FESTO

Product overview 2016

Festo's entire product range on DVD-ROM

FESTO

Products

Quickly find your optimal solution – in our digital product catalogue on DVD-ROM

You can work offline with our convenient product catalogue on DVD.

Quicker search and results
Numerous practical selection and search options are available.
You can use the following functions:

- Direct search: Listing of the product range with various filter functions
- Categories: Product selection using images and the product tree
- Product finder: Input of technical features for quickly locating the required products
- Developer tools: Selection and sizing of the correct products for your application
- Full text search

System requirements

Minimum system requirements

- Intel Pentium IV, 2.4 GHz+ or AMD 2400 xp+
- 1 GB RAM
- DVD-ROM drive
- Screen resolution set to 1024 x 768 pixels
- Operating system: Microsoft Windows Vista SP2
- Browser: Microsoft Internet Explorer 9

Recommended configuration

- PC, no more than 4 years old
- Laptop, no more than 2 years old
- Dual-core CPU with 2 GHz
- 2 GB RAM
- DVD-ROM drive
- Screen resolution set to 1280 x 1024 pixels
- Operating system: Microsoft Windows Vista or Windows 7 / 8 / 10 (32 or 64 bit) incl. all Windows updates
- Browser: Microsoft Internet Explorer 9

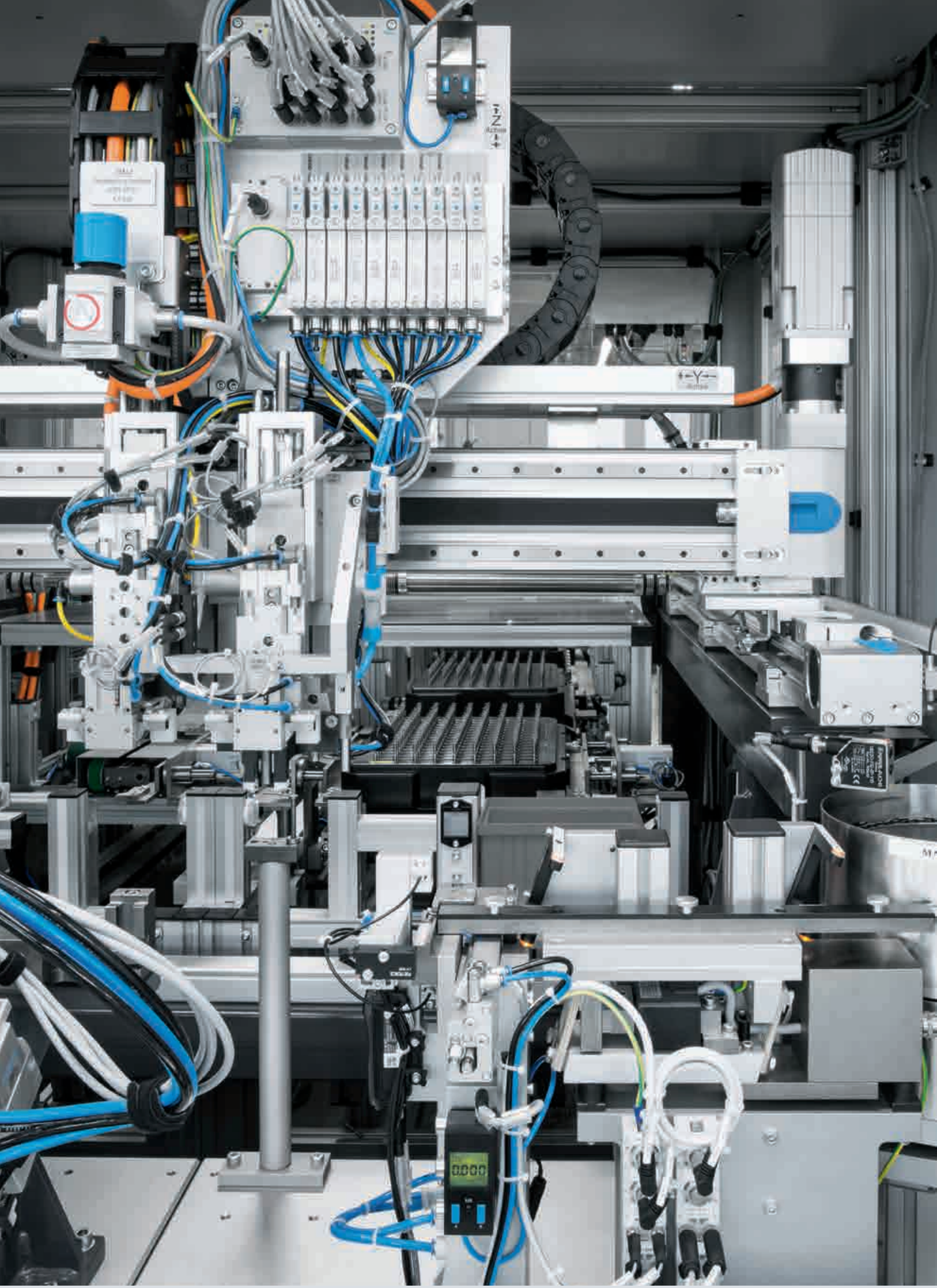
Installation instructions

1. Insert the DVD-ROM into the drive. If the setup routine starts automatically, continue with Step 5.
   If not:
2. Select the **Run** command from the Start menu.
3. Enter the drive letter of your DVD-ROM drive followed by **setup.exe**.
   For example: **d:\setup.exe**
4. Then click **OK** or **Enter**.
5. Follow the instructions.

For further information (installation in a network, FAQs), please read **Info_en.pdf** on the DVD or write to us: **dki@festo.com**

Exclusion of liability

Festo provides this software to support you in the selection and ordering of Festo products. The data/results generated using the software are exclusively intended to describe the products and do not constitute warranted properties in any legal sense. Festo accepts no liability for damages caused through the use of this software, in particular in relation to consequential damage, whether personal injury, material damage or financial loss, directly related to the use of this DVD-ROM.



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

Dear customers,

Fast, flexible and productive – these are the keywords which characterise production today. The relationship between input and output defines economic efficiency.

As your partner, Festo provides you with competent support so that you can achieve maximum productivity. In this catalogue, you will find numerous products and valuable information which will put you on the road to the highest levels of productivity.

Whether you are looking for a technically sophisticated system solution or a very economical alternative for components, we are here to support you on your path to success. Our experts have the expertise to meet four vital needs: security, simplicity, efficiency and competency. And they will do everything to take the step with you to maximum productivity.

Why not take advantage of this?

Best regards,

Dr Ansgar Kriwet

You depend on efficient production.
You want that feeling of security.
We are your global partner for training and automation.

→ WE ARE THE ENGINEERS OF PRODUCTIVITY.

Festo: a partner in dialogue, a partner for maximum productivity.

More than ever before, success in our networked world depends on having the right partners. Experts who make a valuable contribution to the achievement of your goals, who know your processes, quickly understand and resolve your challenges – and make you more productive.

Take advantage of our expertise –
your engineers of productivity.

Solutions for factory and process automation

The right solution for every requirement: Festo provides products, systems and services for electrical and pneumatic control and drive technology.

Partner for technical training and development

Everything from a single source: from equipment for technical institutes to training and consultation for manufacturing companies.

...values

We are ambitious

As a proudly independent family-owned company, we shape our own destiny and are relentless in our pursuit of success. We have high expectations of ourselves and others and harness the passion and experience of our people to deliver top class performance.

We are determined

As a driver and shaper of our market, we meet challenges with courage and determination. We make clear decisions and implement them thoroughly. When we make mistakes, we find out why and learn for the future.

We are dependable

We expect and believe in the personal responsibility of our employees and colleagues. Engagement and dependability are therefore key characteristics of the way we work. When we cannot keep to our commitments we communicate this early and seek alternative solutions.

We value each other

Our diversity is a core strength that enriches Festo. To ensure trust we foster openness and mutual respect. We resolve conflicts quickly and cooperatively, we treat each other with respect and learn from each other's perspectives.

We are visionary

We are determined to develop intelligent and intuitive solutions. For this reason we look beyond our own horizons to learn the current and future challenges of our customers and markets and the actions of our competitors. Our structured cooperation over all disciplines leads to strengths and knowledge in invention and innovation.

Our values – crucial prerequisites for a successful mission ➔

mission...

Festo. At the forefront of industrial automation.

We work with our customers to increase their productivity. We combine our knowledge with a passion for detail, never losing sight of the big picture. We foster sustainable growth to keep the world moving.


Manufacturing of the future ...
... next steps!
FESTO

Factory automation – for optimal productivity

In everyday factory operations, typical tasks such as gripping, moving and positioning part components, modules or complete products, are carried out by Festo automation technology.

Fully integrated competitive edge
Our components and systems are used in production and assembly in a wide range of industry sectors, including the automotive, semiconductor and electronics industries.

The corresponding service and appropriate training make us the No. 1 partner for our customers across their entire value chain.

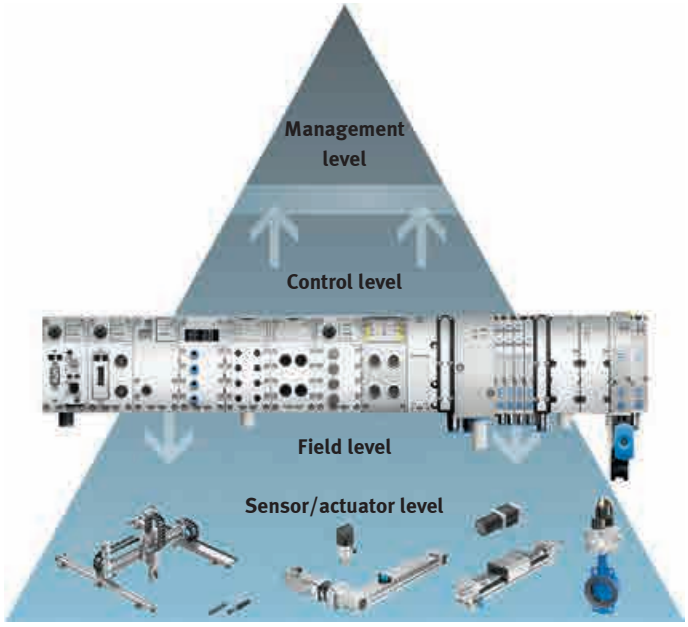
Process automation – for safety during operation

Included in the industry segments for process automation are the water and wastewater technology sector, biotech and pharmaceuticals, chemical industry, laboratory automation, mining, as well as the food and beverage industry.

Tailored industry solutions
We offer these industries centralised and decentralised automation concepts for the production, transport, handling and disposal of fluid media.

With the support of an experienced team of experts, Festo is a competent partner for the automation of individual process steps or complete systems.

Electric automation – optimised productivity in factory and process automation



An automation platform for factory and process automation
Our CODESYS controllers, primarily the IP65 control platform CPX, create unique advantages thanks to function integration and establish new standards in factory and process automation. This includes a cost-effective overall concept, technical synergies and the advantages of decentralised installation as well as connection to Industry 4.0 thanks to OPC UA.

Competency in intelligent automation
Used by Festo: electric drive technology in core and auxiliary machine processes – from linear motion up to motion control of decentralised modules, from the simplest web-parameterised single axis up to the Multi-Carrier-System.

Mechatronic complete solutions
Mechatronic Motion Solutions provides you with a worldwide unique system comprising components, modules, systems and software from Festo. It integrates all types of pneumatic, servopneumatic and (electro)mechanical automation components and combines them according to your task. Irrespective of the control environment you use, Mechatronic Motion Solutions always provides the appropriate interfaces.

The systematically faster route to the right solution

It couldn't be easier:

1. Select the product group you require from the Table of contents
   ➔ 1.
   For example: Electromechanical drives 48

2. Find the products you want on the product pages using the technical features and descriptions.

3. The blue arrow directs you to the search term with which you can find all product information and process your order on the Internet. Simply add the search term or type to the Internet address.
   Example with search term:
   ➔ **www.festo.com/catalogue/electromechanical**
   Example with type:
   ➔ **www.festo.com/catalogue/egc-bs**

Are you already in the electronic product catalogue?
Enter the search term in the search field next to the magnifying glass.

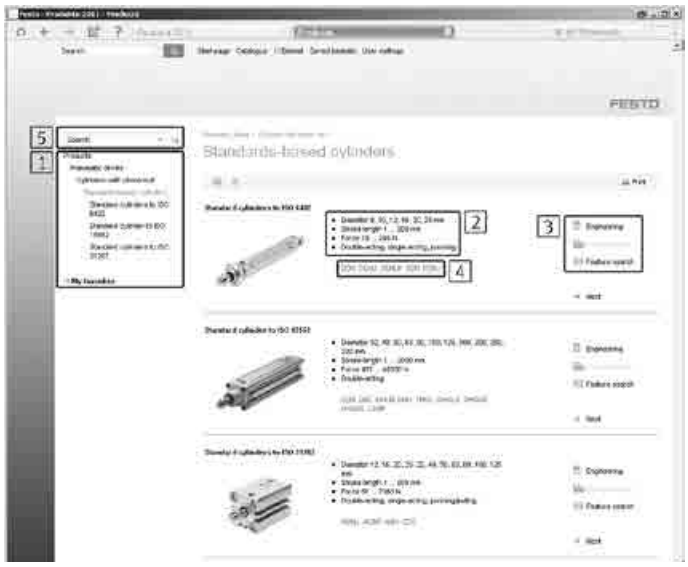
You can also search offline. The electronic product catalogue can be found on the DVD inside the cover. Follow the installation instructions next to the DVD.

The electronic product catalogue offers additional productivity-boosting applications. See page 13 for more information.

Should you require individually tailored advice, you can find contact details on page 182.

Online: Enter ➔ **www.festo.com** in your web browser, then choose your country in the "Automation" field. Click on "Go".
On the homepage, select the "Products" menu.

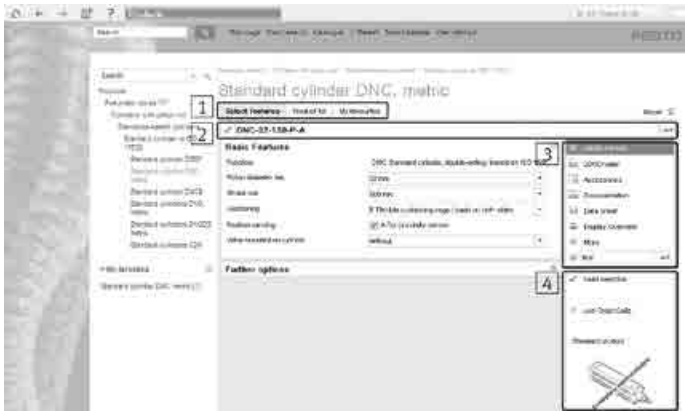
Offline: Insert the DVD and install the product catalogue.
On the start page, click on the "Products" link.



From the product group to the product

There are three options available:

1. Click on a product group [1] or a product photo. A selection of products will then be displayed along with a list [2] of the technical features and the selectable links [3]:
   – "Engineering" starts the selection and calculation software
   – "Documentation" provides detailed information in PDF format
   – "Feature search" lets you further narrow down the product selection
2. Full text search: Enter your search term in the search field [5]. This can be made up of complete or partial keywords, part numbers, type codes or names of favourites. Depending on your input, a selection of products as described in step 1 will be displayed or you will be taken directly to the product you searched for.
3. Quick link: Use the quick link [4] to take you directly to the required product by clicking on a type code.



Functions in the product configurator

1. Tab navigation [1]
   – "Select features": Select the appropriate features here
   – "Product list": Lists all products in the product group
2. Input field for type code 2: Enter the exact type code here.
3. Other actions [3] which are available following a correct configuration:
   – "Add to basket": Adds your product to the basket, see also section "Exporting your basket" and "Managing your basket"
   – "2D/3D view": Creates a CAD model, see the section "Viewing CAD models"
   – "Accessories": Lists suitable accessories
   – "Data Sheet": Contains all the relevant technical data
   – "Display Overview": Displays an overview of all selected models
4. Details 4: Here you will find information such as part number, price, product graphic, product illustration and circuit symbol.

Selecting product features in the product configurator

1. Select the product features:
   – Navigate using the tabs [1].
   – Configure your product by selecting the required features [2] on the tabs [1] running from left to right.
   – The tabs [1] give you a quick overview of all the selected features. Missing features are marked with a blue exclamation mark and incorrect features are marked in red. Clicking on the feature takes you directly to it, so that you can then change it.
2. Graphical representation [3]: A dynamic graphic[1] is created based on your current configuration.
3. Add the product to your basket: Once the configuration is complete, you can add products to the basket by clicking on "Add to basket". A message is displayed to confirm that the product has been added successfully.
   To find out how to place an order, see section "Managing your basket".

1) Available for the valve terminal and service unit product groups.

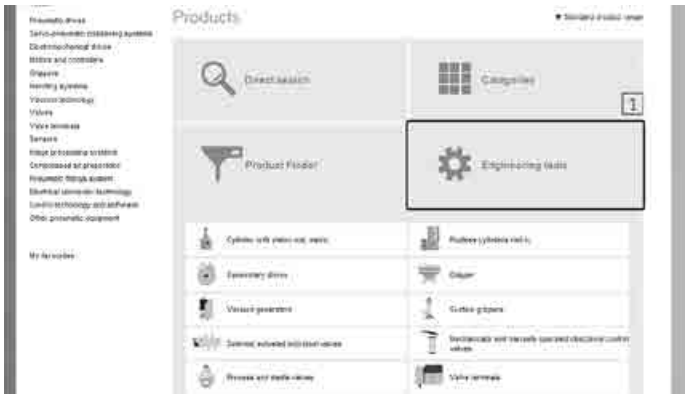
Online or offline – get the ideal solution fast

Online: Enter ➔ **www.festo.com** in your web browser, then choose your country in the "Automation" field. Click on "Go".
On the homepage, select the "Products" menu.

Offline: Insert the DVD and install the product catalogue.
On the start page, click on the "Products" link.

Selecting product features in the product finder

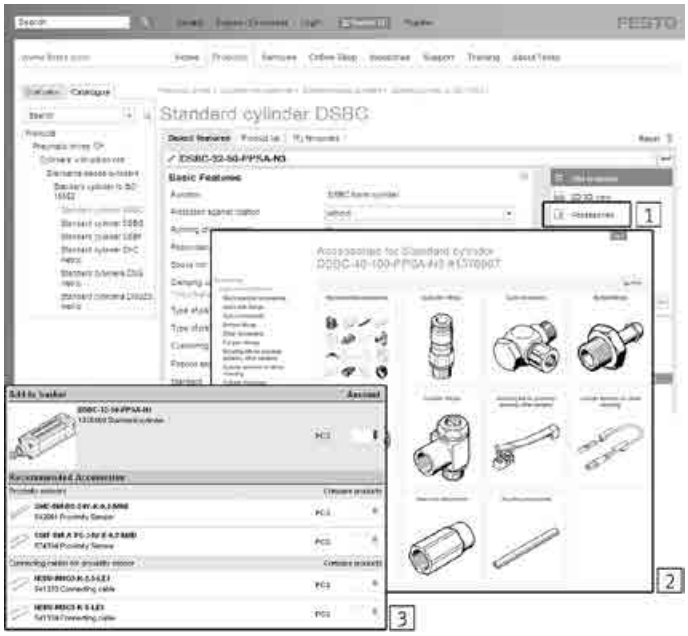
1. Click on the blue button "Product finder" [1] and select the required product group.
2. Select the required technical features in the selection field [2] on the left-hand side.
3. Then click on a product photo. The configurator [3] opens with the features you selected.



Engineering tools for appropriate products for your applications

1. Click on the blue button "Engineering" [1] and select the required engineering tool.

This tool guides you step-by-step to the application simulation based on the technical features you selected and suggests the appropriate products for your application.



Finding the appropriate accessories quickly

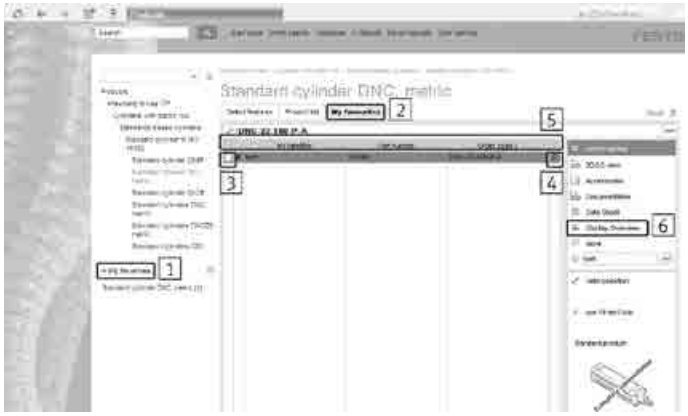
1. Select the required features in the configurator.
2. Click on the "Accessories" button [1] on the right-hand side.
3. Select the required accessory from the accessories on offer [2].

The tool will bring you to the appropriate accessory selection list.

Tip:
For some cylinder series you can find the appropriate accessories faster by selecting "Recommended accessories" in the accessories on offer [2].
For some cylinder series you will also find "Recommended accessories" [3] after you have added your selection to the basket.

Online: Please register as a user to use the functions described on this page.

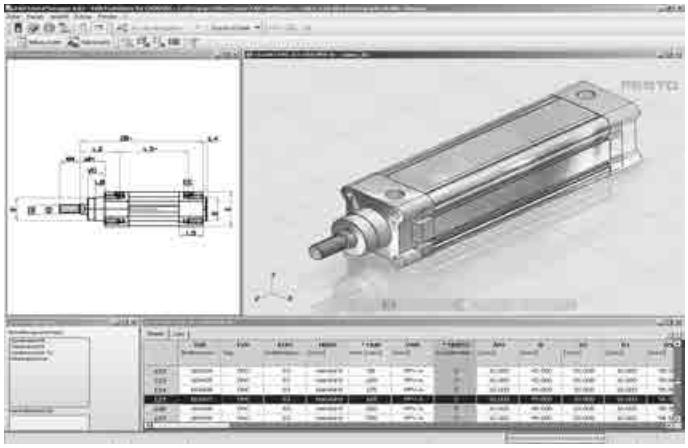
Offline: Registration is not required to use the functions on this page.



My favourites

You can save as many product configurations as favourites as you want.
To display the list of all stored favourites 1:

- Click on the "My favourites" tab 2. A table containing your saved favourites is displayed.
  The name of the favourite, part number, type code and a button 4 for deleting the favourite are displayed.
- Double-clicking on a row in the configuration opens the corresponding configuration window 3.
- You can sort your favourites by clicking on the column headings 5.
- You can select multiple favourites and compare them by clicking on "Product compare" in the field on the right 6.



Viewing CAD models

Clicking on the "2D/3D view" button opens a window containing a CAD preview of the product. The "Export" function lets you export the files to your CAD system in the right format.

Exporting your basket ...

1. ... as a csv file:
   To do this, click on "Export" 1, choose "Save as" in the new window and specify where you want to save it to. This file can then be opened in Excel, for example, and edited.
2. ... in your choice of format: To do this, click "Settings" 3 and specify which information is to be exported.

Managing your basket

1. Upload the basket directly to the Online Shop and place your order: To upload a basket directly to the Online Shop, simply click on "Export to online basket" 2. An Internet connection is established and the products are transferred to the online basket. After logging in via "Login", your net prices and delivery times are displayed. Now just place your order and you're done!
2. Place order: To place an order, simply print out your basket and send it to Festo by fax or export it as an e-mail.

Online: **The Support Portal**
All product information can be accessed centrally ➔ **www.festo.com/sp**

Festo Online Shop

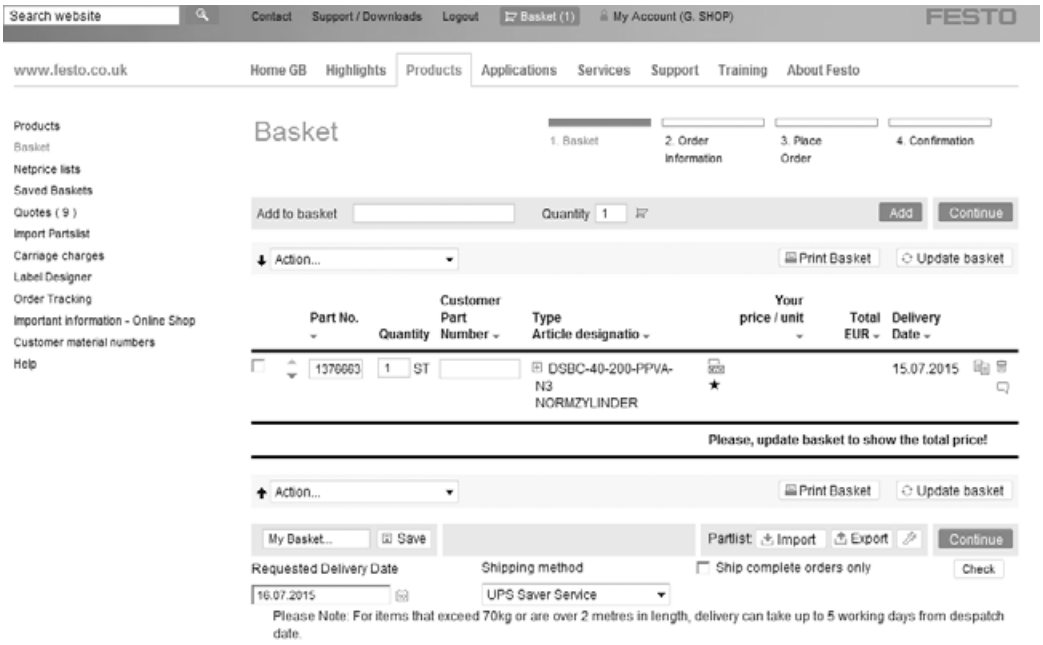
Round-the-clock benefits

- **One-step ordering process** – no waiting times between request, pricing information and order.
- **Complete overview of all orders** – order tracking with search function, status display in lists and easy reordering.
- **Share baskets** – make your basket available to colleagues with access to the Online Shop.
- **Download all documents for a complete basket** – complete documentation for the selected products.
- **Continuous availability** – product information, documentation, prices, availability, ordering, etc.
- **Reliable and secure procurement processes** – import parts lists as a CSV file or by copying and pasting. Export to Office applications.

Always in control

When you register you have access to all the latest information on all the products and their availability at all times

You will find the Online Shop at
➔ **www.festo.com**



Already registered?

Then you can log in directly via ➔ **www.festo.com/login** or by clicking on "Login".

If you have not yet registered, open the registration form by clicking on "Register".

Further information on the Festo Online Shop
➔ **www.festo.com/ols**

FESTO

Festo – Partner for automation

Integrated information ...
... is a prerequisite for successful pneumatic and electric automation.
That's why Festo sees itself as a partner to its customers and maintains a continuous dialogue with them to provide and exchange expert and comprehensive information.

Directly
- Worldwide consultation provided by more than 1,000 sales engineers and project engineers with up-to-date product and industry knowledge
- Hotlines to answer all your questions
- Experts on components, modules, systems and industries

At events
- Over 120 trade fairs around the world each year
- Expotainer – the exhibition that comes to you
- Technology days – specialised presentations and exhibits concerning current topics in the field of automation
- Automation lectures – a series of specialised presentations based on actual practice for real applications

In printed form
- trends in automation – the customer magazine with application examples, news and innovations from the world of automation technology

Documentation
- The printed Festo catalogue. Automation in a compact volume and with a clear structure
- Industry catalogues
- Manuals and operating instructions
- System descriptions and product overview posters
- Specialist literature

Everything can be found on our Support Portal at ➔ **www.festo.com/sp**

Electronically
- Always up-to-date: www.festo.com
- On the Internet or as a DVD-ROM: Database-supported catalogue in 26 languages
- Spare parts catalogue
- Online Shop
- Engineering tools for easier and faster design for energy-efficient solutions

Are you familiar with our basic and further training courses? Festo Didactic brings together and promotes the transfer of know-how:
Festo Didactic ➔ 18.
After all, productivity begins with training.

Festo Didactic

Festo Didactic is the world-leading equipment and solution provider for industrial education. The product and service portfolio offers solutions for rapid learning and retention in the entire spectrum of automation technologies. As an innovation leader and one of the world's largest supplier of automation technology Festo sets standards. This is also shown with the range of Festo Didactic's training courses on automation technology: pneumatics or hydraulics, PLC technology or troubleshooting.

Thus, the customers benefit twice: Close coordination between Festo Didactic and Festo Automation allows us deeper insights into key industry issues than other training providers. We practice what we teach.

No matter which training format you choose – whether public or in-house, a course, a workshop, a best-practice event or corporate strategy games – the focus is always on first-hand experience. In both public and customised training, the outcomes are transparent to all stakeholders, allowing them to track progress towards achieving the required competencies. Rapid transfer to daily practice is a key quality criterion – we help you to measure and optimise this.

Standard training
In public courses, a predefined set of competencies are transferred. Approximately 42,000 course participants attend over 3,000 of our public courses worldwide every year.
Our trainers deliver modular qualityassured training in 39 languages.

Customised training
There are three levels to customised training:
Customised courses designed to achieve agreed outcomes are generally in-house to achieve greater focus on your business needs, increased flexibility and reduced cost, often with the added advantage that participants do not have to travel.
If you are not sure which skills profile a team needs, our Training Needs Analysis (TNA) will identify requirements and audit current skills in a report. To optimise transfer, a post course review can be run a few weeks after training – this audits the upgraded skills set against the agreed outcomes.

Competence development programs
If your customised training exceeds the scope of a single course, qualification programs can be established. These comprise several courses with intervals between to transfer to the workplace and integration of inhouse projects with goals such as optimising setup time.

Competence programs
If your training requirements exceed the scope of a single course, qualification programs can be established. These comprise several courses with intervals between to transfer to the workplace and integration of inhouse projects with goals such as optimising setup time. We now offer brand-new competence programs for different job roles from industry in the fields of Supply Chain Management, Maintenance Management, Mechatronics, Energy management, Safety and Water Management. Using the example of our Supply Chain Management program, the participants firstly focus on the fundamentals, containing the best practices and tools in a global view of Supply Chain. In another section, dedicated to job specific learning, the main focus are job role activities thus enabling the participants to perform effectively in a specific position as part of the Supply Chain.

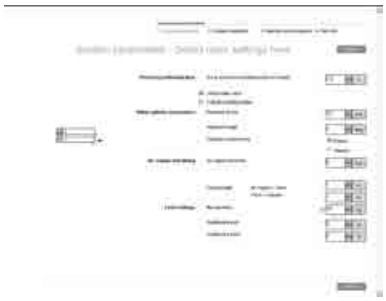
International available training courses:

Our current range of technical training courses covers the fields of
- Electricity Energy efficiency
- Handling Systems
- Hydraulics
- PLC
- Pneumatics
- Process Automation
- Safety
- Troubleshooting
- Water Management.

Moreover, we offer training courses for organizational topics such as Improvement management, Lean Production and Supply Chain Management. We now offer brand-new competence programs for Supply Chain Management, Maintenance Managenment, Mechatronics and Energy Management.

More information on our website: → www.festo-tac.com

Software tool

Pneumatic simulation		Perfect simulations replace expensive actual 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 • either in the electronic catalogue by clicking on the blue button "Engineering" • or on the DVD under Engineering Tools.
Festo Design Tool 3D FDT 3D		This 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 with a single order code – either completely pre-assembled or as individual parts in a single box. As a result, your bill of materials is considerably shortened and downstream processes such as product ordering, order picking and assembly are significantly simplified.	All ordering options are available in the following countries: AT, BE, CH, CZ, DE, DK, ES, FI, FR, GB, HU, IE, IT, NL, NO, PL, RU, SE, SI, SK. This tool can be found • either via the address: www.festo.com/FDT-3D in the above listed countries, • or on the CD "FDT 3D" (part no. 135595 for the above listed countries) • or on the DVD.

Standards-based cylinders

	 **Compact cylinder ADN**	 **Compact cylinder AEN**	 **Compact cylinder ADNP**	 **Compact cylinder ADN-EL**
Mode of operation	Double-acting	Single-acting, pushing, pulling	Double-acting	Double-acting
Piston diameter	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	20 mm, 25 mm, 32 mm, 40 mm, 50 mm	20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm
Theoretical force at 6 bar, advancing	51 ... 7363 N	54 ... 4416 N	188 ... 1178 N	188 ... 4712 N
Stroke	1 ... 500 mm	1 ... 25 mm	5 ... 80 mm	10 ... 500 mm
Cushioning	Elastic cushioning rings/pads at both ends, self-adjusting pneumatic end-position cushioning	Elastic cushioning rings/pads at both ends	Elastic cushioning rings/pads at both ends	Elastic cushioning rings/pads at both ends
Description	• ISO 21287 • Up to 50% less installation space than comparable standard cylinders to ISO 15552 • Piston rod with female or male thread • Wide range of variants for customised applications • For position sensing	• ISO 21287 • Up to 50% less installation space than comparable standard cylinders to ISO 15552 • Piston rod with female or male thread • Wide range of variants for customised applications • For position sensing	• ISO 21287 • Up to 50% less installation space than comparable standard cylinders to ISO 15552 • With polymer end cap and piston rod made from aluminium • Low-cost cylinder for standard applications • Piston rod with female or male thread • For position sensing	• Mounting hole pattern to ISO 21287 • With end-position locking at both ends, front or rear • For position sensing • Piston rod with female or male thread
online: →	**adn**	**aen**	**adnp**	**adn-el**

Standards-based cylinders

FESTO

	 **Compact cylinders, Clean Design CDC**	 **ISO cylinders DSBC**	 **ISO cylinders DSBG**	 **ISO cylinders DSBG**
Mode of operation	Double-acting	Double-acting	Double-acting	Double-acting
Piston diameter	20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm, 80 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	160 mm, 200 mm, 250 mm, 320 mm
Theoretical force at 6 bar, advancing	141 ... 3016 N	415 ... 7363 N	415 ... 7363 N	12064 ... 48255 N
Stroke	1 ... 500 mm	1 ... 2800 mm	1 ... 2800 mm	1 ... 2700 mm
Cushioning	Elastic cushioning rings/pads at both ends	Elastic cushioning rings/pads at both ends, self-adjusting pneumatic end-position cushioning, pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends	Elastic cushioning rings/pads at both ends, self-adjusting pneumatic end-position cushioning, pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends	Elastic cushioning rings/pads at both ends, self-adjusting pneumatic end-position cushioning cushioning adjustable at both ends
Description	• ISO 21287 • Up to 50% less installation space than comparable standard cylinders to ISO 15552 • Easy-to-clean design • Increased corrosion protection • Wide range of variants for customised applications • Piston rod with female or male thread • For position sensing	• ISO 15552 (ISO 6431, VDMA 24562) • Self-adjusting pneumatic end-position cushioning which adapts optimally to changes in load and speed • Wide range of variants for customised applications • Comprehensive range of mounting accessories for just about every type of installation • For position sensing	• ISO 15552 (ISO 6431, VDMA 24562) • Sturdy tie rod design • Self-adjusting pneumatic end-position cushioning which adapts optimally to changes in load and speed • Comprehensive range of mounting accessories for just about every type of installation • For position sensing	• ISO 15552 (ISO 6431, VDMA 24562) • Sturdy tie rod design • Pneumatic end-position cushioning adjustable at both ends • Optionally without end-position cushioning, adjustable at both ends, and position sensing, resulting in a price advantage • New: Optionally with spacer bolt attachment • For position sensing
online: →	**cdc**	**dsbc**	**dsbg**	**dsbg**

Standards-based cylinders

	 **ISO cylinders, Clean Design** **DSBF**	 **ISO cylinders** **DNC**	 **Round cylinders** **DSNU**
Mode of operation	Double-acting	Double-acting	Double-acting
Piston diameter	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	8 mm, 10 mm, 12 mm, 16 mm, 20 mm, 25 mm
Theoretical force at 6 bar, advancing	415 ... 7363 N	415 ... 7363 N	23 ... 295 N
Stroke	1 ... 2800 mm	2 ... 2000 mm	1 ... 500 mm
Cushioning	Elastic cushioning rings/pads at both ends, self-adjusting pneumatic end-position cushioning, pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends	Elastic cushioning rings/pads at both ends, pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends	Elastic cushioning rings/pads at both ends, self-adjusting pneumatic end-position cushioning, pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends
Description	• ISO 15552 • Increased corrosion protection • Easy-to-clean design • FDA-approved lubrication and sealing on the basic version • Long service life thanks to optional seal for unlubricated operation • Self-adjusting pneumatic end-position cushioning which adapts optimally to changes in load and speed • For position sensing	• ISO 15552 (ISO 6431, VDMA 24562) • Wide range of variants for customised applications • Comprehensive range of mounting accessories for just about every type of installation • For position sensing	• ISO 6432 • Wide range of variants for customised applications • Good running performance and long service life • Self-adjusting pneumatic end-position cushioning which adapts optimally to changes in load and speed • Piston rod with male or female thread • For position sensing
online: →	**dsbf**	**dnc**	**dsnu**

Standards-based cylinders

	 **Round cylinders** **ESNU**	 **Round cylinders** **DSNUP**	 **Round cylinders** **DSN, ESN**
Mode of operation	Single-acting, pushing	Double-acting	Double-acting, single-acting, pushing
Piston diameter	8 mm, 10 mm, 12 mm, 16 mm, 20 mm, 25 mm	16 mm, 20 mm, 25 mm	8 mm, 10 mm, 12 mm, 16 mm, 20 mm, 25 mm
Theoretical force at 6 bar, advancing	19 ... 271 N	121 ... 295 N	24 ... 294.5 N
Stroke	1 ... 50 mm	25 ... 100 mm	1 ... 500 mm
Cushioning	Elastic cushioning rings/pads at both ends	Elastic cushioning rings/pads at both ends	Elastic cushioning rings/pads at both ends, pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends
Description	• ISO 6432 • Wide range of variants for customised applications • Good running performance and long service life • Piston rod with female or male thread • For position sensing	• ISO 6432 • Cost-optimised round cylinder • Wrought aluminium alloy cylinder barrel • Polyamide bearing caps and end caps • For position sensing	• ISO 6432 • Good running performance and long service life • Piston rod with female or male thread • Without position sensing
online: →	**esnu**	**dsnup**	**dsn**

Round cylinders

FESTO

	 **Round cylinders DSNU**	 **Round cylinders ESNU**	 **Round cylinders DSNUP**
Mode of operation	Double-acting	Single-acting, pushing	Double-acting
Piston diameter	32 mm, 40 mm, 50 mm, 63 mm	32 mm, 40 mm, 50 mm, 63 mm	16 mm, 20 mm, 25 mm
Theoretical force at 6 bar, advancing	482.5 ... 1870.3 N	406 ... 1765 N	121 ... 295 N
Stroke	1 ... 500 mm	1 ... 50 mm	25 ... 100 mm
Cushioning	Elastic cushioning rings/pads at both ends, self-adjusting pneumatic end-position cushioning, pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends	Elastic cushioning rings/pads at both ends	Elastic cushioning rings/pads at both ends
Description	• Wide range of variants for customised applications • Good running performance and long service life • Self-adjusting pneumatic end-position cushioning which adapts optimally to changes in load and speed • Piston rod with male or female thread • For position sensing	• Wide range of variants for customised applications • Good running performance and long service life • Piston rod with female or male thread • For position sensing	• ISO 6432 • Cost-optimised round cylinder • Wrought aluminium alloy cylinder barrel • Polyamide bearing caps and end caps • For position sensing
online: ➔	**dsnu**	**esnu**	**dsnup**

Round cylinders

	 **Round cylinders DSN, ESN**	 **Round cylinders DG, EG**	 **Round cylinders EG-PK**
Mode of operation	Double-acting, single-acting, pushing	Single-acting, pushing	Single-acting, pushing
Piston diameter	8 mm, 10 mm, 12 mm, 16 mm, 20 mm, 25 mm	6 mm, 12 mm, 16 mm, 25 mm	2.5 mm, 4 mm, 6 mm
Theoretical force at 6 bar, advancing	24 ... 294.5 N	17 ... 215 N	1.9 ... 11.8 N
Stroke	1 ... 500 mm	1 ... 80 mm	5 ... 25 mm
Cushioning	Elastic cushioning rings/pads at both ends, pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends	No cushioning	At one end, no cushioning, non-adjustable
Description	• ISO 6432 • Good running performance and long service life • Piston rod with female or male thread • Without position sensing	• Miniature cylinder • Good running performance and long service life • Piston rod with or without male thread • Without position sensing	• Micro cylinder • Barbed fitting for plastic tubing with standard I.D. • Without position sensing
online: ➔	**dsn**	**eg**	**eg-pk**

Stainless steel cylinder

	 **Round cylinders CRDSNU, CRDSNU-B**	 **Round cylinders CRDSNU, CRDSNU-B**	 **ISO cylinder CRDNG, CRDNGS**	 **Round cylinders CRHD**
Mode of operation	Double-acting	Double-acting	Double-acting	Double-acting
Piston diameter	12 mm, 16 mm, 20 mm, 25 mm	32 mm, 40 mm, 50 mm, 63 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
Theoretical force at 6 bar, advancing	68 ... 295 N	483 ... 1870 N	483 ... 7363 N	483 ... 4712 N
Stroke	1 ... 500 mm	1 ... 500 mm	10 ... 2000 mm	10 ... 500 mm
Cushioning	Elastic cushioning rings/pads at both ends, self-adjusting pneumatic end-position cushioning, pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends	Elastic cushioning rings/pads at both ends, self-adjusting pneumatic end-position cushioning, pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends	Pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends	Pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends
Description	• ISO 6432 • Corrosion resistant against aggressive ambient conditions • Easy-to-clean design • Long service life thanks to optional unlubricated seal • Wide range of variants for customised applications • Self-adjusting pneumatic end-position cushioning which adapts optimally to changes in load and speed • For position sensing	• Corrosion resistant against aggressive ambient conditions • Easy-to-clean design • Long service life thanks to optional unlubricated seal • Wide range of variants for customised applications • Self-adjusting pneumatic end-position cushioning which adapts optimally to changes in load and speed • For position sensing	• ISO 15552 (ISO 6431, VDMA 24562) • Corrosion resistant against aggressive ambient conditions • Easy-to-clean design • Variants: through piston rod, heat-resistant design • Threaded mounting, mounting via accessories • For position sensing	• Corrosion resistant against aggressive ambient conditions • Easy-to-clean design, optimised for most exacting demands • Great flexibility thanks to different end caps • Piston rod with male thread • For position sensing
online: →	**crdnsu**	**crdsnu**	**crdng**	**crhd**

Compact, short-stroke and flat cylinders

FESTO

	 Compact cylinder ADN	 Compact cylinder AEN	 Compact cylinder ADNGF	 Compact cylinder ADNP
Mode of operation	Double-acting	Single-acting, pushing, pulling	Double-acting	Double-acting
Piston diameter	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	12 mm, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm, guide rod with yoke	20 mm, 25 mm, 32 mm, 40 mm, 50 mm
Theoretical force at 6 bar, advancing	51 ... 7363 N	54 ... 4416 N	68 ... 4712 N	188 ... 1178 N
Stroke	1 ... 500 mm	1 ... 25 mm	1 ... 400 mm	5 ... 80 mm
Cushioning	Elastic cushioning rings/pads at both ends, self-adjusting pneumatic end-position cushioning	Elastic cushioning rings/pads at both ends	Elastic cushioning rings/pads at both ends, self-adjusting pneumatic end-position cushioning	Elastic cushioning rings/pads at both ends
Description	• ISO 21287 • Up to 50% less installation space than comparable standard cylinders to ISO 15552 • Piston rod with female or male thread • Wide range of variants for customised applications • For position sensing	• ISO 21287 • Up to 50% less installation space than comparable standard cylinders to ISO 15552 • Piston rod with female or male thread • Wide range of variants for customised applications • For position sensing	• Mounting hole pattern to ISO 21287 • Piston rod secured against rotation by means of guide rod and yoke plate • Plain-bearing guide • Available with through piston rod • For position sensing	• ISO 21287 • Up to 50% less installation space than comparable standard cylinders to ISO 15552 • With polymer end cap and piston rod made from aluminium • Low-cost cylinder for standard applications • Piston rod with female or male thread • For position sensing
online: →	adn	aen	adngf	adnp

Compact, short-stroke and flat cylinders

	 **Compact cylinder ADN-EL**	 **Compact cylinder, Clean Design CDC**	 **Short-stroke cylinders ADVC, AEVC**	 **Compact cylinder ADVU, AEVU, AEVUZ**
Mode of operation	Double-acting	Double-acting	Double-acting, single-acting, pushing	Double-acting, single-acting, pushing, pulling
Piston diameter	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	4 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	12 mm, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm, 125 mm, square piston rod
Theoretical force at 6 bar, advancing	188 ... 4712 N	141 ... 3016 N	4.9 ... 4712 N	42 ... 7363 N
Stroke	10 ... 500 mm	1 ... 500 mm	2.5 ... 25 mm	1 ... 2000 mm
Cushioning	Elastic cushioning rings/pads at both ends	Elastic cushioning rings/pads at both ends	Elastic cushioning rings/pads at both ends	Elastic cushioning rings/pads at both ends
Description	• Mounting hole pattern to ISO 21287 • With end-position locking at both ends, front or rear • For position sensing • Piston rod with male or female thread	• ISO 21287 • Up to 50% less installation space than comparable standard cylinders to ISO 15552 • Easy-to-clean design • Increased corrosion protection • Wide range of variants for customised applications • Piston rod with female or male thread • For position sensing	• Mounting hole pattern to VDMA 24562 as of Ø 32 mm • Very short overall length • High forces in a compact size • Piston rod with female or male thread • For position sensing with proximity sensor for T-slot and for C-slot	• 50% less installation space than comparable standard cylinders to ISO 15552 • Wide range of variants for customised applications • Piston rod with female or male thread • For position sensing
online: →	**adn-el**	**cdc**	**advc**	**advu**

Compact, short-stroke and flat cylinders

FESTO

	 Compact cylinder ADVUL	 Flat cylinder DZF	 Flat cylinder DZH	 Flat cylinder EZH
Mode of operation	Double-acting	Double-acting	Double-acting	Single-acting, pushing
Piston diameter	12 mm, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm, guide rod with yoke	12 mm, 18 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm, oval piston, equivalent diameter	16 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm, oval piston, equivalent diameter	3 mm, 6 mm, 12 mm, 22 mm, rectangular piston rod, equivalent diameter
Theoretical force at 6 bar, advancing	51 ... 4712 N	51 ... 1870 N	104 ... 1870 N	3.8 ... 205 N
Stroke	1 ... 400 mm	1 ... 320 mm	1 ... 1000 mm	10 ... 50 mm
Cushioning	Elastic cushioning rings/pads at both ends	Elastic cushioning rings/pads at both ends	Pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends	No cushioning
Description	• Piston rod secured against rotation by means of guide rod and yoke plate • Plain-bearing guide • Available with through piston rod • For position sensing	• Extremely flat design • Protected against rotation thanks to special piston shape • Ideal for manifold assembly • Wide variety of mounting and attachment options • Piston rod with male or female thread • For position sensing	• Flat design • Protected against rotation thanks to special piston shape • Ideal for manifold assembly • Wide variety of mounting and attachment options • Piston rod with male thread • For position sensing	• Extremely flat design • Protected against rotation thanks to special piston shape • Wide variety of mounting and attachment options • For position sensing
online: →	advul	dzf	dzh	ezh

Cartridge cylinders and multimount cylinders

	 Multimount cylinder DMM, EMM	 Cartridge cylinder EGZ	 Polymer flanged cylinder DFK, EFK
Mode of operation	Double-acting, single-acting, pushing, pulling	Single-acting, pushing	Double-acting, single-acting, pushing
Piston diameter	10 mm, 16 mm, 20 mm, 25 mm, 32 mm	6 mm, 10 mm, 16 mm	8 mm, 10 mm, 12 mm, 16 mm, 20 mm, 25 mm
Theoretical force at 6 bar, advancing	30 ... 483 N	13.9 ... 109 N	20 ... 265 N
Stroke	1 ... 50 mm	5 ... 15 mm	10 ... 80 mm
Cushioning	Elastic cushioning rings/pads at both ends	No cushioning	Elastic cushioning rings/pads at both ends
Description	• Wide variety of mounting and attachment options • Wide selection of piston rod variants • Piston rod with male thread • For position sensing	• Minimal fitting space • Installation with or without mounting components • Piston rod with male thread	• Integrated mounting flange and air connection • Piston rod with male thread • Polymer design
online: →	dmm	egz	dfk

Cylinders with clamping unit

	 **Compact cylinder with clamping cartridge ADN-KP**	 **Round cylinder with clamping cartridge DSNU-KP**	 **Round cylinder with clamping cartridge DSNU-KP**
Mode of operation	Double-acting	Double-acting	Double-acting
Piston diameter	20 mm, 25 mm, 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
Theoretical force at 6 bar, advancing	188 ... 4712 N	30 ... 295 N	483 ... 1870 N
Stroke	10 ... 500 mm	1 ... 500 mm	1 ... 500 mm
Cushioning	Elastic cushioning rings/pads at both ends	Elastic cushioning rings/pads at both ends, self-adjusting pneumatic end-position cushioning, pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends	Elastic cushioning rings/pads at both ends, self-adjusting pneumatic end-position cushioning, pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends
Description	• The piston rod can be held in any position • The piston rod can be held in position for long periods even with alternating loads, fluctuating operating pressure in the system or loss of pressure • Mounting hole pattern to ISO 21287 • Piston rod with female or male thread • For position sensing	• The piston rod can be held in any position • The piston rod can be held in position for long periods even with alternating loads, fluctuating operating pressure in the system or loss of pressure • Mounting hole pattern to ISO 6432 • For position sensing	• The piston rod can be clamped in any position • The piston rod can be held in position for long periods even with alternating loads, fluctuating operating pressure in the system or loss of pressure • For position sensing
online: →	adn-kp	dsnu-kp	dsnu-kp

Cylinder with clamping unit

	 **Cylinder with clamping unit DNCKE**	 **Standard cylinder with clamping cartridge DNC-KP**
Mode of operation	Double-acting	Double-acting
Piston diameter	40 mm, 63 mm, 100 mm	32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm, 125 mm
Theoretical force at 6 bar, advancing	754 ... 4712 N	415 ... 7363 N
Stroke	10 ... 2000 mm	10 ... 2000 mm
Cushioning	Pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends	Elastic cushioning rings/pads at both ends, pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends
Description	• The piston rod can be held and braked in any position • Variant DNCKE-...-S approved for use in safety-oriented parts of control systems • Mounting hole pattern to ISO 15552 • Piston rod with male thread • For position sensing	• Mounting hole pattern to ISO 15552 • The piston rod can be clamped in any position • The piston rod can be held in position for long periods even with alternating loads, fluctuating operating pressure in the system or loss of pressure • Piston rod with male or female thread • For position sensing
online: →	dncke	dnc-kp

Rodless cylinders

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	 **Linear actuators DGC-K**	 **Linear actuators DGC-G, DGC-GF, DGC-KF**	 **Linear drives with heavy-duty guide DGC-HD**	 **Linear actuators SLG**
Piston diameter	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	18 mm, 25 mm, 40 mm	8 mm, 12 mm, 18 mm
Theoretical force at 6 bar, advancing	153 ... 3016 N	30 ... 1870 N	153 ... 754 N	30 ... 153 N
Stroke	1 ... 8500 mm	1 ... 8500 mm	1 ... 5000 mm	100 ... 900 mm
Cushioning	Pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends	Elastic cushioning rings/pads at both ends, pneumatic cushioning, adjustable at both ends, shock absorber, hard characteristic curve, shock absorber, soft characteristic curve	Shock absorber, hard characteristic curve, shock absorber, soft characteristic curve	Elastic cushioning rings/pads at both ends, shock absorber, hard characteristic curve
Position sensing	Via proximity sensor	Via proximity sensor	Via proximity sensor	Via proximity sensor
Description	• Compact design: 30% smaller than basic design DGC-G • Basic drive without external guide, for simple drive functions • Low moving dead weight • Symmetrical design • Fully interchangeable with the linear drive DGP	• Basic design, plain or recirculating ball bearing guides • All settings accessible from one side • Optionally with variable end stops and intermediate position module • Exchangeable with DGPL thanks to foot mountings • Software tool available for bearing calculation • Optional: NSF-H1 lubricant for the food industry • Optional: clamping unit for holding loads	• For maximum loads and torques thanks to duo rail guide • Very good operating performance under torque load • Long service life • Ideal as a basic axis for linear gantries and cantilever axes • Wide range of options for mounting on drive units	• Extremely flat design • Highest precision thanks to integrated recirculating ball bearing guide • Adjustable end stops • Wide range of supply ports • Available with intermediate position module
online: →	**dgc-k**	**dgc**	**dgc-hd**	**slg**

Rodless cylinders

	 **Linear actuators** **DGPL**	 **Linear actuators** **DGO**	 **Linear units** **SLM**
Piston diameter	18 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm, 80 mm	12 mm, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm	12 mm, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm
Theoretical force at 6 bar, advancing	153 ... 3016 N	68 ... 754 N	68 ... 754 N
Stroke	10 ... 3000 mm	10 ... 4000 mm	10 ... 1500 mm
Cushioning	Pneumatic cushioning, adjustable at both ends, shock absorber, hard characteristic curve	Elastic cushioning rings/pads at both ends, pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends	Elastic cushioning rings/pads at both ends, shock absorber, hard characteristic curve
Position detection	Via proximity sensor, with attached displacement encoder, with integrated displacement encoder	Via proximity sensor	Via proximity sensor, via inductive sensor
Description	• Recirculating ball bearing guide or heavy-duty guide • High precision and load capacity • Wide range of variants for customised applications	• Magnetic force transmission • Pressure-tight and zero leakage • Dirt-proof and dust-proof	• Magnetic force transmission • Recirculating ball bearing guide: combination of slide unit and rodless linear drive • Individual choice of end-position cushioning and sensing
online: →	**dgpl**	**dgo**	**slm**

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Software tool

FESTO

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 • either in the electronic catalogue by clicking on the blue button "Engineering" • or on the DVD under Engineering Tools.	

Semi-rotary drives

	 **Semi-rotary drives DRVS**	 **Semi-rotary drives DSM, DSM-B, DSM-HD-B**	 **Semi-rotary drives DSR, DSRL**
Size	6, 8, 12, 16, 25, 32, 40	6, 8, 10, 12, 16, 25, 32, 40, 63	10, 12, 16, 25, 32, 40
Theoretical torque at 6 bar	0.15 ... 20 Nm	0.15 ... 80 Nm	0.5 ... 20 Nm
Permissible mass moment of inertia	6.5 ... 350 kgcm²	6.5 ... 5000 kgcm²	0 ... 150 kgcm²
Position detection	Without	Without, via proximity sensor	Without
Swivel angle	0 ... 270 °	0 ... 270 °	0 ... 180 °
Description	• Double-acting semi-rotary drive with rotary vanes • Lighter than other semi-rotary drives • Fixed swivel angle, adjustable swivel angle possible with the help of accessories • Housing protected against splash water and dust	• Semi-rotary vane drive • With spigot shaft, hollow flanged shaft, tandem rotary vane and spigot shaft, tandem rotary vane and flanged shaft or heavy-duty bearing (HD)	• Semi-rotary vane drive • With spigot or hollow flanged shaft
online: →	**drvs**	**dsm**	**dsr**

Semi-rotary drives

	 **Semi-rotary drives DRRD**	 **Swivel/linear drive units DSL**
Size	8, 10, 12, 16, 20, 25, 32, 35, 40, 50, 63	16 mm, 20 mm, 25 mm, 32 mm, 40 mm
Theoretical torque at 6 bar	0.2 ... 112 Nm	1.25 ... 20 Nm
Permissible mass moment of inertia	15 ... 420000 kgcm²	0.35 ... 40 kgcm²
Position sensing	Via proximity sensor	for proximity sensor
Swivel angle	180 °	0 ... 272 °
Description	• Twin-piston rotary drive, power transmission via rack and pinion principle • Very high accuracy in the end positions • Very high bearing load capacity • Very good axial run-out at the flanged shaft	• Rotation and linear motion can be controlled individually or simultaneously • High repetition accuracy • With plain or recirculating ball bearing guide • Through piston rod
online: →	**drrd**	**dsl**

Tandem and high-force cylinders

	 **High-force cylinder** **ADNH**	 **Tandem cylinder** **DNCT**
Piston diameter	25 mm, 40 mm, 63 mm, 100 mm	32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm, 125 mm
Theoretical force at 6 bar, advancing	1036 ... 18281 N	898 ... 14244 N
Stroke	1 ... 150 mm	2 ... 500 mm
Description	• Mounting hole pattern to ISO 21287 • Max. 4 cylinders can be combined • Thrust increase • Only 2 connections are required to pressurise all cylinders • Piston rod with male or female thread • For position sensing	• Mounting hole pattern to ISO 15552 • Max. 2 cylinders can be combined • Thrust and return force increase • Piston rod with male thread • For position sensing
online: →	**adnh**	**dnct**

Multi-position cylinder

	 **Multi-position cylinder** **ADNM**
Piston diameter	25 mm, 40 mm, 63 mm, 100 mm
Theoretical force at 6 bar, advancing	295 ... 4712 N
Max. total of all individual strokes	1000 mm, 2000 mm
Description	• Mounting hole pattern to ISO 21287 • 2 ... 5 cylinders can be combined • Max. 5 positions can be approached • Piston rod with female or male thread • For position sensing
online: →	**adnm**

Drives with slides

FESTO

	 Mini slides DGSC	 Mini slides DGSL	 Mini slides SLF
Piston diameter	6 mm	6 mm, 8 mm, 10 mm, 12 mm, 16 mm, 20 mm, 25 mm, 32 mm	6 mm, 10 mm, 16 mm
Theoretical force at 6 bar, advancing	17 N	17 ... 483 N	17 ... 121 N
Stroke	10 mm	10 ... 200 mm	10 ... 80 mm
Cushioning	Elastic cushioning rings/pads at both ends	Short elastic cushioning rings/pads at both ends, no cushioning, elastic cushioning rings/pads at both ends, elastic cushioning rings/pads at both ends with fixed stop, shock absorber, self-adjusting, progressive, at both ends, with reducing sleeve, shock absorber, progressive, at both ends	Elastic cushioning rings/pads at both ends
Position detection	Without	Via proximity sensor	Via proximity sensor
Description	• Smallest guided slide unit on the market • Precision ball bearing cage guide: reliable and high-quality process • Long service life thanks to housing made from high-alloy steel • Low break-away pressure and uniform movement thanks to minimal friction from guide and seal	• High load capacity and positioning accuracy • Maximum movement precision thanks to ground-in ball bearing cage guide • Maximum flexibility thanks to 8 sizes • Reliable in the event of pressure drop thanks to clamping cartridge or end-position locking • Wide variety of mounting and attachment options • Compact design	• Flat design • Ball bearing cage guide • Versatile mounting options • Easy adjustment of end positions
online: →	dgsc	dgsl	slf

Drives with slides

	 Mini slides SLS	 Mini slides SLT	 slide units SPZ
Piston diameter	6 mm, 10 mm, 16 mm	6 mm, 10 mm, 16 mm, 20 mm, 25 mm	10 mm, 16 mm, 20 mm, 25 mm, 32 mm
Theoretical force at 6 bar, advancing	17 ... 121 N	34 ... 590 N	60 ... 724 N
Stroke	5 ... 30 mm	10 ... 200 mm	10 ... 100 mm
Cushioning	Elastic cushioning rings/pads at both ends	Shock absorber at both ends, elastic cushioning rings/pads at both ends	Elastic cushioning rings/pads at both ends with metal fixed stop
Position detection	Via proximity sensor	Via proximity sensor	Via proximity sensor
Description	• Flat design • Ball bearing cage guide • Versatile mounting options	• Powerful twin piston drive • Ball bearing cage guide • Versatile mounting options • Easy adjustment of end positions	• Twin-piston drive • High force with excellent protection against rotation • Plain or recirculating ball bearing guides • Widely spaced piston rods for high load capacity
online: →	sls	slt	spz

Drives with guide rods

	 **Guided drive DGRF**	 **Compact cylinder ADNGF**	 **Compact cylinder ADVUL**	 **Mini guided drive DFC**
Piston diameter	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	12 mm, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm	4 mm, 6 mm, 10 mm
Theoretical force at 6 bar, advancing	189 ... 1870 N	68 ... 4712 N	51 ... 4712 N	7.5 ... 47 N
Stroke	10 ... 400 mm	1 ... 400 mm	1 ... 400 mm	5 ... 30 mm
Cushioning	Elastic cushioning rings/pads at both ends, self-adjusting pneumatic end-position cushioning, pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends	Elastic cushioning rings/pads at both ends, self-adjusting pneumatic end-position cushioning	Elastic cushioning rings/pads at both ends	Elastic cushioning rings/pads at both ends
Position sensing	Via proximity sensor	Via proximity sensor	for proximity sensor	Without, via proximity sensor
Description	• Easy-to-clean design • Increased corrosion protection • FDA-approved lubrication and sealing on the basic version • Hygienic mounting of the sensors possible • Compact design with high guidance accuracy and load capacity • Long service life thanks to optional seal for unlubricated operation • Self-adjusting pneumatic end-position cushioning which adapts optimally to changes in load and speed	• Mounting hole pattern to ISO 21287 • Piston rod secured against rotation by means of guide rod and yoke plate • Plain-bearing guide • Available with through piston rod • For position sensing	• Piston rod secured against rotation by means of guide rod and yoke plate • Plain-bearing guide • Available with through piston rod • For position sensing	• Smallest guided drive • High precision and load capacity • Minimal space requirement • Drive and guide unit in a single housing • Plain or recirculating ball bearing guides
online: →	**dgrf**	**adngf**	**advul**	**dfc**

Drives with guide rods

FESTO

	 **Guided drive DFM, DFM-B**	 **Twin-piston cylinder DPZ**	 **Twin-piston cylinder DPZJ**	 **Linear units SLE**
Piston diameter	12 mm, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm	10 mm, 16 mm, 20 mm, 25 mm, 32 mm	10 mm, 16 mm, 20 mm, 25 mm, 32 mm	10 mm, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm
Theoretical force at 6 bar, advancing	68 ... 4712 N	60 ... 966 N	60 ... 724 N	47 ... 1178 N
Stroke	10 ... 400 mm	10 ... 100 mm	10 ... 100 mm	10 ... 500 mm
Cushioning	Elastic cushioning rings/pads at both ends, pneumatic cushioning, adjustable at both ends, shock absorber, soft characteristic curve	Elastic cushioning rings/pads at both ends	Elastic cushioning rings/pads at both ends	shock absorber, hard characteristic curve
Position detection	Via proximity sensor	Via proximity sensor	via proximity sensor	Via proximity sensor, via inductive sensor
Description	• Drive and guide unit in a single housing • High resistance to torques and lateral forces • Plain or recirculating ball bearing guides • Wide variety of mounting and attachment options • Wide range of variants for customised applications	• Twin pistons provide twice the force in half the space • Plain or recirculating ball bearing guides • Precision stroke adjustment in the end position	• With yoke plate on rear of cylinder for higher lateral forces and precision • Twin pistons provide twice the force in half the space • Plain or recirculating ball bearing guides • Precision stroke adjustment in the end position	• Combination of guide unit and standard cylinder • Multi-axis and drive combinations • Recirculating ball bearing guide
online: →	**dfm**	**dpz**	**dpzj**	**sle**

Linear modules

	 **Linear modules HMP**
Mode of operation	Double-acting
Piston diameter	16 mm, 20 mm, 25 mm, 32 mm
Stroke	50 ... 400 mm
Theoretical force at 6 bar, advancing	121 ... 483 N
Position sensing	Via proximity sensor
Description	• Precision, backlash-free guidance • High rigidity with a long stroke • Infinitely adjustable end stops • Flexible thanks to intermediate position • Adjustable end-position cushioning
online: →	**hmp**

Stopper cylinder

	 **Stopper cylinder DFSP**	 **Stopper cylinder DFST**	 **Stopper cylinder STAF**
Piston diameter	16 mm, 20 mm, 32 mm, 40 mm, 50 mm	50 mm, 63 mm, 80 mm	32 mm, 80 mm
Permissible impact force on the advanced piston rod	710 ... 6280 N	3000 ... 6000 N	480 ... 14600 N
Stroke	5 ... 30 mm	30 ... 40 mm	20 ... 40 mm
Position sensing	Via proximity sensor	Via proximity sensor	Via proximity sensor
Toggle lever position sensing		Via inductive sensor	
Description	• Trunnion version with/without female thread, with/without protection against rotation • Roller version with protection against rotation • Compact design • Sensor slots on 3 sides • Long service life thanks to very good cushioning characteristics and sturdy piston rod guide • Workpiece carriers, pallets and packages weighing up to 90 kg can be safely stopped	• Toggle lever design • Integrated, adjustable shock absorber for smooth and adapted stopping • Up to 800 kg impact load • For position sensing on the piston • Lever locking mechanism • Toggle lever deactivator	• Roller version, toggle lever design • Absorption of high lateral forces • Direct mounting of solenoid valves on flange plate
online: →	**dfsp**	**dfst**	**staf**

Clamping cylinder

FESTO

	 **Clamping modules** **EV**
Clamping area	Ø16 mm, Ø20 mm, Ø25 mm, Ø32 mm, Ø40 mm, Ø50 mm, Ø63 mm, Ø12 mm, 10x30, 15x40, 15x63, 20x120, 20x180, 20x75
Stroke	3 ... 5 mm
Description	• Compact rodless cylinder with diaphragm • Single-acting, with reset function • Flat design • Hermetically sealed • Pressure plates and foot mounting as accessories
online: ➔	ev

Linear/swivel clamp

	 **Linear/swivel clamp** **CLR**
Piston diameter	12 mm, 16 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm
Theoretical clamping force at 6 bar	51 ... 1682 N
Clamping stroke	10 ... 50 mm
Swivel angle	90° +/- 2°, 90° +/- 3°, 90° +/- 4°
Description	• Swivelling and clamping in one step • Swivel direction adjustable • Clamping fingers as accessories • Available with dust and welding spatter protection • Double-acting • For position sensing
online: ➔	clr

Hinge cylinders

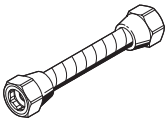
	 **Hinge cylinders** **DFAW**	 **Hinge cylinders** **DW**
Piston diameter	50 mm, 63 mm, 80 mm	50 mm, 63 mm, 80 mm
Stroke	10 ... 200 mm	10 ... 200 mm
Theoretical force at 6 bar, advancing	1178 ... 3016 N	1178 ... 3016 N
Position sensing	via proximity sensor	Without, via proximity sensor
Cushioning	self-adjusting pneumatic end-position cushioning	Pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends
Description	• Clamping of components during the welding process • Double-acting • Easy to mount thanks to swivel bearing on the bearing cap • Integrated flow control • Integrated, self-adjusting end-position cushioning	• Clamping of components during the welding process • Double-acting • Easy to mount thanks to swivel bearing on the bearing cap • Integrated flow control • Integrated end-position cushioning
online: →	**dfaw**	**dw**

Bellows actuators

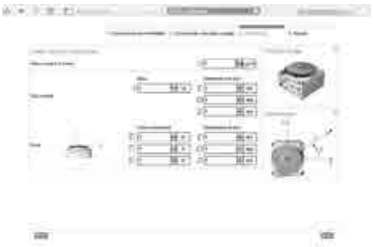
	 **Bellows actuators** **EB**
Size	80, 145, 165, 215, 250, 325, 385
Stroke	20 ... 230 mm
Description	• Use as a spring element or for reducing oscillations • Single-bellows or double-bellows cylinder • High forces with a short stroke • Uniform movement: no stick-slip effect • Use in dusty environments or in water • Maintenance-free
online: →	**eb**

Fluidic muscle

FESTO

	 **fluidic muscle DMSP**	 **fluidic muscle MAS**
Size	10, 20, 40, 5	10, 20, 40
Theoretical force at 6 bar	140 ... 6000 N	480 ... 6000 N
Nominal length	30 ... 9000 mm	40 ... 9000 mm
Max. contraction	25% of nominal length, 20% of nominal length	25% of nominal length
Description	• With press-fitted connection • Up to 30% less weight: a superb force/weight ratio • Single-acting, pulling • Three integrated adapter variants • 10 times the initial force of a comparable pneumatic cylinder • Uniform movement: no stick-slip effect • Hermetically sealed design offers protection against dust, dirt and moisture	• With screwed connection • Optionally with force retention • Single-acting, pulling • Use of customised mounting options • 10 times the initial force of a comparable pneumatic cylinder • Uniform movement: no stick-slip effect • Hermetically sealed design offers protection against dust, dirt and moisture
online: →	**dmsp**	**mas**

Software tool

Rotary indexing table		This tool helps you to select the right rotary indexing table of the 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 best suited to your application.	This tool can be found • either in the electronic catalogue by clicking on the blue button "Engineering" • or on the DVD under Engineering Tools.

Rotary indexing tables

	 **Rotary indexing tables DHTG**
Size	65, 90, 140, 220
Theoretical torque at 6 bar	2.1 ... 58.9 Nm
Indexing stations	2 ... 24
Description	• For swivelling or separating tasks • Sturdy mechanical system • Easy planning and commissioning • Rotary table diameters: 65, 90, 140, 220 mm • Free control of rotational direction
online: →	**dhtg**

Linear actuators for process automation

	 **Linear actuators with displacement encoder** **DFPI**	 **Copac linear actuators** **DLP**
Design	Piston rod, cylinder barrel	Piston rod
Mode of operation	Double-acting	Double-acting
Size of valve actuator	100, 125, 160, 200, 250, 320	80, 100, 125, 160, 200, 250, 320
Flange hole pattern	F07, F10, F14	
Operating pressure	3 ... 8 bar	2 ... 8 bar
Ambient temperature	-20 ... 80 °C	-20 ... 80 °C
Description	• Closed-loop controlled actuator for all linear process valves • Optionally with integrated positioning controller and valve block • Position feedback via analogue 4 ... 20 mA signal for simple diagnostics • Easy to integrate into existing control architecture • Sturdy and compact housing for use outdoors • Connection for process valves to DIN 3358	• NAMUR port pattern for solenoid valves to VDI/VDE 3845 • Integrated air supply • Connection for process valves to DIN 3358
online: →	dfpi	dlp

Quarter turn actuators for process automation

	 **Quarter turn actuators** **DAPS**	 **Quarter turn actuators** **DFPB**
Design	Scotch yoke system	Rack and pinion
Mode of operation	Double-acting, single-acting	Double-acting, single-acting
Size of valve actuator	0008, 0015, 0030, 0053, 0060, 0090, 0106, 0120, 0180, 0240, 0360, 0480, 0720, 0960, 1440, 1920, 2880, 3840, 4000, 5760, 8000	10, 15, 20, 30, 40, 45, 60, 65, 80, 110, 120, 150, 170, 180, 230, 270, 300, 330, 370, 420, 470, 520, 550, 670, 840, 1050
Flange hole pattern	F03, F04, F05, F07, F10, F12, F14, F16, F25	F03, F04, F05, F14, F0507, F0710, F1012
Operating pressure	1 ... 8.4 bar	1 ... 8 bar
Ambient temperature	-50 ... 150 °C	-20 ... 80 °C
Description	• High breakaway torques • Approved in accordance with Directive 2014/34/EU (ATEX) • Flange hole pattern to ISO 5211 • Mounting hole pattern to VDI/VDE 3845 • Available with handwheel as a manual emergency override • Corrosion-resistant version made from stainless steel	• Identical torque characteristic across the entire rotation angle range of 90° • Process valve connection to ISO 5211 on both sides • Can be mounted on all process valves using pressure relief slot • Mounting hole pattern to VDI/VDE 3845 • Sturdy, non-slip and easy-to-clean aluminium housing • Long service life, low wear • Increased corrosion protection
online: →	daps	dfpb

Cylinder/valve combinations

FESTO

	 **ISO cylinder** **DNC-V**
Mode of operation	Double-acting
Piston diameter	32 mm, 40 mm, 50 mm, 63 mm, 80 mm, 100 mm
Theoretical force at 6 bar, advancing	415 ... 4712 N
Stroke	100 ... 2000 mm
Cushioning	Elastic cushioning rings/pads at both ends, pneumatic cushioning, adjustable at both ends cushioning adjustable at both ends
Description	• Mounting hole pattern to ISO 15552 • Assembled and fitted with tubing ready for connection • Particularly suitable for decentralised use in larger systems • Valve versions: single or double solenoid valves, mounted on the right or left • For position sensing • Wide range of variants for customised applications
online: →	dnc-v

Software tool

Shock absorber		Whether diagonal or vertical, curved or straight, lever or disc, all types of cushioned movements are taken into account. The software tool always recommends the best shock absorber.	This tool can be found • either in the electronic catalogue by clicking on the blue button "Engineering" • or on the DVD under Engineering Tools.

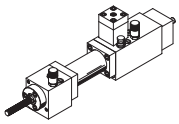
Shock absorber

	 **Shock absorber** **DYSR**	 **shock absorber** **YSR-C**	 **shock absorber** **YSRW**	 **Shock absorber** **YSRW-DGC**
Stroke	8 ... 60 mm	4 ... 60 mm	8 ... 34 mm	
Max. energy absorption per stroke	4 ... 384 J	0.6 ... 380 J	1.3 ... 70 J	
Cushioning	Adjustable	Self-adjusting	Self-adjusting, soft characteristic curve	Self-adjusting, soft characteristic curve
Description	• Hydraulic shock absorber with spring return • Adjustable cushioning hardness	• Hydraulic shock absorber with path-controlled flow control function • Rapidly increasing cushioning force curve • Short cushioning stroke • Suitable for rotary drives	• Hydraulic shock absorber with path-controlled flow control function • Gently increasing cushioning force curve • Long cushioning stroke • Suitable for low-vibration operation • Short cycle times possible	• For linear drives DGC • Gently increasing cushioning force curve • Sizes 12, 18, 25, 32, 40, 50, 63
online: →	dysr	ysr-c	ysrw	ysrw-dgc

Shock absorber

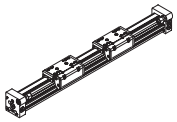
	 **Shock absorber YSRWJ**	 **Shock absorber DYEF-Y1, DYEF-Y1F**	 **Shock absorber DYSC**	 **shock absorber DYSW**
Stroke	8 ... 14 mm	0.9 ... 7 mm	4 ... 25 mm	6 ... 20 mm
Max. energy absorption per stroke	1 ... 3 J	0.005 ... 1.2 J	0.6 ... 100 J	0.8 ... 12 J
Cushioning	Self-adjusting, soft characteristic curve	Elastic cushioning rings/pads at both ends with metal fixed stop, elastic cushioning rings/pads at both ends without metal fixed stop	Self-adjusting	Self-adjusting, soft characteristic curve
Description	• Cushioning with self-adjusting, progressive hydraulic shock absorber • Gently increasing cushioning force curve • Adjustable cushioning stroke • End-position sensing with proximity sensor SME/SMT-8 • Precision end-position adjustment	• Mechanical shock absorber with flexible rubber buffer • Flexible rubber buffer allows a defined metal end position • Adjustable cushioning hardness • Ideal for cushioning low energy • With precise metal end position	• Hydraulic shock absorber with path-controlled flow control function • Rapidly increasing cushioning force curve • Short cushioning stroke • Suitable for rotary drives • With metal fixed stop	• Hydraulic shock absorber with path-controlled flow control function • Gently increasing cushioning force curve • Long cushioning stroke • Suitable for low-vibration operation • Short cycle times possible • With metal fixed stop
online: →	ysrwj	dyef	dysc	dysw

Shock absorber

	 **Hydraulic cushioning cylinder DYHR**	 **Hydraulic cushioning cylinder YD**	 **Hydraulic cushioning cylinder YZL**
Stroke	20 ... 60 mm	70 ... 250 mm	80 ... 250 mm
Max. energy absorption per stroke	32 ... 384 J	80 N when flow control valve is open ... 4000 N	220 N retracting, 150 N advancing ... 4000 N
Cushioning	Adjustable	Adjustable	Adjustable
Description	• Hydraulic cushioning cylinder for constant, slow braking speeds across the entire stroke • Braking speed can be precisely adjusted • A built-in compression spring returns the piston rod to the initial position • Suitable for slow feed speeds in the range up to 0.1 m/s	• With speed control in one direction (retracting piston rod) and rapid traverse (advancing piston rod) • For infinitely adjustable, slow constant speed	• With speed regulation in both directions and pneumatic actuator for intermediate rapid traverse during advancing and retracting • For infinitely adjustable, slow constant speed
online: →	dyhr	yd	yzl

Accessories for pneumatic drives

FESTO

	 Guide units FEN, FENG	 Guide axes DGC-FA	 Guide axes FDG
Size	8/10, 12/16, 20, 25, 32, 40, 50, 63, 80, 100	8, 12, 18, 25, 32, 40, 50, 63	18, 25, 32, 40, 50, 63
Stroke	1 ... 500 mm	1 ... 8500 mm	1 ... 4500 mm
Round material to be clamped			
Static holding force			
Description	• For protecting standard cylinders against rotation at high torque loads • Plain or recirculating ball bearing guides • High guide precision for workpiece handling	• Basic design, plain or recirculating ball bearing guides • All settings accessible from one side • Optionally with variable end stops and intermediate position module • Exchangeable with DGPL thanks to foot mountings • Software tool available for bearing calculation • Optional: NSF-H1 lubricant for the food industry • Optional: clamping unit for holding loads	• Without drive • With recirculating ball bearing guide • With guide and freely movable slide unit • Increased torsional resistance • Reduced vibrations with dynamic loads • For supporting force and torque capacity in multi-axis applications
online: →	fen	dgc-fa	fdg

Accessories for pneumatic drives

	 Clamping cartridges KP	 Clamping units KPE, KEC, KEC-S	 Clamping unit, clamping components DADL
Size			16, 20, 25, 32, 35, 40, 50, 63
Stroke			
Round material to be clamped	4 ... 32 mm	4 ... 32 mm	
Static holding force	80 ... 7500 N	80 ... 8000 N	
Description	• For in-house assembly of clamping units • Not certified for use in safety-relevant control systems	• KPE: ready-to-install combination of clamping cartridge KP and housing • KEC: for use as a holding device (static application) • KEC-S: for safety-related applications	• Clamping unit DADL-EL: for quarter turn actuator DRRD, for mechanical lock in the end positions to prevent unwanted movement in unpressurised condition • Clamping component DADL-EC: for quarter turn actuator DRRD, for securing an intermediate position in combination with the clamping unit DADL-EL
online: →	kp	kpe	dadl

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 – from minor product modifications to complete new product developments.

Common product modifications:
- Materials for special ambient 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.
Further information on customised components can be found on your local website at www.festo.com

Software tool

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2

Soft Stop

Soft Stop virtually makes the impossible possible. Travel times are reduced by as much as 30% for pneumatic drives and vibration is also greatly reduced. The selection program performs all of the necessary calculations.

This tool can be found
- either in the electronic catalogue by clicking on the blue button "Engineering"
- or on the DVD under Engineering Tools.

Linear drives with displacement encoder

	 **Linear drive with displacement encoder DDLI**	 **ISO cylinder with displacement encoder DDPC**	 **ISO cylinder with displacement encoder DNCI**	 **Linear drive with displacement encoder DGCI**
Piston diameter	25 mm, 32 mm, 40 mm, 63 mm	80 mm, 100 mm	32 mm, 40 mm, 50 mm, 63 mm	18 mm, 25 mm, 32 mm, 40 mm, 63 mm
Theoretical force at 6 bar, advancing	295 ... 1870 N	3016 ... 4712 N	415 ... 1870 N	153 ... 1870 N
Max. load, horizontal	30... 180 kg	300 ... 450 kg	45 ... 180 kg	1 ... 180 kg
Max. load, vertical	10 ... 60 kg	100 ... 150 kg	15 ... 60 kg	1 ... 60 kg
Stroke	100 ... 2000 mm	10 ... 2000 mm	10 ... 2000 mm	100 ... 2000 mm
Description	• Based on linear drive DGC-K • Without guide • With displacement encoder for contactless measurement • Suitable for positioning with axis controller CPX-CMAX • Suitable for end-position control with end-position controller CPX-CMPX or SPC11 • Can be used as a measuring cylinder • Supply ports on end face	• Standards-based cylinder to ISO 15552 • With displacement encoder for contactless measurement • Suitable for positioning with axis controller CPX-CMAX • Suitable for end-position control with end-position controller CPX-CMPX or SPC11 • Can be used as a measuring cylinder • Piston rod variants • Fixed cushioning	• Standards-based cylinder to ISO 15552 • With integrated displacement encoder for relative analogue, contactless measuring • Suitable for servopneumatic applications with axis controller CPX-CMAX, end-position controller CPX-CMPX or SPC11 and measuring module CPX-CMIX • Piston rod with male thread • Piston rod variants	• With guide • With displacement encoder for absolute and contactless measurement • Suitable for servopneumatic applications with axis controller CPX-CMAX, end-position controller CPX-CMPX or SPC11 and measuring module CPX-CMIX • Supply ports optionally on end face or front
online: →	**ddli**	**ddpc**	**dnci**	**dgci**

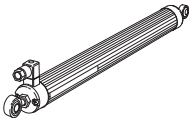
Semi-rotary drives with displacement encoder

	 **Semi-rotary drive with angular displacement encoder** **DSMI**
Piston diameter	25 mm, 40 mm, 63 mm
Theoretical torque at 6 bar	5 ... 40 Nm
Max. mass moment of inertia, horizontal	0.03 ... 0.6 kgm²
Max. mass moment of inertia, vertical	0.03 ... 0.6 kgm²
Swivel angle	0 ... 272 °
Description	• With rotary vane • Integrated rotary encoder • Suitable for servopneumatic applications with axis controller CPX-CMAX, end-position controller CPX-CMPX or SPC11 and measuring module CPX-CMIX • Compact design
online: ➔	dsmi

Axis controllers

	 **Axis controller** **CPX-CMAX**	 **End-position controller** **CPX-CMPX**	 **End-position controller** **SPC11**
No. of axis strings	1	1	1
Axes per string	1	1	1
Description	• Axis controller as CPX module, supports pneumatic drives with piston rod, rodless drives and semi-rotary drives • Force and position control • Use with all fieldbus/Ethernet and CEC controllers available on CPX • Easy commissioning thanks to auto identification function • Rapid commissioning and comprehensive diagnostics with the parameterisation software FCT	• Electronic end-position control for pneumatic drives • Soft Stop for smooth braking and quick acceleration • Use with all fieldbus/Ethernet available on CPX • Easy commissioning with Festo plug and work • Approx. 30% shorter travel times and 30% less air consumption than with comparable standard pneumatics	• Quickly and smoothly into the end position with two additional intermediate positions • Electronic end-position cushioning • Quick and easy commissioning: configure, teach, done • Supports pneumatic drives with piston rod, rodless drives and semi-rotary drives
online: ➔	cpx-cmax	cpx-cmpx	spc11

Displacement encoders

	 **Displacement encoder MLO-POT-TLF**	 **Displacement encoder MLO-POT-LWG**	 **Displacement encoder MME-MTS-TLF**
Stroke	225 ... 2000 mm	100 ... 750 mm	225 ... 2000 mm
Measuring principle of displacement encoder	Analogue	Analogue	Digital
Output signal	Analogue	Analogue	CAN protocol type SPC-AIF
Displacement resolution	0.01 mm	0.01 mm	‹0.01 mm
Description	• Conductive plastic potentiometer • Absolute measurement with high resolution • High travel speed and long service life • Several mounting options on pneumatic linear drives DGPL • Plug-in connections	• Connecting rod potentiometer • Absolute measurement with high resolution • Long service life • High protection class • Plug-in connections	• Measuring principle: magnetostrictive • Contactless with absolute measurement • High travel speed • System product for servopneumatic positioning technology and Soft Stop
online: ➔	**mlo**	**mlo**	**mme**

Proportional valves

	 **Proportional directional control valves VPWP**	 **Proportional directional control valves MPYE**
Valve function	5/3-way proportional directional control valve, closed	5/3-way, closed
Pneumatic connection 1	G1/8, G1/4, G3/8	G1/8, G1/4, G3/8, M5
Operating pressure for positioning/Soft Stop	4 ... 8 bar	
Operating pressure	0 ... 10 bar	0 ... 10 bar
Standard nominal flow rate	350 ... 2000 l/min	100 ... 2000 l/min
Description	• Regulated piston spool valve • Digital actuation • Integrated pressure sensors for monitoring function and force control • With auto identification • Diagnostic function • Integrated digital output, e.g. for a clamping/brake unit • Suitable for servopneumatic applications with CPX-CMAX and CPX-CMPX	• Regulated piston spool valve • Analogue actuation • Setpoint input as analogue voltage signal (0 ... 10 V) • Suitable for servopneumatic applications with SPC11
online: ➔	**vpwp**	**mpye**

Sensor interfaces

	 **Sensor interface CASM**	 **Measured-value transducer DADE**
Diagnostic function	Display via LED	Display via LED
Electrical connection, displacement encoder	M12, socket, 8-pin, 5-pin	M12, socket, 8-pin
Electrical connection, control interface	M9, plug connector, 5-pin	
Control interface	Digital, CAN bus with Festo protocol, without terminating resistor	
Description	• For actuating pneumatic positioning drives with the latest servopneumatic systems such as CPX-CMAX, CPX-CMPX and CPX-CMIX • Short cables for analogue signals, secure digitised bus transmission • Convenient plug and work concept with auto identification and comprehensive diagnostics • High protection class IP67	• For ISO cylinders DNCI and DDPC • Converts sensor signals into voltage or current signals • Diagnostic display via LED • Mounting via through-holes
online: →	**casm**	**dade**

Software tool

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engineering software		Which electromechanical linear drive best meets your needs? Enter the data for your application, such as position values, effective loads and mounting position, and the software suggests a number of solutions.	This tool can be found • either in the electronic catalogue by clicking on the blue button "Engineering" • or on the DVD under Engineering Tools.

Linear drives and slides

	 **Electric cylinder EPCO**	 **Electric cylinders ESBF**	 **Spindle axes EGC-BS**	 **Spindle axes EGC-HD-BS**
Size	16, 25, 40	32, 40, 50, 63, 80, 100	120, 185, 70, 80	125, 160, 220
Max. feed force Fx	50 ... 650 N	1000 ... 17000 N	300 ... 3000 N	300 ... 1300 N
Repetition accuracy	+/-0.02 mm	+/-0.01 mm, +/-0.015 mm, +/-0.05 mm	+/-0.02 mm	+/-0.02 mm
Stroke	1 ... 400 mm	100 ... 400 mm	50 ... 3000 mm	50 ... 2400 mm
Description	• Linear drive with permanently attached motor • With ball screw • Optional: encoder, holding brake and female thread on the piston rod • Two different spindle pitches for high force or high speed • Suitable for simple applications in factory automation that in the past were mostly carried out using pneumatic solutions • Cost-optimised • New accessories: precision and backlash-free guidance	• With recirculating ball spindle (size 32 ... 100) or lead screw (size 32 ... 50) available as spindle drive • Optional: high corrosion protection, protection class IP65, suitable for use in the food industry, piston rod extension • Ball screw: three spindle pitches make it possible to select the optimal force-speed ratio • Ball screw: high rigidity and precision • Axial or parallel motor mounting	• Recirculating ball bearing guide for high loads and torques • Optionally with clamping unit, at one or both ends • Profile with optimised rigidity • Various spindle pitches • The spindle support enables maximum travel speed • Axial or parallel motor mounting	• With heavy-duty guide • With integrated ball screw • For maximum loads and torques, high feed forces and speeds and long service life • Precise and resilient DUO guide
online: →	**epco**	**esbf**	**egc**	**egc**

Linear drives and slides

	 Toothed belt axes EGC-TB	 Toothed belt axes EGC-HD-TB	 Mini slides EGSL	 Mini slides SLTE
Size	120, 185, 50, 70, 80	125, 160, 220	35, 45, 55, 75	10, 16
Max. feed force Fx	50 ... 2500 N	450 ... 1800 N	75 ... 450 N	
Repetition accuracy	+/-0.08 mm, +/-0.1 mm		+/-0.015 mm	+/100,000 µm
Stroke	50 ... 8500 mm	50 ... 5000 mm	50 ... 300 mm	50 ... 150 mm
Description	• Recirculating ball bearing guide for high loads and torques • Optionally with clamping unit, at one or both ends • Profile with optimised rigidity	• With heavy-duty guide • For high loads and torques and high feed forces • Precise and resilient DUO guide • Motor can be mounted on any one of 4 sides	• Very high rated slide loads, ideal for vertical applications such as press-fitting or joining • Reliable: the completely closed spindle stops dirt or stray small parts getting into the guide area • Flexible: motor can be attached laterally or axially, in this case turned by 4 x 90°	• Electromechanical linear axis with lead screw spindle • With DC servo motor • Easy actuation via I/O interface, PROFIBUS, CANopen, DeviceNet • Precise and rigid guide
online: ➔	egc	egc	egsl	slte

Linear drives and slides

	 Electric slide EGSK	 Electric slide EGSP	 Spindle axes ELGA-BS-KF	 Toothed belt axes ELGA-TB-G
Size	15, 20, 26, 33, 46	20, 26, 33, 46	70, 80, 120, 150	120, 70, 80
Max. feed force Fx	19 ... 392 N	69 ... 466 N	300 ... 3000 N	350 ... 1300 N
Repeat accuracy	+/-0.003 - +/-0.004 mm, +/-0.003 - +/-0.01 mm, +/-0.01 mm	+/-0.003 - +/-0.01 mm	+/-0.02 mm	+/-0.08 mm
Stroke	25 ... 840 mm	25 ... 840 mm	50 ... 3000 mm	50 ... 8500 mm
Description	• Electromechanical linear axis with recirculating ball spindle • Recirculating ball bearing guide and ball screw without caged ball bearings • Standardised mounting interfaces • Compact design • High rigidity	• Electromechanical linear axis with recirculating ball spindle • Recirculating ball bearing guide with caged ball bearings • Size 33, 46: ball screw with caged ball bearings • Low-maintenance • Uniform operating behaviour with very low noise levels • Standardised mounting interfaces • Compact design • High rigidity	• Internal, precision recirculating ball bearing guide with high load capacity for high torque loads • The guide and spindle are protected by a cover band • Precision guide rail with high load capacity • For the highest requirements in terms of feed force and accuracy • Speeds up to 2 m/s with high acceleration up to 15 m/s² • Space-saving position sensing • Flexible motor connection	• Integrated plain-bearing guide • For small and medium loads • Low guide backlash • Actuator for external guides • Speeds up to 5 m/s with high acceleration up to 50 m/s² • Flexible motor mounting • Motor can be mounted on any one of 4 sides
online: ➔	egsk	egsp	elga	elga

Linear drives and slides

FESTO

3

	 Toothed belt axes ELGA-TB-RF	 Toothed belt axes ELGA-TB-KF	 Toothed belt axes ELGG	 Toothed belt axes ELGR
Size	70, 80, 120	70, 80, 120, 150	35, 45, 55	35, 45, 55
Max. feed force Fx	260 ... 1000 N	260 ... 2000 N	50 ... 350 N	50 ... 350 N
Repetition accuracy	+/-0.08 mm	+/-0.08 mm, +/-0.1 mm	+/-0.1 mm	+/-0.1 mm
Stroke	50 ... 7400 mm	50 ... 8500 mm	50 ... 1200 mm	50 ... 1500 mm
Description	• Integrated roller bearing guide • High speeds up to 10 m/s with high acceleration up to 50 m/s² • Guide backlash = 0 mm • Very good operating performance under torque load • Sturdy alternative for the recirculating ball bearing guide • As an actuator for external guides, especially for high speeds • Motor can be mounted on any one of 4 sides	• Internal, precision recirculating ball bearing guide with high load capacity for high torque loads • Guide and toothed belt protected by cover band • Precision guide rail with high load capacity • Speeds up to 5 m/s with high acceleration up to 50 m/s² • High feed forces • Flexible motor connection	• Toothed belt axis with two opposing slides • With low-cost plain bearing and precise ball bearing guide • Optional central support improves the rigidity • Motor can be mounted on any one of 4 sides	• Optimum price/performance ratio • Ready-to-install unit for quick and easy design • With plain or recirculating ball bearing guide • Motor can be mounted on any one of 4 sides • Also available as OMS product
online: →	elga	elga	elgg	elgr

Linear drives and slides

	 Cantilever axes DGEA-ZR	 Toothed belt axes DGE-ZR, DGE-ZR-KF, DGE-ZR-HD	 Toothed belt axes DGE-ZR-RF
Size	18, 25, 40	12, 18, 25, 40, 63, 8	25, 40, 63
Max. feed force Fx	230 ... 1000 N	15 ... 1500 N	260 ... 1500 N
Repetition accuracy	+/-0.05 mm	+/-0.08 mm, +/-0.1 mm	+/-0.1 mm
Stroke	1 ... 1000 mm	1 ... 4500 mm	1 ... 5000 mm
Description	• Toothed belt drive with recirculating ball bearing guide • Dynamic cantilever operation • Stationary drive head	• Electromechanical axis with toothed belt; DGE-ZR: without guide; DGE-ZR-KF: with recirculating ball bearing guide • Optional protected version	• Electromechanical axis with toothed belt and internal roller bearing guide • High speeds possible
online: →	dgea	dge-zr	dge-zr

Linear drives and slides

	 Spindle axes DGE-SP	 Positioning axes DMES
Size	18, 25, 40, 63	18, 25, 40, 63
Max. feed force Fx	140 ... 1600 N	240 ... 3000 N
Repetition accuracy	+/-0.02 mm	+/-0.05 mm, +/-0.07 mm
Stroke	100 ... 2000 mm	50 ... 1800 mm
Description	• Basic version or with recirculating ball bearing guide • Optional protected version	• Mechanical linear drive with lead screw spindle • Without guide or with recirculating ball bearing guide • High feed forces of up to 3000 N
online: →	dge-sp	dmes

Semi-rotary drives

	 Rotary drive ERMO	 Rotary modules ERMB
Size	12, 16, 25, 32	20, 25, 32
Max. driving torque	0.15 ... 5 Nm	0.7 ... 8.5 Nm
Max. input speed	50 ... 100 1/min	900 ... 1350 rpm
Rotation angle	Infinite	Infinite
Description	• Electric rotary drive with stepper motor and integrated gear unit • ServoLite – closed-loop operation with encoder • Heavy-duty bearing for high forces and torques • Backlash-free pre-stressed rotating plate with very good axial eccentricity and concentricity properties • Quick and accurate installation • For simple rotary indexing table applications and as a rotary axis in multi-axis applications	• Electromechanical rotary module with toothed belt • Compact design • Mounting interfaces on all sides • Stable arrangement of the output shaft bearings • Unlimited and flexible rotation angle
online: →	ermo	ermb

Electric handling modules

	 Rotary/lifting modules EHMB
Size	20, 25, 32
Max. driving torque	0.7 ... 6.7 Nm
Max. input speed	900 ... 1350 rpm
Rotation angle	Infinite
Description	• Complete module with combined and configurable rotary/lifting movement • Dynamic, flexible, economical thanks to the modular drive concept for the linear movement • Hollow axis with large internal diameter makes laying power supply lines easy, convenient and safe
online: →	ehmb

Linear guides

FESTO

	 Guide units EAGF	 Guide axes ELFA	 Guide axes ELFR
Size	16, 25, 32, 40, 50, 63, 80, 100	70, 80	35, 45, 55
Stroke	1 ... 500 mm	50 ... 7000 mm	50 ... 1500 mm
Guidance	Recirculating ball bearing guide	Roller bearing guide	Plain-bearing guide, recirculating ball bearing guide
Description	• For electric cylinder EPCO and ESBF • For absorption of high forces and torques from the process • High guide precision	• For drive axis ELGA • For supporting force and torque capacity in multi-axis applications • Increased torsional resistance • Reduced vibrations with dynamic loads	• Driveless guide unit with guide and freely movable slide • For supporting force and torque capacity in multi-axis applications • Higher torsional resistance
online: →	**eagf**	**elfa**	**elfr**

Linear guides

	 Guide axes EGC-FA	 Guide axes FDG-ZR-RF
Size	120, 185, 70, 80	25, 40, 63
Stroke	50 ... 8500 mm	1 ... 5000 mm
Guidance	Recirculating ball bearing guide	Roller bearing
Description	• Driveless guide unit with guide and freely movable slide • For supporting force and torque capacity in multi-axis applications • Increased torsional resistance	• Driveless linear guide unit with guide and freely movable slide unit • For supporting force and torque capacity in multi-axis applications • Higher torsional resistance
online: →	**egc**	**fdg**

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 – from minor product modifications to complete new product developments.

Common product modifications:
- Special strokes
- Design for special ambient conditions
- Design optimised for the fitting 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.
Further information on customised components can be found on your local website at www.festo.com

Software tool

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Festo Configuration Tool (FCT)		FCT is a configuration and parameterisation software program that supports all Festo devices, in particular motor controllers. It 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 parameterisation software can be found on the website under Support › Support Portal › enter search term.
CODESYS		CODESYS for standardised programming of embedded devices according to IEC 61131-3. It makes your life easier with simple commissioning, fast programming and parameterisation. Advantages • Hardware-neutral software platform for quick and easy configuration, programming and commissioning of pneumatic and electrical automation solutions • Extensive module libraries for single or multi-axis positioning motions.	• The IEC 61131-3 standard means that CODESYS is flexible and open for all types of control tasks. • Modular: offline and online functions as well as components for hardware configuration and visualisation • User-friendly IEC function block extension • Re-use of existing application parts The parameterisation software can be found on the website under Support › Support Portal › enter search term.

Servo motors

	 **Servo motors EMME-AS**	 **Servo motors EMMS-AS**	 **Motor units MTR-DCI**
Nominal torque	0.12 ... 6.4 Nm	0.14 ... 22.63 Nm	
Nominal rotational speed	3000 ... 9000 rpm	2000 ... 10300 rpm	3000 ... 3400 rpm
Peak torque	0.7 ... 30 Nm	0.5 ... 120 Nm	
Max. rotational speed	3910 ... 10000 rpm	2210 ... 23040 rpm	3000 ... 3400 rpm
Description	• Brushless, permanently excited synchronous servo motor • Digital absolute displacement encoder, single turn or multi-turn • Reliable, dynamic, precise • Optimised connection technology • Over 40 stock types • Available with holding brake	• Permanently excited, electrodynamic, brushless servo motor • Digital absolute displacement encoder, single turn or multi-turn • 66 stock types • 490 built-to-order variants • Optionally with holding brake, IP65, resolver • Various winding variants	• DC motor with encoder • Gear unit, controller, integrated power electronics • Gear ratios: 7:1, 14:1, 22:1 • Parameterisation interface RS232 • I/O, PROFIBUS, CANopen, PROFIBUS DP, DeviceNet interface • Control panel with display, optional
online: →	**emme**	**emms**	**mtr**

Stepper motors

FESTO

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	 **Stepper motors** **EMMS-ST**
Maximum speed	430 ... 6000 1/min
Motor holding torque	0.09 ... 9.3 Nm
Description	• Small increment and high driving torques by 2-phase hybrid technology • Optimised connection technology • 28 stock types • With incremental encoder for closed-loop operation • Available with holding brake
online: ➔	**emms**

Controllers for AC servo motors

	 **Motor controller** **CMMP-AS-M0, CMMP-AS-M3**
Nominal current	2 ... 20 A
Nominal operating voltage AC	230 ... 400 V
Nominal operating voltage phases	1-phase, 3-phase
Rated output of controller	500 ... 12000 VA
Fieldbus coupling	PROFIBUS DP, CANopen, DeviceNet, Ethernet, EtherNet/IP, PROFINET, Sercos
Description	• Many interfaces and functions for decentral motion functions (flying saw, flying measurement, modulo function, etc.) • For cam disk controllers and highly dynamic movements • Standardised interfaces allow seamless integration in mechatronic multi-axis modular systems • Reliable and easy commissioning and parameterisation with the Festo Configuration Tool (FCT) • Optionally with 3 slots for switch or safety module, for extension module • Integrated process interfaces: Modbus/TCP, CAN bus and digital I/O module • Further extension modules: PROFIBUS, PROFINET, EtherCAT, etc.
online: ➔	**cmmp**

Controllers for DC servo motors

	 **Motor controller SFC-DC**
Nominal current, load supply	3 A
Nominal voltage, load supply DC	24 V
Rated output of controller	75 VA
Fieldbus coupling	PROFIBUS DP, CANopen, DeviceNet
Description	• For actuating mini slide SLTE and parallel gripper HGPLE • Easy actuation via I/O interface, PROFIBUS, CANopen, DeviceNet • With or without control panel • Parameterisation via control panel or parameterisation software FCT • Field controller with degree of protection IP54 • Reliable and easy commissioning and parameterisation with the Festo Configuration Tool (FCT)
online: →	**sfc-dc**

Controllers for stepper motors

	 **Motor controller CMMO-ST**	 **Motor controller CMMS-ST**
Nominal current, load supply	6 A	8 O
Max. step frequency		4 kHz
Controller operating mode	PWM MOSFET power output stage, cascade controller with P position controller, PI speed controller, PI current controller	PWM MOSFET power output stage
Fieldbus coupling	Ethernet	PROFIBUS DP, CANopen
Description	• Motor controller of the Optimised Motion Series (for EPCO, ELGR, ERMO) • With convenient FCT commissioning for stepper motor EMMS-ST • Simple and quick parameters configuration via web browser and parameter cloud • Reliable and easy commissioning and parameterisation with the Festo Configuration Tool (FCT) • Simple control via digital I/Os, IO-Link, I-Port, Modbus TCP • Safety function Safe Torque Off (STO) PLe • Sinusoidal current injection for especially silent motor operation	• For controlling stepper motors EMMS-ST and Optimised Motion Series (for EPCO, ELGR, ERMO) • Easy and convenient: commissioning and firmware updates via SD card slot • Reliable and easy commissioning and parameterisation with the Festo Configuration Tool (FCT) • Integrated process interface: digital I/O module, CAN, RS485 • Safety function Safe Torque Off (STO) PLd • Optional: PROFIBUS and DeviceNet
online: →	**cmmo**	**cmms**

Multi-axis controllers

FESTO

	 **Motor controller** **CPX-CEC-M1**	 **Controllers** **CECX-X-C1, CECX-X-M1**
CPU data	256 MB RAM, 32 MB flash, 800 MHz processor	64 MB DRAM, 400 MHz processor
Configuration support	CODESYS V3	
Processing time	Approx. 200 µs/1 k instruction	
Degree of protection	IP65, IP67	IP20
Description	• Easy actuation of valve terminal configurations • Programming with CODESYS to IEC 61131-3 • Connection to all fieldbuses as a remote controller and for pre-processing • Actuation of electric drives via CANopen • SoftMotion functions for coordinated multi-axis movements	• Modular master controller with CODESYS or motion controller with CODESYS and SoftMotion. • Programming to standard IEC 61131-3 • Three plug-in slots for optional modules • Optional: communication module for PROFIBUS
online: ➔	**cpx-cec-m1**	**cecx-x**

Positioners for process automation

	 **Positioner** **CMSX**
Standard nominal flow rate	50 ... 130 l/min
Ambient temperature	-5 ... 60 °C
Reference value	0 - 20 mA, 4 - 20 mA, 0 - 10 V
Operating pressure	3 ... 8 bar
Safety note	Adjustable, opening, closing, holding
Description	• For position control of double-acting pneumatic quarter turn actuators in process automation systems • Simple and efficient position control based on the PID control algorithm • Suitable for quarter turn actuators with a swivel angle of approx. 90° and a mechanical interface in accordance with VDI/VDE Directive 3845 • Power supply 24 V DC
online: ➔	**cmsx**

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Safety systems

	 **Safety modules CAMC**
Safety function	Safe Torque Off (STO), Safe Stop 1 (SS1), Safe Stop 2 (SS2), Safe Operating Stop (SOS), Safely Limited Speed (SLS), Safe Speed Range (SSR), Safe Brake Control (SBC), Safe Speed Monitor (SSM)
Safety Integrity Level (SIL)	Safe Brake Control (SBC) / SIL 3, Safely Limited Speed (SLS) / SIL 3, Safe Operating Stop (SOS) / SIL 3, Safe Stop 1 (SS1) / SIL 3, Safe Stop 2 (SS2) / SIL 3, Safe Speed Monitor (SSM) / SIL 3, Safe Speed Range (SSR) / SIL 3, Safe Torque Off (STO) / SIL 3, Safe Torque Off (STO) / SIL 3 / SILCL 3
Characteristics of logic inputs	Electrically isolated, 4 safe, 2-channel inputs, equivalent/antivalent switching, test pulses can be configured, function can be configured, 6 safe, 1-channel inputs, test pulses can be configured
Number of digital logic inputs	2, 10
Digital output design	Potential-free signal contact, 3 safe, 2-channel semiconductor outputs
Description	• Plug-in module • For motor controller CMMP-AS-...-M3
online: →	camc

Gear units

	 **Gear units EMGA-SST**	 **Gear units EMGA-EAS**	 **Gear units EMGA-SAS**
Continuous output torque	11 ... 110 Nm	11 ... 110 Nm	11 ... 450 Nm
Max. drive speed	7000 ... 18000 rpm	7000 ... 18000 rpm	6500 ... 18000 rpm
Torsional rigidity	1 ... 6 Nm/arc	1 ... 6 Nm/arc	1 ... 38 Nm/arc
Torsional backlash	0.12 ... 0.25°	0.12 ... 0.25°	0.1 ... 0.25°
Mass moment of inertia, gear unit	0.019 ... 0.77 kgcm²	0.019 ... 0.77 kgcm²	0.019 ... 12.14 kgcm²
Max. efficiency	98%	98%	98%
Description	• Planetary gear unit for stepper motors EMMS-ST • Gear ratio i = 3 and i = 5, available ex-stock • Life-time lubrication	• Planetary gear unit for servo motors EMMS-AS • Gear ratio i = 3 and i = 5, available ex-stock • Life-time lubrication	• Planetary gear unit for servo motors EMMS-AS • Gear ratio i = 3 and i = 5, available ex-stock • Life-time lubrication
online: →	emga	emga	emga

Power supply units

FESTO

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	 **Power supply units CACN**
Nominal output voltage DC	24 ... 48 V
Nominal output current	5 ... 20 A
Input voltage range AC	100 ... 500 V
Input current	0.9 - 1.65 A, 1.5 - 3.0 A, 2.2 - 1.2 A, 2.3 - 1.9 A, 5.1 - 2.3 A
Mains buffering	24 ... 110 ms
Description	• H-rail mounting • Mounting position: free convection
online: ➔	**cacn**

Software tool

FESTO

Product finder for grippers

A secure grip is a question of the right calculation. In this case, calculation of weight, direction of movement, distances, etc. The software tool immediately determines which of the parallel, three-point, angle or swivel gripper units best matches your requirements, and in which size.

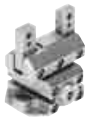
This tool can be found
- either in the electronic catalogue by clicking on the blue button "Product finder"
- or on the DVD under Engineering Tools.

Parallel grippers

	 **Parallel gripper DHPS**	 **Parallel gripper HGPD**	 **Electric parallel gripper HGPLE**	 **Parallel gripper HGPT**
Total gripping force at 6 bar, closing	25 ... 910 N	94 ... 3716 N	See product documentation on our website	106 ... 6300 N
Stroke per gripper jaw	2 ... 12.5 mm	3 ... 20 mm	30 ... 80 mm	1.5 ... 25 mm
Position sensing	Via Hall sensor, via proximity sensor	Via proximity sensor	Via integrated angular displacement encoder	Via proximity sensor
Gripping force backup	During opening, during closing	During opening, during closing		During opening, during closing
Description	• Sturdy and precise T-slot guidance of the gripper jaws • High gripping force and compact size • Max. repetition accuracy • Wide range of options for mounting on drive units	• Ideal for very harsh environments • Precise gripping even at high torque load • Max. gripping force at optimum installation space/force ratio • 8 sizes with up to 40 mm total stroke • Repetition accuracy of 0 ... 0.05 mm	• Electrically actuated gripper with long stroke • Free, speed-controlled selection of gripping positions • Long stroke allows use with workpieces of different sizes • Adjustable gripping force for highly sensitive and large, heavy workpieces • Very high torque resistance, very high accuracy • Short opening and closing times • Minimal installation costs	• Sturdy and powerful • With T-slot guide • Suitable for external and internal gripping • Gripper jaw guide protected by sealing air against dust • High-force variant available
online: →	**dhps**	**hgpd**	**hgple**	**hgpt**

Parallel grippers

FESTO

	 Parallel gripper HGPL	 Parallel gripper HGPP	 Parallel gripper HGPC
Total gripping force at 6 bar, closing	158 ... 2742 N	80 ... 830 N	44 ... 126 N
Stroke per gripper jaw	20 ... 150 mm	2 ... 12.5 mm	3 ... 7 mm
Position sensing	Via proximity sensor	Via Hall sensor, via inductive sensors	Via proximity sensor
Gripping force backup		During opening, during closing	During closing
Description	• Space-saving, high forces and torques • Controlled, precise and centred gripping • Long stroke: long guide length for the gripper jaws • Suitable for external and internal gripping • Opening stroke can be adjusted to optimise time	• High-precision gripper jaw guide • Suitable for external and internal gripping • Very flexible thanks to versatile attachment, mounting and application options	• Compact, low cost, reliable operation, long service life • High force with minimal volume • Suitable for external and internal gripping
online: →	**hgpl**	**hgpp**	**hgpc**

Parallel grippers

	 Parallel gripper HGP	 Parallel gripper HGPM
Total gripping force at 6 bar, closing	160 ... 340 N	16 ... 35 N
Stroke per gripper jaw	5 ... 7.5 mm	2 ... 3 mm
Position sensing	Via proximity sensor	Without
Gripping force backup		
Description	• Double-acting piston drive • High gripping force and compact size • Self-centring • Suitable for external and internal gripping • With protective dust cap for use in dusty environments (protection class IP54) • Max. repetition accuracy • Internal fixed flow control • Versatile thanks to externally adaptable gripper fingers • Wide range of options for mounting on drive units	• Micro gripper: compact, handy design • Versatile thanks to externally adaptable gripper fingers • Mounting options with clamping spigot, with flange mounting, with Z stroke compensation
online: →	**hgp**	**hgpm**

FESTO

Three-point grippers

	 Three-point gripper DHDS	 Three-point gripper HGDD	 Three-point gripper HGDT
Total gripping force at 6 bar, closing	87 ... 750 N	336 ... 2745 N	207 ... 2592 N
Stroke per gripper jaw	2.5 ... 6 mm	4 ... 12 mm	1.5 ... 10 mm
Position sensing	Via Hall sensor, via proximity sensor	Via proximity sensor	Via proximity sensor
Gripping force backup	During closing	During opening, during closing	During opening, during closing
Description	• Sturdy and precise T-slot guidance of the gripper jaws • High gripping force and compact size • Max. repetition accuracy • Wide range of options for mounting on drive units	• Precise gripping with centric movements despite high torque loads • Ideal for very harsh environments • 5 sizes with up to 12 mm stroke/jaw • Repetition accuracy of 0 ... 0.05 mm	• Synchronous movement of gripper jaws • With T-slot guide • Suitable for external and internal gripping • Gripper jaw guide protected by sealing air against dust • High-force variant available
online: →	**hgds**	**hgdd**	**hgdt**

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Angle grippers

	 Angle gripper DHWS	 Angle gripper HGWC	 Angle gripper HGWM
Total gripping torque at 6 bar, closing	30 ... 1362 Ncm	22 ... 144 Ncm	22 ... 64 Ncm
Max. opening angle	40°	30 ... 80°	14 ... 18.5°
Position sensing	Via Hall sensor, via proximity sensor	Via proximity sensor	Without
Gripping force backup	During closing		
Description	• Improved gripper jaw guide • Link guided movement • Internal fixed flow control, does away with the need for external flow control in 90% of applications • Max. repetition accuracy • Wide range of options for mounting on drive units	• High force with minimal volume • Internal fixed flow control, does away with the need for external flow control in 90% of applications • Suitable for external and internal gripping • Repetition accuracy 0.05 mm • Compact and cost-effective	• Micro gripper: compact, handy design • Mounting options with clamping spigot, with flange mounting, with Z stroke compensation • Versatile thanks to externally adaptable gripper fingers
online: →	**dhws**	**hgwc**	**hgwm**

Radial grippers

FESTO

	 Radial gripper DHRS	 Radial gripper HGRC	 Radial gripper HGRT
Total gripping torque at 6 bar, closing	15 ... 660 Ncm	22 ... 144 Ncm	158 ... 7754 Ncm
Max. opening angle	180°	180°	180°
Position sensing	Via Hall sensor, via proximity sensor	Via proximity sensor	Via proximity sensor, via inductive sensor
Description	• Lateral gripper jaw support for high torque loads • Self-centring • Gripper jaw centring options • Max. repetition accuracy	• High force with minimal volume • Internal fixed flow control, does away with the need for external flow control in 90% of applications • Suitable for external and internal gripping • Repetition accuracy 0.05 mm • Compact and cost-effective	• Secure gripping thanks to precise, polished plain-bearing guides • Gripping force backup via compression springs holds the gripped workpiece securely in the event of pressure failure • Compression spring also boosts the gripping force for applications involving heavier loads • Optimum cycle times thanks to freely adjustable opening angle of up to max. 90° per gripper finger. This prevents possible collisions due to the gripper jaws opening too wide
online: →	**dhrs**	**hgrc**	**hgrt**

Swivel/gripper units

	 Swivel/gripper unit HGDS
Total gripping force at 6 bar, closing	74 ... 168 N
Stroke per gripper jaw	2.5 ... 7 mm
Swivel angle	210°
Position sensing, gripper	Via proximity sensor
Description	• Combination of parallel gripper and swivel module • Swivel angle infinitely adjustable • Precise end stop with elastic cushioning or integrated shock absorber
online: →	**hgds**

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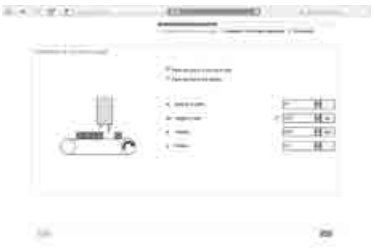
Bellows grippers

	 **Bellows gripper DHEB**
Bellows stroke	3.5 ... 25 mm
Min. diameter to be gripped	8 ... 66 mm
Max. diameter to be gripped	11 ... 85 mm
Max. operating frequency of gripper	≤4 Hz
Description	• 11 sizes for gripping diameter from 8 to 85 mm • Direction of movement: bellows upwards or downwards • Different bellows materials: EPDM or silicone • Air connection on the side or from above • Optimised process sequence with increased quality: prevents the workpieces from being scratched • Additional reliability: optional sensing via proximity or position sensor
online: →	**dheb**

Software tool

Feed separator		This tool helps you to select the right separator of the type HPV from Festo for your application. Let yourself be guided by the program and enter the general parameters and you will receive at least one suggestion for the product best suited to your application.	This tool can be found • either in the electronic catalogue by clicking on the blue button "Engineering" • or on the DVD under Engineering Tools.

Feed separators

	 **Feed separator HPVS**	 **Feed separator HPV**
Mode of operation	Double-acting	Double-acting
Piston diameter	10 mm, 14 mm, 22 mm	10 mm, 14 mm, 22 mm
Stroke	10 ... 60 mm	10 ... 60 mm
Theoretical force at 6 bar, advancing	45 ... 225 N	45 ... 225 N
Description	• Version with one plunger • With non-rotating piston rod • Proximity sensor SME/SMT-8 can be integrated in the housing	• Version with two plungers • With twin piston, non-rotating piston rod and locking mechanism • Cost-effective: replaces at least two drives in the feed process • Proximity sensor SME/SMT-8 can be integrated in the housing
online: →	**hpvs**	**hpv**

Software tool

FESTO

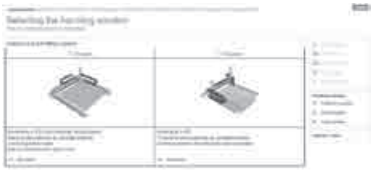
Configurator		Design a product with numerous features reliably and quickly with the help of the configurator. Select all the required product features step-by-step. The use of logic checks ensures that only correct configurations are available for selection.	The configurator is part of the electronic catalogue and is not available as a separate software program.

Handling modules

	 **Handling modules** **HSP**	 **Handling modules, pneumatic** **HSW-AP, HSW-AS**
Size	12, 16, 25	10, 12, 16
Theoretical force at 6 bar	40 ... 65 N	30 ... 55 N
Min. cycle time	0.6 ... 1 s	0.6 ... 1 s
Y-stroke	52 ... 170 mm	
Z-stroke	20 ... 70 mm	80 ... 100 mm
Repetition accuracy	+/-0.01 mm, +/-0.02 mm	
Description	• Function module for the automatic transfer, feed and removal of small parts in extremely confined spaces • Guided vertical and horizontal motion sequence • High precision and good rigidity • Compact design • Extremely short cycle times • Cost-optimised • Stroke adjustment along Y- and Z-axes	• Function module for the automatic transfer, feed and removal of small parts in extremely confined spaces • Guided swivel and linear motion • High precision and good rigidity • HSW-AP: pneumatic, with swivel module DSM; HSW-AS: without drive, with drive shaft • Fast and compact • Low-cost and ideal for universal use
online: →	**hsp**	**hsw**

Software tool

FESTO

Configurator: Handling Guide Online (HGO)		Planning complex handling systems takes a lot of time. You can use the "Handling Guide Online" (HGO) configurator to design a customised handling system for your application in just a few steps.	**Advantages:** • Automatic selection of all relevant components • Automatic design and calculation of workload • CAD model available immediately • Fully automated processing • Fully assembled or unassembled systems This tool can be found in the electronic catalogue by clicking on the blue button "Engineering".

Cartesian systems

	 **Single-axis system** **YXCS**	 **2D linear gantry** **YXCL**	 **2D planar surface gantry** **YXCF**
Description	• Ready-to-install single-axis solution including energy chain for cable and tubing routing as well as matching motor and motor controller package • For any single-axis movement • Ideal for long gantry strokes and heavy loads • High mechanical rigidity and sturdy design	• Ideal for long gantry strokes and heavy loads • High mechanical rigidity and sturdy design • Frequently used in feeding or loading applications • Use of tried and tested drives/axes from Festo	• Can be used universally for handling light to heavy workpieces or high payloads • Especially suitable for very long strokes • High mechanical rigidity and sturdy design • Freely positionable; any intermediate positions
online: →	yxcs	yxcl	yxcf

Cartesian systems

	 **3D gantry** **YXCR**	 **2D planar surface gantry** **EXCH**	 **2D planar surface gantry** **EXCM**
Description	• Can be used universally for handling light to heavy workpieces or high payloads • Especially suitable for very long strokes • High mechanical rigidity and sturdy design • Pneumatic and electric components can be freely combined • As an electrical solution – freely positionable/any intermediate positions	• Optimal dynamic response when compared with other Cartesian gantry systems • Drive concept with low moving dead weight • Flat system design • High acceleration in both axial directions	• Excellent functionality in confined spaces • Small moving loads • Actuation via two stepper motors with integrated optical encoder and two-axis controller • With plain or recirculating ball bearing guide
online: →	yxcr	exch	excm

Parallel kinematic systems

	 **Parallel kinematic system, tripod** **EXPT**
Maximum rated load	5 kg
Working space nominal diameter	450 ... 1200 mm
Working space nominal height	100 mm
Max. picking rate	150 picks/min in 12" cycle
Description	• Low moving mass – ideal for demanding requirements on dynamic response in three dimensions • Great path accuracy with a range of path profiles, even for very dynamic operation
online: ➔	**expt**

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Control systems

	 **Control system** **CMCA**
Electrical connection	Spring-loaded terminal
Mains voltage AC	230/400 V
Nominal operating voltage phases	3-phase
Mains frequency	50 ... 60 Hz
Safety function	Safe Stop 1 (SS1)
Description	• Control solution for handling systems from Festo • Available on a mounting plate with or without control cabinet housing • Includes the multi-axis controller CMXR and the motor controller CMMP required for actuation
online: ➔	**cmca**

Note:
Control cabinets for controllers in handling systems ➔ 175

Software tool

FESTO

Vacuum selection		Which suction cup for which surface and which movement? Don't experiment – calculate! This software tool even enables a differentiation to be made between linear and rotary movements.	This tool can be found • either in the electronic catalogue by clicking on the blue button "Engineering" • or on the DVD under Engineering Tools

Vacuum generators

	 **Vacuum generators OVEM**	 **Vacuum generator, pneumatic VN**	 **Vacuum generators VAD**	 **Vacuum generators VAK**
Nominal width of laval nozzle	0.45 ... 2 mm	0.45 ... 3 mm	0.5 ... 1.5 mm	1 mm
Ejector characteristics	High suction rate, high vacuum, standard	High suction rate, high vacuum, standard, in-line, high vacuum, high suction rate	High vacuum	High vacuum
Integrated function	Electric ejector pulse valve, flow control valve, electric on-off valve, filter, electric air economy circuit, check valve, open silencer, vacuum switch	Pneumatic ejector pulse valve, open silencer, vacuum switch		Ejector pulse, pneumatic
Max. vacuum	93%	86 ... 93%	80%	80%
Max. suction rate with respect to atmosphere	6 ... 86.5 l/min	6.1 ... 339 l/min		
Description	• Compact design • Monitoring with vacuum sensor • Central electrical connection via an M12 plug • Maintenance-free operation and reduced noise level through an integrated, open silencer • Integrated filter with inspection window • Optionally with air-saving function and LCD display • Adjustable ejector pulse	• Can be used directly in the work space • Available as straight type (inline: vacuum port in line with the supply port) or T-shape (standard: vacuum port at 90° to the supply port) • Compact and cost-effective • Maintenance-free operation and reduced noise level through an integrated, open silencer	• Sturdy aluminium housing	• Sturdy aluminium housing • Ejector pulse by built-in reservoir • Connection for external reservoir
online: →	ovem	vn	vad	vak

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Vacuum generators

FESTO

	 Vacuum generators, electropneumatic VN	 Vacuum generators VADM, VADMI	 Vacuum generators VAD-M, VAD-M-I
Nominal width of laval nozzle	0.45 ... 3 mm	0.45 ... 3 mm	0.7 ... 2 mm
Ejector characteristics	Standard, high vacuum, high suction rate	High vacuum	High vacuum
Integrated function	Pneumatic ejector pulse valve, electric on-off valve, open silencer	Electric ejector pulse valve, flow control valve, electric on-off valve, filter, electric air economy circuit, check valve, vacuum switch	Electric ejector pulse valve, electric on-off valve
Max. vacuum	92 ... 93%	85%	85 ... 90%
Max. suction rate with respect to atmosphere	7.2 ... 186 l/min		
Description	• Can be used directly in the work space • Cost-effective • Maintenance-free operation and reduced noise level through an integrated, open silencer • With solenoid valve vacuum On/Off	• Compact and sturdy design • Built-in solenoid valve (on/off) • Integrated filter with inspection window • Optionally with air-saving function, vacuum sensor • Optionally with adjustable ejector pulse	• Compact and sturdy design • Built-in solenoid valve (on/off) • Optionally with ejector pulse
online: →	vn	vadm	vad-m

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Vacuum generators

	 Vacuum generators for valve terminals CPV CPV10-M1H, CPV14-M1H, CPV18-M1H	 Vacuum generator cartridges VN
Nominal width of laval nozzle	0.7 ... 1.4 mm	0.45 ... 2 mm
Ejector characteristics	High vacuum	Standard, high vacuum, high suction rate
Integrated function		
Max. vacuum	85%	92 ... 93%
Max. suction rate with respect to atmosphere		7.2 ... 184.4 l/min
Description	• Combinations of switching valves with vacuum generators are possible on a valve terminal • With solenoid valve vacuum On/Off • Optionally with ejector pulse	• For fitting into customised housing for decentralised vacuum generation
online: →	cpv10-m1h	vn

Vacuum gripping technology

FESTO

	 Bernoulli gripper OGGB	 Suction grippers ESG	 Suction cups with connection attachments ESS
Suction cup size		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
Suction cup Ø		2 ... 200 mm	2 ... 200 mm
Holding force at nominal operating pressure	6 ... 10 N		0.1 ... 1610 N
Design		Vacuum port on top, vacuum port on side, with height compensator, with long height compensator	round, bell-shaped,
Information on suction cup materials		BR, FPM, NBR, PUR, VMQ (silicone), Vulkollan	BR, FPM, NBR, PUR, VMQ (silicone), Vulkollan
Description	• Ideally suited to transporting thin, extremely delicate and brittle workpieces • Minimised workpiece contact, gentle workpiece handling • Low energy costs thanks to minimised air consumption	• Modular system of suction cup holders and suction cups with over 2000 variants • Optionally with angle compensator, height compensator, filter • 15 suction cup diameters • 6 suction cup shapes • Suction cup volume: 0.002 ... 245 cm³ • Min. workpiece radius: 10 ... 680 mm • Vacuum port: push-in connector or barbed fitting for plastic tubing, threaded connection	• Suction cup consisting of the suction cup itself, plus the support plate with mounting • Suction cup volume: 0.002 ... 245 cm³ • Min. workpiece radius: 10 ... 680 mm • Mounting for suction cup holder: female thread, male thread, push-in connector
online: →	oggb	esg	ess

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Vacuum gripping technology

	 Suction cup ESV	 Suction cups with connection attachments VAS, VASB
Suction cup size		
Suction cup Ø	20 ... 200 mm	2 ... 125 mm
Holding force at nominal operating pressure	8.2 ... 1610 N	0.14 ... 700 N
Design	Bell-shaped or round bellows	
Information on suction cup materials	BR, FPM, NBR, PUR, VMQ (silicone), Vulkollan	NBR, PUR, TPE-U (PU), VMQ (silicone)
Description	• Wearing part for suction cup • Easily interchangeable • Suction cup volume: 0.318 ... 245 cm³ • Min. workpiece radius: 10 ... 680 mm	• Sturdy and reliable • Suction cups with fixed connecting thread • 11 suction cup diameters • Round suction cup shape, bellows • Vacuum port on top, on side • Screw-in thread
online: →	esv	vas

Assembly and connecting components

FESTO

	 **Suction cup holder** **ESH**
Design	Vacuum port on top, vacuum port on side, with height compensator
Description	• With or without height compensator • 6 holder sizes • 8 holder types • 3 tubing connector options
online: ➔	esh

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Standard directional control valves

FESTO

	 **Solenoid valves VSNC**	 **Standard valve with central plug VSVA-R5, VSVA-R2**	 **Standard valve with individual plug VSVA-C1**	 **Standard valve, plug-in VSVA-T1**
Type of actuation	Electrical	Electrical	Electrical	Electrical
Pneumatic connection 1	G1/4, NPT1/4-18	Sub-base size 1 to ISO 5599-1, size 2 to ISO 5599-1	Sub-base size 18 mm to ISO 15407-1, size 26 mm to ISO 15407-1	Sub-base size 1 to ISO 5599-2, size 2 to ISO 5599-2, size 18 mm to ISO 15407-2, size 26 mm to ISO 15407-2
Standard nominal flow rate	800 ... 1350 l/min	400 ... 2800 l/min	400 ... 1400 l/min	370 ... 2900 l/min
Valve function	5/2 double-solenoid, 5/2 or 3/2 convertible, 5/3 pressurised, 5/3 exhausted, 5/3 closed	2x2/2-way, single solenoid, closed, 2x3/2-way, single solenoid, closed, 2x3/2-way, single solenoid, open, 2x3/2-way, single solenoid, open/closed, 5/2-way, double-solenoid, 5/2-way, double-solenoid, dominant signal, 5/2-way, single solenoid, 5/3-way, pressurised, 5/3-way, exhausted, 5/3-way, closed	2x2/2-way, single solenoid, closed, 2x3/2-way, single solenoid, closed, 2x3/2-way, single solenoid, open, 2x3/2-way, single solenoid, open/closed, 5/2-way, double solenoid, 5/2-way, double solenoid, dominant signal, 5/2-way, single solenoid, 5/3-way, pressurised, 5/3-way, exhausted, 5/3-way, closed	2x2/2-way, single solenoid, closed, 2x3/2-way, single solenoid, closed, 2x3/2-way, single solenoid, open, 2x3/2-way, single solenoid, open/closed, 2x3/2-way, single solenoid, open/closed, 5/2-way, double solenoid, 5/2-way, double solenoid, dominant signal, 5/2-way, single solenoid, 5/3-way, pressurised, 1 to 2, 4 to 5 closed, 5/3-way, pressurised, 1 to 2, 4 to 5 closed, 5/3-way, pressurised, 5/3-way, exhausted, 5/3-way, closed, 5/3-way, port 2 pressurised, 4 exhausted, 5/3, port 2 pressurised, 4 exhausted, 5/3-way, port 4 pressurised, 2 exhausted
Electrical connection	Plug connector, to industry standard (11 mm), type B, 3-pin	M8x1, M12x1, central plug, round design, 3-pin, 4-pin	To EN 175301-803, to DIN EN 175301-803, type C, with protective earth conductor, without protective earth conductor	Plug connector, plug-in, to ISO 15407-2, to ISO 5599-2, 2-pin, 4-pin
Description	• NAMUR interface • Rotatable seal for 3/2 or 5/2-way valve • Wide choice of EX solenoid systems • Sturdy and powerful • Extended temperature range • Outstanding value for money	• Corresponds to ISO 5599-1 • Electrical connection by central plug • Robust metal housing • Manifold assembly with mixed sizes possible	• Corresponds to ISO 15407-1 and to ISO 15218 for pilot valve with interface • Electrical connection via type C plug • Robust metal housing • Manifold assembly with mixed sizes possible	• For valve terminal VTSA/ VTSA-F • Robust metal housing
online: →	vsnc	vsva	vsva	vtsa

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Standard directional control valves

FESTO

	 Pneumatic valves, toISO15407-1 VSPA	 Solenoid valves, ISO 5599-1 MN1H, MFH, MDH, MEBH, MDH, JMN1H, JMN1DH, JMFH, JMFDH, JMDH, JMEBH, JMEBDH, JMDDH	 Pneumatic valve, ISO 5599-1 VL, J, JD
Type of actuation	Pneumatic	electrical	Pneumatic
Pneumatic connection 1	Sub-base size 18 mm to ISO 15407-1, size 26 mm to ISO 15407-1	Sub-base size 1 to ISO 5599-1, size 2 to ISO 5599-1, size 3 to ISO 5599-1, size 4 to ISO 5599-1	Sub-base size 1 to ISO 5599-1, size 2 to ISO 5599-1, size 3 to ISO 5599-1, size 4 to ISO 5599-1
Standard nominal flow rate	400 ... 1100 l/min	1200 ... 6000 l/min	1200 ... 6000 l/min
Valve function	2x3/2-way, monostable, closed, 2x3/2-way, monostable, open, 2x3/2-way, monostable, open/closed, 5/2-way, bistable, 5/2-way, bistable, dominant, 5/2-way, monostable, 5/3-way, pressurised, 5/3-way, exhausted, 5/3-way, closed	5/2-way, double solenoid, 5/2-way, double solenoid, dominant, 5/2-way, single solenoid, 5/3-way, pressurised, 5/3-way, exhausted, 5/3-way, closed	5/2-way, double solenoid, 5/2-way, double solenoid, dominant, 5/2-way, single solenoid, 5/3-way, pressurised, 5/3-way, exhausted, 5/3-way, closed
Electrical connection		M12x1, central plug, via F coil, to be ordered separately, via N1 coil, to be ordered separately, round design, to DIN EN 175301-803	
Description	• Conforms to ISO 15407-1 • Pneumatic actuation • Manifold assembly with mixed sizes possible	• Conforms to ISO 5599-1 • Robust metal housing • Manifold assembly with mixture of ISO sizes 1/2/3 possible • Extensive range of electrical connection options • Wide range of vertical stacking modules: pressure regulator, flow control valve, vertical pressure shut-off plate, etc. • Also available as a valve terminal	• Conforms to ISO 5599-1 • Pneumatic actuation
online: ➔	**vspa**	**iso 5599-1**	**iso 5599-1**

Standard directional control valves

	 Standard valve, ISO 15218 (CNOMO) MD, MDH, MGXDH, MGXIAH, VSCS	 Standard valve, NAMUR (VDI/VDE 3845) NVF3
Type of actuation	electrical	Electric
Pneumatic connection 1	Sub-base	G1/4
Standard nominal flow rate	18 ... 50 l/min	900 l/min
Valve function	2/2-way, single solenoid, closed	5/2-way or 3/2-way, monostable
Electrical connection	M12x1, to DIN EN 175301-803, to IEC 61076-2-101, type A, type C	
Description	• CNOMO port pattern, to ISO 15218 • With or without manual override	• NAMUR interface • Variants for use in Ex zone I
online: ➔	**iso 15218**	**namur**

FESTO

Universal directional control valves

	 **Solenoid valves VUVS**	 **Pneumatic valves VUWS**	 **Pneumatic valves VUWG**	 **Solenoid valve, plug-in VUVG**
Type of actuation	electrical	Pneumatic	Pneumatic	electrical
Pneumatic connection 1	G1/4, G1/8, G3/8	G1/4, G1/8, G3/8	G1/4, G1/8, M3, M5, M7	
Pneumatic working port	G1/4, G1/8, G3/8, NPT1/4-18, NPT1/8-27, QS-1/4, QS-10, QS-3/8, QS-4, QS-5/16, QS-5/32, QS-6, QS-8	G1/4, G1/8, G3/8, NPT1/4-18, NPT1/8-27, QS-1/4, QS-10, QS-3/8, QS-4, QS-5/16, QS-5/32, QS-6, QS-8	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, G1/8, M5, M7, flange
Standard nominal flow rate	600 ... 2400 l/min	600 ... 2400 l/min	80 ... 1380 l/min	130 ... 1200 l/min
Valve function	3/2-way, single solenoid, closed, 3/2-way, single solenoid, open, 5/2-way, double solenoid, 5/2-way, single solenoid, 5/3-way, pressurised, 5/3-way, exhausted, 5/3-way, closed	3/2-way, monostable, closed, 3/2-way, monostable, open, 5/2-way, bistable, 5/2-way, monostable, 5/3-way, pressurised, 5/3-way, exhausted, 5/3-way, closed	2x3/2-way, single solenoid, closed, 2x3/2-way, single solenoid, open, 2x3/2-way, single solenoid, open/closed, 5/2-way, double solenoid, 5/2-way, single solenoid, 5/3-way, pressurised, 5/3-way, exhausted, 5/3-way, closed	2x3/2-way, single solenoid, closed, 2x3/2-way, single solenoid, open, 2x3/2-way, single solenoid, open/closed, 3/2-way, single solenoid, closed, 3/2-way, single solenoid, open, 5/2-way, double solenoid, 5/2-way, single solenoid, 5/3-way, pressurised, 5/3-way, exhausted, 5/3-way, closed
Electrical connection	Type C, type B			Via E-box
Description	• Universal valve, sturdy and durable • Low-cost, no limitations with regard performance • Can be used as individual valves or manifold valves VTUS	• Universal valve, sturdy and durable • Pneumatically actuated • Can be used as individual valves or manifold valves VTUS	• Compact universal valve • Pneumatically actuated • High flow rate relative to its size • In-line valves can be used as individual valves or manifold valves	• Connecting plate valve • For valve terminal VTUG plug-in
online: →	**vuvs**	**vuws**	**vuwg**	**vuvg**

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Universal directional control valves

FESTO

	 Solenoid valve, for individual connection VUVG	 Solenoid valves VUVB	 Solenoid valves CPE10, CPE14, CPE18, CPE24	 Solenoid valves VMPA1, VMPA14, VMPA2
Type of actuation	electrical	electrical	Electrical, via pilot interface acc. to ISO 15218	electrical
Pneumatic connection 1	G1/4, G1/8, M3, M5, M7	QS-6, QS-8	G1/4, G1/8, G3/8, M5, M7, QS-10, QS-12, QS-4, QS-6, QS-8	G1/8, M7
Pneumatic working port	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	QS-6, QS-8	G1/4, G1/8, G3/8, M5, M7, QS-10, QS-12, QS-4, QS-6, QS-8	G1/8, M7
Standard nominal flow rate	80 ... 1380 l/min	500 ... 800 l/min	180 ... 3200 l/min	230 ... 700 l/min
Valve function	2x3/2-way, single solenoid, closed, 2x3/2-way, single solenoid, open, 2x3/2-way, single solenoid, open/closed, 2x3/2-way, single solenoid, open/closed, 5/2-way, double solenoid, 5/2-way, single solenoid, 5/3-way, pressurised, 5/3-way, exhausted, 5/3-way, closed	3/2-way, single solenoid, closed, 3/2-way, single solenoid, open, 4/2-way, double solenoid, 4/2-way, single solenoid	3/2-way, single solenoid closed, 3/2-way, single solenoid, open, 5/2-way, double solenoid 5/2-way, single solenoid 5/3-way, pressurised, 5/3-way, exhausted, 5/3-way, closed	2x2/2-way, single solenoid, closed, 2x3/2-way, single solenoid, closed, 2x3/2-way, single solenoid, open, 2x3/2-way single solenoid, open/closed, 5/2-way, double solenoid, 5/2-way, single solenoid, 5/3-way, pressurised, 5/3-way, exhausted, 5/3-way, closed
Electrical connection	Via E-box	Plug connector, to EN 175301-803, type C	M8x1, type C, 2-pin, 4-pin	M8x1, plug connector, to EN 60947-5-2, 4-pin
Description	• Compact universal valve • Connection technology by connecting plate • High flow rate relative to its size • In-line valves can be used as individual valves or manifold valves	• Inline valve in polymer technology • Also available as semi in-line valve • Sub-bases mountable for individual valves • Width 20 mm	• Universally applicable individual valve • High flow rate relative to its size	• For valve terminal MPA • As individual valve mounted on sub-base • Comprehensive valve range
online: →	**vuvg**	**vuvb**	**cpe**	**vmpa1**

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Universal directional control valves

	 **Solenoid and pneumatic valves, Tiger 2000 MFH, MVH, JMFH, JMVH, VL, J**	 **Solenoid and pneumatic valves, Tiger Classic MFH, MOFH, JMFH, JMFDH, VL/O, VL, JH, JDH**	 **Solenoid and pneumatic valves, midi pneumatic MEBH, MOEBH, MEH, MOEH, JMEBH, JMEH, VL, J**	 **cassette valves C, CJ, CJM, CL, CM**
Type of actuation	Electric, pneumatic	Electric, pneumatic	Electric, pneumatic	Electric, pneumatic
Pneumatic connection 1	G1/4, G1/8, G3/8	G1/2, G1/4, G1/8, G3/4, NPT1/8-27	G1/8, connecting plate	G1/2, G1/4, sub-base
Pneumatic working port	G1/4, G1/8, G3/8	G1/2, G1/4, G1/8, G3/4	G1/8, connecting plate	G1/2, G1/4, sub-base
Standard nominal flow rate	750 ... 2600 l/min	500 ... 7500 l/min	300 ... 700 l/min	1400 l/min
Valve function	5/2-way, bistable/double solenoid, 5/2-way, monostable/single solenoid, 5/3-way, pressurised, 5/3-way, exhausted, 5/3-way, closed	3/2-way, monostable/single solenoid, closed, 3/2-way, monostable/single solenoid, open, 3/2-way, monostable/single solenoid, open/closed, 5/2-way, bistable/double solenoid, 5/2-way, bistable/double solenoid, dominant signal, 5/2-way, monostable/single solenoid	3/2-way, single solenoid closed, 3/2-way, single solenoid, open, 5/2-way, double solenoid 5/2-way, single solenoid 5/3-way, pressurised, 5/3-way, exhausted, 5/3-way, closed	5/2-way, double solenoid/bistable, 5/2-way, single solenoid/monostable
Electrical connection	Via F coil, to be ordered separately, to EN 175301-803, type B	via F coil, to be ordered separately	Plug, square design, to EN 175301-803, type C	
Description	• Sturdy and reliable • Wide range of voltages due to individual coils • Principle with armature guide tube	• Sturdy and reliable • Poppet valve • All-metal version • Principle with armature guide tube	• Sub-base valve, semi in-line valve • Individual mounting or manifold assembly for 2 ... 10 Valves • Operating voltage 24 V DC, 110/230 V AC (50 ... 60 Hz)	• Sturdy • Direct mounting on sub-base • With or without manual override
online: ➔	**tiger 2000**	**tiger classic**	**mebh**	**cm**

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Universal directional control valves

FESTO

	 **Solenoid valves, supplementary product range BMCH, BMFH, JMC, JMF, MC, MCH, MF, MFH, MLC, MOCH, MOFH**	 **Pneumatic valves, supplementary product range A, VL**	 **Basic valves LC**
Type of actuation	electrical		Pneumatic, electric
Pneumatic connection 1	G1/2, G1/4, G1/8, M5	G1/4	G1/4, G1/8
Pneumatic working port	G1/2, G1/4, G1/8, M5	G1/4	
Standard nominal flow rate	46 ... 300 l/min	700 l/min	80 l/min
Valve function	2/2-way, single solenoid, closed, 2x3/2-way, single solenoid, closed, 3/2-way, single solenoid, closed, 3/2-way, single solenoid, open, 3x3/2-way, single solenoid, closed, 4/2-way, double solenoid, 4/2-way, single solenoid, 5/4-way, closed	5/2 bistable, 5/4 closed	3/2-way directly actuated, 5/4-way indirectly actuated
Electrical connection	Plug connector		
Description	• Manifold mounting or individual valve • Especially suited for positioning, for stopping in the event of an emergency stop and for holding double-acting cylinders in any position • With or without manual override	• For activating cylinders for single stroke and oscillating movements • For positioning, for stopping in the event of an emergency stop and for holding double-acting cylinders in any position • For controlling functions of pneumatic feed units such as feed motions and reciprocal clamping • Actuation either manually by means of switch lever, mechanically by means of control stem or pneumatically	• Screw-in actuator attachments • For positioning, for stopping in the event of an emergency stop and for holding double-acting cylinders in any position
online: →	**bmch**	**vl**	**lc**

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FESTO

Application-specific directional control valves

	 **Control blocks VOFA**	 **Solenoid valves VOFD**	 **Solenoid valves VOFC**	 **Solenoid valves VOVG**
Design	Piston spool	Directly actuated poppet valve	Soft-switching piston valve, piloted piston poppet valve	Piston spool
Valve function	3/2-way, monostable, closed, 5/2-way, monostable	2/2-way, single solenoid, closed	3/2-way, single solenoid, closed, 5/2-way, double solenoid, 5/2-way, single solenoid	3/2-way, single-solenoid, closed, 3/2-way, single-solenoid, open, 5/2-way, single-solenoid
Operating pressure	3 ... 10 bar	0 ... 10 bar	2 ... 8 bar	-0.9 ... 8 bar
Ambient temperature	-5 ... 50 °C	-10 ... 60 °C	-25 ... 60 °C	-5 ... 50 °C
Pneumatic connection 1	G1/4	G1/4, NPT1/4-18, port pattern as per NAMUR	G1/2, G1/4, NPT1/4-18, port pattern as per NAMUR	M5, M7, sub-base
Standard nominal flow rate	950 ... 1050 l/min	450 l/min	600 ... 3000 l/min	180 ... 200 l/min
Description	• Redundantly constructed valve block, can be used for safe reversing of a hazardous movement • 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 • Equipped with VSVA valves • Switching position sensing by sensors	• Suitable for process automation, for use in chemical and petrochemical plants • Suitable for outdoor use under harsh, dusty ambient conditions • Especially suitable for quarter turn actuators thanks to flange pattern to NAMUR • Variants with TÜV approval up to SIL4 to IEC 61508	• Suitable for process automation, for use in chemical and petrochemical plants • Suitable for outdoor use under harsh, dusty ambient conditions • Especially suitable for quarter turn actuators thanks to flange pattern to NAMUR • Valve can switch between internal and external pilot air • Variants with TÜV approval up to SIL3 to IEC 61508	• Very compact valve for solutions with extremely compact assembly • Suitable for applications in the electronics and light assembly industry • In-line, semi in-line and sub-base valve • Manifold rail for 2 ... 10 Valves
online: →	vofa	vofd	vofc	vofg

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Application-specific directional control valves

FESTO

	 **Solenoid valves MHA1, MHP1**	 **Solenoid valves MHE2, MHP2, MHA2, MHE3, MHP3, MHA3, MHE4, MHP4, MHA4**	 **Solenoid valves CDVI5.0**
Design	Poppet valve with spring return	Pressure-relieved poppet valve	Piston spool
Valve function	2/2-way, single solenoid, closed, 2x2/2-way, single solenoid, closed, 3/2-way, single solenoid, closed, 3/2-way, single solenoid, open	3/2-way, single-solenoid, closed, 3/2-way, single-solenoid, open, 5/2-way, single-solenoid	2/2-way, single solenoid, closed, 2/2-way, single solenoid, open, 2x3/2-way, single solenoid, closed, 2x3/2-way, single solenoid, open, 3/2-way, single solenoid, closed, 3/2-way, single solenoid, open, 5/2-way, double solenoid, 5/2-way, single solenoid, 5/3-way, pressurised, 5/3-way, exhausted, 5/3-way, closed
Operating pressure	-0.9 ... 8 bar	-0.9 ... 8 bar	-0.9 ... 10 bar
Ambient temperature	-5 ... 50 °C	-5 ... 60 °C	-5 ... 50 °C
Pneumatic connection 1	QS-3, QS-4, sub-base, prepared for QSP10	G1/4, G1/8, M7, QS-4, QS-6, QS-8, sub-base	Sub-base
Standard nominal flow rate	10 ... 30 l/min	90 ... 400 l/min	300 ... 650 l/min
Description	• Directly actuated poppet valve • Miniature valve: grid dimension 10 mm • Switching times down to 4 ms • Connecting plate valve • Manifold block for 2 ... 10 Valves	• Directly actuated poppet valve • Fast-switching valve: switching times down to 2 ms • Direct mounting, individual sub-base, manifold assembly • Manifold block for 2 ... 10 valves	• Sub-base valve for clean design valve terminal • Easy-to-clean design
online: ➔	**mh1**	**mh2**	**cdvi5.0**

Application-specific directional control valves

	 **Fast-switching valves MHJ9, MHJ10**	 **Solenoid and pneumatic valves, M5 Compact System J, JD, JMFH, MFH, MUFH, VD, VL, VL/O, VLL**
Design	Poppet valve without spring return	Piston valve, disc seat valve
Valve function	2/2-way, closed, monostable	3/2-way, bistable/double solenoid, 3/2-way, monostable/single solenoid, closed, 3/2-way, monostable/single solenoid, open, 5/2-way, bistable/double solenoid, 5/2-way, bistable/double solenoid, dominant signal, 5/2-way, monostable/single solenoid
Operating pressure	0.5 ... 8 bar	-0.9 ... 8 bar
Ambient temperature	-5 ... 60 °C	-10 ... 60 °C
Pneumatic connection 1	QS-4, QS-6, sub-base	PK-3
Standard nominal flow rate	50 ... 160 l/min	50 ... 105 l/min
Description	• Directly actuated poppet valve • Individual valve with integrated QS fitting • Switching frequencies of up to 1000Hz • Service life › 500 million switching cycles	• Control elements with all functions for pneumatic sequence controls • For control cabinet installation • Fast replacement of components
online: ➔	**mhj9**	**m5 compact**

Manually actuated directional control valves: swivel lever valves

	 **Hand lever valve VHER**	 **Hand lever valves H-3-1/4-B, H-5-1/4-B**
Valve function	4/3-way, pressurised, 4/3-way, exhausted, 4/3-way, closed	3/2-way monostable, 5/2-way bistable
Type of actuation	Direct	Direct
Standard nominal flow rate	170 ... 3800 l/min	550 ... 600 l/min
Pneumatic working port	G1/2, G1/4, G1/8, M5	G1/4
Operating pressure	0 ... 10 bar	-0.95 ... 10 bar
Description	• Lever in metal or polymer design • Front panel mounting, through or mounting holes	• Die-cast aluminium design
online: →	vher	n_v14

Manually actuated directional control valves: pushbutton valves

	 **Pushbutton valves VHEM-P**	 **Pushbutton valves K/O-3-PK**	 **Pushbutton valves K-3-M5**
Valve function	3/2-way, single solenoid, closed, 3/2-way, single solenoid, open, 5/2-way, double solenoid, 5/2-way, single solenoid	3/2-way, monostable, open/closed	3/2-way, monostable, closed
Type of actuation	Direct, piloted	Direct	Direct
Standard nominal flow rate	500 ... 1000 l/min	80 l/min	80 l/min
Pneumatic working port	G1/4, G1/8	PK-3	M5
Operating pressure	-0.95 ... 10 bar	0 ... 8 bar	-0.95 ... 8bar
Description	• With button switch • Reverse operation possible	• With button switch • Polymer design • Ducted exhaust air	• With button switch • Suitable for vacuum operation • Sturdy die-cast zinc design
online: →	vhem-p	n_vpk	k-3

Manually actuated directional control valves: pushbutton valves

	 **Pushbutton valves T-5/3-1/4**	 **Pushbutton valves F-3-M5**
Valve function	5/3-way, closed	2/2-way, single solenoid, closed
Type of actuation	piloted	Direct
Standard nominal flow rate	680 l/min	80 l/min
Pneumatic working port	G1/4	M5
Operating pressure	2 ... 10 bar	-0.9 ... 8bar
Description	• With pushbutton • For positioning, for stopping in the event of an emergency stop and for holding double-acting cylinders in any position • Aluminium design	• With pedal • Suitable for vacuum operation • Sturdy die-cast zinc design
online: →	n_msv	f-3-m5

Manually actuated directional control valves: finger lever valves

	 Finger lever valves VHEM-L	 Finger lever valves TH/O-3-PK-3	 Finger lever valves THO-3-1/4-B	 Finger lever valves H-4/3-M5
Valve function	3/2-way, single-solenoid, closed, 3/2-way, single-solenoid, open, 5/2-way, single-solenoid	3/2-way, single solenoid, open/closed,	3/2-way, single-solenoid, closed, 3/2-way, single-solenoid, open, 5/2-way, single-solenoid	4/3-way, exhausted
Type of actuation	Direct	Direct	Direct	Piloted
Standard nominal flow rate	500 ... 1000 l/min	80 l/min	80 ... 600 l/min	125 l/min
Pneumatic working port	G1/4, G1/8	PK-3	G1/4, M5	M5
Operating pressure	-0.95 ... 10 bar	0 ... 8 bar	-0.95 ... 10 bar	0 ... 8bar
Description	• With finger lever • Mechanical spring return • Fast assembly	• With finger lever • Polymer design • Ducted exhaust air	• With finger lever • Die-cast zinc or die-cast aluminium design	• With detenting finger lever • Front panel mounting or mounting on sub-base • Aluminium design
online: ➔	vhem-l	n_vpk	th-3-m5	H-4

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Manually actuated directional control valves: toggle lever valves

	 Toggle lever valves KH/O-3-PK-3	 Toggle lever valves H-5/3-1/4
Valve function	3/2-way, monostable, open/closed	5/3-way, closed
Type of actuation	Direct	Piloted
Standard nominal flow rate	80 l/min	680 l/min
Pneumatic working port	PK-3	G1/4
Operating pressure	0 ... 8 bar	2 ... 10 bar
Description	• With toggle lever • Polymer design • Ducted exhaust air	• With toggle lever • For positioning, for stopping in the event of an emergency stop and for holding double-acting cylinders in any position • Aluminium design
online: ➔	n_vpk	n_msv

Manually actuated directional control valves: foot valves

	 **Foot valves** **F-3-1/4-B, FO-3-1/4-B, F-5-1/4-B**	 **Foot valves with mechanical detent** **FP-3-1/4-B, FPB-3-1/4, FP-5-1/4-B**
Valve function	3/2-way, single-solenoid, closed, 3/2-way, single-solenoid, open, 5/2-way, single-solenoid	3/2-way monostable, 5/2-way bistable
Type of actuation	Direct	Direct
Standard nominal flow rate	550 ... 600 l/min	550 ... 600 l/min
Pneumatic working port	G1/4	G1/4
Operating pressure	-0.95 ... 10 bar	-0.95 ... 10 bar
Description	• With foot pedal • Sturdy die-cast zinc design	• With foot pedal with detent • Sturdy die-cast zinc design
online: ➔	fo-3	fpb-3

Manually operated directional control valves: Selector switches

	 **Selector switch** **HW-6-38**
Valve function	8/6-way, bistable
Type of actuation	Direct
Standard nominal flow rate	180 l/min
Pneumatic working port	M5
Operating pressure	0 ... 8bar
Description	• With rotary knob and arrow • Front panel mounting or mounting on sub-base • With six switching positions
online: ➔	hw-6

Manually operated directional control valves: Front panel valves

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	 **Front panel valves SV/O-3-PK-3x2**	 **Front panel valves SVS-3-1/8, SVS-4-1/8, SVSO-3-1/8**	 **Front panel valves SV-3-M5, SV-5-M5-B**
Valve function	2x3/2-way, monostable, closed	3/2-way, single-solenoid, closed, 3/2-way, single-solenoid, open, 4/2-way, single-solenoid	3/2-way, monostable, closed, 5/2-way, monostable
Type of actuation	Direct	Direct, piloted	Direct
Standard nominal flow rate	70 l/min	120 l/min	65 ... 95 l/min
Pneumatic working port	PK-3	G1/8	M5
Operating pressure	0 ... 8 bar	3.5 ... 8 bar	-0.95 ... 8bar
Description	• For actuator attachments such as toggle and selector switches • Reliable coupling system for rapid assembly and dismantling • Polymer design	• For actuator attachments such as pushbutton actuators, mushroom pushbuttons, mushroom actuators, selector switches, toggle levers, key actuators • Reliable coupling system for rapid assembly and dismantling	• For actuator attachments such as pushbutton actuators, mushroom pushbuttons, mushroom pushbuttons with detent, selector switches or toggle levers • Reliable coupling system for rapid assembly and dismantling • Polymer design
online: →	**sv**	**svos**	**sv-3**

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Mechanically operated directional control valves: Stem actuated valves

	 **Stem actuated valves VMEM-S**	 **Stem actuated valves V/O-3-PK-3**	 **Stem actuated micro valves S-3-PK-3-B, SO-3-PK-3-B**	 **Stem actuated valves VS-3-1/8, VS-4-1/8, V/O-3-1/8, VOS-3-1/8**
Valve function	3/2-way, single-solenoid, closed, 3/2-way, single-solenoid, open, 5/2-way, single-solenoid	3/2-way, single solenoid, open/closed,	3/2-way, monostable, closed, 3/2-way, monostable, open	3/2-way, single-solenoid, closed, 3/2-way, single-solenoid, open, 4/2-way, single-solenoid
Type of actuation	Direct, piloted	Direct	Direct	Piloted
Standard nominal flow rate	500 ... 1000 l/min	80 l/min	60 l/min	140 ... 161 l/min
Pneumatic working port	G1/4, G1/8	PK-3	PK-3	G1/8
Operating pressure	-0.95 ... 10 bar	0 ... 8 bar	-0.95 ... 8 bar	3.5 ... 8bar
Description	• Light weight • Small size • Various actuator attachments	• Through-holes in housing • Polymer or aluminium design	• Dimensions to DIN 41635, type A • Polymer design • Various actuator attachments	• With plunger • Aluminium design • Minimal actuating force with pilot control
online: →	**vmem**	**n_v18**	**s-3-pk**	**vos**

Mechanically operated directional control valves: Stem actuated valves

	 **Stem actuated valves V-3-1/4-B, V-5-1/4-B, VO-3-1/4-B**	 **Limit switch with push-in connector SDK**	 **Limit stop signal generator with push-in connector SDV**
Valve function	3/2-way, single-solenoid, closed, 3/2-way, single-solenoid, open, 5/2-way, single-solenoid	3/2-way, monostable, closed	3/2-way, monostable, closed
Type of actuation	Direct	Direct	Direct
Standard nominal flow rate	550 ... 600 l/min	16 l/min	8 ... 16 l/min
Pneumatic working port	G1/4	PK-3	PK-3
Operating pressure	-0.95 ... 10 bar	0 ... 8 bar	0 ... 8bar
Description	• With plunger • Die-cast aluminium design	• For end-position sensing and position control • High accuracy • Stainless steel design	• For end-position sensing and position control • High precision and low actuating forces • Sturdy design
online: →	vo-3	sdk	sdv

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Mechanically operated directional control valves: Roller lever valves

	 **Roller lever valves R/O-3-PK-3**	 **Roller lever valves RS-3-1/8, RS-4-1/8, ROS-3-1/8**	 **Roller lever valves R-3-M5, R-3-1/4-B, R-5-1/4-B, RO-3-1/4-B**
Valve function	3/2-way, monostable, open/closed	3/2-way, single-solenoid, closed, 3/2-way, single-solenoid, open, 4/2-way, single-solenoid	3/2-way, single-solenoid, closed, 3/2-way, single-solenoid, open, 5/2-way, single-solenoid
Type of actuation	Direct	piloted	Direct
Standard nominal flow rate	80 l/min	128 ... 169 l/min	80 ... 600 l/min
Pneumatic working port	PK-3	G1/8	G1/4, M5
Operating pressure	0 ... 8 bar	3.5 ... 8 bar	-0.95 ... 10 bar
Description	• With roller lever • Polymer design • Ducted exhaust air	• With roller lever • Aluminium design • Minimal actuating force with pilot control	• With roller lever • Die-cast aluminium design
online: →	n_vpk	ros-3	ro-3

Mechanically operated directional control valves: Roller lever valves with idle return

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	 **Roller lever valves with idle return L/O-3-PK-3**	 **Roller lever valves with idle return LS-3-1/8, LS-4-1/8, LOS-3-1/8**	 **Roller lever valves with idle return L-3-M5, L-3-1/4-B, L-4-1/4-B, LO-3-1/4-B**
Valve function	3/2-way, monostable, open/closed	3/2-way, single-solenoid, closed, 3/2-way, single-solenoid, open, 4/2-way, single-solenoid	3/2-way, single-solenoid, closed, 3/2-way, single-solenoid, open, 5/2-way, single-solenoid
Type of actuation	Direct	piloted	Direct
Standard nominal flow rate	80 l/min	128 ... 175 l/min	80 ... 600 l/min
Pneumatic working port	PK-3	G1/8	G1/4, M5
Operating pressure	0 ... 8 bar	3.5 ... 8 bar	-0.95 ... 10 bar
Description	• With roller lever with idle return • Polymer design • Ducted exhaust air	• With toggle lever • Aluminium design • Minimal actuating force with pilot control	• With roller lever • Die-cast aluminium design
online: ➔	n_vpk	los-3	lo-3

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Mechanically operated directional control valves: Swivel lever valves

	 **Swivel lever valves RW/O-3-1/8**	 **Pneumatic limit valve RWN/O-3-1/8-B**	 **Swivel lever valves RW-3-M5**
Valve function	3/2-way, monostable, open/closed	3/2-way, monostable, open/closed	3/2-way, monostable, closed
Type of actuation	Direct		Direct
Standard nominal flow rate	140 l/min	120 l/min	80 l/min
Pneumatic working port	G1/8	G1/8	M5
Operating pressure	-0.95 ... 8 bar	-0.95 ... 8 bar	-0.95 ... 8bar
Description	• Basic valve for actuator attachments such as swivel lever short, long, swivel lever rod • Aluminium design	• Directly actuated in one direction • Aluminium design	• With swivel lever • Sturdy die-cast zinc design • Various actuator attachments
online: ➔	RW	rwn	rw-3

Mechanically operated directional control valves: Whisker valves

	 **Whisker valves** **FVS-3-1/8, FVSO-3-1/8**
Valve function	3/2-way, monostable, closed, 3/2-way, monostable, open
Type of actuation	Piloted
Standard nominal flow rate	146 ... 175 l/min
Pneumatic working port	G1/8
Operating pressure	3.5 ... 8bar
Description	• With whisker • For sensing dissimilar workpieces or workpieces not precisely in position • Aluminium design • Minimal actuating force with pilot control
online: ➔	fvs-3

Non-return valves and quick exhaust valves

	 **Check valves, piloted** **VBNF**	 **Quick exhaust valves** **VBQF**	 **Non-return valves** **H, HA, HB**
Pneumatic connection 1	QS-6, QS-8	G1/4, G1/8, 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
Standard nominal flow rate			115 ... 2230 l/min
Standard nominal flow rate exhaust 6 -› 0 bar		1300 ... 2500 l/min	
Standard nominal flow rate pressurisation 6 -› 5 bar		350 ... 960 l/min	
Standard nominal flow rate 1 -› 2 from 6 to 5 bar	260 ... 620 l/min		1000 ... 5900 l/min
Operating pressure		0.2 ... 10 bar	-1 ... 12 bar
Operating pressure for entire temperature range	0.2 ... 10 bar		
Description	• Minimal height • High flow rate • Can be rotated horizontally through 360° in assembled state	• Minimal height • High flow rate • Reduced noise emission • Available with silencer • Available with ducted or unducted exhaust air	• Valve function: non-return • Screw-in or in-line installation • With connecting thread at both ends, push-in connector at both ends, threaded/push-in connector
online: ➔	vbnf	vbqf	h-qs

Non-return valves and quick exhaust valves

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	 Check valves, piloted HGL	 Manual override tools HAB	 Quick exhaust valves SE, SEU
Pneumatic connection 1	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	G1/2, G1/4, G1/8, G3/4, G3/8
Standard nominal flow rate			
Standard nominal flow rate exhaust 6 -› 0 bar		165 l/min	1000 ... 6500 l/min
Standard nominal flow rate pressurisation 6 -› 5 bar			300 ... 4560 l/min
Standard nominal flow rate 1 -› 2 from 6 to 5 bar	130 ... 1600 l/min		
Operating pressure	0.5 ... 10 bar	0 ... 10 bar	0.2 ... 10 bar
Operating pressure for entire temperature range			
Description	• Valve function: piloted non-return function • Pneumatically piloted • Screw-in with male thread • Pilot air connection: M5, G1/8, G1/4, G3/8, QS-4	• Valve function: exhaust component • For check valve HGL • For manual exhausting air trapped in a cylinder	• Valve function: quick exhaust • Shut-off valve, piloted • Screw-in • With or without silencer
online: ➔	**hgl**	**hab**	**se**

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Ball valves and shut-off valves

	 Hand slide valves VBOH	 Shut-off valves HE	 Hand slide valves W	 Ball valves QH, QHS
Valve function	3/2-way, bistable	2/2-way bistable, 3/2-way bistable	3/2-way, bistable	2/2-way, bistable
Pneumatic connection 1	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	G1/2, G1/4, G1/8, G3/4, G3/8, M5	G1, G1 1/2, G1/2, G1/4, G3/4, G3/8, QS-4, QS-6, R1/8
Standard nominal flow rate	236 ... 7691 l/min	270 ... 840 l/min	120 ... 6800 l/min	148 ... 84000 l/min
Operating pressure	-0.95 ... 12 bar	-0.95 ... 10 bar	-0.95 ... 10 bar	-1 ... 10 bar
Description	• Used as a shut-off function for pressurising and exhausting compressed air systems, for example, upstream of service unit combinations, for air guns and also for exhausting pneumatic cylinders • Non-overlapping, so no pressure losses when switching • Minimal installation	• Shut-off valve, manually operated • Connection: thread at both ends, push-in connector at both ends, threaded/push-in connector	• Shut-off valve, manually actuated • In-line installation • Metal design	• Shut-off valve, manually actuated • In-line installation, can be screwed in, bulkhead fitting • Variants: thread at both ends, push-in connector at both ends, thread/push-in connector
online: ➔	**vboh**	**he**	**w-3**	**qh**

Logic valves

	 Logic components OS	 Amplifier modules VK	 NOT modules VLO	 Logic components ZK
Valve function	OR function			AND function
Pneumatic connection 1	G1/2, G1/4, G1/8, PK-3, PK-4	M5	M5	G1/8, PK-3, PK-4
Standard nominal flow rate	100 ... 5000 l/min	80 l/min	80 l/min	100 ... 550 l/min
Operating pressure	0.001 ... 10 bar	0.001 ... 6 bar	0.001 ... 6 bar	0.001 ... 10 bar
Description	• Valve function: OR function • Logic valve • Pneumatic control system • Mounting via through-holes	• For pneumatic sensors	• For pneumatic sensors	• Valve function: AND function • Dual-pressure valve • Connects two input signals in the AND function • Mounting via through-holes
online: ➔	os	vk	vlo	zk

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Pressure regulators

	 Pressure regulators LR, LRMA	 Differential pressure regulator LRL, LRLL
Pressure regulation range	1 ... 8 bar	2 ... 6 bar
Standard nominal flow rate	22 ... 150 l/min	
Standard nominal flow rate, closed		30 ... 730 l/min
Standard nominal flow rate, open		30 ... 760 l/min
Pneumatic connection 1	G1/4, G1/8, M5, QS-4, QS-6, QS-8	G1/2, G1/4, G1/8, G3/8, M5
Pneumatic connection 2	QS-4, QS-6, QS-8	QS-10, QS-12, QS-4, QS-6, QS-8
Description	• Piston regulator with through pressure supply • Optionally with pressure gauge • Directly actuated • Connections: push-in connector at both ends, thread/push-in connector • Push-in connector can be rotated 360°	• Piston regulator with through pressure supply • Without pressure gauge • Connections: thread/push-in connector on top or at side • Push-in connector can be rotated 360°
online: ➔	lrma	lrl

One-way flow control valves

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	 One-way flow control valves VFOF	 One-way flow control valves VFOC	 One-way flow control valves GRLA, GRLZ, CRGRLA, GRGA, GRGZ, GRLSA	 One-way flow control valves GRXA
Valve function	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
Pneumatic connection 1	QS-6, QS-8	QS-4, QS-6	G1/2, G1/4, G1/8, G3/4, G3/8, M3, M5, PK-3, PK-3 with union nut, PK-4, PK-4 with union nut, PK-6 with union nut, QS-10, QS-12, QS-3, QS-4, QS-6, QS-8	QS-4, QS-6, QS-8
Standard nominal flow rate in flow control direction	240 ... 650 l/min	0 ... 270 l/min	0 ... 4320 l/min	130 ... 280 l/min
Adjusting element	Internal hex	Slotted head screw	Knurled screw, slotted head screw, internal hex	Slotted head screw
Description	• Minimal height • High flow rate • Can be rotated horizontally through 360° in assembled state • Functional combination of one-way flow control valve and piloted check valve	• Shut-off valve, flow control at one end • Metal design • Precision adjustment for low and medium speeds • Push-in connector/push-in sleeve	• Flow control valve, flow control at one end • Polymer, metal or stainless steel design • Standard, mini, in-line variants with different flow rates • Functional combination of one-way flow control valve and piloted check valve • Connections: thread at both ends, push-in connector at both ends, threaded/push-in connector	• Functional combination of one-way flow control valve and piloted check valve • Holding function and speed setting in one housing • Additional supply port for holding crossover connection
online: →	vfof	vfoc	grla	grxa-hg

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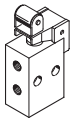
One-way flow control valves

	 One-way flow control valves GR, GRA	 One-way flow control valves GG, GGO, GRR	 Precision one-way flow control valves GRP	 One-way flow control valves, M5 Compact System GRF
Valve function	one-way flow control function	one-way flow control function	one-way flow control function	one-way flow control function
Pneumatic connection 1	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
Standard nominal flow rate in flow control direction	29.5 ... 3300 l/min	870 ... 1300 l/min	3.8 ... 75.8 l/min	45 l/min
Adjusting element	Knurled screw	Roller lever	Rotary knob with scale	Knurled screw
Description	• Non-return and flow control valve • in-line installation	• Non-return and flow control valve • With roller lever	• Non-return and flow control valve • Mounting on sub-base or for front panel mounting	• Complete system offering control components with all the functions required for pneumatic sequence controls • For control cabinet installation • Fast replacement of components
online: →	gra	gg	grp	m5 compact

Flow control valves

	 Flow control silencer VFFK	 Flow control valves GRLO, GRGO	 Flow control valves, barbed Y-connector with restrictor GRO, Y-PK3
Valve function	Flow control/silencer function	Flow control function	Flow control function
Pneumatic connection 1	M5, M7, R1/4, R1/8	M3, M5	G1/4, G1/8, M5, QS-3, QS-4, QS-6
Standard nominal flow rate in flow control direction 6 -› 0 bar		33 ... 169 l/min	
Standard nominal flow rate in flow control direction		18 ... 95 l/min	85 ... 350 l/min
Standard nominal flow rate 6 -› 0 bar	0 ... 420 l/min		
Adjusting element	Knurled screw	Slotted head screw	Knurled screw
Description	• With polymer silencer	• Flow control valve, flow control at both ends • Standard or mini flow control valve • Precision adjustment for low and medium speeds • Connections: thread at both ends, thread/push-in connector • Connections: elbow outlet or parallel outlet • Metal version	• Flow control valve, flow control at both ends • In-line flow control valve • Connections: push-in connector at both ends • Connections: in-line, Y-shape • Polymer design
online: →	vffk	grlo	gro

Flow control valves

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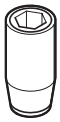
	 Precision flow control valves GRPO	 Exhaust air flow control valve, flow control/silencer GRU, GRE	 Restrictors VMPA1-FT
Valve function	Flow control function	Flow control/silencer function	Flow control function
Pneumatic connection 1	G1/8, PK-3, PK-4	G1/2, G1/4, G1/8, G3/4, G3/8	Sub-base
Standard nominal flow rate in flow control direction 6 -› 0 bar	5.2 ... 129 l/min		
Standard nominal flow rate in flow control direction	3.8 ... 75.8 l/min	520 ... 3600 l/min	3.5 ... 115 l/min
Standard nominal flow rate 6 -› 0 bar		0 ... 8000 l/min	
Adjusting element	Rotary knob with scale	slotted head screw	
Description	• Connections: threaded connection at both ends, push-in connector at both ends • Metal version	• Exhaust air flow control valve GRE: sintered metal • Flow control/silencer GRU: polymer	• Flow control function • Mounting: screw-in
online: ➔	grpo	gre	vmpa1

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Time delay valves

	 Time delay valves, M5 Compact System VLK, VZ, VZO	 Time delay valves VZA, VZOA, VZB, VZOB
Pneumatic port	PK-3	G1/4, G1/8
Standard nominal flow rate	60 ... 90 l/min	600 l/min
Adjustable delay time	0.25 ... 5 s	0 ... 30 s
Operating pressure	2.5 ... 8 bar	0 ... 10 bar
Type of mounting	Optional: front panel mounting, on mounting frame	With through-hole
Description	• Complete system offering control components with all the functions required for pneumatic sequence controls • For control cabinet installation • Fast replacement of components	• Time delay infinitely adjustable
online: ➔	m5 compact	vza

Proportional valves

	 Proportional pressure regulators VPPX	 Proportional pressure regulators VPPM	 Proportional pressure regulators MPPE	 Proportional pressure regulators MPPES
Valve function	3-way proportional pressure regulator	3-way proportional pressure regulator	3-way proportional pressure regulator, closed	3-way proportional pressure regulator, closed
Pneumatic connection 1	G1/2, G1/4, G1/8, sub-base	G1/2, G1/4, G1/8, sub-base	G1/2, G1/4, G1/8	G1/2, G1/4, G1/8
Pressure regulation range	0.1 ... 10 bar	0.02 ... 10 bar	0 ... 10 bar	0 ... 10 bar
Operating pressure for positioning/Soft Stop				
Operating pressure			0 ... 12 bar	≤12 bar
Standard nominal flow rate	1400 ... 7000 l/min	380 ... 7000 l/min		
Description	• Pressure regulator with additional sensor input • Multi-sensor control (cascade control) • Control characteristic adjustable via FCT software • Integrated pressure sensor with separate output • Pressure is maintained if the controller fails	• Pilot actuated pressure regulating valve • Multi-sensor control (cascade control) • Integration in valve terminal MPA • User interface with LED displays, LCD display, adjustment/selection buttons • Integrated pressure sensor • Electrical connection via plug, round design, 8-pin, M12 or terminal linking	• Pilot actuated pressure regulating valve • Setpoint value input as analogue voltage or current signal • Choice of pressure regulation ranges • Optionally with setpoint module • Electrical connection via plug, round design to DIN 45326, M16 x 0.75, 8-pin	• Directly actuated (G1/8), pilot actuated (G1/4, G1/2) • Setpoint value input as analogue voltage or current signal • Choice of pressure regulation ranges • Optionally with setpoint module • Electrical connection via plug, round design to DIN 45326, M16 x 0.75, 8-pin
online: →	vppx	vppm	mppe	mppes

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Proportional valves

FESTO

	 Proportional pressure regulators VPPE	 Proportional directional control valves VPWP	 Proportional directional control valves MPYE
Valve function	3-way proportional pressure regulator, 3-way proportional pressure regulator, closed	5/3-way proportional directional control valve, closed	5/3-way, closed
Pneumatic connection 1	G1/8	G1/4, G1/8, G3/8	G1/4, G1/8, G3/8, M5
Pressure regulation range	0.02 ... 10 bar		
Operating pressure for positioning/Soft Stop		4 ... 8bar	
Operating pressure	8bar	0 ... 10 bar	0 ... 10 bar
Standard nominal flow rate	310 ... 1250 l/min	350 ... 2000 l/min	100 ... 2000 l/min
Description	• Pilot actuated pressure regulating valve • Setpoint input as analogue voltage signal (0 ... 10 V) • Electrical connection via M12x1 plug, 4-pin • Optionally with setpoint module	• Controlled piston spool valve • Digital actuation • Integrated pressure sensors for monitoring function and force control • With auto identification • Diagnostic function • Integrated digital output, e.g. for a clamping/brake unit • Suitable for servopneumatic applications with CPX-CMAX and CPX-CMPX	• Controlled piston spool valve • Analogue actuation • Setpoint input as analogue voltage signal (0 ... 10 V) • Suitable for servopneumatic applications with SPC11
online: →	**vppe**	**vpwp**	**mpye**

Solenoid-actuated process and media valves

	 **Solenoid valves VZWD**	 **Reverse jet pulse valves VZWE-E, VZWE-F**	 **Solenoid valves VZWF**
Design	Directly actuated poppet valve	Angled version, straight version with flange, diaphragm valve	Diaphragm valve, force pilot operated
Type of actuation	electrical	electrical	electrical
Nominal width	1 ... 6 mm	20 ... 76 mm	13.5 ... 50 mm
Process valve connection	G1/4, G1/8, NPT1/4, NPT1/8		G1, G1 1/2, G1 1/4, G1/2, G1/4, G2, G3/4, G3/8, NPT1, NPT1 1/2, NPT1 1/4, NPT1/2, NPT1/4, NPT2, NPT3/4, NPT3/8
Process valve connection 1		Flange diameter 60 mm, 75 mm, 89 mm, G1, G1 1/2, G2, G2 1/2, G3/4	
Process valve connection 2		Flange diameter 145.5 mm, 162 mm, 59 mm, 74 mm, G1, G1 1/2, G2, G2 1/2, G3/4	
Temperature of medium	-10 ... 80 °C		-10 ... 80 °C
Medium pressure	0 ... 90 bar	0.35 ... 8 bar	0 ... 10 bar
Medium pressure of gaseous media			
Medium pressure of liquid media			
Flow rate Kv	0.06 ... 0.4 m³/h	15 ... 210 m³/h	1.8 ... 28 m³/h
Description	• Extensive pressure range • Directly actuated poppet valve • No pressure difference required • Can also be used in vacuum technology	• High flow rates • For mechanically cleaning filters and dust filter systems • Fast opening and closing times • Sturdy pilot system	• High flow rates • Large nominal diameters with relatively small solenoids • No pressure difference required • Can also be used in vacuum technology
online: →	**vzwd**	**vzwe**	**vzwf**

Solenoid-actuated process and media valves

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	 **Solenoid valves VZWM**	 **Solenoid valves VZWP**	 **Solenoid valves MN1H**
Design	Poppet valve with diaphragm seal	Piloted piston poppet valve	Diaphragm valve
Type of actuation	electrical	electrical	electrical
Nominal width	13 ... 50 mm	13 ... 25 mm	13 ... 40 mm
Process valve connection	G1, G1 1/2, G1 1/4, G1/2, G1/4, G2, G3/4, G3/8	G1, G1/2, G1/4, G3/4, G3/8, NPT1, NPT1/2, NPT1/4, NPT3/4, NPT3/8	G1, G1 1/2, G1/2, G1/4, G3/4, G3/8
Process valve connection 1			
Process valve connection 2			
Temperature of medium	-10 ... 60 °C	-10 ... 80 °C	-10 ... 60 °C
Medium pressure		0.5 ... 40 bar	0.5 ... 10 bar
Medium pressure of gaseous media	0.5 ... 10 bar		
Medium pressure of liquid media	0.5 ... 6 bar		
Flow rate Kv	1.6 ... 39 m³/h	1.5 ... 11.5 m³/h	
Description	• Poppet valve with diaphragm seal • Brass or stainless steel casting design • Electrical connection via solenoid armature tube • Wide range of coils • Coil can be ordered separately	• For all applications with a differential pressure of min. 0.5 bar • For high pressures and high flow rates with relatively small solenoids • For controlling gaseous and liquid media in open circuits	• Pilot operated diaphragm valve • Brass design • Can only be used for gaseous media • Adjustable closing cushioning, in-line mounting or through-hole
online: →	**vzwm**	**vzwp**	**mn1h-2**

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Pneumatically and mechanically actuated process and media valves

	 Pinch valves VZQA	 Angle seat valves VZXF	 Ball valves VZBC	 Ball valve actuator units VZBC
Design	Pinch valve, pneumatically actuated	Poppet valve with spring return	2-way ball valve	2-way ball valve, quarter turn actuator
Type of actuation	Pneumatic	Pneumatic	Mechanical	Pneumatic
Nominal width		12 ... 45 mm		
Nominal width DN	15 mm, 25 mm, 6 mm	15 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm	100 mm, 15 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 65 mm, 80 mm	100 mm, 15 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 65 mm, 80 mm
Process valve connection	G1, G1/2, G1/4, NPT1/2, NPT1/4, clamp to ASME-BPE, clamp to DIN 32676	G1, G1 1/2, G1 1/4, G1/2, G2, G3/4, NPT1, NPT1 1/2, NPT1 1/4, NPT1/2, NPT2, NPT3/4	Ring housing with threaded flange	Ring housing with threaded flange
Flow rate Kv	0.7 ... 5 m³/h	3.3 ... 43 m³/h	19.4 ... 1414 m³/h	19.4 ... 1414 m³/h
Standard nominal flow rate				
Temperature of medium	-5 ... 100 °C	-40 ... 200 °C	-10 ... 200 °C	-10 ... 200 °C
Medium pressure	0 ... 6 bar	-0.9 ... 40 bar		
Description	• Modular design • Quick and easy replacement of the diaphragm • Selection of different materials for housing and connector caps • Different connection cap designs (G and NPT thread), clamp ferrule to DIN 32676 and ASME-BPE • For critical, abrasive and viscous media • Up to 2 million switching cycles • FDA-compliant materials • Easy-to-clean design • Flow direction is freely selectable	• Sturdy design • Stainless steel and gunmetal process valves with stainless steel, brass or aluminium drives • For operating pressures up to 40 bar • Safety position "closing" • Different actuator sizes and housing materials • Selection of different seat and shaft seals • Flow direction is freely selectable • For liquids, gases and other easily contaminated media • Easy-to-clean design	• Automatable 2-way ball valve with compact flange • Stainless steel design • Short installed length • Blow-out proof shaft • Manual operation possible using hand lever • Connecting thread to DIN 2999 or DIN ISO 228-1 • Mounting flange to ISO 5211 • ATEX certification for Zone 1, 21, 2, 22	• Ball valve actuator unit with double-acting or single-acting quarter turn actuator • Stainless steel ball valve in compact design • Port pattern as per NAMUR for solenoid valves/sensor boxes to VDI/VDE 3845 • Flow is fully opened or closed in both directions • ATEX certification for Zone 1, 21, 2, 22
online: →	vzqa	vzxf	vzbc	vzbc

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Pneumatically and mechanically actuated process and media valves

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	 Ball valves VAPB	 Ball valves VZBA	 Ball valve actuator units VZBA
Design	2-way ball valve	2-way ball valve, 3-way ball valve, L-shaped hole, T-shaped hole	2-way ball valve, 3-way ball valve, L-shaped hole, quarter turn actuator, T-shaped hole
Type of actuation	Mechanical	Mechanical	Pneumatic
Nominal width			
Nominal width DN	15 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm	10 mm, 100 mm, 15 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 65 mm, 8 mm, 80 mm	10 mm, 100 mm, 15 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 65 mm, 8 mm, 80 mm
Process valve connection	Rp1, Rp1 1/2, Rp1 1/4, Rp1/2, Rp1/4, Rp2, Rp2 1/2, Rp3/4, Rp3/8	Rp1, Rp1 1/2, Rp1 1/4, Rp1/2, Rp1/4, Rp2, Rp2 1/2, Rp3, Rp3/4, Rp3/8, Rp4, 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, weld-on ends/weld-on ends
Flow rate Kv	5.9 ... 535 m³/h	7 ... 1414 m³/h	7 ... 1414 m³/h
Standard nominal flow rate			
Temperature of medium	-20 ... 150 °C	-10 ... 200 °C	-10 ... 200 °C
Medium pressure			
Description	• Automatable 2-way ball valve • Brass design • Blow-out proof shaft • Manual operation possible using hand lever • Connecting thread to DIN 2999 or DIN ISO 228-1 • Mounting flange to ISO 5211	• Automatable 2-way or 3-way ball valve • Stainless steel design • Blow-out proof shaft • Manual operation possible using hand lever • Connecting thread to DIN 2999 or DIN ISO 228-1 • Mounting flange to ISO 5211 • ATEX certification for Zone 1, 21, 2, 22	• Ball valve actuator unit with double-acting or single-acting quarter turn actuator • Stainless steel ball valve • Port pattern as per NAMUR for solenoid valves/sensor boxes to VDI/VDE 3845 • Flow is fully opened or closed in both directions • ATEX certification for Zone 1, 21, 2, 22
online: →	vapb	vzba	vzba

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Pneumatically and mechanically actuated process and media valves

	 Ball valve actuator units VZPR	 Pneumatic valves VLX
Design	2-way ball valve, quarter turn actuator	Diaphragm valve
Type of actuation	Electric, pneumatic	Pneumatic
Nominal width		13 ... 25 mm
Nominal width DN	15 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm	
Process valve connection	Rp1, Rp1 1/2, Rp1 1/4, Rp1/2, Rp1/4, Rp2, Rp2 1/2, Rp3/4, Rp3/8	G1, G1/2, G1/4, G3/4, G3/8
Flow rate Kv	5.9 ... 535 m³/h	
Standard nominal flow rate		2400 ... 14000 l/min
Temperature of medium	-20 ... 150 °C	-10 ... 80 °C
Medium pressure	1 ... 8.4 bar	1 ... 10 bar
Description	• Ball valve actuator unit with double-acting quarter turn actuator • Brass ball valve • Port pattern as per NAMUR for solenoid valves/sensor boxes to VDI/VDE 3845 • Flow is fully opened or closed in both directions	• Poppet valve • Indirectly actuated • Brass design • In-line mounting or via through-holes
online: →	vzpr	vlx

Pneumatic control systems

	 **Quickstepper FSS**	 **Control block for two-hand start ZSB**	 **Pneumatic counters, M5 Compact System PZ, PZA, PZV**
Design	Sequencer, additive	Two-hand operation in accordance with EN ISO 12100	Mechanical sequence counter with pneumatic drive
Pneumatic port		G1/8	M5
Operating pressure	2 ... 6 bar	4 ... 8 bar	2 ... 8bar
Type of mounting		Optionally: with through hole, with female thread	Front panel mounting, with through-hole
Description	• Pneumatic/mechanical sequencer with 12 steps and linked to start • Ready-to-install sequence controller • Acknowledgement-controlled motion sequences • Fast replacement, tubing can be left in place	• Used wherever manual actuation poses a risk of accident to operating personnel • Safety component in accordance with EU Machinery Directive	• Complete system offering control components with all the functions required for pneumatic sequence controls • For control cabinet installation • Fast replacement of components • Available with protective cap
online: ➔	fss	zsb	pza

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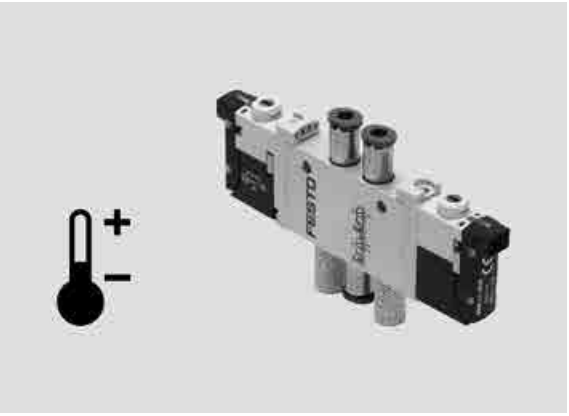
Pneumatic control systems

	 **Timer, M5 Compact System PZVT, PZVT-S, PZVT-FR, PZVT-AUT**	 **Electrical counter CCES**
Design	Mechanical sequence counter with pneumatic drive	Electric adding counter with battery
Pneumatic port	Female thread M5	
Operating pressure	2 ... 6 bar	
Type of mounting	Front panel mounting	Front panel mounting
Description	• Complete system offering control components with all the functions required for pneumatic sequence controls • For control cabinet installation • Fast replacement of components • Mechanical sequence counter with pneumatic drive • Adjustable delay time • Available with protective cap	• 8-digit LCD display • Independent power supply • Connection via terminal strip • Reset button
online: ➔	pzvt	cces

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 – from minor product modifications to complete new product developments.

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.
Further information on customised components can be found on your local website at www.festo.com

Software tool

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Product finder for valve terminals		Find the right valve terminal quickly with the help of the product finder. Start the product finder by clicking on the blue button "Product finder " under "Products". Select your technical features on the left-hand side step-by-step; the selection of suitable products on the right-hand side is automatically updated to reflect the chosen technical features.	The use of logic checks ensures that only correct configurations are available for selection. The product finder for valve terminals is part of the electronic catalogue and is not available as a separate software program.

Standards-based valve terminals

	 **Valve manifolds, ISO 15407-1** **VTIA**	 **Valve terminals** **VTSA**
Width	18 mm, 26 mm	18 mm, 26 mm
Max. standard nominal flow rate	1100 l/min at 26 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
Max. number of valve positions	16	16, 32
Electrical actuation	Individual connection	Individual connection, Ethernet, fieldbus, multi-pin plug, integrated controller
Valve terminal design	Modular, valve sizes can be mixed	Modular, valve sizes can be mixed
Description	• Conforms to ISO 15407-1 • Wide range of individual electrical connections • Two valve sizes can be combined	• Conforms to ISO 15407-2/ISO 5599-2 • Multi-pin plug or fieldbus connection via CPX system • Five valve sizes can be combined on one valve terminal • Integrated safety functions
online: →	vtia	vtsa

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Universal valve terminals

FESTO

	 Valve manifolds VTUS	 Valve manifolds VTUG-S	 Valve terminals multi-pin plug/fieldbus connection VTUG	 Valve terminals VTUB
Width	21, 26.5	10, 14, 18	10, 14, 18	20
Standard nominal flow rate	600 ... 1300 l/min	1380 l/min at 18 mm, 380 l/min at 10 mm, 780 l/min at 14 mm	1200 l/min at 18 mm, 330 l/min at 10 mm, 630 l/min at 14 mm	1000 l/min at 20 mm, 200 l/min, 1000 l/min
Max. number of valve positions	16	16	24	16
Electrical actuation	Individual connection	Individual connection	Individual connection, fieldbus, multi-pin plug, IO-Link, I-Port	Individual connection, multi-pin plug
Valve terminal design	Fixed grid	Fixed grid	Fixed grid	Fixed grid
Description	• Robust VUVS valves with long service life • Individual electrical connection • Pilot air supply in the manifold rail • Comprehensive range of accessories	• Compact with small VUVG valves • Connection technology easy to change via the E-box • Wide range of valve functions • Also with semi in-line valves	• Low-cost fixed grid • Extremely easy assembly • Exchangeable electrical actuation • IO-Link capable • Valves VUVG with individual electrical connection can be integrated • Also available with pneumatic multiple connector plate	• Low-cost fixed grid • Extremely easy assembly • Valves in polymer technology • Electrical multi-pin plug connection
online: →	vtus	vtug	vtug	vtub

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Universal valve terminals

	 Valve terminals MPA-L	 Valve terminals MPA-S	 Valve terminals VTSA-F	 Valve terminals, Compact Performance CPV
Width	10, 14, 20	10, 20	18, 26, 42, 52, 65	18 mm, 10, 14, 18
Standard nominal flow rate	360 l/min at 10 mm, 670 l/min at 14 mm, 870 l/min at 20 mm	360 l/min at 10 mm, 700 l/min at 20 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	1600 l/min at 18 mm, 400 l/min at 10 mm, 800 l/min at 14 mm
Max. number of valve positions	32	24, 32, 64, 8	32	8
Electrical actuation	Fieldbus, multi-pin plug, IO-Link, I-Port	AS-Interface, fieldbus, multi-pin plug	Ethernet, fieldbus, multi-pin plug, integrated controller	AS-Interface, CPI installation system, individual connection, fieldbus, multi-pin plug
Valve terminal design	Modular, valve sizes can be mixed	Modular, valve sizes can be mixed	Modular, valve sizes can be mixed	Fixed grid
Description	• Maximum modularity • Single granular • Polymer sub-base • 3 valve sizes • Fieldbus connection via CPX • IO-Link capable	• Valve terminals for universal applications • High-performance valves in a sturdy metal housing • Metal linking • Two valve sizes can be combined • Excellent communication due to serial linking • Fieldbus connection via CPX • Max. 128 valves	• Flow rate-optimised VTSA valve terminal • Linking with increased flow rates • Functions as per VTSA	• Maximum performance in the minimum of space • Three sizes • Wide range of connection and mounting options • Multi-pin or fieldbus control • IO-Link capable
online: →	mpa-l	mpa-s	vtsa	cpv

Universal valve terminals

	 Valve terminals CPV-SC	 Valve manifolds, Compact Performance CPV10-EX	 Valve terminals VTUB-12
Width	10	10	12 mm, 24 mm, 12, 24
Standard nominal flow rate	170 l/min at 10 mm	400 l/min, 400 l/min at 10 mm	400 l/min at 12 mm
Max. number of valve positions	16	8	35
Electrical actuation	CPI installation system, individual connection, fieldbus, multi-pin plug	Individual connection	Fieldbus, multi-pin plug
Valve terminal design	Fixed grid	Fixed grid	Fixed grid
Description	• Small and compact • High flow rate even with compact design • Suitable for vacuum • Multi-pin or fieldbus control	• Intrinsically safe valve manifold design to ATEX Category 2 (zone 1) • Optimised for control cabinet assembly • Optimal for pilot control of process valves	• Compact dimensions • Poppet valves in polymer technology • Multi-pin or fieldbus control • IO-Link capable
online: →	cpv-sc	cpv10-ex	vtub-12

Application-specific valve terminals

FESTO

	 Valve terminals MPA-C	 Valve terminals VTOC	 Valve terminals MH1
Width	14	10	10
Standard nominal flow rate	780 l/min at 14 mm	10 l/min at 10 mm	10 l/min at 10 mm
Max. number of valve positions	32	24	24
Electrical actuation	Multi-pin plug, IO-Link, I-Port	Multi-pin plug, IO-Link, I-Port	Individual connection, multi-pin plug
Valve terminal design	Modular and expandable	Fixed grid	Fixed grid
Description	• Valve terminal in Clean Design • High corrosion resistance • Protection class IP69K • FDA-compliant materials • Redundant sealing system • Easy-to-clean design	• Compact pilot valves • Compact assembly • Greater safety by interlock function • Multi-pin or fieldbus control • IO-Link capable	• Miniaturised poppet valves • Flow rate up to 14 l/min • Multi-pin or electrical individual connection
online: →	mpa-c	vtoc	mh1

Electrical peripherals

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	 Fieldbus module CTEU	 CPI installation system CTEC	 Terminal CPX	 Terminal CPX-P
Protocol	PROFIBUS DP, AS-Interface, CANopen, CC-Link, CPI-B, DeviceNet, EtherCAT, PROFINET	INTERBUS, DeviceNet, PROFIBUS, CANopen, CC-Link, Ether-Net/IP, PROFINET, EtherCAT, ModbusTCP	INTERBUS, DeviceNet, PROFIBUS, CANopen, CC-Link, Ether-Net/IP, PROFINET, EtherCAT, ModbusTCP	DeviceNet, PROFIBUS, EtherNet/IP, PROFINET, ModbusTCP
Max. address capacity, inputs	2 ... 64	16	64	64
Max. address capacity, outputs	2 ... 64	16	64	64
Parameterisation	Activate diagnostics, diagnostic behaviour, failsafe and idle response, failsafe response, watchdog disable, watchdog enable		Diagnostic behaviour, failsafe response, forcing of channels, signal setup	Diagnostic behaviour, failsafe response, forcing of channels, signal setup
Protection class	IP65, IP67	IP65, IP67	IP65, IP67	IP20, IP65
Nominal DC operating voltage	24 ... 30 V	24 V	24 V	24 V
Operating voltage range DC	18 ... 31.6 V	18 ... 30 V	18 ... 30 V	18 ... 30 V
Description	• For valve terminals VTUB-12, VTUG, MPA-L, CPV, VTOC • Can be expanded into installation system CTEL • Fieldbus-typical LEDs, interfaces and switching elements available • Isolated power supply for electronics and valves	• CPX master module for four CPI strings • Combination of centralised and decentralised installation possible • Decentralised pneumatic components and sensors for fast processes • Can be connected to valve terminal CPV, MPA-S, CPV-SC	• Automation platform • Open to all common fieldbus protocols and Ethernet • Integrated diagnostic and maintenance functions • Applicable as stand-alone as remote I/O or with valve terminals MPA-S, MPA-L, VTSA/VTSA-F • Choice of plastic or metal housing with individual linking	• Use of matching remote I/O and valve terminals in a control cabinet • Combination with modules of the electrical terminal CPX, which enables use for hybrid applications • Unique modular structure • Comprehensive integrated diagnostic and service functions
online: →	cteu	ctec	cpx	cpx-p

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Electrical peripherals

	 AS-Interface components ASI, CACC	 Electrical interface CPX-CTEL	 AS-Interface module CESA
Protocol		I-Port, IO-Link	AS-Interface, CANopen, Profibus
Max. address capacity, inputs		32	
Max. address capacity, outputs		32	
Parameterisation		Diagnostic behaviour, fail-safe mode per channel, force mode per channel, idle mode per channel, module parameter, tool changeover mode	
Protection class	IP65	IP65, IP67	IP20
Nominal DC operating voltage	24 V	24 V	AS-i voltage 30 VDC
Operating voltage range DC	26.5 ... 31.6 V	18 ... 30 V	
Description	• Accessories for AS-Interface installation system • Modules for actuating individual valves ASI-EVA • Cable distributor ASI-KVT • Addressing device ASI-PRG-ADR • Compact I/O modules (IP65, IP67) • AS-Interface power supply unit SVG	• CPX-CTEL master module with 4 I-Port connections • Decentralised pneumatic components and sensors for fast processes • Standardised M12 connections	• AS-i master gateway • Duplicate address recognition • Direct operation by pushbuttons • Graphic display • Comprehensive diagnostics via LED and display • Specification 3.0
online: →	as-interface	cpx-ctel	cesa

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- Modified valve sub-bases

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Software tool

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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.	The configurator is part of the electronic catalogue and is not available as a separate software program.
Festo Design Tool 3D FDT 3D		This 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 with a single order code – either completely pre-assembled or as individual parts in a single box. As a result, your bill of materials is considerably shortened and downstream processes such as product ordering, order picking and assembly are significantly simplified.	All ordering options are available in the following countries: AT, BE, CH, CZ, DE, DK, ES, FI, FR, GB, HU, IE, IT, NL, NO, PL, RU, SE, SI, SK. This tool can be found • either via the address: www.festo.com/FDT-3D in the above listed countries, • or on the CD "FDT 3D" (part no. 135595 for the above listed countries) • or on the DVD.

Proximity sensors, for T-slot

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	 **Proximity sensor SDBT**	 **Proximity sensor SMT-8M-A**	 **Proximity sensor SME-8, SME-8M, SME-8-SL, SME-8-FM**	 **Proximity sensor SMT-8**
Electrical connection	M12x1, cable, cable with plug, 2-pin, 3-pin, 2-wire, 3-wire, rotatable thread	M8x1, M12x1, cable, cable with plug, 2-pin, 3-pin, 2-wire, 3-wire, rotatable thread	M8x1, cable, cable with plug, plug, 3-pin, 2-wire, 3-wire, rotatable thread	M8x1, cable, cable with plug, plug, 3-pin, 2-wire, 3-wire, rotatable thread
Operating voltage range DC	10 ... 30 V	5 ... 30 V	0 ... 230 V	10 ... 30 V
Switching element function	N/O contact	N/C contact, N/C contact or N/O contact, switchable, N/O contact	N/C contact, N/O contact	NAMUR, N/O contact
Switching output	NPN, PNP, non-contacting, 2-wire	NPN, PNP, PNP/NPN, switchable, non-contacting, 2-wire	Contacting, bipolar, without LED function	NAMUR, PNP
Description	• Measuring principle: magneto-resistive • Oil-resistant, welding field immune, resistant to welding spatter • Screw-clamped in slot, insertable from above • LED switching status display • Cable length 0.3 ... 5 m	• Measuring principle: magneto-resistive • Short design • Variant EX2 for use in potentially explosive areas • Inserted in the slot from above, flush with the cylinder profile • LED switching status display • LED operating reserve indication • Cable length 0.1 ... 30 m	• Measuring principle: magnetic reed • SME-8-...-S6: heat-resistant design • Variants suitable for use with energy chains and robots • Screw-clamped or clamped in slot, insertable in the slot from above or lengthwise • LED switching status display • Cable length 0.3, 2.5, 5, 7.5, 0.2 ... 10 m	• Measuring principle: magneto-resistive • SMT-8-F: in accordance with the ATEX directive for explosive atmospheres • SMT-8G: design ideally matched to gripper sensing • SMT-8-SL: sturdy thanks to long guides and plug directly at the sensor • Variants suitable for use with energy chains and robots • Insertable in the slot lengthwise or from above • LED switching status display • Cable length 0.3, 2.5, 5 m
online: →	**sdbt**	**smt-8m**	**sme-8**	**smt-8**

Proximity sensors, for T-slot

	 **Proximity sensor CRSMT-8**	 **Proximity sensor CRSMT-8M**	 **Proximity sensor SMEO-8E**
Electrical connection	Cable, 3-wire	M8x1, M12x1, cable, cable with plug, 3-pin, 3-wire, rotatable thread	M8x1, M12x1, cable, plug connector, 3-pin, 2-wire
Operating voltage range DC	10 ... 30 V	5 ... 30 V	0 ... 250 V
Switching element function	N/O contact	N/O contact	N/O contact
Switching output	PNP	PNP	Contacting, contacting bipolar, without LED function
Description	• Measuring principle: magneto-resistive • Corrosion-resistant design • Suitable for the food industry, resistant to acids and cooling lubricants • Insertable in the slot lengthwise, flush with the cylinder profile • LED switching status display • Cable length 2.5, 5 m	• Measuring principle: magneto-resistive • Corrosion-resistant design • Suitable for the food industry, resistant to acids and cooling lubricants • Insertable in the slot lengthwise, flush with the cylinder profile • LED switching status display • Cable length 2.5, 5 m	• Measuring principle: magnetic reed • Sturdy sensor in block design • Plug integrated in housing • LED switching status display • Cable length 2.5 m
online: →	crsmt-8	crsmt-8m	smeo

Proximity sensors, for T-slot

	 **Proximity sensor SMTO-8E**	 **Proximity sensor SMTSO-8E**	 **Proximity sensor SMPO-8E**
Electrical connection	M8x1, M12x1, plug connector, 3-pin	M12 x 1, plug connector, 3-pin	
Operating voltage range DC	10 ... 30 V	10 ... 30 V	
Switching element function	N/O contact	N/O contact	
Switching output	NPN, PNP	NPN, PNP	
Description	• Measuring principle: magneto-resistive • Sturdy sensor in block design • Plug integrated in housing • LED switching status display	• Measuring principle: magneto-inductive • Welding field immune design • Sturdy sensor in block design • Plug integrated in housing • LED switching status display	• Measuring principle: magnetic • Pneumatic proximity sensor • Function: 3/2-way valve, normally closed • Pneumatic connection via female thread M5 • Visual switching status indication
online: →	smto	smtso	smpo

Proximity sensors, for C-slot

FESTO

	 **Proximity sensor SME-10, SME-10M**	 **Proximity sensor SMT-10M, SMT-10G**
Electrical connection	M8x1, M12, cable, cable with plug, open end, 2-pin, 3-pin, 3-wire, rotatable thread, snap collar	M8x1, M12, cable, cable with plug, open end, 2-pin, 3-pin, 3-wire, rotatable thread, snap collar
Operating voltage range DC	5 ... 30 V	5 ... 30 V
Switching element function	N/O contact	N/O contact
Switching output	Contacting, bipolar	NPN, PNP, non-contacting, 2-wire
Description	• Measuring principle: magnetic reed • Clamped in C-slot, insertable in the slot from above or lengthwise • LED switching status display • Cable length 0.3, 2.5 m	• Measuring principle: magneto-resistive • Clamped in C-slot, insertable in the slot from above or lengthwise • LED switching status display • Cable length 0.3, 2.5 m
online: ➔	**sme-10**	**smt-10**

Proximity sensors, round design

	 **Proximity sensor SMEO-4**	 **Proximity sensor CRSMEO-4**	 **Proximity sensor SMTO-4**
Electrical connection	M8x1, cable, plug connector, 3-pin, 2-wire, 3-wire	Cable, 3-wire	M8x1, cable, plug connector, 3-pin, 3-wire
Operating voltage range DC	12 ... 250 V	12 ... 30 V	10 ... 30 V
Switching element function	N/O contact	N/O contact	N/O contact
Switching output	Contacting, bipolar, without LED function	Contacting, bipolar	NPN, PNP
Description	• Measuring principle: magnetic reed • U-shaped housing • LED switching status display • Cable length 2.5, 5 m	• Measuring principle: magnetic reed • Corrosion-resistant design • LED switching status display • Cable length 2.5 m	• Measuring principle: magneto-inductive • U-shaped housing • LED switching status display • Cable length 2.5 m
online: ➔	**smeo-4**	**crsmeo-4**	**smto-4**

Proximity sensors, block design

	 Proximity sensor SME-1	 Proximity sensor SMT-C1	 Proximity sensor SMEO-1	 Proximity sensor SME-2
Electrical connection	M8x1, cable, plug connector, 3-pin, 2-wire, 3-wire	M8x1, M12x1, cable, cable with plug, 3-pin, 3-wire, rotatable thread	M8x1, cable, plug connector, 3-pin, 2-wire, 3-wire	Connector socket to DIN 43650
Operating voltage range DC	0 ... 200 V	10 ... 30 V	0 ... 200 V	24 V
Switching element function	N/O contact	N/O contact	N/O contact	
Switching output	Contacting, bipolar	PNP	Contacting, bipolar	
Description	• Measuring principle: magneto-inductive • For mounting kit • With or without LED switching status display	• Measuring principle: magneto-inductive • For Clean Design ISO cylinder DSBF with mounting rail for sensors • LED switching status display	• Measuring principle: magnetic reed • SMEO-1-S6: heat-resistant design • With or without LED switching status display • Cable length 2.5, 5 m	• Measuring principle: magneto-inductive • For mounting kit • LED status displays
online: →	sme-1	smt-c1	smeo-1	sme-2

Proximity sensors, block design

	 Proximity sensor SMEO-2	 Proximity sensor SMTO-1	 Proximity sensor SMTSO-1	 Proximity sensor SMPO-1
Electrical connection	Connector socket to EN 175301-803 (DIN 43650)	M8x1, cable, plug connector, 3-pin, 3-wire	M12x1, plug connector, 3-pin	
Operating voltage range DC	0 ... 200 V	10 ... 30 V	10 ... 30 V	
Switching element function	N/O contact	N/O contact	N/O contact	
Switching output		NPN, PNP	PNP	
Description	• Measuring principle: magneto-inductive • For mounting kit • With or without LED switching status display	• Measuring principle: magneto-resistive • LED switching status display • Cable length 2.5 m	• Measuring principle: magneto-resistive • Welding field immune design • LED switching status display	• Measuring principle: magnetic • Pneumatic proximity sensor • Function: 3/2-way valve, normally closed • Pneumatic connection via barbed connector for tubing I.D. 3 mm • Visual switching status indication
online: →	smeo-2	smto-1	smtso-1	smpo

Cylinder signal generators

FESTO

	 **Cylinder signal generator PPL**
Standard nominal flow rate	48 l/min
Operating pressure	1 ... 8 bar
Pneumatic connection	Barbed connector for 3 mm I.D. plastic tubing
Type of mounting	Hollow bolt G1/8, G1/4
Description	• For contactless pneumatic signal generation at the end of cylinder strokes • Function: 3/2-way valve, normally closed • Can be screwed directly into the supply port of the cylinder using a hollow bolt
online: →	ppl

Inductive sensors

	 **Inductive sensor SIEA**	 **Inductive sensor SIED**	 **Inductive sensor SIEF**	 **Inductive sensor SIEH**
Size	M12, M18, M30, M8	M12, M18, M30	40x40x65 mm, M12, M18, M30, M8	3 mm, M12, M18
Switching output		Non-contacting, 2-wire	NPN, PNP	NPN, PNP
Switching element function		N/C contact, N/O contact	Antivalent, N/O contact	N/C contact, N/O contact
Electrical connection	M8x1, M12x1, plug connector, 3-pin, 4-pin	M12x1, cable, plug connector, 2-pin, 2-wire	M8x1, M12x1, cable, plug connector, Fixcon, 3-pin, 4-pin, 3-wire	M8x1, M12x1, cable, cable with plug, plug connector, 3-pin, 3-wire
Operating voltage range DC	15 ... 30 V	10 ... 320 V	10 ... 65 V	10 ... 30 V
Description	• With analogue output • Flush mounting • Metric thread	• With standard switching distance • For DC and AC voltage • Metric thread • Flush or non-flush mounting • LED switching status display • Design with metal or polyamide housing	• Reduction factor 1 for all metals • Welding field immune • Design with housing resistant to welding spatter • Flush, partially flush or non-flush mounting • LED switching status display	• With increased switching distance • Flush mounting • Metric thread • LED switching status display • Design with stainless steel housing
online: →	siea	sied	sief	sieh

Inductive sensors

	 **Inductive sensor SIEN**	 **Inductive sensor SIES-Q**	 **Inductive sensor SIES-8M**
Size	4 mm, 6.5 mm, M12, M12x1, M18, M18x1, M30, M30x1.5, M5x0.5, M8x1	12x26x40 mm, 15x20x30 mm, 40x40x120 mm, 5x5x25 mm, 8x8x40 mm	Slot 8
Switching output	NPN, PNP	NPN, PNP	NPN, PNP
Switching element function	N/C contact, N/O contact	Antivalent, N/C contact, N/O contact	N/C contact, N/O contact
Electrical connection	M8x1, M12x1, cable, plug connector, 3-pin, 3-wire	M8x1, cable, plug connector, screw terminal, 3-pin, 3-wire	M8x1, cable, cable with plug, 3-pin, 3-wire, rotatable thread
Operating voltage range DC	10 ... 30 V	10 ... 30 V	10 ... 30 V
Description	• With standard switching distance • For DC voltage • Round design • Metric thread • Flush or non-flush mounting • LED switching status display • Design with metal or polyamide housing	• Block design • Flush mounting • LED switching status display	• Suitable for position sensing for electric axes and grippers with T-slot • Flush mounting • Switching status indication with 2 LEDs for better visibility regardless of the direction from which it is approached
online: →	sien	sies	sies

Position sensors

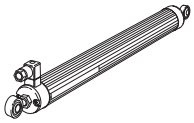
	 **Position sensor SRBS**	 **Position transmitter SDAT**	 **Position transmitter SMAT-8E**
Design	Round	For T-slot	For T-slot
Position measuring range	›270 ...	0 ... 160000 µm	48 ... 52 mm
Analogue output	50 mA	4 - 20 mA, 100 mA	0 - 10 V, 4 - 20 mA
Electrical connection	M8, cable with plug, 4-pin, rotatable thread	M8, cable with plug, 4-pin, rotatable thread	M8x1, plug connector, 4-pin
Description	• Used to detect rotation of the shaft on rotary drives DRVS and DSM • The sensor can be quickly assembled without having to manually search for switching points • Simple and reliable operation using just one pushbutton directly on the device	• Measuring principle: magnetic Hall • Insertable in the slot from above, secured with screw • Suitable for use with energy chain and robot lines • LED status displays • Cable length 0.3 m	• Measuring principle: magnetic Hall • Current and voltage signal at the analogue output • Insertable in the slot lengthwise • Suitable for use with energy chain and robot lines • LED status displays • Cable length 2.5, 5 m
online: →	srbs	sdat	smat-8e

Position sensors

FESTO

	 Position transmitter SMAT-8M	 Position sensors SMH
Design	For T-slot	For gripper
Position measuring range	40 mm	
Analogue output	0 - 10 V	
Electrical connection	M8x1, cable with plug, 4-pin, rotatable thread	M8x1, cable with plug, 4-pin
Description	• Measuring principle: magnetic Hall • Displacement-proportional analogue output signal • Insertable in the slot from above, central clamping • Suitable for use with energy chain and robot lines • LED status displays • Cable length 0.3 m	• Measuring principle: magnetic Hall • 3 gripper positions can be detected using an evaluation unit • Freely selectable switching points
online: ➔	**smat-8m**	**smh-s1**

Displacement encoders

	 Displacement encoders MME-MTS-TLF	 Displacement encoders MLO-POT-TLF	 Displacement encoders MLO-POT-LWG
Stroke	225 ... 2000 mm	225 ... 2000 mm	100 ... 750 mm
Measuring principle of displacement encoder	Digital	Analogue	Analogue
Output signal	CAN protocol type SPC-AIF	Analogue	Analogue
Displacement resolution	‹0.01 mm	0.01 mm	0.01 mm
Description	• Measuring principle: magnetostrictive • Contactless with absolute measurement • High travel speed • System product for servopneumatic positioning technology and Soft Stop	• Conductive plastic potentiometer • Absolute measurement with high resolution • High travel speed and long service life • Several mounting options on pneumatic linear drives DGPL • Plug-in connections	• Connecting rod potentiometer • Absolute measurement with high resolution • Long service life • High protection class • Plug-in connections
online: ➔	**mme**	**mlo**	**mlo**

Pressure and vacuum sensors

	 Pressure sensor SPAE	 Pressure sensor SPAU	 Pressure sensor SPAW	 Pressure switch SPBA
Pressure measuring range	-1 ... 10 bar	-1 ... 16 bar	-1 ... 100 bar	-1 ... 10 bar
Switching element function	N/C contact, N/O contact, switchable	N/C or N/O contact, switchable	Switchable	Antivalent, changeover switch
Pneumatic connection	Push-in sleeve QS-4, QS-6, QS-3, QS-4, flange	G1/8, M5, M7, NPT1/8-27, QS-4, QS-5/32, QS-6, R1/4, R1/8	Male thread G1/2, female thread G1/4	G1/8
Electrical connection	Cable, open end, 3-wire	M8x1, M12x1, plug connector, round design, to EN 60947-5-2, 4-pin	M12x1, plug connector, round design, to EN 60947-5-2, 4-pin, 5-pin	M12x1, plug connector, round design, to EN 60947-5-2, 4-pin
Display type	LED display, 2-digit	Illuminated LCD, LED	4-character alphanumeric, LED display	
Description	• 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 • Display of minimum and maximum readings • All entered parameters can be transferred to other SPAEs (replicating function)	• For monitoring compressed air and non-corrosive gases • With or without display • Transfer of the pressure value as switch signal, analogue signal or via IO-Link to the connected control system	• Highly robust • For liquid and gaseous media • Quick and easy adjustment of the switching outputs using three pushbuttons • Optimum legibility of the display in any mounting position	• Pressure sensor with permanently set switching point • For solenoid valve VSVA • Mounting: screw-in
online: →	**spae**	**spau**	**spaw**	**spba**

Pressure and vacuum sensors

FESTO

	 Pressure transmitter SPTE	 Pressure transmitter SPTW	 Pressure sensor SPAB	 Pressure switch, vacuum switch PEV, VPEV
Pressure measuring range	-1 ... 10 bar	-1 ... 100 bar	-1 ... 10 bar	-1 ... 10 bar
Switching element function			Switchable	Changeover contact
Pneumatic connection	Push-in sleeve QS-4, QS-6, QS-3, QS-4, flange	G1/4	Male thread G1/8, NPT1/8-27, R1/8, female thread M5	G1/4, G1/8, M5
Electrical connection	Cable, open end, 3-wire	M12x1, plug connector, round design, to EN 60947-5-2, 4-pin	M8x1, cable, plug connector, round design, square design, to EN 60947-5-2, 4-pin, 4-wire	M8x1, M12x1, plug connector, screw terminal, round design, square design, to DIN 43650, to EN 60947-5-2, type A, 4-pin
Display type			Illuminated LCD, multi-colour	
Description	• Piezoresistive pressure sensor • Measured variable: relative pressure • Cable length 2.5 m	• Sensor versions: piezoresistive pressure sensor or metal thin-film pressure sensor • Measured variable: relative pressure	• Relative pressure measurement • Switching output PNP, NPN and analogue output • Two-part, multi-coloured display • Easy commissioning thanks to intuitive operation • Compact design 30x30 mm • Certification: c UL us listed (OL), C-Tick	• Mechanical pressure and vacuum switch • Adjustable switching point • Mounting: screw-in, via through-holes or via H-rail • Visual scale for pressure adjustment • Certification: CCC
online: →	**spte**	**sptw**	**spab**	**pev**

Pressure and vacuum sensors

	 PE converter PEN, PE, VPE	 Pressure sensor SDE1	 Pressure sensor SDE3	 Pressure sensor SDE5
Pressure measuring range	-1 ... 0 bar	-1 ... 10 bar	-1 ... 10 bar	-1 ... 10 bar
Switching element function	N/O contact, changeover switch	Switchable	Switchable	N/C contact, N/O contact, switchable
Pneumatic connection	G1/8, M5, PK-3, PK-4	G1/8, QS-4, R1/4, R1/8	QS-4, QS-5/32	QS-1/4, QS-4, QS-5/32, QS-6
Electrical connection	Cable, screw terminal, 3 connector leads, open end, 3-wire, 4-wire	M8x1, M12x1, cable with plug, plug connector, round design, to EN 60947-5-2, 3-pin, 4-pin, 5-pin	M8x1, M12x1, cable, cable with plug, plug connector, round design, to EN 60947-5-2, 4-pin, 5-pin	M8x1, cable, plug connector, round design, to EN 60947-5-2, 3-pin, 3-wire
Display type		Illuminated LCD, back-lit LCD	Illuminated LCD	
Description	• Pneumatic/electric differential pressure switch • Pneumatic/electric pressure transducer • Design for vacuum • Mounting on mounting frame 2N • Splash-proof design • Certification: CCC	• 5 pressure measuring ranges • Measurement of relative or differential pressure • Switching output PNP, NPN and with analogue current or voltage output • LCD or illuminated LCD display • Mounting: via H-rail, via wall/surface bracket, mounting on service unit, front panel mounting • Certification: c UL us listed (OL), C-Tick	• 5 pressure measuring ranges • Measurement of relative or differential pressure or 2 independent pressure inputs • Switching output 2x PNP or 2x NPN • Numerical and graphical pressure indication • Mounting: via H-rail, via wall/surface bracket, front panel mounting, with through-holes • Certification: C-Tick, ATEX, c UL us - Listed (OL)	• Programmable and configurable pressure switch for simple pressure sensing tasks • Threshold/window comparator • Switching point adjustment by teach-in function • Integrated microprocessor • Switching status indicated by an LED visible from all sides • Certification: c UL us listed (OL), C-Tick
online: →	pen	sde1	sde3	sde5

Flow sensors

	 Flow sensor SFAB	 Flow sensor SFAM	 Flow sensor SFE3
Flow measuring range final value	10 ... 1000 l/min	1000 ... 15000 l/min	0.5 ... 50 l/min
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4], ISO 8573-1:2010 [6:4:4], nitrogen	Compressed air to ISO 8573-1:2010 [7:4:4], nitrogen	Compressed air to ISO 8573-1:2010 [1:4:2], nitrogen
Operating pressure	0 ... 10 bar	0 ... 16 bar	-0.7 ... 7 bar
Pneumatic connection	QS-1/4, QS-10, QS-12, QS-3/8, QS-5/16, QS-6, QS-8	G1, G1 1/2, G1/2, NPT1 1/2-11 1/2, NPT1-11 1/2, NPT1/2-14, manifold module	Female thread G1/8, QS-6
Electrical connection	M12x1, plug, straight, 5-pin	M12x1, plug, straight, 5-pin	Cable
Description	• Flow sensor with integrated digital display • With unidirectional flow input • Mounting: H-rail mounting, wall or surface mounting • Certification: C-Tick	• Stand-alone device or combined with MS series service units • Supplies absolute flow information and accumulated air consumption measurements • Covers large measuring range with great precision thanks to high dynamic response • Large, illuminated LCD display	• Flow sensor with integrated digital display • With unidirectional flow input • Mounting: via through-holes or mounting bracket • Electrical connection via open cable end • Cable length 1 m • Certification: C-Tick
online: →	sfab	sfam	sfe3

Flow sensors

FESTO

	 Flow sensor SFET	 Flow indicator SFEV
Flow measuring range final value	0.05 ... 50 l/min	
Operating medium	Compressed air to ISO 8573-1:2010 [1:4:2], nitrogen	
Operating pressure	-0.9 ... 7 bar	
Pneumatic connection	Female thread G1/8, QS-4, QS-6	
Electrical connection	Cable	Cable
Description	• With unidirectional (SFET-F) or bidirectional (SFET-R) flow input • Mounting: via through-holes or mounting bracket • Electrical connection via open cable end • Cable length 1 m, 3 m • Certification: C-Tick	• For flow sensor SFET • 3 1/2-digit alphanumeric display • Indicating range: 0.05 ... 50 l/min (flow sensor SFET-F); 0.05 ... 10 l/min (flow sensor SFET-R)
online: →	sfet	sfev

Opto-electrical sensors

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	 Sensor SOEG-RT, SOEG-RS	 Through-beam sensor SOEG-E, SOEG-S	 Fibre-optic unit SOEG-L	 Laser diffuse sensor, laser retro-reflective sensor SOEL-RT, SOEL-RS
Method of measurement	Distance sensor, retro-reflective sensor, diffuse sensor, diffuse sensor with background suppression, for transparent objects	Through-beam sensor, receiver, transmitter	Fibre-optic unit	Distance sensor, retro-reflective sensor, diffuse sensor, diffuse sensor with background suppression
Working range	0 ... 5500 mm	0 ... 20000 mm	0 ... 250 mm	0 ... 20000 mm
Size	20x32x12 mm, 30x30x15 mm, 4 mm, 50x50x17 mm, M12, M12x1, M18, M18x1, M5x0.5	20x32x12 mm, 30x30x15 mm, 50x50x17 mm, M18x1	20x32x12 mm, 30x30x15 mm	20x32x12 mm, 50x50x17 mm
Type of light	Infrared, red, red polarised	Infrared, red	Red	Laser, pulsed laser, red, red 650 nm, red polarised
Switching output	NPN, PNP	NPN, PNP	NPN, PNP	NPN, PNP
Description	• Round or block design • Setting option: teach-in via button and via electrical connection • Electrical connection via open cable end or plug	• Round or block design • Setting option: teach-in, teach-in via electrical connection, potentiometer • Electrical connection via open cable end or plug	• Block design • Setting option: teach-in, teach-in via electrical connection, potentiometer • Electrical connection via open cable end or plug	• Setting option: teach-in, teach-in via electrical connection, potentiometer • Electrical connection via open cable end or plug
online: →	soeg	soeg	soeg	soel

FESTO

Opto-electrical sensors

	 **Colour sensor SOEC**	 **Fibre-optic unit SOE4**	 **Fork light barrier SOOF**	 **Fibre-optic cable SOEZ, SOOC**
Method of measurement	Colour sensor	Fibre-optic unit	Fork light barrier	Through-beam sensor, fixed focus, fork light barrier, fibre-optic cable, diffuse sensor
Working range	12 ... 32 mm	2 ... 2000 mm		2 ... 650 mm
Size	50x50x17 mm		Fork 120x60 mm, 30x35 mm, 50x55 mm, 80x55 mm	M4, M6
Type of light	White	Red	Red	
Switching output	PNP	NPN, PNP	NPN, PNP	
Description	• Diffuse sensor • Block design • Setting option: teach-in, teach-in via electrical connection • Electrical connection via M12x1 plug, 8-pin • Display via 7 LEDs	• Use for precise and space-saving position sensing in electronics and light assembly • Switching frequencies of up to 8000 Hz • Operational with fibre-optic cable SOOC as accessory • Variants: LED or LED display, timer function • Setting option: teach-in • Mounting: H-rail mounting or via through-holes • With protection against mutual interference	• Through-beam sensor with minimal installation effort • Design: polymer or metal • Sturdy housing: high shock and vibration resistance • Protection class IP67 • Electrical connection via M8x1 plug, 3-pin • Setting option: potentio-meter or teach-in • LED displays	• Thread M4, M6 • Cable connection, push-in connector
online: →	soec	soe4	soof	soez

10

Signal converters

	 **Signal converter SVE4**	 **Evaluation unit SMH-AE**
Signal range	0 - 10 V +/-0.3 V, 0 - 20 mA +/-0.6 mA, adapted for position sensors SMH-S1-HG	
Switching output	2x NPN, 2x PNP	NPN, PNP
Switching function	Freely programmable	
Electrical connection, output	M8x1, plug connector, 4-pin, to EN 60947-5-2	5-pin, plug connector, M12x1
Electrical connection, input	M8x1, socket, 4-pin, to EN 60947-5-2	4-pin, socket, M8x1, to EN 60947-5-2
Description	• Converts analogue signals into switching points • Switching function freely programmable with teach-in • Threshold value, hysteresis or window comparator • Mounting: H-rail mounting or via adapter plate • LED switching status display • Certification: c UL us listed (OL), C-Tick	• Electronic evaluation unit for position sensor SMH-S1 • Amplifies the signal from the sensor • With 3 potentiometers for setting 3 switching points • LED operating and switching status display
online: →	sve4	smh-ae

Air gap sensors

FESTO

	 Air gap sensor SOPA	 Micro reflex sensor, reflex sensor RML, RFL	 Back pressure end stop SD-2, SD-3, SD-3-N	 Air barrier SFL, SML
Sensing range	20 ... 200 µm	Distance between nozzles 4.8 ... 5.1 mm, 4.5 ... 15.5 mm	Distance between nozzles 0 ... 0.5 mm	Distance between nozzles 5 ... 50 mm, to 100 mm
Operating pressure	4 ... 7 bar	0.075 ... 0.5 bar, 0.1 ... 1.5 bar	0 ... 8 bar	0.1 ... 0.4 bar, 0.1 ... 4 bar, 0 ... 8 bar
Display type	Illuminated LCD, multi-colour	Signal pressure ≥0.5 mbar	Pressure signal 0 ... 8 bar	Pressure signal
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4]	Filtered, unlubricated compressed air	Compressed air, filtered, lubricated or unlubricated	Filtered, unlubricated compressed air
Description	• Convenient solution for high-precision contact and distance monitoring • Setting option: teach-in or numerical setting using three-button operation • Integrated air jet function • Multi-coloured LCD display • Mounting: H-rail mounting, wall mounting, through-hole • Certification: C-Tick	• Back pressure actuated valve • For non-contacting sensing of indicating instruments, checking pressing and stamping tools, edge control, magazine control, for measuring and counting • Can be used even in very dirty environments, in complete darkness, with translucent or magnetic objects	• Can be used for stroke-dependent signal generation as a limit switch and fixed stop • Ideal for end-position sensing and position control with high accuracy requirements and small actuating forces • SD-3-N for sensing fluid levels and heavily foaming liquids • For use in inaccessible places	• Sender nozzle, receiver nozzle, gap sensor • Back pressure actuated valve • Operational reliability even in very dirty environments • Reliable even with high ambient temperatures • Insensitive to mechanical influences and sound waves • Reliable even in complete darkness and when sensing translucent objects
online: →	sopa	rfl	sd	sfl

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Sensor boxes

	 Limit switch attachment SRAP	 Limit switch attachment DAPZ
Measured variable	Rotation angle	
Operating voltage range AC		4 ... 250 V
Operating voltage range DC	15 ... 30 V	4 ... 250 V
Electrical connection	Screw terminal, 9-pin, plug-in	Screw terminal
Type of mounting		
Description	• Based on standard VDI/VDE 3845 (NAMUR) • Analogue • For monitoring the position of quarter turn actuators • Sensors based on 2D Hall technology	• Square or round design • Drive interface to standard VDI/VDE 3845 (NAMUR) • With pneumatic, electric or inductive sensing
online: →	srap	dapz

Electromechanical switches

	 **Micro switch** **S, SR**	 **Electrical limit switch** **ER, EL**
Operating voltage range AC	12 ... 250 V	0 ... 250 V
Operating voltage range DC	12 ... 250 V	0 ... 250 V
Electrical connection	Screw connector	4-wire cable with protective earth conductor, 1.1 m long
Protection class	IP00	IP54
Type of mounting	2 through-holes in housing, mounting plate	2 through-holes in housing
Description	• Electrical limit switch • N/C contact, N/O contact, changeover switch • Actuator attachments: roller lever type AR, roller lever with idle return type AL, whisker actuator type AF	• For signalling in end positions • Max. switching frequency 200/min. • With roller lever or with toggle lever and idle return • N/C contact, N/O contact, changeover switch
online: →	s-3	el

Vision sensors

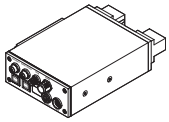
FESTO

	 **Code reader, object sensor** **SBSI-B, SBSI-Q**
Sensor resolution	736 x 480 pixels (Wide VGA)
Working distance	6 mm - infinite, 30 mm - infinite
Field of view	min. 5 x 4 mm, min. 8 x 6 mm
Frame rate (full image)	50 fps
Max. no. of inspection programs	8
Description	• Vision sensor with integrated lighting/lens • Enables reading of 1D/2D codes or quality inspection of parts • Intuitive software for simple parameter setting • All-in-one device with integrated lens, lighting, evaluation and communication
online: ➔	**sbsi**

Diagnostics for fast processes

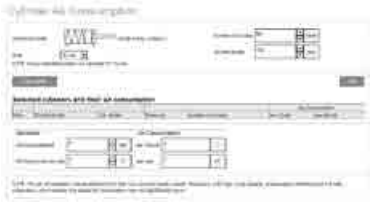
	 **Compact vision system** **SBOA-M**	 **Compact vision system** **SBOC-M**
Sensor resolution	640 x 480 pixels (VGA)	640 x 480 pixels (VGA)
Working distance	Depends on the lens chosen	Depends on the lens chosen
Field of view	Depends on the lens chosen	Depends on the lens chosen
Frame rate (full image)	27 ... 241 fps	241 fps
Exposure time	1 ... 1000000 µs	1 ... 1000000 µs
Description	• Systainer with compact vision system SBOC-M and accessories	• High-speed camera for diagnostics and commissioning as well as for function monitoring of fast motion sequences • Recording and storage electronics integrated in the camera • For standard lens with C mount connection • Can be networked via Ethernet • Compact dimensions, low weight
online: ➔	**sbox**	**sbox**

Position and quality inspection

	 **Compact vision system SBOC-Q**	 **Compact vision system SBOI-Q**	 **Checkbox Compact CHB-C**
Sensor resolution	1280 x 1024 pixels (SXGA) , 640 x 480 pixels (VGA), 752 x 480 pixels (Wide VGA)	640 x 480 pixels (VGA), 752 x 480 pixels (Wide VGA)	2048 pixels/line
Working distance	Depends on the lens chosen	20 ... 1000 mm	
Field of view	Depends on the lens chosen	14 x 10 mm - 520 x 390 mm, 7.9 x 5.5 mm - 195 x 125 mm	
Frame rate (full image)	27 ... 150 fps	60 ... 150 fps	
Exposure time	8 ... 1000000 µs	18 ... 1000000 µs	
Description	• Intelligent field-based camera • For 2D quality inspection, position and rotary orientation sensing, reading of 1D and 2D codes, reading of optical characters (OCR) • Integrated full PLC (CODESYS) • Ethernet and CAN for communicating with higher-order controllers	• Intelligent field-based camera • For 2D quality inspection, position and rotary orientation sensing, reading of 1D and 2D codes, reading of optical characters (OCR) • Integrated full PLC (CODESYS) • Ethernet and CAN for communicating with higher-order controllers	• Intelligent line-scan camera • For orientation recognition and quality inspection of small moving parts • Encoder connection • Teach-in function
online: →	sbox	sbox	chb-c

Software tool

FESTO

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. It includes a feature for exporting the input table together with the result directly to Excel.	This tool can be found • either in the electronic catalogue by clicking on the blue button "Engineering" • or on the DVD under Engineering Tools.
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. A dynamic graphic generated on the basis of the configuration provides visual assistance in selecting the correct product features.	The configurator is part of the electronic catalogue and is not available as a separate software program.

Service unit combinations: MSE series

	 **Service unit combinations MSE6**
Pneumatic port 1	G1/2
Standard nominal flow rate	In main flow direction 1 -› 24500 l/min
Flow measuring range final value	5000 l/min
Operating pressure	4 ... 10 bar
Fieldbus interface	Sub-D socket, 9-pin
Description	• Intelligent pneumatic service unit for optimising the use of compressed air as energy medium • Function: energy saving (2/2-way function DE, V24) • Equipped with measuring, control and diagnostic functions • Identification of production downtime and leakages • Used as process monitoring module • Electrical activation via bus node • Size: 6
online: ➔	mse6

Service unit combinations: MS series

	 **Service unit combinations MSB4, MSB6, MSB9**
Pneumatic port 1	G1, G1 1/2, G1 1/4, G1/2, G1/4, G1/8, G3/4, NPT1 1/2-11 1/2, NPT1 1/4-11 1/2, NPT1-11 1/2, NPT1/2-14, NPT3/4-14
Standard nominal flow rate	750 ... 18000 l/min
Pressure regulation range	0.5 ... 16 bar
Operating pressure	0 ... 20 bar
Grade of filtration	0.01 ... 40 µm
Description	• Combination of filter regulator, filter, lubricator, on-off valve, soft-start valve • Size 4, 6, 9
online: →	msb4

Service unit combinations: D series, metal

	 **Service unit combinations with lubricator FRC-K**	 **Service unit combinations without lubricator LFR-K, LFRS-K**
Pneumatic port 1	G1/2, G1/4, G1/8, G3/4, G3/8	G1/2, G1/4, G1/8, G3/4, G3/8
Standard nominal flow rate	530 ... 8200 l/min	575 ... 9400 l/min
Pressure regulation range	0.5 ... 12 bar	0.5 ... 12 bar
Operating pressure	1 ... 16 bar	1 ... 16 bar
Grade of filtration	40 µm	40 µm
Description	• Combination of filter regulator, branching module, lubricator, on-off valve, soft-start valve, mounting accessories • Sizes: mini, midi, maxi	• Combination of filter regulator, branching module, on-off valve, soft-start valve, mounting accessories • Sizes: mini, midi, maxi
online: →	frc	lfr

Service unit combinations: D series, polymer

	 **Service unit combinations with lubricator FRC-K**	 **Service unit combinations without lubricator LFR-DB**
Pneumatic port 1	G1/4	G1/4
Standard nominal flow rate	400 ... 700 l/min	1900 l/min
Pressure regulation range	0.5 ... 7 bar	0.5 ... 7 bar
Operating pressure	1.5 ... 10 bar	1.5 ... 10 bar
Grade of filtration	40 µm	40 µm
Description	• Combination of on-off valve, filter regulator, distributor module and lubricator • Size: mini	• Combination of on-off valve, filter regulator and distributor module • Size: mini
online: →	frc	lfr

Filter regulators/lubricators: MS series

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	 **Service unit combinations** **MSB4-FRC, MSB6-FRC**
Pneumatic port 1	G1/2, G1/4, G1/8, G3/8
Standard nominal flow rate	850 ... 4800 l/min
Pressure regulation range	0.3 ... 12 bar
Operating pressure	1.5 ... 20 bar
Grade of filtration	5 ... 40 µm
Description	• Filter, regulator and lubricator functions in a single unit • High flow rate and highly efficient in removing contaminants • Good regulation characteristics with minimal pressure hysteresis • Size: 4, 6
online: →	msb4-frc

Filter regulators/lubricators: D series, metal

	 **Service units** **FRC, FRCS**
Pneumatic port 1	G1, G1/2, G1/4, G1/8, G3/4, G3/8, M5, M7, QS-4, QS-6
Standard nominal flow rate	80 ... 8700 l/min
Pressure regulation range	0.5 ... 12 bar
Operating pressure	1 ... 16 bar
Grade of filtration	5 ... 40 µm
Description	• Filter, regulator and lubricator functions in a single unit • Sizes: micro, mini, midi, maxi
online: →	frc

Filter regulators/lubricators: D series, polymer

	 **Service units** **FRC-DB**
Pneumatic port 1	G1/4, G1/8
Standard nominal flow rate	≥400
Pressure regulation range	0.5 ... 7 bar
Operating pressure	1.5 ... 10 bar
Grade of filtration	5 ... 40 µm
Description	• Filter, regulator and lubricator functions in a single unit • With manual or semi-automatic condensate drain • Size: mini
online: →	frc

Filter regulators: MS series

	 **Filter regulators** **MS4-LFR, MS6-LFR, MS9-LFR, MS12-LFR**
Pneumatic port 1	G1/2, G1/4, G1/8, G3/8, internal
Standard nominal flow rate	850 ... 24000 l/min
Pressure regulation range	0.3 ... 16 bar
Operating pressure	0.8 ... 20 bar
Grade of filtration	5 ... 40 µm
Description	• 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 • Good regulation characteristics with primary pressure compensation and minimal hysteresis • Good particle and condensate separation • With or without secondary venting • High flow rate • Lockable rotary knob • Return flow option for exhausting from output 2 to input 1 already integrated • Size: 4, 6, 9, 12
online: ➔	ms4-lfr

Filter regulators: D series, metal

	 **Filter regulators** **LFR, LFRS**
Pneumatic port 1	G1, G1/2, G1/4, G1/8, G3/4, G3/8, M5, M7, QS-4, QS-6
Standard nominal flow rate	110 ... 11000 l/min
Pressure regulation range	0.5 ... 12 bar
Operating pressure	1 ... 16 bar
Grade of filtration	5 ... 40 µm
Description	• Two pressure gauge connections for different installation options • With manual, semi-automatic or fully automatic condensate drain • Lockable rotary knob • Sizes: micro, mini, midi, maxi
online: ➔	lfr

Filter regulators: D series, polymer

	 **Filter regulators LFR-DB**
Pneumatic port 1	G1/4, G1/8
Standard nominal flow rate	≥500
Pressure regulation range	0.5 ... 7 bar
Operating pressure	1.5 ... 10 bar
Grade of filtration	5 ... 40 µm
Description	• With manual or semi-automatic condensate drain • Size: mini
online: →	lfr

Filters: MS series

	 **Filters MS4-LF, MS6-LF, MS9-LF, MS12-LF**	 **Fine filters MS4-LFM-B, MS6-LFM-B, MS9-LFM-B, MS12-LFM-B**	 **Micro filters MS4-LFM-A, MS6-LFM-A, MS9-LFM-A, MS12-LFM-A**	 **Activated carbon filters MS4-LFX, MS6-LFX, MS9-LFX, MS12-LFX**
Pneumatic port 1	G1/2, G1/4, G1/8, G3/8, internal	G1, G1/2, G1/4, G1/8, G3/4, G3/8, manifold module	G1, G1/2, G1/4, G1/8, G3/4, G3/8, manifold module	G1/2, G1/4, G1/8, G3/8
Standard nominal flow rate	1000 ... 16000 l/min	54 ... 10000 l/min	54 ... 7800 l/min	360 ... 2500 l/min
Operating pressure	0 ... 20 bar	0 ... 20 bar	0 ... 20 bar	0 ... 20 bar
Grade of filtration	5 ... 40 µm	1 µm	0.01 µm	0.01 ... 1 µm
Description	• Good particle and condensate separation • High flow rate with minimal pressure drop • Available with manual, semi-automatic, fully automatic or fully automatic, electrically actuated condensate drain • Size: 4, 6, 9, 12	• High-efficiency filter for exceptionally clean compressed air • Removal of oil aerosols from compressed air • Optionally with differential pressure indicator for indication of contamination • Available with electronic filter pollution indicator • Size: 4, 6, 9, 12	• High-efficiency filter for exceptionally clean compressed air • Removal of oil aerosols from compressed air • Optionally with differential pressure indicator for indication of contamination • Available with electronic filter pollution indicator • Size: 4, 6, 9, 12	• Removal of gaseous oil particles from compressed air using activated carbon • Air quality class at the output [1.4.1] acc. to ISO 8573-1 • Eliminates odours and vapours • Residual oil content = 0.003 mg/m³ • Size: 4, 6, 9, 12
online: →	ms4-lf	ms4-lfm-b	ms4-lfm-a	ms4-lfx

Filters: D series, metal design

	 **filter** **LF**	 **Fine filters** **LFMB**	 **Micro filters** **LFMA**
Pneumatic port 1	G1, G1/2, G1/4, G1/8, G3/4, G3/8, M5, M7, QS-4, QS-6, connecting plate	G1, G1/2, G1/4, G1/8, G3/4, G3/8, connecting plate	G1, G1/2, G1/4, G1/8, G3/4, G3/8, connecting plate
Standard nominal flow rate	170 ... 5300 l/min	125 ... 2780 l/min	80 ... 2200 l/min
Operating pressure	0 ... 16 bar	1 ... 16 bar	1 ... 16 bar
Grade of filtration	5 ... 40 µm	1 µm	0.01 µm
Description	• Good particle and condensate separation • With manual or fully automatic condensate drain • Sizes: micro, mini, midi, maxi	• High-efficiency filter for exceptionally clean compressed air • Removal of oil aerosols from compressed air • Version with differential pressure indicator for visual indication of filter contamination • Sizes: mini, midi, maxi	• High-efficiency filter for exceptionally clean compressed air • Removal of oil aerosols from compressed air • Version with differential pressure indicator for visual indication of filter contamination • Sizes: mini, midi, maxi
online: ➔	**lf**	**lfmb**	**lfma**

Filters: D series, metal design

	 **Filter combinations** **LFMBA**	 **Activated carbon filters** **LFX**
Pneumatic port 1	G1, G1/2, G1/4, G1/8, G3/4, G3/8	G1, G1/2, G1/4, G1/8, G3/4, G3/8, connecting plate, manifold module
Standard nominal flow rate	125 ... 600 l/min	360 ... 1100 l/min
Operating pressure	1 ... 16 bar	0 ... 16 bar
Grade of filtration	0.01 µm	
Description	• High-efficiency filter for exceptionally clean compressed air • Fully assembled filter combination, comprising LFMB and LFMA • Version with differential pressure indicator for visual indication of filter contamination • Sizes: mini, midi, maxi	• Removal of gaseous oil particles from compressed air using activated carbon • Air quality class at the output [1.4.1] acc. to ISO 8573-1 • Eliminates odours and vapours • Residual oil content = 0.003 mg/m³ • Sizes: mini, midi, maxi
online: ➔	**lfmba**	**lfx**

Filters: individual devices

	 **Filter silencer LFU**
Size	G1/4, G3/8
Grade of filtration	1 µm
Operating pressure	0 ... 16 bar
Flow rate with respect to atmosphere	4000 ... 12500 l/min
Noise reduction	Reduction by 40 dB
Description	• Removes up to 99.99% of oil and other contaminants from exhaust air • Manual rotary condensate drain • Exhaust noise reduced regardless of frequency
online: ➔	lfu

Regulators: MS series

	 **Pressure regulators MS4-LR, MS6-LR, MS9-LR**	 **Pressure regulators MS12-LR**	 **Pressure regulators MS4-LRB, MS6-LRB**
Pneumatic port 1	G1/2, G1/4, G1/8, G3/8	Sub-base	G1/2, G1/4
Standard nominal flow rate	1000 ... 30000 l/min	12000 ... 22000 l/min	300 ... 7300 l/min
Pressure regulation range	0.3 ... 16 bar	0.15 ... 16 bar	0.3 ... 16 bar
Operating pressure	0.8 ... 20 bar	0.8 ... 21 bar	0.8 ... 20 bar
Max. pressure hysteresis	0.25 ... 0.4 bar	0.04 ... 0.4 bar	0.25 bar
Description	• High flow rate with minimal pressure drop • Good regulation characteristics with primary pressure compensation and minimal hysteresis • With or without secondary venting • Lockable rotary knob • Optional pressure sensor and rotary knob pressure gauge • Size 4, 6, 9	• High flow rate with minimal pressure drop • Good regulation characteristics with primary pressure compensation and minimal hysteresis • With secondary venting • Lockable rotary knob • MS12-LR-...-PO: pneumatically actuated (pressure range determined by means of pilot regulator) • MS12-LR-...-PE6: electrically actuated (pilot control by proportional pressure regulator) • Size: 12	• To build up a regulator manifold with through air supply for pressure ranges that can be adjusted independently of another • Good regulation characteristics with primary pressure compensation and minimal hysteresis • Lockable rotary knob • With or without secondary venting • Integrated return flow option for exhausting from output 2 to input 1 • Optional pressure sensor and rotary knob pressure gauge • Size: 4, 6
online: ➔	ms4-lr	ms12-lr	ms4-lrb

Regulators: MS series

	 **Precision pressure regulators** **MS6-LRP, MS6-LRPB**	 **Electric pressure regulators** **MS6-LRE**
Pneumatic port 1	G1/2, G1/4, G3/8	G1/2, G1/4, G3/8
Standard nominal flow rate	800 ... 5000 l/min	2200 ... 7500 l/min
Pressure regulation range	0.05 ... 12 bar	0.3 ... 16 bar
Operating pressure	1 ... 14 bar	0.8 ... 20 bar
Max. pressure hysteresis	0.02 bar	0.25 bar
Description	• As individual device and for manifold assembly • Manifold assembly with through air supply • Good regulation characteristics with primary pressure compensation and minimal hysteresis • High secondary venting • Lockable rotary knob • Optionally with pressure sensor with display • Size: 6	• With integrated electric drive unit for remotely setting the output pressure • Constant output pressure even in the event of a power failure thanks to the fail-safe function • Optionally with control unit with display • Optional pressure sensor • With or without secondary venting • Size: 6
online: →	ms6-lrp	ms6-lre

Regulators: D series, metal

	 **Pressure regulators** **LR, LRS**	 **Pressure regulators** **LRB, LRBS**	 **Pressure regulator combinations** **LRB-K**
Pneumatic port 1	G1, G1/2, G1/4, G1/8, G3/4, G3/8, M5, M7, QS-4, QS-6	Connecting plate	G1/2, G1/4, G3/8
Standard nominal flow rate	120 ... 12500 l/min	1600 ... 3800 l/min	1600 ... 3800 l/min
Pressure regulation range	0.5 ... 12 bar	0.5 ... 12 bar	0.5 ... 12 bar
Operating pressure	0 ... 16 bar	1 ... 16 bar	1 ... 16 bar
Max. pressure hysteresis	0.2 ... 0.4 bar	0.2 bar	0.2 bar
Description	• Lockable design • Two pressure gauge connections for different installation options • Micro, mini, midi size: directly actuated diaphragm regulator • Maxi size: piloted piston regulator, diaphragm regulator LRS-DI • Optional return flow option for venting from output 2 to input 1 • Available with pressure gauge • Sizes: micro, mini, midi, maxi	• To build up a regulator manifold with through air supply for pressure ranges that can be adjusted independently of another • Directly actuated diaphragm regulator • Settings secured via detent on rotary knob and push-in adjustment lock • Lockable design • Without pressure gauge • Sizes: mini, midi	• Regulator manifold with through air supply for pressure ranges that can be adjusted independently of one another • Directly actuated diaphragm regulator • Settings secured via detent on rotary knob and push-in adjustment lock • Without pressure gauge • Sizes: mini, midi
online: →	lr	lrb	lrb

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Regulators: D series, polymer

	 **Pressure regulators** **LR-DB**	 **Pressure regulator combinations** **LRB-DB**
Pneumatic port 1	G1/4, G1/8	G1/2
Standard nominal flow rate	≥800	≥1000
Pressure regulation range	0.5 ... 7 bar	0.5 ... 7 bar
Operating pressure	1.5 ... 10 bar	1.5 ... 10 bar
Max. pressure hysteresis	0.5 bar	0.5 bar
Description	• Setting values are secured by locking the rotary knob • Available with pressure gauge • Size: mini	• Regulator manifold with through air supply for pressure ranges that can be adjusted independently of one another • Setting values are secured by locking the rotary knob • Without pressure gauge • Size: mini
online: →	**lr-db**	**lrb-db**

Regulators: individual devices

	 **Precision pressure regulators** **LRP, LRPS**
Pneumatic port 1	G1/4
Standard nominal flow rate	800 ... 2300 l/min
Pressure regulation range	0.05 ... 10 bar
Operating pressure	1 ... 12 bar
Max. pressure hysteresis	0.02 bar
Description	• Lockable design • Good regulation characteristics with primary pressure compensation and minimal hysteresis • High secondary venting
online: →	**lrp**

Lubricators: MS series

	 **Lubricator** **MS4-LOE, MS6-LOE, MS9-LOE, MS12-LOE**
Pneumatic port 1	G1/2, G1/4, G1/8, G3/8, internal
Standard nominal flow rate	1100 ... 27000 l/min
Operating pressure	1 ... 16 bar
Minimum flow rate for lubricator function	40 ... 400 l/min
Description	• Proportional lubricator with precision oil metering • Quick and easy top-up even under pressure • Oil capacity 30 ... 1500 cm³ • Size: 4, 6, 9, 12
online: →	**ms4-loe**

Lubricators: D series

	 **Lubricator** **LOE**
Pneumatic port 1	G1, G1/2, G1/4, G1/8, G3/4, G3/8, M5, M7, QS-4, QS-6
Standard nominal flow rate	160 ... 9000 l/min
Operating pressure	0 ... 16 bar
Minimum flow rate for lubricator function	3 ... 10 l/min
Description	• Proportional lubricator with precision oil metering • Quick and easy top-up even under pressure • Oil capacity 6.5 ... 190 cm³ • Sizes: micro, mini, midi, maxi
online: →	**loe**

On-off and soft-start valves: MS series

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	 **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**
Pneumatic port 1	G1/2	G1/2	G1/2, G1/4, G1/8, G3/8, manifold module
Standard nominal flow rate	4300 ... 5700 l/min	4300 ... 16550 l/min	1200 ... 32000 l/min
Operating pressure	3 ... 10 bar	3 ... 16 bar	0 ... 20 bar
Type of actuation	electrical	electrical	Manual
Description	• Reliable 2-channel venting with self-monitoring up to Performance Level e and category 4 to EN ISO 13849-1 • For reducing pressure quickly and reliably and for building up pressure gradually • SIL 3 • Adjustable pressure build-up time • Optionally with silencer • Supply voltage 24 V DC • Size: 6	• Single-channel venting up to Performance Level c and category 1 to EN ISO 13849-1 • For reducing pressure quickly and reliably and for building up pressure gradually • Adjustable pressure build-up time • Adjustable switch-through pressure • Supply voltage 24 V DC • Size: 6, 9	• Manual 3/2-way valve for pressurising and venting pneumatic installations • A silencer can be attached or the exhaust air ducted at port 3 • Switching position is immediately recognisable • Available with pressure gauge and pressure sensor • Size: 4, 6, 9, 12
online: →	ms6-sv-e	ms6-sv-c	ms4-em1

On-off and soft-start valves: MS series

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	 **On-off valves MS4-EE, MS6-EE, MS9-EE, MS12-EE**	 **Soft-start valves MS4-DL, MS6-DL, MS12-DL**	 **Soft-start valves MS4-DE, MS6-DE, MS12-DE**
Pneumatic port 1	G1/2, G1/4, G1/8, G3/8, manifold module	G1/2, G1/4, G1/8, G3/8, manifold module	G1/2, G1/4, G3/8, NPT1/2-14, manifold module
Standard nominal flow rate	1000 ... 32000 l/min	1000 ... 42000 l/min	1000 ... 42000 l/min
Operating pressure	3 ... 18 bar	2 ... 20 bar	3 ... 18 bar
Type of actuation	electrical	Pneumatic	electrical
Description	• Electrical 3/2-way valve for pressurising and venting pneumatic installations • A silencer can be attached or the exhaust air ducted at port 3 • Supply voltage 24 V DC, 110, 230 V AC • Available with pressure gauge and pressure sensor • With solenoid coil, without plug socket • Size: 4, 6, 9, 12	• 2/2-way valve for slowly pressurising pneumatic installations (for use with on-off valves EM1 and EE) • For building up pressure gradually • Adjustable pressure build-up time • Size: 4, 6, 12	• 2/2-way valve for slowly pressurising pneumatic installations with electrically switchable pressure switchover point • Supply voltage 24 V DC, 110, 230 V AC • Switchable pressure switching point • For advancing the drives slowly and reliably into the initial position • For avoiding sudden and unexpected movements • Adjustable pressure build-up time • Sizes: 4, 6, 12
online: →	ms4-ee	ms4-dl	ms4-de

On-off and soft-start valves: D series

	 **On-off valves HE**	 **On-off valves HEE**	 **On/off valve HEP**	 **Soft-start valves HEL**
Pneumatic port 1	G1, G1/2, G1/4, G1/8, G3/4, G3/8	G1, G1/2, G1/4, G1/8, G3/4, G3/8	G1, G1/2, G1/4, G1/8, G3/4, G3/8	G1, G1/2, G1/4, G1/8, G3/4, G3/8
Standard nominal flow rate	1000 ... 10000 l/min	1000 ... 6500 l/min	1000 ... 6500 l/min	1000 ... 6500 l/min
Operating pressure	0 ... 16 bar	2.5 ... 16 bar	0 ... 16 bar	3 ... 16 bar
Type of actuation	Manual	electrical	Pneumatic	Pneumatic
Description	• Manual 3/2-way valve for pressurising and venting pneumatic installations • A silencer can be attached or the exhaust air ducted at port 3 • The switching position is immediately recognisable • Sizes: mini, midi, maxi	• Electrical 3/2-way valve for pressurising and venting pneumatic installations • A silencer can be attached or the exhaust air ducted at port 3 • With solenoid coil, without plug socket • Solenoid head can be repositioned by 4 x 90° • Detenting and non-detenting manual override • Supply voltage 24 V DC, 110, 230 V AC • Sizes: mini, midi, maxi	• Pneumatic 3/2-way valve for pressurising and venting pneumatic installations • Especially suitable for applications requiring explosion protection • Sizes: mini, midi, maxi	• 2/2-way valve for slowly pressurising pneumatic installations (for use with on-off valves HE and HEE) • For building up pressure gradually • Adjustable pressure build-up time • Sizes: mini, midi, maxi
online: →	he	hee	hep	hel

On-off and soft-start valves: individual devices

	 **Shut-off valves HE-LO**
Pneumatic port 1	G1, G1/2, G3/4, G3/8
Standard nominal flow rate	5200 ... 10000 l/min
Operating pressure	1 ... 10 bar
Type of actuation	Manual
Description	• For shutting off the compressed air supply whilst simultaneously venting systems powered by compressed air • Can be locked in the closed position • Screwed into piping, through-holes for wall mounting • To OSHA 29 CFR 147
online: →	he-lo

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Air dryers: MS series

	 **Membrane air dryers** **MS4-LDM1, MS6-LDM1**
Pneumatic port 1	G1/8, G1/4, G3/8, G1/2
Standard nominal flow rate	50 ... 400 l/min
Operating pressure	3 ... 12.5 bar
Pressure dew point reduction	20 K
Description	• Final dryer with excellent operational reliability • Suitable for use as an individual device or for integration into existing service unit combinations • Flow rate-dependent dew point reduction • Wear-free function requiring no external energy • Size: 4, 6
online: ➔	**ms4-ldm1**

Air dryers: D series

	 **Membrane air dryers** **LDM1**
Pneumatic port 1	G1, G1/2, G3/4
Standard nominal flow rate	300 ... 1000 l/min
Operating pressure	3 ... 12.5 bar
Pressure dew point reduction	17 ... 20 K
Description	• Final dryer with excellent operational reliability • Suitable for use as an individual device or for integration into existing service unit combinations • Flow rate-dependent dew point reduction • Wear-free function requiring no external energy • Individual device with or without sub-bases, for service unit combination • Size: maxi
online: ➔	**ldm1**

Air dryers: individual devices

	 **Adsorption dryer PDAD**
Pneumatic port 1	G1/2, G3/8
Standard nominal flow rate	10 ... 1000 l/min
Supply pressure 1	4 ... 16 bar
Pressure dew point	-40 °C, -70 °C (with reduced flow rate)
Description	• Ideal for decentralised compressed air drying • Integrated filtering of oil and particulates • Defined pressure dew point • Low purge air consumption
online: →	**pdad**

Compressed air distribution units: MS series

	 **Branching modules MS4-FRM, MS6-FRM, MS9-FRM, MS12-FRM**	 **Distributor blocks MS4-FRM-FRZ, MS6-FRM-FRZ**
Pneumatic port 1	G1, G1 1/2, G1 1/4, G1/2, G1/4, G1/8, G3/4, G3/8, NPT1 1/2-11 1/2, NPT1 1/4-11 1/2, NPT1-11 1/2, NPT1/2-14, NPT3/4-14, G1, G1/2, G1/4, G2, manifold module, NPT1-11 1/2	G1/2, G1/4
Standard nominal flow rate in main flow direction 1->2	1200 ... 50000 l/min	4050 ... 14600 l/min
Operating pressure	0 ... 20 bar	0 ... 20 bar
Description	• Optionally with integrated non-return function and pressure switch • Outlet at top and bottom • Can be used as an intermediate distributor for varying air qualities • Available with pressure sensor • Size: 4, 6, 9, 12	• Slim pneumatic distributor • Outlet at top and bottom • Can be used as an intermediate distributor for varying air qualities • Can be used as an adapter between two pressure regulators with large rotary knob with pressure gauge on size MS4 • Size: 4, 6
online: →	**ms*-frm**	**ms*-frm-frz**

Compressed air distribution units: D series

	 **Branching modules** **FRM**	 **Distributor blocks** **FRZ**
Pneumatic port 1	G1, G1/2, G1/4, G1/8, G3/4, G3/8	Manifold module
Standard nominal flow rate in main flow direction 1->2	1100 ... 20000 l/min	
Operating pressure	0 ... 16 bar	
Description	• Outlet at top and bottom • Can be used as an intermediate distributor for varying air qualities • Optionally with integrated non-return function and pressure switch • Sizes: mini, midi, maxi	• Outlet at top and bottom • Can be used as an intermediate distributor for varying air qualities • Slim pneumatic distributor • Sizes: micro, mini, midi, maxi
online: ➔	frm	frz

Condensate drain

	 **Water separators** **MS6-LWS, MS9-LWS, MS12-LWS**	 **Condensate drain, electrical** **PWEA**	 **Condensate drain, automatic** **WA**
Pneumatic connection		G1/2	M9
Pneumatic port 1	G1/2, G1/4, G3/8		
Operating pressure	0.8 ... 16 bar	0.8 ... 16 bar	1.5 ... 16 bar
Description	• Efficient and maintenance-free water separator • Constantly high condensate separation (99%) up to the maximum flow rate • Available with fully automatic or fully automatic, electrically actuated condensate drain • Size: 6, 9, 12	• Fully automatic condensate drain with independent electrical controller • Interface for communicating with master control device • Reliable thanks to non-contacting capacitive sensor • Can be used with service units or simply in piping systems • Ready status and switching status indicated via LEDs and electrical interface	• For attachment to service units and compressed air networks/systems • Automatic emptying after the max. fill level has been reached • Automatic emptying after the operating pressure p < 0.5 bar is switched off • Manual actuation during operation is possible
online: ➔	ms6-lws	pwea	wa

Pressure boosters

	 **Pressure booster** **DPA**
Pneumatic port 1	G1/2, G1/4, G3/8, QS-10, QS-12, QS-16
Output pressure 2	4 ... 16 bar
Supply pressure 1	2 ... 10 bar
Description	• Pneumatic pressure increase up to the double inlet pressure • Optional as pressure booster/air pressure reservoir combinations • Any mounting position • Short filling times • Long service life • Compact design • Available with sensing option
online: →	dpa

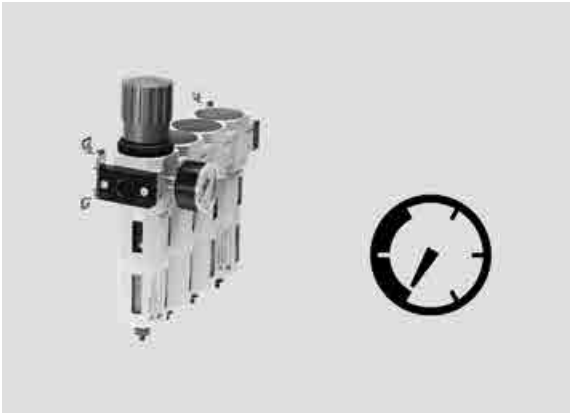
Pressure indicators

	 **Pressure gauge** **PAGN**	 **Pressure gauge** **MA**	 **Flanged pressure gauge** **FMA**
Type of mounting	in-line installation	in-line installation	Front panel mounting
Indicating range [bar]	0 ... 16 bar	0 ... 25 bar	0 ... 16 bar
Pneumatic connection	Cartridge 10 mm, R1/8	G1/4, G1/8, M5, QS-4, QS-6, QS-8, R1/4, R1/8	G1/4
Operating pressure	0 ... 16 bar	0 ... 25 bar	0 ... 16 bar
Measurement accuracy class	1.6, 2.5, 4	1.6, 2.5, 4, 5	1.6, 2.5
Description	• Pneumatic connection via QSP-10 • Mounting via retaining clamp • Display units bar, psi	• Designs based on DIN EN 837-1, available with red-green range • Pneumatic connection via R, metric or G thread, push-in connector • Display units bar, psi, MPa	• Front panel mounting • Designs based on EN 837-1 • Pneumatic connection via G thread • Display units bar, psi
online: →	pagn	ma	fma

Pressure indicators

	 **Flanged precision pressure gauge, precision pressure gauge FMAP, MAP**	 **Pressure gauge kit DPA**	 **Vacuum gauge VAM, FVAM**
Type of mounting	Front panel mounting, in-line installation	With male thread	Front panel mounting, screw-in
Indicating range [bar]	0 ... 16 bar		-1 ... 9 bar
Pneumatic connection	G1/4, R1/8	G1/4, G1/8, R1/8	G1/4, G1/8, R1/4, R1/8
Operating pressure	0 ... 16 bar	10 ... 16 bar	-1 ... 9 bar
Measurement accuracy class	1, 1.6	2.5, 4	2.5
Description	• Designs based on EN 837-1 • Screw-in or front panel mounting • Pneumatic connection via R or G thread • Display units bar, psi	• For pressure booster DPA • For monitoring the supply and output pressure • Pneumatic connection via R or G thread	• Designs based on DIN EN 837-1, available with red-green range • Screw-in or front panel mounting • Pneumatic connection via R or G thread • Double or single scale • Display units bar, in Hg, psi
online: →	fmap	dpa	vam

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 – from minor product modifications to complete new product developments.

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.
Further information on customised components can be found on your local website at www.festo.com

Software tool

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Product finder for tubing		Simply enter parameters such as working pressure, chemicals and required resistance to cleaning agents and have the program calculate the right tubing for your application.	This tool can be found • either in the electronic catalogue by clicking on the blue button "Product finder" • or on the DVD under Engineering Tools.
Festo Design Tool 3D FDT 3D		This 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 with a single order item – either completely pre-assembled or as individual parts in a single box. As a result, your bill of materials is considerably shortened and downstream processes such as product ordering, order picking and assembly are significantly simplified.	All ordering options are available in the following countries: AT, BE, CH, CZ, DE, DK, ES, FI, FR, GB, HU, IE, IT, NL, NO, PL, RU, SE, SI, SK. This tool can be found • either via the address: www.festo.com/FDT-3D in the above listed countries, • or on the CD "FDT 3D" (part no. 135595 for the above listed countries) • or on the DVD.

O.D. tubing

	 **Plastic tubing PUN, PUN-DUO**	 **Plastic tubing PUN-H, PUN-H-DUO**	 **Plastic tubing PUN-CM**	 **Plastic tubing PUN-V0**
O.D.	3 ... 16 mm	2 ... 16 mm	4 ... 12 mm	4 ... 16 mm
I.D.	2 ... 11 mm	1.2 ... 11 mm	2.5 ... 8 mm	2 ... 11.8 mm
Temperature-dependent operating pressure	-0.95 ... 30 bar	-0.95 ... 10 bar	-0.95 ... 10 bar	-0.95 ... 30 bar
Ambient temperature	-35 ... 60 °C	-35 ... 60 °C	-35 ... 60 °C	-35 ... 60 °C
Description	• Polyurethane • High resistance to stress cracks • Suitable for use with energy chains • Also available as DUO plastic tubing • Operating media: compressed air, vacuum	• Polyurethane • High resistance to microbes and hydrolysis • Material suitable for use in the food industry • Suitable for use with energy chains • Also available as DUO plastic tubing • Operating media: compressed air, vacuum, water	• Polyurethane • Plastic tubing, antistatic, electrically conductive • Suitable for use with energy chains • Operating media: compressed air, vacuum	• Polyurethane • Flame-retardant to UL 94 V0 ... V2 • For use in the immediate vicinity of welding applications • High resistance to microbes and hydrolysis • Suitable for energy chains • Operating media: compressed air, vacuum, water
online: →	pun	pun-h	pun-cm	pun-v0

O.D. tubing

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	 Plastic tubing PEN	 Plastic tubing PAN	 Plastic tubing PAN-MF	 Heavy-duty tubing PAN-R
O.D.	4 ... 16 mm	4 ... 16 mm	4 ... 16 mm	4 ... 28 mm
I.D.	2.7 ... 10.8 mm	2.5 ... 12 mm	2.5 ... 12 mm	2.5 ... 23 mm
Temperature-dependent operating pressure	-0.95 ... 10 bar	-0.95 ... 35 bar	-0.95 ... 31 bar	-0.95 ... 35 bar
Ambient temperature	-30 ... 60 °C	-60 ... 100 °C	-60 ... 100 °C	-30 ... 80 °C
Description	• Polyethylene • High resistance to chemicals and very high resistance to hydrolysis • Resistant to most cleaning agents and lubricants • Suitable for use with energy chains • Operating media: compressed air, vacuum, water	• Polyamide • High thermal and mechanical load capacities • High resistance to microbes • Operating media: compressed air, vacuum	• Polyamide • High thermal and mechanical load capacities • Meets the requirements to DIN 73378 "Polyamide tubing for use in motor vehicles". • Operating media compressed air, mineral oil	• Polyamide • For applications with a high pressure range • High resistance to microbes • Operating media: compressed air, vacuum
online: ➔	pen	pan	pan	pan-r

O.D. tubing

	 Plastic tubing PAN-V0	 Plastic tubing PLN	 Plastic tubing PFAN
O.D.	6 ... 14 mm	4 ... 16 mm	4 ... 12 mm
I.D.	2.5 ... 9 mm	2.9 ... 12 mm	2.9 ... 8.4 mm
Temperature-dependent operating pressure	-0.95 ... 12 bar	-0.95 ... 14 bar	-0.95 ... 16 bar
Ambient temperature	-30 ... 90 °C	-30 ... 80 °C	-20 ... 150 °C
Description	• PVC, polyamide • Flame-retardant to UL 94 V0 • High resistance to microbes and UV radiation • Double-sheath tubing • Suitable for energy chains • Operating medium: compressed air, vacuum, water, mineral oil	• Polyethylene • High resistance to chemicals, microbes and hydrolysis • Material suitable for use in the food industry • Resistant to most cleaning agents and lubricants • Operating media: compressed air, vacuum, water	• Perfluoroalkoxy alkane • Pneumatic tubing with resistance to high temperatures and chemicals • Material suitable for use in the food industry • High resistance to chemicals, microbes, UV radiation, hydrolysis and stress cracks • Operating medium: compressed air, vacuum, water
online: ➔	pan-v0	pln	pfan

Standard I.D. tubing

	 **Plastic tubing** **PU**	 **Plastic tubing** **PCN**	 **Rubber tubing** **P**
O.D.	11.6 ... 18 mm	6.5 mm	13 ... 31 mm
I.D.	9 ... 13.1 mm	4 mm	6 ... 19 mm
Operating pressure for entire temperature range	-0.95 ... 10 bar	-0.5 ... 0.25 bar	-0.95 ... 16 bar
Ambient temperature	-35 ... 60 °C	-10 ... 60 °C	-20 ... 80 °C
Description	• Polyurethane with reinforcing fabric • High resistance to abrasion and kinks • Operating media: compressed air, vacuum (PU-13)	• Polyvinyl chloride • For use with condensate drains on D series service units • Operating media: compressed air, water	• P-6 and P-9: nitrile rubber with reinforcing fabric • P-13 and P-19: ethylene propylene rubber, styrene butadiene rubber with reinforcing fabric • Operating media: compressed air, vacuum, water
online: →	pu	pcn	p

Spiral tubing

	 **Spiral plastic tubing** **PUN-S, PUN-S-DUO**	 **Spiral plastic tubing** **PUN-SG**	 **Spiral plastic tubing** **PPS**
O.D.	4 ... 12 mm	9.5 ... 11.7 mm	6.3 ... 7.8 mm
I.D.	2.6 ... 8 mm	6.4 ... 7.9 mm	4.7 ... 6.2 mm
Working length	0.5 ... 6 m	2.4 ... 6 m	7.5 ... 15 m
Temperature-dependent operating pressure	-0.95 ... 10 bar	-0.95 ... 15 bar	-0.95 ... 21.2 bar
Ambient temperature	-35 ... 60 °C	-40 ... 60 °C	-30 ... 80 °C
Description	• Polyurethane • Also available as DUO plastic tubing • Operating media: compressed air, vacuum	• Polyurethane, nickel-plated brass, polyacetal • Pre-assembled with captive rotatable fittings • High resistance to microbes and hydrolysis • Operating media: compressed air, vacuum	• Polyamide, brass, galvanised steel • Pre-assembled with 2 rotatable connectors and captive sealing rings OL • Highly resistant to microbes • Operating media: compressed air, vacuum, water
online: →	spiral	spiral	pps

Push-in fittings

FESTO

	 Push-in fittings NPQH	 Push-in fittings/connectors, metal, standard NPQM	 Push-in fittings/connectors, resistant to media NPQP	 Cartridges QSP10, QSPK, QSPKG, QSPLK, QSPLKG, QSPLLK, QSPLLKG
Pneumatic connection 1	Male thread G1/2, G1/4, G1/8, G3/8, M5, M7, female thread G1/4, G1/8, push-in sleeve QS-10, QS-12, QS-14, QS-4, QS-6, QS-8, for tubing O.D. 10 mm, 12 mm, 14 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, 14 mm, 4 mm, 6 mm, 8 mm, G1/2, G1/4, G1/8, G3/8, M5, M7	Push-in sleeve QS-10, QS-12, QS-4, QS-6, QS-8, for tubing O.D. 10 mm, 12 mm, 4 mm, 6 mm, 8 mm, R1/2, R1/4, R1/8, R3/8	Cartridge 10 mm, 14 mm, 18 mm, 20 mm
Pneumatic connection 2	Push-in sleeve QS-10, QS-12, QS-14, QS-4, QS-6, QS-8, for tubing O.D. 10 mm, 12 mm, 14 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	For tubing O.D. 10 mm, 12 mm, 4 mm, 6 mm, 8 mm	For tubing O.D. 10 mm, 12 mm, 3 mm, 4 mm, 6 mm, 8 mm
Temperature-dependent operating pressure			-0.95 ... 10 bar	
Operating pressure for entire temperature range	-0.95 ... 20 bar	-0.95 ... 16 bar		-0.95 ... 10 bar
Ambient temperature	0.00 ... 150 °C	-20 ... 70 °C	-20 ... 60 °C	-10 ... 60 °C
Description	• Solid-metal brass, chemically nickel-plated • High corrosion and chemical resistance • Highly resistant to temperatures and pressure • Materials suitable for use in the food industry • Operating media: compressed air, vacuum, water	• Solid-metal brass, nickel-plated • Attractively priced metal push-in fitting • Sturdy • Operating media: compressed air, vacuum, water	• Polypropylene • Low-cost alternative to stainless steel: resistant to most cleaning agents in combination with tubing PLN • For use with extreme influence of media • Materials suitable for use in the food industry • Operating medium: compressed air, vacuum	• Plug-in cartridges • Straight or angled design • PBT and nickel-plated brass • Operating medium: compressed air, vacuum
online: →	**npqh**	**npqm**	**npqp**	**qsp**

Push-in fittings

FESTO

	 **Push-in fittings, Mini series QSM, QSMC, QSMF, QSMP, QSMS, QSML, QSMLL, QSMLV, QSMLLV, QSMT, QSMTL, QSMX, QSMY**	 **Push-in fittings, standard QS, QSF, QSS, QSSF, QSC, QSH, QSL, QSLL, QSLF, QSLV, QST, QSTF, QSTL, QSW, QSX, QSY, QSYL, QSYLV, QSYTF**	 **Push-in fittings, stainless steel CRQS, CRQSL, CRQSS, CRQST, CRQSY**
Pneumatic connection 1	Male thread G1/8, M3, M5, M6, M6x0.75, M7, M8x0.75, R1/8, female thread M3, M5, push-in sleeve QS-2, QS-3, QS-4, QS-6, for tubing O.D. 2 mm, 3 mm, 4 mm, 6 mm	Male thread G1/2, G1/4, G1/8, G3/4, G3/8, M5, R1/2, R1/4, R1/8, R3/8, female thread G1/2, G1/4, G1/8, G3/8, push-in sleeve QS-10, QS-12, QS-16, QS-4, QS-6, QS-8, for tubing O.D. 10 mm, 12 mm, 16 mm, 4 mm, 6 mm, 8 mm	Male thread M5, R1/2, R1/4, R1/8, R3/8, for tubing O.D. 10 mm, 12 mm, 16 mm, 4 mm, 6 mm, 8 mm
Pneumatic connection 2	For tubing O.D. 2 mm, 3 mm, 4 mm, 6 mm	Female thread G1/2, G1/4, G1/8, G3/8, push-in sleeve QS-10, QS-12, QS-16, QS-4, QS-6, QS-8, for tubing O.D. 10 mm, 12 mm, 16 mm, 22 mm, 4 mm, 6 mm, 8 mm	For tubing O.D. 10 mm, 12 mm, 16 mm, 4 mm, 6 mm, 8 mm
Temperature-dependent operating pressure	-0.95 ... 14 bar	-0.95 ... 14 bar	
Operating pressure for entire temperature range	-0.95 ... 6 bar	-0.95 ... 14 bar	-0.95 ... 10 bar
Ambient temperature	-10 ... 80 °C	-20 ... 80 °C	-15 ... 120 °C
Description	• Mini series • Compact for maximum component density in confined installation spaces • PBT and nickel-plated brass • Operating media: compressed air, vacuum, (water)	• Standard series • Wide range of variants: wide selection for maximum flexibility in standard applications • PBT and nickel-plated brass • Operating media: compressed air, vacuum, (water)	• Maximum corrosion resistance (corrosion resistance class 4 to Festo standard 940 070) and chemical resistance • Materials suitable for use in the food industry • Operating media: compressed air, vacuum, (water) • Stainless steel
online: →	qsm	qs	crqs

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Push-in fittings

FESTO

	 **Push-in fittings, resistant to welding spatter QS-V0, QSL-V0, QST-V0**	 **Self-sealing/rotary push-in fittings and connectors QSK, QSSK, QSKL, QSR, QSRL**
Pneumatic connection 1	For tubing O.D. 10 mm, 12 mm, 4 mm, 6 mm, 8 mm, 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, M5, R1/2, R1/4, R1/8, R3/8, for tubing O.D. 10 mm, 12 mm, 4 mm, 6 mm, 8 mm
Pneumatic connection 2	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
Temperature-dependent operating pressure		-0.95 ... 14 bar
Operating pressure for entire temperature range	-0.95 ... 10 bar	-0.95 ... 6 bar
Ambient temperature	0.00 ... 60 °C	-10 ... 80 °C
Description	• PBT, reinforced • Resistant to welding spatter • For use in all areas where there is a risk of fire • Reliable even for applications in close proximity to welding spatter • Operating medium: compressed air, vacuum, water	• Standard series • Self-sealing push-in fitting blocks the air flow after the tubing is disconnected • PBT and nickel-plated brass • Push-in fitting, rotatable with swivel connection, rotatable by 360° with max. 500 rpm • Operating media: compressed air, vacuum
online: →	qs-v0	qsr

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Barbed fittings

FESTO

	 **Quick connectors NPCK**	 **Barbed fittings CN, CRCN, FCN, L-PK, LCN, N, RTU, SCN, LCNH, T-PK, TCN, V-PK, Y-PK**	 **Barbed hose fittings C-P, N-P, N-MS, SK**	 **Quick connectors ACK, CK, QCK, SCK, CV-PK, GCK-KU, LCK, LCKN, TCK, KCK-KU, FCK-KU, MCK, LK, TK, VT**
Nominal width	2 ... 6.2 mm	1.3 ... 5.3 mm	4 ... 16.5 mm	1.7 ... 12 mm
Pneumatic connection 1	Male thread G1/4, G1/8, G3/8, M5	Male thread G1/4, G1/8, G3/8, M3, M5, for tubing O.D. 3 mm, 4 mm, 6 mm, 8 mm	Male thread G1, G1/2, G1/4, G1/8, G3/4, G3/8, female thread G1/2, G1/4, G1/8, G3/8, NPT1-11 1/2, NPT3/4-14	Male thread G1/2, G1/4, G1/8, G3/8, M5, R1/4, R1/8, R3/8, female thread G1/2, G1/4, G1/8, G3/8, M5, for barbed connector I.D. 3 mm with union nut, 4 mm, 6 mm, 9 mm with union nut
Pneumatic connection 2	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 tubing O.D. 8 mm, for tubing I.D. 19 mm, 13 mm, 9 mm	For tubing O.D. 4 mm, 6 mm, 8 mm, for tubing I.D. 13 mm, 9 mm, for barbed fitting I.D. 13 mm with union nut, 3 mm, 4 mm, 6 mm, 9 mm with union nut
Operating pressure for entire temperature range	-0.95 ... 12 bar	-0.95 ... 10 bar	-0.95 ... 16 bar	-0.9 ... 16 bar
Ambient temperature	-20 ... 120 °C	0.00 ... 60 °C		-20 ... 80 °C
Description	• Stainless steel design • Materials suitable for use in the food industry • Fulfils all Clean Design requirements • Straight shape • Operating medium: compressed air, vacuum, water	• Straight shape, T-shape, L-shape, Y-shape • Operating medium: compressed air, vacuum • Brass, POM, aluminium or stainless steel	• Female hose connector with or without sealing ring • Hose clip to DIN 3017 • Operating medium: compressed air, vacuum • Brass or aluminium, steel	• Bulkhead quick connector • Sealing cap for plastic tube fittings and barbed connectors • Multiple distributor • Union nut for CK tube fitting • Operating media: compressed air, vacuum, (water) • Aluminium, steel, POM or zinc
online: →	npck	n_070302	n_cnp	ck

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Threaded fittings

FESTO

	 Threaded fittings NPFC	 Adapters NPFV	 Reducer, sleeve, double nipple D, E, ESK, FR, G, LJK, NPFA, QM, QMR, QSP10, SCM, TJK
Pneumatic connection 1	G1, G1/2, G1/4, G1/8, G3/4, G3/8, M5, M7, R1, R1/2, R1/4, R1/8, R3/4, R3/8	G1/4	G1, G1/2, G1/4, G1/8, G3/4, G3/8, M3, M5, M7, R1/2, R1/4, R1/8, R3/8
Pneumatic connection 2	G1, G1/2, G1/4, G1/8, G3/4, G3/8, M5, R1, R1/2, R1/4, R1/8, R3/4, R3/8	G1/4, NPT1/4-18	G1, G1/2, G1/4, G1/8, G3/4, G3/8, M3, M5, M7, R1/2, R1/4, R1/8, R3/8
Operating pressure	-0.95 ... 50 bar	2 ... 8 bar	0.9 ... 8bar
Operating pressure for entire temperature range			
Ambient temperature	-20 ... 150 °C		-5 ... 50 °C
Nominal width		6 mm	2.6 ... 10.7 mm
Description	• Nickel-plated brass • Sleeve • Reducing sleeve • Extension • Double nipple • Reducing nipple • L, T, Y or X-fitting • Operating media: compressed air, vacuum	• Aluminium • Adapter with filter • From G 1/4 to NPT 1/4 or G 1/4 • Operating medium: compressed air, vacuum	• Brass or aluminium • Reducing nipple • Reducing sleeve • Double nipple • Distributor block • Female bulkhead fitting • Sleeve • Operating media: compressed air, vacuum
online: ➔	npfc	npfv	esk

Threaded fittings

	 Ring piece, hollow bolt LK, TK, VT	 Blanking plug B
Pneumatic connection 1	Male thread G1/4, G1/8, G3/8, M5	
Pneumatic connection 2	For barbed connector I.D. 3 mm with union nut, 4 mm with union nut, 6 mm with union nut	
Operating pressure		
Operating pressure for entire temperature range	0 ... 10 bar	
Ambient temperature		
Nominal width		
Description	• Multiple distributor consisting of hollow bolt VT and ring piece LK or TK • With two to six outlets and one common air feed • Operating medium: compressed air, vacuum • Galvanised steel	• Aluminium, steel stainless • With sealing ring
online: ➔	lk	b-1

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Click fittings

	 **Click fittings** **NPKA**
Pneumatic connection 1	Male thread G1/8
Pneumatic connection 2	For tubing O.D. 6 mm
Temperature-dependent operating pressure	-0.95 ... 10 bar
Nominal width	4 mm
Ambient temperature	-10 ... 60 °C
Description	• POM, polyamide 66 • Quick and simple tube installation using one hand • Completely plastic • Suitable for use in cleaning-intensive areas • Materials suitable for use in the food industry • Operating medium: compressed air, vacuum, water
online: →	npka

Pipes

	 **Plastic pipes** **PQ-PA**	 **Pipes** **PQ-AL**	 **Plastic-coated metal tubes** **PM**
O.D.	12 ... 28 mm	12 ... 28 mm	6 ... 8 mm
Information on tubing materials	PAppl	Wrought aluminium alloy	Wrought aluminium alloy, PE
Temperature-dependent operating pressure	-0.95 ... 15 bar	-0.95 ... 15 bar	-0.95 ... 30 bar
Ambient temperature	-25 ... 75 °C	-30 ... 75 °C	-29 ... 65 °C
Description	• Rigid pipe made from high-quality polyamide • Smooth inside wall ensures optimum flow conditions • Operating media: compressed air, vacuum, liquid media	• Rigid aluminium pipe • Smooth inside wall ensures optimum flow conditions • Operating media: compressed air, vacuum, liquid media	• Polyethylene, aluminium • Can be bent straight and reshaped several times without a pipe-bending device and without being damaged • Resistant to deformation • Operating media: compressed air, vacuum
online: →	pq-pa	pq-al	pm

Push-in fittings for piping PQ

FESTO

	 **Push-in fittings** **CQ, CQA, CQC, CQD, CQH, CQL, CQO, CQSR, CQT**
Pneumatic connection 1	Male thread G1, G1/2, G3/4, G3/8, female thread G1/2, push-in sleeve CQ-12, CQ-15, CQ-18, CQ-22, CQ-28, QS-16, for pipe/tubing O.D. 12 mm, 15 mm, 18 mm, 22 mm, 28 mm
Pneumatic connection 2	Female thread G1/2, push-in sleeve CQ-12, CQ-15, CQ-18, CQ-22, CQ-28, QS-12, QS-16, for pipe/tubing O.D. 12 mm, 15 mm, 18 mm, 22 mm, 28 mm
Nominal width	8 ... 24.9 mm
Temperature-dependent operating pressure	-0.95 ... 15 bar
Ambient temperature	-25 ... 70 °C
Description	• For pipes PQ-PA, PQ-AL and tubing PAN and PUN • Operating media: compressed air, vacuum, liquid media • POM
online: →	cq

Couplings

	 **Quick coupling sockets, quick coupling plugs** **KDMS6, KDS6, KSS6**	 **Quick coupling sockets, quick coupling plugs** **KD1, KD2, KD3, KD4, KD5, KS1, KS2, KS3, KS4, KS5**	 **Multiple connectors** **KSV, KDV, KDVF**	 **Multi-tube connectors** **KM**
Pneumatic port			For tubing O.D. 3 mm, 4 mm, 6 mm, 8 mm, PK-2, PK-3, PK-4, PK-6	PK-2, PK-3, PK-4
Pneumatic connection 1	Male thread G1/2, G1/4, G1/8, G3/8, female thread G1/2, G1/4, G3/8, CK-13, CK-9, N-9	Male thread G1/2, G1/4, G1/8, G3/8, M3, M5, female thread G1/2, G1/4, G1/8, G3/8, M5, CK-13, CK-3, CK-4, CK-6, CK-9, CN-2, CN-4, CN-6, N-13, N-6, N-9		
Nominal flow rate	963 ... 1935 l/min	44 ... 2043 l/min		
operating pressure			-0.95 ... 16 bar	-0.95 ... 8 bar
Ambient temperature	-10 ... 60 °C	-10 ... 80 °C	-10 ... 60 °C	-10 ... 60 °C
Description	• Safety coupling • Shut-off on one side • With male or female thread • Nickel-plated brass; PP, galvanised steel, hardened steel • Operating medium: compressed air, vacuum	• Quick connection coupling for standard applications without safety function • Shut-off at one or both ends • With male or female thread or with barbed fitting or quick connector • Nickel-plated brass, PP • Operating medium: compressed air, vacuum	• POM, aluminium, brass • Multi-plug, multi-socket • Terminal plug and terminal socket • Operating media: compressed air, vacuum	• Polymer, brass • For max. 22 lines • Used as control cabinet outlets • Operating media: compressed air, vacuum
online: →	kdms	kd1	ksv	km

Distributors

	 Push-in fittings QSLV, QSQ, QST3	 Push-in fittings QSYTF	 Distributor FR	 Rotary distributor GF
Pneumatic connection 1	Male thread G1/2, G1/4, G1/8, G3/8, R1/2, R1/4, R1/8, R3/8, 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	Female thread G1/4, G3/8	Male thread G1/4, G3/8, G1/2, G1/4, G1/8
Pneumatic connection 2	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 G1/8, for tubing O.D. 4 mm, 6 mm	Female thread G1/4, G3/8, G1/2, G1/4, G1/8, M5
Pneumatic connection, supply line			G1/2, G1/4, G1/8, G3/4, G3/8	
Pneumatic connection, outlet			G1/2, G1/4, G1/8, G3/8, M3, M5	
No. of supply lines	1	1	1	
No. of outlets	2, 3, 4, 6	3	3, 8, 9, 12	
Maximum speed				300 ... 3000 rpm
Description	• PBT and nickel-plated brass • L-shape, T-shape • Rotatable 360° • Reducing design • Operating media: compressed air, vacuum, (water)	• PBT and nickel-plated brass • Y-shape • Rotatable 360° • Operating media: compressed air, vacuum, (water)	• Aluminium • 4, 8, 9 or 12 connections • Operating medium: compressed air, vacuum	• 2 or 4 axial and radial outlets • Single or multiple rotary distributor • Operating medium: compressed air, vacuum • Brass, hardened steel
online: →	qslv	qsytf	fr	gf

Protective tubing systems

	 Protective conduits MK, MKG, MKR, MKV	 Fittings HMZAS, HMZV, MKA, MKGV, MKM, MKRL, MKRS, MKRT, MKRV, MKVM, MKVV, MKY
I.D.	7.5 ... 48 mm	
O.D.	10 ... 52 mm	
Design	Strip-wound metal conduit, internally and externally corrugated all-plastic conduit, separable	
Ambient temperature	-20 ... 100 °C	-40 ... 200 °C
Description	• For protecting pneumatic tubing and electrical cables • Galvanised steel, PA, PP, PVC spring steel • Metal or plastic design • High alternate bending strength	• Installation kit • Junction box • Adapter connector • Protective conduit fitting • Lock nut • Protective conduit connector • Y-distributor • Polymer, polyamide, nickel-plated brass
online: →	mkg	mka

Software tool

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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.	The configurator is part of the electronic catalogue and is not available as a separate software program.

Universal connecting cables

	 **Connecting cables NEBU**	 **Connecting cables/plug sockets with cable SIM**	 **Flat cable KASI**
Electrical connection	M8x1, M12x1, straight plug, angled plug, straight socket, angled socket, rotatable socket, 7/8“ round plug connector, open end, 2-pin, 3-pin, 4-pin, 5-pin, 2-wire, 3-wire, 4-wire, 5-wire, rotatable thread, straight plug / open end, angled socket / angled plug, angled socket / open end, straight socket / cable, straight socket / straight plug, straight socket / angled plug, straight socket / open end, M5x0.5 / open end, M8x1 / -, M8x1 / M8x1, M8x1 / M12x1, M12x1 / -, M12x1 / M12x1, M12x1 / M8x1, 3-pin / 3-pin, 3-pin / 4-pin, 4-pin / 4-pin, 5-pin / 4-pin, 5-pin / 5-pin, 3-pin / 3-wire, 4-pin / 3-wire, 4-pin / 4-wire, 5-pin / 3-wire, 5-pin / 4-wire, 5-pin / 5-wire, - / rotatable thread	M12x1, straight socket, angled socket, 3-pin, 4-pin, clip-on, angled socket / open end, straight socket / open end, M8x1 / -, M12x1 / -, 3-pin / 3-wire, 4-pin / 4-wire, 5-pin / 3-wire, 5-pin / 4-wire, 5-pin / 5-wire	2-pin, open cable end
Cable length	0.1 ... 30 m	2 ... 10 m	100 m
Description	• Designs for static, standard, energy chain and robot applications • Versions with switching status display • Designs for connecting sensors and actuators	• Pre-assembled at both ends	• For AS-Interface • 2-wire • Reverse polarity protected • Contact using insulation displacement technology • No need to strip cable and wire insulation • Two different colours: yellow (preferred for the AS-Interface network) and black (for auxiliary power supply)
online: →	**nebu**	**sim**	**kasi**

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Universal connecting cables

	 **Connecting cable KEA**	 **Connecting cable KM8, KM12**
Electrical connection	Socket, Sub-D, 25-pin	Cable, 4-wire, straight plug / straight socket, straight plug / angled socket, straight plug / straight socket, straight plug / angled socket, M8x1 / M8x1, M12x1 / M12x1, M12x1 / M8x1, M12x1 / M8, 3-pin / 3-pin, 4-pin / 3-pin, 4-pin / 4-pin, 8-pin / 8-pin
Cable length	5 ... 10 m	0.5 ... 5 m
Description	• For multi-pin plug connection • Type of mounting: 2 screws M3x16 • Operating voltage range 250 V AC/DC	• For connecting inputs and outputs or for connecting individual valves or sensors • Pre-assembled at both ends: straight plug with straight or angled socket • Type of mounting: union nut, threaded connector
online: ➔	kea	km8

Connecting cables for control systems

	 **Connecting cables NEBC**	 **Connecting cables, diagnostic cable SBOA**	 **Cables FEC-KBG**	 **Addressing cables KASI-ADR**
Electrical connection	M12x1, straight plug, socket, straight plug, USB 2.0 type B, 4-pin, straight plug M12x1, 4-pin, D, straight plug, RJ45, 4-pin, angled plug, M9, 5-pin, straight plug M12, 4-pin, D, screenable, open end, 26-wire, straight plug, USB 2.0 type A, 4-pin, straight plug, Sub-D, 25-pin, open end, 4-wire, open end, 5-wire, Sub-D, 5-pin, 9-pin, 15-pin, 25-pin, straight plug / open end, straight socket / straight socket, square design / angled, Sub-D / Sub-D, Sub-D / -, 15-pin / 9-pin	Angled plug / straight socket, straight plug / straight socket / straight socket	RJ11 plug / Sub-D, socket, 15-pin, RJ12 plug / Sub-D, socket, 15-pin	Straight socket / angled plug / straight socket, 4-pin / 4-pin / 2-pin
Cable length	0.3 ... 10 m	2 m	2.5 ... 5 m	2.5 m
Description	• For I/O interface • For connecting motor controller CMMS-ST to any control system	• Used as Ethernet diagnostic cable, for integration in a CPI system, for I/O extension, for compact vision system type SBOC-Q, SBOI-Q	• For connecting electrical terminal CPX to operator unit FED	• For AS-Interface • For any slaves such as individual valve interface, valve terminal with AS-Interface connection • Reverse polarity protected
online: ➔	nebc	sboa	fec-kbg	kasi-adr

Connecting cables for control systems

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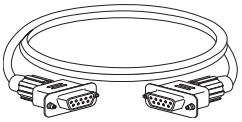
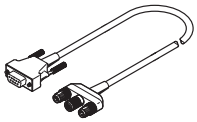
	 Control cables KES	 Programming cables KDI	 Programming cables PS1	 Connecting cables KV-M12
Electrical connection		Straight socket, Sub-D, 9-pin, straight socket, M12, 4-pin, straight plug / straight socket, straight socket / straight plug, M8x1 / Sub-D, Sub-D / Sub-D, 4-pin / 9-pin, 9-pin / 9-pin	Sub-D, 9-pin	Straight socket, M12, 5-pin, A-coded, straight plug, M12x1, 5-pin, A-coded
Cable length	2.5 ... 10 m	2.5 ... 5 m	1.5 m	1.5 ... 3.5 m
Description	• For I/O interface for connecting motor controller SFC-DC to any controller • For I/O interface for connecting motor unit MTR-DCI to any controller	• Pre-assembled at both ends • For diagnostic interface • For servo motor MTR-DCI	• Connecting cable for motor controller CMMS-ST	• Plug socket with cable for diagnostic interface (to CPX terminal) • Pre-assembled at both ends • 5-pin/4-wire • Round plug • Mounting via union nut M12
online: ➔	kes	kdi	cmms-st	kv-m12

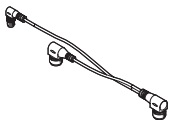
Connecting cables for motors

	 Motor, encoder, resolver cables NEBM	 Motor cables KMTR	 Power supply cables KPWR	 Fieldbus adapter FBA
Cable length	1.5 ... 15 m	2.5 ... 10 m	2.5 ... 10 m	
Description	• For servo motor EMMS-AS and stepper motor EMMS-ST • Suitable for use with energy chains	• For motor controller SFC-DC	• For motor unit MTR-DCI • For motor controller SFC-DC for connecting load and logic supply	• 9-pin Sub-D plug to 5-pin round plug/M12 socket
online: ➔	nebm	kmtr	kpwr	fba

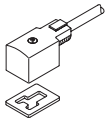
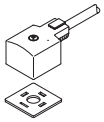
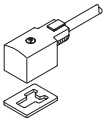
Connecting cables for positioning

	 Connecting cables NEBP
Electrical connection 1	Angled socket, M16x0.75, 6-pin
Electrical connection 2	Angled plug, M9x0.5, 5-pin
Cable length	2 m
Description	• Connection between linear drive DGPI, DGPIL or displacement encoder MME and measuring module CPX-CMIX
online: ➔	nebp

Connecting cables for valves

	 Connecting cables NEDV	 Plug socket with cable KMYZ-2, KMYZ-3, KMYZ-4, KMYZ-9	 Plug socket with cable KMEB-1, KMEB-2, KMEB-3	 Plug socket with cable KME
Electrical connection	2x angled socket, M12, 3-pin, angled plug, M8, 4-pin	Cable, angled socket, square design MSZB, square design MSZC, angled socket / straight plug, angled socket / angled plug, angled socket / cable, square design / M8x1, square design / open end, square design / square design, 2-pin / 2-pin, 2-pin / 3-pin, 2-pin / 2-wire	Angled socket, to DIN EN 175301-803, type C, 2-pin, 3-pin, 4-pin, 5-pin	Angled socket, square design, 3-pin, type C, open end, 2-wire
Cable length	0.2 m	0.2 ... 10 m	0.5 ... 10 m	2.5 ... 10 m
Description	• For proportional valves VPWP • For connection to connecting plate VAPV-S3 • Pre-assembled	• For valves with ZB solenoid coil: MZBH, MOZBH • For valves with ZC solenoid coil: CPE10-M1BH, CPE14-M1BH, MH2, MH3 • Mounting via central screw	• For valves with EB solenoid coil: CPE18, CPE24, MEBH, MOEBH, JMEBH, JMEBDH, JMN2DH • Polyvinyl chloride or polyurethane cable • Mounting via central screw	• For valves with E solenoid coil: MEH, MOEH, JMEH • Mounting via central screw • Polyvinyl chloride cable • Ambient temperature -20 ... +80 °C
online: →	nedv	kmyz-2	kmeb-1	kme

Connecting cables for valves

	 Plug socket with cable KMF	 Plug socket with cable KMC	 Connecting cable/plug socket with cable KMH	 Plug socket with cable KMV
Electrical connection	Socket	Socket, type A	Socket, 2-pin, 3-pin	Socket, type B
Cable length	2.5 ... 10 m	2.5 ... 10 m	0.5 ... 5 m	2.5 ... 10 m
Description	• For valves with F solenoid coil: MFH, MOFH, JMFH, JMFDH, NVF3, MUFH • Mounting via central screw • Polyvinyl chloride cable • Ambient temperature -20 ... +80 °C	• For valves with D solenoid coil: MDH, MODH, JMDH, • For valves with N1 solenoid coil: MN1H, JMN1H, JMN1DH • Polyvinyl chloride cable • Mounting via central screw • Ambient temperature -20 ... +80 °C	• For miniature valves MHA1 and MHP1 • For fast-switching valves MHA2 and MHP2 • Mounting via clip • Ambient temperature -40 ... +80 °C • Polyvinyl chloride cable	• For valves with V solenoid coil • Mounting via central screw M3 • Polyvinyl chloride cable • Ambient temperature -20 ... +80 °C
online: →	kmf	kmc	kmh	kmv

Connecting cables for valves

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	 Connecting cable KRP	 Electrical plug-in base MHAP-PI	 Plug socket with cable KMPPE
Electrical connection	Angled socket, 2-pin	Socket, 2-pin, 3-pin	8-pin
Cable length	2.5 ... 5 m	0.5 ... 1 m	2.5 ... 5 m
Description	• Plug socket with cable for connecting relay plates (valve terminal CPV10 and CPV14) • Pre-assembled • Mounting via self-tapping central screw	• Plug base with cable for connecting individual valves • Pre-assembled • Socket, 2-pin or 3-pin • Mounting via clip	• For proportional pressure regulators MPPE and MPPES • Mounting with union nut M16x0.75 • Polyvinyl chloride cable • Ambient temperature -30 ... +80 °C
online: ➔	krp	mhap	kmppe

Connecting cables for valves

	 Connecting cable KMPYE-AIF, KMPYE-5, KMPYE-...	 Connecting cable MHJ9-KMH	 Connecting cable/plug socket with cable NEBV-H1, NEBV-M8
Electrical connection		Straight socket / straight socket / cable, 2-pin / 2-pin / 4-wire	M8x1, socket, straight socket, M12, 8-pin, straight plug, M12, 4-pin, 2-pin, angled socket / straight plug, angled socket / cable, straight socket / straight plug, M8x1 / M8x1, M12x1 / M12x1, 4-pin / 3-pin, 8-pin / 4-pin, 4-pin / 2-wire, socket / plug / plug, M12x1 / M12x1 / M12x1, 8-pin / 4-pin / 4-pin
Cable length	0.3 ... 5 m	0.5 ... 2.5 m	0.5 ... 10 m
Description	• Plug socket with cable, screened, 5 m cable, for proportional directional control valves MPYE	• For valves MHJ9 • With plug sockets KMH • With control electronics for two valves	• Connecting cable for valves with ZC solenoid coils (CPE10, CPE14), for valves VUVG • Pre-assembled
online: ➔	kmpye	mhj9-kmh	nebv

Connecting cables for valve terminals

	 Connecting cable/plug socket with cable NEBV-S1	 Connecting cable KMP3, KMP4, KMP6	 Connecting cable KVI	 Connecting cable KVIA
Electrical connection	Cable with plug, socket, Sub-D, 25-pin, 37-pin, 44-pin	Socket, Sub-D, 9-pin, 15-pin, 25-pin, 26-pin	M9, plug, socket, 5-pin, straight socket / straight plug	Straight plug, straight plug / straight socket, straight plug / angled socket
Cable length	2.5 ... 10 m	2.5 ... 10 m	0.25 ... 8 m	5 ... 10 m
Description	• Connecting cable for multi-pin plug connection • Pre-assembled	• Plug socket with cable for multi-pin plug connection • Pre-assembled • Mounting via union nut, with 2 screws	• For fieldbus connection (for valve terminal CPV and installation system CPI) • Pre-assembled at both ends • Suitable for energy chains	• For inputs/outputs (analogue connections) • Pre-assembled at both ends • 4-pin/5-pin round plug • Suitable for energy chains
online: ➔	nebv	kmp	kvi	kvia

Connecting cables for valve terminals

	 Distributor, universal FB-TA	 Connecting cables VMPA-KMS1, VMPA-KMS2, VMPAL-KM, VMPAL-KMSK
Electrical connection	Plug / socket, M12x1 / M12x1, 5-pin / 5-pin	Cable with plug
Cable length	1.4 m	2.5 ... 10 m
Description	• For fieldbus connection (for valve terminal CPV and installation system CPI) • Branch line for connecting and disconnecting fieldbus components • With open cable end or with 5-pin push-in connector	• Plug socket with cable for multi-pin connection (to valve terminal MPA) • Variant suitable for use with energy chains • Cable outlet straight or to side • Pre-assembled at one end • Polyvinyl chloride or polyurethane cable
online: ➔	fb-ta	vmpa-kms

Connecting cables for sensors

	 Connecting cables NEBS
Electrical connection 1	Straight socket, M12x1, 12-pin, A-coded, straight socket M12, 5-pin, A-coded, socket, square design L1, 4-pin
Electrical connection 2	Straight socket, M12x1, 12-pin, A-coded, open end, 12-wire, open end, 4-wire, open end, 5-wire
Cable length	0.5 ... 10 m
Description	• For pressure sensor SPAB • Protection class IP40
online: ➔	nebs

Universal plug connectors

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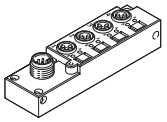
	 Plug socket NEFU	 Plug connector NECU, NECU-HX	 Push-in T-connector NEDU	 Multi-pin plug distributor NEDU
Electrical connection	Angled socket, RJ45, 4-pin, straight socket, M12x1, 4-pin, D	M8x1, M12x1, straight plug, socket, Sub-D, 9-pin, straight socket, 7/8", 4-pin, straight socket, 7/8", 5-pin, socket, IDC terminal, straight socket, M12x1, 5-pin, B-coded, screenable, screw terminal, screw terminal, screenable, spring-loaded terminal, AIDA push-pull, straight plug, M8x1, 4-pin, straight plug, M12x1, 4-pin, D-coded, screenable, straight plug, M12x1, 5-pin, B-coded, screenable, plug Sub-D, 9-pin, square design, type A, 3-pin, 4-pin, 5-pin, 7-pin, 8-pin, 2x20-pin, A-coded, R=2.54, pre-assembled, straight plug / insulation displacement connector, straight plug / screw terminal, socket / spring-loaded terminal	Straight socket, M12, 5-pin, A-coded, straight socket, M12x1, 5-pin, A-coded, straight plug, M12x1, 2-pin, A-coded, to EN 60947-5-2, plugs / sockets, M8x1 / M8x1, M12x1 / M12x1, M12x1 / M8x1, 4-pin / 3-pin, 4-pin / 4-pin, A-coded / A-coded, socket / socket / plug, M12x1 / M12x1 / M12x1, 4-pin / 4-pin / 4-pin, A-coded / A-coded / A-coded	Straight socket, M8, 3-pin, straight plug, M12x1, 8-pin
Connection cross section		0.08 ... 2.5 mm²		
Protection class	IP20, IP65, IP67, to IEC 60529, in assembled state	IP20, IP40, IP65, IP67	IP65, IP67	IP68
Description	• Cable socket for branching the AS-Interface network at any required point • Reconnecting AS-Interface flat cable to 5-pin M12 socket • Reverse polarity protected	• Power supply socket for fieldbus connection • NECU-HX: reconnectable M8 and M12 round plug connectors with Harax® quick connection technology for low-voltage applications • Plug and socket for power supply • Can be assembled with any cable lengths	• For fieldbus connection • Branch line for connecting and disconnecting fieldbus components	• Multi-pin plug distributor • Particularly compact
online: →	**nefu**	**necu**	**nedu**	**nedu**

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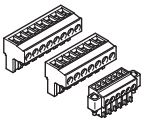
Universal plug connectors

	 **Plug connector** **SEA**	 **Cable distributor** **ASI-KVT**	 **Cable socket** **ASI-SD**
Electrical connection	M8x1, M12x1, M12x1 round plug connector, type A, 3-pin, 4-pin, 5-pin, straight plug / solder connection, straight plug / insulation displacement connector, straight plug / screw terminal, angled socket / screw terminal	2-pin, 4-pin, socket M12, insulation displacement technology	Straight socket, screw terminal, 2-pin, 4-pin, 5-pin, straight socket / insulation displacement technology
Connection cross section	0.08 ... 0.75 mm²	1.5 mm²	0.75 ... 1.5 mm²
Protection class	IP65, IP67	IP65, to IEC 60529, in assembled state	IP65, IP67
Description	• Sensor plug and socket for inputs/ outputs • Can be assembled with any cable lengths	• Flat cable distributor for branching or for reconnecting AS-Interface flat cables • Reverse polarity protected	• For AS-Interface • Flat-cable socket for connecting AS-Interface stations to the AS-Interface bus system • M12 connection • Reverse polarity protected • Detachable connection
online: →	**sea**	**asi-kvt**	**asi-sd**

Plug connectors for control systems

	 **Plug connector** **NECC**	 **Plug connector** **PS1-SAC, PS1-ZC**	 **Plug connector** **FBS-SUB-9-WS**
Electrical connection	Plug, spring-loaded terminal, 11-pin, Sub-D / screw terminal, 9-pin / 9-pin	Socket / terminal strip, 10-pin / 10-pin, 10-pin / 30-pin	5-pin, type A, M12x1, straight plug / screw terminal
Connection cross section	0.2 ... 2.5 mm²	0.08 ... 0.75 mm²	0.75 mm²
Protection class	IP40		IP40
Description	• Encoder plug for motor controller CMMS-ST, CMMS-AS • Plug for multi-axis controller CMXR for interface housing CAMI-C, 11-pin • Plug for multi-axis controllers CMXR and for modular controllers CECX for peripheral modules • 2-pin, 4-pin, 6-pin, 8-pin, 11-pin, 18-pin	• For power supply • Cable connection using clamping technology • Individually or as a set	• Plug connector for bus connection CAN bus and PROFIBUS • Cable connection 2x horizontal or 2x vertical • Printed circuit terminal block with screw connector
online: →	**necc**	**ps1**	**fbs-sub-9-ws**

Plug connectors for control systems

	 Plug connector FBS-RJ45	 Plug assortment NEKM
Electrical connection	5-pin, type A, M12x1, straight plug / screw terminal	2 ... 9-pin, screw connector
Connection cross section	0.75 mm²	0.2 ... 2.5 mm²
Protection class	IP65, IP67 to IEC 60529	
Description	• Ethernet plug with 8-pin RJ45 connection • High transmission quality • Detachable connection	• For motor cable, encoder cable, power supply, reference switch, STO safety function • Comprising plug for power supply and plug for motor connection
online: →	fbs-rj	nekm

Plug connectors for valves

	 Plug socket MSSD	 Soldering base PCBC	 Multi-pin plug socket NECA	 Angled socket MPPE-3-B
Electrical connection	Socket, angled socket, angled socket, square design, 3-pin, type C, socket, to EN 175301-803, type C, square design, square design MSC, square design MSEB, square design MSF, square design MSN1, square design MSN2, square design MSV, to DIN EN 175301-803, to DIN EN 61984, type A, type B, type C, 3-pin, 4-pin	2-pin	Socket, Sub-D, 9-pin	Angled socket, 8-pin, solderable
Connection cross section	0.25 ... 1.5 mm²		0.34 ... 1 mm²	0.75 mm²
Protection class	IP50, IP65, IP67, to IEC 60529, in assembled state	IP40	IP65, to IEC 60529	IP67
Description	• For valves with F, D, N1, V, E, EB, N2, Y, Z, ZB, ZC, MD-2 and MH-2 solenoid coils • For connecting individual valves • Cable connection using clamping screws, insulation displacement technology or push-in connector • Available with LED display	• For mounting miniature valves MHA1 and MHP1 on a PCB with plug connection underneath (-PI)	• For soft-start/quick exhaust valves MS6-SV, MS series • Electrical connection via 9-pin Sub-D, 9-pin screw terminal	• For proportional pressure regulators MPPE and MPPES • Mounting via union nut
online: →	mssd	pcbc	neca	mppe-3-b

Plug connectors for valves

	 **Time delay insert** **MFZ**	 **Illuminating seal** **MC-LD, ME-LD, MEB-LD, MF-LD, MV-LD**	 **Indicating insert** **MCL, MCLZ, MFL, MFLZ**
Electrical connection	For connector socket or device plug type F	Square design MSC, square design MSE, square design MSEB, square design MSF, square design MSV, to DIN EN 175301-803, type A, type B, type C	Plug, to DIN 43650
Connection cross section			
Protection class	IP64	IP65	IP65
Description	• Electronic timer with adjustable time delay of between 0 ... 10 s • For mounting between the solenoid coil and connector socket and device plug	• The seal is illuminated yellow when the power is switched on • For mounting between the solenoid coil and connector socket and device plug • For F, D, N1, V, E and EB solenoid coils	• Variant with integrated protective circuit • For mounting between the solenoid coil and connector socket and device plug • With yellow LED display
online: →	**mfz**	**mc-ld**	**mcl**

Plug connectors for valve terminals

	 **Bus connection** **FBSD-KL**	 **Plug socket** **FBSD**	 **Plug socket** **NTSD**	 **Bus connection** **FBA-1, FBA-2**
Electrical connection	Angled socket / screw terminal, 5-pin / 5-pin	M12x1, type A, 4-pin, 5-pin, angled socket / screw terminal, straight socket / screw terminal	Straight socket, angled socket, screw terminal, 4-pin, 5-pin, straight plug / screw terminal	Straight socket / straight plug, Sub-D / M12x1, Sub-D / -, 9-pin / 5-pin, straight socket / plug and socket
Connection cross section	0.2 ... 2.5 mm²	0.75 mm²	0.75 ... 2.5 mm²	
Protection class	IP20	IP67	IP67	IP40, IP65 to IEC 60529
Description	• 5-pin angled socket, 5-pin screw terminal	• For fieldbus connection • Straight or angled design • Can be assembled with any cable lengths	• Straight or angled design • For power supply • Can be assembled with any cable lengths	• Can be assembled with any cable lengths
online: →	**fbsd-kl**	**fbs**	**ntsd**	**fba**

Plug connectors for valve terminals

FESTO

	 Plug connector FBS-SUB	 Sensor socket, angled plug socket SIE-GD, SIE-WD	 Cover cap ISK	 Plug socket, plug SD-SUB
Electrical connection	M12x1, type A, 5-pin, straight plug / screw terminal	M12x1, straight socket, angled socket, 4-pin		Plug, Sub-D, 25-pin
Connection cross section	0.75 mm²	0.25 ... 0.75 mm²		
Protection class	IP65, IP67 to IEC 60529, in assembled state	IP67	IP65	IP65
Description	• Variants for PROFIBUS DP, INTERBUS nodes CPX and CPV, CC-Link CPX and CPV, CPX-FEC • Position of DIL switches can be read externally • Easy assembly	• For customised fabrication of cables • Pin adapter for fieldbus connection • With screw terminals • Straight or angled design	• For sealing unused ports/ openings • Thread M8, M12	• Socket for multi-pin plug connection • Plug for inputs/outputs • Can be assembled with any cable lengths
online: ➔	**fbs-sub**	**sie-gd**	**isk**	**sd-sub**

Plug connectors for sensors

	 Angled plug socket PEV-...-WD	 Plug socket SD-4-WD
Electrical connection	Angled socket, 4-pin	4-pin, plug, Sub-D
Connection cross section		
Protection class	IP65	IP65, to IEC 60529
Description	• For pressure switch PEV • 15 ... 30, 180 V DC, 230 V AC • Available with LED display • Angled design	• For swivel module DSMI • Angled design
online: ➔	**pev*wd**	**sd-4-wd**

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Pneumatic and electropneumatic controllers

	 **Stepper** **TAA, TAB**	 **Memory modules** **SBA-2N**	 **Pulse oscillator** **VLG**
Pneumatic port	Barbed connections for 3 mm plastic tubing NW3	Barbed connections for 3 mm plastic tubing NW3	G1/8, G1/4
Type of mounting	On mounting frame	On mounting frame	Through-hole in housing
Nominal width	2 mm	3 mm	3.5 mm, 7 mm
Standard nominal flow rate	60 l/min	70 l/min	120 l/min, 600 l/min
Description	• For ensuring a logical program sequence • Poppet valve with integrated AND as well as OR element	• For input logic operations • For simplifying the design and installation of pneumatic controllers	• For generating infinitely adjustable signals in controllers • For high-speed cylinder movements of diaphragm cylinders, single and double-acting diaphragm cylinders
online: ➔	**taa**	**sba**	**vlg**

Software tool

CODESYS

CODESYS for standardised programming of embedded devices according to IEC 61131-3. It makes your life easier with simple commissioning, fast programming and parameterisation.

Advantages

- Hardware-neutral software platform for quick and easy configuration, programming and commissioning of pneumatic and electrical automation solutions
- Extensive module libraries for single or multi-axis positioning motions.
- The IEC 61131-3 standard means that CODESYS is flexible and open for all types of control tasks.
- Modular: offline and online functions as well as components for hardware configuration and visualisation
- User-friendly IEC function block extension
- Re-use of existing application parts

The parameterisation software can be found on the website under Support › Support Portal › enter search term.

Electronic controllers

FESTO

	 Controllers CECC-D, CECC-LK, CECC-S	 Controllers CECX-X-C1, CECX-X-M1	 Input/output modules CECX-D-E8A, CECX-A-4E4A	 Input modules CECX-D-16E, CECX-A-4E-V
Operating voltage	19.2 - 30 VDC, 20.4 - 30 VDC	19.2 - 30 VDC	19.2 - 30 VDC	19.2 ... 30 V DC
CPU data	400 MHz processor	64 MB DRAM, 400 MHz processor	64 MB DRAM, 400 MHz processor	64 MB DRAM, 400 MHz processor
Fieldbus interface	CAN bus	CAN bus		
Ethernet, connector plug	RJ45	RJ45, socket, 8-pin		
Description	• Compact programmable logic controller • Programming with CODESYS to IEC 61131-3 • 12 digital inputs, 8 digital outputs, additionally 2 high-speed counters up to 250 kHz • Ethernet 10/100 Mbit/s • USB interface for data transfer • CECC-LK with CANopen, I/O link, I-Port and Modbus TCP protocol	• Modular master controller with CODESYS or motion controller with CODESYS and SoftMotion. • Programming to standard IEC 61131-3 • Three plug-in slots for optional modules • Optional: communication module for PROFIBUS	• Digital modules: 6 or 8 digital inputs and 8 digital outputs • Analogue modules for voltage: 4 analogue voltage inputs and 4 analogue voltage outputs • Analogue modules for current: 4 analogue current inputs and 4 analogue current outputs • Address setting function, short circuit monitoring function for outputs, debounce function, interrupt function, sensor failure detection function	• Digital modules: 16 digital inputs • Analogue modules for voltage: 4 analogue voltage inputs • Temperature input modules: 4 or 6 temperature inputs
online: →	cecc	cecx-x	cecx	cecx

Electronic controllers

	 Output modules CECX-D-14A-2, CECX-A-4A-V	 Encoder interface CECX-C-2G	 Bus interface CECX-F-PB-S-V, CECX-F-PB-V1, CECX-B-CO
Operating voltage	24 VDC +25%/-15%	19.2 - 30 VDC	19.2 - 30 VDC
CPU data			
Fieldbus interface			CAN bus, PROFIBUS master DP-V1, PROFIBUS slave DP-V1
Ethernet, connector plug		9-pin, socket, RJ45	8-pin, socket, 9-pin, plug
Description	• Digital modules: 14 digital outputs • Analogue modules: 4 analogue voltage outputs	• Distance measurement function • Pulse counter • Speed measurement function • Shaft encoder monitoring function • Counter reading latch function • Sensor break monitoring • Status display function	• PROFIBUS-Master DP-V1 • Connection via CAN Bus to the modular controller • For connecting decentralised peripheral modules in series
online: →	cecx	cecx	cecx

Electronic controllers

	 **Electrical interfaces** **CECX-C-2S1**	 **AS-Interface module** **CESA**
Operating voltage		AS-i voltage 30 VDC
CPU data		
Fieldbus interface		CANopen Device Specification CiA DS-301, PROFIBUS to DIN 19245 Part 3
Ethernet, connector plug	8-pin	
Description	• For extending the controller with two RS232 serial interfaces	• AS-i master gateway • Duplicate address recognition • Direct operation by pushbuttons • Graphic display • Comprehensive diagnostics via LED and display • Specification 3.0
online: →	cecx	cesa

Electrical peripherals

	 **Terminal** **CPX-P**	 **Input module for installation system CTEL** **CTSL**	 **Fieldbus module** **CTEU**	 **CPI installation system** **CTEC**
Max. no. of inputs	Digital 512, analogue 32	16	128	128
Max. no. of outputs	Digital 512, analogue 32		128	128
No. of module positions	10		32	Max. 4 installation strings, max. 4 CP modules per string
Electrical actuation	Fieldbus, integrated controller	IO-Link, I-Port	CanOpen, DeviceNet, CC-Link, PROFIBUS, EtherCAT, I-Port	Fieldbus, integrated controller
Description	• Use of matching remote I/O and valve terminals in a control cabinet • Combination with modules of the electrical terminal CPX, which enables use for hybrid applications • Unique modular structure • Comprehensive integrated diagnostic and service functions	• For installation system CTEL • For recording sensor input signals • Display of the input statuses for each input signal via an assigned LED • Diagnostic LED for short circuit/overload in sensor supply	• For valve terminals VTUB-12, VTUG, MPA-L, CPV, VTOC • Can be expanded into installation systems CTEL • Fieldbus-typical LEDs, interfaces and switching elements available • Isolated power supply for electronics and valves	• CPX Master module for four CPI strings • Combination of centralised and decentralised installation possible • Decentralised pneumatic components and sensors for fast processes • Can be connected to valve terminal CPV, MPA-S, CPV-SC
online: →	cpx-p	ctsl	cteu	ctec

Electrical peripherals

FESTO

	 Terminal CPX	 Electrical interface CPX-CTEL	 Measuring modules CPX-CMIX	 AS-interface components ASI, CACC
Max. no. of inputs	Digital 512, analogue 32	256		4, 8
Max. no. of outputs	Digital 512, analogue 18	256		8
No. of module positions	Max. 9 electric input/output modules	Max. 4 modules with I-Port interface	9	
Electrical actuation	Fieldbus, integrated controller	I-Port		AS-Interface
Description	• Automation platform • Open to all common fieldbus protocols and Ethernet • Integrated diagnostic and maintenance functions • Applicable as stand-alone as remote I/O or with valve terminals MPA-S, MPA-L, VTSA/VTSA-F • Choice of plastic or metal housing with individual linking	• CPX-CTEL master module with 4 I-Port connections • Decentralised pneumatic components and sensors for fast processes • Standardised M12 connections	• Pneumatics and electrics – movement and measurement on one platform • Innovative measurement technology for piston rod drives, rodless drives, rotary drives • Actuation via fieldbus • Remote maintenance, remote diagnostics, web server, SMS and e-mail alerts are all possible via TCP/IP • Modules can be quickly exchanged and expanded without altering the wiring	• Accessories for AS-Interface installation system • Modules for actuating individual valves ASI-EVA • Cable distributor ASI-KVT • Addressing device ASI-PRG-ADR • Compact I/O modules (IP65, IP67) • AS-Interface power supply unit SVG
online: →	cpx	cpx-ctel	CPX-CMIX	as-interface

Operator units

	 Operator units CDPX	 Simulators CDSM	 Operator units FED-50
Advertisement	Colour TFT		Monochrome LCD, with backlighting
Display size	13.3“, 7“, 4.3“, 10.4“		4 x 20 characters
Recipe memory	32 KB		16 KB
Display resolution	480 x 272 pixels, SVGA, 800 x 600 pixels, WVGA, 800 x 480 pixels, WXGA, 1280 x 800 pixels		120x32 pixels
Ethernet interface	RJ45 10/100 MBd		Optional, 10 MBd
No. of user LEDs			5
No. of function keys			4
Description	• Powerful processors combined with wide-screen technology • Remote access, remote control • FTP and HTTP servers • Open for web and multimedia applications	• Straightforward design of human-machine dialogues • Semi-graphical display of process values makes them easier to read • Suitable for commissioning the following motor controllers: CMMO-ST, CMMP-AS, CMMS-ST • To simulate input and output signals during commissioning	• Straightforward design of human-machine dialogues • Semi-graphical display of process values makes them easier to read • 4-line text display and operating buttons • Recipe handling • Serial interface • Password protection
online: →	cdpx	cdsm	fed

Operator units

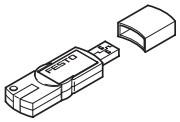
	 **Operator units** **FED-770, FED-3000**	 **Operator units** **cpx-mmi**
Display	Colour TFT	128 x 64 pixels, LCD display, with background illumination
Display size	13.3“, 7“	
Recipe memory	32 KB	
Display resolution	WVGA, 800 x 480 pixels, WXGA, 1280 x 800 pixels	
Ethernet interface	RJ45 10/100 MBd	
No. of user LEDs	1	
No. of function keys		
Description	• Graphics-capable for maximum flexibility when displaying processes and data • No programming effort in the PLC program • Convenient FED Designer WYSIWYG design tool • Shorter project planning thanks to re-usable objects • Trend display • Program sequences display • Can be connected to all FEC® units • Extremely sturdy thanks to metal housing	• Data polling, configuration and diagnostic functions for terminal CPX • Connection to the CPX bus nodes or control block via a pre-assembled M12 cable • 3 function keys, 4 arrow keys
online: ➔	**fed**	**cpx-mmi**

Software

	 **Operator packages** **GSIB**	 **Operator packages** **P.BP**	 **Software** **GSPF**	 **Software and manual** **P.SW**
Description	• Information software and documentation for motor controllers CMMD-AS, CMMS-AS, CMMP-AS, CMMS-ST • The operator package contains a CD-ROM with user documentation for motor controller and configuration software FCT (Festo Configuration Tool) and a brief description	• Information software and documentation for motor controllers CMMP-AS and SFC-DC, handling module HSP/HSW and motor unit MTR-DCI • The operator package contains a CD-ROM with user documentation for motor controller and configuration software FCT (Festo Configuration Tool) and a brief description	• Programming software and documentation for motor controller CMMP-AS with additional functions for cam disc functionality • Software for configuring, programming, commissioning and maintaining the controller CECC • Programming software for creating custom application programs for safety systems CMGA • Operating software for configuring, programming and for AS-Interface diagnostics with serial connecting cable • The software package contains a CD-ROM with user documentation for the motor controller	• For configuring the terminal CPX, for parameterising the CPX modules, for programming the controller CPX-FEC • Software for checkbox CHB-C for image evaluation, display, protocol and adaptation of the I/O parameters • Software for Checkbox CHB-C for the complete analysis of recognition processes
online: ➔	**gsib**	**software**	**gspf**	**software**

Software

FESTO

	 Software licences GSLO	 Software (FluidDraw S5®) GSWF-S5	 Software (FluidDraw P5®) GSWF-P5
Description	• For enabling tools on the Compact Vision System SBOC-Q/SBOI-Q	• Quick and easy creation of pneumatic circuit diagrams • Extensive library of pneumatic symbols • Easy, user-friendly operator guidance • Interface to Festo products (catalogue, online shop)	• Quick and easy creation of pneumatic circuit diagrams • Comprehensive library of pneumatic and electrical symbols • User-specific product databases and translation tables • Terminal plans, cable diagrams, cable lists, parts lists • Dimensioning function for preparing simple control cabinet and system layouts • Consistent equipment identification • Multi-level project tree
online: ➔	gslo	gswf-s5	gswf-p5

Learning systems

	 EduTrainer Universal D:ET-SPS
Description	• PLC EduTrainer® support system for use in teaching and training • Equipped with PLCs from different manufacturers • Two series: Universal and Compact • Equipped with 19" simulation modules • Individually configurable or pre-assembled
online: ➔	edutrainer

Tools

	 **Clip fix tool** **AGTC**
Valve function	3/2-way, closed, monostable
Type of actuation	Mechanical
Operating pressure	2 ... 6
Pneumatic connection 1	Female thread G1/4
Description	• Pneumatic mounting device for clips of various designs • Material recommendation for polymer clip adapter: e.g. PBT, PE-UHMW or POM
online: ➔	agtc

Air cushion plates

	 **Air cushion plate** **ATBT**
Size	100
Operating pressure	≤2 bar
Pneumatic connection	G1/4
Bearing length	100 ... 1500 mm
Max. surface load in operation	400 kg/m²
Repetition accuracy of the gliding height	±10 µm
Description	• Works without contact by means of an air cushion, with low compressed air consumption • Uniform air flow ensures maximum precision and allows for short cycle times • For transporting and conveying flat products • Suitable for vacuum and can be used as a flat suction cup • Operating media: compressed air, vacuum • Aluminium hydroxide, aluminium
online: ➔	atbt

Air reservoirs

FESTO

	 Air reservoir VZS	 Air reservoir CRVZS
Volume	20 l	0.1 l, 0.4 l, 0.75 l, 10 l, 2 l, 20 l, 5 l
Information on air reservoir materials	Powder-coated steel	High-alloy stainless steel
Conforms to standard	EN 286-1	AD 2000
Condensate drain connection	G3/8	G3/8
Description	• Can be used to compensate pressure fluctuations, and act as accumulators in the event of sudden air consumption • Provision of large quantities of compressed air for supplying fast pulsing drives • With connection for condensate drain • Conforms to the requirements of directive 2014/29/EC and EN 286-1 • Operating media: compressed air, vacuum	• Corrosion-resistant • Can be used to compensate pressure fluctuations, and act as accumulators in the event of sudden air consumption • Provision of large quantities of compressed air for supplying fast pulsing drives • Partially with connection for condensate drain • Material suitable for use in the food industry • Designs in accordance with EU Pressure Equipment Directive EN 286-1 • Operating media: compressed air, vacuum
online: →	vzs	crvzs

Pneumatic silencers

	 Pneumatic silencer AMTE	 Pneumatic silencer U	 Pneumatic silencer UC	 Pneumatic silencer AMTC
Information on silencer insert materials	Bronze	PE, Bronze	PE	PE
Pneumatic connection	G1, G1/2, G1/4, G1/8, G3/4, G3/8, M3, M5, NPT1/2-14, NPT1/4-18, NPT1/8-27, NPT3/8-18, UNF10-32	G1, G1/2, G1/4, G1/8, G3/4, G3/8, NPT3/4-14, PK-3, PK-4	G1/4, G1/8, G3/8, M5, M7, QS-10, QS-3, QS-4, QS-6, QS-8	Cartridge 10 mm
Noise level	55 ... 95 dB(A)	70 ... 85 dB(A)	58 ... 68 dB(A)	58 dB(A)
Description	• Long or short design • Metal design • Operating medium: compressed air	• Compact design, plastic or die-cast • Barbed fitting or threaded connection • Operating medium: compressed air	• Threaded connection or push-in sleeve for push-in fitting QS • Plastic design • Operating medium: compressed air	• For solenoid valves VUVB-ST12 and valve terminals VTUB-12 • Attached via pin (spring clip, included in the scope of delivery of the valve) • Plastic design • Operating medium: compressed air
online: →	amte	u	uc	amtc

Pneumatic silencers

	 **Pneumatic silencer** **UO**	 **Pneumatic silencer** **UOS-1, UOS-1-LF**	 **Pneumatic silencer** **UOM, UOMS**
Information on silencer insert materials	PE	PE	PU foam
Pneumatic connection	G1/4, G1/8, M7	G1	G1/4, G3/8
Noise level			
Description	• Special open minimal resistance silencer • For vacuum generators • Facilitates trouble-free operation of the vacuum generator • Operating medium: compressed air	• Safety silencer for MS6-SV, MS series • Operating medium: compressed air	• Special open minimal resistance silencer • For vacuum generators • Facilitates trouble-free operation of the vacuum generator • Silencer extension for extending the silencer for further noise reduction • Operating medium: compressed air
online: →	**uo**	**uos**	**uom**

Air guns

	 **Air gun** **LSP**	 **Air nozzle** **LPZ**
Exhaust air function	Metered blowing	
Pneumatic connection	Female thread G1/4	Male thread M12x1.25
Information on housing materials	Wrought aluminium alloy, reinforced PA6	Aluminium, brass, chrome-plated and nickel-plated die-cast zinc
Description	• Precise, infinitely variable, lever-operated flow metering • Interchangeable nozzles • Operating medium: compressed air	• With protective air shield or silencer • Targeted, strong air jet or powerful, focused air jet • Low noise level • Operating medium: compressed air
online: →	**lsp**	**lpz**

Pneumatic indicators

FESTO

	 Visual indicator OH	 Pneumatic terminal, end clamp, distributor LT, LTE, LTV
Design	Indicator plate with 16 pressure indicators, indicating pin with spring return, reflection principle	
Size	8, 10, 22	
Operating pressure	-1 ... 8 bar	0.1 ... 8 bar
Pneumatic connection	Barbed connector PK-3, G1/8	Barbed connector PK-3, PK-4
Type of mounting		
Description	• Visual indicator • Indicator colours: red, blue, yellow or green • Aluminium or polymer • Operating medium: compressed air	• Pneumatic terminal for checking incoming and outgoing signals at the controller input and output • Up to 15 distributor pieces with common air supply, for easy connection • Brass, polymer • Operating medium: compressed air
online: ➔	oh	lt

Inscription systems

	 Inscription label ASLR, BZ, HWF, IBS, KM, KMC, MH, SBS, SIEZ	 Inscription label holder ST, CPV10-VI-ST, CPV14-VI-ST, CPV18-VI-ST, CPVSC1-ST, CPX-ST, IBT, MN2H-BZT, MVH-BZ, VMPA1-ST
Type of mounting	Inscription clip is pressed onto a cable, pressed into a holder or carrier, through-hole	Plug-on, snap-in, clip-on
Width	4.5 ... 11 mm	12 mm
Height	9 ... 20 mm	2 mm
Description	• For labelling items • Can be inserted in holders or carriers on suitably equipped components	• Holder for inscription labels • For components without pre-assembled carriers
online: ➔	aslr	ascf

Control technology and remote I/O

- Electronic controllers and remote I/Os including electrical peripherals for standard and potentially explosive atmospheres.

➔ **www.festo.com/pa/control**

Valve terminals

- Valve modules with electrical multi-pin, individual, or fieldbus connections or integrated control, with or without electrical inputs and outputs

➔ **www.festo.com/pa/valveterminals**

Pilot valves

	 **Solenoid valve VSNC**	 **Standard valve, NAMUR (VDI/VDE 3845) NVF3**	 **Solenoid valve VOFC**	 **Solenoid valve VOFD**
Valve function	5/2 double-solenoid, 5/2 or 3/2 convertible, 5/3 pressurised, 5/3 exhausted, 5/3 closed	5/2-way or 3/2-way, single solenoid	3/2-way, single solenoid, closed, 5/2-way, double solenoid, 5/2-way, single solenoid	2/2-way, single solenoid, closed
Operating pressure	1.5 ... 10 bar	2 ... 10 bar	2 ... 8 bar	0 ... 10 bar
Ambient temperature	-20 ... 60 °C	-5 ... 40 °C	-25 ... 60 °C	-10 ... 60 °C
Pneumatic connection 1	G1/4, NPT1/4-18	G1/4	G1/2, G1/4, NPT1/4-18, port pattern as per NAMUR	G1/4, NPT1/4-18, port pattern as per NAMUR
Standard nominal flow rate	800 ... 1350 l/min	900 l/min	600 ... 3000 l/min	450 l/min
Explosion prevention and protection	For zone 1, 21	II 2G, II 2D, EPL Db (RU), EPL Dc (RU), EPL Gb (RU), c T6, EPL Gc (RU), c 40°C	II 2G, II 2D, for zone 1, 2, 21, 22, Ex tD A21 IP65 T80°C, T95°C, Ex emb II T6, T5, Ex ia IIC T6, T5	II 2G, II 2D, for zone 1, 2, 21, 22, Ex tD A21 IP65 T80°C, T95°C, Ex emb II T6, T5
Description	• NAMUR interface • Rotatable seal for 3/2 or 5/2-way valve • Wide choice of EX solenoid systems • Sturdy and powerful • Extended temperature range • Outstanding value for money	• NAMUR interface • Variants for use in Ex zone I	• Suitable for process automation, for use in chemical and petrochemical plants • Suitable for outdoor use under harsh, dusty ambient conditions • Especially suitable for quarter turn actuators thanks to flange pattern to NAMUR • Valve can switch between internal and external pilot air • Variants with TÜV approval up to SIL3 to IEC 61508	• Suitable for process automation, for use in chemical and petrochemical plants • Suitable for outdoor use under harsh, dusty ambient conditions • Especially suitable for quarter turn actuators thanks to flange pattern to NAMUR • Variants with TÜV approval up to SIL4 to IEC 61508
online: ➔	vsnc	namur	vofc	vofd

Sensor boxes

FESTO

	 Sensor box SRBC	 Limit switch attachment SRAP	 Limit switch attachment DAPZ
Information on housing materials	Die-cast aluminium	Wrought aluminium alloy	
Operating voltage range AC	0 ... 250 V		4 ... 250 V
Operating voltage range DC	0 ... 175 V	15 ... 30 V	4 ... 250 V
Measuring principle	Inductive, magnetic reed, mechanical/ electrical, for proximity sensor	Magnetic Hall	Inductive, mechanical/electrical
Switching element function	N/C contact, N/O contact, toggle switch, single-pole		N/C contact, N/O contact, changeover switch
Description	• Pre-assembled mounting adapter for ease of installation • The trip cams can be set easily without additional tools • Sturdy, corrosion-resistant design, ideal for use in harsh operating conditions • Clearly visible 3D position indicator allows rapid detection of the current position of the quarter turn actuator	• Based on VDI/VDE 3845 (NAMUR) • Analogue • For monitoring the position of quarter turn actuators • Sensors based on 2D Hall technology	• Square or round design • Drive interface to standard VDI/VDE 3845 (NAMUR) • With pneumatic, electrical or inductive sensing
online: →	srbc	srap	dapz

Positioners

	 Positioner CMSX
Standard nominal flow rate	50 ... 130 l/min
Ambient temperature	-5 ... 60 °C
Setpoint	0 - 20 mA, 4 - 20 mA, 0 - 10 V
Operating pressure	3 ... 8 bar
Safety note	Adjustable, opening, closing, holding
Operating voltage range DC	21.6 ... 26.4 V
Description	• For position control of double-acting pneumatic quarter turn actuators in process automation systems • Simple and efficient position control based on the PID control algorithm • Suitable for quarter turn actuators with a swivel angle of approx. 90° and a mechanical interface in accordance with VDI/VDE Directive 3845 • Power supply 24 V DC
online: →	cmsx

Linear actuators

	 **Copac linear actuators** **DLP**	 **Linear actuator with displacement encoder** **DFPI**
Piston diameter	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
Stroke	40 ... 600 mm	40 ... 990 mm
Theoretical force at 6 bar, advancing	3016 ... 48255 N	4712 ... 48255 N
Position sensing	For proximity sensor	With integrated displacement encoder
Description	• Port pattern as per NAMUR for solenoid valves to VDI/VDE 3845 • Integrated air supply • Connection for process valves to DIN 3358	• Closed-loop controlled actuator for all linear process valves • Optionally with integrated positioning controller and valve block • Position feedback via analogue 4 ... 20 mA signal for simple diagnostics • Easy to integrate into existing control architecture • Sturdy and compact housing for use outdoors • Connection for process valves to DIN 3358
online: →	**dlp**	**dfpi**

Quarter turn actuators

	 **Quarter turn actuator** **DAPS**	 **Quarter turn actuator** **DFPB**
Design	Scotch yoke system	Rack and pinion
Mode of operation	Double-acting, single-acting	Double-acting, single-acting
Size of valve actuator	0008, 0015, 0030, 0053, 0060, 0090, 0106, 0120, 0180, 0240, 0360, 0480, 0720, 0960, 1440, 1920, 2880, 3840, 4000, 5760, 8000	10, 15, 1050, 110, 120, 150, 170, 180, 20, 230, 270, 30, 300, 330, 370, 40, 420, 45, 470, 520, 550, 60, 65, 670, 80, 840
Flange hole pattern	F03, F04, F05, F07, F10, F12, F14, F16, F25	F03, F04, F05, F0507, F0710, F1012, F14
Operating pressure	1 ... 8.4 bar	1 ... 8 bar
Ambient temperature	-50 ... 150 °C	-20 ... 80 °C
Description	• High breakaway torques • Approved in accordance with Directive 2014/34/EU (ATEX) • Flange hole pattern to ISO 5211 • Mounting hole pattern to VDI/VDE 3845 • Available with handwheel as a manual emergency override • Corrosion-resistant version made from stainless steel	• Identical torque characteristic across the entire rotation angle range of 90° • Process valve connection to ISO 5211 on both sides • Can be mounted on all process valves using pressure relief slot • Mounting hole pattern to VDI/VDE 3845 • Sturdy, non-slip and easy-to-clean aluminium housing • Long service life, low wear • Increased corrosion protection
online: →	**daps**	**dfpb**

Ball valves and ball valve units

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	 Ball valve VAPB	 Ball valve VZBC	 Ball valve actuator unit VZBC
Design	2-way ball valve	2-way ball valve	2-way ball valve, quarter turn actuator
Type of actuation	Mechanical	Mechanical	Pneumatic
Nominal width DN	15 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm	100 mm, 15 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 65 mm, 80 mm	100 mm, 15 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 65 mm, 80 mm
Process valve connection	Rp1, Rp1 1/2, Rp1 1/4, Rp1/2, Rp1/4, Rp2, Rp2 1/2, Rp3/4, Rp3/8	Ring housing with threaded flange	Ring housing with threaded flange
Flow rate Kv	5.9 ... 535 m³/h	19.4 ... 1414 m³/h	19.4 ... 1414 m³/h
Temperature of medium	-20 ... 150 °C	-10 ... 200 °C	-10 ... 200 °C
Description	• Automatable 2-way ball valve • Brass design • Blow-out proof shaft • Manual operation possible using hand lever • Connecting thread to DIN 2999 or DIN ISO 228-1 • Mounting flange ISO 5211	• Automatable 2-way ball valve with compact flange • Stainless steel design • Short installed length • Blow-out proof shaft • Manual operation possible using hand lever • Connecting thread to DIN 2999 or DIN ISO 228-1 • Mounting flange to ISO 5211 • ATEX certification for zone 1, 21, 2, 22	• Ball valve actuator unit with double-acting or single-acting quarter turn actuator • Stainless steel ball valve in compact design • Port pattern as per NAMUR for solenoid valves/sensor boxes to VDI/VDE 3845 • Flow is fully opened or closed in both directions • ATEX certification for zone 1, 21, 2, 22
online: →	vapb	vzbc	vzbc

Ball valves and ball valve units

	 Ball valve VZBA	 Ball valve actuator unit VZBA	 Ball valve actuator unit VZPR
Design	2-way ball valve, 3-way ball valve, L-shaped hole, T-shaped hole	2-way ball valve, 3-way ball valve, L-shaped hole, quarter turn actuator, T-shaped hole	2-way ball valve, quarter turn actuator
Type of actuation	Mechanical	Pneumatic	Electric, pneumatic
Nominal width DN	10 mm, 100 mm, 15 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 65 mm, 8 mm, 80 mm	10 mm, 100 mm, 15 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 65 mm, 8 mm, 80 mm	15 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm
Process valve connection	Rp1, Rp1 1/2, Rp1 1/4, Rp1/2, Rp1/4, Rp2, Rp2 1/2, Rp3, Rp3/4, Rp3/8, Rp4, 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, weld-on ends/weld-on ends	Rp1, Rp1 1/2, Rp1 1/4, Rp1/2, Rp1/4, Rp2, Rp2 1/2, Rp3/4, Rp3/8
Flow rate Kv	7 ... 1414 m³/h	7 ... 1414 m³/h	
Temperature of medium	-10 ... 200 °C	-10 ... 200 °C	-20 ... 150 °C
Description	• Automatable 2-way or 3-way ball valve • Stainless steel design • Blow-out proof shaft • Manual operation possible using hand lever • Connecting thread to DIN 2999 or DIN ISO 228-1 • Mounting flange to ISO 5211 • ATEX certification for zone 1, 21, 2, 22	• Ball valve actuator unit with double-acting or single-acting quarter turn actuator • Stainless steel ball valve • Port pattern as per NAMUR for solenoid valves/sensor boxes conforming to VDI/VDE 3845 • Flow is fully opened or closed in both directions • ATEX certification for zone 1, 21, 2, 22	• Ball valve actuator unit with double-acting quarter turn actuator • Brass ball valve • Port pattern as per NAMUR for solenoid valves/sensor boxes to VDI/VDE 3845 • Flow is fully opened or closed in both directions
online: →	vzba	vzba	vzpr

Solenoid-actuated media valves

	 **Solenoid valve VZWD**	 **Solenoid valve VZWM**	 **Solenoid valve MN1H**
Design	Directly actuated poppet valve	Poppet valve with diaphragm seal	Diaphragm valve
Type of actuation	Electrical	Electrical	Electrical
Nominal width	1 ... 6 mm	13 ... 50 mm	13 ... 40 m
Process valve connection	G1/4, G1/8, NPT1/4, NPT1/8	G1, G1 1/2, G1 1/4, G1/2, G1/4, G2, G3/4, G3/8	G1, G1 1/2, G1/2, G1/4, G3/4, G3/8
Flow rate Kv	0.06 ... 430 l/min	1.6 ... 31000 l/min	2000 ... 30500 l/min
Medium pressure	0 ... 90 bar	0.5 ... 10 bar	0.5 ... 10 bar
Temperature of medium	-10 ... 80 °C	-10 ... 60 °C	-10 ... 60 °C
Description	• Extensive pressure range • Directly actuated poppet valve • No pressure difference required • Can also be used in vacuum technology	• Poppet valve with diaphragm seal • Brass or stainless steel casting design • Electrical connection via solenoid armature tube • Wide range of coils • Coil can be ordered separately	• Pilot operated diaphragm valve • Brass design • Can only be used for gaseous media • Adjustable closing cushioning, in-line mounting or through-hole
online: →	vzwd	vzwm	mn1h-2

Solenoid-actuated media valves

	 **Solenoid valve VZWP**	 **Solenoid valve VZWF**	 **Reverse jet pulse valve VZWE-E, VZWE-F**
Design	Piloted piston poppet valve	Diaphragm valve, force pilot operated	Angled version, straight version with flange, diaphragm valve
Type of actuation	Electrical	Electrical	Electrical
Nominal width	13 ... 25 mm	13.5 ... 50 mm	20 ... 76 m
Process valve connection	G1, G1/2, G1/4, G3/4, G3/8, NPT1, NPT1/2, NPT1/4, NPT3/4, NPT3/8	G1, G1 1/2, G1 1/4, G1/2, G1/4, G2, G3/4, G3/8, NPT1, NPT1 1/2, NPT1 1/4, NPT1/2, NPT1/4, NPT2, NPT3/4, NPT3/8	Flange diameter 60 mm, 75 mm, 89 mm, G1, G1 1/2, G2, G2 1/2, G3/4
Flow rate Kv	1.5 ... 12250 l/min	1.8 ... 29900 l/min	15 ... 210 m³/h
Medium pressure	0.5 ... 40 bar	0 ... 10 bar	0.35 ... 8 bar
Temperature of medium	-10 ... 80 °C	-10 ... 80 °C	
Description	• For all applications with a differential pressure of min. 0.5 bar • For high pressures and high flow rates with relatively small solenoids • For controlling gaseous and liquid media in open circuits	• High flow rates • Large nominal diameters with relatively small solenoids • No pressure difference required • Can also be used in vacuum technology	• High flow rates • For mechanically cleaning filters and dust filter systems • Fast opening and closing times • Sturdy pilot system
online: →	vzwp	vzwf	vzwe

Pneumatically actuated media valves

FESTO

	 **Pinch valve VZQA**	 **Angle seat valve VZXF**	 **Pneumatic valve VLX**
Design	Pinch valve, pneumatically actuated	Poppet valve with spring return	Diaphragm valve
Type of actuation	Pneumatic	Pneumatic	Pneumatic
Nominal width DN	15 mm, 25 mm, 6 mm	15 mm, 20 mm, 25 mm, 32 mm, 40 mm, 50 mm	
Nominal width		12 ... 45 mm	13 ... 25 m
Process valve connection	G1, G1/2, G1/4, NPT1/2, NPT1/4, clamp to ASME-BPE, clamp to DIN 32676	G1, G1 1/2, G1 1/4, G1/2, G2, G3/4, NPT1, NPT1 1/2, NPT1 1/4, NPT1/2, NPT2, NPT3/4	G1, G1/2, G1/4, G3/4, G3/8
Flow rate Kv	0.7 ... 5 m³/h	3.3 ... 43 m³/h	2400 ... 14000 l/min
Medium pressure	0 ... 6 bar	-0.9 ... 40 bar	1 ... 10 bar
Temperature of medium	-5 ... 100 °C	-40 ... 200 °C	-10 ... 80 °C
Description	• Modular design • Quick and easy replacement of the diaphragm • Selection of different materials for housing and connector caps • Different connection cap designs (G and NPT thread), clamp ferrule to DIN 32676 and ASME-BPE • For critical, abrasive and viscous media • Up to 2 million switching cycles • FDA-compliant materials • Easy-to-clean design • Flow direction is freely selectable	• Sturdy design • Stainless steel and gunmetal process valves with stainless steel, brass or aluminium drives • For medium pressures up to 40 bar • Safety position "closing" • Different actuator sizes and housing materials • Selection of different seat and shaft seals • Flow direction is freely selectable • For liquids, gases and other easily contaminated media • Easy-to-clean design	• Poppet valve • Indirectly actuated • Brass design • In-line mounting or via through-holes
online: →	vzqa	vzxf	vlx

Compressed air preparation

- Service unit combinations and individual units for compressed air preparation in two series: series MS and D (in metal or polymer)

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Pneumatic connection technology

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Control cabinets

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Type	 Factory automation	 Process automation	 Control cabinets for control systems
Technical data	• Simple to complex control cabinet designs • Application-specific combination of components • Fully tested, with test certificate • Ready-to-install • Complete documentation • Design conforms to: – EN 60204-1 – ATEX zone 1 and 21 (pneumatic only), ATEX zone 2 and 22 (electric and electropneumatic) – UL-508A • Implementation of safety functions • Different bus technologies	• Simple to complex control cabinet designs • Application-specific combination of components • Different operating voltages • Fully tested, with test certificate • Ready-to-install • Complete documentation • Design conforms to: – EN 60204-1 – ATEX zone 1 and 21 (pneumatic only), ATEX zone 2 and 22 (electric and electropneumatic) – UL-508A • Implementation of safety functions • Wide range of bus technologies • Compliance with special cleanliness and hygiene requirements • Special materials • Protected against the ingress of liquids and foreign matter • Heating or cooling elements • Intrinsically safe valve terminal technology • Hot swap inspection window	• Simple to complex control cabinet designs • 1 ... 31 axes • Application-specific combination of components • Use of the latest innovations and technologies • Fully tested, with test certificate • Ready-to-install • Complete documentation • Design conforms to: – EN 60204-1 – ATEX zone 1 and 21 (pneumatic only), ATEX zone 2 and 22 (electric and electropneumatic) – UL-508A • Implementation of safety functions • Wide range of bus technologies
Description	• Control cabinets made to measure • Pneumatic, electric, combined • Individually configured • Adapted to requirements in industrial automation • Design and sizing included	• Control cabinets made to measure • Pneumatic, electric, combined • Individually configured • Adapted to requirements in process automation • Design and sizing included	• Made-to-measure control cabinets for handling systems • Software package for third-party devices included • Individually configurable • Adapted to requirements for handling solutions ➔ „Cartesian systems“, page 65
online: ➔	**ready-to-install**	**ready-to-install**	**ready-to-install**

Mounting plates and assemblies

FESTO

Type	 Mounting plates	 Assemblies
Technical data	• Customised support plate shape • Support plate available in different materials • Application-specific combination of components • Fully assembled, connected and wired • Defined interfaces • Ready-to-install • Fully tested, with test certificate • Complete documentation • Design conforms to: – EN 60204-1 – ATEX zone 1 and 21 (pneumatic only), ATEX zone 2 and 22 (electric and electropneumatic) – UL-508A • Implementation of safety functions	• Combination of various pneumatic and/or electrical components to create a single unit • Application-specific combination of components • Accessories mounted on sub-assembly • Use of the latest innovations and technologies • Ready-to-install • Fully tested, with test certificate • Complete documentation • Design conforms to: – EN 60204-1 – ATEX zone 1 and 21 (pneumatic only), ATEX zone 2 and 22 (electric and electropneumatic) – UL-508A • Implementation of safety functions
Description	• Machine-specific pre-assembly of pneumatic and electric components on support plate • Tubing and wiring included • Defined interfaces for simple installation directly in the system	• Pneumatic and electric components pre-assembled to create a function unit • Can be combined from around 30,000 catalogue components • Connections included • For integration in machines
online: →	ready-to-install	ready-to-install

Integration solutions

Type	 Manifold duct plates	 Cartridge solutions	 Sheet-metal constructions and special housings	 Function blocks
Technical data	• Freely selectable manifold duct plate shape • Combination of over 30,000 catalogue components • High density of components • No tubing • Variable positioning of mechanical, pneumatic and electrical interfaces • Integration of customised components • Available with protective cover • Fully tested • Ready-to-install • Complete documentation • Implementation of safety functions	• Space-saving thanks to extremely compact design • Pneumatic functions integrated in a single compact housing • Housing in different materials • No tubing required • Minimal cabling required • Significant design freedom • Variable integration options on and within the machine • Sturdy design • Fully tested • Ready-to-install • Complete documentation	• Sheet-metal constructions – Customised shape and size – Reduced weight and number of assembly parts • Special housing – Customised shape – Customised dimensions – Various materials – Compact, space-optimised format – Protection against environmental influences and unauthorised access • In combination – Alternative to conventional control cabinets – Variable integration options on and within the machine – Short tubing and cable lengths – Attractive design	• No tubing required thanks to drilled ducts • Housing available in different materials • Customised design of the pneumatic interfaces for the system • Ideal for a small number of components and variable connection options • Extremely economical, even for small quantities
Description	• Ideal for a large number of pneumatic connections in an extremely compact space • No tubing • Compact • Easy to service • Immune to malfunction	• Integration of various pneumatic functions in one component • No need for single housings • Ideal for applications that require a highly compact design	• Reduced weight thanks to optimal use of materials with sheet-metal constructions • Protection against environmental influences and unauthorised access • Ideally combined as a control cabinet directly in the system	• Compressed air supply for pneumatic components via drilled ducts • Ideal for a small number of pneumatic components and variable connection options • Compact and easy to service
online: →	ready-to-install	ready-to-install	ready-to-install	ready-to-install

Integration solutions

FESTO

Type	 Profile solutions
Technical data	• Profiles in customised cross sections and lengths • Integrated ducts for straight-line routing of the compressed air • Common air supply for multiple valves or valve terminals via a single duct • Combination of exhaust air and supply air without tubing, even over long distances • Supply of compressed air at different locations • No tubing required • Significantly reduced cabling • Modular, easy to realise construction • Optional: profile as mechanical mounting element for other components or as a supporting part of the machine frame
Description	• Extruded profiles in combination with valves as a valve terminal • For the distribution of compressed air in the machine concept • Customised profile cross sections available
online: →	**ready-to-install**

FESTO

Operating phase

Type	 Maintenance	 Repair service
Services	Implementation of the following preventive maintenance measures to DIN 31051: • Inspections – Checking for damage and wear characteristics – Checking mechanical, pneumatic and electrical connections and connectors – Checking lubrication – Checking compressed air preparation – Carrying out component-specific inspections • Service – Lubrication/relubrication of guides – Tightening connectors – Replacement of air filters – Replacement of silencers – Carrying out component-specific preventive maintenance tasks • Repair – Troubleshooting – Solution finding – Error elimination – Elimination of leakages – Replacement or repair of components	• Inspection • Analysis of economic efficiency • Repair or replacement of faulty components or wearing parts • Leakage testing • Functional test Please send the faulty component and a detailed error description to your Festo national company. Detailed spare parts lists can be found on the Festo website.
Description	• Preventive and corrective maintenance • Directly on your system • For high machine availability and rapid assistance should the worst happen	• Send high-quality components and assemblies to Festo for repair • Extended service life • Reduced costs
online: →	Services	Services

Energy Saving Services

FESTO

Type	 Compressed air generation energy analysis	 Compressed air consumption analysis	 Compressed air quality analysis	 Leakage detection
Services	• Measurement of compressor operating times as well as load/idling times • Power consumption measurement • Flow measurement/ consumption measurement • Pressure measurement (level and band width) • Estimate of leakage volume • Comparison of energy consumption and compressed air volume supplied	• Installation and removal of the measuring equipment with standard components (fittings, tubing, etc.) • Measurement of flow rate, consumption and pressure with machine running and when idle • Determination and analysis of different characteristics – Consumption per machine cycle – Average consumption per minute – Average pressure – Max./min. pressure – Max./min. rate of air flow • Documentation of measurement results including graphical representation of measurement results, optionally available as PDF file or colour printout • 3 hours on-site service (additional time on request)	• Inspection of decentralised air preparation at point of usage • Measurement of residual oil content up to class 2 (ISO 8573-1:2010) • Measurement of pressure dew point up to class 2 (ISO 8573-1:2010) • Analysis of measurement results and recommendation of improvement measures (if applicable) • Documentation of all measurement results • 3 hours on-site service (max. 3 measurements; additional time on request)	• Detection of compressed air leakages using highly sensitive ultrasound detectors during operation • Checking of the complete compressed air system from the compressor to the pneumatic application • Classification of the leakages according to size and cost • Documentation of faulty components as well as of the type and cause of the fault • Leakage report containing: – Recommended measures – Spare parts required – Estimation of repair time – Prioritisation of measures – Assessment as to whether repair can be carried out while machine is in operation • Information on optimisation options • Documentation of measures carried out
Description	• Energy Saving Services – the service package for energy efficiency • Identification and optimum utilisation of potential savings for compressed air • Save up to 60% on compressed air costs • Energy saving begins with the compressor	• Determination of exact compressed air consumption • Optimal configuration of compressed air supply • No pressure drop due to undersupply • No unnecessary energy costs due to oversupply	• Optimisation of compressed air quality • Increased service life of components • Reduction of maintenance costs	• Detection and repair of leakages in production plants • Immediate energy and operating cost savings
online: →	**Services**	**Services**	**Services**	**Services**

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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.

When using pneumatic components, ensure that they are operated using correctly prepared compressed air without aggressive media and that they comply with environmental specifications (e.g. climate).

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

Unauthorised conversions or modifications to products and systems from Festo constitute a safety risk and are thus not permitted. Festo does not accept any liability for the resulting damages.

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 use in the planned application.
- You are unsure about the product's suitability for use in safety-oriented applications.

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

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