sturdy housing: high shock and vibration resistance</li> <li>• Degree of protection IP67</li> <li>• Electrical connection via M8x1 plug connector, 3-pin</li> <li>• LED indicators</li> </ul>	<ul style="list-style-type: none"> <li>• Cable connection, push-in connector</li> </ul>
<b>online:</b> →	<a href="#">soec</a>	<a href="#">soe4</a>	<a href="#">soof</a>	<a href="#">soez</a>

## Signal converters






**Signal converters**  
**SCDN**




<b>Signal range</b>	0 - 10 V, 0 - 20 mA
<b>Switching output</b>	2 x PNP or 2 x NPN, switchable
<b>Switching function</b>	Freely programmable
<b>Electrical connection, connection type</b>	Plugs
<b>Electrical connection, connection technology</b>	Connection pattern L1J
<b>Electrical connection, number of pins/wires</b>	4
<b>Electrical connection 2, connection type</b>	2x socket
<b>Electrical connection 2, connection technology</b>	Connection pattern EC
<b>Electrical connection 2, number of pins/wires</b>	4
<b>Description</b>	<ul style="list-style-type: none"> <li>• Converts analogue signals into IO-Link® signals</li> <li>• Switching function freely programmable with teach-in</li> <li>• Mounting: wall or surface mounting, front panel mounting, manifold mounting using mounting brackets</li> <li>• Large, illuminated LCD display</li> </ul>
<b>online:</b> →	<a href="#">scdn</a>

## Product overview


### Limit switch attachments

	 <b>Limit switch attachments</b> <b>SRBK</b>	 <b>End switch attachments</b> <b>SRBC</b>	 <b>End switch attachments</b> <b>SRBG</b>
<b>Information on housing materials</b>	PA, PA66, electrically conductive	Die-cast aluminium	PBT
<b>Operating voltage range AC</b>	0 ... 230 V	0 ... 230 V	
<b>Operating voltage range DC</b>	0 ... 175 V	0 ... 175 V	6 ... 60 V
<b>Measuring principle</b>	Inductive, Magnetic reed, Mechanical/ electrical	Inductive, Magnetic reed, Mechanical/ electrical	Inductive
<b>Switching element function</b>	N/O contact, Toggle switch, single-pole	N/C contact, N/O contact, Toggle switch, single-pole	N/C contact, N/C or N/O contact, switchable, N/O contact
<b>Safety integrity level (SIL)</b>	Safety Integrity Level 3	Safety Integrity Level 3	SIL 2
<b>Description</b>	<ul style="list-style-type: none"> <li>• Sturdy polymer housing with UV resistance</li> <li>• Different switch variants – mechanical, inductive and reed switches</li> <li>• Multifunctional mounting adapter for adaptations on the ISO3845 interface</li> <li>• Variants with M12 plug connection for easy installation (plug&amp;play)</li> </ul>	<ul style="list-style-type: none"> <li>• Pre-assembled mounting adapter for ease of installation</li> <li>• The trip cams can be easily set without additional tools</li> <li>• Sturdy, corrosion-resistant design, ideal for use in harsh ambient conditions</li> <li>• Clearly visible 3D position indicator allows the current position of the quarter turn actuator to be quickly detected</li> <li>• With safety functions</li> <li>• Variants to EU Explosion Protection Directive (ATEX)</li> </ul>	<ul style="list-style-type: none"> <li>• Compact housing with M12 plug connection</li> <li>• Direct mounting on quarter turn actuators to VDI/VDE 3845</li> <li>• For quarter turn actuators for process automation with position indicators</li> <li>• AS-Interface version with extended addressing options</li> <li>• LED status indicator for switching status, supply voltage and solenoid valve output</li> <li>• With safety functions</li> <li>• Variants to EU Explosion Protection Directive (ATEX)</li> </ul>
<b>online:</b> →	<a href="#">srbk</a>	<a href="#">srbc</a>	<a href="#">srbg</a>

## Limit switch attachments





	 <b>End switch attachments SRBE</b>	 <b>Limit switch attachments SRAP</b>	 <b>Limit switch box SRBI</b>
<b>Information on housing materials</b>	Painted die cast aluminium	Wrought aluminium alloy	PBT
<b>Operating voltage range AC</b>	0 ... 240 V		
<b>Operating voltage range DC</b>	0 ... 60 V	15 ... 30 V	10 ... 30 V
<b>Measuring principle</b>	Inductive, Magnetic reed, Mechanical/electrical, Via proximity switch	Magnetic Hall	Inductive
<b>Switching element function</b>	N/C contact, N/O contact, Toggle switch, single-pole, Toggle switch, double-pole		N/O contact
<b>Safety integrity level (SIL)</b>	Safety Integrity Level 3		
<b>Description</b>	<ul style="list-style-type: none"> <li>• The trip cams can be easily set without additional tools</li> <li>• Sturdy, corrosion-resistant design, ideal for use in harsh ambient conditions</li> <li>• Clearly visible 3D position indicator allows the current position of the quarter turn actuator to be quickly detected</li> <li>• With safety functions</li> <li>• To EU Explosion Protection Directive (ATEX)</li> </ul>	<ul style="list-style-type: none"> <li>• Based on standard VDI/VDE 3845 (NAMUR)</li> <li>• Analogue</li> <li>• For monitoring the position of quarter turn actuators</li> <li>• Sensors based on 2D Hall technology</li> <li>• Variants to EU Explosion Protection Directive (ATEX)</li> </ul>	<ul style="list-style-type: none"> <li>• Compact housing with M12 plug connection</li> <li>• Direct mounting on quarter turn actuators to VDI/VDE 3845</li> <li>• For quarter turn actuators for process automation with position indicators</li> <li>• LED status indicator for switching status and supply voltage</li> </ul>
<b>online: →</b>	<a href="#">srbe</a>	<a href="#">srap</a>	<a href="#">srbi</a>

## Accessories for limit switch attachments

	 <b>Position indicators SASF</b>
<b>Setting range of swivel angle</b>	0 ... 360 deg
<b>Ambient temperature</b>	-40 - 80°C
<b>Type of mounting</b>	To VDI/VDE 3845
<b>Description</b>	<ul style="list-style-type: none"> <li>• For limit switch attachments SRBG, SRBI, SRBC</li> <li>• Variants for mounting on drive shafts of standard drives according to VDI/VDE 3845</li> <li>• Variants with adjustable swivel angle</li> <li>• Variants for clockwise and anticlockwise rotating actuators with 90° and 180° rotation</li> <li>• Variants with position indicator in yellow/red, I-, T-, L-design or with 180° arrow</li> </ul>
<b>online: →</b>	<a href="#">sASF</a>

## Product overview



### Air gap sensors

	 <b>Air gap sensors SOPA</b>	 <b>Micro reflex sensors, reflex sensors RML, RFL</b>	 <b>Back pressure end stops SD-2, SD-3, SD-3-N</b>	 <b>Air barriers SFL, SML</b>
<b>Sensing range</b>	20 ... 200 µm			
<b>Operating pressure</b>	4 ... 7 bar			
<b>Display type</b>	Illuminated LCD, multi-colour			
<b>Operating medium</b>	Compressed air ISO 8573-1:2010 [7:4:4]			
<b>Description</b>	<ul style="list-style-type: none"> <li>Convenient solution for high-precision contact and distance monitoring</li> <li>Setting option: IO-Link®, teach-in or numerical setting using three buttons</li> <li>Integrated air jet function</li> <li>Multi-coloured LCD display</li> <li>Mounting: H-rail mounting, wall mounting, through-hole</li> <li>Certification: C-Tick</li> </ul>	<ul style="list-style-type: none"> <li>Back pressure actuated valve</li> <li>For contactless sensing of indicating instruments, checking pressing and stamping tools, edge control, magazine control, for measuring and counting</li> <li>Can be used even in very dirty environments, in complete darkness, with translucent or magnetic objects</li> </ul>	<ul style="list-style-type: none"> <li>Can be used for stroke-dependent signal generation as a limit switch and fixed stop</li> <li>Ideal for end-position sensing and position control with high accuracy requirements and small actuating forces</li> <li>SD-3-N for sensing fluid levels and heavily foaming liquids</li> <li>For use in places that are difficult to access</li> </ul>	<ul style="list-style-type: none"> <li>Sender nozzle, receiver nozzle, gap sensor</li> <li>Back pressure actuated valve</li> <li>Functional reliability even in very dirty environments</li> <li>Reliable even at high ambient temperatures</li> <li>Insensitive to mechanical influences and sound waves</li> <li>Reliable even in complete darkness and when sensing translucent objects</li> </ul>
<b>online:</b> →	<a href="#">sopa</a>	<a href="#">rfl</a>	<a href="#">sd</a>	<a href="#">sfl</a>




Product overview

Software tools

<p><b>Air consumption</b></p>		<p>Calculate your system's air consumption quickly and conveniently. Simply enter all the drives and tubing, set the cycle times and working pressure and the air consumption per minute and per day will be calculated for you. It includes a feature for exporting the input table together with the result directly to Excel.</p> <p>This tool can be found at  <a href="http://www.festo.com/x/air-consumption">→ www.festo.com/x/air-consumption</a></p>
<p><b>Configurator</b></p>		<p>Design a product with numerous features reliably and quickly with the help of the configurator.</p> <p>Select all the required product features step-by-step. The use of logic checks ensures that only correct configurations are available for selection.</p> <p>A dynamic graphic generated on the basis of the configuration provides a visual aid for selecting the correct product features.</p> <p>This tool can be found at  <a href="http://www.festo.com/x/service-unit-sizing">→ www.festo.com/x/service-unit-sizing</a></p>



Service units for compressed air >

Series MS-B

	 <p><b>Service units</b>  <b>MS4-EM1FR, MS6-EM1FR</b></p>
<b>Size</b>	4, 6
<b>Pressure indication</b>	Prepared for G1/8, With pressure gauge
<b>Operating pressure [MPa]</b>	0.1 ... 1 MPa
<b>Operating pressure</b>	1 ... 10 bar
<b>Standard nominal flow rate</b>	1500 ... 5300 l/min
<b>Type of mounting</b>	Either:, In-line installation, Via mounting bracket, With accessories
<b>Description</b>	<ul style="list-style-type: none"> <li>• Combination of on/off valve and filter regulator</li> <li>• With manual or fully automatic condensate drain</li> <li>• For filtered and unlubricated compressed air supply</li> <li>• Supply pressure can be switched on or off</li> <li>• Output pressure is continuously adjustable within the pressure regulation range</li> </ul>
<b>online: →</b>	<a href="http://ms4-em1fr">ms4-em1fr</a>


Service units for compressed air >

MS series

	 <p><b>Service unit combinations</b> <b>MSB4, MSB6, MSB9</b></p>	 <p><b>Energy efficiency module</b> <b>MSE6</b></p>
<b>Pneumatic connection 1</b>	G1/8, G1/4, G3/8, G1/2, G3/4, G1, 1/2 NPT, 3/4 NPT, 1 NPT, 1 1/4 NPT, 1 1/2 NPT, G1, G1 1/2, G1 1/4, G1/2, G1/4, G1/8, G3/4	G3/4, G1/2
<b>Standard nominal flow rate</b>	750 ... 18000 l/min	4500 ... 7000 l/min
<b>Flow measuring range</b>		50 ... 5000 l/min
<b>Pressure regulation range</b>	0.1 ... 16 bar	2.5 ... 10 bar
<b>Operating pressure [MPa]</b>	0 ... 2 MPa	0.35 ... 1.3 MPa
<b>Operating pressure</b>	0 ... 20 bar	3.5 ... 13 bar
<b>Grade of filtration</b>	0.01 ... 40 µm	
<b>Fieldbus interface</b>		2x socket, M12x1, 4-pin, D-coded, 2x RJ45 push-pull socket, AIDA, Sub-D socket, 9-pin
<b>Description</b>	<ul style="list-style-type: none"> <li>• Combination of filter regulator, filter, lubricator, on/off valve, soft-start valve</li> <li>• Grid dimension 40, 62, 90 mm (size 4, 6, 9)</li> </ul>	<ul style="list-style-type: none"> <li>• Intelligent service unit component for optimising the use of compressed air as an energy medium in industrial automation technology</li> <li>• Combination of flow sensor and stop valve with pressure sensor</li> <li>• Identification of production downtime and leakages</li> <li>• Equipped with measurement, control and diagnostic functions</li> <li>• Fieldbus connection (PROFIBUS DP, PROFINET IO, EtherNet/IP or EtherCAT®) via integrated fieldbus nodes enables connection to a higher-level controller</li> <li>• Sustainable operation with active air shut-off and pressure reduction</li> </ul>
<b>online: →</b>	<a href="#">msb4</a>	<a href="#">mse6</a>

Filter regulators/lubricators >

MS series

	 <p><b>Service unit combinations</b> <b>MSB4-FRC, MSB6-FRC</b></p>
<b>Pneumatic connection 1</b>	G1/2, G1/4, G1/8, G3/8
<b>Standard nominal flow rate</b>	850 ... 4800 l/min
<b>Pressure regulation range</b>	0.3 ... 12 bar
<b>Operating pressure</b>	0.8 ... 20 bar
<b>Grade of filtration</b>	5 µm, 40 µm
<b>Description</b>	<ul style="list-style-type: none"> <li>• Filter, regulator and lubricator functions in a single unit</li> <li>• High flow rate and highly efficient in removing contaminants</li> <li>• Good control characteristics with minimal pressure hysteresis</li> <li>• Grid dimension 40, 62 mm (size 4, 6)</li> </ul>
<b>online: →</b>	<a href="#">msb4-frc</a>

## Product overview

### Filter regulators >

## Series MS-B



**Filter regulators**  
**MS2-LFR-B, MS4-LFR-B, MS6-LFR-B**

<b>Pneumatic connection 1</b>	G1/2, G1/4, M5, QS-6
<b>Standard nominal flow rate</b>	140 ... 5300 l/min
<b>Pressure regulation range [MPa]</b>	0.03 ... 0.7 MPa
<b>Pressure regulation range</b>	0.3 ... 7 bar
<b>Grade of filtration</b>	5 µm, 40 µm
<b>Operating pressure [MPa]</b>	0.1 ... 1 MPa
<b>Operating pressure</b>	1 ... 10 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• Competitively priced basic component focused on the most important technical functions</li> <li>• Lightweight and sturdy thanks to modern polymer materials</li> <li>• Compatible with the MS series for the ideal combination of low-cost basic functionality and high-end functional requirements</li> <li>• Stable control response</li> <li>• With or without pressure gauge</li> <li>• Rotary knob with latch</li> <li>• With integrated secondary exhausting and primary exhausting with return flow function</li> <li>• MS2: Directly operated diaphragm regulator</li> <li>• MS4, MS6: directly actuated piston regulator</li> <li>• Grid dimension 25, 40, 62 mm (sizes 2, 4, 6)</li> </ul>
<b>online: →</b>	<a href="#">ms2-lfr</a>

### Filter regulators >

## MS series






**Filter regulators**  
**MS4-LFR, MS6-LFR, MS9-LFR, MS12-LFR**

<b>Pneumatic connection 1</b>	G1/8, G1/4, G3/8, G1/2, G3/4, G1, Internal, G1/2, G1/4, G1/8, G3/8
<b>Standard nominal flow rate</b>	850 ... 24000 l/min
<b>Pressure regulation range</b>	0.3 ... 16 bar
<b>Operating pressure</b>	0 ... 20 bar
<b>Grade of filtration</b>	5 µm, 40 µm
<b>Description</b>	<ul style="list-style-type: none"> <li>• MS4-LFR, MS6-LFR: directly actuated diaphragm regulator, MS9-LFR: piloted or directly actuated filter-diaphragm regulator, MS12-LFR: piloted diaphragm regulator without internal air consumption</li> <li>• Good control characteristics with minimal pressure hysteresis and primary pressure compensation</li> <li>• Good particle and condensate separation</li> <li>• With or without secondary exhausting</li> <li>• High flow rate</li> <li>• Lockable rotary knob</li> <li>• Return flow option for exhausting from output 2 to input 1 already integrated</li> <li>• Variants to EU Explosion Protection Directive (ATEX)</li> <li>• With or without pressure gauge</li> <li>• Grid dimension 40, 62, 90, 124 mm (size 4, 6, 9, 12)</li> </ul>
<b>online: →</b>	<a href="#">ms4-lfr</a>


Filter regulators >

Individual devices

	 <b>Filter regulator PCRI</b>	 <b>Filter regulators PCRPs</b>	 <b>Filter regulators LFR-EX4</b>
<b>Pneumatic connection 1</b>		1/4 NPT, 1/2 NPT, G1/2, G1/4, NPT1/2-14, NPT1/4-18	1/4 NPT, 1/2 NPT, G1/2, G1/4
<b>Standard nominal flow rate</b>	1400 l/min	1600 ... 4115 l/min	1150 ... 3400 l/min
<b>Pressure regulation range</b>	0.5 ... 8 bar	0.5 ... 12 bar	0.5 ... 16 bar
<b>Grade of filtration</b>	5 µm, 40 µm	5 µm, 40 µm	5 µm, 40 µm
<b>Operating pressure [MPa]</b>	0.1 ... 0.9 MPa	0.1 ... 2 MPa	0.1 ... 2 MPa
<b>Operating pressure</b>	1 ... 9 bar	1 ... 20 bar	1 ... 20 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• Pneumatic extension module for valve terminal VTOP</li> <li>• Smooths pressure fluctuations and regulates the compressed air to the set output pressure</li> <li>• Removes dirt particles from the compressed air that passes through it</li> </ul>	<ul style="list-style-type: none"> <li>• Robust housing for the specific requirements of the process automation industry</li> <li>• Suitable for use outdoors and at temperatures down to -60 °C</li> <li>• Resistant to UV radiation and corrosive environments</li> <li>• Two pressure gauge connections for different installation options</li> <li>• With manual condensate drain, rotating</li> <li>• Size 44, 64</li> <li>• Sustainable operation thanks to reduced pressure level</li> </ul>	<ul style="list-style-type: none"> <li>• Sturdy thanks to full metal design</li> <li>• High corrosion resistance (corrosion resistance class CRC 3 to Festo standard 940 070) and chemical resistance</li> <li>• Ambient temperature -40 ... +80 °C</li> <li>• Resistant to UV radiation and corrosive environments</li> <li>• With or without pressure gauge</li> <li>• Reliable manual drain</li> <li>• Energy efficient: excellent leakage values</li> <li>• Attractive price</li> <li>• To EU Explosion Protection Directive (ATEX)</li> <li>• Size: Midi</li> </ul>
<b>online: →</b>	<a href="#">pcri</a>	<a href="#">pcrp</a>	<a href="#">lfr</a>

Compressed air filters >





Series MS-B

	 <b>Filter MS2-LF-B</b>
<b>Pneumatic connection 1</b>	M5, QS-6
<b>Standard nominal flow rate</b>	225 ... 250 l/min
<b>Operating pressure</b>	1 ... 10 bar
<b>Grade of filtration</b>	5 µm
<b>Description</b>	<ul style="list-style-type: none"> <li>• Very compact and extremely lightweight series for use close to the process directly in the machine</li> <li>• Lightweight and sturdy thanks to modern polymer materials</li> <li>• Compatible with the MS series for the ideal combination of low-cost basic functionality and high-end functional requirements</li> <li>• With manual condensate drain, rotating</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> </ul>
<b>online: →</b>	<a href="#">ms2-lf-b</a>

## Product overview


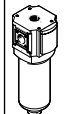
### Compressed air filters >

## MS series

	 <b>Filters</b> MS4-LF, MS6-LF, MS9-LF, MS12-LF	 <b>Fine filters</b> MS4-LFM-B, MS6-LFM-B, MS9-LFM-B, MS12-LFM-B	 <b>Micro filters</b> MS4-LFM-A, MS6-LFM-A, MS9-LFM-A, MS12-LFM-A	 <b>Activated carbon filters</b> MS4-LFX, MS6-LFX, MS9-LFX, MS12-LFX
<b>Pneumatic connection 1</b>	G3/8, G3/4, G1, Internal, G1/2, G1/4, G1/8, G3/8	Manifold module, 1/2 NPT, 3/4 NPT, 1 NPT, 1 1/4 NPT, 1 1/2 NPT, G1, G1 1/2, G1 1/4, G1/2, G1/4, G1/8, G3/4, G3/8	Manifold module, 1/2 NPT, 3/4 NPT, 1 NPT, 1 1/4 NPT, 1 1/2 NPT, G1, G1 1/2, G1 1/4, G1/2, G1/4, G1/8, G3/4, G3/8	Manifold module, 1/2 NPT, 3/4 NPT, 1 NPT, 1 1/4 NPT, 1 1/2 NPT, G1, G1 1/2, G1 1/4, G1/2, G1/4, G1/8, G3/4, G3/8
<b>Standard nominal flow rate</b>	1000 ... 16000 l/min			4800 ... 6000 l/min
<b>Operating pressure</b>	0 ... 20 bar	0 ... 20 bar	0 ... 20 bar	0 ... 20 bar
<b>Grade of filtration</b>	5 µm, 40 µm	0.01 µm, 1 µm	0.01 µm, 1 µm	0.01 µm, 1 µm
<b>Description</b>	<ul style="list-style-type: none"> <li>• Good particle and condensate separation</li> <li>• High flow rate performance with minimal pressure drop</li> <li>• Available with manual, semi-automatic, fully automatic or fully automatic, electrically actuated condensate drain</li> <li>• Grid dimension 40, 62, 90, 124 mm (size 4, 6, 9, 12)</li> </ul>	<ul style="list-style-type: none"> <li>• High-efficiency filter for exceptionally clean compressed air</li> <li>• Removing oil aerosols from compressed air</li> <li>• Optionally with differential pressure indicator for indication of contamination</li> <li>• Available with electronic filter contamination indicator</li> <li>• Grid dimension 40, 62, 90, 124 mm (size 4, 6, 9, 12)</li> </ul>	<ul style="list-style-type: none"> <li>• High-efficiency filter for exceptionally clean compressed air</li> <li>• Removing oil aerosols from compressed air</li> <li>• Optionally with differential pressure indicator for indication of contamination</li> <li>• Available with electronic filter contamination indicator</li> <li>• Grid dimension 40, 62, 90, 124 mm (size 4, 6, 9, 12)</li> </ul>	<ul style="list-style-type: none"> <li>• Removal of gaseous oil particles from compressed air using activated carbon</li> <li>• Air quality class at the output [1.4.1] to ISO 8573-1</li> <li>• Eliminates odours and vapours</li> <li>• Residual oil content = 0.003 mg/m<sup>3</sup></li> <li>• Grid dimension 40, 62, 90, 124 mm (size 4, 6, 9, 12)</li> </ul>
<b>online:</b> →	<a href="#">ms4-lf</a>	<a href="#">ms4-lfm-b</a>	<a href="#">ms4-lfm-a</a>	<a href="#">ms4-lfx</a>

### Compressed air filters >

## Individual devices

	 <b>Filter silencers</b> LFU	 <b>Micro filters</b> PFML
<b>Size</b>	G1/2, G1, G1/4, G3/8	90, 186
<b>Grade of filtration</b>	1 µm	0.01 µm
<b>Operating pressure [MPa]</b>	0 ... 1.6 MPa	0 ... 5 MPa
<b>Operating pressure</b>	0 ... 16 bar	0 ... 50 bar
<b>Operating pressure [psi]</b>	0 ... 232 psi	0 ... 725 psi
<b>Flow rate with respect to atmosphere</b>	4000 ... 12500 l/min	
<b>Noise reduction</b>	Reduction by 40 dB	
<b>Description</b>	<ul style="list-style-type: none"> <li>• Removes up to 99.99% of oil and other contaminants from the exhaust air</li> <li>• Manual rotary condensate drain</li> <li>• Exhaust noise reduced regardless of frequency</li> </ul>	<ul style="list-style-type: none"> <li>• For high-pressure applications</li> <li>• Food grade <a href="http://www.festo.com/certificates/PFML">www.festo.com/certificates/PFML</a></li> </ul>
<b>online:</b> →	<a href="#">lfu</a>	<a href="#">pfml</a>

Pressure regulators >

Series MS-B






**Pressure regulators**  
**MS2-LR-B, MS4-LR-B, MS6-LR-B**

<b>Pneumatic connection 1</b>	G1/2, G1/4, M5, QS-6
<b>Standard nominal flow rate</b>	170 ... 6000 l/min
<b>Pressure regulation range</b>	0.3 ... 7 bar
<b>Operating pressure [MPa]</b>	0.1 ... 1 MPa
<b>Operating pressure</b>	1 ... 10 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• Competitively priced basic component focused on the most important technical functions</li> <li>• Lightweight and sturdy thanks to modern polymer materials</li> <li>• Compatible with the MS series for the ideal combination of low-cost basic functionality and high-end functional requirements</li> <li>• Stable control response</li> <li>• With or without pressure gauge</li> <li>• Rotary knob with latch</li> <li>• With integrated secondary exhausting and primary exhausting with return flow function</li> <li>• MS2: Directly operated diaphragm regulator</li> <li>• MS4, MS6: directly actuated piston regulator</li> <li>• Grid dimension 25, 40, 62 mm (sizes 2, 4, 6)</li> <li>• Sustainable operation thanks to reduced pressure level</li> </ul>
<b>online: →</b>	<a href="#">ms-lr-b</a>

## Product overview



### Pressure regulators >

### MS series

	 <b>Pressure regulators</b> <b>MS4-LR, MS6-LR, MS9-LR</b>	 <b>Pressure regulators</b> <b>MS4N-LR, MS6N-LR</b>	 <b>Pressure regulators</b> <b>MS12-LR</b>
<b>Pneumatic connection 1</b>	G1/8, G1/4, G3/8, G1/2, G3/4, G1, G1/2, G1/4, G1/8, G3/8	3/4 NPT	Sub-base
<b>Standard nominal flow rate</b>	800 ... 30000 l/min	6500 l/min	12000 ... 22000 l/min
<b>Pressure regulation range</b>	0.1 ... 16 bar	0.3 ... 7 bar	0.15 ... 16 bar
<b>Operating pressure [MPa]</b>	0.08 ... 2 MPa	0.08 ... 2 MPa	0.08 ... 2.1 MPa
<b>Operating pressure</b>	0.8 ... 20 bar	0.8 ... 20 bar	0.8 ... 21 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• High flow rate performance with minimal pressure drop</li> <li>• Good control characteristics with minimal pressure hysteresis and primary pressure compensation</li> <li>• With or without secondary exhausting</li> <li>• Lockable rotary knob</li> <li>• Optional pressure sensor and rotary knob pressure gauge</li> <li>• Grid dimension 25, 40, 62, 90 mm (size 2, 4, 6, 9)</li> </ul>	<ul style="list-style-type: none"> <li>• High flow rate performance with minimal pressure drop</li> <li>• Good control characteristics with minimal pressure hysteresis and primary pressure compensation</li> <li>• With or without secondary exhausting</li> <li>• Lockable rotary knob</li> <li>• Optional pressure sensor and rotary knob pressure gauge</li> <li>• Grid dimension 40, 62 mm (size 4, 6)</li> </ul>	<ul style="list-style-type: none"> <li>• High flow rate performance with minimal pressure drop</li> <li>• Good control characteristics with minimal pressure hysteresis and primary pressure compensation</li> <li>• With secondary exhausting</li> <li>• Lockable rotary knob</li> <li>• With or without pressure gauge</li> <li>• MS12-LR-...-PO: pneumatically actuated (pressure range determined by pilot regulator)</li> <li>• MS12-LR-...-PE6: electrically actuated (pilot control by proportional pressure regulator)</li> <li>• Grid dimension 124 mm (size 12)</li> <li>• Sustainable operation thanks to reduced pressure level</li> </ul>
<b>online: →</b>	<a href="#">ms4-lr</a>	<a href="#">ms4n-lr</a>	<a href="#">ms12-lr</a>


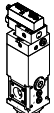
Pressure regulators >

MS series

	 <b>Pressure regulators</b> <b>MS4-LRB, MS6-LRB</b>	 <b>Precision pressure regulators</b> <b>MS6-LRP, MS6-LRPB</b>
<b>Pneumatic connection 1</b>	G1/2, G1/4	G1/4, G3/8, G1/2, G3/4, 1/4 NPT, 3/8 NPT, 3/4 NPT, G1/2, G1/4, G3/8
<b>Standard nominal flow rate</b>	300 ... 7300 l/min	800 ... 9000 l/min
<b>Pressure regulation range</b>	0.3 ... 16 bar	0.05 ... 12 bar
<b>Operating pressure [MPa]</b>		0.1 ... 1.4 MPa
<b>Operating pressure</b>	0.8 ... 20 bar	1 ... 14 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>To build a regulator manifold with through air supply for pressure ranges that can be adjusted independently of one another</li> <li>Good control characteristics with minimal pressure hysteresis and primary pressure compensation</li> <li>Lockable rotary knob</li> <li>With or without secondary exhausting</li> <li>Integrated return flow option for exhausting from output 2 to input 1</li> <li>Optional pressure sensor and rotary knob pressure gauge</li> <li>Variants to EU Explosion Protection Directive (ATEX)</li> <li>Grid dimension 40, 62 mm (size 4, 6)</li> </ul>	<ul style="list-style-type: none"> <li>As individual device and for manifold assembly</li> <li>Manifold assembly with through air supply</li> <li>Good control characteristics with minimal pressure hysteresis and primary pressure compensation</li> <li>High secondary exhausting</li> <li>Lockable rotary knob</li> <li>Optional pressure sensor and rotary knob pressure gauge</li> <li>Grid dimension 62 mm (size 6)</li> </ul>
<b>online: →</b>	<a href="#">ms4-lrb</a>	<a href="#">ms6-lrp</a>

Pressure regulators >

Individual devices

	 <b>Precision pressure regulators</b> <b>LRP, LRPS</b>	 <b>Electrical pressure regulators</b> <b>PREL</b>
<b>Pneumatic connection 1</b>	For sub-base Ø 7 mm, G1/4, G1/8	G1
<b>Standard nominal flow rate</b>	240 ... 2300 l/min	
<b>Pressure regulation range</b>	0.05 ... 10 bar	0.4 ... 40 bar
<b>Operating pressure [MPa]</b>	0.1 ... 1.2 MPa	0 ... 5 MPa
<b>Operating pressure</b>	1 ... 12 bar	0 ... 50 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>Lockable design</li> <li>Good control characteristics with minimal pressure hysteresis and primary pressure compensation</li> <li>High secondary exhausting</li> <li>Variants to EU Explosion Protection Directive (ATEX)</li> <li>Variants recommended for production systems for manufacturing lithium-ion batteries</li> </ul>	<ul style="list-style-type: none"> <li>For high-pressure applications</li> <li>Food grade see <a href="http://www.festo.com/certificates/PREL">www.festo.com/certificates/PREL</a></li> <li>Size 90 mm, 186 mm</li> </ul>
<b>online: →</b>	<a href="#">lrp</a>	<a href="#">prel</a>

## Product overview

### Compressed air lubricators >

## MS series



### Lubricators

**MS4-LOE, MS6-LOE, MS9-LOE, MS12-LOE**

<b>Pneumatic connection 1</b>	G3/8, G3/4, G1, Internal, G1/2, G1/4, G1/8, G3/8
<b>Standard nominal flow rate</b>	1100 ... 27000 l/min
<b>Operating pressure</b>	1 ... 16 bar
<b>Minimum flow rate for lubricator function</b>	40 ... 400 l/min
<b>Description</b>	<ul style="list-style-type: none"> <li>• Proportional lubricator with precision oil metering</li> <li>• Quick and easy top-up even under pressure</li> <li>• Oil capacity 30 ... 1500 cm<sup>3</sup></li> <li>• Grid dimension 40, 62, 90, 124 mm (size 4, 6, 9, 12)</li> </ul>
<b>online:</b> →	<a href="#">ms4-loe</a>

### On/off and soft-start valves >

## Series MS-B



### On/off valves

**MS4-EE-B, MS6-EE-B**







### Soft-start valves

**MS4-EDE-B, MS6-EDE-B**

<b>Design</b>	Poppet valve, electrically actuated	Poppet valve, electrically actuated
<b>Pneumatic connection 1</b>	G1/4, G1/2, G1/2, G1/4	G1/4, G1/2, G1/2, G1/4
<b>Operating pressure [MPa]</b>	0.3 ... 0.7 MPa	0.3 ... 0.7 MPa
<b>Operating pressure</b>	3 ... 7 bar	3 ... 7 bar
<b>Standard nominal flow rate</b>	2000 ... 5000 l/min	2000 ... 5000 l/min
<b>Exhaust air function</b>	Without flow control option	Without flow control option
<b>Electrical connection</b>	Type C, To EN 175301-803	Type C, To EN 175301-803
<b>Description</b>	<ul style="list-style-type: none"> <li>• Very compact and extremely lightweight series for use close to the process directly in the machine</li> <li>• Electrically operated 3/2-way valve for pressurising and exhausting pneumatic systems</li> <li>• Ducted exhaust air possible via threaded connection with silencer</li> <li>• Detenting and non-detenting manual override</li> <li>• Supply voltage 24 V DC</li> <li>• With solenoid coil, without plug socket</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> <li>• Grid dimension 40, 62 mm (size 4, 6)</li> </ul>	<ul style="list-style-type: none"> <li>• Very compact and extremely lightweight series for use close to the process directly in the machine</li> <li>• Electrically operated 3/2-way valve for slowly pressurising and exhausting pneumatic systems</li> <li>• The switching pressure can be precisely controlled with a solenoid valve</li> <li>• Adjustable switching time delay</li> <li>• Built-in connections into which the tubing can be directly inserted</li> <li>• Detenting and non-detenting manual override</li> <li>• Supply voltage 24 V DC</li> <li>• With solenoid coil, without plug socket</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> <li>• Grid dimension 40, 62 mm (size 4, 6)</li> </ul>
<b>online:</b> →	<a href="#">ms-ee-b</a>	<a href="#">ms-ed-e-b</a>

## On/off and soft-start valves &gt;





## MS series

	 Soft-start/quick exhaust valves MS6-SV-E, MS6-SV-D	 Soft-start/quick exhaust valves MS6-SV-C, MS9-SV-C	 On/off valves MS4-EM1, MS6-EM1, MS9-EM, MS12-EM	 On/off valves MS4N-EM1
<b>Pneumatic connection 1</b>	G1/2	G1/2	Manifold module, G3/8, G3/4, G1, G1/2, G1/4, G1/8, G3/8	3/8 NPT
<b>Standard nominal flow rate</b>	4300 ... 16550 l/min	4300 ... 16550 l/min	1200 ... 32000 l/min	2200 l/min
<b>Operating pressure</b>	3 ... 16 bar	3 ... 16 bar	0 ... 20 bar	0 ... 14 bar
<b>Actuation type</b>	Electric	Electric	Manual	Manual
<b>Description</b>	<ul style="list-style-type: none"> <li>• With safety functions</li> <li>• For reducing pressure quickly and reliably and for building up pressure gradually</li> <li>• Adjustable pressure build-up time</li> <li>• Available with silencer</li> <li>• Supply voltage 24 V DC</li> <li>• Grid dimension 62 mm (size 6)</li> </ul>	<ul style="list-style-type: none"> <li>• With safety functions</li> <li>• For reducing pressure quickly and reliably and for building up pressure gradually</li> <li>• Adjustable pressure build-up time</li> <li>• Adjustable switch-through pressure</li> <li>• Supply voltage 24 V DC</li> <li>• Grid dimension 62, 90 mm (size 6, 9)</li> </ul>	<ul style="list-style-type: none"> <li>• Manual 3/2-way valve for pressurising and exhausting pneumatic systems</li> <li>• A silencer can be attached or the exhaust air ducted at port 3</li> <li>• Switching position is immediately recognisable</li> <li>• Optionally with pressure gauge and pressure sensor</li> <li>• Variants to EU Explosion Protection Directive (ATEX)</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> <li>• Grid dimension 40, 62, 90, 124 mm (size 4, 6, 9, 12)</li> </ul>	<ul style="list-style-type: none"> <li>• Manual 3/2-way valve for pressurising and exhausting pneumatic systems</li> <li>• A silencer can be attached or the exhaust air ducted at port 3</li> <li>• Switching position is immediately recognisable</li> <li>• Optionally with pressure gauge and pressure sensor</li> <li>• Grid dimension 40, 62, 124 mm (size 4, 6, 12)</li> </ul>
<b>online:</b> →	<a href="#">ms6-sv-e</a>	<a href="#">ms6-sv-c</a>	<a href="#">ms4-em1</a>	<a href="#">ms4n-em</a>

## Product overview



### On/off and soft-start valves >

## MS series

				
	<b>On/off valves</b> <b>MS4-EE, MS6-EE, MS9-EE, MS12-EE</b>	<b>On/off valves</b> <b>MS4N-EE, MS6N-EE, MS12N-EE</b>	<b>Soft-start valves</b> <b>MS4-DL, MS6-DL, MS12-DL</b>	<b>Soft-start valves</b> <b>MS4-DE, MS6-DE, MS12-DE</b>
<b>Pneumatic connection 1</b>	Manifold module, G1/8, G1/4, G3/8, G1/2, G3/4, G1, G1/2, G1/4, G1/8, G3/8	1/2 NPT	Manifold module, G1/2, G1/4, G1/8, G3/8	Manifold module, G1/2, G1/4, G3/8
<b>Standard nominal flow rate</b>	1000 ... 32000 l/min	7000 l/min	1000 ... 42000 l/min	1000 ... 42000 l/min
<b>Operating pressure</b>	3 ... 18 bar	4 ... 18 bar	2 ... 20 bar	3 ... 18 bar
<b>Actuation type</b>	Electric	Electric	Pneumatic	Electric
<b>Description</b>	<ul style="list-style-type: none"> <li>• Electric 3/2-way valve for pressurising and exhausting pneumatic installations</li> <li>• A silencer can be attached or the exhaust air ducted at port 3</li> <li>• Supply voltage 24 V DC, 110, 230 V AC</li> <li>• Optionally with pressure gauge and pressure sensor</li> <li>• With solenoid coil, without plug socket</li> <li>• Variants to EU Explosion Protection Directive (ATEX)</li> <li>• Grid dimension 40, 62, 90, 124 mm (size 4, 6, 9, 12)</li> </ul>	<ul style="list-style-type: none"> <li>• Electric 3/2-way valve for pressurising and exhausting pneumatic installations</li> <li>• A silencer can be attached or the exhaust air ducted at port 3</li> <li>• Supply voltage 24 V DC, 110, 230 V AC</li> <li>• Optionally with pressure gauge and pressure sensor</li> <li>• With solenoid coil, without plug socket</li> <li>• Grid dimension 40, 62, 124 mm (size 4, 6, 12)</li> </ul>	<ul style="list-style-type: none"> <li>• 2/2-way valve for slowly pressurising pneumatic systems (for use with on/off valves EM(1) and EE)</li> <li>• For building up pressure gradually</li> <li>• Adjustable pressure build-up time</li> <li>• Variants to EU Explosion Protection Directive (ATEX)</li> <li>• Grid dimension 40, 62, 124 mm (size 4, 6, 12)</li> </ul>	<ul style="list-style-type: none"> <li>• 2/2-way valve for slowly pressurising pneumatic installations with electrically switchable pressure switchover point</li> <li>• Supply voltage 24 V DC, 110, 230 V AC</li> <li>• Switchable pressure switching point</li> <li>• For advancing the drives slowly and reliably into the initial position</li> <li>• For avoiding sudden and unexpected movements</li> <li>• Adjustable pressure build-up time</li> <li>• Variants to EU Explosion Protection Directive (ATEX)</li> <li>• Grid dimension 40, 62, 124 mm (size 4, 6, 12)</li> </ul>
<b>online:</b> →	<a href="#">ms4-ee</a>	<a href="#">ms4n-ee</a>	<a href="#">ms4-dl</a>	<a href="#">ms4-de</a>


## On/off and soft-start valves &gt;

## Individual devices

	 <b>Shut-off valves</b> <b>HE-LO</b>	 <b>On/off valves</b> <b>PVEL</b>
<b>Pneumatic connection 1</b>	G1, G1/2, G3/4, G3/8	
<b>Standard nominal flow rate</b>	5200 ... 10000 l/min	
<b>Nominal size DN</b>		54
<b>Operating pressure [MPa]</b>		0 ... 5 MPa
<b>Operating pressure</b>	1 ... 10 bar	0 ... 50 bar
<b>Actuation type</b>	Manual	Manual, Pneumatic
<b>Description</b>	<ul style="list-style-type: none"> <li>• For shutting off the compressed air supply whilst simultaneously exhausting systems powered by compressed air</li> <li>• Can be locked in the closed position</li> <li>• Screwed into piping, through-holes for wall mounting</li> <li>• To OSHA 29 CFR 147</li> </ul>	<ul style="list-style-type: none"> <li>• Food grade see <a href="http://www.festo.com/certificates/PVEL">www.festo.com/certificates/PVEL</a></li> <li>• For high-pressure applications</li> </ul>
<b>online: →</b>	<a href="#">he-lo</a>	<a href="#">pvel</a>

## Air dryers &gt;


## MS series

	 <b>Membrane air dryers</b> <b>MS4-LDM1, MS6-LDM1</b>
<b>Pneumatic connection 1</b>	G1/2, G1/4
<b>Standard nominal flow rate</b>	50 ... 400 l/min
<b>Operating pressure</b>	3 ... 12.5 bar
<b>Pressure dew point reduction</b>	see documentation on the Internet
<b>Description</b>	<ul style="list-style-type: none"> <li>• Final dryer with excellent operational reliability</li> <li>• Suitable for use as an individual device or for integration into existing service unit combinations</li> <li>• Flow rate-dependent dew point reduction</li> <li>• Wear-free function requiring no external energy</li> <li>• Grid dimension 40, 62 mm (size 4, 6)</li> </ul>
<b>online: →</b>	<a href="#">ms4-ldm1</a>

## Product overview



Air dryers >

### Air dryers: individual devices

	 <p><b>Adsorption dryers</b> <b>PDAD</b></p>
<b>Pneumatic connection 1</b>	G1/2, G3/8
<b>Inlet pressure 1</b>	4 ... 16 bar
<b>Pressure dew point</b>	-40°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• Ideal for decentralised compressed air drying</li> <li>• Integrated filtering of oil and particulates</li> <li>• Defined pressure dew point</li> <li>• Low purge air consumption</li> </ul>
<b>online: →</b>	<a href="#">pdad</a>


Compressed air distributors >

### MS series


	 <p><b>Branching modules</b> <b>MS4-FRM, MS6-FRM, MS9-FRM, MS12-FRM</b></p>	 <p><b>Distributor blocks</b> <b>MS4-FRM-FRZ, MS6-FRM-FRZ</b></p>
<b>Pneumatic connection 1</b>	G1/4, G1/2, G1, G2, Manifold module, 1/2 NPT, 3/4 NPT, 1 NPT, 1 1/4 NPT, 1 1/2 NPT, G1, G1 1/2, G1 1/4, G1/2, G1/4, G1/8, G3/4, G3/8	G1/4, G1/2
<b>Standard nominal flow rate in main flow direction 1-&gt;2</b>	1200 ... 50000 l/min	4050 ... 14600 l/min
<b>Operating pressure</b>	0 ... 20 bar	0 ... 20 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• Optionally with integrated non-return function and pressure switch</li> <li>• Outlet at top and bottom</li> <li>• Can be used as an intermediate distributor for varying air qualities</li> <li>• Optionally with pressure sensor</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> <li>• Grid dimension 40, 62, 90, 124 mm (size 4, 6, 9, 12)</li> </ul>	<ul style="list-style-type: none"> <li>• Slim compressed air distributor</li> <li>• Outlet at top and bottom</li> <li>• Can be used as an intermediate distributor for varying air qualities</li> <li>• Can be used as an adapter between two pressure regulators size 4 with pressure gauge with large rotary knob</li> <li>• Grid dimension 40, 62 mm (size 4, 6)</li> </ul>
<b>online: →</b>	<a href="#">ms*-frm</a>	<a href="#">ms*-frm-frz</a>

Compressed air distributors >

Individual devices

	 <p><b>Branching modules</b> <b>PMBL</b></p>
<b>Pneumatic connection 3</b>	G1
<b>Pneumatic connection 4</b>	G1
<b>Operating pressure [MPa]</b>	0 ... 5 MPa
<b>Operating pressure</b>	0 ... 50 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• For high-pressure applications</li> <li>• Food grade see <a href="http://www.festo.com/certificates/PMBL">www.festo.com/certificates/PMBL</a></li> <li>• Size 90 mm, 186 mm</li> </ul>
<b>online:</b> →	<a href="#">pmb</a>

Generators

	 <p><b>Pressure vacuum generators</b> <b>PGVA</b></p>
<b>Output pressure 1 [MPa]</b>	-0.062 MPa, -0.045 MPa
<b>Output pressure 2 [Mpa]</b>	0.045 MPa, 0.08 MPa
<b>Pneumatic connection 1</b>	QS-4
<b>Display</b>	LED
<b>Configuration support</b>	CODESYS V3, Python scripts, Integrated web server
<b>Electrical power consumption</b>	11 W, 19 W
<b>Nominal operating voltage DC</b>	24 V
<b>Electrical actuation</b>	COM port, Ethernet, Integrated controller
<b>Description</b>	<ul style="list-style-type: none"> <li>• Complete solution with integrated compressor</li> <li>• Proportional pressure/vacuum regulation or preset fixed values</li> <li>• Power supply 24 V DC</li> <li>• Flexible to use and easy to integrate</li> <li>• Easy to operate and configure with the GUI configuration tool, see <a href="http://www.festo.com/software/PGVA">www.festo.com/software/PGVA</a></li> <li>• Dynamic and precise</li> <li>• Sustainable operation thanks to consumer-optimised, decentralised pressure generation</li> </ul>
<b>online:</b> →	<a href="#">pgva</a>

## Product overview

### Condensate drain >

## MS series



**Water separators**  
**MS6-LWS, MS9-LWS, MS12-LWS**

<b>Pneumatic connection 1</b>	G1/2, G1/4, G3/8
<b>Operating pressure</b>	0.8 ... 16 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• No replacement of filter cartridges necessary</li> <li>• Constantly high condensate separation (99%) up to the maximum flow rate</li> <li>• Available with fully automatic or fully automatic, electrically actuated condensate drain</li> </ul>
<b>online: →</b>	<a href="#">ms6-lws</a>

### Condensate drain >

## Individual devices



**Condensate drains, electrical**  
**PWEA**



**Condensate drains, automatic**  
**WA**

<b>Pneumatic connection</b>	G1/2	M9
<b>Operating pressure</b>	0.8 ... 16 bar	1.5 ... 16 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fully automatic condensate drain with independent electric controller</li> <li>• Interface available for communicating with master control device</li> <li>• Reliable thanks to contactless capacitive sensor</li> <li>• Can be used with service units or simply in piping systems</li> <li>• Ready status and switching status indicated via LEDs and electrical interface</li> </ul>	<ul style="list-style-type: none"> <li>• For attaching to service units and compressed air networks/ systems</li> <li>• Automatic emptying after the max. fill level has been reached</li> <li>• Automatic emptying after the operating pressure <math>p &lt; 0.5</math> bar is switched off</li> <li>• Manual actuation during operation is possible</li> </ul>
<b>online: →</b>	<a href="#">pwea</a>	<a href="#">wa</a>

Pressure amplifiers

Pressure boosters



**Pressure boosters**  
**DPA**

<b>Pneumatic connection 1</b>	G1/2, G1/4, G3/8, QS-10, QS-12, QS-16
<b>Outlet pressure 2</b>	4 ... 16 bar
<b>Inlet pressure 1</b>	2 ... 10 bar
<b>Description</b>	<ul style="list-style-type: none"> <li>• Pneumatic pressure increase up to double the input pressure</li> <li>• Available as pressure booster/air pressure reservoir combinations</li> <li>• Any mounting position</li> <li>• Short filling times</li> <li>• Long service life</li> <li>• Compact design</li> <li>• Available with sensing option</li> </ul>
<b>online:</b> →	<a href="#">dpa</a>

Pressure gauges



**Pressure gauges**  
**PAGN**



**Pressure gauges**  
**MA**



**Flanged pressure gauges**  
**FMA**






**Flanged precision pressure gauges, precision pressure gauges**  
**FMAP, MAP**

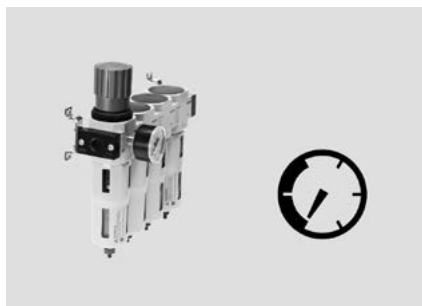
<b>Type of mounting</b>	Front panel mounting, In-line installation	In-line installation	Front panel mounting	Front panel mounting, In-line installation
<b>Indicating range [MPa]</b>	0 ... 1.6 MPa	0 ... 1.6 MPa		
<b>Display range</b>	0 ... 16 bar	0 ... 25 bar	0 ... 16 bar	0 ... 16 bar
<b>Display range [psi]</b>	0 ... 232 psi	0 ... 362.5 psi	0 ... 232 psi	0 ... 232 psi
<b>Pneumatic connection</b>	G1/8 with sealing ring, G1/4, Cartridge 10 mm, G1/4, R1/8	G1/4, G1/8, M5, QS-4, QS-6, QS-8, R1/4, R1/8	G1/4	G1/4, R1/8
<b>Operating pressure [MPa]</b>	0 ... 1.6 MPa	0 ... 2.5 MPa	0 ... 1.6 MPa	0 ... 1.6 MPa
<b>Operating pressure</b>	0 ... 16 bar	0 ... 25 bar	0 ... 16 bar	0 ... 16 bar
<b>Operating pressure [psi]</b>	0 ... 232 psi	0 ... 362.5 psi	0 ... 232 psi	0 ... 232 psi
<b>Measurement accuracy class</b>	1, 1.6, 2.5, 4, 5	1.6, 2.5, 4, 5	1.6, 2.5	1, 1.6
<b>Description</b>	<ul style="list-style-type: none"> <li>• Designs based on EN 837-1</li> <li>• Display units bar, psi, MPa</li> </ul>	<ul style="list-style-type: none"> <li>• Designs based on DIN EN 837-1, available with red-green range</li> <li>• Pneumatic connection via R, G or metric thread, push-in connector</li> <li>• Display units bar, psi, MPa</li> </ul>	<ul style="list-style-type: none"> <li>• Designs based on EN 837-1</li> <li>• Pneumatic connection via G thread</li> <li>• Display units bar, psi</li> </ul>	<ul style="list-style-type: none"> <li>• Designs based on EN 837-1</li> <li>• Pneumatic connection via R or G thread</li> <li>• Display units bar, psi</li> </ul>
<b>online:</b> →	<a href="#">pagn</a>	<a href="#">ma</a>	<a href="#">fma</a>	<a href="#">fmap</a>

## Product overview

### Pressure gauges

	 <b>Pressure gauge kits DPA</b>	 <b>Vacuum gauges VAM, FVAM</b>	 <b>Pressure gauges PAGL</b>
<b>Type of mounting</b>	Via male thread	Front panel mounting, Screw-in	In-line installation
<b>Indicating range [MPa]</b>			0 ... 6 MPa
<b>Display range</b>		-1 ... 9 bar	0 ... 60 bar
<b>Display range [psi]</b>		0 ... 130 psi	0 ... 870 psi
<b>Pneumatic connection</b>	G1/4, G1/8, R1/8	G1/4, G1/8, R1/4, R1/8	G1/4
<b>Operating pressure [MPa]</b>			0 ... 6 MPa
<b>Operating pressure</b>	10 ... 16 bar	-1 ... 9 bar	0 ... 60 bar
<b>Operating pressure [psi]</b>			0 ... 870 psi
<b>Measurement accuracy class</b>	2.5, 4	2.5	1.6
<b>Description</b>	<ul style="list-style-type: none"> <li>• For pressure booster DPA</li> <li>• For monitoring the supply and output pressure</li> <li>• Pneumatic connection via R or G thread</li> </ul>	<ul style="list-style-type: none"> <li>• Designs based on DIN EN 837-1, available with red-green range</li> <li>• Pneumatic connection via R or G thread</li> <li>• Double or single scale</li> <li>• Display units bar, in Hg, psi</li> </ul>	<ul style="list-style-type: none"> <li>• For high-pressure applications</li> <li>• Display units bar, psi, MPa</li> </ul>
<b>online: →</b>	<a href="#">dpa</a>	<a href="#">vam</a>	<a href="#">pagl</a>

### Customised components – for your specific requirements



#### Components for compressed air preparation with customised designs

Can't find the compressed air preparation components you need in our catalogue?

We can offer you customised components that are tailored to your specific requirements.

Common product modifications:

- Modified pressure range
- Rotary knob: in a special colour, with protection against rotation
- Fitting: integrated throttling port, special thread
- Tubing with special printing
- Pressure gauge with red-green range

Many additional variants are possible.

Ask your Festo sales engineer, who will be happy to help you:

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



## Product overview

## Software tools

### Configurator for connecting cable NEBA



Design a product with numerous features reliably and quickly with the help of the configurator.

Select all the relevant product features step-by-step.

The use of logic checks ensures that only correct configurations are available for selection.





A dynamic graphic, which is generated based on the configuration, provides you with a visual aid for selecting the correct product features.

You will find the configurator

- at [www.festo.com/catalogue/neba](http://www.festo.com/catalogue/neba)
- Click on the product
- Click on the blue „Configure product“ button

## Connecting cables &gt;




## Connecting cables, universal

				
	<b>Connecting cables NEBA</b>	<b>Connecting cables NEBU-G78W5-K</b>	<b>Connecting cable M12x1 A-coded, 8-pin NEBU-M12W8-K, SIM-M12</b>	<b>Connecting cable M12x1 A-coded, 1 mm<sup>2</sup> NEBU-M12G5-E</b>
<b>Electrical connection, connection type</b>	Socket, Cable, Plugs	Socket, Cable	Socket, Cable, Plugs	Socket, Cable, Plugs
<b>Electrical connection, cable outlet</b>	Straight, Straight, angled, Angled	Angled	Straight, Angled	Straight
<b>Electrical connection, design</b>	Round	Round	Round	Round
<b>Electrical connection, connection technology</b>	M12x1, A-coded to EN 61076-2-101, M8x1, A-coded to EN 61076-2-104, M8x1, A-coded, to EN 61076-2-104, Open end, Diameter 8 mm, A-coded to EN 61076-2-104	G7/8 coded to NFPA/T3.5.29 R1-2007, Open end	M12x1, A-coded to EN 61076-2-101, Open end	M12x1, A-coded to EN 61076-2-101, Open end
<b>Electrical connection, number of pins/wires</b>	3, 4, 5	5	8	5
<b>Cable length</b>	0.3 ... 30 m	2 m	2 ... 25 m	5 ... 10 m
<b>Description</b>	<ul style="list-style-type: none"> <li>• Powerful universal connecting cables</li> <li>• Suitable for harsh environments and applications in constant motion or vibration</li> <li>• Meets the safety requirements of IEC 61010-1 and IEC 61010-2-202 for electrical equipment for measurement, control, and laboratory devices</li> <li>• High IP65, IP68, IP69k degree of protection</li> <li>• Resistant to abrasion and low adhesion</li> <li>• Suitable for use with energy chains and robots</li> <li>• Flame-retardant and self-extinguishing</li> <li>• Recommended for production plants for the manufacture of Li-ion manifolds (F1A)</li> </ul>	<ul style="list-style-type: none"> <li>• Connecting cables with 5-pin plug/socket M12x1 A-coded according to EN 61076-2-101 and conductor nominal cross-section 1 mm<sup>2</sup> (NEBU-M12G5-E-...-Q8N-...)</li> <li>• Shielded connecting cables with 8-pin angled socket M12x1 A-coded according to EN 61076-2-101 (NEBU-M12W8-K-...)</li> <li>• Connecting cable with power supply socket G7/8 coded according to NFPA/T3.5.29 R1-2007 (NEBU-G78W5-...)</li> </ul>	<ul style="list-style-type: none"> <li>• Shielded connecting cables with 8-pin sockets M12x1 A-coded according to EN 61076-2-101</li> <li>• Cable length 2 ... 25 m</li> </ul>	<ul style="list-style-type: none"> <li>• Connecting cables with 5-pin plug/socket M12x1 A-coded according to EN 61076-2-101</li> <li>• Nominal conductor cross-section 1 mm<sup>2</sup></li> <li>• Cable length 5 ... 10 m</li> </ul>
<b>online:</b> →	<a href="#">neba</a>	<a href="#">nebu</a>	<a href="#">m12_m8</a>	<a href="#">m12_1</a>

## Product overview


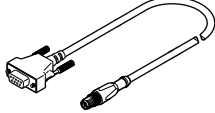
### Connecting cables >

## Connecting cables for control systems

	 <b>Connecting cables</b> <b>NEBC</b>	 <b>Connecting cables</b> <b>NEBP</b>	 <b>Connecting cables</b> <b>NEBL</b>
	4.6 ... 10.8 mm	5.5 mm	4.8 ... 6.75 mm
<b>Electrical connection</b>	25-pin, 5-pin, Straight plug, Straight plug connector/open at one end, Sub-D/-, Sub-D/ Sub-D, Square design/angled, M12x1		
<b>Electrical connection, connection type</b>	Socket, Cable, Hybrid plug, Plugs, Plug and socket strip	Socket, Plugs	Socket, Cable, Plugs
<b>Electrical connection, cable outlet</b>	Straight, Angled	Angled	Straight, Angled
<b>Electrical connection, design</b>	Angular, Round	Round	Round
<b>Electrical connection, connection technology</b>	Connection pattern P1, M12x1, Festo-specific coding, Plug pattern type A to EN 175301-803, M12x1, A-coded to EN 61076-2-101, M8x1, D-coded according to EN 61076-2-114, M12x1, D-coded to EN 61076-2-101, M9x0.5, RJ45 to IEC 60603-7-3, USB 2.0 type A, M8x1, A-coded, to EN 61076-2-104, RJ45, RJ45 and socket strip 12 pins, 2 rows, Sub-D, USB 2.0 Type B, Open end	M9x0.5, M16x0.75	M8x1, A-coded to EN 61076-2-104, M12x1, T-coded according to EN 61076-2-111, Open end, M8x1, A-coded, to EN 61076-2-104
<b>Electrical connection, number of pins/wires</b>	3, 4, 5, 8, 9, 17, 20, 25, 26	5, 6	4
<b>Cable length</b>	0.2 ... 50 m	2 m	0.3 ... 15 m
<b>Description</b>	<ul style="list-style-type: none"> <li>• Variants in easy-to-clean design</li> <li>• Standard variants, variants with shielding or as a hybrid cable</li> <li>• Variants suitable for energy chains</li> <li>• Variants with Ethernet, CANopen, I-Port or RS232</li> </ul>	<ul style="list-style-type: none"> <li>• Connection between displacement encoder MME and measuring module CPX-CMIX</li> </ul>	<ul style="list-style-type: none"> <li>• For power supply</li> <li>• Suitable for use with energy chains</li> </ul>
<b>online:</b> →	<a href="#">nebc</a>	<a href="#">nebp</a>	<a href="#">nebl</a>

## Connecting cables &gt;




## Connecting cables for motors

	 <b>Motor, encoder, resolver cables</b> <b>NEBM</b>	 <b>Fieldbus adapters</b> <b>FBA</b>
<b>Electrical connection, connection type</b>	4x socket, Socket, 4x cable, Hybrid socket, Hybrid plug, Cable, Plugs, Plugs and cables	Socket, Plugs
<b>Electrical connection, cable outlet</b>	Straight, Angled	Straight
<b>Electrical connection, design</b>	Angular, Round	Angular, Round
<b>Electrical connection, connection technology</b>	Connection pattern F1, Connection pattern H6, coded for motor, Plug pattern L5, Connection pattern H7, coded for motor brake, Plug pattern L10, Plug pattern L15, Connection pattern L5, Connection pattern RE, ITT M3, M12x1, A-coded to EN 61076-2-101, RJ45 and open end, Sub-D, Sub-D and open end, M12x1, T-coded according to EN 61076-2-111, M17x0.75, Open end, M23x1, M40x1, M40x1.5	M12x1, A-coded to EN 61076-2-101, Sub-D
<b>Electrical connection, number of pins/wires</b>	2, 4, 6, 8, 9, 12, 14, 15, 21, 24, 28, 31	5, 9
<b>Cable length</b>	0.2 ... 100 m	0.1 m
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electro-mechanical actuators, motors, servo drives and control systems</li> <li>• For stepper and servo motors</li> <li>• For motor controllers</li> <li>• For servo drive</li> <li>• Can be used in a wide temperature range</li> <li>• Suitable for energy chains</li> </ul>	<ul style="list-style-type: none"> <li>• 9-pin Sub-D plug to 5-pin round plug/M12 socket</li> <li>• For CANopen and DeviceNet</li> </ul>
<b>online:</b> →	<a href="#">nebm</a>	<a href="#">fba</a>

## Product overview


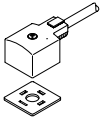

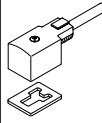
### Connecting cables >

## Connecting cables for valves

	 <b>Connecting cables/plug sockets with cable NEBV</b>	 <b>Plug sockets with cable KMEB-1, KMEB-2, KMEB-3</b>	 <b>Connecting/plug sockets with cable KMPYE-AIF, KMPYE-5</b>
<b>Electrical connection</b>	4-pin/2-wire, 4-pin/3-pin, 44-pin, Socket, Angled socket/cable, Angled socket/straight plug, M8x1/M8x1, Sub-D, M8x1	4-pin, 5-pin, Angled socket, Type C, To DIN EN 175301-803	
<b>Electrical connection, connection type</b>	2x single wires, Socket, Socket, narrow, Cable with socket, Cable, Plugs, Twin wire	Socket	Socket, Cable, Plugs
<b>Electrical connection, cable outlet</b>	Straight, Angled	Angled	Straight
<b>Electrical connection, design</b>	Angular, Round	Angular	Round
<b>Electrical connection, connection technology</b>	Connection pattern ZB, self-tapping screw, Connection pattern ZC, self-tapping screw, Plug pattern ZC, metric screw, Connection pattern H, Connection pattern HP, Connection pattern Q7, M12x1, A-coded to EN 61076-2-101, Connection pattern S, Connection pattern type A based on EN 175301-803, Plug pattern type B to industry standard, 11 mm, Plug pattern type C to EN 175301-803, M8x1, A-coded to EN 61076-2-104, Open end, Sub-D	Open end	M12x1, A-coded to EN 61076-2-101, M9x0.5, Open end
<b>Electrical connection, number of pins/wires</b>	2, 3, 4, 5, 8, 10, 25, 26, 27, 36, 37, 44	2, 3	4, 7
<b>Cable length</b>	0.1 ... 30 m	0.5 ... 10 m	0.3 ... 5 m
<b>Description</b>	<ul style="list-style-type: none"> <li>• For solenoid coils form A, form B or form C</li> <li>• For solenoid coils with thread M8x1 or M12x1 A-coded</li> <li>• For solenoid coils ZC or various special connection patterns</li> <li>• Pre-assembled at one or both ends</li> <li>• Cable length 0.1 ... 30 m</li> <li>• With PUR cable</li> <li>• Ambient temperature -25 ... +80 °C</li> </ul>	<ul style="list-style-type: none"> <li>• For solenoid coils with plug pattern type C according to EN 175301-803</li> <li>• For EB solenoid coils</li> <li>• With PVC or PUR cable</li> <li>• Ambient temperature -20 ... +80 °C</li> </ul>	<ul style="list-style-type: none"> <li>• For solenoid coils with thread M12x1 A-coded according to EN 61076-2-101</li> <li>• For connecting proportional directional control valves MPYE with end-position controller SPC11</li> <li>• Cable length 0.3 ... 5 m</li> <li>• With PVC or PUR cable</li> <li>• Ambient temperature -25 ... +80 °C</li> </ul>
<b>online:</b> →	<a href="#">nebv</a>	<a href="#">kmeb-1</a>	<a href="#">kmpye</a>



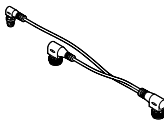

## Connecting cables &gt;

## Connecting cables for valves

	 <b>Plug sockets with cable</b> <b>KME</b>	 <b>Connecting cables</b> <b>KMC</b>	 <b>Plug sockets with cable</b> <b>KMF</b>	 <b>Plug sockets with cable</b> <b>KMV</b>
<b>Type of mounting</b>	On solenoid valve via M3 central screw	On solenoid valve via M3 central screw	On solenoid valve via M3 central screw	On solenoid valve via M3 central screw
<b>Signal status display</b>	Yellow LED			
<b>Electrical connection 1</b>	Angled socket, square design, 3-pin, type C			
<b>Electrical connection 2</b>	Open end, 2-wire			
<b>Nominal operating voltage DC</b>	24 V	24 V	24 V	24 V
<b>Operating voltage range DC</b>				
<b>Description</b>	<ul style="list-style-type: none"> <li>For solenoid coils with plug pattern type C as per industrial standard, 9.4 mm</li> <li>For E solenoid coils</li> <li>With PVC cable</li> <li>Ambient temperature -20 ... +80 °C</li> </ul>	<ul style="list-style-type: none"> <li>For solenoid coils with plug pattern type A according to EN 175301-803</li> <li>For D solenoid coils</li> <li>For N1 solenoid coils</li> <li>With PVC cable</li> <li>Ambient temperature -20 ... +80 °C</li> </ul>	<ul style="list-style-type: none"> <li>For solenoid coils with plug pattern type B as per industrial standard, 11 mm</li> <li>For F solenoid coils</li> <li>With PVC cable</li> <li>Ambient temperature -20 ... +80 °C</li> </ul>	<ul style="list-style-type: none"> <li>For solenoid coils with plug pattern type B according to EN 175301-803</li> <li>For V solenoid coils</li> <li>With PVC cable</li> <li>Ambient temperature -20 ... +80 °C</li> </ul>
<b>online:</b> →	<a href="#">kme</a>	<a href="#">kmc</a>	<a href="#">kmf</a>	<a href="#">kmv</a>

## Connecting cables &gt;





## Connecting cables for valves

	 <b>Connecting cables/plug sockets with cable</b> <b>KMYZ-2, KMYZ-4</b>	 <b>Electrical plug-in bases</b> <b>MHAP-PI</b>	 <b>Connecting cables</b> <b>NEDV</b>	 <b>Connecting cables</b> <b>MHJ9-KMH</b>
<b>Type of mounting</b>	On solenoid valve via M2 central screw, On solenoid valve via self-tapping screw	Clip		Either-, With through-hole, With H-rail
<b>Signal status display</b>				
<b>Electrical connection 1</b>			2x angled socket, M12, 3-pin	
<b>Electrical connection 2</b>			Angled plug, M8, 4-pin	
<b>Nominal operating voltage DC</b>	24 V			
<b>Operating voltage range DC</b>	3 ... 36 V	≤60 V	0 ... 30 V	12 ... 53 V
<b>Description</b>	<ul style="list-style-type: none"> <li>For solenoid coils with plug pattern ZB</li> <li>For solenoid coils with plug pattern ZC</li> <li>With PVC or PUR cable</li> <li>Ambient temperature -10 ... +50 °C</li> </ul>	<ul style="list-style-type: none"> <li>Electrical plug-in base with plug pattern H</li> <li>For sub-base valves and semi in-line valves MHA1-...-PI and MHP1-...-PI</li> <li>Pre-assembled</li> <li>Ambient temperature -20 ... +80 °C</li> </ul>	<ul style="list-style-type: none"> <li>For proportional valves VPWP</li> <li>For connecting to sub-base VABP-S3</li> <li>Pre-assembled</li> <li>With PUR cable</li> <li>Ambient temperature -25 ... +80 °C</li> </ul>	<ul style="list-style-type: none"> <li>With control electronics for solenoid valves MHJ9</li> <li>With plug sockets KMH</li> <li>With PVC cable</li> <li>Ambient temperature -5 ... +50 °C</li> </ul>
<b>online:</b> →	<a href="#">kmyz-2</a>	<a href="#">mhap</a>	<a href="#">nedv</a>	<a href="#">mhj9-kmh</a>

## Product overview





### Connecting cables >

## Connecting cables for valve terminals

	 <b>Connecting cables</b> <b>NEBV-S1, NEBV-C</b>	 <b>Connecting cables</b> <b>KMP3, KMP4, KMP6</b>	 <b>Flat cables</b> <b>KASI</b>	 <b>Addressing cables</b> <b>KASI-ADR</b>
<b>Electrical connection</b>	44-pin, Socket, Sub-D			
<b>Electrical connection, connection type</b>	Socket, Cable	Socket, Cable		Socket
<b>Electrical connection, cable outlet</b>	Straight, Angled	Straight, Angled		Straight, Angled
<b>Electrical connection, design</b>	Angular	Angular		Angular, Round
<b>Electrical connection, connection technology</b>	Open end, Sub-D	Open end, Sub-D		AS-Interface, M12x1, A-coded to EN 61076-2-101
<b>Electrical connection, number of pins/wires</b>	10, 25, 26, 27, 36, 37, 44	9, 10, 15, 18, 20, 25, 26		2, 4
<b>Cable length</b>	2.5 ... 10 m	1 ... 99 m	100 m	
<b>Description</b>	<ul style="list-style-type: none"> <li>• For multi-pin plug connection Sub-D</li> <li>• Connecting cable between valve terminal and controller</li> <li>• Variants in easy-to-clean design</li> <li>• With PVC or PUR cable</li> <li>• Pre-assembled at one end</li> <li>• Ambient temperature -5 ... +50 °C</li> </ul>	<ul style="list-style-type: none"> <li>• For multi-pin plug connection Sub-D</li> <li>• Connecting cable between valve terminal and controller</li> <li>• Pre-assembled</li> <li>• With PVC or PUR cable</li> <li>• Ambient temperature -40 ... +70 °C</li> </ul>	<ul style="list-style-type: none"> <li>• For AS-Interface</li> <li>• Reverse polarity protected</li> <li>• Contact using insulation displacement technology</li> <li>• No need to strip cable and wire insulation</li> <li>• Two different colours: yellow (preferred for the AS-Interface® network) and black (for auxiliary power supply)</li> </ul>	<ul style="list-style-type: none"> <li>• For AS-Interface</li> <li>• For any slaves such as individual valve interface, valve terminal with AS-Interface® connection</li> <li>• Reverse polarity protected</li> </ul>
<b>online:</b> →	<a href="#">nebv</a>	<a href="#">kmp</a>	<a href="#">kasi</a>	<a href="#">kasi-adr</a>

## Connecting cables &gt;




## Connecting cables for valve terminals

	 Connecting cables KV-M12	 Connecting cables KMPV-SUB	 Connecting cables VMPA-KMS1, VMPA-KMS2, VMPAL-KM, VMPAL-KMSK	 Connecting cables NEBU-G78W5-K
<b>Electrical connection</b>			Cable with plug	
<b>Electrical connection, connection type</b>	Socket, Plugs	Socket, Cable	Socket, Cable	Socket, Cable
<b>Electrical connection, cable outlet</b>	Straight	Straight	Angled	Angled
<b>Electrical connection, design</b>	Round	Angular	Angular	Round
<b>Electrical connection, connection technology</b>	M12x1, A-coded to EN 61076-2-101	Open end, Sub-D	Open end, Sub-D	G7/8 coded to NFPA/T3.5.29 R1-2007, Open end
<b>Electrical connection, number of pins/wires</b>	5	15	10, 25	5
<b>Cable length</b>	1.5 ... 3.5 m	5 ... 10 m	2.5 ... 10 m	2 m
<b>Description</b>	<ul style="list-style-type: none"> <li>• Plug socket with cable for diagnostic interface (to CPX terminal)</li> <li>• Pre-assembled at both ends</li> <li>• With PUR cable</li> <li>• Ambient temperature -25 ... +70 °C</li> </ul>	<ul style="list-style-type: none"> <li>• For multi-pin plug connection Sub-D</li> <li>• Pre-assembled at one end</li> <li>• With PUR cable</li> <li>• Ambient temperature -20 ... +80 °C</li> </ul>	<ul style="list-style-type: none"> <li>• For multi-pin plug connection Sub-D</li> <li>• Connecting cable between valve terminal MPA and controller</li> <li>• Variants suitable for energy chains</li> <li>• Pre-assembled at one end</li> <li>• With PVC or PUR cable</li> <li>• Ambient temperature -40 ... +80 °C</li> </ul>	<ul style="list-style-type: none"> <li>• Connecting cables with 5-pin plug/socket M12x1 A-coded according to EN 61076-2-101 and conductor nominal cross-section 1 mm<sup>2</sup> (NEBU-M12G5-E-...-Q8N-...)</li> <li>• Shielded connecting cables with 8-pin angled socket M12x1 A-coded according to EN 61076-2-101 (NEBU-M12W8-K-...)</li> <li>• Connecting cable with power supply socket G7/8 coded according to NFPA/T3.5.29 R1-2007 (NEBU-G78W5-...)</li> </ul>
<b>online: →</b>	<a href="#">kv-m12</a>	<a href="#">kmpv</a>	<a href="#">vmpa-kms</a>	<a href="#">nebu</a>

## Product overview



### Connecting cables >

## Connecting cables for sensors

	 <b>Connecting cables</b> <b>NEBA</b>	 <b>Connecting cables</b> <b>NEBS</b>	 <b>Connecting cables</b> <b>NEBU-G78W5-K</b>
<b>Electrical connection, connection type</b>	Socket, Cable, Plugs	Socket, Cable, Plugs	Socket, Cable
<b>Electrical connection, cable outlet</b>	Straight, Straight, angled, Angled	Straight	Angled
<b>Electrical connection, design</b>	Round	Angular, Round	Round
<b>Electrical connection, connection technology</b>	M12x1, A-coded to EN 61076-2-101, M8x1, A-coded to EN 61076-2-104, M8x1, A-coded, to EN 61076-2-104, Open end, Diameter 8 mm, A-coded to EN 61076-2-104	Connection pattern L1J, M12x1, A-coded to EN 61076-2-101, Open end	G7/8 coded to NFPA/T3.5.29 R1-2007, Open end
<b>Electrical connection, number of pins/wires</b>	3, 4, 5	4, 5	5
<b>Cable length</b>	0.3 ... 30 m	0.5 ... 15 m	2 m
<b>Description</b>	<ul style="list-style-type: none"> <li>• Powerful universal connecting cables</li> <li>• Suitable for harsh environments and applications in constant motion or vibration</li> <li>• Meets the safety requirements of IEC 61010-1 and IEC 61010-2-202 for electrical equipment for measurement, control, and laboratory devices</li> <li>• High IP65, IP68, IP69k degree of protection</li> <li>• Resistant to abrasion and low adhesion</li> <li>• Suitable for use with energy chains and robots</li> <li>• Flame-retardant and self-extinguishing</li> <li>• Recommended for production plants for the manufacture of Li-ion manifolds (F1A)</li> </ul>	<ul style="list-style-type: none"> <li>• For connection with rectangular design L1, grid dimension 5.8 mm</li> <li>• For thread M12x1 A-coded according to EN 61076-2-101</li> <li>• For thread M16x0.75</li> <li>• Connecting cable for pressure sensor SPAN</li> <li>• Degree of protection IP40, IP65, IP67, IP69K, when mounted</li> <li>• With PVC or PUR cable</li> <li>• Ambient temperature -40 ... +70 °C</li> </ul>	<ul style="list-style-type: none"> <li>• Connecting cables with 5-pin plug/socket M12x1 A-coded according to EN 61076-2-101 and conductor nominal cross-section 1 mm<sup>2</sup> (NEBU-M12G5-E-...-Q8N-...)</li> <li>• Shielded connecting cables with 8-pin angled socket M12x1 A-coded according to EN 61076-2-101 (NEBU-M12W8-K-...)</li> <li>• Connecting cable with power supply socket G7/8 coded according to NFPA/T3.5.29 R1-2007 (NEBU-G78W5-...)</li> </ul>
<b>online: →</b>	<a href="#">neba</a>	<a href="#">nebs</a>	<a href="#">nebu</a>

## Plugs &gt;



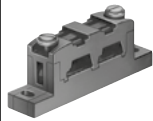
## Universal plug connectors

	 <b>T-distributors</b> <b>NEDY</b>	 <b>Connecting cables</b> <b>NEBC</b>
<b>Electrical connection 1, design</b>	Round	Angular, Round
<b>Electrical connection 1, connection type</b>	Cable, Plugs	Socket, Hybrid plug, Cable, Plugs, Plug and socket strip
<b>Electrical connection 1, number of pins/wires</b>	3, 4	3, 4, 5, 8, 9, 20, 25
	M12x1, A-coded to EN 61076-2-101, M8x1, A-coded, to EN 61076-2-104, Open end	Connection pattern P1, Plug pattern type A to EN 175301-803, M12x1, A-coded to EN 61076-2-101, M12x1, Festo-specific coding, M12x1, D-coded to EN 61076-2-101, M8x1, A-coded, to EN 61076-2-104, M8x1, D-coded according to EN 61076-2-114, RJ45, RJ45 to IEC 60603-7-3, RJ45 and socket strip 12 pins, 2 rows, Sub-D, USB 2.0 Type B, Open end
<b>Electrical connection 2, design</b>	Angular, Round	Angular, Round
<b>Electrical connection 2, connection type</b>	2x socket, 2x cable	Socket, Hybrid plug, Cable, Plugs
<b>Electrical connection 2, number of pins/wires</b>	2, 3, 4, 5	4, 5, 8, 9, 17, 25, 26
<b>Electrical connection 2, connection technology</b>	Connection pattern ZB, self-tapping screw, Connection pattern ZC, self-tapping screw, Plug pattern ZC, metric screw, Connection pattern H, Plug pattern type A to EN 175301-803, Plug pattern type B to EN 175301-803, Plug pattern type B to industry standard, 11 mm, Plug pattern type C to EN 175301-803, Plug pattern type C to industry standard, 9.4 mm, M12x1, A-coded to EN 61076-2-101, M8x1, A-coded to EN 61076-2-104, Open end	M12x1, A-coded to EN 61076-2-101, M12x1, Festo-specific coding, M12x1, D-coded to EN 61076-2-101, M8x1, D-coded according to EN 61076-2-114, M9x0.5, RJ45, RJ45 to IEC 60603-7-3, Sub-D, USB 2.0 type A, Open end
<b>Degree of protection</b>	IP65, IP67, IP68, IP69K	IP20, IP40, IP65, IP66, IP67, IP69K, In assembled state
<b>Connection cross section</b>		0.25 mm <sup>2</sup>
<b>Description</b>	<ul style="list-style-type: none"> <li>Collecting signals between field devices (sensors) and double-assigned controller inputs</li> <li>Distributing signals between double-assigned controller outputs and field devices (actuators, e.g. valves)</li> </ul>	<ul style="list-style-type: none"> <li>Variants in easy-to-clean design</li> <li>Standard variants, variants with shielding or as a hybrid cable</li> <li>Variants suitable for energy chains</li> <li>Variants with Ethernet, CANopen, I-Port or RS232</li> </ul>
<b>online:</b> →	<a href="#">nedy</a>	<a href="#">nebc</a>

## Product overview




### Plugs >

## Universal plug connectors

	 <b>Plugs, power supply sockets</b> <b>NECU, NECU-HX</b>	 <b>Cable sockets</b> <b>NEFU</b>	 <b>Cable distributors</b> <b>ASI-KVT</b>
<b>Electrical connection</b>	3-pin, 4-pin, 7-pin, 8-pin, A-coded, Spring-loaded terminal, Screw terminal, Straight plug/insulation displacement connector, Straight plug, Square design, M8x1, M12x1		
<b>Electrical connection 1</b>	Socket, sub-D, 9-pin, Straight socket, 7/8", 4-pin, Straight socket, 7/8", 5-pin, Straight socket, M12x1, 5-pin, B-coded, screenable, Straight plug connector, M12x1, 4-pin, D-coded, screenable, Straight plug connector, M12x1, 5-pin, B-coded, screenable, Sub-D plug, 9-pin	Straight socket, M12x1, 4-pin, D-coded	
<b>Electrical connection 2</b>	IDC terminal, Screw terminal, Screw terminal, can be screened	Straight socket, M12x1, 4-pin, D-coded, Angled socket, RJ45, 4-pin	
<b>Operating voltage range DC</b>	0 ... 250 V	0 ... 30 V	≤75 V
<b>Operating voltage range AC</b>	0 ... 250 V		≤60 V
<b>Degree of protection</b>	IP20, IP40, IP65, IP67	IP20, IP65, IP67	IP65
<b>Connection cross section</b>	0.1 ... 2.5 mm <sup>2</sup>		1.5 mm <sup>2</sup>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Power supply socket for fieldbus connection</li> <li>• NECU-HX: reconnectable M8 and M12 round plug connector with Harax® quick connection technology for low-voltage applications</li> <li>• Plug and socket for power supply</li> <li>• Can be assembled with any cable lengths</li> </ul>	<ul style="list-style-type: none"> <li>• Cable socket for branching the AS-Interface network at any required point</li> <li>• Reconnecting AS-Interface flat cable to 5-pin M12 socket</li> <li>• Reverse polarity protected</li> </ul>	<ul style="list-style-type: none"> <li>• Flat cable distributor for branching or for reconnecting AS-Interface flat cables</li> <li>• Reverse polarity protected</li> </ul>
<b>online:</b> →	<a href="#">necu</a>	<a href="#">nefu</a>	<a href="#">asi-kvt</a>

## Plugs &gt;




## Universal plug connectors

	 <b>Cable sockets ASI-SD</b>	 <b>Multi-pin plug distributors NEDU</b>	 <b>Push-in T-connectors NEDU</b>
<b>Electrical connection</b>	2-pin, 4-pin, Straight socket, Screw terminal		4-pin/4-pin/4-pin, A-coded/A-coded/A-coded, Socket/socket/ plug connector, M12x1/M12x1/M12x1
<b>Electrical connection 1</b>		Straight socket, M8, 3-pin	Straight socket, M12x1, 5-pin, A-coded
<b>Electrical connection 2</b>		Straight plug connector, M12x1, 8-pin	Straight socket, M12, 5-pin, A-coded, Straight plug connector, M12x1, 2-pin, A-coded
			Straight plug, M12, 5-pin, A-coded, Straight plug connector, M12, 3-pin, A-coded
<b>Operating voltage range DC</b>	≤75 V	10 ... 30 V	0 ... 30 V
<b>Operating voltage range AC</b>	≤125 V		
<b>Degree of protection</b>	IP65, IP67	IP68	IP65, IP67
<b>Connection cross section</b>	0.75 ... 1.5 mm <sup>2</sup>		
<b>Description</b>	<ul style="list-style-type: none"> <li>• For AS-Interface</li> <li>• Flat-cable socket for connecting AS-Interface stations to the AS-Interface bus system</li> <li>• M12 connection</li> <li>• Reverse polarity protected</li> <li>• Detachable connection</li> </ul>	<ul style="list-style-type: none"> <li>• Particularly compact</li> <li>• LED switching status indication</li> </ul>	<ul style="list-style-type: none"> <li>• For fieldbus interface</li> <li>• Branch line for connecting and disconnecting fieldbus components</li> </ul>
<b>online:</b> →	<a href="#">asi-sd</a>	<a href="#">nedu</a>	<a href="#">nedu</a>

## Product overview



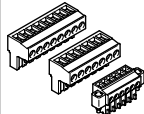

### Plugs >

## Plug connectors for control systems

	 <b>Plug NOCC</b>	 <b>Plug connectors NECC</b>	 <b>Plug, adapter, manifold block NEFC</b>
	SC-RJ to IEC 61754-24		
	2		
	Lock nut		
<b>Electrical connection</b>		9-pin/9-pin, Plugs, Sub-D/screw terminal	5-pin, Plugs, M12x1
<b>Electrical connection, connection type</b>		Socket, Plugs	Socket, Plugs
<b>Electrical connection, design</b>		Angular	Round
<b>Electrical connection, connection technology</b>		Spring-loaded terminal, Connection pattern L8, Insulation displacement connector, RJ45	M12x1, A-coded to EN 61076-2-101
<b>Electrical connection, number of pins/wires</b>		5, 8	5, 8
<b>Degree of protection</b>	IP65, IP67	IP20, IP40, IP65, IP67	IP20, IP65, IP67
<b>Description</b>	<ul style="list-style-type: none"> <li>• Push-pull plug for fibre optic applications</li> <li>• For Ethernet interface with PROFINET protocol</li> <li>• Protection against unintentional removal</li> </ul>	<ul style="list-style-type: none"> <li>• Encoder plug for motor controller</li> <li>• For controllers</li> <li>• 2-pin, 4-pin, 6-pin, 8-pin, 11-pin, 18-pin</li> </ul>	<ul style="list-style-type: none"> <li>• Adapter, 5-pin M12, for mini USB socket with controller software for CPX terminal</li> <li>• Adapter for rotary drive unit ERMS which forms a connection between the motor and IO-Link master</li> <li>• Plug and manifold block for motor controller CMMO-ST to form a connection from the I/O interface to the controller</li> </ul>
<b>online:</b> →	<a href="#">nocc</a>	<a href="#">necc</a>	<a href="#">nefc</a>


### Plugs >

## Plug connectors for control systems

	 <b>Plug connectors FBS-SUB-9-WS</b>	 <b>Plug connectors PS1-SAC</b>	 <b>Assortments of plugs NEKM</b>	 <b>Plug socket NEFF</b>
<b>Electrical connection</b>		10-pin/30-pin, Socket/terminal strip		
<b>Degree of protection</b>	IP20			IP40
<b>Connection cross section</b>	1 mm <sup>2</sup>	0.08 ... 0.75 mm <sup>2</sup>		
<b>Description</b>	<ul style="list-style-type: none"> <li>• Plug connector for CAN bus and PROFIBUS bus connection</li> <li>• Cable connection 2x horizontal or 2x vertical</li> <li>• PCB terminal block with screw connector</li> </ul>	<ul style="list-style-type: none"> <li>• For power supply</li> <li>• Cable connection using clamping technology</li> <li>• Individually or as a set</li> </ul>	<ul style="list-style-type: none"> <li>• For motor controllers</li> <li>• For servo drive</li> </ul>	<ul style="list-style-type: none"> <li>• For operation of an interlock-capable valve terminal interface in pure I-Port mode</li> </ul>
<b>online:</b> →	<a href="#">fbs-sub-9-ws</a>	<a href="#">ps1</a>	<a href="#">nekm</a>	<a href="#">neff</a>

## Plugs &gt;





## Plugs for motors

	 <p><b>Adapter NEFM</b></p>
<b>Electrical connection 1, connection type</b>	Socket, Plugs
<b>Electrical connection, design</b>	Angular
<b>Electrical connection, connection technology</b>	Connection pattern RE, RJ45, Sub-D
<b>Electrical connection, number of pins/wires</b>	6, 8, 9
<b>Degree of protection</b>	IP20
<b>Description</b>	<ul style="list-style-type: none"> <li>• Pre-assembled</li> <li>• Adapter for encoder cable</li> <li>• With PVC cable</li> <li>• Ambient temperature -40 ... +80 °C</li> </ul>
<b>online:</b> →	<a href="#">nefm</a>

## Product overview





### Plugs >

## Plug connectors for valves

	 <p><b>Plug sockets</b> MSSD</p>	 <p><b>Electrical plug-in base, adapter</b> NEFV</p>	 <p><b>Illuminating seals</b> MC-LD, ME-LD, MEB-LD, MF-LD, MV-LD</p>	 <p><b>Indicating inserts</b> MCL, MFL, MFLZ</p>
<b>Electrical connection</b>	3-pin, Socket, Angled socket, Type A, Type B, Type C, To DIN EN 175301-803, To DIN EN 61984, Square design, Square design MSC, Square design MSEB, Square design MSF, Square design MSN1, Square design MSN2, Square design MSV		Type A, Type B, Type C, To DIN EN 175301-803, Square design MSC, Square design MSE, Square design MSEB, Square design MSF, Square design MSV	Type A, Type B, Plugs, To DIN EN 175301-803, To industry standard (11 mm)
<b>Electrical connection, connection type</b>	Socket, Cable	Socket, 4x plug connectors		
<b>Electrical connection, design</b>	Angular	Round		
<b>Electrical connection, connection technology</b>	Plug pattern type A to EN 175301-803, Plug pattern type B to industry standard, 11 mm, Plug pattern type C to EN 175301-803, Screw terminal	M12x1, A-coded to EN 61076-2-101		
<b>Electrical connection, number of pins/wires</b>	3	8		
<b>Connection cross section</b>	0.25 ... 1.5 mm <sup>2</sup>			
<b>Degree of protection</b>	IP50, IP65, IP67, To IEC 60529	IP65, IP67	IP65	IP65, To IEC 60529
<b>Description</b>	<ul style="list-style-type: none"> <li>• For valves with F, D, N1, V, E, EB, N2, Y, Z, ZB, ZC, MD-2 and MH-2 solenoid coils</li> <li>• For connecting individual valves</li> <li>• Available with LED display</li> </ul>	<ul style="list-style-type: none"> <li>• Adapter for connecting the piezo valves to the electronics module VAVE-P12</li> </ul>	<ul style="list-style-type: none"> <li>• The seal lights up yellow when the power is switched on</li> <li>• For mounting between the solenoid coil and connector socket or device plug</li> <li>• For F, D, N1, V, E and EB solenoid coils</li> </ul>	<ul style="list-style-type: none"> <li>• Variant with integrated protective circuit</li> <li>• For mounting between the solenoid coil and connector socket or device plug</li> <li>• With yellow LED display</li> </ul>
<b>online:</b> →	<a href="#">mssd</a>	<a href="#">nefv</a>	<a href="#">mc-ld</a>	<a href="#">mcl</a>





Plugs >

Plug connectors for valves

	 <b>Time delay inserts MFZ</b>	 <b>Soldering bases PCBC</b>	 <b>Multi-pin plug sockets NECA</b>	 <b>Multi-pin plug distributors MPV-E/A</b>
<b>Electrical connection</b>		2-pin		
<b>Connection cross section</b>			0.34 ... 1 mm <sup>2</sup>	
<b>Degree of protection</b>	IP64	IP40	IP65, To IEC 60529	IP65, In assembled state, To IEC 60529
<b>Description</b>	<ul style="list-style-type: none"> <li>• Electronic timer with adjustable delay time of between 0 ... 10 s</li> <li>• For mounting between the solenoid coil and connector socket or device plug</li> </ul>	<ul style="list-style-type: none"> <li>• For mounting miniature valves MHA1 and MHP1 on a PCB with plug connection underneath (-PI)</li> </ul>	<ul style="list-style-type: none"> <li>• For soft-start/quick exhaust valves MS6-SV, MS series</li> <li>• Electrical connection via 9-pin Sub-D, 9-pin screw terminal</li> </ul>	<ul style="list-style-type: none"> <li>• Mounting: H-rail mounting or via through-holes</li> <li>• LED switching status indication</li> </ul>
<b>online:</b> →	<a href="#">mfz</a>	<a href="#">pcbc</a>	<a href="#">neca</a>	<a href="#">mpv</a>

Plugs >




Plug connectors for valve terminals

	 <b>Cable plug connectors NECL</b>	 <b>Plug sockets FBSD-GD, FBSD-WD</b>	 <b>Plug sockets NTSD-GD, NTSD-WD</b>	 <b>T adapter FB-TA</b>
<b>Electrical connection</b>		4-pin, 5-pin/5-pin, Straight socket/screw terminal, Angled socket/screw terminal, Type A, M12x1	4-pin, 5-pin, Straight socket, Angled socket, Screw terminal, Straight plug connector/screw terminal	5-pin, M12x1/M12x1, Plug connectors/sockets
<b>Fieldbus interface</b>				
<b>Degree of protection</b>	IP65, IP67	IP20, IP67	IP67	IP67
<b>Connection cross section</b>		0.2 ... 2.5 mm <sup>2</sup>	0.75 ... 2.5 mm <sup>2</sup>	
<b>Description</b>	<ul style="list-style-type: none"> <li>• Power supply socket, power supply plug</li> <li>• Straight or angled design</li> <li>• For thread M12x1, L-coded to EN 61076-2-111</li> <li>• For cable diameter 8 ... 13 mm</li> </ul>	<ul style="list-style-type: none"> <li>• For fieldbus interface</li> <li>• Straight or angled design</li> </ul>	<ul style="list-style-type: none"> <li>• Straight or angled design</li> <li>• For power supply</li> </ul>	<ul style="list-style-type: none"> <li>• Branch line for connecting and disconnecting fieldbus components</li> <li>• For fieldbus connection with thread M12x1 A-coded according to EN 61076-2-101</li> <li>• Cable length 150 mm</li> </ul>
<b>online:</b> →	<a href="#">necl</a>	<a href="#">fbs</a>	<a href="#">ntsd</a>	<a href="#">fb-ta</a>

## Product overview




Plugs >

### Plug connectors for valve terminals

	 <b>Bus connections</b> <b>FBA-1, FBA-2</b>	 <b>Plug connectors</b> <b>FBS-SUB, FBS-SCRJ, FBS-M12</b>	 <b>Plug connectors</b> <b>FBS-RJ45</b>
<b>Electrical connection</b>	9-pin/5-pin, Straight socket/straight plug connector, Straight socket/plug connector and socket, Sub-D/-, Sub-D/M12x1		
<b>Fieldbus interface</b>	Socket and plug, M12x1, 5-pin, B-coded	1x 5 spring-loaded terminals, 1x 9 spring-loaded terminals, 2x 2 spring-loaded terminals, 2x 4 spring-loaded terminals, 2x 5 spring-loaded terminals	
<b>Degree of protection</b>	IP40, IP65, To IEC 60529	IP65, IP67, In assembled state, To IEC 60529	IP65, IP67, To IEC 60529
<b>Connection cross section</b>			
<b>Description</b>	<ul style="list-style-type: none"> <li>• 9-pin Sub-D plug on M12 or screw terminal for CANopen and DeviceNet®</li> <li>• 9-pin Sub-D socket on M12 for PROFIBUS and CC-LINK®</li> </ul>	<ul style="list-style-type: none"> <li>• Fieldbus plug with 9-pin Sub-D connection</li> <li>• Variants for different fieldbus systems</li> <li>• Position of DIL switches can be read externally</li> <li>• Easy assembly</li> </ul>	<ul style="list-style-type: none"> <li>• Push-pull plug for RJ45 applications</li> <li>• For Ethernet interface with PROFINET protocol</li> <li>• Detachable connection</li> </ul>
<b>online:</b> →	<a href="#">fba</a>	<a href="#">fbs-sub</a>	<a href="#">fbs-rj</a>



Plugs >

### Plug connectors for valve terminals

	 <b>Bus connections</b> <b>FBSD-KL</b>	 <b>Cover caps</b> <b>ISK</b>	 <b>Plug sockets, plug connectors</b> <b>SD-SUB</b>
<b>Electrical connection</b>	5-pin/5-pin, Angled socket/screw terminal		25-pin, Plugs, Sub-D
<b>Fieldbus interface</b>			
<b>Degree of protection</b>	IP20	IP65, IP67	IP65
<b>Connection cross section</b>	0.2 ... 2.5 mm <sup>2</sup>		
<b>Description</b>	<ul style="list-style-type: none"> <li>• 5-pin angled socket, 5-pin screw terminal</li> </ul>	<ul style="list-style-type: none"> <li>• For sealing unused ports/openings</li> <li>• Thread M8, M12</li> </ul>	<ul style="list-style-type: none"> <li>• Plug socket for multi-pin plug connection</li> <li>• Plug for inputs/outputs</li> <li>• Can be assembled with any cable lengths</li> </ul>
<b>online:</b> →	<a href="#">fbsd-kl</a>	<a href="#">isk</a>	<a href="#">sd-sub</a>

## Plugs &gt;

## Plug connectors for sensors

	 <b>Angled plug sockets</b> PEV...-WD	 <b>Plug sockets</b> SD-4-WD
<b>Electrical connection</b>	4-pin, Angled socket	
<b>Degree of protection</b>	IP65	IP65, To IEC 60529
<b>Description</b>	<ul style="list-style-type: none"> <li>• For pressure switch PEV</li> <li>• 15 ... 30, 180 V DC, 230 V AC</li> <li>• Available with LED display</li> <li>• Angled design</li> </ul>	<ul style="list-style-type: none"> <li>• For swivel module DSMI</li> <li>• Angled design</li> </ul>
<b>online:</b> →	<a href="#">pev*wd</a>	<a href="#">sd-4-wd</a>

## Product overview



## Product overview

## Software tools

### Calculating the media resistance



Which Festo tubing is resistant to benzene? Can elastomers withstand contact with glycol? Which type of stainless steel can be used in acetic acid?

You can find the answer to these and many other questions about media resistance right here.

You can search for chemical reactions from A to Z.

You can filter the media either by name or chemical formula and/or select the material in question.

This tool can be found at

→ [www.festo.com/x/media-resistance](http://www.festo.com/x/media-resistance)

### Configurator for tubing



Design a product with numerous features reliably and quickly with the help of the configurator.

Select all the required product features step-by-step.

The use of logic checks ensures that only correct configurations are available for selection.

You will find the configurator for your desired product

- at [www.festo.com/catalogue/tubing](http://www.festo.com/catalogue/tubing)
- Select your desired product
- Click on the blue „Configure product“ button

### Festo Design Tool 3D



The Festo Design Tool 3D is a 3D product configurator for generating specific CAD product combinations from Festo.

The configurator makes your search for the right accessory quicker, easier, and more reliable.

You can then order the module that has been created as a single order item, either completely pre-assembled or as individual parts in one box.




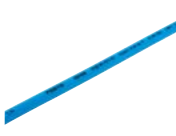
This considerably reduces your bill of materials, and downstream processes such as product ordering, order picking and assembly are significantly simplified.

You will find this tool at

→ [www.festo.com/fdt-3D](http://www.festo.com/fdt-3D)

## Pneumatic tubing &gt;





## O.D. pneumatic tubing

	 Plastic tubing PUN-H, PUN-H-DUO	 Plastic tubing PUN-H-SF	 Plastic tubing PUN-H-F	 Plastic tubing PUN, PUN-DUO
<b>Outside diameter</b>	2 ... 16 mm	4 ... 25 mm	4 ... 16 mm	3 ... 16 mm
<b>Inside diameter</b>	1.2 ... 11 mm	2.3 ... 15.3 mm	2.6 ... 11 mm	2.1 ... 11 mm
<b>Temperature-dependent operating pressure [MPa]</b>	-0.095 ... 1 MPa	-0.095 ... 1.3 MPa	-0.095 ... 1 MPa	-0.095 ... 1 MPa
<b>Temperature-dependent operating pressure</b>	-0.95 ... 10 bar	-0.95 ... 13 bar	-0.95 ... 10 bar	-0.95 ... 10 bar
<b>Temperature-dependent operating pressure [psi]</b>	-13.775 ... 145 psi	-13.775 ... 188.5 psi	-13.775 ... 145 psi	-13.775 ... 145 psi
<b>Ambient temperature</b>	-35 ... 60°C	-35 ... 80°C	-35 ... 60°C	-35 ... 60°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• Polyurethane</li> <li>• High resistance to microbes and hydrolysis</li> <li>• Suitable for use with energy chains</li> <li>• Clean room-compatible combination with fitting NPKA</li> <li>• Also available as DUO plastic tubing</li> <li>• Operating media compressed air, vacuum, water. Water as per the manufacturer's declaration, see <a href="http://www.festo.com/certificates/PUN_H">www.festo.com/certificates/PUN_H</a></li> </ul>	<ul style="list-style-type: none"> <li>• Polyurethane</li> <li>• Very resistant to kinking and extremely sturdy thanks to increased wall thickness</li> <li>• Maximum flexibility despite increased wall thickness</li> <li>• High resistance to microbes and hydrolysis</li> <li>• Suitable for use with energy chains</li> <li>• Operating medium: compressed air, vacuum, water</li> </ul>	<ul style="list-style-type: none"> <li>• Polyurethane</li> <li>• High resistance to microbes and hydrolysis</li> <li>• For food safety certificates, see <a href="http://www.festo.com/certificates/PUN_H_F">www.festo.com/certificates/PUN_H_F</a></li> <li>• Operating medium: compressed air, vacuum, water</li> </ul>	<ul style="list-style-type: none"> <li>• Polyurethane</li> <li>• High resistance to stress cracks</li> <li>• Suitable for use with energy chains</li> <li>• Also available as DUO plastic tubing</li> <li>• Operating medium: compressed air, vacuum</li> </ul>
<b>online:</b> →	<a href="#">pun-h</a>	<a href="#">pun-h-sf</a>	<a href="#">pun-h-f</a>	<a href="#">pun</a>

## Product overview





### Pneumatic tubing >

### O.D. pneumatic tubing

	 Plastic tubing PTFEN	 Plastic tubing PUN-CM	 Plastic tubing PUN-V0	 Plastic tubing PEN
<b>Outside diameter</b>	4 ... 16 mm	4 ... 12 mm	4 ... 16 mm	4 ... 16 mm
<b>Inside diameter</b>	2.9 ... 11 mm	2.5 ... 8 mm	2 ... 11.8 mm	2.7 ... 10.8 mm
<b>Temperature-dependent operating pressure [MPa]</b>	-0.095 ... 1.5 MPa	-0.095 ... 1 MPa	-0.095 ... 3 MPa	-0.095 ... 1 MPa
<b>Temperature-dependent operating pressure</b>	-0.95 ... 15 bar	-0.95 ... 10 bar	-0.95 ... 30 bar	-0.95 ... 10 bar
<b>Temperature-dependent operating pressure [psi]</b>	-13.775 ... 217.5 psi	-13.775 ... 145 psi	-13.775 ... 435 psi	-13.775 ... 145 psi
<b>Ambient temperature</b>	-20 ... 150°C	-35 ... 60°C	-35 ... 60°C	-30 ... 60°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• Polytetrafluoroethylene</li> <li>• Food grade see <a href="http://www.festo.com/certificates/PTFEN">www.festo.com/certificates/PTFEN</a></li> <li>• High resistance to chemicals</li> <li>• High temperature resistance</li> <li>• Operating medium: compressed air, vacuum</li> </ul>	<ul style="list-style-type: none"> <li>• Polyurethane</li> <li>• Plastic tubing, antistatic, electrically conductive</li> <li>• Suitable for use with energy chains</li> <li>• Operating medium: compressed air, vacuum</li> </ul>	<ul style="list-style-type: none"> <li>• Polyurethane</li> <li>• Flame retardant to UL 94 V0 ... V2</li> <li>• For use in the immediate vicinity of welding applications</li> <li>• High resistance to microbes and hydrolysis</li> <li>• Suitable for use with energy chains</li> <li>• Operating medium: compressed air, vacuum, water</li> </ul>	<ul style="list-style-type: none"> <li>• Polyethylene</li> <li>• High resistance to chemicals and very high resistance to hydrolysis</li> <li>• Resistant to most cleaning agents and lubricants</li> <li>• Suitable for use with energy chains</li> <li>• Operating media compressed air, vacuum, water. Water as per the manufacturer's declaration, see <a href="http://www.festo.com/certificates/PEN_S">www.festo.com/certificates/PEN_S</a></li> </ul>
<b>online:</b> →	<a href="#">ptfen</a>	<a href="#">pun-cm</a>	<a href="#">pun-v0</a>	<a href="#">pen</a>

## Pneumatic tubing &gt;




## O.D. pneumatic tubing

	 Plastic tubing PAN	 Plastic tubing PAN-MF	 Heavy-duty tubing PAN-R	 Plastic tubing PAN-V0
<b>Outside diameter</b>	4 ... 16 mm	4 ... 16 mm	4 ... 28 mm	6 ... 14 mm
<b>Inside diameter</b>	2.9 ... 12 mm	2.5 ... 12 mm	2.5 ... 23 mm	2.5 ... 9 mm
<b>Temperature-dependent operating pressure [MPa]</b>	-0.095 ... 1.9 MPa	-0.095 ... 3.1 MPa	-0.095 ... 3.5 MPa	-0.095 ... 1.2 MPa
<b>Temperature-dependent operating pressure</b>	-0.95 ... 19 bar	-0.95 ... 31 bar	-0.95 ... 35 bar	-0.95 ... 12 bar
<b>Temperature-dependent operating pressure [psi]</b>	-13.775 ... 275.5 psi	-13.775 ... 449.5 psi	-13.775 ... 507.5 psi	-13.775 ... 174 psi
<b>Ambient temperature</b>	-30 ... 80°C	-60 ... 100°C	-30 ... 80°C	-30 ... 90°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• Polyamide</li> <li>• High thermal and mechanical load capacities</li> <li>• Highly resistant to microbes</li> <li>• Operating medium: compressed air, vacuum</li> </ul>	<ul style="list-style-type: none"> <li>• Polyamide</li> <li>• High thermal and mechanical load capacities</li> <li>• Meets the requirements to DIN 73378 "Polyamide tubing for use in motor vehicles"</li> <li>• Operating media: compressed air, mineral oil</li> </ul>	<ul style="list-style-type: none"> <li>• Polyamide</li> <li>• For applications with high pressure ranges</li> <li>• Highly resistant to microbes</li> <li>• Operating medium: compressed air, vacuum</li> </ul>	<ul style="list-style-type: none"> <li>• Polyvinyl chloride, polyamide</li> <li>• Flame retardant according to UL 94 V0</li> <li>• High resistance to microbes and UV radiation</li> <li>• Double-sheath tubing</li> <li>• Operating medium: compressed air, vacuum, water, mineral oil</li> <li>• Resistant to welding spatter</li> </ul>
<b>online:</b> →	<a href="#">pan</a>	<a href="#">pan-mf</a>	<a href="#">pan-r</a>	<a href="#">pan-v0</a>

## Product overview


### Pneumatic tubing >

### O.D. pneumatic tubing

	 <b>Customised tubing</b> <b>PAN, PEN, PLN, PUN</b>	 <b>Plastic tubing</b> <b>PLN</b>	 <b>Plastic tubing</b> <b>PFAN</b>
<b>Outside diameter</b>	3 ... 16 mm	4 ... 16 mm	3 ... 12 mm
<b>Inside diameter</b>	2 ... 12 mm	2.9 ... 12 mm	2.3 ... 8.4 mm
<b>Temperature-dependent operating pressure [MPa]</b>		-0.095 ... 1.4 MPa	-0.095 ... 1.6 MPa
<b>Temperature-dependent operating pressure</b>	-0.95 ... 35 bar	-0.95 ... 14 bar	-0.95 ... 16 bar
<b>Temperature-dependent operating pressure [psi]</b>		-13.775 ... 203 psi	-13.775 ... 232 psi
<b>Ambient temperature</b>	-60 ... 100°C	-30 ... 80°C	-20 ... 150°C
<b>Description</b>	<ul style="list-style-type: none"> <li>Individual lengths: delivered in units of 25, 50, 100, 200 ... 500 m</li> <li>Minimum order quantity: from 1500m/3000 m (or less depending on type) depending on diameter</li> <li>Customised design: specific printing possible</li> <li>Easy to recognise and handle: individual colour selection</li> <li>Choose from 9 basic colours; further colours available on request</li> <li>Select, size and order quickly, easily and reliably with the configurator</li> </ul>	<ul style="list-style-type: none"> <li>Polyethylene</li> <li>High resistance to chemicals, microbes and hydrolysis</li> <li>Food grade see <a href="http://www.festo.com/certificates/PLN">www.festo.com/certificates/PLN</a></li> <li>Resistant to most cleaning agents and lubricants</li> <li>Operating media compressed air, vacuum, water. Water as per the manufacturer's declaration, see <a href="http://www.festo.com/certificates/PLN">www.festo.com/certificates/PLN</a></li> </ul>	<ul style="list-style-type: none"> <li>Perfluoroalkoxy alkane</li> <li>Pneumatic tubing with resistance to high temperatures and chemicals</li> <li>Food grade see <a href="http://www.festo.com/certificates/PFAN">www.festo.com/certificates/PFAN</a></li> <li>High resistance to chemicals, microbes, UV radiation, hydrolysis and stress cracks</li> <li>Operating media compressed air, vacuum, water. Water as per the manufacturer's declaration, see <a href="http://www.festo.com/certificates/PFAN">www.festo.com/certificates/PFAN</a></li> </ul>
<b>online:</b> →	<a href="#">pan</a>	<a href="#">pln</a>	<a href="#">pfan</a>




### Pneumatic tubing >

### Standard I.D. tubing

	 <b>Plastic tubing</b> <b>PU</b>
<b>Outside diameter</b>	11.6 ... 17.6 mm
<b>Inside diameter</b>	9 ... 13 mm
<b>Operating pressure for entire temperature range</b>	-0.95 ... 10 bar
<b>Ambient temperature</b>	-35 ... 60°C
<b>Description</b>	<ul style="list-style-type: none"> <li>Polyurethane with fabric</li> <li>High resistance to abrasion and kinks</li> <li>Operating media: compressed air, vacuum (PU-13)</li> </ul>
<b>online:</b> →	<a href="#">pu</a>


## Pneumatic tubing &gt;

## Spiral tubing

	 <b>Spiral plastic tubing PUN-S, PUN-S-DUO</b>	 <b>Spiral plastic tubing PUN-SG</b>	 <b>Spiral plastic tubing PPS</b>
<b>Outside diameter</b>	4 ... 12 mm	10 ... 12.4 mm	6.3 ... 7.8 mm
<b>Inside diameter</b>	2.6 ... 8 mm	6 ... 8 mm	4.7 ... 6.2 mm
<b>Working length</b>	0.5 ... 6 m	2.4 ... 6 m	7.5 ... 15 m
<b>Temperature-dependent operating pressure</b>	-0.95 ... 10 bar	-0.95 ... 15 bar	-0.95 ... 21.2 bar
<b>Ambient temperature</b>	-35 ... 60°C	-40 ... 60°C	-30 ... 80°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• Polyurethane</li> <li>• Also available as DUO plastic tubing</li> <li>• Operating medium: compressed air, vacuum</li> <li>• High resistance to UV radiation and stress cracks</li> </ul>	<ul style="list-style-type: none"> <li>• Polyurethane, nickel-plated brass, polyacetal</li> <li>• Pre-assembled with captive rotatable fittings</li> <li>• High resistance to microbes and hydrolysis</li> <li>• Operating medium: compressed air, vacuum</li> </ul>	<ul style="list-style-type: none"> <li>• Polyamide, brass, galvanised steel</li> <li>• Pre-assembled with 2 rotatable connectors and captive sealing rings OL</li> <li>• Highly resistant to microbes</li> <li>• Operating medium: compressed air, vacuum</li> </ul>
<b>online:</b> →	<a href="#">pun-s</a>	<a href="#">pun-sg</a>	<a href="#">pps</a>

## Pneumatic fittings &gt;


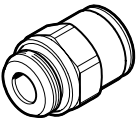

## Pneumatics push-in fittings

	 <b>Push-in fittings/connectors, standard series QS, QSM</b>
<b>Pneumatic connection 1</b>	Male thread M8x1.25, Push-in sleeve Ø 2 mm, Push-in sleeve Ø 3 mm, Push-in sleeve Ø 4 mm, Push-in sleeve Ø 6 mm, Push-in sleeve Ø 8 mm, Push-in sleeve Ø 10 mm, Push-in sleeve Ø 12 mm, Push-in sleeve Ø 16 mm, Female thread G1/2, G1/4, G1/8, G3/8, M3, M5, For tubing O.D. 10 mm, 12 mm, 16 mm, 2 mm, 3 mm, 4 mm, 6 mm, 8 mm, Male thread G1/2, G1/4, G1/8, G3/4, G3/8, M3, M5, M6, M6x0.75, M7, M8x0.75, R1/2, R1/4, R1/8, R3/8
<b>Pneumatic connection 2</b>	Push-in sleeve Ø 4 mm, Push-in sleeve Ø 6 mm, Push-in sleeve Ø 8 mm, Push-in sleeve Ø 10 mm, Push-in sleeve Ø 12 mm, Push-in sleeve Ø 16 mm, Female thread G1/2, G1/4, G1/8, G3/8, For tubing O.D. 10 mm, 12 mm, 16 mm, 2 mm, 22 mm, 3 mm, 4 mm, 6 mm, 8 mm
<b>Design type</b>	45° angle, 45° angle, long, Blanking plug, L-shape, L-shape, dual, parallel, L-shape, long, L-shape, additional connection, female thread, lengthwise, T-shape, additional push-in connector, lengthwise, Bulkhead, T-shape, X-shape, Y-shape, Straight design, Straight design, round releasing ring
<b>Temperature-dependent operating pressure</b>	-0.95 ... 14 bar
<b>Operating pressure for entire temperature range</b>	-0.95 ... 14 bar
<b>Ambient temperature</b>	-20 ... 80°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• Design: Mini series and standard series</li> <li>• Wide range of variants: wide selection for maximum flexibility in standard applications</li> <li>• Dimensions: Compact for maximum component density in confined installation spaces</li> <li>• Material: PBT and nickel-plated brass</li> <li>• Operating media: compressed air, vacuum, water (water as per the manufacturer's declaration, see <a href="http://www.festo.com/certificates/QS">www.festo.com/certificates/QS</a>)</li> <li>• Design/construction: Straight shape, L-shape, T-shape, at 45° angle, X-shape, Y-shape, push-in bulkhead connector</li> <li>• Assembly/installation: external and internal hexagon and plug connection for O.D. tubing</li> </ul>
<b>online:</b> →	<a href="#">qs</a>

## Product overview




### Pneumatic fittings >

## Pneumatics push-in fittings

	 <p><b>Push-in fittings/connectors NPQH</b></p>	 <p><b>Push-in fittings/connectors NPQE-F1A</b></p>	 <p><b>Push-in fitting NPQO</b></p>
<b>Pneumatic connection 1</b>	Push-in sleeve Ø 4 mm, Push-in sleeve Ø 6 mm, Push-in sleeve Ø 8 mm, Push-in sleeve Ø 10 mm, Push-in sleeve Ø 12 mm, Push-in sleeve Ø 14 mm, Female thread G1/4, G1/8, For tubing O.D. 10 mm, 12 mm, 14 mm, 4 mm, 6 mm, 8 mm, Male thread G1/2, G1/4, G1/8, G3/8, M5, M7	For tubing O.D. 10 mm, 12 mm, 4 mm, 6 mm, 8 mm, Male thread G1/4, G1/8, M3, M5, M7, R1/4, R1/8	Male thread M5, Male thread G1/8, Male thread G1/4, Male thread G3/8, For tubing outer diameter of 4 mm, For tubing outside diameter of 6 mm, For tubing outer diameter of 8 mm, For tubing outer diameter of 10 mm, For tubing outer diameter of 12 mm
<b>Pneumatic connection 2</b>	Push-in sleeve Ø 4 mm, Push-in sleeve Ø 6 mm, Push-in sleeve Ø 8 mm, Push-in sleeve Ø 10 mm, Push-in sleeve Ø 12 mm, Push-in sleeve Ø 14 mm, For tubing O.D. 10 mm, 12 mm, 14 mm, 4 mm, 6 mm, 8 mm	For tubing O.D. 10 mm, 12 mm, 4 mm, 6 mm, 8 mm	For tubing outside diameter of 4 mm, For tubing outside diameter of 6 mm, For tubing outside diameter of 8 mm, For tubing outside diameter of 10 mm, For tubing outer diameter of 12 mm
<b>Design type</b>	Blanking plug, L-shape, L-shape, long, Bulkhead, T-shape, Plug screw, Y-shape, Straight design	L-shape, T-shape, Y-shape, Straight design	L-shape, T-shape, Straight design
<b>Temperature-dependent operating pressure</b>			-0.9 ... 16 bar
<b>Operating pressure for entire temperature range</b>	-0.95 ... 20 bar	-0.95 ... 8 bar	-0.9 ... 20 bar
<b>Ambient temperature</b>	0 ... 150°C	-5 ... 60°C	0 ... 120°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• Solid-metal brass, chemically nickel-plated</li> <li>• High corrosion and chemical resistance</li> <li>• Highly resistant to temperatures and pressure</li> <li>• Food grade see <a href="http://www.festo.com/certificates/NPQH">www.festo.com/certificates/NPQH</a></li> <li>• Operating media compressed air, vacuum, water. Water as per the manufacturer's declaration, see <a href="http://www.festo.com/certificates/NPQH">www.festo.com/certificates/NPQH</a></li> <li>• Straight shape, L-shape, T-shape, Y-shape, push-in bulkhead connector</li> </ul>	<ul style="list-style-type: none"> <li>• Economical push-in fittings for pneumatic applications</li> <li>• Recommended for production plants for the manufacture of Li-ion manifolds (F1A)</li> <li>• Tapered thread in accordance with JIS B0203 and compatible with pressure-tight media to DIN EN 10226</li> <li>• Operating medium: compressed air, vacuum</li> <li>• Straight shape, T-shape, L-shape, Y-shape</li> </ul>	<ul style="list-style-type: none"> <li>• Oxygen compatibility (in accordance with ISO 15001 and ASTM G93)</li> <li>• Biocompatibility (according to ISO 18562)</li> <li>• FDA-listed materials</li> <li>• Can be used with a variety of gases (O<sub>2</sub>, CO<sub>2</sub>, N<sub>2</sub>O, NO, He, N<sub>2</sub>, Xe, Ar)</li> <li>• Wide range from 4 mm to 12 mm in size</li> <li>• Push-in fittings and connections (straight, L-shaped, T-shaped)</li> </ul>
<b>online:</b> →	<a href="#">npqh</a>	<a href="#">npqe</a>	<a href="#">npqo</a>

Pneumatic fittings >





Pneumatics push-in fittings

	 <b>Push-in fittings/connectors NPQR</b>	 <b>Push-in fittings/connectors, metal, standard series NPQM</b>	 <b>Push-in fittings/connectors, resistant to media NPQP</b>
<b>Pneumatic connection 1</b>	For tubing O.D. 10 mm, 12 mm, 14 mm, 16 mm, 4 mm, 6 mm, 8 mm, Male thread G1/2, G1/4, G1/8, G3/8, M5, M7	Push-in sleeve Ø 4 mm, Push-in sleeve Ø 6 mm, Push-in sleeve Ø 8 mm, Push-in sleeve Ø 10 mm, Push-in sleeve Ø 12 mm, Push-in sleeve Ø 14 mm, Female thread G1/4, G1/8, For tubing O.D. 10 mm, 12 mm, 14 mm, 4 mm, 6 mm, 8 mm, Male thread G1/2, G1/4, G1/8, G3/8, M5, M7, Push-in sleeve QS-10, QS-12, QS-8	Push-in sleeve Ø 4 mm, Push-in sleeve Ø 6 mm, Push-in sleeve Ø 8 mm, Push-in sleeve Ø 10 mm, Push-in sleeve Ø 12 mm, For tubing O.D. 10 mm, 12 mm, 4 mm, 6 mm, 8 mm, Male thread R1/2, R1/4, R1/8, R3/8
<b>Pneumatic connection 2</b>	For tubing O.D. 10 mm, 12 mm, 14 mm, 16 mm, 4 mm, 6 mm, 8 mm	For tubing O.D. 10 mm, 12 mm, 14 mm, 3 mm, 4 mm, 6 mm, 8 mm, Push-in sleeve QS-10, QS-12, QS-14, QS-4, QS-6, QS-8	For tubing O.D. 10 mm, 12 mm, 4 mm, 6 mm, 8 mm
<b>Design type</b>	L-shape, Bulkhead, T-shape, Plug screw, Y-shape, Straight design	L-shape, L-shape, dual, F-outlet, Bulkhead, T-shape, Y-shape, Straight design	Blanking plug, L-shape, T-shape, additional push-in connector, lengthwise, Bulkhead, T-shape, Y-shape, Straight design
<b>Temperature-dependent operating pressure</b>			-0.95 ... 10 bar
<b>Operating pressure for entire temperature range</b>	-0.95 ... 16 bar	-0.95 ... 16 bar	-0.95 ... 4.5 bar
<b>Ambient temperature</b>	-20 ... 150°C	-20 ... 70°C	-20 ... 60°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• Very easy to clean thanks to chamfered O-ring and fewer edges where dirt can accumulate</li> <li>• Optimal price/performance ratio, perfect for applications from a single source</li> <li>• Maximum corrosion resistance (corrosion resistance class CRC 4 to Festo standard 940 070) and chemical resistance</li> <li>• High temperature resistance</li> <li>• Stainless steel</li> <li>• Operating media: compressed air, vacuum, (water)</li> <li>• Straight shape, L-shape, T-shape, Y-shape, push-in bulkhead connector</li> </ul>	<ul style="list-style-type: none"> <li>• Solid-metal brass, nickel-plated</li> <li>• Attractively priced metal push-in fitting</li> <li>• Sturdy</li> <li>• Operating medium: compressed air, vacuum</li> <li>• Straight shape, L-shape, T-shape, Y-shape, push-in bulkhead connector</li> </ul>	<ul style="list-style-type: none"> <li>• Polypropylene</li> <li>• Low-cost alternative to stainless steel: resistant to most cleaning agents in combination with tubing PLN</li> <li>• For use with extreme media influences</li> <li>• Food grade see <a href="http://www.festo.com/certificates/NPQP">www.festo.com/certificates/NPQP</a></li> <li>• Operating medium: compressed air, vacuum</li> <li>• Straight shape, L-shape, T-shape, Y-shape, push-in bulkhead connector</li> </ul>
<b>online:</b> →	<a href="#">npqr</a>	<a href="#">npqm</a>	<a href="#">npqp</a>

## Product overview




### Pneumatic fittings >

## Pneumatics push-in fittings

	 <b>Push-in fittings, resistant to welding spatter QS-V0</b>	 <b>Self-sealing push-in fittings/ connectors QSK</b>	 <b>Push-in fittings, rotatable QSR</b>	 <b>Push-in fittings CQA</b>
<b>Pneumatic connection 1</b>	For tubing O.D. 10 mm, 12 mm, 4 mm, 6 mm, 8 mm, Male thread G1/2, G1/4, G1/8, G3/8, R1/2, R1/4, R1/8, R3/8	For tubing O.D. 10 mm, 12 mm, 4 mm, 6 mm, 8 mm, Male thread G1/2, G1/4, G1/8, G3/8, M5, R1/2, R1/4, R1/8, R3/8	Male thread G1/2, G1/4, G1/8, G3/8, M5, R1/2, R1/4, R1/8, R3/8	For pipe and tubing O.D. 22 mm, Push-in sleeve CQ-28
<b>Pneumatic connection 2</b>	For tubing O.D. 10 mm, 12 mm, 4 mm, 6 mm, 8 mm	For tubing O.D. 10 mm, 12 mm, 4 mm, 6 mm, 8 mm	For tubing O.D. 10 mm, 12 mm, 4 mm, 6 mm, 8 mm	For pipe and tubing O.D. 22 mm, Push-in sleeve CQ-28
<b>Design type</b>	L-shape, T-shape, Straight design	L-shape, Bulkhead, Straight design	L-shape, Straight design	
<b>Temperature-dependent operating pressure</b>		-0.95 ... 14 bar	-0.95 ... 14 bar	-0.95 ... 15 bar
<b>Operating pressure for entire temperature range</b>	-0.95 ... 10 bar	-0.95 ... 6 bar	-0.95 ... 6 bar	-0.95 ... 7 bar
<b>Ambient temperature</b>	0 ... 60°C	-10 ... 80°C	0 ... 60°C	-25 ... 70°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• PBT, reinforced</li> <li>• Resistant to welding spatter</li> <li>• For use in all areas where there is a risk of fire</li> <li>• Reliable even for applications in close proximity to welding spatter</li> <li>• Operating medium: compressed air, vacuum, water</li> <li>• Straight design, L-shaped, T-shaped</li> </ul>	<ul style="list-style-type: none"> <li>• Standard series</li> <li>• Self-sealing push-in fitting blocks the air flow after the tubing is disconnected</li> <li>• PBT and nickel-plated brass</li> <li>• Operating medium: compressed air, vacuum</li> <li>• Straight shape, L-shape, push-in bulkhead connector</li> </ul>	<ul style="list-style-type: none"> <li>• Push-in fitting, rotatable with swivel connection, rotatable by 360° with max. 500 rpm</li> <li>• Compact installation space</li> <li>• Straight shape, L-shape</li> </ul>	<ul style="list-style-type: none"> <li>• Assembling and disassembling without tools</li> <li>• For pipes PQ-PA, PQ-AL and tubing PAN and PUN</li> <li>• Sturdy, air-tight connection</li> <li>• Straight design, T-shape</li> </ul>
<b>online:</b> →	<a href="#">qs-v0</a>	<a href="#">qsk</a>	<a href="#">qsr</a>	<a href="#">cq</a>




Pneumatic fittings >

Pneumatics push-in fittings

	 <b>Cartridges/blanking plugs NPQX</b>	 <b>Cartridges QSP</b>	 <b>Cartridges, polymer, black QSPK</b>
<b>Pneumatic connection 1</b>	Cartridge 12 mm, Cartridge 15 mm, Cartridge 10 mm	Cartridge 10 mm, 14 mm, 17 mm	Cartridge 10 mm, 18 mm
<b>Pneumatic connection 2</b>	For tubing outer diameter of 12 mm, For tubing outside diameter of 1/4", For tubing O.D. 1/4 in „, 1/8 in „, 10 mm, 12 mm, 3/8 in „, 4 mm, 5/16 in „, 5/32 in „, 6 mm, 8 mm	Male thread G1/8, For tubing O.D. 4 mm, 6 mm	For tubing O.D. 10 mm, 3 mm, 4 mm, 6 mm, 8 mm
<b>Design type</b>	Straight design	Straight design	L-shape, L-shape, long, Straight design
<b>Temperature-dependent operating pressure</b>			
<b>Operating pressure for entire temperature range</b>	-0.95 ... 10 bar	-0.95 ... 10 bar	-0.95 ... 10 bar
<b>Ambient temperature</b>	-10 ... 60°C	-10 ... 60°C	-5 ... 60°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• Specially developed for valve terminal VTUX</li> <li>• Versions with aluminium or polyamide housing</li> <li>• Straight shape</li> </ul>	<ul style="list-style-type: none"> <li>• Plug-in cartridges</li> <li>• PBT and nickel-plated brass</li> <li>• Operating medium: compressed air, vacuum</li> <li>• Straight shape</li> </ul>	<ul style="list-style-type: none"> <li>• Compact installation space</li> <li>• Threadless mounting</li> <li>• Straight shape, L-shape</li> </ul>
<b>online:</b> →	<a href="#">npqx</a>	<a href="#">qsp</a>	<a href="#">qspk</a>

Pneumatic fittings >





Pneumatics push-in fittings

	 <b>Cartridges QSPK, NPT</b>	 <b>Cartridges, polymer, grey QSPKG</b>	 <b>Cartridges QSPKG, NPT</b>
<b>Pneumatic connection 1</b>	Cartridge 18 mm	Cartridge 10 mm, 14 mm, 18 mm, 20 mm	Cartridge 10 mm, 14 mm, 18 mm, 20 mm
<b>Pneumatic connection 2</b>	For tubing O.D. 1/4 in „, 3/8 in „	For tubing O.D. 10 mm, 12 mm, 3 mm, 4 mm, 6 mm, 8 mm	For tubing O.D. 1/2 in „, 1/4 in „, 1/8 in „, 3/8 in „, 5/16 in „, 5/32 in „
<b>Design type</b>	L-shape, Straight design	L-shape, L-shape, long, Straight design	L-shape, L-shape, long, Straight design
<b>Temperature-dependent operating pressure</b>			
<b>Operating pressure for entire temperature range</b>	-0.95 ... 10 bar	-0.95 ... 10 bar	-0.95 ... 10 bar
<b>Ambient temperature</b>	-5 ... 60°C	-5 ... 60°C	-5 ... 60°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• Compact installation space</li> <li>• Threadless mounting</li> <li>• Straight shape, L-shape</li> </ul>	<ul style="list-style-type: none"> <li>• Compact installation space</li> <li>• Threadless mounting</li> <li>• Straight shape, L-shape</li> </ul>	<ul style="list-style-type: none"> <li>• Compact installation space</li> <li>• Threadless mounting</li> <li>• Straight shape, L-shape</li> </ul>
<b>online:</b> →	<a href="#">qspk</a>	<a href="#">qspk</a>	<a href="#">qspk</a>

## Product overview





### Pneumatic fittings >

## Barbed fittings

	 <b>Quick connectors NPCK</b>	 <b>Barbed fittings CN, CRCN, FCN, L-PK, LCN, LCNH, N, RTU, SCN, T-PK, TCN, Y-PK</b>	 <b>Quick connectors ACK, CK, CV, FCK, GCK, LCK, QCK, SCK, TCK</b>	 <b>Barbed hose fittings C-P, N-P, N-MS</b>
<b>Nominal size</b>	2 ... 6.2 mm	1.3 ... 5.3 mm	2 ... 12 mm	4 ... 16.5 mm
<b>Pneumatic connection 1</b>	Male thread G1/4, G1/8, G3/8, M5	For tubing O.D. 3 mm, 4 mm, 6 mm, 8 mm, Male thread G1/4, G1/8, G3/8, M3, M5	Female thread G1/2, G1/4, G1/8, G3/8, M5, For barbed connector I.D. 3 mm Via union nut, 4 mm Via union nut, 6 mm Via union nut, 9 mm Via union nut, For tubing O.D. 4 mm, 6 mm, 8 mm, Male thread G1/2, G1/4, G1/8, G3/8, M5, R1/4, R1/8, R3/8	Male thread R1, Male thread 3/4 NPT, Male thread 1 NPT, Female thread G1/2, G1/4, G1/8, G3/8, Male thread G1/2, G1/4, G1/8, G3/4, G3/8
<b>Pneumatic connection 2</b>	For tubing O.D. 10 mm, 4 mm, 6 mm, 8 mm	For tubing O.D. 3 mm, 4 mm, 6 mm, 8 mm	For barbed connector I.D. 13 mm Via union nut, 3 mm Via union nut, 4 mm Via union nut, 6 mm Via union nut, 9 mm Via union nut, For tubing O.D. 4 mm, 6 mm, 8 mm	For tubing I.D. 6 mm, For tubing I.D. 19 mm, For tubing I.D. 13 mm, 9 mm, For tubing O.D. 8 mm
<b>Design type</b>	Straight design	Straight design	L-shape, Bulkhead, T-shape, Straight design	Straight design
<b>Operating pressure for entire temperature range</b>	-0.95 ... 12 bar	-0.95 ... 10 bar	-0.95 ... 16 bar	-0.95 ... 16 bar
<b>Ambient temperature</b>	-20 ... 120°C	-10 ... 60°C	-40 ... 150°C	-10 ... 60°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• Stainless steel design</li> <li>• Food grade see <a href="http://www.festo.com/certificates/NPCK">www.festo.com/certificates/NPCK</a></li> <li>• Fulfils all clean design requirements</li> <li>• Operating media compressed air, vacuum, water. Water as per the manufacturer's declaration, see <a href="http://www.festo.com/certificates/NPCK">www.festo.com/certificates/NPCK</a></li> <li>• Straight shape</li> </ul>	<ul style="list-style-type: none"> <li>• Operating medium: compressed air, vacuum</li> <li>• Brass, POM, aluminium or stainless steel</li> <li>• Straight shape, T-shape, L-shape, Y-shape</li> </ul>	<ul style="list-style-type: none"> <li>• Bulkhead quick connector</li> <li>• Sealing cap for plastic tube fittings and barbed fittings</li> <li>• Multiple distributor</li> <li>• Union nut for CK tube fitting</li> <li>• Operating media: compressed air, vacuum, (water)</li> <li>• Aluminium, steel, POM or zinc</li> <li>• Straight design, L-shaped, T-shaped</li> </ul>	<ul style="list-style-type: none"> <li>• Barbed hose fitting with or without sealing ring</li> <li>• Tubing clip to DIN 3017</li> <li>• Operating medium: compressed air, vacuum</li> <li>• Brass or aluminium, steel</li> </ul>
<b>online:</b> →	<a href="#">npck</a>	<a href="#">n_070302</a>	<a href="#">ck</a>	<a href="#">n_cnp</a>




## Pneumatic fittings &gt;

## Threaded fittings

	 <b>Threaded fittings NPFC</b>	 <b>Blanking plugs B</b>	 <b>Adapters NPFV</b>	 <b>Ring pieces, hollow bolts LK, TK, VT</b>
<b>Pneumatic connection 1</b>	G1, G1/2, G1/4, G1/8, G3/4, G3/8, M3, M5, M7, R1, R1/2, R1/4, R1/8, R3/4, R3/8	Male thread G1, G1/2, G1/4, G1/8, G3/4, G3/8, M3, M5, M7	1/4 NPT, G1/4	Male thread G1/4, G1/8, G3/8, M5, G1/4, G1/8, G3/8
<b>Pneumatic connection 2</b>	G1, G1/2, G1/4, G1/8, G3/4, G3/8, M3, M5, R1, R1/2, R1/4, R1/8, R3/4, R3/8		1/4 NPT, G1/4	Female thread G1/4, G1/8, G3/8, For barbed connector I.D. 3 mm Via union nut, 4 mm Via union nut, 6 mm Via union nut
<b>Operating pressure</b>	-0.95 ... 50 bar		2 ... 8 bar	
<b>Operating pressure for entire temperature range</b>				0 ... 10 bar
<b>Ambient temperature</b>	-20 ... 150°C			
<b>Description</b>	<ul style="list-style-type: none"> <li>• Brass, nickel-plated</li> <li>• Sleeve</li> <li>• Extension</li> <li>• Double nipple</li> <li>• Reducing nipple</li> <li>• Operating medium: compressed air, vacuum</li> <li>• Straight shape, L-shape, T-shape, X-shape, Y-shape</li> </ul>	<ul style="list-style-type: none"> <li>• Aluminium, stainless steel</li> <li>• With sealing ring</li> <li>• Variants recommended for production systems for manufacturing lithium-ion batteries</li> </ul>	<ul style="list-style-type: none"> <li>• Adapter with filter</li> <li>• From male thread G1/4 to female thread G1/4 or NPT1/4 and male thread NPT1/4 to female thread NPT1/4</li> <li>• Adapter material: high-alloy stainless steel</li> <li>• Operating medium compressed air</li> </ul>	<ul style="list-style-type: none"> <li>• Multiple distributor consisting of hollow bolt VT and ring piece LK or TK</li> <li>• With two to six outlets and one common air feed</li> <li>• Operating medium: compressed air, vacuum</li> <li>• Galvanised steel</li> </ul>
<b>online:</b> →	<a href="#">npfc</a>	<a href="#">b-1</a>	<a href="#">npfv</a>	<a href="#">lk</a>

## Pneumatic fittings &gt;




## Threaded fittings

	 <b>Reducers, sleeve, double nipple LJK, TJK</b>	 <b>Reducers, sleeve, double nipple E, ESK</b>	 <b>Reducers, sleeve, double nipple QM</b>
<b>Pneumatic connection 1</b>	Male thread G1/2, G1/4, G1/8, G3/8, M3	R1/2, R1/4, R1/8, R3/8	Female thread M5, G1, G1/2, G1/4, G1/8, G3/4, G3/8
<b>Pneumatic connection 2</b>	Female thread G1/2, G1/4, G1/8, G3/8, M3	R1/2, R1/4, R1/8, R3/8	Female thread M5, G1, G1/2, G1/4, G1/8, G3/4, G3/8
<b>Operating pressure</b>			
<b>Operating pressure for entire temperature range</b>			
<b>Ambient temperature</b>			
<b>Description</b>	<ul style="list-style-type: none"> <li>• T-fitting, swivelling, with female thread</li> <li>• Elbow fitting with female thread</li> <li>• With sealing ring</li> </ul>	<ul style="list-style-type: none"> <li>• For connecting pneumatic components with different threaded connections</li> </ul>	<ul style="list-style-type: none"> <li>• Available in different threaded connection variants</li> <li>• RoHS compliant</li> <li>• LABS (PWIS) compliant according to VDMA24364-B1/B2-L</li> </ul>
<b>online:</b> →	<a href="#">jk</a>	<a href="#">esk</a>	<a href="#">qm</a>

## Product overview


### Pneumatic fittings >

## Threaded fittings

	 <p><b>Reducers, sleeve, double nipple</b> <b>D</b></p>	 <p><b>Reducers, sleeve, double nipple</b> <b>FR</b></p>	 <p><b>Reducers, sleeve, double nipple</b> <b>G</b></p>
<b>Pneumatic connection 1</b>	M5	Male thread G1/4, G1/8, G3/8, M5	G1/4, G1/8, G3/8, M5
<b>Pneumatic connection 2</b>	M7	Female thread G1/4, G1/8, G3/8, M5	G1/4, G1/8, G3/8, M5
<b>Operating pressure</b>			
<b>Operating pressure for entire temperature range</b>			
<b>Ambient temperature</b>			
<b>Description</b>	<ul style="list-style-type: none"> <li>• Reducing nipple</li> <li>• For reducing threaded connections</li> <li>• With sealing ring</li> <li>• Brass</li> </ul>	<ul style="list-style-type: none"> <li>• With sealing ring</li> <li>• Aluminium</li> </ul>	<ul style="list-style-type: none"> <li>• Elbow piece</li> <li>• With sealing ring</li> <li>• Aluminium</li> </ul>
<b>online:</b> →	<a href="#">d</a>	<a href="#">fr</a>	<a href="#">g</a>


### Pneumatic fittings >

## Click fitting




	 <p><b>Click fittings</b> <b>NPKA</b></p>
<b>Pneumatic connection 1</b>	For tubing O.D. 6 mm, Male thread G1/8
<b>Pneumatic connection 2</b>	For tubing O.D. 6 mm
<b>Operating pressure [MPa]</b>	-0.095 ... 1 MPa
<b>Operating pressure</b>	-0.95 ... 10 bar
<b>Nominal size</b>	4 mm
<b>Ambient temperature</b>	-10 ... 60°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• POM, polyamide 66</li> <li>• Quick and easy one-handed tube installation</li> <li>• Completely made of polymer</li> <li>• Food grade see <a href="http://www.festo.com/certificates/NPKA">www.festo.com/certificates/NPKA</a></li> <li>• Operating media compressed air, vacuum, water. Water as per the manufacturer's declaration, see <a href="http://www.festo.com/certificates/NPKA">www.festo.com/certificates/NPKA</a></li> <li>• No copper, fluor or silicone</li> <li>• Cleanroom compatible</li> <li>• Easy-to-clean design with few corners and edges</li> <li>• Straight design, L-shaped, T-shaped</li> </ul>
<b>online:</b> →	<a href="#">npka</a>

## Connection technology for fluid media

## Fittings for liquid media

	
	<b>Fitting NLFA</b>
<b>Design</b>	Tubing mount via clamped connection, Tubing mount via barbed connector
<b>Design type</b>	Straight design
<b>Fluid connection</b>	UNF1/4-28
<b>Fluid connection 2</b>	For tubing O.D. 3 mm, For tubing I.D. 1.2 mm, For tubing I.D. 2.1 mm, For tubing O.D. 1.6 mm (1/16"), For tubing O.D. 3.2 mm (1/8")
<b>Operating pressure for entire temperature range</b>	-0.75 ... 6 bar
<b>Operating pressure [MPa] for entire temperature range</b>	-0.075 ... 0.6 MPa
<b>Operating pressure [psi] for entire temperature range</b>	-10.875 ... 87 psi
<b>Medium</b>	Liquid media, Gaseous media
<b>Ambient temperature</b>	0 ... 50°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• For mounting in laboratory devices</li> <li>• Very easy to flush thanks to connection without dead space</li> <li>• For liquid and gaseous media</li> <li>• Also for aggressive liquid media</li> <li>• Materials in contact with the media: PP</li> <li>• For securing tubing and dosing needles</li> <li>• Straight design</li> </ul>
<b>online:</b> →	<a href="#">nlfa</a>

## Pipes

			
	<b>Plastic pipes PQ-PA</b>	<b>Pipes PQ-AL</b>	<b>Plastic-coated metal tubes PM</b>
<b>Outside diameter</b>	12 ... 28 mm	12 ... 28 mm	6 ... 8 mm
<b>Information on tubing materials</b>	PA	Wrought aluminium alloy	Wrought aluminium alloy, PE
<b>Temperature-dependent operating pressure</b>	-0.95 ... 15 bar	-0.95 ... 15 bar	-0.95 ... 30 bar
<b>Ambient temperature</b>	-25 ... 75°C	-30 ... 75°C	-29 ... 65°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• Rigid pipe made from high-quality polyamide</li> <li>• Smooth inside wall ensures optimum flow conditions</li> <li>• Operating media: compressed air, vacuum, liquid media</li> </ul>	<ul style="list-style-type: none"> <li>• Rigid aluminium pipe</li> <li>• Smooth inside wall ensures optimum flow conditions</li> <li>• Operating media: compressed air, vacuum, liquid media</li> </ul>	<ul style="list-style-type: none"> <li>• Polyethylene, aluminium</li> <li>• Can be bent straight and reshaped several times without a pipe-bending device and without being damaged</li> <li>• Resistant to deformation</li> <li>• Operating medium: compressed air, vacuum</li> </ul>
<b>online:</b> →	<a href="#">pq-pa</a>	<a href="#">pq-al</a>	<a href="#">pm</a>

## Product overview





### Push-in fittings for piping PQ



**Push-in fittings**  
**CQ, CQC, CQH, CQL, CQT**




<b>Pneumatic connection 1</b>	For pipe and tubing O.D. 12 mm, 15 mm, 18 mm, 22 mm, 28 mm, Male thread G1, G1/2, G3/4, G3/8, Push-in sleeve CQ-12, CQ-15, CQ-18, CQ-22, CQ-28
<b>Pneumatic connection 2</b>	For pipe and tubing O.D. 12 mm, 15 mm, 18 mm, 22 mm, 28 mm, Push-in sleeve CQ-12, CQ-15, CQ-18, CQ-22, CQ-28, QS-12, QS-16
<b>Nominal size</b>	8 ... 24.9 mm
<b>Temperature-dependent operating pressure</b>	-0.95 ... 15 bar
<b>Ambient temperature</b>	-25 ... 70°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• For pipes PQ-PA, PQ-AL and tubing PAN and PUN</li> <li>• Operating media: compressed air, vacuum, liquid media</li> <li>• POM</li> <li>• Straight design, L-shaped, T-shaped</li> </ul>
<b>online:</b> →	<a href="#">CQ</a>

## Couplings



				
	<b>Quick coupling sockets, quick coupling plugs</b> NPHS-D6, NPHS-S6	<b>Quick coupling sockets, quick coupling plugs</b> KD2, KD3, KD4, KS2, KS3, KS4	<b>Multiple connectors</b> KSV, KDV, KDVF	<b>Multi-tube connectors</b> KM
<b>Pneumatic connection</b>			For tubing O.D. 3 mm, 4 mm, 6 mm, 8 mm, PK-2, PK-3, PK-4, PK-6	For tubing O.D. 3 mm, 4 mm, 6 mm
<b>Pneumatic connection 1</b>	Barbed hose fitting 9 mm, Female thread G1/2, G1/4, G3/8, Male thread G1/2, G1/4, G1/8, G3/8	For barbed fitting I.D. 3 mm with union nut, For barbed fitting I.D. 4 mm with union nut, For barbed fitting I.D. 6 mm with union nut, Barbed hose fitting 6 mm, Barbed hose fitting 9 mm, Female thread G1/2, G1/4, G1/8, G3/8, M5, Male thread G1/2, G1/4, G1/8, G3/8, M3, M5, CK-3, CK-4, CK-6, CK-9, CN-2		
<b>Standard nominal flow rate</b>	875 ... 2100 l/min	44 ... 1350 l/min		
<b>Operating pressure</b>	-0.95 ... 12 bar	-0.95 ... 12 bar	-0.95 ... 16 bar	-0.95 ... 8 bar
<b>Ambient temperature</b>	-20 ... 80°C	-10 ... 60°C	-10 ... 60°C	-10 ... 60°C
<b>Description</b>	<ul style="list-style-type: none"> <li>• Safety coupling</li> <li>• Shut-off at one end</li> <li>• Exhaust the air on the connector side without releasing the coupling</li> <li>• Combination of coupling and hand slide valve</li> <li>• Can be used as an on/off valve</li> <li>• Nickel-plated brass or galvanised hardened steel</li> </ul>	<ul style="list-style-type: none"> <li>• Quick connection coupling for standard applications without safety function</li> <li>• Shut-off at one or both ends</li> <li>• With male or female thread or with barbed fitting or quick connector</li> <li>• Nickel-plated brass, PP</li> <li>• Operating medium: compressed air, vacuum</li> </ul>	<ul style="list-style-type: none"> <li>• POM, aluminium, brass</li> <li>• Multi-plug, multi-socket</li> <li>• Terminal plug and terminal socket</li> <li>• Operating medium: compressed air, vacuum</li> </ul>	<ul style="list-style-type: none"> <li>• Polymer, brass</li> <li>• For max. 22 lines</li> <li>• Used as control cabinet outlets</li> <li>• Operating medium: compressed air, vacuum</li> </ul>
<b>online:</b> →	<a href="#">nphs</a>	<a href="#">kd1</a>	<a href="#">ksv</a>	<a href="#">km</a>

## Product overview



### Distributors

	 <b>Push-in fittings</b> <b>QSLV, QSQ, QST3</b>	 <b>Push-in fittings</b> <b>QSYTF</b>	 <b>Distributors</b> <b>FR</b>
<b>Pneumatic connection 1</b>	For tubing O.D. 10 mm, 6 mm, 8 mm, Male thread G1/2, G1/4, G1/8, G3/8, R1/2, R1/4, R1/8, R3/8	Male thread G1/2, G1/4, G1/8, G3/8, R1/2, R1/4, R1/8, R3/8	Female thread G1/2, G1/4, G1/8, G3/8, G3/4
<b>Pneumatic connection 2</b>	For tubing O.D. 10 mm, 12 mm, 4 mm, 6 mm, 8 mm	Female thread G1/2, G1/4, G1/8, G3/8, For tubing O.D. 10 mm, 12 mm, 6 mm, 8 mm	Female thread G1/2, G1/4, G1/8, G3/8, M3, M5
<b>No. of supply lines</b>	1	1	1
<b>No. of outlets</b>	2, 3, 4, 6	3	3, 8, 9, 12
<b>Max. rotational speed</b>			
<b>Description</b>	<ul style="list-style-type: none"> <li>• PBT and nickel-plated brass</li> <li>• Rotatable 360°</li> <li>• Reducing design</li> <li>• Operating media: compressed air, vacuum, (water)</li> <li>• Straight design, L-shaped, T-shaped</li> </ul>	<ul style="list-style-type: none"> <li>• PBT and nickel-plated brass</li> <li>• Rotatable 360°</li> <li>• Operating media: compressed air, vacuum, (water)</li> <li>• Y-shape</li> </ul>	<ul style="list-style-type: none"> <li>• Aluminium</li> <li>• 4, 8, 9 or 12 connections</li> <li>• Operating medium: compressed air, vacuum</li> </ul>
<b>online:</b> →	<a href="#">qslv</a>	<a href="#">qsytf</a>	<a href="#">fr</a>

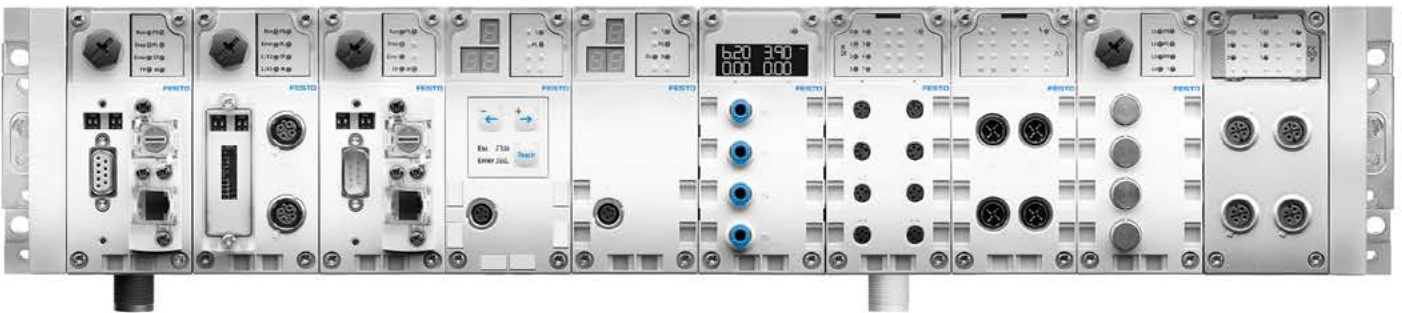
### Distributors

	 <b>Distributors</b> <b>CQD</b>	 <b>Rotary distributors</b> <b>GF</b>
<b>Pneumatic connection 1</b>	Female thread G1/2	Male thread G1/4, G3/8, G1/2, G1/4, G1/8
<b>Pneumatic connection 2</b>	Female thread G1/2	Female thread G1/4, G3/8, G1/2, G1/4, G1/8, M5
<b>No. of supply lines</b>	1	
<b>No. of outlets</b>	4	
<b>Max. rotational speed</b>		300 ... 3000 rpm
<b>Description</b>	<ul style="list-style-type: none"> <li>• POM</li> <li>• Operating medium: compressed air, vacuum</li> </ul>	<ul style="list-style-type: none"> <li>• 2 or 4 axial and radial outlets</li> <li>• Single or multiple rotary distributor</li> <li>• Operating medium: compressed air, vacuum</li> <li>• Brass, hardened steel</li> </ul>
<b>online:</b> →	<a href="#">cq</a>	<a href="#">gf</a>

## Protective conduit systems



	 <p><b>Protective conduits</b> MK, MKG, MKR, MKV</p>	 <p><b>Fittings</b> HMZAS, HMZV, MKA, MKGV, MKM, MKRL, MKRS, MKRT, MKRV, MKVM, MKVV, MKY</p>
<b>Mounting position</b>	optional	optional
<b>Description</b>	<ul style="list-style-type: none"> <li>• For protecting pneumatic tubing and electrical cables</li> <li>• Galvanised steel, PA, PP, PVC spring steel</li> <li>• Metal or polymer design</li> <li>• High alternating bending strength</li> </ul>	<ul style="list-style-type: none"> <li>• Installation kit</li> <li>• Junction box</li> <li>• Reducing connector</li> <li>• Protective conduit fitting</li> <li>• Lock nut</li> <li>• Protective conduit connector</li> <li>• Y-distributor</li> <li>• Polymer, polyamide, nickel-plated brass</li> </ul>
<b>online:</b> →	<a href="#">mkg</a>	<a href="#">mka</a>

## Product overview





## Product overview

### Pneumatic and electropneumatic controllers

	 <b>Steppers</b> <b>TAA, TAB</b>	 <b>Pulse generators</b> <b>VLG</b>
<b>Operating pressure</b>		3.5 ... 10 bar
<b>Operating pressure [MPa]</b>		0.35 ... 1 MPa
<b>Explosion prevention and protection</b>	Zone 1 (ATEX), Zone 2 (ATEX), Zone 21 (ATEX), Zone 22 (ATEX)	
<b>Description</b>	<ul style="list-style-type: none"> <li>For ensuring a logical program sequence</li> <li>Poppet valve with integrated AND as well as OR element</li> </ul>	<ul style="list-style-type: none"> <li>For generating infinitely adjustable signals in controllers</li> <li>For high-speed cylinder movements of diaphragm cylinders, single- and double-acting cylinders</li> </ul>
<b>online:</b> →	<a href="#">taa</a>	<a href="#">vlg</a>

### Electronic controllers

	 <b>Control unit</b> <b>CEPE</b>	 <b>Controllers</b> <b>CECC-D, CECC-LK, CECC-S</b>
<b>CPU data</b>	8 GB RAM, Dual core 2.2 GHz	Dual core 500 MHz
<b>Operating voltage</b>		19.2 - 30 V DC, 20.4 - 30 V DC
<b>Fieldbus interface, protocol</b>	EtherCAT®	
<b>Fieldbus interface, connection technology</b>		Plugs, Sub-D, 9-pin
<b>Ethernet interface, protocol</b>	TCP/IP	OPC UA
<b>Ethernet interface, function</b>	Cloud connection, Network	
<b>Ethernet interface, connection technology</b>	RJ45	
<b>NEW</b>	<ul style="list-style-type: none"> <li>New</li> </ul>	
<b>Description</b>	<ul style="list-style-type: none"> <li>High-performance industrial PC with real-time operating system Fest AX OS</li> <li>Based on PLCnext Technology – the open ecosystem for modular automation</li> <li>Extension of IEC standards with IT languages such as Python and C++ to open up new automation potentials</li> <li>Easy programming with CODESYS or Visual Studio Code</li> <li>Extended functionality available via apps from the Festo and PLCnext App Store</li> <li>Seamless connectivity from OT servo technologies to IT cloud services</li> <li>Available in two different software versions (C1/IoT &amp; M1/Motion)</li> </ul>	<ul style="list-style-type: none"> <li>Compact programmable logic controller</li> <li>Programming with CoDeSys to IEC 61131-3</li> <li>12 digital inputs, 8 digital outputs, and also two high-speed counters up to 200 kHz</li> <li>Ethernet 10/100 Mbit/s</li> <li>USB interface for data transfer</li> </ul>
<b>online:</b> →	<a href="#">cepe</a>	<a href="#">cecc</a>

## Software tools





## Connectivity Finder



This tool can be used to find the optimum way to connect a Festo solution to your preferred (non-Festo) controller. You will also be provided with expert knowledge for your selected connection option, making the integration of the Festo solution into your machine really easy.




You will find this tool at  
[www.festo.com/x/connectivity-finder](http://www.festo.com/x/connectivity-finder)

## Remote I/O and network interface components



	 <b>Remote I/O systems</b> <b>CPX-AP-A</b>	 <b>Automation systems</b> <b>CPX-AP-I</b>	 <b>For automation systems</b> <b>CPX-AP-I</b>	 <b>Remote I/O system</b> <b>CPX-AP-L</b>
<b>Address capacity, inputs</b>	1024 ... 4096 byte		244 ... 2048 byte	2 byte
<b>Max. no. of inputs</b>				
<b>Address capacity, outputs</b>	1024 ... 4096 byte		244 ... 2048 byte	1 byte
<b>Electrical actuation</b>	AP interface, Ethernet			
<b>Protocol</b>	AP		IO-Link®	AP
<b>Description</b>	<ul style="list-style-type: none"> <li>• Modular and lightweight IO system in IP65/IP67</li> <li>• Highly flexible remote IO system with maximum performance</li> <li>• Can be expanded and easily combined with CPX-AP-A and CPX-AP-I to form an integrated system</li> <li>• Seamless connectivity along with advanced diagnostics option increase the machine availability and productivity</li> <li>• Easy to integrate into the controller of your choice: PROFINET, PROFIBUS, EtherCAT®, EtherNet/IP, ModbusTCP, PROFIBUS</li> <li>• Module for IO-Link® available</li> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Powerful remote I/O system that flexibly links 80 modules at a data rate of 200 Mbaud in real time</li> <li>• Sustainable operation thanks to energy shut-off</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Powerful remote I/O system that flexibly links 80 modules at a data rate of 200 Mbaud in real-time</li> <li>• Seamless connectivity along with advanced diagnostics option increase the machine availability and productivity</li> <li>• Easy to integrate into the controller of your choice: PROFINET, EtherCAT®, EtherNet/IP, ModbusTCP</li> <li>• Real-time capability and deterministic system behaviour enable cycle times of up to 250 µs</li> <li>• Cable lengths of up to 50 m between every module enable vast system dimensions</li> <li>• The IO-Link master and parameterisation software enable simple integration of any IO-Link® devices</li> <li>• Ethernet performance up to the valve terminal and digital as well as analogue input/output modules</li> <li>• Sustainable operation thanks to energy shut-off</li> </ul>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> <li>• Decentralised and lightweight I/O system in IP65/IP67</li> <li>• Highly flexible remote IO system with maximum performance</li> <li>• Can be expanded and easily combined with CPX-AP-I and CPX-AP-A to form an integrated system</li> <li>• Seamless connectivity along with advanced diagnostics option increase the machine availability and productivity</li> <li>• Easy to integrate into the controller of your choice: PROFINET, EtherCAT®, EtherNet/IP, ModbusTCP</li> <li>• Module for IO-Link® available</li> <li>• Powerful remote I/O system that flexibly links 80 modules at a data rate of 200 Mbaud in real-time</li> <li>• Cable lengths of up to 50 m between every module enable vast system dimensions</li> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> </ul>	<ul style="list-style-type: none"> <li>• Decentralised and lightweight I/O system in IP20</li> <li>• Highly flexible remote IO system with maximum performance</li> <li>• Can be expanded and easily combined with CPX-AP-I and CPX-AP-A to form an integrated system</li> <li>• Seamless connectivity along with advanced diagnostics option increase the machine availability and productivity</li> <li>• Easy to integrate into the controller of your choice: PROFINET, PROFIBUS, EtherCAT®, EtherNet/IP, ModbusTCP, PROFIBUS</li> <li>• Powerful remote I/O system that flexibly links 80 modules at a data rate of 200 Mbaud in real time</li> <li>• Cable lengths of up to 50 m between every module enable vast system dimensions</li> <li>• Fits perfectly into our comprehensive product portfolio of electromechanical actuators, motors, servo drives and control systems</li> </ul>
<b>online:</b> →	<a href="#">cpx-apa</a>	<a href="#">cpx-api</a>	<a href="#">cpx-api</a>	<a href="#">cpx-apl</a>

## Product overview

### Remote I/O and network interface components

	 <b>Input modules for installation system CTSL</b> <b>CTSL</b>	 <b>Fieldbus modules CTEU</b> <b>CTEU</b>	 <b>Terminal CPX</b> <b>CPX</b>
<b>Address capacity, inputs</b>		2 ... 64 byte	64 byte
<b>Max. no. of inputs</b>	16		
<b>Address capacity, outputs</b>		2 ... 64 byte	64 byte
<b>Electrical actuation</b>			Fieldbus, Integrated controller
<b>Protocol</b>	I-Port, IO-Link®	AS-Interface, CANopen, CC-Link, DeviceNet, EtherCAT, EtherNet/IP, PROFINET, Modbus® TCP, PROFIBUS DP	
<b>Description</b>	<ul style="list-style-type: none"> <li>For installation system CTEL</li> <li>For recording sensor input signals</li> <li>Display of the input statuses for each input signal via an assigned LED</li> <li>Diagnostic LED for short circuit/overload in sensor supply</li> </ul>	<ul style="list-style-type: none"> <li>For valve terminals VTUG, MPA-L, VTOC</li> <li>Can be expanded into the installation system CTEL</li> <li>Fieldbus-typical LEDs, interfaces and switching elements</li> <li>Isolated power supply for electronics and valves</li> </ul>	<ul style="list-style-type: none"> <li>Automation platform</li> <li>Open to all common fieldbus protocols and Ethernet</li> <li>Integrated diagnostic and maintenance functions</li> <li>Can be used as stand-alone remote I/O or with valve terminals MPA-S, MPA-L, VTSA/VTSA-F</li> <li>Choice of polymer or metal interlinking block with individual linking</li> <li>Analogue inputs and outputs, 2-way/4-way, with optional HART protocol</li> </ul>
<b>online: →</b>	<a href="#">ctsl</a>	<a href="#">cteu</a>	<a href="#">cpx</a>

### Remote I/O and network interface components

	 <b>Electrical interfaces CPX-CTEL</b> <b>CPX-CTEL</b>	 <b>AS-Interface® module ASI</b> <b>ASI</b>
<b>Address capacity, inputs</b>	32 byte	
<b>Max. no. of inputs</b>		
<b>Address capacity, outputs</b>	32 byte	
<b>Electrical actuation</b>		
<b>Protocol</b>	I-Port, IO-Link®	
<b>Description</b>	<ul style="list-style-type: none"> <li>CPX-CTEL master module with 4 I-Port connections</li> <li>Decentralised pneumatic components and sensors for fast processes</li> <li>Standardised M12 connections</li> </ul>	<ul style="list-style-type: none"> <li>Accessories for the AS-Interface installation system</li> <li>Compact I/O modules (IP65, IP67)</li> </ul>
<b>online: →</b>	<a href="#">cpx-ctel</a>	<a href="#">as-interface</a>

## Software tools

### Festo Automation Suite commissioning software





Quickly and reliably to a ready-to-use drive system – the Festo Automation Suite combines the parameterisation, programming and maintenance of complete drive systems, from the mechanical to the control system, in just one software program. Perfect for making industrial automation simple, efficient and seamless.

#### Plug-in automation system CPX-E




- Controller programming in CODESYS as a system expansion for SoftMotion – up to robotic applications
- Just 2 mouse clicks instead of 100: greatly simplified integration of the servo drive CMMT-AS into the control program with CPX-E-CEC
- Conveniently install the plug-in using the software  
This tool can be found
- on our website at [www.festo.com/AutomationSuite](http://www.festo.com/AutomationSuite)

## Controllers and motion control



	 <b>Automation systems</b> <b>CPX-E</b>	 <b>Motor controllers</b> <b>CPX-CEC-M1</b>
<b>Max. address capacity inputs</b>	64	
<b>CPU data</b>		800 MHz processor, 256 MB RAM, 32 MB Flash
<b>Processing time</b>		Approx. 200 µs/1 k instruction
<b>Degree of protection</b>	IP20	IP65, IP67
<b>Configuration support</b>		CODESYS V3
<b>Fieldbus interface, type</b>		CAN bus
<b>Fieldbus interface, connection technology</b>		Plugs, Sub-D, 9-pin
<b>Description</b>	<ul style="list-style-type: none"> <li>• Fits perfectly into our comprehensive product portfolio of electro-mechanical actuators, motors, servo drives and control systems</li> <li>• Modern control system with high performance</li> <li>• Fieldbus master interfaces, EtherCAT® master, fieldbus slave interfaces, PROFINET, EtherNet/IP, PROFIBUS, EtherCAT® digital input modules (16DI), digital output modules (8DO/0.5A)</li> <li>• Analogue input modules (current, voltage), analogue output modules (current, voltage)</li> <li>• Modern programming with CoDeSys V3 to IEC 61131-3</li> <li>• Integration of SoftMotion functions (SoftMotion)</li> <li>• Compact I/O assembly</li> <li>• Easy mounting of the control system</li> </ul>	<ul style="list-style-type: none"> <li>• Easy control of valve terminal configurations</li> <li>• Programming with CoDeSys to IEC 61131-3</li> <li>• Connection to all fieldbuses as a remote controller and for pre-processing</li> <li>• Control of electric drives via CANopen</li> <li>• SoftMotion functions for coordinated multi-axis movements</li> </ul>
<b>online: →</b>	<a href="#">cpx-e</a>	<a href="#">cpx-cec-m1</a>

## Product overview

### Operator units



	 <b>Operator unit CDSV</b>	 <b>Operator units CDSA</b>	 <b>IO-Link Master USB CDSU-1</b>
<b>Conforms to standard</b>			EN 61131-9
<b>Operating voltage range DC</b>	15 ... 30 V	19.2 ... 30 V	
<b>Electrical connection for IO-Link®, connection type</b>			Socket
<b>Electrical connection for IO-Link®, connection technology</b>			M12x1, A-coded to EN 61076-2-101
<b>Electrical connection for IO-Link®, number of pins/wires</b>			5
<b>Protocol</b>			IO-Link®
<b>Display type</b>	Illuminated LCD		
<b>Display</b>		LCD display, With backlighting	
<b>Display size</b>		7 in „	
<b>Display resolution</b>		WSVGA, 600x1024 pixels	
<b>NEW</b>	<ul style="list-style-type: none"> <li>• New</li> </ul>		
<b>Description</b>	<ul style="list-style-type: none"> <li>• Display and operating panel for the mass flow controller VEFC</li> <li>• Compact design 30x30 mm</li> <li>• Diagnostic function</li> <li>• Parameterisation function of the basic device</li> <li>• High-contrast display with blue backlight</li> </ul>	<ul style="list-style-type: none"> <li>• For mobile commissioning and optimisation</li> <li>• Integrated reporting system and user administration in combination with the robotics library from Festo</li> <li>• Terminal box for installation in a control cabinet and various cable lengths available</li> <li>• Interfaces for Ethernet, RS-422-A/RS-232-C, USB host/USB client</li> <li>• With colour touchscreen</li> </ul>	<ul style="list-style-type: none"> <li>• Allows Festo IO-Link® products to be commissioned quickly and intuitively</li> <li>• Compact, cost-effective, powerful</li> <li>• Universal connections</li> <li>• Galvanic isolation</li> <li>• Connecting cables for almost all IO-Link® devices from Festo</li> <li>• For IO-Link® devices with protocol version 1.1 or 1.0</li> <li>• Supports data storage</li> </ul>
<b>online: →</b>	<a href="#">cdsv</a>	<a href="#">cdsa</a>	<a href="#">cdsu</a>

## Operator units

	 Operator units CDSB	 Operator units CDPX
<b>Conforms to standard</b>		
<b>Operating voltage range DC</b>	4.5 ... 5.5 V	10 ... 32 V
<b>Electrical connection for IO-Link®, connection type</b>		
<b>Electrical connection for IO-Link®, connection technology</b>		
<b>Electrical connection for IO-Link®, number of pins/wires</b>		
<b>Protocol</b>		
<b>Display type</b>		TFT colour
<b>Display</b>	Colour TFT	With backlighting
<b>Display size</b>	1.77"	5", 10.1", 15.6", 21.5", 7 in „, 4.3 in „
<b>Display resolution</b>	128x160 pixels	1024x600 pixels, 1025x600 pixels, 1280x800 pixels, 1366x768 pixels, 1920x1080 pixels, 800x480 pixels, 480x272 Pixels
<b>Description</b>	<ul style="list-style-type: none"> <li>• Plug-in display and control unit for the servo drive CMMT and automation system CPX-E</li> <li>• Colour touchscreen</li> <li>• Diagnostic function</li> <li>• Very compact size</li> <li>• Mini USB interface</li> <li>• Update function for basic unit</li> </ul>	<ul style="list-style-type: none"> <li>• Cost-optimised for simple visualisation tasks, e.g. of process data</li> <li>• Powerful processors combined with wide-screen technology</li> <li>• Ideally matched to CODESYS controls from Festo or ModbusTCP networks</li> <li>• Integrated EtherNet interfaces</li> <li>• With touchscreen</li> <li>• Variants according to EU explosion protection directive (ATEX) and in IP67 suitable for the requirements in process automation</li> </ul>
<b>online:</b> →	<a href="#">cdsb</a>	<a href="#">cdpx</a>

## Product overview

### Positioners

	 <b>Positioner CMSH</b>	 <b>Positioners CMSX</b>
<b>Mode of operation</b>	Double-acting, Single-acting	Double-acting, Single-acting
<b>Standard nominal flow rate</b>		50 ... 130 l/min
<b>Ambient temperature</b>	-40 ... 80°C	-5 ... 60°C
<b>Reference value</b>		
<b>Operating voltage range DC</b>		21.6 ... 26.4 V
<b>Operating pressure [MPa]</b>	0.14 ... 0.8 MPa	0.3 ... 0.8 MPa
<b>Operating pressure</b>	1.4 ... 8 bar	3 ... 8 bar
<b>Operating pressure [psi]</b>	20.3 ... 116 psi	43.5 ... 116 psi
<b>Design features</b>	Safety position - pneumatic outlets closed, Safety pneumatic output 2 exhausted, Safety pneumatic output 4 pressurised	Safety position – pneumatic outlet 4 exhausted, Safety position – pneumatic outlet 2 pressurised, Safety position - pneumatic outlets closed
<b>Degree of protection</b>	IP66, IP67	IP65
<b>Type of mounting</b>	With accessories, To VDI/VDE 3845, To VDI/VDE 3847-2	With accessories
<b>Information on housing materials</b>	Aluminium, powder-coated	PC-reinforced
<b>Description</b>	<ul style="list-style-type: none"> <li>• Intelligent, digital electropneumatic positioner with HART communication</li> <li>• Fast and precise position control of single- and double-acting pneumatic rotary and linear drives</li> <li>• With integrated or external path/angular detection</li> <li>• Commissioning, operation, maintenance and diagnostics on the local display via the user-friendly software menu or via remote access with EDD-based (Electronic Device Description) or FDT-based (Field Device Tool) transmission</li> <li>• 2-conductor technology</li> <li>• Perfect interaction with the pneumatic extension modules VTOP</li> <li>• Variants with safety functions</li> <li>• Sustainable operation thanks to efficient control</li> </ul>	<ul style="list-style-type: none"> <li>• Digital, electropneumatic positioner</li> <li>• Simple and efficient position control of single- and double-acting pneumatic rotary and linear drives</li> <li>• Sustainable thanks to extended life cycle and easier repairs</li> <li>• With integrated or external path/angular detection</li> <li>• Simple commissioning through automatic initialisation function</li> <li>• Intuitive menu navigation</li> <li>• 4-conductor technology</li> <li>• Variants with safety functions</li> </ul>
<b>online:</b> →	<a href="#">cmsh</a>	<a href="#">cmsx</a>

### Documentation

	 <b>Descriptions</b>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Manuals, operating instructions</li> </ul>
<b>online:</b> →	<a href="#">p.be</a>

## Training systems

## Learning systems



**EduTrainer Universal**  
**D:ET-SPS**




<b>Description</b>	<ul style="list-style-type: none"> <li>• PLC EduTrainer® support system for use in teaching and training</li> <li>• Equipped with PLCs from different manufacturers</li> <li>• Two series: universal and compact</li> <li>• Equipped with 19 simulation modules</li> <li>• Individually configurable or pre-assembled</li> </ul>
<b>online:</b> →	<a href="#">edutrain</a>

## Product overview





## Product overview







### Edge Control

	 <b>Festo AX Controls CODESYS PLC</b> <b>GSBE-PLC</b>	 <b>Festo AX Controls Motion Robotic</b> <b>GSBE-MR</b>	 <b>Festo AX Controls WebIQ</b> <b>GSBE-IQ</b>
<b>NEW</b>	<ul style="list-style-type: none"> <li>• New</li> </ul>	<ul style="list-style-type: none"> <li>• New</li> </ul>	<ul style="list-style-type: none"> <li>• New</li> </ul>
<b>Description</b>	<ul style="list-style-type: none"> <li>• CODESYS app for Festo AX Controls controllers</li> <li>• From 256 to an unlimited number of I/Os</li> <li>• For controlling four to an unlimited number of axes</li> <li>• Modular licensing concept for the needs-based expansion of functions</li> <li>• Easy expansion of CNC and robotics functionality with the advanced licence</li> </ul>	<ul style="list-style-type: none"> <li>• Motion Robotic Package for Festo AX Controls Motion controllers</li> <li>• Enables programming with FTL (Festo Teach Language) for precise control</li> <li>• Extended functions for more complex machine control for CNC or robotics applications</li> <li>• Modular licensing concept for the needs-based expansion of functions</li> <li>• API for easy programming in other languages such as Python</li> </ul>	<ul style="list-style-type: none"> <li>• WebIQ app for Festo AX Controls controllers</li> <li>• Web-based HMI system for customised real-time monitoring</li> <li>• Responsive design for use on all devices and screen sizes</li> <li>• User-friendly no-code/low-code environment for short development cycles</li> <li>• Easy to use with no special skills required</li> <li>• Seamless integration and compatibility with proven Festo products</li> <li>• Modular licensing concept for customised solutions</li> </ul>
<b>online:</b> →	<a href="#">gsbe-plc</a>	<a href="#">gsbe-mr</a>	<a href="#">gsbe-iq</a>





### Edge Control

	 <b>Festo AX Controls Python</b> <b>GSBE-PY</b>	 <b>Festo AX Controls Node-RED</b> <b>GSBE-NR</b>
<b>NEW</b>	<ul style="list-style-type: none"> <li>• New</li> </ul>	<ul style="list-style-type: none"> <li>• New</li> </ul>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Python app for Festo AX Controls controllers</li> <li>• Web-based IDE</li> <li>• Easy programming language for different applications</li> <li>• Possible to use existing libraries</li> <li>• Portable programming language</li> <li>• Purchase licence for an unlimited period of use</li> </ul>	<ul style="list-style-type: none"> <li>• Node-RED app for Festo AX Controls controllers</li> <li>• Flow-based language for various applications and monitoring functionalities</li> <li>• Visually controlled user interface for easy programming via web browser</li> <li>• Web-based IDE</li> <li>• With pre-installed demo sequence to aid understanding</li> <li>• Free software licence for an unlimited period of use</li> </ul>
<b>online:</b> →	<a href="#">gsbe-py</a>	<a href="#">gsbe-nr</a>

## Industrial Intelligence




	 	 	 
	<b>Smartenance GASM</b>	<b>Festo AX Data Access GASA-DA</b>	<b>Festo AX Motion Insights Pneumatic GASA-MIP</b>
<b>NEW</b>	<ul style="list-style-type: none"> <li>• New</li> </ul>		<ul style="list-style-type: none"> <li>• New</li> </ul>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Combines maintenance and servicing software (CMMS) with a machine logbook in a single solution</li> <li>• Web application for maintenance or production managers and mobile app for maintenance staff and operators</li> <li>• Seamless integration with SAP maintenance management (S4/HANA)</li> <li>• Optimises processes and reduces unplanned downtime</li> <li>• Integration of AI software enables predictive maintenance (condition-based maintenance)</li> <li>• Development of an internal knowledge database for rapid problem solving</li> </ul>	<ul style="list-style-type: none"> <li>• Access to Festo components (brownfield or greenfield)</li> <li>• IoT gateway with protocol translator from OT to IT (MQTT)</li> <li>• Reduces IT administration with plug and play solution</li> <li>• Simplifies asset management, creates transparency</li> <li>• Monitors existing and new processes (process data)</li> <li>• Enables data-driven solutions (e.g. status and diagnostic messages)</li> <li>• Can save hundreds of hours of work for many components</li> </ul>	<ul style="list-style-type: none"> <li>• Continuous monitoring of the pneumatic drive chain</li> <li>• Detects wear and anomalies, makes maintenance plannable</li> <li>• Connectivity using PLC, no data science expertise required</li> <li>• Simple visualisation and access via browser</li> <li>• Works with drives from all manufacturers: one standard app for all</li> <li>• Reduces unplanned downtime, increases productivity (OEE)</li> <li>• Fixed price per cylinder helps with planning the investment</li> </ul>
<b>online:</b> →	<a href="#">gasm</a>	<a href="#">gasa</a>	<a href="#">gasa</a>

## Industrial Intelligence




	 	 
	<b>Festo AX Motion Insights Electric GASA-MIE</b>	<b>Festo AX Energy Insights GASA-EI</b>
<b>NEW</b>	<ul style="list-style-type: none"> <li>• New</li> </ul>	<ul style="list-style-type: none"> <li>• New</li> </ul>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Continuous monitoring of the electric drive chain for wear and anomalies</li> <li>• Plug and play with CMMT-AS/ST servo drives from Festo</li> <li>• No intervention in the PLC necessary, no data science expertise required</li> <li>• Simple visualisation and access via browser</li> <li>• Reduces unplanned downtime, increases productivity (OEE)</li> <li>• Fixed price per servo drive helps to plan the investment</li> </ul>	<ul style="list-style-type: none"> <li>• Continuous energy monitoring of compressed air and electrical energy</li> <li>• Automatic leakage detection thanks to AI fingerprint and intelligent consumption analysis</li> <li>• Works with sensors from Festo as well as third-party suppliers: Pressure, flow and electrical energy meters</li> <li>• Simple visualisation and access via browser</li> <li>• Ensures transparency about consumption and helps to track optimisation measures</li> <li>• Fixed price per cylinder helps with planning the investment</li> </ul>
<b>online:</b> →	<a href="#">gasa</a>	<a href="#">gasa</a>

## Product overview




### Application software

	 <b>Festo Positioning CNC Robotics</b> <b>GSBE-R</b>	 <b>Motion Apps</b> <b>GAMM</b>	 <b>Software packages</b> <b>GSAY</b>
<b>NEW</b>	<ul style="list-style-type: none"> <li>• New</li> </ul>		
<b>Description</b>	<ul style="list-style-type: none"> <li>• Comprehensive pair of software programs from Festo for electric drives and controllers</li> <li>• Versatile for CNC, robotics and pick and place applications</li> <li>• Host interface to third-party controllers such as Beckhoff, Omron, Rockwell, Siemens</li> <li>• Precise control of complex trajectories and space curves</li> <li>• Flexible combination of functions and methods for customised solutions</li> <li>• Easy integration of motion into customised program sequences</li> <li>• Useful tools for implementing, commissioning, testing and analysis</li> <li>• Practical tools: Status monitors, motion cockpits, CNC editor, path view</li> <li>• User-friendly, even for beginners in CNC or robotics technology</li> </ul>	<ul style="list-style-type: none"> <li>• Open and closed-loop control programs for valves VEVM</li> <li>• A new dimension in flexibility thanks to Motion Apps – a single valve with a wide range of different functions</li> <li>• Accelerated engineering processes</li> <li>• Short response times without the need to adapt the hardware</li> <li>• Reduced system complexity</li> <li>• Shorter time to market for your application</li> </ul>	<ul style="list-style-type: none"> <li>• Licences for the application software for the servo press kit YJKP</li> </ul>
<b>online:</b> →	<a href="#">gsbe-r</a>	<a href="#">gamm</a>	<a href="#">gsay</a>

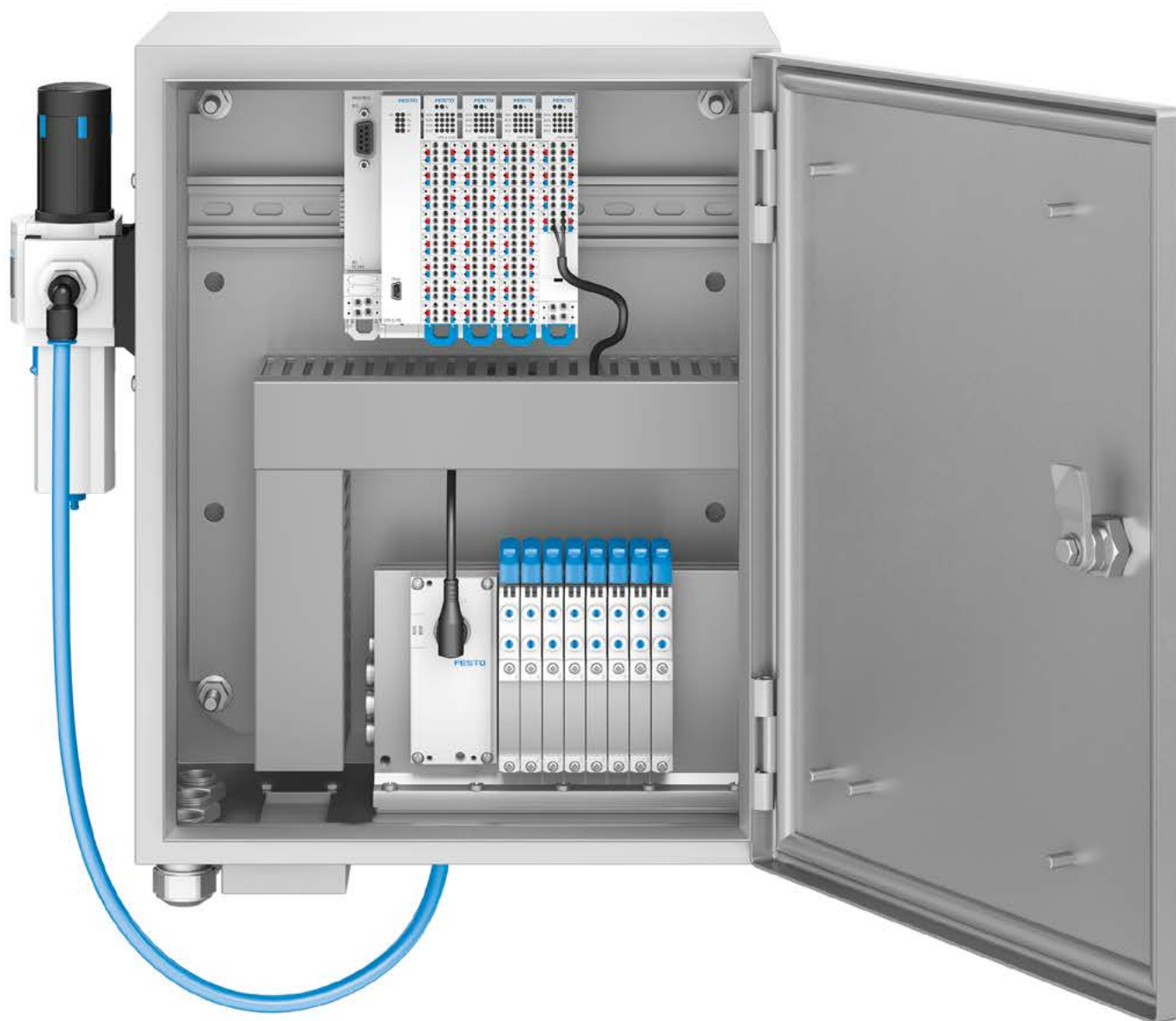
### Application software

	 <b>Software packages</b> <b>GSAY</b>	 <b>Licence PA Toolkit</b> <b>GSPL</b>	 <b>Licence</b> <b>GSAR</b>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Licences for software or software libraries for motion or robotics applications</li> </ul>	<ul style="list-style-type: none"> <li>• For simple and intuitive development of control logics and user interfaces</li> <li>• For implementing your automation solutions without in-depth programming knowledge</li> <li>• Extensive set of predefined function blocks and associated visualisation elements for the CODESYS development environment and CODESYS-based controllers</li> <li>• Compatible with controller CPX-E-CEC, control block CPX-CEC</li> </ul>	<ul style="list-style-type: none"> <li>• Software licence for controlling a handling system from Festo</li> <li>• For point-to-point interpolation or Cartesian interpolation</li> </ul>
<b>online:</b> →	<a href="#">gsay</a>	<a href="#">gspl</a>	<a href="#">gsar</a>

Learning and tools




	 <b>Smartenance</b> <b>GASL</b>	 <b>Software (FluidDraw® P6/365)</b> <b>GSWF</b>	 <b>Eplan projects (Schematic Solution)</b> <b>GDDE</b>
<b>NEW</b>	<ul style="list-style-type: none"> <li>• New</li> </ul>		
<b>Description</b>	<ul style="list-style-type: none"> <li>• Access to the Festo Learning Experience (Festo LX) – the digital all-in-one learning portal for personalised learning experiences</li> <li>• Content: Benefit from more than 700 courses in various learning formats (e-learning courses, learning videos, learning success checks, hardware-related courses, etc.) and from more than 40 ready-made learning paths</li> <li>• Adjustment: Customise the learning content or learning paths from Festo LX to your needs and create your own content with our AI-supported content creator</li> <li>• Efficiency: access Festo LX from any device, anywhere and at any time</li> <li>• Easy to manage: It has never been easier to assign content, evaluate progress and learning success, manage access rights and export learning outcomes</li> </ul>	<ul style="list-style-type: none"> <li>• Generate pneumatic and electrical circuit diagrams quickly and easily</li> <li>• Documentation of complete systems</li> <li>• Extensive standard symbol library</li> <li>• Insert products directly via the integrated product catalogue from Festo</li> <li>• Automatically generated evaluations of item data and circuit information</li> <li>• Automatic equipment labelling with customisation options</li> <li>• Create your own symbols, libraries, product databases or drawing frames</li> </ul>	<ul style="list-style-type: none"> <li>• Get complete EPLAN projects of complex products in minutes</li> <li>• Simple integration into existing EPLAN projects</li> <li>• Significant time saving</li> <li>• More certainty on completeness</li> </ul>
<b>online:</b> →	<a href="#">gasl</a>	<a href="#">gswf</a>	<a href="#">gdde</a>

## Product overview


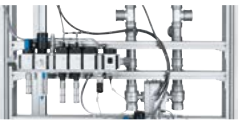



## Product overview

### Control cabinets

	 <b>Factory automation</b>	 <b>Process automation</b>	 <b>Control cabinets for handling systems</b>
<b>Technical data</b>	<ul style="list-style-type: none"> <li>• Simple to complex control cabinet designs</li> <li>• Application-specific combination of components</li> <li>• Fully tested, with test certificate</li> <li>• Ready-to-install</li> <li>• Complete documentation</li> <li>• Design conforms to:               <ul style="list-style-type: none"> <li>– EN 60204-1</li> <li>– ATEX zone 1 and 21 (pneumatic only), ATEX zone 2 and 22 (electric and electropneumatic)</li> <li>– UL-508 A</li> </ul> </li> <li>• Implementation of safety functions</li> <li>• Different bus technologies</li> </ul>	<ul style="list-style-type: none"> <li>• Simple to complex control cabinet designs</li> <li>• Application-specific combination of components</li> <li>• Different operating voltages</li> <li>• Fully tested, with test certificate</li> <li>• Ready-to-install</li> <li>• Complete documentation</li> <li>• Design conforms to:               <ul style="list-style-type: none"> <li>– EN 60204-1</li> <li>– ATEX zone 1 and 21 (pneumatic only), ATEX zone 2 and 22 (electric and electropneumatic)</li> <li>– UL-508 A</li> </ul> </li> <li>• Implementation of safety functions</li> <li>• Wide range of bus technologies</li> <li>• Compliance with special cleanliness and hygiene requirements</li> <li>• Special materials</li> <li>• Protected against the ingress of liquids and foreign matter</li> <li>• Heating or cooling elements</li> <li>• Intrinsically safe valve terminal technology</li> <li>• Hot swap inspection window</li> </ul>	<ul style="list-style-type: none"> <li>• Simple to complex control cabinet designs</li> <li>• Control of motion sequences with up to 6 axes</li> <li>• Application-specific combination of components</li> <li>• Use of the latest innovations and technologies</li> <li>• Fully tested, with test certificate</li> <li>• Ready-to-install</li> <li>• Complete documentation</li> <li>• Design conforms to:               <ul style="list-style-type: none"> <li>– EN 60204-1</li> <li>– ATEX zone 1 and 21 (pneumatic only), ATEX zone 2 and 22 (electric and electropneumatic)</li> <li>– UL-508 A</li> </ul> </li> <li>• Implementation of safety functions</li> <li>• Wide range of bus technologies</li> <li>• Function modules for motion applications</li> <li>• Host modules for easy connection to the customer's control environment</li> </ul>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Made-to-measure control cabinets</li> <li>• Pneumatic, electric, combined</li> <li>• Individually configured</li> <li>• Adapted to requirements in industrial automation</li> <li>• Design and sizing included</li> </ul>	<ul style="list-style-type: none"> <li>• Made-to-measure control cabinets</li> <li>• Pneumatic, electric, combined</li> <li>• Individually configured</li> <li>• Adapted to requirements in process automation</li> <li>• Design and sizing included</li> </ul>	<ul style="list-style-type: none"> <li>• Made-to-measure control cabinets for handling systems</li> <li>• Software package for third-party devices included</li> <li>• Individually configurable</li> <li>• Adapted to requirements for handling solutions → chapter 7 „Handling systems and industrial robots“ see page 95</li> </ul>
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## Mounting and installation plates

	 <b>Mounting plates</b>	 <b>Hall installation plates (HIP) for body assembly</b>	 <b>Robot installation plates (RIP) for body assembly</b>
<b>Technical data</b>	<ul style="list-style-type: none"> <li>• Customised support plate shape</li> <li>• Support plate available in different materials</li> <li>• Application-specific combination of components</li> <li>• Fully assembled, connected and wired</li> <li>• Defined interfaces</li> <li>• Ready-to-install</li> <li>• Fully tested, with test certificate</li> <li>• Complete documentation</li> <li>• Design conforms to:               <ul style="list-style-type: none"> <li>– EN 60204-1</li> <li>– ATEX zone 1 and 21 (pneumatic only), ATEX zone 2 and 22 (electric and electropneumatic)</li> <li>– UL-508 A</li> </ul> </li> <li>• Implementation of safety functions</li> </ul>	<ul style="list-style-type: none"> <li>• Media supply for compressed air and cooling water for welding cells</li> <li>• Made to measure: profile as support element, design perfectly adapted to the installation space, for installation within safety barriers</li> <li>• Labelling: customised labelling for safe operation</li> <li>• Fast installation: thanks to assembly according to the customer's specification</li> <li>• Medium water: fittings for liquid media</li> </ul>	<ul style="list-style-type: none"> <li>• Media supply for compressed air and cooling water for welding robots</li> <li>• Protection against ambient conditions through the use of special materials, such as hoses and fittings resistant to welding spatter</li> <li>• Protection against environmental influences to prevent damage to the installation</li> <li>• Made to measure: profile as support element, design perfectly adapted to the installation space</li> <li>• Cooling water suction cylinder for drawing in cooling water when changing welding caps</li> <li>• Water flow sensor: measures flow rate, volume and cooling water temperature – to monitor the welding process</li> <li>• Easy to maintain thanks to removable fittings</li> </ul>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Machine-specific pre-assembly of pneumatic and electric components on support plate</li> <li>• Tubing and wiring included</li> <li>• Defined interfaces for simple installation directly in the system</li> </ul>	<ul style="list-style-type: none"> <li>• Controls and monitors the compressed air and cooling water supply for whole welding cells</li> </ul>	<ul style="list-style-type: none"> <li>• Controls and monitors the compressed air and cooling water supply for individual welding guns</li> </ul>
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## Product overview

## Software tools

### Festo Design Tool 3D



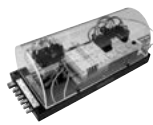


The Festo Design Tool 3D is a 3D product configurator for generating specific CAD product combinations from Festo. The configurator makes your search for the right accessory easier, more reliable and faster.



You can then order the module that has been created as a single order item, either completely pre-assembled or as individual parts in a single box. This considerably reduces your bill of materials, and downstream processes such as product ordering, order picking and assembly are significantly simplified.

This tool can be found at  
[→ www.festo.com/x/festo-design-tool](http://www.festo.com/x/festo-design-tool)

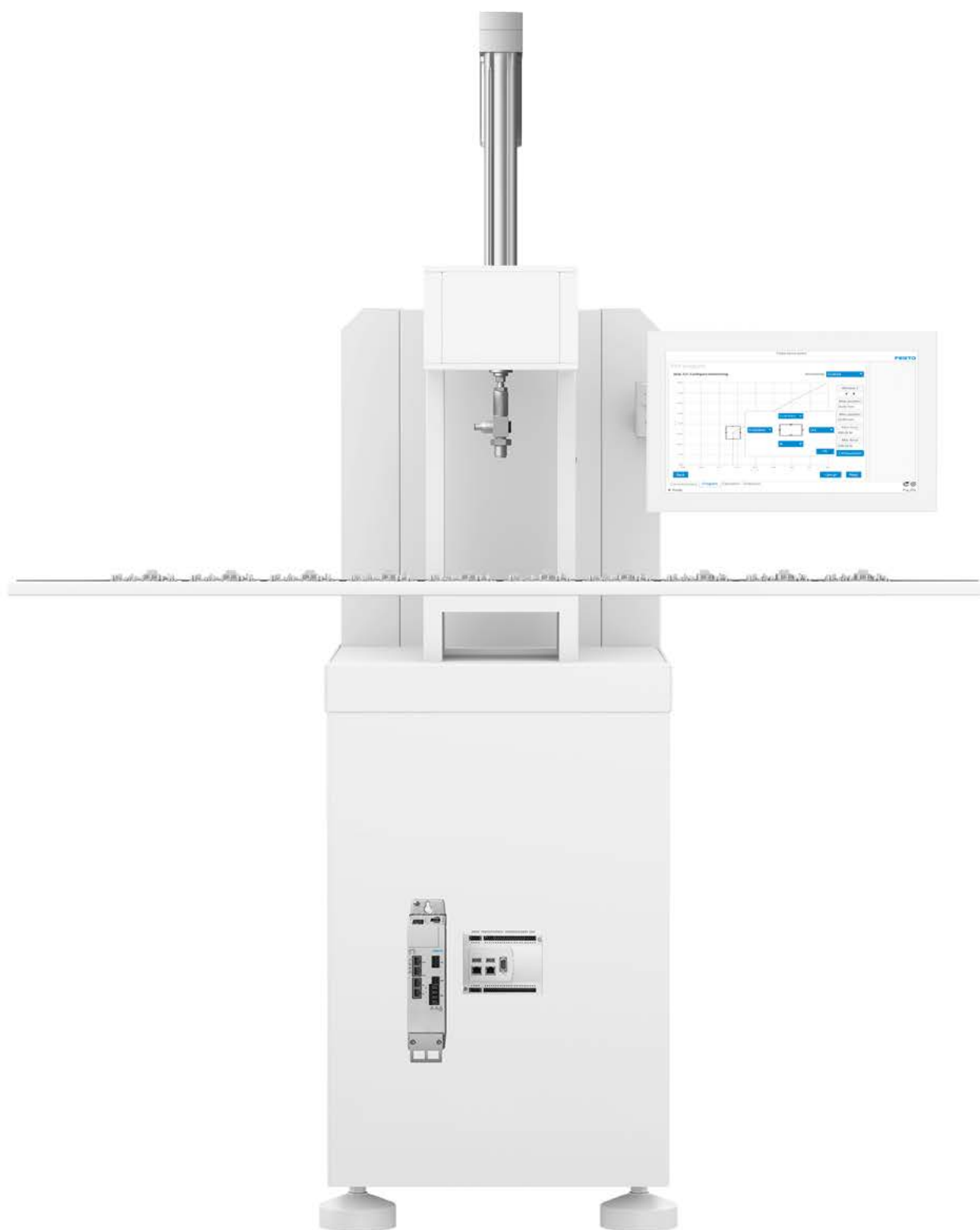
## Modules

	 <b>Modules</b>	 <b>Cartridge solutions</b>	 <b>Sheet-metal constructions and special housings</b>
<b>Technical data</b>	<ul style="list-style-type: none"> <li>• Combination of various pneumatic and/or electric components to create a single unit</li> <li>• Application-specific combination of components</li> <li>• Accessories mounted on sub-assembly</li> <li>• Use of the latest innovations and technologies</li> <li>• Ready-to-install</li> <li>• Fully tested, with test certificate</li> <li>• Complete documentation</li> <li>• Design conforms to:                             <ul style="list-style-type: none"> <li>– EN 60204-1</li> <li>– ATEX zone 1 and 21 (pneumatic only), ATEX zone 2 and 22 (electric and electropneumatic)</li> <li>– UL-508 A</li> </ul> </li> <li>• Implementation of safety functions</li> </ul>	<ul style="list-style-type: none"> <li>• Space-saving thanks to extremely compact design</li> <li>• Pneumatic functions integrated in a single compact housing</li> <li>• Housing in different materials</li> <li>• No tubing required</li> <li>• Minimal cabling required</li> <li>• Significant design freedom</li> <li>• Flexible integration options on and within the machine</li> <li>• Sturdy design</li> <li>• Fully tested</li> <li>• Ready-to-install</li> <li>• Complete documentation</li> </ul>	<ul style="list-style-type: none"> <li>• Sheet-metal structures                             <ul style="list-style-type: none"> <li>– Customised shape and size</li> <li>– Reduced weight and number of assembly parts</li> </ul> </li> <li>• Special housing                             <ul style="list-style-type: none"> <li>– Customised shape</li> <li>– Customised dimensions</li> <li>– Various materials</li> <li>– Compact, space-saving format</li> <li>– Protection against environmental influences and unauthorised access</li> </ul> </li> <li>• In combination                             <ul style="list-style-type: none"> <li>– Alternative to conventional control cabinets</li> <li>– Variable integration options on and within the machine</li> <li>– Short tubing and cable lengths</li> <li>– Attractive design</li> </ul> </li> </ul>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Pneumatic and electric components pre-assembled to create a function unit</li> <li>• Can be combined from around 30,000 catalogue components</li> <li>• Connections included</li> <li>• For integration in machines</li> </ul>	<ul style="list-style-type: none"> <li>• Integration of various pneumatic functions in one component</li> <li>• No need for single housings</li> <li>• Ideal for applications that require a highly compact design</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced weight thanks to optimal use of materials with sheet-metal structures</li> <li>• Protection against environmental influences and unauthorised access in the special housing</li> <li>• Ideally combined as a control cabinet directly in the system</li> </ul>
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## Modules

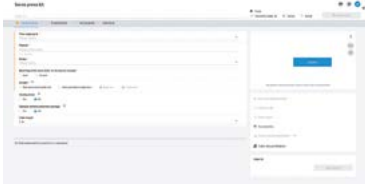

	 <b>Function blocks</b>	 <b>Profile solutions</b>
<b>Technical data</b>	<ul style="list-style-type: none"> <li>• No tubing required thanks to drilled ducts</li> <li>• Housing available in different materials</li> <li>• Customised design of the pneumatic interfaces for the system</li> <li>• Ideal for a small number of components and variable connection options</li> <li>• Extremely economical, even for small quantities</li> </ul>	<ul style="list-style-type: none"> <li>• Profiles in customised cross sections and lengths</li> <li>• Integrated ducts for straight-line routing of the compressed air</li> <li>• Common air supply for multiple valves or valve terminals via a single duct</li> <li>• Combination of exhaust air and supply air without tubing, even over long distances</li> <li>• Supply of compressed air at different locations</li> <li>• No tubing required</li> <li>• Significantly reduced cabling</li> <li>• Modular structure easy to achieve</li> <li>• Optional: profile as mechanical mounting element for other components or as a supporting part of the machine frame</li> </ul>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Compressed air supply for pneumatic components via drilled ducts</li> <li>• Ideal for a small number of pneumatic components and variable connection options</li> <li>• Compact and easy to service</li> </ul>	<ul style="list-style-type: none"> <li>• Extruded profiles in combination with valves as a valve terminal</li> <li>• For the distribution of compressed air in the machine concept</li> <li>• Customised profile cross sections available</li> </ul>
<b>Contact us for more information:</b> →	<a href="http://www.festo.com/contact">www.festo.com/contact</a>	<a href="http://www.festo.com/contact">www.festo.com/contact</a>

## Product overview





## Product overview

## Software tools



<b>Configurator</b>		<p>Design a product with numerous features reliably and quickly with the help of the configurator.</p> <p>Select all the required product features step-by-step. The use of logic checks ensures that only correct configurations are available for selection.</p> <p>A dynamic graphic generated on the basis of the configuration provides a visual aid for selecting the correct product features.</p> <p>You will find the configurator</p> <ul style="list-style-type: none"> <li>• at <a href="http://www.festo.com/catalogue/yjpk">www.festo.com/catalogue/yjpk</a></li> <li>• Click on the product</li> <li>• Click on the blue „Configure product“ button</li> </ul>
<b>Connectivity Finder</b>		<p>You can use this tool to find the optimum way to connect a Festo solution to your preferred (non-Festo) controller. In addition, you will be provided with expert knowledge for your selected connection option, making the integration of the Festo solution into your machine extremely easy.</p> <p>This tool can be found at  <a href="http://www.festo.com/x/connectivity-finder">→ www.festo.com/x/connectivity-finder</a></p>

## Joining technology

## Function-specific systems

	 <b>Servo press kits</b> <b>YJKP</b>	 <b>Commissioning service</b> <b>GFCA-Y2</b>
<b>Working stroke</b>	100 ... 400 mm	
<b>Pressing force</b>	0 ... 17 kN	
<b>Feed speed</b>	0 ... 250 mm/s	
<b>Accuracy in ± % FS</b>	0.25 %FS	
<b>Protocol</b>	EtherNet/IP, OPC UA, PROFINET IO, TCP/IP, Modbus® TCP	
<b>Description</b>	<ul style="list-style-type: none"> <li>• Optimised and qualified interaction: electric cylinder, motor, servo drive, force sensor, controller and application software including the necessary accessories.</li> <li>• Time savings thanks to fast commissioning via the web interface</li> <li>• Even complex process sequences are easy to configure</li> <li>• Options for the precise analysis of the force-displacement curve to ensure the high quality of your workpiece</li> <li>• Easy to integrate thanks to function blocks for your system controllers</li> </ul>	<ul style="list-style-type: none"> <li>• Commissioning services for the servo press kit YJKP</li> <li>• Available remotely or on site</li> <li>• Support with commissioning</li> <li>• Support with electrical installation</li> <li>• Checking the electrical connections and the travel path</li> <li>• Configuration and parameterisation</li> <li>• Testing the system, data backup and documentation</li> <li>• Introduction to WebVisu software</li> </ul>
<b>online:</b> →	<a href="http://yjpk">yjpk</a>	<a href="http://gfca">gfca</a>

## Handling solutions

	 <b>Balancer kits YHBP</b>	 <b>Control systems CMCB</b>
<b>Stroke range</b>	100 ... 1990 mm	
<b>Cylinder diameter</b>	50 ... 200 mm	
<b>Max. travel speed</b>	1 m/s	
<b>Load</b>	25 ... 999 kg	
<b>Operating pressure</b>	4 ... 8 bar	
<b>Operating pressure [MPa]</b>	0.4 ... 0.8 MPa	
<b>Design</b>		Mounting plate, Control cabinet, Built-in safety relay unit
<b>Electrical connection</b>		Spring-loaded terminal, Push-in
<b>Nominal operating voltage DC</b>	24 V	24 V
<b>Nominal operating voltage AC</b>		230 V
<b>Max. current consumption</b>		1100 mA
<b>Description</b>	<ul style="list-style-type: none"> <li>• Very low operating forces of just 10 N</li> <li>• For applications involving the movement of heavy loads in defined, repetitive sequences</li> <li>• Extremely fast, automatic weight detection for a wide range of variants in production processes</li> <li>• With safety functions</li> <li>• The individual components are delivered mounted in the control cabinet, on a mounting plate or unassembled</li> </ul>	<ul style="list-style-type: none"> <li>• Ready-to-install control system</li> <li>• Available on a mounting plate with or without control cabinet housing</li> <li>• Variants with safety functions</li> <li>• Adapted for balancer kit YHBP</li> <li>• With connecting cables for balancer kit YHBP connected</li> </ul>
<b>online:</b> →	<a href="#">yhbp</a>	<a href="#">cmcb</a>



## Product overview







## Product overview

### Air reservoir





### Air reservoirs

		
	<b>Air pressure reservoirs VZS</b>	<b>Air pressure reservoirs CRVZS</b>
<b>Volume</b>	20 l	0.1 l, 0.4 l, 0.75 l, 10 l, 2 l, 20 l, 5 l
<b>Information on air reservoir materials</b>	Powder-coated steel	High-alloy stainless steel
<b>Conforms to standard</b>	EN 286-1	AD 2000
<b>Condensate drain connection</b>	G3/8	G3/8
<b>Description</b>	<ul style="list-style-type: none"> <li>• Compensation of pressure fluctuations and as accumulators in the event of sudden air consumption</li> <li>• Providing large quantities of compressed air for supplying fast pulsing drives</li> <li>• With connection for condensate drain</li> <li>• Conforms to the requirements of Directive 2014/29/EC and EN 286-1</li> <li>• Operating medium: compressed air, vacuum</li> </ul>	<ul style="list-style-type: none"> <li>• Corrosion-resistant</li> <li>• Compensation of pressure fluctuations and as accumulators in the event of sudden air consumption</li> <li>• Providing large quantities of compressed air for supplying fast pulsing drives</li> <li>• With connection for condensate drain in some cases</li> <li>• Food-safe, see <a href="http://www.festo.com/catalogue/crvzs">www.festo.com/catalogue/crvzs</a> &gt; "Support / Downloads" tab &gt; "Certificates"</li> <li>• Operating medium: compressed air, vacuum</li> </ul>
<b>online:</b> →	<a href="#">vzs</a>	<a href="#">crvzs</a>



### Pneumatic silencers

				
	<b>Silencer AMTX</b>	<b>Silencers AMTE</b>	<b>Silencers U</b>	<b>Silencers UC</b>
<b>Operating pressure</b>	-1 ... 7 bar	0 ... 10 bar	0 ... 10 bar	0 ... 10 bar
<b>Operating pressure [MPa]</b>	-0.1 ... 0.7 MPa	0 ... 1 MPa	0 ... 1 MPa	0 ... 1 MPa
<b>Information on silencer insert materials</b>		Bronze	PE, Bronze	PE
<b>Pneumatic connection</b>	Cartridge 12 mm	10-32 UNF-2A, 1/8 NPT, 1/4 NPT, 3/8 NPT, 1/2 NPT, G1, G1/2, G1/4, G1/8, G3/4, G3/8, M3, M5	3/4 NPT, G1, G1/2, G1/4, G1/8, G3/4, G3/8, PK-3, PK-4	G1/4, G1/8, G3/8, M5, M7, QS-10, QS-3, QS-4, QS-6, QS-8
<b>Noise level</b>		55 ... 95 dB(A)	70 ... 90 dB(A)	58 ... 68 dB(A)
<b>Description</b>		<ul style="list-style-type: none"> <li>• Long or short design</li> <li>• Metal version</li> <li>• Operating medium compressed air</li> <li>• High temperature resistance up to 80°C</li> <li>• Slim width</li> <li>• Many different variants</li> <li>• Universal applications</li> </ul>	<ul style="list-style-type: none"> <li>• Compact design, polymer or die-cast</li> <li>• Barbed fitting or threaded connection</li> <li>• Operating medium compressed air</li> </ul>	<ul style="list-style-type: none"> <li>• For noise reduction and prevention of contamination at exhaust ports of pneumatic components</li> <li>• Polymer version</li> <li>• Operating medium compressed air</li> <li>• For solenoid valves CPE</li> <li>• Threaded connection or push-in sleeve for push-in fitting QS</li> </ul>
<b>online:</b> →	<a href="#">amtx</a>	<a href="#">amte</a>	<a href="#">u</a>	<a href="#">uc</a>

## Pneumatic silencers



	 <b>Silencers AMTC</b>	 <b>Silencers UO</b>	 <b>Silencers UOS-1, UOS-1-LF</b>	 <b>Silencers UOM, UOMS</b>
<b>Operating pressure</b>	0 ... 10 bar	0 ... 8 bar	0 ... 10 bar	
<b>Operating pressure [MPa]</b>	0 ... 1 MPa	0 ... 0.8 MPa	0 ... 1 MPa	
<b>Information on silencer insert materials</b>	PE	PE	PE	PU foam
<b>Pneumatic connection</b>	Cartridge 10 mm	G1/4, G1/8, M5, M7	G1	G1/4, G3/8
<b>Noise level</b>	58 dB(A)		75 dB(A)	
<b>Description</b>	<ul style="list-style-type: none"> <li>Attached via pin (spring clip, included in the delivery of the valve)</li> <li>Polymer version</li> <li>Operating medium compressed air</li> </ul>	<ul style="list-style-type: none"> <li>Special open minimal resistance silencer</li> <li>For vacuum generators</li> <li>Facilitates trouble-free operation of the vacuum generator</li> <li>Operating medium compressed air</li> </ul>	<ul style="list-style-type: none"> <li>Silencer for MS6-SV, MS series</li> <li>Operating medium compressed air</li> </ul>	<ul style="list-style-type: none"> <li>Special open minimal resistance silencer</li> <li>For vacuum generators</li> <li>Facilitates trouble-free operation of the vacuum generator</li> <li>Silencer extension for extending the silencer for further noise reduction</li> <li>Operating medium compressed air</li> </ul>
<b>online:</b> →	<a href="#">amtc</a>	<a href="#">uo</a>	<a href="#">uos</a>	<a href="#">uom</a>

## Compressed air pistols



	 <b>Air guns LSP</b>	 <b>Air nozzles LPZ</b>
<b>Exhaust air function</b>	Metered blowing	
<b>Pneumatic connection</b>	Female thread G1/4	Male thread M12x1.25
<b>Information on housing materials</b>	Die-cast aluminium, coated, PA6 reinforced	Aluminium, Brass, Die-cast zinc, Chrome-plated, Nickel-plated
<b>Description</b>	<ul style="list-style-type: none"> <li>Precise, infinitely variable, lever-operated flow metering</li> <li>Interchangeable nozzles</li> <li>Operating medium compressed air</li> </ul>	<ul style="list-style-type: none"> <li>With protective air shield or silencer</li> <li>Targeted, strong air jet or powerful, focused air jet</li> <li>Low noise level</li> <li>Operating medium compressed air</li> </ul>
<b>online:</b> →	<a href="#">lsp</a>	<a href="#">lpz</a>

## Product overview

### Pressure indicators

	 <p><b>Visual indicators</b> <b>OH</b></p>	 <p><b>Pneumatic terminals, end clamps, distributors</b> <b>LT, LTE, LTV</b></p>
<b>Operating pressure [MPa]</b>	-0.1 ... 0.8 MPa	
<b>Operating pressure</b>	-1 ... 8 bar	0.1 ... 8 bar
<b>Pneumatic connection</b>	Barbed connector PK-3, G1/8	Barbed connector PK-3, PK-4
<b>Pneumatic connection 2</b>		For tubing O.D. 4 mm, 6 mm
<b>Type of mounting</b>	Installation into control panel in Ø22.5	
<b>Description</b>	<ul style="list-style-type: none"> <li>• Visual indicator</li> <li>• Indicator colours red, blue, yellow or green</li> <li>• Aluminium or polymer</li> <li>• Operating medium compressed air</li> </ul>	<ul style="list-style-type: none"> <li>• Pneumatic terminal for checking incoming and outgoing signals at the controller input and output</li> <li>• Up to 15 distributor pieces with common air supply, for easy connection</li> <li>• Brass, polymer</li> <li>• Operating medium compressed air</li> </ul>
<b>online:</b> →	<a href="#">oh</a>	<a href="#">lt</a>



### Inscription systems

	 <p><b>Inscription labels</b> <b>ASLR, BZ, HWF, IBS, KM, KMC, MH, SBS</b></p>	 <p><b>Inscription label holders</b> <b>ASCF, CPV10-VI-ST, CPV14-VI-ST, CPV18-VI-ST, CPVSC1-ST, CPX-ST, VMPA1-ST, VMPA14-ST, VMPAL-ST</b></p>
<b>Type of mounting</b>	Plug-in, Can be pressed in manually	
<b>Width</b>		21 mm, 12 mm
<b>Height</b>		7 mm, 2 mm
<b>Description</b>	<ul style="list-style-type: none"> <li>• For labelling items</li> <li>• Can be inserted in holders or carriers on suitably equipped components</li> </ul>	<ul style="list-style-type: none"> <li>• Holder for inscription labels</li> <li>• For components without pre-assembled carriers</li> </ul>
<b>online:</b> →	<a href="#">aslr</a>	<a href="#">ascf</a>




## Product overview

### Commissioning services

	 <p><b>Commissioning service</b> <b>GFCH</b></p>	 <p><b>Commissioning service</b> <b>GFCA-Y2</b></p>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Commissioning services for handling systems</li> <li>• Available for 1, 2 and 3-axis systems with and without safety module, remote or local</li> <li>• Inspection of the cabling, electrical and pneumatic connections as well as travel distances and energy chains</li> <li>• Configuration and parameterisation, incl. optimisation of the controller parameters and homing</li> <li>• Activation of components in test mode</li> <li>• Data backup and documentation</li> <li>• Instruction for machine operators</li> </ul>	<ul style="list-style-type: none"> <li>• Commissioning services for the servo press kit YJKP</li> <li>• Available remotely or on site</li> <li>• Support with commissioning</li> <li>• Support with electrical installation</li> <li>• Checking the electrical connections and the travel path</li> <li>• Configuration and parameterisation</li> <li>• Testing the system, data backup and documentation</li> <li>• Introduction to WebVisu software</li> </ul>
<b>online:</b> →	<a href="#">gfch</a>	<a href="#">gfca</a>

### Energy Saving Services

	 <p><b>Compressed Air Energy Efficiency Audit</b> <b>GFAA</b></p>
<b>Description</b>	<ul style="list-style-type: none"> <li>• TÜV-certified energy efficiency analysis of the entire compressed air system according to DIN EN ISO 11011</li> <li>• Available in three packages, depending on the number of existing compressors</li> <li>• Analysis of the current situation with weighted recommendations for improving energy efficiency</li> <li>• Documentation of CO2 values, costs and savings potentials</li> <li>• Savings of up to 60% of the compressed air costs of pneumatic systems</li> <li>• Improved productivity and Overall Equipment Effectiveness (OEE)</li> <li>• Sustainable operation by checking the energy efficiency of the compressed air system</li> </ul>
<b>online:</b> →	<a href="#">gfaa</a>



## Festo Services and Support

### Consistent and comprehensive support

The service and support philosophy of Festo is based on a constant analysis of the value chains of different types of customers.

Festo has built on this knowledge to develop a sophisticated portfolio that supports you along your entire value chain.

It includes numerous services such as the Energy Saving Services, customised developments of ready-to-install solutions and special designs.

Our networked digital information system now consists of a database-driven catalogue with over 30,000 products and accessories as well as tools for configuration, planning and design. Globally standardised application platforms for product lifecycle, production, logistics, sales and finance help to create integrated, global processes that will benefit you.

#### Engineering



- Consulting
- Design aids
- 2D/3D CAD drawings and models
- Design and sizing tools
- Selection tools
- Engineering of ready-to-install solutions

#### Procurement/logistics



- Festo Online Shop
- 24-hour delivery service
- Logistics optimisation service
- PrePack

#### Assembly and commissioning



- Commissioning axis systems
- Compressed air consumption analysis
- Commissioning and training for servo-pneumatic welding guns

#### Operation



- Worldwide after-sales service
- Energy Saving Services
- Compressed air quality analysis
- Support Portal with documentation for the entire product lifecycle

Are you interested in these services?

Simply ask your local contact person or find out more at [→ www.festo.com/services](http://www.festo.com/services)

You will find further information about our services there.

Festo Didactic is a leading global solution provider for technical basic and further training with a strong industrial DNA. Thanks to a state-of-the-art approach to training and education, we ensure the employability and productivity of our customers. Our product and service portfolio offers comprehensive training solutions for key technology areas in factory and

process automation. We integrate technical teaching content with expertise and training from other specialist areas such as process optimisation, management and communication to offer you a complete training experience. Our experienced trainers teach content that is relevant and tailored to each specific group.

## Our offer

The aim is to maximise added value. This can be achieved through training on a variety of topics and formats.



### Technology

Development of technical skills: core technologies in factory and process automation



### Organisation

Driving continuous improvement: strategic planning and process optimisation along the value chain



### People

Development of behaviour and attitude: teamwork, communication skills and leadership qualities



### Innovations

Skills development for the future: learning, managing and being ready for future production in the context of Industry 4.0



### Overview of topics

- Pneumatics
- Hydraulics
- PLCs (programmable logic controllers)
- Electrical engineering/electronics
- Process automation
- Handling systems
- Water management
- Maintenance
- Supply chain management
- Lean production
- Process optimisation
- Service and sales competence
- Industry 4.0
- Machine safety
- Battery life cycle management
- Electric drive technology



### Quality offer

- Public courses
- Company-specific training courses
- Consulting
- Coaching
- Skills programmes
- Business games
- Learning needs analyses, certifications, blended learning concepts

+++ NEW – Electric drive technology training +++

### Basics of electric automation with CMMT (3 days)

Main points:

- Getting to know the various motor technologies
- Theory and practice for commissioning motor controllers
- Knowledge and application of tools such as Electric Motion Sizing, FESTO Automation Suite
- Configuration and design of electric drive systems (motor, axis and CMMT motor controller, safety functions)
- Integration and control, e.g. on the SIEMENS TIA Portal
- Recognising and rectifying simple errors
- Evaluating the drive behaviour of electric drives
- Configuring and commissioning the motor controller CMMT
- Practical exercises in small groups



### What are you waiting for? Contact us:

Festo Didactic SE | Rechbergstraße 3 | D-73770 Denkendorf | [did@festo.com](mailto:did@festo.com)

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

## What must be taken into account when using Festo products?

The limit values specified in the technical data and any specific safety instructions must be adhered to by the user in order to ensure correct functioning.

The pneumatic components must be supplied with correctly prepared compressed air without aggressive media.

Take the ambient conditions at the place of use into consideration. Corrosive, abrasive and dusty environments (e.g. water, ozone, grinding dust) will reduce the service life of the product.

Check the resistance of the materials of Festo products to the media used and surrounding media.

When using Festo products in safety-oriented applications, all national and international laws and regulations, for example the EC Machinery Directive, must be observed and complied with together with the relevant references to standards, trade association rules and the applicable international regulations.

Unauthorised conversions or modifications to products and systems from Festo constitute a safety risk and are thus not permitted.

Festo doesn't accept any liability for any resulting damage.

You should contact Festo if one of the following applies to your application:

- The ambient conditions and conditions of use or the operating medium differ from the specified technical data.
- The product is to perform a safety function.
- A risk or safety analysis is required.
- You are unsure about the product's suitability for the planned application.
- You are unsure about the product's suitability for use in safety-oriented applications.

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