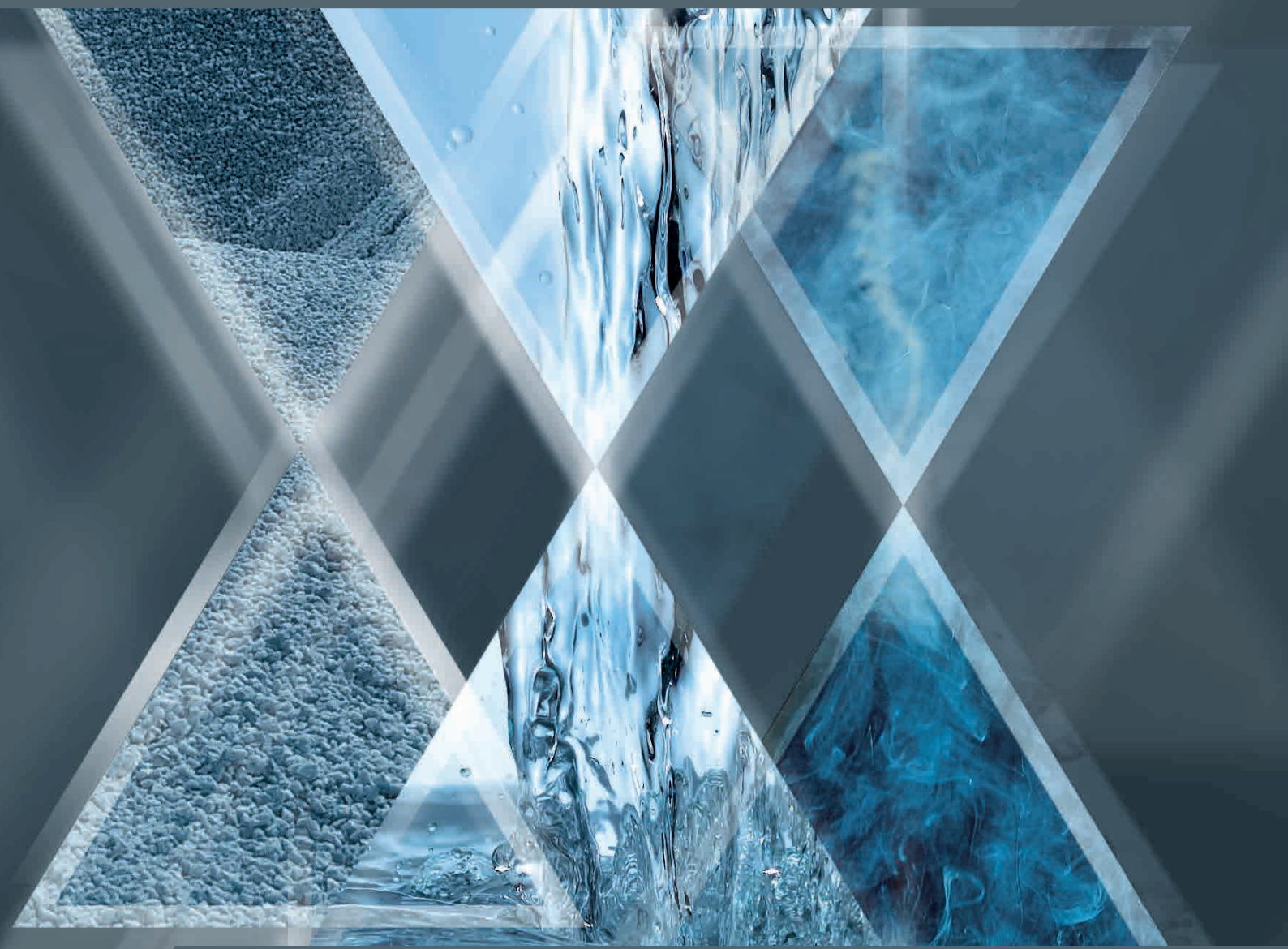
FESTO

Product overview



for process automation

Product overview for process automation

Issue 2018/04

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

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

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Preface

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

Dear Customers,

Increasing your productivity – that is our motto for everything we do. The new product overview from Festo for the process industries shows this in a truly impressive way. We support you along the entire value chain, from engineering to commissioning and operation – and with our tailored services too. We can also work with you to develop automation concepts for your specific production situation.

You have access to our wide range of components, systems and integrated automation solutions for the process industries. For example, our complete process valve units and control cabinets enable you to have just one partner, providing real benefits.

Our process valve units are a combination of optimised individual components that are factory-tested and fully assembled according to your needs. They can also meet industry-specific demands such as explosion prevention or corrosion resistance on request.

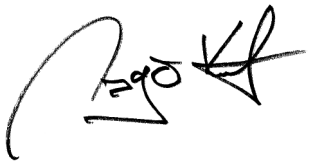
We are also constantly expanding and optimising our range of components for installation in control cabinets. With the new, extremely compact electrical remote I/O CPX-E, you save space in the control cabinet and costs, since the parameters are specifically designed for mounting in control cabinets. And with the optimised variant of the valve terminal VTUG, you do not need any tubing connections in the control cabinet – a significant cost advantage in assembly.

Our core product range benefits from short delivery times. The 2,200 products marked with a star are in stock and are sent out to you within 24 hours or within five days for configurable products.

Last but not least, we drive automation forward with our pioneering innovations: The Festo Motion Terminal VTEM is propelling pneumatics into the app-controlled, digital age. It is self-diagnosing, self-adaptive to external influences and has a digital image in the form of a Product Key. Another world's first is the energy efficiency module MSE6-E2M, which automates energy saving in compressed air systems. The compressed air flows are monitored, regulated and switched off fully automatically during operation and standby, and leakage testing is integrated.

Dive into this overview, which shows you entirely new ways of increasing your competitiveness. And find out how solutions from Festo simplify your work and also make you more productive.
We hope you find it rewarding!

Best regards,



Ansgar Kriwet

Greater productivity worldwide

At the heart of Europe

Our Scharnhausen Technology Plant in Germany

Our main goal is fast, flexible and reliable production through a smooth workflow. This is true for both highly automated volume production and for the manufacture of complex, customised products.

A central position in the Midwest

Mason, Ohio, USA

70% of our customers that are served by Mason are located within a radius of 1000 kilometres.

In the region for the region

Jinan, China

Fast response times, outstanding flexibility and proximity to customers also differentiates us on the Asian automation market.

Our plants are ready for the future

How can we make you even more productive?

We are constantly asking ourselves this question. In addition to having 13 service centres around the world, we have also made our own production particularly future-proof to minimise the distance between you and us – in our plants in Scharnhausen, Germany, Mason, Ohio, USA and in Jinan, China.

Applying the same standards worldwide

All Festo plants continuously exchange information and learn from each other. This Festo Value Production concept, enhanced by the continuous further training and upskilling of our employees, ensures that the highest possible standards are applied globally. For your benefit as the customer.

Keeping Industry 4.0 constantly in focus

The comprehensive approach that Festo takes to Industry 4.0 and the Internet of Things (IoT) sets it apart.

In our opinion, customised products demand plants that are completely networked using intelligent automation components that enable intuitive interfaces between people and machines.

Ensuring that people have the right training and competencies in planning and production is also key to the success of Industry 4.0. Furthermore, engineering processes must be implemented faster and more intuitively in the future.

Anticipating and targeting future trends

An ability to adapt, maximum added value, the best possible quality, speed, delivery reliability and short routes to the customer are the key requirements that the food and packaging industry must meet. This is the only way in which it can compete in the long term and at a global level.

Responding flexibly to customer needs

Without making production more flexible, many future challenges such as changing orders, fluctuating batch sizes, increasingly large numbers of product variants, or the smooth integration of new products, will be nearly impossible to overcome. With Festo, you will be more than well-equipped for this megatrend. By realising highly profitable and extremely process-reliable concepts as part of a continuous production system, bottlenecks in the value stream can be avoided. The proximity of our plants to your production locations will be one of the factors that are sure to benefit you. Perfect for guaranteeing a quick delivery and a direct supply.

Stars in Pneumatics

★ Marked with a star!

More than 2,200 products from our core product range are generally ready for dispatch from the Festo factory within 24 hours, even in large quantities. They span the entire electrical and pneumatic control sequence, from actuators to accessories, for factory automation as well as for process automation. So we cover up to 80% of all automation tasks – at attractive prices and in the familiar Festo quality.

Available from 13 service centres around the world!

→ www.festo.com/stars

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. The benefits:

- 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 at www.festo.com › click on 'Support/Downloads' › enter 'CODESYS' in the search box › click on the 'Software' tab.

Electronic controllers

	 **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 V DC, 20.4 – 30 V DC	19.2 – 30 V DC	19.2 – 30 V DC	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 contact, 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 Mbps • USB interface for data transfer • CECC-LK with CANopen®, IO-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-14 A-2, CECX-A-4 A-V**	 **Encoder interfaces** **CECX-C-2G**	 **Bus interfaces** **CECX-F-PB-S-V, CECX-F-PB-V1, CECX-B-CO**
Operating voltage	24 +25%/–15% V DC	19.2 – 30 V DC	19.2 – 30 V DC
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 latching function • Sensor break monitoring • Status display function	• 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	9.2 ... 30 V DC	AS-i voltage 30 V DC
Fieldbus interface		CANopen®, Dev. Spec. CiA DS-301, PROFIBUS® to DIN 19245 Part 3
Ethernet, connector plug	8-pin	
Description	• For extending the controller with two RS232 serial interface modules	• AS-Interface® master gateway • Duplicate address recognition • Direct operation via pushbuttons • Graphic display • Comprehensive diagnostics via LED and display • Specification 3.0
online: →	**cecx**	**cesa**

Remote I/O and electrical peripherals

	 **Terminal CPX**	 NEW **Terminal CPX-E**	 **Terminal CPX-P**	 **CPI installation systems CTEC**
Max. no. of inputs	Digital 512, analogue 32	Digital 16, analogue 4	Digital 512, analogue 32	128
Max. no. of outputs	Digital 512, analogue 32	Digital 8, analogue 4	Digital 512, analogue 32	128
No. of module positions	Max. 9 electric input/ output modules plus bus node	10	10	
Electrical actuation	Fieldbus, integrated controller	Fieldbus, integrated controller	Fieldbus, integrated controller	Fieldbus, integrated controller
New		• New product for 4/2018		
Description	• Automation platform • Open to all common fieldbus protocols and Ethernet • Integrated diagnostic and maintenance functions • Can be used as stand-alone remote I/O or with valve terminals MPA-S, MPA-L, VTSA/VTSA-F • Choice of polymer or metal housing with individual linking • Analogue inputs and outputs, 2-way/4-way, optionally with HART protocol	• Modern control system with high performance • Fieldbus master interfaces, EtherCAT® master, fieldbus slave interfaces, PROFINET®, EtherNet/IP®, PROFIBUS®, EtherCAT® digital input modules (16DI), digital output modules (8DO/0.5 A) • Analogue input modules (current, voltage), analogue output modules (current, voltage) • Modern CODESYS V3 programming system to IEC 61131-3 • Integration of motion functions (SoftMotion) • High I/O component density • Easy mounting of the control system	• 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 • Analogue inputs and outputs with HART protocol	• 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	cpx-e	cpx-p	ctec

Remote I/O and electrical peripherals

	 **Input modules CTSL**	 **Fieldbus modules CTEU**	 **CPI installation systems CTEC**
Max. no. of inputs	16	128	128
Max. no. of outputs		128	128
No. of module positions		32	Max. 4 installation strings, max. 4 CP modules per string
Electrical actuation	IO-Link®, I-Port	CANopen®, DeviceNet®, AS-Interface®, CC-LINK®, PROFIBUS®, EtherCAT®, EtherNet/IP®, PROFINET®, CPI-B, I-Port	Fieldbus, integrated controller
Description	• 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 the installation system CTEL • Fieldbus-typical LEDs, interfaces and switching elements • 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: ➔	**ctsl**	**cteu**	**ctec**

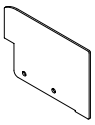
Remote I/O and electrical peripherals

	 **Electrical interface CPX-CTEL**	 **Measuring modules CPX-CMIX**	 **AS-Interface® components ASI, CACC**
Max. no. of inputs	256		4, 8
Max. no. of outputs	256		8
No. of module positions	Max. 4 modules with I-Port interface	9	
Electrical actuation	I-Port		AS-Interface®
Description	• 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 actuators, rodless actuators, rotary actuators • 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 the AS-Interface® installation system • Cable distributor ASI-KVT • Addressing device ASI-PRG-ADR • Compact I/O modules (IP65, IP67)
online: ➔	**cpx-ctel**	**cpx-cmix**	**as-interface**

For terminal CPX

	 **Control blocks** **CPX-CEC-M1-V3, CPX-CEC-S1-V3, CPX-CEC-C1-V3**	 **Control blocks** **CPX-CEC, CPX-CEC-C1**
CPU data	256 MB RAM, 32 MB flash, 800 MHz processor	32 MB flash, 32 MB RAM, 400 MHz processor
Configuration support	CODESYS V3	CODESYS V2.3
Processing time	Approx. 200 µs/1 k instructions	Approx. 200 µs/1 k instructions
Degree of protection	IP65, IP67	IP65, IP67
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 actuators via CANopen® • SoftMotion functions for coordinated multi-axis movements	• Easy actuation of valve terminal configurations with MPA, VTSA • Programming with CODESYS to IEC 61131-3 • Connection to all fieldbuses as a remote controller and for pre-processing • Actuation of electric actuators as individual axes via CANopen® (CPX-CEC-C1)
online: ➔	cpx-cec-m1	cpx-cec

For terminal CPX

	 **Input modules** **CPX-P-8DE**	 **Connection blocks** **CPX-P-AB**	 **Insulating plates** **CPX-P-AB-IP**
Degree of protection	Depending on connection block	IP20, IP65	
Diagnostics	Wire break per channel, limit value violation per channel, short circuit per channel, parameterisation error		
Parameterisation	Data format, input debounce time per channel, input function per channel, substitute value in case of diagnostics per channel, signal extension time per channel, dead time per channel, limit value monitoring per channel, short circuit monitoring per channel, parameter monitoring, counter configuration per channel, upper limit value per channel, lower limit value		
Description	• Variant with ATEX certification • 8 digital inputs for NAMUR sensors or wired mechanical contacts • Variant with intrinsically safe design	• Variant with ATEX certification • Polymer • Variants for intrinsically safe design • Compatible with digital input module CPXP-8DE • 4x socket, M12, 4-pin • 2x plug, 8-pin	• Insulating plate for safe separation of intrinsically safe and non-intrinsically safe areas of the CPX terminal
online: ➔	cpx-p	cpx-p	cpx

Pneumatic and electropneumatic controllers

	 **Steppers** **TAA, TAB**	 **Command memory modules** **SBA-2 N**	 **Pulse oscillators** **VLG**
Pneumatic connection	Barbed fitting for plastic tubing NW3	Barbed fitting for 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 gate	• 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-acting and double-acting cylinders
online: ➔	**taa**	**sba**	**vlg**

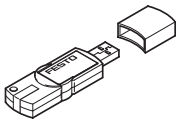
Operator units

	 **Operator units** **CDPX**	 **Simulators** **CDSM**	 **Operator units** **CPX-MMI**
Display	Colour TFT		128x64 pixels, LCD display, with background illumination
Display size	13.3", 7", 4.3", 10.4"		
Recipe memory	32,000 bytes		
Display resolution	480x272 pixels, SVGA, 800x600 pixels, WVGA, 800x480 pixels, WXGA, 1280x800 pixels		
Ethernet interface	RJ45 10/100 MBd		
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 • For simulating input and output signals during commissioning	• 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: ➔	**cdpx**	**cdsm**	**cpx-mmi**

Software

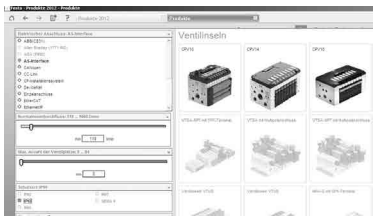
			
	Operator packages **GSIB**	**Operator packages** **P. BP**	**Software** **GSPF**
Description	• Information software and documentation for motor controllers CMMP-AS, CMMS-ST • The operator package contains a CD-ROM with user documentation for motor controller and configuration software FCT (Festo Configuration Tool) and a brief description	• Information software and documentation for motor controllers CMMP-AS and SFC-DC, handling module HSP/HSW • 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 • 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 motor controllers
online: ➔	gsib	software	gspf

Software

			
	Software and manuals **P. SW**	**Software licences** **GSLO**	**Software (FluidDraw® P5)** **GSWF-P5**
Description	• 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	• For enabling tools on the Compact Vision System SBOC-Q/SBOI-Q	• 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 maps, cable lists, parts lists • Sizing function for preparing simple control cabinet and system layouts • Consistent equipment identification • Multi-level project tree
online: ➔	software	gslo	gswf-p5

Software tool

Product Finder for valve terminals

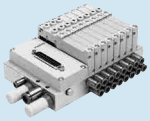


Find the right valve terminal quickly with the help of the Product Finder. Start the Product Finder by clicking on the blue button “Product Finder” under “Products”. Select the technical features on the left-hand side step-by-step; the selection of suitable products on the right-hand side is automatically 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.

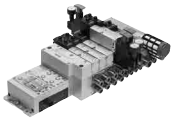
This tool can be found

- on our website under www.festo.com/catalogue by clicking on the blue icon “Product Finder”.

Universal valve terminals

	 **Valve manifolds VTUG-S**	 NEW **Valve terminals with multi-pin plug/fieldbus connection VTUG**	 **Valve terminals MPA-L**
Width	10 mm, 14 mm, 18 mm	10 mm, 14 mm, 18 mm	10 mm, 14 mm, 20 mm
Standard nominal flow rate	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	360 l/min at 10 mm, 670 l/min at 14 mm, 870 l/min at 20 mm
Max. no. of valve positions	16	24	32
Electric actuation	Individual connection	Individual connection, fieldbus, multi-pin plug, IO-Link®, I-Port	Fieldbus, multi-pin plug, IO-Link®, I-Port
Valve terminal design	Fixed grid	Fixed grid	Valve sizes can be mixed
New		• New 4/2017: optimised variants for control cabinet installation	
Description	• Compact thanks to small valves VUVG • 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 • Energy-efficient thanks to reverse operation and targeted pressure reduction	• Maximum modularity • Single granular • Polymer sub-base • 3 valve sizes • Tamper-proof fixed flow restrictor • Fieldbus connection via CPX • IO-Link® capable
online: →	**vtug**	**vtug**	**mpa-l**

Universal valve terminals

	 **Valve terminals MPA-S**	 **Valve terminals VTSA-F**	 **Valve terminals, Compact Performance CPV**
Width	10 mm, 20 mm	18 mm, 26 mm, 42 mm, 52 mm, 65 mm	18 mm, 10 mm, 14 mm, 18 mm
Standard nominal flow rate	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	400 l/min, 1600 l/min at 18 mm, 400 l/min at 10 mm, 800 l/min at 14 mm
Max. no. of valve positions	64	32	8
Electric actuation	AS-Interface, fieldbus, multi-pin plug, integrated controller	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	Fixed grid
Description	• Valve terminals for universal applications • High-performance valves in a sturdy metal housing • Metal linking • Two valve sizes can be combined • Excellent communication thanks to serial linking • Fieldbus connection via CPX • Max. 128 valves	• Flow rate-optimised valve terminal VTSA • Linking with increased flow rates • Functions as with standards-based valve terminal VTSA	• Maximum performance in the smallest of spaces • Three sizes • Wide range of connection and mounting options • Multi-pin or fieldbus control • IO-Link® capable
online: ➔	**mpa-s**	**vtsa**	**cpv**

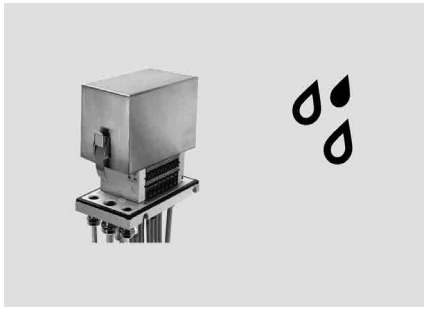
Universal valve terminals

	 **Valve terminals CPV-SC**	 **Valve manifolds, Compact Performance CPV10-EX-I**
Width	10 mm	10 mm
Standard nominal flow rate	170 l/min at 10 mm	400 l/min, 400 l/min at 10 mm
Max. no. of valve positions	16	8
Electric actuation	CPI installation system, individual connection, fieldbus, multi-pin plug	Individual connection
Valve terminal design	Fixed grid	Fixed grid
Description	• Small and compact • High flow rate even with compact design • Suitable for vacuum • Multi-pin or fieldbus actuation	• Intrinsically safe valve manifold design to ATEX category 2 (zone 1) • Optimised for control cabinet assembly • Optimal for pilot control of process valves
online: ➔	**cpv-sc**	**cpv10-ex**

Standards-based valve terminals

	 **Valve terminals VTSA**
Width	18 mm, 26 mm, 42 mm, 52 mm, 65 mm
Max. standard nominal flow rate	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. no. of valve positions	32
Electric actuation	Ethernet, fieldbus, multi-pin plug, integrated controller
Valve terminal design	Modular, valve sizes can be mixed
Description	• Conforms to ISO 15407-2/ISO 5599-2 • Multi-pin plug connection or fieldbus connection via the CPX system • Five valve sizes can be combined on one valve terminal • Integrated safety functions
online: ➔	**vtsa**

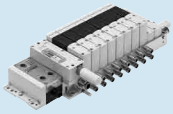
Customised components – for your specific requirements



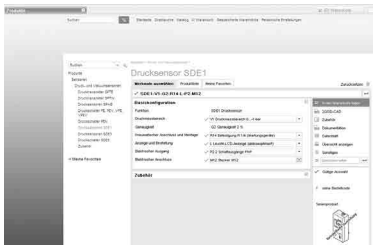
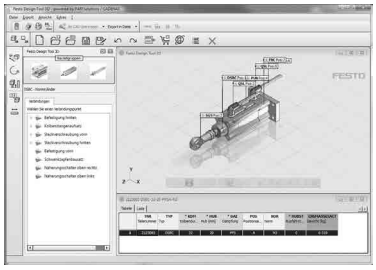
Valve terminals with customised designs
Can't find the valve terminal you need in our catalogue? We can offer you customised components that are tailored to your specific requirements.
Common product modifications:
- Coatings for special ambient conditions
- Customised cables: length, pin allocation, pre-assembled with plug
- Modified actuating elements
- Modified connecting thread
- Modified valve sub-bases

Many additional variants are possible. Ask your Festo sales engineer, who will be happy to help.
Further information on customised components can be found on your local website
➔ **www.festo.com**

Motion Terminal

	 NEW **Motion Terminal VTEM**
Design	Fixed grid
Grid dimension	28 mm
Flow rate	Up to 500 l/min
Electric actuation	Fieldbus
Pneumatic connection 1	G3/8
Operating pressure	–0.9 ... 8 bar with external pilot air
Actuation type	Electric
Nominal operating voltage	24 V DC ±25%
Temperature of medium	–5 ... +50 °C
Ambient temperature	–5 ... +50 °C
New	• New product for 11/2017
Description	• Many functions in one component – thanks to apps • Combines the advantages of electric and pneumatic technologies • Highest possible level of standardisation • Reduced complexity and time-to-market • Greater profitability and knowledge protection • Reduced installation effort • Increased energy efficiency
online: ➔	vtem

Software tool

Configurator		Design a product with numerous features reliably and quickly with the help of the configurator. Select all the relevant product features step-by-step. The use of logic checks ensures that only correct configurations are available for selection. The configurator is part of the electronic catalogue and is not available as a separate software program.
Festo Design Tool 3D (FDT 3D)		The Festo Design Tool 3D is a 3D product configurator for generating specific CAD product combinations from Festo. The configurator makes your search for the right accessory easier, more reliable and faster. You can then order the module that has been created with a single order item – either completely pre-assembled or as individual components 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, EST, FI, FR, GB, GR, HU, IE, IT, NL, NO, PL, PT, RU, SE, SI, SK, TR, ZA. This tool can be found • via the address: www.festo.com/FDT-3D in the above listed countries.

Proximity sensors, for T-slot

	 **Proximity sensors SMT-8M-A** ★	 **Proximity sensors SME-8, SME-8M** ★
Electrical connection	2-wire, 3-wire, 2-pin, 3-pin, cable, cable with plug, M8x1, M12x1, rotatable thread	M8x1, cable, cable with plug, plug, 3-pin, 2-wire, 3-wire
Operating voltage range DC	5 … 30 V	0 … 230 V
Switching element function	N/C contact, N/C contact or N/O contact, switchable, N/O contact	N/C contact, N/O contact
Switching output	NPN, PNP, PNP/NPN, switchable, non-contacting, 2-wire	Contacting, bipolar, without LED function
New		
Description	• Measuring principle: magneto-resistive • Short design • Variant EX2 for use in potentially explosive areas • Insertable in the slot from above, flush with the cylinder profile • LED switching status indication • LED function 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 the slot, insertable in the slot from above or lengthwise • LED switching status indication • Cable length 0.3, 2.5, 5, 7.5, 0.2 … 10 m
online: ➔	**smt-8 m**	**sme-8**

Proximity sensors, for T-slot

	 NEW **Proximity sensors SMT-8-SL, SMT-8 F, SMT-8G**	 **Proximity sensors CRSMT-8**
Electrical connection	2-wire, 3-wire, 3-pin, cable, cable with plug, M8x1, plug, rotatable thread	Cable, 3-wire
Operating voltage range DC	10 ... 30 V	10 ... 30 V
Switching element function	NAMUR, N/O contact	N/O contact
Switching output	NAMUR, NPN, PNP	PNP
New	• New 7/2017: additional versions	
Description	• Measuring principle: magneto-resistive • SMT-8-F: in accordance with the ATEX directive for explosive atmospheres • SMT-8G: design ideal for 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 indication • Cable length 0.3, 2.5, 5 m	• Measuring principle: magneto-resistive • Corrosion-resistant design • Food-safe see www.festo.com/sp/crsmt-8 › Certificates tab, resistant to acids and cooling lubricants • Insertable in the slot lengthwise, flush with the cylinder profile • LED switching status indication • Cable length 2.5, 5 m
online: ➔	**smt-8**	**crsmt-8**

Proximity sensors, for C-slot

	 **Proximity sensors SME-10, SME-10M** ★
Electrical connection	M8x1, cable, cable with plug, 3-pin, 3-wire
Operating voltage range DC	5 ... 30 V
Switching element function	N/O contact
Switching output	Contacting, bipolar
Description	• Measuring principle: magnetic reed • Clamped in C-slot, insertable in the slot from above or lengthwise • LED switching status indication • Cable length 0.3, 2.5 m
online: ➔	**sme-10**

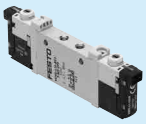
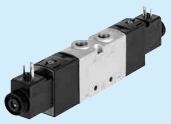
Pressure and vacuum sensors

	 **Pressure sensors SPAU**	 **Pressure sensors SPAW**	 **Pressure transmitters SPTW**
Pressure measuring range	–1 ... 16 bar	–1 ... 100 bar	–1 ... 100 bar
Switching element function	N/C or N/O contact, switchable	Switchable	Antivalent, changeover switch
Pneumatic connection	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	G1/4
Electrical connection	M8x1, M12x1, plug, round design, to EN 60947-5-2, 4-pin	M12x1, plug, round design, to EN 60947-5-2, 4-pin, 5-pin	M12x1, plug, round design, to EN 60947-5-2, 4-pin
Display type	Illuminated LCD, LED	4-character alphanumeric, LED indicator	
Description	• For monitoring compressed air and non-corrosive gases • With or without display • Transfer of the pressure value as a switching signal, analogue signal or via IO-Link® to the connected control system • Maximum flexibility thanks to versatile pneumatic adaptation and switchable electrical outputs	• Highly robust • For liquid and gaseous media • Quick and easy adjustment of the switching outputs using three push-buttons • Display is easy to read in any installation position • Operating medium: liquid and gaseous media • Display housing rotatable 320°, display at an angle of 45°	• Sensor versions: piezoresistive pressure sensor or metal thin-film pressure sensor • Measured variable: relative pressure • Operating medium: liquid and gaseous media • Seal-free: pressure measurement cell and interfaces in stainless steel • Degree of protection IP67
online: →	**spau**	**spaw**	**sptw**

Flow sensors

	 **Flow sensors SFAW**	 **Flow sensors SFAB**
Flow measuring range end value	32 ... 100 l/min	10 ... 1000 l/min
Operating medium	Liquid media, water, neutral liquids	Compressed air to ISO 8573-1:2010 [7:4:4], ISO 8573-1:2010 [6:4:4], nitrogen
Operating pressure	0 ... 12 bar	0 ... 10 bar
Pneumatic connection		QS-1/4, QS-10, QS-12, QS-3/8, QS-5/16, QS-6, QS-8
Electrical connection	M12x1, straight plug, 5-pin, A-coded	M12x1, plug, straight, 5-pin
Description	• Cooling circuit monitoring, leakage or line break monitoring, process water monitoring, fill level monitoring • Input connection: clamped terminal connection DN15, DN20, barbed hose fitting 13 mm, female thread G1/2, G3/4, G1, user-specific connection • With optional integrated temperature sensor • Connection to higher-level systems is provided by two switching outputs, an analogue output and/or an IO-Link® interface • Certification: RCM compliance mark, c UL us Listed (OL) • Rotatable display, 90° counter-clockwise and 180° clockwise	• Flow sensor with integrated digital display • With unidirectional flow input • Mounting: H-rail mounting, wall or surface mounting • Certification: C-Tick
online: →	**sfaw**	**sfab**

Universal directional control valves

	 NEW **Solenoid valves, for individual connection** **VUVG** ★	 **Solenoid valves, plug-in** **VUVG**	 NEW **Solenoid valves** **VUVS** ★
Actuation type	Electric	Electric	Electric
Pneumatic connection 1	G1/4, G1/8, M3, M5, M7		G1/4, G1/8, G3/8
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	G1/4, G1/8, M5, M7, flange	G1/4, G1/8, G3/8, NPT1/4-18, NPT1/8-27, NPT3/8-18, QS-1/2, QS-1/4, QS-10, QS-12, QS-3/8, QS-4, QS-5/16, QS-5/32, QS-6, QS-8
Standard nominal flow rate	80 ... 1380 l/min	130 ... 1200 l/min	500 ... 2400 l/min
Valve function	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	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	Plug, via electrical connection box, connection pattern H, horizontal connection, M8x1, A-coded, 2-pin, 3-pin	Via sub-base	To EN 175301-803, type B, type C
New	• New 4/2017: space-saving variants for control cabinet installation (outlet to the front)		• New 4/2018: additional versions
Description	• Compact universal valve • Connection technology via electrical connection box (E-box) • High flow rate relative to its size • In-line valves can be used as individual valves or manifold valves	• Sub-base valve • For valve terminal VTUG with plug-in	• Universal valve, sturdy and durable • Low-cost with no performance limitations • Can be used as individual valves or manifold valves VTUS
online: →	**vuvg**	**vuvg**	**vuvs**

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**
Actuation type	Electric, pneumatic	Electric, pneumatic
Pneumatic connection 1	G1/4, G1/8, G3/8	G1/2, G1/4, G1/8, G3/4, NPT1/8-27
Pneumatic working port	G1/4, G1/8, G3/8	G1/2, G1/4, G1/8, G3/4
Standard nominal flow rate	750 ... 2600 l/min	500 ... 7500 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, closed, monostable/single solenoid, 3/2-way, open, monostable/single solenoid, 3/2-way, open/closed, monostable/single solenoid, 5/2-way, bistable/double solenoid, 5/2-way, bistable/double solenoid, dominant signal, 5/2-way, monostable/single solenoid
Electrical connection	Via F coil, to be ordered separately	Via F coil, to be ordered separately
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
online: →	**tiger 2000**	**tiger classic**

Standards-based directional control valves

	 **Solenoid valves VSNC** ★	 **Standards-based valves to ISO 15218 (CNOMO) MDH, MGXDH, MGXIAH, VSCS**	 **Standards-based valves, NAMUR (VDI/VDE 3845) NVF3**
Actuation type	Electric	Electric	Electric
Pneumatic connection 1	G1/4, NPT1/4-18, QS-1/4, QS-10, QS-3/8, QS-5/16, QS-6, QS-8	Sub-base	G1/4
Standard nominal flow rate	800 ... 1350 l/min	18 ... 50 l/min	900 l/min
Valve function	5/2-way, double solenoid, 5/2-way or 3/2-way convertible, 5/3-way, pressurised, 5/3-way, exhausted, 5/3-way, closed	3/2-way, closed, single solenoid	5/2-way or 3/2-way, single solenoid
Electrical connection	Plug, to EN 175301-803, to industry standard (11 mm), type A, type B, 3-pin	M12x1, to DIN EN 175301-803, to IEC 61076-2-101, type A, type C	
Description	• NAMUR interface • Rotatable seal for 3/2-way or 5/2-way valve • Wide choice of EX solenoid systems • Sturdy and powerful • Extended temperature range • Outstanding value for money • All solenoid coils can be used on an armature tube • The variant VSNC-...FN achieves higher energy efficiency with reduced power consumption	• CNOMO port pattern, to ISO 15218 • With or without manual override	• Port pattern to NAMUR for solenoid valves to VDI/VDE 3845 • Electrically actuated, piloted • Reset via mechanical spring • Explosion protection to ATEX
online: ➔	vsnc	iso 15218	namur

Application-specific directional control valves

	 **Solenoid valves VOFD**	 **Solenoid valves VOFC**
Design	Directly actuated poppet valve	Piston spool, piloted piston poppet valve
Valve function	3/2-way, closed, single solenoid, semi-automatic, 3/2-way, closed, single solenoid	3/2-way closed, single solenoid, 5/2-way double solenoid, 5/2-way single solenoid
Operating pressure	0 ... 12 bar	0 ... 8 bar
Ambient temperature	–50 ... 60 °C	–25 ... 60 °C
Pneumatic connection 1	G1/4, M5, NPT1/4-18, port pattern to NAMUR	G1/2, G1/4, M5, NPT1/4-18, port pattern to NAMUR
Standard nominal flow rate	52 ... 1900 l/min	766 ... 2686 l/min
Description	• Suitable for process automation, for applications in the chemical and petrochemical industries • Suitable for outdoor use under harsh, dusty ambient conditions • Especially suitable for quarter turn actuators thanks to NAMUR flange pattern • Variants with TÜV approval up to SIL4 acc. to IEC 61508	• Suitable for process automation, for applications in the chemical and petrochemical industries • Suitable for outdoor use under harsh, dusty ambient conditions • Especially suitable for quarter turn actuators thanks to NAMUR flange pattern • Valve can switch between internal and external pilot air • Variants with TÜV approval up to SIL3 acc. to IEC 61508
online: ➔	vofd	vofc

Accessories for solenoid valves

	 **Exhaust protection VABD-D3**	 **Throttle plates VABF-S7**	 **Sub-bases VABS-S7**	 **Mounting plate, mounting bracket VAME-S7, VAME-S6**
Pneumatic connection	G1/4, 1/4 NPT; G1/2, 1/2 NPT	G1/4	G1/4, 1/4 NPT	M5, port pattern to NAMUR
Type of mounting	Screw-in, via male thread	Via through-hole	Via through-hole	Via through-hole
Description	• Operating pressure 0 ... 12 bar • Housing material: PA	• Variants for single-acting and double-acting actuators • Variant for supply air flow control and/or exhaust air flow control of an actuator with NAMUR interface for valves VOFC/VOFD • Variant for two-duct exhaust air flow control of an actuator with NAMUR interface	• Pneumatic connection 2: flange 1/4, port pattern as per NAMUR • As pressurisation and exhaust block or redundant block	• Material: Ematal coated aluminium
online: ➔	vabd	vabf	vabs	vame

Check valves and quick exhaust valves

	 **Check valves, piloted VBNF**	 **Quick exhaust valves VBQF**	 **Check 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 flow rate exhaust 6->0 bar		850 ... 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° when mounted • Manually actuated exhaust possible	• Minimal height • High flow rate • Reduced noise emission • Available with silencer • Available with ducted or unducted exhaust air • For faster cycle times	• Valve function: non-return function • Screw-in or in-line installation • With connecting thread at both ends, push-in connector at both ends, thread/push-in connector
online: ➔	vbnf	vbqf	h-qs

Check valves and quick exhaust valves

	 **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 flow rate exhaust 6->0 bar		165 l/min	550 ... 7500 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 via male thread • Pilot air connection: M5, G1/8, G1/4, G3/8, QS-4 • Manually operated exhaust with separate accessories possible	• Valve function: exhaust component • For check valve HGL • For manually exhausting air trapped in a cylinder	• Valve function: quick exhaust • Shut-off valve, piloted • Screw-in • With or without silencer
online: ➔	**hgl**	**hab**	**se**

Ball valves and shut-off valves

	 **Hand slide valves VBOH**	 **Shut-off valves HE**	 **Ball valves QH-QS, QHS-QS**
Valve function	3/2-way, bistable	2/2-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	QS-4, QS-6, R1/8
Standard nominal flow rate	236 ... 7691 l/min	270 ... 840 l/min	148 ... 560 l/min
Operating pressure	–0.95 ... 12 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 units, for air guns and also for exhausting pneumatic cylinders • Non-overlapping, so no pressure losses when switching • Minimal installation effort	• Shut-off valve, manually operated • Connection: thread at both ends, push-in connector at both ends, thread/push-in connector • Different mounting variants	• Shut-off valve, manually operated • 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**	**qh**

Logic valves

	 **OR gates** **OS**	 **AND gates** **ZK**
Valve function	OR function	AND function
Pneumatic connection 1	G1/2, G1/4, G1/8, PK-3, PK-4	G1/8, PK-3, PK-4
Standard nominal flow rate	100 ... 5000 l/min	100 ... 550 l/min
Operating pressure	0.001 ... 10 bar	0.001 ... 10 bar
Description	• Pneumatic control system • Mounting via through-holes	• AND valve • Connects two input signals in the AND function • Mounting via through-holes
online: ➔	os	zk

Pressure regulators

	 **Pressure regulators** **LR, LRMA**	 **Differential pressure regulators** **LRL, LRLL**
Pressure regulation range	1 ... 8 bar	2 ... 6 bar
Standard nominal flow rate	22 ... 150 l/min	
Nominal flow rate, closed		30 ... 730 l/min
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° • Higher energy efficiency thanks to motion-specific pressure adjustment	• Piston regulator with through pressure supply • Without pressure gauge • Connections: thread/push-in connector on top or at the side • Push-in connector can be rotated 360°
online: ➔	lrma	lrl

One-way flow control valves

	 **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 GR, GRA**
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	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	G1/2, G1/4, G1/8, G3/4, G3/8, M3, M5, QS-3, QS-4, QS-6, QS-8
Standard nominal flow rate in flow control direction	240 ... 590 l/min	0 ... 270 l/min	0 ... 4320 l/min	29.5 ... 3300 l/min
Adjusting element	Internal hex	Slotted head screw	Knurled screw, slotted head screw, internal hex	Knurled screw
Description	• High flow rate • Can be rotated horizontally through 360° when mounted • Function combination consisting of one-way flow control valve and piloted check valve • Compact and can be operated from the side	• Shut-off valve, flow control at one end • Metal version • 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 rate ranges • Function combination consisting of one-way flow control valve and piloted check valve • Connections: thread at both ends, push-in connector at both ends, thread/push-in connector	• Non-return and flow control valve • In-line installation
online: →	vfof	vfoc	grla	gra

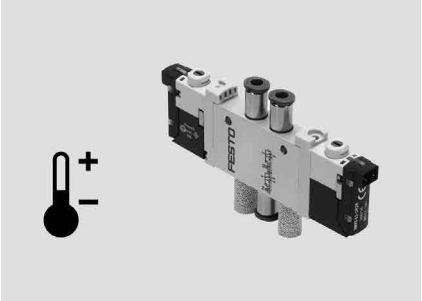
Flow control valves

	 **Flow control/silencers VFFK**	 **Flow control valves, barbed Y-connectors with restrictor GRO, Y-PK3**	 **Exhaust air flow control valves, flow control/silencers GRE, GRU**
Valve function	Flow control/silencer function	Flow control function	Flow control/silencer function
Pneumatic connection 1	M5, M7, R1/4, R1/8	G1/4, G1/8, M5, PK-3, QS-3, QS-4, QS-6	G1/2, G1/4, G1/8, G3/4, G3/8
Standard nominal flow rate in flow control direction		85 ... 350 l/min	520 ... 3600 l/min
Standard flow rate 6-› 0 bar	0 ... 420 l/min		0 ... 8000 l/min
Adjusting element	Knurled screw	Knurled screw	Slotted head screw
Description	• With polymer silencer	• 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	• Exhaust air flow control valve GRE: sintered metal • Flow control/silencer GRU: polymer
online: ➔	**vffk**	**gro**	**gre**

Proportional valves

	 **Proportional pressure regulators VPPX**	 **Proportional pressure regulators VPPM**
Valve function	3-way proportional pressure regulator	3-way proportional pressure regulator
Pneumatic connection 1	G1/2, G1/4, G1/8, sub-base	G1/2, G1/4, G1/8, sub-base
Pressure regulation range	0.1 ... 10 bar	0.02 ... 10 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 (Festo Configuration Tool) software • Integrated pressure sensor with separate output • Pressure is maintained if the controller fails	• Pilot actuated pressure regulator • 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
online: ➔	**vppx**	**vppm**

Customised components – for your specific requirements



Valves with customised designs
Can't find the valve you need in our catalogue? We can offer you customised components that are tailored to your specific requirements.
Common product modifications:

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

Many additional variants are possible. Ask your Festo sales engineer, who will be happy to help.
Further information on customised components can be found on your local website
➔ **www.festo.com**

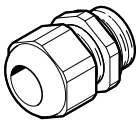
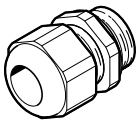
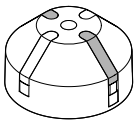
Sensor boxes

	 **Sensor boxes SRBC** ★	 **Sensor boxes SRBG**	 **Sensor boxes SRBE**
Information on housing materials	Die-cast aluminium	PBT	Die-cast aluminium
Operating voltage range AC	0 ... 250 V		0 ... 250 V
Operating voltage range DC	0 ... 175 V	6 ... 60 V	0 ... 60 V
Measuring principle	Inductive, magnetic reed, mechanical/ electrical, for proximity sensor	Inductive	Inductive, magnetic reed, mechanical/ electrical, for proximity sensor
Switching element function	N/C contact, N/O contact, toggle switch, single-pole	N/C contact, N/C contact or N/O contact, switchable, N/O contact	N/C contact, N/O contact, toggle switch, single-pole, toggle switch, double-pole
Description	• Pre-assembled mounting adapter for ease of installation • Trip cams can be set easily without additional tools • Sturdy, corrosion-resistant design, ideal for use in harsh ambient conditions • Clearly visible 3D position indicator allows rapid detection of the current position of the quarter turn actuator	• Compact housing with M12 plug connection • Direct mounting on quarter turn actuators to VDI/VDE 3845 • AS-Interface version with extended addressing options • Intrinsically safe version to ATEX and SIL 2 to IEC 61508	• Trip cams can be set easily without additional tools • Sturdy, corrosion-resistant design, ideal for use in harsh ambient conditions • Clearly visible 3D position indicator allows rapid detection of the current position of the quarter turn actuator
online: ➔	**srbc**	**srbg**	**srbe**

Sensor boxes

	 **Limit switch attachments SRAP**	 **Limit switch attachments DAPZ**
Information on housing materials	Wrought aluminium alloy	ABS, PC
Operating voltage range AC		4 ... 250 V
Operating voltage range DC	15 ... 30 V	4 ... 250 V
Measuring principle	Magnetic Hall	Inductive, mechanical/electrical
Switching element function		N/C contact, N/O contact, changeover switch
Description	• Based on standard VDI/VDE 3845 (NAMUR) • Analogue • For monitoring the position of quarter turn actuators • Sensors based on 2D Hall technology	• Round design • Actuator interface to standard VDI/VDE 3845 (NAMUR) • With display
online: ➔	**srap**	**dapz**

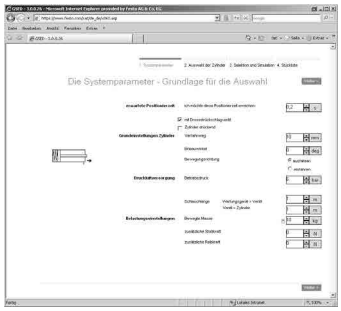
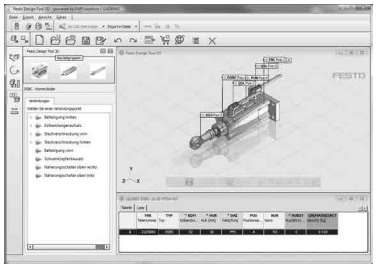
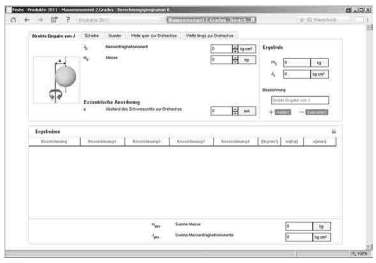
Accessories for sensor boxes

	 **Cable connectors** **NETC-M-KA, NETC-P-KA**	 **Cable connectors** **NETC-P**	 **Position indicators** **SASF**
Description	• Compatible with sensor boxes SRAP, analogue • Cable connector M20x1.5 • Polymer or metal design	• Compatible with sensor boxes SRBG • Cable connector M20x1.5 • Polymer design	• Compatible with sensor boxes SRBG • For mounting on drive shaft of standard actuators to VDI/VDE 3845
online: ➔	netc	netc	sasf

Positioners

	 **Positioners** **CMSX** ★
Standard nominal flow rate	50 ... 130 l/min
Ambient temperature	–5 ... 60 °C
Setpoint value	0–10, 0–20 mA, 4–20 mA
Operating pressure	3 ... 8 bar
Standard nominal flow rate	50 l/min, 130 l/min
Safety instructions	Safety position: In the case of a broken cable or a failure in the operating voltage, the regulating action is opening/closing or holding
Operating voltage range DC	21.6 ... 26.4 V
Type of mounting	On flange to ISO 5211, via accessories
Degree of protection	IP65
Housing material	PC
Description	• Digital electropneumatic positioner for single-acting or double-acting pneumatic quarter turn actuators and double-acting pneumatic linear actuators • No air consumption in the regulated state
online: ➔	**cmsx**

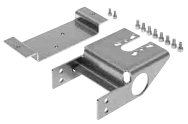
Software tool

Pneumatic simulation		Perfect simulations replace expensive real-life tests. The tool is an expert system that supports you in the selection and configuration of the entire pneumatic control chain. If one parameter is changed, the program automatically adapts all the others. This tool can be found • on our website at www.festo.com/catalogue by clicking on the blue icon "Engineering” › Pneumatic drives › Pneumatic simulation
Festo Design Tool 3D (FDT 3D)		The Festo Design Tool 3D is a 3D product configurator for generating specific CAD product combinations from Festo. The configurator makes your search for the right accessory easier, more reliable and faster. You can then order the module that has been created with a single order code – either completely pre-assembled or as individual components 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, EST, FI, FR, GB, GR, HU, IE, IT, NL, NO, PL, PT, RU, SE, SI, SK, TR, ZA. This tool can be found • via the address: www.festo.com/FDT-3D in the above listed countries.
Mass moment of inertia		Juggling pencils and pocket calculators is now a thing of the past. 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 • on our website at www.festo.com/catalogue by clicking on the blue icon “Engineering” › Pneumatic drives › Mass moment of inertia

Linear actuators for process automation

	 **Linear actuators with displacement encoder DFPI-NB3P**	 **Linear actuators with displacement encoder DFPI**	 **Copac linear actuators DLP**
Design	Piston rod, cylinder barrel	Piston rod, cylinder barrel	Piston rod
Stroke	40 ... 990 mm	40 ... 990 mm	40 ... 600 mm
Mode of operation	Double-acting	Double-acting	Double-acting
Size of valve actuator	100, 125, 160, 200, 250, 320	100, 125, 160, 200, 250, 320	80, 100, 125, 160, 200, 250, 320
Operating pressure	3 ... 8 bar	3 ... 8 bar	2 ... 8 bar
Ambient temperature	–20 ... 80 °C	–20 ... 60 °C	–20 ... 80 °C
Description	• Mounting interfaces to ISO 15552 • Sturdy tie rod design • Optionally with integrated displacement encoder or fully integrated positioner • IP65, IP67, IP69K, NEMA4 • ATEX certification	• Mounting interfaces for process valves to DIN 3358 • Integrated air supply • Optionally with integrated displacement encoder or fully integrated positioner • IP65, IP67, IP69K, NEMA4 • ATEX certification	• Mounting interfaces for process valves to DIN 3358 • Integrated air supply • Port pattern as per NAMUR for solenoid valves to VDI/VDE 3845 • ATEX certification
online: ➔	**dfpi**	**dfpi**	**dlp**

Accessories for linear actuators for process automation

	 **Adapter kits DADG-AK-F6-A2**	 **Connecting cables NHSB-A1**
Size	100 ... 320	
Electrical connection		Straight plug, 3-pin or 5-pin
Description	• For direct mounting of a positioner • Compatible with linear actuator DFPI-NB3P	• Ready-to-use connecting cable • Suitable for linear actuators DFPI • Cable lengths 5, 10, 15 m
online: ➔	**dfpi**	**dfpi**

Quarter turn actuators for process automation

	 NEW ★ **Quarter turn actuators DFPD**	 **Quarter turn actuators DAPS**
Design	Rack and pinion principle	Scotch yoke system
Mode of operation	Double-acting, single-acting	Double-acting, single-acting
Size of valve actuator	10, 20, 40, 80, 120, 160, 240, 300, 480, 700, 900, 1200, 2300	0008, 0015, 0030, 0053, 0060, 0090, 0106, 0120, 0180, 0240, 0360, 0480, 0720, 0960, 1440, 1920, 2880, 3840, 4000, 5760, 8000
Flange hole pattern	F03, F04, F05, F0507, F0710, F1012, F1216	F03, F04, F05, F07, F10, F12, F14, F16, F25
Operating pressure	2 ... 8 bar	1 ... 8.4 bar
Ambient temperature	–50 ... 150 °C	–50 ... 150 °C
New	• New 11/2017: additional versions	
Description	• Uniform torque characteristic across the entire rotation angle range of 90° with the double-acting version • Process valve connector to ISO 5211 • Mounting hole pattern to VDI/VDE 3845 • Sturdy, non-slip and easy-to-clean aluminium housing • Long service life, low wear • Increased corrosion protection	• High break-away 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 variant made from stainless steel
online: →	dfpd	daps

Accessories for quarter turn actuators for process automation

	 **Mounting kits DARQ-K** ★
Based on standard	EN 15081
Description	• Variants suitable for high corrosion stress
online: →	darq

Customised components – for your specific requirements

Actuators with customised designs

Can't find the pneumatic actuator you need in our catalogue? We can offer you customised components that are tailored to your specific requirements.

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

➔ **www.festo.com**

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

Ball valves and ball valve units

	 NEW **Ball valves VZBD**	 NEW **Ball valves VZBE**	 NEW **Ball valves VZBF**	 NEW **Ball valves VZBM**
Design	2-way ball valve	2-way ball valve, 3-way ball valve, L-shaped hole, T-shaped hole	2-way ball valve	2-way ball valve, 3-way ball valve, L-shaped hole, T-shaped hole
Valve function	2/2-way	2/2-way, 3/2-way	2/2-way	2/2-way, 3/2-way
Actuation type	Mechanical	Mechanical	Mechanical	Mechanical
Nominal width DN	15, 20, 25, 32, 40, 50, 65, 80, 100	8, 10, 15, 20, 25, 32, 40, 50, 65, 80, 100	15, 20, 25, 32, 40, 50, 65, 80, 100, 150, 200	8, 10, 15, 20, 25, 32, 40, 50
Process valve connection	Clamp to ASME-BPE, clamp to DIN 32676 series B, weld-on end to ASME-BPE, weld-on to ISO 1127	NPT1, NPT1 1/2, NPT1 1/4, NPT1/2, NPT1/4, NPT2, NPT2 1/2, NPT3, NPT3/4, NPT3/8, NPT4	Flange to ANSI B16.5 class 150	Rp1, Rp1 1/2, Rp1 1/4, Rp1/2, Rp1/4, Rp2, Rp3/4, Rp3/8
Flow rate Kv	3.5 ... 436.3 m3/h	5 ... 435.2 m3/h	8.5 ... 2078.3 m3/h	5.9 ... 243 m3/h
Temperature of medium	–20 ... 200 °C	–20 ... 200 °C	–20 ... 200 °C	–20 ... 130 °C
Process valve PN nominal pressure	16	63	20	25, 50
New	• New product for 4/2017	• New product for 4/2017	• New product for 4/2017	• New 11/2017: additional versions
Description	• Electropolished surfaces SFV4 • PTFE seal with minimal dead space • The high-performance ball valve for the pharmaceutical and cosmetics industry • FDA-compliant seal to FDA 21 CFR 177.1550	• 2-way manual, optionally with lockable hand lever • 3-way, L-shaped or T-shaped hole, optionally with lockable hand lever • Pipe thread to ASME B1.20.1	• Flanged connections to ANSI B 16.5. class 150 • Static discharge assured • API 607 Fire Safe approval • Easy to service	• Brass design • Pipe thread to EN 10226-1
online: →	**vzbd**	**vzbe**	**vzbf**	**vzbm**

Ball valves and ball valve units

	 **Ball valves VAPB**	 **Ball valves VZBC**	 **Ball valve actuator units VZBC**	 **Ball valves VZBA**
Design	2-way ball valve	2-way ball valve	2-way ball valve, quarter turn actuator	2-way ball valve, 3-way ball valve, L-shaped hole, T-shaped hole
Actuation type	Mechanical	Mechanical	Pneumatic	Mechanical
Nominal width DN	15, 20, 25, 32, 40, 50, 63	15, 20, 25, 32, 40, 50, 65, 80, 100	15, 20, 25, 32, 40, 50, 65, 80, 100	8, 10, 15, 20, 25, 32, 40, 50, 65, 80, 100
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	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	19.4 ... 1414 m3/h	19.4 ... 1414 m3/h	7 ... 1414 m3/h
Temperature of medium	–20 ... 150 °C	–10 ... 200 °C	–10 ... 200 °C	–10 ... 200 °C
Process valve PN nominal pressure	25, 40	16, 40	16, 40	63
Description	• Automatable 2-way ball valve • Brass design • Blow-out proof shaft • Manual actuation possible using hand lever • Connecting thread to EN 10226-1 • Mounting flange to ISO 5211	• Automatable 2-way ball valve with compact flange • Stainless steel design • Short installed length • Blow-out proof shaft • Manual actuation possible using hand lever • Flange to DIN 1092-1 • Mounting flange to ISO 5211 • Use in 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 • Use in zone 1, 21, 2, 22	• Automatable 2-way or 3-way ball valve • Stainless steel design • Blow-out proof shaft • Manual actuation possible using hand lever • Connecting thread to EN 10226-1 • Mounting flange to ISO 5211 • Use in zone 1, 21, 2, 22
online: ➔	vapb	vzbc	vzbc	vzba

Ball valves and ball valve units

	 **Ball valve actuator units VZBA**	 **Ball valve actuator units VZPR**	 **Ball valves QH**
Design	2-way ball valve, 3-way ball valve, L-shaped hole, quarter turn actuator, T-shaped hole	2-way ball valve, quarter turn actuator	Ball valve
Valve function			2/2-way, bistable
Actuation type	Pneumatic	Electric, pneumatic	Manual
Nominal width DN	8, 10, 15, 20, 25, 32, 40, 50, 65, 80, 100	15, 20, 25, 32, 40, 50, 63	
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, Rp3/4, Rp3/8	
Flow rate Kv	7 ... 1414 m3/h	5.9 ... 535 m3/h	
Temperature of medium	–10 ... 200 °C	–20 ... 150 °C	
Process valve PN nominal pressure	63	25, 40	
Description	• 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 • Use in 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	• Shut-off valve, manually operated • In-line installation • Female thread at both ends • With hand lever • Pipe thread to ISO 2281
online: ➔	vzba	vzpr	qh

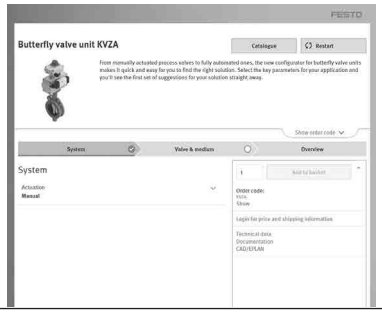
Accessories for ball valves

	 **Hand levers VAOH**	 **Reducing sleeve square DR-RH**
Description	• High-alloy stainless steel, galvanised steel • Lockable variant	• For fitting ball valves on valve actuators
online: ➔	vaoh	dr-rh

Angle seat valves

	 **Angle seat valves VZXF** ★	 NEW **Angle seat valve VZXA**
Actuator size		46 mm, 75 mm, 90 mm
Design	Poppet valve with spring return	Poppet valve with piston actuator 46 mm, poppet valve with piston actuator 75 mm, poppet valve with diaphragm actuator 90 mm
Valve function	2/2-way, closed, monostable	2/2-way
Control function		Closed via spring force, N/C; double-acting; opened via spring force, N/O; closed via reduced spring force, N/C
Actuation type	Pneumatic	Pneumatic
Nominal width DN	15, 20, 25, 32, 40, 50	DN13, DN20, DN25, DN32, DN40, DN50, DN65, ½", ¾", 1", 1 ¼", 1 ½", 2", 2 ½"
Nominal width	12 ... 45 mm	
Process valve connection	G1, G1 1/2, G1 1/4, G1/2, G2, G3/4, NPT1, NPT1 1/2, NPT1 1/4, NPT1/2, NPT2, NPT3/4	G thread to DIN ISO 228, NPT thread to ANSI and Rc thread to DIN 10226; clamp to ASME-BPE and DIN 32676 type A and B; weld-on ends to ASME-BPE and DIN EN ISO 1127 and DIN 11850 R2
Flow rate Kv	3.3 ... 43 m3/h	6 ... 50.1 m3/h
Medium pressure	–0.9 ... 40 bar	0 ... 30 bar
Temperature of medium	–40 ... 200 °C	–30 ... 200 °C
Process valve PN nominal pressure	16, 40	40
New		• New 7/2017: additional versions
Description	• Sturdy design • Stainless steel and gunmetal process valves with stainless steel, brass or aluminium actuators • 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	• Highly flexible, extremely high flow rates • Long service life • Modular design • Hygienic design, insensitive to dirt • Quick and easy maintenance • Simple and sturdy: an ideal choice for virtually all media with a viscosity of up to 600 mm2/s • High chemical and thermal resistance
online: ➔	**vzxf**	**vzxa**

Software tool

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

Butterfly valves

	 NEW **Butterfly valves, manually operated KVZA**	 NEW **Butterfly valves, automatically operated KVZA**	 NEW **Butterfly valve units, regulated operation KVZA**
Butterfly valve nominal diameter	DN25 – DN200, 1" – 8"	DN25 – DN300, 1" – 12"	DN25 – DN300, 1" – 12"
Swivel angle	0–90°	0–90°	0–90°
Medium pressure	10–16 bar	10–16 bar	10–16 bar
Operating pressure	2–8 bar	2–8 bar	2–8 bar
Safety factor	0–2	0–2	0–2
New	• New product for 4/2018	• New product for 4/2018	• New product for 4/2018
Description	• For a variety of uses in different industrial segments • Butterfly valve with hand lever • Butterfly valve type: wafer or lug • Connection standard DIN EN 1092-1 or ANSI CLASS 150	• For a variety of uses in different industrial segments • Butterfly valve with quarter turn actuator • Optional end-position feedback • Optional pilot valve • Butterfly valve type: wafer or lug • Connection standard DIN EN 1092-1 or ANSI CLASS 150	• For a variety of uses in different industrial segments • Butterfly valve with quarter turn actuator and positioner • Butterfly valve type: wafer or lug • Connection standard DIN EN 1092-1 or ANSI CLASS 150
online: →	**kvza**	**kvza**	**kvza**

Solenoid-actuated media valves

	 **Solenoid valves VZWD** ★	 **Solenoid valves VZWM** ★	 **Solenoid valves MN1H**
Design	Directly actuated poppet valve	Poppet valve with diaphragm seal	Diaphragm valve
Actuation type	Electric	Electric	Electric
Nominal width	1 ... 6 mm	13 ... 50 mm	13 ... 40 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	G1, G1 1/2, G1/2, G1/4, G3/4, G3/8
Flow rate Kv	0.06 ... 430 l/min	1.6 ... 31,000 l/min	2000 ... 30,500 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
Medium pressure	0 ... 90 bar		0.5 ... 10 bar
Description	• Extensive pressure range • Directly actuated poppet valve • No pressure difference required • Can also be used in vacuum technology	• Brass or stainless steel casting design • Electrical connection via solenoid armature • Wide range of coils • Coil can be ordered separately	• Piloted diaphragm valve • Brass design • Can only be used for gaseous media • Adjustable closing cushioning, in-line mounting or through-hole • Operating voltage 24 V DC, 110/230 V AC
online: ➔	**vzwd**	**vzwm**	**mn1h-2**

Solenoid-actuated media valves

	 **Solenoid valves VZWP**	 **Solenoid valves VZWF** ★	 **Reverse jet pulse valves VZWE-E, VZWE-F**
Design	Piloted piston poppet valve	Diaphragm valve, force pilot operated	Angled version, straight version with flange, diaphragm valve
Actuation type	Electric	Electric	Electric
Nominal width	13 ... 25 mm	13.5 ... 50 mm	20 ... 76 mm
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, 75, 89, G1, G1 1/2, G2, G2 1/2, G3/4
Flow rate Kv	1.5 ... 12,250 l/min	1.8 ... 29,900 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	
Medium pressure	0.5 ... 40 bar	0 ... 10 bar	0.35 ... 8 bar
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 widths 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**

Accessories for solenoid-actuated process and media valves

	 **Solenoid coils MD** ★	 **Solenoid coils MH**	 **Solenoid coils VACC**	 **Solenoid coils VACN** ★
Type of mounting	Via knurled nut	Via lock nut	Via knurled nut	Via knurled nut, via lock nut
Electrical connection	Plug pins with connection pattern to EN 175301-803 type A	Plug pins with connection pattern to EN 175301-803 type A	Plug, terminal housing, cable entry thread M20x1.5, to EN 175301-803, type A	Plug pins, 3-pin, with connection pattern to EN 175301-803, type A
Degree of protection	IP65	IP65	IP64, IP65	IP65
Characteristic coil data	24 V DC: 6.8 W 110 V AC: 50/60 Hz, pick-up power 14.5 VA, holding power 10.5 VA 230 V AC: 50/60 Hz, pick-up power 14.5 VA, holding power 10.5 VA	24 V DC: 7.9 W 110 V AC: 14 VA 230 V AC: 14 VA	24 V DC, 24 V AC/DC, 110 V AC/DC, 230 V AC/DC 2 W, 3.6 W at 24 V DC	24 V DC, 110, 230 V AC
Description	• Can be replaced without interrupting the pneumatic circuit • Compatible with solenoid valves VZWM	• Can be replaced without interrupting the pneumatic circuit • Compatible with solenoid valves VZWM	• Can be replaced without interrupting the pneumatic circuit • For 13 mm, 18 mm armature tube	• Can be replaced without interrupting the pneumatic circuit • For 9 mm, 14 mm armature tube
online: →	md	mh	vacc	vacn

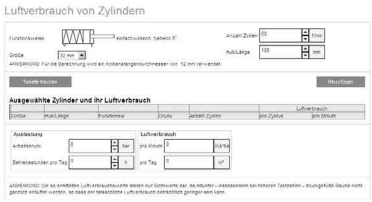
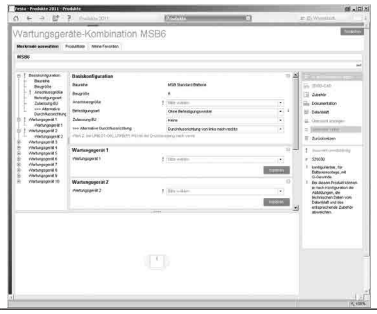
Pneumatically actuated media valves

	 NEW **Pinch valves** **VZQA**	 **Pneumatic valves** **VLX**
Design	Pneumatically actuated pinch valve	Diaphragm valve
Valve function	2/2-way closed, monostable, 2/2-way open, monostable	
Type of control	Pneumatic	Pneumatic
Nominal width DN	6, 15, 25	
Nominal width		13 ... 25 mm
Process valve connection	G1, G1/2, G1/4, NPT1, NPT1/2, NPT1/4, clamp to ASME-BPE type A, clamp to ASME-BPE type B, clamp to DIN 32676 series A	G1, G1/2, G1/4, G3/4, G3/8
Flow rate Kv	0.7 ... 18 m3/h	2400 ... 14,000 l/min
Medium pressure	0 ... 6 bar	1 ... 10 bar
Temperature of medium	–5 ... 150 °C	–10 ... 80 °C
New	New 4/2018: additional versions	
Description	• Modular design • Quick and easy replacement of the diaphragm • Selection of different materials for housing and connection 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	• Poppet valve • Indirectly actuated • Brass design • Inline mounting
online: ➔	vzqa	vlx

Accessories for pinch valves

	 **Seal cartridges** **VAVC-Q2**
Description	• Seal cartridge VAVC-Q2 • Nominal width 6 mm, 15 mm, 25 mm
online: ➔	vzqa

Software tool

Air consumption		Calculate your system's air consumption quickly and conveniently. Simply enter all the actuators 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 • on our website at www.festo.com/catalogue by clicking on the blue icon "Engineering" › Compressed air preparation › Air consumption
Configurator		Design a product with numerous features reliably and quickly with the help of the configurator. Select all the relevant product features step-by-step. The use of logic checks ensures that only correct configurations are available for selection. A dynamic graphic 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 units: MS series

	 **Service units MSB4, MSB6, MSB9** ★	 **Service units MSE6**
Pneumatic connection 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	G1/2
Standard nominal flow rate	750 ... 18,000 l/min	4500 l/min
Pressure regulation range	0.5 ... 16 bar	
Flow measuring range		50 ... 5000 l/min
Operating pressure	0 ... 20 bar	4 ... 10 bar
Grade of filtration	0.01 ... 40 µm	
Fieldbus interface		Sub-D socket, 9-pin; 2x M12x1 socket, 4-pin, D-coded; 2x RJ45 push-pull socket, AIDA; 2x SCRJ push-pull socket, AIDA
Description	• Combination of filter regulator, filter, lubricator, on/off valve, soft-start valve • Size: 4, 6, 9	• Intelligent pneumatic service unit for optimising the use of compressed air as an energy source • Function: energy saving (2/2-way function DE, V24) • Equipped with measuring, control and diagnostic functions • Identification of production downtime and leakages • Use as process monitoring module • Electrical actuation via bus node • Size: 6
online: ➔	**msb4**	**mse6**

Service units: D series, polymer

	 **Service units with lubricator FRC-K**	 **Service units without lubricator LFR-DB**
Pneumatic connection 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

	 **Service units MSB4-FRC, MSB6-FRC** ★
Pneumatic connection 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	0.8 ... 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 control characteristics with minimal pressure hysteresis • Size: 4, 6
online: ➔	msb4-frc

Filter regulators/lubricators: D series, polymer

	 **Service units FRC-DB**
Pneumatic connection 1	G1/4
Standard nominal flow rate	≥550 l/min
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 connection 1	G1/2, G1/4, G1/8, G3/8, internal
Standard nominal flow rate	850 ... 24,000 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 minimal pressure hysteresis and inlet pressure compensation • 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

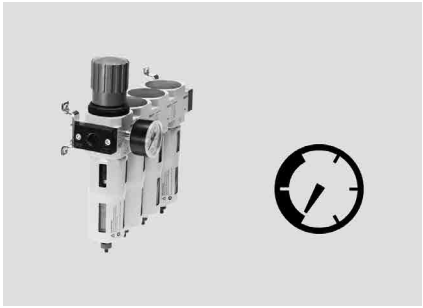
Filter regulators: D series, polymer

	 **Filter regulators** **LFR-DB**
Pneumatic connection 1	G1/4
Standard nominal flow rate	≥1000 l/min
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

On/off and soft-start valves: individual devices

	 **Shut-off valves HE-LO**
Pneumatic connection 1	G1, G1/2, G3/4, G3/8
Standard nominal flow rate	5200 ... 10,000 l/min
Operating pressure	1 ... 10 bar
Actuation type	Manual
Description	• For shutting off the compressed air supply whilst simultaneously exhausting 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**

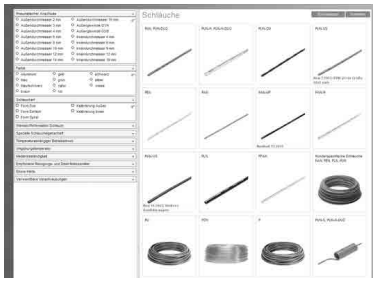
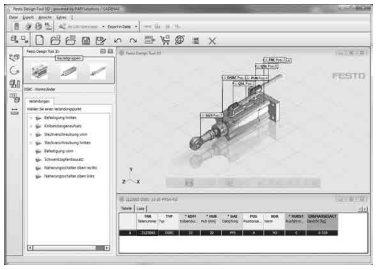
Customised components – for your specific requirements



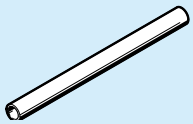
Components for compressed air preparation with customised designs
Can't find the compressed air preparation components you need in our catalogue? We can offer you customised components that are tailored to your specific requirements.
Common product modifications:
- Modified pressure range
- Rotary knob: in a special colour, with protection against rotation
- Fitting: integrated throttling port, special thread
- Tubing with special printing
- Pressure gauge with red-green range

Many additional variants are possible. Ask your Festo sales engineer, who will be happy to help.
Further information on customised components can be found on your local website
➔ **www.festo.com**

Software tool

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 • on our website under www.festo.com/catalogue by clicking on the blue icon "Product Finder" › Pneumatic fittings systems › Tubing
Festo Design Tool 3D (FDT 3D)		The Festo Design Tool 3D is a 3D product configurator for generating specific CAD product combinations from Festo. The configurator makes your search for the right accessory easier, more reliable and faster. You can then order the module that has been created with a single order item – either completely pre-assembled or as individual components 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, EST, FI, FR, GB, GR, HU, IE, IT, NL, NO, PL, PT, RU, SE, SI, SK, TR, ZA. This tool can be found • via the address: www.festo.com/FDT-3D in the above listed countries.

Standard O. D. tubing

	 **Plastic tubing PUN, PUN-DUO** ★	 **Plastic tubing PUN-H, PUN-H-T, PUN-H-DUO** ★	 NEW **Plastic tubing PTFEN**	 **Plastic tubing PAN**
Outside diameter	3 ... 16 mm	2 ... 16 mm	4 ... 16 mm	4 ... 16 mm
Inside diameter	2 ... 11 mm	1.2 ... 11 mm	2.9 ... 11 mm	2.5 ... 12 mm
Temperature-dependent operating pressure	–0.95 ... 30 bar	–0.95 ... 10 bar	–0.95 ... 15 bar	–0.95 ... 35 bar
Ambient temperature	–35 ... 60 °C	–35 ... 60 °C	–20 ... 150 °C	–60 ... 100 °C
New			• New product for 7/2017	
Description	• Polyurethane • High resistance to stress cracks • Suitable for energy chains • Also available as DUO tubing • Operating media: compressed air, vacuum	• Polyurethane • High resistance to microbes and hydrolysis • Food-safe see www.festo.com/sp/pun-h › "Certificates" tab • Suitable for energy chains • Also available as DUO tubing • Operating media: compressed air, vacuum, water	• Polytetrafluoroethylene • Food-safe see www.festo.com/sp/ptfen › "Certificates" tab • High resistance to chemicals • High temperature resistance • Operating media: compressed air, vacuum	• Polyamide • High thermal and mechanical load capacities • Highly resistant to microbes • Operating media: compressed air, vacuum
online: →	pun	pun-h	ptfen	pan

Standard O. D. tubing

	 **Plastic tubing PLN**	 **Plastic tubing PFAN**
Outside diameter	4 ... 16 mm	3 ... 12 mm
Inside diameter	2.9 ... 12 mm	2.3 ... 8.4 mm
Temperature-dependent operating pressure	–0.95 ... 14 bar	–0.95 ... 16 bar
Ambient temperature	–30 ... 80 °C	–20 ... 150 °C
Description	• Polyethylene • High resistance to chemicals, microbes and hydrolysis • Food-safe see www.festo.com/sp/pln › "Certificates" tab • Resistant to most cleaning agents and lubricants • Resistant to welding spatter • Resistant to welding spatter • Operating media: compressed air, vacuum, water	• Perfluoroalkoxy alkane • Pneumatic tubing with resistance to high temperatures and chemicals • Food-safe see www.festo.com/sp/pfan › "Certificates" tab • High resistance to chemicals, microbes, UV radiation, hydrolysis and stress cracks • Operating media: compressed air, vacuum, water
online: ➔	**pln**	**pfan**

Push-in fittings

	 **Push-in fittings, mini series QSM, QSMC, QSMF, QSMP, QSMS, QSML, QSMLL, QSMLV, QSMLLV, QSMT, QSMTL, QSMX, QSMY** ★	 **Push-in fittings, mini series QSM**	 NEW **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 NPQH**
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 M8x1.25	Male thread M3, M5	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 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
Pneumatic connection 2	For tubing O. D. 2 mm, 3 mm, 4 mm, 6 mm	For tubing O. D. 5/32", 1/4"	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	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
Temperature-dependent operating pressure	–0.95 ... 14 bar		–0.95 ... 14 bar	
Operating pressure	–0.95 ... 6 bar	–13.78 ... 145 psi	–0.95 ... 14 bar	–0.95 ... 20 bar
Ambient temperature	–10 ... 80 °C	32 ... 140 °F	–20 ... 80 °C	0 ... 150 °C
New			• New 4/2017: additional versions	
Description	• Mini series • Compact for maximum component density in confined installation spaces • PBT and nickel-plated brass • Operating media: compressed air, vacuum (water)	• Mini series • Compact for maximum component density in confined installation spaces • High-alloy stainless steel and nickel-plated brass • Operating media: compressed air, vacuum	• Standard series • Wide range of variants: large selection for maximum flexibility in standard applications • PBT and nickel-plated brass • Operating media: compressed air, vacuum, (water)	• Solid-metal brass, chemically nickel-plated • High corrosion and chemical resistance • Highly resistant to temperatures and pressure • Food-safe see www.festo.com/sp/npqh › "Certificates" tab • Operating media: compressed air, vacuum, water
online: →	qsm	qsm	qs	npqh

Push-in fittings

	 **Push-in fittings/connectors, metal, standard NPQM**	 **Push-in fittings, stainless steel CRQS, CRQSL, CRQSS, CRQST, CRQSY**	 **Push-in fittings, resistant to welding spatter QS-V0, QSL-V0, QST-V0**	 **Self-sealing/rotatable push-in fittings and connectors QSK, QSSK, QSKL, QSR, QSRL**
Pneumatic connection 1	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	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	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, 14 mm, 3 mm, 4 mm, 6 mm, 8 mm	For tubing O. D. 10 mm, 12 mm, 16 mm, 4 mm, 6 mm, 8 mm	For tubing O. D. 10 mm, 12 mm, 4 mm, 6 mm, 8 mm	For tubing O. D. 10 mm, 12 mm, 4 mm, 6 mm, 8 mm
Temperature-dependent operating pressure				–0.95 ... 14 bar
Operating pressure	–0.95 ... 16 bar	–0.95 ... 10 bar	–0.95 ... 10 bar	–0.95 ... 6 bar
Ambient temperature	–20 ... 70 °C	–15 ... 120 °C	0 ... 60 °C	–10 ... 80 °C
Description	• Solid-metal brass, nickel-plated • Attractively priced metal push-in fitting • Sturdy • Operating media: compressed air, vacuum, water	• Maximum corrosion resistance (corrosion resistance class 4 to Festo standard 940 070) and chemical resistance • Food-safe see www.festo.com/sp/crqs › "Certificates" tab • Operating media: compressed air, vacuum, (water) • Stainless steel	• 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 media: 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 • Rotatable push-in fitting with swivel connection, rotatable by 360° with max. 500 rpm • Operating media: compressed air, vacuum
online: ➔	**npqm**	**crqs**	**qs-v0**	**qsr**

Threaded fittings

	 **Push-in fittings, rotatable and push-in L-fittings QSR, QSRL**	 **Threaded fittings NPFC**	 **Adapters NPFV**	 **Reducers, sleeves, double nipples D, E, ESK, FR, G, LJK, NPFA, QM, QMR, QSP10, SCM, TJK**
Pneumatic connection 1	Male thread NPT1/2-14, NPT1/4-18, NPT1/8-27, NPT3/8-18, NPT1/2-14	G1, G1/2, G1/4, G1/8, G3/4, G3/8, M3, M5, M7, R1, R1/2, R1/4, R1/8, R3/4, R3/8	G1/4, NPT1/4-18	G1, G1/2, G1/4, G1/8, G3/4, G3/8, M5, R1/2, R1/4, R1/8, R3/8
Pneumatic connection 2	For tubing O. D. 1/2", 3/8", 1/4", 3/16", 5/16", 5/32"	G1, G1/2, G1/4, G1/8, G3/4, G3/8, M3, 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, M5, M7, R1/2, R1/4, R1/8, R3/8
Operating pressure		–0.95 ... 50 bar	2 ... 8 bar	
Operating pressure for entire temperature range	0.95 ... 10 bar			
Ambient temperature	–10 ... 60 °C	–20 ... 150 °C		
Nominal width	2.1 ... 8 mm		6 mm	2.6 ... 10.7 mm
Description	• Standard series • Rotatable push-in fitting with swivel connection, rotatable by 360° with max. 500 rpm • PBT • Operating media: compressed air	• 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 G1/4 to NPT1/4 or G1/4 • Operating media: compressed air, vacuum	• Brass or aluminium • Reducing nipple • Reducing sleeve • Double nipple • Distributor block • Female bulkhead fitting • Sleeve • Operating media: compressed air, vacuum
online: →	qsr	npfc	npfv	esk

Pipes

	 **Plastic pipes PQ-PA**	 **Pipes PQ-AL**
Outside diameter	12 ... 28 mm	12 ... 28 mm
Information on tubing materials	PA	Wrought aluminium alloy
Temperature-dependent operating pressure	–0.95 ... 15 bar	–0.95 ... 15 bar
Ambient temperature	–25 ... 75 °C	–30 ... 75 °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
online: ➔	pq-pa	pq-al

Push-in fittings for piping PQ

	 **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** **KD1, KD2, KD3, KD4, KD5, KS1, KS2, KS3, KS4, KS5** ★
Pneumatic connection	
Pneumatic connection 1	Male thread G1/2, G1/4, G1/8, G3/8, M3, M5, female thread G1/2, G1/4, G1/8, G3/8, M5, CK-3, CK-4, CK-6, CK-9, CN-2, N-6, N-9
Standard nominal flow rate	44 ... 1350 l/min
Ambient temperature	–10 ... 80 °C
Description	• 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 • Operating media: compressed air, vacuum
online: ➔	**kd1**

Distributors

	 **Multiple distributors** **QSLV, QSQ, QST3**	 **Distributors** **FR**
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	Female thread G1/2, G1/4, G1/8, G3/8, G3/4
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, M3, M5, for tubing O. D. 4 mm, 6 mm
No. of supply lines	1	1
No. of outlets	2, 3, 4, 6	3, 8, 9, 12
Description	• PBT and nickel-plated brass • L-shape, T-shape • Rotatable 360° • Reducing design • Operating media: compressed air, vacuum, (water)	• Aluminium • 4, 8, 9 or 12 connections • Operating media: compressed air, vacuum
online: ➔	**qslv**	**fr**

Connecting cables for valves

	 **Connecting cables/plug sockets with cable NEBV-H, NEBV-M, NEBV-A, NEBV-B** ★
Electrical connection, connection type	Socket, narrow socket, cable, plug
Electrical connection, cable outlet	Straight, angled
Electrical connection, design	Square, round
Electrical connection, connection technology	Plug pattern ZB, self-tapping screw, plug pattern ZC, flue screw, plug pattern ZC, metr. screw, M8x1 A-coded, type A to EN175301-803, M12x1 A-coded, type B industrial, type C, open end, Sub-D
Electrical connection, number of pins/wires	2, 3, 4, 5, 8, 25, 44
Cable length	0.3 ... 30 m
Description	• Connecting cable for valves with ZC solenoid coils (CPE10, CPE14), for valves VUVG • Pre-assembled
online: ➔	**nebv**

Universal plug connectors

	 **Plugs NECU, NECU-HX**
Electrical connection, connection type	Socket
Electrical connection, design	Square
Electrical connection, connection technology	Plug pattern FC, spring-loaded terminal, plug pattern PP, coding 2 and 5, insulation displacement connector
Electrical connection, number of pins/wires	5, 40
Degree of protection	IP20, IP40, IP65, IP67
Connection diameter	0.08 ... 2.5 mm²
Description	• 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
online: ➔	**necu**

Plug connectors for valves

	 **Plug sockets** **MSSD** ★
Electrical connection, connection type	Socket
Electrical connection, design	Square
Electrical connection, connection technology	Type A, type B industrial, screw terminal
Electrical connection, number of pins/wires	3
Connection diameter	0.25 ... 1.5 mm²
Degree of protection	IP50, IP65, IP67, to IEC 60529
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 • Optionally with LED display
online: ➔	**mssd**

Control cabinets

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-508 A • 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-508 A • 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-508 A • Implementation of safety functions • Wide range of bus technologies
Description	• Made-to-measure control cabinets • Pneumatic, electric, combined • Individually configured • Adapted to requirements in industrial automation • Design and sizing included	• Made-to-measure control cabinets • 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 ➔ yxcs
online: ➔	ready-to-install	ready-to-install	ready-to-install

Mounting plates and assemblies

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-508 A • Implementation of safety functions	• Combination of various pneumatic and/or electric components to create a single unit • Application-specific combination of components • Accessories mounted on sub-assemblies • 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-508 A • 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 30000 catalogue components • Connections included • For integration in machines
online: ➔	**ready-to-install**	**ready-to-install**

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 as well as compliance 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 involve a safety risk and are thus not permitted. Festo does not accept any liability for resulting damages.

You should contact Festo's advisors if one of the following apply 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.

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

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