FESTO

Product catalogue

for process automation

Product catalogue for process automation

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Product catalogue for process automation

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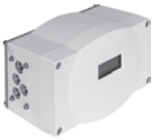	Positioners	286	03
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Editorial

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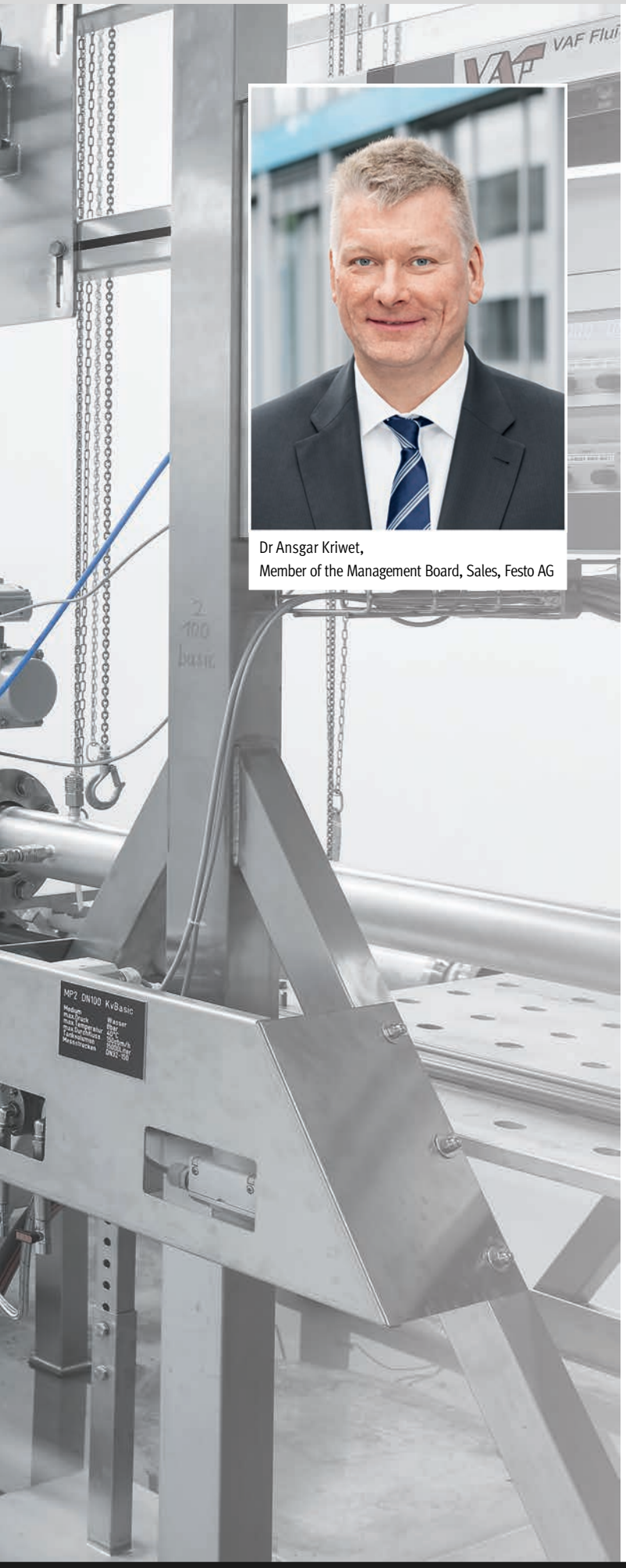
Preface



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

Dear Customers,

Increasing your productivity is our motto for everything we do. The new product catalogue from Festo for the process industries is a truly impressive example of this. We support you along the entire value chain, from engineering to commissioning and operation, including 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 and solutions for the process industries. For example, our complete process valve units and control cabinets enable you to collaborate with just one partner, while our online configurators help you to find the precise combination you need with just a few mouse clicks.

Digitalisation, as we understand it, is not an end in itself. On the contrary, it boosts your productivity along all areas of the value chain, whether in engineering or in operation. Cloud services such as data analytics and visualisation via dashboards make it possible to realise a completely new kind of energy monitoring, and form the basis for predictive maintenance. Our energy efficiency modules MSE6 help you to reduce your CO2 emissions and lower your energy costs. They can also be easily retrofitted into existing systems, offering you a very easy first step into the world of digitalisation.

The Festo Motion Terminal VTEM is propelling pneumatics into the app-controlled, digital age. By installing apps, a wide range of functions can be realised on a standardised hardware platform; this eliminates the contradiction between standardisation and flexibility in planning and operation. The decentralised processing of process information in the VTEM means that the process control can be adapted to changing conditions automatically as well as virtually autonomously and decentrally in the field. The digital image, which can be created using the Product Key, rounds off the topic.

Another trend to which we are paying great attention is the modularisation of automation. Innovative products such as the modular electrical terminal CPX with integrated controller CEC and valve terminal MPA provide you with a uniform interface for decentralised intelligence that enables you to fully control machines or complex subsystems. The benefits of this modularity are clear: greater flexibility in production and a shorter time to market for your products.

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

Take a look at this catalogue since it shows you completely new ways of increasing your competitiveness with automation technology from Festo. And find out how solutions from Festo simplify your work and also make you more productive. I hope you find it rewarding!

Ansgar Kriwet

You want to make your applications more productive. You are looking for efficient solutions. We are entering the digital future with you.

→ WE ARE THE ENGINEERS OF PRODUCTIVITY.

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

Best products. Best solutions. Best services. That is our claim. In this context, there is much more you can expect from us to permanently increase your productivity.

Build with engineering excellence.

Use our ingredients for quick and easy engineering: extremely simple and suitable product selection, smart engineering and simulation processes, also with a digital twin, and a unique Product Key for complete product information. And procurement? It couldn't be easier.

Operate your systems smartly.

Connectivity to the cloud ensures reliable processes with greater productivity. Condition monitoring lets you see immediately when a service or repair is due - our MyDashboards will tell you. And with the Smartenance digital maintenance manager you have the servicing of all systems under control – even third-party systems.

Prepare to be inspired.

What does the automation of tomorrow look like? What are the trends? And what will make my production highly flexible, while also offering standardisation? You can find the answers right now with our Festo Motion Terminal VTEM, the first app-controlled pneumatic component. Future Concepts and our bionic studies show you how the world of tomorrow might look.

Never stop learning.

The market and global competition are accelerating steadily – and require constant learning if you want to maintain your competitive edge. You and your employees will benefit from the offer of Festo Didactic. Knowledge that pays off.

You rely on factory automation.
You rely on process automation.
We are technology and training.

→ WE ARE THE ENGINEERS OF PRODUCTIVITY.

Product range

The rapid changes of our time are challenging and we have to continually adapt processes, functional concepts and solutions. Mastering this challenge technically and economically will become a core competency in the coming years. Only then can we keep up with general developments. Many tasks can be solved with simple means, some only with special approaches: our range is designed to support with all aspects.

1

Core product range
Our core product range offers you special advantages – selected products for 80% of automation applications. They can be ordered using a part number and are especially attractively priced.

- **Generally ready for dispatch from the Festo factory in 24 hours**
- In stock worldwide in 13 service centres
- Over 2200 products

Look for the star!

2

Complete product range
You will find solutions for more specific requirements in our complete product range, which we will deliver on the indicated date. This part of the range is not separately identified.

3

Customer solutions
If you cannot find the right products for your task in our range, our specialists in the "customer solutions" area are at your disposal.

Your partner for all automation questions.

Contact us ➔ **www.festo.com**

Digitalisation – megatrend for productivity

The virtual and real worlds are continuing to converge – and leading to Industry 4.0. Increasing digitalisation is one of the basic prerequisites for this process. Festo is driving this process forward in the field of automation – and we invite our customers to undertake this journey together with us.

The future: smart products – smart offering

Digital products can do more and more – and are masters at integrating additional functions. Smart products optimise themselves, adapt to external influences and identify themselves. The digital twin is accessed via the Product Key. These are the prerequisites for highly flexibly and extremely fast and adaptive production.

This also includes a tailored digital offering in the form of software, apps and firmware along our customer journey. Festo is making every effort in this area. Engineering tools such as FluidDraw or EPLAN Schematic Solutions ensure seamless, error-free documentation. Condition monitoring of components or solutions takes place via dashboards that output all relevant parameters – including on the go. This makes it possible to reconcile maximum system availability and optimum maintenance planning. Huge savings potential can be realised with Smartenance, our digital maintenance manager with reminder functions and proof for audits, including for non-Festo products.

Your entry into the digital world? CPX/MPA as an example

The advantages of digitalisation are clearly demonstrated by a valve terminal MPA ordered and configured in the Online Shop and the CPX automation platform with decentralised intelligence. It features numerous approaches from integrated industries. It is documented electromechanically and pneumatically in no time at all with Schematic Solutions and FluidDraw from the App World, so that a digital twin is immediately available. In addition, the Product Key as a data matrix code on the product ensures that important information is easy to retrieve during commissioning and maintenance.

An additional, configurable OPC UA interface connects the CPX/MPA to the IoT gateway that transfers the data to the Festo Cloud. Festo MyDashboards visualise this data, for example for condition monitoring. Smartenance is used for maintenance planning, including for the entire system or production line.

Only this combination of classic hardware and software-controlled elements boost the automation productivity and flexibility. We are happy to share this expertise with our customers.

Automation x3

Factory automation

... for maximum productivity

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

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

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

Process automation

... for safety during operation

Regulating and controlling fluids, gases and solids are typical process automation tasks. The main fields of application are in water and wastewater technology, the pharmaceutical sector, the chemical industry and food and beverage production. However, our solutions are also used in many factories, for example in cooling circuits and ventilation systems.

Tailored industry solutions
Together with and for our customers, we develop tailored automation solutions for controlling and regulating fluids, gases and solids. We provide support in all project phases from development through to commissioning.

Electric automation

... seamless connectivity in factory and process automation

One automation platform for factory and process automation
Our CODESYS controllers, primarily the modular control system CPX-E and the control platform CPX with protection to IP65 create unique advantages and set new standards in factory and process automation.
This includes a cost-effective overall concept, technical synergies and the advantages of decentralised installation as well as connecting to Industry 4.0, the IoT and the Festo Cloud thanks to OPC UA.

A comprehensive platform for electric automation
Automation in core and secondary machine processes: from electromechanics and rotary modules, servo motors and servo drives, complete positioning systems and motion control solutions to complete handling systems and decentralised control solutions as well as the Multi-Carrier System – and always with the appropriate Festo Automation Suite sizing and engineering software.
Includes intelligent connectivity with various communication tools as well as the direct and complete integration of our servo drives in higher-level control concepts from globally controller manufacturers.

Easy selection

Quick order placement for selected basic designs

We make it easy for you!
We have compiled a globally standardised core product range that not only offers you faster and easier selection, but also fast delivery.
It has been selected by Festo experts based on actual customer requirements and covers the main applications of automation technology, while offering the best
possible value for money.

Products with the star: easy selection and fast delivery
You can recognise these outstanding products at a glance:
they are marked in the catalogues with a ★ star.

Quick and easy to order
Preconfigured to ensure the best possible value for money, these products can be ordered quickly and easily either via the order code, which is based on the features,
or the unique part number.

High level of availability
In stock and generally ready for immediate dispatch:
these products are available in no time at all.[1)]

More variety or individually configured? No problem!
If your requirements go beyond the main applications of automation technology or if you need individually configurable products such as valve terminals, you can choose from the full spectrum of Festo's automation portfolio with all of its technological diversity.
- Each product in this catalogue is presented as part of a product range overview, e.g. Solenoid valves VSNC, NAMUR ➔ page 24
- Make your selection using the configurator in our digital product catalogue – online at
  ➔ **www.festo.com/catalogue/...**, enter the type code, e.g. **vsnc**
- You can also place the order from the configurator.

Further information on how to quickly find the optimal solution
➔ page 15, 18 and 19.

1) Special features are explicitly stated.

★

You can benefit from these advantages whenever you need core pneumatic and electrical functions. Wherever you see this symbol in our printed or electronic catalogue, it identifies a selected product which is perfect for the main applications of automation technology. The stars will help you to find what you are looking for more quickly and place orders more easily. These star products are generally in stock and ready for immediate delivery.

At a glance:

+ Fast: generally ready for dispatch in 24 hours
+ Superb: Festo quality at an attractive price
+ Easy: just a few clicks to place an order online

Quick order placement for selected basic designs

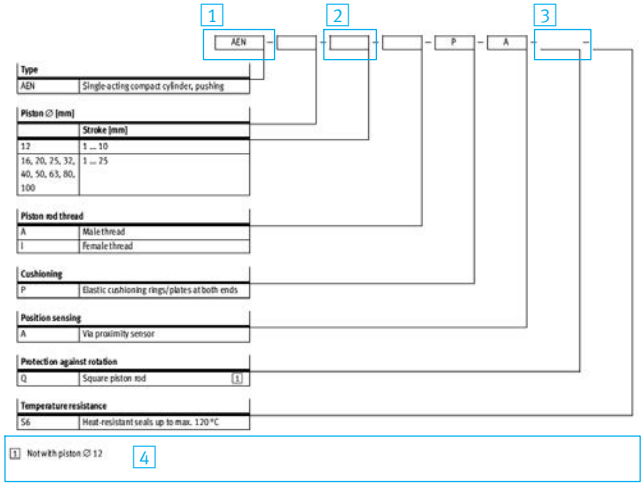
You will find the order code for each product on the product pages.
The appropriate accessories for each product are presented in tabular format at the end of each product description.

It couldn't be easier:
to get the correct order code, complete the fields in the first row from the left to the right. Follow the connecting line from each field to the column with the associated sizes and variants and make your selection.

There are three types of fields:
+ Mandatory data with predefined content 1:
  in the example on the right, the basic design AEN is specified.
+ Mandatory data (empty field) 2:
  enter your required stroke length here.
+ Optional data (line only) 3:
  if nothing is entered here, the basic variant will be supplied
  (in this example this means a standard piston rod).

When making your selection, note the conditions associated with the variants 4, which are shown as footnotes.

Example of an order code:



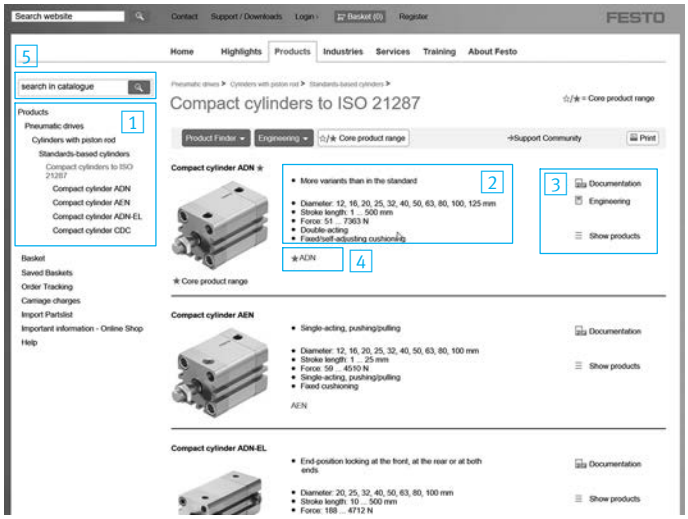
Contact

On pages 879 to 880 you will find the service network with details of our contacts.

Prefer online?
➔ www.festo.com

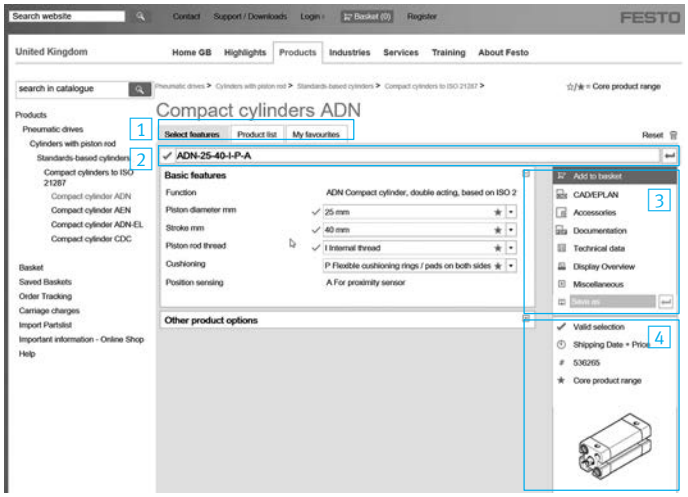
We look forward to hearing from you.

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



From the product group to the product
There are three options available:

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

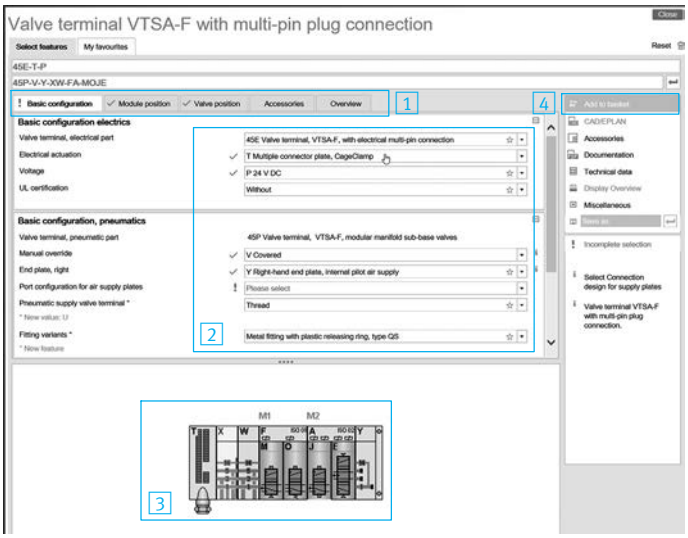


Functions in the product configurator

1. Tab navigation 1
   – "Select features": Select the appropriate features here
   – "Product list": Lists all products in the product group
2. Input field for order code 2:
   Enter the exact order code here.
3. Other actions 3 which are available following a correct configuration:
   – "Add to basket": Adds your product to the basket, see also the sections
   "Exporting your basket" and "Managing your basket" ➔ 18.
   – "2D/3D view": Creates a CAD model, see the section "Viewing CAD models"
   – "Accessories": Lists suitable accessories
   – "Data Sheet": Contains all the relevant technical data
   – "Display Overview": Displays an overview of all selected models
4. Details 4:
   Here you will find information such as part number, price, product graphic, product illustration and circuit symbol.

Online or offline – get the ideal solution fast

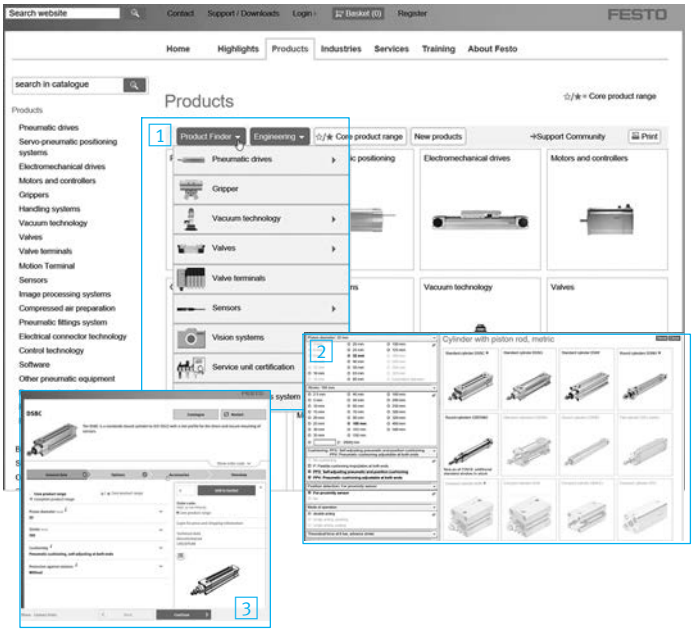
Online: Enter ➔ www.festo.com in your web browser, then choose your country. Click on Go.
On the homepage, select the "Products" menu.



Selecting product features in the product configurator

1. Select the product features:
   - Navigate using the tabs 1.
   - Configure your product by selecting the required features 2 on the tabs 1 running from left to right.
   - The tabs 1 give you a quick overview of all the selected features. Missing features are marked with a blue exclamation mark and incorrect features are marked in red. Clicking on the feature takes you directly to it, so that you can then change it.
2. Graphic representation 3: A dynamic graphic[1)] is created based on your current configuration.
3. Add the product to the basket: Once the configuration is complete, you can add products to the basket by clicking on "Add to basket" 4. A message is displayed to confirm that the product has been added successfully.
   To find out how to place an order, see the section "Managing your basket" ➔ 18.

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

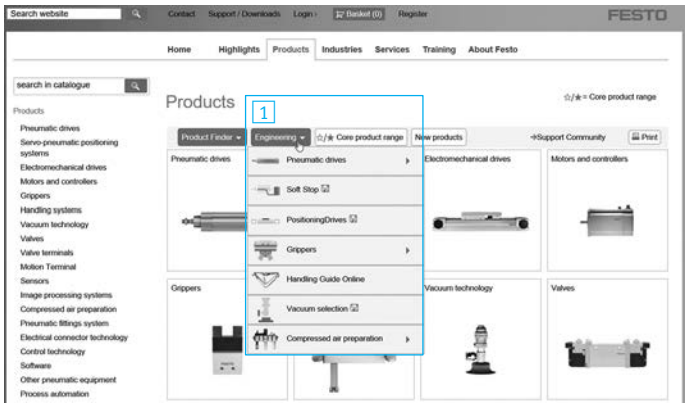


Selecting product features in the product finder

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

Online or offline – get the ideal solution fast

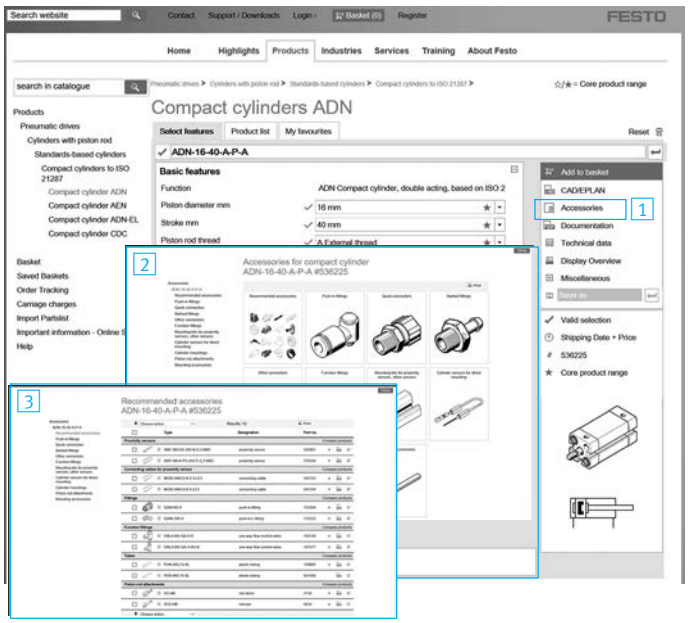
Online: Enter ➔ www.festo.com in your web browser, then choose your country. Click on Go.
On the homepage, select the "Products" menu.



Engineering tools for appropriate products for your applications

1. Click on the blue icon "Engineering" 1 and select the required engineering tool.

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



Finding the appropriate accessories quickly

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

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

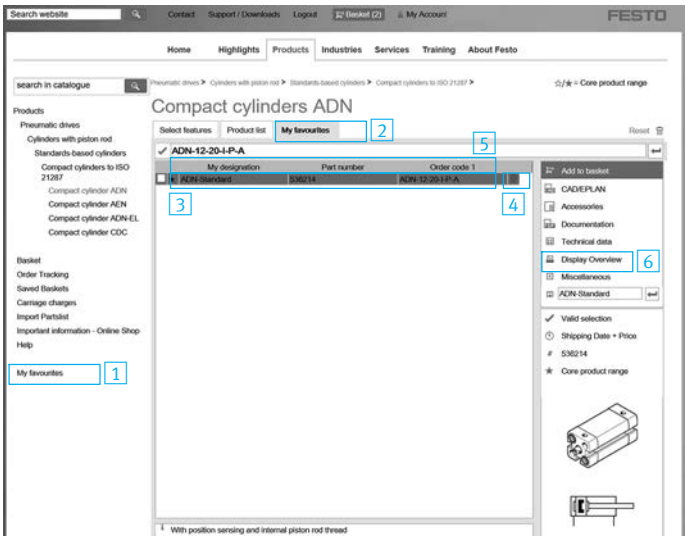
Tip:

For some cylinder series you can find the appropriate accessories faster by selecting "Recommended accessories" in the accessories on offer 2.

For some cylinder series you will also find "Recommended accessories" 3 after you have added your selection to the basket.

Online or offline – get the ideal solution fast

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



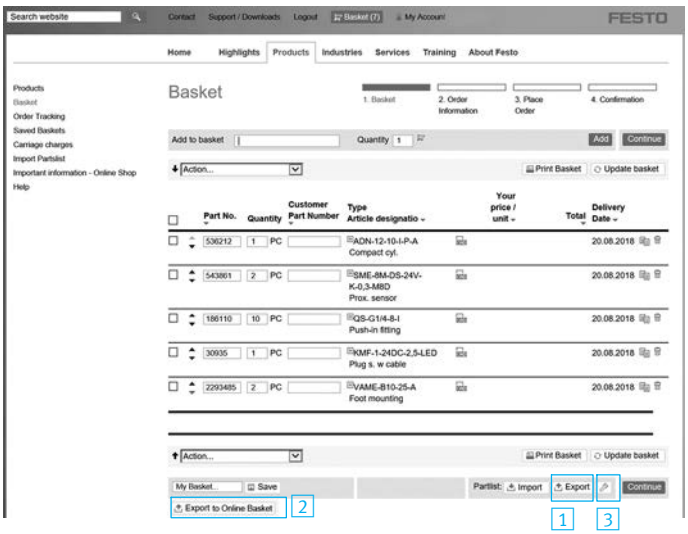
My favourites

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

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

Viewing CAD models

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



Exporting your basket ...

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

Managing your basket

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

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

Round-the-clock benefits

24h online

+ **Continuous availability** – product information, documentation, prices, availability, ordering, etc.

+ **Complete overview of all orders** – order tracking with search function, status display in lists and easy reordering.

+ **No minimum quantity surcharge** – there will be no additional costs for small orders.

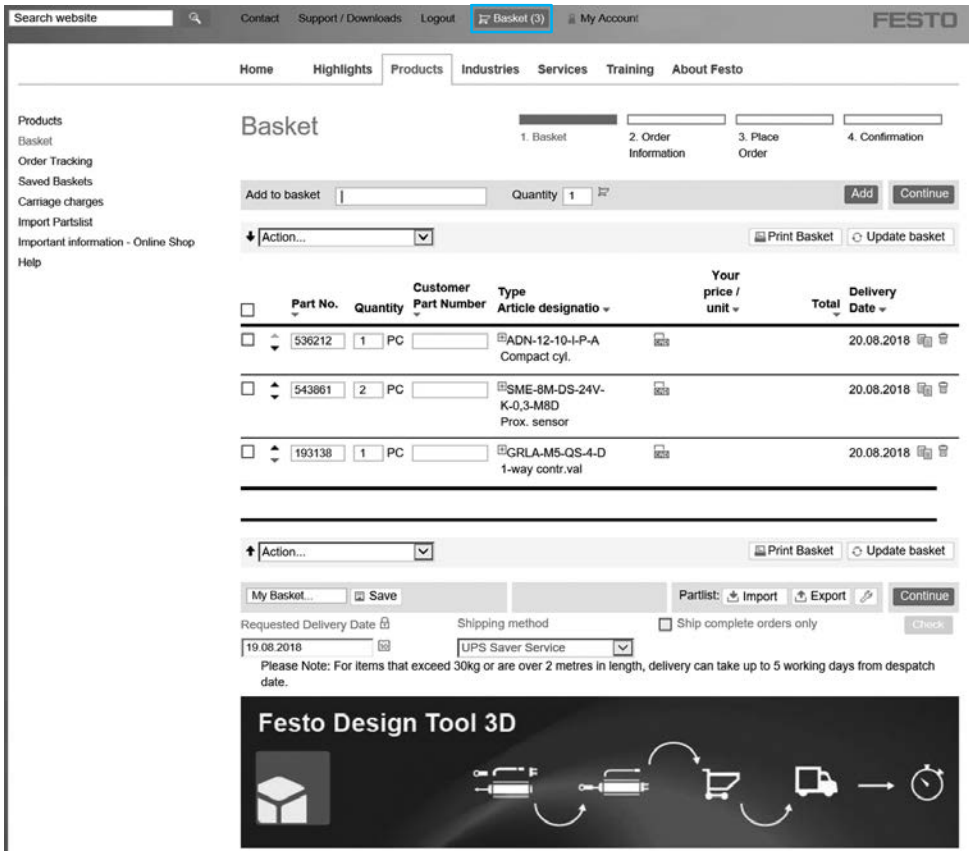
+ **Request quotations** – you can request quotations directly from the basket at the push of a button.

+ **Download all documents for a complete basket** – complete documentation for the selected products.

+ **Express delivery** – orders placed before 8:30 p.m. with express delivery selected will be with you by noon the following working day,
provided they are in stock.

You will find our Online Shop at ...

➔ www.festo.com
› click on the "Basket" link

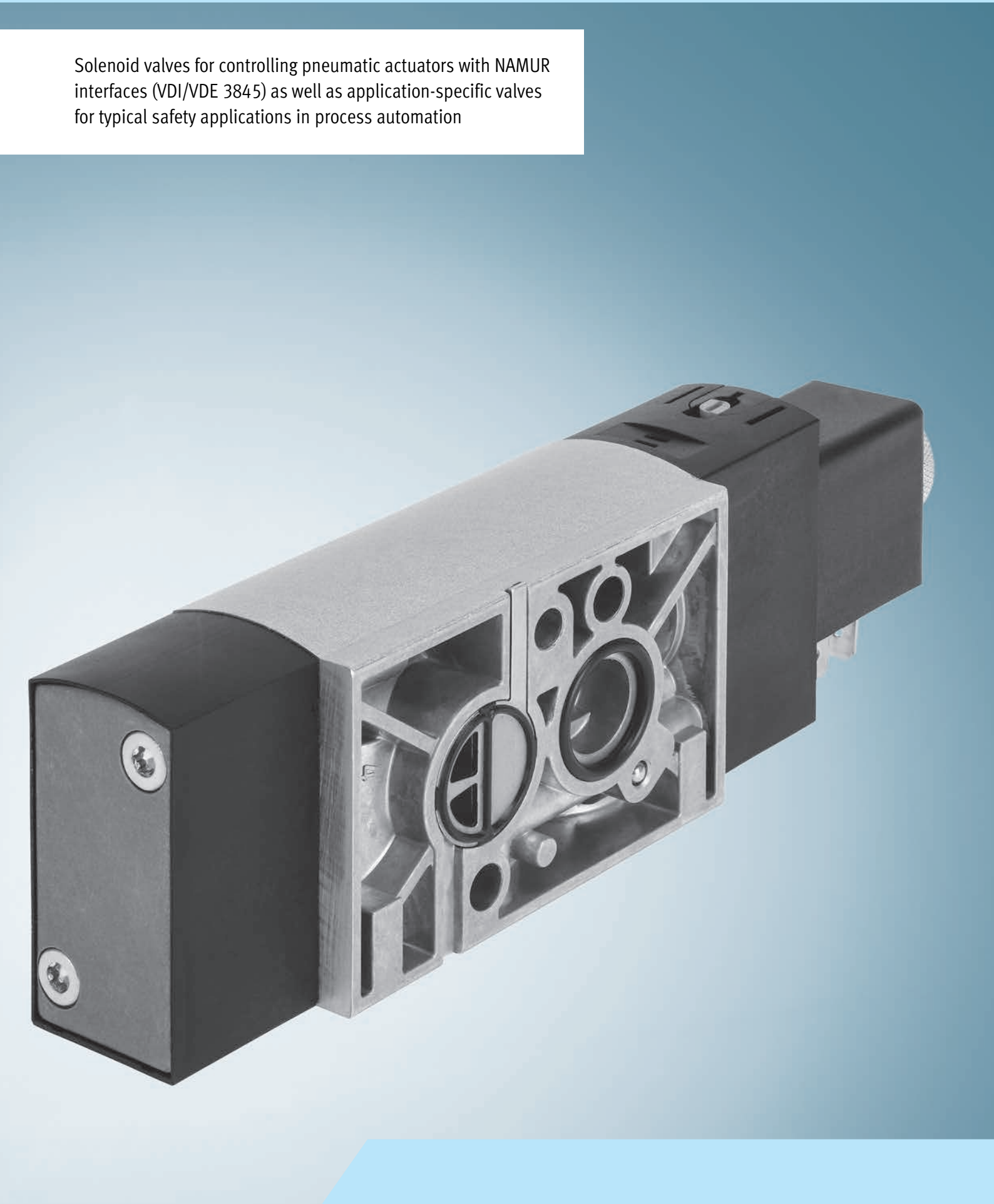


Already registered?
Then you can log in directly via ➔ **www.festo.com/login** or by clicking on "Login".

If you have not yet registered ...
... open the registration form via ➔ **www.festo.com** and by clicking on "Register".
Further information on the Festo Online Shop can be found here:
➔ **www.festo.com/ols**

01 Pilot valves

Solenoid valves for controlling pneumatic actuators with NAMUR interfaces (VDI/VDE 3845) as well as application-specific valves for typical safety applications in process automation



VSNC ★

Solenoid valves, NAMUR

+ Certified to all current Ex standards
+ Sturdy and with high flow rates

➔ page 23

VOFC

Solenoid valves

+ Directly actuated poppet valve
+ Variants with TÜV approval up to SIL3 to IEC 61508

➔ page 85

VOFD

Solenoid valves

+ Piston spool valve, piloted piston poppet valve
+ Variants with TÜV approval up to SIL3 to IEC 61508

➔ page 151

VACF, VACN, VACC

Solenoid coils

+ For solenoid valves VSNC, VOFC, VOFD
+ For solenoid valves VZWM-L, reverse jet pulse valves VZWE

➔ page 211

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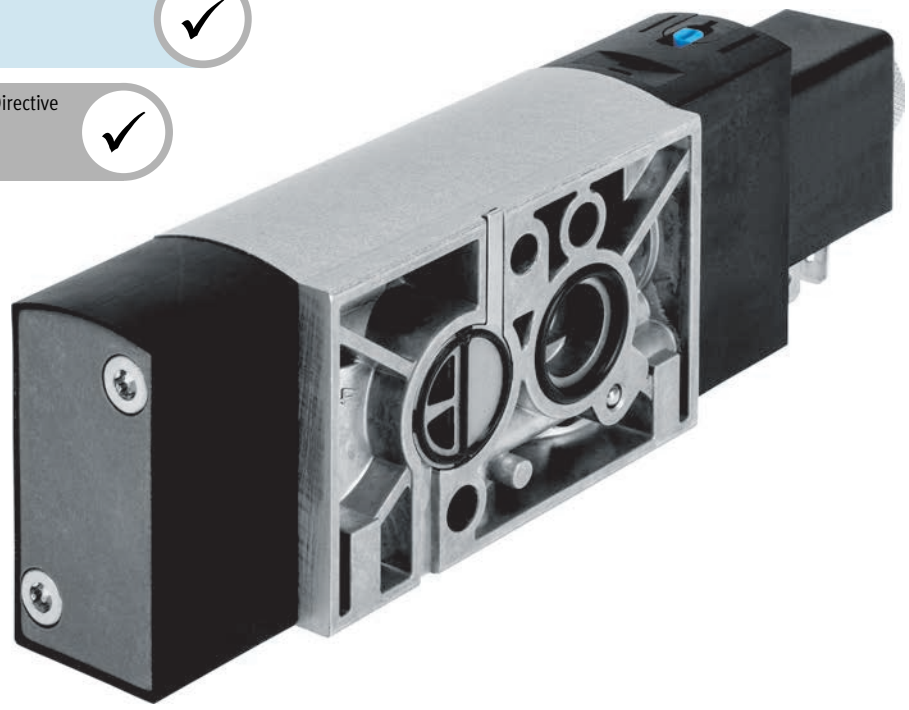
Solenoid valves, NAMUR
VSNC ★

Overview, configuration and ordering
➔ **www.festo.com/catalogue/vsnc** ✓

Additional information, support and user documentation
➔ **www.festo.com/sp/vsnc** ✓

Quick ordering of basic designs
➔ page 38, 50 ✓

Selected types in accordance with the ATEX Directive for explosive atmospheres
➔ **www.festo.com/ex** ✓



+ The VSNC-...FN armature system permits the use of solenoid coils with and without explosion protection
+ The VSNC-...FN variant achieves higher energy efficiency with reduced power consumption

+ Connection G1/4, NPT1/4
+ Flow rate 900 ... 1000 l/min
+ Voltage 12, 24, 48 V DC, 24, 48, 120, 230 V AC
+ NAMUR connection pattern to VDE/VDI 3845
+ Electrically actuated, piloted
+ Mechanical spring return
+ Wide range of Ex solenoid systems, IEC Ex, FM EX
+ Convertible from 5/2-way function to 3/2-way function

Solenoid valves VSNC

Key features, product range overview VSNC-...

Function

VSNC valves are pilot valves for single- and double-acting quarter turn and linear actuators with a port pattern in accordance with VDI/VDE 3845, such as DAPS, DFPB. They can also be mounted on actuators without a NAMUR interface, e.g. diaphragm actuators thanks to appropriate accessories such as a connection kit. They are designed for the requirements of process automation. Mechanical springs (single-solenoid valves) ensure safe switching to the initial position in the event of a power failure.

Innovative

- Conversion from 3/2-way to 5/2-way valve simply by turning the seal
- Enables single- or double-acting actuators to be controlled with one valve
- The valve can be ordered either with non-detenting/detenting or non-detenting manual override or without manual override. It is converted using a special cover. The part number is therefore identical. The manual override option can be changed at any time

Cost- and application-optimised

- Cost-optimised variant with plastic cover and brass armature and IP65 coils

Voltage
12, 24, 48 V DC
24, 48, 120, 230 V AC

Operating pressure
2.5 ... 10 bar

Temperature range
–20 ... +60 °C

Flexible

- Application-optimised variant with aluminium cover, stainless steel armature tube for IP65 and Ex coils, and protective cap for armature tube exhaust
- One armature tube system for all Ex solenoid systems
- For zone 1 to IEC Ex with type of ignition protection
- Ex-ia
- Ex-mb
- For zone 2 to IEC Ex with type of ignition protection
- Ex-nA
- For Class I, Div I to NEC 505
- AEx-m

VSNC-F8

VSNC with IP65 solenoid

VSNC-F ... -FN

VSNC piston spool

VSNC with Ex-iA solenoid

VSNC with Ex-nA solenoid

VSNC-FT ... - FN

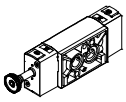
VSNC poppet seat

VSNC with FM solenoid

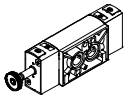
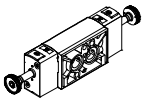
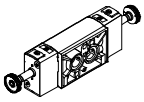
VSNC with Ex-m solenoid

Key features, product range overview VSNC-...-F8

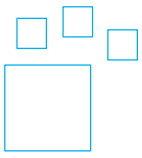
VSNC-F8



- Valve cover cap material: Plastic/metal
- Armature material: Brass
- Pilot air (incoming air of armature), unprotected

Version	Type	Pneumatic connection 1, 3, 5	Pneumatic connection 2, 4, based on standard	Standard nominal flow rate [l/min]	➔ Page
5/2-way or 3/2-way valve, convertible, single solenoid					
	VSNC-FC-M52-MD-G14-F8	G 1/4	VDI/VDE 3845 NAMUR ¼	1250	34
	VSNC-FC-M52-MD-N14-F8	NPT 1/4			
	VSNC-FC-M52-MD-G14-F8-1A1	G 1/4			
5/2-way valve, double solenoid					
	VSNC-F-B52-D-G14-F8	G 1/4	VDI/VDE 3845 NAMUR	1350	39
	VSNC-F-B52-D-N14-F8	NPT 1/4			
5/3-way valve					
	VSNC-F-P53C-MD-G14-F8	G 1/4	VDI/VDE 3845 NAMUR	1250	42
	VSNC-F-P53U-MD-G14-F8	G 1/4		950	
	VSNC-F-P53E-MD-G14-F8	G 1/4		1050	
	VSNC-F-P53C-MD-N14-F8	NPT 1/4		1250	
	VSNC-F-P53U-MD-N14-F8	NPT 1/4		950	
	VSNC-F-P53E-MD-N14-F8	NPT 1/4		1050	

Ordering data – Product options



Configurable product
This product and all its product options can be ordered using the configurator.

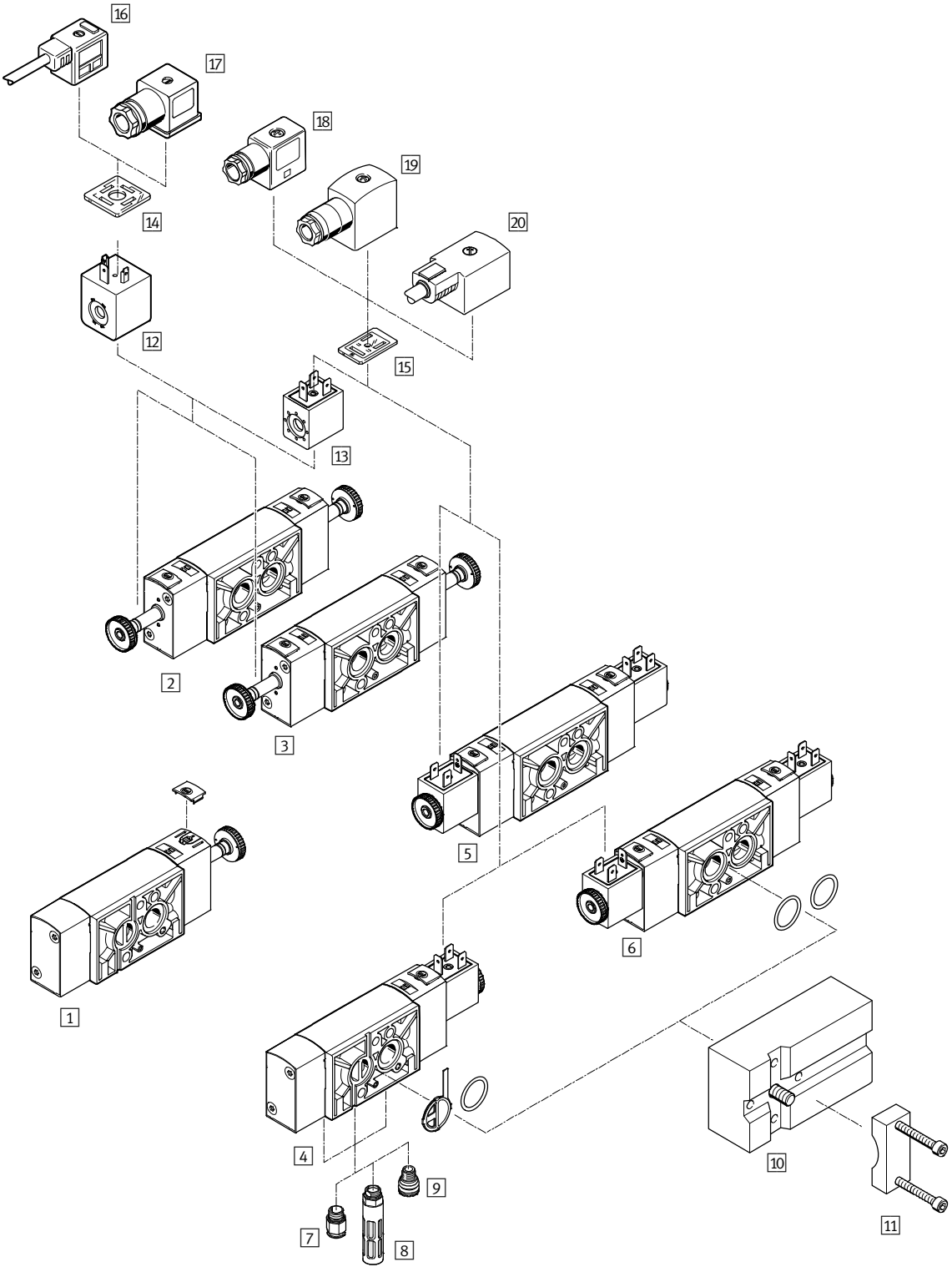
The configurator can be found at
➔ **www.festo.com/catalogue/...**

Part No.	Type
8026033	VSNC

Coils	IP65 Industrial type B							IP65 type A						
Valve function	12 V DC	24 V DC	48 V DC	24 V AC	48 V AC	120 V AC	230 V AC	12 V DC	24 V DC	48 V DC	24 V AC	48 V AC	120 V AC	230 V AC
5/2-way and 3/2-way, single solenoid	■	■ Part no.	■	■	■	■	■	■	■ Part no.	■	■	■	■	■
5/2-way, double solenoid	■	■ Part no.	■	■	■	■	■	■	■ Part no.	■	■	■	■	■
5/3 G	■	■	■	■	■	■	■	■	■	■	■	■	■	■
5/3 B	■	■	■	■	■	■	■	■	■	■	■	■	■	■
5/3 E	■	■	■	■	■	■	■	■	■	■	■	■	■	■

■ = Can be combined using a modular system
Part no. = Can be ordered with part number as a fast seller

Peripherals overview VSNC-...-F8



Peripherals overview VSNC-...-F8

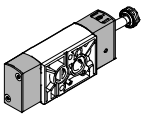
Mounting components and accessories

		Brief description	➔ Page/Internet
1	VSNC-...-F8 Solenoid valves	3/2-way and 5/2-way single solenoid valve with converting seal, plastic cover cap and brass armature tube, for controlling single- or double-acting actuators	34
2	VSNC-...-F8 Solenoid valves	5/2-way double solenoid valve with plastic cover cap and brass armature tube, for controlling double-acting actuators	39
3	VSNC-...-F8 Solenoid valves	5/3-way single solenoid valve, normally open, closed or exhausted, with plastic cover cap and brass armature tube, for controlling double-acting actuators	42
4	VSNC-...-F8 Solenoid valves	3/2-way and 5/2-way single solenoid valve with converting seal, plastic cover cap, brass armature tube and 24 V DC solenoid coil, for controlling single- or double-acting actuators	34
5	VSNC-...-F8 Solenoid valves	5/2-way double solenoid valve with plastic cover cap, brass armature tube and 24 V DC solenoid coil, for controlling double-acting actuators	39
6	VSNC-...-F8 Solenoid valves	5/3-way single solenoid valve, normally open, closed or exhausted, with plastic cover cap, brass armature tube and 24 V DC solenoid coil, for controlling double-acting actuators	42
7	QS Push-in fitting	For connecting tubing with standard outside diameters	83
8	U Silencer	–	83
9	VABD-D3-SN-G14 Exhaust protection	Exhaust protection to IP65. The spring chamber of the actuator is protected against the ingress of aggressive ambient air and water by the one-way flow control system	83
10	VABS-S7-S-G14 Connection kit	Mounting plate for attaching the valve to a NAMUR rib	82
11	VAME-S7-Y Mounting bracket	Alternative option (instead of screw) of attaching the valve to a NAMUR rib with the help of a mounting bracket	82
12	VACF-A Solenoid coil	Electrical connection to DIN EN 175301-803, type A	67
13	VACF-B Solenoid coil	Electrical connection to Festo standard for MSSD-F	69
14	MC-LD Illuminating seal	Illuminating seal for displaying the switching status	83
15	MF-LD Illuminating seal	Illuminating seal for displaying the switching status	83
16	KMC Connecting cable	–	73
17	MSSD-C Plug socket	Electrical connection to DIN EN 175301-803, type A	83
18	MSSD-F Plug socket	Electrical connection to Festo standard with screw terminal connection	83
19	MSSD-F-S Plug socket	Electrical connection to Festo standard with insulation displacement connection	83
20	KMF Connecting cable	–	kmf

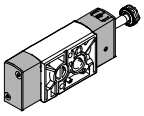
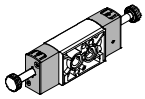
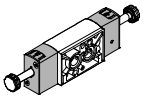
Solenoid valves VSNC

Key features and product range overview – VSNC-...-FN

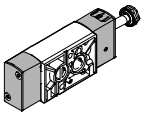
VSNC-F ... -FN



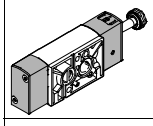
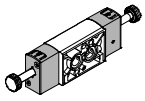
- Design of piston spool
- Valve cover cap material: Aluminium/metal
- Armature material: Stainless steel
- Pilot air (incoming air of armature tube), protected

Version	Type	Pneumatic connection 1, 3, 5	Pneumatic connection 2, 4, based on standard	Standard nominal flow rate [l/min]	➔ Page
3/2-way or 5/2-way valve -...-FN, convertible, single solenoid					
	VSNC-FC-M52-MD-G14-FN	G 1/4	VDI/VDE 3845 NAMUR	1250	46
	VSNC-FC-M52-MD-N14-FN	NPT 1/4-18			
	VSNC-FC-M52-MD-G14-FN-1A1-EX4-A	G 1/4			
	VSNC-FC-M52-MD-N14-FN-1A1-EX4-A	NPT 1/4-18			
	VSNC-FC-M52-MD-G14-GN-1A1+G	G 1/4			
	VSNC-FC-M52-MD-G14-FN-3AA1+G	G 1/4			
5/2-way valve -...-FN, double solenoid					
	VSNC-F-B52-D-G14-FN	G 1/4	VDI/VDE 3845 NAMUR	1350	51
	VSNC-F-B52-D-N14-FN	NPT 1/4-18			
	VSNC-F-B52-D-G14-FN-1A1-EX4-A	G 1/4			
	VSNC-F-B52-D-N14-FN-1A1-EX4-A	NPT 1/4-18			
5/3-way valve -...-FN					
	VSNC-F-P53C-MD-G14-FN	G 1/4	VDI/VDE 3845 NAMUR	1250	55
	VSNC-F-P53U-MD-G14-FN			950	
	VSNC-F-P53E-MD-G14-FN			1050	
	VSNC-F-P53C-MD-N14-FN	NPT 1/4-18		1250	
	VSNC-F-P53U-MD-N14-FN			950	
	VSNC-F-P53E-MD-N14-FN			1050	

VSNC-FT ... -FN

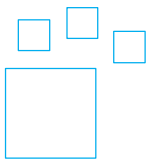


- Design of poppet seat
- Valve cover cap material: Aluminium/metal
- Armature material: Stainless steel
- Pilot air (incoming air of armature tube), protected

Version	Type	Pneumatic connection 1, 3, 5	Pneumatic connection 2, 4, based on standard	Standard nominal flow rate [l/min]	➔ Page
3/2-way or 5/2-way valve -...-FN, convertible, single solenoid					
	VSNC-FTC-M52-MD-G14-FN	G 1/4	VDI/VDE 3845 NAMUR	800	59
	VSNC-FTC-M52-MD-N14-FN	NPT 1/4-18			
	VSNC-FTC-M52-MD-G14-FN-1A1	G 1/4			
5/2-way valve -...-FN, double solenoid					
	VSNC-FT-B52-D-G14-FN	G 1/4	VDI/VDE 3845 NAMUR	1000	62
	VSNC-FT-B52-D-N14-FN	NPT 1/4-18			
	VSNC-FT-B52-D-G14-FN-1A1	G 1/4			

Key features and product range overview – VSNC-...-FN

Ordering data – Product options



Configurable product
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The configurator can be found at
➔ **www.festo.com/catalogue/...**

Part No.	Type
8026033	**VSNC**

Coils	IP 65			Ex-nA			Ex-ia	Ex-mb			AEx-m		
Valve function	24 V DC	120 V AC	230 V AC	24 V DC	120 V AC	230 V AC	24 ... 32 V DC	24 V DC	120 V AC	230 V AC	24 V DC	120 V AC	230 V AC
5/2-way and 3/2-way, single solenoid	■ Part no.	■	■	■	■	■	■	■	■	■	■	■	■
5/2-way, double solenoid	■ Part no.	■	■	■	■	■	■	■	■	■	■	■	■
5/3 G	■	■	■	■	■	■	■	■	■	■	■	■	■
5/3 B	■	■	■	■	■	■	■	■	■	■	■	■	■
5/3 E	■	■	■	■	■	■	■	■	■	■	■	■	■

■ = Can be combined using a modular system
Part no. = Can be ordered with part number as a fast seller

Intrinsically safe coils VACN-...-Ex4A

- Category II 2G II 2D
- Type of ignition protection Ex-ia
- IEC Ex certification
- ATEX certification

Non-sparking coils VACN-...-Ex2N

- Category II 3G II 3D
- Type of ignition protection nA
- ATEX certification

Encapsulated coils VACN-...-Ex4M

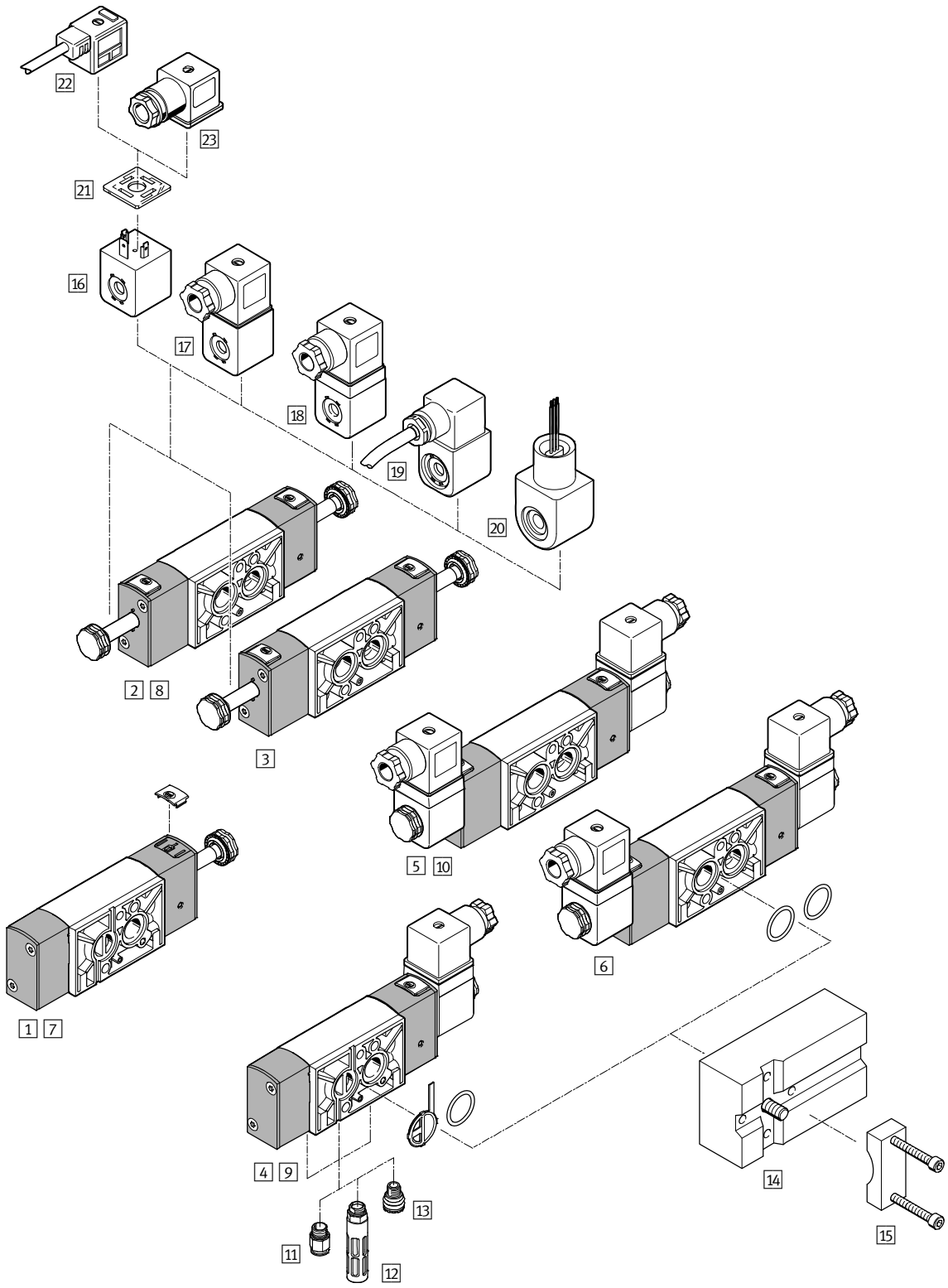
- Category II 2G II 2D
- Type of ignition protection Ex-m
- IEC Ex certification
- ATEX certification

Encapsulated coils with conduit, connection VACN-...-U4M

- Class I; Div I
- Type of ignition protection AEx-...-m
- FM approval

Solenoid valves VSNC

Peripherals overview – VSNC-F-...-FN



Peripherals overview – VSNC-F-...-FN

Mounting components and accessories

		Brief description	➔ Page/Internet
1	VSNC-F ...-FN Piston spool	3/2-way and 5/2-way single solenoid valve with converting seal, aluminium cover cap and stainless steel armature tube	46
2		5/2-way double solenoid valve with aluminium cover cap and stainless steel armature tube	51
3		5/3-way single solenoid valve, normally open, closed or exhausted, with aluminium cover cap and stainless steel armature tube	55
4		3/2-way and 5/2-way single solenoid valve with converting seal, aluminium cover cap and stainless steel armature tube and Ex ia solenoid coil	46
5		5/2-way double solenoid valve with aluminium cover cap and stainless steel armature tube and Ex ia solenoid coil	51
6		5/3-way single solenoid valve, normally open, closed or exhausted, with aluminium cover cap and stainless steel armature tube and Ex ia solenoid coil	55
7	VSNC-FT- ... -FN Poppet seat	3/2-way and 5/2-way single solenoid valve with converting seal, aluminium cover cap and stainless steel armature tube	59
8		5/2-way double solenoid valve with aluminium cover cap and stainless steel armature tube	62
9		3/2-way and 5/2-way single solenoid valve with converting seal, aluminium cover cap and stainless steel armature tube and 24 V DC solenoid coil	59
10		5/2-way double solenoid valve with aluminium cover cap, stainless steel armature tube and 24 V DC solenoid coil	62
11	QS Push-in fitting	For connecting tubing with standard outside diameter	83
12	U Silencer	–	83
13	VABD-D3-SN-G14 Exhaust protection	Exhaust protection to IP65. The spring chamber of the actuator is protected against the ingress of aggressive ambient air and water by the one-way flow control system	83
14	VABS-S7-S-G14 Connection kit	Mounting plate for attaching the valve to a NAMUR rib	82
15	VAME-S7-Y Mounting bracket	Alternative option (instead of screw) for attaching the valve to a NAMUR rib with the help of a mounting bracket	82
16	VACN-N Solenoid coil	Electrical connection to DIN EN 175301-803, type A	72
17	VACN-N- ... -Ex2-N Solenoid coil	Type of ignition protection nA = non-sparking, for use in zone 2	74
18	VACN-N- ... -Ex4-A Solenoid coil	Type of ignition protection iA = intrinsically safe, for use in zone 1	80
19	VACN-N- ... -Ex4-M Solenoid coil	Type of ignition protection m = encapsulated, for use in zone 1	78
20	VACN-N- ... -U4-M Solenoid coil	Type of ignition protection m = encapsulated, for use in Class I, Div I (American FM approval to NEC 500)	76
21	MC-LD Illuminating seal	Illuminating seal for displaying the switching status	83
22	KMC Connecting cable	–	73
23	MSSD-C Plug socket	Electrical connection to DIN EN 175301-803, type A	83

Solenoid valves VSNC

Type codes

VSNC – F – [ ] – [ ] – [ ] – [ ] – [ ] – [ ] – [ ] – [ ] – [ ]

Type	
VSNC	Solenoid valves

Type of directional control valve	
F	Flanged valve

Design principle	
	Piston spool
T	Poppet seat

Additional function	
	None
C	Convertible valve function

Valve function	
B52	5/2-way valve, double solenoid
M52	5/2-way valve, single solenoid
P53C	5/3-way valve, mid-position closed
P53E	5/3-way valve, mid-position exhausted
P53U	5/3-way valve, mid-position pressurised

Reset method for single solenoid valves	
	None
M	Mechanical spring

Manual override	
D	Non-detenting, detenting
H	Non-detenting, resetting
S	Covered

Pneumatic connection	
Q6	Push-in connector 6 mm
Q8	Push-in connector 8 mm
G14	G 1/4
N14	N 1/4
Q10	Push-in connector 10 mm
T14	Push-in connector 1/4
T38	Push-in connector 3/8
T516	Push-in connector 5/16

Venting	
	Without fitting
QN	With fitting
U1	Silencer with metal housing
U3	Silencer with polymer housing

Interface to valve pilot	
F8	With armature tube 8 mm long
FN	With armature tube 9 mm long

Type codes

	–		–		–		–		–		–	

Nominal operating voltage

	None
1A	24 V AC/50-60 Hz
3A	230 V AC/50-60 Hz
3W	230 V AC/240 V AC/50-60 Hz
16B	120 V AC/60 Hz and 110 V AC/50-60 Hz
1	24 V DC
5	12 V DC

Electrical connection

	None
A1	Connection pattern type A, to EN 175301
B2	Connection pattern type B, industry standard
C3	Cable, 3 m
K11	Cable with insulating conduit connection

Degree of protection for electrics

	Standard
S8	IP67

EU certification

	None
EX2	II 3GD
EX4	II 2GD

Approval

	None
U4	Class 1 Div 1 to NEC 500

Type of ignition protection

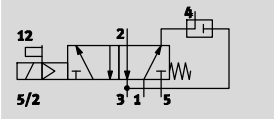
	None
A	Intrinsically safe
M	Encapsulation
N	Non-sparking

Electrical accessories, valve

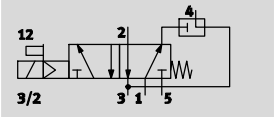
	None
G	Connector socket without LED

Technical data – 3/2-way or 5/2-way valve, convertible, single solenoid

Function[1)]
5/2-way valve

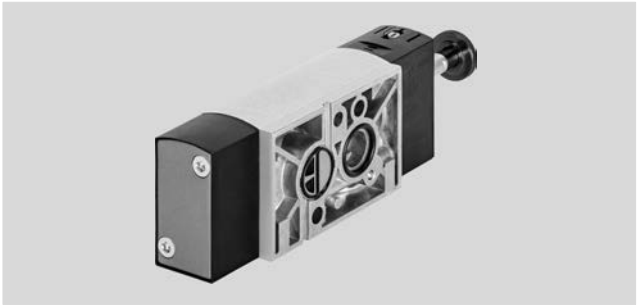


3/2-way valve
with exhaust return



1) Can be changed by exchanging the seal plate

- Voltage
  24 V DC
- Operating pressure
  2.5 ... 10 bar
- Temperature range
  –20 ... +60 °C



General technical data

			VSNC-FC- ... -G14-F8 VSNC-FC- ... -N14-F8	VSNC-FC- ... -G14-F8-1B2	VSNC-FC- ... -G14-F8-1A1
Valve function			3/2-way or 5/2-way, convertible		
Width		[mm]	32		
Design			Piston spool		
Sealing principle			Soft		
Type of pilot			Electrical		
Reset method			Mechanical spring		
Type of control			Piloted		
Manual override			Detenting, non-detenting		
Exhaust function			Flow control		
Vent connection			Not ducted		
Pilot air supply			Internal		
Type of mounting			With through-hole		
Mounting position			Any		
Max. tightening torque of valve mounting		[Nm]	3.5		–
Non-overlapping			Yes		
Standard nominal flow rate	1 → 2	[l/min]	1250		
	Exhaust air return 4 → 3	[l/min]	110		
b value			0.4		
C value		[l/sbar]	5.2		
Pneumatic connection	1, 3, 5		G 1/4, NPT 1/4	G 1/4	G 1/4
	2, 4		Port pattern to NAMUR		
Conforms to standard			VDI/VDE 3845 NAMUR		
Certificate issuing authority			DNVGL-TAA000011J		
Product weight		[g]	335	390	335

Technical data – 3/2-way or 5/2-way valve, convertible, single solenoid

Operating and environmental conditions				
		VSNC-FC- ... -G14-F8 VSNC-FC- ... -N14-F8	VSNC-FC- ... -G14-F8-1B2	VSNC-FC- ... -G14-F8-1A1
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)		
Operating pressure	[bar]	2.5 ... 10		
Ambient temperature	[°C]	–20 ... +60		
Temperature of medium	[°C]	–20 ... +60		
Corrosion resistance class CRC[1)]		2		
Certification		–		c UL us - Recognized (OL)
Maritime classification[2)]		See certificate		–

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
2) Additional information www.festo.com/sp ➔ Certificates.

Electrical data				
		VSNC-FC- ... -G14-F8 VSNC-FC- ... -N14-F8	VSNC-FC- ... -G14-F8-1B2	VSNC-FC- ... -G14-F8-1A1
Electrical connection		–	3-pin push-in connector, type B to industry standard (11 mm)	To EN 175301-803 type A
Coil characteristics, 24 V DC	[W]	See solenoid coil, to be ordered separately	3.3	2.6
Permissible voltage fluctuations	[%]	–	±10	±10
Duty cycle	[%]	–	100	100
Degree of protection		–	IP65, IP67	IP65, IP67 to IEC 60529 with socket
Switching time on	[ms]	11	11	11
Switching time off	[ms]	38	48	48

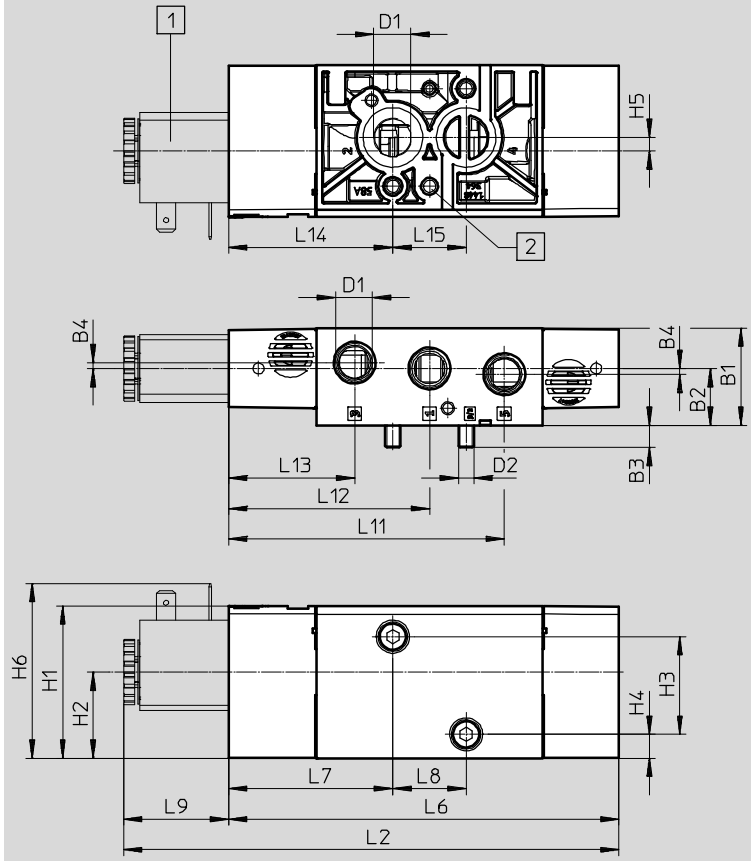
Materials		
1	Housing	Wrought aluminium alloy
2	Seals	NBR
	–	RoHS compliant

Solenoid valves VSNC

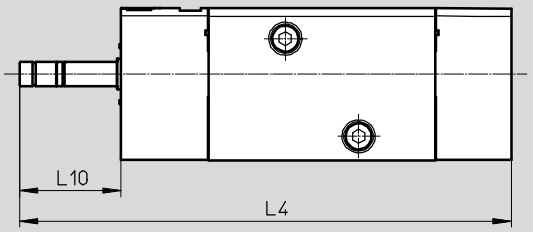
Technical data – 3/2-way or 5/2-way valve, convertible, single solenoid

Dimensions Download CAD data ➔ **www.festo.com**

VSNC-FC-M52-MD-...14-F8-1B2



VSNC-FC-M52-MD-...14-F8



1 Solenoid coil

2 ∅ 5.5 x 4 (for threaded pin DIN 913-M5x10-45H)

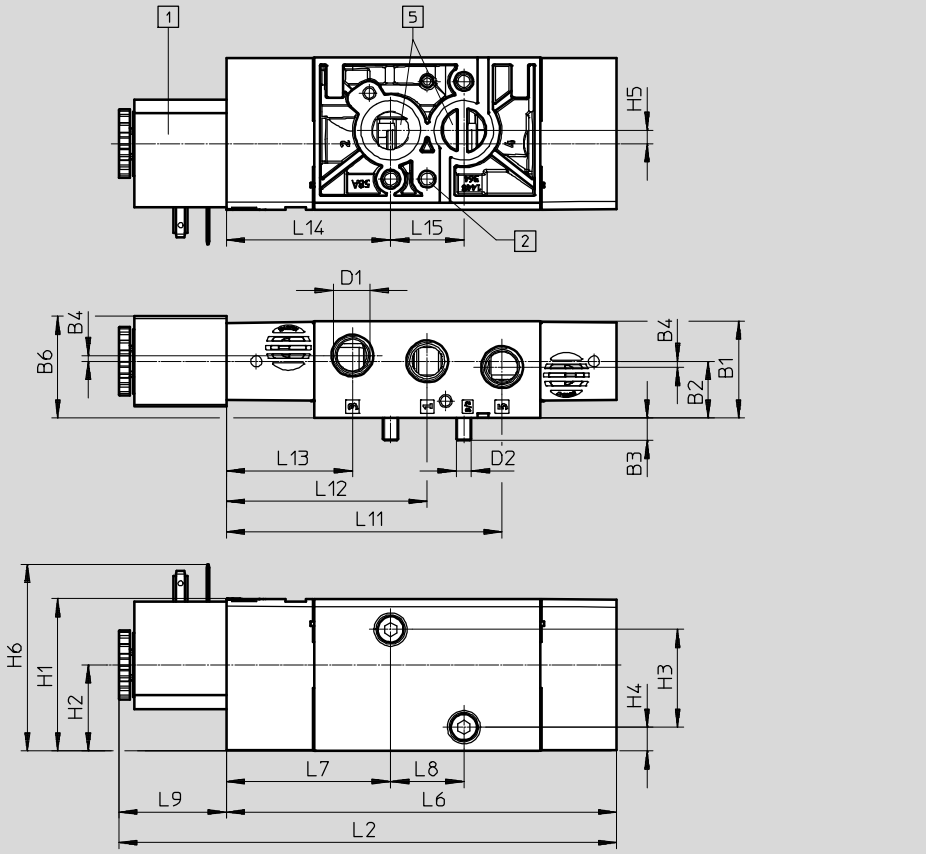
Type	B1	B2	B3	B4	D1	D2	H1	H2	H3	H4	H5	H6
VSNC-FC-M52-MD-G14-F8	31.8	18.6	7.3	1.9	G 1/4	M5	49.9	28.2	32	7.8	4.4	–
VSNC-FC-M52-MD-N14-F8					NPT 1/4-18							
VSNC-FC-M52-MD-G14-F8-1B2					G 1/4							57.2

Type	L2	L4	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15
VSNC-FC-M52-MD-G14-F8	162.2	161.1	127.8	53.8	24	34.4	33.3	90.3	65.8	41.3	53.8	24
VSNC-FC-M52-MD-N14-F8												
VSNC-FC-M52-MD-G14-F8-1B2												

Technical data – 3/2-way or 5/2-way valve, convertible, single solenoid

Dimensions Download CAD data ➔ **www.festo.com**

VSNC-FC-M52-MD-G14-F8-1A1



1 Solenoid coil
2 ∅ 5 x 4 to DIN 913-M5x10-45h
5 Working port 2 and 4, port pattern to NAMUR

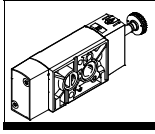
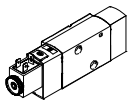
Type	B1	B2	B3	B4	B6	D1	D2	H1	H2	H3	H4	H5
VSNC-FC-M52-MD-G14-F8-1A1	31.8	18.6	7.3	1.9	33.3	G 1/4	M5	49.9	28.2	32	7.8	4.4

Type	H6	L2	L6	L7	L8	L9	L11	L12	L13	L14	L15
VSNC-FC-M52-MD-G14-F8-1A1	61.1	163	127.8	53.8	24	35.2	90.3	65.8	41.3	53.8	24

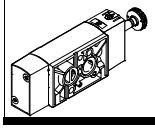
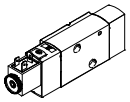
Technical data – 3/2-way or 5/2-way valve, convertible, single solenoid

★ Core product range

Ordering data – Valves

Directional control valve without solenoid coil			Directional control valve with 24 V DC solenoid coil, without socket		
	Part No.	Type		Part No.	Type
	★ 577257	VSNC-FC-M52-MD-G14-F8		★ 577295	VSNC-FC-M52-MD-G14-F8-1B2

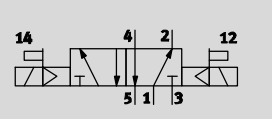
Ordering data – Valves

Directional control valve without solenoid coil			Directional control valve with 24 V DC solenoid coil, without socket		
	Part No.	Type		Part No.	Type
	577262	VSNC-FC-M52-MD-N14-F8		8074945	VSNC-FC-M52-MD-G14-F8-1A1

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Technical data – 5/2-way valve, double solenoid

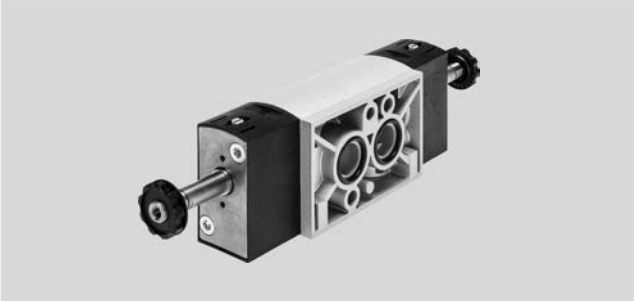
Function
5/2-way valve



Voltage
24 V DC

Operating pressure
1.5 ... 10 bar

Temperature range
–20 ... +60 °C



General technical data				
			VSNC-F-B52-D-G14-F8 VSNC-F-B52-D-N14-F8	VSNC-F-B52-D-G14-F8-1B2
Valve function			5/2-way, double solenoid	
Width		[mm]	32	
Nominal size DN		[mm]	7.2	
Design			Piston spool	
Sealing principle			Soft	
Type of actuation			Electrical	
Type of reset			–	
Type of actuation			Piloted	
Manual override			Detenting, non-detenting	
Type of mounting			With through-hole	
Mounting position			Any	
Max. tightening torque of valve mounting		[Nm]	3.2	
Non-overlapping			Yes	
Standard nominal flow rate	1 → 2	[l/min]	1200	
b value			0.4	
C value		[l/sbar]	5.6	
Pneumatic connection	1, 3, 5		G 1/4, NPT 1/4-18	
	2, 4		Port pattern to NAMUR	
Conforms to standard			VDI/VDE 3845 (NAMUR)	
Certificate issuing authority			DNVGL-TAA000011J	
Product weight		[g]	345	455

Technical data – 5/2-way valve, double solenoid

Operating and environmental conditions			
		VSNC-F-B52-D-G14-F8 VSNC-F-B52-D-N14-F8	VSNC-F-B52-D-G14-F8-1B2
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]	
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)	
Operating pressure	[bar]	1.5 ... 10	
Ambient temperature	[°C]	–20 ... +60	
Temperature of medium	[°C]	–20 ... +60	
Corrosion resistance class CRC[1)]		2	
Maritime classification[2)]		See certificate	

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

2) Additional information www.festo.com/sp ➔ Certificates.

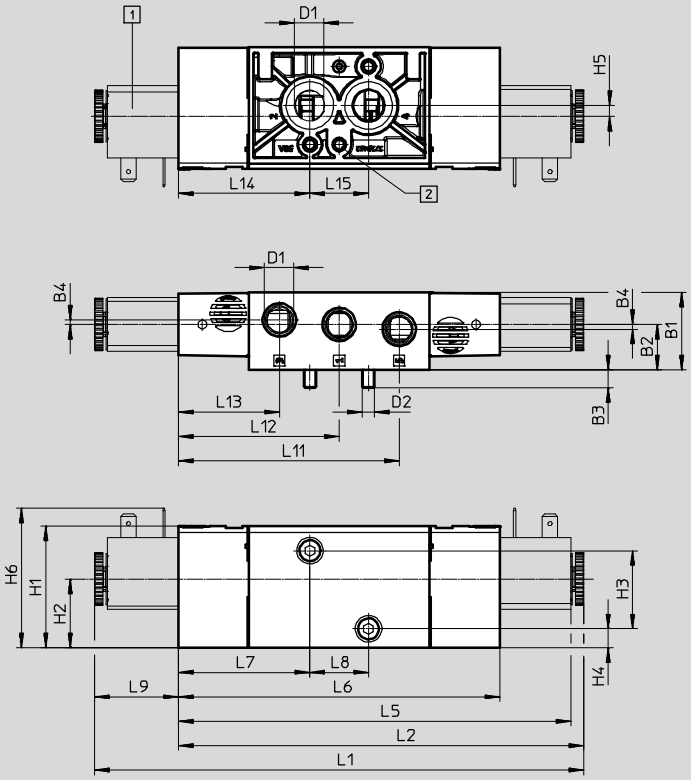
Electrical data			
		VSNC-F-B52-D-G14-F8 VSNC-F-B52-D-N14-F8	VSNC-F-B52-D-G14-F8-1B2
Electrical connection		–	3-pin push-in connector, to industry standard (11 mm), type B
Coil characteristics, 24 V DC	[W]	See solenoid coil, to be ordered separately	3.3
Permissible voltage fluctuations	[%]	–	±10
Degree of protection		–	IP65, IP67
Switching time on	[ms]	11	

Materials	
1 Housing	Wrought aluminium alloy
2 Seals	NBR
–	RoHS compliant

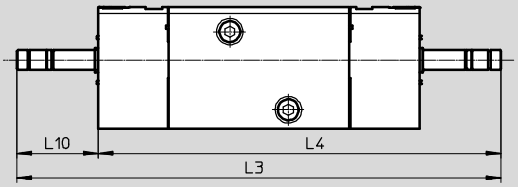
Technical data – 5/2-way valve, double solenoid

Dimensions Download CAD data ➔ **www.festo.com**

VSNC-F-B52-D-...14-F8-1B2



VSNC-F-B52-D-...14-F8



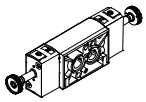
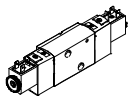
1 Solenoid coil

2 ∅ 5.5 x 4 (for threaded pin DIN 913-M5x10-45H)

Type	B1	B2	B3	B4	D1	D2	H1	H2	H3	H4	H5	H6	L1	L2
VSNC-F-B52-D-G14-F8	31.8	18.6	7.3	1.9	G 1/4	M5	49.9	28.2	32	7.8	4.4	–	–	–
VSNC-F-B52-D-N14-F8					NPT 1/4-18									
VSNC-F-B52-D-G14-F8-1B2					G 1/4							57.2	200.3	166

Type	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15
VSNC-F-B52-D-G14-F8	198.2	164.9	–	131.6	53.8	24	–	33.3	90.3	65.8	41.3	53.8	24
VSNC-F-B52-D-N14-F8													
VSNC-F-B52-D-G14-F8-1B2			160.6				34.4						

Ordering data – Valves

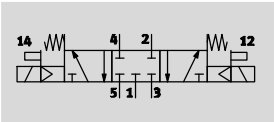
Directional control valve without solenoid coil			Directional control valve with solenoid coil		
	Part No.	Type		Part No.	Type
	**577258**	**VSNC-F-B52-D-G14-F8**		**577296**	**VSNC-F-B52-D-G14-F8-1B2**
	577263	**VSNC-F-B52-D-N14-F8**			

Solenoid valves VSNC

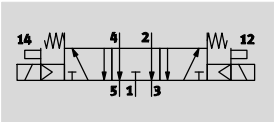
Technical data – 5/3-way valve

Function

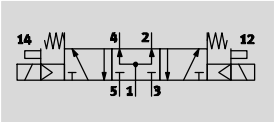
5/3-way valve, closed



5/3-way valve, exhausted

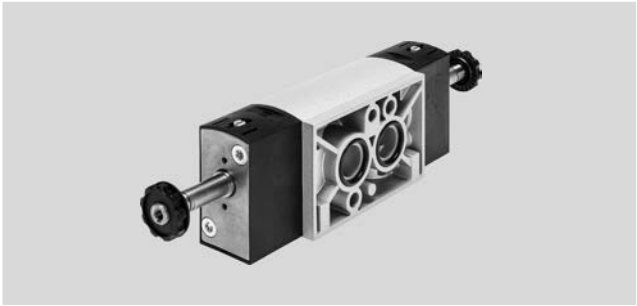


5/3-way valve, pressurised



Operating pressure
3 ... 10 bar

Temperature range
–20 ... +60 °C



General technical data

			VSNC-F-P53C-MD-G14-F8 VSNC-F-P53C-MD-N14-F8	VSNC-F-P53E-MD-G14-F8 VSNC-F-P53E-MD-N14-F8	VSNC-F-P53U-MD-G14-F8 VSNC-F-P53U-MD-N14-F8
Valve function			5/3-way, closed	5/3-way, exhausted	5/3-way, pressurised
Width		[mm]	32		
Nominal width		[mm]	7.2	6	6
Design			Piston spool		
Sealing principle			Soft		
Type of actuation			Electrical		
Reset method			Mechanical spring		
Type of control			Piloted		
Manual override			Non-detenting, non-detenting		
Type of mounting			With through-hole		
Mounting position			Any		
Max. tightening torque of valve mounting		[Nm]	3.5		
Non-overlapping			Yes		
Standard nominal flow rate	1 → 2	[l/min]	1200	800	800
b value			0.4	0.4	0.5
C value		[l/sbar]	5.2	4.4	2.1
Pneumatic connection	1, 3, 5		G 1/4, NPT 1/4-18		
	2, 4		Port pattern to NAMUR		
Conforms to standard			VDI/VDE 3845 (NAMUR)		
Certificate issuing authority			DNVGL-TAA000011J		
Product weight		[g]	345		

Technical data – 5/3-way valve

Operating and environmental conditions				
		VSNC-F-P53C-MD-G14-F8 VSNC-F-P53C-MD-N14-F8	VSNC-F-P53E-MD-G14-F8 VSNC-F-P53E-MD-N14-F8	VSNC-F-P53U-MD-G14-F8 VSNC-F-P53U-MD-N14-F8
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)		
Operating pressure	[bar]	3 ... 10		
Ambient temperature	[°C]	–20 ... +60		
Temperature of medium	[°C]	–20 ... +60		
Corrosion resistance class CRC[1)]		2		
Maritime classification[2)]		See certificate		

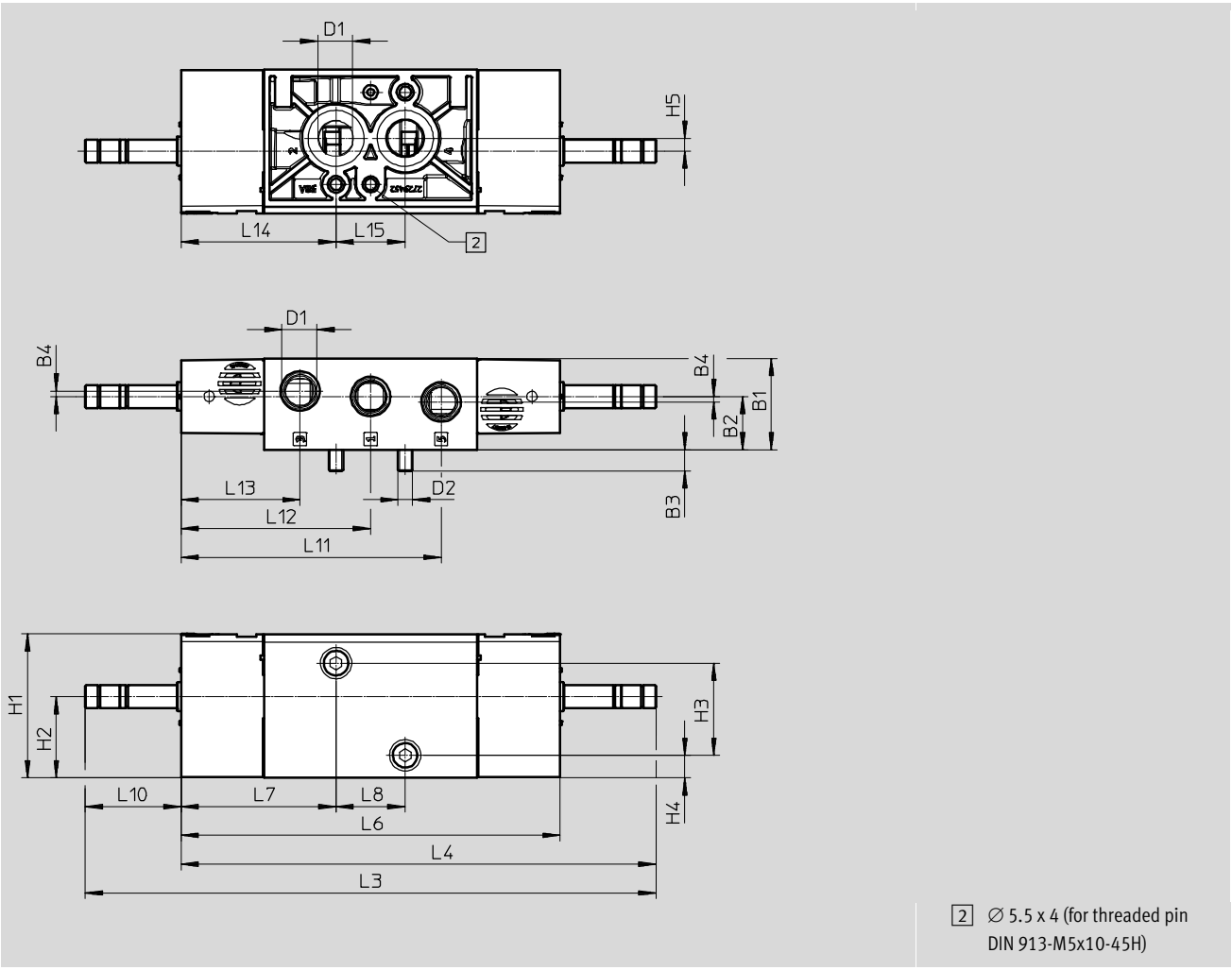
1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
2) Additional information www.festo.com/sp ➔ Certificates.

Electrical data				
		VSNC-F-P53C-MD-G14-F8 VSNC-F-P53C-MD-N14-F8	VSNC-F-P53E-MD-G14-F8 VSNC-F-P53E-MD-N14-F8	VSNC-F-P53U-MD-G14-F8 VSNC-F-P53U-MD-N14-F8
Coil characteristics		See solenoid coil, to be ordered separately		
Switching time on	[ms]	13	14	14
Switching time off	[ms]	42	48	48
Changeover time	[ms]	26	25	25

Materials		
1	Housing	Wrought aluminium alloy
2	Seals	NBR
–		RoHS compliant

Technical data – 5/3-way valve

Dimensions Download CAD data ➔ **www.festo.com**



2 ∅ 5.5 x 4 (for threaded pin DIN 913-M5x10-45H)

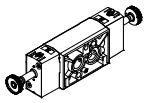
Type	B1	B2	B3	B4	D1	D2	H1	H2	H3	H4	H5
VSNC-F-P53C-MD-G14-F8	31.8	18.6	7.3	1.9	G 1/4	M5	49.9	28.2	32	7.8	4.4
VSNC-F-P53U-MD-G14-F8											
VSNC-F-P53E-MD-G14-F8											
VSNC-F-P53C-MD-N14-F8					NPT 1/4-18						
VSNC-F-P53U-MD-N14-F8											
VSNC-F-P53E-MD-N14-F8											

Type	L3	L4	L6	L7	L8	L10	L11	L12	L13	L14	L15
VSNC-F-P53C-MD-G14-F8	198.2	164.9	131.6	53.8	24	33.3	90.3	65.8	41.3	53.8	24
VSNC-F-P53U-MD-G14-F8											
VSNC-F-P53E-MD-G14-F8											
VSNC-F-P53C-MD-N14-F8											
VSNC-F-P53U-MD-N14-F8											
VSNC-F-P53E-MD-N14-F8											

Technical data – 5/3-way valve

Ordering data – Valves

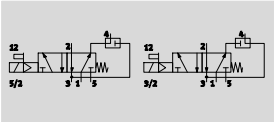
Directional control valve without solenoid coil

	Part No.	Type
	**577259**	**VSNC-F-P53C-MD-G14-F8**
	577260	**VSNC-F-P53U-MD-G14-F8**
	577261	**VSNC-F-P53E-MD-G14-F8**
	577264	**VSNC-F-P53C-MD-N14-F8**
	577265	**VSNC-F-P53U-MD-N14-F8**
	577266	**VSNC-F-P53E-MD-N14-F8**

Solenoid valves VSNC

Technical data – 3/2-way or 5/2-way ...-FN, convertible, single solenoid

Function
3/2-way or 5/2-way valve, convertible



Operating pressure
2.5 ... 8 bar

Temperature range
–20 ... +60 °C

General technical data

			VSNC- ... -G14-FN VSNC- ... -N14-FN	VSNC- ... -G14-FN-1A1-EX4-A VSNC- ... -N14-FN-1A1-EX4-A	VSNC- ... -G14-FN-1A1+G VSNC- ... -G14-FN-3AA1+G
Valve function			3/2-way or 5/2-way, convertible		
Width		[mm]	32		
Design			Piston spool		
Sealing principle			Soft		
Type of actuation			Electrical		
Reset method			Mechanical spring		
Type of control			Piloted		
Pilot air supply port			Internal		
Exhaust air function			With flow control		
Manual override			Detenting, non-detenting		
Type of mounting			With through-hole		
Connection for venting hole			Not ducted		
Mounting position			Any		
Non-overlapping			Yes		
Standard nominal flow rate	1 → 2	[l/min]	1250		
	Exhaust return 4 → 3	[l/min]	110		
b value			0.4		
C value		[l/sbar]	5.2		
Pneumatic connection	1, 3, 5		G 1/4, NPT 1/4		G 1/4
	2, 4		Port pattern to NAMUR		
Conforms to standard			VDI/VDE 3845 (NAMUR)		
Certificate issuing authority			DNVGL-TAA000011J		
Product weight		[g]	415		

Operating and environmental conditions

			VSNC- ... -G14-FN VSNC- ... -N14-FN	VSNC- ... -G14-FN-1A1-EX4-A VSNC- ... -N14-FN-1A1-EX4-A	VSNC- ... -G14-FN-1A1+G VSNC- ... -G14-FN-3AA1+G
Operating medium			Compressed air to ISO 8573-1:2010 [7:4:4]		
Note on operating/pilot medium			Lubricated operation possible (in which case lubricated operation will always be required)		
Operating pressure		[bar]	2.5 ... 8		
Ambient temperature		[°C]	–20 ... +60		
Temperature of medium		[°C]	–20 ... +60		
Corrosion resistance class CRC[1)]			2		
Maritime classification[2)]			See certificate		

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

2) Additional information www.festo.com/sp ➔ Certificates.

Technical data – 3/2-way or 5/2-way -...-FN, convertible, single solenoid

ATEX				
		VSNC- ... -G14-FN VSNC- ... -N14-FN	VSNC- ... -G14-FN-1A1-EX4-A VSNC- ... -N14-FN-1A1-EX4-A	VSNC- ... -G14-FN-1A1+G VSNC- ... -G14-FN-3AA1+G
ATEX category gas		–	II 2G	–
Type of ignition protection for gas		–	Ex ia IIC T6 Ga	–
ATEX category dust		–	II 2D	–
Type of ignition protection for dust		–	Ex t IIIC T80°C Db	–
Explosion protection certification outside the EU		–	EPL Db (IEC-EX)	–
		–	EPL Ga (IEC-EX)	–
Explosion-proof temperature	[°C]	–	-40 °C <= Ta <= +50 °C	–
Degree of protection		–	IP65	IP65
		–	IP67	IP67
		–		To IEC 60529, with socket
CE marking (see declaration of conformity)		As per EU Explosion Protection Directive (ATEX)		–

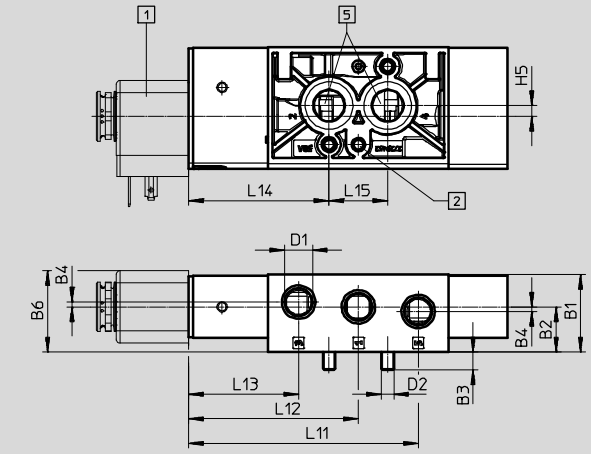
Electrical data				
		VSNC- ... -G14-FN VSNC- ... -N14-FN	VSNC- ... -G14-FN-1A1-EX4-A VSNC- ... -N14-FN-1A1-EX4-A	VSNC- ... -G14-FN-1A1+G VSNC- ... -G14-FN-3AA1+G
Electrical connection		–	Type A, to EN 175301-803	Type A, to EN 175301-803
Coil characteristics 24 V DC	[W]	See solenoid coil, to be ordered separately	–	0.7
Coil characteristics 230 V AC, 50/60 Hz				
Pick-up power rating	[VA]	–	–	6.2
Holding power	[VA]	–	–	3.7
Duty cycle	[%]	100		
Switching time on	[ms]	32	35	35
Switching time off	[ms]	92		
Permissible voltage fluctuations	[%]	–	± 10	± 10

Materials	
1 Housing	Wrought aluminium alloy
2 Seals	NBR
3 Screws	High-alloy stainless steel
–	RoHS compliant

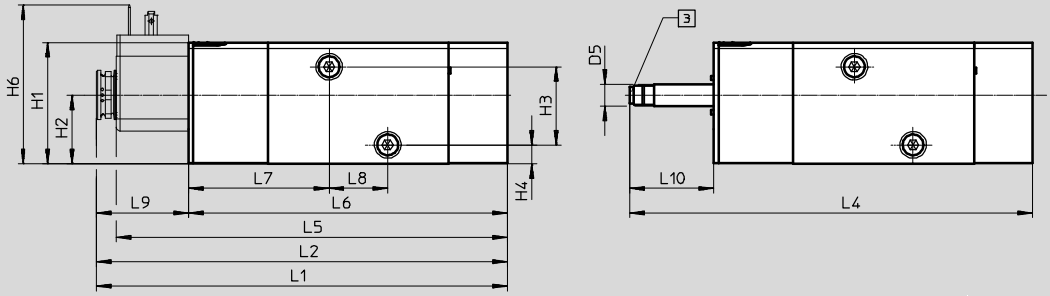
Technical data – 3/2-way or 5/2-way -...-FN, convertible, single solenoid

Dimensions Download CAD data ➔ **www.festo.com**

VSNC-FC-M52-MD-...14-FN-1A1-Ex4-A



VSNC-FC-M52-MD-...14-FN



1 Solenoid coil
2 ∅ 5x4 to DIN 913-M5x10-45h
3 Auxiliary pilot air exhaust port 82, M5
5 Working port 2 and 4, port pattern to NAMUR

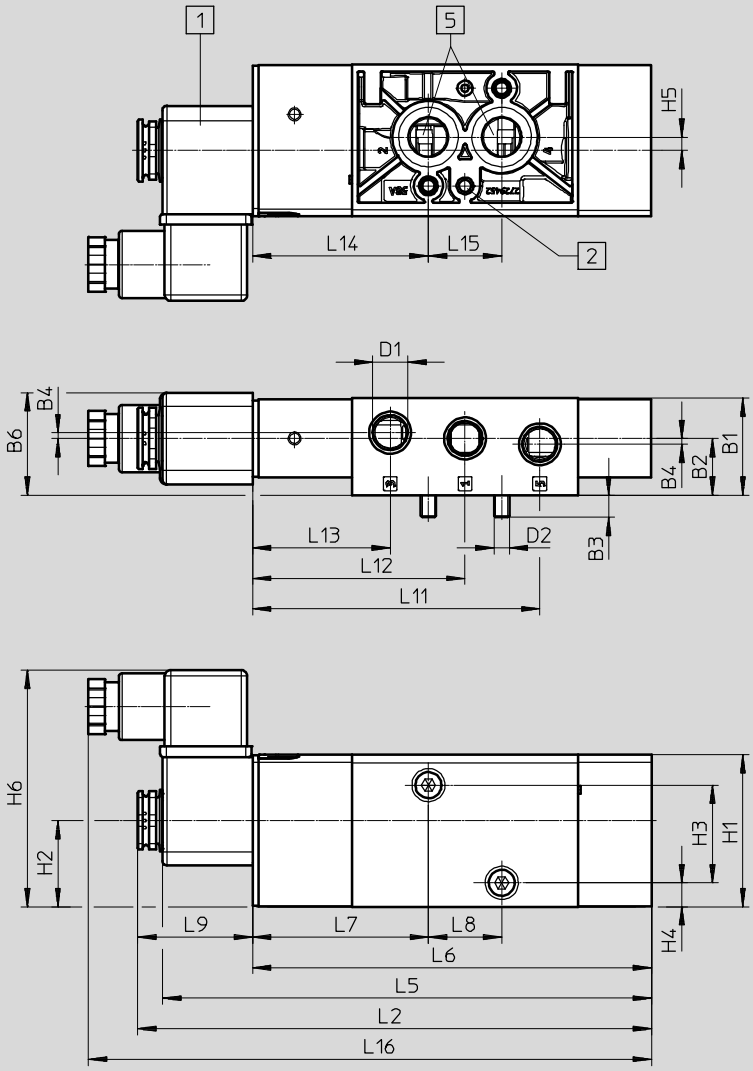
Type	B1	B2	B3	B4	B6	D1	D2	D5 ∅	H1	H2	H3	H4	H5	H6
VSNC-FC-M52-MD-G14-FN	31.8	18.6	7.3	1.9	33.4	G 1/4	M5	9	49.8	28.2	32	7.8	4.4	–
VSNC-FC-M52-MD-G14-FN-1A1-Ex4-A														65.1
VSNC-FC-M52-MD-N14-FN						NPT 1/4								–
VSNC-FC-M52-MD-N14-FN-1A1-Ex4-A														65.1

Type	L2	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15
VSNC-FC-M52-MD-G14-FN	–	165	–	130.6	57.6	24	–	34.4	94.1	69.6	45.1	57.6	24
VSNC-FC-M52-MD-G14-FN-1A1-Ex4-A	168.3		160.1				37.7						
VSNC-FC-M52-MD-N14-FN	–		–				–						
VSNC-FC-M52-MD-N14-FN-1A1-Ex4-A	168.3		160.1				37.7						

Technical data – 3/2-way or 5/2-way -...-FN, convertible, single solenoid

Dimensions Download CAD data ➔ **www.festo.com**

VSNC- ... -G14-FN- ... +G



1 Connector socket, M16
2 ∅ 5x4 to DIN 913-M5x10-45h
5 Working port 2 and 4, port pattern to NAMUR

Type	B1	B2	B3	B4	B6	D1	D2	H1	H2	H3	H4	H5	H6
VSNC-FC-M52-MD-G14-FN- ... +G	31.8	18.6	7.3	1.9	33.3	G 1/4	M5	49.8	28.2	32	7.8	4.4	77.5

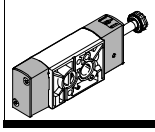
Type	L2	L5	L6	L7	L8	L9	L11	L12	L13	L14	L15	L16
VSNC-FC-M52-MD-G14-FN- ... +G	168.3	160.1	130.6	57.6	24	37.7	94.1	69.6	45.1	57.6	24	184.4

Technical data – 3/2-way or 5/2-way -...-FN, convertible, single solenoid

★ Core product range

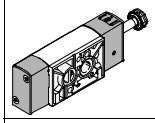
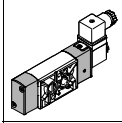
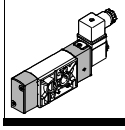
Ordering data – Valves

Directional control valve without solenoid coil

	Part No.	Type
	★ **577267**	**VSNC-FC-M52-MD-G14-FN**

Ordering data – Valves

Directional control valve without solenoid coil

	Part No.	Type
	**577272**	**VSNC-FC-M52-MD-N14-FN**
Directional control valve with solenoid coil and socket		
	**8078398**	**VSNC-FC-M52-MD-G14-FN-1A1+G**
	8078399	**VSNC-FC-M52-MD-G14-FN-3AA1+G**
Directional control valve with Ex i solenoid coil including socket		
	**577281**	**VSNC-FC-M52-MD-G14-FN-1A1-Ex4-A**
	577286	**VSNC-FC-M52-MD-N14-FN-1A1-Ex4-A**

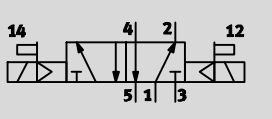
Festo core product range

★ Generally ready for shipping ex works in 24 hours

☆ Generally ready for shipping ex works in 5 days

Technical data – 5/2-way -...-FN, double solenoid

Function
5/2-way valve, double solenoid



Operating pressure
1.5 ... 8 bar

Temperature range
–20 ... +60 °C

General technical data

		VSNC-F-B52-D-G14-FN VSNC-F-B52-D-N14-FN	VSNC-F-B52-D-G14-FN-1A1-EX4-A VSNC-F-B52-D-N14-FN-1A1-EX4-A
Valve function		5/2-way, double solenoid	
Width	[mm]	32	
Design		Piston spool	
Sealing principle		Soft	
Type of actuation		Electrical	
Type of control		Piloted	
Pilot air supply port		Internal	
Exhaust air function		With flow control	
Manual override		Non-detenting, detenting	
Type of mounting		With through-hole	
Connection for venting hole		Not ducted	
Mounting position		Any	
Non-overlapping		Yes	
Standard nominal flow rate	[l/min]	1350	
b value		0.4	
C value	[l/sbar]	5.6	
Pneumatic connection 1, 3, 5		G 1/4, NPT 1/4-18	
Pneumatic connection 2, 4		Port pattern to NAMUR	
Conforms to standard		VDI/VDE 3845 (NAMUR)	
Certificate issuing authority		DNVGL-TAA000011J	
Product weight	[g]	461	

Operating and environmental conditions

		VSNC-F-B52-D-G14-FN VSNC-F-B52-D-N14-FN	VSNC-F-B52-D-G14-FN-1A1-EX4-A VSNC-F-B52-D-N14-FN-1A1-EX4-A
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]	
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)	
Operating pressure	[bar]	1.5 ... 8	
Ambient temperature	[°C]	–20 ... +60	
Temperature of medium	[°C]	–20 ... +60	
Corrosion resistance class CRC[1)]		2	
Maritime classification[2)]		See certificate	

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
2) Additional information www.festo.com/sp ➔ Certificates.

Technical data – 5/2-way -...-FN, double solenoid

ATEX			
		VSNC-F-B52-D-G14-FN VSNC-F-B52-D-N14-FN	VSNC-F-B52-D-G14-FN-1A1-Ex4-A VSNC-F-B52-D-N14-FN-1A1-Ex4-A
ATEX category gas		–	II 2G
Type of ignition protection for gas		–	Ex ia IIC T6 Ga
ATEX category dust		–	II 2D
Type of ignition protection for dust		–	Ex t IIIC T80°C Db
Explosion protection certification outside the EU		–	EPL Db (IEC-EX)
		–	EPL Ga (IEC-EX)
Explosion-proof temperature	[°C]	–	–40 °C <= Ta <= +50 °C
Degree of protection		–	IP65
		–	IP67
CE marking (see declaration of conformity)		As per EU Explosion Protection Directive (ATEX)	

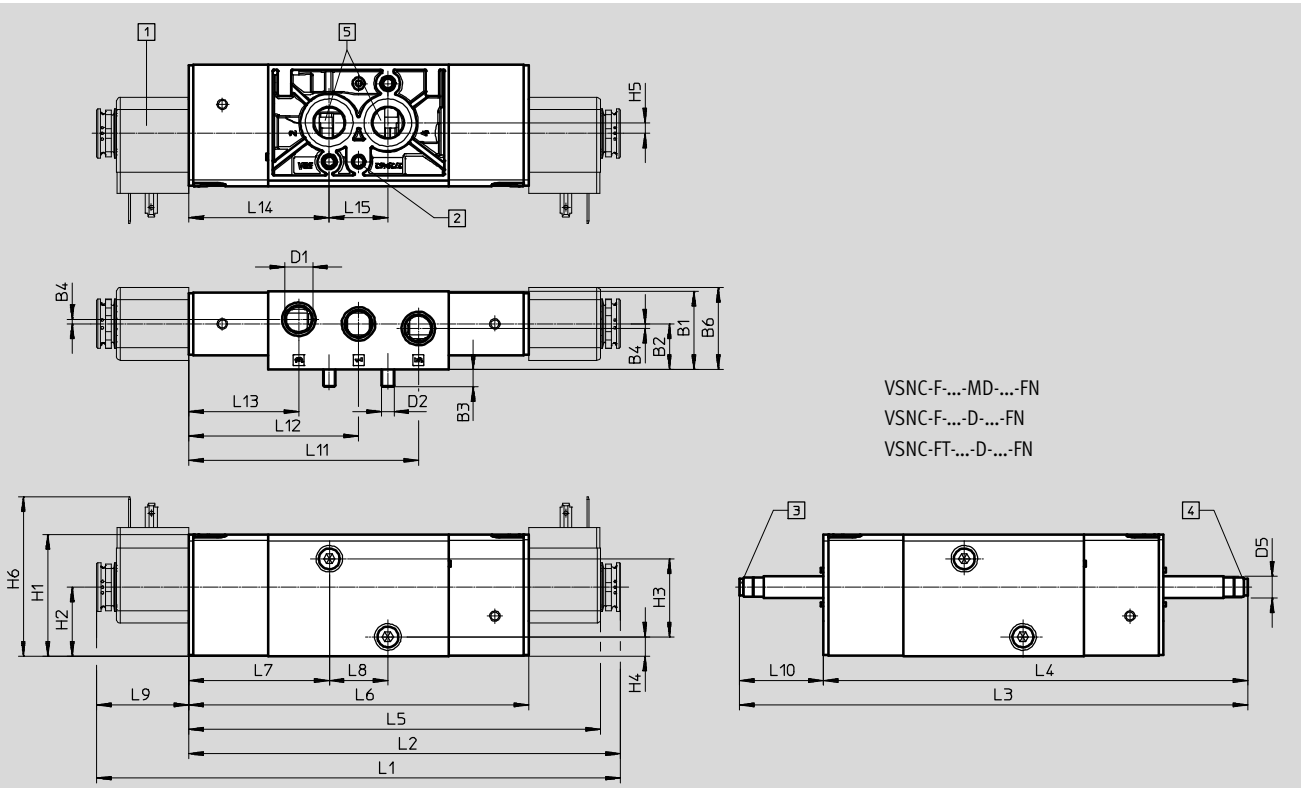
Electrical data			
		VSNC-F-B52-D-G14-FN VSNC-F-B52-D-N14-FN	VSNC-F-B52-D-G14-FN-1A1-Ex4-A VSNC-F-B52-D-N14-FN-1A1-Ex4-A
Electrical connection		–	Type A, to EN 175301-803
Coil characteristics		See solenoid coil, to be ordered separately	–
Changeover time	[ms]	20	
Permissible voltage fluctuations	[%]	–	± 10

Materials	
1 Housing	Wrought aluminium alloy
2 Seals	NBR
–	RoHS compliant

Technical data – 5/2-way -...-FN, double solenoid

Dimensions

Download CAD data ➔ **www.festo.com**



1 Solenoid coil
2 ∅ 5x4 to DIN 913-M5x10-45h
3 Auxiliary pilot air exhaust port 82, M5
4 Auxiliary pilot air exhaust port 82, M5
5 Working port 2 and 4, port pattern to NAMUR

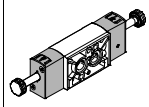
Type	B1	B2	B3	B4	B6	D1	D2	D5 ⌀	H1	H2	H3	H4	H5	H6	L1
VSNC-F-B52-D-G14-FN	31.8	18.6	7.3	1.9	33.4	G 1/4	M5	9	49.8	28.2	32	7.8	4.4	–	–
VSNC-F-B52-D-G14-FN-1A1-Ex4-A														65.1	214.5
VSNC-F-B52-D-N14-FN						NPT 1/4								–	–
VSNC-F-B52-D-N14-FN-1A1-Ex4-A														65.1	214.5

Type	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15
VSNC-F-B52-D-G14-FN	–	208	173.6	–	139.2	57.6	24	–	34.4	94.1	69.6	45.1	57.6	24
VSNC-F-B52-D-G14-FN-1A1-Ex4-A	176.9			168.7				37.7						
VSNC-F-B52-D-N14-FN	–			–				–						
VSNC-F-B52-D-N14-FN-1A1-Ex4-A	176.9			168.7				37.7						

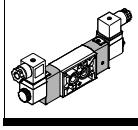
Technical data – 5/2-way -...-FN, double solenoid

Ordering data – Valves

Directional control valve without solenoid coil

	Part No.	Type
	**577268**	**VSNC-F-B52-D-G14-FN**
	577273	**VSNC-F-B52-D-N14-FN**

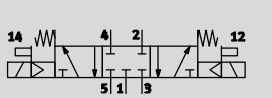
Directional control valve with Ex i solenoid coil including socket

	**577282**	**VSNC-F-B52-D-G14-FN-1A1-Ex4-A**
	577287	**VSNC-F-B52-D-N14-FN-1A1-Ex4-A**

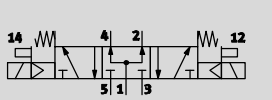
Technical data – 5/3-way -...-FN

Function

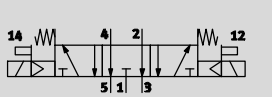
5/3-way valve, closed



5/3-way valve, exhausted

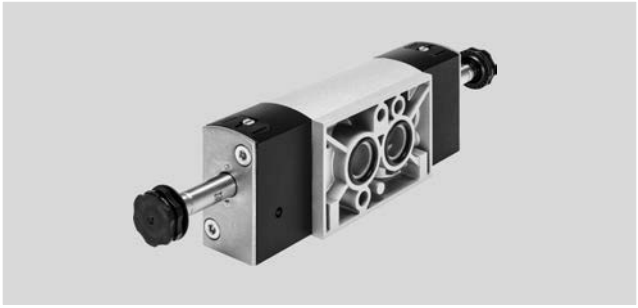


5/3-way valve, pressurised



Operating pressure
3 ... 8 bar

Temperature range
–20 ... +60 °C



General technical data

		VSNC-F-P53C-MD-G14-FN VSNC-F-P53C-MD-N14-FN	VSNC-F-P53U-MD-G14-FN VSNC-F-P53U-MD-N14-FN	VSNC-F-P53E-MD-G14-FN VSNC-F-P53E-MD-N14-FN
Valve function		5/3		
		Closed	Pressurised	Exhausted
Width	[mm]	32		
Design		Piston spool		
Sealing principle		Soft		
Type of actuation		Electrical		
Reset method		Mechanical spring		
Type of control		Piloted		
Pilot air supply port		Internal		
Exhaust air function		With flow control		
Manual override		Non-detenting, detenting		
Type of mounting		With through-hole		
Connection for venting hole		Not ducted		
Mounting position		Any		
Non-overlapping		Yes		
Standard nominal flow rate	[l/min]	1250	950	1050
b value		0.4	0.5	0.4
C value	[l/sbar]	5.2	2.1	4.4
Pneumatic connection	1, 3, 5	G 1/4, NPT 1/4-18		
	2, 4	Port pattern to NAMUR		
Conforms to standard		VDI/VDE 3845 (NAMUR)		
Certificate issuing authority		DNVGL-TAA000011J		
Product weight	[g]	461		

Technical data – 5/3-way -...-FN

Operating and environmental conditions

		VSNC-F-P53C-MD-G14-FN VSNC-F-P53C-MD-N14-FN	VSNC-F-P53U-MD-G14-FN VSNC-F-P53U-MD-N14-FN	VSNC-F-P53E-MD-G14-FN VSNC-F-P53E-MD-N14-FN
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)		
Operating pressure	[bar]	3 ... 8		
Ambient temperature	[°C]	–20 ... +60		
Temperature of medium	[°C]	–20 ... +60		
Corrosion resistance class CRC[1)]		2		
Maritime classification[2)]		See certificate		

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
2) Additional information www.festo.com/sp ➔ Certificates.

Electrical data

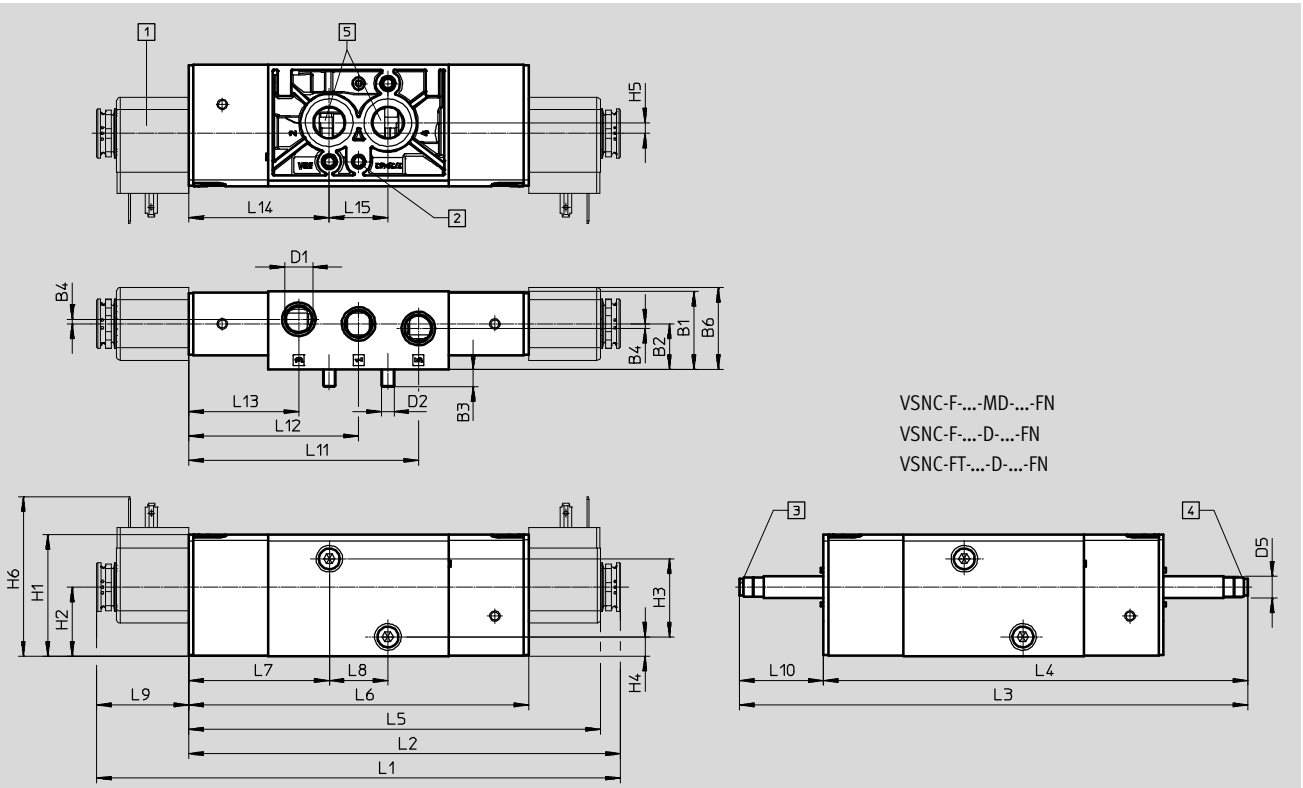
		VSNC-F-P53C-MD-G14-FN VSNC-F-P53C-MD-N14-FN	VSNC-F-P53U-MD-G14-FN VSNC-F-P53U-MD-N14-FN	VSNC-F-P53E-MD-G14-FN VSNC-F-P53E-MD-N14-FN
Coil characteristics		See solenoid coil, to be ordered separately		
Switching time on	[ms]	23		
Switching time off	[ms]	103		
Changeover time	[ms]	55		

Materials

1	Housing	Wrought aluminium alloy
2	Seals	NBR
–		RoHS compliant

Technical data – 5/3-way -...-FN

Dimensions Download CAD data ➔ **www.festo.com**



1 Solenoid coil
2 ∅ 5x4 to DIN 913-M5x10-45h
3 Auxiliary pilot air exhaust port 82, M5
4 Auxiliary pilot air exhaust port 82, M5
5 Working port 2 and 4, port pattern to NAMUR

Type	B1	B2	B3	B4	B6	D1	D2	D5 ∅	H1	H2	H3	H4	H5	H6	L1
VSNC-F-P53C-MD-G14-FN	31.8	18.6	7.3	1.9	33.4	G 1/4	M5	9	49.8	28.2	32	7.8	4.4	–	–
VSNC-F-P53U-MD-G14-FN															
VSNC-F-P53E-MD-G14-FN															
VSNC-F-P53C-MD-N14-FN						NPT 1/4									
VSNC-F-P53U-MD-N14-FN															
VSNC-F-P53E-MD-N14-FN															

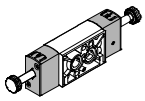
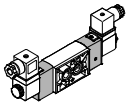
Type	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15
VSNC-F-P53C-MD-G14-FN	–	208	173.6	–	139.2	57.6	24	–	34.4	94.1	69.6	45.1	57.6	24
VSNC-F-P53U-MD-G14-FN														
VSNC-F-P53E-MD-G14-FN														
VSNC-F-P53C-MD-N14-FN														
VSNC-F-P53U-MD-N14-FN														
VSNC-F-P53E-MD-N14-FN														

Solenoid valves VSNC

Technical data – 5/3-way -...-FN

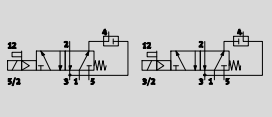
Ordering data – Valves

Directional control valve without solenoid coil

	Part No.	Type
	**577269**	**VSNC-F-P53C-MD-G14-FN**
	577270	**VSNC-F-P53U-MD-G14-FN**
	577271	**VSNC-F-P53E-MD-G14-FN**
Directional control valve with 24 V DC solenoid coil		
	**577274**	**VSNC-F-P53C-MD-N14-FN**
	577275	**VSNC-F-P53U-MD-N14-FN**
	577276	**VSNC-F-P53E-MD-N14-FN**

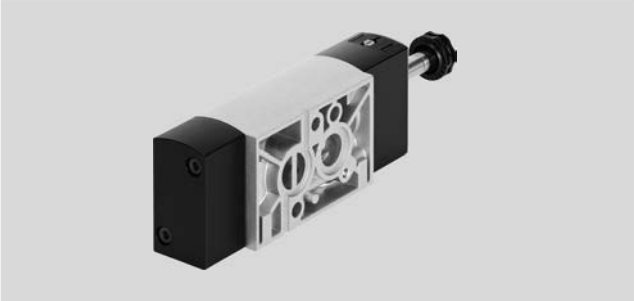
Technical data – 3/2-way or 5/2-way -...-FN poppet seat, convertible, single solenoid

Function
3/2-way or 5/2-way valve, convertible



Operating pressure
2.5 ... 8 bar

Temperature range
–20 ... +60 °C



General technical data			VSNC-FTC-M52-MD-G14-FN VSNC-FTC-M52-MD-N14-FN	VSNC-FTC-M52-MD-G14-FN-1A1
Valve function			3/2-way or 5/2-way, convertible	
Width		[mm]	32	
Design			Poppet seat	
Sealing principle			Soft	
Type of actuation			Electrical	
Reset method			Mechanical spring	
Type of control			Piloted	
Pilot air supply port			Internal	
Exhaust air function			With flow control	
Manual override			Non-detenting, detenting	
Type of mounting			With through-hole	
Connection for venting hole			Not ducted	
Mounting position			Any	
Non-overlapping			No	
Direction of flow			Non-reversible	
Standard nominal flow rate	1 ⇢ 2	[l/min]	800	
	Exhaust return 4 ⇢ 3	[l/min]	800	
b value			0.15	
C value		[l/sbar]	3.96	
Pneumatic connection	1, 3, 5		G 1/4	
	2, 4		Port pattern to NAMUR	
Conforms to standard			VDI/VDE 3845 (NAMUR)	
Certificate issuing authority			DNVGL-TAA000011J	
Degree of protection			–	IP65, IP67
Product weight		[g]	404	440

Technical data – 3/2-way or 5/2-way -...-FN poppet seat, convertible, single solenoid

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Operating pressure	[bar]	2.5 ... 8
Ambient temperature	[°C]	–20 ... 60
Temperature of medium	[°C]	–20 ... 60
Corrosion resistance class CRC[1)]		2
Maritime classification[2)]		See certificate

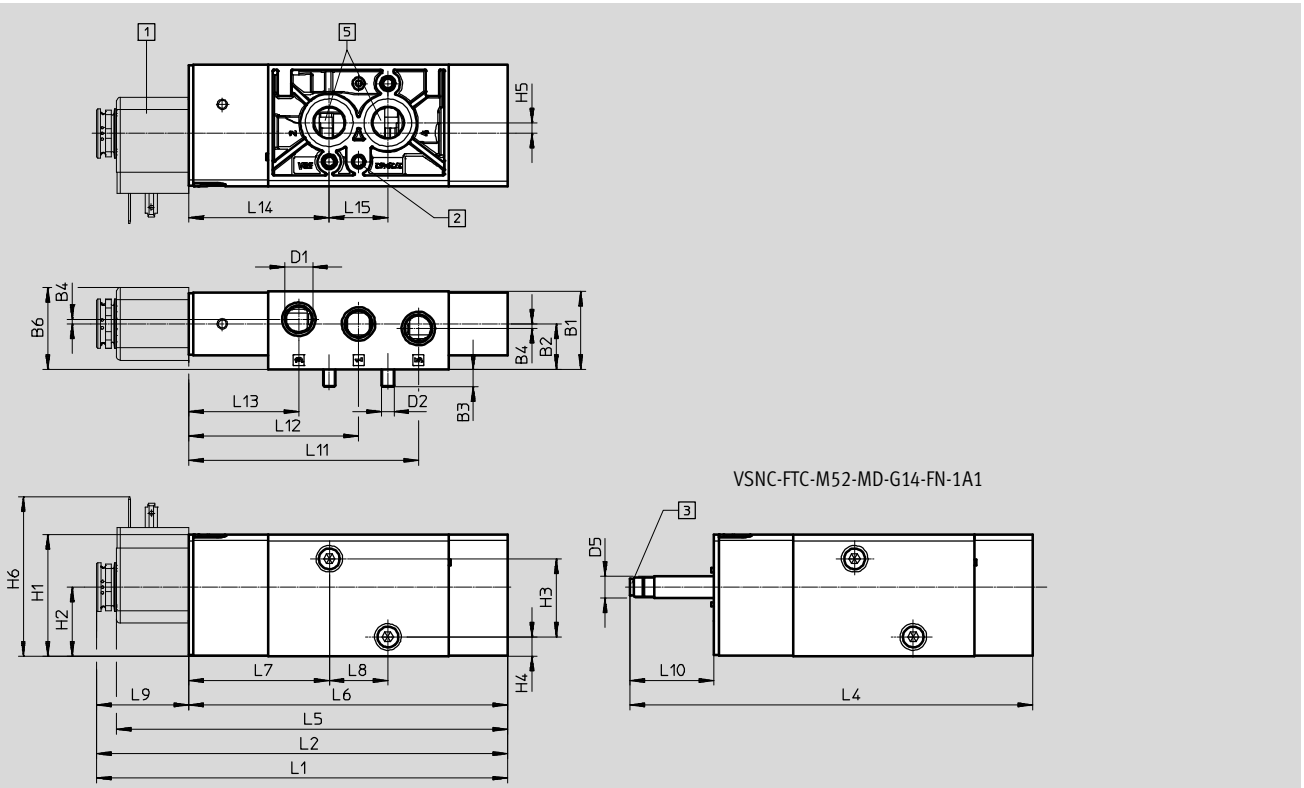
1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
2) Additional information www.festo.com/sp ➔ Certificates.

Electrical data			
		VSNC-FTC-M52-MD-G14-FN VSNC-FTC-M52-MD-N14-FN	VSNC-FTC-M52-MD-G14-FN-1A1
Electrical connection		–	Type A to EN 175301-803
Coil characteristics, 24 V DC	[W]	See solenoid coil, to be ordered separately	0.7
Switching time on	[ms]	16	16
Switching time off	[ms]	120	120
Permissible voltage fluctuations	[%]	–	±10

Materials		
1	Housing	Wrought aluminium alloy
2	Seals	NBR
	–	RoHS compliant

Technical data – 3/2-way or 5/2-way -...-FN poppet seat, convertible, single solenoid

Dimensions Download CAD data ➔ **www.festo.com**



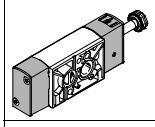
1 Solenoid coil
2 ∅ 5x4 to DIN 913-M5x10-45h
3 Auxiliary pilot air exhaust port 82, M5
5 Working port 2 and 4, port pattern to NAMUR

Type	B1	B2	B3	B4	B6	D1	D2	D5 ∅	H1	H2	H3	H4	H5	H6
VSNC-FTC-M52-MD-G14-FN	31.8	18.6	7.3	1.9	33.4	G 1/4	M5	9	49.8	28.2	32	7.8	4.4	–
VSNC-FTC-M52-MD-G14-FN-1A1														
VSNC-FTC-M52-MD-N14-FN-1A1						NPT 1/4								

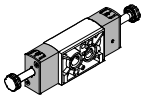
Type	L2	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15
VSNC-FTC-M52-MD-G14-FN	–	165	–	130.6	57.6	24	–	34.4	94.1	69.6	45.1	57.6	24
VSNC-FTC-M52-MD-G14-FN-1A1			–				–						
VSNC-FTC-M52-MD-N14-FN-1A1			160.1				37.7						

Ordering data – Valves

Directional control valve without solenoid coil

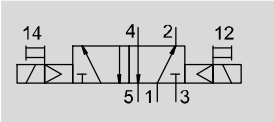
	Part No.	Type
	**577277**	**VSNC-FTC-M52-MD-G14-FN**
	577279	**VSNC-FTC-M52-MD-N14-FN**

Directional control valve with 24 V DC solenoid coil

	**577297**	**VSNC-FTC-M52-MD-G14-FN-1A1**

Technical data – 5/2-way, double solenoid

Function
3/2-way or 5/2-way valve, convertible



Operating pressure
1.5 ... 8 bar

Temperature range
–20 ... +60 °C

General technical data

			VSNC-FT-B52-D-G14-FN VSNC-FT-B52-D-N14-FN	VSNC-FT-B52-D-G14-FN-1A1
Valve function			5/2-way, double solenoid	
Width		[mm]	32	
Design			Poppet seat	
Sealing principle			Soft	
Type of actuation			Electrical	
Reset method			Mechanical spring	
Type of control			Piloted	
Pilot air supply port			Internal	
Exhaust air function			With flow control	
Manual override			Non-detenting, detenting	
Type of mounting			With through-hole	
Connection for venting hole			Not ducted	
Mounting position			Any	
Non-overlapping			No	
Direction of flow			Non-reversible	
Standard nominal flow rate		[l/min]	1000	
b value			0.24	
C value		[l/sbar]	4.6	
Pneumatic connection	1, 3, 5		G 1/4 or NPT 1/4-18	
	2, 4		Port pattern to NAMUR	
Conforms to standard			VDI/VDE 3845 (NAMUR)	
Certificate issuing authority			DNVGL-TAA000011J	
Degree of protection			–	IP65, IP67
Product weight		[g]	519	670

Technical data – 5/2-way, double solenoid

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Operating pressure	[bar]	1.5 ... 8
Ambient temperature	[°C]	–20 ... +60
Temperature of medium	[°C]	–20 ... +60
Corrosion resistance class CRC[1)]		2
Maritime classification[2)]		See certificate

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
2) Additional information www.festo.com/sp ➔ Certificates.

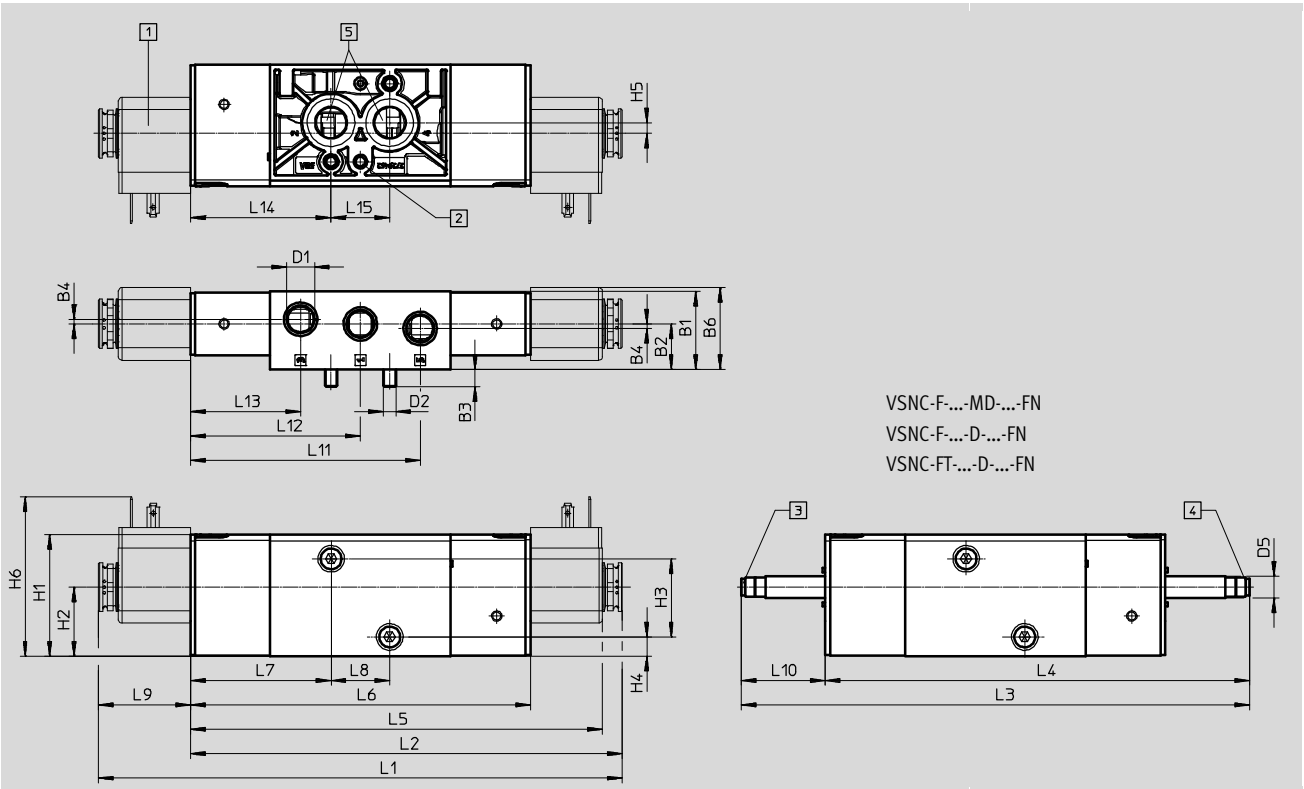
Electrical data			
		VSNC-FT-B52-D-G14-FN VSNC-FT-B52-D-N14-FN	VSNC-FT-B52-D-G14-FN-1A1
Electrical connection		–	Type A to EN 175301-803
Coil characteristics, 24 V DC	[W]	See solenoid coil, to be ordered separately	0.7
Changeover time	[ms]	16	16
Permissible voltage fluctuations	[%]	–	±10

Materials		
1	Housing	Wrought aluminium alloy
2	Seals	NBR
	–	RoHS compliant

Solenoid valves VSNC

Technical data – 5/2-way, double solenoid

Dimensions Download CAD data ➔ **www.festo.com**



1 Solenoid coil
2 ∅ 5x4 to DIN 913-M5x10-45h
3 Auxiliary pilot air exhaust port 82, M5
4 Auxiliary pilot air exhaust port 82, M5
5 Working port 2 and 4, port pattern to NAMUR

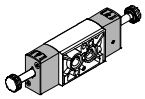
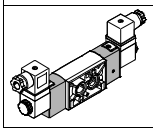
Type	B1	B2	B3	B4	B6	D1	D2	D5 ∅	H1	H2	H3	H4	H5	H6	L1
VSNC-F-P53C-MD-G14-FN	31.8	18.6	7.3	1.9	33.4	G 1/4	M5	9	49.8	28.2	32	7.8	4.4	–	–
VSNC-F-P53U-MD-G14-FN															
VSNC-F-P53E-MD-G14-FN															
VSNC-F-P53C-MD-N14-FN						NPT 1/4									
VSNC-F-P53U-MD-N14-FN															
VSNC-F-P53E-MD-N14-FN															

Type	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15
VSNC-F-P53C-MD-G14-FN	–	208	173.6	–	139.2	57.6	24	–	34.4	94.1	69.6	45.1	57.6	24
VSNC-F-P53U-MD-G14-FN														
VSNC-F-P53E-MD-G14-FN														
VSNC-F-P53C-MD-N14-FN														
VSNC-F-P53U-MD-N14-FN														
VSNC-F-P53E-MD-N14-FN														

Technical data – 5/2-way, double solenoid

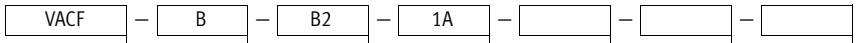
Ordering data – Valves

Directional control valve without solenoid coil

	Part No.	Type
	**577278**	**VSNC-FT-B52-D-G14-FN**
	577280	**VSNC-FT-B52-D-N14-FN**
Directional control valve with solenoid coil		
	**577298**	**VSNC-FT-B52-D-G14-FN-1A1**

Solenoid coils VACF

Type codes



Type	
VACF	Solenoid coil, F series

Solenoid coil type	
A	Width 30 mm, for 8 mm armature tube
B	Width 22 mm, for 8 mm armature tube

Electrical connection	
A1	Connection pattern type A, to EN 175301
B2	Connection pattern type B, to industry standard
C1	Connection pattern type C, to EN 175301
K1	Cable

Operating voltage	
5	12 V DC
1	24 V DC
7	48 V DC
1A	24 V AC, 50/60 Hz
7A	48 V AC, 50/60 Hz
16B	110/120 V AC, 50/60 Hz
3A	230 V AC, 50/60 Hz
3W	230/240 V AC, 50/60 Hz

Cable length	
–	None
1	12 V DC
5	24 V DC
20	24 V DC

ATEX certification EU	
–	None
EX4	ATEX category II 2GD

Type of ignition protection	
–	None
M	Moulded encapsulation

Technical data

- Voltage
  12 ... 48 V DC
  24 ... 240 V AC

- Temperature range
  –20 ... +50 °C

- In accordance with VDE regulation 0580, insulation class H
- Can be replaced without interrupting the pneumatic circuit

General technical data	
Type of mounting	Via knurled nut
Mounting position	Any (can be rotated in increments of 45° on the armature tube)

Materials	
Housing seal set	Aluminium, HNBR
Housing	PA, steel
Winding	Copper
Note on materials	RoHS compliant

Electrical data		
Electrical connection		Plug pins, 3-pin, with connection pattern to EN 175301-803, type A
Permissible voltage fluctuations	[%]	–10 / +10
Duty cycle	[%]	100
Degree of protection to EN 60529		IP65 with plug socket
Insulation class		H

Characteristic coil data								
Operating voltage		12 V DC	24 V DC	48 V DC	24 V AC	48 V AC	110/120 V AC	230/240 V AC
Power	[W]	2.8	2.6	2.8	–	–	–	–
Pick-up power, 50 Hz	[VA]	–	–	–	2.5	2.5	2.7	3.9
Holding power, 50 Hz	[VA]	–	–	–	1.7	1.7	1.9	2.8
Frequency	[Hz]	–	–	–	50/60	50/60	50/60	50/60

Operating and environmental conditions								
Operating voltage		12 V DC	24 V DC	48 V DC	24 V AC	48 V AC	110/120 V AC	230/240 V AC
Ambient temperature	[°C]	–20 ... +50					–20 ... +50	
Corrosion resistance class CRC[1]		2					2	
CE marking (see declaration of conformity)[2]		–					To EU Low Voltage Directive	
Certification		c UL us - Recognized (OL)		–	c UL us - Recognized (OL)	–	–	
Maritime classification[2]		See certificate					See certificate	
Certificate issuing authority		DNVGL-TAA000011J					DNVGL-TAA000011J	

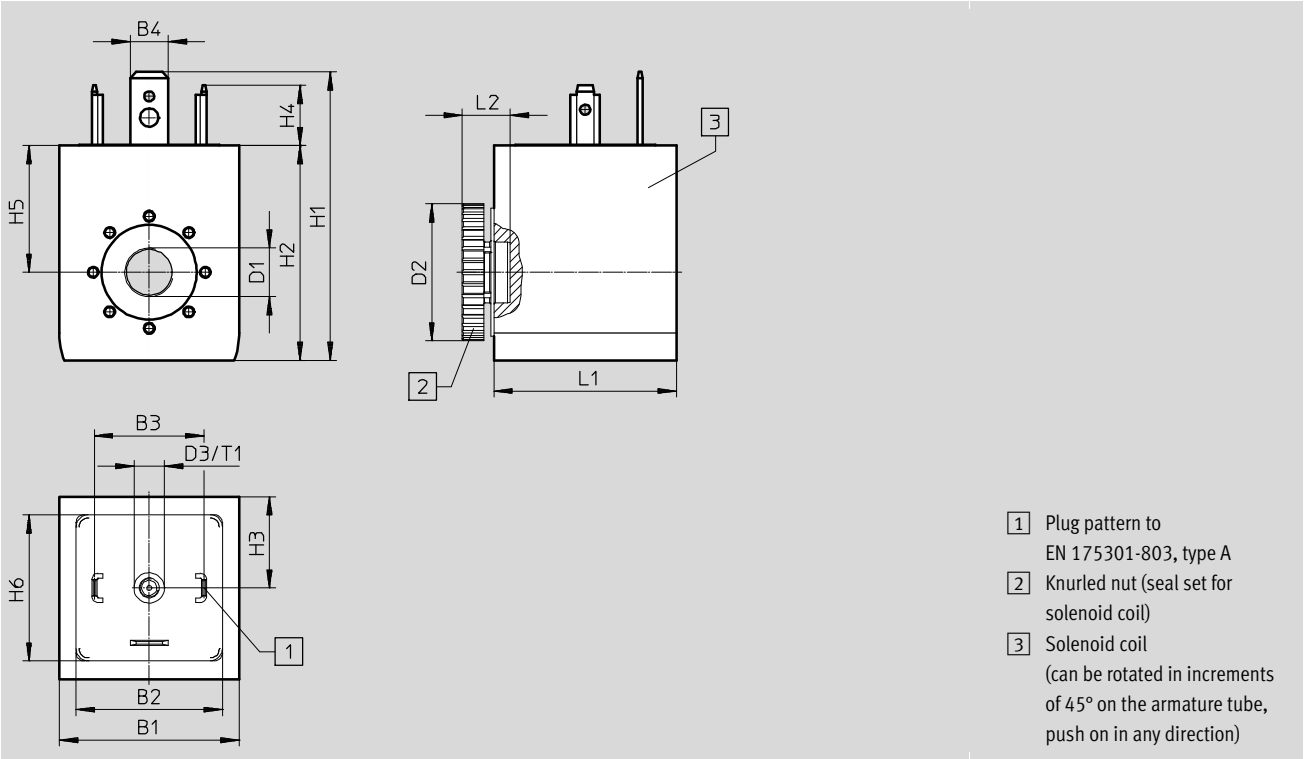
1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
2) Additional information www.festo.com/sp ➔ Certificates.

Solenoid coils VACF-A-A1

Technical data

★ Core product range

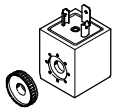
Dimensions Download CAD data ➔ **www.festo.com**



1 Plug pattern to EN 175301-803, type A
2 Knurled nut (seal set for solenoid coil)
3 Solenoid coil (can be rotated in increments of 45° on the armature tube, push on in any direction)

Type	B1	B2	B3	B4	D1	D2	D3	H1	H2	H3	H4	H5	H6	L1	L2	T1
VACF-A-A1-...	29.5	24	18	6.3	8.2	22.5	M3	47.4	35.3	15	9.9	20.8	24	30	7.9	5

Ordering data

	Description		Part No.	Type
Solenoid coil				
	Without plug socket, connection pattern to EN 175301-803, type A	12 V DC	**8030821**	**VACF-A-A1-5**
		24 V DC	★ **8030822**	**VACF-A-A1-1**
		48 V DC	**8030823**	**VACF-A-A1-7**
		24 V AC	**8030824**	**VACF-A-A1-1A**
		48 V AC	**8030825**	**VACF-A-A1-7A**
		110/120 V AC	**8030826**	**VACF-A-A1-16B**
		230/240 V AC	**8030828**	**VACF-A-A1-3W**
Seal set				
	To achieve degree of protection IP67	For solenoid coil VACF	**8034611**	**VAMC-B10-A-B-S8**

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Technical data

- Voltage
  12 ... 48 V DC
  24 ... 240 V AC

- Temperature range
  –10 ... +50 °C

- In accordance with VDE regulation 0580, insulation class H
- Can be replaced without interrupting the pneumatic circuit

General technical data	
Type of mounting	Via knurled nut
Mounting position	Any (can be rotated in increments of 45° on the armature tube)

Materials	
Housing seal set	Aluminium, HNBR
Housing	PA, steel
Winding	Copper
Note on materials	RoHS compliant

Electrical data		
Electrical connection		Plug pins, 3-pin, with connection pattern to industry standard, type B
Permissible voltage fluctuations	[%]	–10 / +10
Duty cycle	[%]	100
Degree of protection to EN 60529		IP65 with plug socket
Insulation class		H

Characteristic coil data								
Operating voltage		12 V DC	24 V DC	48 V DC	24 V AC	48 V AC	110/120 V AC	230/240 V AC
Power	[W]	3.4	3.3	3.4	–	–	–	–
Pick-up power, 50 Hz	[VA]	–	–	–	3.9	3.9	4.4	5.8
Holding power, 50 Hz	[VA]	–	–	–	2.6	2.7	3.3	4.6
Frequency	[Hz]	–	–	–	50/60	50/60	50/60	50/60
Surge resistance	[kV]	–	–	–	–	–	2.5	4

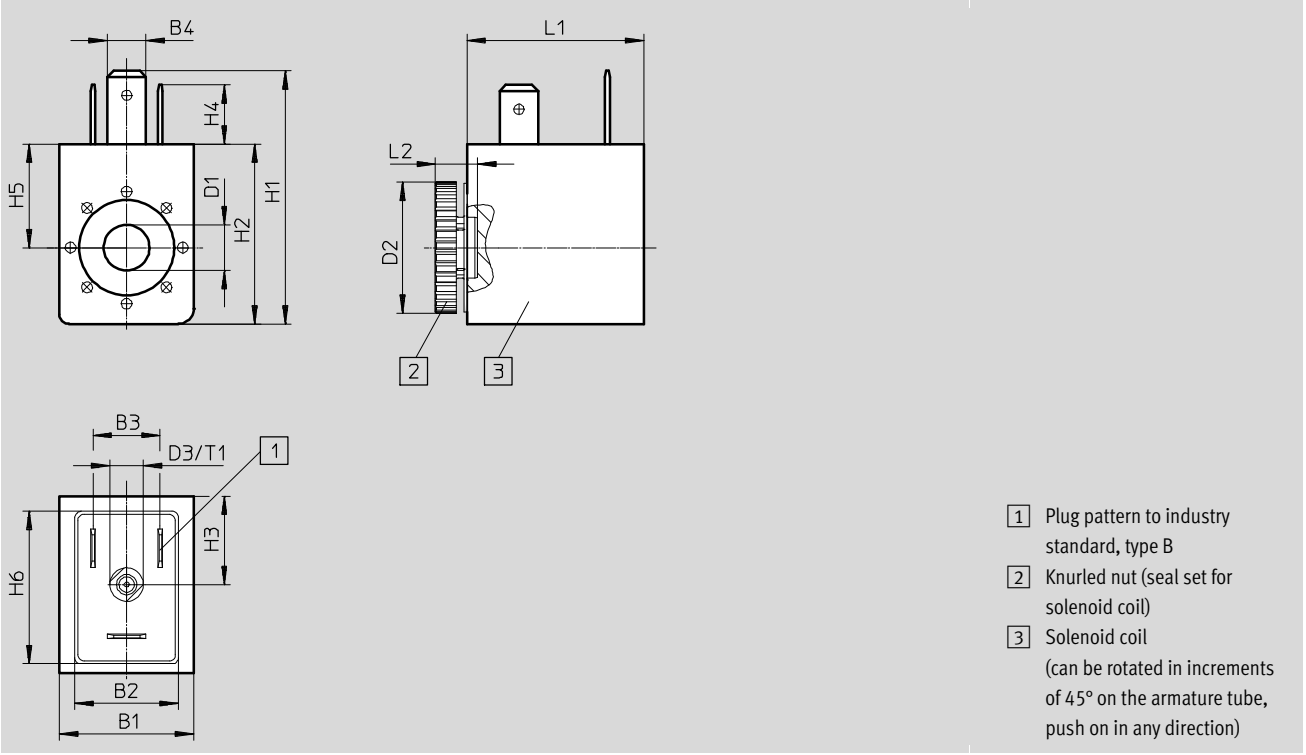
Operating and environmental conditions								
Operating voltage		12 V DC	24 V DC	48 V DC	24 V AC	48 V AC	110/120 V AC	230/240 V AC
Ambient temperature	[°C]	–20 ... +50					–20 ... +50	
Corrosion resistance class CRC[1]		2					2	
Degree of contamination		–					3	
CE marking (see declaration of conformity)[2]		–					To EU Low Voltage Directive	
Certification		c UL us - Recognized (OL)		–	c UL us - Recognized (OL)	–	–	
Maritime classification[2]		See certificate					See certificate	
Certificate issuing authority		DNVGL-TAA000011J					DNVGL-TAA000011J	

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
2) Additional information www.festo.com/sp ➔ Certificates.

Solenoid coils VACF-B-B2

Technical data

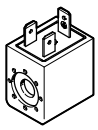
Dimensions Download CAD data ➔ **www.festo.com**



1 Plug pattern to industry standard, type B
2 Knurled nut (seal set for solenoid coil)
3 Solenoid coil (can be rotated in increments of 45° on the armature tube, push on in any direction)

Type	B1	B2	B3	B4	D1	D2	D3	H1	H2	H3	H4	H5	H6	L1	L2	T1
VACF-B-B2-...	22	17	11	6.3	8.2	21.5	M3	41.5	29.5	14.5	9.7	17	25	29	6.9	5

Ordering data

	Description		Part No.	Type
Solenoid coil				
	Without plug socket, connection pattern to industry standard, type B	12 V DC	**8030801**	**VACF-B-B2-5**
		24 V DC	**8030802**	**VACF-B-B2-1**
		48 V DC	**8030803**	**VACF-B-B2-7**
		24 V AC	**8030804**	**VACF-B-B2-1A**
		48 V AC	**8030805**	**VACF-B-B2-7A**
		110/120 V AC	**8030806**	**VACF-B-B2-16B**
		230/240 V AC	**8030808**	**VACF-B-B2-3W**
Seal set				
	To achieve degree of protection IP67		**8034609**	**VAMC-B10-B-B-S8**

Type codes

VACN – N – K11 – 16B – 0,5 – [ ] – U4 – M

Type	
VACN	Solenoid coil, N series

Solenoid coil type	
N	N solenoid coil, for 9 mm armature tube

Electrical connection	
A1	Connection pattern type A, to EN 175301
K1	With 3 m cable
K11	With 0.6 m cable

Operating voltage	
1	24 V DC
3A	230 V AC, 50/60 Hz
16B	120 V AC or 110 V AC

Cable length	
–	3 m
0,5	0.6 m

ATEX certification EU	
–	Without certification
EX2	ATEX category II 3D
EX4	ATEX category II 2D

Additional certifications	
–	Without certification
U4	Explosion protection certification for USA

Type of ignition protection	
–	None
A	Intrinsically safe
M	Encapsulation
N	Non-sparking

Solenoid coils VACN-N

Technical data

- Voltage
  24 V DC
  110, 230 V AC

- Temperature range
  –20 ... +60 °C

- Can be replaced without interrupting the pneumatic circuit

General technical data		
Type of mounting		Via knurled nut
Mounting position		Any (can be rotated in increments of 45° on the armature tube)
Product weight	[g]	95

Materials	
Housing	Steel, polymer
Winding	Copper
Pin contacts	Brass
Note on materials	RoHS compliant

Electrical data		
Electrical connection		Plug pins, 3-pin, with connection pattern to EN 175301-803, type A
Permissible voltage fluctuations	[%]	–10 / +10
Duty cycle	[%]	100
Insulation class		F
Enamelled wire insulation class		F
Degree of protection to EN 60529		IP65 with plug socket

Characteristic coil data						
Nominal operating voltage	[V]	24 DC	110 AC		230 AC	
Frequency	[Hz]	–	50	60	50	60
Power	[W]	0.7	–	–	–	–
Pick-up power	[VA]	–	5.2	4.2	6.2	4.9
Holding power	[VA]	–	3.1	2.5	3.7	2.9
Surge resistance	[kV]	–	2.5		4	

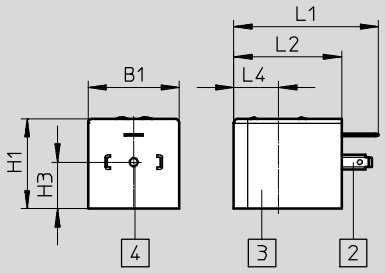
Operating and environmental conditions				
Nominal operating voltage	[V]	24 DC	110 AC	230 AC
Ambient temperature	[°C]	–20 ... +60	–20 ... +60	
Corrosion resistance class CRC[1)]		2	2	
Degree of contamination		–	3	
CE marking (see declaration of conformity)[2)]		–	To EU Low Voltage Directive	
Maritime classification[2)]		See certificate		
Certificate issuing authority		DNVGL-TAA000011J		

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
2) Additional information www.festo.com/sp ➔ Certificates.

Technical data

★ Core product range

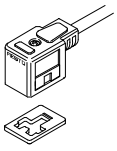
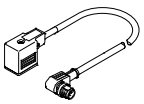
Dimensions Download CAD data ➔ **www.festo.com**



2 Plug pattern to EN 175301-803, type A
3 Solenoid coil
4 Mounting screw M3

Type	B1	H1	H3	L1	L2	L4
VACN-N-A1-...	30	29.5	15.3	47.6	35.5	14.7

Ordering data

	Description		Part No.	Type
Solenoid coil				
	Without plug socket, connection pattern to EN 175301-803, type A	24 V DC	★ **8029144**	**VACN-N-A1-1**
		110 V AC	**8029134**	**VACN-N-A1-16B**
		230 V AC	**8029135**	**VACN-N-A1-3A**
Plug socket				
	Operating voltage 230 V DC/V AC	Cable fitting Pg9	**34583**	**MSSD-C**
		Cable fitting M16	**539709**	**MSSD-C-M16**
	Operating voltage 24 V DC, signal status display with LED	Cable fitting Pg11	**177617**	**MSSD-C-TY-24DC**
Connecting cable				
	Operating voltage 24 V DC, signal status display with LED	Cable length 0.6 m	**3679776**	**NEBV-A1W3F-P-K-0.6-N-LE3**
		Cable length 2.5 m	**30931**	**KMC-1-24DC-2,5-LED**
		Cable length 5 m	**30933**	**KMC-1-24DC-5-LED**
		Cable length 10 m	**193459**	**KMC-1-24-10-LED**
	Operating voltage 230 V DC/V AC	Cable length 0.6 m	**3579466**	**NEBV-A1W3-K-0.6-N-LE3**
		Cable length 2.5 m	**30932**	**KMC-1-230AC-2,5**
		Cable length 5 m	**30934**	**KMC-1-230AC-5**
	Electrical connection 2, M12x1, A-coded Operating voltage 24 V DC, signal status display with LED	Cable length 0.3 m	**3679771**	**NEBV-A1W3F-P-K-0.3-N-M12W3**
		Cable length 0.6 m	**3679772**	**NEBV-A1W3F-P-K-0.6-N-M12W3**
	Electrical connection 2, M12x1, A-coded Operating voltage 230 V DC/V AC	Cable length 0.3 m	**3579461**	**NEBV-A1W3-K-0.3-N-M12W3**
		Cable length 0.6 m	**3579462**	**NEBV-A1W3-K-0.6-N-M12W3**
Illuminating seal				
	Operating voltage 24 V DC		**19145**	**MC-LD-12-24DC**
	Operating voltage 230 V DC/V AC		**19146**	**MC-LD-230AC**

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Solenoid coils VACN-N-...-EX2-N

Technical data

- Non-sparking solenoid coil
- Category "II 3G" and "II 3D"
- Type of ignition protection for gas "Ex nA"
- ATEX certification
- Can be replaced without interrupting the pneumatic circuit

General technical data		
Type of mounting		Via knurled nut
Mounting position		Any (can be rotated in increments of 45° on the armature tube)
Product weight	[g]	95

Materials	
Housing	Steel, polymer
Winding	Copper
Pin contacts	Brass
Note on materials	RoHS compliant

Electrical data		
Electrical connection		Plug pins, 3-pin, with connection pattern to EN 175301-803, type A
Permissible voltage fluctuations	[%]	–10 / +10
Duty cycle	[%]	100
Insulation class		F
Enamelled wire insulation class		H
Degree of protection to EN 60529		IP65 with plug socket

Characteristic coil data						
Nominal operating voltage	[V]	24 DC	110 AC		230 AC	
Frequency	[Hz]	–	50	60	50	60
Power	[W]	2.1	–	–	–	–
Pick-up power	[VA]	–	6.9	5.4	6.9	5.4
Holding power	[VA]	–	4.1	3.2	4.1	3.3

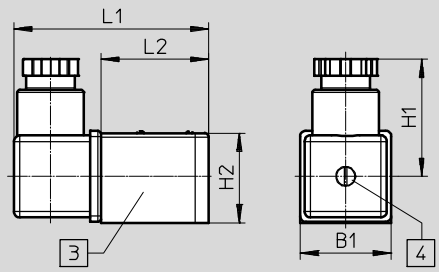
Operating and environmental conditions		
Ambient temperature	[°C]	–20 ... +60
Corrosion resistance class CRC[1)]		2
CE marking (see declaration of conformity)[2)]		To EU Explosion Protection Directive (ATEX)
Maritime classification[2)]		See certificate
Certificate issuing authority		DNVGL-TAA000011J

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
2) Additional information www.festo.com/sp ➔ Certificates.

Technical data

ATEX	
ATEX category for gas	II 3G
Type of ignition protection for gas	Ex nA IIC T5/T4 X Gc
ATEX category for dust	II 3D
Type of ignition protection for dust	Ex tc IIIC T95°C/T105°C X Dc
Explosion ambient temperature [°C]	−20 ≤ Ta ≤ +60

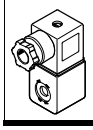
Dimensions Download CAD data ➔ **www.festo.com**



3 Solenoid coil
4 Mounting screw M3

Type	B1	H1	H2	L1	L2
VACN-N-A1-...-EX2-N	30	38.5	29.5	64	35.5

Ordering data

	Description		Part No.	Type
	With plug socket included in delivery, connection pattern to EN 175301-803, type A	24 V DC	**8029136**	**VACN-N-A1-1-EX2-N**
		110 V AC	**8029137**	**VACN-N-A1-16B-EX2-N**
		230 V AC	**8029138**	**VACN-N-A1-3A-EX2-N**

Solenoid coils VACN-N-...-U4-M

Technical data

FM APPROVED

- Encapsulated solenoid coil with insulating conduit connection
- Explosion protection certification "Class I", "Class II" and "Class III"
- FM certification
- Can be replaced without interrupting the pneumatic circuit

General technical data		
Type of mounting		Via knurled nut
Mounting position		Any (can be rotated in increments of 45° on the armature tube)
Product weight	[g]	207

Materials	
Housing	Steel, polymer
Winding	Copper
Note on materials	Contains paint-wetting impairment substances
	RoHS compliant

Electrical data		
Electrical connection		Cable
Cable length	[m]	0.61
Permissible voltage fluctuations	[%]	–10 / +10
Duty cycle	[%]	100
Insulation class		H
Enamelled wire insulation class		H
Degree of protection to EN 60529		IP65

Characteristic coil data				
Nominal operating voltage	[V]	24 DC	110 AC	230 AC
Frequency	[Hz]	–	60	50
Power	[W]	4.6	–	–
Pick-up power	[VA]	–	10	11.5
Holding power	[VA]	–	6.8	8

Operating and environmental conditions				
Nominal operating voltage		24 V DC	110 V AC	230 V AC
Ambient temperature	[°C]	–20 ... +60	–20 ... +60	
Corrosion resistance class CRC[1)]		2	2	
CE marking (see declaration of conformity)[2)]		–	To EU Low Voltage Directive	
Maritime classification[2)]		See certificate		
Certificate issuing authority		DNVGL-TAA000011J		

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

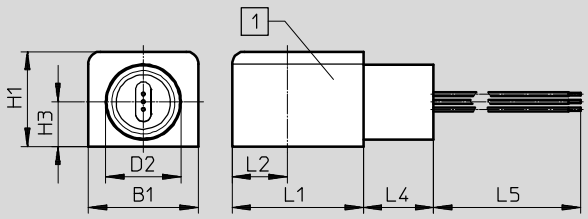
2) Additional information www.festo.com/sp ➔ Certificates.

Technical data

ATEX		
Type of ignition protection for gas	AEx m II T4	
	Ex m II T4	
Explosion ambient temperature [°C]	–20 ≤ Ta ≤ +60	
Explosion protection certification outside the EU	EPL Gb (US)	
	Class I, Div. 1 (US)	Class I, Div. 1 (CA)
	Class I, Div. 2 (US)	Class I, Div. 2 (CA)
	Class II, Div. 1 (US)	Class II, Div. 1 (CA)
	Class III, Div. 1 (US)	Class III, Div. 1 (CA)
Certificate issuing authority	CSA 265489	
	FM 3053936	

Dimensions

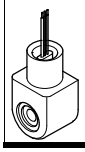
Download CAD data ➔ **www.festo.com**



1 Solenoid coil

Type	B1	D2	H1	H3	L1	L2	L4	L5
VACN-N-K11-...	36	24.6	31	14.5	43	18	23	610

Ordering data

	Description		Part No.	Type
	Moulded-in cable	24 V DC	**8029146**	**VACN-N-K11-1-0.5-U4-M**
		110 V AC	**8029145**	**VACN-N-K11-16B-0.5-U4-M**
		230 V AC	**8029140**	**VACN-N-K11-3A-0.5-U4-M**

Solenoid coils VACN-N-...-EX4-M

Technical data

- Category "II 2G" and "II 2D"
- Type of ignition protection for gas "Ex mb"
- ATEX certification
- Can be replaced without interrupting the pneumatic circuit

General technical data		
Type of mounting		Via knurled nut
Mounting position		Any (can be rotated in increments of 45° on the armature tube)
Product weight	[g]	353

Materials	
Housing	Steel, polymer
Winding	Copper
Note on materials	RoHS compliant

Electrical data		
Electrical connection		Cable
Cable length	[m]	3
Cable diameter	[mm]	7
Permissible voltage fluctuations	[%]	–10 / +10
Duty cycle	[%]	100
Insulation class		F
Enamelled wire insulation class		H
Degree of protection to EN 60529		IP65 with plug socket

Characteristic coil data				
Nominal operating voltage	[V]	24 DC	110 AC	230 AC
Frequency	[Hz]	–	50/60	50/60
Power	[W]	2.6	–	–
	[VA]	–	2.4	2.1

Operating and environmental conditions		
Ambient temperature	[°C]	–20 ... +50
Corrosion resistance class CRC[1)]		2
CE marking (see declaration of conformity)[2)]		To EU Explosion Protection Directive (ATEX)
Maritime classification[2)]		See certificate
Certificate issuing authority		DNVGL-TAA000011J

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

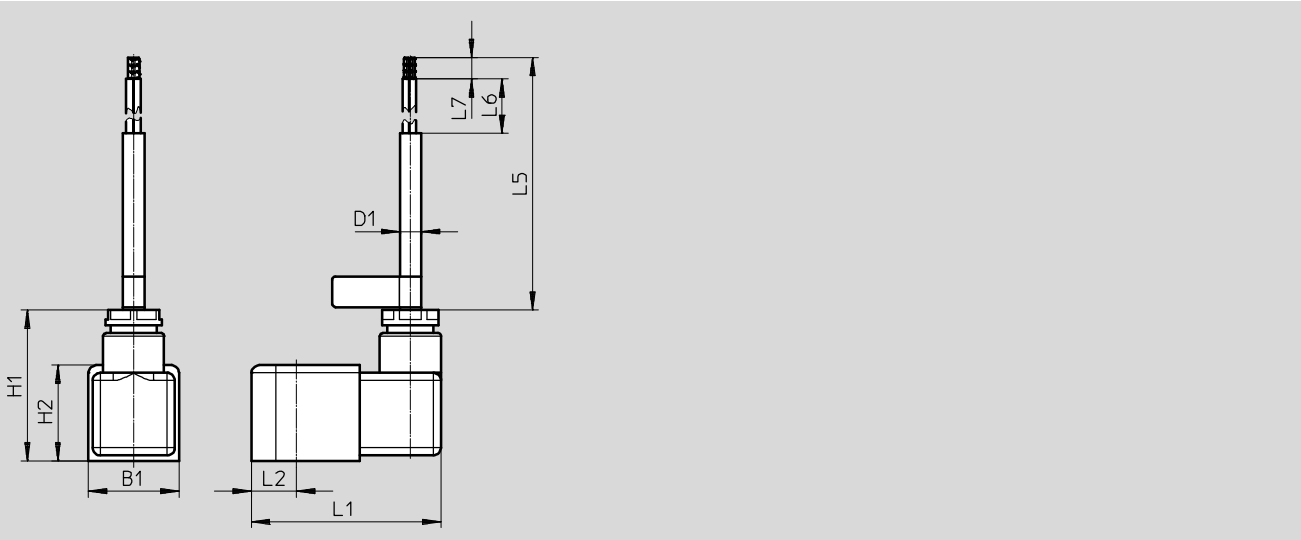
2) Additional information www.festo.com/sp ➔ Certificates.

Technical data

ATEX	
ATEX category for gas	II 2G
Type of ignition protection for gas	Ex mb IIC T6
ATEX category for dust	II 2D
Type of ignition protection for dust	Ex mb tb IIIC T80°C
Explosion ambient temperature [°C]	−20 ≤ Ta ≤ +50
Explosion protection certification outside the EU	EPL Db (BR), EPL Db (IEC-EX), EPL Gb (BR), EPL Gb (IEC-EX)
Certificate issuing authority	DNV 15.0189X
	IECEx PTB 15.0016X
	PTB 14 ATEX 2027 X

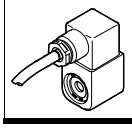
Dimensions

Download CAD data ➔ **www.festo.com**



Type	B1	D1	H1	H2	L1	L2	L5	L6	L7
VACN-N-K1-...	29.7	7	49.3	31.3	67	14.8	3000	43	7

Ordering data

	Description		Part No.	Type
	With plug socket, with 3 m cable	24 V DC	**8029143**	**VACN-N-K1-1-EX4-M**
		110 V AC	**8029142**	**VACN-N-K1-16B-EX4-M**
		230 V AC	**8029141**	**VACN-N-K1-3A-EX4-M**

Solenoid coils VACN-N-...-EX4-A

Technical data

- Intrinsically safe solenoid coil
- Category "II 2G" and "II 2D"
- Type of ignition protection for gas "Ex ia"
- ATEX certification
- Can be replaced without interrupting the pneumatic circuit

General technical data		
Type of mounting		Via knurled nut
Mounting position		Any (can be rotated in increments of 45° on the armature tube)
Product weight	[g]	114

Materials	
Housing	Steel, polymer
Winding	Copper
Note on materials	RoHS compliant

Electrical data		
Electrical connection		Plug connector, connection pattern to EN 175301-803, type A
Permissible voltage fluctuations	[%]	–10 / +10
Duty cycle	[%]	100
Insulation class		F
Enamelled wire insulation class		H
Degree of protection to EN 60529		IP65 with plug socket

Characteristic coil data		
Nominal operating voltage	[V]	24 DC
Max. input voltage	[V]	28 DC
Max. input current	[mA]	115
Required current consumption	[mA]	≥27
Effective internal capacitance		Negligibly low
Effective internal inductance		Negligibly low

Operating and environmental conditions		
Ambient temperature	[°C]	–20 ... +50
Corrosion resistance class CRC[1)]		2
CE marking (see declaration of conformity)[2)]		To EU Explosion Protection Directive (ATEX)
Maritime classification[2)]		See certificate
Certificate issuing authority		DNVGL-TAA000011J

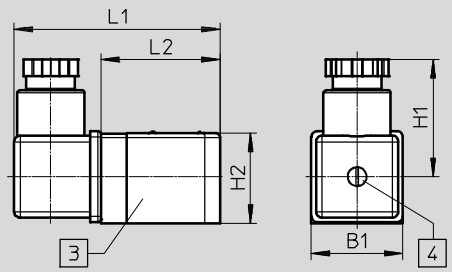
1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

2) Additional information www.festo.com/sp ➔ Certificates.

Technical data

ATEX	
ATEX category for gas	II 2G
Type of ignition protection for gas	Ex ia IIC T6, T4 Ga
ATEX category for dust	II 2D
Type of ignition protection for dust	Ex tb IIIC T80°C, T130°C Db IP65
Explosion ambient temperature [°C]	T4,T130°C: -40°C <= Ta <= +85°C
[°C]	T6,T80°C: -40°C <= Ta <= +50°C
Explosion protection certification outside the EU	EPL Db (BR), EPL Db (IEC-EX), EPL Ga (BR), EPL Gb (IEC-EX), EPL Gb (IN), EPL Db (IN)
Certificate issuing authority	DNV 15.0188
	IECEx PTB 15.0013
	PTB 09 ATEX 2043

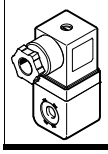
Dimensions Download CAD data ➔ **www.festo.com**



3 Solenoid coil
4 Mounting screw M3

Type	B1	H1	H2	L1	L2
VACN-N-A1-...-EX4-A	30	38.5	29.5	67.7	39.2

Ordering data

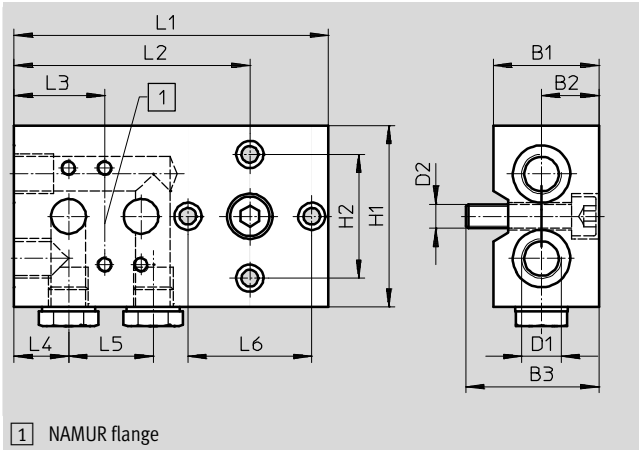
	Description		Part No.	Type
	Intrinsically safe solenoid coil with plug socket included in delivery, connection pattern to EN 175301-803, type A	24 V DC	**8029139**	**VACN-N-A1-1-EX4-A**

Solenoid valves VSNC

Accessories

Connection kit
Mounting position: Any
Type of mounting: With through-hole
Operating pressure: 0 ... 10 bar
Operating medium: Compressed air to ISO 8573-1:2010 [7:-:-]
Degree of protection IP65

Materials: Wrought aluminium alloy
Seals: NBR
Contains paint-wetting impairment substances, RoHS-compliant



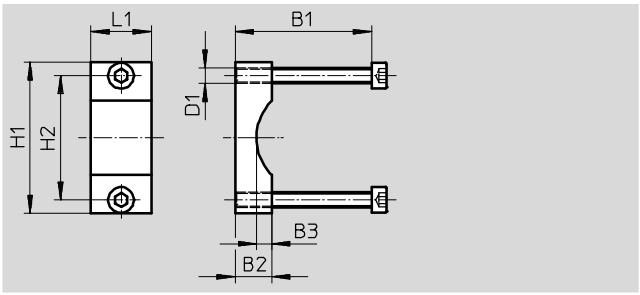
1 NAMUR flange

Dimensions [mm] and ordering data

B1	B2	B3	D1	D2	H1	H2	L1	L2	L3	L4	L5	L6	CRC[1)]	Part No.	Type
35	19	44	G¼	M8	60	41	104	78	30	18	28	41	4	**563396**	**VABS-S7-S-G14**

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Mounting bracket
Materials: Bracket:
Wrought aluminium alloy
Contains paint-wetting impairment substances, RoHS-compliant



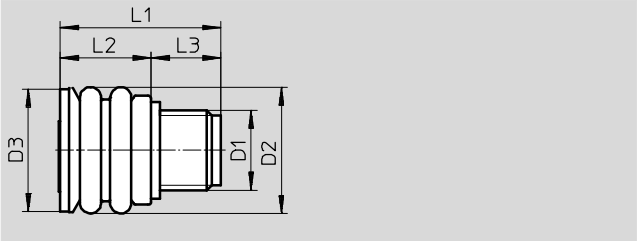
Dimensions [mm] and ordering data

B1	B2	B3	D1	H1	H2	L1	CRC[1)]	Part No.	Type
45/65	12	5	M5	50	41	20	3	**563403**	**VAME-S7-Y**

1) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Accessories

Exhaust protection
Materials:
EPDM, PA
Contains paint-wetting impairment substances, RoHS-compliant

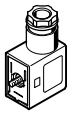


Dimensions [mm] and ordering data

D1	D2	D3	L1	L2	L3	CRC[1]	Part No.	Type
G¼, ¼NPT	21	20.5	26.5	15	11.5	3	**563400**	**VABD-D3-SN-G14**

1) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Ordering data

	Description	Part No.	Type
Plug socket			Technical data ➔ Internet: mssd
	3-pin, angled socket, square design connection pattern type B, to industrial standard 11 mm	**539710**	**MSSD-F-M16**
	3-pin, angled socket, square design connection pattern type A, to DIN EN 175301-803, type A	**539709**	**MSSD-C-M16**
	3-pin, IP67 socket to IEC 60529, type B	**192746**	**MSSD-F-S-M16**
	4-pin, IP67 socket to IEC 60529, type A	**192748**	**MSSD-C-S-M16**
	3-pin, angled socket, square design, IP65 to DIN EN 175301-803, type A	**34583**	**MSSD-C**
Push-in fittings QS			Technical data ➔ Internet: qs
	G male thread with internal hex	**186108**	**QS-G1/4-6-I**
		186110	**QS-G1/4-8-I**
		186112	**QS-G1/4-10-I**
	NPT male thread with internal hex	**572320**	**QB-1/4-1/4-I-U**
		572321	**QB-1/4-5/16-I-U**
		572322	**QB-1/4-3/8-I-U**
Silencer U			Technical data ➔ Internet: u
	G male thread, polymer design	**534223**	**U-1/4-20**
		2316	**U-1/4**
	G male thread, die-cast metal design	**6842**	**U-1/4-B**
	NPT male thread, die-cast metal design	**12639**	**U-1/4-B-NPT**
Illuminating seal			Technical data ➔ Internet: mc-ld
	For F solenoid coils	**19143**	**MF-LD-12-24 DC**
		19144	**MF-LD-230 AC**
	For valves with D and N1 solenoid coils	**19145**	**MC-LD-12-24 DC**
		19146	**MC-LD-230 AC**
Cover cap			
	For valves	**8028240**	**VAMC-B10-20-CH2**

Solenoid valves

VOFC

Overview, configuration and ordering
➔ **www.festo.com/catalogue/**vofc

Additional information, support and user documentation
➔ **www.festo.com/sp/**vofc

Selected types in accordance with the ATEX Directive for explosive atmospheres
➔ **www.festo.com/**ex

+ Integrated shuttle valve for changing over between internal/external pilot air
+ Sturdy and corrosion-resistant thanks to hard Ematal surface
+ Valve function 3/2-way, 5/2-way, single and double solenoid
+ Connection G1/4, G1/2, NPT1/4, NPT1/2, NAMUR and NAMUR+
+ Voltage 24, 110, 230 V DC, UC
+ Explosion protection EX me and EX ia, ATEX

Solenoid valves VOFC

Features

General remarks

- The valves of series VOFC are special 3/2-way and 5/2-way valves for process automation and applications in chemical and petrochemical installations, where they are frequently used as pilot valves for butterfly valves and actuators. Their sturdy design and high resistance to corrosion make these valves suitable for outdoor use under harsh ambient conditions.
- With the flange pattern to NAMUR, the solenoid valves are particularly suitable for quarter turn actuators. The integrated spring chamber re-breather function protects quarter turn actuators with spring return (single-acting cylinders and actuators) against contaminated ambient atmospheres and weather influences such as rain.
- Approved by the German Technical Control Board (TÜV) up to SIL-3

Function, design

- 3/2-way or 5/2-way, single or double solenoid, depending on the type
- Pilot-actuated piston spool and piston poppet valves

Robust

- The surface of the valve housing is Ematal coated. This treatment involves converting the aluminium surface into a very hard aluminium oxide layer with titanium oxide intercalations. This treatment makes the valves extremely resistant to wear and abrasion and gives them first-class sliding qualities. This provides optimum protection against atmospheric and chemical influences. The media resistance of the product can be found under ➔ www.festo.com.

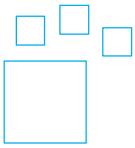
Flexible functionality

- Changeover between internal and external pilot air via automatic OR valve
- Suitable for vacuum

Economical

- Port pattern to NAMUR for direct mounting on the actuator and the G and NPT threaded connections in a valve housing

Ordering data – Product options



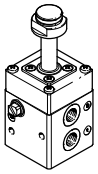
Configurable product
This product and all its options can be ordered using the configurator.

The configurator can be found at
➔ **www.festo.com/catalogue/...**

Part No.	Type
3344863	**VOFC-L**
2868687	**VOFC-LT**

Key features

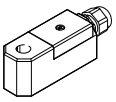
VOFC - Basic valves



- 3/2, 5/2-way valves
- Ports G¼, ¼NPT, G½, ½ NPT, flange ports
- Port pattern to NAMUR, optionally with P duct

➔ Page 92

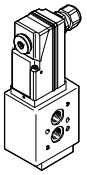
VACC - S13 coils



- AC and DC voltage 24 V, 60 V, 110 V, 230 V
- Types of ignition protection EX EMB II, EX IA IIC

➔ Page 137

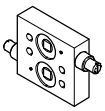
VOFC - Solenoid valves



- Combination of basic valve VOFC and P3 nozzle/baffle pilot control system
- 3/2, 5/2-way valves
- Types of ignition protection EX ia

➔ Page 105, 118

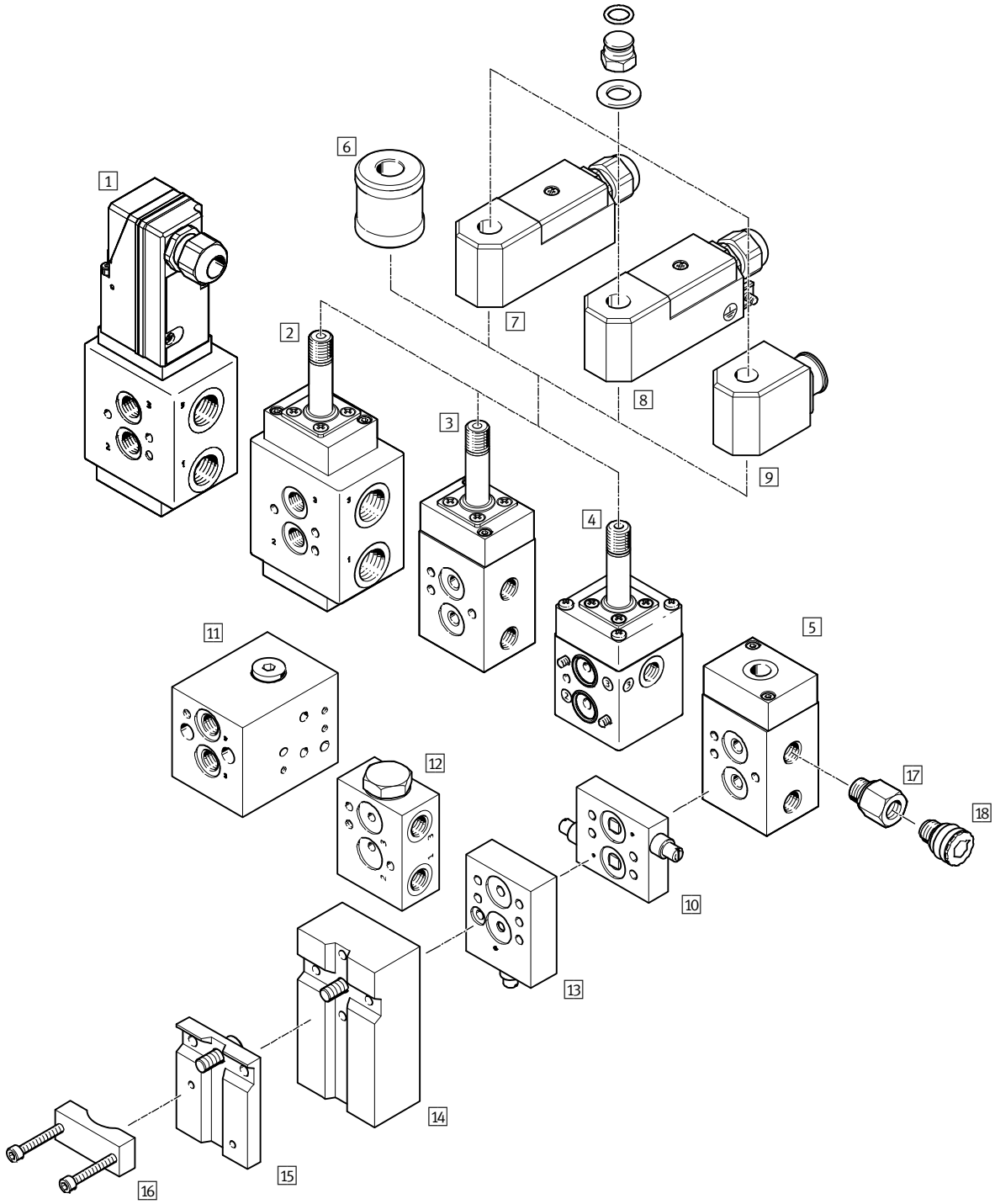
VOFC - Accessories



- Flow control plate
- Sub-base
- Mounting plate
- Connection kit
- Adapter with filter
- Mounting bracket
- Manual override

➔ Page 144

Peripherals overview



Peripherals overview

Mounting components and accessories

		Brief description	➔ Page/Internet
1	Solenoid valve VOFC-LT-...-FG12-...-P3-...	Solenoid valve with valve pilot control, interface for pilot nozzle/baffle plate ➔ Modular product system - Configurable via online configurator	86
2	Basic valve VOFC-LT-...-FG12-...-F19...	3/2-way valve, G1/2 port, poppet valve ➔ Modular product system - Configurable via online configurator	86
3	Basic valve VOFC-L-...-FG14-...-F19...	3/2-way valve, G1/4 port, piston spool ➔ Modular product system - Configurable via online configurator	86
4	Basic valve VOFC-LT-...-FG14-...-F19...	3/2-way valve, G1/4 port, poppet valve ➔ Modular product system - Configurable via online configurator	86
5	Directional control valve VOFC-L-...-SG14/SN14-...	3/2-way valve, 5/2-way valve, G1/4 port, piston spool ➔ Modular product system - Configurable via online configurator	86
6	Manual override VAOH-MB-S7-S13	Manual override (MO)	149
7	Solenoid coil VACC-S13-...3A	Type of ignition protection iA = intrinsically safe, for use in zone 1	140
8	Solenoid coil VACC-S13-...ME	Type of ignition protection ME = mould-encapsulated, for use in zone 1	142
9	Solenoid coil VACC-S13...A1	IP65, electrical port pattern type A to DIN EN 175-803	138
10	Flow control plate VABF-S7-F1B1P2-F	Exhaust-air flow control plate for NAMUR interface for installation between the solenoid valve and double-acting actuators	147
11	Sub-base VABS-S7-RB-B-...14-V14-A	For mounting two solenoid valves for redundant circuitry, with flange ¼, port pattern to NAMUR	144
12	Sub-base VABS-S7-BE-B-...14-V14-A	Pressurisation and exhaust block, with flange ¼, port pattern to NAMUR	144
13	Flow control plate VABF-S7-F1B5P1-F	Exhaust-air flow control plate for NAMUR interface for installation between the solenoid valve and single-acting actuators	147
14	Connection kit VABF-S7-S-G14	Mounting plate for attaching the valve to the NAMUR rib	147
15	Mounting plate VAME-S7-P	Mounting plate for attaching the valve to the NAMUR rib	146
16	Mounting bracket VAME-S7-Y	Alternative (instead of screw) for attaching the valve to the NAMUR rib using a mounting bracket	148
17	Adapter NPFV-AF-...-MF	Adapter with filter	148
18	Exhaust protection VABD-D3-SN-...	Exhaust protection IP65. The spring chamber of the solenoid valve is protected against the ingress of an aggressive ambient atmosphere and water by the non-return system	148

Solenoid valves VOFC

Type code VOFC

VOFC – L – [ ] – [ ] – [ ] – [ ] – [ ] – [ ] – [ ] – [ ] – [ ] – [ ]

Type	
VOFC	Solenoid valves

Valve type	
L	In-line valve

Nominal width	
–	Standard

Design principle	
–	Piston spool
T	Poppet valve

Valve function	
B52	5/2-way valve, double solenoid
M52	5/2-way valve, single solenoid
M32C	3/2-way valve, normally closed

Reset method for single solenoid valves	
–	Without
M	Mechanical spring

Pilot air	
–	Internal
C	Internal/external
Z	External

Manual override	
–	Without
H	Non-detenting (resetting)
Y	Detenting

Pneumatic connection	
G12	G1/2
G14	G1/4
N12	1/2 NPT
N14	1/4 NPT
FG12	Flange G1/4, ports G1/2
FG13	Flange G1/2, ports G1/2
FG14	Flange G1/4, ports G1/4
FN12	Flange 1/4 NPT, ports 1/2 NPT
FN13	Flange 1/2 NPT, ports 1/2 NPT
FN14	Flange 1/4 NPT, ports 1/4 NPT
FGP14	Flange G1/4, ports G1/4 and additional pneumatic connection
FNP14	Flange 1/4 NPT, ports 1/4 NPT and additional pneumatic connection

Supply port version	
–	Standard
PF	With particle filter
NPF	With particle filter and connecting thread 1/4 NPT

Type code VOFC

– [ ] – [ ] – [ ] – [ ] – [ ] – [ ] – [ ] – [ ] – [ ]

Exhaust	
–	Without fitting
U6	With exhaust protection

Corrosion protection	
–	Standard
R1	Stainless steel

Valve pilot control interface	
P3	Interface for pilot nozzle/baffle plate
F19	Electrical system with armature tube for solenoid coil 13mm
F19A	Electrical system with armature tube for solenoid coil 13mm, intrinsically safe
SG14	Interface with thread G1/4
SN14	Interface with thread 1/4 NPT

Power consumption	
–	Without
11	1.1 W
18	1.8 W
0,4	40 mW
0,09	9 mW

Nominal operating voltage	
–	Without
1U	24 V DC and AC
2U	110 V DC and AC
3U	230 V DC and AC
1	24 V DC
27	60 V DC

Electrical connection	
–	Without
A1	Plug pattern type A, to EN 175301
K4	Cable connector, metric

Circuitry	
–	Without
F	Fuse

EU certification	
–	Without
EX4	II 2GD

Type of ignition protection	
–	Without
A	Intrinsically safe
ME	Moulded encapsulation, enhanced safety

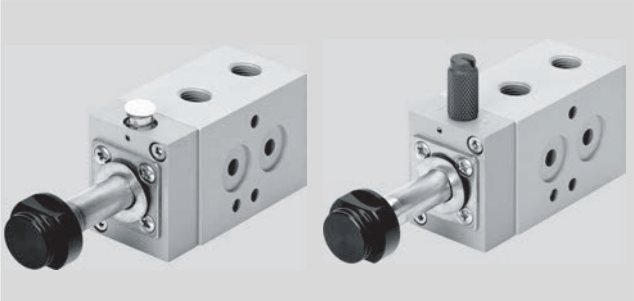
Solenoid valves VOFC-L ... F19/F19A/SN14/SG14

Technical data – Modular system, piston spool valve

Function
- 3/2-way solenoid valve
- 5/2-way single solenoid valve
- 5/2-way double solenoid valve

Temperature range
–25 ... +60 °C

Flow rate
913 ... 1030 l/min



General technical data		
Type VOFC-L-...		
Valve functions		3/2-way closed, single solenoid, 5/2-way single solenoid, 5/2-way double solenoid
Design		Piston spool
Sealing principle		Soft
Width	[mm]	40
Mounting position		Any
Manual override		None
		Non-detenting
		Detenting
Reset method		Without
		Mechanical spring
Actuation type		Electrical
Type of pilot control		Pilot-actuated
Pilot air supply		Internal
		External
Flow rate for piston valve pressurisation	[m^3/h]	0.66 ... 1.08
Flow rate for piston valve exhaust	[m^3/h]	0.66 ... 1.08
Switching time off	[ms]	22 (VOFC-L-B52-..., VOFC-L-M52-...)
Switching time on	[ms]	26 (VOFC-L-B52-..., VOFC-L-M52-...)
Flow direction		Non-reversible
Nominal width	[mm]	6
Standard nominal flow rate 1⟶2	[l/min.]	913 ... 1030
Standard nominal flow rate 2⟶3	[l/min.]	978 ... 983

Technical data, 5/2-way valve, single or double solenoid		
VOFC-L-B52-G14-	1	G1/4
VOFC-L-M52-...-G14-	2	G1/4
	3	G1/4
	4	G1/4
	5	G1/4
VOFC-L-B52-N14-	1	1/4 NPT
VOFC-L-M52-...-N14-	2	1/4 NPT
	3	1/4 NPT
	4	1/4 NPT
	5	1/4 NPT
VOFC-L-B52-FG14-	1	G1/4
VOFC-L-M52-...-FG14-	2	Port pattern to NAMUR, flange 1/4
	3	G1/4
	4	Port pattern to NAMUR, flange 1/4
	5	G1/4
VOFC-L-B52-FN14-	1	1/4 NPT
	2	Port pattern to NAMUR, flange 1/4
	3	1/4 NPT
	4	Port pattern to NAMUR, flange 1/4
	5	1/4 NPT

Technical data – Modular system, piston spool valves

Technical data, 3/2-way valve, single or double solenoid		
VOFC-L-M32C-...-FG14-	1	G1/4
	2	Port pattern to NAMUR, flange 1/4
	3	G1/4

Technical data, weights		
Type	Weight of basic valve	Weight of pilot control -P3-
VOFC-L-B52-G14-...	790	170
VOFC-L-B52-N14-...	790	170
VOFC-L-B52-FG14-...	680	170
VOFC-L-M52-MH-G14-...	520	85
VOFC-L-M52-MY-G14-...	520	85
VOFC-L-M52-MH-FG14-...	520	85
VOFC-L-M52-MY-FG14-...	520	85
VOFC-L-M52-M-N14-...	520	85
VOFC-L-M32C-MH-FG14-...	520	85
VOFC-L-M32C-MY-FG14-...	520	85
VOFC-L-M52-MZ-...	430	–
VOFC-L-M32C-MZ-...	430	–

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Degree of protection		IP50, IP65
Operating pressure range	[bar]	2.5 ... 8
	[psi]	36 ... 116
Temperature of medium	[°C]	–25 ... +60
Ambient temperature	[°C]	–25 ... +60
Safety Integrity Level	[SIL]	Up to SIL2 Low Demand mode
		Up to SIL2 High Demand mode
Corrosion resistance class CRC[1)]		4
Note on materials		Contains paint-wetting impairment substances
		RoHS-compliant

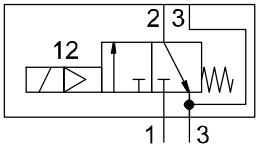
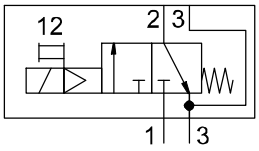
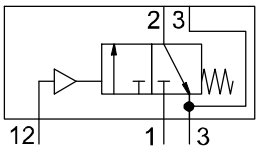
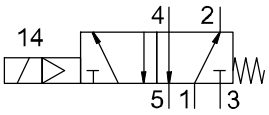
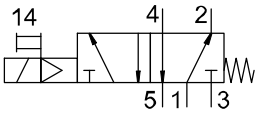
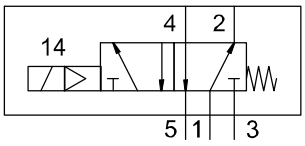
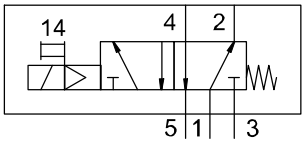
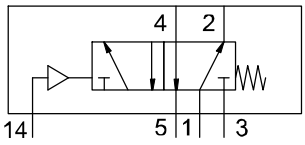
1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Materials		
	VOFC-L-...	VOFC-L-...-P3
Housing	Aluminium (Ematal coated)	Aluminium, Ematal coated, PBT-reinforced
Seals	NBR	NBR, EPDM, VMQ

Solenoid valves VOFC-L

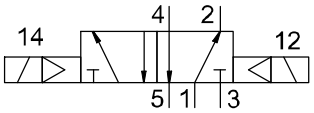
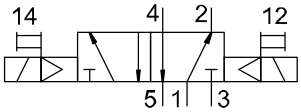
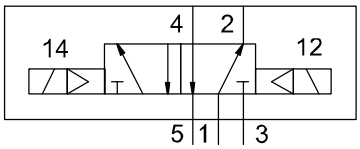
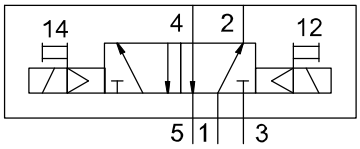
Technical data – Modular system, piston spool valves

Valve functions

Circuit symbol	Type code	Description
	VOFC-L-M32C-M-FG14-...	3/2-way valve, single solenoid, closed • Electrically pilot-actuated • Non-reversible • With spring return • Internal pilot air • With NAMUR port • Without manual override (MO)
	VOFC-L-M32C-MH-FG14-... (MO non-detenting) VOFC-L-M32C-MY-FG14-... (MO detenting)	3/2-way valve, single solenoid, closed • Electrically pilot-actuated • Non-reversible • With spring return • Internal pilot air • With NAMUR port • With manual override (MO)
	VOFC-L-M32C-MZ-...	3/2-way valve, single solenoid, closed • Pneumatically pilot-actuated • Non-reversible • With spring return • External pilot air supply • With NAMUR port • Without manual override (MO)
	VOFC-L-M52-M-G14-... VOFC-L-M52-M-N14-...	5/2-way valve, single solenoid • Electrically pilot-actuated • Non-reversible • With spring return • Internal pilot air • Without manual override (MO)
	VOFC-L-M52-MH-G14-... (MO non-detenting) VOFC-L-M52-MY-G14-... (MO detenting) VOFC-L-M52-MH-N14-... (MO non-detenting) VOFC-L-M52-MY-N14-... (MO detenting)	5/2-way valve, single solenoid • Electrically pilot-actuated • Non-reversible • With spring return • Internal pilot air • With manual override (MO)
	VOFC-L-M52-M-FG14-... VOFC-L-M52-M-FN14-...	5/2-way valve, single solenoid • Electrically pilot-actuated • Non-reversible • With spring return • Internal pilot air • With NAMUR port • Without manual override (MO)
	VOFC-L-M52-MH-FG14-... (MO non-detenting) VOFC-L-M52-MY-FG14-... (MO detenting) VOFC-L-M52-MH-FN14-... (MO non-detenting) VOFC-L-M52-MY-FN14-... (MO detenting)	5/2-way valve, single solenoid • Electrically pilot-actuated • Non-reversible • With spring return • Internal pilot air • With NAMUR port • With manual override (MO)
	VOFC-L-M52-MZ-...	5/2-way valve, single solenoid • Pneumatically pilot-actuated • Non-reversible • With spring return • External pilot air supply • With NAMUR port • Without manual override (MO)

Technical data – Modular system, piston spool valves

Valve functions

Circuit symbol	Type code	Description
	VOFC-L-B52-G14-... VOFC-L-B52-N14-...	5/2-way solenoid valve, double solenoid • Electrically pilot-actuated • Non-reversible • Internal pilot air • Without manual override (MO)
	VOFC-L-B52-H-G14-... (MO non-detenting) VOFC-L-B52-H-N14-... (MO non-detenting)	5/2-way solenoid valve, double solenoid • Electrically pilot-actuated • Non-reversible • Internal pilot air • With manual override (MO)
	VOFC-L-B52-FG14-... VOFC-L-B52-FN14-...	5/2-way solenoid valve, double solenoid • Electrically pilot-actuated • Non-reversible • Internal pilot air • With NAMUR port • Without manual override (MO)
	VOFC-L-B52-H-FG14-... (MO non-detenting)	5/2-way solenoid valve, double solenoid • Electrically pilot-actuated • Non-reversible • Internal pilot air • With NAMUR port • With manual override (MO)

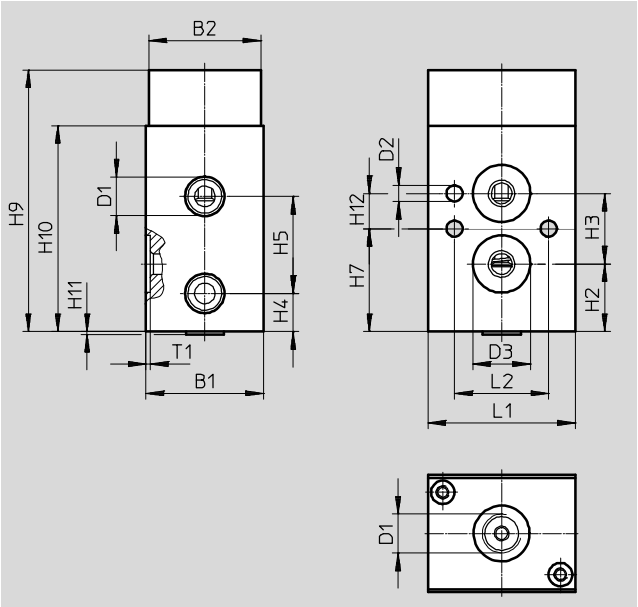
Solenoid valves VOFC-L ... SN14/SG14

Technical data – Modular system, piston spool valves

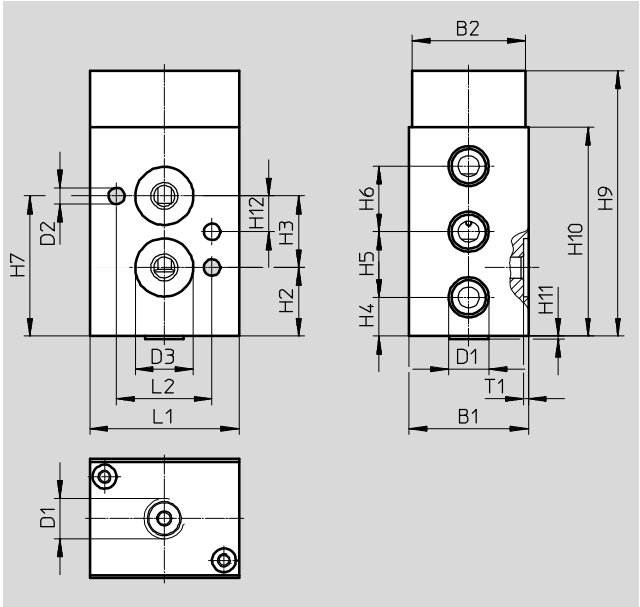
Dimensions

Download CAD data ➔ **www.festo.com**

3/2-way valves (without armature tube)
Interface -SG14/-SN14



5/2-way valves (without armature tube)
Interface -SG14/-SN14



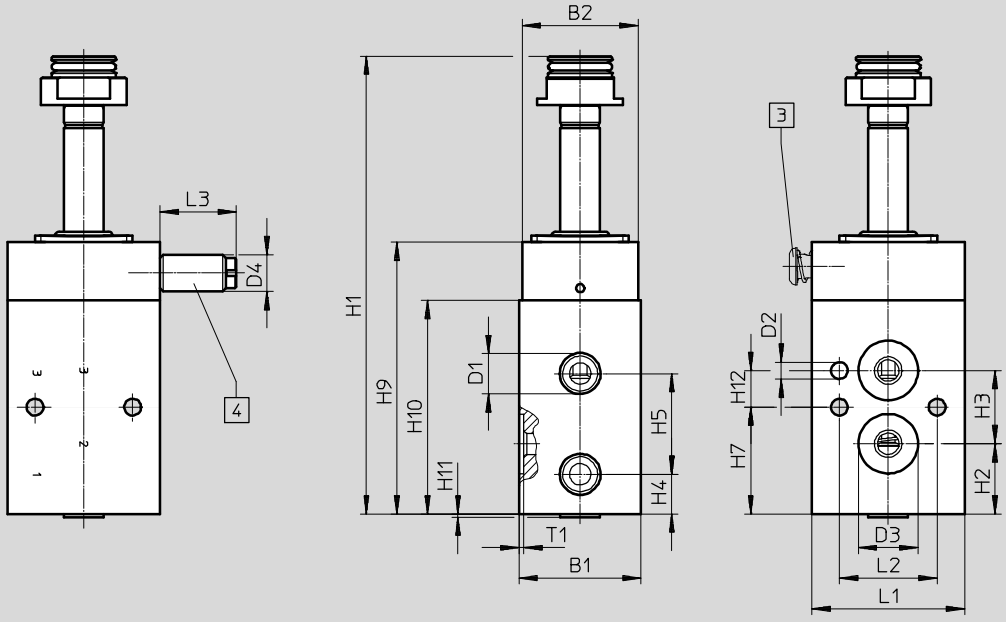
Type	B1	B2	D1	D2 ∅	D3 ∅	H2	H3	H4	H5	H6	H7	H9	H10	H11	H12	L1	L2	T1
VOFC-L-M32-MZ-FG14-SG14-...	40	38	G1/4	5.5	19.5	23	24	13	33	–	35	89	70	1	12	50	32	1.6
VOFC-L-M32-MZ-FN14-SN14-...			1/4 NPT															
VOFC-L-M52-MZ-FG14-SG14-...			G1/4						22	22	47							
VOFC-L-M52-MZ-FN14-SN14-...			1/4 NPT															

Technical data – Modular system, piston spool valves

Dimensions

Download CAD data ➔ **www.festo.com**

3/2-way valves, basic valve



3 Manual override, non-detenting (VOFC-L-M32-MH- ...)

4 Manual override, detenting (VOFC-L-M32-MY- ...)

Type	B1	B2	D1	D2 ∅	D3 ∅	D4 ∅	H1	H2	H3	H4	H5	H7	H9	H10	H11	H12	L1	L2	L3	T1
VOFC-L-M32-M-FG14-...	40	38	G1/4	5.5	19.5	–	150	23	24	13	33	35	89	70	1	12	50	32	–	1.6
VOFC-L-M32-MH-FG14-...																				
VOFC-L-M32-MY-FG14-...						12													25	

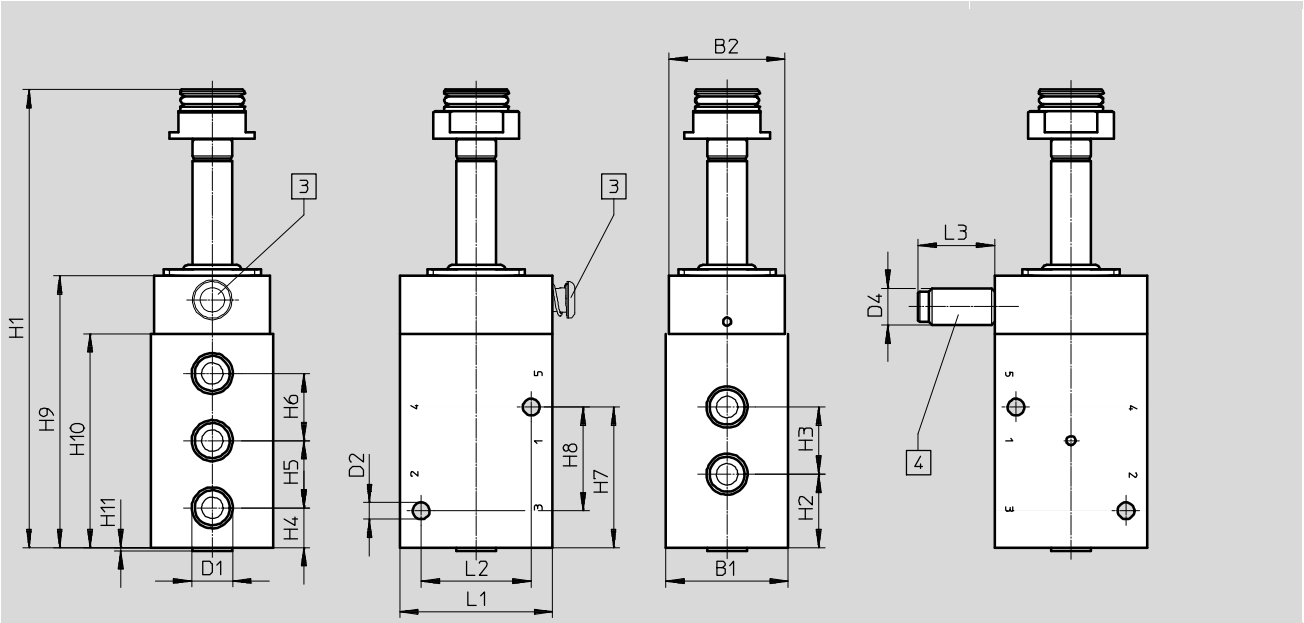
Solenoid valves VOFC-L ... F19/F19A

Technical data – Modular system, piston spool valves

Dimensions

Download CAD data ➔ **www.festo.com**

5/2-way valves, basic valve,
port -G14/-N14



3 Manual override, non-detenting (VOFC-L-M52-MH- ...)

4 Manual override, detenting (VOFC-L-M52-MY- ...)

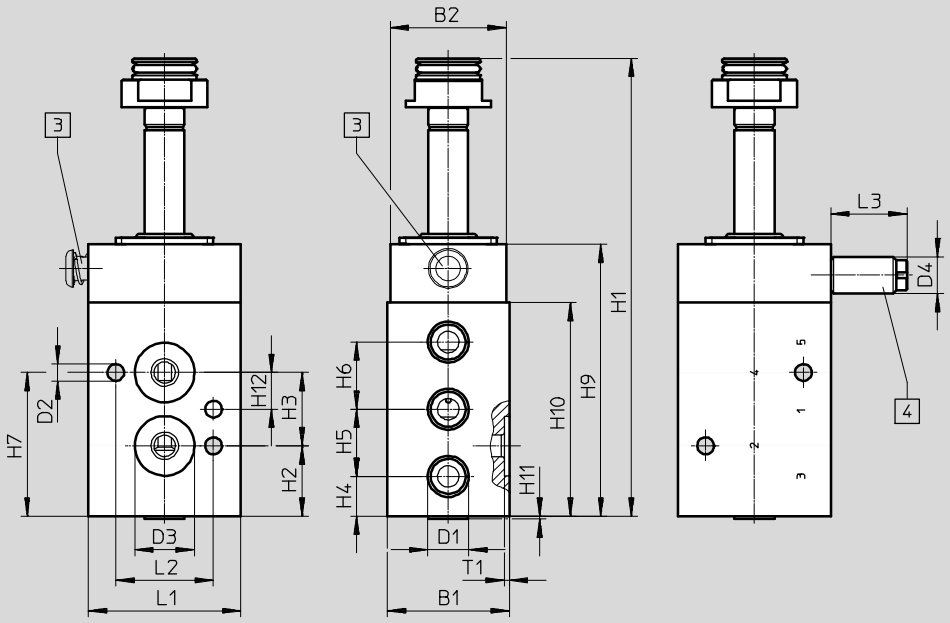
Type	B1	B2	D1	D2 ∅	D4 ∅	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	L1	L2	L3
VOFC-L-M52-M-G14-...	40	38	G1/4	5.5	–	150	24	22	13	22	22	46	34	89	70	1	50	36	–
VOFC-L-M52-MH-G14-...																			
VOFC-L-M52-M-N14-...			1/4 NPT																
VOFC-L-M52-MH-N14-...																			
VOFC-L-M52-MY-G14-...			G1/4		12														25

Technical data – Modular system, piston spool valves

Dimensions

Download CAD data ➔ **www.festo.com**

5/2-way valves, basic valve,
port -FG14



3 Manual override, non-detenting (VOFC-L-M52-MH- ...)

4 Manual override, detenting (VOFC-L-M52-MY- ...)

Type	B1	B2	D1	D2 ∅	D3 ∅	D4 ∅	H1	H2	H3	H4	H5	H6	H7	H9	H10	H11	H12	L1	L2	L3	T1
VOFC-L-M52-M-FG14-...	40	38	G1/4	5.5	19.5	–	150	23	24	13	22	22	47	89	70	1	12	50	32	–	1.6
VOFC-L-M52-MH-FG14-...																					
VOFC-L-M52-MY-FG14-...						12														25	

Solenoid valves VOFC-L ... F19/F19A

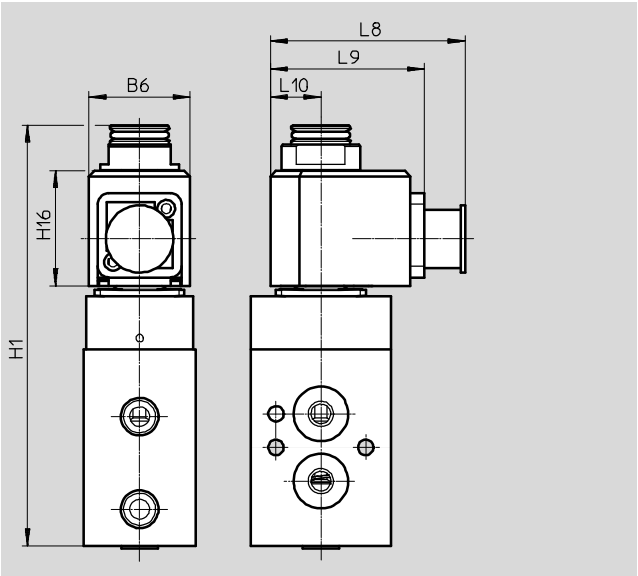
Technical data – Modular system, piston spool valves

Dimensions

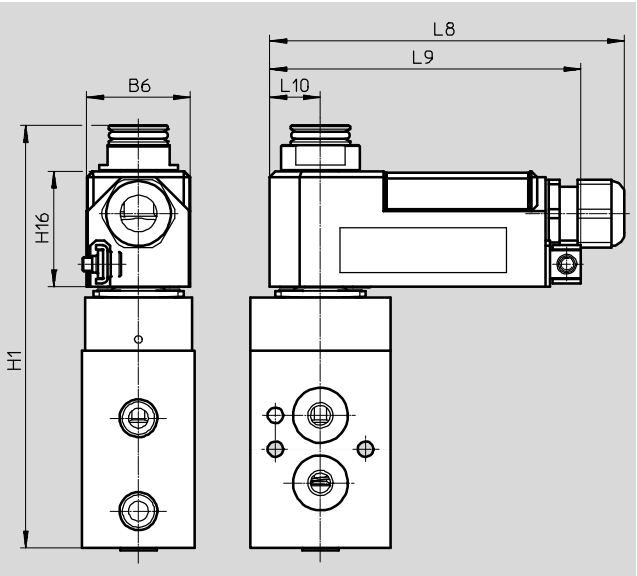
Download CAD data ➔ **www.festo.com**

Single solenoid valves with solenoid coil

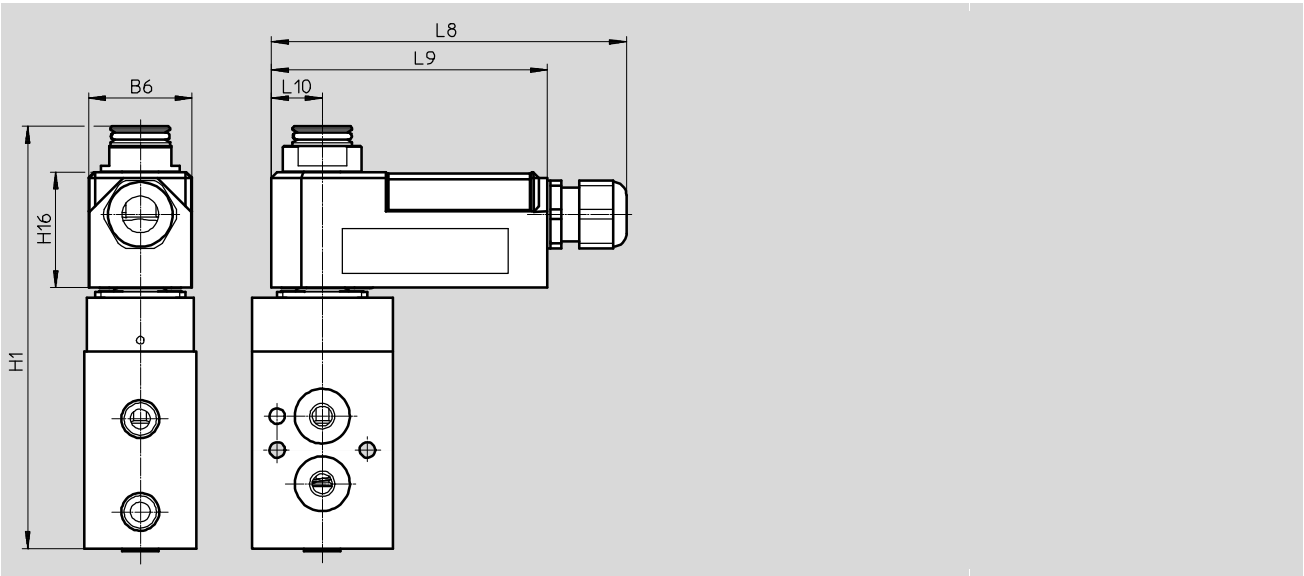
VOFC-...-18-A1-...



VOFC-...-18-K4-...-EX4ME



VOFC-...-11-K4-1-EX4A



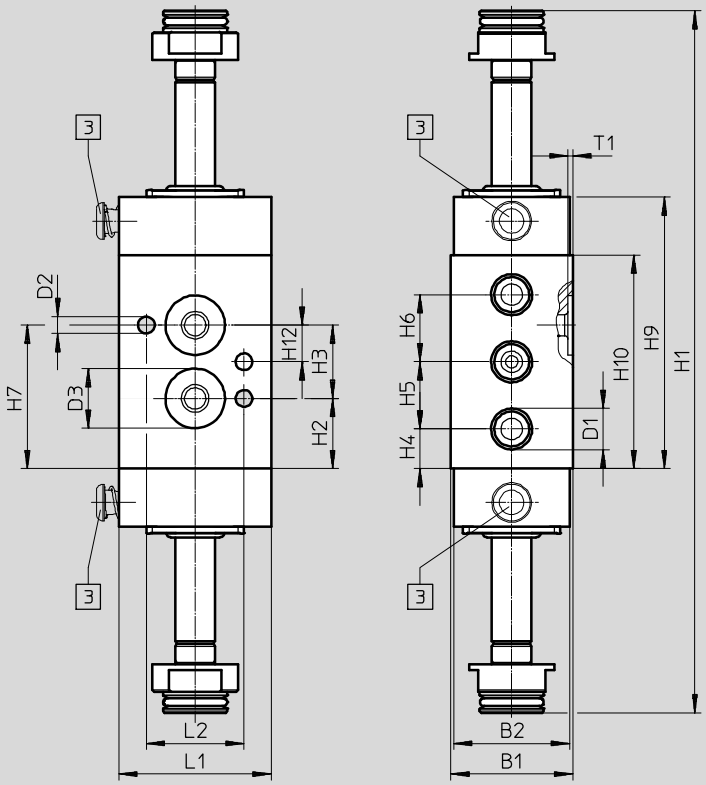
Type	B6	H1	H16	L8	L9	L10
VOFC-...-18-A1-...	36	150	41	69.4	55	18
VOFC-...-18-K4-...-EX4ME	37	150	41	125	111	18
VOFC-...-11-K4-1-EX4A	37	150	41	125	98	18

Technical data – Modular system, piston spool valves

Dimensions

Download CAD data ➔ **www.festo.com**

5/2-way valves, double solenoid, basic valve
port -FG



3 Manual override, non-detenting (VOFC-L-B52-H- ...)

Type	B1	B2	D1	D2 ∅	D3 ∅	H1	H2	H3	H4	H5	H6	H7	H9	H10	H12	L1	L2	T1
VOFC-L-B52-...-FG14-...	40	38	G1/4	5.5	19.5	230	23	24	13	22	22	47	89	70	12	50	32	1.6
VOFC-L-B52-H-...-FG14-...																		

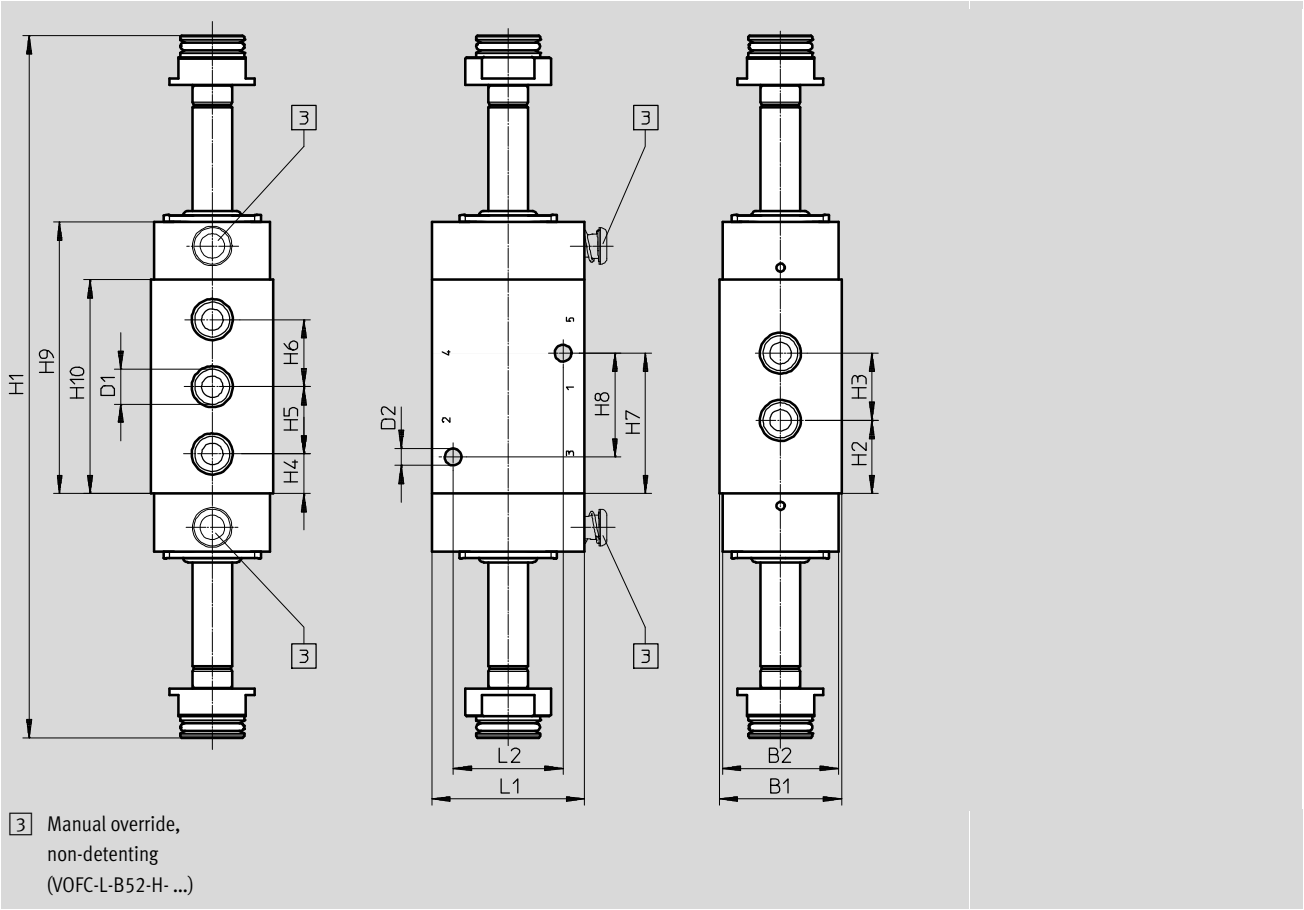
Solenoid valves VOFC-L ... F19/F19A

Technical data – Modular system, piston spool valves

Dimensions

Download CAD data ➔ **www.festo.com**

5/2-way valves, double solenoid, basic valve
port -G14/-N14



3 Manual override, non-detenting (VOFC-L-B52-H- ...)

Type	B1	B2	D1	D2 ∅	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	L1	L2
VOFC-L-B52-...-G14-...	40	38	G1/4	5.5	230	24	22	13	22	22	46	34	89	70	50	36
VOFC-L-B52-H-G14-...																
VOFC-L-B52-...-N14-...			1/4 NPT													
VOFC-L-B52-H-N14-...																

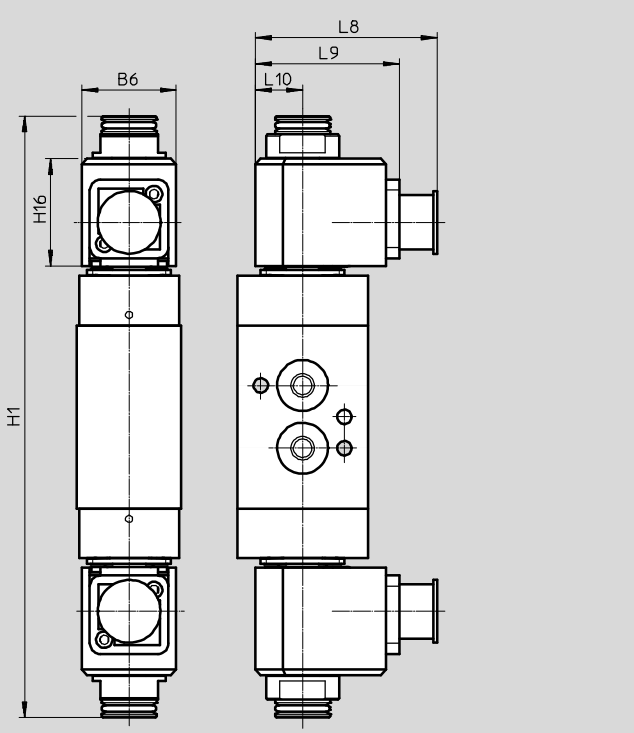
Technical data – Modular system, piston spool valves

Dimensions

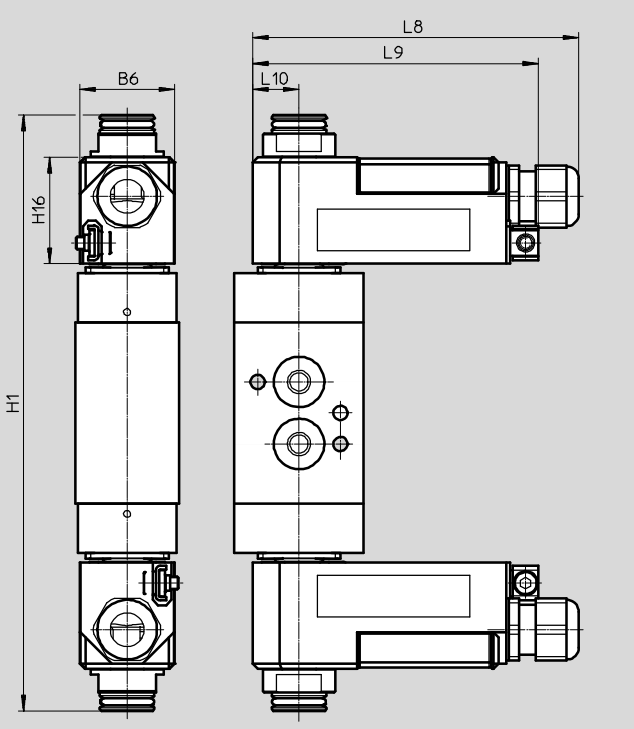
Download CAD data ➔ **www.festo.com**

Double solenoid valves with solenoid coil

VOFC-...-18-A1-...



VOFC-...-18-K4-...-EX4ME



Type	B6	H1	H16	L8	L9	L10
VOFC-...-18-A1-...	36	230	41	69.4	55	18
VOFC-...-18-K4-...-EX4ME	37	230	41	125	111	18

Solenoid valves VOFC-L ... F19/F19A

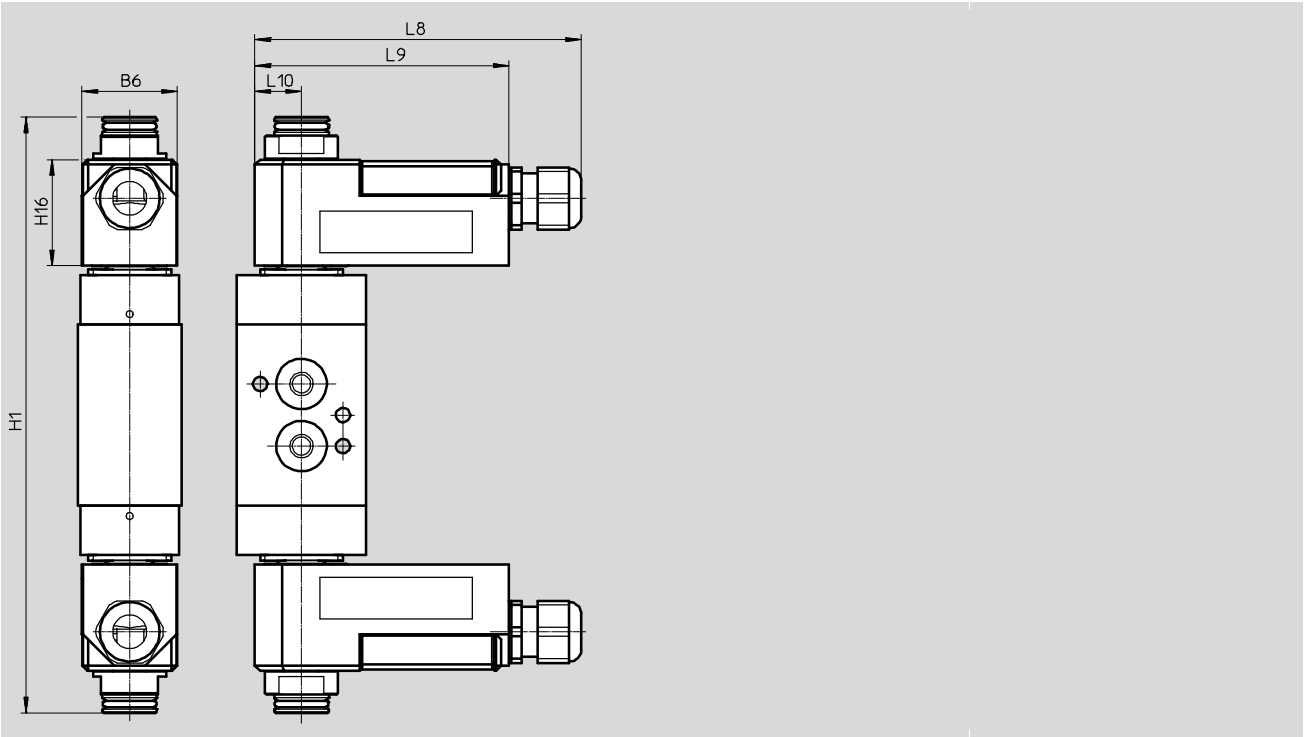
Technical data – Modular system, piston spool valves

Dimensions

Download CAD data ➔ **www.festo.com**

Double solenoid valves with solenoid coil

VOFC-...-11-K4-1-EX4A



Type	B6	H1	H16	L8	L9	L10
VOFC-...-11-K4-1-EX4A	37	230	41	125	98	18

Technical data – Modular system, piston spool valves

Solenoid valve, nozzle/baffle plate
(VOFC-...-P3-...)

Technical data, solenoid valve, nozzle/baffle plate			
Type		VOFC-...-P3-...-0.09-...-EX4A	VOFC-...-P3-...-0.4-...-EX4A
With pilot control unit		VACC-P3-0.09-K4-1-EX4A	VACC-P3-0.4-K4-1-EX4A
Design		Nozzle/baffle plate pilot control	
Operating voltage range	[V DC]	6.4 ... 40	16 ... 40
Degree of protection		IP 50	
Reverse polarity protection		Bipolar	
Duty cycle	[%]	100	
Max. input power Pi	[mW]	650	
Max. input voltage Ui	[V]	40	
Max. input current Ii	[mA]	200	
Effective internal capacitance Ci		Negligibly low	
Effective internal inductance Li		Negligibly low	
ATEX category for gas		II 2G	
Type of ignition protection for gas		Ex ia IIC T6, T5 Gb	
ATEX category for dust		II 2D	
Type of ignition protection for dust		Ex ia IIIC T85°C, T125°C Db	
Explosion-proof ambient temperature	[°C]	T5, T125: –40 ≤ Ta ≤ +70	
		T6, T85: –40 ≤ Ta ≤ +30	
Certificate issuing authority		BVS14ATEXE098X	
		IECEx BVS14.0063X	
		KGS15-GA4BO-0565X	
Notified body for quality testing		0344	
Explosion protection certification outside the EU		EPL Gb (IEC-EX)	
		EPL Db (IEC-EX)	
		EPL Gb (KR)	
		EPL Db (KR)	
CE marking (see declaration of conformity)		To EU Explosion Protection Directive (ATEX)	
Insulation class		H	
Electrical connection		Terminal box, cable entry, thread M20 x 1.5, conductor cross-section max. 1.5 mm^2, cable diameter 5-9 mm	
Information on materials for solenoid coil		PBT-reinforced, UP	

Solenoid valves VOFC-L ... P3

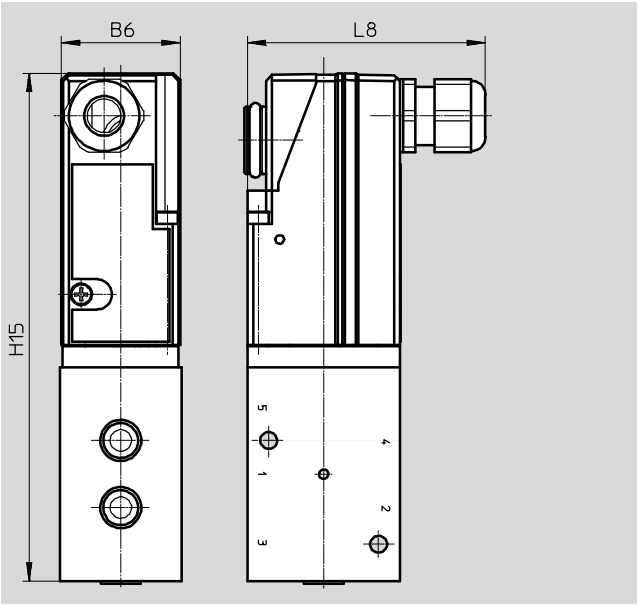
Technical data – Modular system, piston spool valves

Dimensions

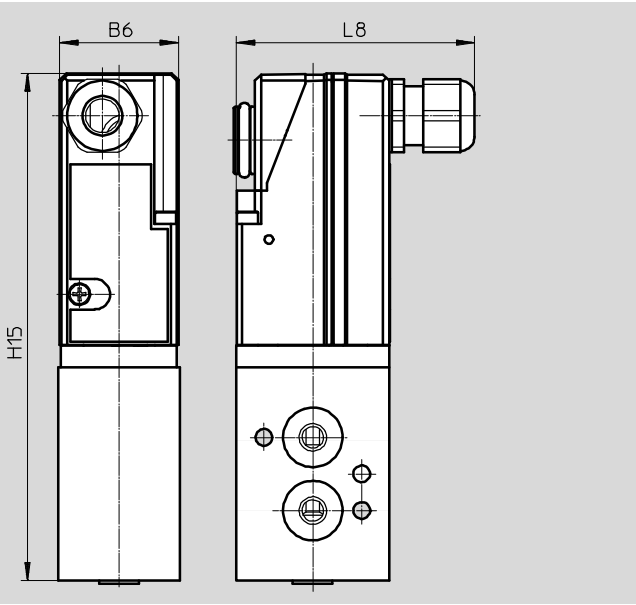
Download CAD data ➔ **www.festo.com**

Solenoid valve with nozzle/baffle plate, pilot

port -G14/-N14



port -FG14



Type	B6	H15	L8
VOFC-L-M52-M...-G14-P3-0.4-1-K4-EX4A	39	167	76
VOFC-L-M52-M...-N14-P3-0.4-1-K4-EX4A			
VOFC-L-M52-M...-FG14-P3-0.4-1-K4-EX4A			
VOFC-L-M52-M...-G14-P3-0.09-1-K4-EX4A			
VOFC-L-M52-M...-N14-P3-0.09-1-K4-EX4A			
VOFC-L-M52-M...-FG14-P3-0.09-1-K4-EX4A			

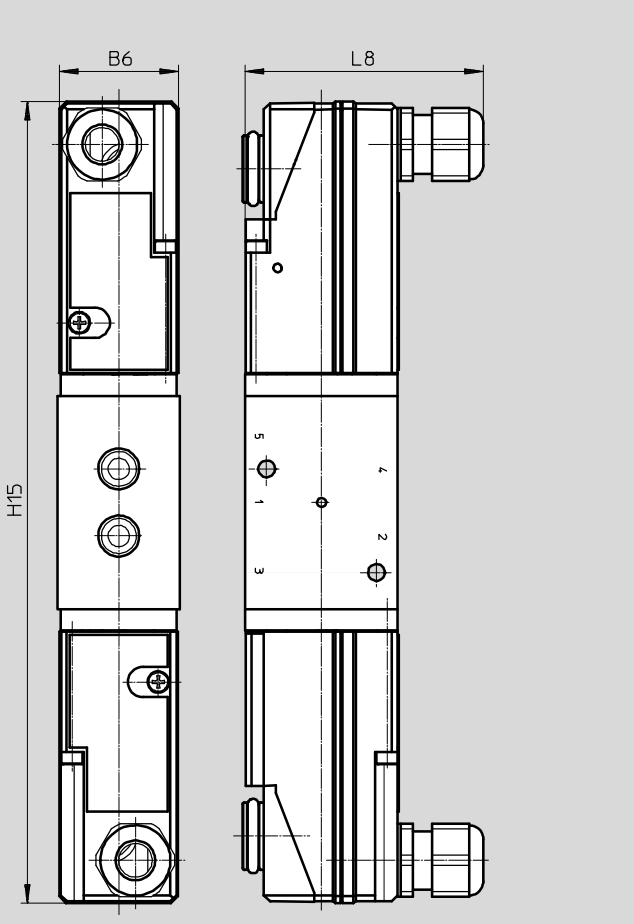
Technical data – Modular system, piston spool valves

Dimensions

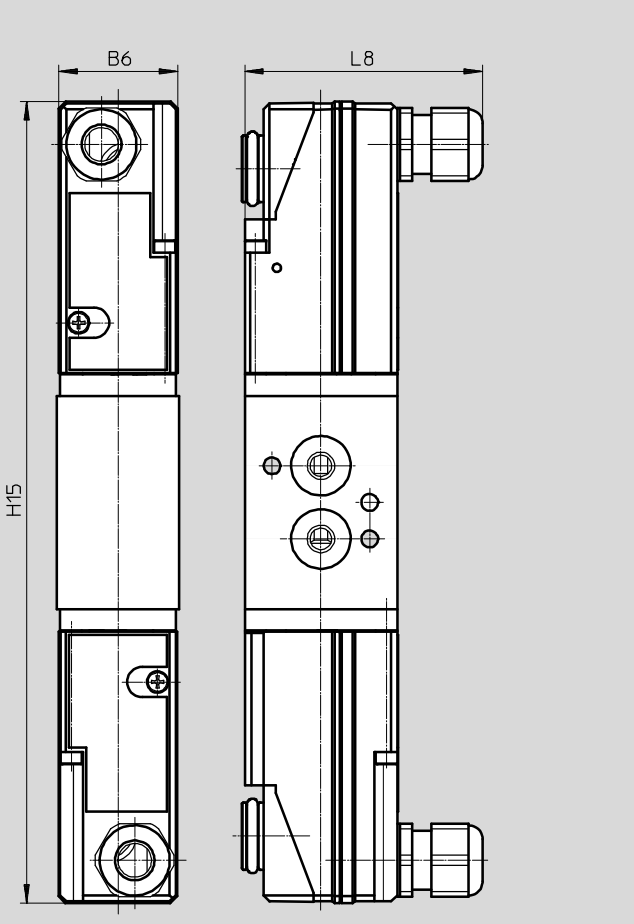
Download CAD data ➔ **www.festo.com**

Double solenoid valve with nozzle/baffle plate pilot

port -G14/-N14



port -FG14



Type	B6	H15	L8
VOFC-L-B52-...-G14-P3-0.4-1-K4-EX4A	39	263	76
VOFC-L-B52-...-N14-P3-0.4-1-K4-EX4A			
VOFC-L-B52-...-FG14-P3-0.4-1-K4-EX4A			
VOFC-L-B52-...-G14-P3-0.09-1-K4-EX4A			
VOFC-L-B52-...-N14-P3-0.09-1-K4-EX4A			
VOFC-L-B52-...-FG14-P3-0.09-1-K4-EX4A			

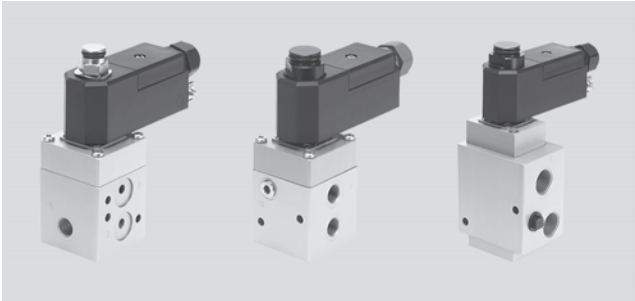
Solenoid valves VOFC-LT ... F19/F19A

Technical data – Modular system, poppet valves

Function
- 3/2-way solenoid valve

Temperature range
–25 ... +60 °C

Flow rate
766 ... 2686 l/min



General technical data			
Type		VOFC-LT-M32C-M...12-... VOFC-LT-M32C-M...13-...	VOFC-LT-M32C-M...14-...
Valve functions		3/2-way single solenoid valve	
Design		Poppet valve	
Sealing principle		Hard	
Width	[mm]	51	
Mounting position		Any	
Manual override		None	
Type of reset		Mechanical spring	
Actuation type		Electrical	
Type of control		Pilot-actuated	
Pilot air supply		Internal	
		Internal/external	
Flow rate for piston valve pressurisation	[m^3/h]	0.5 ... 2.4	
Flow rate for piston valve exhaust	[m^3/h]	0.65 ... 3.3	
Switching time off	[ms]	14	18
Switching time on	[ms]	25	24
Direction of flow		Non-reversible	
Nominal width	[mm]	6 ... 12	
Standard nominal flow rate 1 ⟶ 2	[l/min.]	766 ... 2686	
Standard nominal flow rate 2 ⟶ 3	[l/min.]	1467 ... 3462	

Technical data of pneumatic connection, type VOFC-LT-...14-...		
VOFC-LT-M32C-...-G14-...	1	G1/4
	2	G1/4
	3	G1/4
VOFC-LT-M32C-...-N14-...	1	1/4 NPT
	2	1/4 NPT
	3	1/4 NPT
VOFC-LT-M32C-...-FG14-...	1	G1/4
	2	Port pattern to NAMUR, flange 1/4
	3	G1/4
VOFC-LT-M32C-...-FGP14-...	1	Port pattern to M 5 NAMUR
	2	Port pattern to NAMUR, flange 1/4
	3	G1/4
VOFC-LT-M32C-...-FNP14-...	1	Port pattern to M 5 NAMUR
	2	Port pattern to NAMUR, flange 1/4
	3	1/4 NPT
VOFC-LT-M32C-...-FN14-...	1	1/4 NPT
	2	Port pattern to NAMUR, flange 1/4
	3	1/4 NPT

Technical data – Modular system, poppet valves

Technical data of pneumatic connection, type VOFC-LT-...12-..., type VOFC-LT-...13-...		
VOFC-LT-M32C-...-G12-...	1	G1/2
	2	G1/2
	3	G1/2
VOFC-LT-M32C-...-N12-...	1	1/2 NPT
	2	1/2 NPT
	3	1/2 NPT
VOFC-LT-M32C-...-FG12-...	1	G1/2
	2	Port pattern to NAMUR, flange 1/4
	3	G1/2
VOFC-LT-M32C-...-FN12-...	1	1/2 NPT
	2	Port pattern to NAMUR, flange 1/4
	3	1/2 NPT
VOFC-LT-M32C-...-FG13-...	1	G1/2
	2	Port pattern to NAMUR, flange 1/2
	3	G1/2
VOFC-LT-M32C-...-FN13-...	1	1/2 NPT
	2	Port pattern to NAMUR, flange 1/2
	3	1/2 NPT

Technical data, weights		
Type	Weight of basic valve	Weight of pilot control -P3-
VOFC-LT-M32C-M...12-...	880	85
VOFC-LT-M32C-MC-G14-...	550	85
VOFC-LT-M32C-MC-N14-...	550	85
VOFC-LT-M32C-M-F...14-...	600	85
VOFC-LT-M32C-MC-F...P14-...	600	85
VOFC-LT-M32C-MC-F...13-...	900	85

Operating and environmental conditions						
Type VOFC-LT-...		-M32C-M-...12-...	-M32C-M-...14-...	-M32C-MC-...12-... -M32C-MC-...13-...	-M32C-MC-...14-...	-M32C-MZ-...14-...
Operating medium		Compressed air to ISO 8573-1:2010 [7: – : –]				
Degree of protection		IP50, IP65				
Operating pressure range	[bar]	2 ... 8	1 ... 8	2 ... 8	1 ... 8	0 ... 8
	[psi]	29 ... 116	15 ... 116	29 ... 116	15 ... 116	0 ... 116
Note on operating pressure	[bar]	–		0 ... 8 (for external pilot air)		
Pilot pressure	[bar]	–		>2		
Temperature of medium	[°C]	–25 ... +60				
Ambient temperature	[°C]	–25 ... +60				
Safety Integrity Level	[SIL]	Up to SIL3 Low Demand mode				
		Up to SIL3 High Demand mode				
Corrosion resistance class CRC[1)]		4				
Note on materials		Contains paint-wetting impairment substances				
		RoHS compliant				

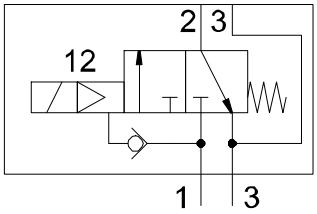
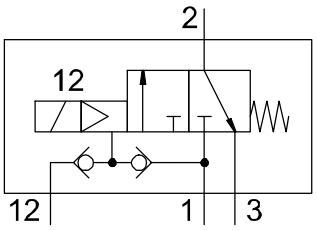
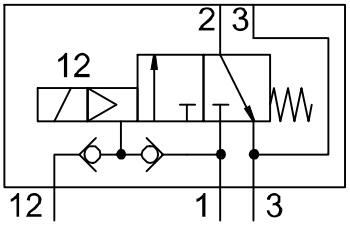
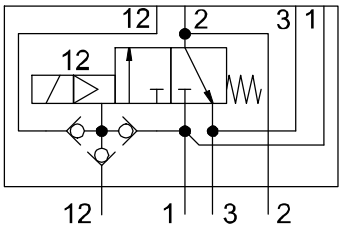
1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Materials			
Type	VOFC-LT-...	VOFC-LT-... -R1-...	VOFC-LT-... -P3-...
Housing	Aluminium (Ematal coated)	High-alloy stainless steel	Aluminium, Ematal coated, PBT-reinforced
Seals	NBR	NBR	NBR, EPDM, VMQ

Solenoid valves VOFC-LT

Technical data – Modular system, poppet valves

Valve functions

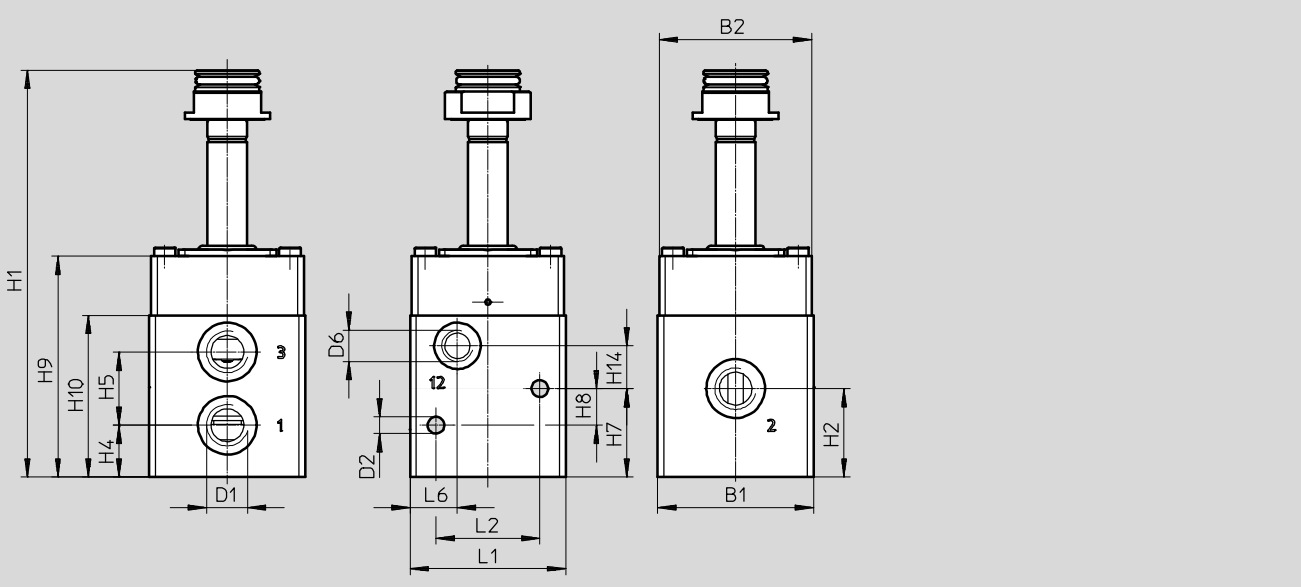
Circuit symbol	Type code	Description
	VOFC-LT-M32C-M-FG12- VOFC-LT-M32C-M-FG14- VOFC-LT-M32C-M-FN12- VOFC-LT-M32C-M-FN14-	3/2-way valve, single solenoid, closed • Electrically pilot-actuated • Non-reversible • With spring return • Internal pilot air supply • With NAMUR port • Without manual override • One-way flow control valve
	VOFC-LT-M32C-MC-G12- VOFC-LT-M32C-MC-G14- VOFC-LT-M32C-MC-N12- VOFC-LT-M32C-MC-N14-	3/2-way valve, single solenoid, closed • Electrically pilot-actuated • Non-reversible • With spring return • Pilot air supply, internal/external • Without manual override • One-way flow control valve
	VOFC-LT-M32C-MC-FG13- VOFC-LT-M32C-MC-FN13-	3/2-way valve, single solenoid, closed • Electrically pilot-actuated • Non-reversible • With spring return • Pilot air supply, internal/external • With NAMUR port • Without manual override • One-way flow control valve
	VOFC-LT-M32C-MC-FGP14- VOFC-LT-M32C-MC-FNP14-	3/2-way valve, single solenoid, closed • Electrically pilot-actuated • Non-reversible • With spring return • Pilot air supply, internal/external • With NAMUR port and additional supply port • Without manual override • One-way flow control valve

Technical data – Modular system, poppet valves

Dimensions

Download CAD data ➔ **www.festo.com**

3/2-way valves, basic valve, port -G14/-N14



Type	B1	B2	D1	D2 ∅	H1	H2	H4	H5
VOFC-LT-M32C-MC-G14-...	51	50	G1/4	5.5	133	29	17	24
VOFC-LT-M32C-MC-N14-...			1/4 NPT					

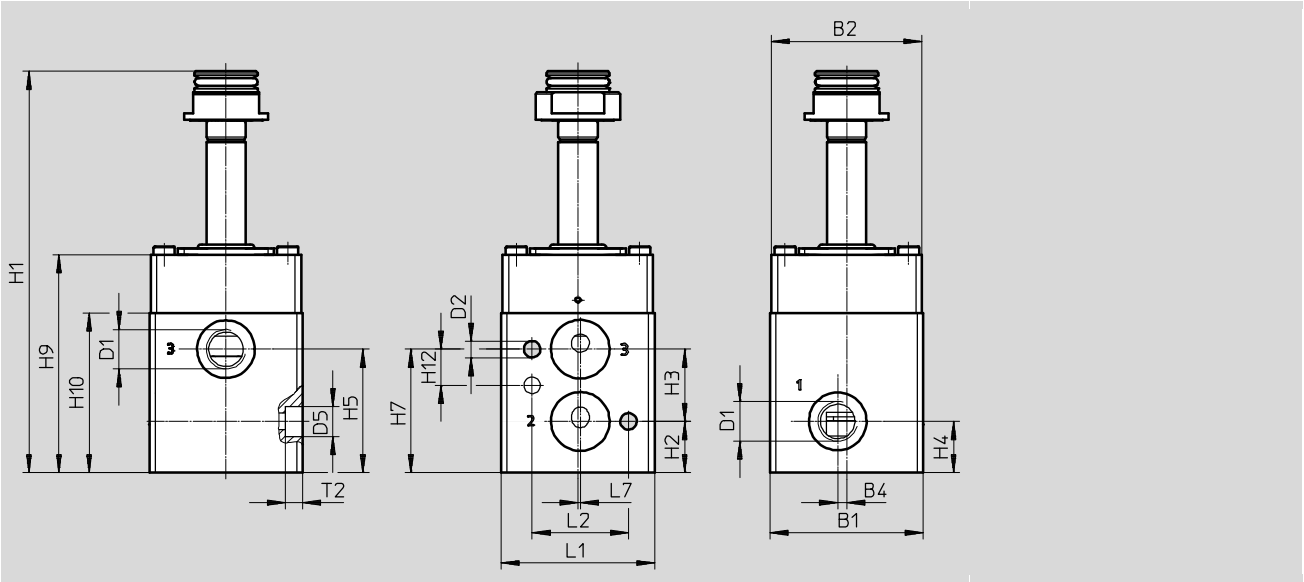
Type	H7	H8	H9	H10	H14	L1	L2	L6
VOFC-LT-M32C-MC-G14-...	29	12	72	53	14	51	34	15.5
VOFC-LT-M32C-MC-N14-...								

Solenoid valves VOFC-LT ... F19/F19A

Technical data – Modular system, poppet valves

Dimensions Download CAD data ➔ **www.festo.com**

3/2-way valves, basic valve, port -FG14

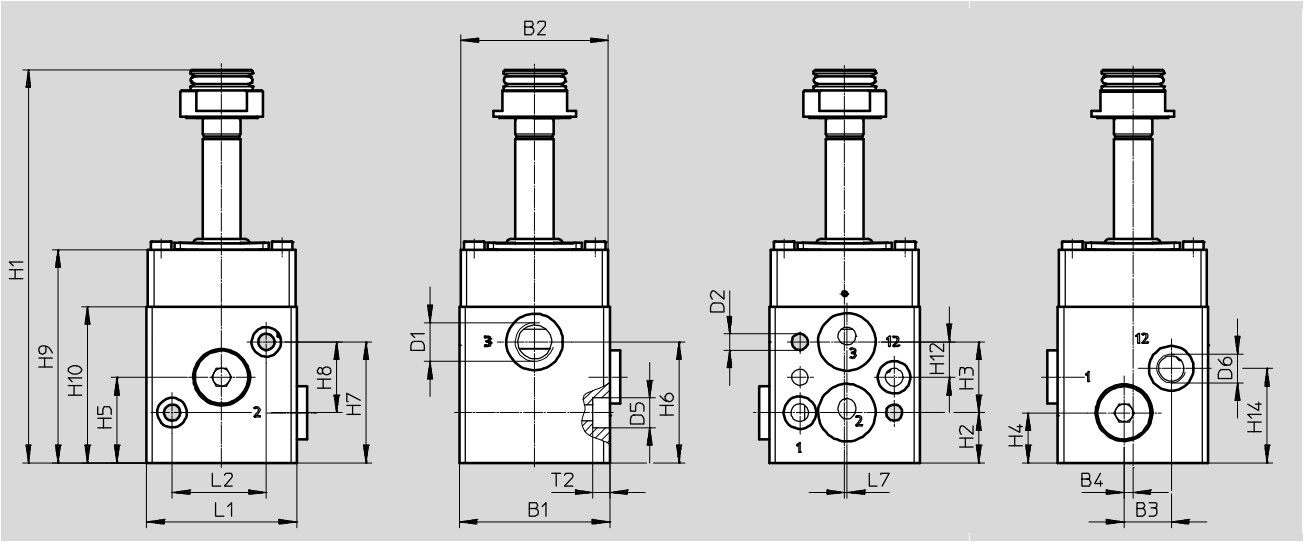


Type	B1	B2	B4	D1	D2 ∅	D5 ∅	H1	H2	H3	H4
VOFC-LT-M32C-M-FG14-...	51	50	3	G1/4	5.5	10	133	17	24	17

Type	H5	H7	H9	H10	H12	L1	L2	L7	T2
VOFC-LT-M32C-M-FG14-...	41	41	72	53	12	51	32	0.8	5.7

Dimensions Download CAD data ➔ **www.festo.com**

3/2-way valves, basic valve, port -FGP14



Type	B1	B2	B3	B4	D1	D2 ∅	D5 ∅	D6	H1	H2	H3	H4
VOFC-LT-M32C-M-FGP14-...	51	50	16	3	G1/4	5.5	10	G1/8	133	17	24	17

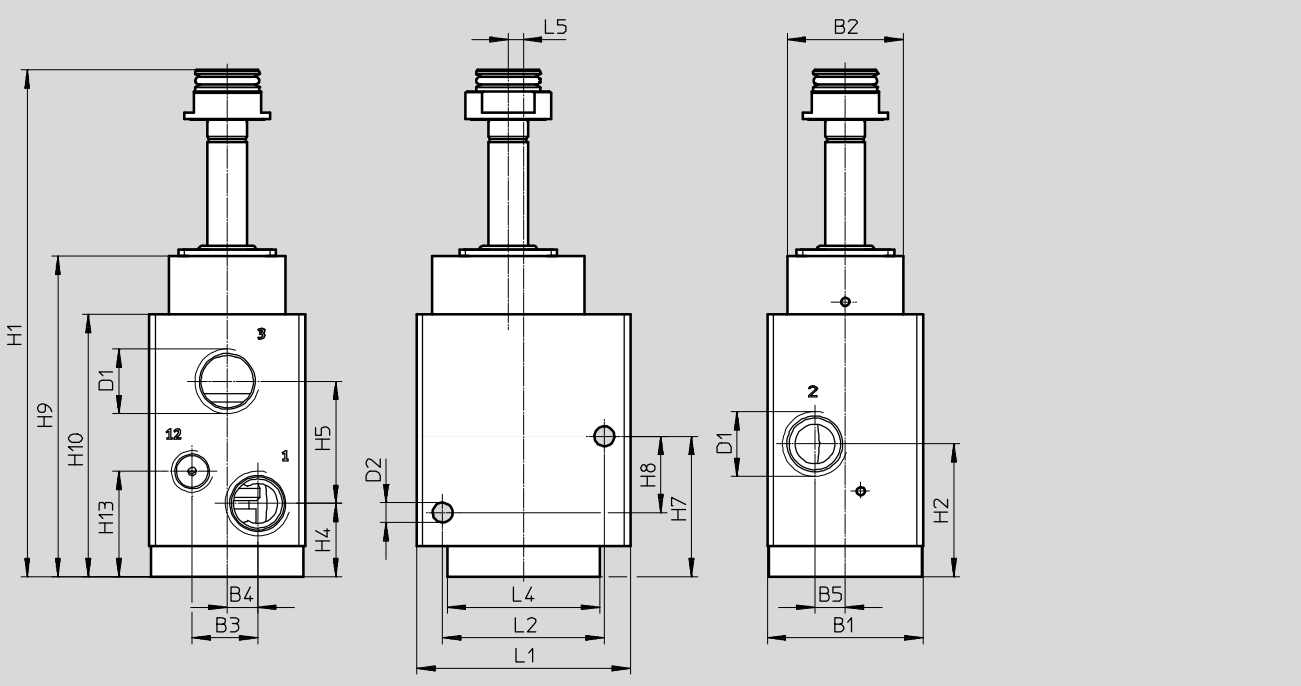
Type	H5	H6	H7	H8	H9	H10	H12	H14	L1	L2	L7	T2
VOFC-LT-M32C-M-FGP14-...	29	41	41	24	72	53	12	32	51	32	0.8	5.7

Technical data – Modular system, poppet valves

Dimensions

Download CAD data ➔ **www.festo.com**

3/2-way valves, basic valve, port -G12/-N12



Type	B1	B2	B3	B4	B5	D1	D2 ∅	H1	H2	H4
VOFC-LT-M32C-MC-G12-...	51	38	22	10	10	G1/2	5.5	166	43.5	24
VOFC-LT-M32C-MC-N12-...			21.5			1/2 NPT				

Type	H5	H7	H8	H9	H10	H13	L1	L2	L4	L5
VOFC-LT-M32C-MC-G12-...	40	46	25	89	105	34.5	70	53	50	5
VOFC-LT-M32C-MC-N12-...										

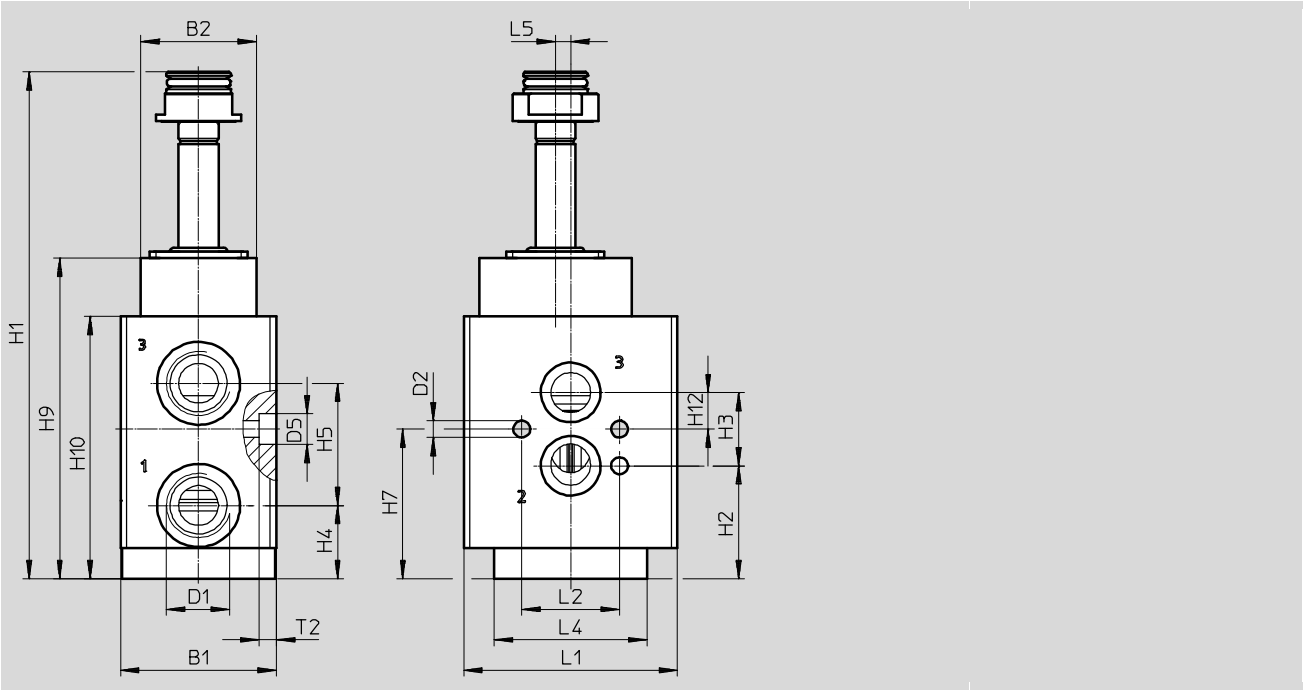
Solenoid valves VOFC-LT

Technical data – Modular system, poppet valves

Dimensions

Download CAD data ➔ **www.festo.com**

3/2-way valves, basic valve, port -FG12



Type	B1	B2	D1	D2 ∅	D5 ∅	H1	H2	H3	H4	H5
VOFC-LT-M32C-MC-FG12-...	51	38	G1/2	5.5	10	166	37	24	24	40

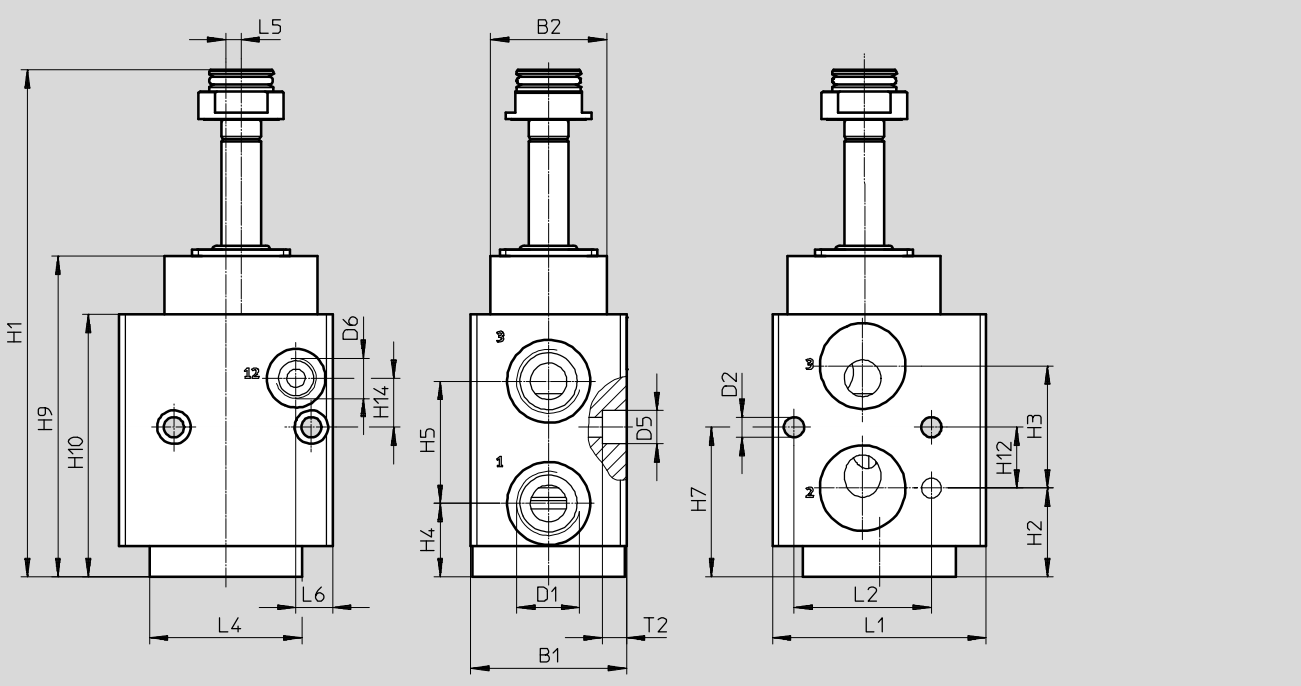
Type	H7	H9	H10	H12	L1	L2	L4	L5	T2
VOFC-LT-M32C-MC-FG12-...	49	105	86	12	70	32	50	5	5.7

Technical data – Modular system, poppet valves

Dimensions

Download CAD data ➔ **www.festo.com**

3/2-way valves, basic valve, port -FG13



Type	B1	B2	D1	D2 ∅	D5 ∅	H1	H2	H3	H4	H5
VOFC-LT-M32C-M-FG13-...	51	38	G1/2	6.6	11	166	29	40	24	40

Type	H7	H9	H10	H12	H14	L1	L2	L4	L5	L6	T2
VOFC-LT-M32C-M-FG13-...	49	105	86	20	16	70	45	50	5	12	8

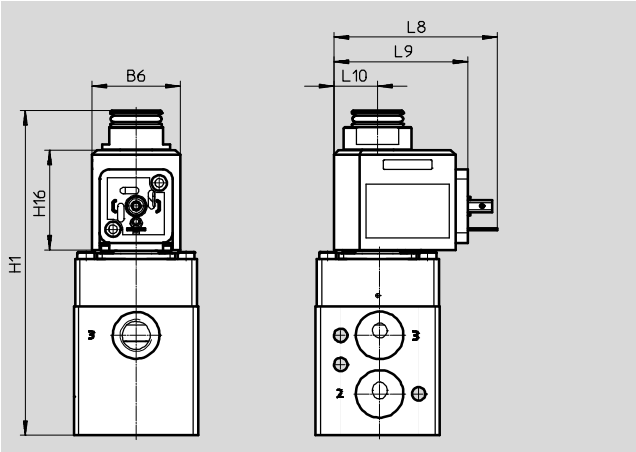
Solenoid valves VOFC-LT

Technical data – Modular system, poppet valves

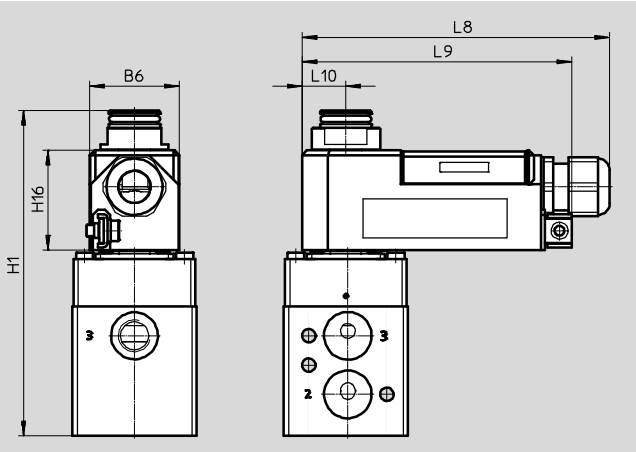
Dimensions Download CAD data ➔ **www.festo.com**

Valves with solenoid coil, pneumatic connection, size 1/4"

VOFC-LT-...-18-A1-...



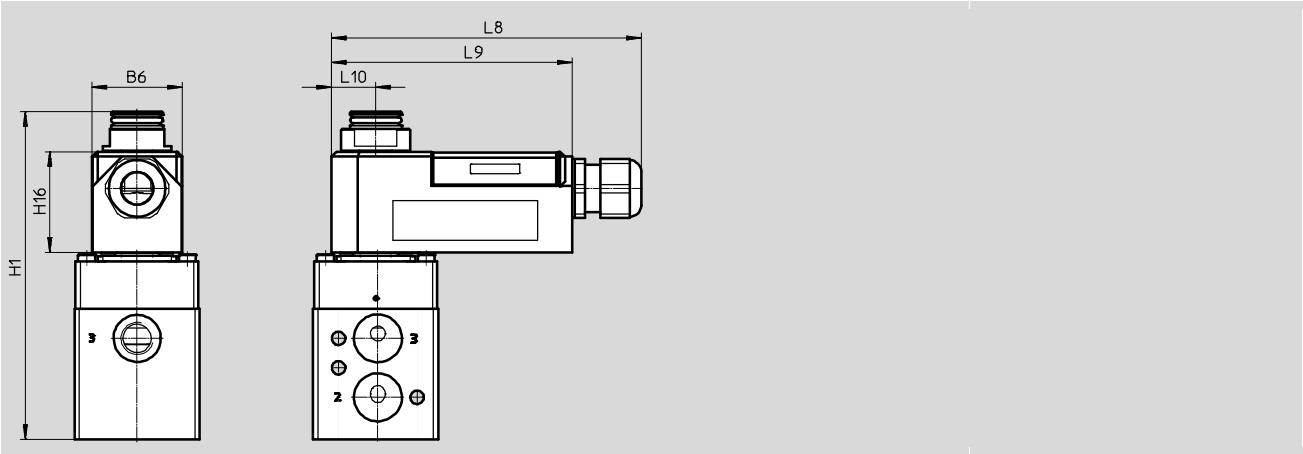
VOFC-LT-...-18-K4-...-EX4ME



Dimensions Download CAD data ➔ **www.festo.com**

Valves with solenoid coil, pneumatic connection, size 1/4"

VOFC-LT-...-11-K4-1-EX4A



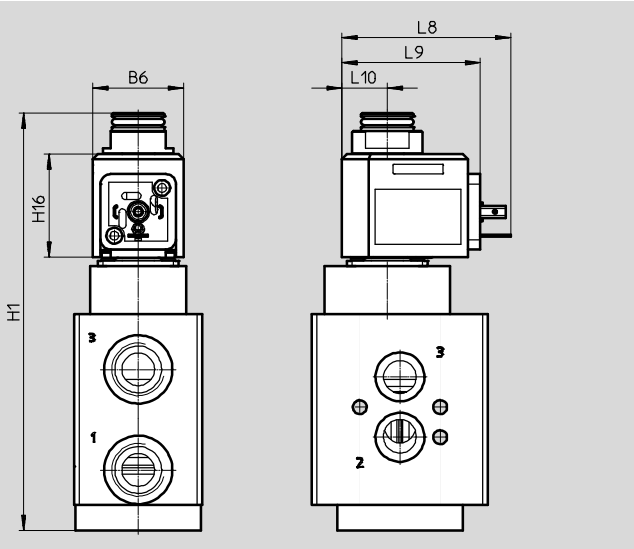
Type	B6	H1	H16	L8	L9	L10
VOFC-LT-...-18-A1-...	36	133	41	67	55	18
VOFC-LT-...-18-K4-...-EX4ME	37	133	41	125	111	18
VOFC-LT-...-11-K4-1-EX4A	37	133	41	125	98	18

Technical data – Modular system, poppet valves

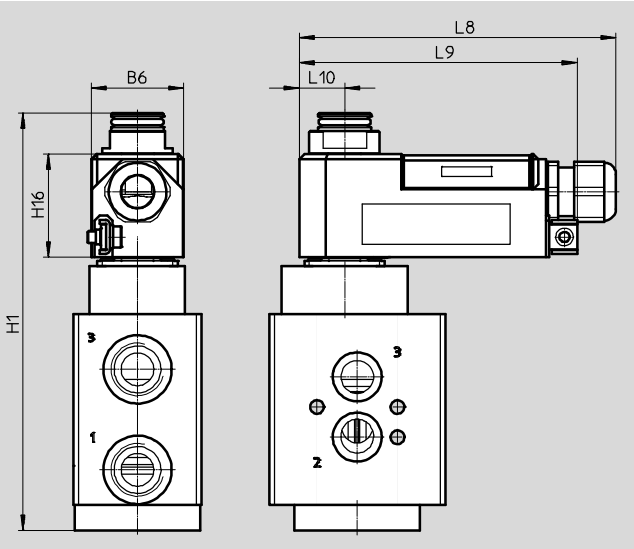
Dimensions Download CAD data ➔ **www.festo.com**

Valves with solenoid coil, pneumatic connection, size 1/2"

VOFC-LT-...-18-A1-...



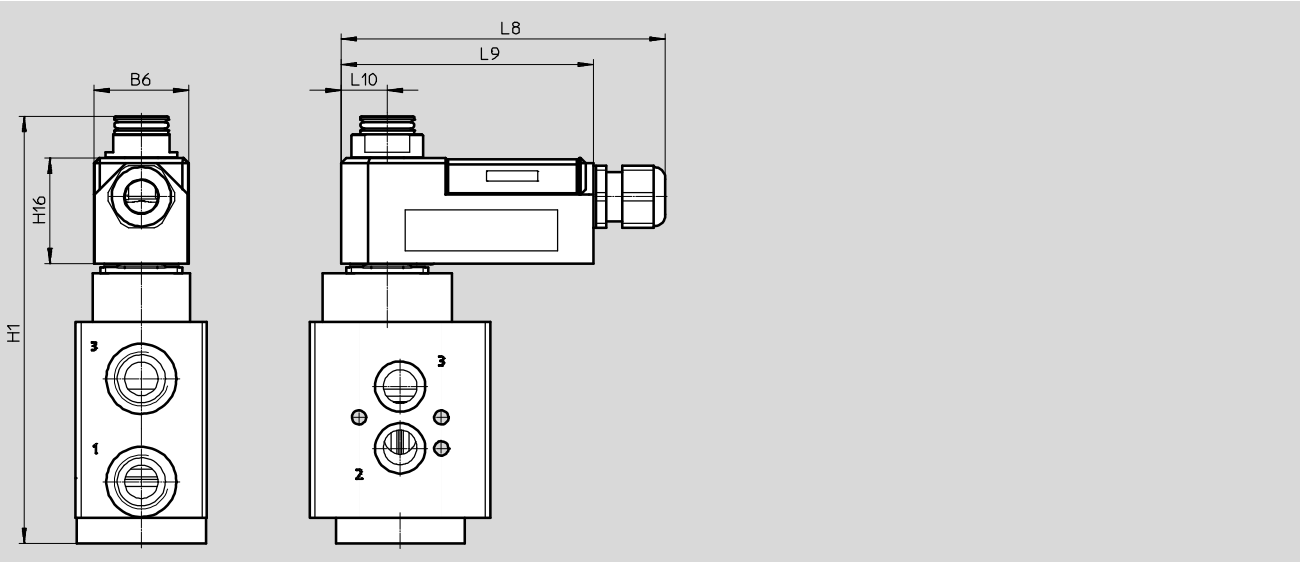
VOFC-LT-...-18-K4-...-EX4ME



Dimensions Download CAD data ➔ **www.festo.com**

Valves with solenoid coil, pneumatic connection, size 1/2"

VOFC-LT-...-11-K4-1-EX4A



Type	B6	H1	H16	L8	L9	L10
VOFC-LT-...-18-A1-...	36	166	41	67	55	18
VOFC-LT-...-18-K4-...-EX4ME	37	166	41	125	111	18
VOFC-LT-...-11-K4-1-EX4A	37	166	41	125	98	18

Solenoid valves VOFC-LT ... P3

Technical data – Modular system, poppet valves

Solenoid valve, nozzle/baffle plate
(VOFC-...-P3-...)

Technical data, solenoid valve, nozzle/baffle plate

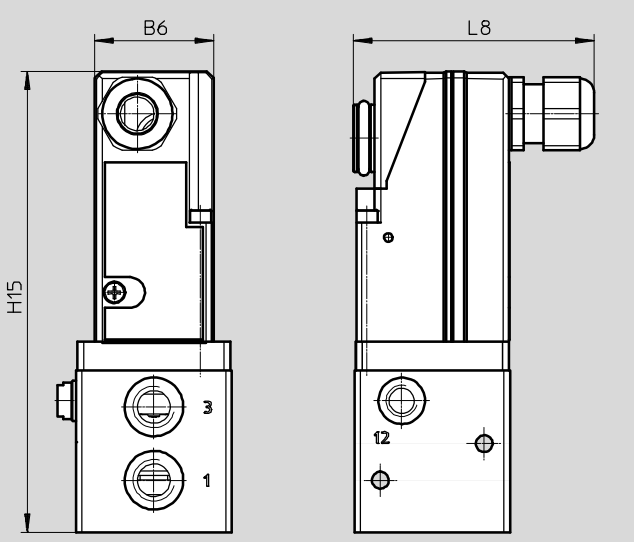
Type		VOFC-...-P3-...-0.09-...-EX4A	VOFC-...-P3-...-0.4-...-EX4A
With pilot control unit		VACC-P3-0.09-K4-1-EX4A	VACC-P3-0.4-K4-1-EX4A
Design		Nozzle/baffle plate pilot control	
Operating voltage range	[V DC]	6.4 ... 40	16 ... 40
Degree of protection		IP 50	
Reverse polarity protection		Bipolar	
Duty cycle	[%]	100	
Max. input power Pi	[mW]	650	
Max. input voltage Ui	[V]	40	
Max. input current Ii	[mA]	200	
Effective internal capacitance Ci		Negligibly low	
Effective internal inductance Li		Negligibly low	
ATEX category for gas		II 2G	
Type of ignition protection for gas		Ex ia IIC T6, T5 Gb	
ATEX category for dust		II 2D	
Type of ignition protection for dust		Ex ia IIIC T85°C, T125°C Db	
Explosion-proof ambient temperature	[°C]	T5, T125: –40 ≤ Ta ≤ +70	
		T6, T85: –40 ≤ Ta ≤ +30	
Certificate issuing authority		BVS14ATEXE098X	
		IECEx BVS14.0063X	
		KGS15-GA4BO-0565X	
Notified body for quality testing		0344	
Explosion protection certification outside the EU		EPL Gb (IEC-EX)	
		EPL Db (IEC-EX)	
		EPL Gb (KR)	
		EPL Db (KR)	
CE marking (see declaration of conformity)		To EU Explosion Protection Directive (ATEX)	
Insulation class		H	
Electrical connection		Terminal box, cable entry, thread M20x1.5, conductor cross-section max. 1.5 mm^2, cable diameter 5-9 mm	
Information on materials for solenoid coil		PBT-reinforced, UP	

Technical data – Modular system, poppet valves

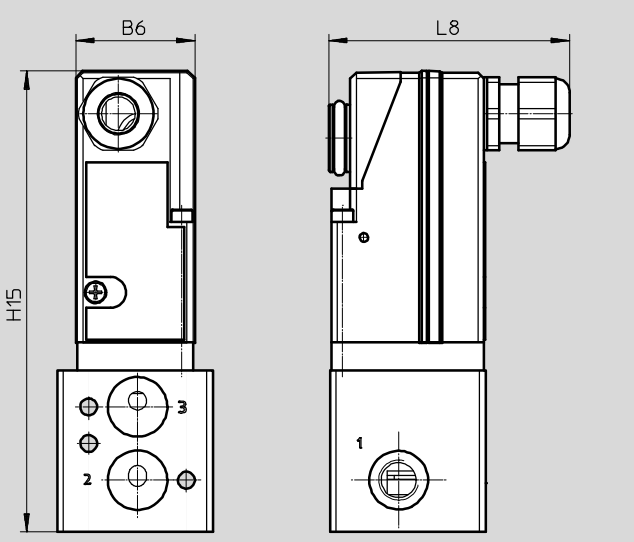
Dimensions Download CAD data ➔ **www.festo.com**

Solenoid valve with nozzle/baffle plate, pilot, pneumatic connection, size 1/4"

Port -G14/-N14



Port -FG14

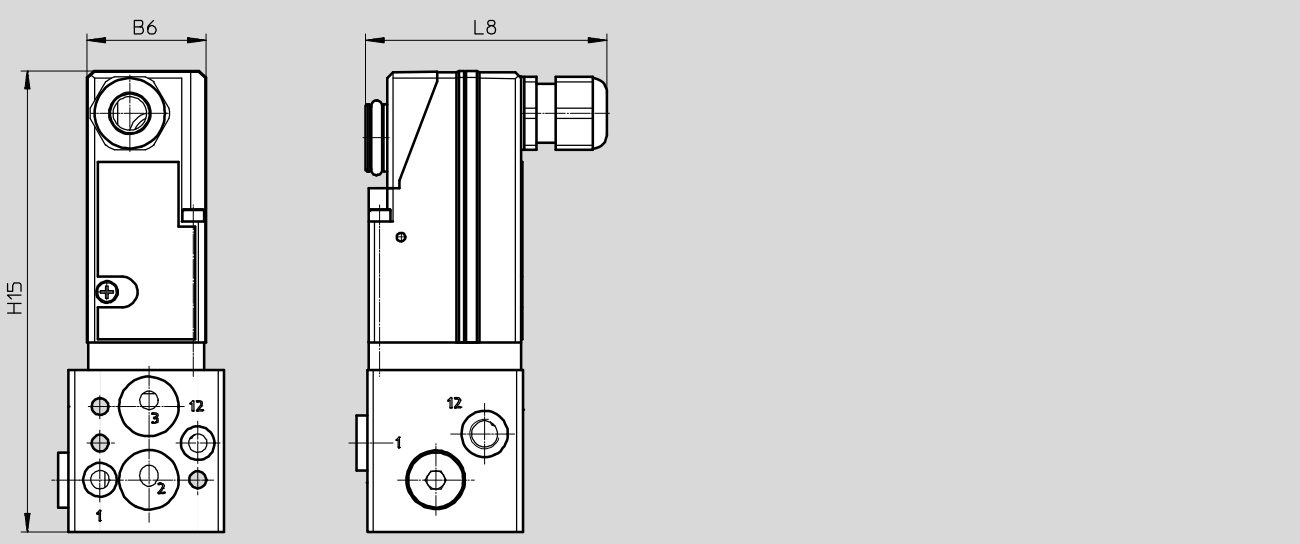


Type	B6	H15	L8
VOFC-LT-M32C-MC-G14-P3-0.4-1-K4-EX4A	39	151	77
VOFC-LT-M32C-MC-N14-P3-0.4-1-K4-EX4A			
VOFC-LT-M32C-MC-G14-P3-0.09-1-K4-EX4A			
VOFC-LT-M32C-MC-N14-P3-0.09-1-K4-EX4A			
VOFC-LT-M32C-M-FG14-P3-0.4-1-K4-EX4A			
VOFC-LT-M32C-M-FG14-P3-0.09-1-K4-EX4A			

Dimensions Download CAD data ➔ **www.festo.com**

Solenoid valve with nozzle/baffle plate, pilot, pneumatic connection, size 1/4"

Port -FGP14



Type	B6	H15	L8
VOFC-LT-M32C-M-FGP14-P3-0.4-1-K4-EX4A	39	151	77
VOFC-LT-M32C-M-FGP14-P3-0.09-1-K4-EX4A			

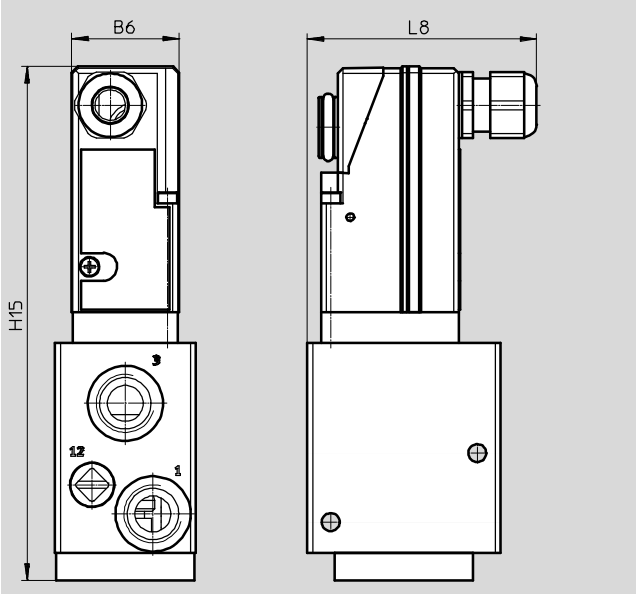
Solenoid valves VOFC-LT ... P3

Technical data – Modular system, poppet valves

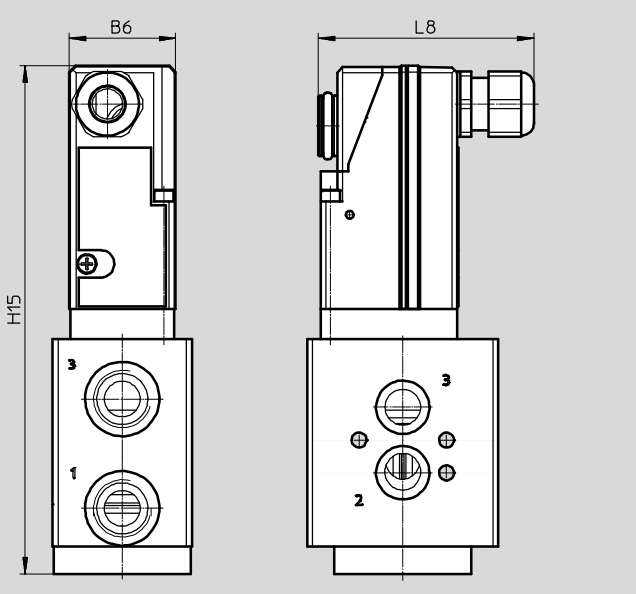
Dimensions Download CAD data ➔ **www.festo.com**

Solenoid valve with nozzle/baffle plate pilot, pneumatic connection, size 1/2"

Port -G12/-N12



Port -FG12

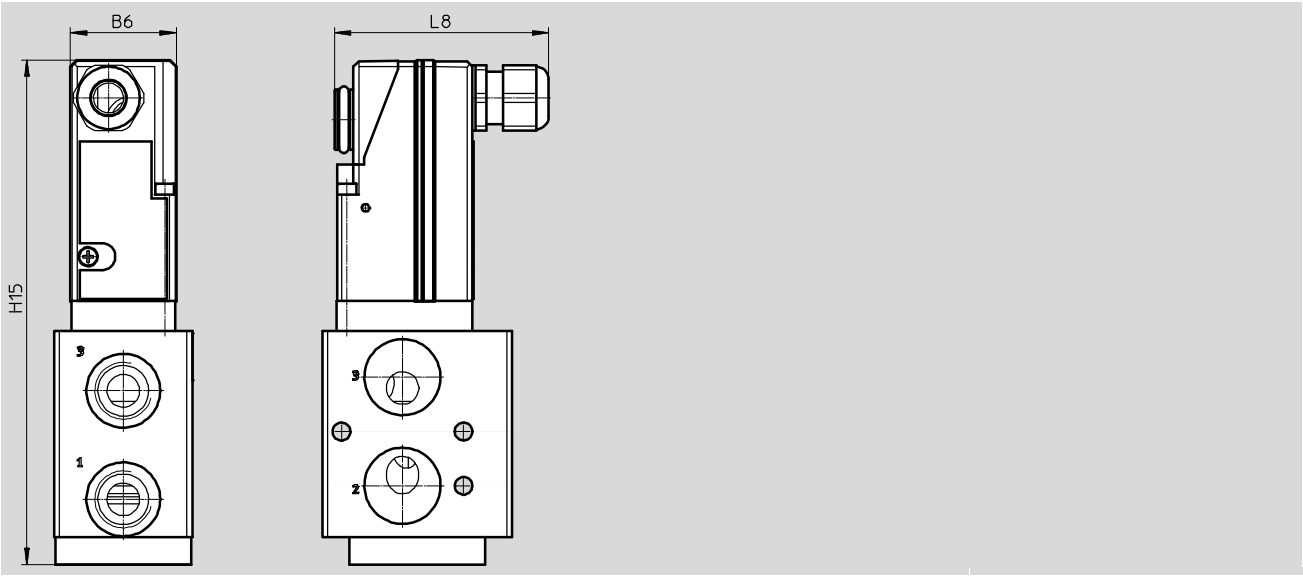


Type	B6	H15	L8
VOFC-LT-M32C-MC-G12-P3-0.4-1-K4-EX4A	39	185.9	79.9
VOFC-LT-M32C-MC-N12-P3-0.4-1-K4-EX4A			
VOFC-LT-M32C-MC-G12-P3-0.09-1-K4-EX4A			
VOFC-LT-M32C-MC-N12-P3-0.09-1-K4-EX4A			
VOFC-LT-M32C-M-FG12-P3-0.4-1-K4-EX4A			
VOFC-LT-M32C-M-FG12-P3-0.09-1-K4-EX4A			

Dimensions Download CAD data ➔ **www.festo.com**

Solenoid valve with nozzle/baffle plate pilot, pneumatic connection, size 1/2"

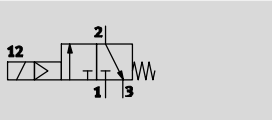
Port -FG13



Type	B6	H15	L8
VOFC-LT-M32C-M-FG13-P3-0.4-1-K4-EX4A	39	185.9	79.9
VOFC-LT-M32C-M-FG13-P3-0.09-1-K4-EX4A			

Technical data – 3/2-way valves, poppet valve, single solenoid, G1/4 NAMUR

Function
3/2-way valve



- Temperature range
  –25 ... +60 °C
- Flow rate
  766 l/min

General technical data					
		G1/4 basic valve, NAMUR	G1/4 basic valve, NAMUR, intrinsically safe	G1/4 basic valve, NAMUR, supply port	G1/4 basic valve, NAMUR, supply port, intrinsically safe
Valve function		3/2-way, single solenoid, closed			
Pneumatic connection	1	G1/4		M5 and port pattern to NAMUR	
	2	Flange 1/4 and port pattern to NAMUR			
	3	G1/4			
Design		Pilot-actuated piston poppet valve			
Width	[mm]	51			
Mounting position		Any			
Sealing principle		Hard			
Manual override		None			
Reset method		Mechanical spring			
Actuation type		Electrical			
Type of control		Pilot-actuated			
Pilot air supply		Internal		Internal, external	
Flow rate for piston valve pressurisation	[m^3/h]	0.5		0.5	
Flow rate for piston valve exhaust	[m^3/h]	0.8		0.65	
Flow direction		Non-reversible			
Product weight	[g]	600			
Switching time off	[ms]	18			
Switching time on	[ms]	24			
Nominal width	[mm]	6			
Standard nominal flow rate 1⟶2	[l/min.]	766			
Standard nominal flow rate 2⟶3	[l/min.]	1467			

Operating and environmental conditions					
		G1/4 basic valve, NAMUR	G1/4 basic valve, NAMUR, intrinsically safe	G1/4 basic valve, NAMUR, supply port	G1/4 basic valve, NAMUR, supply port, intrinsically safe
Operating medium		Compressed air to ISO 8573-1:2010 [7:–:–]			
Degree of protection		IP65			
Operating pressure range	[bar]	1 ... 8			
Operating pressure range in case of external pilot air	[bar]	–		0 ... 8	
Temperature of medium	[°C]	–25 ... +60			
Ambient temperature	[°C]	–25 ... +60			
Safety Integrity Level	[SIL]	Up to SIL3 Low Demand mode			
		Up to SIL3 High Demand mode			
Corrosion resistance class CRC[1)]		4			

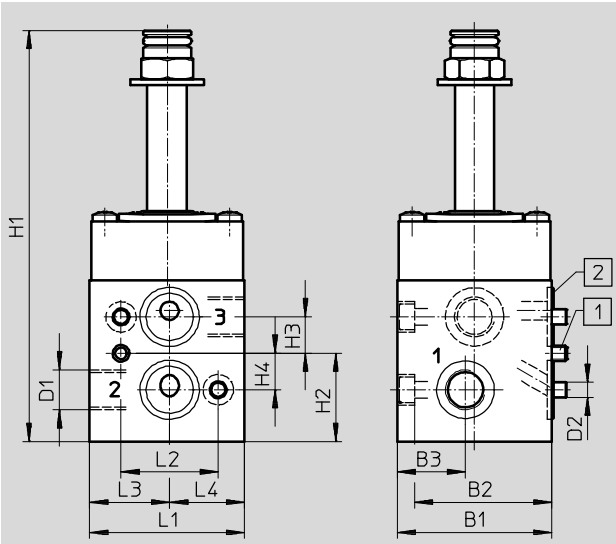
1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Basic valves VOFC-LT ... F19/F19A

Technical data – 3/2-way valves, poppet valve, single solenoid, G1/4 NAMUR

Materials	
Housing	Aluminium (Ematal coated)
Seals	NBR
Note on materials	Contains paint-wetting impairment substances, RoHS-compliant

Dimensions Download CAD data ➔ **www.festo.com**

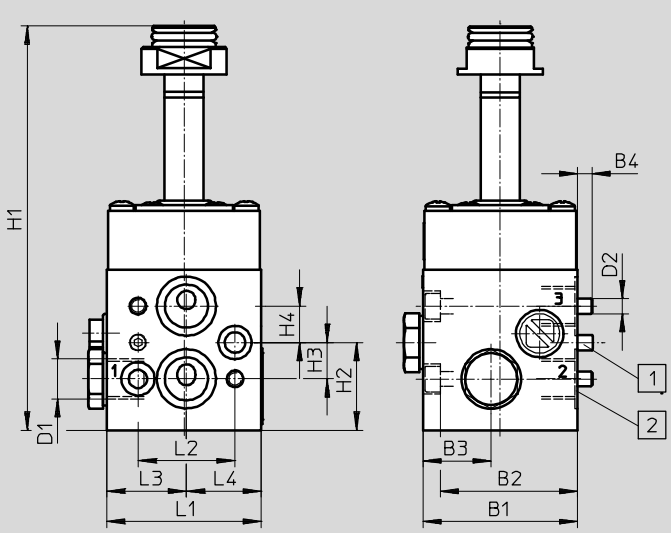


1 Coding pin M5x10
2 O-ring 16 x 2

Type	B1	B2	B3	D1	D2	H1	H2	H3	H4	L1	L2	L3	L4
VOFC-LT-M32C-M-FG14-F19	51	45.3	22.5	G1/4	5.5	135.3	29	12	12	51	32	26.3	24.7
VOFC-LT-M32C-M-FG14-F19A													

Technical data – 3/2-way valves, poppet valve, single solenoid, G1/4 NAMUR

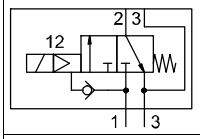
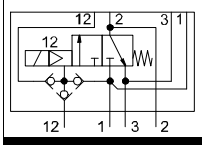
Dimensions Download CAD data ➔ **www.festo.com**



1 Coding pin M5x10
2 O-ring 16 x 2

Type	B1	B2	B3	B4	D1	D2	H1	H2	H3	H4	L1	L2	L3	L4
VOFC-LT-M32C-MC-FGP14-F19	51	45.3	22.5	4.7	NAMUR G1/4	M5	133.4	29	12	12	51	32	26.3	24.7
VOFC-LT-M32C-MC-FGP14-F19A														

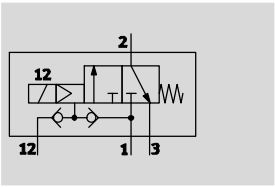
Ordering data

Circuit symbol	Function	Pneumatic connection	Type of ignition protection	Part No.	Type
In-line valve					
	3/2-way, single solenoid, closed	G1/4 and NAMUR	Without	**4514738**	**VOFC-LT-M32C-M-FG14-F19**
			Intrinsically safe	**4514739**	**VOFC-LT-M32C-M-FG14-F19A**
	3/2-way, single solenoid, closed	G1/4 and NAMUR, supply port	Without	**4514744**	**VOFC-LT-M32C-MC-FGP14-F19**
			Intrinsically safe	**4514745**	**VOFC-LT-M32C-MC-FGP14-F19A**

Basic valves VOFC-LT ... F19/F19A

Technical data – 3/2-way valves, poppet valve, single solenoid, G1/4 sleeve

Function
3/2-way valve



- Temperature range
  –25 ... +60 °C

- Flow rate
  766 l/min

General technical data

			G1/4 basic valve	G1/4 basic valve, intrinsically safe	NPT basic valve	NPT basic valve, intrinsically safe
Valve function			3/2-way, single solenoid, closed			
Pneumatic connection	1		G1/4	G1/4	1/4 NPT	1/4 NPT
	2		G1/4	G1/4	1/4 NPT	1/4 NPT
	3		G1/4	G1/4	1/4 NPT	1/4 NPT
Design			Pilot-actuated piston poppet valve			
Width		[mm]	51			
Mounting position			Any			
Sealing principle			Hard			
Manual override			None			
Reset method			Mechanical spring			
Actuation type			Electrical			
Type of control			Pilot-actuated			
Pilot air supply port			Internal, external			
Flow rate for piston valve pressurisation		[m^3/h]	0.72			
Flow rate for piston valve exhaust		[m^3/h]	1.4			
Flow direction			Non-reversible			
Product weight		[g]	550			
Switching time off		[ms]	18			
Switching time on		[ms]	24			
Nominal width		[mm]	6			
Standard nominal flow rate 1⟶2		[l/min.]	766			
Standard nominal flow rate 2⟶3		[l/min.]	1467			

Operating and environmental conditions

Operating medium		Compressed air to ISO 8573-1:2010 [7:–:–]
Degree of protection		IP65
Operating pressure range	[bar]	1 ... 8
Operating pressure range in case of external pilot air	[bar]	0 ... 8
Temperature of medium	[°C]	–25 ... +60
Ambient temperature	[°C]	–25 ... +60
Safety Integrity Level	[SIL]	Up to SIL3 Low Demand mode
		Up to SIL3 High Demand mode
Corrosion resistance class CRC[1)]		4

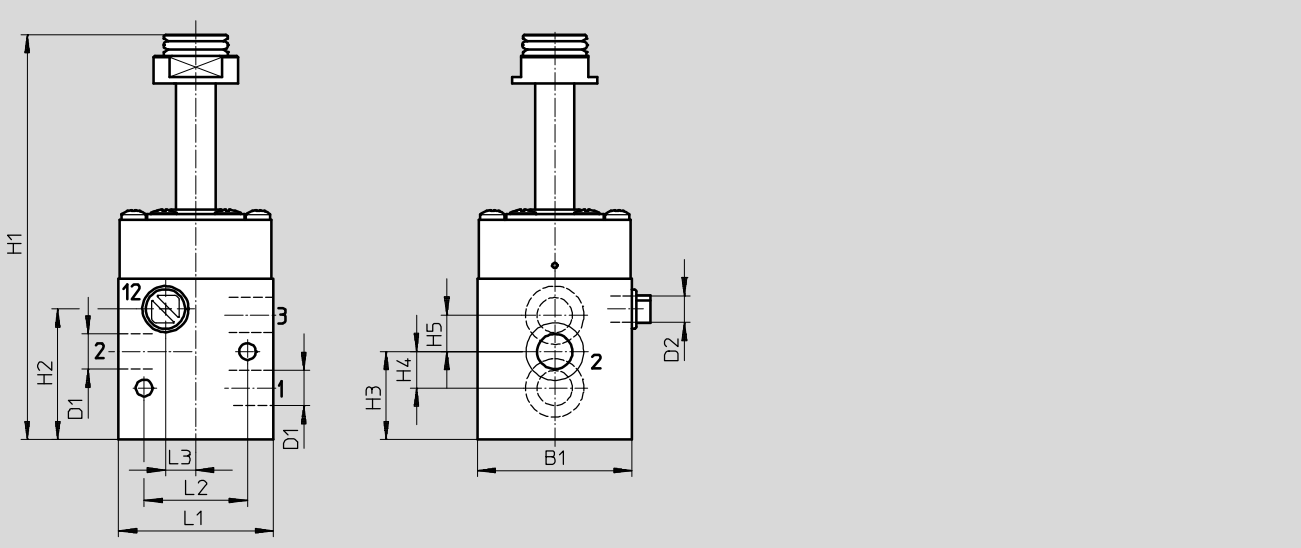
1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Materials

Housing	Aluminium (Ematal coated)
Seals	NBR
Note on materials	Contains paint-wetting impairment substances, RoHS-compliant

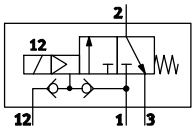
Technical data – 3/2-way valves, poppet valve, single solenoid, G1/4 sleeve

Dimensions Download CAD data ➔ **www.festo.com**



Type	B1	D1	D2	H1	H2	H3	H4	H5	L1	L2	L3
VOFC-LT-M32C-MC-G14-F19	51	G1/4	G1/8	133	43	29	12	12	51	34	10
VOFC-LT-M32C-MC-G14-F19A											
VOFC-LT-M32C-MC-N14-F19		1/4NPT	1/8NPT								
VOFC-LT-M32C-MC-N14-F19A											

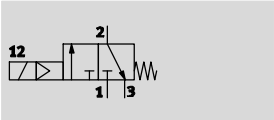
Ordering data

Circuit symbol	Function	Pneumatic connection	Type of ignition protection	Part No.	Type
In-line valve					
	3/2-way, single solenoid, closed	G1/4	Without	**4514740**	**VOFC-LT-M32C-MC-G14-F19**
			Intrinsically safe	**4514741**	**VOFC-LT-M32C-MC-G14-F19A**
		1/4 NPT	Without	**4514742**	**VOFC-LT-M32C-MC-N14-F19**
			Intrinsically safe	**4514743**	**VOFC-LT-M32C-MC-N14-F19A**

Basic valves VOFC-LT ... F19/F19A

Technical data – 3/2-way valve, poppet valve, single solenoid, G1/2 NAMUR

Function
3/2-way valve



- Temperature range
  –25 ... +60 °C

- Flow rate
  2868 l/min

General technical data				
			VOFC-...-FG12-F19 VOFC-...-FG12-F19A	VOFC-...-FG13-F19 VOFC-...-FG13-F19A
Valve function			3/2-way, single solenoid, closed	
Pneumatic connection	1		G1/2	
	2		Flange 1/4 and port pattern to NAMUR	Flange 1/2 and port pattern to NAMUR
	3		G1/2	
Design			Pilot-actuated piston poppet valve	
Width		[mm]	51	
Mounting position			Any	
Sealing principle			Hard	
Manual override			None	
Reset method			Mechanical spring	
Actuation type			Electrical	
Type of control			Pilot-actuated	
Pilot air supply			Internal	Internal, external
Flow rate for piston valve pressurisation		[m^3/h]	2.4	
Flow rate for piston valve exhaust		[m^3/h]	3.3	
Flow direction			Non-reversible	
Product weight		[g]	880	900
Switching time off		[ms]	14	
Switching time on		[ms]	25	
Nominal width		[mm]	12	
Standard nominal flow rate 1⟶2		[l/min.]	2686	
Standard nominal flow rate 2⟶3		[l/min.]	3462	

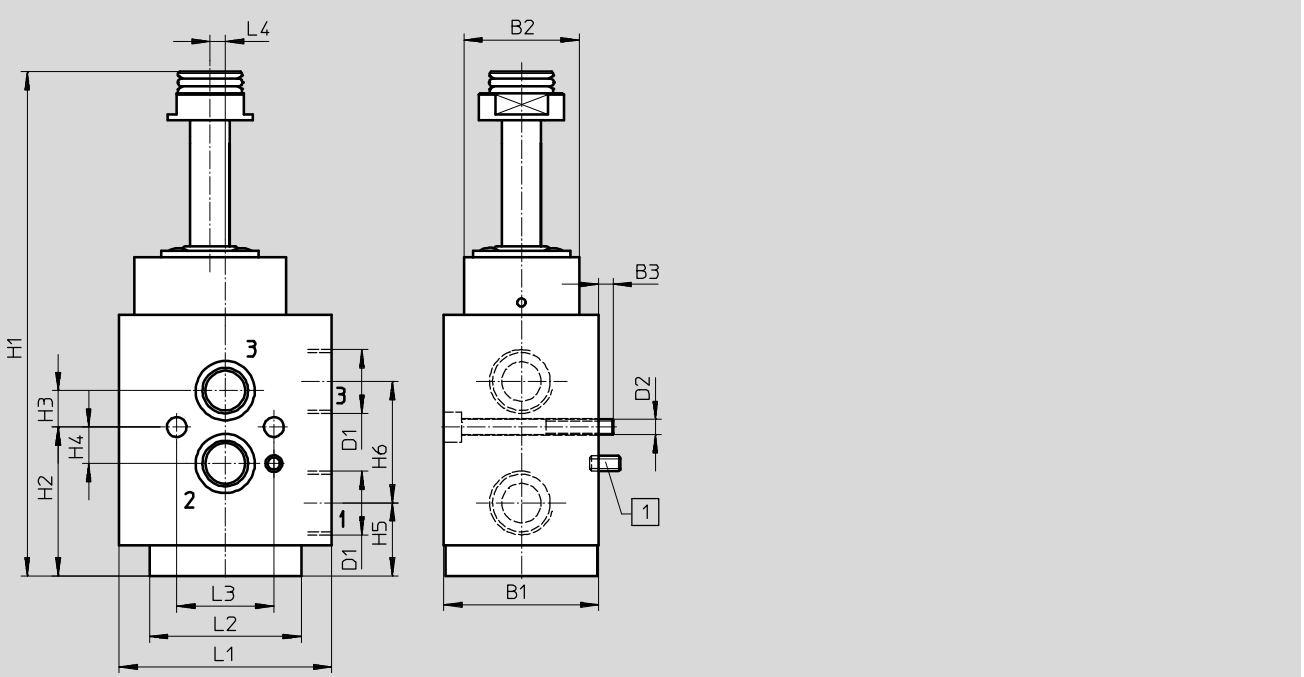
Operating and environmental conditions				
			VOFC-...-FG12-F19 VOFC-...-FG12-F19A	VOFC-...-FG13-F19 VOFC-...-FG13-F19A
Operating medium			Compressed air to ISO 8573-1:2010 [7:–:–]	
Degree of protection			IP65	
Operating pressure range		[bar]	2 ... 8	
Operating pressure range in case of external pilot air		[bar]	–	0 ... 8
Temperature of medium		[°C]	–25 ... +60	
Ambient temperature		[°C]	–25 ... +60	
Safety Integrity Level		[SIL]	Up to SIL3 Low Demand mode	
			Up to SIL3 High Demand mode	
Corrosion resistance class CRC[1)]			4	

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Technical data – 3/2-way valve, poppet valve, single solenoid, G1/2 NAMUR

Materials	
Housing	Aluminium (Ematal coated)
Seals	NBR
Note on materials	Contains paint-wetting impairment substances, RoHS-compliant

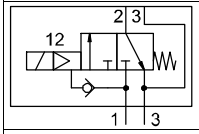
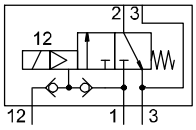
Dimensions Download CAD data ➔ **www.festo.com**



1 Coding pin M5x10

Type	B1	B2	B3	D1	D2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4
VOFC-LT-M32C-M-FG12-F19	51	38	4.7	G1/2	M5	166	49	12	12	24	40	70	50	32	5
VOFC-LT-M32C-M-FG12-F19A															
VOFC-LT-M32C-MC-FG13-F19															
VOFC-LT-M32C-MC-FG13-F19A															

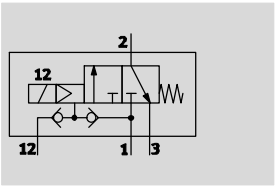
Ordering data

Circuit symbol	Function	Pneumatic connection	Type of ignition protection	Part No.	Type
In-line valve					
	3/2-way, single solenoid, closed	G1/2 and NAMUR	Without	**4514746**	**VOFC-LT-M32C-M-FG12-F19**
			Intrinsically safe	**4514747**	**VOFC-LT-M32C-M-FG12-F19A**
	3/2-way, single solenoid, closed	G1/2 Flange 1/2 (port pattern to NAMUR) G1/2	Without	**4527268**	**VOFC-LT-M32C-MC-FG13-F19**
			Intrinsically safe	**4527269**	**VOFC-LT-M32C-MC-FG13-F19A**

Basic valves VOFC-LT ... F19/F19A

Technical data – 3/2-way valve, poppet valve, single solenoid, G1/2 sleeve

Function
3/2-way valve



- Temperature range
  –25 ... +60 °C

- Flow rate
  2686 l/min

General technical data		
Valve function		3/2-way, single solenoid, closed
Pneumatic connection	1	G1/2
	2	G1/2
	3	G1/2
Design		Pilot-actuated piston poppet valve
Width	[mm]	51
Mounting position		Any
Sealing principle		Hard
Manual override		None
Reset method		Mechanical spring
Actuation type		Electrical
Type of control		Pilot-actuated
Pilot air supply		Internal, external
Flow rate for piston valve pressurisation	[m^3/h]	2.4
Flow rate for piston valve exhaust	[m^3/h]	3.3
Flow direction		Non-reversible
Product weight	[g]	880
Switching time off	[ms]	14
Switching time on	[ms]	25
Nominal width	[mm]	12
Standard nominal flow rate 1→2	[l/min.]	2686
Standard nominal flow rate 2→3	[l/min.]	3462

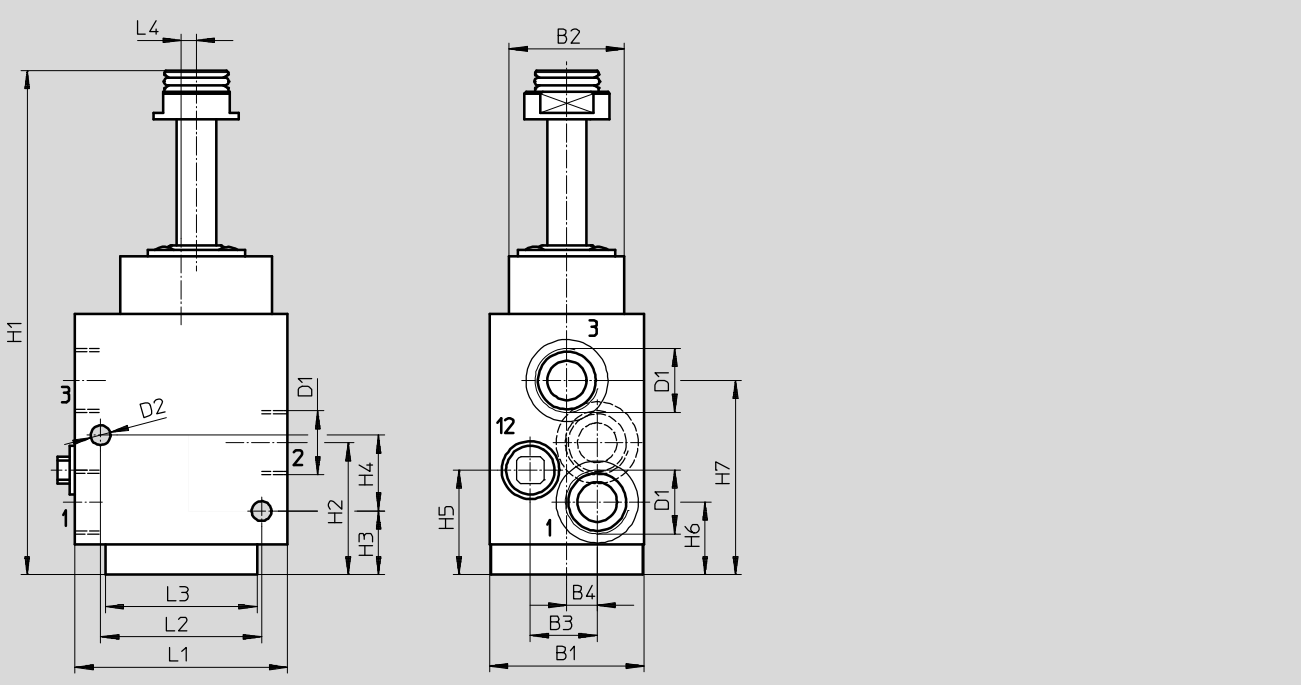
Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:–:–]
Degree of protection		IP65
Operating pressure range	[bar]	2 ... 8
Operating pressure range in case of external pilot air	[bar]	0 ... 8
Temperature of medium	[°C]	–25 ... +60
Ambient temperature	[°C]	–25 ... +60
Safety Integrity Level	[SIL]	Up to SIL3 Low Demand mode
		Up to SIL3 High Demand mode
Corrosion resistance class CRC[1)]		4

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (→ also FN 940082) using appropriate media.

Materials	
Housing	Aluminium (Ematal coated)
Seals	NBR
Note on materials	Contains paint-wetting impairment substances, RoHS-compliant

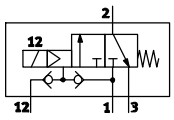
Technical data – 3/2-way valve, poppet valve, single solenoid, G1/2 sleeve

Dimensions Download CAD data ➔ **www.festo.com**



Type	B1	B2	B3	B4	D1	D2	H1	H2	H3	H4	H5	L1	L2	L3	L4
VOFC-LT-M32C-MC-G12-F19	51	37	22	10	G1/2	6.5	166	43.5	21	25	34.5	70	53	50	5
VOFC-LT-M32C-MC-G12-F19A															

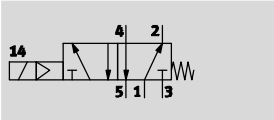
Ordering data

Circuit symbol	Function	Pneumatic connection	Type of ignition protection	Part No.	Type
In-line valve					
	3/2-way, single solenoid, closed	G1/2	Without	**4514748**	**VOFC-LT-M32C-MC-G12-F19**
			Intrinsically safe	**4514749**	**VOFC-LT-M32C-MC-G12-F19A**

Basic valves VOFC-L ... F19/F19A

Technical data – 5/2-way valve, piston spool, single solenoid, G1/4 NAMUR

Function
5/2-way valve



- Temperature range
  –25 ... +60 °C

- Flow rate
  1030 l/min

General technical data		
Valve function		5/2-way, single solenoid
Pneumatic connection	1	G1/4
	2	G1/4 and port pattern to NAMUR
	3	G1/4
	4	G1/4 and port pattern to NAMUR
	5	G1/4
Design		Piston spool valve
Mounting position		Any
Width	[mm]	40
Sealing principle		Soft
Manual override		None
Reset method		Mechanical spring
Actuation type		Electrical
Type of control		Pilot-actuated
Pilot air supply		Internal
Flow rate for piston valve pressurisation	[m³/h]	1.08
Flow rate for piston valve exhaust	[m³/h]	1.08
Flow direction		Non-reversible
Product weight	[g]	520
Switching time off	[ms]	22
Switching time on	[ms]	26
Nominal width	[mm]	6
Standard nominal flow rate 1→2	[l/min.]	1030
Standard nominal flow rate 2→3	[l/min.]	978

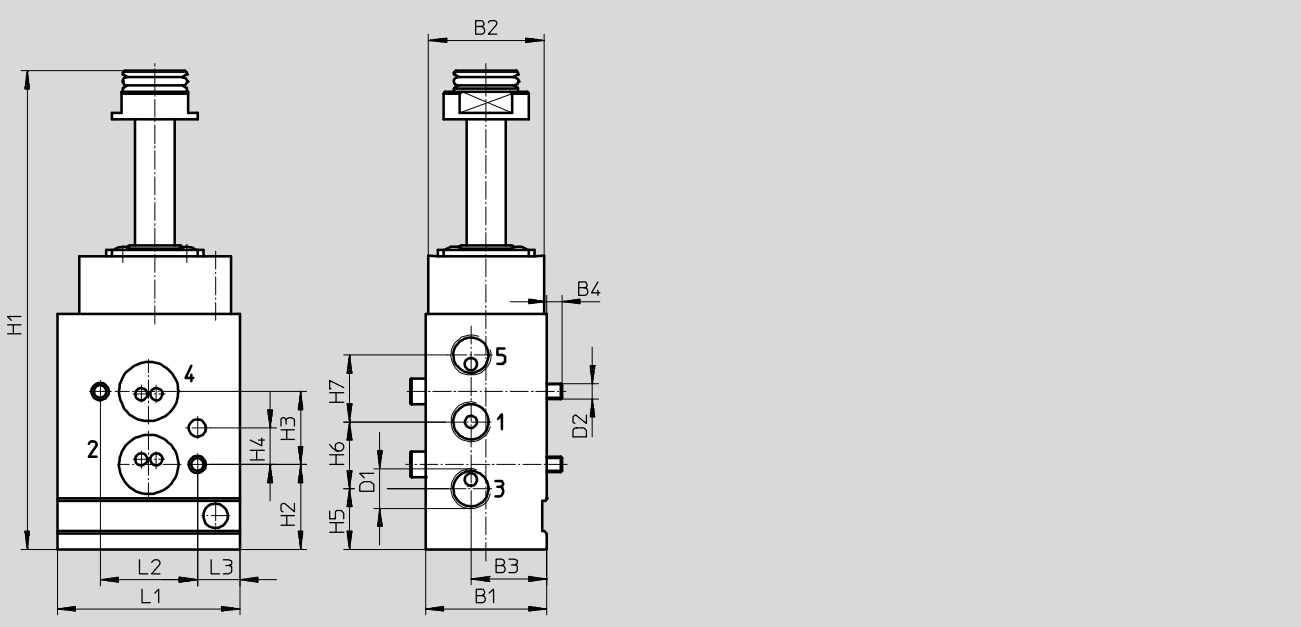
Operating and environmental conditions		
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Degree of protection		IP65
Operating pressure range	[bar]	2.5 ... 8
Temperature of medium	[°C]	–25 ... +60
Ambient temperature	[°C]	–25 ... +60
Safety Integrity Level	[SIL]	Up to SIL2 Low Demand mode
		Up to SIL2 High Demand mode
Corrosion resistance class CRC[1)]		4

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (→ also FN 940082) using appropriate media.

Materials	
Housing	Aluminium (Ematal coated)
Seals	NBR
Note on materials	Contains paint-wetting impairment substances, RoHS-compliant

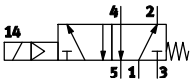
Technical data – 5/2-way valve, piston spool, single solenoid, G1/4 NAMUR

Dimensions Download CAD data ➔ **www.festo.com**



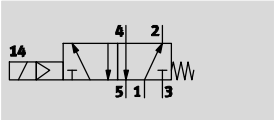
Type	B1	B2	B3	B4	D1	D2	H1	H2	H3	H4	H5	H6	H7	L1	L2	L3
VOFC-L-M52-M-FG14-F19	40	38	25	5	G1/4	M5	158	28	24	12	20	22	22	60	32	14
VOFC-L-M52-M-FG14-F19A																

Ordering data

Circuit symbol	Function	Pneumatic connection	Type of ignition protection	Part No.	Type
In-line valve					
	5/2-way, single solenoid	G1/4 and NAMUR	Without	**4514923**	**VOFC-L-M52-M-FG14-F19**
			Intrinsically safe	**4514924**	**VOFC-L-M52-M-FG14-F19A**

Technical data – 5/2-way valve, piston spool, single solenoid, G1/4 sleeve

Function
5/2-way valve



- Temperature range
  –25 ... +60 °C

- Flow rate
  1030 l/min

General technical data		
Valve function		5/2-way, single solenoid
Pneumatic connection	1	G1/4
	2	G1/4
	3	G1/4
	4	G1/4
	5	G1/4
Design		Piston spool valve
Mounting position		Any
Width	[mm]	40
Sealing principle		Soft
Manual override		None
Reset method		Mechanical spring
Actuation type		Electrical
Type of control		Pilot-actuated
Pilot air supply		Internal
Flow rate for piston valve pressurisation	[m^3/h]	1.08
Flow rate for piston valve exhaust	[m^3/h]	1.08
Flow direction		Non-reversible
Product weight	[g]	520
Switching time off	[ms]	22
Switching time on	[ms]	26
Nominal width	[mm]	6
Standard nominal flow rate 1→2	[l/min.]	1030
Standard nominal flow rate 2→3	[l/min.]	978

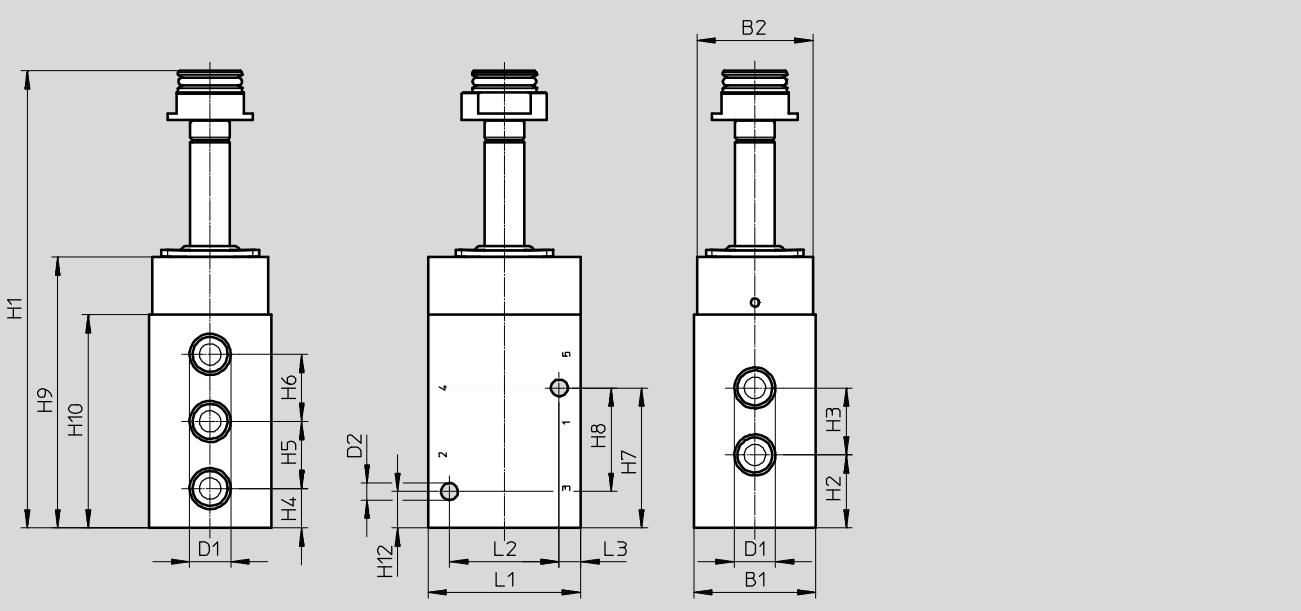
Operating and environmental conditions		
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Degree of protection		IP65
Operating pressure range	[bar]	2.5 ... 8
Temperature of medium	[°C]	–25 ... +60
Ambient temperature	[°C]	–25 ... +60
Safety Integrity Level	[SIL]	Up to SIL2 Low Demand mode
		Up to SIL2 High Demand mode
Corrosion resistance class CRC[1)]		4

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (→ also FN 940082) using appropriate media.

Materials	
Housing	Aluminium (Ematal coated)
Seals	NBR
Note on materials	Contains paint-wetting impairment substances, RoHS-compliant

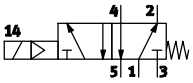
Technical data – 5/2-way valve, piston spool, single solenoid, G1/4 sleeve

Dimensions Download CAD data ➔ **www.festo.com**



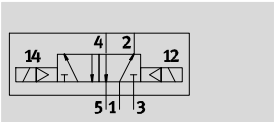
Type	B1	B2	D1	D2	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H13	L1	L2	L3
VOFC-L-M52-M-G14-F19	40	38	G1/4	5.5	150	24	22	13	22	22	46	34	89	70	12	50	36	7
VOFC-L-M52-M-G14-F19A																		

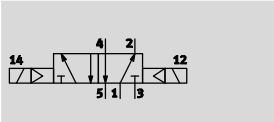
Ordering data

Circuit symbol	Function	Pneumatic connection	Type of ignition protection	Part No.	Type
In-line valve					
	5/2-way, single solenoid	G1/4	Without	**4514925**	**VOFC-L-M52-M-G14-F19**
				4514926	**VOFC-L-M52-M-G14-F19A**

Technical data – 5/2-way valves, piston spool, double solenoid, G1/4, NAMUR

Function
5/2-way valve





- Temperature range
  –25 ... +60 °C

- Flow rate
  989 l/min

General technical data				
			G1/4, NAMUR	G1/4
Valve function			5/2-way, double solenoid	
Pneumatic connection		1	G1/4	G1/4
		2	Flange 1/4 and port pattern to NAMUR	G1/4
		3	G1/4	G1/4
		4	Flange 1/4 and port pattern to NAMUR	G1/4
		5	G1/4	G1/4
Design			Piston spool valve	
Mounting position			Any	
Width	[mm]		40	
Sealing principle			Soft	
Manual override			None	
Actuation type			Electrical	
Type of control			Pilot-actuated	
Pilot air supply port			Internal	
Flow rate for piston valve pressurisation	[m³/h]		1.08	
Flow rate for piston valve exhaust	[m³/h]		1.08	
Flow direction			Non-reversible	
Product weight	[g]		680	790
Switching time off	[ms]		22	
Switching time on	[ms]		26	
Max. switching frequency	[Hz]		1	
Nominal width	[mm]		6	
Standard nominal flow rate 1→2	[l/min.]		989	
Standard nominal flow rate 2→3	[l/min.]		978	

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Degree of protection		IP65
Operating pressure range	[bar]	2.5 ... 8
Temperature of medium	[°C]	–25 ... +60
Ambient temperature	[°C]	–25 ... +60
Safety Integrity Level	[SIL]	Up to SIL 2 Low Demand mode
		Up to SIL 2 High Demand mode
Corrosion resistance class CRC[1)]		4

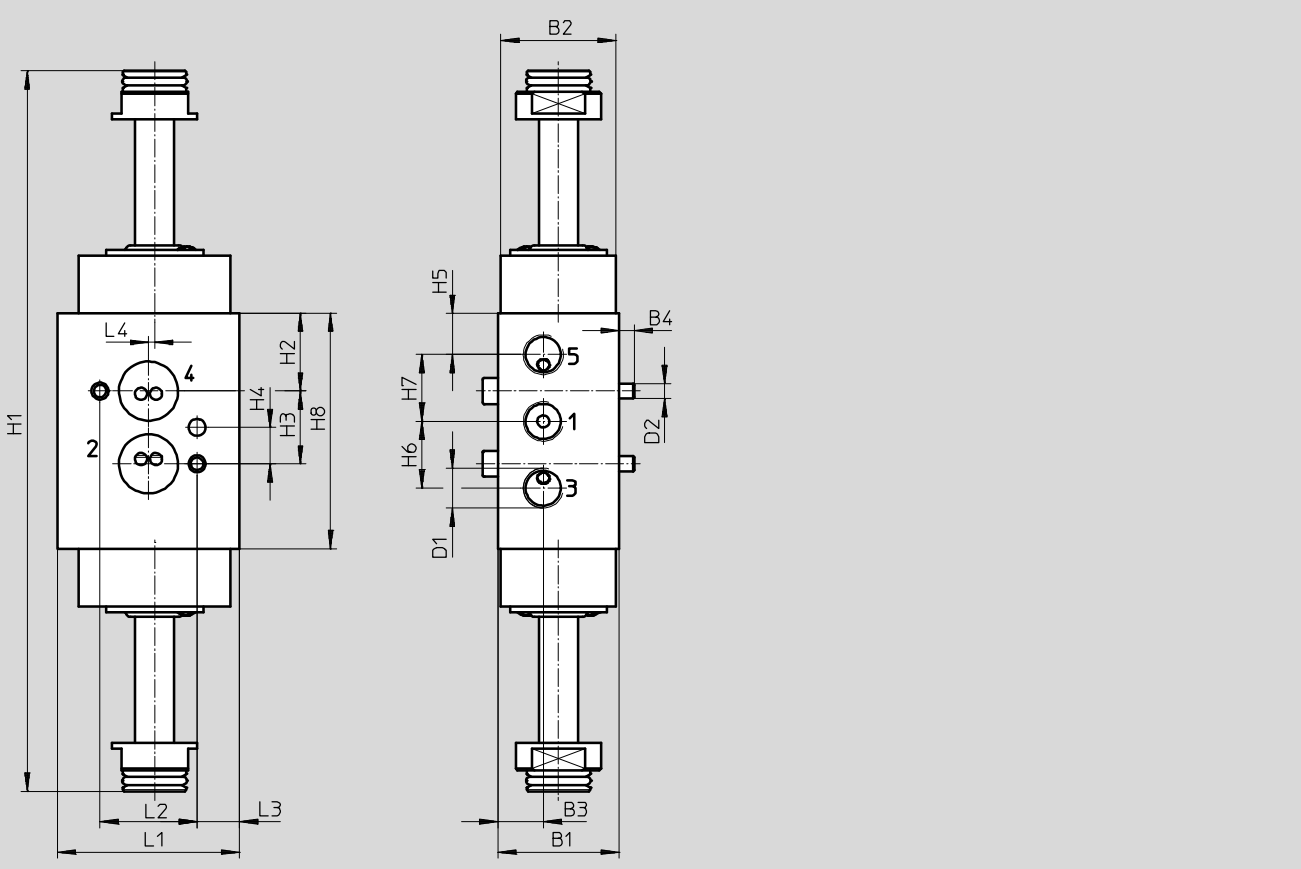
1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (→ also FN 940082) using appropriate media.

Materials	
Housing	Aluminium (Ematal coated)
Seals	NBR
Note on materials	Contains paint-wetting impairment substances, RoHS-compliant

Technical data – 5/2-way valves, piston spool, double solenoid, G1/4, NAMUR

Dimensions

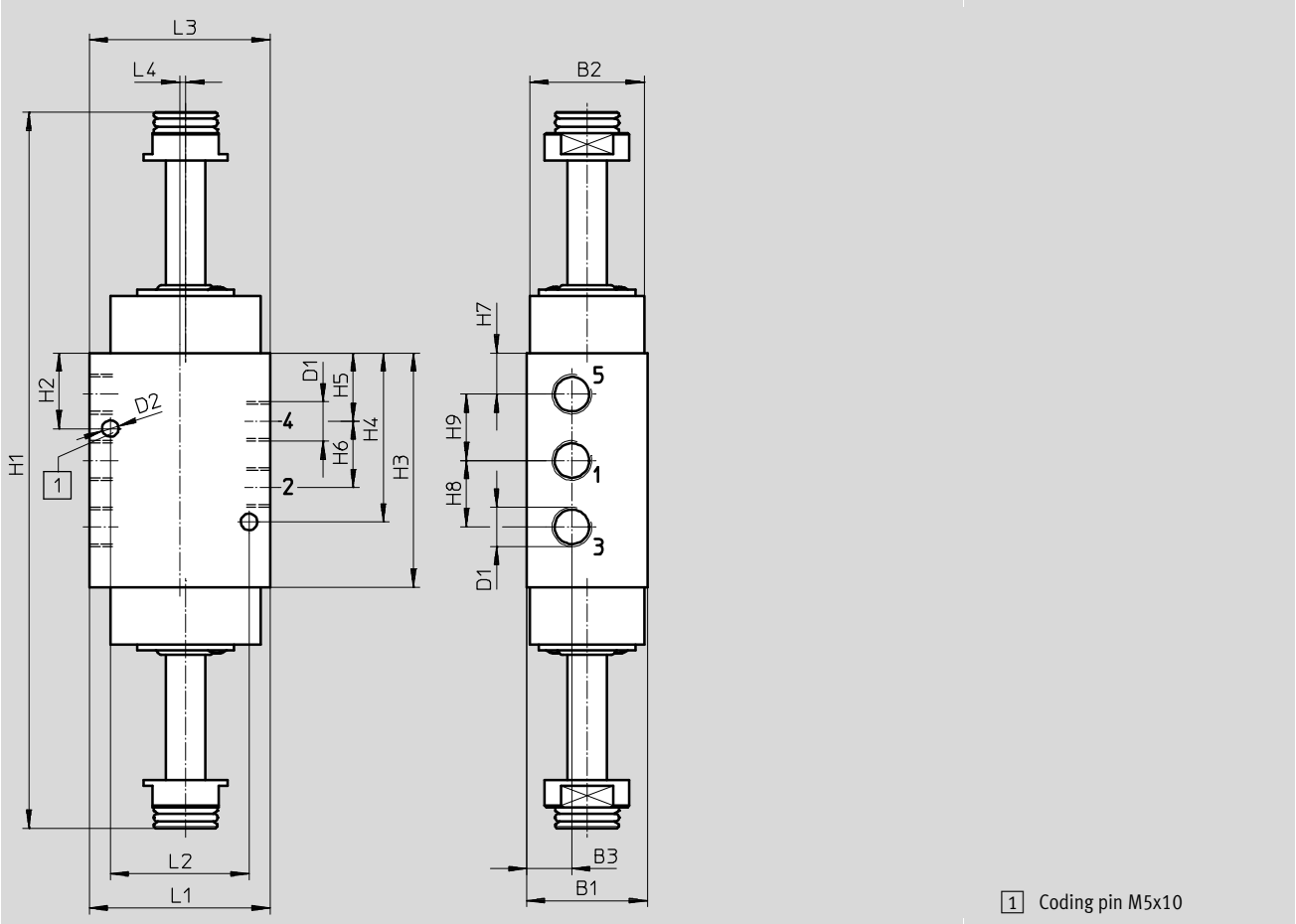
Download CAD data ➔ **www.festo.com**



Type	B1	B2	B3	B4	D1	D2	H1	H2	H3	H4	H5	H6	H7	H8	L1	L2	L3	L4
VOFC-L-B52-FG14-F19	40	38	15	5	G1/4	M5	237.6	25.6	24	12	13.6	22	22	77.6	60	32	14	2
VOFC-L-B52-FG14-F19A																		

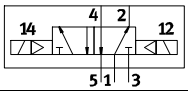
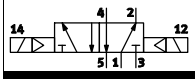
Technical data – 5/2-way valves, piston spool, double solenoid, G1/4, NAMUR

Dimensions Download CAD data ➔ **www.festo.com**



Type	B1	B2	B3	D1	D2	H1	H2	H3	H4	H5	H6	H7	H8	H9	L1	L2	L3	L4
VOFC-L-B52-G14-F19	40	38	15	G1/4	5.5	240	25	77.6	56	22.6	22	13.6	22	22	60	46	60	2
VOFC-L-B52-G14-F19A																		

Ordering data

Circuit symbol	Function	Pneumatic connection	Type of ignition protection	Part No.	Type
In-line valve					
	5/2-way, double solenoid	G1/4 and NAMUR	Without	**4514929**	**VOFC-L-B52-FG14-F19**
			Intrinsically safe	**4514930**	**VOFC-L-B52-FG14-F19A**
	5/2-way, double solenoid	G1/4	Without	**4514927**	**VOFC-L-B52-G14-F19**
			Intrinsically safe	**4514928**	**VOFC-L-B52-G14-F19A**

Type codes

VACC – [ ] – [ ] – [ ] – [ ] [ ] – [ ] [ ]

Type	
VACC	Solenoid coil, C series

Solenoid coil type	
S13	Solenoid coil, for 13 mm armature tube

Power consumption	
11	1.1 W
18	1.8 W

Electrical connection	
A1	Connection pattern type A, to EN 175301
K4	Cable fitting, metric

Operating voltage	
1U	24 V DC and AC
2U	110 V DC and AC
3U	230 V DC and AC
27U	60 V DC and AC
1	24 V DC

Circuitry	
–	None
F	With fuse

ATEX certification EU	
–	None
EX4	ATEX category II 2GD

Type of ignition protection	
–	None
A	Intrinsically safe
ME	Moulded encapsulation, enhanced safety

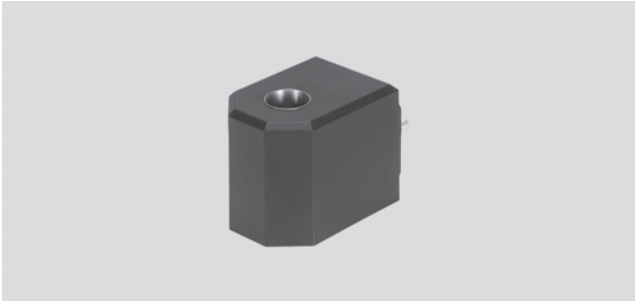
Solenoid coils VACC-S13-18-A1

Technical data

- Voltage
  24 V DC
  24 V AC/DC
  110 V AC/DC
  230 V AC/DC

- Temperature range
  –20 ... +60 °C

Nominal power
2 watt at 24 V DC



General technical data		
Type of mounting		Via knurled nut
Type of actuation		Electrical
Mounting position		Any
Product weight	[g]	210

Materials	
Housing	PA, UP
Note on materials	Contains paint-wetting impairment substances
	RoHS compliant

Electrical data		
Electrical connection		Plug pins, 3-pin, with connection pattern to EN 175301-803, type A
Permissible voltage fluctuations	[%]	–15 ... 10
Duty cycle	[%]	100
Degree of protection to EN 60529		IP65 with plug socket
Insulation class		H

Characteristic coil data								
Nominal operating voltage		24 V DC	24 V AC/DC		110 V AC/DC		230 V AC/DC	
Frequency	[Hz]	–	40/65	–	40/65	–	40/65	–
Power	[W]	1.8	–	1.8	–	1.8	–	1.8
	[VA]	–	1.8	–	1.8	–	1.8	–

Operating and environmental conditions					
Nominal operating voltage		24 V DC	24 V AC/DC	110 V AC/DC	230 V AC/DC
Ambient temperature	[°C]	–20 ... 60		–20 ... 60	
Corrosion resistance class CRC[1)]		4		4	
CE marking (see declaration of conformity)[2)]		–		To EU Low Voltage Directive (only for alternating voltage AC)	

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

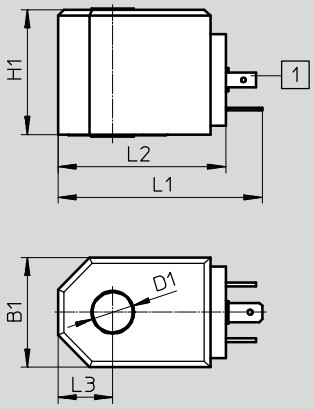
2) Additional information www.festo.com/sp ➔ Certificates.

Solenoid coils VACC-S13-18-A1

Technical data

Dimensions

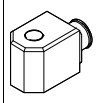
Download CAD data ➔ **www.festo.com**



1 Plug pattern type A, to EN 175301-803

Type	B1	D1	H1	L1	L2	L3
VACC-S13-18-A1-...	36	13.1	41	67	55	18

Ordering data

	Description		Part No.	Type
	Plug connector type A, to EN 175301-803	24 V DC	**562889**	**VACC-S13-18-A1-1**
		24 V AC/DC	**562890**	**VACC-S13-18-A1-1U**
		110 V AC/DC	**562891**	**VACC-S13-18-A1-2U**
		230 V AC/DC	**562892**	**VACC-S13-18-A1-3U**

Solenoid coils VACC-S13-11-...-EX4A

Technical data

- ⏚ - Voltage
24 V DC

Nominal power
1.1 watt at 24 V DC

General technical data		
Type of mounting		Via knurled nut
Type of actuation		Electrical
Mounting position		Any
Product weight	[g]	330

Materials	
Housing	PA, UP
Note on materials	Contains paint-wetting impairment substances
	RoHS compliant

Electrical data		
Electrical connection		Terminal box, cable entry thread metric, M20x1.5
Permissible voltage fluctuations	[%]	–15 ... 10
Duty cycle	[%]	100
Maximum input power, Pi	[W]	1.2
Maximum input voltage, Ui	[V]	32
Maximum input current, Ii	[A]	0.2
Required current consumption, Imin	[mA]	16
Degree of protection to EN 60529		IP64
Insulation class		H

Characteristic coil data		
Nominal operating voltage	[V DC]	14 ... 32
Power	[W]	0.22 ... 1.1
Effective internal capacitance, Ci		Negligibly low
Effective internal inductance, Li		Negligibly low

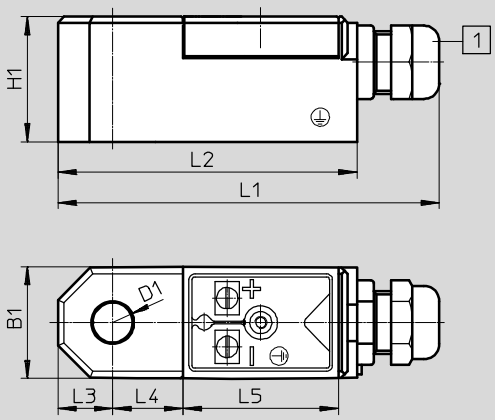
Operating and environmental conditions	
Corrosion resistance class CRC[1)]	4
CE mark (see declaration of conformity)[3)]	To EU EMC Directive[2)]
	To EU Explosion Protection Directive (ATEX)

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.
2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.
3) Additional information www.festo.com/sp ➔ Certificates.

Technical data

ATEX	
ATEX category for gas	II 2G
Type of ignition protection for gas	Ex ia IIC T6, T5 Gb
ATEX category for dust	II 2D
Type of ignition protection for dust	Ex ia IIIC T80°C,T95°C Db
Explosion ambient temperature	T5, T95°C: –30°C <= Ta <= +65°C
	T6, T80°C: –30°C <= Ta <= +50°C
Explosion protection certification outside the EU	EPL Gb (BR), EPL Gb (CN), EPL Db (BR)
Certificate issuing authority	BVS15 ATEXE030X
	DNV 17.0043X
	NEPSI GYJ111105
	TÜV 12.1949 X

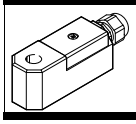
Dimensions Download CAD data ➔ **www.festo.com**



[1] Terminal box, cable entry thread M20x1.5

Type	B1	D1	H1	L1	L2	L3	L4	L5
VACC-S13-11-K4-1-EX4A	37	13.1	41	131	98	18	23	51

Ordering data

	Description	Part No.	Type
	Terminal box, cable entry thread metric, M20x1.5	**562896**	**VACC-S13-11-K4-1-EX4A**

Solenoid coils VACC-S13-18-...-EX4ME

Technical data

- Voltage
  24 V AC/DC
  60 V AC/DC
  110 V AC/DC
  230 V AC/DC

Nominal power
2 watt at 24 V DC

General technical data		
Type of mounting		Via knurled nut
Type of actuation		Electrical
Mounting position		Any
Product weight	[g]	330

Materials	
Housing	PA, UP
Note on materials	Contains paint-wetting impairment substances
	RoHS compliant

Electrical		
Electrical connection		Terminal box, cable entry thread metric, M20x1.5
Permissible voltage fluctuations	[%]	–15 ... 10
Duty cycle	[%]	100
Insulation class		H
Degree of protection to EN 60529		IP64 (IP65 with internal fuse protection)

Characteristic coil data											
Nominal operating voltage		24 V AC/DC		24 V AC/DC With fuse		60 V AC/DC		110 V AC/DC		230 V AC/DC	
Frequency	[Hz]	40/65	–	40/65	–	40/65	–	40/65	–	40/65	–
Power	[W]	–	1.8	–	1.8	–	1.8	–	1.8	–	1.8
	[VA]	1.8	–	1.8	–	1.8	–	1.8	–	1.8	–

Operating and environmental conditions	
Corrosion resistance class CRC[1)]	4
CE marking (see declaration of conformity)[2)]	To EU Explosion Protection Directive (ATEX)

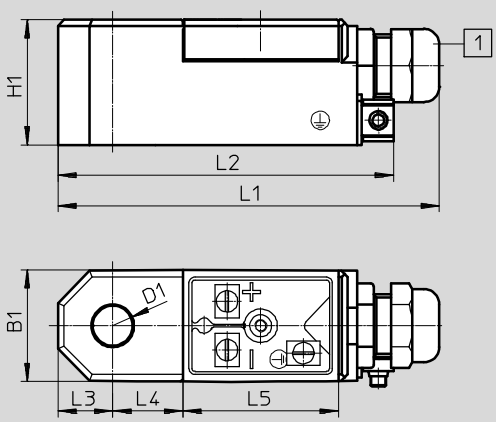
1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (→ also FN 940082) using appropriate media.
2) Additional information www.festo.com/sp → Certificates.

Technical data

ATEX			
		Solenoid coil without internal fuse	Solenoid coil with internal fuse
ATEX category for gas		II 2G	II 2G
Type of ignition protection for gas		Ex e mb IIC T6, T5, T4 Gb	Ex e mb IIC T6 Gb
ATEX category for dust		II 2D	II 2D
Type of ignition protection for dust		ExtbIIICT85°C,T95°C,T130°C Db	Ex tb IIIC T70°C Db
Explosion ambient temperature	[°C]	T4, T130°C: -20°C <= Ta <= +60°C	–
		T5, T95°C: -20°C <= Ta <= +60°C	–
		T6, T80°C: -20°C <= Ta <= +50°C	T6, T70°C: -20°C <= Ta <= +40°C
Explosion protection certification outside the EU		EPL Db (BR)	–
		EPL Db (CN)	–
		EPL Db (IEC-EX)	EPL Db (IEC-EX)
		EPL Gb (BR)	–
		EPL Gb (CN)	–
		EPL Gb (IEC-EX)	EPL Gb (IEC-EX)
Certificate issuing authority		BVS15 ATEXE029X	BVS15 ATEXE029X
		IECEx BVS15.0075 X	–
		NEPSI GYJ111104X	–
		TÜV 12.1947 X	–

Dimensions

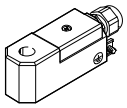
Download CAD data ➔ **www.festo.com**



1 Terminal box, cable entry thread M20x1.5

Type	B1	D1	H1	L1	L2	L3	L4	L5
VACC-S13-18-K4-...-EX4ME	37	13.1	41	125	98	18	23	51
VACC-S13-18-K4-27U-EX4ME					111			

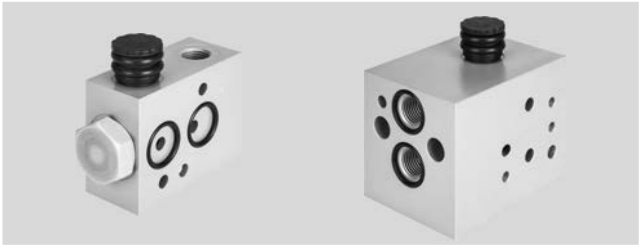
Ordering data

	Description		Part No.	Type
	Terminal box, cable entry thread metric, M20x1.5	24 V AC/DC	**562893**	**VACC-S13-18-K4-1U-EX4ME**
		24 V AC/DC With fuse	**570784**	**VACC-S13-18-K4-1UF-EX4ME**
		60 V AC/DC	**8040578**	**VACC-S13-18-K4-27U-EX4ME**
		110 V AC/DC	**562894**	**VACC-S13-18-K4-2U-EX4ME**
		230 V AC/DC	**562895**	**VACC-S13-18-K4-3U-EX4ME**

Sub-bases

Accessories – Sub-base VABS-S7-RB/BE-...

Port pattern: NAMUR



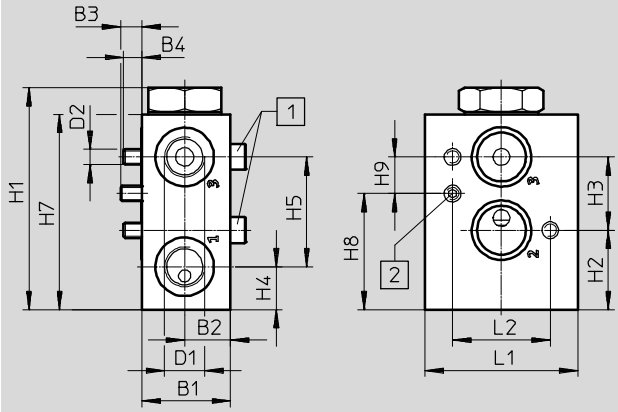
General technical data			
Type		Pressurisation and exhaust block, with flange ¼, port pattern to NAMUR, VABS-S7-BE-...	Redundancy block VABS-S7-RB-...
Type of mounting		With through-hole	
Mounting position		Any	
Flow rate for piston valve pressurisation	[m³/h]	2.2	–
Flow rate for piston valve exhaust	[m³/h]	8.6	–
Product weight	[g]	250	–
Pneumatic connection	1	G1/4, 1/4 NPT	G1/4, 1/4 NPT
	2	Flange 1/4, port pattern to NAMUR	Flange 1/4, port pattern to NAMUR
	3	G1/4, 1/4 NPT	G1/4, 1/4 NPT
	12	–	G1/4, 1/4 NPT

Operating and environmental conditions		VABS-S7-BE	VABS-S7-RB
Operating medium		Compressed air to ISO 8573-1:2010 [–:–:–]	
Operating pressure	[bar]	2 ... 8	0 ... 10
Pilot air supply		Internal	External/internal
Degree of protection		IP65 (when installed)	
Corrosion resistance class CRC[1)]		4	

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Materials	
Sub-base	Aluminium, Ematal coated
Seals	NBR
Note on materials	Contains paint-wetting impairment substances, RoHS compliant

Dimensions Download CAD data ➔ **www.festo.com**

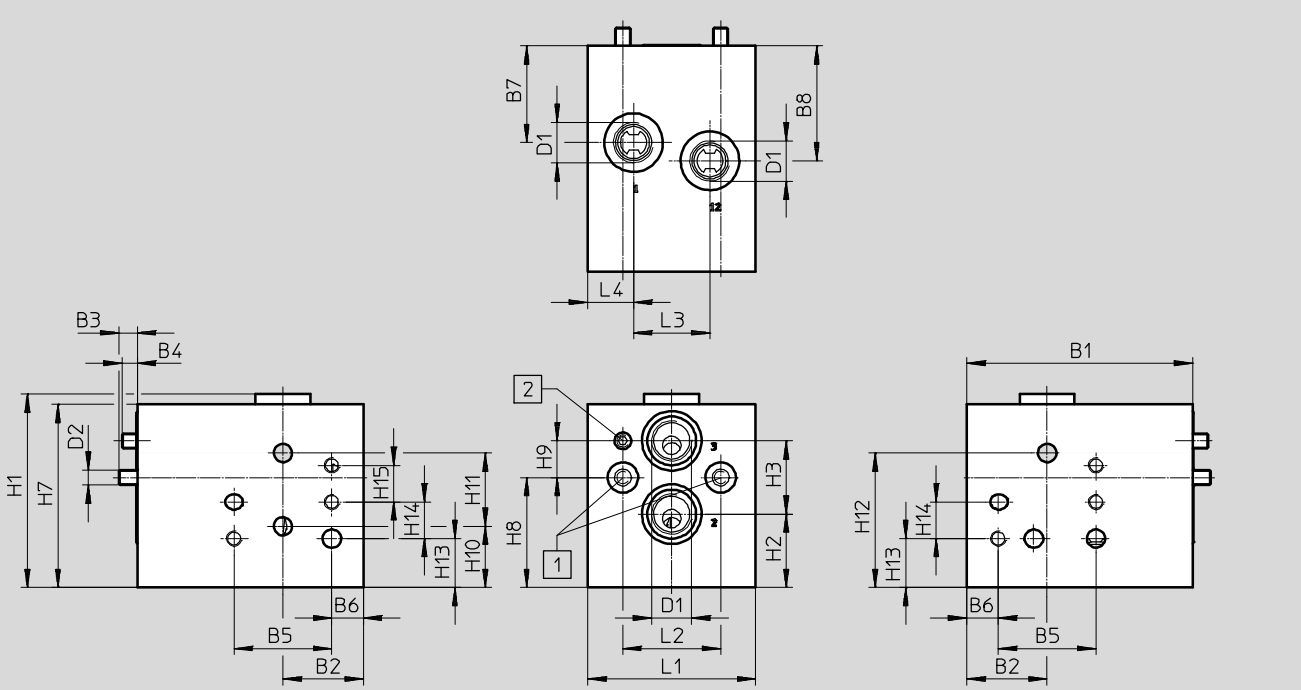


1 Socket head screw M5x35 2 Threaded pin M5x10

Type	B1	B2	B3	B4	D1	D2	H1	H2	H3	H4	H5	H7	H8	H9	L1	L2
VABS-S7-BE-B-G14-V14-A	29	15	7	6	G1/4	M5	72.7	26	24	14	36	64	38	12	50	32
VABS-S7-BE-B-N14-V14-A					1/4 NPT											

Accessories – Sub-base VABS-S7-RB/BE-...

Dimensions Download CAD data ➔ **www.festo.com**

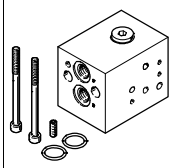
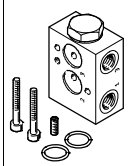


1 Socket head screw M5x70 2 Threaded pin M5x10

Type	B1	B2	B3	B4	B5	B6	B7	B8	D1	D2	L1	L2	L3	L4
VABS-S7-RB-B-G14-V14-A	74	26.3	6	5	32	10.3	31.7	37.7	G1/4	M5	55	32	25	15
VABS-S7-RB-B-N14-V14-A									1/4 NPT					

Type	H1	H2	H3	H7	H8	H9	H10	H11	H12	H13	H14	H15
VABS-S7-RB-B-G14-V14-A	63.4	24	24	60	36	12	20	24	44	16	12	12
VABS-S7-RB-B-N14-V14-A												

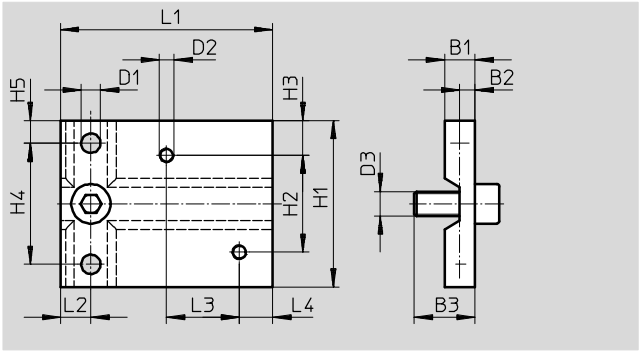
Ordering data

	Description	Part No.	Type
	Sub-base for mounting two solenoid valves with a G thread port for redundant circuitry, with flange 1/4, port pattern to NAMUR With the auxiliary air supply connection, the intermediate plate can be used for fail-safe functions, also in the case of piloted solenoid valves and actuators with positioners.	**3580505**	**VABS-S7-RB-B-G14-V14-A**
	Sub-base the mounting two solenoid valves with an NPT thread port for redundant circuitry, with flange 1/4, port pattern to NAMUR With the auxiliary air supply connection, the intermediate plate can be used for fail-safe functions, also in the case of piloted solenoid valves and actuators with positioners.	**4727331**	**VABS-S7-RB-B-N14-V14-A**
	Sub-base as pressurisation and exhaust block with G threaded port, with flange 1/4, port pattern to NAMUR	**2999476**	**VABS-S7-BE-B-G14-V14-A**
	Sub-base as pressurisation and exhaust block with NPT thread port, with flange 1/4, port pattern to NAMUR	**4727328**	**VABS-S7-BE-B-N14-V14-A**

Solenoid valves

Accessories

Mounting plate VAME-S7-P
Mounting plate material: aluminium, Ematal coated
Contains paint-wetting impairment substances, RoHS-compliant
Mounting: With through-hole



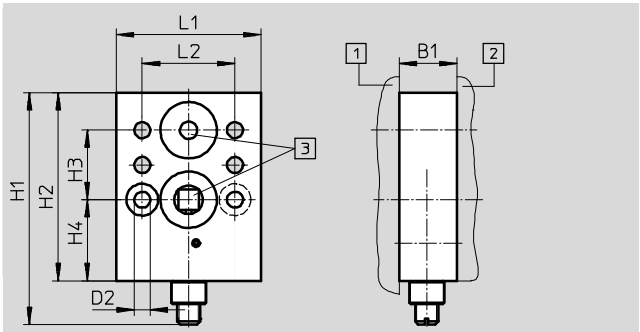
Dimensions [mm] and ordering data

B1	B2	B3	D1	D2	D3	H1	H2	H3	H4	H5	L1	L2	L3	L4	CRC[1]	Part No.	Type
10	5	20	6.4	M5	M8	55	32	11.5	40	7.5	70	10	24	11	4	**563399**	**VAME-S7-P**

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Flow control plate for single-acting actuators
Flow control plate material: Aluminium, Ematal coated
Material of seals: NBR
Contains paint-wetting impairment substances, RoHS-compliant
Operating medium: Compressed air to ISO 8573-1:2010 [7:–:–]
Operating pressure: 0 ... 12 bar
Pilot air supply: Internal/external
Mounting position: Any
Mounting: With through-hole
Degree of protection: IP65 (when installed)

Function:
Supply air flow control and/or exhaust air flow control of an actuator with a NAMUR interface for VOFC/VOFD valves



1 Actuator
2 Valve
3 Working ports for G¼ and ¼ NPT valves

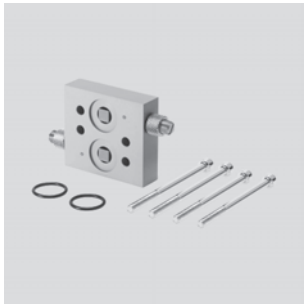
Dimensions [mm] and ordering data

B1	D2	H1	H2	H3	H4	L1	L2	CRC[1]	Part No.	Type
20	5.5	80	65	24	28	50	32	4	**563401**	**VABF-S7-F1B5P1-F**

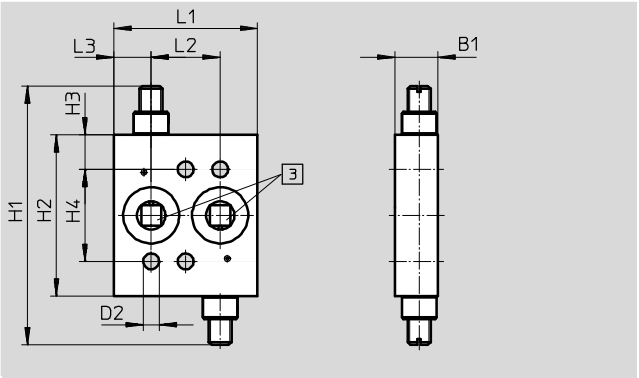
1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Accessories

Flow control plate for double-acting actuator
Flow control plate material: Aluminium, Ematal coated
Material of seals: NBR
Contains paint-wetting impairment substances, RoHS-compliant
Operating medium: Compressed air to ISO 8573-1:2010 [7:–:–]
Operating pressure: 0 ... 12 bar
Pilot air supply: Internal/external
Mounting position: Any
Mounting: With through-hole
Degree of protection: IP65 (when installed)



Function:
2-duct exhaust air flow control of an actuator with NAMUR interface



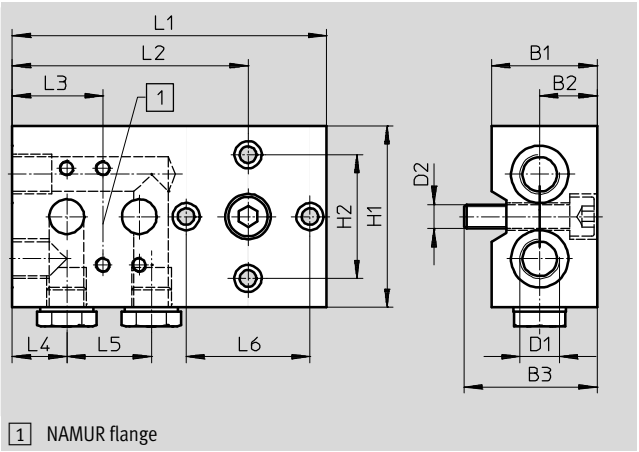
3 Working ports for G¼ and ¼ NPT valves

Dimensions [mm] and ordering data

B1	D2	H1	H2	H3	H4	L1	L2	L3	CRC[1]	Part No.	Type
15	5.5	90	56	12	32	50	24	13	4	**563395**	**VABF-S7-F1B1P2-F**

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Sub-base
Sub-base material: Aluminium, Ematal coated
Material of seals: NBR
Contains paint-wetting impairment substances, RoHS-compliant
Operating medium: Compressed air to ISO 8573-1:2010 [7:–:–]
Operating pressure: 0 ... 10 bar
Mounting position: Any
Mounting: With through-hole
Degree of protection: IP65 (when installed)



1 NAMUR flange

Dimensions [mm] and ordering data

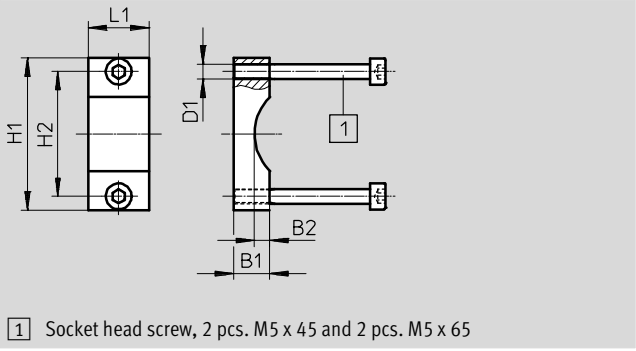
B1	B2	B3	D1	D2	H1	H2	L1	L2	L3	L4	L5	L6	CRC[1]	Part No.	Type
35	19	44	G¼	M8	60	41	104	78	30	18	28	41	4	**563396**	**VABS-S7-S-G14**

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Solenoid valves

Accessories

Mounting bracket
Mounting bracket material:
Aluminium, Ematal coated
Contains paint-wetting impairment substances, RoHS-compliant



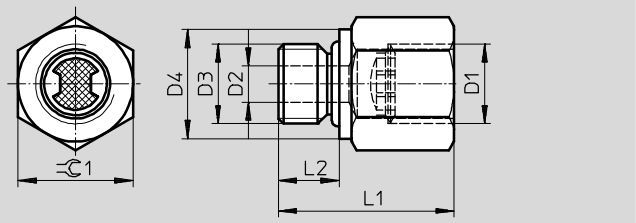
1 Socket head screw, 2 pcs. M5 x 45 and 2 pcs. M5 x 65

Dimensions [mm] and ordering data

B1	B2	D1	H1	H2	L1	CRC[1)]	Part No.	Type
12	5	M5	50	41	20	4	**563403**	**VAME-S7-Y**

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Adapter with filter
Adapter material: High-alloy stainless steel
Material of seals: NBR
Note on materials:
Contains paint-wetting impairment substances, RoHS-compliant
Operating pressure 2 ... 8 bar

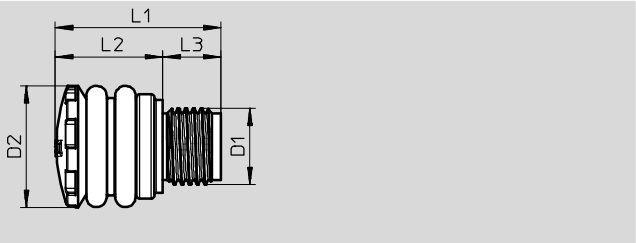


Dimensions [mm] and ordering data

D1	D2	D3	D4	L1	L2	⌀1	CRC[1)]	Part No.	Type
1/4 NPT	6	G1/4	18	29	10	19	1	**563397**	**NPFV-AF-G14-N14-MF**
G1/4	6	G1/4	18	29	10	19	1	**563398**	**NPFV-AF-G14-G14-MF**
1/4 NPT	6	1/4 NPT	18	29	10	19	1	**4727333**	**NPFV-AF-N14-N14-MF**

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Exhaust protection G1/4
Housing material: PA
Material of seals: EPDM
Contains paint-wetting impairment substances, RoHS-compliant
Operating medium: Compressed air to ISO 8573-1:2010 [7:–:–]
Operating pressure: 0 ... 10 bar
Ambient temperature: –50 ... +60 °C
Type of mounting: can be screwed in, with male thread

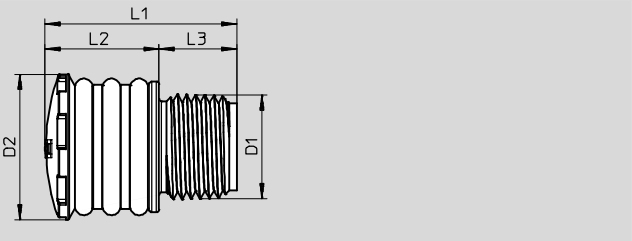


Dimensions [mm] and ordering data

D1	D2	L1	L2	L3	Part No.	Type
G1/4, 1/4 NPT	21	28.5	18.5	10	**563400**	**VABD-D3-SN-G14**

Accessories

Exhaust protection 1/2 NPT
Housing material: PA
Material of seals: EPDM
Contains paint-wetting impairment substances, RoHS compliant
Operating medium: Compressed air to ISO 8573-1:2010 [7:–:–]
Operating pressure: 0 ... 12 bar
Ambient temperature: –50 ... +60 °C
Type of mounting: Can be screwed in, with male thread

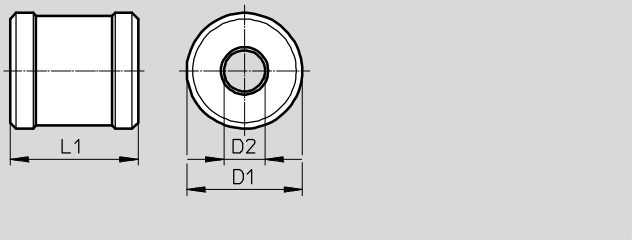


Dimensions [mm] and ordering data

D1	D2	L1	L2	L3	Part No.	Type
G1/2, 1/2 NPT	29	38	23	15	**3535104**	**VABD-D3-SN-N12**

Manual override
Material: Aluminium, anodised,
Contains paint-wetting impairment substances, RoHS compliant

Function:
Manual override of basic valves instead of a solenoid coil

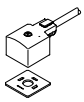


Dimensions [mm] and ordering data

D1	D2	L1	Weight [g]	CRC[1)]	Part No.	Type
38	13.5	42	120	2	**3580654**	**VAOH-MB-S7-S13**

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Ordering data

	Description		Part No.	Type
Connecting cable				Technical data ➔ Internet: kmc
	Operating voltage 24 V DC, switching status indication with LED	Cable length 2.5 m	**30931**	**KMC-1-24 DC-2,5-LED**
		Cable length 5 m	**30933**	**KMC-1-24 DC-5-LED**
		Cable length 10 m	**193459**	**KMC-1-24-10-LED**
	Operating voltage up to 240 V AC	Cable length 2.5 m	**30932**	**KMC-1-230 AC-2,5**
		Cable length 5 m	**30934**	**KMC-1-230 AC-5**
Plug socket				Technical data ➔ Internet: mssd
	Cable connection using clamping screws		**34583**	**MSSD-C**

Solenoid valves

VOFD

Overview, configuration and ordering
➔ **www.festo.com/catalogue/vofd**

Additional information, support and user documentation
➔ **www.festo.com/sp/vofd**

Selected types in accordance with the ATEX Directive for explosive atmospheres
➔ **www.festo.com/ex**

+ Connection G1/4, G1/2, NPT1/4, NPT1/2 and NAMUR
+ Voltage 24, 110, 230 V DC, AC, UC
+ Explosion protection EX me and EX d, ATEX
+ Sturdy and corrosion-resistant thanks to hard Ematal surface
+ SIL certificate

Solenoid valves VOFD

Key features

General

- The valves from the series VOFD are special 3/2-way valves for process automation, for use in chemical and petrochemical plants. Here they are frequently used as pilot valves for butterfly valves and actuators. Their sturdy design and high resistance to corrosion make these valves suitable for outdoor use under harsh ambient conditions.
- The NAMUR flange pattern makes the solenoid valves especially suitable for quarter-turn actuators. The integrated spring chamber re-breather function protects quarter-turn actuators with spring return (single-acting cylinders and actuators) against contaminated ambient air and weather influences such as rain.
- With German Technical Control Board (TÜV) approval up to SIL 3.

Function, design

- 3/2-way directly actuated poppet valves

Safety

- Can be used in emergency shutdown (ESD) applications
- Suitable for use in safety-related systems up to and including SIL 3 to IEC 61508

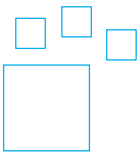
Robust

- The surface of the valve housing is Ematal coated. This treatment involves converting the aluminium surface into a very hard aluminium oxide layer with titanium oxide intercalations, which makes the valves extremely resistant to wear and abrasion and gives them first-class sliding qualities. This provides optimum protection against atmospheric and chemical influences.
- You can find information on the media resistance of the product at ➔ www.festo.com.

Economical

- One valve, two connection options
- Port patterns to NAMUR for direct installation on the actuator as well as G and NPT threaded connections
- Manual override can be ordered optionally
- Manual override can be retrofitted and removed again – no additional valve version required

Ordering data – Product options



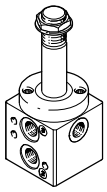
Configurable product
This product and all its product options can be ordered using the configurator.

The configurator can be found at
➔ **www.festo.com/catalogue/...**

Part No.	Type
2956784	**VOFD-L35T**
3212962	**VOFD-L50T**
2964753	**VOFD-L100T**

Key features

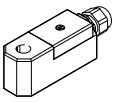
VOFD – Basic valves



- 3/2-way valves
- Ports G¼, ¼ NPT, G½, ½ NPT
- Port pattern to NAMUR, port pattern to NAMUR with P duct

➔ Page 168

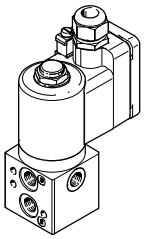
VACC – S18 coils, VACC – S13 coils



- AC and DC voltage 24 V, 48 V, 60 V, 110 V, 120 V, 230 V
- Type of ignition protection EX EMB II, EX tD

➔ Page 179, 196

VOFD – Solenoid valves



- Combination of VOFD basic valve and VACC-S18 coil (in the case of basic valve VOFD-L12T-..., VACC-S13 coil)
- 3/2-way valves
- Type of ignition protection EX EMB II, EX tD

Configurable product
➔ Page 152

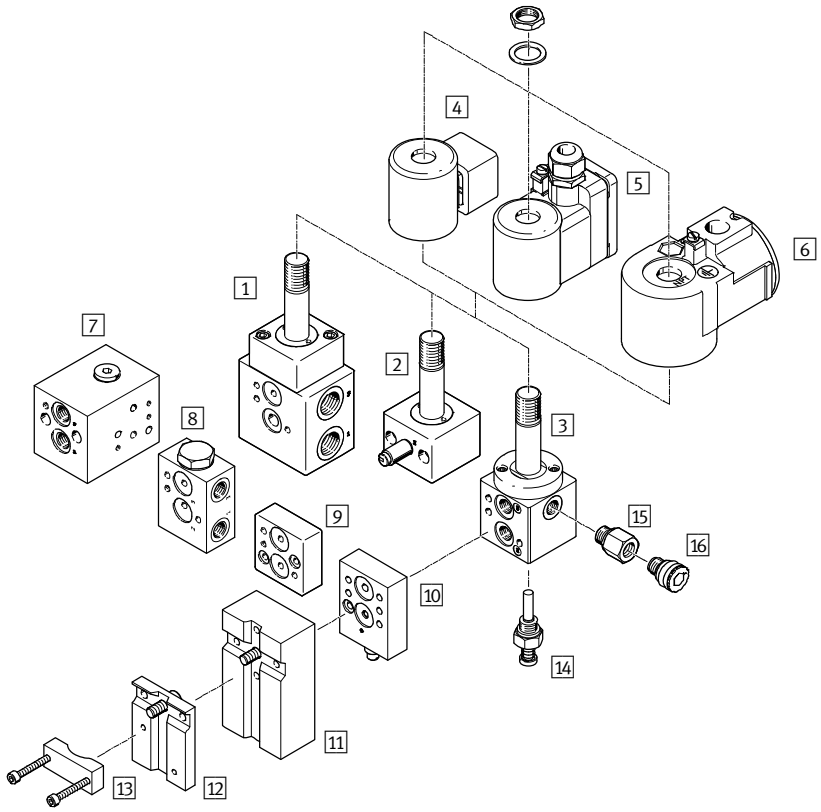
VOFD – Accessories

- Flow control plate
- Sub-base
- Mounting plate
- Connection kit
- Adapter with filter
- Exhaust protection
- Mounting bracket
- Manual override

➔ Page 203

Solenoid valves VOFD-L35/50/100T-...-F10

Peripherals overview



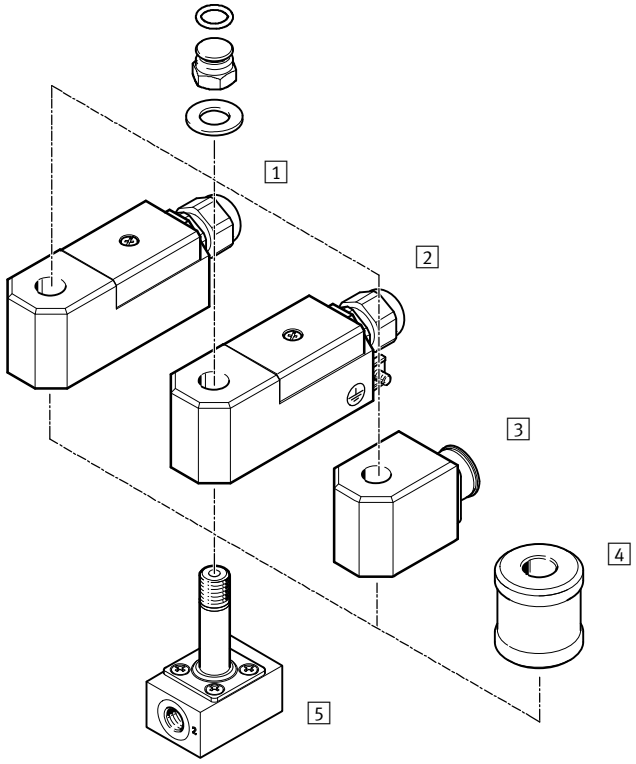
Mounting components and accessories

		Brief description	➔ Page/Internet
1	Basic valve VOFD-L100T-...	3/2-way valve, port G1/2, poppet valve ➔ modular product system – can be configured using the online configurator	152
2	Basic valve VOFD-L35T-...	3/2-way valve, port G1/4, poppet valve ➔ modular product system – can be configured using the online configurator	152
3	Basic valve VOFD-L50T-...	3/2-way valve, port G1/4, poppet valve ➔ modular product system – can be configured using the online configurator	152
4	Solenoid coil VACC-S18-...-A1-...	A1 standard solenoid	180, 182
5	Solenoid coil VACC-S18-...-ME	Ex-ME solenoid	190, 192
6	Solenoid coil VACC-S18-...-D	Ex-D solenoid	184, 186, 188
7	Sub-base VABS-S7-RB-...	Sub-base for mounting two solenoid valves for redundant circuitry	203
8	Connecting plate VABS-S7-BE-...	Sub-base as a pressurisation and exhaust block	203
9	Mounting plate VAME-S7-P-N-V14-A	Mounting plate as a spacer plate for solenoid valves when combined with ATEX solenoid coils	209
10	Flow control plate VABF-S7-F1B5P1-F	Exhaust air flow control plate for NAMUR interface for installation between the solenoid valve and single-acting actuators	206
11	Connection kit VABF-S7-S-G14	Mounting plate for attaching the valve to a NAMUR rib	207
12	Mounting plate VAME-S7-P	Mounting plate for attaching the valve to a NAMUR rib	206

Peripherals overview

Mounting components and accessories

	Brief description	➔ Page/Internet
13 Mounting bracket VAME-S7-Y	Alternative option (instead of screw) for attaching the valve to a NAMUR rib with the help of a mounting bracket	207
14 Manual override VAOH-S8	Manual override	209
15 Adapter NPFV-AF-...-MF	Adapter with filter	208
16 Exhaust protection VABD-D3-SN-G14	Exhaust protection to IP65. The spring chamber of the solenoid valve is protected against the ingress of aggressive ambient air and water by the one-way flow control system	208



Accessories: Valve pilot control interface for solenoid coil 13 mm

	Brief description	➔ Page/Internet
1 Solenoid coil VACC-S13-...-4A	EX-4A solenoid	199
2 Solenoid coil VACC-S13-...-ME	Ex-ME solenoid	201
3 Solenoid coil VACC-S13-...-A1-...	A1 standard solenoid	197
4 Manual override VAOH-MB-S7-S13	Manual override (MO)	209
5 Basic valve VOFD-L12T-...	3/2-way valve, port G1/4, poppet valve, valve pilot control interface for solenoid coil 13 mm	159

Solenoid valves VOFD

Type codes VOFD

VOFD – L [ ] T – [ ] – M N [ ] – [ ] – [ ] – [ ] –

Type	
VOFD	Solenoid valves, series D

Valve type	
L	In-line valve

Nominal width	
12	1.2 mm
35	3.5 mm
40	4 mm
50	5 mm
100	10 mm

Design principle	
T	Poppet valve

Valve function	
M32	3/2-way valve, normally closed or open
M32A	3/2-way valve, normally closed, semi-automatic

Reset method for single solenoid valves	
M	Mechanical spring

Pilot air	
N	None

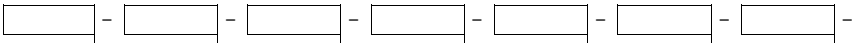
Manual override	
–	None
H	Non-detenting
Y	Detenting without accessories

Pneumatic connection	
G12	G1/2
G14	G1/4
N12	1/2 NPT
N14	1/4 NPT
FG12	Flange G1/4, ports G1/2
FG14	Flange G1/4, ports G1/4
FGP14	Flange G1/4, ports G1/4 and additional pn port (NAMUR)
FNP14	Flange 1/4 NPT and additional pn port (NAMUR)

Supply port version	
–	Standard
PF	With particle filter
NPF	With particle filter and connecting thread NPT

Exhaust	
–	No fitting
U6	With exhaust protection

Type codes VOFD



Pressure range	
8	0 ... 8 bar
10	0 ... 10 bar
12	0 ... 12 bar

Temperature range	
–	Standard
T6	–50 ... +60 °C

Corrosion protection	
–	Standard
R1	Stainless steel

Valve pilot control interface	
F10	Electric with armature tube for solenoid coil 18 mm
F19	Electric with armature tube for solenoid coil 13 mm
F19A	Electric with armature tube for solenoid coil 13 mm, intrinsically safe

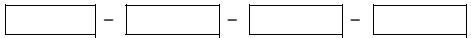
Power consumption	
–	None
18	1.8 W
25	2.5 W
35	3.5 W
70	7 W
120	12 W

Nominal operating voltage	
–	None
1A	24 V AC/50-60 Hz
1U	24 V AC and DC
2A	110 V AC/50-60 Hz
2U	110 V AC and DC
3A	220 VAC/50-60 Hz
3U	220 V AC and DC
7U	48 V AC and DC
16U	120 V AC and DC
1	24 V DC
3	230 V DC
7	48 V DC
16	120 V DC
27	60 V DC

Electrical connection	
–	None
A1	Plug pattern type A, to EN 175301
K4	Cable connector, metric
K5	Cable connector NPT

Solenoid valves VOFD

Type codes VOFD



Circuitry	
–	None
F	Fuse

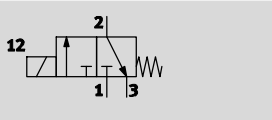
EU certification	
–	Without certification
EX4	II 2GD

Certification outside the EU	
–	Without certification
U2	cULus, hazardous environment, USA and Canada (NEC 500)

Type of ignition protection	
–	None
A	Intrinsically safe
D	Pressure-resistant encapsulation
ME	Moulded encapsulation, enhanced safety

Technical data – Basic valve VOFD-L12T-...

Function
3/2-way valve



Flow rate
Up to 52 l/min

General technical data			
Basic valve G1/4		VOFD- ... -F19	VOFD- ... -F19-A
Valve function		3/2-way, single solenoid, closed	
Pneumatic connection	1	G1/4	
	2	G1/4	
	3	G1/4	
Design		Directly actuated poppet valve	
Width	[mm]	50	
Mounting position		Any	
Sealing principle		Soft	
Manual override		None	
Reset method		Mechanical spring	
Type of actuation		Electrical	
Suitability for vacuum		Yes	
Type of control		Direct	
Flow rate for piston valve pressurisation	[m^3/h]	0.04	
Flow rate for piston valve exhausting	[m^3/h]	0.04	
b value		0.2	0.53
C value	[l/s bar]	0.44	0.21
Direction of flow		Non-reversible	
Product weight	[g]	170	
Switching time off	[ms]	60	
Switching time on	[ms]	40	
Nominal width	[mm]	1.2	
Standard nominal flow rate	[l/min]	52	
Standard nominal flow rate 2⟶3	[l/min]	49	

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:–:–]
Operating pressure range	[bar]	0 ... 8
Temperature of medium	[°C]	–25 ... +60
Ambient temperature	[°C]	–25 ... +60
Corrosion resistance class CRC[1)]		4

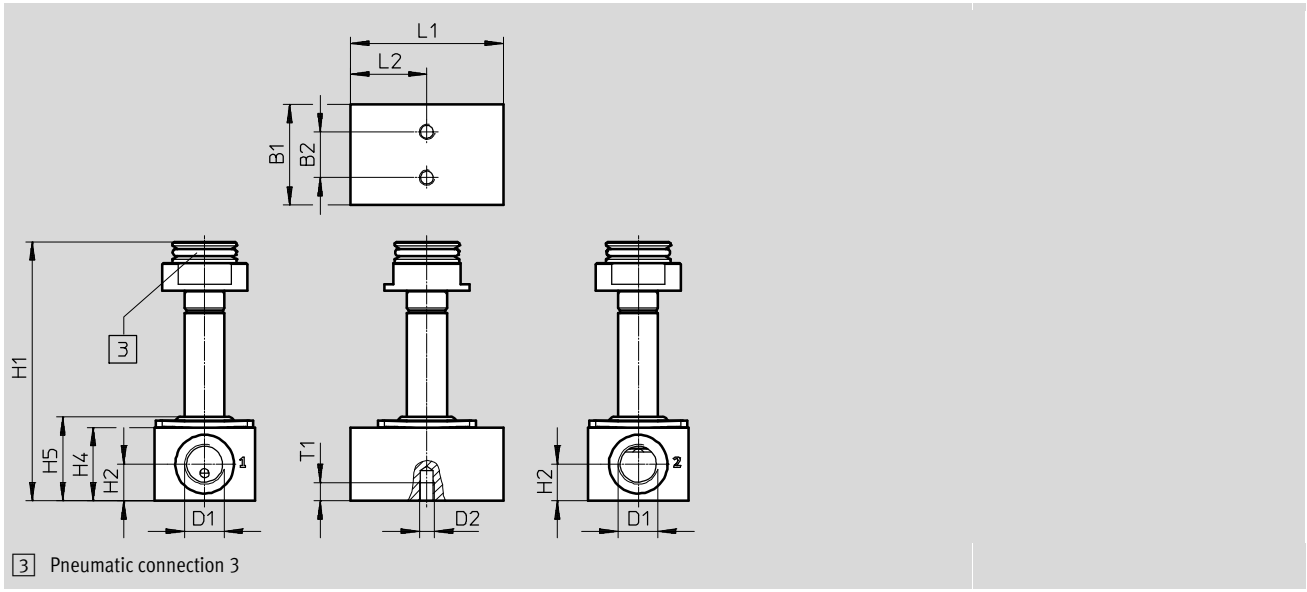
1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Materials	
Housing	Aluminium (Ematal coated)
Seals	NBR
Note on materials	Contains paint-wetting impairment substances, RoHS-compliant

Basic valves VOFD-L12T-...-F19/F19A

Technical data – Basic valve VOFD-L12T-...

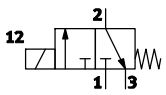
Dimensions Download CAD data ➔ **www.festo.com**



3 Pneumatic connection 3

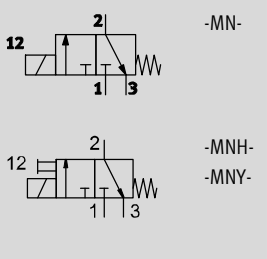
Type	B1	B2	D1	D2	H1	H2	H4	H5	L1	L2	T1
VOFD-L12T-M32-MN-G14-F19	33	15	G1/4	M5	85	12	24	27.5	50	25	6
VOFD-L12T-M32-MN-G14-F19-A											

Ordering data

Circuit symbol	Function	Pneumatic connection	Type of ignition protection	Part No.	Type
Directly actuated poppet valve					
	3/2-way, single solenoid, closed	G1/4	None	**3013904**	**VOFD-L12T-M32-MN-G14-F19**
			Intrinsically safe	**3014556**	**VOFD-L12T-M32-MN-G14-F19A**

Technical data – Modular system NW 3.5 mm

Function
3/2-way valve



- Flow rate
  Up to 406 l/min

General technical data Basic valve G1/4		VOFD-L35T-...-MN-...	VOFD-L35T-...-MNH-...	VOFD-L35T-...-MNY-...-
Valve function		3/2-way, single solenoid, closed (M32)		
		3/2-way, single solenoid, closed, semi-automatic (M32A)		
Pneumatic connection VOFD-...-G14	1	G1/4		
	2	G1/4		
	3	G1/4		
Pneumatic connection VOFD-...-N14	1	1/4 NPT		
	2	1/4 NPT		
	3	1/4 NPT		
Design		Directly actuated poppet valve		
Width	[mm]	51 (50 stainless steel design)		
Mounting position		Any		
Sealing principle		Soft		
Manual override		None	Non-detenting	Detenting
Type of reset		Mechanical spring		
Type of actuation		Electrical		
Suitability for vacuum		No		
Type of control		Direct		
Flow rate for piston valve pressurisation	[m^3/h]	0.32		
Flow rate for piston valve exhausting	[m^3/h]	0.32		
b value		0.15		
C value	[l/s bar]	1.8		
Direction of flow		Non-reversible		
Product weight	[g]	390		
Switching time off	[ms]	60		
Switching time on	[ms]	40		
Nominal width	[mm]	3.5		
Standard nominal flow rate 1 ⟶ 2	[l/min]	406		
Standard nominal flow rate 2 ⟶ 3	[l/min]	440		

Selection of solenoid coils

Suitable solenoid coils for the basic valves are available in the section on accessories.

The following solenoid coils can be selected:
- S18-18, nominal power 3 watt at 230 V AC (Ex-D)
- S18-70, nominal power 7 watt at 24 V DC (Ex-D)
- S18-120, nominal power 12 watt at 24 V DC (Ex-ME)

- Note

Additional information and solenoid coils to fit basic valves can be found in the Festo online configurator.

➔ Internet: VACC
➔ www.festo.com/sp

Basic valves VOFD-L35T-...-F10

Technical data – Modular system NW 3.5 mm

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:–:–]
Operating pressure range	[bar]	0 ... 8
Temperature of medium	[°C]	–25 ... +60
Temperature of medium, low temperature	[°C]	–50 ... +60
Ambient temperature	[°C]	–25 ... +60
Ambient temperature, low temperature	[°C]	–50 ... +60
Corrosion resistance class CRC[1)]		4

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

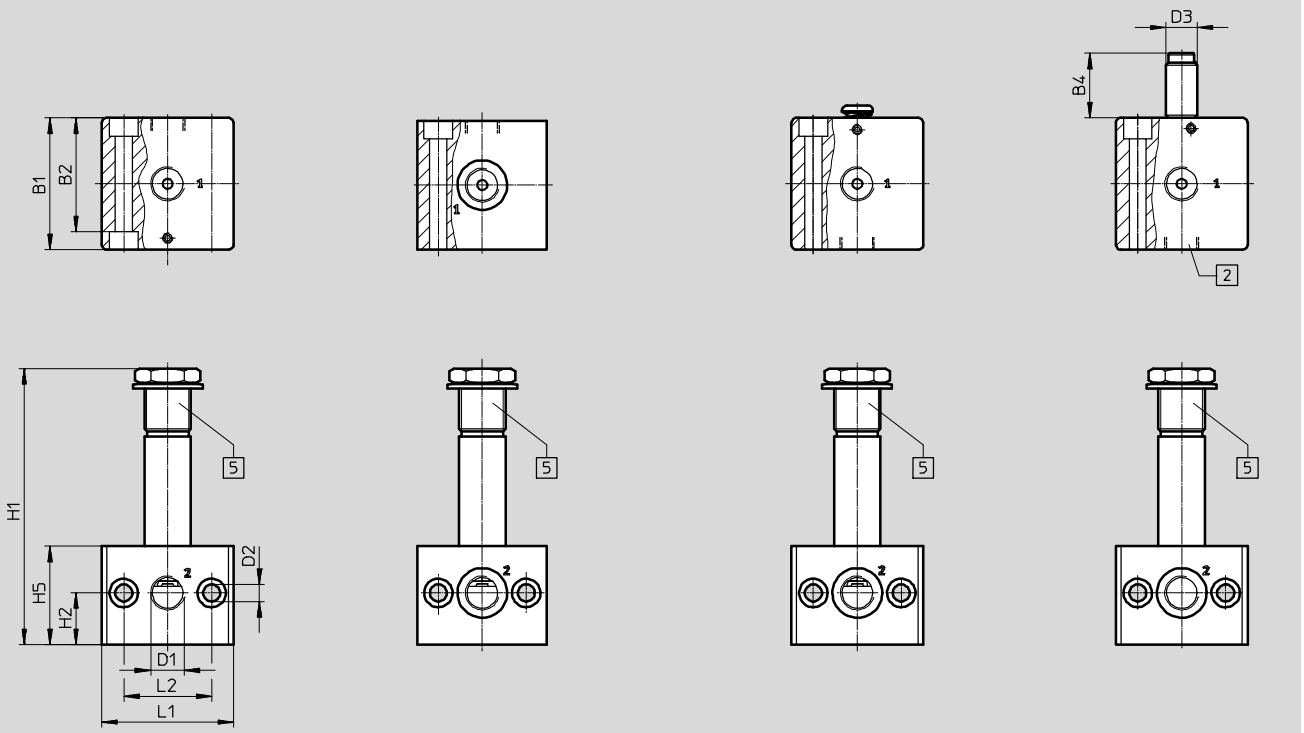
Materials	
Housing	Aluminium (Ematal coated)
Stainless steel housing	High-alloy stainless steel
Seals	NBR
Low temperature seals, stainless steel	VMQ
Note on materials	Contains paint-wetting impairment substances, RoHS-compliant

Technical data – Modular system NW 3.5 mm

Dimensions

Download CAD data ➔ **www.festo.com**

VOFD-L35T-M32-MN-...-R1 VOFD-L35T-M32-MNH-... VOFD-L35T-M32-MNY-...



2 Working port 5 Port 3

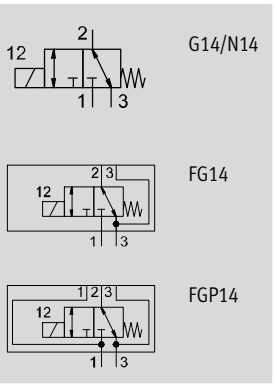
Type of G thread	B1	B2	B4	D1	D2 ∅	D3 ∅	H1	H2	H5	L1	L2
VOFD-L35T-M32-MN-G14-...-F10	51	44	–	G1/4	6.6	–	106.5	20	38	51	34
VOFD-L35T-M32-MN-G14-...-R1-F10	50	43	–			–				50	
VOFD-L35T-M32-MNH-G14-...-F10	51	44	–			–				51	
VOFD-L35T-M32-MNY-G14-...-F10	51	44	25			12				51	

Type of NPT thread	B1	B2	B4	D1	D2 ∅	D3 ∅	H1	H2	H5	L1	L2
VOFD-L35T-M32-MN-N14-...-F10	51	44	–	1/4 NPT	6.6	–	106.5	20	38	51	34
VOFD-L35T-M32-MN-N14-...-R1-F10	50	43								50	
VOFD-L35T-M32-MNH-N14-...-F10	51	44								51	
VOFD-L35T-M32A-MNH-N14-...-F10	51	44								51	
VOFD-L35T-M32A-MNH-N14-...-R1-F10	50	43								50	

Basic valves VOFD-L50T-...-F10

Technical data – Modular system NW 5 mm

Function
3/2-way valve



Flow rate
Up to 493 l/min

General technical data Basic valve G1/4			VOFD-L50T-...G14-... VOFD-L50T-...N14-...	VOFD-L50T-...-FG14-... VOFD-L50T-...-FGP14-...	VOFD-L50T-...G14-R1-... VOFD-L50T-...N14-R1-...
Valve function			3/2-way, single solenoid, closed		
Pneumatic connection VOFD-...-G14	1		G1/4		
	2		G1/4		
	3		G1/4		
Pneumatic connection VOFD-...-N14	1		1/4 NPT		
	2		1/4 NPT		
	3		1/4 NPT		
Pneumatic connection VOFD-...-FG14	1		G1/4		
	2		Port pattern to NAMUR, flange 1/4		
	3		G1/4		
Pneumatic connection VOFD-...-FGP14	1		M5 port pattern to NAMUR		
	2		Port pattern to NAMUR, flange 1/4		
	3		G1/4		
Design			Directly actuated poppet valve		
Width		[mm]	51	50.5 (flange thread)	28 (stainless steel design)
Mounting position			Any		
Sealing principle			Soft		
Manual override			None		
Reset method			Mechanical spring		
Type of actuation			Electrical		
Suitability for vacuum			Yes		
Type of control			Direct		
Flow rate for piston valve pressurisation		[m^3/h]	0.36		
Flow rate for piston valve exhausting		[m^3/h]	0.36		
b value			0.25		
C value		[l/s bar]	2		
Direction of flow			Reversible		
Product weight		[g]	560		
Switching time off		[ms]	60		
Switching time on		[ms]	40		
Nominal width		[mm]	5		
Standard nominal flow rate		[l/min]	493		
Standard nominal flow rate 2→3		[l/min]	429		

Technical data – Modular system NW 5 mm

Selection of solenoid coils

Suitable solenoid coils for the basic valves are available in the section on accessories.

The following solenoid coils can be selected:
- S18-25, nominal power 2.5 watt at 24 V DC (Ex-D)
- S18-35, nominal power 3.5 watt at 24 V DC (Ex-ME)

Note

Additional information and solenoid coils to fit basic valves can be found in the Festo online configurator.

➔ Internet: VACC
➔ www.festo.com/sp

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:2:2]
Operating pressure range	[bar]	0 ... 10
Temperature of medium	[°C]	–25 ... +60
Ambient temperature	[°C]	–25 ... +60
Extended ambient temperature, Low Demand mode	[°C]	–25 ... +60
Safety integrity level	[SIL]	Up to SIL 3 Low Demand mode
Corrosion resistance class CRC[1)]		4

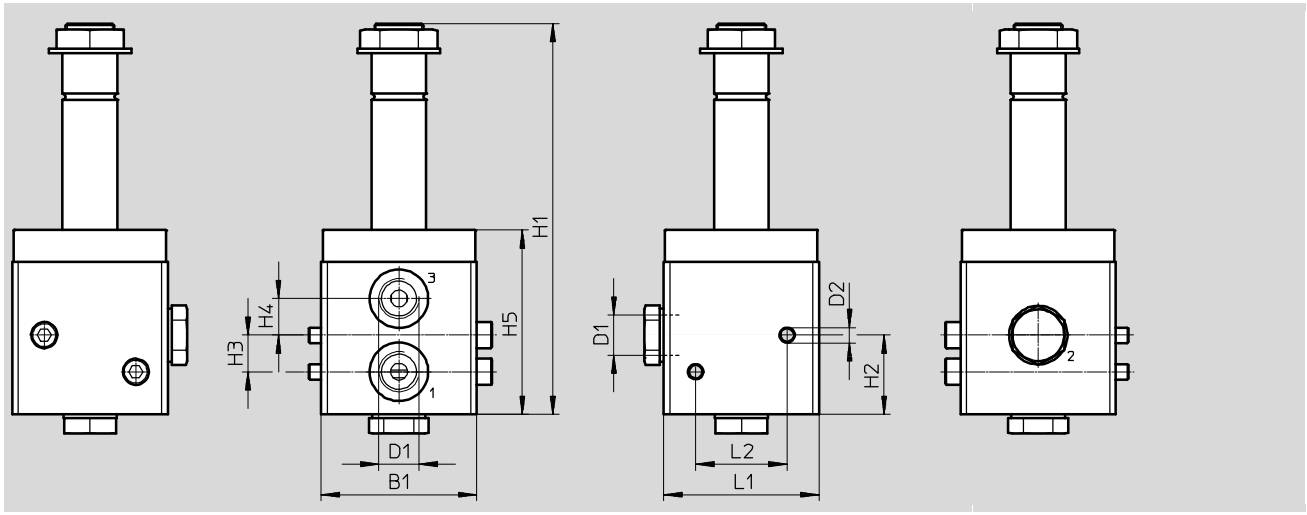
1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Materials	
Housing	Aluminium (Ematal coated)
Stainless steel housing	High-alloy stainless steel
Seals	NBR
Note on materials	Contains paint-wetting impairment substances, RoHS-compliant

Basic valves VOFD-L50T-...-F10

Technical data – Modular system NW 5 mm

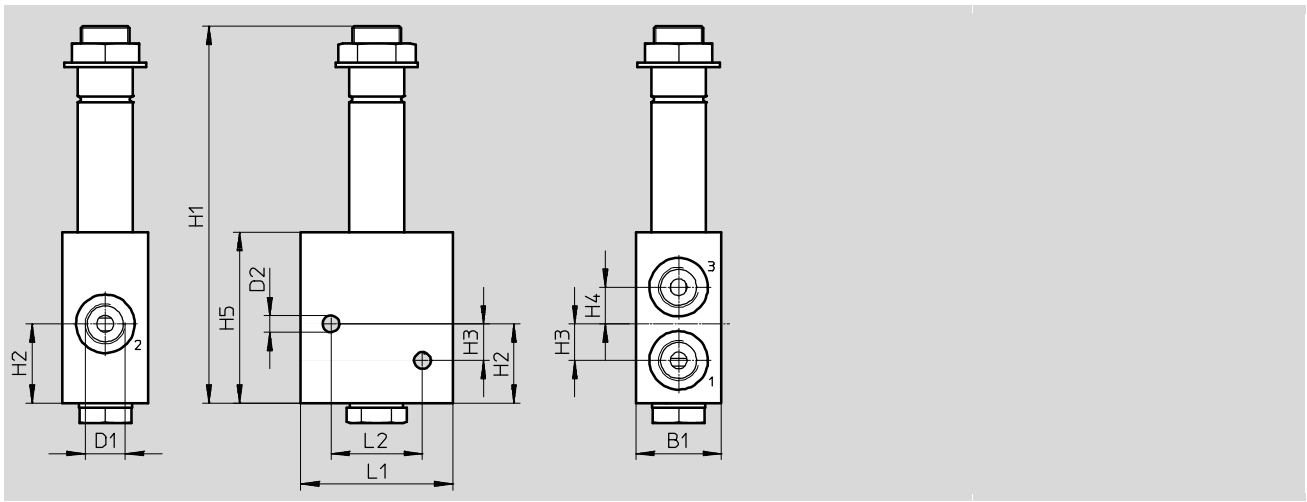
Dimensions Download CAD data ➔ **www.festo.com**



Type of G thread	B1	D1	D2 ∅	H1	H2	H3	H4	H5	L1	L2
VOFD-L50T-M32-MN-G14-...-F10	51	G1/4	5.5	128	26	12	12	60.5	51	30

Type of NPT thread	B1	D1	D2 ∅	H1	H2	H3	H4	H5	L1	L2
VOFD-L50T-M32-MN-N14-...-F10	51	1/4 NPT	5.5	128	26	12	12	60.5	51	30

Dimensions Download CAD data ➔ **www.festo.com**



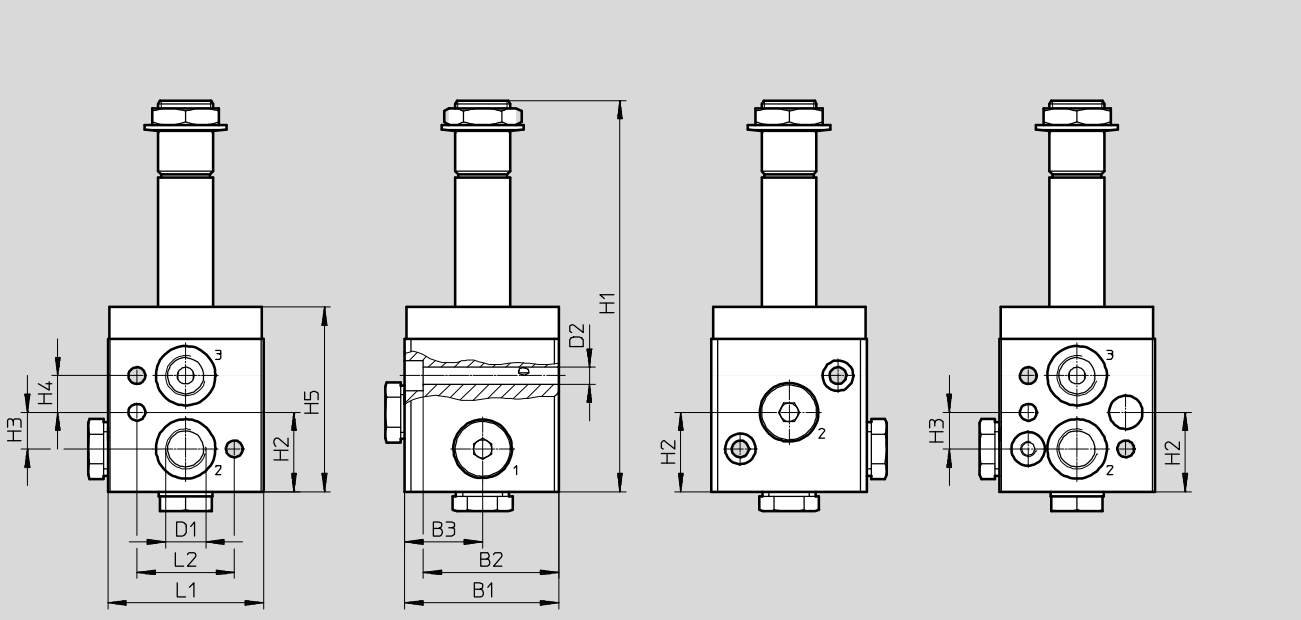
Type of G thread	B1	D1	D2 ∅	H1	H2	H3	H4	H5	L1	L2
VOFD-L50T-M32-MN-G14-...-R1-F10	28	G1/4	5.5	124	26	12	12	56	50	30

Type of NPT thread	B1	D1	D2 ∅	H1	H2	H3	H4	H5	L1	L2
VOFD-L50T-M32-MN-N14-...-R1-F10	28	1/4 NPT	5.5	124	26	12	12	56	50	30

Technical data – Modular system NW 5 mm

Dimensions

Download CAD data ➔ **www.festo.com**

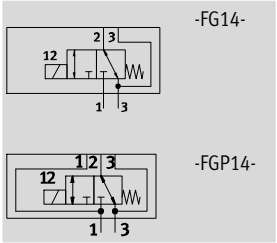


Type of flange thread	B1	B2	B3	D1	D2 ∅	H1	H2	H3	H4	H5	L1	L2
VOFD-L50T-M32-MN-FG14-F10	50.5	44.5	25.5	G1/4	5.5	128	26	12	12	60.5	51	32
VOFD-L50T-M32-MN-FGP14-F10												

Basic valves VOFD-L50T-...-F10

Technical data – Basic valve NW 5 mm, G1/4 NAMUR

Function
3/2-way valve



Flow rate
450 l/min (-LT-M32-)
493 l/min (-L50T-M32-)

General technical data				
Type VOFD-LT-M32-...			G1/4 basic valve and NAMUR	G1/4 basic valve and NAMUR, supply port
Valve function			3/2-way, single solenoid, closed	
Pneumatic connection		1	G1/4	Port pattern to NAMUR
		2	G1/4 and port pattern to NAMUR	
		3	G1/4	
		4	G1/4 and port pattern to NAMUR	
Design			Directly actuated poppet valve	
Width	[mm]		51	
Mounting position			Any	
Duty cycle			100%	
Sealing principle			Soft	
Manual override			None	
Reset method			Mechanical spring	
Type of actuation			Electrical	
Suitability for vacuum			Yes	
Type of control			Direct	
Flow rate for piston valve pressurisation	[m^3/h]		0.36	
Flow rate for piston valve exhausting	[m^3/h]		0.36	
Direction of flow			Non-reversible	
Product weight	[g]		560	
Switching time off	[ms]		9	
Switching time on	[ms]		45	
Nominal width	[mm]		5	
Standard nominal flow rate	[l/min]		450	

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:2:2]
Degree of protection		IP65
Operating pressure range	[bar]	0 ... 10
Temperature of medium	[°C]	–25 ... +60
Ambient temperature	[°C]	–25 ... +60
Extended ambient temperature, Low Demand mode	[°C]	–25 ... +60
Safety integrity level	[SIL]	Up to SIL 3 Low Demand mode
		Up to SIL 3 High Demand mode
Corrosion resistance class CRC[1)]		4

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Materials	
Housing	Aluminium (hard Ematal-coated)
Seals	NBR
Note on materials	Contains paint-wetting impairment substances, RoHS-compliant

Technical data – Basic valve NW 5 mm, G1/4 NAMUR

General technical data				
Type VOFD-L50T-M32-...			G1/4 basic valve and NAMUR	G1/4 basic valve and NAMUR, supply port
Valve function			3/2-way, single solenoid, closed	
Pneumatic connection	1		G1/4	M5 and port pattern to NAMUR
	2		Flange 1/4 and port pattern to NAMUR	Flange 1/4 and port pattern to NAMUR
	3		G1/4	G1/4
Design			Directly actuated poppet valve	
Width		[mm]	50.5	
Mounting position			Any	
Sealing principle			Soft	
Manual override			None	
Reset method			Mechanical spring	
Type of actuation			Electrical	
Suitability for vacuum			Yes	
Type of control			Direct	
Flow rate for piston valve pressurisation		[m^3/h]	0.36	
Flow rate for piston valve exhausting		[m^3/h]	0.36	
b value			0.25	
C value		[l/s bar]	2	
Direction of flow			Reversible	
Product weight		[g]	560	
Switching time off		[ms]	60	
Switching time on		[ms]	40	
Nominal width		[mm]	5	
Standard nominal flow rate		[l/min]	493	
Standard nominal flow rate 2→3		[l/min]	429	

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:2:2]
Degree of protection		IP65
Operating pressure range	[bar]	0 ... 10
Temperature of medium	[°C]	–25 ... +60
Ambient temperature	[°C]	–25 ... +60
Extended ambient temperature, Low Demand mode	[°C]	–25 ... +60
Safety integrity level	[SIL]	Up to SIL 3 Low Demand mode
		Up to SIL 3 High Demand mode
Corrosion resistance class CRC[1)]		4

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (→ also FN 940082) using appropriate media.

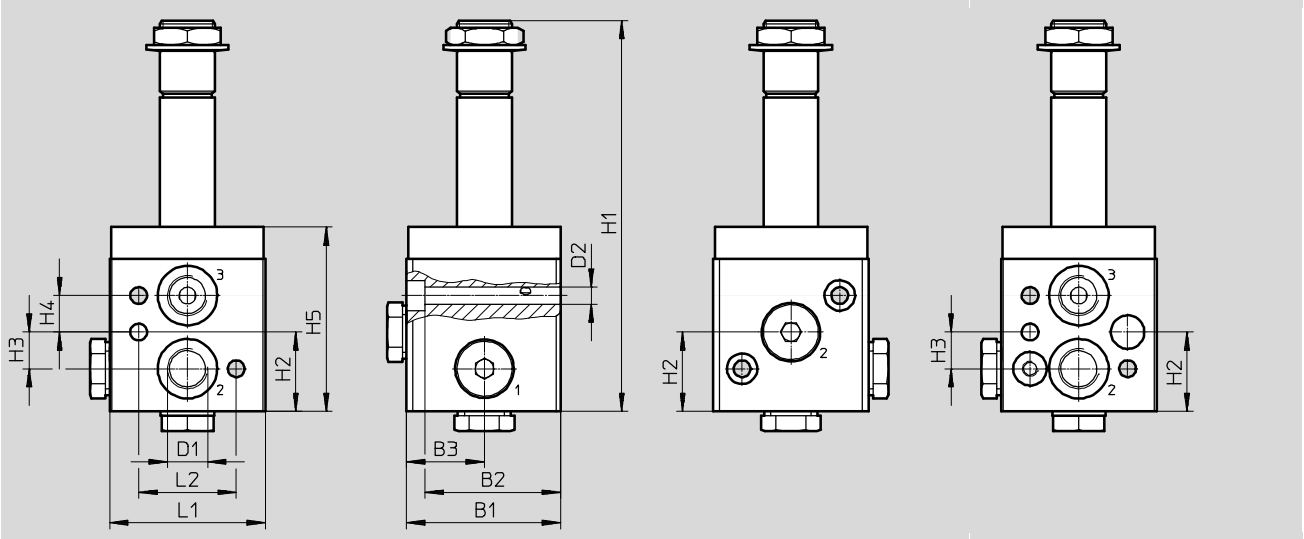
Materials	
Housing	Aluminium (Ematal coated)
Seals	NBR
Note on materials	Contains paint-wetting impairment substances, RoHS-compliant

Basic valves VOFD-L50T-...-F10

Technical data – Basic valve NW 5 mm, G1/4 NAMUR

Dimensions G1/4 basic valve and NAMUR

Download CAD data ➔ **www.festo.com**

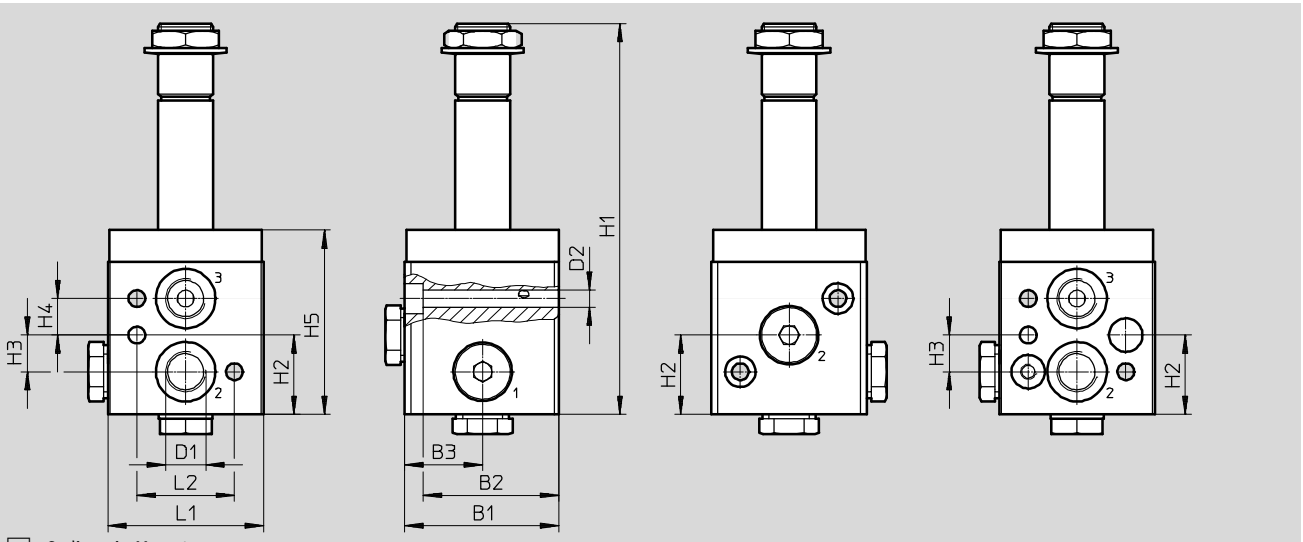


Type of flange thread	B1	B2	B3	D1	D2 ∅	H1	H2	H3	H4	H5	L1	L2
VOFD-L50T-M32-MN-FG14-F10	50.5	44.5	25.5	G1/4, NAMUR	5.5	128	26	12	12	60.5	51	32
VOFD-L50T-M32-MN-FGP14-F10												

Technical data – Basic valve NW 5 mm, G1/4 NAMUR

Dimensions – G1/4 basic valve and NAMUR, supply port

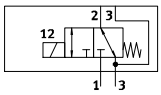
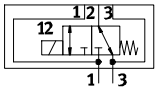
Download CAD data ➔ **www.festo.com**



1 Coding pin M5x10

Type of flange thread	B1	B2	B3	D1	D2 ∅	H1	H2	H3	H4	H5	L1	L2
VOFD-LT-M32-MN-FGP14-F10	51	44.5	25.5	G1/4, NAMUR	5.5	128	26	12	12	60.5	51	32
VOFD-L50T-M32-MN-FGP14-10-F10												

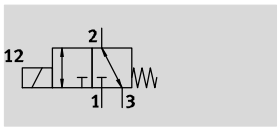
Ordering data

Circuit symbol	Function	Pneumatic connection	Part No.	Type
Directly actuated poppet valve				
	3/2-way, single solenoid, closed	G1/4 and NAMUR	**4514999**	**VOFD-L50T-M32-MN-FG14-10-F10**
	3/2-way, single solenoid, closed	NAMUR with supply port	**4515000**	**VOFD-L50T-M32-MN-FGP14-10-F10**

Basic valves VOFD-L50T-...-F10

Technical data – Basic valve NW 5 mm, G/NPT 1/4, in-line

Function
3/2-way valve



Flow rate
450 l/min (-LT-M32-)
493 l/min (-L50T-M32-)

General technical data				
Type VOFD-LT-M32-...			G1/4 basic valve	1/4 NPT basic valve
Valve function			3/2-way, single solenoid, closed	
Pneumatic connection		1	G1/4	1/4 NPT
		2	G1/4	1/4 NPT
		3	G1/4	1/4 NPT
Design			Directly actuated poppet valve	
Width	[mm]		51	
Mounting position			Any	
Duty cycle			100%	
Sealing principle			Soft	
Manual override			None	
Reset method			Mechanical spring	
Type of actuation			Electrical	
Suitability for vacuum			Yes	
Type of control			Direct	
Flow rate for piston valve pressurisation	[m^3/h]		0.36	
Flow rate for piston valve exhausting	[m^3/h]		0.36	
Direction of flow			Reversible	
Product weight	[g]		560	
Switching time off	[ms]		9	
Switching time on	[ms]		45	
Nominal width	[mm]		5	
Standard nominal flow rate	[l/min]		450	

Operating and environmental conditions			
Operating medium			Compressed air to ISO 8573-1:2010 [7:2:2]
Degree of protection			IP65
Operating pressure range	[bar]		0 ... 10
Temperature of medium	[°C]		–25 ... +60
Ambient temperature	[°C]		–25 ... +60
Extended ambient temperature, Low Demand mode	[°C]		–25 ... +60
Safety integrity level	[SIL]		Up to SIL 3 Low Demand mode
			Up to SIL 3 High Demand mode
Corrosion resistance class CRC[1)]			4

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Materials	
Housing	Aluminium (hard Ematal-coated)
Seals	NBR
Note on materials	Contains paint-wetting impairment substances, RoHS-compliant

Technical data – Basic valve NW 5 mm, G/NPT 1/4, in-line

General technical data				
Type VOFD-L50T-M32-...			G1/4 basic valve	1/4 NPT basic valve
Valve function			3/2-way, single solenoid, closed	
Pneumatic connection		1	G1/4	1/4 NPT
		2	G1/4	1/4 NPT
		3	G1/4	1/4 NPT
Design			Directly actuated poppet valve	
Width	[mm]		51, 28 (stainless steel design)	
Mounting position			Any	
Sealing principle			Soft	
Manual override			None	
Reset method			Mechanical spring	
Type of actuation			Electrical	
Suitability for vacuum			Yes	
Type of control			Direct	
Flow rate for piston valve pressurisation	[m^3/h]		0.36	
Flow rate for piston valve exhausting	[m^3/h]		0.36	
b value			0.25	
C value	[l/s bar]		2	
Direction of flow			Reversible	
Product weight	[g]		560	
Switching time off	[ms]		60	
Switching time on	[ms]		40	
Nominal width	[mm]		5	
Standard nominal flow rate	[l/min]		493	
Standard nominal flow rate 2⟶3	[l/min]		429	

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:2:2]
Degree of protection		IP65
Operating pressure range	[bar]	0 ... 10
Temperature of medium	[°C]	–25 ... +60
Ambient temperature	[°C]	–25 ... +60
Extended ambient temperature, Low Demand mode	[°C]	–25 ... +60
Safety integrity level	[SIL]	Up to SIL 3 Low Demand mode
		Up to SIL 3 High Demand mode
Corrosion resistance class CRC[1)]		4

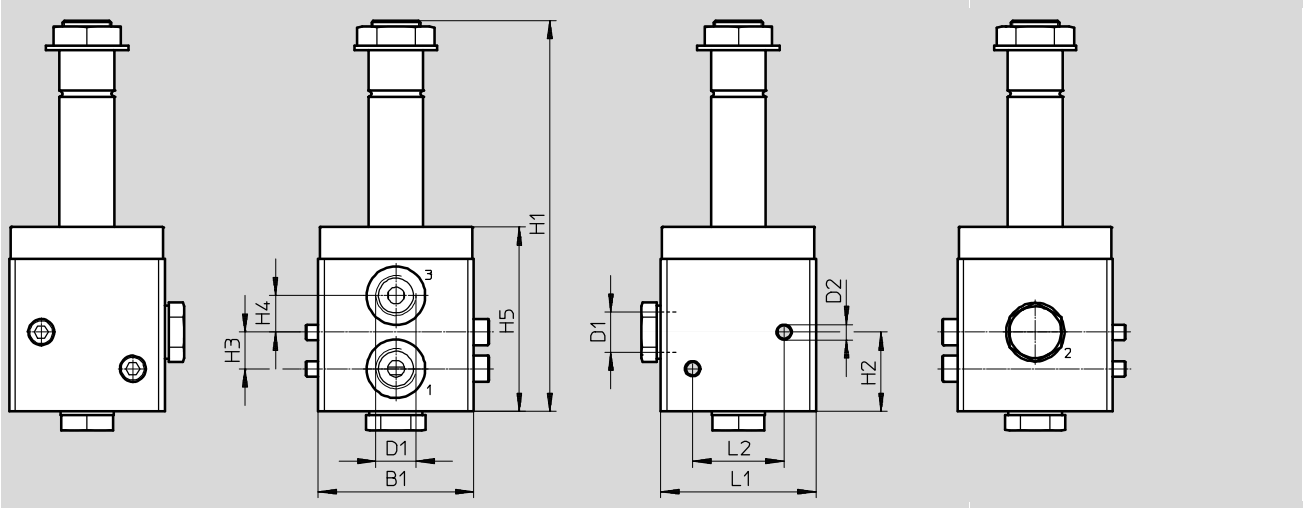
1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Materials	
Housing	Aluminium (Ematal coated)
Stainless steel housing	High-alloy stainless steel
Seals	NBR
Note on materials	Contains paint-wetting impairment substances, RoHS-compliant

Basic valves VOFD-L50T-...-F10

Technical data – Basic valve NW 5 mm, G/NPT 1/4, in-line

Dimensions Download CAD data ➔ **www.festo.com**

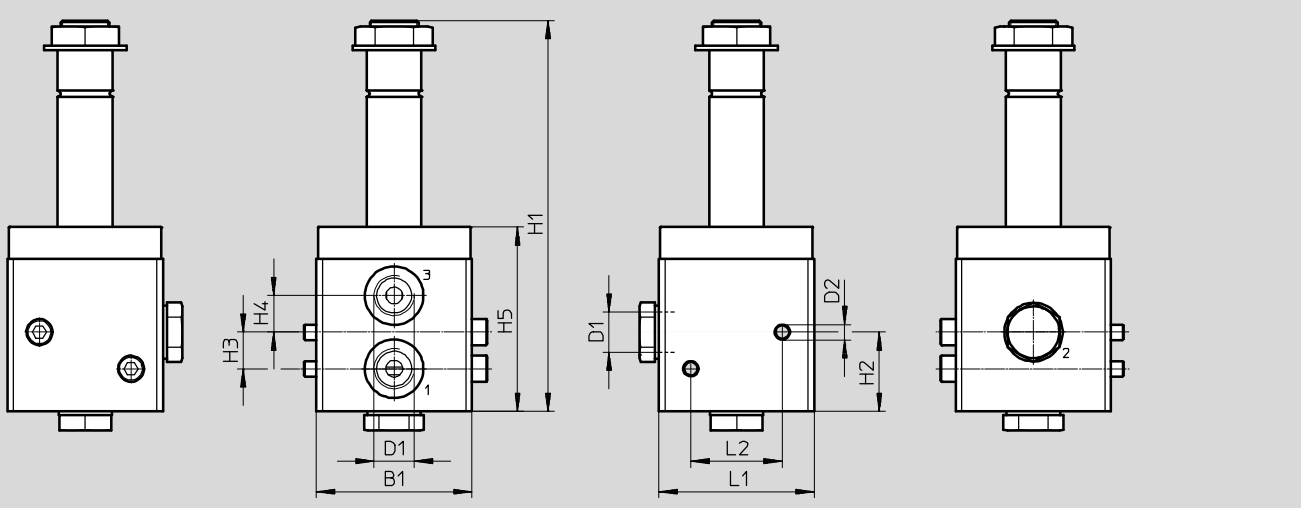


Type of G thread	B1	D1	D2 ∅	H1	H2	H3	H4	H5	L1	L2
VOFD-LT-M32-MN-G14-F10 VOFD-L50T-M32-MN-G14-...-F10	51	G1/4	5.5	128	26	12	12	60.5	51	30

Type of NPT thread	B1	D1	D2 ∅	H1	H2	H3	H4	H5	L1	L2
VOFD-LT-M32-MN-N14-F10 VOFD-L50T-M32-MN-N14-...-F10	51	1/4 NPT	5.5	128	26	12	12	60.5	51	30

Technical data – Basic valve NW 5 mm, G/NPT 1/4, in-line

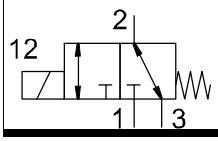
Dimensions Download CAD data ➔ **www.festo.com**



Type of G thread	B1	D1	D2 ∅	H1	H2	H3	H4	H5	L1	L2
VOFD-L50T-M32-MN-G14-...-R1-F10	28	G1/4	5.5	124	26	12	12	56	50	30

Type of NPT thread	B1	D1	D2 ∅	H1	H2	H3	H4	H5	L1	L2
VOFD-L50T-M32-MN-N14-...-R1-F10	28	1/4 NPT	5.5	124	26	12	12	56	50	30

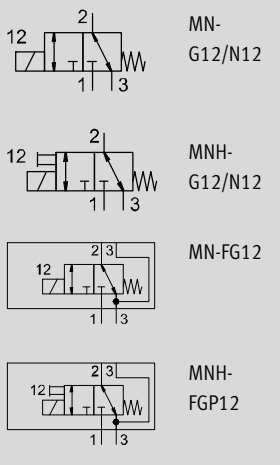
Ordering data

Circuit symbol	Function	Pneumatic connection	Part No.	Type
Directly actuated poppet valve				
	3/2-way, single solenoid, closed	G1/4	**4514997**	**VOFD-L50T-M32-MN-G14-10-F10**
			4515019	**VOFD-L50T-M32-MN-G14-10-R1-F10**
		1/4 NPT	**4514998**	**VOFD-L50T-M32-MN-N14-10-F10**
			4515018	**VOFD-L50T-M32-MN-N14-10-R1-F10**

Basic valves VOFD-L100T-...-F10

Technical data – Modular system NW 10 mm, G/NPT 1/2, NAMUR, and in-line

Function
3/2-way valve



Flow rate
Up to 1900 l/min

General technical data			
Basic valve G1/2		VOFD-L100T-M32-MN-...	VOFD-L100T-M32-MNH-...
Valve function		3/2-way, single solenoid, closed	
Pneumatic connection VOFD-...-G12	1	G1/2	
	2	G1/2	
	3	G1/2	
Pneumatic connection VOFD-...-N12	1	1/2 NPT	
	2	1/2 NPT	
	3	1/2 NPT	
Pneumatic connection VOFD-...-FG12	1	G1/2	
	2	Port pattern to NAMUR, flange 1/2	
	3	G1/2	
Design		Directly actuated poppet valve	
Width	[mm]	51	
Mounting position		Any	
Sealing principle		Soft	
Manual override		None	Non-detenting
Type of reset		Mechanical spring	
Type of actuation		Electrical	
Suitability for vacuum		Yes	
Type of control		Direct	
Flow rate for piston valve pressurisation	[m^3/h]	1.68	
Flow rate for piston valve exhausting	[m^3/h]	1.68	
b value		0.22	
C value	[l/s bar]	7.6	
Direction of flow		Reversible	
Product weight	[g]	950	
Switching time off	[ms]	60	
Switching time on	[ms]	40	
Nominal width	[mm]	10	
Standard nominal flow rate 1 ⟶ 2	[l/min.]	1900	
Standard nominal flow rate 2 ⟶ 3	[l/min.]	1888	

Selection of solenoid coils

Suitable solenoid coils for the basic valves are available in the section on accessories.

The following solenoid coils can be selected:
- S18-70, nominal power 7 watt at 24 V DC (Ex-D)
- S18-120, nominal power 12 watt at 24 V DC (Ex-ME)

Note

Additional information and solenoid coils to fit basic valves can be found in the Festo online configurator.

➔ Internet: VACC
➔ www.festo.com/sp

Technical data – Modular system NW 10 mm, G/NPT 1/2, NAMUR, and in-line

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:–:–]
Operating pressure range	[bar]	0 ... 12
Temperature of medium	[°C]	–25 ... +60
Ambient temperature	[°C]	–25 ... +60
Corrosion resistance class CRC[1)]		4

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Materials	
Housing	Aluminium (Ematal coated)
Seals	NBR
Note on materials	Contains paint-wetting impairment substances, RoHS-compliant

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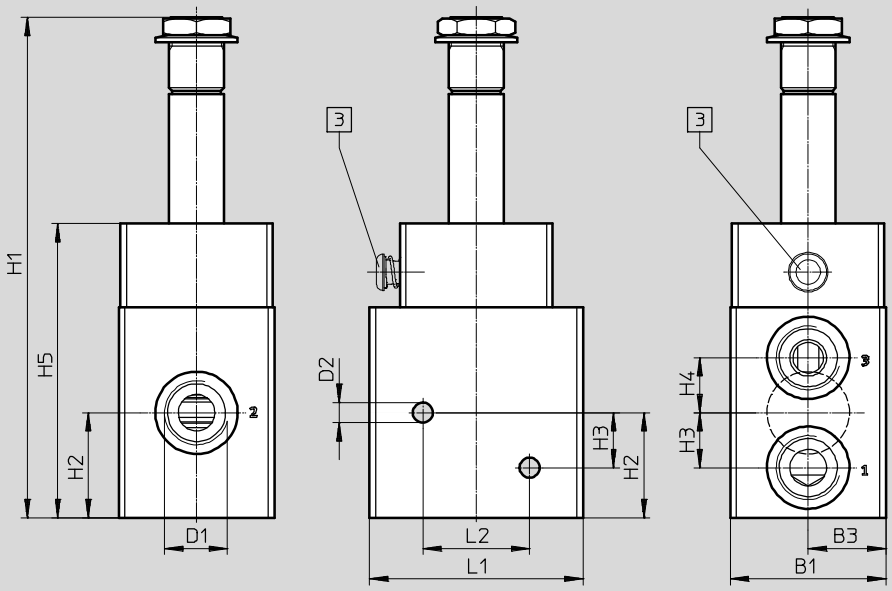
VOFD-L100T-M32-MN...



3 MO manual override, non-detenting

Type of G thread	B1	B3	D1	D2 ∅	H1	H2	H3	H4	H5	L1	L2
VOFD-L100T-M32-MN-G12-...-F10	51	25	G1/2	6.6	164	34.5	18	18	96.5	70	35
VOFD-L100T-M32-MNH-G12-...-F10											

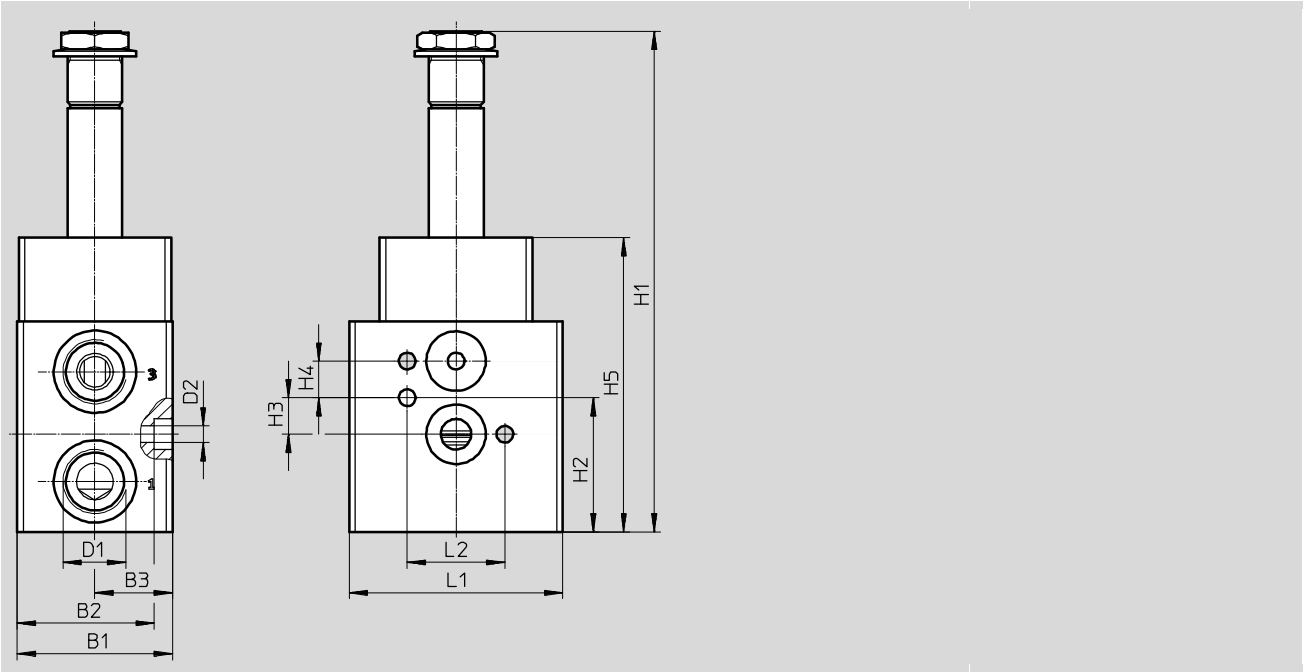
Type of NPT thread	B1	B3	D1	D2 ∅	H1	H2	H3	H4	H5	L1	L2
VOFD-L100T-M32-MN-N12-...-F10	51	25	1/2 NPT	6.6	164	34.5	18	18	96.5	70	35
VOFD-L100T-M32-MNH-N12-...-F10											

Basic valves VOFD-L100T-...-F10

Technical data – Modular system NW 10 mm, G/NPT 1/2, NAMUR, and in-line

Dimensions Download CAD data ➔ **www.festo.com**

VOFD-L100T-...-FG12-...-F10



Type of flange thread	B1	B2	B3	D1	D2 ∅	H1	H2	H3	H4	H5	L1	L2
VOFD-L100T-...-FG12-...-F10	51	45	25.5	G1/2	5.5	164	44	12	12	96.5	70	32

Type codes

VACC – [ ] – [ ] – [ ] – [ ] [ ] – [ ] [ ]

Type	
VACC	Solenoid coil, C series

Solenoid coil type	
S18	Solenoid coil, for 18 mm armature tube

Power consumption	
18	1.8 W
25	2.5 W
35	3.5 W
70	7 W
120	12 W

Electrical connection	
A1	Connection pattern type A, to EN 175301
K4	Cable fitting, metric
K5	Cable fitting NPT

Operating voltage	
1A	24 V AC, 50/60 Hz
1U	24 V DC and AC
2A	110 V AC/50-60 Hz
2U	110 V DC and AC
3A	230 V AC/50-60 Hz
3U	230 V DC and AC
7U	48 V DC and AC
16U	120 V DC and AC
1	24 V DC
3	230 V DC
7	48 V DC
16	120 V DC
27	60 V DC

Circuitry	
–	None
F	With fuse

Certification	
–	Without certification
EX4	ATEX category II 2GD
U2	Hazardous environment for USA and Canada (to NEC 500) cULus

Type of ignition protection	
–	None
D	Flameproof enclosure
ME	Moulded encapsulation, enhanced safety

Solenoid coils VACC-S18-35-A1

Technical data

- Voltage
  24 V DC
  24 V AC
  110 V AC
  230 V AC
- Temperature range
  –20 ... +60 °C

Nominal power
3.6 watt at 24 V DC

General technical data					
Nominal operating voltage	[V]	24 V DC	24 V AC	110 V AC	230 V AC
Type of mounting		Via knurled nut			
Type of actuation		Electrical			
Mounting position		Any			
Product weight	[g]	530			580

Materials	
Solenoid coil	Steel, PA
Note on materials	Contains paint-wetting impairment substances
	RoHS compliant

Electrical data		
Electrical connection		Plug pins, 3-pin, with connection pattern type A, to EN 175301-803
Permissible voltage fluctuations	[%]	–15 ... 10
Duty cycle	[%]	100
Degree of protection to EN 60529		IP65 with plug socket
Insulation class		H

Characteristic coil data					
Nominal operating voltage		24 V DC	24 V AC	110 V AC	230 V AC
Frequency	[Hz]	–	50/60	50/60	50/60
Power	[W]	3.5	–	–	–
	[VA]	–	3.5	3.5	3.5

Operating and environmental conditions					
Nominal operating voltage		24 V DC	24 V AC	110 V AC	230 V AC
Ambient temperature	[°C]	–20 ... 60		–20 ... 60	
Corrosion resistance class CRC[1)]		4		4	
CE marking (see declaration of conformity)[2)]		–		To EU Low Voltage Directive	

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.
2) Additional information www.festo.com/sp ➔ Certificates.

Solenoid coils VACC-S18-35-A1

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

Type	D1 ∅	D2 ∅	H1	L1	L2
VACC-S18-35-A1-1	18.2	50	58	50	38
VACC-S18-35-A1-1A					
VACC-S18-35-A1-2A					
VACC-S18-35-A1-3A					

Ordering data

	Description		Part No.	Type
	Plug connector type A, to EN 175301-803	24 V DC	**562906**	**VACC-S18-35-A1-1**
		24 V AC	**562907**	**VACC-S18-35-A1-1A**
		110 V AC	**562908**	**VACC-S18-35-A1-2A**
		230 V AC	**562909**	**VACC-S18-35-A1-3A**

Solenoid coils VACC-S18-120-A1

Technical data

- Voltage
  24 V DC
  24 V AC
  110 V AC
  230 V AC
- Temperature range
  –20 ... +60 °C

Nominal power
12 watt at 24 V DC

General technical data		
Type of mounting		Via knurled nut
Type of actuation		Electrical
Mounting position		Any
Product weight	[g]	530

Materials	
Housing	PA, steel
Note on materials	Contains paint-wetting impairment substances
	RoHS compliant

Electrical data		
Electrical connection		Plug pins, 3-pin, with connection pattern to EN 175301-803, type A
Permissible voltage fluctuations	[%]	–15 ... 10
Duty cycle	[%]	100
Degree of protection to EN 60529		IP65 with plug socket
Insulation class		H

Characteristic coil data					
Nominal operating voltage		24 V DC	24 V AC	110 V AC	230 V AC
Frequency	[Hz]	–	50/60	50/60	50/60
Power	[W]	12.0	–	–	–
	[VA]	–	12.0	12.0	12.0

Operating and environmental conditions					
Nominal operating voltage		24 V DC	24 V AC	110 V AC	230 V AC
Ambient temperature	[°C]	–20 ... 60		–20 ... 60	
Corrosion resistance class CRC[1)]		4		4	
CE marking (see declaration of conformity)[2)]		–		To EU Low Voltage Directive	

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

2) Additional information www.festo.com/sp ➔ Certificates.

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

Type	D1 ∅	D2 ∅	H1	L1	L2
VACC-S18-120-A1-1	18.2	50	58	50	38
VACC-S18-120-A1-1A					
VACC-S18-120-A1-2A					
VACC-S18-120-A1-3A					

Ordering data

	Description		Part No.	Type
	Plug connector type A, to EN 175301-803	24 V DC	**8040580**	**VACC-S18-120-A1-1**
		24 V AC	**8040890**	**VACC-S18-120-A1-1A**
		110 V AC	**8040582**	**VACC-S18-120-A1-2A**
		230 V AC	**8040584**	**VACC-S18-120-A1-3A**

Solenoid coils VACC-S18-18-...-EX4D

Technical data

- Voltage
  230 V AC
- Temperature range
  –20 ... +90 °C

Nominal power
3 watt at 230 V AC

General technical data		
Type of mounting		Via knurled nut
Type of actuation		Electrical
Mounting position		Any
Product weight	[g]	1700

Materials	
Housing	Wrought aluminium alloy, grey cast iron
Note on materials	Contains paint-wetting impairment substances
	RoHS compliant

Electrical data		
Electrical connection	K4	Terminal box, cable entry thread metric, M20x1.5
	K5	Terminal box, cable entry thread NPT, 1/2 NPT
Permissible voltage fluctuations	[%]	–15 ... 10
Duty cycle	[%]	100
Degree of protection to EN 60529		IP65 with plug socket
Insulation class		H

Characteristic coil data		
Nominal operating voltage	[V AC]	230
Frequency	[Hz]	50/60
Power	[VA]	1.8

ATEX		
ATEX category for gas		II 2G
Type of ignition protection for gas		Ex d IIC T6, T5, T4 Gb
ATEX category for dust		II 2D
Type of ignition protection for dust		Ex tb IIIC T80°C,T95°C,T130°C Db
Explosion ambient temperature	[°C]	T4,T130°C: -50°C <= Ta <= +90°C
		T5,T95°C: -50°C <= Ta <= +55°C
		T6,T80°C: -50°C <= Ta <= +40°C
Explosion protection certification outside the EU		EPL Db (BR), EPL Db (CN), EPL Db (IEC-EX), EPL Gb (BR), EPL Gb (CN), EPL Gb (IEC-EX)
Certificate issuing authority		NEPSI GYJ111107
		BVS15ATEXE135
		IECExBVS.15.0116
		TÜV 12.1948

Operating and environmental conditions	
Corrosion resistance class CRC[1)]	4
CE marking (see declaration of conformity)[2)]	To EU Explosion Protection Directive (ATEX)

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

2) Additional information www.festo.com/sp ➔ Certificates.

Technical data

Dimensions

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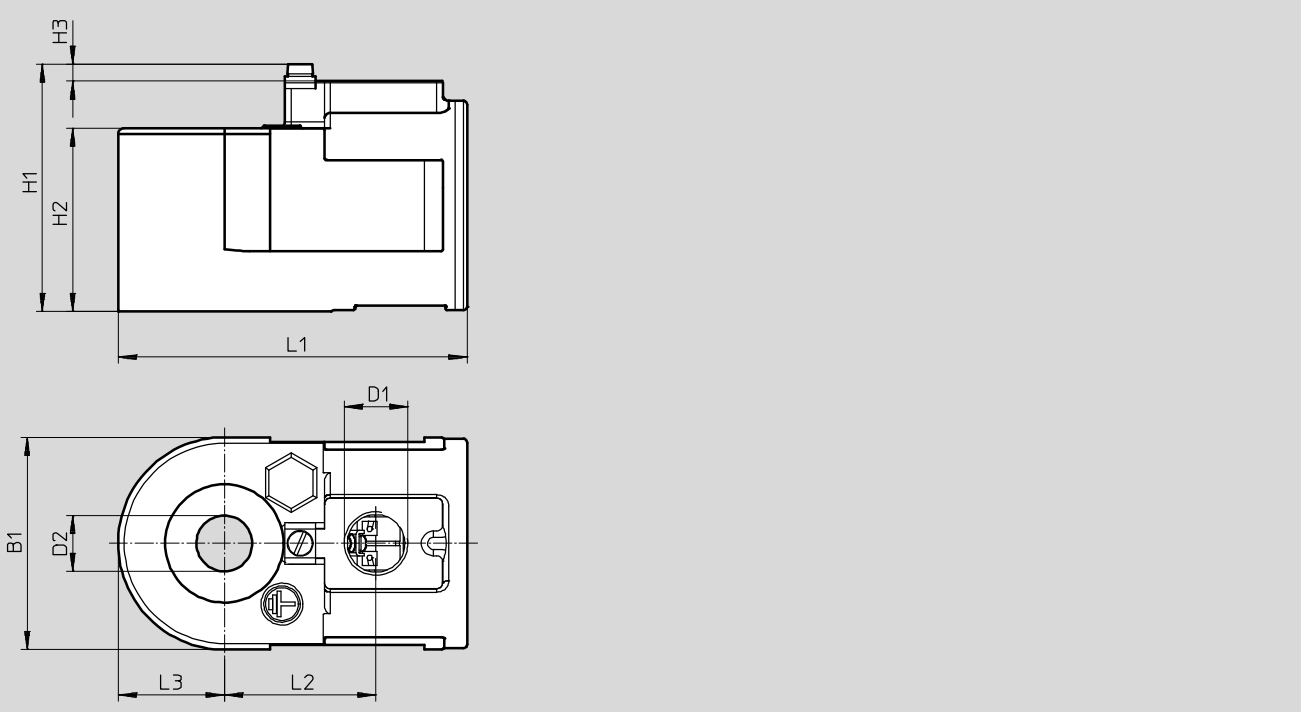
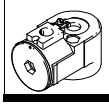


Type	B1	D1	D2 ∅	H1	H2	H3	L1	L2	L3
VACC-S18-18-K4-3A-EX4D	70	M20x1.5	18.2	82	60.5	6	115	50	35
VACC-S18-18-K5-3A-EX4D		1/2 NPT							

Ordering data

	Description	Part No.	Type
	Terminal box, cable fitting metric, M20x1.5	**3504741**	**VACC-S18-18-K4-3A-EX4D**
	Terminal box, cable fitting NPT, 1/2 NPT	**3546734**	**VACC-S18-18-K5-3A-EX4D**

Solenoid coils VACC-S18-25-...-EX4D

Technical data

- Voltage
  24 V AC/DC
  110 V AC/DC
  230 V AC/DC
- Temperature range
  –20 ... +60 °C

Nominal power
2.5 watt at 24 V DC

General technical data		
Type of mounting		Via knurled nut
Type of actuation		Electrical
Mounting position		Any
Product weight	[g]	1700

Materials	
Housing	Wrought aluminium alloy, grey cast iron
Note on materials	Contains paint-wetting impairment substances
	RoHS compliant

Electrical data		
Electrical connection	K4	Terminal box, cable entry thread metric, M20x1.5
	K5	Terminal box, cable entry thread NPT, 1/2 NPT
Permissible voltage fluctuations	[%]	–15 ... 10
Duty cycle	[%]	100
Degree of protection to EN 60529		IP65
Insulation class		H

Characteristic coil data				
Nominal operating voltage		24 V AC/DC	110 V AC/DC	230 V AC/DC
Frequency	[Hz]	40/65	40/65	40/65
Power	[W]	2.5	2.5	2.5
	[VA]	2.5	2.5	2.5

ATEX		
ATEX category for gas		II 2G
Type of ignition protection for gas		Ex d IIC T6, T5, T4 Gb
ATEX category for dust		II 2D
Type of ignition protection for dust		Ex tb IIIC T80°C,T95°C,T130°C Db
Explosion ambient temperature	[°C]	T4,T130°C: -50°C <= Ta <= +90°C
		T5,T95°C: -50°C <= Ta <= +55°C
		T6,T80°C: -50°C <= Ta <= +40°C
Explosion protection certification outside the EU		EPL Gb (BR), EPL Gb (CN)
Certificate issuing authority		NEPSI GYJ111107
		PTB 08 ATEX 1086
		TÜV 12.1948

Operating and environmental conditions	
Corrosion resistance class CRC[1)]	4
CE marking (see declaration of conformity)[2)]	To EU Explosion Protection Directive (ATEX)

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

2) Additional information www.festo.com/sp ➔ Certificates.

Technical data

Dimensions

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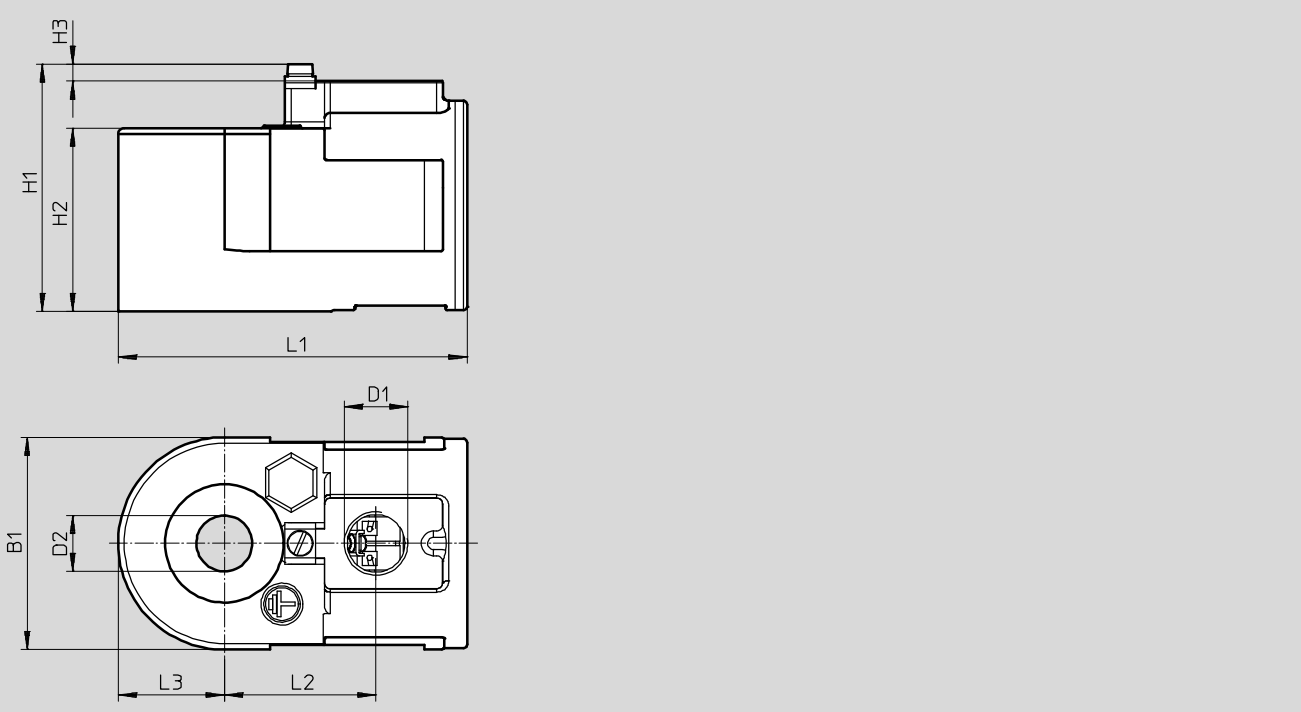
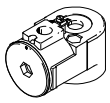


Type	B1	D1	D2 ∅	H1	H2	H3	L1	L2	L3
VACC-S18-25-K4-...U-EX4D	70	M20x1.5	18.2	82	60.5	6	115	50	35
VACC-S18-25-K5-...U-EX4D		1/2 NPT							

Ordering data

	Description		Part No.	Type
	Terminal box, cable entry thread metric, M20x1.5	24 V AC/DC	**562903**	**VACC-S18-25-K4-1U-EX4D**
		110 V AC/DC	**562904**	**VACC-S18-25-K4-2U-EX4D**
		230 V AC/DC	**562905**	**VACC-S18-25-K4-3U-EX4D**
	Terminal box, cable entry thread NPT, 1/2 NPT	24 V AC/DC	**562900**	**VACC-S18-25-K5-1U-EX4D**
		110 V AC/DC	**562901**	**VACC-S18-25-K5-2U-EX4D**
		230 V AC/DC	**562902**	**VACC-S18-25-K5-3U-EX4D**

Solenoid coils VACC-S18-70-...-EX4D

Technical data

- Voltage
  24 V AC/DC
  48 V AC/DC
  110 V AC/DC
  120 V AC/DC
  230 V AC/DC

- Temperature range
  –20 ... +90 °C

Nominal power
7 watt at 24 V DC

General technical data		
Type of mounting		Via knurled nut
Type of actuation		Electrical
Mounting position		Any
Product weight	[g]	1700

Materials	
Housing	Wrought aluminium alloy, grey cast iron
Note on materials	Contains paint-wetting impairment substances
	RoHS compliant

Electrical data		
Electrical connection	K4	Terminal box, cable entry thread metric, M20x1.5
	K5	Terminal box, cable entry thread NPT, 1/2 NPT
Permissible voltage fluctuations	[%]	–15 ... 10
Duty cycle	[%]	100
Degree of protection to EN 60529		IP65
Insulation class		H

Characteristic coil data						
Nominal operating voltage		24 V AC/DC	48 V AC/DC	110 V AC/DC	120 V AC/DC	230 V AC/DC
Frequency	[Hz]	40/65	40/65	40/65	40/65	40/65
Power	[W]	7	7	7	7	7
	[VA]	7	7	7	7	7

ATEX		
ATEX category for gas		II 2G
Type of ignition protection for gas		Ex d IIC T6, T5, T4 Gb
ATEX category for dust		II 2D
Type of ignition protection for dust		Ex tb IIIC T80°C,T95°C,T130°C Db
Explosion ambient temperature	[°C]	T4,T130°C: -50°C <= Ta <= +90°C
		T5,T95°C: -50°C <= Ta <= +55°C
		T6,T80°C: -50°C <= Ta <= +40°C
Explosion protection certification outside the EU		EPL Db (BR), EPL Db (CN), EPL Db (IEC-EX), EPL Gb (BR), EPL Gb (CN), EPL Gb (IEC-EX)
Certificate issuing authority		NEPSI GYJ111107
		BVS15ATEXE135
		IECExBVS.15.0116
		TÜV 12.1948

Operating and environmental conditions	
Corrosion resistance class CRC[1)]	4
CE marking (see declaration of conformity)[2)]	To EU Explosion Protection Directive (ATEX)

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

2) Additional information www.festo.com/sp ➔ Certificates.

Technical data

Dimensions

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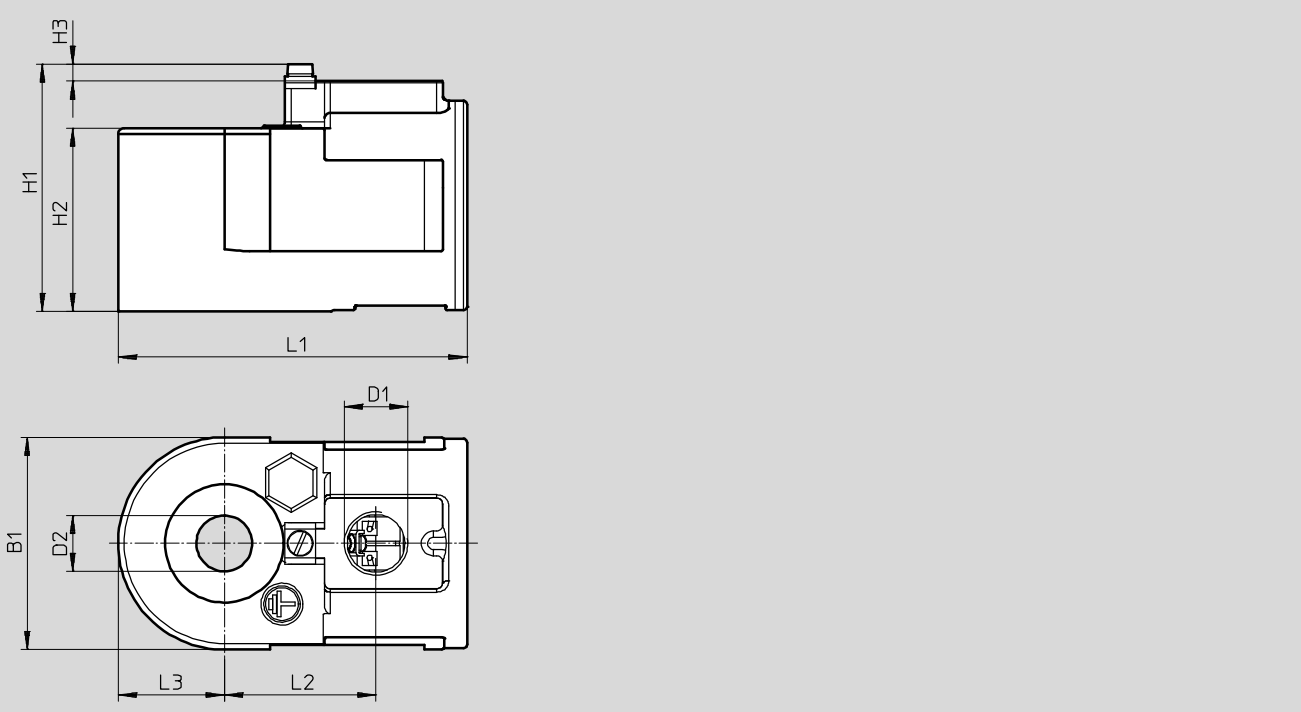

Type	B1	D1	D2 ∅	H1	H2	H3	L1	L2	L3
VACC-S18-70-K4-...-EX4D	70	M20x1.5	18.2	82	60.5	6	115	50	35
VACC-S18-70-K5-...-EX4D	70	1/2 NPT	18.2	82	60.5	6	115	50	35

Ordering data

	Description		Part No.	Type
	Terminal box, cable fitting metric, M20x1.5	24 V AC/DC	**3504563**	**VACC-S18-70-K4-1U-EX4D**
		48 V AC/DC	**3504574**	**VACC-S18-70-K4-7U-EX4D**
		120 V AC/DC	**3504609**	**VACC-S18-70-K4-16U-EX4D**
		230 V AC/DC	**3504639**	**VACC-S18-70-K4-3U-EX4D**
	Terminal box, cable fitting NPT, 1/2 NPT	24 V AC/DC	**3546549**	**VACC-S18-70-K5-1U-EX4D**
		48 V AC/DC	**3546588**	**VACC-S18-70-K5-7U-EX4D**
		110 V AC/DC	**3546625**	**VACC-S18-70-K5-2U-EX4D**
		230 V AC/DC	**3546662**	**VACC-S18-70-K5-3U-EX4D**

Solenoid coils VACC-S18-35-...-EX4ME

Technical data

- Voltage
  24 V AC/DC
  110 V AC/DC
  230 V AC/DC

Nominal power
3.4 watt at 24 V DC

General technical data		
Type of mounting		Via knurled nut
Type of actuation		Electrical
Mounting position		Any
Product weight	[g]	580

Materials	
Housing	PA, steel
Note on materials	Contains paint-wetting impairment substances
	RoHS compliant

Electrical data		
Electrical connection		Terminal box, cable entry thread metric, M20x1.5
Permissible voltage fluctuations	[%]	–15 ... 10
Duty cycle	[%]	100
Degree of protection to EN 60529		IP65 with plug socket
Insulation class		H

Characteristic coil data					
Nominal operating voltage		24 V AC/DC	24 V AC/DC With fuse	110 V AC/DC	230 V AC/DC
Frequency	[Hz]	50/60	50/60	50/60	50/60
Power	[W]	3.5	3.5	3.5	3.5
	[VA]	3.5	3.5	3.5	3.5

ATEX		
ATEX category for gas		II 2G
Type of ignition protection for gas		Ex e mb II T6, T5
ATEX category for dust		II 2D
Type of ignition protection for dust		Ex tD A21 IP65 T80°C, T95°C
Explosion ambient temperature	[°C]	T5, T95°C: -20°C <= Ta <= +60°C
		T6, T80°C: -20°C <= Ta <= +50°C
Explosion protection certification outside the EU		EPL Db (BR), EPL Db (CN), EPL Gb (BR), EPL Gb (CN)
Certificate issuing authority		NEPSI GYJ111106X
		PTB 08 ATEX 2033 X
		TÜV 12.1946 X

Operating and environmental conditions	
Corrosion resistance class CRC[1)]	4
CE marking (see declaration of conformity)[2)]	To EU Explosion Protection Directive (ATEX)

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

2) Additional information www.festo.com/sp ➔ Certificates.

Technical data

Dimensions

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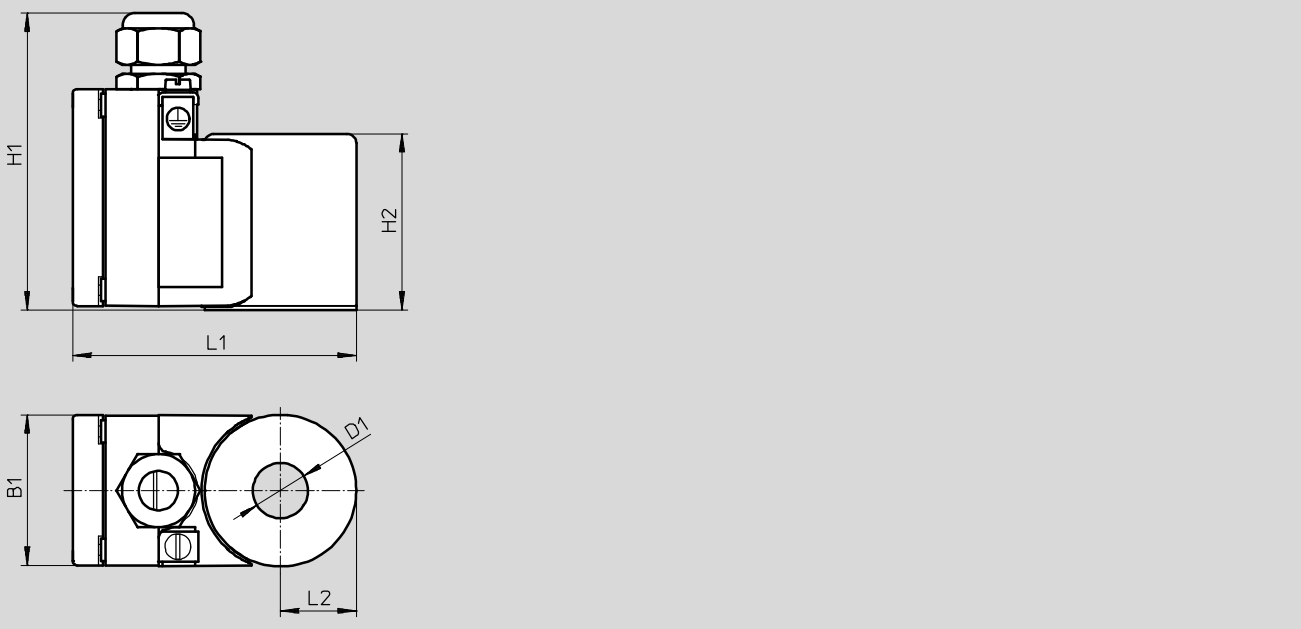
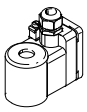


Type	B1	D1 ∅	H1	H2	L1	L2
VACC-S18-35-K4-...-EX4ME	50	18.2	100	58	95	25

Ordering data

	Description		Part No.	Type
	Terminal box, cable entry thread metric, M20x1.5	24 V AC/DC	**562897**	**VACC-S18-35-K4-1U-EX4ME**
		24 V AC/DC With fuse	**570785**	**VACC-S18-35-K4-1UF-EX4ME**
		110 V AC/DC	**562898**	**VACC-S18-35-K4-2U-EX4ME**
		230 V AC/DC	**562899**	**VACC-S18-35-K4-3U-EX4ME**

Solenoid coils VACC-S18-120-...-EX4ME

Technical data

- Voltage
  24 V AC/DC
  48 V DC
  60 V DC
  110 V AC/DC
  230 V AC/DC

Nominal power
12.0 watt at 24 V DC

General technical data		
Type of mounting		Via knurled nut
Type of actuation		Electrical
Mounting position		Any
Product weight	[g]	580

Materials	
Housing	PA, steel
Note on materials	Contains paint-wetting impairment substances
	RoHS compliant

Electrical data		
Electrical connection		Terminal box, cable entry thread metric, M20x1.5
Permissible voltage fluctuations	[%]	–15 ... 10
Duty cycle	[%]	100
Degree of protection to EN 60529		IP65 with plug socket
Insulation class		H

Characteristic coil data							
Nominal operating voltage		24 V AC/DC	24 V AC/DC With fuse	48 V AC/DC	60 V AC/DC	110 V AC/DC	230 V AC/DC
Frequency	[Hz]	50/60	50/60	–	–	50/60	50/60
Power	[W]	12	12	12	12	12	12
	[VA]	12	12	–	–	12	12

ATEX	
ATEX category gas	II 2G
Type of ignition protection for gas	Ex e mb II T4
ATEX category for dust	II 2D
Type of ignition protection for dust	Ex tD A21 IP65 T130°C
Explosion ambient temperature [°C]	T4, T130°C: -20°C = Ta = +40°C
Explosion protection certification outside the EU	EPL Db (BR), EPL Db (CN), EPL Gb (BR), EPL Gb (CN)
Certificate issuing authority	NEPSI GYJ111106X
	PTB 08 ATEX 2033 X
	TÜV 12.1946 X

Operating and environmental conditions	
Corrosion resistance class CRC[1)]	4
CE marking (see declaration of conformity)[2)]	To EU Explosion Protection Directive (ATEX)

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (→ also FN 940082) using appropriate media.

2) Additional information www.festo.com/sp → Certificates.

Technical data

Dimensions

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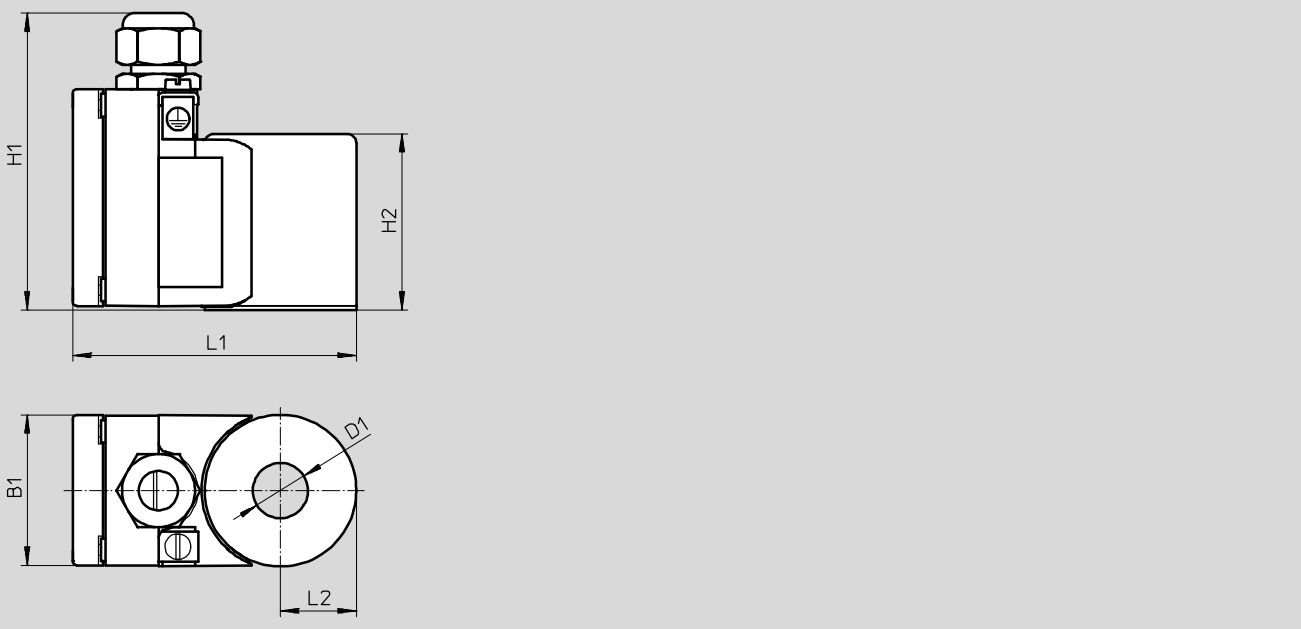
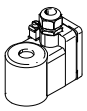


Type	B1	D1 ∅	H1	H2	L1	L2
VACC-S18-120-K4-...-EX4ME	50	18.2	100	58	95	25

Ordering data

	Description		Part No.	Type
	Terminal box, cable entry thread metric, M20x1.5	24 V AC/DC	**3536527**	**VACC-S18-120-K4-1U-EX4ME**
		24 V AC/DC With fuse	**3535840**	**VACC-S18-120-K4-1UF-EX4ME**
		48 V DC	**3536573**	**VACC-S18-120-K4-7-EX4ME**
		60 V DC	**3536569**	**VACC-S18-120-K4-27-EX4ME**
		110 V AC/DC	**3536565**	**VACC-S18-120-K4-2U-EX4ME**
		230 V AC/DC	**3536568**	**VACC-S18-120-K4-3U-EX4ME**

Solenoid coils VACC-S18-70-...-U2D

Technical data

- Voltage
  24 V DC
  48 V DC
  125 V DC
  220 V DC

Nominal power
7.0 watt at 24 V DC

General technical data		
Type of mounting		Via knurled nut
Type of actuation		Electrical
Mounting position		Any
Product weight	[g]	1700

Materials	
Housing	Grey cast iron, wrought aluminium alloy
Note on materials	Contains paint-wetting impairment substances
	RoHS compliant

Electrical data		
Electrical connection		Terminal box, cable entry thread 1/2 NPT
Permissible voltage fluctuations	[%]	–15 ... 10
Duty cycle	[%]	100
Degree of protection to EN 60529		IP65 with plug socket
Insulation class		H

Characteristic coil data					
Nominal operating voltage		24 V DC	48 V DC	125 V DC	220 V DC
Power	[W]	7.0	7.0	7.0	7.0

Operating and environmental conditions				
Nominal operating voltage	24 V DC	48 V DC	125 V DC	220 V DC
Corrosion resistance class CRC[1)]	4		4	
CE marking (see declaration of conformity)[2)]	–		To EU Low Voltage Directive	

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (→ also FN 940082) using appropriate media.

2) Additional information www.festo.com/sp → Certificates.

Technical data

Dimensions

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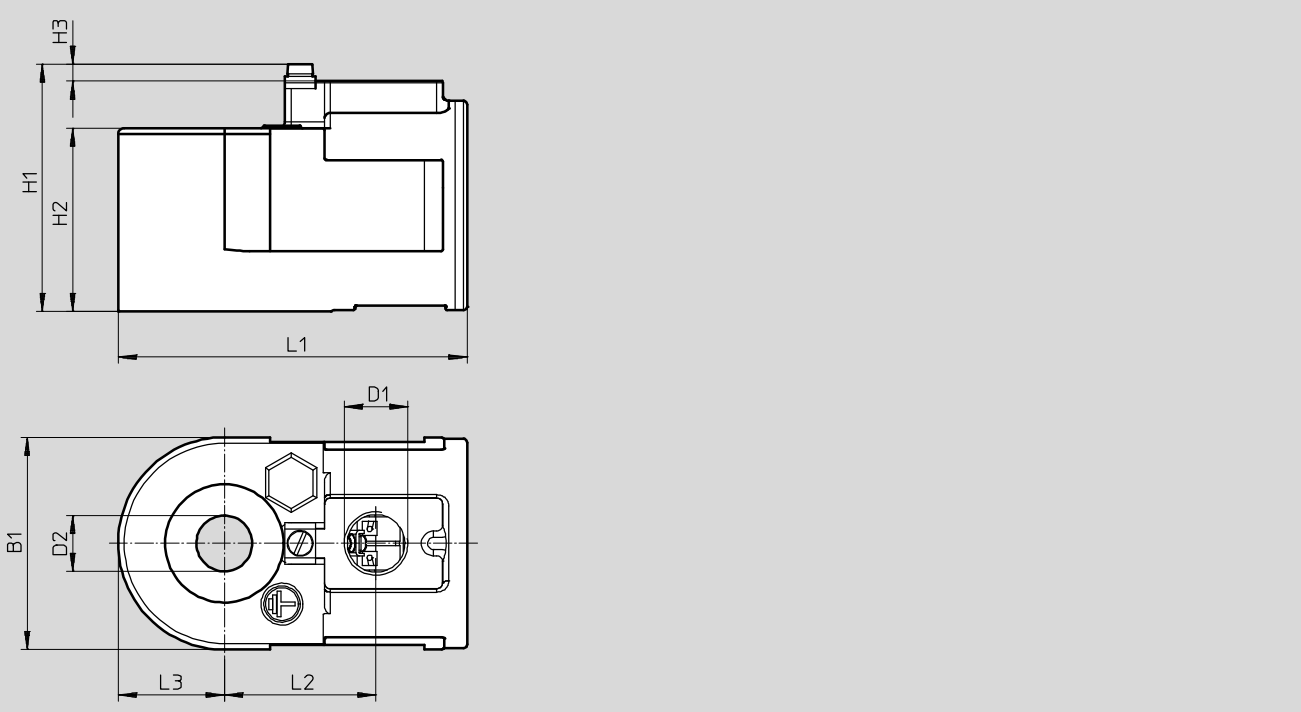
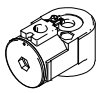


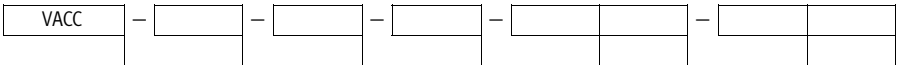
Type	B1	D1	D2 ∅	H1	H2	H3	L1	L2	L3
VACC-S18-70-K5-...-U2D	70	1/2 NPT	18.2	82	60.5	6	115	50	35

Ordering data

	Description		Part No.	Type
	Terminal box, cable entry thread 1/2 NPT	24 V DC	**3546816**	**VACC-S18-70-K5-1-U2D**
		48 V DC	**3546876**	**VACC-S18-70-K5-7-U2D**
		125 V DC	**3546913**	**VACC-S18-70-K5-16-U2D**
		220 V DC	**3546949**	**VACC-S18-70-K5-3-U2D**

Solenoid coils VACC-S13

Type codes



Type	
VACC	Solenoid coil, C series

Solenoid coil type	
S13	Solenoid coil, for 13 mm armature tube

Power consumption	
11	1.1 W
18	1.8 W

Electrical connection	
A1	Connection pattern type A, to EN 175301
K4	Cable fitting, metric

Operating voltage	
1U	24 V DC and AC
2U	110 V DC and AC
3U	230 V DC and AC
27U	60 V DC and AC
1	24 V DC

Circuitry	
–	None
F	With fuse

ATEX certification EU	
–	None
EX4	ATEX category II 2GD

Type of ignition protection	
–	None
A	Intrinsically safe
ME	Moulded encapsulation, enhanced safety

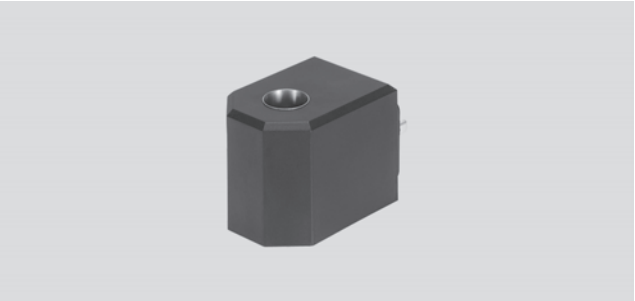
Solenoid coils VACC-S13-18-A1

Technical data

- Voltage
  24 V DC
  24 V AC/DC
  110 V AC/DC
  230 V AC/DC

Nominal power
2 watt at 24 V DC

- Temperature range
  –20 ... +60 °C



General technical data		
Type of mounting		Via knurled nut
Type of actuation		Electrical
Mounting position		Any
Product weight	[g]	210

Materials		
Housing		PA, UP
Note on materials		Contains paint-wetting impairment substances
		RoHS compliant

Electrical data		
Electrical connection		Plug pins, 3-pin, with connection pattern to EN 175301-803, type A
Permissible voltage fluctuations	[%]	–15 ... 10
Duty cycle	[%]	100
Degree of protection to EN 60529		IP65 with plug socket
Insulation class		H

Characteristic coil data								
Nominal operating voltage		24 V DC	24 V AC/DC		110 V AC/DC		230 V AC/DC	
Frequency	[Hz]	–	40/65	–	40/65	–	40/65	–
Power	[W]	1.8	–	1.8	–	1.8	–	1.8
	[VA]	–	1.8	–	1.8	–	1.8	–

Operating and environmental conditions					
Nominal operating voltage		24 V DC	24 V AC/DC	110 V AC/DC	230 V AC/DC
Ambient temperature	[°C]	–20 ... 60		–20 ... 60	
Corrosion resistance class CRC[1)]		4		4	
CE marking (see declaration of conformity)[2)]		–		To EU Low Voltage Directive (only for alternating voltage AC)	

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.
2) Additional information www.festo.com/sp ➔ Certificates.

Solenoid coils VACC-S13-18-A1

Technical data

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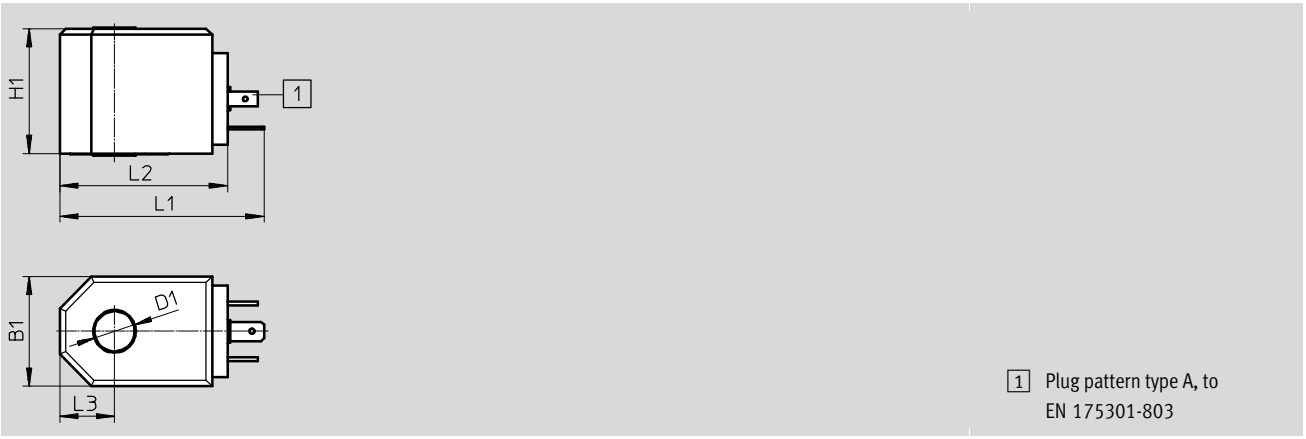

1 Plug pattern type A, to EN 175301-803

Type	B1	D1	H1	L1	L2	L3
VACC-S13-18-A1-...	36	13.1	41	67	55	18

Ordering data

	Description		Part No.	Type
	Plug connector type A, to EN 175301-803	24 V DC	**562889**	**VACC-S13-18-A1-1**
		24 V AC/DC	**562890**	**VACC-S13-18-A1-1U**
		110 V AC/DC	**562891**	**VACC-S13-18-A1-2U**
		230 V AC/DC	**562892**	**VACC-S13-18-A1-3U**

Technical data

- ⎓ - Voltage
24 V DC

Nominal power
1.1 watt at 24 V DC

General technical data		
Type of mounting		Via knurled nut
Type of actuation		Electrical
Mounting position		Any
Product weight	[g]	330

Materials	
Housing	PA, UP
Note on materials	Contains paint-wetting impairment substances
	RoHS compliant

Electrical data		
Electrical connection		Terminal box, cable entry thread metric, M20x1.5
Permissible voltage fluctuations	[%]	–15 ... 10
Duty cycle	[%]	100
Maximum input power, Pi	[W]	1.2
Maximum input voltage, Ui	[V]	32
Maximum input current, Ii	[A]	0.2
Required current consumption, Imin	[mA]	16
Degree of protection to EN 60529		IP64
Insulation class		H

Characteristic coil data		
Nominal operating voltage	[V DC]	14 ... 32
Power	[W]	0.22 ... 1.1
Effective internal capacitance, Ci		Negligibly low
Effective internal inductance, Li		Negligibly low

Operating and environmental conditions	
Corrosion resistance class CRC[1)]	4
CE mark (see declaration of conformity)[3)]	To EU EMC Directive[2)]
	To EU Explosion Protection Directive (ATEX)

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.
2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.
3) Additional information www.festo.com/sp ➔ Certificates.

Solenoid coils VACC-S13-11-...-EX4A

Technical data

ATEX	
ATEX category for gas	II 2G
Type of ignition protection for gas	Ex ia IIC T6, T5 Gb
ATEX category for dust	II 2D
Type of ignition protection for dust	Ex ia IIIC T80°C,T95°C Db
Explosion ambient temperature	T5, T95°C: –30°C <= Ta <= +65°C
	T6, T80°C: –30°C <= Ta <= +50°C
Explosion protection certification outside the EU	EPL Gb (BR), EPL Gb (CN), EPL Db (BR)
Certificate issuing authority	BVS15 ATEXE030X
	DNV 17.0043X
	NEPSI GYJ111105
	TÜV 12.1949 X

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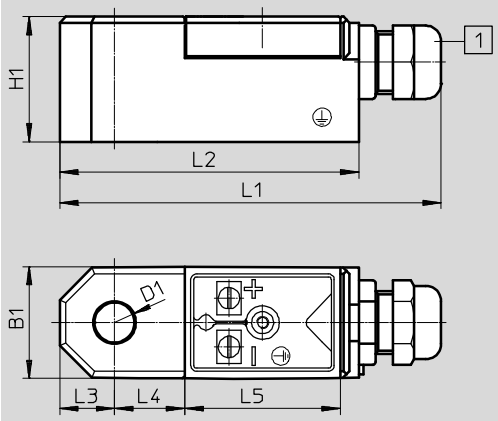
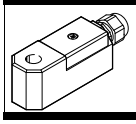


1 Terminal box, cable entry thread M20x1.5

Type	B1	D1	H1	L1	L2	L3	L4	L5
VACC-S13-11-K4-1-EX4A	37	13.1	41	131	98	18	23	51

Ordering data

	Description	Part No.	Type
	Terminal box, cable entry thread metric, M20x1.5	**562896**	**VACC-S13-11-K4-1-EX4A**

Technical data

- ϟ - Voltage
24 V AC/DC
60 V AC/DC
110 V AC/DC
230 V AC/DC

Nominal power
2 watt at 24 V DC

General technical data		
Type of mounting		Via knurled nut
Type of actuation		Electrical
Mounting position		Any
Product weight	[g]	330

Materials		
Housing		PA, UP
Note on materials		Contains paint-wetting impairment substances
		RoHS compliant

Electrical		
Electrical connection		Terminal box, cable entry thread metric, M20x1.5
Permissible voltage fluctuations	[%]	–15 ... 10
Duty cycle	[%]	100
Insulation class		H
Degree of protection to EN 60529		IP64 (IP65 with internal fuse protection)

Characteristic coil data											
Nominal operating voltage		24 V AC/DC		24 V AC/DC With fuse		60 V AC/DC		110 V AC/DC		230 V AC/DC	
Frequency	[Hz]	40/65	–	40/65	–	40/65	–	40/65	–	40/65	–
Power	[W]	–	1.8	–	1.8	–	1.8	–	1.8	–	1.8
	[VA]	1.8	–	1.8	–	1.8	–	1.8	–	1.8	–

Operating and environmental conditions	
Corrosion resistance class CRC[1)]	4
CE marking (see declaration of conformity)[2)]	To EU Explosion Protection Directive (ATEX)

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.
2) Additional information www.festo.com/sp ➔ Certificates.

Solenoid coils VACC-S13-18-...-EX4ME

Technical data

ATEX		
	Solenoid coil without internal fuse	Solenoid coil with internal fuse
ATEX category for gas	II 2G	II 2G
Type of ignition protection for gas	Ex e mb IIC T6, T5, T4 Gb	Ex e mb IIC T6 Gb
ATEX category for dust	II 2D	II 2D
Type of ignition protection for dust	ExtbIIICT85°C,T95°C,T130°C Db	Ex tb IIIC T70°C Db
Explosion ambient temperature [°C]	T4, T130°C: -20°C <= Ta <= +60°C	–
	T5, T95°C: -20°C <= Ta <= +60°C	–
	T6, T80°C: -20°C <= Ta <= +50°C	T6, T70°C: -20°C <= Ta <= +40°C
Explosion protection certification outside the EU	EPL Db (BR)	–
	EPL Db (CN)	–
	EPL Db (IEC-EX)	EPL Db (IEC-EX)
	EPL Gb (BR)	–
	EPL Gb (CN)	–
	EPL Gb (IEC-EX)	EPL Gb (IEC-EX)
Certificate issuing authority	BVS15 ATEXE029X	BVS15 ATEXE029X
	IECEx BVS15.0075 X	–
	NEPSI GYJ111104X	–
	TÜV 12.1947 X	–

Dimensions

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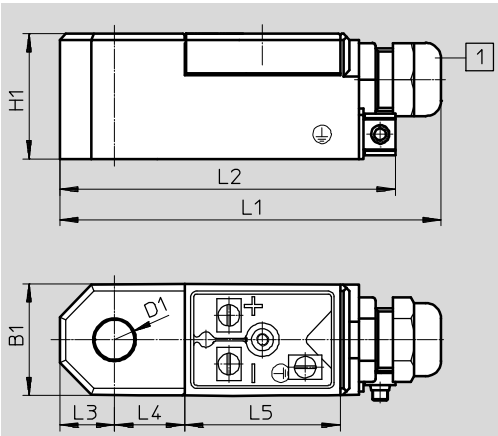
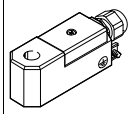


1 Terminal box, cable entry thread M20x1.5

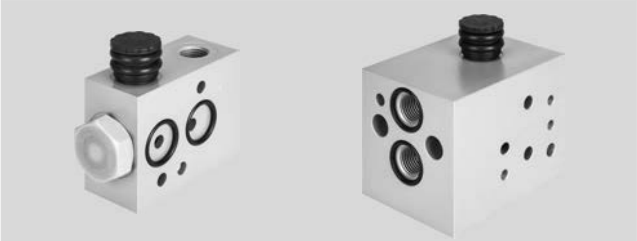
Type	B1	D1	H1	L1	L2	L3	L4	L5
VACC-S13-18-K4-...-EX4ME	37	13.1	41	125	98	18	23	51
VACC-S13-18-K4-27U-EX4ME					111			

Ordering data

	Description		Part No.	Type
	Terminal box, cable entry thread metric, M20x1.5	24 V AC/DC	**562893**	**VACC-S13-18-K4-1U-EX4ME**
		24 V AC/DC With fuse	**570784**	**VACC-S13-18-K4-1UF-EX4ME**
		60 V AC/DC	**8040578**	**VACC-S13-18-K4-27U-EX4ME**
		110 V AC/DC	**562894**	**VACC-S13-18-K4-2U-EX4ME**
		230 V AC/DC	**562895**	**VACC-S13-18-K4-3U-EX4ME**

Accessories – Sub-base VABS-S7-RB/BE-...

Port pattern: NAMUR



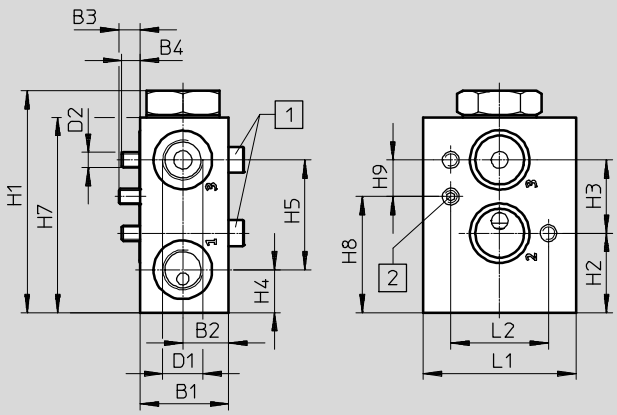
General technical data				
Type			Pressurisation and exhaust block VABS-S7-BE-...	Redundancy block VABS-S7-RB-...
Type of mounting			With through-hole	
Mounting position			Any	
Flow rate for piston valve pressurisation		[m³/h]	2.2	–
Flow rate for piston valve exhausting		[m³/h]	8.6	–
Product weight		[g]	250	–
Pneumatic connection	1		G1/4, 1/4 NPT	G1/4, 1/4 NPT
	2		Flange 1/4, port pattern to NAMUR	Flange 1/4, port pattern to NAMUR
	3		G1/4, 1/4 NPT	G1/4, 1/4 NPT
	12		–	G1/4, 1/4 NPT

Operating and environmental conditions		VABS-S7-BE	VABS-S7-RB
Operating medium		Compressed air to ISO 8573-1:2010 [–:–:–]	
Operating pressure	[bar]	2 ... 8	0 ... 10
Pilot air supply port		Internal	External/internal
Degree of protection		IP65	
Corrosion resistance class CRC[1)]		4	

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Materials	
Sub-base	Aluminium (Ematal coated)
Seals	NBR
Note on materials	Contains paint-wetting impairment substances, RoHS-compliant

Dimensions Download CAD data ➔ **www.festo.com**



1 Socket head screw M5x35

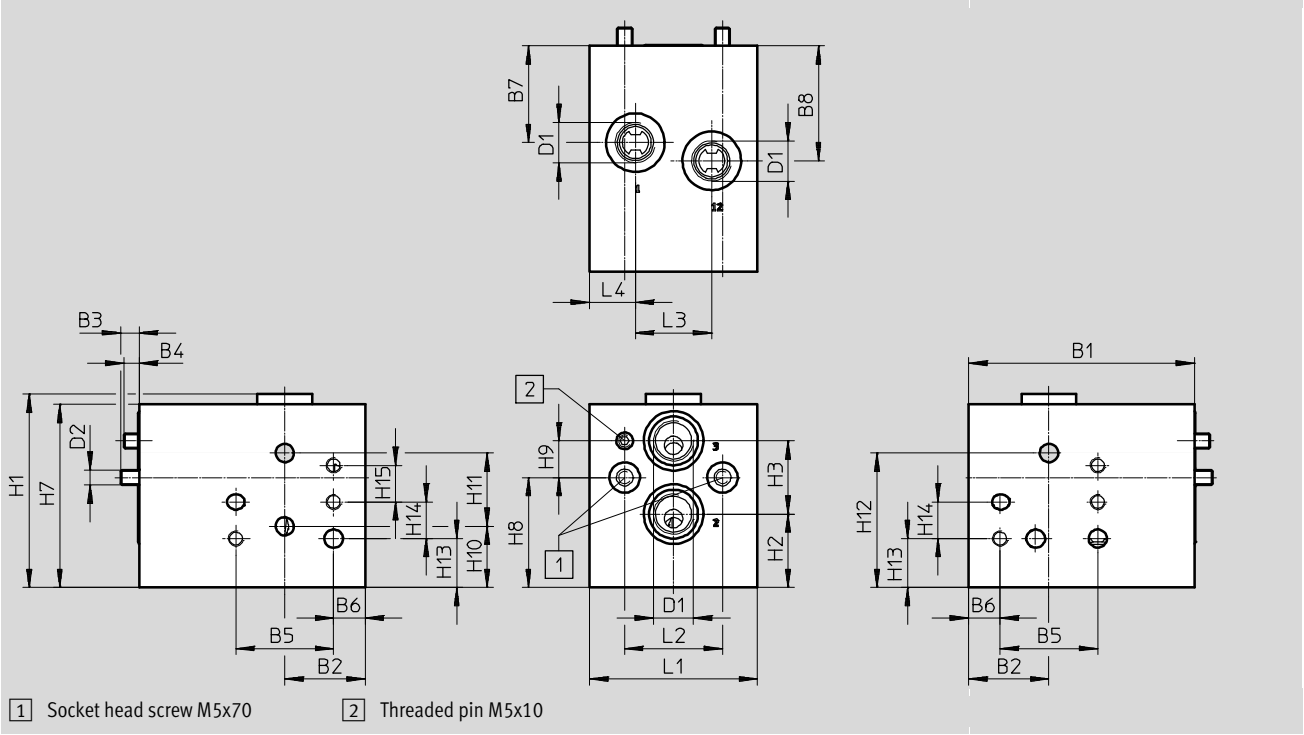
2 Threaded pin M5x10

Type	B1	B2	B3	B4	D1	D2	H1	H2	H3	H4	H5	H7	H8	H9	L1	L2
VABS-S7-BE-B-G14-V14-A	29	15	7	6	G1/4	M5	72.7	26	24	14	36	64	38	12	50	32
VABS-S7-BE-B-N14-V14-A					1/4 NPT											

Sub-bases

Accessories – Sub-base VABS-S7-RB/BE-...

Dimensions Download CAD data ➔ **www.festo.com**

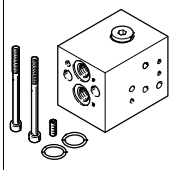
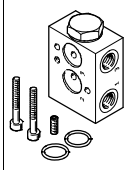


1 Socket head screw M5x70 2 Threaded pin M5x10

Type	B1	B2	B3	B4	B5	B6	B7	B8	D1	D2	L1	L2	L3	L4
VABS-S7-RB-B-G14-V14-A	74	26.3	6	5	32	10.3	31.7	37.7	G1/4	M5	55	32	25	15
VABS-S7-RB-B-N14-V14-A									1/4 NPT					

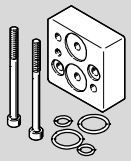
Type	H1	H2	H3	H7	H8	H9	H10	H11	H12	H13	H14	H15
VABS-S7-RB-B-G14-V14-A	63.4	24	24	60	36	12	20	24	44	16	12	12
VABS-S7-RB-B-N14-V14-A												

Ordering data

	Description	Part No.	Type
	Sub-base for mounting two solenoid valves with G-thread port for redundant circuitry, with 1/4 flange, port pattern to NAMUR. Using the additional auxiliary power terminal, the intermediate plate can also be used with pilot-controlled solenoid valves on actuators that have a positioner for fail-safe functions.	**3580505**	**VABS-S7-RB-B-G14-V14-A**
	Sub-base for mounting two solenoid valves with NPT-thread port for redundant circuitry, with 1/4 flange, port pattern to NAMUR. Using the additional auxiliary power terminal, the intermediate plate can also be used with pilot-controlled solenoid valves on actuators that have a positioner for fail-safe functions.	**4727331**	**VABS-S7-RB-B-N14-V14-A**
	Sub-base as a pressurisation and exhaust block with G-thread port, with 1/4 flange, port pattern to NAMUR.	**2999476**	**VABS-S7-BE-B-G14-V14-A**
	Sub-base as a pressurisation and exhaust block with NPT-thread port, with 1/4 flange, port pattern to NAMUR.	**4727328**	**VABS-S7-BE-B-N14-V14-A**

Accessories – Mounting plate VAME-S7-P-N-...

Port pattern: NAMUR



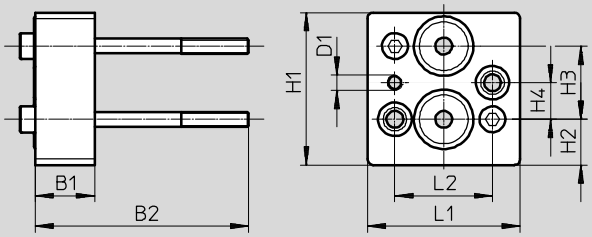
General technical data		
Type of mounting		With through-hole
Mounting position		Any
Pneumatic connection	1	M5, port pattern to NAMUR
	2	Flange 1/4, port pattern to NAMUR
	3	G1/4

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [–:–:–]
Operating pressure range	[bar]	0 ... 10
Operating pressure range	[psi]	0 ... 145
Degree of protection		IP65 (in the installed state)
Corrosion resistance class CRC[1)]		4

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

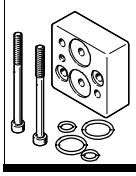
Materials	
Mounting plate	Aluminium (Ematal coated)
Seals	NBR
Note on materials	Contains paint-wetting impairment substances, RoHS-compliant

Dimensions Download CAD data ➔ **www.festo.com**



Type	B1	B2	D1	H1	H2	H3	H4	L1	L2
VAME-S7-P-N-V14-A	19.5	70	M5	50	15	24	12	50	32

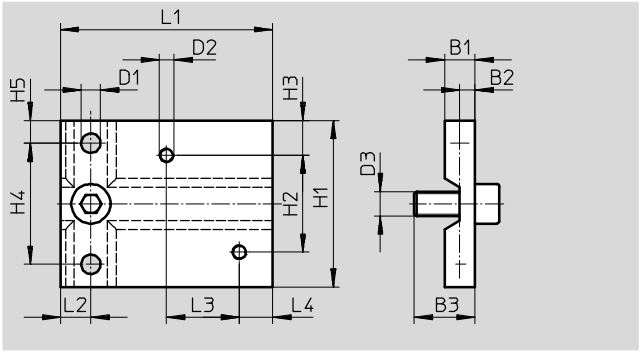
Ordering data

	Description	Part No.	Type
	Mounting/spacer plate for solenoid valves when combined with ATEX solenoid coils, with 1/4 flange, port pattern to NAMUR	**3581412**	**VAME-S7-P-N-V14-A**

Solenoid valves

Accessories

Mounting plate VAME-S7-P
Mounting plate material: Aluminium (Ematal-coated)
Seals material: NBR
Contains paint-wetting impairment substances, RoHS-compliant
Mounting: Via through-holes



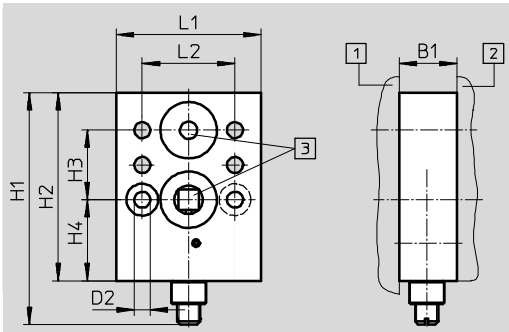
Dimensions [mm] and ordering data

B1	B2	B3	D1	D2	D3	H1	H2	H3	H4	H5	L1	L2	L3	L4	CRC[1]	Part No.	Type
10	5	20	6.4	M5	M8	55	32	11.5	40	7.5	70	10	24	11	4	**563399**	**VAME-S7-P**

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Flow control plate for single-acting actuators
Flow control plate material: Aluminium (Ematal-coated)
Seals material: NBR
Contains paint-wetting impairment substances, RoHS-compliant
Operating medium: Compressed air to ISO 8573-1:2010 [7:–:–]
Operating pressure: 0 ... 12 bar
Pilot air supply: internal/external
Mounting position: Any
Mounting: Via through-holes
Degree of protection: IP65

Function:
Flow control for supply air and/or exhaust air for a drive with NAMUR interface for valves VOFC/VOFD



1 Actuator
2 Valve
3 Working ports for G1/4 and 1/4 NPT valves

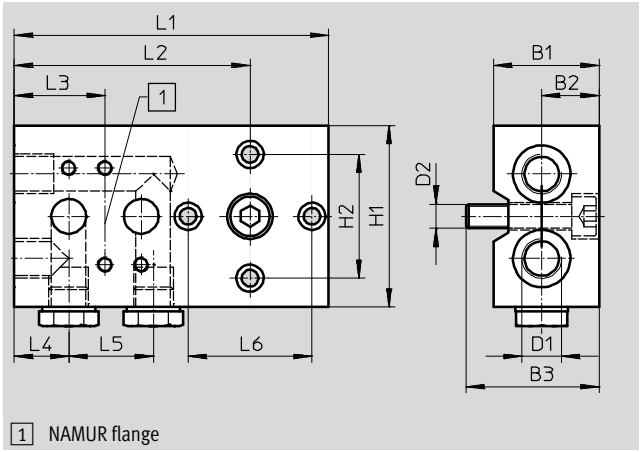
Dimensions [mm] and ordering data

B1	D2	H1	H2	H3	H4	L1	L2	CRC[1]	Part No.	Type
20	5.5	80	65	24	28	50	32	4	**563401**	**VABF-S7-F1B5P1-F**

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Accessories

Mounting plate
Mounting plate material: Aluminium (Ematal-coated)
Seals material: NBR
Contains paint-wetting impairment substances, RoHS-compliant
Operating medium: Compressed air to ISO 8573-1:2010 [7:–:–]
Operating pressure 0 ... 10 bar
Mounting position: Any
Mounting: Via through-holes
Degree of protection: IP65



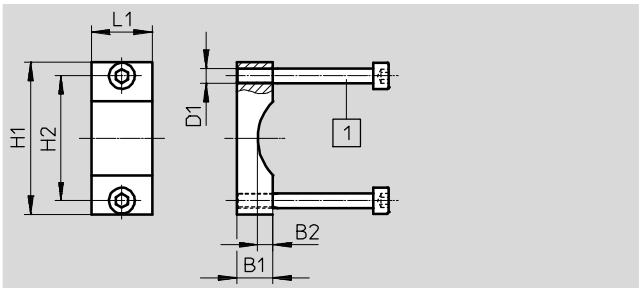
1 NAMUR flange

Dimensions [mm] and ordering data

B1	B2	B3	D1	D2	H1	H2	L1	L2	L3	L4	L5	L6	CRC[1)]	Part No.	Type
35	19	44	G¼	M8	60	41	104	78	30	18	28	41	4	**563396**	**VABS-S7-S-G14**

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Mounting bracket
Mounting bracket material:
Aluminium (Ematal-coated)
Contains paint-wetting impairment substances, RoHS-compliant



1 Socket head screw, 2x M5x45 and 2x M5x65

Dimensions [mm] and ordering data

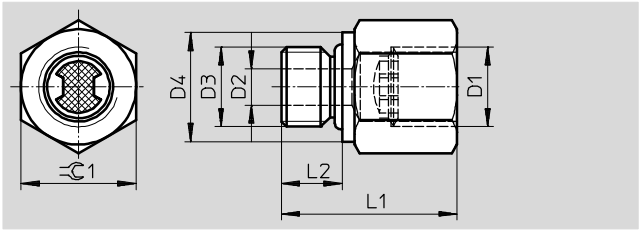
B1	B2	D1	H1	H2	L1	CRC[1)]	Part No.	Type
12	5	M5	50	41	20	4	**563403**	**VAME-S7-Y**

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Solenoid valves

Accessories

Adapter with filter
Adapter material: High-alloy stainless steel
Seals material: NBR
Note on materials:
Contains paint-wetting impairment substances, RoHS-compliant
Operating pressure: 2 ... 8 bar

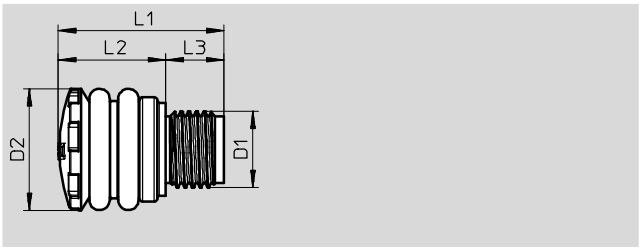


Dimensions [mm] and ordering data

D1	D2	D3	D4	L1	L2	⌀C1	CRC[1)]	Part No.	Type
1/4 NPT	6	G1/4	18	29	10	19	1	**563397**	**NPFV-AF-G14-N14-MF**
G1/4	6	G1/4	18	29	10	19	1	**563398**	**NPFV-AF-G14-G14-MF**
1/4 NPT	6	1/4 NPT	18	29	10	19	1	**4727333**	**NPFV-AF-N14-N14-MF**

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

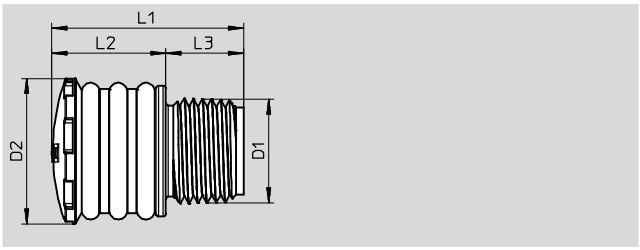
Exhaust protection G1/4
Housing material: PA
Seals material: EPDM
Contains paint-wetting impairment substances, RoHS-compliant
Operating medium: Compressed air to ISO 8573-1:2010 [7:–:–]
Operating pressure 0 ... 10 bar
Ambient temperature: –50 ... +60 °C
Type of mounting: Screw-in, with male thread



Dimensions [mm] and ordering data

D1	D2	L1	L2	L3	Part No.	Type
G1/4, 1/4 NPT	21	28.5	18.5	10	**563400**	**VABD-D3-SN-G14**

Exhaust protection 1/2 NPT
Housing material: PA
Seals material: EPDM
Contains paint-wetting impairment substances, RoHS-compliant
Operating medium: Compressed air to ISO 8573-1:2010 [7:–:–]
Operating pressure: 0 ... 12 bar
Ambient temperature: –50 ... +60 °C
Type of mounting: Screw-in, with male thread



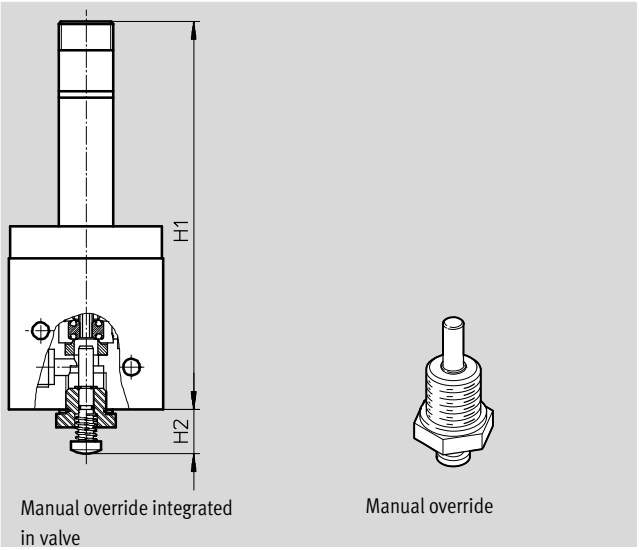
Dimensions [mm] and ordering data

D1	D2	L1	L2	L3	Part No.	Type
G1/2, 1/2 NPT	29	38	23	15	**3535104**	**VABD-D3-SN-N12**

Accessories

Manual override
Housing material: Anodised aluminium
Contains paint-wetting impairment substances, RoHS-compliant
Actuation: Manual
Mounting position: Any

Function:
Can be retrofitted with manual override (VOFD-50T only) in version with spring return, acting directly on the valve seat.
The manual override can also be used only temporarily, e.g. during commissioning or inspections.



Manual override integrated in valve

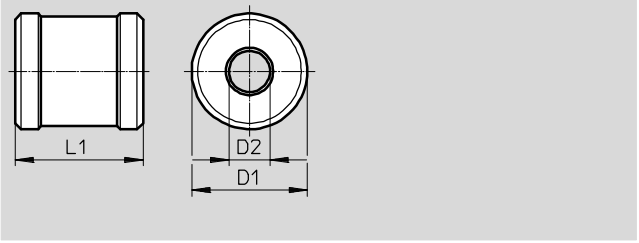
Manual override

Dimensions [mm] and ordering data

H1	H2	CRC[1)]	Part No.	Type
128	14	3	**563402**	**VAOH-S8**

1) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Manual override
Material: Anodised aluminium
Contains paint-wetting impairment substances, RoHS-compliant
Function:
For manual override of basic valves in place of a solenoid coil.

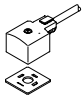


Dimensions [mm] and ordering data

D1	D2	L1	Weight [g]	CRC[1)]	Part No.	Type
38	13.5	42	120	2	**3580654**	**VAOH-MB-S7-S13**

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Ordering data

	Description		Part No.	Type
Connecting cable				Technical data ➔ Internet: kmc
	Operating voltage 24 V DC, switching status indication with LED	Cable length 2.5 m	**30931**	**KMC-1-24 DC-2,5-LED**
		Cable length 5 m	**30933**	**KMC-1-24 DC-5-LED**
		Cable length 10 m	**193459**	**KMC-1-24-10-LED**
	Operating voltage up to 240 V AC	Cable length 2.5 m	**30932**	**KMC-1-230 AC-2,5**
		Cable length 5 m	**30934**	**KMC-1-230 AC-5**
Plug socket				Technical data ➔ Internet: mssd
	Cable connection using clamping screws		**34583**	**MSSD-C**

Accessories for valves

Solenoid coils

Overview, configuration and ordering
➔ **www.festo.com/catalogue/vacf**

Additional information, support and user documentation
➔ **www.festo.com/sp/vacf**

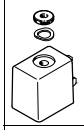
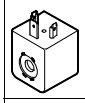
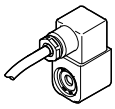
Selected types in accordance with the ATEX Directive for explosive atmospheres
➔ **www.festo.com/ex**

Product range overview and selection aid

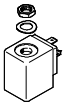
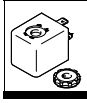
+ Solenoid coils for valve series
  – VOFD
  – VOFC
  – VSNC
  – VZWM-L
  – VZWE

Solenoid coils

Product range overview

Version	Type	For valve series			➔ Page/ Internet
		VSNC ➔ page 23	VOFC ➔ page 85	VOFD ➔ page 151	
F solenoid coil					
	VACF	■	–	–	67 66
N solenoid coil					
	VACN-N	■	–	–	71
N solenoid coil for explosive atmospheres (➔ certification)					
	VACN...-EX2-N VACN...-U4-M VACN...-EX4-M VACN...-EX4-A	■	–	–	74 76 78 80
C solenoid coil					
	VACC-S13	–	■	■	137, 197
	VACC-S18	–	–	■	179

Product range overview

Version	Type	For valve series		➔ Page/ Internet
		VZWM-L ➔ page 717	VZWE ➔ page 747	
H solenoid coil				
	MH-2	■	–	725
H1 solenoid coil				
	VACN-H1	–	■	758
X solenoid coil				
	VACN-X	–	■	758
D solenoid coil				
	MD-2	■	–	728

- Note

ATEX certification is only effective in combination with other ATEX-certified components.

➔www.festo.com/en/ex

Selection aid

Solenoid valves and corresponding solenoid coils									
Valve series	**Valve type**		**Solenoid coil**						
			C	**D**	**F**	**H**	**H1**	**N**	**X**
Solenoid valves for process automation	VSNC	**➔ page 23**	–	–	■	–	–	■	–
	VOFC	**➔ page 85**	■	–	–	–	–	–	–
	VOFD	**➔ page 151**	■	–	–	–	–	–	–
Process directional control valves	VZWM-L	**➔ page 717**	–	■	–	■	–	–	–
	VZWE	**➔ page 747**	–	–	–	–	■	–	■

02 Sensor boxes

Digital and analogue limit switch boxes with optical display for quarter turn actuators in standard and potentially explosive atmospheres

SRBC

Sensor boxes

+ Sturdy and corrosion-resistant design
+ Intrinsically safe variants to ATEX for zone 1/21

➔ page 217

SRBG

Sensor boxes

+ Inductive double sensor
+ Direct mounting on quarter turn actuator
+ Compact and cost-effective

➔ page 235

SRBE

Sensor boxes

+ Worldwide certification to ATEX, IECEx, cCSAus
+ Type of ignition protection “flameproof enclosure”

➔ page 251

Contents

Sensor boxes SRBC 217
Sensor boxes SRBG 235
Sensor boxes SRBE 251
Sensor boxes SRAP, analogue 269
Limit switch attachment DAPZ 279

Sensor boxes
SRBC ★

Overview, configuration and ordering
➔ **www.festo.com/catalogue/srbc** ✓

Additional information, support and user documentation
➔ **www.festo.com/sp/srbc** ✓

Quick ordering of basic designs
➔ page 226, 231 ✓

Selected types in accordance with the ATEX Directive for explosive atmospheres
➔ **www.festo.com/ex** ✓

+ Weather-tight housing for outdoor applications
+ Extensive range of switch variants for virtually all applications
+ Intrinsically safe to ATEX
+ cCSAus Listed, General Purpose
+ SIL2 to IEC 61508
+ Two cable inputs for common power supply for the sensor box and solenoid valve
+ Pre-assembled mounting bridge
+ Cable connector and blanking plug included in the scope of delivery

Sensor boxes SRBC

Key features and product range overview

Function

Sensor boxes SRBC are used for electrical feedback and control of the position of process valves actuated using pneumatic quarter turn actuators. They can be mounted quickly and easily on quarter turn actuators with a hole pattern to VDI/VDE 3845 using mounting adapters. The sturdy design of the sensor box SRBC is ideal for the harsh conditions in process automation.

Innovative

- Pre-assembled mounting adapter for ease of installation
- The trip cams can be set easily without additional tools
- Sturdy, corrosion-resistant design, ideal for use in harsh operating conditions
- Clearly visible 3D position indicator allows rapid detection of the current position of the quarter turn actuator

Flexible

- Weather-tight housing for outdoor applications too
- Mechanical, inductive or magnetic switch variants for virtually all ranges of application
- Intrinsically safe variants for use in potentially explosive areas
- Two cable inputs for common power supply for the sensor box and solenoid valve as standard

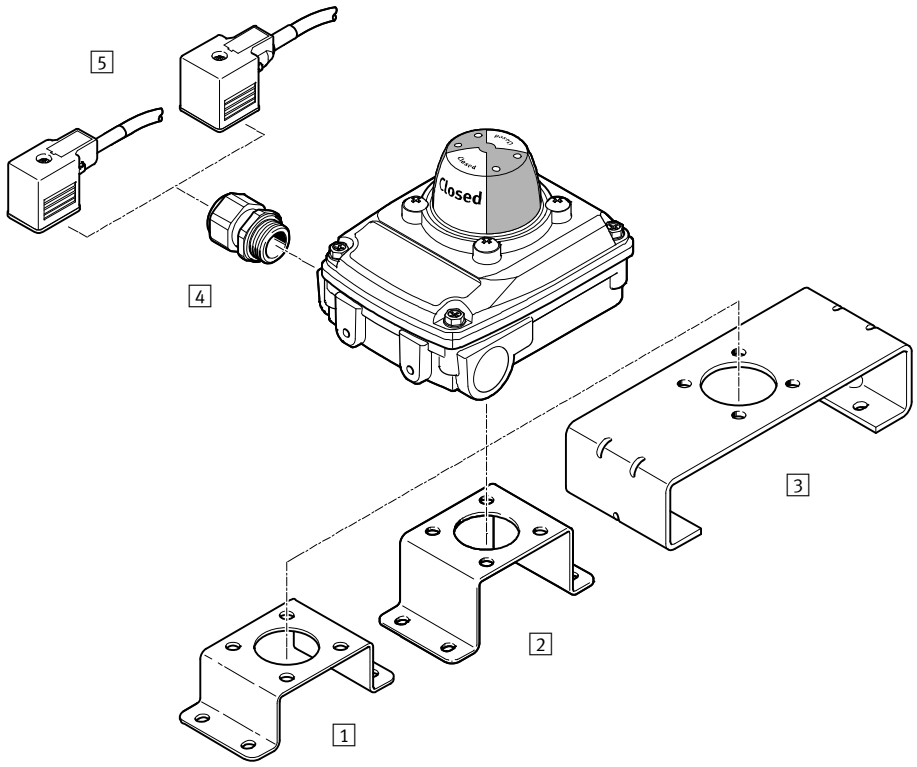
Design

- Sturdy aluminium housing with two cable inputs M20x1.5
- Captive stainless steel screws on the housing cover
- Pre-assembled stainless steel mounting adapter 80x30 H20 for ease of mounting on standard drives as per VDI/VDE 3845
- Cable connector and blanking plug included in the scope of delivery
- 3D OPEN/CLOSED position indicator
- Mechanical, inductive or magnetic switch variants
- Number of switches: 2
- IP67, NEMA 4/4x
- cCSAus Listed, General Purpose
- ATEX ia version
- SIL 2 to IEC 61508

Product range overview

Measuring principle	Type	Operating voltage range	Switching output	Switching element function
Electromechanical	SRBC-...-MW-22A-1W-	0...250 V AC 0...30 V DC	Contacting	Toggle switch, single-pole (SPDT)
Magnetic reed	SRBC-...-R-2A-1W-	0...120 V AC 0...175 V DC	Contacting	Toggle switch, single-pole (SPDT)
Inductive	SRBC-...-N-20N-ZC-	8.2 V DC	NAMUR	N/C contact
Inductive	SRBC-...-N-20N-ZC-...-EX6	8.2 V DC	NAMUR	N/C contact
Inductive	SRBC-...-N-1-P-	10...30 V DC	PNP	N/O contact
Inductive	SRBC-...-N-1-N-	10...30 V DC	NPN	N/O contact
Inductive	SRBC-...-N-1-ZU-	5...60 V DC	Contactless, 2-wire	N/O contact

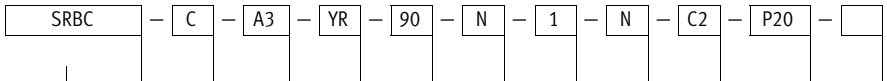
Peripherals overview



Accessories	• Brief description	➔ Page/Internet
1 Mounting adapter DARQ-K-X1-A1-F05-20-R1	• Mounting adapter for mounting sensor boxes on quarter turn actuators with hole pattern 30 x 80 mm, shaft height 20 mm • Included in the scope of delivery of the sensor box and pre-assembled	232
2 Mounting adapter DARQ-K-X1-A1-F05-30-R1	• Mounting adapter for mounting sensor boxes on quarter turn actuators with hole pattern 30 x 80 mm, shaft height 30 mm • Can be ordered separately as an accessory	232
3 Mounting adapter DARQ-K-X1-A2-F05-30-R1	• Mounting adapter for mounting sensor boxes on quarter turn actuators with hole pattern 30 x 130 mm, shaft height 30 mm • Can be ordered separately as an accessory	232
4 Cable connector NETC-P-M20	• Polymer cable connector M20x1.5 • Included in the scope of delivery of the sensor box • Further cable connectors can be ordered separately as an accessory	233
5 Connecting cable NEBV	• For valve connection for sensor box with terminal rail connection • Can be ordered separately as an accessory	233

Sensor boxes SRBC

Type codes SRBC



Type	
SRBC	Limit switch attachment

Design	
C	Sensor box

Mechanical interface	
A3	Mounting adapter, hole pattern 30 x 80 mm, shaft height 20 mm

Display type	
YR	Position indicator yellow/red

Measuring range	
90	0 ... 90°

Sensor principle	
N	Proximity sensors, inductive
R	Reed with contact
MW	Floating contact, changeover switch

Nominal operating voltage	
2A	110 V AC, 50-60 Hz
20N	8.2 V DC, NAMUR
22A	250 V AC
1	24 V DC

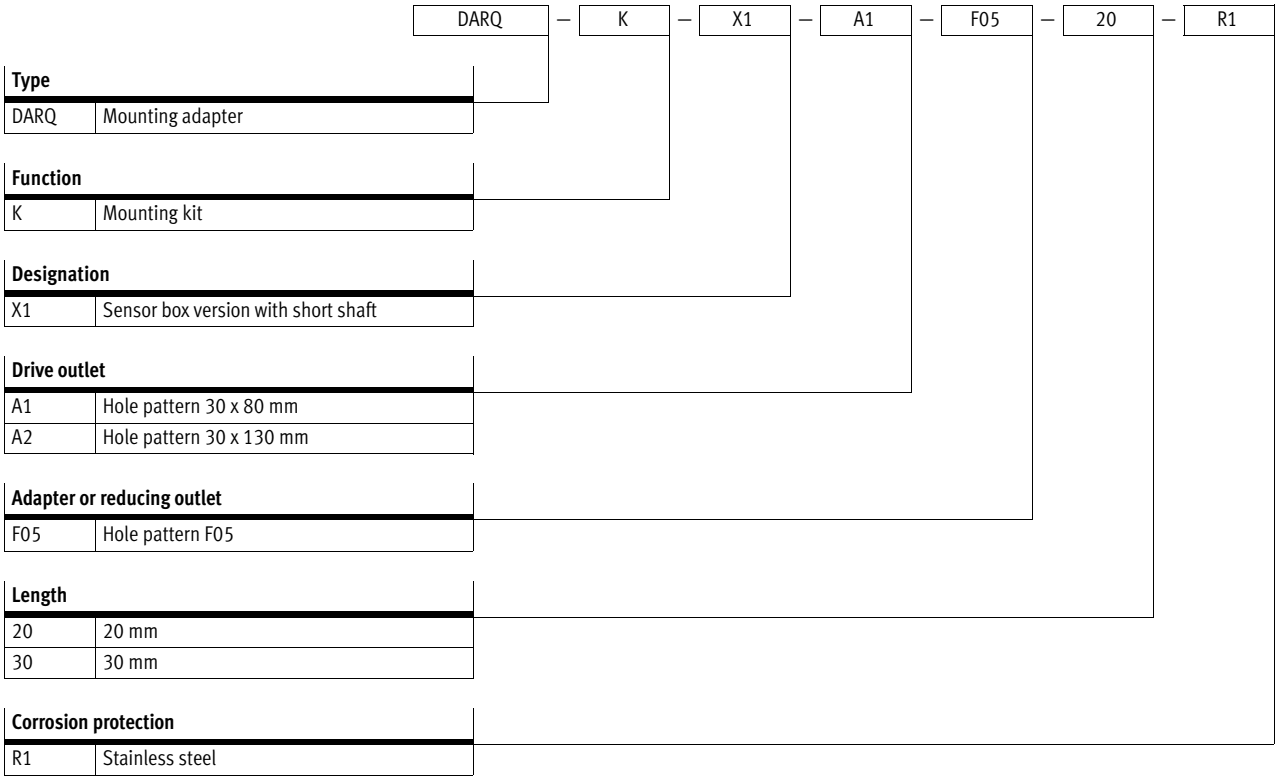
Electrical output	
N	NPN
P	PNP
1W	1-pin toggle switch
ZC	2-wire N/C contact
ZU	2-wire N/O contact

Electrical connection	
C2	Screw terminal

Cable connector	
P20	M20x1.5, polymer

EU certification	
–	None
EX6	II 1GD

Type codes DARQ



Type	
DARQ	Mounting adapter

Function	
K	Mounting kit

Designation	
X1	Sensor box version with short shaft

Drive outlet	
A1	Hole pattern 30 x 80 mm
A2	Hole pattern 30 x 130 mm

Adapter or reducing outlet	
F05	Hole pattern F05

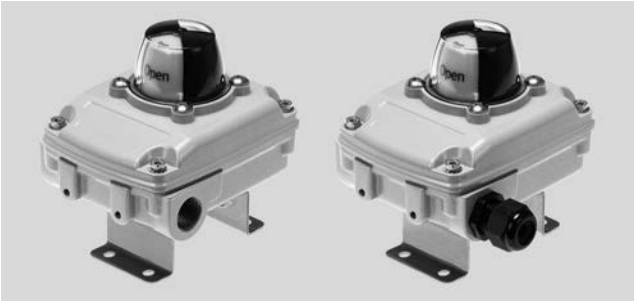
Length	
20	20 mm
30	30 mm

Corrosion protection	
R1	Stainless steel

Sensor boxes SRBC, electromechanical and magnetic reed

Technical data

- Measuring principle: electromagnetic or magnetic reed
- Switching element function: toggle switch, single-pole (SPDT)
- For DC and AC voltage
- Pre-assembled mounting adapter 80 x 30 H20
- Cable connector and blanking plug included in the scope of delivery



General technical data			
Type SRBC-...		-MW	-R
Setting range for angle detection	[°]	0 ... 90	
Based on standard		ISO 5211	
		VDI/VDE 3845	
		–	EN 60947-5-2
Type of mounting		On flange to ISO 5211	
		With mounting bracket	

Electrical characteristic data			
Type SRBC-...		-MW	-R
Measuring principle		Mechanical/electrical	Magnetic reed
Switching output		Contacting	
Switching element function		Toggle switch, single-pole	
Operating voltage range Alternating current AC	[V]	0 ... 250	0 ... 120
Max. output current AC	[mA]	3000 (at 250 V)	250 (at 120 V)
Operating voltage range Direct current DC	[V]	0 ... 30	0 ... 175
Max. output current DC	[mA]	3000 (at 30 V)	250 (at 175 V)

Electromechanical components			
Type SRBC-...		-MW	-R
Cable connector		M20x1.5	
Permissible cable diameter	[mm]	5 ... 13	
Electrical connection		10-pin	
		Screw terminal	
Nominal conductor cross section that can be connected	[mm^2]	0.25 ... 2.5	
Materials			
Cable connection		PA	
Blanking plug		PA	

Technical data

Operating and environmental conditions		
Ambient temperature	[°C]	–20 ... +80
Storage temperature	[°C]	–20 ... +80
Degree of protection		IP67
		NEMA 4/4X
Shock resistance		Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27
Vibration resistance		Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6
CE marking (see declaration of conformity)[1)]		To EU Low Voltage Directive
		To EU RoHS Directive
Approval certificate		c CSA us (OL)
Safety integrity level (SIL)		SIL 2

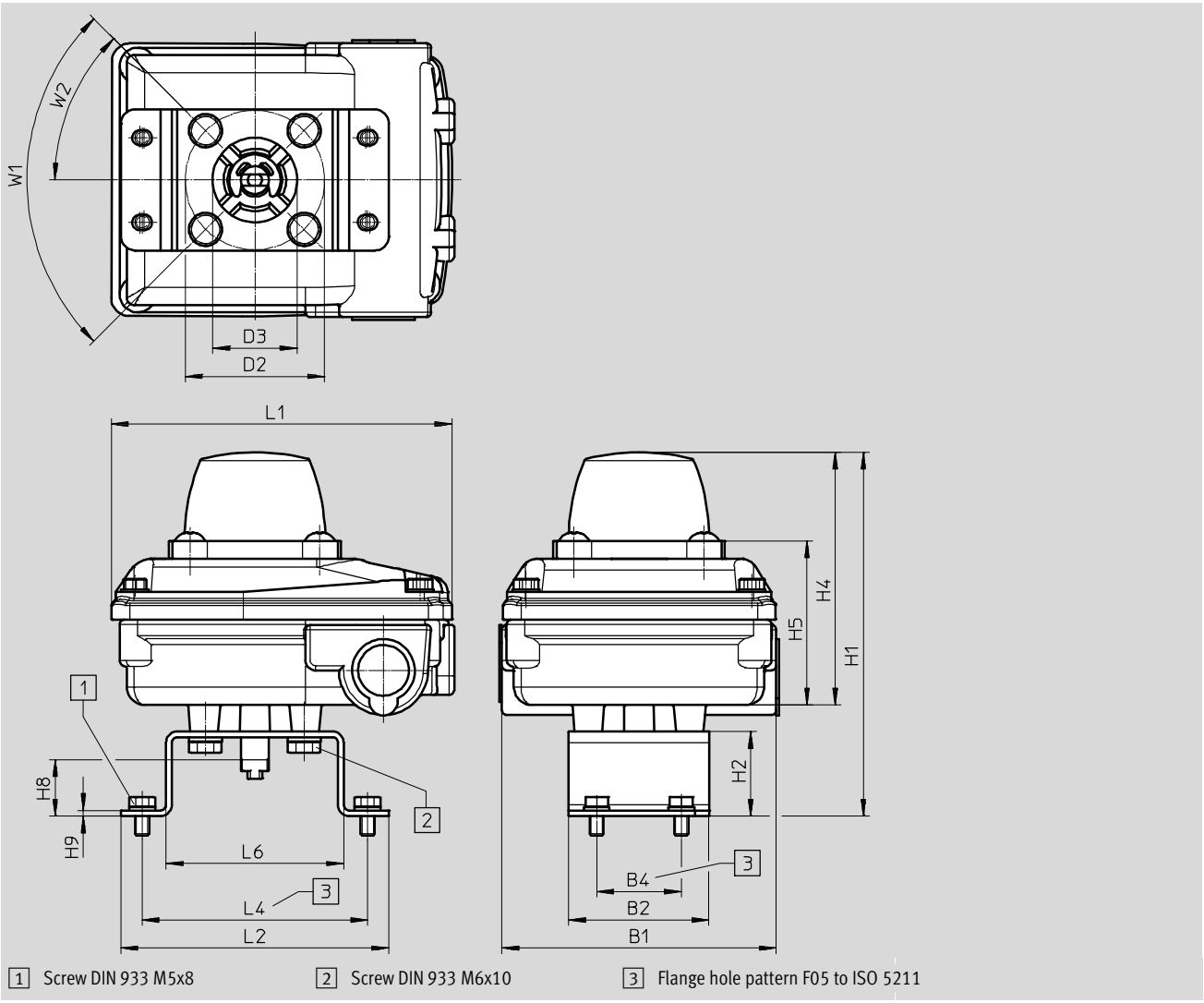
1) Additional information www.festo.com/sp ➔ Certificates.

Materials	
Housing	Die-cast aluminium
Wall mounting bracket	High-alloy stainless steel
Shaft	
Circlip	
Washer	
Screws	
Seals	NBR
Pointer	PC
Note on materials	RoHS compliant
	Contains paint-wetting impairment substances

Sensor boxes SRBC, electromechanical and magnetic reed

Technical data

Dimensions Download CAD data ➔ **www.festo.com**



1 Screw DIN 933 M5x8 2 Screw DIN 933 M6x10 3 Flange hole pattern F05 to ISO 5211

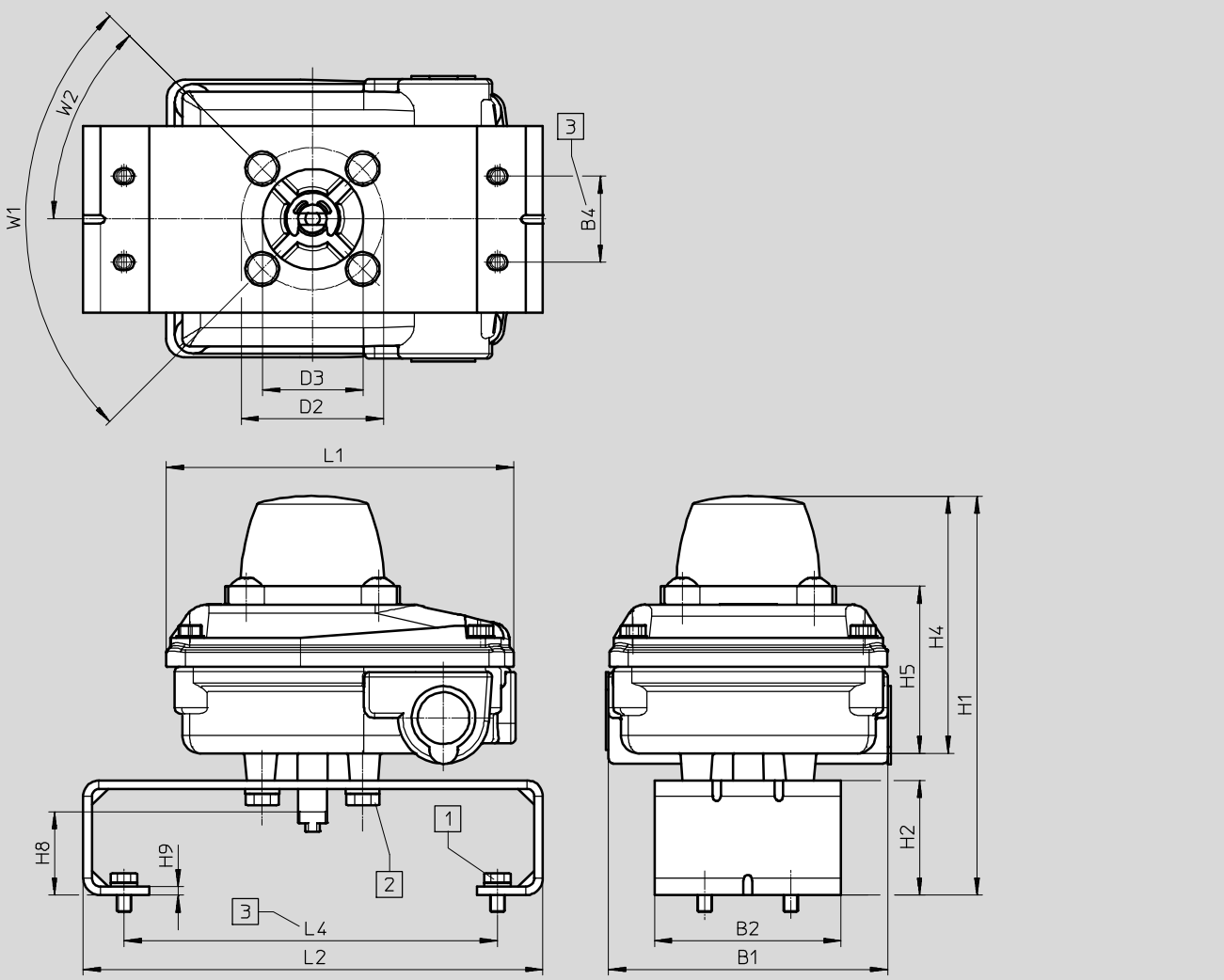
SRBC	B1	B2	B4	D2 ∅	D3 ∅	H1	H2 +0.5	H4
With DARQ-K-X1-A1-F05-20-R1	98	50	30	50	30	129	30	90
With DARQ-K-X1-A1-F05-30-R1						139	40	

SRBC	H5	H8	H9	L1	L2	L4	L6	W1	W2
With DARQ-K-X1-A1-F05-20-R1	58.2	20	2	120	95	80	63	90°	45°
With DARQ-K-X1-A1-F05-30-R1		30							

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**



1 Screw DIN 933 M5x8
2 Screw DIN 933 M6x10
3 Flange hole pattern F05 to ISO 5211

SRBC	B1	B2	B4	D2 ∅	D3 ∅	H1	H2 +0.5	H4
With DARQ-K-X1-A2-F05-30-R1	98	65	30	50	35	139	40	90

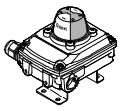
SRBC	H5	H8	H9	L1	L2	L4	W1	W2
With DARQ-K-X1-A2-F05-30-R1	58.2	30	3	120	160	130	90°	45°

Sensor boxes SRBC, electromechanical and magnetic reed

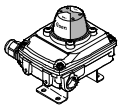
Technical data

★ Core product range

Ordering data

	Brief description	Dimensions Mounting adapter [mm]	Weight [g]	Part No.	Type
	Sensor box including pre-assembled mounting adapter; cable connector and blanking plug included in the scope of delivery	30 x 80, H: 20	800	★ **3482805**	**SRBC-CA3-YR90-MW-22A-1W-C2P20**

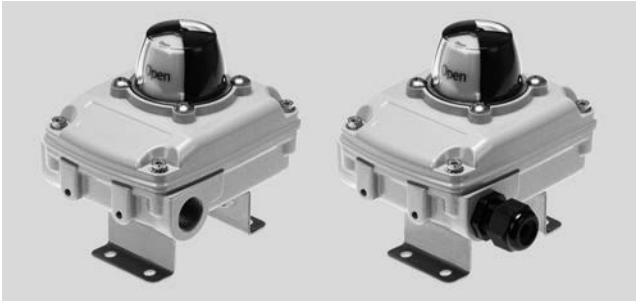
Ordering data

	Brief description	Dimensions Mounting adapter [mm]	Weight [g]	Part No.	Type
	Sensor box including pre-assembled mounting adapter; cable connector and blanking plug included in the scope of delivery	30 x 80, H: 20	800	**3482811**	**SRBC-CA3-YR90-R-2A-1W-C2P20**

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Technical data

- Inductive measuring principle
- Switching outputs PNP, NPN, 2-wire DC, NAMUR
- Pre-assembled mounting adapter 80 x 30 H20
- Cable connector and blanking plug included in the scope of delivery



General technical data

Type SRBC-...		-1-P	-1-N	-1-ZU	-20N	-20N-...-EX6
Setting range for angle acquisition	[°]	0 ... 90				
Based on standard		ISO 5211				
		VDI/VDE 3845				
		EN 60947-5-2			EN 60947-5-6	
Type of mounting		On flange to ISO 5211				
		With mounting bracket				

Electrical characteristic data

Type SRBC-...		-1-P	-1-N	-1-ZU	-20N	-20N-...-EX6
Measuring principle		Inductive				
Switching output		PNP	NPN	Non-contacting, 2-wire	NAMUR	
Switching element function		N/O contact			N/C contact	
Operating voltage range	[V DC]	10 ... 30		5 ... 60	8.2	
Max. input voltage Ui	[V]	–				16
Max. output current DC	[mA]	100			3	
Voltage drop	[V]	≤ 3		≤ 5	–	
Idle current	[mA]	≤ 15		–		
Residual current	[mA]	0 ... 0.5		0 ... 1	–	
Minimum load current	[mA]	–		4	–	
Effective internal inductance Li	[µH]	–				100
Effective internal capacitance Ci	[nF]	–				100
Max. input parameters intrinsically safe circuit[1)]		–				See IECEx certificate
		–				See ATEX certificate
Reverse polarity protection		For all electrical connections			–	
Protection against short circuit		Pulsed		–		

Electromechanical components

Type SRBC-...		-1-P	-1-N	-1-ZU	-20N	-20N-...-EX6
Cable connector		M20x1.5				
Permissible cable diameter	[mm]	5 ... 13				5.5 ... 13
Electrical connection		10-pin				
		Screw terminal				
Nominal conductor cross section that can be connected	[mm²]	0.25 ... 2.5				
Materials						
Cable connection		PA				
Blanking plug		PA				

Sensor boxes SRBC, inductive

Technical data

Operating and environmental conditions						
Type SRBC-...		-1-P	-1-N	-1-ZU	-20N	-20N-...-EX6
Ambient temperature	[°C]	–20 ... +70		–20 ... +80		
Storage temperature	[°C]	–20 ... +70		–20 ... +80		–20 ... +70
Degree of protection		IP67				
		NEMA 4/4X				
Shock resistance		Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27				
Vibration resistance		Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6				
CE marking (see declaration of conformity)[1]		To EU EMC Directive[2]				
		To EU RoHS Directive				
		–				To EU Explosion Protection Directive (ATEX)
Approval certificate		c CSA us (OL)				–
		RCM mark				
ATEX category for gas		–				II 1G
ATEX category for dust		–				II 1D
Type of ignition protection for gas		–				Ex ia IIC T6/T5 Ga
Type of ignition protection for dust		–				Ex ia IIIC Txx°C Da
Explosion-proof temperature rating		–				See IECEx certificate
		–				See ATEX certificate
Explosion protection certification outside the EU		–				EPL Ga (IEC-EX)
		–				EPL Da (IEC-EX)
Safety integrity level (SIL)		SIL 2				

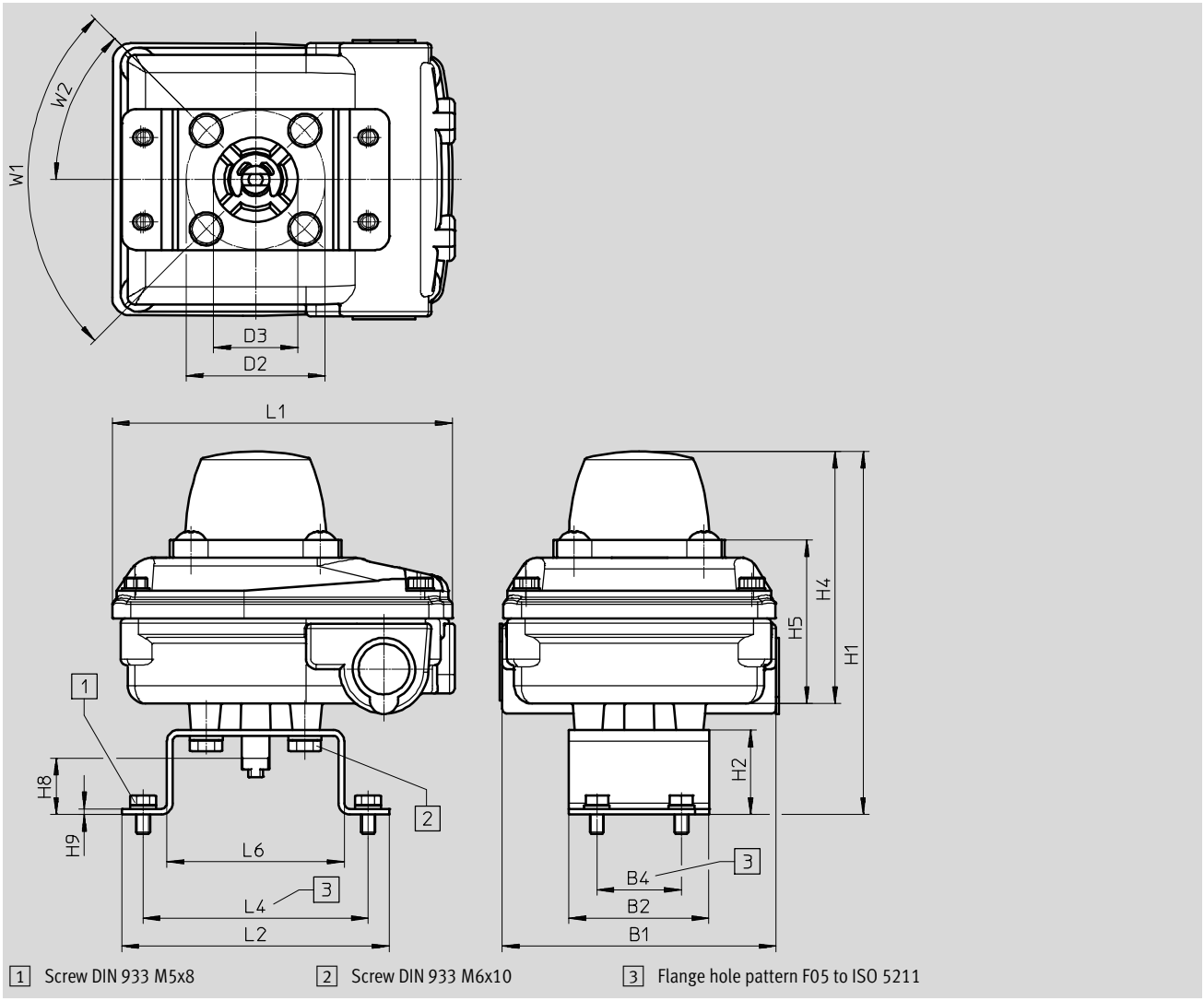
1) Additional information www.festo.com/sp ➔ Certificates.
2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Materials	
Housing	Die-cast aluminium
Wall mounting bracket	High-alloy stainless steel
Shaft	
Circlip	
Washer	
Screws	
Seals	NBR
Pointer	PC
Note on materials	RoHS compliant
	Contains paint-wetting impairment substances

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**



1 Screw DIN 933 M5x8
2 Screw DIN 933 M6x10
3 Flange hole pattern F05 to ISO 5211

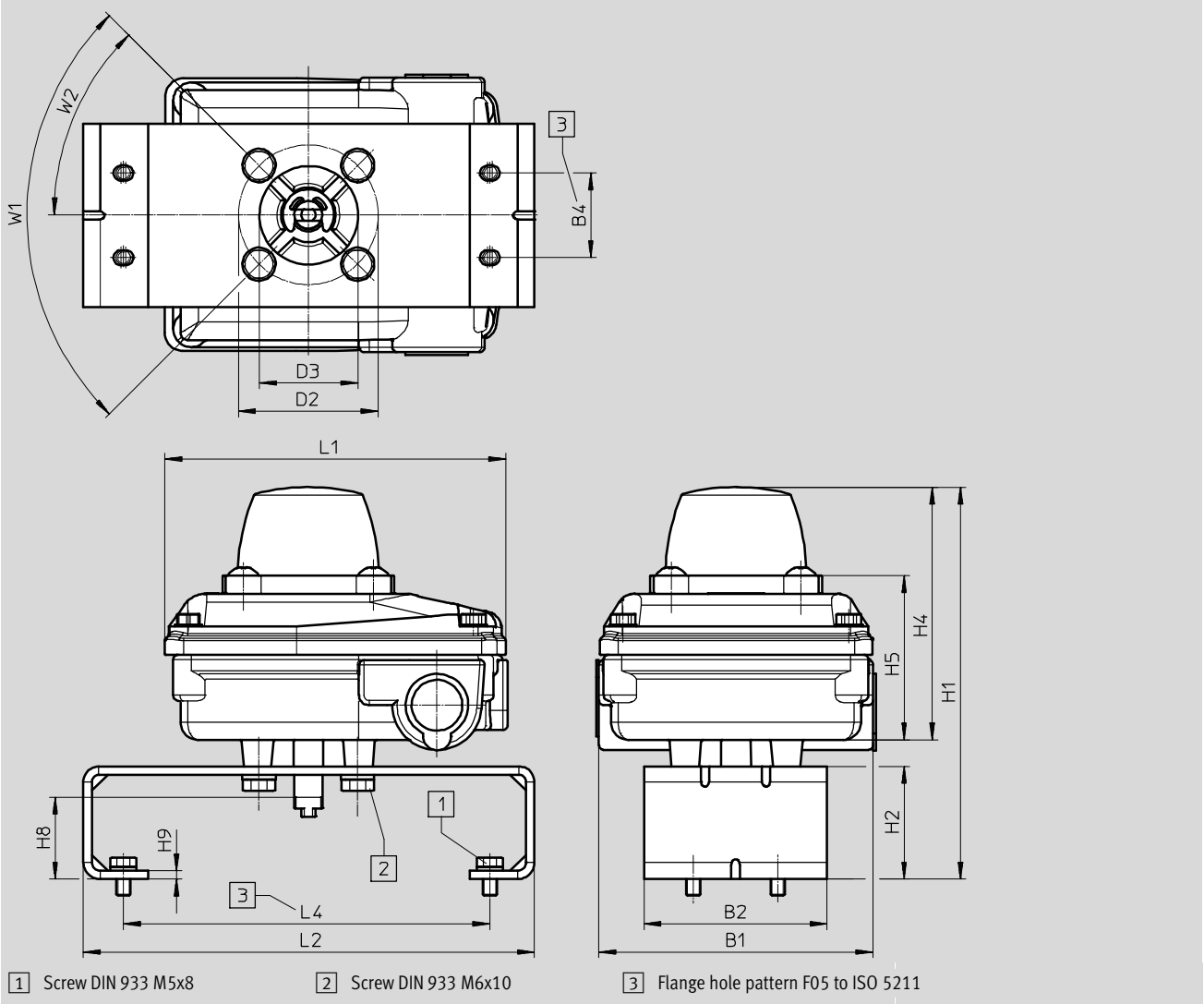
SRBC	B1	B2	B4	D2 ∅	D3 ∅	H1	H2 +0.5	H4
With DARQ-K-X1-A1-F05-20-R1	98	50	30	50	30	129	30	90
With DARQ-K-X1-A1-F05-30-R1						139	40	

SRBC	H5	H8	H9	L1	L2	L4	L6	W1	W2
With DARQ-K-X1-A1-F05-20-R1	58.2	20	2	120	95	80	63	90°	45°
With DARQ-K-X1-A1-F05-30-R1		30							

Sensor boxes SRBC, inductive

Technical data

Dimensions Download CAD data ➔ **www.festo.com**



1 Screw DIN 933 M5x8 2 Screw DIN 933 M6x10 3 Flange hole pattern F05 to ISO 5211

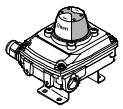
SRBC	B1	B2	B4	D2 ∅	D3 ∅	H1	H2 +0.5	H4
With DARQ-K-X1-A2-F05-30-R1	98	65	30	50	35	139	40	90

SRBC	H5	H8	H9	L1	L2	L4	W1	W2
With DARQ-K-X1-A2-F05-30-R1	58.2	30	3	120	160	130	90°	45°

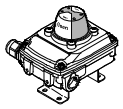
Technical data

★ Core product range

Ordering data

	Brief description	Dimensions Mounting adapter [mm]	Weight [g]	Part No.	Type
	Sensor box including pre-assembled mounting adapter; cable connector and blanking plug included in the scope of delivery	30 x 80, H: 20	800	★ **3482807**	**SRBC-CA3-YR90-N-20N-ZC-C2P20-EX6**
				★ **3482808**	**SRBC-CA3-YR90-N-1-P-C2P20**

Ordering data

	Brief description	Dimensions Mounting adapter [mm]	Weight [g]	Part No.	Type
	Sensor box including pre-assembled mounting adapter; cable connector and blanking plug included in the scope of delivery	30 x 80, H: 20	800	**3482806**	**SRBC-CA3-YR90-N-20N-ZC-C2P20**
				3482809	**SRBC-CA3-YR90-N-1-N-C2P20**
				3482810	**SRBC-CA3-YR90-N-1-ZU-C2P20**

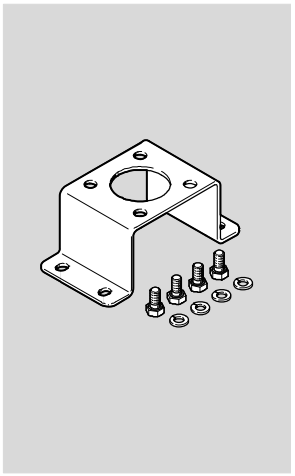
Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

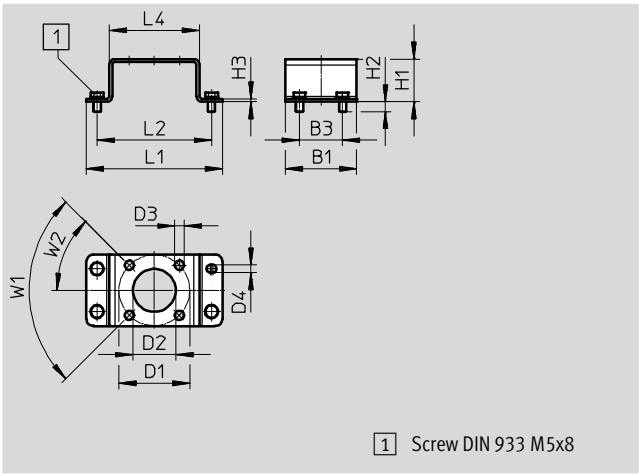
Sensor boxes SRBC

Accessories

Mounting adapter DARQ-K-X1-A1-...

- Mounting adapter for mounting on standard drives as per VDI/VDE 3845
- Size 30x80, height 20 or 30x80, high 30
- Mounting screws included in the scope of delivery
- Material: High-alloy stainless steel
- Contains paint-wetting impairment substances, RoHS compliant



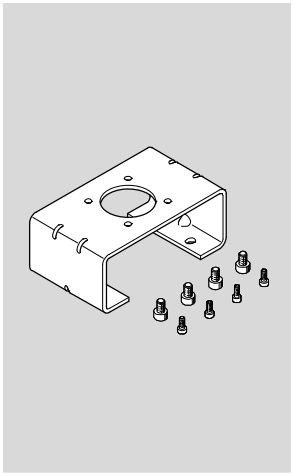


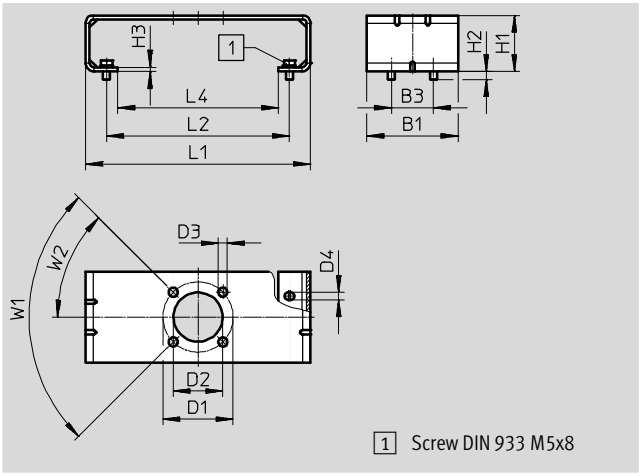
Dimensions and ordering data

B1	B3	D1 ∅	D2 ∅	D3 ∅	D4 ∅	H1 +0.5	H2	H3	L1	L2	L4	W1	W2	Weight [g]	Part No.	Type
50	30	50	30	6.5	5.5	30	6.8	2	95	80	63	90°	45°	350	**3636269**	**DARQ-K-X1-A1-F05-20-R1**
						40								380	**3636270**	**DARQ-K-X1-A1-F05-30-R1**

Mounting adapter DARQ-K-X1-A2-...

- Mounting adapter for mounting on standard drives as per VDI/VDE 3845
- Size 30x130, height 30
- Mounting screws included in the scope of delivery
- Material: High-alloy stainless steel
- Contains paint-wetting impairment substances, RoHS compliant



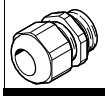


Dimensions and ordering data

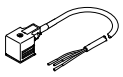
B1	B3	D1 ∅	D2 ∅	D3 ∅	D4 ∅	H1 +0.5	H2	H3	L1	L2	L4	W1	W2	Weight [g]	Part No.	Type
65	30	50	35	6.5	5.4	40	5.8	3	160	130	114	90°	45°	460	**3886114**	**DARQ-K-X1-A2-F05-30-R1**

Accessories

Ordering data

	Description	Material	Colour	Part No.	Type
Cable connector NETC					
	M20x1.5	Metal	Metal	**568279**	**NETC-M-M20-P4**
	M20x1.5	Polymer	Black	**4464895**	**NETC-P-M20**
	M20x1.5	Polymer	Blue	**4197362**	**NETC-P-M20-EX4**

Ordering data

	Electrical connection	Cable length [m]	Protective circuit	Part No.	Type
Connecting cables NEBV for valve connection for sensor box with terminal rail connection					
	Angled socket, connection pattern type A, EN 175301-803	0.6	Yes	**3679776**	**NEBV-A1W3F-P-K-0.6-N-LE3**
			No	**3579466**	**NEBV-A1W3-K-0.6-N-LE3**
	Angled socket, connection pattern type B, to industry standard 11 mm	0.6	Yes	**3679778**	**NEBV-B2W3F-P-K-0.6-N-LE3**
			No	**3579468**	**NEBV-B2W3-K-0.6-N-LE3**

Sensor boxes

SRBG

Overview, configuration and ordering
➔ **www.festo.com/catalogue/srbg**

Additional information, support and user documentation
➔ **www.festo.com/sp/srbg**

Selected types in accordance with the ATEX Directive for explosive atmospheres
➔ **www.festo.com/ex**

+ Inductive double sensor
+ Direct mounting on quarter turn actuator
+ Compact and stable
+ M12 plug connector or terminal rail connection
+ Switching output: PNP, NAMUR, 2-wire DC, AS-Interface
+ cULus Listed, General Purpose
+ Intrinsically safe versions to ATEX and SIL2 to IEC 61508

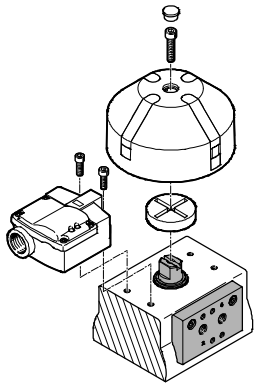
+ Position indicators SASF ➔ page 247

Sensor boxes SRBG

Key features

Function

SRBG sensor boxes are the compact solution when it comes to electrical feedback signals and monitoring the position of process valves which are actuated with pneumatic quarter turn actuators. They can be mounted directly without other accessories on quarter turn actuators with a mounting interface to VDI/VDE 3845. Direct mounting means that they require minimal space.



Innovative

- Direct mounting on quarter turn actuators to VDI/VDE 3845
- No adjustment is necessary when mounting the sensor
- LED on-site status display for the switching status, supply voltage and solenoid valve output
- For clockwise and anticlockwise rotating actuators with 90° and 180° rotation

Flexible

- SRBG-...-M12 with space-saving sensor connection via M12 plug connector
- SRBG-...-C2 with terminal rail connection for sensor and solenoid valve for connecting the sensor and solenoid valve to the same power supply if required
- Extensive range of switching outputs for virtually all applications
- AS-Interface versions for easy and cost-effective networking of sensors and solenoid valves
- Intrinsically safe Ex ia version for use in potentially explosive areas

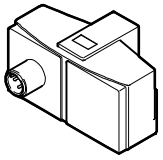
Design

- Inductive double sensor
- Compact plastic housing
- PNP, NAMUR, 2-wire DC, AS-Interface switching outputs
- Direct mounting on quarter turn actuators to VDI/VDE 3845
- M12 plug connector or terminal rail connection
- LED on-site status display
- IP67
- cULus Listed, General Purpose
- Intrinsically safe Ex ia version
- SIL 2 to IEC 61508

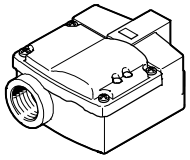
Product range overview

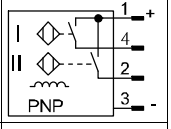
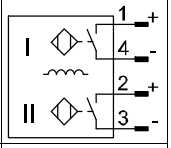
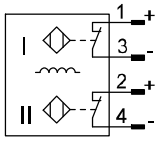
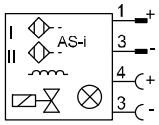
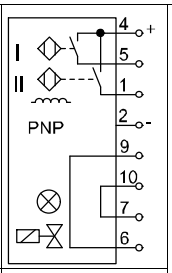
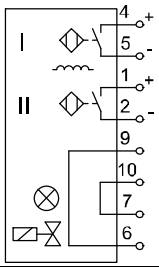
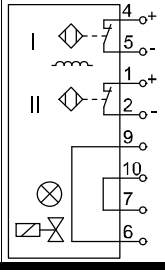
Product range overview

Variant SRBG-...-M12



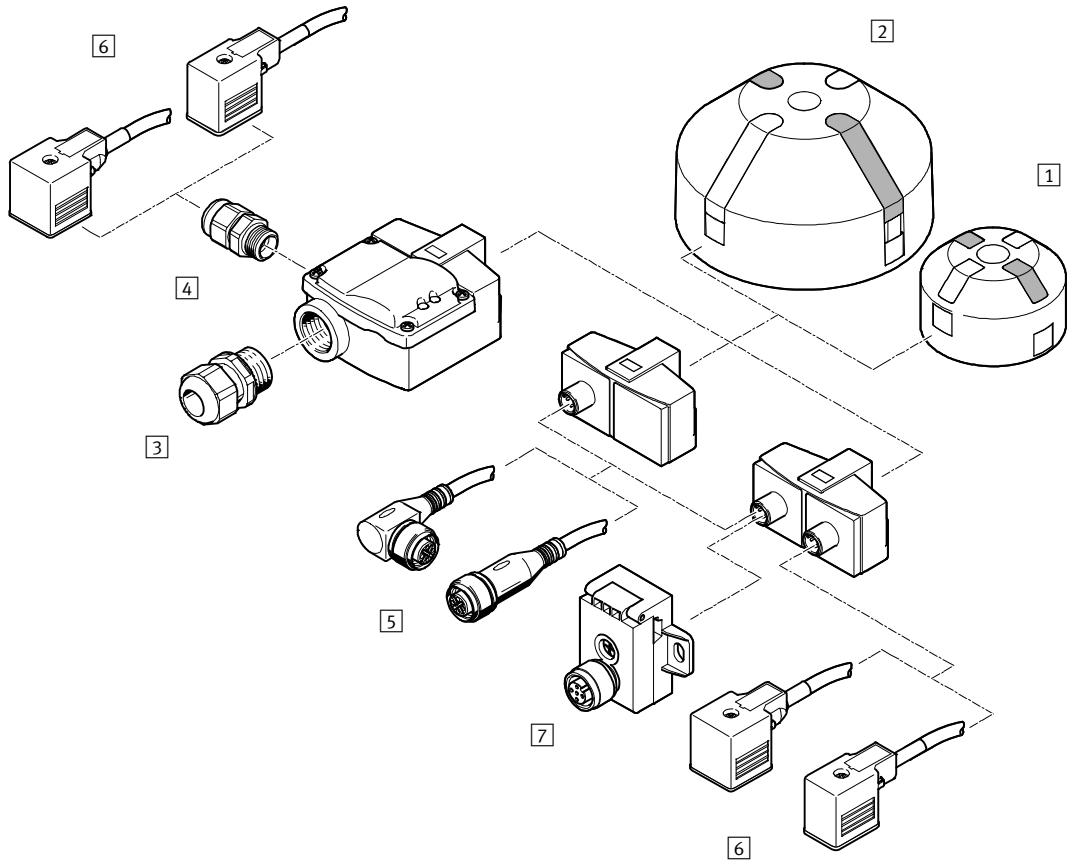
Variant SRBG-...-C2



Electrical connection	Type	Operating voltage range [V]	Switching output	Switching element function	Pin allocation	➔ Page
M12 plug connector	SRBG-C1-N-1-P-M12	10 ... 30	PNP	N/O contact		240
	SRBG-C1-N-1-ZU-M12	6 ... 60	Non-contacting, 2-wire	N/O contact		
	SRBG-C1-N-20N-ZC-M12-EX5	8.2	NAMUR	N/C contact		
	SRBG-C1-N-1-AS-M12-M12	26.5 ... 31.6	AS-Interface	Programmable		
Terminal rail connection	SRBG-C1-N-1-P-C2-C2	10 ... 30	PNP	N/O contact		244
	SRBG-C1-N-1-ZU-C2-C2	6 ... 60	Non-contacting, 2-wire	N/O contact		
	SRBG-C1-N-20N-ZC-C2-C2-EX5	8.2	NAMUR	N/C contact		

Sensor boxes SRBG

Peripherals overview



Accessory	Brief description	➔ Page/Internet
1 Position indicator SASF-...-A34	• Position indicator with 4 actuating elements fixed at an offset of 90° • For mounting hole pattern 30 x 80 mm, shaft height 20 mm and 30 mm	248
2 Position indicator SASF-...-A56	• Position indicator with 4 actuating elements fixed at an offset of 90° • For mounting hole pattern 30 x 130 mm, shaft height 30 mm and 50 mm	248
3 Cable connector NETC-P-M20-...	• Polymer cable connector M20x1.5 • Black • Blue	249
4 Cable connector NETC-P-M12-...	• Polymer cable connector M12x1.5 • Black • Blue	249
5 Connecting cables NEBU-M12	Connecting cable for system connection SRBG	249
6 Connecting cables NEBV-...	Connecting cables for connecting a solenoid valve to SRBG-...-C2 or SRBG-...-M12-M12	249
7 AS-Interface components	AS-Interface components for bus connection of SRBG-C1-N-1-AS-M12-M12	250

Type codes

SRBG

SRBG – C1 – N – 20N – ZC – C2 – C2 – EX5

Type

SRBG	Sensor box

Design

C1	Dual sensor

Sensor principle

N	Proximity sensor, inductive

Nominal operating voltage

1	24 V DC
20N	8.2 V DC, NAMUR

Electrical output

P	PNP
ZC	2-wire N/C contact
ZU	2-wire N/O contact
AS	AS-Interface

Electrical connection

C2	Screw terminal
M12	M12 plug connector, A-coded

Electrical connection, valve

–	Without
C2	Screw terminal
M12	M12 plug connector, A-coded

EU certification

–	None
EX5	II1G

SASF

SASF – S2 – B – F – A34

Type

SASF	Actuator for dual sensor

Designation

S2	SRBG

Actuator

B	Actuator

Switching position

F	Fixed

Mechanical interface

A34	Hole pattern 30 x 80 mm, shaft height 20 mm and 30 mm
A56	Hole pattern 30 x 130 mm, shaft height 30 mm and 50 mm

Sensor boxes SRBG-...-M12

Technical data

- Compact housing with M12 plug connection
- Direct mounting on quarter turn actuators to VDI/VDE 3845
- PNP, NAMUR, 2-wire DC, AS-Interface switching outputs
- AS-Interface version as A/B slave with extended addressing for up to 62 slaves
- cULus Listed, General Purpose
- Intrinsically safe version to ATEX and SIL 2 to IEC 61508

General technical data

Type SRBG-...	-P	-ZU	-ZC	-AS
Based on standard	VDI/VDE 3845			
	EN 60947-5-2		EN 60947-5-6	EN 60947-5-2
Mounting position	Any			

Electrical data

Type SRBG-...		-P	-ZU	-ZC	-AS
Measuring principle		Inductive			
Switching output		PNP	Non-contacting, 2-wire	NAMUR	AS-Interface
Switching element function		N/O contact		N/C contact	N/C or N/O contact, switchable
Max. switching frequency	[Hz]	500		3000	100
Max. switching output voltage	[V DC]	–			26.4
Operating voltage range	[V DC]	10 ... 30	6 ... 60	8.2	26.5 ... 31.6
Max. output current DC	[mA]	100		3	100
Max. switching capacity DC	[W]	–			2.5
Voltage drop	[V]	≤ 3	≤ 6	–	
Idle current	[mA]	≤ 25	–		≤ 35
Residual current	[mA]	0 ... 0.5	0 ... 1	–	
Minimum load current	[mA]	–	4	–	
Reverse polarity protection		For all electrical connections			–
Short circuit protection		Pulsed	–	Yes	–
AS-Interface					
Protocol		–			AS-Interface
Protocol version		–			V3.0
Addressing range		–			1A ... 31A (0) 1B ... 31B
Product identification		–			IO code: D ID code: A ID1 code: 7 ID2 code: E

Technical data

Display/operation				
Type SRBG-...	-P	-ZU	-ZC	-AS
Ready status display	Green LED	–		Green LED
Switching status indication	Yellow LED			
Status display	–			Yellow LED = valve switching status
	–			Red LED = wire break/short circuit at valve

Electromechanical components				
Type SRBG-...	-P	-ZU	-ZC	-AS
Electrical connection, input	Plug connector			
	M12x1			
	4-pin			
Electrical connection, output	–			Socket
	–			M12x1
	–			4-pin

Operating and environmental conditions					
Type SRBG-...		-P	-ZU	-ZC	-AS
Ambient temperature	[°C]	–25 ... +70		–25 ... +100	–25 ... +70
Storage temperature	[°C]	–25 ... +70		–40 ... +100	–25 ... +70
Degree of protection		IP67			
Shock resistance		Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27			
Vibration resistance		Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6			
Degree of contamination		3			
Certification		c UL us (OL)			
		RCM compliance mark			
CE marking		To EU EMC Directive[1)]			
		–		To EU Explosion Protection Directive (ATEX)	–
ATEX category gas		–		II 1G	–
Type of ignition protection for gas		–		Ex ia IIC T6 GA	–
Explosion-proof temperature rating		–		-25°C <= Ta <= +100°C	–
Safety Integrity Level (SIL)		–		SIL 2	–

1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Materials	
Housing	PBT
Screws	High-alloy stainless steel
Note on materials	RoHS-compliant
	Contains paint-wetting impairment substances

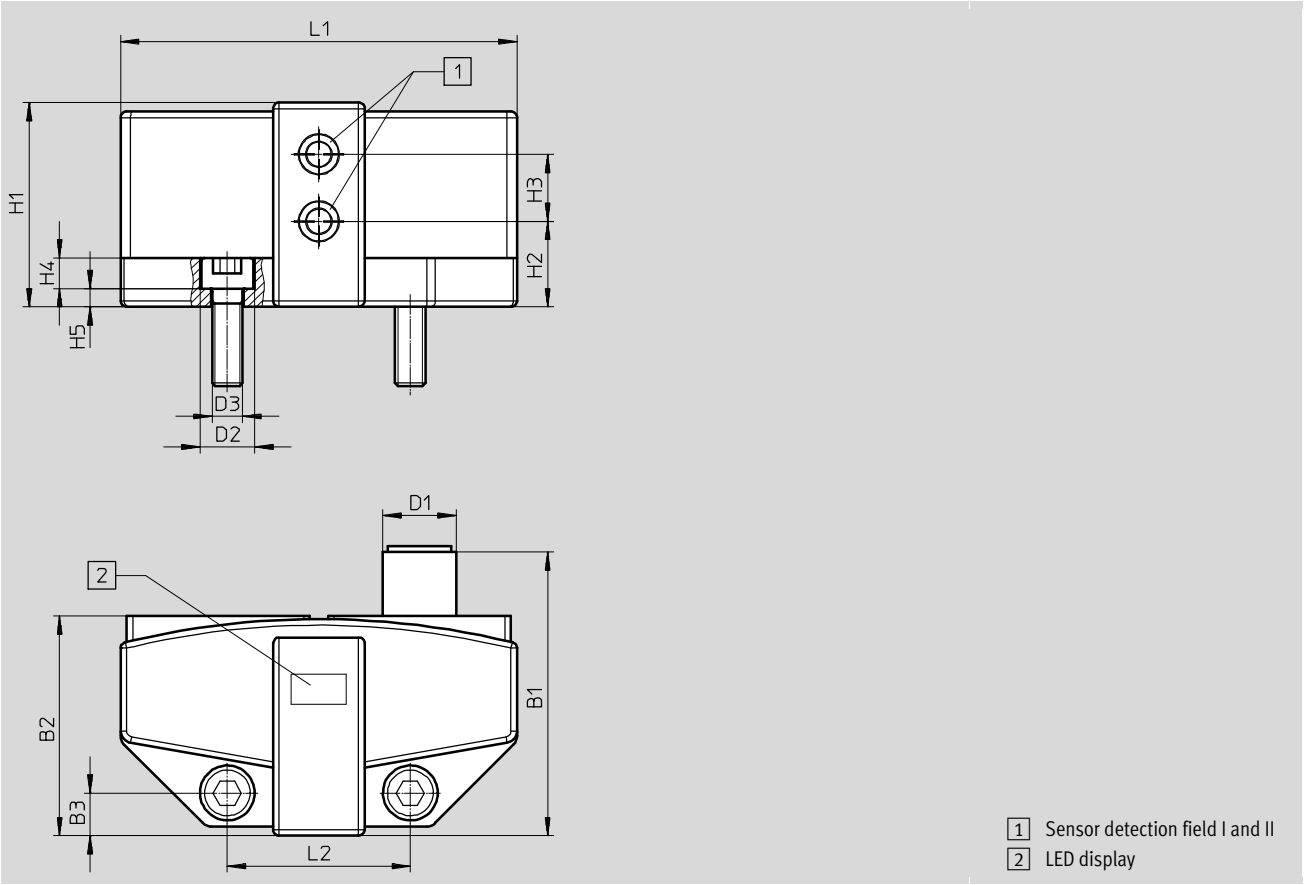
Sensor boxes SRBG-...-M12

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

SRBG-...-M12



Type	B1	B2	B3	D1	D2 ∅	D3 ∅
SRBG-C1-N-1-P-M12	46.5	36	7	M12x1	9	5.4
SRBG-C1-N-1-ZU-M12						
SRBG-C1-N-20N-ZC-M12-EX5						

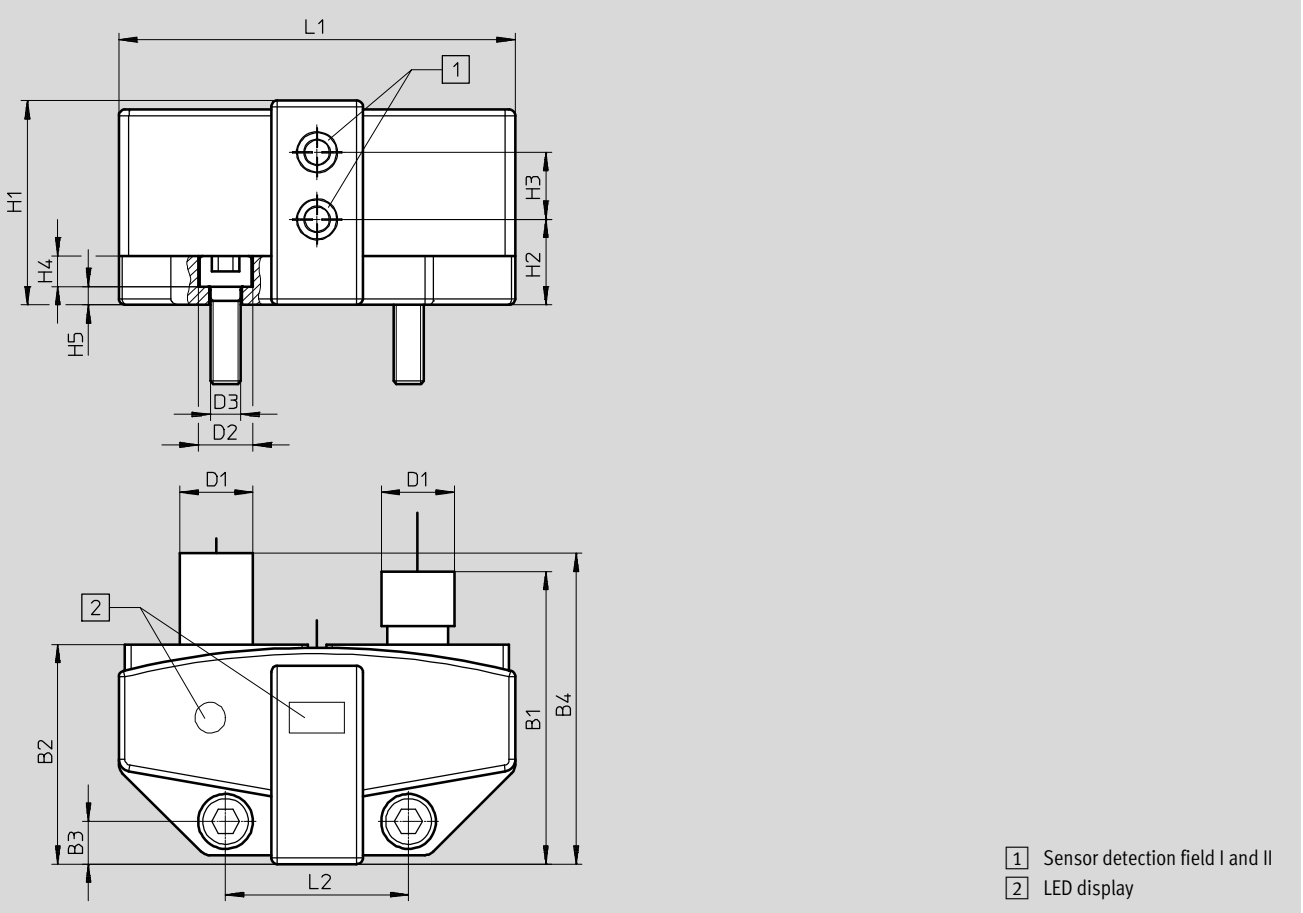
Type	H1	H2	H3	H4	H5	L1	L2
SRBG-C1-N-1-P-M12	33.5	14	11	5	3	65	30
SRBG-C1-N-1-ZU-M12							
SRBG-C1-N-20N-ZC-M12-EX5							

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

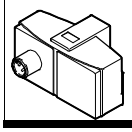
SRBG-...-M12-M12



Type	B1	B2	B3	B4	D1	D2 ∅	D3 ∅
SRBG-C1-N-1-AS-M12-M12	48	36	7	51	M12x1	9	5.4

Type	H1	H2	H3	H4	H5	L1	L2
SRBG-C1-N-1-AS-M12-M12	33.5	14	11	5	3	65	30

Ordering data

	Brief description	Dimensions [mm]	Weight [g]	Part No.	Type
	Sensor box with M12 plug connection	65 x 45, H: 35	70	**3568055**	**SRBG-C1-N-1-P-M12**
				3568056	**SRBG-C1-N-1-ZU-M12**
				3568057	**SRBG-C1-N-20N-ZC-M12-EX5**
				3567908	**SRBG-C1-N-1-AS-M12-M12**

Sensor boxes SRBG-...-C2

Technical data

- Compact housing with terminal rail connection for sensor and solenoid valve
- Direct mounting on quarter turn actuators to VDI/VDE 3845
- PNP, NAMUR, 2-wire DC switching outputs
- cULus Listed, General Purpose
- Intrinsically safe version to ATEX and SIL 2 to IEC 61508

General technical data			
Type SRBG-...	-P	-ZU	-ZC
Based on standard	VDI/VDE 3845		
	EN 60947-5-2		EN 60947-5-6
Mounting position	Any		

Electrical data				
Type SRBG-...		-P	-ZU	-ZC
Measuring principle		Inductive		
Switching output		PNP	Non-contacting, 2-wire	NAMUR
Switching element function		N/O contact		N/C contact
Max. switching frequency	[Hz]	500		3000
Operating voltage range	[V DC]	10 ... 30	6 ... 60	8.2
Max. output current DC	[mA]	100		3
Voltage drop	[V]	≤ 3	≤ 6	–
Idle current	[mA]	≤ 25	–	
Residual current	[mA]	0 ... 0.5	0 ... 1	–
Minimum load current	[mA]	–	4	–
Reverse polarity protection		For all electrical connections		
Protection against short circuit		Pulsed	–	Yes

Technical data

Display/operation			
Type SRBG-...	-P	-ZU	-ZC
Ready status display	Green LED	–	
Switching status indication	Yellow LED		
Status display	Yellow LED = valve switching status		

Electromechanical components			
Type SRBG-...	-P	-ZU	-ZC
Electrical connection, input	Spring-loaded terminal		
Electrical connection, output	Spring-loaded terminal		
Cable connector	M20x1.5		
	M12x1.5		
Connectable nominal conductor cross section [mm²]	0.2 ... 2.5		

Operating and environmental conditions			
Type SRBG-...	-P	-ZU	-ZC
Ambient temperature [°C]	–25 ... +70		–25 ... +100
Storage temperature [°C]	–25 ... +70		–40 ... +100
Degree of protection	IP67		
Shock resistance	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27		
Vibration resistance	Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6		
Degree of contamination	3		
Certification	c UL us (OL)		
	RCM compliance mark		
CE marking	To EU EMC Directive[1)]		
	–		To EU Explosion Protection Directive (ATEX)
ATEX category gas	–		II 1G
Explosion ignition protection type for gas	–		Ex ia IIC T6 GA
Explosion-proof temperature rating	–		-25°C <= Ta <= +86°C
Safety Integrity Level (SIL)	–		SIL 2

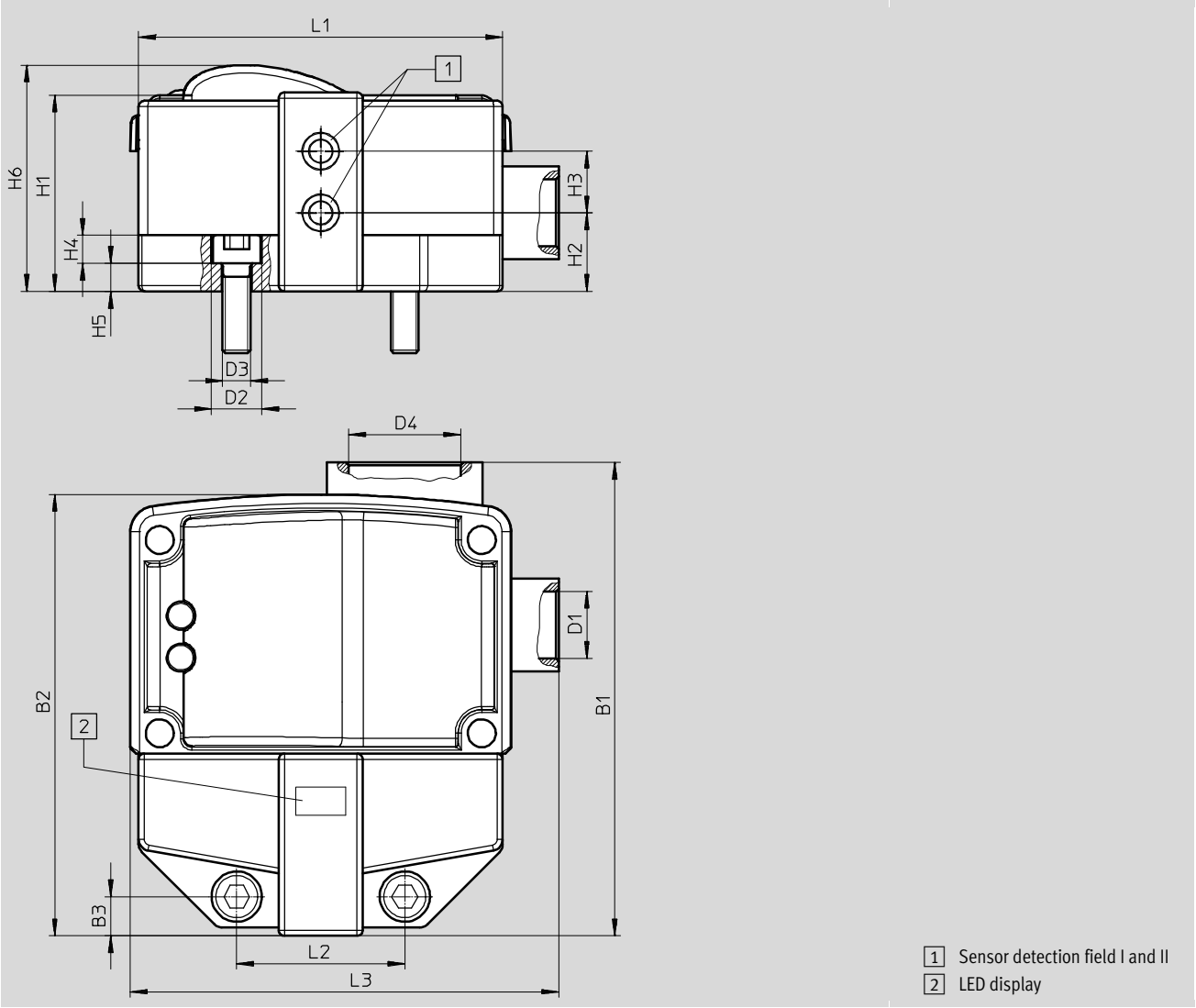
1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Materials	
Housing	PBT
Screws	High-alloy stainless steel
Note on materials	RoHS-compliant
	Contains paint-wetting impairment substances

Sensor boxes SRBG-...-C2

Technical data

Dimensions Download CAD data ➔ **www.festo.com**

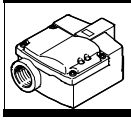


1 Sensor detection field I and II
2 LED display

Type	B1	B2	B3	D1	D2 ∅	D3 ∅	D4	H1
SRBG-C1-N-1-P-C2-C2	84.5	78.8	7	M12x1	9	5.4	M20x1.5	35
SRBG-C1-N-1-ZU-C2-C2								
SRBG-C1-N-20N-ZC-C2-C2-EX5								

Type	H2	H3	H4	H5	H6	L1	L2	L2
SRBG-C1-N-1-P-C2-C2	14	11	5	5	40	65	30	76.5
SRBG-C1-N-1-ZU-C2-C2								
SRBG-C1-N-20N-ZC-C2-C2-EX5								

Ordering data

	Brief description	Dimensions [mm]	Weight [g]	Part No.	Type
	Sensor box with terminal rail connection	65 x 90, H: 40	170	**3568165**	**SRBG-C1-N-1-P-C2-C2**
				3568166	**SRBG-C1-N-1-ZU-C2-C2**
				3568167	**SRBG-C1-N-20N-ZC-C2-C2-EX5**

Accessories

Position indicator SASF
for sensor boxes SRBG

- For mounting on drive shaft of standard actuators to VDI/VDE 3845
- Four fixed actuating lugs offset by 90°
- For clockwise and anticlockwise rotating actuators with 90° and 180° rotation
- Made from conductive plastic material, which prevents static discharge and is suitable for use in Ex zones
- Two position indicators suitable for all quarter turn actuator sizes

General technical data			
Type SASF-...		-A34	-A56
Type of mounting		To VDI/VDE 3845	
Adjustment range of swivel angle	[deg]	0 ... 90	

Operating and environmental conditions			
Type SASF-...		-A34	-A56
Ambient temperature	[°C]	–25 ... +80	
Shock resistance		Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27	
Vibration resistance		Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6	

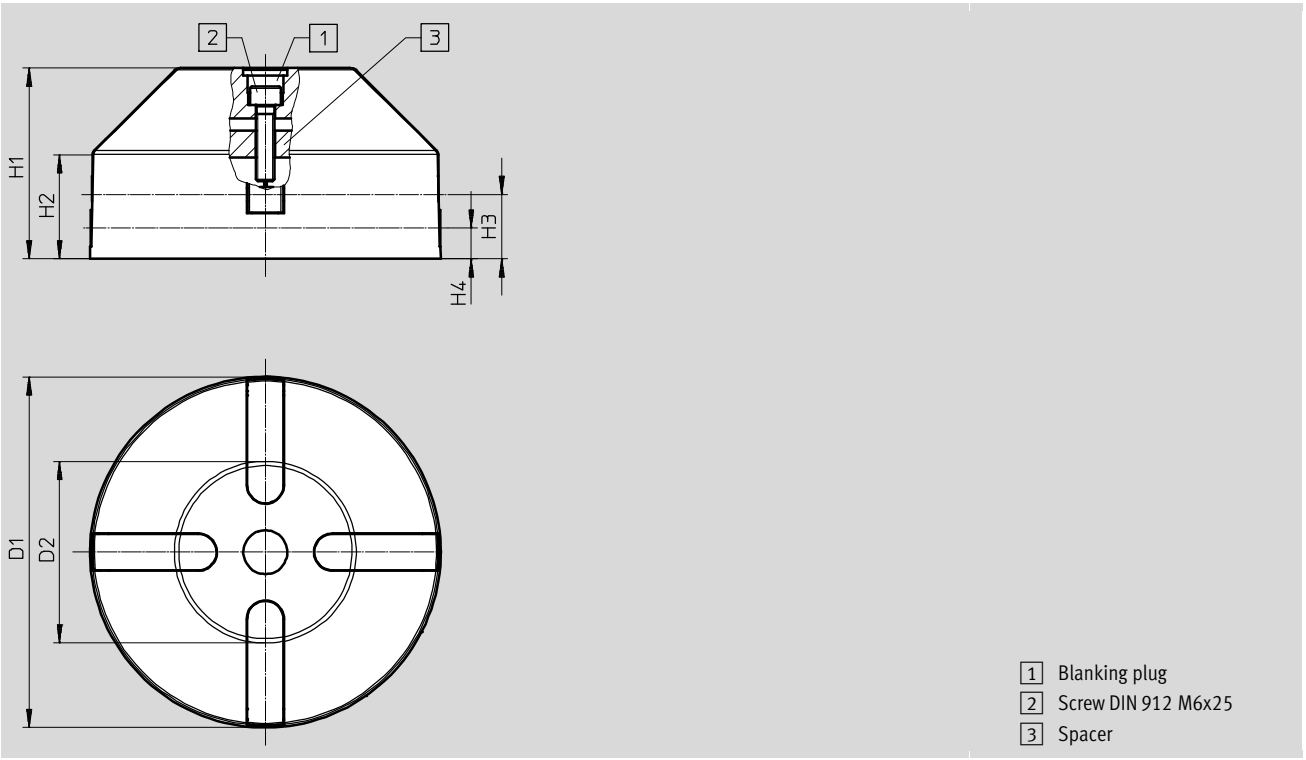
1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Materials	
Housing	PBT
	PP
	High-alloy stainless steel
Spacer	PA
Screws	High-alloy stainless steel
Note on materials	RoHS-compliant
	Contains paint-wetting impairment substances

Sensor boxes SRBG

Accessories

Dimensions Download CAD data ➔ **www.festo.com**



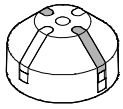
1 Blanking plug
2 Screw DIN 912 M6x25
3 Spacer

Type	D1 ∅	D2 ∅	H1	H2	H3	H4
SASF-S2-B-F-A34	65	41.9	38.5	26.5	18.5	7.5
SASF-S2-B-F-A56	115	59	62.5	34	21	10

Possible combinations

Function	Drives	Sizes	SASF-S2-B-F-A34	SASF-S2-B-F-A56
Double-acting	DFPD	10 ... 480	■	–
	DAPS	0008 ... 1920	■	–
	DAPS	2880 ... 8000	–	■
	DAPS-CR	0120 ... 0480	■	–
Single-acting	DFPD	20 ... 480	■	–
	DAPS	0015 ... 0960	■	–
	DAPS	1440 ... 4000	–	■
	DAPS-CR	0060 ... 0240	■	–

Ordering data – Position indicator

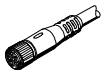
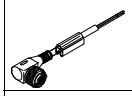
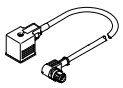
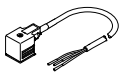
	Brief description	Dimensions [mm]	Weight [g]	Part No.	Type
	Mounting on drive shaft of standard actuators to VDI/VDE 3845	Mounting hole pattern 30 x 80 mm Shaft height 20 and 30 mm	55	**4046082**	**SASF-S2-B-F-A34**
		Mounting hole pattern 30 x 130 mm Shaft height 30 and 50 mm	140	**4077125**	**SASF-S2-B-F-A56**

Accessories

Ordering data

	Description	Colour	Part No.	Type
Cable connectors NETC				
	M20x1.5 made from polymer	Black	**4464895**	**NETC-P-M20**
		Blue	**4197362**	**NETC-P-M20-EX4**
	M12x1.5 made from polymer	Black	**4197367**	**NETC-P-M12**
		Blue	**4197366**	**NETC-P-M12-EX4**

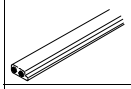
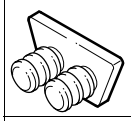
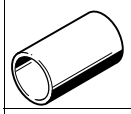
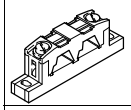
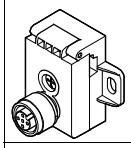
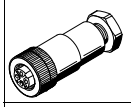
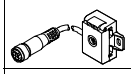
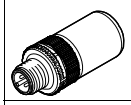
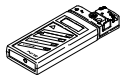
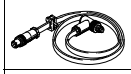
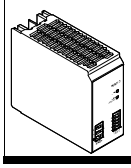
Ordering data

	Electrical connection Left	Right	Cable length [m]	Protective circuit	Part No.	Type
Connecting cables NEBU						
	Straight socket, M12x1, 5-pin	Cable, open end, 4-wire	2.5	–	**550326**	**NEBU-M12G5-K-2.5-LE4**
			5		**541328**	**NEBU-M12G5-K-5-LE4**
			7		**8003134**	**NEBU-M12G5-K-7-LE4**
	Angled socket, M12x1, 5-pin	Cable, open end, 4-wire	2.5		**550325**	**NEBU-M12W5-K-2.5-LE4**
			5		**541329**	**NEBU-M12W5-K-5-LE4**
			10		**569841**	**NEBU-M12W5-K-10-LE4**
Connecting cables NEBV for valve connection for sensor box with AS-Interface						
	Angled socket, connection pattern type A, EN 175301-803		0.3	Yes	**3679771**	**NEBV-A1W3F-P-K-0.3-N-M12W3**
				No	**3579461**	**NEBV-A1W3-K-0.3-N-M12W3**
			0.6	Yes	**3679772**	**NEBV-A1W3F-P-K-0.6-N-M12W3**
				No	**3579462**	**NEBV-A1W3-K-0.6-N-M12W3**
	Angled socket, connection pattern type B, to industry standard 11 mm		0.3	Yes	**3679773**	**NEBV-B2W3F-P-K-0.3-N-M12W3**
				No	**3579463**	**NEBV-B2W3-K-0.3-N-M12W3**
			0.6	Yes	**3679774**	**NEBV-B2W3F-P-K-0.6-N-M12W3**
				No	**3579464**	**NEBV-B2W3-K-0.6-N-M12W3**
Connecting cables NEBV for valve connection for sensor box with terminal rail connection						
	Angled socket, connection pattern type A, EN 175301-803		0.6	Yes	**3679776**	**NEBV-A1W3F-P-K-0.6-N-LE3**
				No	**3579466**	**NEBV-A1W3-K-0.6-N-LE3**
	Angled socket, connection pattern type B, to industry standard 11 mm		0.6	Yes	**3679778**	**NEBV-B2W3F-P-K-0.6-N-LE3**
				No	**3579468**	**NEBV-B2W3-K-0.6-N-LE3**

Sensor boxes SRBG

Accessories

Ordering data

	Description	Part No.	Type
AS-Interface components			
	Flat cable for AS-Interface components, yellow, cable length 100 m	**18940**	**KASI-1,5-Y-100**
	Flat cable for AS-Interface components, black, cable length 100 m	**18941**	**KASI-1,5-Z-100**
	Cable cap for flat cable (pack of 50)	**18787**	**ASI-KK-FK**
	Cable sleeve (pack of 20)	**165593**	**ASI-KT-FK**
	Cable distributor for flat cables, rotatable cables	**18786**	**ASI-KVT-FK**
	Cable distributor for flat cables, symmetrical cables	**18797**	**ASI-KVT-FK-S**
	AS-Interface data to socket M12, 4-pin	**572225**	**NEFU-X22F-M12G4**
	Straight socket, 4-pin, screw terminal for connecting AS-Interface stations to the AS-Interface bus system	**18789**	**ASI-SD-PG-M12**
	AS-Interface data and load voltage supply to socket M12, 4-pin, cable length 1 m	**572227**	**NEFU-X24F-1-M12G4**
	AS-Interface module as bus termination	**567035**	**CACF-BT-AS**
Miscellaneous			
	Addressing device for AS-Interface stations	**18959**	**ASI-PRG-ADR**
	Addressing cable for addressing device	**18960**	**KASI-ADR**
	Primary switched mode, modular power supply, 24 V DC power supply 5 A, 10 A	**2247681**	**CACN-3A-1-5**
		2247682	**CACN-3A-1-10**

Sensor boxes

SRBE

Overview, configuration and ordering
➔ **www.festo.com/catalogue/srbe**

Additional information, support and user documentation
➔ **www.festo.com/sp/srbe**

Selected types in accordance with the ATEX Directive for explosive atmospheres
➔ **www.festo.com/ex**

+ Measuring principle: electromagnetic, magnetic reed or inductive
+ Switching element function toggle switch, single-pole (SPDT) and double-pole (DPDT)
+ Switching outputs PNP, NPN, 2-wire DC, NAMUR
+ For DC and AC voltage

+ Pre-assembled mounting bridge
+ Suitable for use in potentially explosive areas
  – ATEX: II 2G & II 2D
  – IECEX: EPL Gb; EPL Db
  – Type of ignition protection: Ex d & Ex td

Sensor boxes SRBE

Key features and product range overview

Function

Sensor boxes SRBE are used for electrical feedback and control of the position of process valves actuated using pneumatic quarter turn actuators. They are suitable for use in potentially explosive environments. They can be mounted quickly and easily on quarter turn actuators with a connection pattern to VDI/VDE 3845 using mounting adapters.

Innovative

- Pre-assembled mounting adapter for ease of installation
- The trip cams can be set easily without additional tools
- Sturdy, corrosion-resistant design, ideal for use in harsh operating conditions
- Clearly visible 3D position indicator allows rapid detection of the current position of the quarter turn actuator

Flexible

- Worldwide certifications (ATEX, IECEX, cCSAus, INMETRO) for use in potentially explosive environments
- The type of protection of the flameproof enclosure enables installation without safety barriers or NAMUR amplifier in potentially explosive environments
- Weather-tight housing for outdoor applications too
- Mechanical, inductive or magnetic switch variants for virtually all ranges of application
- Two cable inputs for common power supply for the sensor box and solenoid valve as standard

Design

- Sturdy aluminium housing with two cable inputs
- Captive stainless steel screws on the housing cover
- Pre-assembled stainless steel mounting adapter 80x30 H20 for ease of mounting on standard actuators to VDI/VDE 3845
- 3D OPEN/CLOSED position indicator
- Mechanical, inductive or magnetic switch variants
- Number of switches: 2
- IP67, NEMA 4/4x
- ATEX, IECEX, cCSAus, INMETRO
- SIL 2 to IEC 61508

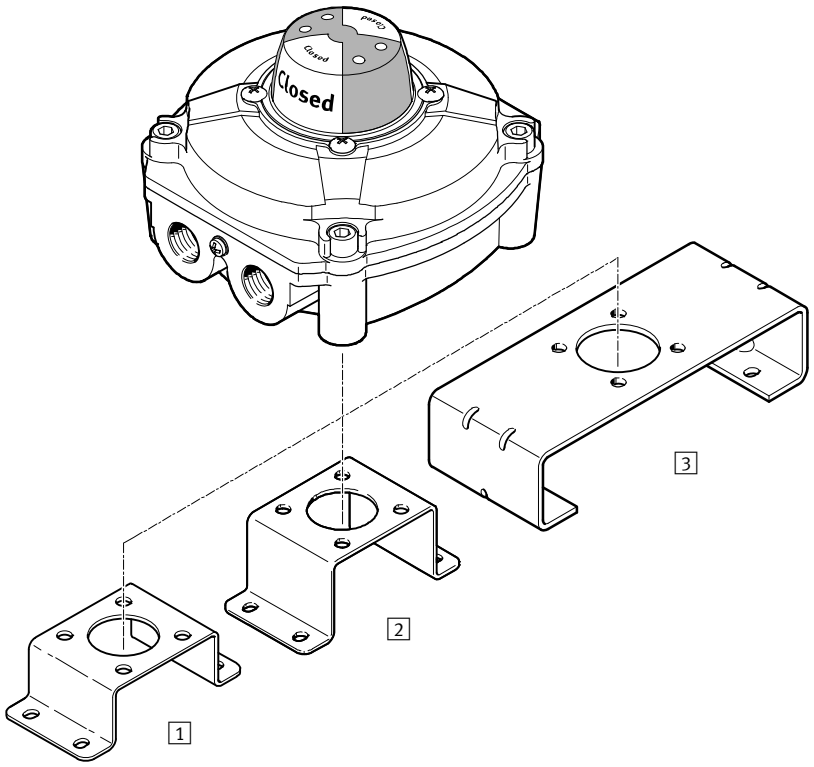
Key features and product range overview

Product range overview

Measuring principle	Type	EX certifications	Operating voltage range	Switching output	Switching element function
Electromechanical	SRBE-...-MW-22A-1W-...-EX	ATEX, IECEX, INMETRO	0 ... 250 V AC 0 ... 30 V DC	Contacting	Toggle switch, single-pole (SPDT)
	SRBE-...-MW-22A-1W-...-C1	cCSAus			
Electromechanical	SRBE-...-MW-22A-2W-...-EX	ATEX, IECEX, INMETRO	0 ... 250 V AC 0 ... 30 V DC	Contacting	Toggle switch, double-pole (DPDT)
	SRBE-...-MW-22A-2W-...-C1	cCSAus			
Magnetic reed	SRBE-...-R-2A-1W-...-EX	ATEX, IECEX, INMETRO	0 ... 240 V AC 0 ... 30 V DC	Contacting	Toggle switch, single-pole (SPDT)
	SRBE-...-R-2A-1W-...-C1	cCSAus			
Inductive	SRBE-...-N-20N-ZC-...-EX	ATEX, IECEX, INMETRO	8.2 V DC	NAMUR	N/C contact
	SRBE-...-N-20N-ZC-...-C1	cCSAus			
Inductive	SRBE-...-N-1-P-...-EX	ATEX, IECEX, INMETRO	10 ... 30 V DC	PNP	N/O contact
	SRBE-...-N-1-P-...-C1	cCSAus			
Inductive	SRBE-...-N-1-N-...-EX	ATEX, IECEX, INMETRO	10 ... 30 V DC	NPN	N/O contact
	SRBE-...-N-1-N-...-C1	cCSAus			
Inductive	SRBE-...-N-1-ZU-...-EX	ATEX, IECEX, INMETRO	5 ... 60 V DC	Contactless, 2-wire	N/O contact
	SRBE-...-N-1-ZU-...-C1	cCSAus			

Sensor boxes SRBE

Peripherals overview



Accessories	Brief description	➔ Page/Internet
1 Mounting adapter DARQ-K-X1-A1-F05-20-R1	• Mounting adapter for mounting sensor boxes on quarter turn actuators with hole pattern 30 x 80 mm, shaft height 20 mm • Included in the scope of delivery of the sensor box and pre-assembled	267
2 Mounting adapter DARQ-K-X1-A1-F05-30-R1	• Mounting adapter for mounting sensor boxes on quarter turn actuators with hole pattern 30 x 80 mm, shaft height 30 mm • Can be ordered separately as an accessory	267
3 Mounting adapter DARQ-K-X1-A2-F05-30-R1	• Mounting adapter for mounting sensor boxes on quarter turn actuators with hole pattern 30 x 130 mm, shaft height 30 mm • Can be ordered separately as an accessory	267

Type codes SRBE

SRBE – C – A3 – YR – 90 – N – 1 – N – C2 – N12 – EX

Type	
SRBE	Limit switch attachment

Design	
C	Sensor box

Mechanical interface	
A3	Mounting adapter, hole pattern 30 x 80 mm, shaft height 20 mm

Display type	
YR	Position indicator yellow/red

Measuring range	
90	0 ... 90°

Sensor principle	
N	Proximity sensors, inductive
R	Reed with contact
MW	Floating contact, changeover switch

Nominal operating voltage	
2A	110 V AC, 50-60 Hz
20N	8.2 V DC, NAMUR
22A	250 V AC
1	24 V DC

Electrical output	
N	NPN
P	PNP
1W	1-pin toggle switch
2W	2-pin toggle switch
ZC	2-wire N/C contact
ZU	2-wire N/O contact

Electrical connection	
C2	Screw terminal

Connecting thread	
M20	M20
N12	1/2 NPT

EU certification	
C1	CSA mark (Canada)
EX	EX certification (ATEX)

Mounting kits DARQ

Type codes DARQ

DARQ – K – X1 – A1 – F05 – 20 – R1

Type	
DARQ	Mounting adapter

Function	
K	Mounting kit

Designation	
X1	Sensor box version with short shaft

Actuator outlet	
A1	Hole pattern 30 x 80 mm
A2	Hole pattern 30 x 130 mm

Adapter or reducing outlet	
F05	Hole pattern F05

Length	
20	20 mm
30	30 mm

Corrosion protection	
R1	Stainless steel

Technical data

- Measuring principle: electromagnetic or magnetic reed
- Switching element function: toggle switch, single-pole (SPDT) and double-pole (DPDT)
- For DC and AC voltage
- Pre-assembled mounting adapter 80 x 30 H20

General technical data

Type SRBE-...		-MW-...-1W	-MW-...-2W	-R
Setting range for angle acquisition	[°]	0 ... 90		
Based on standard		ISO 5211		
		VDI/VDE 3845		
		–		EN 60947-5-2
Type of mounting		On flange to ISO 5211		
		With mounting bracket		

Electrical data

Type SRBE-...		-MW-...-1W	-MW-...-2W	-R
Measuring principle		Mechanical/electrical		Magnetic reed
Switching output		Contacting		
Switching element function		Toggle switch, single-pole	Toggle switch, double-pole	Toggle switch, single-pole
Operating voltage range Alternating current AC	[V]	0 ... 250		0 ... 240
Max. output current AC	[mA]	3000 (at 250 V)		416 (at 240 V)
Operating voltage range Direct current DC	[V]	0 ... 30		
Max. output current DC	[mA]	6000 (at 30 V)		3000 (at 30 V)

Electromechanical components

Type SRBE-...		-MW-...-1W	-MW-...-2W	-R
Electrical connection		10-pin	14-pin	10-pin
		Screw terminal		
Nominal conductor cross section that can be connected	[mm^2]	0.25 ... 2.5		
Cable connector		M20x1.5 for ...-C2M20-...		
		1/2 NPT for ...-C2N12-...		

Materials

Housing	Epoxy-coated die-cast aluminium
Shaft	High-alloy stainless steel
Screws	High-alloy stainless steel
Mounting bracket	High-alloy stainless steel
Seals	NBR
Pointer	PC
Note on materials	RoHS compliant
	Contains paint-wetting impairment substances

Sensor boxes SRBE, electromechanical and magnetic reed

Technical data

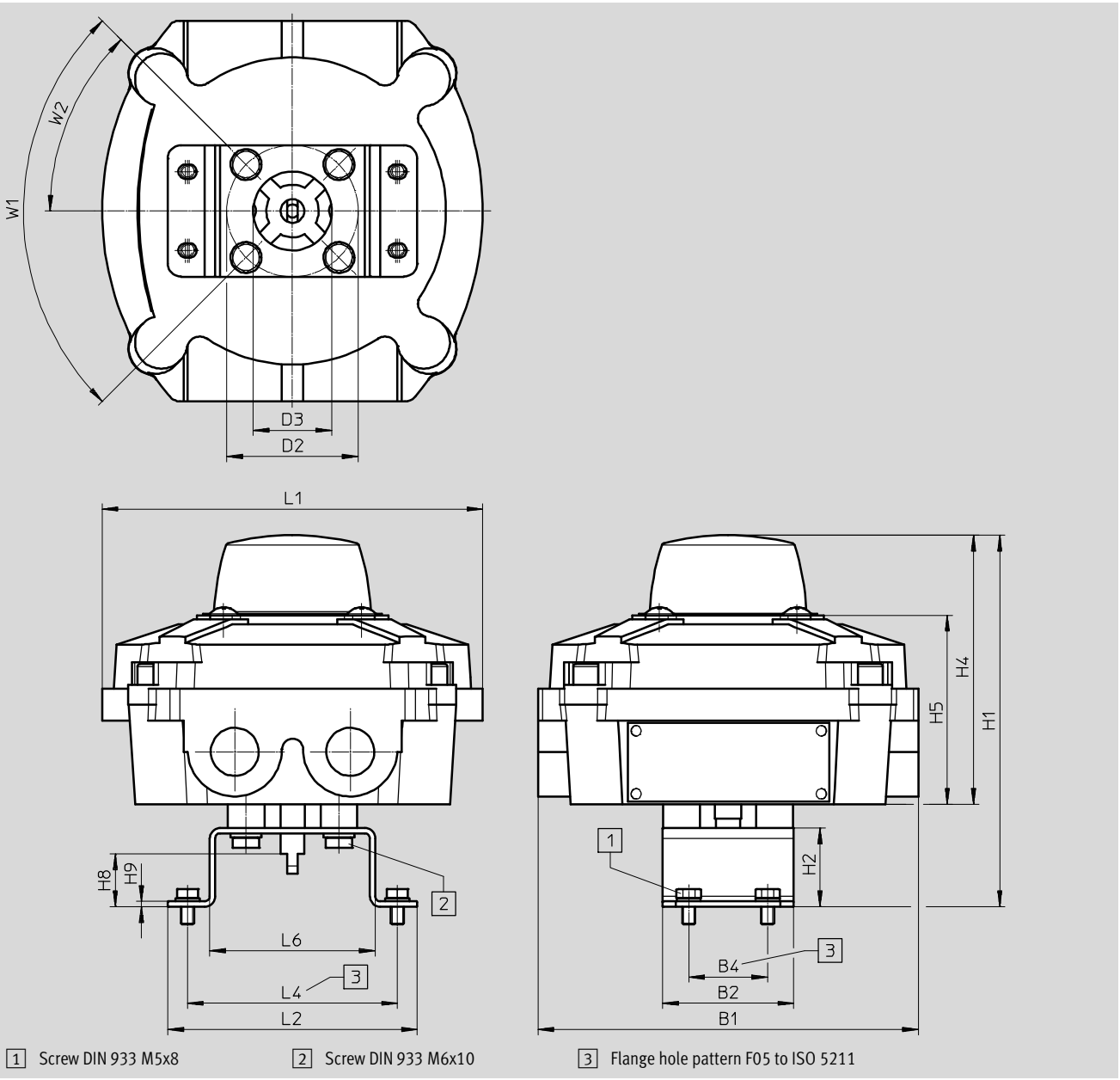
Operating and environmental conditions				
Type SRBE-...		-MW-...-1W	-MW-...-2W	-R
Ambient temperature	[°C]	–20 ... +60		
Storage temperature	[°C]	–20 ... +60		
Shock resistance		Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27		
Vibration resistance		Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6		
CE marking		To EU Low Voltage Directive[1)]		
Safety integrity level (SIL)		SIL 2		
Certifications for ...-EX variants		-MW-...-1W	-MW-...-2W	-R
Degree of protection		IP67		
CE marking		To EU Explosion Protection Directive (ATEX)		
ATEX category for gas		II 2G		
ATEX category for dust		II 2D		
Explosion ambient temperature		–20 ... +60		
Type of ignition protection for gas		Ex d IIC T6 Gb		
Type of ignition protection for dust		Ex tb IIIC T75°C Db		Ex tb IIIC T61°C Db
Explosion protection certification outside the EU		EPL Db (IEC-EX)		
		EPL Db (BR)		
		EPL Db (CN)		
		EPL Gb (IEC-EX)		
		EPL Gb (BR)		
		EPL Gb (CN)		
Certificate issuing authority		DNV 16.0067X (INMETRO)		
		FTZU 15 ATEX 0095X (PESO)		
		GYJ 16.1497X (NEPSI)		
		IECEx FTZU 15.0014X		
Certifications for ...-C1 variants		-MW-...-1W	-MW-...-2W	-R
Degree of protection		IP67		
		NEMA 4/4X		
Type of ignition protection for gas		AEx d IIB T5 Gb		
		Ex d IIB T5 Gb		
		–		AEx nA IIC T5 Gc
		–		Ex nA IIC T5 Gc
Type of ignition protection for dust		AEx tb IIIC T108°C Db		
		Ex tb IIIC T108°C Db		
Explosion protection certification outside the EU		Class I, Div. 1 (CA)		
		Class I, Div. 1 (US)		
		–		Class I, Div. 2 (CA)
		–		Class I, Div. 2 (US)
		Class II, Div. 1 (CA)		
		Class II, Div. 1 (US)		
		Class III (CA)		
		Class III (US)		
		EPL Db (CA)		
		EPL Db (US)		
		EPL Gb (CA)		
		EPL Gb (US)		
		–		EPL Gc (CA)
		–		EPL Gc (US)
Certificate issuing authority		CSA 263311		

1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**



1 Screw DIN 933 M5x8
2 Screw DIN 933 M6x10
3 Flange hole pattern F05 to ISO 5211

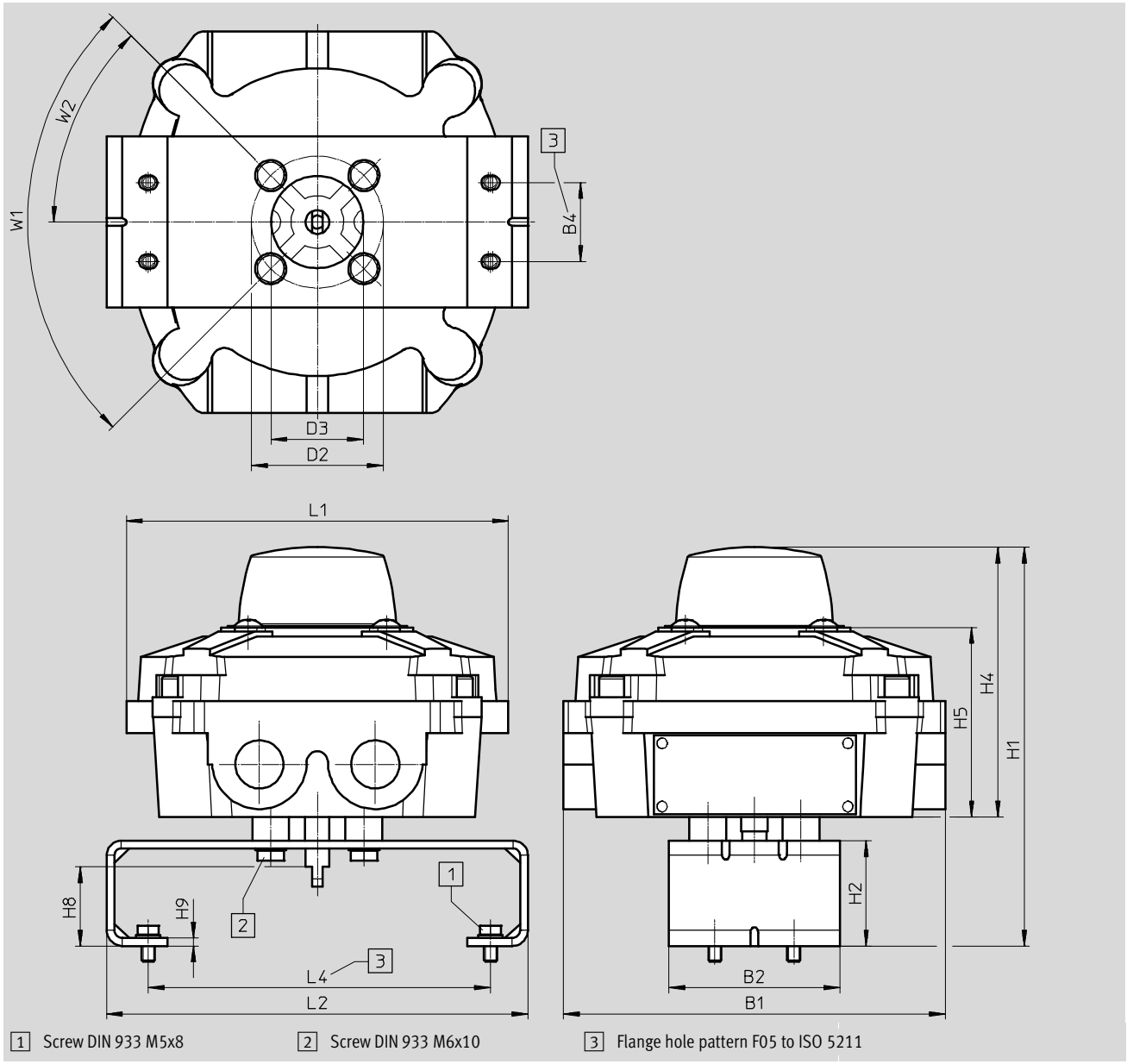
SRBE	B1	B2	B4	D2 ∅	D3 ∅	H1	H2 +0.5	H4
With DARQ-K-X1-A1-F05-20-R1	145	50	30	50	30	141.5	30	102.5
With DARQ-K-X1-A1-F05-30-R1						151.5	40	

SRBE	H5	H8	H9	L1	L2	L4	L6	W1	W2
With DARQ-K-X1-A1-F05-20-R1	72	20	2	145	95	80	63	90°	45°
With DARQ-K-X1-A1-F05-30-R1		30							

Sensor boxes SRBE, electromechanical and magnetic reed

Technical data

Dimensions Download CAD data ➔ **www.festo.com**



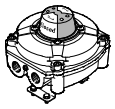
1 Screw DIN 933 M5x8 2 Screw DIN 933 M6x10 3 Flange hole pattern F05 to ISO 5211

SRBE	B1	B2	B4	D2 ∅	D3 ∅	H1	H2 +0.5	H4
With DARQ-K-X1-A2-F05-30-R1	145	65	30	50	35	151.5	40	102.5

SRBE	H5	H8	H9	L1	L2	L4	W1	W2
With DARQ-K-X1-A2-F05-30-R1	72	30	3	145	160	130	90°	45°

Technical data

Ordering data

	Brief description	Dimensions Mounting adapter [mm]	Weight [g]	Part No.	Type
	Sensor box including pre-assembled mounting adapter	30 x 80, H: 20	1700	**3471008**	**SRBE-CA3-YR90-MW-22A-1W-C2N12-EX**
				3471009	**SRBE-CA3-YR90-MW-22A-1W-C2M20-EX**
				3471010	**SRBE-CA3-YR90-MW-22A-2W-C2N12-EX**
				3471011	**SRBE-CA3-YR90-MW-22A-2W-C2M20-EX**
				3471020	**SRBE-CA3-YR90-R-2A-1W-C2N12-EX**
				3471021	**SRBE-CA3-YR90-R-2A-1W-C2M20-EX**
				3998917	**SRBE-CA3-YR90-MW-22A-1W-C2N12-C1**
				3998918	**SRBE-CA3-YR90-MW-22A-2W-C2N12-C1**
				3998923	**SRBE-CA3-YR90-R-2A-1W-C2N12-C1**

Sensor boxes SRBE, inductive

Technical data

- Inductive measuring principle
- Switching outputs PNP, NPN, 2-wire DC, NAMUR
- Pre-assembled mounting adapter 80 x 30 H20

General technical data					
Type SRBE-...		-1-P	-1-N	-1-ZU	-20N
Setting range for angle detection	[°]	0 ... 90			
Based on standard		ISO 5211			
		VDI/VDE 3845			
		EN 60947-5-2			EN 60947-5-6
Type of mounting		On flange to ISO 5211			
		With mounting bracket			

Electrical data					
Type SRBE-...		-1-P	-1-N	-1-ZU	-20N
Measuring principle		Inductive			
Switching output		PNP	NPN	Non-contacting, 2-wire	NAMUR
Switching element function		N/O contact			N/C contact
Operating voltage range	[V DC]	10 ... 30		5 ... 60	8.2
Voltage drop	[V]	≤ 3		≤ 5	–
Max. output current	[mA]	100			3
Idle current	[mA]	≤ 15		–	
Residual current	[mA]	0 ... 0.5		0 ... 1	–
Minimum load current	[mA]	–		4	–
Reverse polarity protection		For all electrical connections			–
Protection against short circuit		Pulsed		–	

Electromechanical components		
Electrical connection		10-pin
		Screw terminal
Nominal conductor cross section that can be connected	[mm²]	0.25 ... 2.5
Cable connector		M20x1.5 for ...-C2M20-...
		1/2 NPT for ...-C2N12-...

Materials	
Housing	Epoxy-coated die-cast aluminium
Shaft	High-alloy stainless steel
Screws	High-alloy stainless steel
Mounting bracket	High-alloy stainless steel
Seals	NBR
Pointer	PC
Note on materials	RoHS compliant
	Contains paint-wetting impairment substances

Technical data

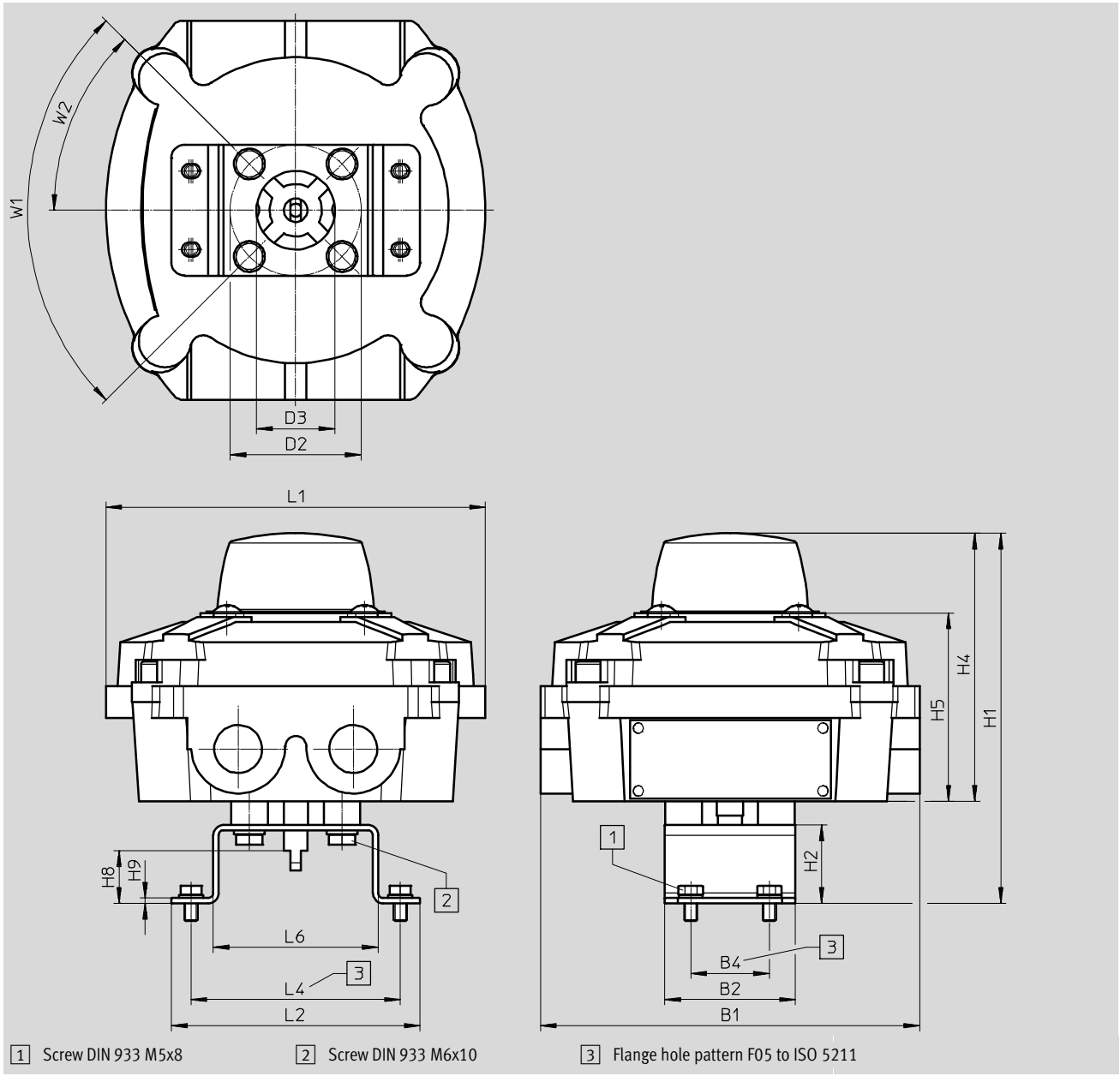
Operating and environmental conditions Type SRBE-...			
Ambient temperature	[°C]	–20 ... +60	
Storage temperature	[°C]	–20 ... +60	
CE marking		To EU EMC Directive[1)]	
Approval certificate		RCM mark	
Shock resistance		Shock test with severity level 2 according to FN 942017-5 and EN 60068-2-27	
Vibration resistance		Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6	
Safety integrity level (SIL)		SIL 2	
Certifications for ...-EX variants			-1-ZU
Degree of protection		IP67	
CE marking		As per EU Explosion Protection Directive (ATEX)	
ATEX category for gas		II 2G	
ATEX category for dust		II 2D	
Explosion ambient temperature		–20 ... +60	
Type of ignition protection for gas		Ex d IIC T6 Gb	
Type of ignition protection for dust		Ex tb IIIC T61°C Db	Ex tb IIIC T75°C Db
Explosion protection certification outside the EU		EPL Db (IEC-EX)	
		EPL Db (BR)	
		EPL Db (CN)	
		EPL Gb (IEC-EX)	
		EPL Gb (BR)	
		EPL Gb (CN)	
Certificate issuing authority		DNV 16.0067X (INMETRO)	
		FTZU 15 ATEX 0095X (PESO)	
		GYJ 16.1497X (NEPSI)	
		IECEx FTZU 15.0014X	
Certifications for ...-C1 variants			
Degree of protection		IP67	
		NEMA 4/4X	
Type of ignition protection for gas		AEx d IIB T5 Gb	
		Ex d IIB T5 Gb	
		AEx nA IIC T5 Gc	
		Ex nA IIC T5 Gc	
Type of ignition protection for dust		AEx tb IIIC T108°C Db	
		Ex tb IIIC T108°C Db	
Explosion protection certification outside the EU		Class I, Div. 1 (CA)	
		Class I, Div. 1 (US)	
		Class I, Div. 2 (CA)	
		Class I, Div. 2 (US)	
		Class II, Div. 1 (CA)	
		Class II, Div. 1 (US)	
		Class III (CA)	
		Class III (US)	
		EPL Db (CA)	
		EPL Db (US)	
		EPL Gb (CA)	
		EPL Gb (US)	
		EPL Gc (CA)	
		EPL Gc (US)	
Certificate issuing authority		CSA 263311	

1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Sensor boxes SRBE, inductive

Technical data

Dimensions Download CAD data ➔ **www.festo.com**



1 Screw DIN 933 M5x8 2 Screw DIN 933 M6x10 3 Flange hole pattern F05 to ISO 5211

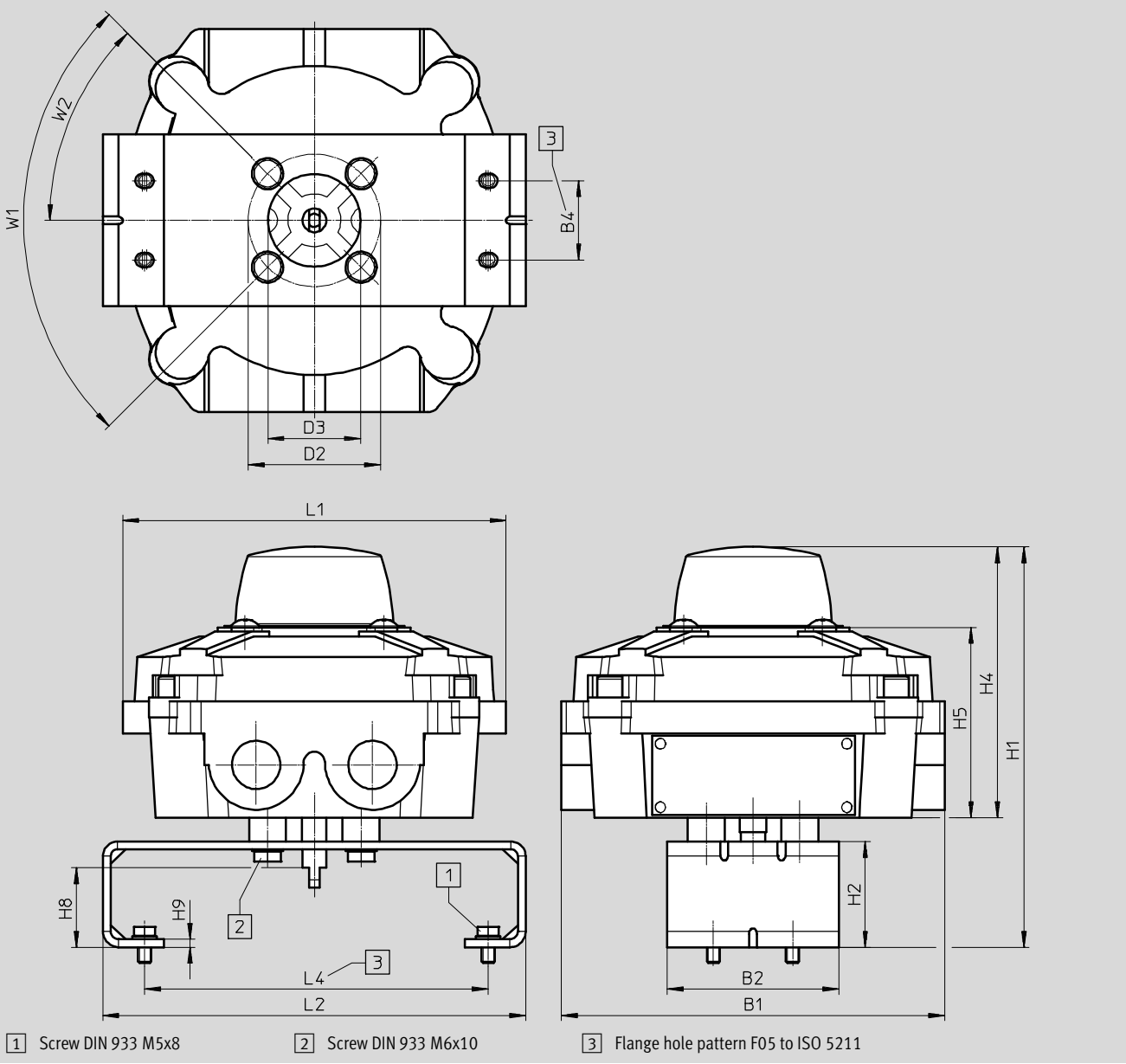
SRBE	B1	B2	B4	D2 ∅	D3 ∅	H1	H2 +0.5	H4
With DARQ-K-X1-A1-F05-20-R1	145	50	30	50	30	141.5	30	102.5
With DARQ-K-X1-A1-F05-30-R1						151.5	40	

SRBE	H5	H8	H9	L1	L2	L4	L6	W1	W2
With DARQ-K-X1-A1-F05-20-R1	72	20	2	145	95	80	63	90°	45°
With DARQ-K-X1-A1-F05-30-R1		30							

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**



1 Screw DIN 933 M5x8
2 Screw DIN 933 M6x10
3 Flange hole pattern F05 to ISO 5211

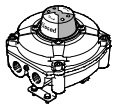
SRBE	B1	B2	B4	D2 ∅	D3 ∅	H1	H2 +0.5	H4
With DARQ-K-X1-A2-F05-30-R1	145	65	30	50	35	151.5	40	102.5

SRBE	H5	H8	H9	L1	L2	L4	W1	W2
With DARQ-K-X1-A2-F05-30-R1	72	30	3	145	160	130	90°	45°

Sensor boxes SRBE, inductive

Technical data

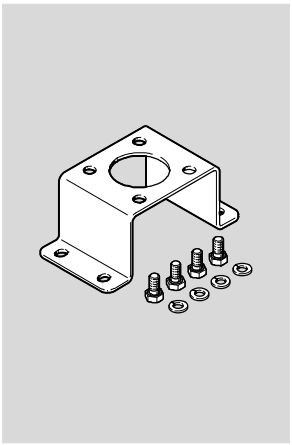
Ordering data

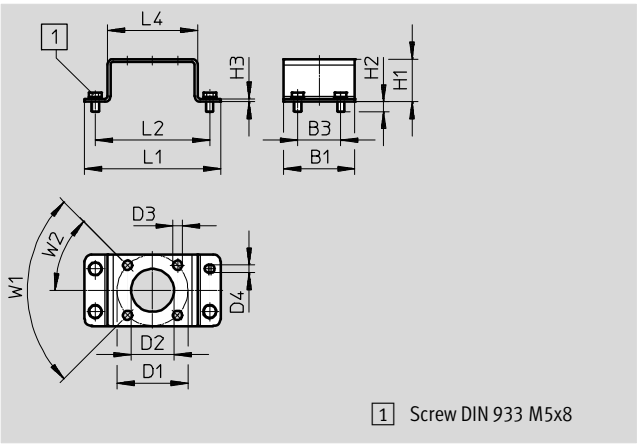
	Brief description	Dimensions Mounting adapter [mm]	Weight [g]	Part No.	Type
	Sensor box including pre-assembled mounting adapter	30 x 80, H: 20	1700	**3471012**	**SRBE-CA3-YR90-N-20N-ZC-C2N12-EX**
				3471013	**SRBE-CA3-YR90-N-20N-ZC-C2M20-EX**
				3471014	**SRBE-CA3-YR90-N-1-P-C2N12-EX**
				3471015	**SRBE-CA3-YR90-N-1-P-C2M20-EX**
				3471016	**SRBE-CA3-YR90-N-1-N-C2N12-EX**
				3471017	**SRBE-CA3-YR90-N-1-N-C2M20-EX**
				3471018	**SRBE-CA3-YR90-N-1-ZU-C2N12-EX**
				3471019	**SRBE-CA3-YR90-N-1-ZU-C2M20-EX**
				3998919	**SRBE-CA3-YR90-N-20N-ZC-C2N12-C1**
				3998920	**SRBE-CA3-YR90-N-1-P-C2N12-C1**
				3998921	**SRBE-CA3-YR90-N-1-N-C2N12-C1**
				3998922	**SRBE-CA3-YR90-N-1-ZU-C2N12-C1**

Accessories

Mounting adapter DARQ-K-X1-A1-...

- Mounting adapter for mounting on standard actuators to VDI/VDE 3845
- Mounting screws included in the scope of delivery
- Size 30 x 80
- Material:
  High-alloy stainless steel
- Contains paint-wetting impairment substances, RoHS compliant



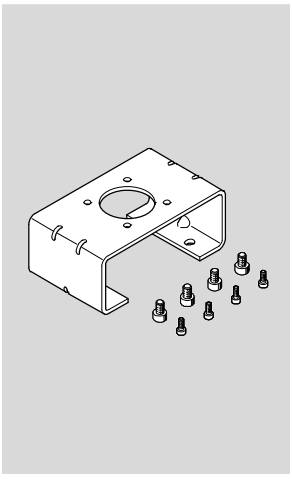


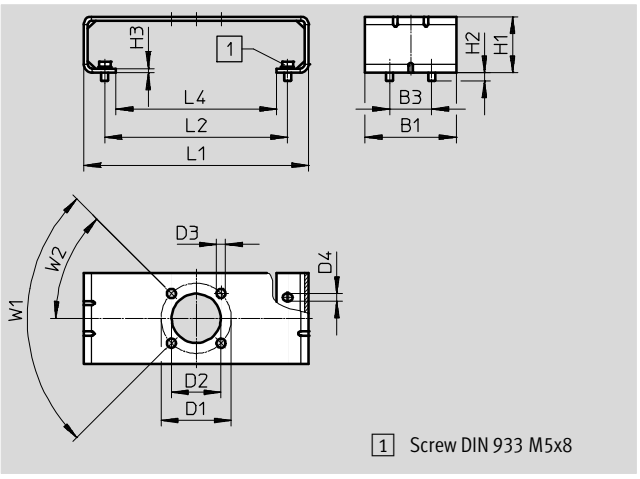
Dimensions and ordering data

B1	B3	D1 ∅	D2 ∅	D3 ∅	D4 ∅	H1 +0.5	H2	H3	L1	L2	L4	W1	W2	Weight [g]	Part No.	Type
50	30	50	30	6.5	5.5	30	6.8	2	95	80	63	90°	45°	350	**3636269**	**DARQ-K-X1-A1-F05-20-R1**
						40								380	**3636270**	**DARQ-K-X1-A1-F05-30-R1**

Mounting adapter DARQ-K-X1-A2-...

- Mounting adapter for mounting on standard actuators to VDI/VDE 3845
- Mounting screws included in the scope of delivery
- Size 30 x 130
- Material:
  High-alloy stainless steel
- Contains paint-wetting impairment substances, RoHS compliant





Dimensions and ordering data

B1	B3	D1 ∅	D2 ∅	D3 ∅	D4 ∅	H1 +0.5	H2	H3	L1	L2	L4	W1	W2	Weight [g]	Part No.	Type
65	30	50	35	6.5	5.4	40	5.8	3	160	130	114	90°	45°	460	**3886114**	**DARQ-K-X1-A2-F05-30-R1**

Sensor boxes, analogue

SRAP

Overview, configuration and ordering
➔ **www.festo.com/catalogue/srap**

Additional information, support and user documentation
➔ **www.festo.com/sp/srap**

Selected types in accordance with the ATEX Directive for explosive atmospheres
➔ **www.festo.com/ex**

+ Analogue sensor box
+ For monitoring the position of quarter turn actuators
+ Output signal 4 ... 20 mA

Sensor boxes SRAP, analogue

Key features

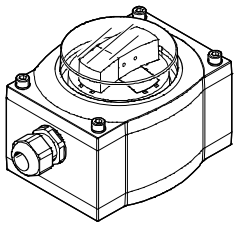
General information

Analogue sensor box for greater functionality. The analogue sensor box monitors the position of semi-rotary actuators and reports this back to the controller via an analogue 4 ... 20 mA output signal.

Advantages

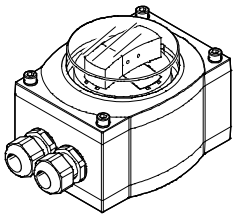
- Simple mounting and commissioning: with teach-in function for flexible adjustment of the zero point within a range from 0 – 270°
- Everything in view, including from a distance: colour-based indication of the current position of the semi-rotary actuator
- Innovative and intelligent: homing to the actual swivel angle makes optimum use of the initial range
- Sturdy and explosion-proof: a match for even harsh, corrosive and potentially explosive environments thanks to corrosion-resistant and waterproof metal housing
- Insensitive to vibration. Always supplies a stable signal as there is no contact between the shaft and sensor
- Quick and easy integration in existing systems thanks to the industrial analogue output signal
- Cost and time savings thanks to the common power supply for the sensor box and solenoid valve
- Cost-efficient regulation in combination with 5/3-way valve compared with positioner solution
- Festo know-how in automation: concept and solution from a single source
- You can find information on the media resistance of the product at ➔ www.festo.com

1 cable connector



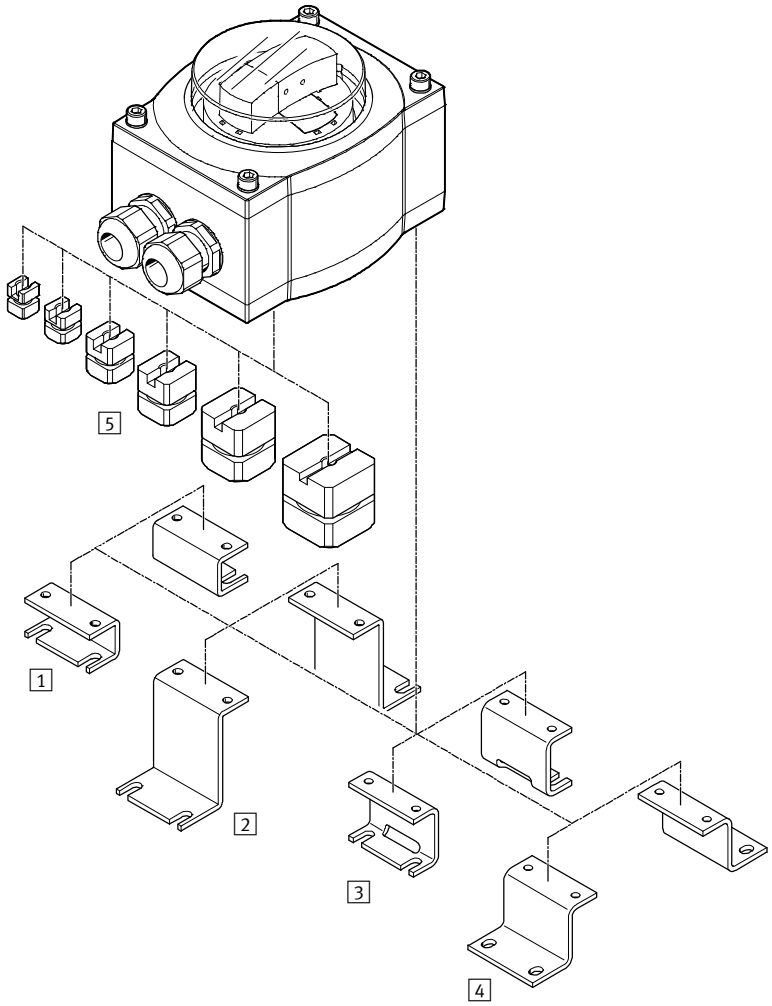
- Power supply for sensor box only

2 cable connectors



- Common power supply for sensor box and solenoid valve

Peripherals overview



Mounting attachments and accessories

		Brief description	→ Page/Internet
1	Adapter kit DASB-P1-HA-SB	Hole pattern 30x80 mm, height 20 mm	277
2	Adapter kit DASB-P1-HL-SB	Hole pattern 30x130 mm, height 50 mm	277
3	Adapter kit DASB-P1-HB-SB	Hole pattern 30x80 mm, height 30 mm	277
4	Adapter kit DASB-P1-HC-SB	Hole pattern 30x130 mm, height 30 mm	277
5	Coupling DARQ-C-S9	For direct mounting of sensor boxes SRAP	277
	Coupling DARQ-C-S11	For direct mounting of sensor boxes SRAP	277
	Coupling DARQ-C-S14	For direct mounting of sensor boxes SRAP	277
	Coupling DARQ-C-S17	For direct mounting of sensor boxes SRAP	277
	Coupling DARQ-C-S22	For direct mounting of sensor boxes SRAP	277
	Coupling DARQ-C-S27	For direct mounting of sensor boxes SRAP	277

Sensor boxes SRAP, analogue

Type codes

SRAP – M – CA1 – BB270 – 1 – A – T2P20 – [ ] – EX2

Function	
SRAP	Analogue sensor box

Product version	
M	Primarily metal

Design	
C	Sensor box

Mechanical interface	
A1	Direct mounting, hole pattern 30x80 mm

Indicator type	
–	No indicator
BB	Blue/black position indicator
GR	Green/red position indicator
YB	Yellow/black position indicator

Measuring range	
270	0 ... 270°

Nominal operating voltage	
1	24 V DC

Electrical output	
A	4 ... 20 mA

Electrical connection	
T	Terminal box

Valve connection	
–	None
2	With valve connection

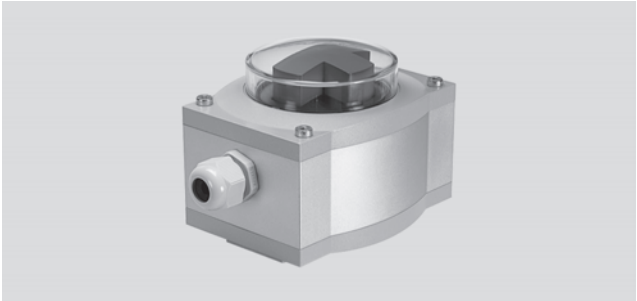
Cable connector	
M20	M20x1.5, metal
P20	M20x1.5, polymer

Temperature range	
–	Standard –20 ... +80 °C

EU certification	
–	None
EX2	II 3GD

Technical data

- The analogue sensor box not only reports the open/closed position of the semi-rotary actuator, but also detects the entire swivel range and reports this back to the controller via an analogue signal
- The integrated sensors are based on proven 2D Hall technology



General technical data			
Adjustment range for angle detection		[°]	0 ... 270
Based on standard			VDI/VDE 3845 (NAMUR)
Design			Angular
Mounting position			Any
Measured variable			Swivel angle
Measuring principle			Magnetic Hall
Adjustment options			Teach-in
			Teach-in via electrical connection
Idle current		[mA]	12 ... 20
Analogue output		[mA]	4 ... 20
Repetition accuracy of analogue output			+/– 1 deg
Operating voltage range	Direct voltage DC	[V]	15 ... 30
Insulation voltage		[V]	50
Surge capacity		[kV]	0.8
Protection against short circuit			Yes
Protection against overloading			Yes
Reverse polarity protection			For all electrical connections
Electrical connection			9-pin
			Screw terminal
			Plug-in
Cable connector			M20x1.5
Max. cable length		[m]	30
Permissible cable diameter		[mm]	5 ... 13
Connectable nominal conductor cross section		[mm^2]	2.5
Product weight		[g]	1000
Housing material			Wrought aluminium alloy
Note on materials			RoHS-compliant

Sensor boxes SRAP, analogue

Technical data

Operating and environmental conditions		
Certification		C-Tick
		c UL us - Recognized (OL)
		RCM trademark
Ambient temperature	[°C]	–20 ... +80 °C
Protection class		IP65
CE mark (see declaration of conformity)		To EU EMC Directive
Electrical protection class		III
Degree of contamination		3
Corrosion resistance class CRC[1)]		3

1) Corrosion resistance class 3 according to Festo standard 940 070
Components subject to high corrosion stress. External visible parts in direct contact with industrial atmospheres or media such as solvents and cleaning agents, with a predominantly functional requirement for the surface.

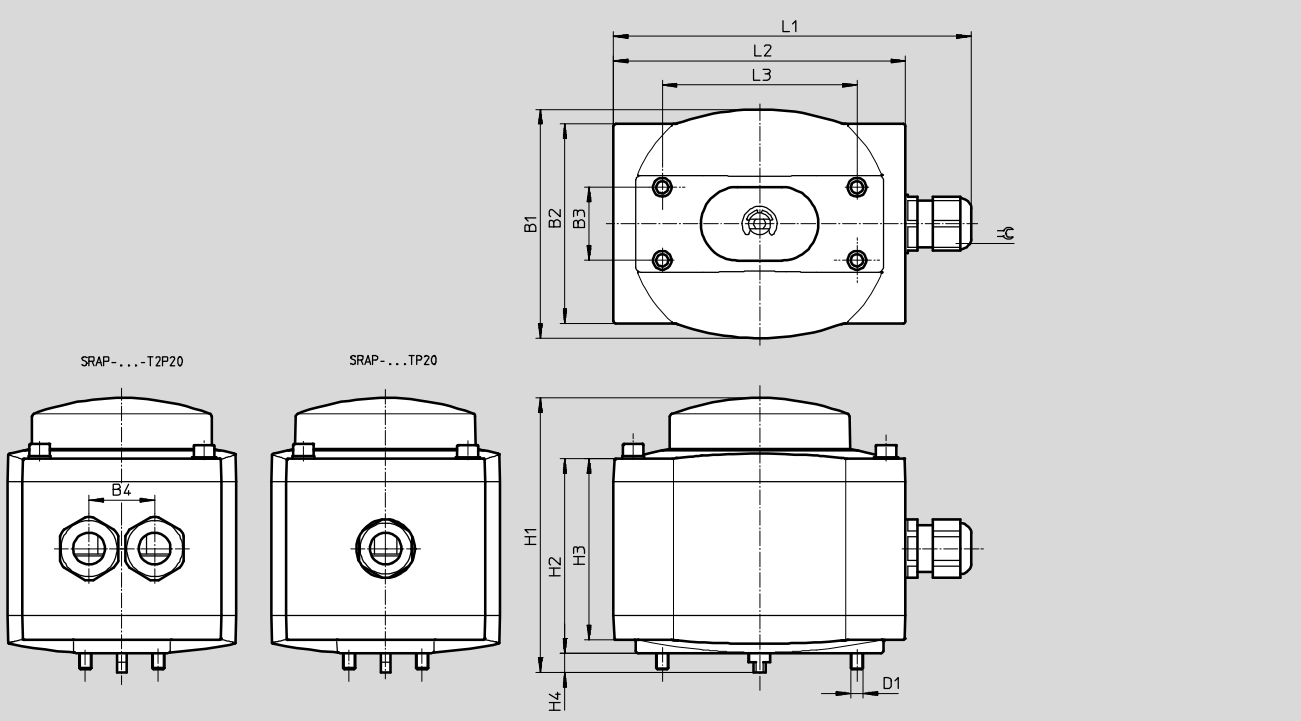
Operating and environmental conditions with explosion protection		
Certification		C-Tick
		c UL us - Recognized (OL)
		RCM trademark
Ambient temperature	[°C]	–20 ... +80 °C
Protection class		IP65
CE mark (see declaration of conformity)		To EU EMC Directive
		To EU Explosion Protection Directive (ATEX)
ATEX category for gas		II 3G
Explosion ignition protection type for gas		Ex nA IIC T5 X Gc
ATEX category for dust		II 3D
Explosion ignition protection type for dust		Ex tc IIIC T90°C X Dc IP65
Explosion-proof ambient temperature		–20 °C ≤ Ta ≤ +80 °C
Explosion protection certification outside the EU		EPL Dc (RU)
		EPL Gc (RU)
Electrical protection class		III
Degree of contamination		3
Corrosion resistance class CRC[1)]		3

1) Corrosion resistance class 3 according to Festo standard 940 070
Components subject to high corrosion stress. External visible parts in direct contact with industrial atmospheres or media such as solvents and cleaning agents, with a predominantly functional requirement for the surface.

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

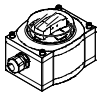
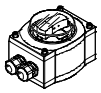


Type	B1	B2 ±1	B3	B4	D1	H1	H2	H3	H4	L1	L2 ±1	L3	⌯
SRAP-M-CA1-BB270-1-A-TP20	94	82	30	–	M5	112.7	80	74.5	7.8	148	120	80	24
SRAP-M-CA1-BB270-1-A-TP20-EX2													
SRAP-M-CA1-GR270-1-A-TM20										147			22
SRAP-M-CA1-GR270-1-A-TP20										148			24
SRAP-M-CA1-GR270-1-A-TP20-EX2													
SRAP-M-CA1-YB270-1-A-TM-20										147			22
SRAP-M-CA1-YB270-1-A-TP-20										148			24
SRAP-M-CA1-YB270-1-A-TP-20-EX2													
SRAP-M-CA1-GR270-1-A-T2P20				27									
SRAP-M-CA1-GR270-1-A-T2P20-EX2													
SRAP-M-CA1-270-1-A-T2P20													
SRAP-M-CA1-270-1-A-T2P20-EX2													

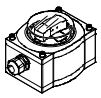
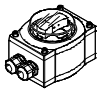
Sensor boxes SRAP, analogue

Technical data

Ordering data – Sensor boxes SRAP, analogue without explosion protection

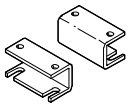
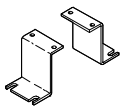
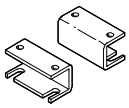
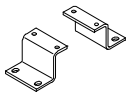
	Position indicator	Part No.	Type
	Blue/black	**568236**	**SRAP-M-CA1-BB270-1-A-TP20**
	Red/green	**568238**	**SRAP-M-CA1-GR270-1-A-TM20**
	Red/green	**568239**	**SRAP-M-CA1-GR270-1-A-TP20**
	Yellow/black	**568242**	**SRAP-M-CA1-YB270-1-A-TM20**
	Yellow/black	**568243**	**SRAP-M-CA1-YB270-1-A-TP20**
	Red/green	**568246**	**SRAP-M-CA1-GR270-1-A-T2P20**
	No indicator	**570527**	**SRAP-M-CA1-270-1-A-T2P20**

Ordering data – Sensor boxes SRAP, analogue with explosion protection

	Position indicator	Part No.	Type
	Blue/black	**568237**	**SRAP-M-CA1-BB270-1-A-TP20-Ex2**
	Red/green	**568241**	**SRAP-M-CA1-GR270-1-A-TP20-Ex2**
	Yellow/black	**568245**	**SRAP-M-CA1-YB270-1-A-TP20-Ex2**
	Red/green	**568247**	**SRAP-M-CA1-GR270-1-A-T2P20-Ex2**
	No indicator	**570528**	**SRAP-M-CA1-270-1-A-T2P20-Ex2**

Accessories

Dimensions and ordering data

	Brief description	Part No.	Type
Adapter kit			
	• Adapter kit for DAPS • Shaft height 20 mm, hole patterns 80x30 mm	**568275**	**DASB-P1-HA-SB**
	• Adapter kit for third-party drives • Shaft height 50 mm, hole patterns 130x30 mm	**568276**	**DASB-P1-HL-SB**
	• Adapter kit for DAPS • Shaft height 30 mm, hole patterns 80x30 mm	**572418**	**DASB-P1-HB-SB**
	• Adapter kit for DAPS • Shaft height 30 mm, hole patterns 130x30 mm	**572419**	**DASB-P1-HC-SB**
Couplings			
	Couplings for direct mounting of sensor boxes SRAP	**568674** **568675** **568676** **568677** **568678** **568679**	**DARQ-C-S9** **DARQ-C-S11** **DARQ-C-S14** **DARQ-C-S17** **DARQ-C-S22** **DARQ-C-S27**
Cable connector			
	Polymer cable connector M20x1.5	**568278**	**NETC-P-M20-P4**
	Metal cable connector M20x1.5	**568279**	**NETC-M-M20-P4**

Limit switch attachments
DAPZ

Overview, configuration and ordering
➔ **www.festo.com/catalogue/dapz**

Additional information, support and user documentation
➔ **www.festo.com/sp/dapz**

Selected types in accordance with the ATEX Directive for explosive atmospheres
➔ **www.festo.com/ex**

+ Drive interface to NAMUR VDI/VDE 3845
+ Quick and easy assembly and connection
+ Integrated actuation of the solenoid valve

+ DAPZ-SB-I-... (measuring principle: inductive), DAPZ-SB-M... (measuring principle: mechanical) with AS-i interface

Limit switch attachments DAPZ

Type codes

DAPZ – SB – M – 250AC – DR – AR

Type	
DAPZ	Limit switch attachment

Specification	
SB	Sensor box

Measuring principle	
I	Inductive
M	Electrical, micro switch

Operating voltage	
25DC	8 V DC
30DC	30 V DC
250AC	250 V AC/DC

Version	
EX	Explosion-proof
D	Display
R	Round design

Variant	
AR	Foot height adjustable

Technical data

- Drive interface to Namur VDI/VDE 3845
- Quick and easy assembly and connection
- Integrated solenoid valve actuation

General technical data			DAPZ-SB-M-250AC-DR-AR	DAPZ-SB-I-30DC-DR-AR	DAPZ-SB-I-25DC-EXDR-AR
Measuring principle			Mechanical, electrical	Inductive	Inductive
Based on standard			EN 60947-5-1	EN 60947-5-2	EN 60947-5-6
			VDI/VDE 3845 (NAMUR)		
Design			Round		
Mounting position			Any		
Protection against short circuit			No	Pulsed	No
Switching element function			Changeover switch	Normally open contact	Normally closed contact
Protection against reverse polarity			No	For all electrical connections	No
Switching position display			Yes		
Switching output			–	PNP	Namur
Operating voltage range	Direct current DC	[V]	4 ... 250	10 ... 30	–
	Alternating current AC	[V]	4 ... 250	–	–
Intrinsic current consumption at operating voltage		[mA]	1 ... 5	0 ... 100	–
Nominal operating voltage DC		[V]	–	–	8
Max. input power Pi		[mW]	–	–	34
Max. input voltage Ui	Direct current DC	[V]	–	–	16
Max. input current Ii		[mA]	–	–	25
Insulation voltage		[V]	250	50	25
Surge capacity		[kV]	2.5	0.5	0.5
Max. output current		[mA]	5,000	100	–
Switching current	Attenuated	[mA]	–	–	0 ... 1
	Non-attenuated	[mA]	–	–	3
Minimum load current			1 mA at 4 V/DC	–	–
Electrical connection			Screw terminal		
Permissible cable diameter		[mm]	7 ... 13		
Cable connector			M20x1.5		

Limit switch attachments DAPZ

Technical data

Operating and environmental conditions		DAPZ-SB-M-250AC-DR-AR	DAPZ-SB-I-30DC-DR-AR	DAPZ-SB-I-25DC-EXDR-AR
Ambient temperature	[°C]	–20 ... +70 °C		
Protection class		IP67		
CE marking (see declaration of conformity)		To EU Low Voltage Directive	–	To EU Explosion Protection Directive (ATEX)
ATEX category for gas		–	–	II 2GX
Explosion ignition protection type for gas		–	–	EEx ia IIB T6
Explosion-proof temperature rating		–	–	–20 °C ≤ Ta ≤ +70 °C
Certificate issuing authority		–	–	PTB 00 ATEX 2032 X
Explosion protection certification outside the EU		–	–	EPL Gb (RU)
		–	–	EPL Gc (RU)
PFD		–	–	4,69E-04
PFH		–	–	1,07E-07
Degree of contamination		3		
Corrosion resistance class CRC[1)]		2		

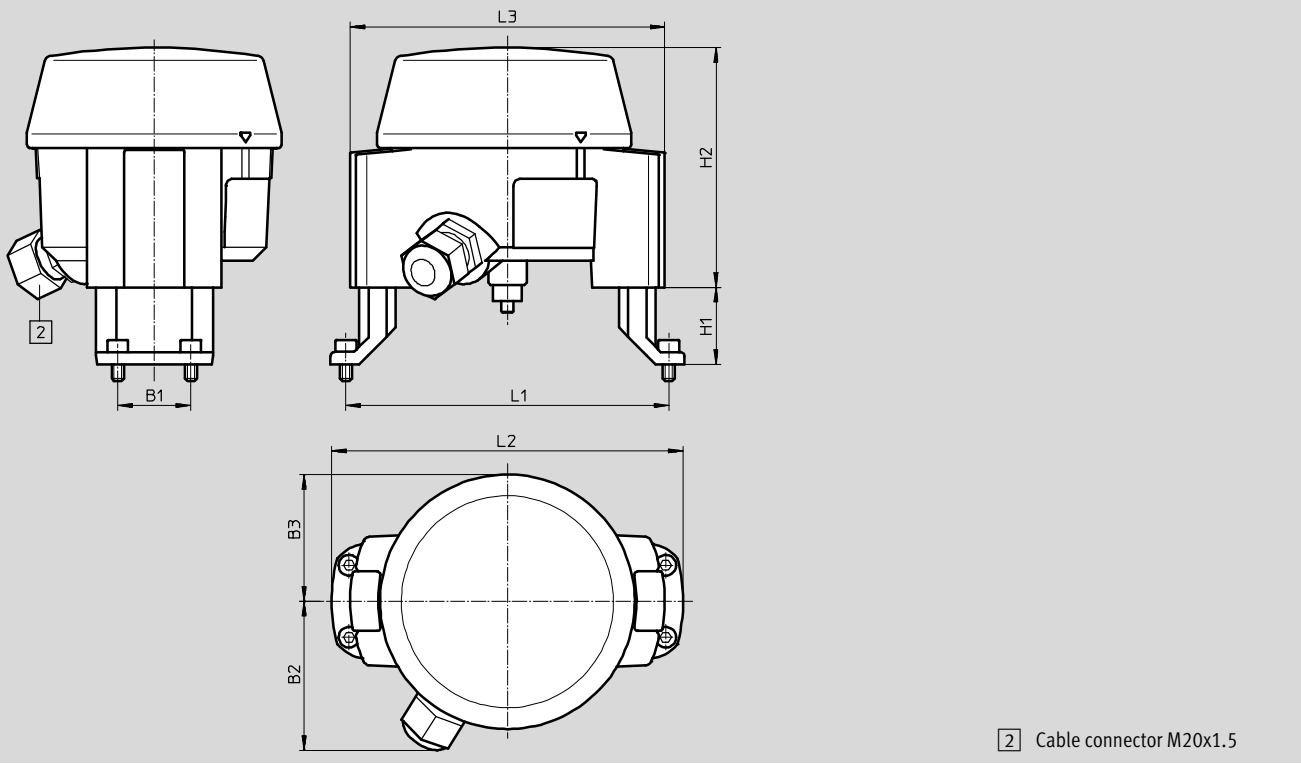
1) Corrosion resistance class 2 according to Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

Materials	
Housing cover	PC
Housing socket, bracket	ABS, PC
Seals	NBR
Note on materials	RoHS-compliant

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**



2 Cable connector M20x1.5

	B1	B2	B3	H1	H2	L1	L2	L3
Feet mounted inwards								
Foot height adjustable	30	62	52.5	20, 30, 50	100	80	66	130
Feet mounted outwards								
Foot height adjustable	30	62	52.5	20, 30, 50	100	130	144	130

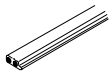
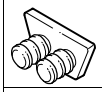
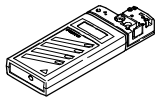
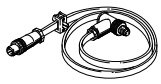
Ordering data

Sensing type	Variant	Measuring principle	Part No.	Type
Mechanical	Basic version	Mechanical, electrical	**534474**	**DAPZ-SB-M-250AC-DR-AR**
Contactless	Basic version	Inductive	**534475**	**DAPZ-SB-I-30DC-DR-AR**
Contactless	Explosion-proof	Inductive	**534476**	**DAPZ-SB-I-25DC-EXDR-AR**

Limit switch attachments DAPZ

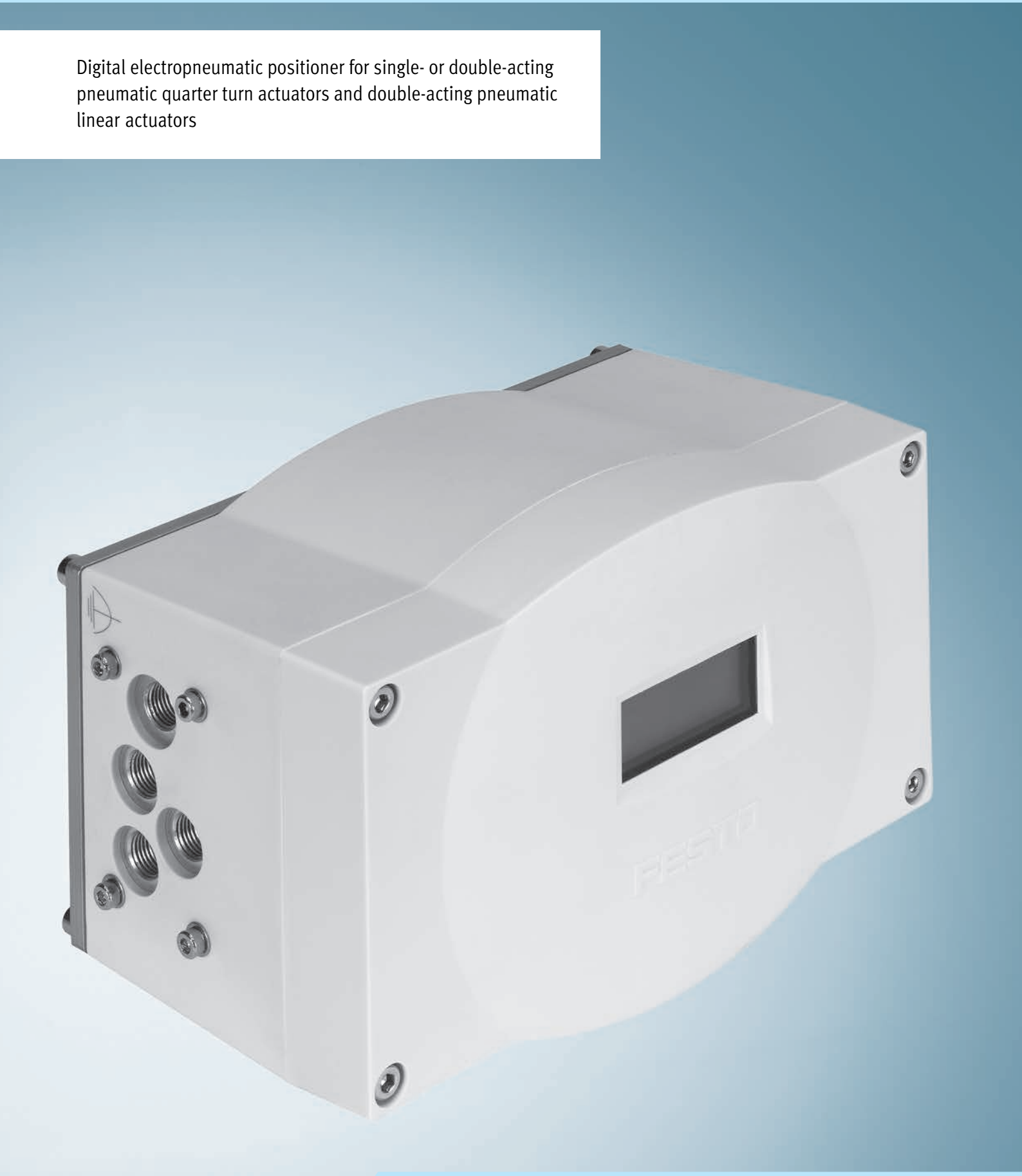
Accessories

Ordering data

	Brief description	Part No.	Type
Fieldbus connection			
	Flat cable for AS-interface components, yellow, 100 m	**18940**	**KASI-1,5-Y-100**
	Cable distributor for flat cable, cable rotatable	**18786**	**ASI-KVT-FK**
	Cable distributor for flat cable, cable symmetrical	**18797**	**ASI-KVT-FK-S**
	Cable cap for flat cable (50 included in the scope of delivery)	**18787**	**ASI-KK-FK**
	Cable sleeve (20 included in the scope of delivery)	**165593**	**ASI-KT-FK**
Miscellaneous			
	Addressing device for AS-interface stations	**18959**	**ASI-PRG-ADR**
	Addressing cable for addressing device	**18960**	**KASI-ADR**

03 Positioners

Digital electropneumatic positioner for single- or double-acting pneumatic quarter turn actuators and double-acting pneumatic linear actuators



CMSX ★

Positioners

+ Digital, electropneumatic
+ Positioner for pneumatic quarter turn and linear actuators
+ Predefinable safety position

➔ page 289

Contents

Positioners CMSX 289

Positioners
CMSX ★

Overview, configuration and ordering
➔ **www.festo.com/catalogue/cmsx**

Additional information, support and user documentation
➔ **www.festo.com/sp/cmsx**

Quick ordering of basic designs
➔ page 299

+ No air consumption in the adjusted state
+ Power supply 24 VDC
+ Setpoint input 0/4...20 mA, 0...10 V
+ Position feedback 4 ... 20 mA
+ 1 digital input, 3 digital outputs
+ Standard nominal flow rate 50 l/min or 130 l/min
+ Integrated or remote position sensing
+ Safety position fail safe or fail in place

+ For single- and double-acting quarter turn actuators DFPD with size ≥40, single-acting quarter turn actuators DAPS with size ≥53, for double-acting quarter turn actuators DAPS with size ≥60 as well as double-acting linear actuators DFPI with size 100 ... 320 (piston diameter ≥63 mm)

Positioners CMSX

Key features

Function and application

The positioner CMSX is used to control the position of single- and double-acting pneumatic actuators and double-acting linear actuators in process automation systems. It is suitable for operation with actuators that have a swivel angle of approx. 90° and a mechanical interface in accordance with VDI/VDE Directive 3845. The CMSX enables simple and efficient position control based on the PID control algorithm. Positions are specified via a setpoint signal. The integrated potentiometer senses the current position of the quarter turn actuator via the shaft and forwards the measured value to the internal regulator. The regulator compares the setpoint value specified by analogue means with the measured value and actuates the solenoid valves accordingly via pulse-width modulation (PWM).

Security

Several freely programmable safety positions in case of current failure, additional digital error signal for emergency shut-down.
Several freely configurable, analogue input signals for each task, for reliable monitoring of the actual position via the analogue feedback signal.

Economic efficiency

Via integrated, analogue feedback functions and the definable safety positions.
No air consumption if the actuator is not moving.

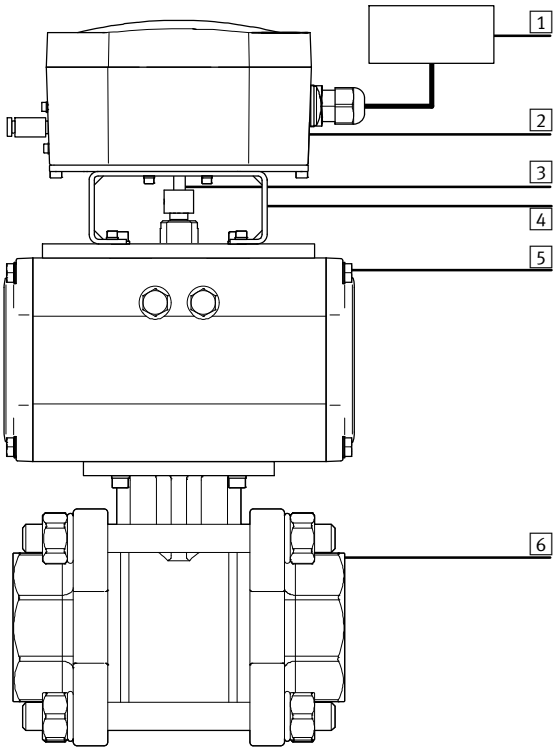
Variants

CMSX-...-A
On this product variant, working port 4 is exhausted and working port 2 is pressurised. The process valve is opened or closed depending on the tubing connections between the CMSX-...-A and the quarter turn actuator.

CMSX-...-C
On the product variant CMSX-...-C, working ports 2 and 4 are pressurised to maintain the current position of the quarter turn actuator.

Key features

System structure

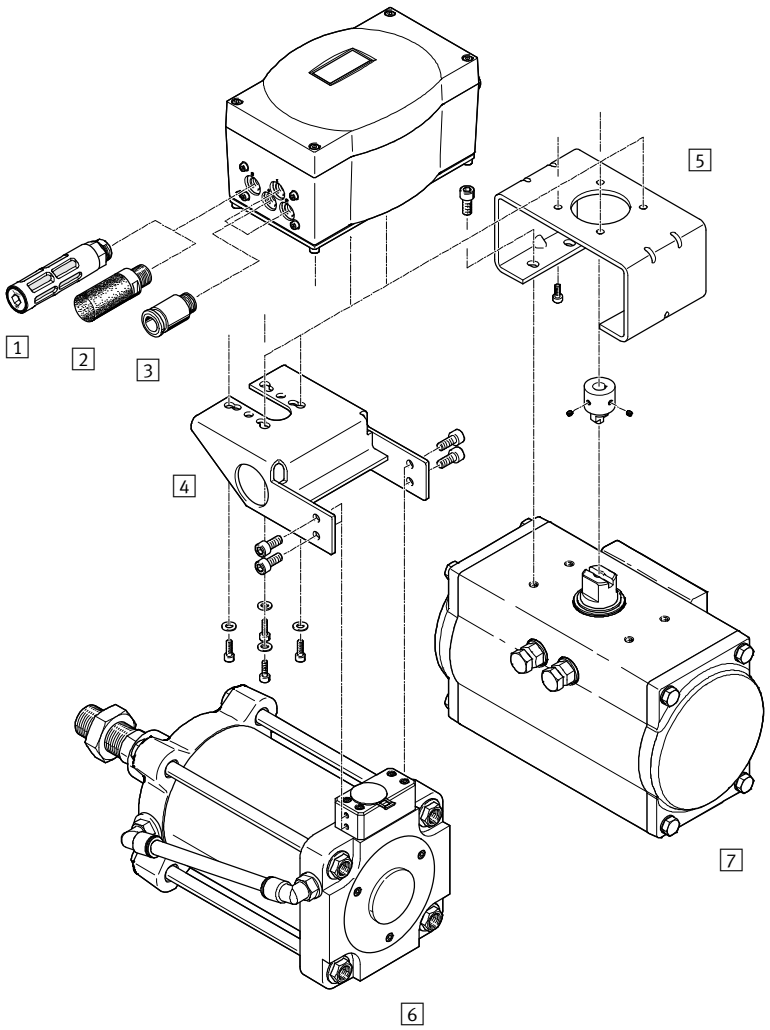


1 Higher-level system (PLC/IPC or external setpoint generator)
2 Positioner CMSX
3 Mechanical coupling
4 Mounting bridge DARQ
5 Quarter turn actuator (example: DFPD)
6 Process valve (example: VZBA)

Positioners	Semi-rotary drives DFPD ➔ page 373		DAPS ➔ page 413		Linear drives DFPI ➔ page 317
	single-acting	double-acting	single-acting	double-acting	double-acting
	Sizes		Sizes		Piston ∅ [mm]
CMSX-P-...-C-U-F1-S-50-...	≥ 40	–	≥ 0060	–	–
CMSX-P-...-C-U-F1-D-50-...	–	≥ 40	–	≥ 0060	–
CMSX-P-...-C-U-F1-S-130-...	≥ 240	–	≥ 0240	–	≥ 100
CMSX-P-...-C-U-F1-D-130-...	–	≥ 240	–	≥ 0240	≥ 100

Positioners CMSX

Peripherals overview



Mounting components and accessories

	Brief description	➔ Page/Internet
1 Silencer U	With polymer, male thread	u
2 Silencer U	For reducing noise at exhaust ports	uc
3 Push-in fittings QS	A secure solution for every connection	qs
4 Adapter kit DADG	For direct mounting of a positioner on the actuator	363
5 Mounting bridges DARQ	For connecting positioners and actuators for process automation	300
6 Linear actuator DFPI	Actuators for process automation with integrated displacement encoder	317
7 Quarter turn actuator DFPD	Actuators for process automation	373

Type codes

CMSX – P – S – C – U – F1 – D – 50 – A

Type	
CMSX	Positioner for process automation

Product version	
P	Primarily polymers

Design	
S	Positioner, displacement/angle measurement integrated
SE	Positioner, displacement/angle measurement external

Display type	
C	LCD, backlit

Setpoint value	
U	Configurable (0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA)

Position feedback	
F1	4 ... 20 mA

Function	
D	Double-acting
S	Single-acting

Flow	
50	50 l/min
130	130 l/min

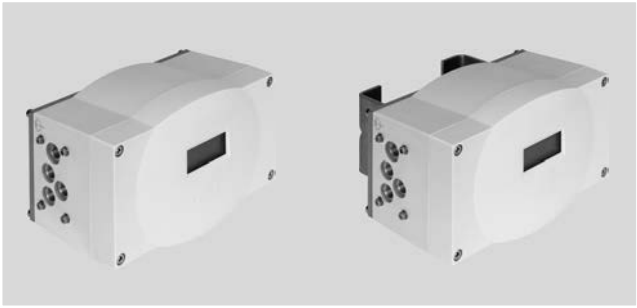
Safety function	
A	Opening or closing in the event of a system failure[1)]
C	Maintain position[2)] in the event of a system failure[1)]

1) Cable fracture or failure of the power supply
2) Pressurise quarter turn actuator at both ends

Positioners CMSX

Technical data

- Voltage
  21.6 ... 26.4 V DC
- Temperature range
  –5 ... +60 °C
- Flow rate
  50 ... 130 l/min



General technical data		
Pneumatic connection		G1/8
Conforms to standard		VDI/VDE 3845 (NAMUR)
Cable connector		M20x1.5
Type of mounting		On flange to ISO 5211, via accessories
Type of process valve characteristic curves		Freely adjustable over 21 support points
		Linear, equal percentage (1:25, 1:33, 1:50)
Leakproof characteristics		Automatic
		Adjustable
Control range adaptation		Adjustable
Active direction		Adjustable
		Rising, falling
UV resistance		Yes
Display type		Backlit LCD
Setting options		Via display and keys
Size of the dead zone	[%]	0.5 ... 10
Product weight	[g]	970

Electrical data			
		Positioner, displacement/angle measurement integrated	Positioner, displacement/angle measurement external
Measuring principle displacement encoder		–	Potentiometer
Protection against short circuit		Yes	
Protection against incorrect polarity		For operating voltage connections	
		For setpoint value	
Operating voltage range DC	[V]	21.6 ... 26.4	
Setpoint value	[V]	0 ... 10	
	[mA]	0 ... 20	
	[mA]	4 ... 20	
Connection resistance	[kOhm]	–	≥ 20
Max. output current	[mA]	500	
Max. load resistance of current output	[Ohm]	500	
Max. current consumption	[A]	1	
Idle current	[mA]	90 ... 300	
Switching level	[V]	Signal 0 ≤ 5	
	[V]	Signal 1 ≥ 10	
Safety information			
For variant A		Safety position: In the case of a broken cable or a failure in the operating voltage, the regulating action is opening/closing	
For variant C		Safety position: In the case of a broken cable or a failure in the operating voltage, the regulating action is holding[1)]	

1) Pressurise quarter turn actuator at both ends

Technical data

Operating and environmental conditions		
Operating pressure	[bar]	3 ... 8
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Lubricated operation not possible
Ambient temperature	[°C]	–5 ... 60
Temperature of medium	[°C]	–5 ... 60
Storage temperature	[°C]	–20 ... 60
Corrosion resistance class CRC[1]		2
CE marking (see declaration of conformity)[3]		To EU EMC Directive[2]
Approval certificate		RCM trademark
Protection class		IP65

1) Corrosion resistance class 2 according to Festo standard 940070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with the surrounding industrial environment or media such as coolants or lubricating agents.
2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.
3) Additional information www.festo.com/sp ➔ Certificates.

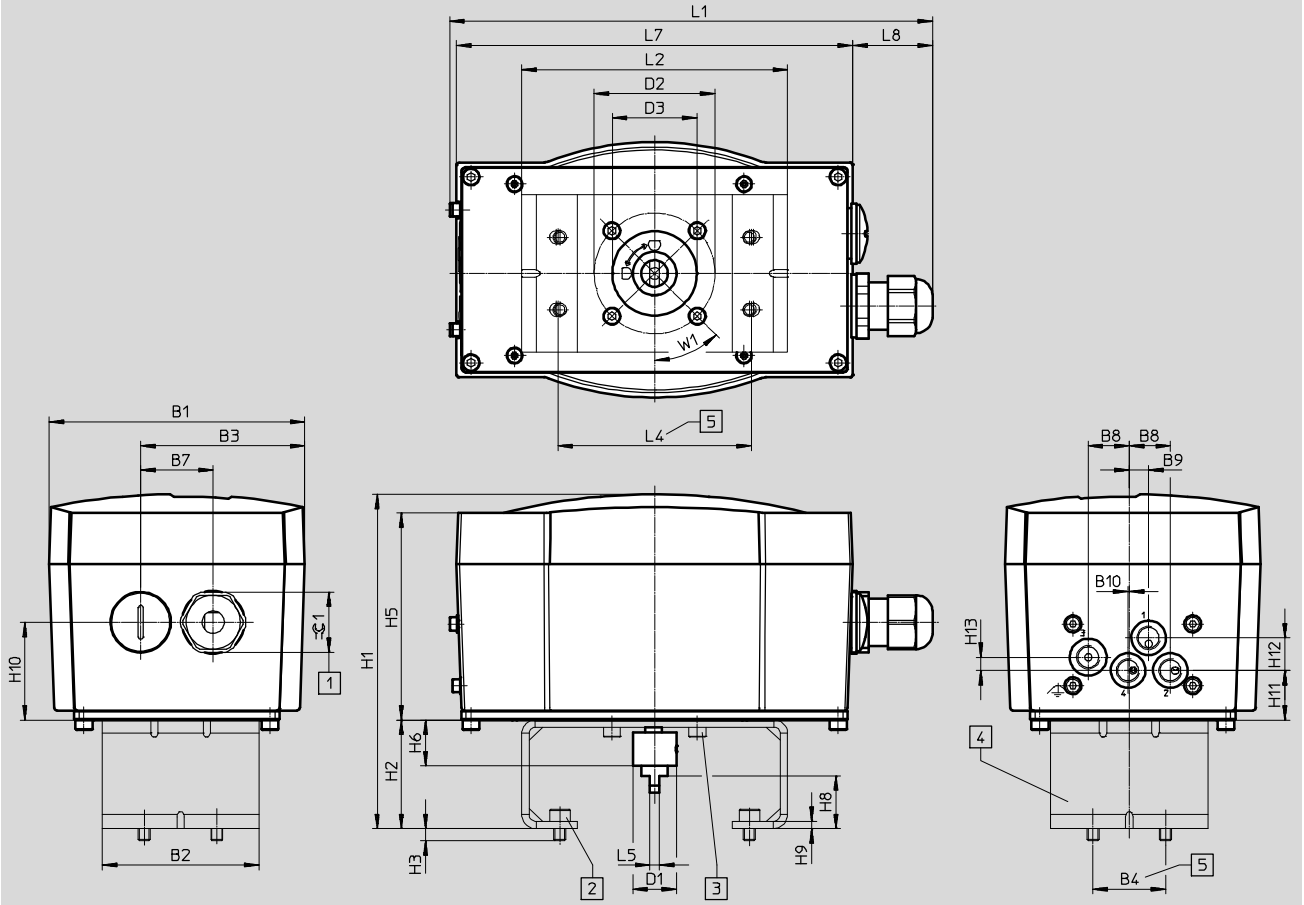
Materials	
Housing	PC
Threaded coupling	High-alloy stainless steel
Adapter plate	Aluminium
Plate	Aluminium
Seals	NBR
Cable connection	PA
Note on materials	RoHS compliant

Positioners CMSX

Technical data

Dimensions Download CAD data ➔ **www.festo.com**

Displacement/angle measurement integrated



1 Cable connector M20x1.5
2 Screw DIN 912 M5x16 (4x)
3 Screw DIN 912 M4x12 (4x)
4 Mounting bridge DARQ
5 Flange hole pattern F05 to ISO 5211

Type	B1	B2	B3	B4	B7	B8	B9	B10	D1 ∅	D2 ∅	D3 ∅	H3	H5
CMSX-P-S-C-U-F1-D-130-...	105.8	65	67.9	30	30	17	8	0.5	18	50	35	5	85.8
CMSX-P-S-C-U-F1-D-50-...													
CMSX-P-S-C-U-F1-S-50-...													
CMSX-P-S-C-U-F1-S-130-...													

Type	H6	H9	H10	H11	H12	L1	L5	L7	L8	W1	⊊1
CMSX-P-S-C-U-F1-D-130-...	19	40.5	20.5	13.5	5.5	200	4	164	32.5	45°	25
CMSX-P-S-C-U-F1-D-50-...											
CMSX-P-S-C-U-F1-S-50-...											
CMSX-P-S-C-U-F1-S-130-...											

Technical data

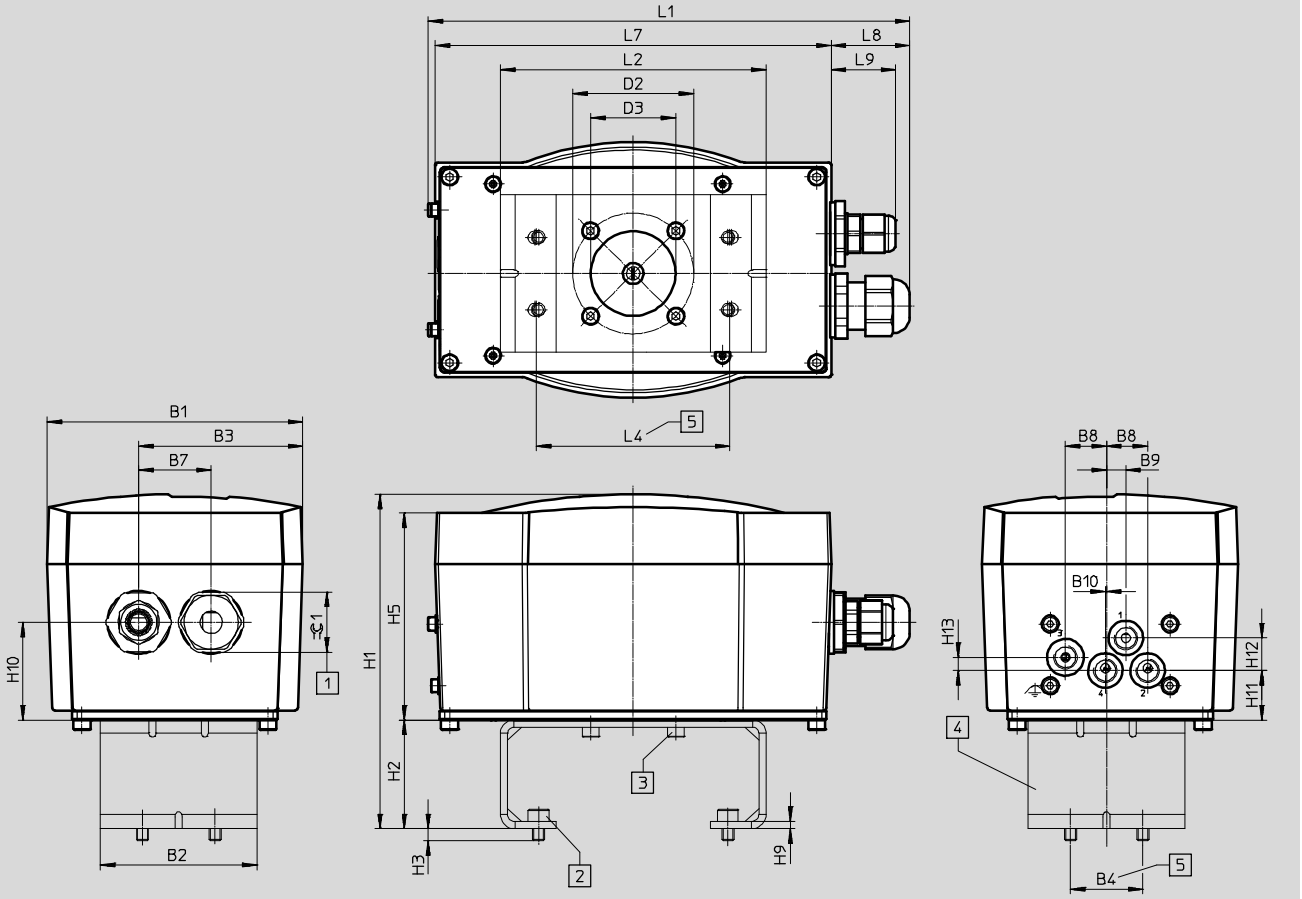
Positioner	Mounting bridge ➔ page 300	H1	H2	H8	L2	L4 ±0.3
CMSX-P-S-C-U-F1-D-130-...	DARQ-K-P-A1-F05-20-R1	138.5	45	20	110	80
	DARQ-K-P-A1-F05-30-R1	148.5	55	30	110	80
	DARQ-K-P-A2-F05-30-R1	148.5	55	30	160	130
CMSX-P-S-C-U-F1-D-50-...	DARQ-K-P-A1-F05-20-R1	138.5	45	20	110	130
	DARQ-K-P-A1-F05-30-R1	148.5	55	30	110	80
	DARQ-K-P-A2-F05-30-R1	148.5	55	30	160	80
CMSX-P-S-C-U-F1-S-50-...	DARQ-K-P-A1-F05-20-R1	138.5	45	20	110	130
	DARQ-K-P-A1-F05-30-R1	148.5	55	30	110	130
	DARQ-K-P-A2-F05-30-R1	148.5	55	30	160	80
CMSX-P-S-C-U-F1-S-130-...	DARQ-K-P-A1-F05-20-R1	138.5	45	20	110	80
	DARQ-K-P-A1-F05-30-R1	148.5	55	30	110	130
	DARQ-K-P-A2-F05-30-R1	148.5	55	30	160	130

Positioners CMSX

Technical data

Dimensions Download CAD data ➔ **www.festo.com**

Displacement/angle measurement external



1 Cable connector M20x1.5
2 Screw DIN 912 M5x16 (4x)
3 Screw DIN 912 M4x12 (4x)
4 Mounting bridge DARQ
5 Flange hole pattern F05 to ISO 5211

Type	B1	B2	B3	B4	B7	B8	B9	B10	D2 ∅	D3 ∅	D4 ∅	H3
CMSX-P-SE-C-U-F1-D-...	105.8	65	67.9	30	30	17	8	0.5	50	35	5.4	5

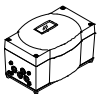
Type	H5	H9	H10	H11	H12	H13	L1	L7	L8	L9	⊊1
CMSX-P-SE-C-U-F1-D-...	85.8	3	40.5	20.5	13.5	5.5	200	164	32.5	25.6	25

Positioner	Mounting bridge ➔ page 300	H1	H2	L2	L4 ±0.3
CMSX-P-SE-C-U-F1-D-...	DARQ-K-P-A1-F05-20-R1	138.5	45	110	80
	DARQ-K-P-A1-F05-30-R1	148.5	55	110	80
	DARQ-K-P-A2-F05-30-R1	148.5	55	160	130

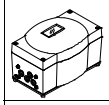
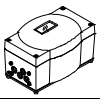
Technical data

★ Core product range

Ordering data

	Safety setting	Standard nominal flow rate [l/min]	Sensing range in degrees [deg]	Part No.	Type
Positioner, displacement/angle measurement integrated					
	Can be set to open or close in the event of a system failure[1]	50	0 ... 100	★ **3929313**	**CMSX-P-S-C-U-F1-D-50-A**
		50		★ **3929370**	**CMSX-P-S-C-U-F1-S-50-A**
Positioner, displacement/angle measurement external					
	Can be set to open or close in the event of a system failure[1]	130	–	★ **3929539**	**CMSX-P-SE-C-U-F1-D-130-A**

Ordering data

	Safety setting	Standard nominal flow rate [l/min]	Sensing range in degrees [deg]	Part No.	Type
Positioner, displacement/angle measurement integrated					
	Can be set to open or close in the event of a system failure[1]	130	0 ... 100	**3929312**	**CMSX-P-S-C-U-F1-D-130-A**
				3929369	**CMSX-P-S-C-U-F1-S-130-A**
	Maintain position in the event of a system failure[1]	130	0 ... 100	**3929314**	**CMSX-P-S-C-U-F1-D-130-C**
		50		**3929315**	**CMSX-P-S-C-U-F1-D-50-C**
Positioner, displacement/angle measurement external					
	Maintain position in the event of a system failure[1]	130	–	**3929540**	**CMSX-P-SE-C-U-F1-D-130-C**

1) Cable fracture or failure of the power supply
2) Pressurise quarter turn actuator at both ends

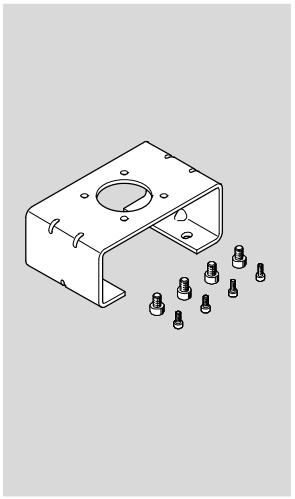
Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

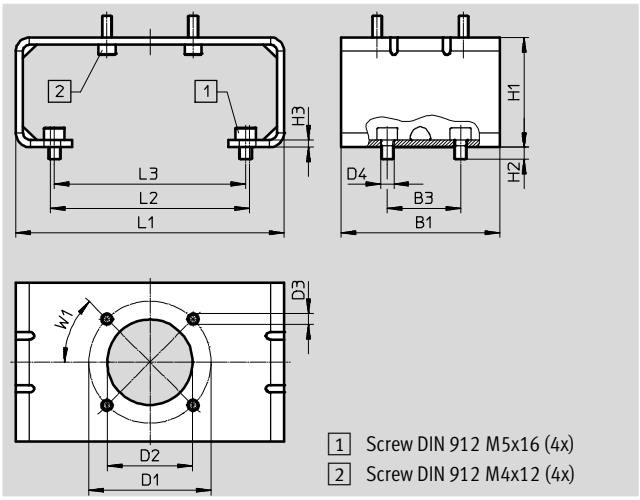
Positioners CMSX

Accessories

Mounting bridge DARQ-K-P-...

- Mounting bridge for mounting on standard actuators as per VDI/VDE 3845
- Mounting screws included in the scope of delivery
- Material: High-alloy stainless steel
- Contains paint-wetting impairment substances, RoHS compliant





Dimensions and ordering data

B1	B3	D1 ∅	D2 ∅	D3 ∅	D4 ∅	H1	H2	H3	L1	L2	L3	W1	CRC[1]	Weight [g]	Part No.	Type
65	30	50	35	4.5	5.4	45	5	3	110	81.6	78.4	45°	2	350	★ **2197135**	**DARQ-K-P-A1-F05-20-R1**
						55								380	★ **2197136**	**DARQ-K-P-A1-F05-30-R1**
						55			160	131.6	128.4			460	**2197137**	**DARQ-K-P-A2-F05-30-R1**

1) Corrosion resistance class 2 according to Festo standard 940070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with the surrounding industrial environment or media such as coolants or lubricating agents.

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

04 Linear drives

+ Pneumatic linear actuators for opening/closing and control applications

DLP

Linear actuators, Copac

+ For opening/closing applications
+ Mounting interface for process valve to DIN EN ISO 5210
+ NAMUR connection pattern for solenoid valves to VDI/VDE 3845

➔ page 305

DFPI

Linear actuators, regulated

+ Optionally with integrated displacement encoder or integrated positioner
+ Mounting interface based on ISO 15552 or DIN EN ISO 5210
+ Different connection versions

➔ page 317

Contents

Linear actuators, Copac DLP 305
Linear actuators DFPI 317

Linear actuators, Copac

DLP

Overview, configuration and ordering
➔ **www.festo.com/catalogue/dlp**

Additional information, support and user documentation
➔ **www.festo.com/sp/dlp**

Selected types in accordance with the ATEX Directive for explosive atmospheres
➔ **www.festo.com/ex**

+ Double-acting
+ Integrated T-slot for proximity sensor for position sensing
+ Integrated air duct
+ NAMUR connection pattern for solenoid valves to VDI/VDE 3845
+ Mounting interface for process valve to DIN EN ISO 5210

+ Diameter 80, 100, 125, 160, 200, 250, 320 mm
+ Force 2800 ... 48000 N
+ Stroke length 40 ... 600 mm

Linear actuators DLP, Copac

Key features and type codes

General

- Ø - Diameter
  80 ... 320 mm
- \- Stroke length
  40 ... 600 mm, additional stroke lengths upon request
- Force
  2800 ... 48000 N

Festo Copac linear valve actuators are ideally suited for use in water, sewage, industrial process water and sileage technology, as well as the paper and bulk goods industry.
A clean solution for shut-off, safety and control slide valves. The Copac linear actuator acts directly upon the slide plate and facilitates accurate advancing to various positions.

- Fast or slow valve actuation
- Position sensing
- Internal air channels eliminate protruding tubing and attachments, and thus also harmful accumulation of contaminants
- Suitable for manual on-site use, as well as automatic operation
- Opening and closing actuated via flange-mounted solenoid valve with port pattern to Namur, or via valve terminals with a choice of 30 different fieldbus protocols
- Sturdy and reliable, even in aggressive environments
- Highly corrosion resistant
- Mounting port pattern to DIN 3358/ISO 5210 for direct mounting
- Port pattern to Namur VDI/VDE 3845 for attaching solenoid valves

DLP	–	100	–	125	–	A

Type

DLP	Double-acting linear actuator

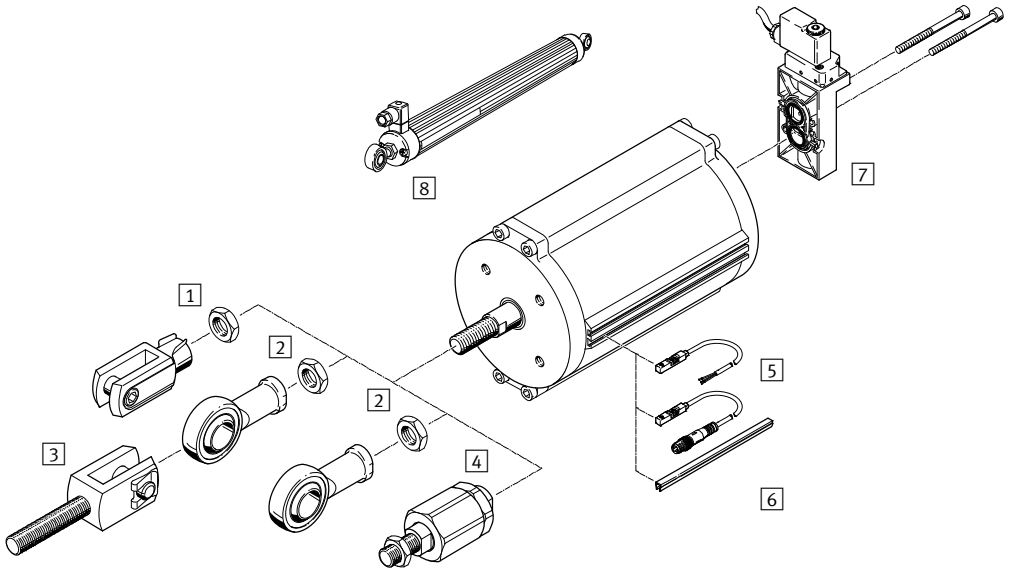
Piston ∅ [mm]

Stroke [mm]

Position sensing

A	Via proximity sensor

Peripherals overview



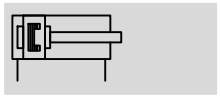
Mounting attachments and accessories

		Brief description	DLP-80/100	DLP-125/160	DLP-200 ... 320	→ Page/Internet
1	Rod clevis SG	Enables simple connection between the piston rod and the slide plate	■	■	■	313
	Rod clevis, stainless steel CRSG		■	■	–	313
2	Rod eye SGS	With spherical bearing	■	■	■	313
	Rod eye, stainless steel CRSGS		■	■	–	313
3	Rod clevis SGA	With male thread	■	■	■	313
4	Self-aligning rod coupler FK/CRFK	For compensating radial and angular deviations	■	■	■	313
5	Proximity sensor SMT-8M-A	Magneto-resistive, 5 ... 30 V, to EU Explosion Protection Directive (ATEX)	■	■	■	314
	Proximity sensor CRSMT-8	Magneto-resistive, corrosion resistant, to EU Explosion Protection Directive (ATEX)	■	■	■	314
	Proximity sensor SDBT	Magneto-resistive, NAMUR, to EU Explosion Protection Directive (ATEX)	■	■	■	314
6	Slot cover ABP-5-S	To keep dirt away from the sensor cable and slots	■	■	■	315
7	Solenoid valve	Namur port pattern, not with 8	■	■	■	23, 85, 151
8	Displacement encoder MLO-POT	Conversion of linear movement to voltage signal. The maximum stroke is 700 mm	■	■	■	313

Linear actuators DLP, Copac

Technical data

Function



Diameter
80 ... 320 mm

Stroke length
40 ... 600 mm, additional stroke lengths upon request

Force
2800 ... 48000 N

General technical data Piston ∅	80	100	125	160	200	250	320
Pneumatic connection	G1/4						
Based on standard	DIN 3358						
Valve connection conforms to	VDI/VDE 3845 (NAMUR)						
Design	Piston cylinder, double-acting						
Cushioning	None						
Stroke reserve [mm]	2				4		
Assembly position	Any						
Position sensing	Via proximity sensor						
Efficiency actuator [%]	95						

Operating and environmental conditions	
Operating pressure[1] [bar]	2 ... 8
Nominal operating pressure [bar]	6
Operating medium	Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium	Operation with lubricated medium possible (in which case lubricated operation will always be required)
Ambient temperature[2][3] [°C]	–20 ... +80
Corrosion resistance class CRC[4]	3
CE marking (see declaration of conformity) ➔ www.festo.com	To EU Explosion Protection Directive (ATEX)
ATEX category gas	II 2G
Ex-ignition protection type gas	c T4
ATEX category dust	II 2D
EX-ignition protection type dust	c 120°C
ATEX ambient temperature[3]	–20°C ≤ Ta ≤ +60°C

1) Depending upon the counter force of the valve slide, a higher minimum pressure may be required to actuate the overall system
2) Further temperature ranges upon request
3) Note operating range of proximity sensors
4) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

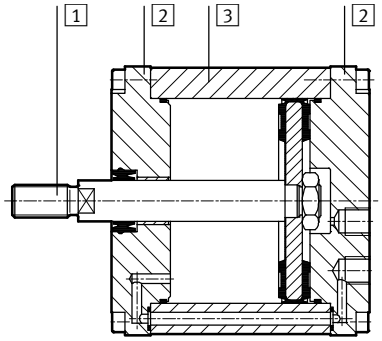
Technical data

Forces [N] and air consumption [Nl]							
Piston ∅	80	100	125	160	200	250	320
Theoretical force at 6 bar, advancing	3016	4712	7363	12064	18850	29452	48255
Theoretical force at 6 bar, retracting	2827	4524	6881	11581	18080	28698	47501
Theoretical air consumption at 6 bar and 10 mm stroke, pushing	0.35	0.55	0.86	1.41	2.12	3.44	5.63
Theoretical air consumption at 6 bar and 10 mm stroke, pulling	0.33	0.53	0.80	1.35	2.11	3.35	5.54

Weights [g]							
Piston ∅	80	100	125	160	200	250	320
Basic weight with 0 mm stroke	1843	2801	4855	5854	12831	21117	33907
Additional weight per 10 mm stroke	68	80	145	159	187	325	399
Moving load with 0 mm stroke	624	997	1809	2183	4691	6650	11040
Additional moving load per 10 mm stroke	25	25	63	63	99	99	99

Materials

Sectional view



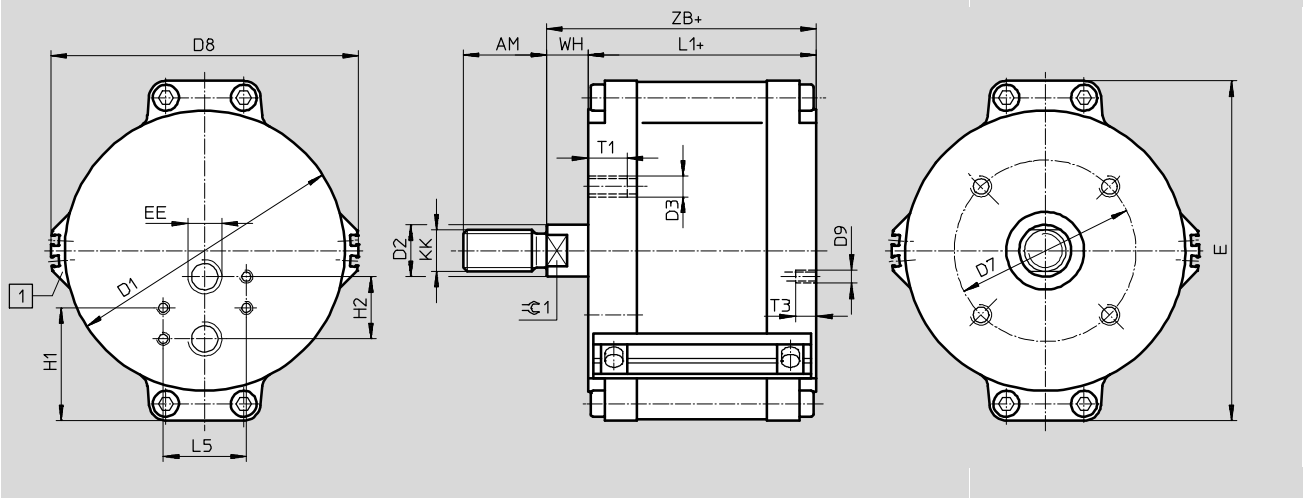
Linear actuator			
1	Piston rod	∅ 80 ... 320	High-alloy stainless steel
2	Cylinder cap	∅ 80 ... 160, 250, 320	Wrought aluminium alloy
		∅ 200	Cast aluminium
3	Cylinder barrel	∅ 80 ... 160, 320	Wrought aluminium alloy, smooth anodised
		∅ 200, 250	High alloy steel
–	Seals	∅ 80... 320	NBR
		∅ 80, 100, 320	NBR, TPE-U (PU)

Linear actuators DLP, Copac

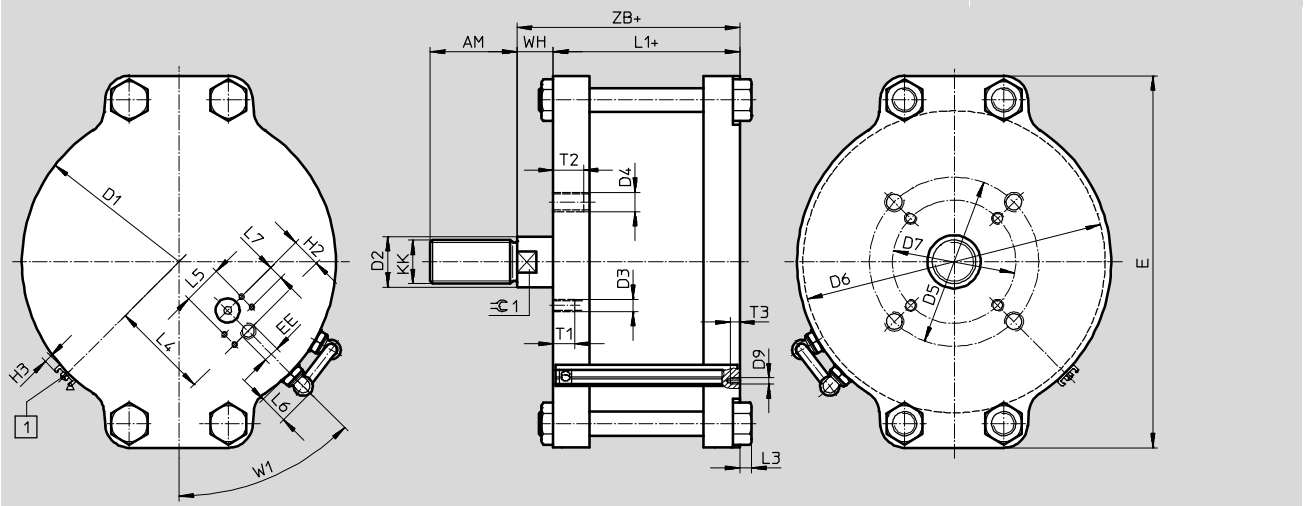
Technical data

Dimensions Download CAD data ➔ **www.festo.com**

∅ 80 ... 160



∅ 200 ... 320



1 Mounting slots for proximity sensor SME/SMT-8

\+ = plus stroke length

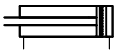
Technical data

∅ [mm]	AM −2	D1 ∅	D2 ∅	D3 ∅	D4 ∅	D5 ∅	D6 ∅	D7 ∅	D8 ∅	D9 ∅	E	EE	H1	H2	H3
DLP-80-...-A	32	87	20	M8	–	–	–	70	99	M5	108	G1/4	43.5	24	–
DLP-100-...-A	32	108	20	M8	–	–	–	70	119	M5	131	G1/4	43.5	24	–
DLP-125-...-A	54	135	32	M10	–	–	–	102	147	M5	163	G1/4	43.5	24	–
DLP-160-...-A	54	170	32	M10	–	–	–	102	182	M5	199	G1/4	43.5	24	–
DLP-200-...-A	72	216	40	M10	M16	140	210	102	–	M5	271	G1/4	43.5	24	4.5
DLP-250-...-A	72	260	40	M10	M16	140	244	102	–	M5	308	G1/4	43.5	24	4.5
DLP-320-...-A	72	332	40	M10	M16	140	324	102	–	M5	378	G1/4	43.5	24	4.5

∅ [mm]	KK	L1	L3	L4	L5	L6	L7	T1	T2	T3	W1	WH	ZB	⫧1
DLP-80-...-A	M16x1.5	100 +1.4/−0.4	–	–	32	–	–	15	–	8	45°	16 +0.6/−1.8	116 +0.6/−0.8	16
DLP-100-...-A	M16x1.5	104 +1.4/−0.4	–	–	32	–	–	15	–	8	45°	16 +0.6/−1.8	120 +0.6/−0.8	16
DLP-125-...-A	M27x2	114 +1.6/−0.6	–	–	32	–	–	18	–	8	45°	24 +0.8/−1.8	138 +0.8/−1.0	27
DLP-160-...-A	M27x2	114 +1.6/−0.6	–	–	32	–	–	18	–	8	45°	24 +1.2/−1.8	138 +1.2/−0.8	27
DLP-200-...-A	M36x2	150 +0.8/−1.0	10	81	32	24.5	12	20	24	8	45°	30 ±1.4	180 ±1	36
DLP-250-...-A	M36x2	152 +0.8/−1.4	25	94	32	24.5	12	20	25	8	45°	30 +1.8/−1.4	182 ±1	36
DLP-320-...-A	M36x2	159 +0.8/−1.4	–	130	32	24.5	12	20	25	8	45°	30 +1.8/−1.6	189 +0.8/−1.2	36

Linear actuators DLP, Copac

Technical data

Ordering data				
Version	Piston ∅ [mm]	Stroke [mm]	Part No.	Type
With position sensing				
	80	40 ... 500	**187479**	**DLP-80-...-A**
	100	50 ... 500	**187480**	**DLP-100-...-A**
	125	50 ... 500	**187481**	**DLP-125-...-A**
	160	100 ... 500	**187482**	**DLP-160-...-A**
	200	100 ... 600	**542711**	**DLP-200-...-A**
	250	100 ... 600	**187483**	**DLP-250-...-A**
	320	150 ... 600	**187484**	**DLP-320-...-A**

- - Note

Stroke length of the actuator

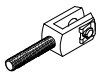
Generally, the stroke length of the Copac linear actuator corresponds to the nominal diameter of the process valve. The system tolerances may lead to a greater stroke range than the specified nominal stroke range of the linear actuator. The zero point is set with an adjustable rod clevis. This ensures that the end position of the valve slide is reached and the zero position of the system is fixed.

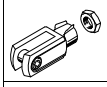
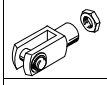
Additional stroke lengths upon request

Accessories

Ordering data – Piston rod attachments

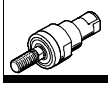
Technical data ➔ Internet: piston rod attachment

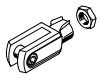
Designation	For ∅	Part No.	Type
Rod eye SGS			
	80, 100	**9263**	**SGS-M16x1,5**
	125, 160	**10774**	**SGS-M27x2**
	200, 250, 320	**10775**	**SGS-M36x2**
Rod clevis SGA			
	80, 100	**10768**	**SGA-M16x1,5**
	125, 160	**10770**	**SGA-M27x2**
	200, 250, 320	**10771**	**SGA-M36x2**

Designation	For ∅	Part No.	Type
Rod clevis SG			
	80, 100	**6146**	**SG-M16x1,5**
	125, 160	**14987**	**SG-M27x2-B**
	200, 250, 320	**9581**	**SG-M36x2**
Self-aligning rod coupler FK			
	80, 100	**6142**	**FK-M16x1,5**
	125, 160	**10485**	**FK-M27x2**
	200, 250, 320	**10746**	**FK-M36x2**

Ordering data – Piston rod attachments, corrosion-resistant

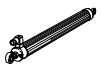
Technical data ➔ Internet: piston rod attachment

Designation	For ∅	Part No.	Type
Rod eye CRSG			
	80, 100	**13571**	**CRSG-M16x1,5**
	125, 160	**185361**	**CRSG-M27x2**
Self-aligning rod coupler CRFK			
	80	**2490673**	**CRFK-M16x1,5**
	100		

Designation	For ∅	Part No.	Type
Rod clevis CRSGS			
	80, 100	**195584**	**CRSGS-M16x1,5**
	125, 160	**195586**	**CRSGS-M27x2**

Ordering data – Displacement encoders

Technical data ➔ Internet: mlo

	Stroke [mm]	Part No.	Type
	100	**192213**	**MLO-POT-100-LWG**
	150	**192214**	**MLO-POT-150-LWG**
	225	**152645**	**MLO-POT-225-LWG**
	300	**152646**	**MLO-POT-300-LWG**
	360	**152647**	**MLO-POT-360-LWG**
	450	**152648**	**MLO-POT-450-LWG**
	600	**152650**	**MLO-POT-600-LWG**
	750	**152651**	**MLO-POT-750-LWG**

Ordering data – Plug socket for displacement encoder

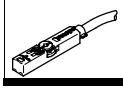
Technical data ➔ Internet: sd-4

	Pin	Pin allocation	Part No.	Type
	1	Power supply	**194332**	**SD-4-WD-7**
	2	Signal		
	3	0 V		
	4	PE (yellow), screened		

Accessories

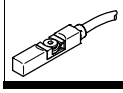
Ordering data – Proximity sensor for T-slot, magneto-resistive

Technical data ➔ Internet: smt-8

	Switching output	Electrical connection		Cable length [m]	Part No.	Type
		Cable	Plug M8x1			
N/O contact						
	Contactless	2-wire	–	5	**574341**	**SMT-8M-A-ZS-24V-E-5,0-OE-EX2**
	PNP	–	3-pin	0.3	**574342**	**SMT-8M-A-PS-24V-E-0,3-M8D-EX2**

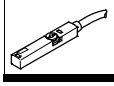
Ordering data – Proximity sensor for T-slot, corrosion resistant

Technical data ➔ Internet: crsmt

	Switching output	Electrical connection	Cable length [m]	Part No.	Type
N/O contact					
	PNP	Cable, 3-wire	5	**574380**	**CRSMT-8M-PS-24V-K-5,0-OE**

Ordering data – Proximity sensor for T-slot, NAMUR

Technical data ➔ Internet: sdbt

	Switching output	Electrical connection	Cable length [m]	Part No.	Type
N/O contact					
	NAMUR	Cable, 2-wire	5	**579071**	**SDBT-MS-20NL-ZN-E-5-LE-EX6**
			10	**579072**	**SDBT-MS-20NL-ZN-E-10-LE-EX6**

Accessories

Ordering data – Connecting cable M8x1

Technical data ➔ Internet: nebu

	Electrical connection, left	Electrical connection, right	Switching output	Cable length [m]	Part No.	Type
Basic version						
	Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	–	2.5	**541333**	**NEBU-M8G3-K-2.5-LE3**
				5	**541334**	**NEBU-M8G3-K-5-LE3**
				10	**541332**	**NEBU-M8G3-K-10-LE3**
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	–	2.5	**541338**	**NEBU-M8W3-K-2.5-LE3**
				5	**541341**	**NEBU-M8W3-K-5-LE3**
				10	**541335**	**NEBU-M8W3-K-10-LE3**
With switching status display						
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	PNP	2.5	**541337**	**NEBU-M8W5P-K-2.5-LE3**
				5	**541340**	**NEBU-M8W5P-K-5-LE3**
			NPN	2.5	**541336**	**NEBU-M8W5N-K-2.5-LE3**
				5	**541339**	**NEBU-M8W5N-K-5-LE3**

Ordering data – Slot cover for T-slot

	Assembly	Length [m]	Part No.	Type
	Insertable from above	2x 0.5	**151680**	**ABP-5-S**

Ordering data – Cable clip SMBK-8

		Part No.	Type
	For fixing the cable in the sensor slot	**534254**	**SMBK-8**

Ordering data – Inscription labels

	Material	Usage	Dimensions [mm]	Part No.	Type	PU[1]
	Polycarbonate	For insertion in the inscription label holder	23x4	**541598**	**ASLR-L-423**	**34**

1) Packaging unit per frame

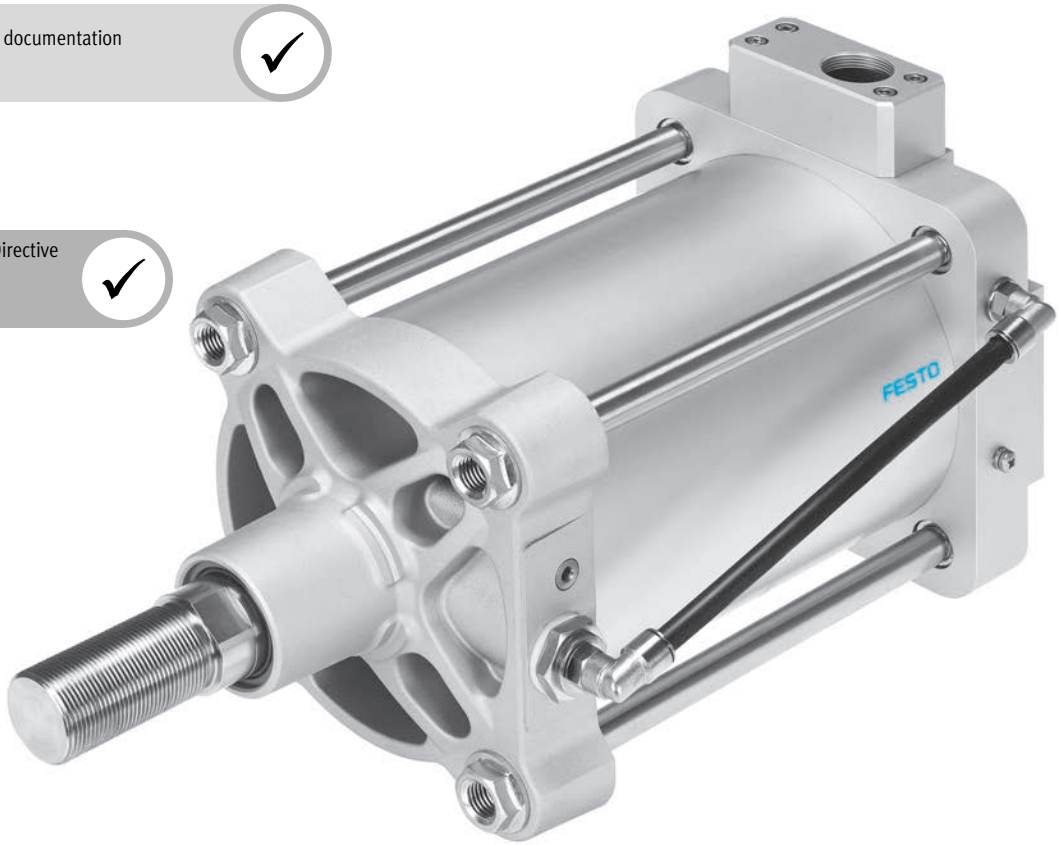
Linear actuators

DFPI

Overview, configuration and ordering
➔ **www.festo.com/catalogue/dfpi** ✓

Additional information, support and user documentation
➔ **www.festo.com/sp/dfpi** ✓

Selected types in accordance with the ATEX Directive for explosive atmospheres
➔ **www.festo.com/ex** ✓



+ Double-acting
+ Integrated displacement encoder
+ Optionally with integrated positioner
+ Mounting interface based on ISO 15552 or DIN EN ISO 5210
+ Different connection versions

+ Diameter 100, 125, 160, 200, 250, 320 mm
+ Force 4712 ... 48255 N
+ Stroke length 40 ... 990 mm

Linear actuators DFPI

Key features

Function

DFPIs are closed-loop controlled linear actuators. They are available with integrated displacement encoder (DFPI-...-E-...) or fully integrated positioner (DFPI-...-C1V-...). In the version DFPI-...-E-..., the potentiometric displacement encoder supplies an analogue voltage signal proportional to the piston position. This can be used for operation with an external positioner. In the version DFPI-...-C1V-..., the integrated positioner provides the positioning function. This actuator has a factory-defined safety position that is assumed if the operating voltage or the analogue setpoint value fails. The position is preset via an analogue setpoint signal in the range of 4 ... 20 mA. The position feedback takes place via an analogue feedback signal in the range of 4 ... 20 mA. The feedback signal provides the user with greater reliability and easier diagnostics. The travel speed can be adjusted using the integrated flow control screws. Variants with a mounting interface to ISO 15552 or DIN EN ISO 5210 are available. The sturdy corrosion-resistant design of the DFPI is ideal for use under harsh ambient conditions.

Innovative

- Ready-to-install, compact unit for easy installation
- Sturdy and corrosion-resistant, ideal for use under harsh ambient conditions

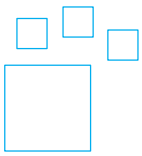
Flexible

- Wide range of accessories for virtually any installation situation
- Suitable for use in potentially explosive locations
- Additional contactless binary end-position sensing possible with proximity sensors
- Suitable for applications with closed-loop controlled linear and swivel motion

Design

- Double-acting
- Optionally with integrated displacement encoder or fully integrated positioner
- Sizes ∅ 100, ∅ 125, ∅ 160, ∅ 200, ∅ 250 and ∅ 320
- Stroke lengths 40 to 990 mm
- Mounting interfaces to ISO 15552 or DIN EN ISO 5210
- IP65, IP67, IP69K, NEMA4
- ATEX certification

Ordering data – Product options



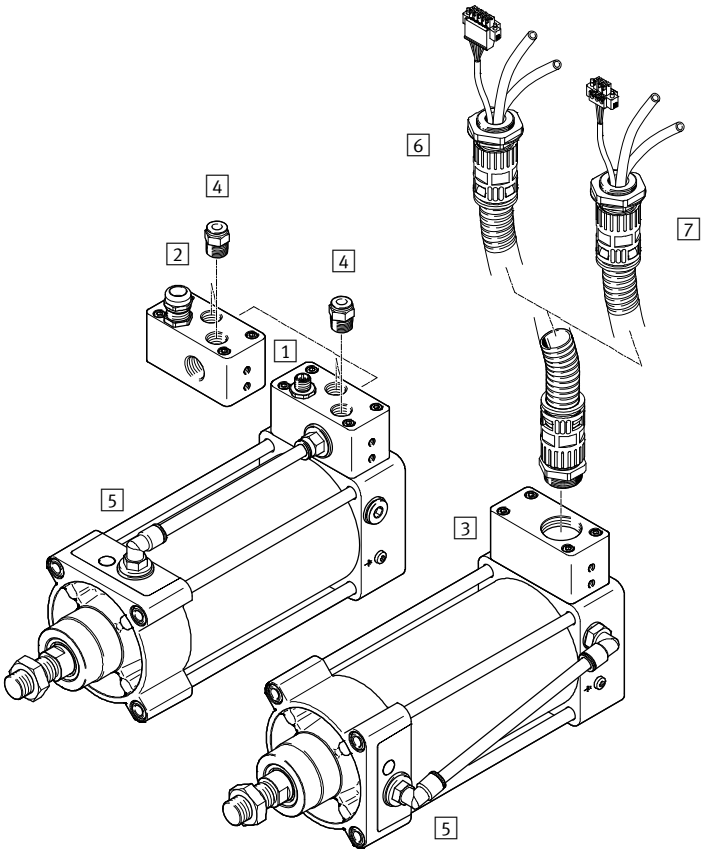
Configurable product
This product and all its product options can be ordered using the configurator.

The configurator can be found at
➔ **www.festo.com/catalogue/...**

Part no.	Type
5078949	**DFPI-100**
5087658	**DFPI-125**
5091793	**DFPI-160**
5092508	**DFPI-200**
5099770	**DFPI-250**
5106115	**DFPI-320**

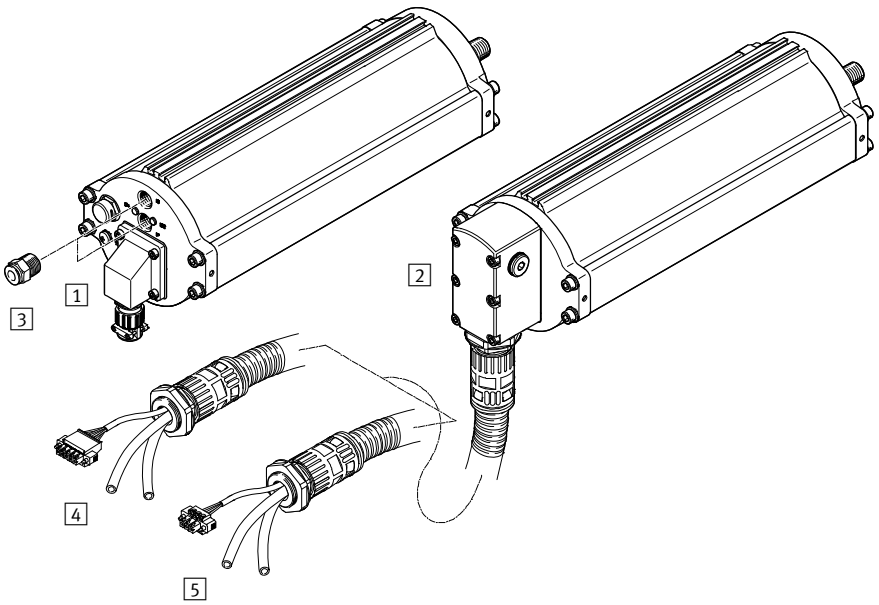
Key features

Product options for DFPI-...-NB3P... based on ISO 15552



1 M12x1 plug, 5-pin, A-coded
2 Cable connector M16x1.5
3 Metal flanged socket
4 Push-in fitting QS[1)]
5 Air duct at the actuator, stainless steel pipe or plastic tubing
6 Connecting cable NHSB[1)], 5-wire, for DFPI-...-C1V-P-A
7 Connecting cable NHSB[1)], 3-wire, for DFPI-...-E-P

Product options for DFPI-...-E-... and DFPI-...-C1V-... based on DIN EN ISO 5210



1 Plastic flanged socket
2 Metal flanged socket
3 Push-in fitting QS[1)]
4 Connecting cable NHSB[1)], 5-wire, for DFPI-...-C1V-P-A
5 Connecting cable NHSB[1)], 3-wire, for DFPI-...-E-P

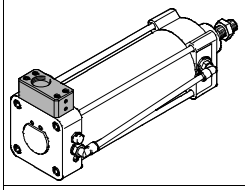
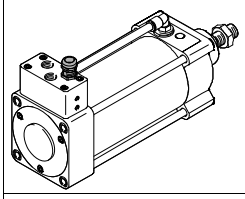
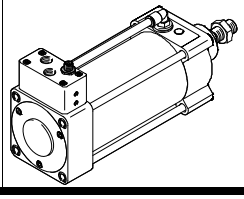
1) Can be ordered separately as an accessory

Linear actuators DFPI

Product range overview

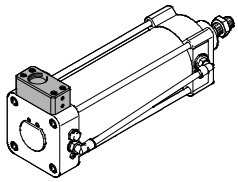
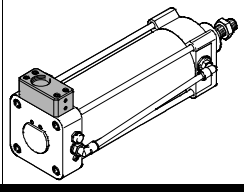
DFPI-...-E-NB3...

- For operation with an external positioner with analogue voltage input
- Potentiometric displacement encoder integrated into the actuator DFPI
- Sturdy tie rod design
- Double-acting
- Mounting interfaces to ISO 15552 on bearing and end caps

Version		Characteristics	➔ Page
DFPI-...-E-NB3...	**DFPI-...-E-NB3P-...**		
		• Electrical, pneumatic connection using metal flanged socket, pre-assembled connecting cable NHSB, see ➔ page 352 • Air duct on the outside of the actuator via plastic tubing	327
	DFPI-...-E-NB3P9B2-...		
		• Electrical connection using cable connector M16x1.5, screw terminal • Pneumatic connection G3/8 • Air duct on the outside of the actuator, either using a stainless steel pipe for variant DFPI-...-E-NB3P9B2-M or plastic tubing for variant DFPI-...-E-NB3P9B2	327
	DFPI-...-E-NB3M12B2-...		
		• Electrical connection via M12x1 plug, 5-pin • Pneumatic connection G3/8 • Air duct on the outside of the actuator, either using a stainless steel pipe for variant DFPI-...-E-NB3M12B2-M or plastic tubing for variant DFPI-...-E-NB3M12B2	327

DFPI-...-C1V-NB3...

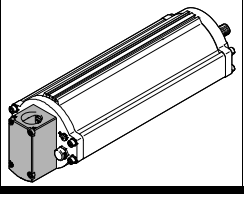
- Digital electropneumatic positioner integrated within the drive housing
- Setpoint input 4 ... 20 mA
- Position feedback 4 ... 20 mA
- Safety position either retracting or advancing piston rod depending on the product version
- Sturdy tie rod design
- Double-acting
- Mounting interfaces to ISO 15552 on bearing and end caps

Version		Characteristics	➔ Page
DFPI-...-C1V-NB3	**DFPI-...-C1V-NB3P-A**		
		• Electrical, pneumatic connection using metal flanged socket, pre-assembled connecting cable NHSB, see ➔ page 352 • Air duct on the outside of the actuator via plastic tubing • Safety position if the operating voltage or setpoint signal fails: retracting piston rod	333
	DFPI-...-C1V-NB3P-R-A		
		• Electrical, pneumatic connection using metal flanged socket, pre-assembled connecting cable NHSB, see ➔ page 352 • Air duct on the outside of the actuator via plastic tubing • Safety position if the operating voltage or setpoint signal fails: advancing piston rod	333

Product range overview

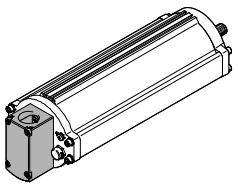
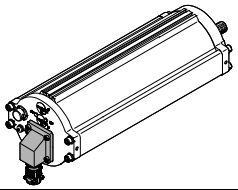
DFPI-...-E-...

- For operation with an external positioner with analogue voltage input
- Potentiometric displacement encoder integrated into the actuator
- Integrated air duct on the actuator
- Double-acting
- Mounting interfaces for process valves to DIN EN ISO 5210

Version		Characteristics	➔ Page
DFPI-...-E-...	**DFPI-...-E-P-G2**		
		• Electrical, pneumatic connection using metal flanged socket, pre-assembled connecting cable NHSB, ➔ page 352	340

DFPI-...-C1V-...

- Digital electropneumatic positioner integrated within the drive housing
- Setpoint input 4 ... 20 mA
- Position feedback 4 ... 20 mA
- Retracting piston rod safety position
- Integrated air duct on the actuator
- Double-acting
- Mounting interfaces for process valves to DIN EN ISO 5210

Version		Characteristics	➔ Page
DFPI-...-C1V-...	**DFPI-...-C1V-P-A**		
		• Electrical, pneumatic connection using metal flanged socket, pre-assembled connecting cable NHSB, ➔ page 352	346
	DFPI-...-C1V-A		
		• Electrical connection using plastic flanged socket, screw terminal • Pneumatic connection G1/4	346

Linear actuators DFPI

Type codes

DFPI – 100 – 200 – N D2 P – C1 V –

Type	
DFPI	Closed-loop controlled actuator for process automation

Piston diameter	
100	100 mm
125	125 mm
160	160 mm
200	200 mm
250	250 mm
320	320 mm

Stroke	
	x length [40 ... 990 mm]

Cushioning	
N	No cushioning

Displacement encoder	
D2	Analogue

Method of measurement	
P	Potentiometer

Control unit	
–	None
C1	Closed-loop controller 1

Closed-loop controller attachment position	
–	Integrated
E	External

Directional control valve	
–	None
V	Integrated

Type codes

NB3	P	–		–		–	A	–		–	

Standard

–	Not according to standard
NB3	Based on ISO 15552

Connection type

–	Standard
P	Protected
P9	Cable connector
M12	Plug M12x1, A-coded

Connection type material

–	Standard
B2	Brass, nickel-plated

Safety position

–	Advancing
R	Retracting

Additional function

–	Standard
A	Position feedback 4 ... 20 mA

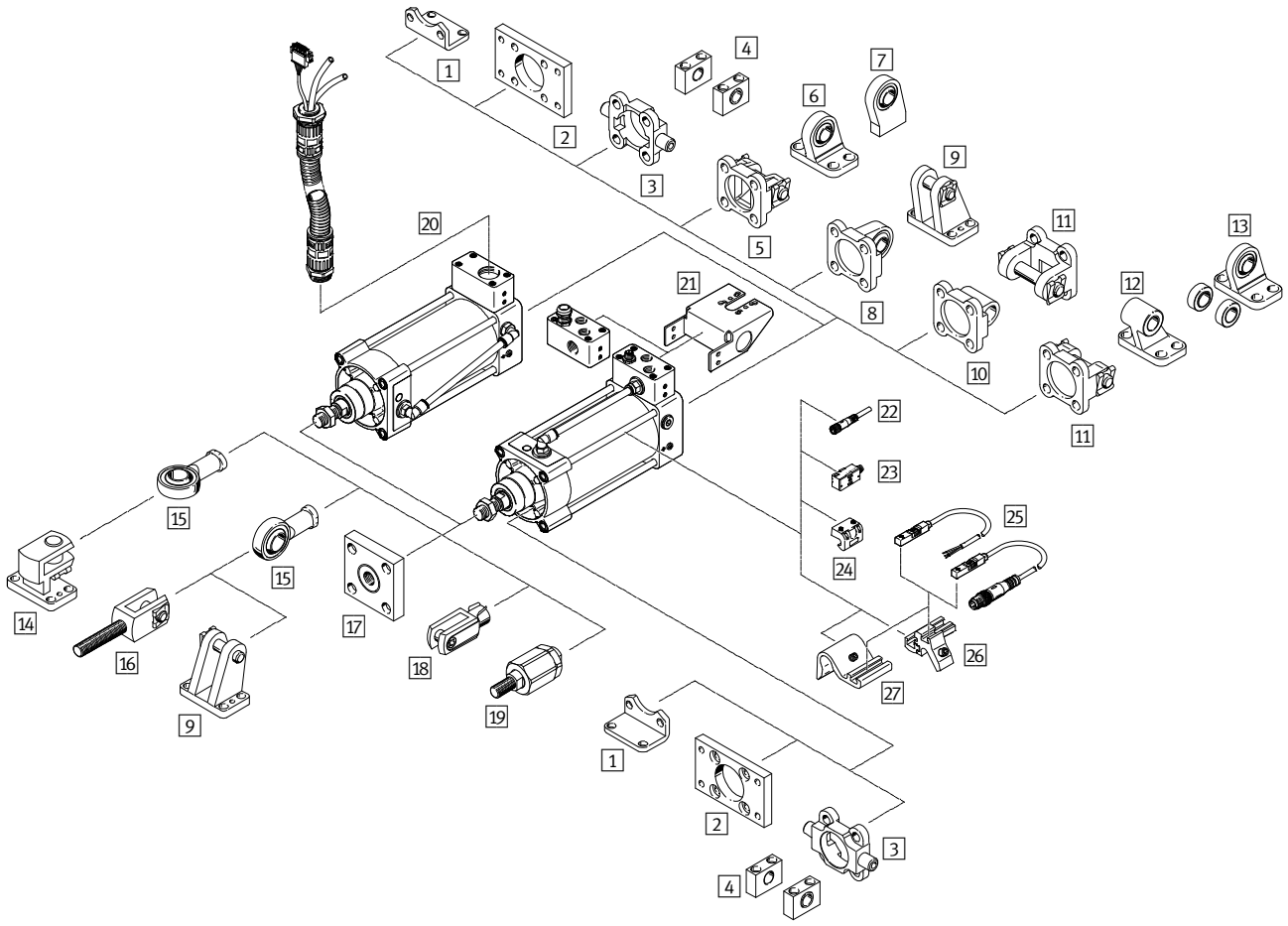
Tubing

–	Standard
M	Metal

Generation

–	First generation
G2	Second generation

Overview of peripherals for DFPI based on ISO 15552



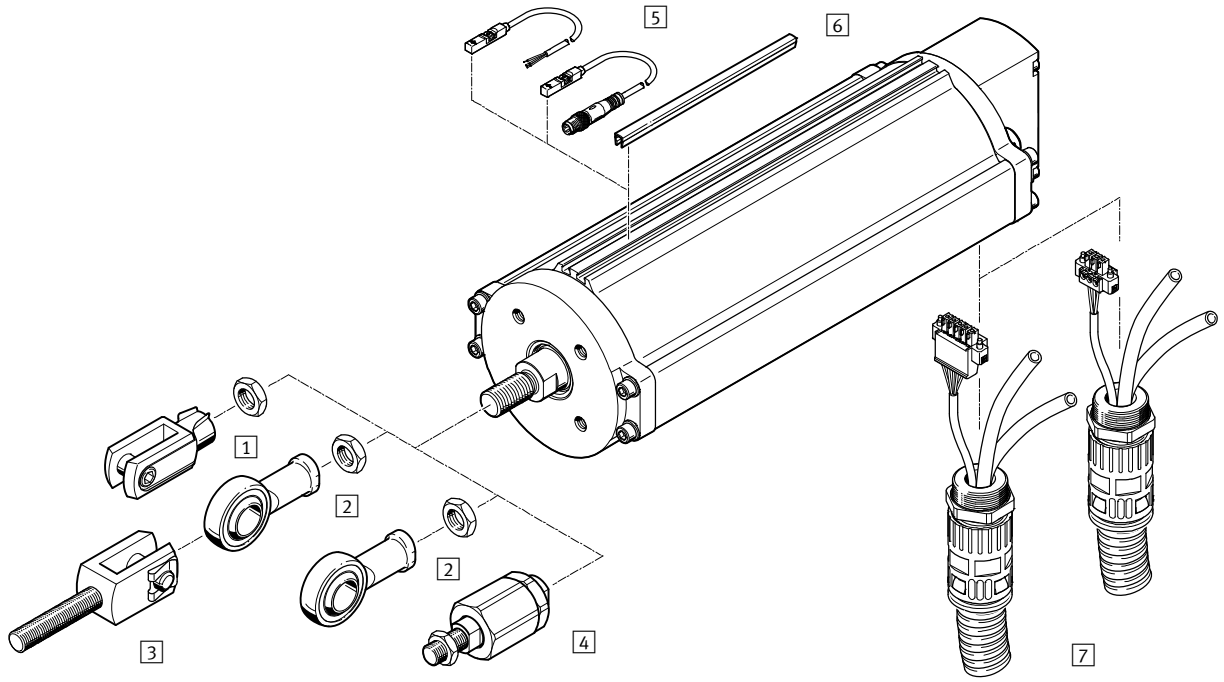
Mounting components and accessories

		Description	➔ Page/Internet
1	Foot mounting HNC/CRHNC	For bearing or end caps	354
	Foot mounting HNG	For bearing or end caps, corresponds to MS1 to ISO 15552	354
2	Flange mounting FNC/CRFNG	For bearing or end caps	356
	Flange mounting FNG	For bearing or end cap, corresponds to MF1/MF2 to ISO 15552	356
3	Trunnion flange ZNCF/CRZNG	For bearing or end caps	357
4	Trunnion support LNZG/CRLNZG	For trunnion flange ZNCF/CRZNG	358
5	Swivel flange SNC	For end caps	359
	Swivel flange SNG	For end caps	359
6	Clevis foot LSNG	With spherical bearing	365

Overview of peripherals for DFPI based on ISO 15552

Mounting components and accessories			
		Description	**➔ Page/Internet**
7	Clevis foot LSNSG	Weld-on, with spherical bearing	365
8	Swivel flange SNCS	With spherical bearing for end caps	361
9	Clevis foot LBG	For swivel flange SNCS	365
10	Swivel flange SNCL	For end caps	362
	Swivel flange SNGL	For end caps, corresponds to MP2 to ISO 15552	362
11	Swivel flange SNCB/SNCB-...-R3	For end caps	360
	Swivel flange SNGB	For end caps, corresponds to MP2 to ISO 15552	360
12	Clevis foot LNG/CRLNG	For swivel flange SNCB	365
	Clevis foot LN/LNG	For swivel flange SNGB	365
13	Clevis foot LSN	With spherical bearing	365
14	Right-angle clevis foot LQG	For rod eye SGS	365
15	Rod eye SGS/CRSGS	With spherical bearing	366
16	Rod clevis SGA	With male thread	366
17	Coupling piece KSG	To compensate for radial deviations	366
18	Rod clevis SG/CRSG	Permits a swivel motion of the cylinder in one plane	366
19	Self-aligning rod coupler FK/CRFK	To compensate for radial and angular deviations	366
20	Connecting cable NHSB	For electrical and pneumatic connection of linear actuator DFPI-...-P-... • 3-wire, for DFPI-...-E-P • 5-wire, for DFPI-...-C1V-P-A	352
21	DADG-AK-F6-A2	Mounting bracket for mounting a positioner with interface according to VDI/VDE 3845 or mounting with a hole spacing of 150 mm	363
22	Connecting cable NEBU	For proximity sensor	368
23	Proximity sensor SMPO-1-H-B	For sensing the piston position	368
24	Mounting kit SMBS	For proximity sensor SMPO-1-H-B 41	368
25	Proximity sensor SMT-8M-A	Magnetoresistive, 5 ... 30 V DC, to EU Explosion Protection Directive (ATEX)	367
	Proximity sensor CRSMT-8	Magnetoresistive, corrosion-resistant, to EU Explosion Protection Directive (ATEX)	367
	Proximity sensor SDBT	Magnetoresistive, NAMUR, to EU Explosion Protection Directive (ATEX)	367
26	Mounting kit SMBZ-8- ...	For proximity sensor SME/SMT-8M, for piston diameter 100	367
27	Sensor bracket DASP-M4- ...	For proximity sensor SME/SMT-8M, for piston diameters 125, 160, 200, 250, 320	367

Overview of peripherals for DFPI based on DIN EN ISO 5210

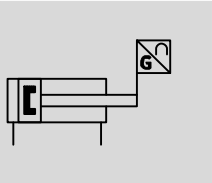


Mounting components and accessories

		Description	➔ Page/Internet
1	Rod clevis SG	Enables a simple connection between the piston rod and slide gate	366
	Rod clevis, stainless steel CRSG		366
2	Rod eye SGS	With spherical bearing	366
	Rod eye, stainless steel CRSGS		366
3	Rod clevis SGA	With male thread	366
4	Self-aligning rod coupler FK	To compensate for radial and angular deviations	366
5	Proximity sensor SMT-8M-A	Magnetoresistive, 5 ... 30 V DC, to EU Explosion Protection Directive (ATEX)	367
	Proximity sensor CRSMT-8	Magnetoresistive, corrosion-resistant, to EU Explosion Protection Directive (ATEX)	367
	Proximity sensor SDBT	Magnetoresistive, NAMUR, to EU Explosion Protection Directive (ATEX)	367
6	Slot cover ABP-5-S	To protect the sensor cables and slots from contamination	367
7	Connecting cable NHSB	For electrical and pneumatic connection of linear actuator DFPI-...-P-... • 3-wire, for DFPI-...-E-P • 5-wire, for DFPI-...-C1V-P-A	352

Technical data

Function



- Piston diameter
  100 ... 320 mm
- Stroke
  40 ... 990 mm
- Force
  4417 ... 46385 N

General technical data		
Stroke	[mm]	40 ... 990
Mode of operation		Double-acting
Based on standard		ISO 15552
Cushioning		No cushioning
Mounting position		Any
Design		Piston
		Piston rod
		Tie rod
		Cylinder barrel
Position sensing		With integrated displacement encoder
Measuring principle of displacement encoder		Potentiometer
Pneumatic connection		
DFPI-... -E-NB3P...		With specific accessories, for tubing O.D. of 8 mm
DFPI-...-E-NB3M12B2		G3/8
DFPI-...-E-NB3P9B2		G3/8
Electrical connection		
DFPI-... -E-NB3P...		With specific accessories, 3-pin, straight plug, screw terminal
DFPI-...-E-NB3M12B2		M12x1, 5-pin, straight plug, A-coded
DFPI-...-E-NB3P9B2		Cable connector M16x1.5, 3-pin, straight plug, screw terminal

General electrical data		
Operating voltage range	[V DC]	0 ... 15
Resistance value of displacement encoder (on the TET) dependent on the stroke length[1)]		
≤ 290 mm	[kΩ]	5
> 290 ... 590 mm	[kΩ]	10
> 590 ... 990 mm	[kΩ]	20
Displacement encoder		
Recommended loop current	[µA]	< 0.1
Max. short-time loop current	[mA]	10
Independent linearity	[%]	±0.04
Repetition accuracy	[mm]	±0.12
Hysteresis	[mm]	0.33

1) TET = theoretical electrical travel

Linear actuators DFPI-...-E-NB3...

Technical data

Operating and environmental conditions		
Operating pressure	[bar]	3 ... 8
Nominal operating pressure	[bar]	6
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Storage temperature	[°C]	–20 ... +80
Ambient temperature	[°C]	–20 ... +80
Relative humidity	[%]	5 ... 100, condensing
Degree of protection		IP65, IP67, IP69K, NEMA 4
Vibration resistance in accordance with DIN/IEC 68, Part 2-6		Tested to severity level 2
Continuous shock resistance in accordance with DIN/IEC 68, Part 2-82		Tested to severity level 2
CE marking (see declaration of conformity)[1)]		To EU Explosion Protection Directive (ATEX)

1) Additional information www.festo.com/sp ➔ Certificates.

ATEX	
ATEX category for gas	II 2G
Type of ignition protection for gas	c T4
ATEX category for dust	II 2D
Type of ignition protection for dust	c 120°C
Explosion-proof ambient temperature rating	–20 °C <= Ta <= +60 °C

Forces [N] and impact energy [J]						
Piston diameter	100	125	160	200	250	320
Theoretical force at 6 bar, advancing	4712	7363	12064	18850	29452	48255
Theoretical force at 6 bar, retracting	4417	6881	11581	18080	28274	46385
Max. impact energy in the end positions	1.3	1.0	1.4	1.0	1.9	2.4

Permissible impact velocity:

$$v_{perm.} = \sqrt{\frac{2 \times E_{perm.}}{m_{Intrinsic} + m_{Load}}}$$

$v_{perm.}$ Permissible impact velocity
$E_{perm.}$ Maximum impact energy
$m_{Intrinsic}$ Moving mass (actuator)
m_{Load} Moving payload

Maximum permissible load:

$$m_{Load} = \frac{2 \times E_{perm.}}{v^2} - m_{Intrinsic}$$

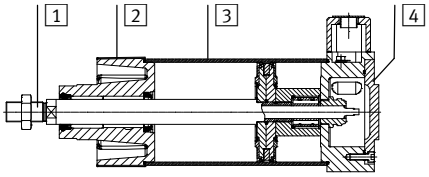
Air consumption [l]						
Piston diameter	100	125	160	200	250	320
Air consumption, advancing, per 10 mm stroke	0.549	0.859	1.407	2.119	3.436	5.63
Air consumption, retracting, per 10 mm stroke	0.515	0.803	1.351	2.111	3.299	5.412

Technical data

Weights [g]						
Piston diameter	100	125	160	200	250	320
Basic weight with 0 mm stroke	4900	7500	12800	18100	31100	57700
Additional weight per 10 mm stroke	90	134	200	238	358	582
Moving mass at 0 mm stroke	1060	1900	3700	4800	9300	16500
Additional moving mass per 10 mm stroke	28	53	89	89	134	227

Materials

Sectional view

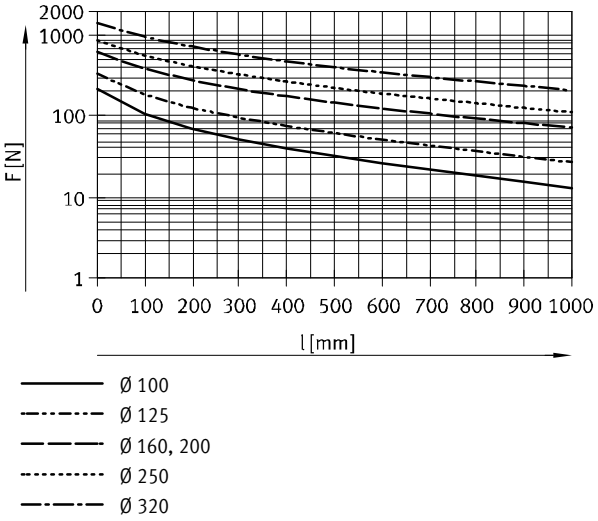


		Piston diameter	
1	Piston rod	100 ... 320	High-alloy stainless steel
2	Bottom cover	100 ... 320	Coated die-cast aluminium
3	Cylinder barrel	100 ... 320	Smooth anodised wrought aluminium alloy
4	End cap	100 ... 320	Coated wrought aluminium alloy
–	Tie rod	100 ... 320	High-alloy stainless steel
–	Screws	100 ... 320	Coated steel
			High-alloy stainless steel
–	Piston rod wiper seal	100	TPE-U (PU)
		125 ... 320	NBR
–	M12 plug DFPI-...-E-NB3M12B2	100 ... 320	Brass, nickel-plated
–	Cable connector DFPI-...-E-NB3P9B2	100 ... 320	Brass, nickel-plated
–	Air duct for characteristic value M	100 ... 320	Stainless steel pipe or plastic tubing
–	Static seals	100 ... 320	NBR
–	Note on materials	100 ... 320	RoHS-compliant
			Contains PWIS (paint-wetting impairment substances)

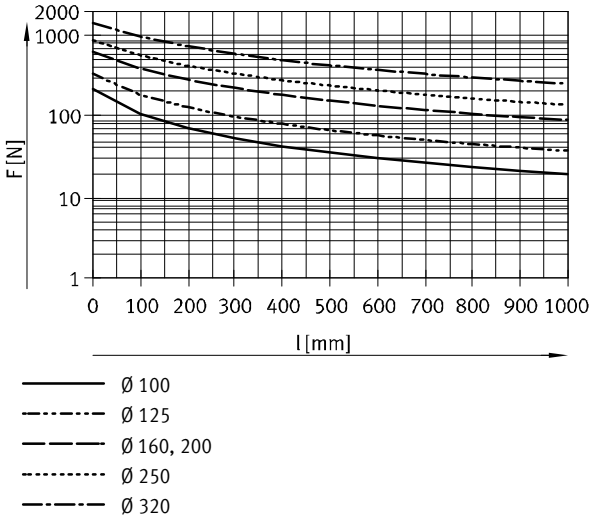
Max. lateral force as a function of stroke length l

The maximum lateral force (horizontal/vertical) applies to the static application. In closed-loop operation, the maximum lateral force needs to be adjusted to the type of control. If necessary, the piston rod must be guided to avoid system vibration.

Horizontal lateral force



Vertical lateral force

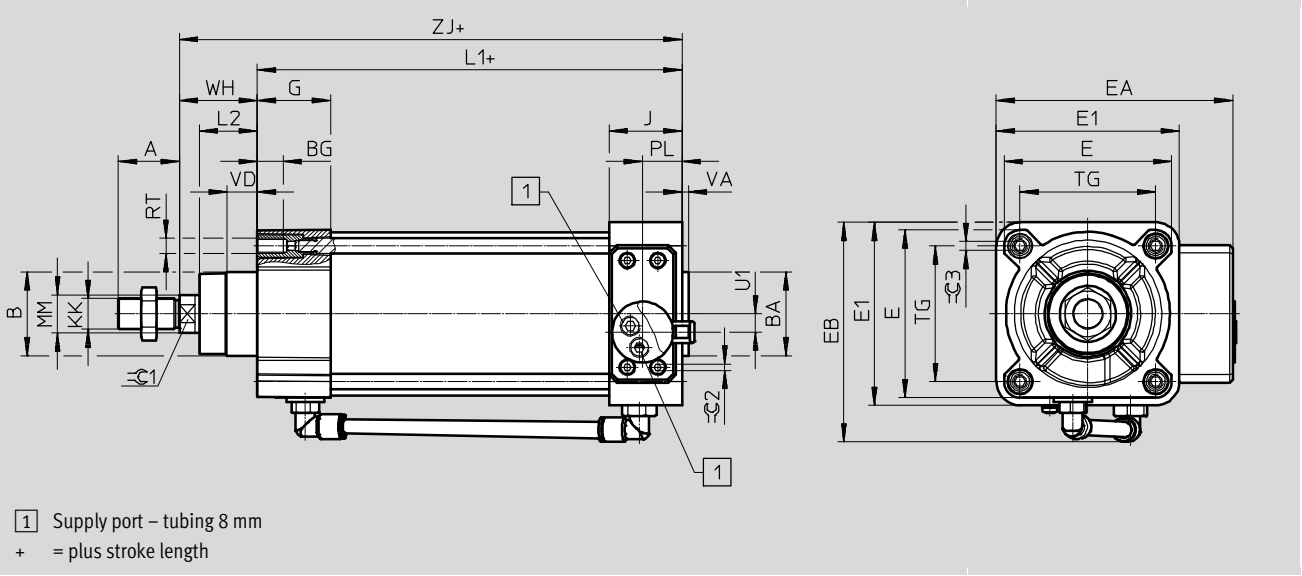


Linear actuators DFPI-...-E-NB3...

Technical data

Dimensions Download CAD data ➔ **www.festo.com**

Piston diameters 100, 125



1 Supply port – tubing 8 mm
\+ = plus stroke length

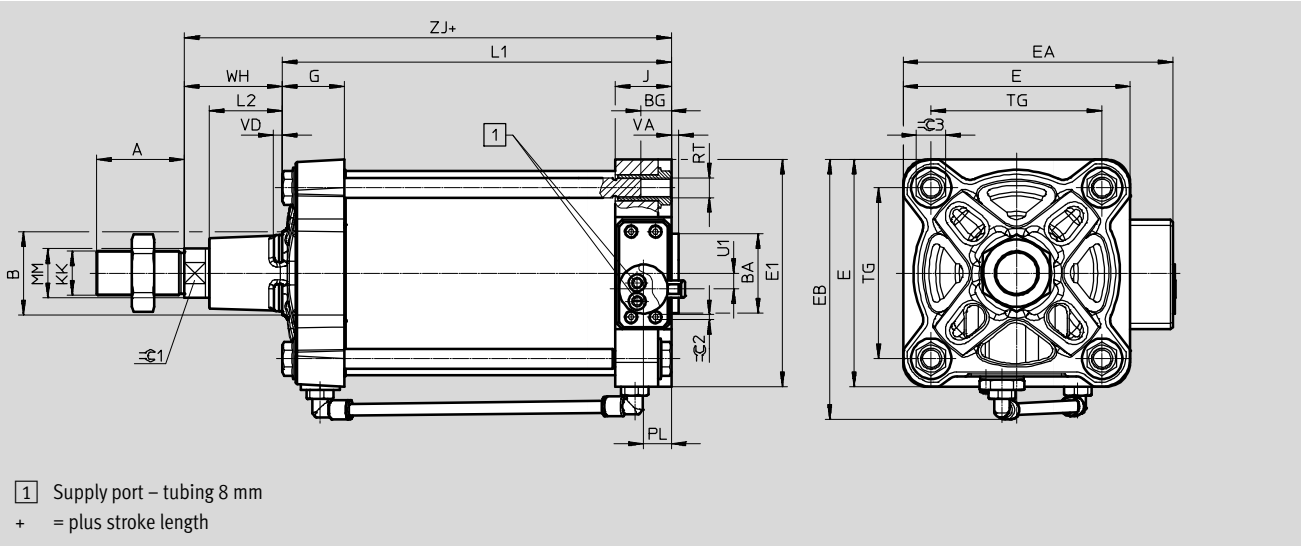
Piston diameter [mm]	A −0.5	B ∅	BA ∅ d11	BG	E	E1	EA	EB	G	J	KK	L1
DFPI-100	40	55	55	17	110	120	155	146	48	48	M20x1.5	179
DFPI-125	54	60	60	20	136	145	180	173	44.7		M27x2	200

Piston diameter [mm]	L2	MM ∅	PL	RT	TG	U1	VD	VA −1	WH	ZJ	⌀C1	⌀C2	⌀C3
DFPI-100	38	25	26	M10	89	12	19.2	4	51±1.8	229.7	22	4	6
DFPI-125	45.5	32		M12	110	22	20.5	6	65±2.2	264.7	27		8

Technical data

Dimensions Download CAD data ➔ **www.festo.com**

Piston diameters 160, 200, 250, 320



1 Supply port – tubing 8 mm
\+ = plus stroke length

Piston diameter [mm]	A −0.5	B ∅	BA ∅ d11	BG	E	E1	EA	EB	G	J	KK	L1
DFPI-160	72	65	65	24	186	186	221	212	51	46	M36x2	219
DFPI-200		75	75		230	230	265	256	47.2			225
DFPI-250	84	90	90	25	284	270	312	312	52	51.5	M42x2	254
DFPI-320	96	110	110	28	347	342	378.5	379	56	58	M48x2	281.2

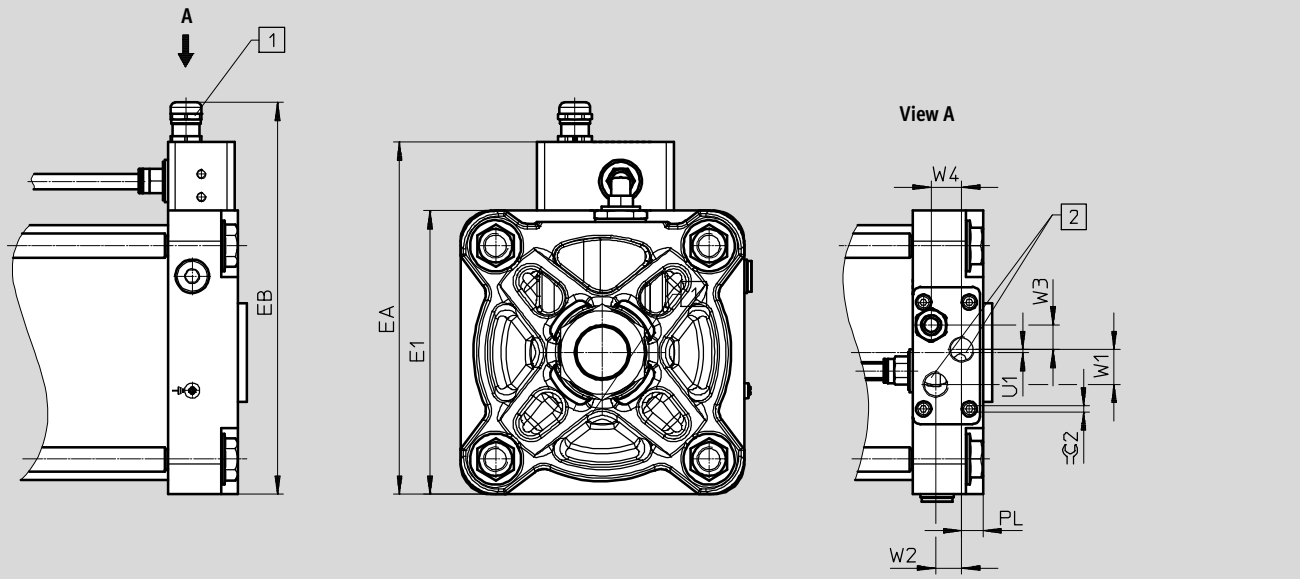
Piston diameter [mm]	L2	MM ∅	PL	RT	TG	U1	VD	VA −1	WH ±2.2	ZJ	=C1	=C2	=C3
DFPI-160	60	40	23	M16	140	13	7.5	6	80	298.6	36	4	24
DFPI-200	70				175	32			95	320			
DFPI-250	80	50	29.5	M20	220	47	13.7	10	105	359	46		42
DFPI-320	90	63	36	M24	270	62	10.7		120	401.2	55		50

Linear actuators DFPI-...-E-NB3...

Technical data

Dimensions Download CAD data ➔ **www.festo.com**

Variants DFPI-...-E-NB3P9B2-... and DFPI-...-E-NB3M12B2...

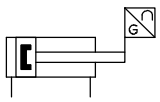


1 DFPI-...-P9B2-...: electrical connection: cable connector M16x1.5, 3-pin, straight plug, screw terminal
DFPI-...-M12B2-...: electrical connection: M12x1, 5-pin, straight plug, A-coded

2 Pneumatic connection: G3/8

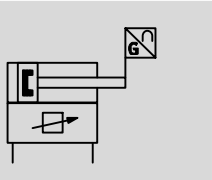
Type	E1	EA	EB	PL	U1	W1	W2	W3	W4	⊂2
DFPI-100-...-P9	110	157	183.5	16	4	23	17	16	20	4
DFPI-100-...-M12			170							
DFPI-125-...-P9	136	183	209.5		6					
DFPI-125-...-M12			196							
DFPI-160-...-P9	186	231	275.5	14	2					
DFPI-160-...-M12			244							
DFPI-200-...-P9	230	272	298.5							
DFPI-200-...-M12			285							
DFPI-250-...-P9	270	322.6	349.1	19.5	11					
DFPI-250-...-M12			335.6							
DFPI-320-...-P9	340	393.5	420	26						
DFPI-320-...-M12			406.5							

Ordering data

		Piston diameter [mm]	Part no.	Type
	• Linear actuators with integrated displacement encoder • Based on ISO 15552	100	**2185733**	**DFPI-100- ... -ND2P-E-NB3P**
		125	**2207685**	**DFPI-125- ... -ND2P-E-NB3P**
		160	**2208573**	**DFPI-160- ... -ND2P-E-NB3P**
		200	**2209613**	**DFPI-200- ... -ND2P-E-NB3P**
		250	**2210666**	**DFPI-250- ... -ND2P-E-NB3P**
		320	**2186271**	**DFPI-320- ... -ND2P-E-NB3P**

Technical data

Function



Piston diameter
100 ... 320 mm

Stroke
40 ... 990 mm

Force
4417 ... 46385 N

General technical data		
Stroke	[mm]	40 ... 990
Mode of operation		Double-acting
Based on standard		ISO 15552
Cushioning		No cushioning
Mounting position		Any
Design		Piston
		Piston rod
		Tie rod
		Cylinder barrel
Position sensing		With integrated displacement encoder
Measuring principle of displacement encoder		Potentiometer
Pneumatic connection		With specific accessories
		For tubing O.D. 8 mm
		For tubing O.D. 10 mm
Electrical connection		With specific accessories
		5-pin
		Straight plug
		Screw terminal

General electrical data		
Operating voltage range	[V DC]	21.6 ... 26.4
Nominal operating voltage	[V DC]	24
Setpoint input	[mA]	4 ... 20
Analogue output	[mA]	4 ... 20
Accuracy of analogue output	[%FS]	1
Max. current consumption	[mA]	220
Reverse polarity protection		For operating voltage
		For setpoint value
		Initialisation connection
Positioning accuracy	[%FS]	1
Repetition accuracy	[%FS]	±1
Size of dead space	[%FS]	1
Hysteresis	[%FS]	±1

Linear actuators DFPI-...-C1V-NB3...

Technical data

Operating and environmental conditions		
Operating pressure	[bar]	3 ... 8
Nominal operating pressure	[bar]	6
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Temperature of medium	[°C]	–5 ... +40
Ambient temperature	[°C]	–5 ... +50
Storage temperature	[°C]	–5 ... +50
Relative humidity	[%]	5 ... 100, condensing
Degree of protection		IP65, IP67, IP69K, NEMA 4
Vibration resistance in accordance with DIN/IEC 68, Part 2-6		Tested to severity level 2
Continuous shock resistance in accordance with DIN/IEC 68, Part 2-82		Tested to severity level 2
Certification		RCM compliance mark
CE marking (see declaration of conformity)[1)]		To EU EMC Directive
		To EU Explosion Protection Directive (ATEX)

1) Additional information www.festo.com/sp ➔ Certificates.

ATEX	
ATEX category for gas	II 3G
Type of ignition protection for gas	Ex nA IIC T4 Gc
ATEX category for dust	II 3D
Type of ignition protection for dust	Ex tc IIIC T120°C Dc
Explosion-proof ambient temperature rating	–5°C <= Ta <= +50°C

Technical data

Forces [N]						
Piston diameter	100	125	160	200	250	320
Theoretical force at 6 bar, advancing	4712	7363	12064	18850	29452	48255
Theoretical force at 6 bar, retracting	4417	6881	11581	18080	28274	46385

Maximum permissible load: $m_{Load} = \frac{2 \times E_{perm.}}{v^2} - m_{Intrinsic}$

$m_{Intrinsic}$ Moving mass (actuator)
m_{Load} Moving payload

Air consumption [l]						
Piston diameter	100	125	160	200	250	320
Air consumption, advancing, per 10 mm stroke	0.549	0.859	1.407	2.199	3.436	5.63
Air consumption, retracting, per 10 mm stroke	0.515	0.803	1.351	2.111	3.299	5.412

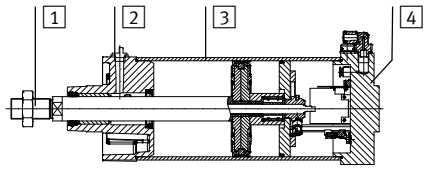
Weights [g]						
Piston diameter	100	125	160	200	250	320
Basic weight with 0 mm stroke	5280	7950	14330	20410	35370	57550
Additional weight per 10 mm stroke	90	134	200	238	358	582
Moving mass with 0 mm stroke	1060	1900	3700	4800	9300	16500
Additional moving mass per 10 mm stroke	28	53	89	89	134	227

Linear actuators DFPI-...-C1V-NB3...

Technical data

Materials

Sectional view

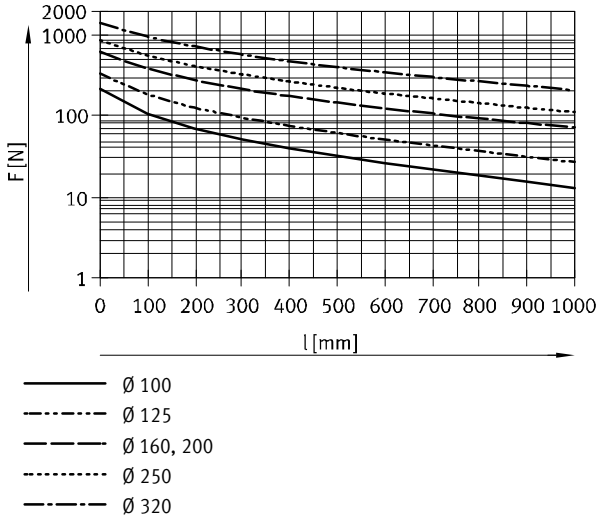


		Piston diameter	
1	Piston rod	100 ... 320	High-alloy stainless steel
2	Bottom cover	100 ... 320	Coated die-cast aluminium
3	Cylinder barrel	100 ... 320	Smooth anodised wrought aluminium alloy
4	End cap	100 ... 320	Coated wrought aluminium alloy
–	Tie rod	100 ... 200	High-alloy stainless steel
–	Screws	100 ... 320	Coated steel
			High-alloy stainless steel
–	Piston rod wiper seal	100	TPE-U (PU)
		125 ... 320	NBR
–	Static seals	100 ... 320	NBR
–	Note on materials	100 ... 320	RoHS-compliant
			Contains PWIS (paint-wetting impairment substances)

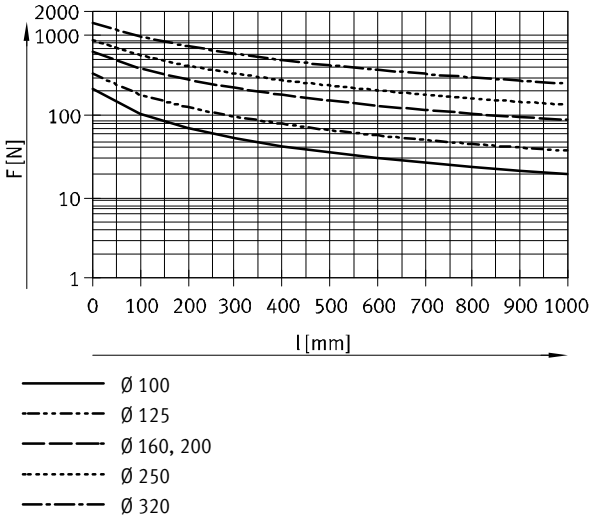
Max. lateral force as a function of stroke length l

The maximum lateral force (horizontal/vertical) applies to the static application. In closed-loop operation, the maximum lateral force needs to be adjusted to the type of control. If necessary, the piston rod must be guided to avoid system vibration.

Horizontal lateral force



Vertical lateral force

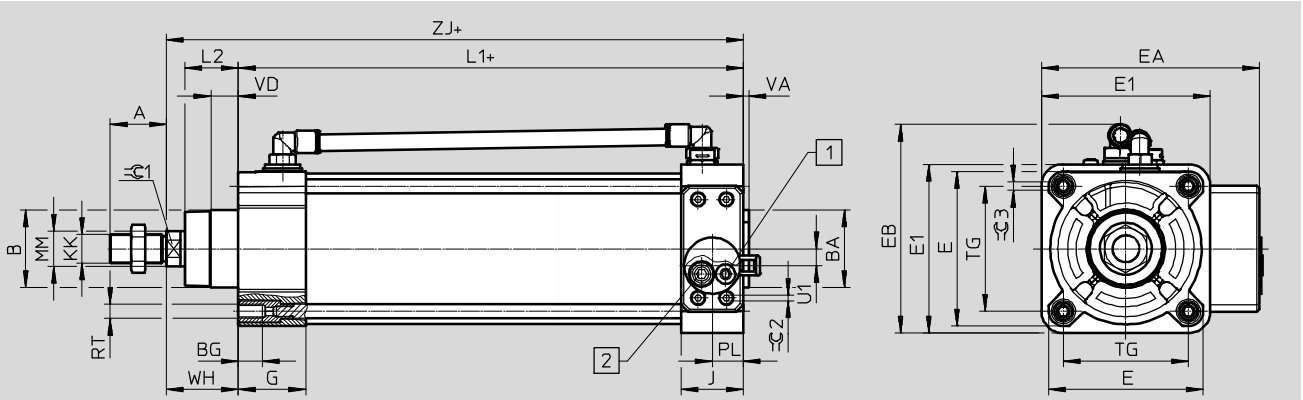


Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

Piston diameters 100, 125



1 Supply port – tubing 8 mm
2 Exhaust air – tubing 10 mm
+ = plus stroke length

Piston diameter [mm]	A −0.5	B ∅	BA ∅ d11	BG	E	E1	EA	EB	G	J	KK	L1
DFPI-100	40	55	55	17	110	120	155	146	48	44	M20x1.5	258.9
DFPI-125	54	60	60	20	136	145	180	173	44.7		M27x2	254.4

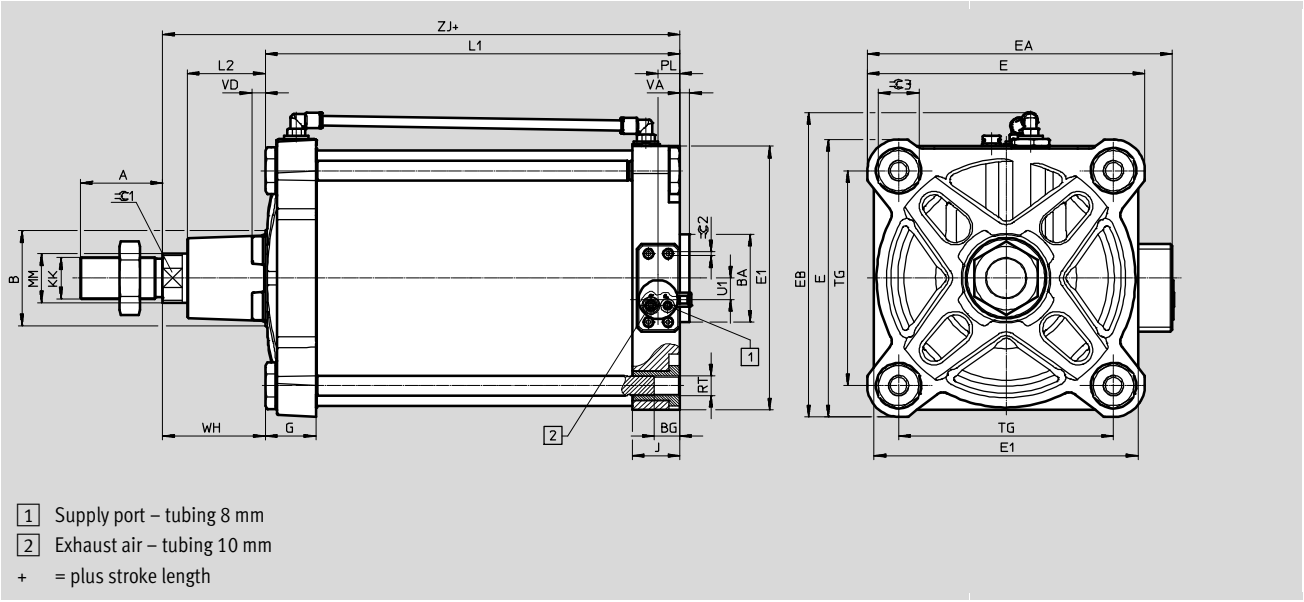
Piston diameter [mm]	L2	MM ∅	PL	RT	TG	U1	VD	VA −1	WH	ZJ	⌀C1	⌀C2	⌀C3
DFPI-100	38	25	22	M10	89	12	19.2	4	51±1.8	309.9	22	4	6
DFPI-125	45.5	32		M12	110	2	20.5	6	65±2.2	319.4	27		8

Linear actuators DFPI-...-C1V-NB3...

Technical data

Dimensions Download CAD data ➔ **www.festo.com**

Piston diameters 160, 200, 250, 320



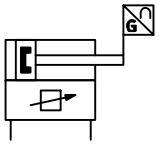
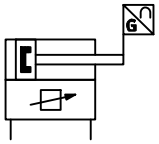
1 Supply port – tubing 8 mm
2 Exhaust air – tubing 10 mm
\+ = plus stroke length

Piston diameter [mm]	A −0.5	B ∅	BA ∅ d11	BG	E	E1	EA	EB	G	J	KK	L1
DFPI-160	72	65	65	24	186	186	221	212	51	46	M36x2	291.8
DFPI-200		75	75		230	230	265	256	47.2			297
DFPI-250	84	90	90	25	284	270	312	312	52	48.5	M42x2	324.4
DFPI-320	96	110	110	28	347	342	378.5	379	56	46	M48x2	351.4

Piston diameter [mm]	L2	MM ∅	PL	RT	TG	U1	VD	VA −1	WH ±2.2	ZJ	⌀C1	⌀C2	⌀C3
DFPI-160	60	40	22	M16	140	12	7.5	6	80	371.8	36	4	24
DFPI-200	70				175	32			95	392			
DFPI-250	80	50		M20	220	22	13.7	10	105	429.2	46		42
DFPI-320	90	63	22.5	M24	270	52	10.7		120	471.4	55		50

Technical data

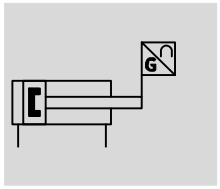
Ordering data

		Piston diameter [mm]	Part no.	Type
Safety position advancing				
	• Linear actuators with integrated positioner • Based on ISO 15552	100	**2184841**	**DFPI-100-...-ND2P-C1V-NB3P-A**
		125	**2180905**	**DFPI-125-...-ND2P-C1V-NB3P-A**
		160	**2201101**	**DFPI-160-...-ND2P-C1V-NB3P-A**
		200	**2206373**	**DFPI-200-...-ND2P-C1V-NB3P-A**
		250	**2200311**	**DFPI-250-...-ND2P-C1V-NB3P-A**
		320	**2185309**	**DFPI-320-...-ND2P-C1V-NB3P-A**
Safety position retracting				
	• Linear actuators with integrated positioner • Based on ISO 15552	100	**4588304**	**DFPI-100-...-ND2P-C1V-NB3P-R-A**
		125	**4588636**	**DFPI-125-...-ND2P-C1V-NB3P-R-A**
		160	**4588972**	**DFPI-160-...-ND2P-C1V-NB3P-R-A**
		200	**4587974**	**DFPI-200-...-ND2P-C1V-NB3P-R-A**
		250	**4591209**	**DFPI-250-...-ND2P-C1V-NB3P-R-A**
		320	**4591205**	**DFPI-320-...-ND2P-C1V-NB3P-R-A**

Linear actuators DFPI-...-E-...-G2

Technical data

Function



Piston diameter
100 ... 320 mm

Stroke
40 ... 990 mm

Force
4417 ... 48255 N

General technical data							
Piston diameter		100	125	160	200	250	320
Stroke	[mm]	40 ... 990					
Stroke reserve	[mm]	3			4		
Mode of operation		Double-acting					
Connection to process valve to standard		DIN EN ISO 5210					
Flange hole pattern		F07	F10		F10, F14		
Cushioning		No cushioning					
Mounting position		Any					
Design		Piston					
		Piston rod					
		Profile barrel			Tie rod, cylinder barrel		
Position sensing		With integrated displacement encoder					
Measuring principle of displacement encoder		Potentiometer					
Pneumatic connection		With specific accessories					
		For tubing O.D. of 8 mm					
Electrical connection		With specific accessories					
		3-pin					
		Straight plug					
		Screw terminal					

General electrical data		
Operating voltage range	[V DC]	0 ... 15
Resistance value of displacement encoder (on the TET) dependent on the stroke length[1)]		
≤ 290 mm	[kΩ]	5
> 290 ... 590 mm	[kΩ]	10
> 590 ... 990 mm	[kΩ]	20
Displacement encoder		
Recommended loop current	[µA]	< 0.1
Max. short-time loop current	[mA]	10
Independent linearity	[%]	±0.04
Repetition accuracy	[mm]	±0.12
Hysteresis	[mm]	0.33

1) TET = theoretical electrical travel

Technical data

Operating and environmental conditions		
Operating pressure	[bar]	3 ... 8
Nominal operating pressure	[bar]	6
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Ambient temperature	[°C]	–20 ... +60
Storage temperature	[°C]	–20 ... +60
Relative humidity	[%]	5 ... 100, condensing
Degree of protection		IP65, IP67, IP69K, NEMA 4
Continuous shock resistance to DIN/IEC 68 Part 2-82		Tested to severity level 2
Vibration resistance to DIN/IEC 68 Part 2-6		Tested to severity level 2
CE marking (see declaration of conformity)[1)]		To EU Explosion Protection Directive (ATEX)

1) Additional information www.festo.com/sp ➔ Certificates.

ATEX	
ATEX category for gas	II 2G
Type of ignition protection for gas	c T4 X
ATEX category for dust	II 2D
Type of ignition protection for dust	c 120°C X
Explosion-proof ambient temperature rating	–20 °C <= Ta <= +60 °C

Linear actuators DFPI-...-E-...-G2

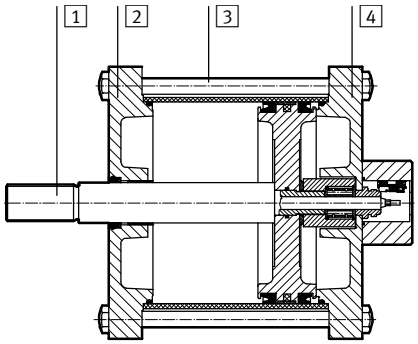
Technical data

Forces [N] and air consumption [l]						
Piston diameter	100	125	160	200	250	320
Theoretical force at 6 bar, advancing	4712	7363	12064	18850	29452	48255
Theoretical force at 6 bar, retracting	4417	6881	11581	18080	28698	47501
Air consumption, advancing, per 10 mm stroke	0.5498	0.859	1.4074	2.119	3.4361	5.6297
Air consumption, retracting, per 10 mm stroke	0.5153	0.8027	1.3511	2.111	3.3482	5.5418

Weights							
Piston diameter		100	125	160	200	250	320
Basic weight with 0 mm stroke	[g]	3476	5530	6529	13946	22569	35359
Additional moving mass per 10 mm stroke	[g]	27	52	52	87	87	87
Moving mass with 0 mm stroke	[g]	1228	1944	2250	4722	7059	11417
Additional weight per 10 mm stroke	[g]	80	145	159	187	325	399
Additional weight of displacement encoder per 10 mm	[g]	2					

Materials

Sectional view

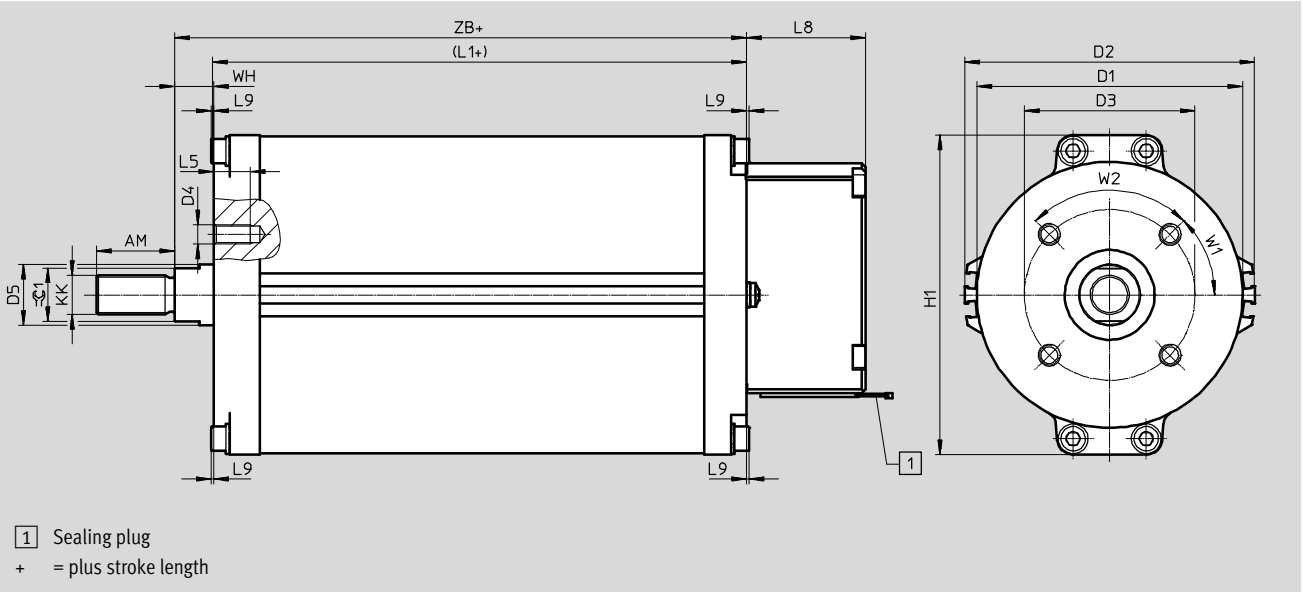


		Piston diameter	
1	Piston rod	100 ... 320	High-alloy stainless steel
2	Bottom cover	100, 125, 250, 320	Anodised wrought aluminium alloy
		160, 200	Coated die-cast aluminium
3	Cylinder barrel	100 ... 200	Smooth anodised wrought aluminium alloy
		250 ... 320	High-alloy stainless steel
4	End cap	100, 125, 250, 320	Anodised wrought aluminium alloy
		160, 200	Coated die-cast aluminium
–	Tie rod	200 ... 320	High-alloy stainless steel
–	Screws	100 ... 320	High-alloy stainless steel
–	Piston rod wiper seal	100	TPE-U (PU)
		125 ... 320	NBR
–	Static seals	100 ... 320	NBR
–	Note on materials	100 ... 320	RoHS-compliant
			Contains PWIS (paint-wetting impairment substances)

Technical data

Dimensions Download CAD data ➔ **www.festo.com**

Piston diameter 100 ... 160



1 Sealing plug
\+ = plus stroke length

Piston diameter [mm]	AM −2	D1 ∅	D2 ∅	D3 ∅	D4	D5 ∅	H1	KK	L1+
DFPI-100	32	109	119	70	M8	25	131	M16x1.5	118.5
DFPI-125	54	135	147	102	M10	32	163	M27x2	119
DFPI-160		170	182				199		126.5

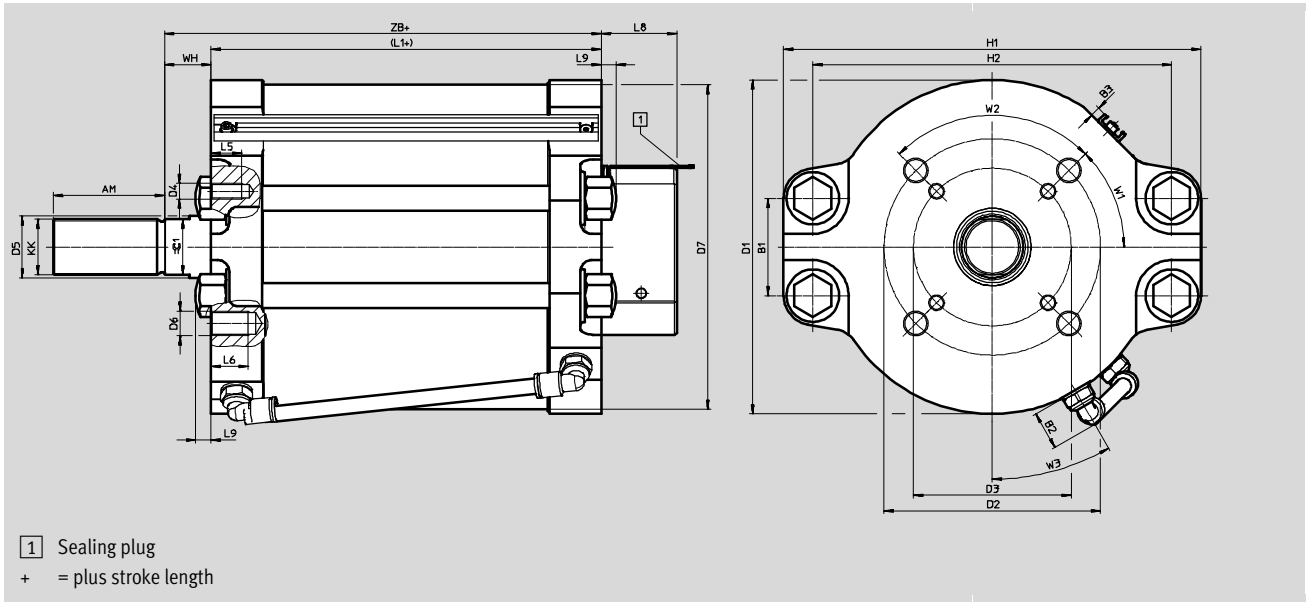
Piston diameter [mm]	L5	L8	L9	W1	W2	WH	ZB+	=⌀C1
DFPI-100	15	48.8	1	45°	90°	16	134.5	22
DFPI-125	18	48.8	–	45°	90°	24	143	27
DFPI-160							150.5	

Linear actuators DFPI-...-E-...-G2

Technical data

Dimensions Download CAD data ➔ **www.festo.com**

Piston diameter 200 ... 320



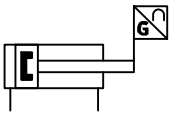
1 Sealing plug
\+ = plus stroke length

Piston diameter [mm]	AM −2	B1	B2	B3	D1 ∅	D2 ∅	D3 ∅	D4	D5 ∅	D6	D7 ∅ min.	H1	H2
DFPI-200	72	63	25.6	6.5	216	140	102	M10	40	M16	210	270	232
DFPI-250	72	82	25.6	6.5	260	140	102	M10	40	M16	254	308	268
DFPI-320		126			332						325	378	338

Piston diameter [mm]	KK	L1+	L5	L6 min.	L8	L9	WH	W1	W2	W3	ZB+	=⊂1
DFPI-200	M36x2	152.5	20	24	48.8	10	30	45	90	30	182.5	36
DFPI-250	M36x2	152.2	20	25	48.8	25	30	45	90	30	182.2	36
DFPI-320		160		24							190	

Technical data

Ordering data

		Piston diameter [mm]	Part no.	Type
	• Linear actuators with integrated displacement encoder • Based on DIN EN ISO 5210	100	**1808236**	**DFPI-100-...-ND2P-E-P-G2**
		125	**1808239**	**DFPI-125-...-ND2P-E-P-G2**
		160	**1808242**	**DFPI-160-...-ND2P-E-P-G2**
		200	**1808245**	**DFPI-200-...-ND2P-E-P-G2**
		250	**1808253**	**DFPI-250-...-ND2P-E-P-G2**
		320	**1808263**	**DFPI-320-...-ND2P-E-P-G2**

Note

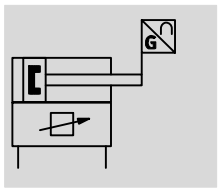
Stroke length of the actuator

The stroke length of the actuator should generally at least correspond to the nominal diameter of the process valve so that the process valve can be fully opened and closed. The system tolerances can lead to a greater stroke range than the specified nominal stroke range of the linear actuator. The adjustable rod clevis enables adjustment of the system.

Linear actuators DFPI-...-C1V-...

Technical data

Function



- Piston diameter
  100 ... 320 mm
- Stroke
  40 ... 990 mm
- Force
  4417 ... 48255 N

General technical data

Piston diameter		100	125	160	200	250	320
Stroke	[mm]	40 ... 990					
Stroke reserve	[mm]	3			4		
Mode of operation		Double-acting					
Connection to process valve to standard		DIN EN ISO 5210					
Flange hole pattern		F07	F10		F10, F14		
Cushioning		No cushioning					
Mounting position		Any					
Design		Piston					
		Piston rod					
		Profile barrel			Tie rod, cylinder barrel		
Position sensing		With integrated displacement encoder					
Measuring principle of displacement encoder		Potentiometer					
Pneumatic connection							
DFPI-...-...-ND2P-C1V-A		G1/4					
DFPI-...-...-ND2P-C1V-P-A		With specific accessories, for tubing O.D. of 8 mm and 10 mm					
Electrical connection							
		5-pin					
		Straight plug					
		Screw terminal					
DFPI-...-...-ND2P-C1V-A		G1/4					
DFPI-...-...-ND2P-C1V-P-A		With specific accessories, for tubing O.D. of 8 mm and 10 mm					

General electrical data

Operating voltage range	[V DC]	21.6 ... 26.4
Nominal operating voltage	[V DC]	24
Setpoint input	[mA]	4 ... 20
Analogue output	[mA]	4 ... 20
Accuracy of analogue output	[%FS]	1
Max. current consumption	[mA]	220
Reverse polarity protection		For operating voltage
		For setpoint value
		Initialisation connection
Positioning accuracy	[%FS]	1
Repetition accuracy	[%FS]	±1
Size of dead space	[%FS]	1
Hysteresis	[%FS]	±1

Technical data

Operating and environmental conditions		
Operating pressure	[bar]	3 ... 8
Nominal operating pressure	[bar]	6
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Temperature of medium	[°C]	–5 ... +40
Storage temperature	[°C]	–5 ... +50
Ambient temperature	[°C]	–5 ... +50
Relative humidity	[%]	5 ... 100, condensing
Degree of protection		IP65, IP67, IP69K, NEMA 4
Continuous shock resistance to DIN/IEC 68 Part 2-82		Tested to severity level 2
Vibration resistance to DIN/IEC 68 Part 2-6		Tested to severity level 2
Certification		RCM compliance mark
CE marking (see declaration of conformity)[1)]		To EU EMC Directive[2)]
		To EU Explosion Protection Directive (ATEX)

1) Additional information www.festo.com/sp ➔ Certificates.
2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

ATEX	
ATEX category for gas	II 3G
Type of ignition protection for gas	Ex nA IIC T4 X Gc
ATEX category for dust	II 3D
Type of ignition protection for dust	Ex tc IIIC T120°C X Dc
Explosion-proof ambient temperature rating	–5°C <= Ta <= +50°C

Forces [N] and air consumption [l]						
Piston diameter	100	125	160	200	250	320
Theoretical force at 6 bar, advancing	4712	7363	12064	18850	29452	48255
Theoretical force at 6 bar, retracting	4417	6881	11581	18080	28698	47501
Air consumption, retracting, per 10 mm stroke	0.5153	0.8027	1.3511	2.111	3.3482	5.5418
Air consumption, advancing, per 10 mm stroke	0.5498	0.859	1.4074	2.119	3.4361	5.6297

Linear actuators DFPI-...-C1V-...

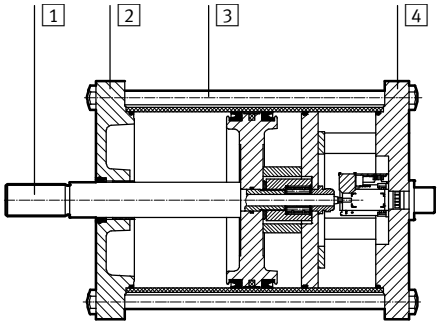
Technical data

Weights

Piston diameter		100	125	160	200	250	320
Basic weight with 0 mm stroke							
DFPI-...-...-ND2P-C1V-A	[g]	4671	7693	9099	18358	29956	45200
DFPI-...-...-ND2P-C1V-P-A	[g]	5237	8259	9665	18924	30522	45766
Moving mass with 0 mm stroke	[g]	1228	1944	2250	4722	7059	11417
Additional weight per 10 mm stroke	[g]	80	145	159	187	325	399
Additional weight of moving mass per 10 mm stroke	[g]	27	52		87		
Additional weight of displacement encoder per 10 mm	[g]	2					

Materials

Sectional view



		Piston diameter	
1	Piston rod	100 ... 320	High-alloy stainless steel
2	Bottom cover	100, 125, 250, 320	Anodised wrought aluminium alloy
		160, 200	Coated die-cast aluminium
3	Cylinder barrel	100 ... 200	Smooth anodised wrought aluminium alloy
		250 ... 320	High-alloy stainless steel
4	End cap	100 ... 320	Anodised wrought aluminium alloy
–	Tie rod	200 ... 320	High-alloy stainless steel
–	Screws	100 ... 320	High-alloy stainless steel
–	Piston rod wiper seal	100	TPE-U (PU)
		125 ... 320	NBR
–	Static seals	100 ... 320	NBR
–	Note on materials	100 ... 320	RoHS-compliant
			Contains PWIS (paint-wetting impairment substances)

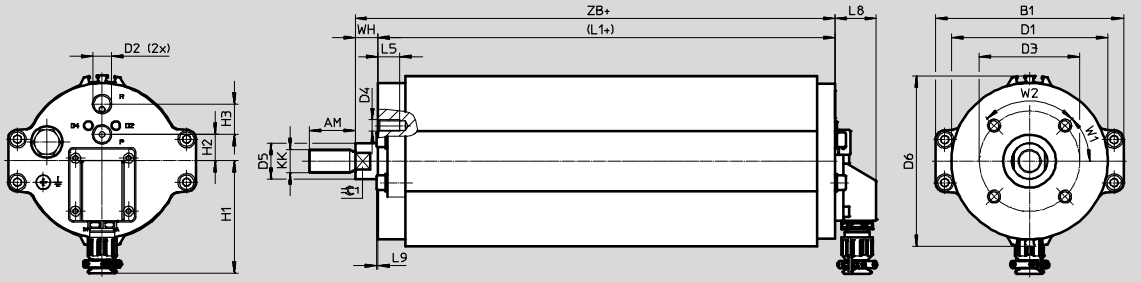
Technical data

Dimensions Download CAD data ➔ **www.festo.com**

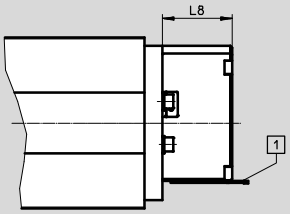
Piston diameter 100 ... 160

Shown without adhesive seals

DFPI- ... -ND2P-C1V-A



DFPI- ... -ND2P-C1V-P-A



1 Sealing plug
\+ = plus stroke length

Piston diameter [mm]	AM −2	B1	D1 ∅	D2 ∅	D3 ∅	D4	D5 ∅	D6 ∅	H1 ±2	H2
DFPI-100- ... -C1V-A	32	131	109	G1/4	70	M8	25	119	79	18.3
DFPI-125- ... -C1V-A	54	163	135	G1/4	102	M10	32	147	79	18.3
DFPI-160- ... -C1V-A		199	170					182		

Piston diameter [mm]	H3	KK	L1+	L5	L8	L9	WH	ZB+	⫧C1
DFPI-100- ... -C1V-A	21.2	M16x1.5	218.5	15	28.8	1	16	234.5	22
DFPI-125- ... -C1V-A	21.2	M27x2	221	18	28.8	–	24	245	27
DFPI-160- ... -C1V-A			227.5					251.5	

Piston diameter [mm]	AM −2	B1	D1 ∅	D2 ∅	D3 ∅	D4	D5 ∅	D6 ∅	H1	H2
DFPI-100- ... -C1V-P-A	32	131	109	G1/4	70	M8	25	119	–	18.3
DFPI-125- ... -C1V-P-A	54	163	135	G1/4	102	M10	32	147	–	18.3
DFPI-160- ... -C1V-P-A		199	170					182		

Piston diameter [mm]	H3	KK	L1+	L5	L8	L9	WH	ZB+	⫧C1
DFPI-100- ... -C1V-P-A	21.2	M16x1.5	218.5	15	48.8	1	16	234.5	22
DFPI-125- ... -C1V-P-A	21.2	M27x2	221	18	48.8	–	24	245	27
DFPI-160- ... -C1V-P-A			227.5					251.5	

Linear actuators DFPI-...-C1V-...

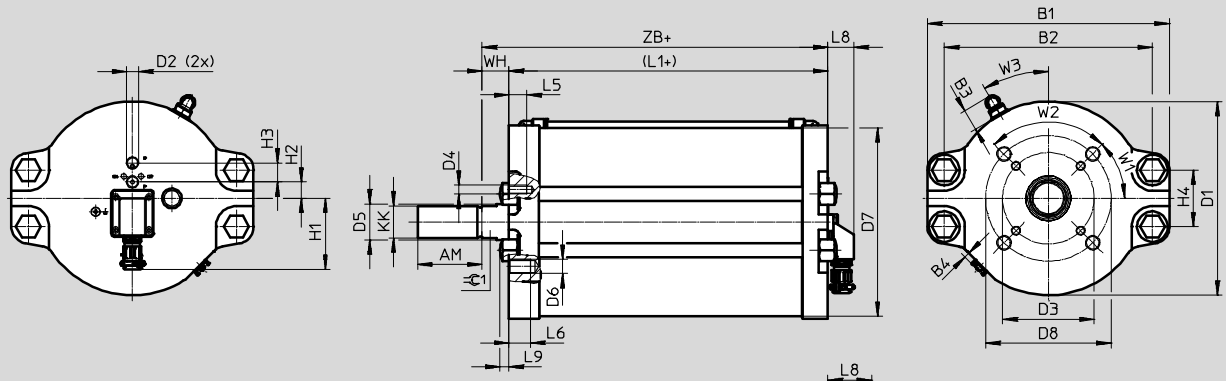
Technical data

Dimensions

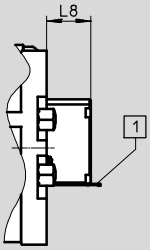
Download CAD data ➔ **www.festo.com**

Piston diameter 200 ... 320

DFPI- ... -ND2P-C1V-A



DFPI- ... -ND2P-C1V-P-A



1 Sealing plug

\+ = plus stroke length

Piston diameter [mm]	AM −2	B1	B2	B3	B4	D1 ∅	D2	D3 ∅	D4	D5 ∅	D6	D7 ∅ min.	D8 ∅	H1 ±2	H2
DFPI-200- ... -C1V-A	72	270	232	24.5	6.5	216	G1/4	102	M10	40	M16	210	140	79	18.3
DFPI-250- ... -C1V-A	72	308	268	24.5	6.5	260	G1/4	102	M10	40	M16	254	140	79	18.3
DFPI-320- ... -C1V-A		378	338			332						325			

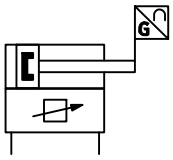
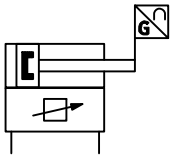
Piston diameter [mm]	H3	H4	KK	L1+	L5	L6 min.	L8	L9	⊂1	WH	W1	W2	W3	ZB+
DFPI-200- ... -C1V-A	21.2	63	M36x2	255.5	20	24	28.8	10	36	30	45°	90°	30°	285.5
DFPI-250- ... -C1V-A	21.2	82	M36x2	255	20	25	28.8	25	36	30	45°	90°	30°	285
DFPI-320- ... -C1V-A		126		262				–						292

Piston diameter [mm]	AM −2	B1	B2	B3	B4	D1 ∅	D2	D3 ∅	D4	D5 ∅	D6	D7 ∅ min.	D8 ∅	H2	H3
DFPI-200- ... -C1V-P-A	72	270	232	24.5	6.5	216	G1/4	102	M10	40	M16	210	140	18.3	21.2
DFPI-250- ... -C1V-P-A	72	308	268	24.5	6.5	260	G1/4	102	M10	40	M16	254	140	18.3	21.2
DFPI-320- ... -C1V-P-A		378	338			332						325			

Piston diameter [mm]	H4	KK	L1+	L5	L6 min.	L8	L9	⊂1	WH	W1	W2	W3	ZB+
DFPI-200- ... -C1V-P-A	63	M36x2	255.5	20	24	48.8	10	36	30	45°	90°	30°	285.5
DFPI-250- ... -C1V-P-A	82	M36x2	255	20	25	48.8	25	36	30	45°	90°	30°	285
DFPI-320- ... -C1V-P-A	126		262				–						292

Technical data

Ordering data

		Piston diameter [mm]	Part no.	Type
	• Linear actuators with integrated positioner • Based on DIN EN ISO 5210	100	**1548004**	**DFPI-100-...-ND2P-C1V-A**
		125	**1548020**	**DFPI-125-...-ND2P-C1V-A**
		160	**1548026**	**DFPI-160-...-ND2P-C1V-A**
		200	**1548030**	**DFPI-200-...-ND2P-C1V-A**
		250	**1548037**	**DFPI-250-...-ND2P-C1V-A**
		320	**1548041**	**DFPI-320-...-ND2P-C1V-A**
Variant with protected pneumatic and electrical connections				
	• Linear actuators with integrated positioner • Based on DIN EN ISO 5210	100	**1548005**	**DFPI-100-...-ND2P-C1V-P-A**
		125	**1548021**	**DFPI-125-...-ND2P-C1V-P-A**
		160	**1548028**	**DFPI-160-...-ND2P-C1V-P-A**
		200	**1548032**	**DFPI-200-...-ND2P-C1V-P-A**
		250	**1548039**	**DFPI-250-...-ND2P-C1V-P-A**
		320	**1548044**	**DFPI-320-...-ND2P-C1V-P-A**

Note

Stroke length of the actuator

The stroke length of the actuator should generally at least correspond to the nominal diameter of the process valve so that the process valve can be fully opened and closed. The system tolerances can lead to a greater stroke range than the specified nominal stroke range of the linear actuator. During initialisation, the integrated positioner learns the stroke length used and ensures that the slide gate moves to the required positions in a controlled way – at most to the end positions learned during initialisation.

Linear actuators DFPI

Accessories

Connecting cable NHSB

- Pre-assembled connecting cable
- Suitable for linear actuators DFPI-...-E-P-... and DFPI-...-C1V-P-...
- Cable lengths 5, 10 and 15 m

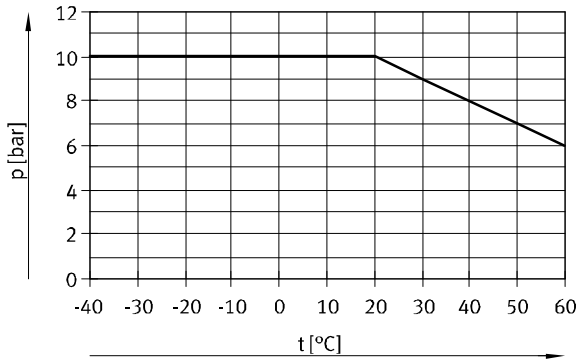
General technical data			
Connecting cable	[mm²]	3x 0.75	5x 0.75
Mounting position		Any	
Electrical connection 1		Straight plug connector, 3-pin	Straight plug, 5-pin
Electrical connection 2		Open end, 3-wire	Open end, 5-wire
Min. cable bending radius	[mm]	100	
Pneumatic connection		For tubing O.D. 8 mm	
		–	For tubing O.D. 10 mm

Operating and environmental conditions		
Ambient temperature	[°C]	–20 ... +60
Ambient temperature with flexible cable installation	[°C]	–5 ... +60
Operating voltage range	[V DC]	0 ... 30
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Lubricated operation possible
Degree of protection		IP65, IP67, IP69K, NEMA 4
Relative humidity	[%]	5 ... 100, condensing

Materials	
Protective conduit	PA
Protective conduit fitting	PA
Cable sheath	PVC
Seals	TPE
Note on materials	RoHS-compliant

Operating pressure [bar] as a function of operating temperature [°C]

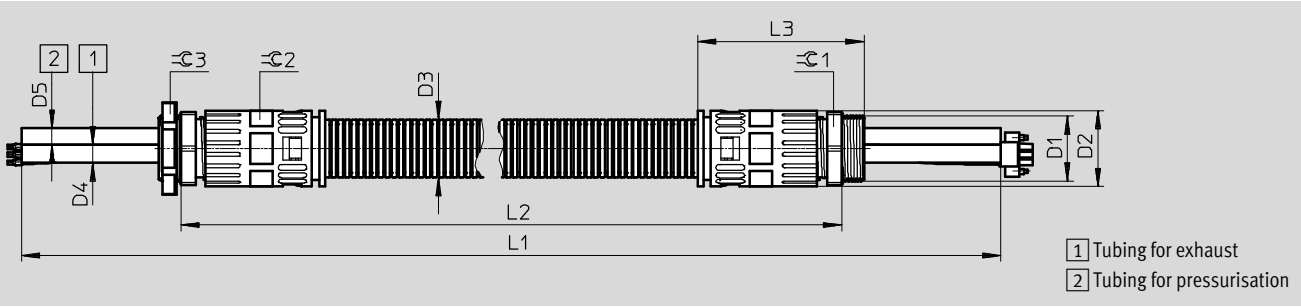
NHSB-A1-...



Accessories

Dimensions Download CAD data ➔ **www.festo.com**

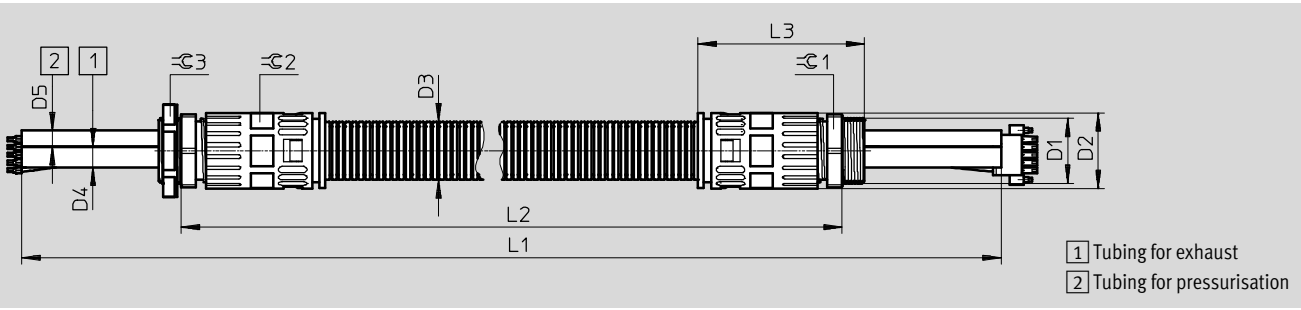
3-wire



Type	D1	D2 ∅	D3 ∅	D4 ∅	D5 ∅	L1 ±25	L2 ±25	L3	⌀1	⌀2	⌀3
NHSB-A1-0,6-BLG3-LE3-PU8-2xBB	M32x1.5	37	28.5	8	8	1400	600	82	36	34	41
NHSB-A1-5-BLG3-LE3-PU8-2xBB						6100	5000				
NHSB-A1-10-BLG3-LE3-PU8-2xBB						11100	10000				
NHSB-A1-15-BLG3-LE3-PU8-2xBB						16100	15000				

Dimensions Download CAD data ➔ **www.festo.com**

5-wire



Type	D1	D2 ∅	D3 ∅	D4 ∅	D5 ∅	L1 ±25	L2 ±25	L3	⌀1	⌀2	⌀3
NHSB-A1-5-BLG5-LE5-PU8-2xBB	M32x1.5	37	28.5	10	8	6100	5000	82	36	34	41
NHSB-A1-10-BLG5-LE5-PU8-2xBB						11100	10000				
NHSB-A1-15-BLG5-LE5-PU8-2xBB						16100	15000				

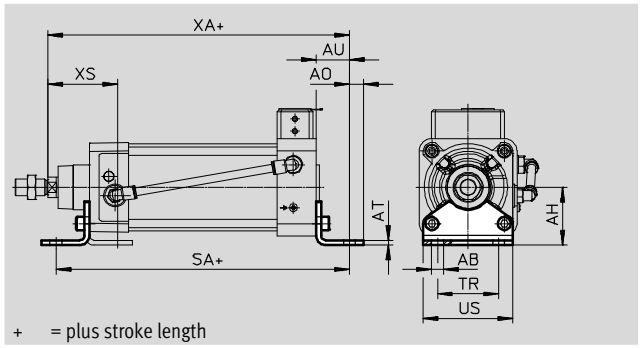
Ordering data – Connecting cable Technical data ➔ Internet: nhsb

	Electrical connection 1	Electrical connection 2	Length [m]	Cable composition [mm²]	Weight [g]	Part no.	Type
3-wire, for DFPI- ... -E-P-...							
	Straight plug, 3-pin	Open end, 3-wire	0.6	3x 0.75	280	**3673475**	**NHSB-A1-0,6-BLG3-LE3-PU8-2XBB**
			5		1250	**1686608**	**NHSB-A1-5-BLG3-LE3-PU8-2XBB**
			10		2500	**1686609**	**NHSB-A1-10-BLG3-LE3-PU8-2XBB**
			15		3750	**1686610**	**NHSB-A1-15-BLG3-LE3-PU8-2XBB**
5-wire, for DFPI- ... -C1V-P-...							
	Straight plug, 5-pin	Open end, 5-wire	5	5x 0.75	1250	**1585793**	**NHSB-A1-5-BLG5-LE5-PU8-2XBB**
			10		2500	**1585794**	**NHSB-A1-10-BLG5-LE5-PU8-2XBB**
			15		3750	**1585795**	**NHSB-A1-15-BLG5-LE5-PU8-2XBB**

Accessories

Foot mounting HNC/CRHNC

Material:
HNC: Galvanised steel
CRHNC: High-alloy steel
Free of copper and PTFE



Dimensions

For ∅ [mm]	AB ∅	AH	AO	AT	AU	SA	TR	US	XA	XS
100	14.5	71	17.5	6	41	261	75	110	270.7	86
125	16.5	90	22	8	45	290	90	131	309.7	102

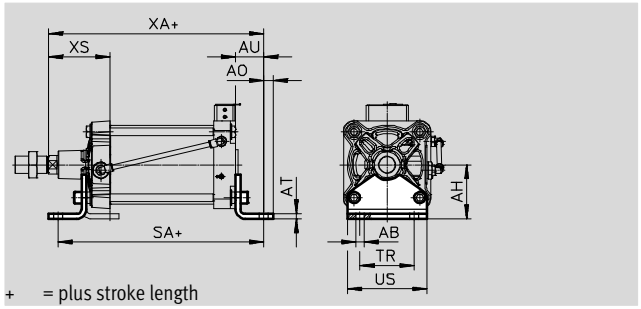
Ordering data

For ∅ [mm]	Basic design				High corrosion protection			
	CRC[1]	Weight [g]	Part no.	Type[2]	CRC[1]	Weight [g]	Part no.	Type[2]
100	2	1009	**174374**	**HNC-100**	4	990	**176942**	**CRHNC-100**
125	2	1902	**174375**	**HNC-125**	4	1920	**176943**	**CRHNC-125**

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.
2) Suitable for ATEX

Foot mounting HNG

Material:
Galvanised steel
Free of copper and PTFE



Dimensions and ordering data

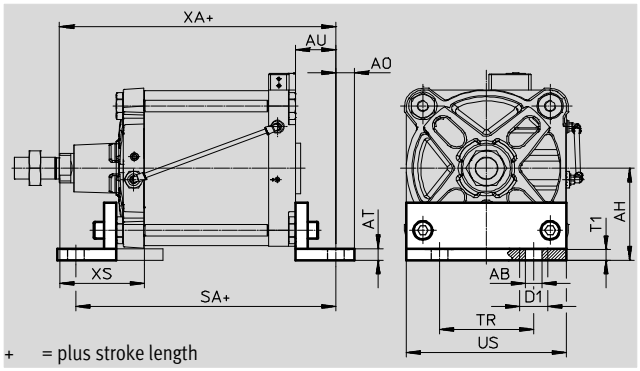
For ∅ [mm]	AB ∅	AH	AO	AT	AU	SA	TR	US	XA	XS	CRC[1]	Weight [g]	Part no.	Type
160	18.5	115	20	10	60	339	115	169	358.6	130	2	3931	**34476**	**HNG-160**
200	24	135	30	12	70	365	135	214	390	153	2	6896	**34477**	**HNG-200**

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Accessories

Foot mounting HNG

Material:
Galvanised steel
Free of copper and PTFE



Dimensions and ordering data

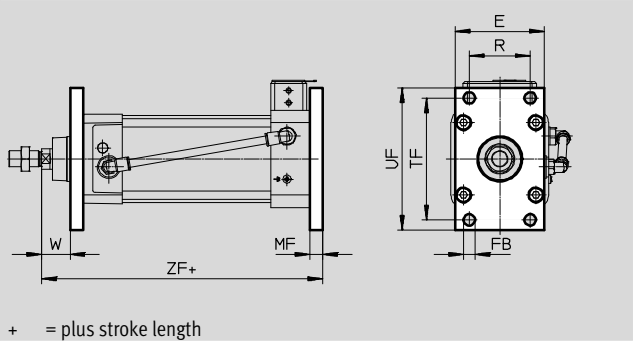
For ∅ [mm]	AB ∅	AH	AO	AT	AU	D1 ∅	SA	T1	TR	US	XA	XS	CRC[1)]	Weight [g]	Part no.	Type
250	28	165	35	20	75	–	404	–	165	270	434	160	2	17084	**157510**	**HNG-250**
320	35	200	40	25	85	60	451.2	23	200	340	486.2	180	2	29968	**157511**	**HNG-320**

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Accessories

Flange mounting FNC/CRFNG

Material:
FNC: Galvanised steel
CRFNG: High-alloy steel
Free of copper and PTFE
RoHS-compliant



+ = plus stroke length

Dimensions

For ∅ [mm]	E	FB ∅	MF	R	TF	UF	W	ZF
100	110	14	16	75	150	175	35	245.7
125	132	16	20	90	180	210	45	284.7

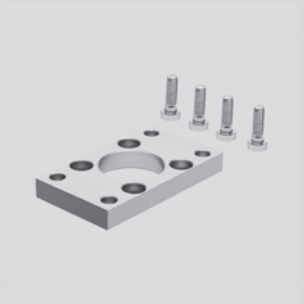
Ordering data

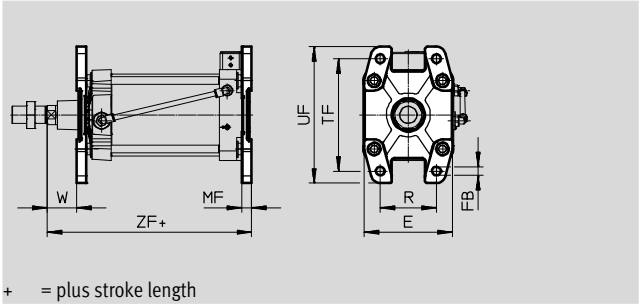
For ∅ [mm]	Basic design				High corrosion protection			
	CRC[1]	Weight [g]	Part no.	Type[2]	CRC[1]	Weight [g]	Part no.	Type[2]
100	1	2041	**174381**	**FNC-100**	4	2054	**161851**	**CRFNG-100**
125	1	3775	**174382**	**FNC-125**	4	3787	**185363**	**CRFNG-125**

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).
Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.
2) Suitable for ATEX

Flange mounting FNG

Material:
Painted spheroidal graphite cast iron
Free of copper and PTFE





+ = plus stroke length

Dimensions and ordering data

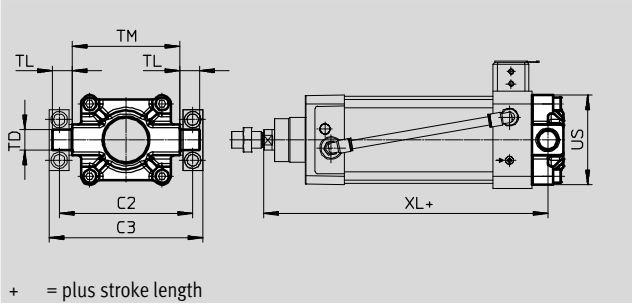
For ∅ [mm]	E	FB ∅	MF	R	TF	UF	W	ZF	CRC[1]	Weight [g]	Part no.	Type
160	180	18	20	115	230	280	60	318.6	1	3550	**34478**	**FNG-160**
200	220	22	25	135	270	320	70	345	1	5321	**34479**	**FNG-200**
250	270	26	25	165	330	390	80	384	1	8657	**157508**	**FNG-250**
320	340	33	30	200	400	470	90	431.2	1	15109	**157509**	**FNG-320**

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Accessories

Trunnion flange ZNCF/CRZNG

Material:
ZNCF: Stainless steel casting
CRZNG: Electropolished stainless steel casting
Free of copper and PTFE
RoHS-compliant



+ = plus stroke length

Dimensions

For ∅ [mm]	C2	C3	TD ∅ e9	TL	TM	US	XL
100	164	189	25	24.5	132	110	248.7
125	192	217			160	131	289.7

Ordering data

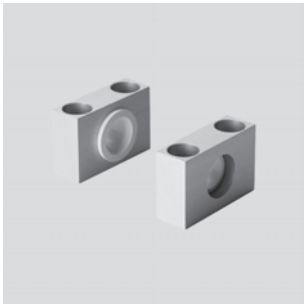
For ∅ [mm]	Basic design				High corrosion protection			
	CRC[1]	Weight [g]	Part no.	Type[2]	CRC[1]	Weight [g]	Part no.	Type[2]
100	2	2254	**174416**	**ZNCF-100**	4	2254	**161857**	**CRZNG-100**
125	2	3484	**174417**	**ZNCF-125**	4	3484	**185362**	**CRZNG-125**

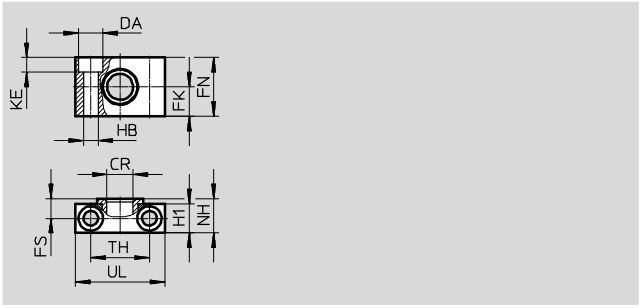
1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.
2) Suitable for ATEX

Accessories

Trunnion support LNZG

Mounting material:
Diameter 100, 125: Anodised wrought aluminium alloy
Diameter 160 ... 320: Galvanised steel
Material of bearing:
Diameter 100 ... 200: Plastic
Diameter 250, 320: Bronze
Free of copper and PTFE
RoHS-compliant





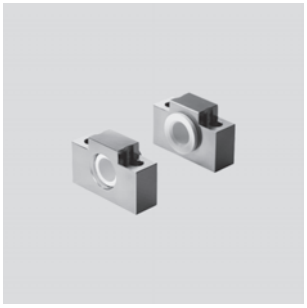
Dimensions and ordering data

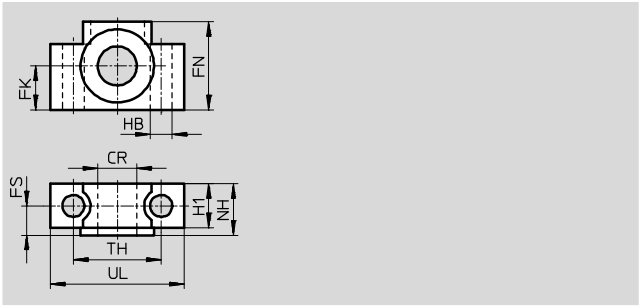
For ∅ [mm]	CR ∅	DA ∅ H13	FK	FN	FS	H1	HB ∅ H13	KE	NH	TH	UL	CRC[1]	Weight [g]	Part no.	Type
100, 125	25D11	20	25±01	50	16	24.5	14	13	28.5	50 ±0.2	75	2	306	**32962**	**LNZG-100/125**
160, 200	32D11	26	30 ±0.2	60	22.5	36	18	17	40	60 ±0.3	92	2	659	**35780**	**LNZG-160/200**
250	40G7	33	35 ±0.2	70	27.5	45	22	21.5	50	90 ±0.3	140	2	2218	**157516**	**LNZG-250**
320	50G7	40	40 ±0.2	80	32.5	55	26	25.5	60	100 ±0.3	150	2	2934	**157517**	**LNZG-320**

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Trunnion support CRLNZG

Material:
High-alloy steel
Free of copper and PTFE
RoHS-compliant





Dimensions and ordering data

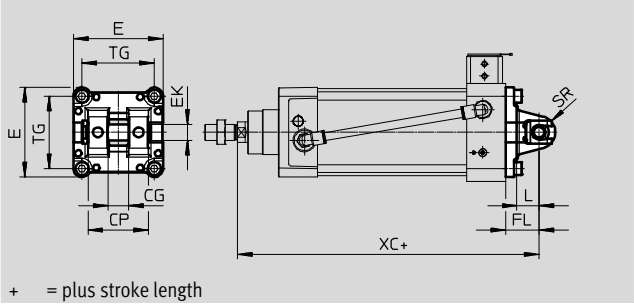
For ∅ [mm]	CR ∅ D11	FK ±0.1	FN	FS	H1	HB ∅ H13	NH	TH ±0.2	UL	CRC[1]	Weight [g]	Part no.	Type
100, 125	25	25	50	16	24.5	14	28.5	50	75	4	739	**161877**	**CRLNZG-100/125**

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.

Accessories

Swivel flange SNC

Material:
Die-cast aluminium
RoHS-compliant



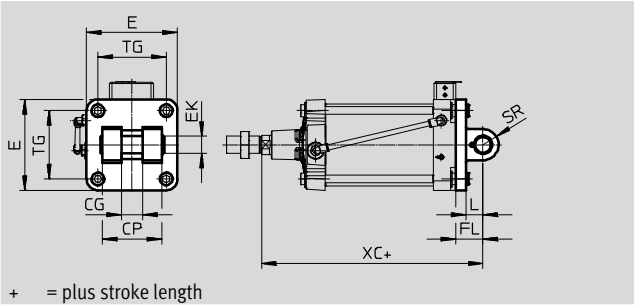
Dimensions and ordering data

For ∅ [mm]	CG H14	CP h14	E	EK ∅ H9	FL ±0.2	L	SR	TG	XC	CRC[1]	Weight [g]	Part no.	Type[2]
100	25	75	110+0.3/–0.8	20	41	27	20	89	270.7	1	895	**174388**	**SNC-100**
125	37	97	131–0.8	30	50	30	25	110	334.7	1	1740	**174389**	**SNC-125**

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).
2) Suitable for ATEX

Swivel flange SNG

Material:
Die-cast aluminium
RoHS-compliant



Dimensions and ordering data

For ∅ [mm]	CG H14	CP d12	E max.	EK ∅ F7/h9	FL ±0.2	L min.	SR max.	TG ±0.3	XC	CRC[1]	Weight [g]	Part no.	Type[2]
160	43	122	186	35	55	35	32	140	353.6	2	3577	**152597**	**SNG-160**
200			230		60			175	380	2	5160	**152598**	**SNG-200**

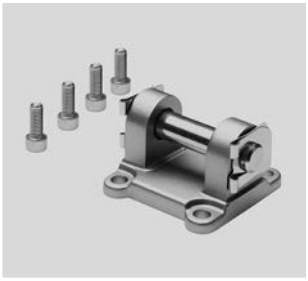
1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
2) Suitable for ATEX

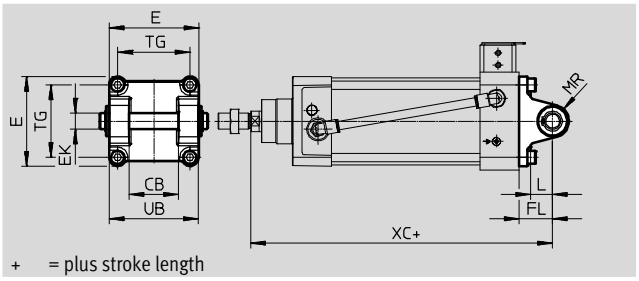
Linear actuators DFPI

Accessories

Swivel flange
SNCB/SNCB-...-R3

Material:
SNCB: Die-cast aluminium
SNCB-...-R3: Die-cast aluminium with protective coating,
high corrosion protection
Free of copper and PTFE
RoHS-compliant





Dimensions

For ∅ [mm]	CB H14	E	EK ∅ H9/e8	FL ±0.2	L	MR −0.5	TG	UB	XC
100	60	110+0.3/−0.8	20	41	27	20	89	110	270.7
125	70	131−0.8	25	50	30	25	110	130	314.7

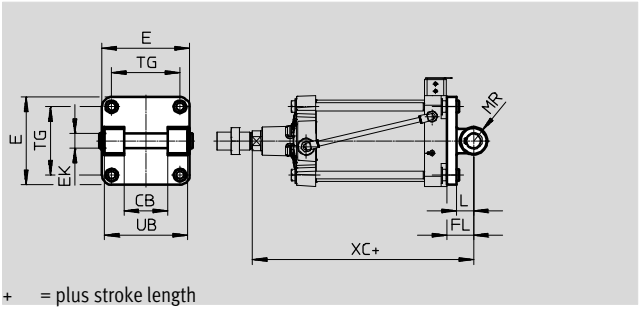
Ordering data

For ∅ [mm]	Basic design				Variant R3 – High corrosion protection			
	CRC[1)]	Weight [g]	Part no.	Type	CRC[1)]	Weight [g]	Part no.	Type
100	1	1035	**174395**	**SNCB-100**	3	986	**176949**	**SNCB-100-R3**
125	1	1860	**174396**	**SNCB-125**	3	1776	**176950**	**SNCB-125-R3**

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).
Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Swivel flange SNGB
for clevis foot LN/LSN

Material:
Die-cast aluminium



Dimensions and ordering data

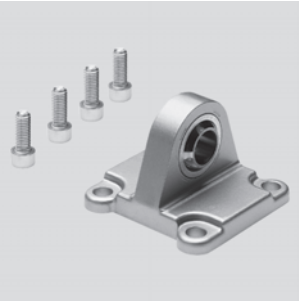
For ∅ [mm]	CB H14	E	EK ∅	FL ±0.2	L	MR	TG ±0.2	UB h14	XC	CRC[1)]	Weight [g]	Part no.	Type
160	90	183.5	30 H9	55	37	30	140	170	353.6	2	3445	**34547**	**SNGB-160**
200		220		60	40	25	175		380	2	10020	**562455**	**SNGB-200-B**
250	110	268	40 E10	70	47	40	220	200	426	1	16141	**157512**	**SNGB-250**
320	120	338	45 H9	80	52	45	270	220	481.2	1	26636	**157513**	**SNGB-320**

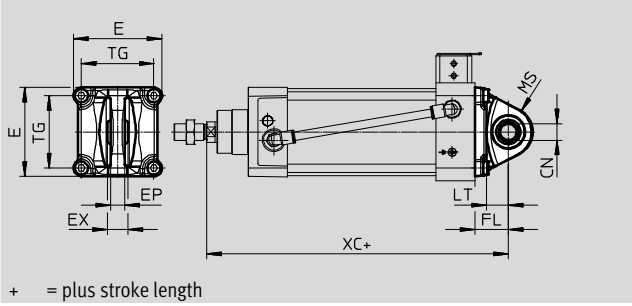
1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).
Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Accessories

Swivel flange SNCS

Material:
Wrought aluminium alloy
Free of copper and PTFE
RoHS-compliant





Dimensions and ordering data

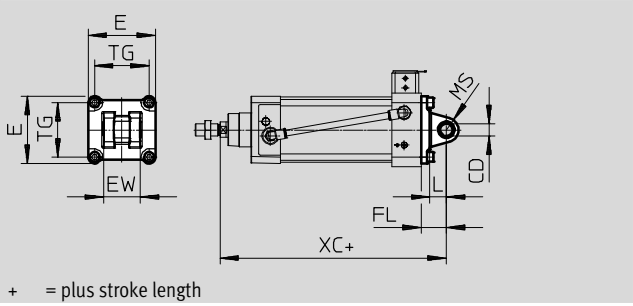
For ∅ [mm]	CN ∅	E +1/–0.7	EP ±0.2	EX	FL	LT	MS	TG	XC	CRC[1)]	Weight [g]	Part no.	Type
100	20	109	18	25	41	27	30	89	270.7	2	683	**174402**	**SNCS-100**
125	30	132	25	37	50	30	39	110	314.7	2	1369	**174403**	**SNCS-125**

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Accessories

Swivel flange SNCL

Material:
Die-cast aluminium
Free of copper and PTFE
RoHS-compliant



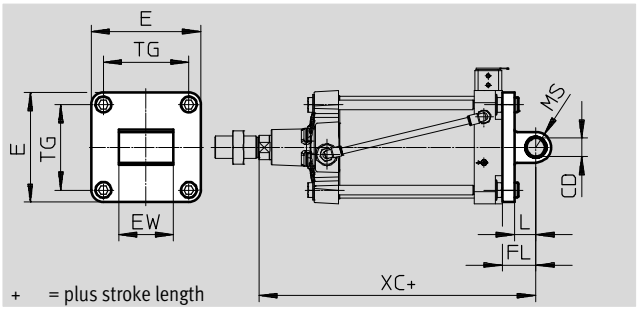
Dimensions and ordering data

For ∅ [mm]	CD ∅ H9	E	EW −0.2/−0.6	FL +0.2	L	MS	TG	XC	CRC[1]	Weight [g]	Part no.	Type
100	20	110+0.3/−0.8	60	41	27	20	72	270.7	1	606	**174409**	**SNCL-100**
125	25	131−0.8	70	50	30	25	89	314.7	1	1135	**174410**	**SNCL-125**

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Swivel flange SNGL

Material:
Die-cast aluminium
Free of copper and PTFE



Dimensions and ordering data

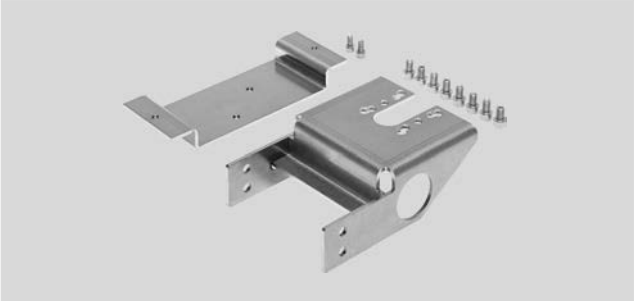
For ∅ [mm]	CD ∅ H9	E ±0.5	EW −0.5/−1.2	FL +0.2	L	MS	TG	XC	CRC[1]	Weight [g]	Part no.	Type
160	30	179.5	90	55	35	25	140	353.6	2	2358	**151534**	**SNGL-160**
200		219.5		60			175	380	2	3713	**151535**	**SNGL-200**

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Accessories

Adapter kit DADG-AK-F6-A2

For direct mounting of a positioner on the linear actuator DFPI-ND2P-E-NB3P



General technical data		
Ambient temperature[1]	[°C]	–20 ... +80
Corrosion resistance class CRC[2]		3

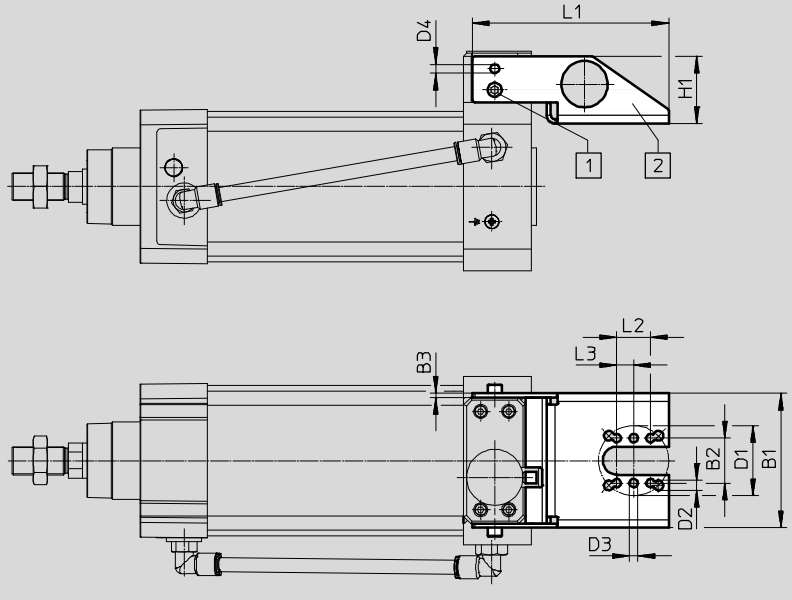
1) Note operating range of proximity sensors and cylinder
2) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Materials	
Mounting bracket	High-alloy stainless steel
Screws	High-alloy stainless steel
Note on materials	Contains PWIS (paint-wetting impairment substances)
	RoHS-compliant

Dimensions

Download CAD data ➔ **www.festo.com**

Mounting bracket for mounting a positioner with interface according to VDI/VDE 3845 sheet 1:2010-09



1 Socket head screw DIN 912-M6x10-A2-70
2 The adapter can also be turned 180° during mounting

Dimensions

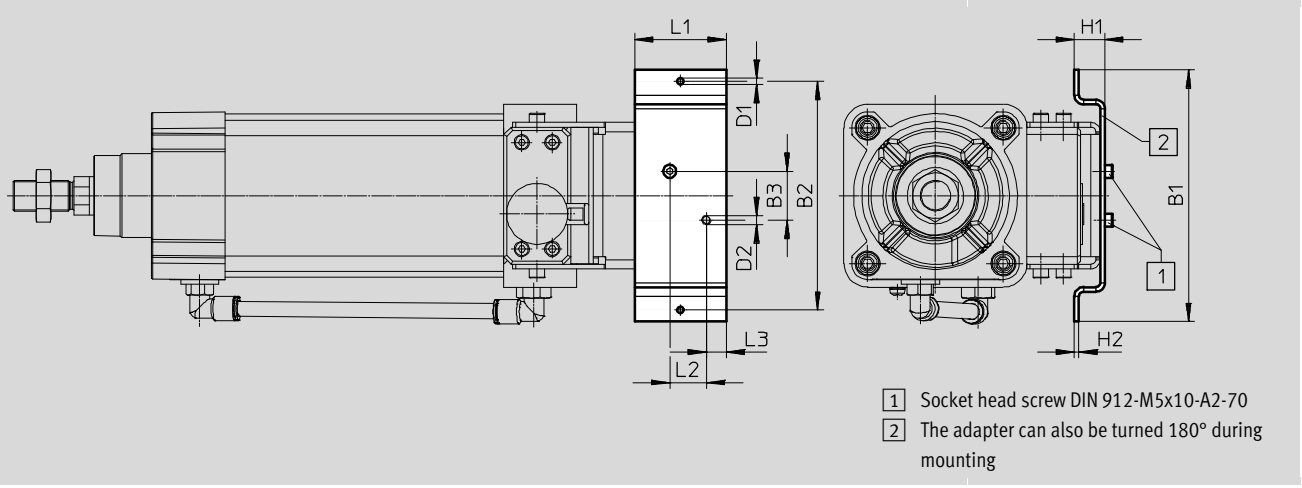
Type	B1	B2	B3	D1 ∅	D2 ∅	D3 ∅	D4 ∅	H1	L1	L2	L3
DADG-1	96	32	3	50	7	6	6.3	48	140	24	12

Accessories

Dimensions

Download CAD data ➔ **www.festo.com**

Mounting bracket for mounting a positioner with hole spacing of 150 mm

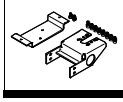


Dimensions

Type	B1	B2	B3	D1 ∅	D2 ∅	H1	H2	L1	L2	L3
DADG-2	165	150	32	M5	M6	20	3	60	24	13

Ordering data – Adapter kit

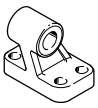
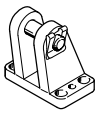
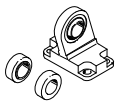
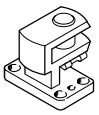
Technical data ➔ Internet: smbs

	For ∅	Description	Part no.	Type
	100 ... 320 mm	For direct mounting of an external positioner on the actuator	**3179433**	**DADG-AK-F6-A2**

Accessories

Ordering data – Mounting components

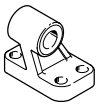
Technical data ➔ Internet: clevis foot

Designation	For ∅	Part no.	Type
Clevis foot LN/LNG			
	100	**33895**	**LNG-100**
	125	**33896**	**LNG-125**
	160	**9037**	**LN-160**
	200	**33898**	**LNG-200**
	250	**9039**	**LN-250**
	320	**9040**	**LN-320**
Clevis foot LSNG			
	100	**31745**	**LSNG-100**
	125	**31746**	**LSNG-125**
	160	**152599**	**LSNG-160**
	200	**152600**	**LSNG-200**
Clevis foot LBG [1]			
	100	**31766**	**LBG-100**
	125	**31767**	**LBG-125**
Clevis foot LSN			
	100	**5566**	**LSN-100**
	125	**6987**	**LSN-125**
	160	**6988**	**LSN-160**
	200	**6989**	**LSN-200**
	250	**6990**	**LSN-250**
	320	**6991**	**LSN-320**
Clevis foot LSNSG			
	100	**31752**	**LSNSG-100**
	125	**31753**	**LSNSG-125**
Right-angle clevis foot LQG [1]			
	100	**31773**	**LQG-100**
	125	**31774**	**LQG-125**

1) Suitable for ATEX

Ordering data – Mounting components, corrosion-resistant

Technical data ➔ Internet: crlng

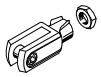
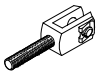
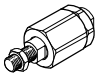
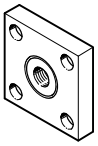
Designation	For ∅	Part no.	Type
Clevis foot CRLNG			
	100	**161845**	**CRLNG-100**
	125	**176951**	**CRLNG-125**

Linear actuators DFPI

Accessories

Ordering data – Piston-rod attachments

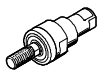
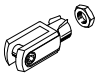
Technical data ➔ Internet: piston-rod attachment

Designation	For ∅	Part no.	Type
Rod eye SGS			
	100	**9264**	**SGS-M20x1,5**
	125	**10774**	**SGS-M27x2**
	160, 200	**10775**	**SGS-M36x2**
	250	**10776**	**SGS-M42x2**
	320	**10777**	**SGS-M48x2**
Rod clevis SG[1]			
	100	**6147**	**SG-M20x1,5**
	125	**14987**	**SG-M27x2-B**
	160, 200	**9581**	**SG-M36x2**
	250	**9582**	**SG-M42x2**
	320	**9583**	**SG-M48x2**
Rod clevis SGA[1]			
	100	**10769**	**SGA-M20x1,5**
	125	**10770**	**SGA-M27x2**
	160, 200	**10771**	**SGA-M36x2**
Self-aligning rod coupler FK[1]			
	100	**6143**	**FK-M20x1,5**
	125	**10485**	**FK-M27x2**
	160, 200	**10746**	**FK-M36x2**
Coupling piece KSG[1]			
	100	**32966**	**KSG-M20x1,5**
	125	**32967**	**KSG-M27x2**

1) Suitable for ATEX

Ordering data – Piston-rod attachments, corrosion-resistant

Technical data ➔ Internet: piston-rod attachment

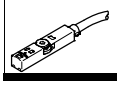
Designation	For ∅	Part no.	Type
Rod eye CRSGS			
	100	**195585**	**CRSGS-M20x1,5**
	125	**195586**	**CRSGS-M27x2**
Self-aligning rod coupler CRFK			
	100	**2545677**	**CRFK-M20x1,5**
Rod clevis CRSG[1]			
	100	**13572**	**CRSG-M20x1,5**
	125	**185361**	**CRSG-M27x2**

1) Suitable for ATEX

Accessories

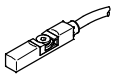
Ordering data – Proximity sensor for T-slot, magnetoresistive

Technical data ➔ Internet: smt-8

	Switching output	Electrical connection		Cable length [m]	Part no.	Type
		Cable	Plug M8x1			
N/O contact						
	Contactless	2-wire	–	5	**574341**	**SMT-8M-A-ZS-24V-E-5,0-OE-EX2**
	PNP	–	3-pin	0.3	**574342**	**SMT-8M-A-PS-24V-E-0,3-M8D-EX2**

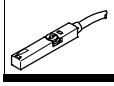
Ordering data – Proximity sensor for T-slot, corrosion-resistant

Technical data ➔ Internet: crsmt

	Switching output	Electrical connection	Cable length [m]	Part no.	Type
N/O contact					
	PNP	Cable, 3-wire	5	**574380**	**CRSMT-8M-PS-24V-K-5,0-OE**

Ordering data – Proximity sensor for T-slot, NAMUR

Technical data ➔ Internet: sdbt

	Switching output	Electrical connection	Cable length [m]	Part no.	Type
N/O contact					
	NAMUR	Cable, 2-wire	5	**579071**	**SDBT-MS-20NL-ZN-E-5-LE-EX6**
			10	**579072**	**SDBT-MS-20NL-ZN-E-10-LE-EX6**

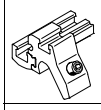
Ordering data – Slot cover for T-slot

Technical data ➔ Internet: abp

	Assembly	Length [m]	Part no.	Type
	Insertable	2x 0.5	**151680**	**ABP-5-S**

Ordering data – Mounting kits for proximity sensors SMT/CRSMT/SDBT

Technical data ➔ Internet: smbz, dasp

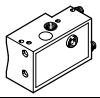
	For ∅	Materials	Part no.	Type
	100	Rail: anodised wrought aluminium alloy Screws: high-alloy stainless steel Free of copper and PTFE	**537806**	**SMBZ-8-32/100**
	125		**1451483**	**DASP-M4-125-A**
	160, 200		**1553813**	**DASP-M4-160-A**
	250		**1456781**	**DASP-M4-250-A**
	320		**3015256**	**DASP-M4-320-A**

Accessories

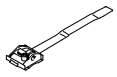
Ordering data – Connecting cables Technical data ➔ Internet: nebu

	Electrical connection, left	Electrical connection, right	Cable length [m]	Part no.	Type
	Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	**541333**	**NEBU-M8G3-K-2.5-LE3**
			5	**541334**	**NEBU-M8G3-K-5-LE3**
	Straight socket, M12x1, 5-pin	Cable, open end, 3-wire	2.5	**541363**	**NEBU-M12G5-K-2.5-LE3**
			5	**541364**	**NEBU-M12G5-K-5-LE3**
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	**541338**	**NEBU-M8W3-K-2.5-LE3**
			5	**541341**	**NEBU-M8W3-K-5-LE3**
	Angled socket, M12x1, 5-pin	Cable, open end, 3-wire	2.5	**541367**	**NEBU-M12W5-K-2.5-LE3**
			5	**541370**	**NEBU-M12W5-K-5-LE3**

Ordering data – Rectangular proximity sensor, pneumatic Technical data ➔ Internet: smpo

	Assembly	Pneumatic connection	Part no.	Type
3/2-way valve, normally closed				
	With accessories	Barbed fitting for tubing I.D. 3 mm	**31008**	**SMPO-1-H-B**

Ordering data – Mounting kit for proximity sensor SMPO-1 Technical data ➔ Internet: smbs

	For ∅	Assembly	Part no.	Type
	32 ... 100 mm	On the cylinder barrel using clamping strap	**151226**	**SMBS-2**

05 Quarter turn actuators

Pneumatic quarter turn actuators according to the rack and pinion or Scotch yoke principle, in aluminium or stainless steel, for automating swivel valves such as butterfly valves and ball valves

DFPD

Quarter turn actuators

+ With rack and pinion kinematics
+ Flange hole pattern to ISO 5211
+ Mounting hole pattern to VDI/VDE 3845

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DAPS

Quarter turn actuators

+ With Scotch yoke kinematics
+ Flange hole pattern to ISO 5211
+ Mounting hole pattern to VDI/VDE 3845

➔ page 413

Contents

Quarter turn actuators DFPD 373
Quarter turn actuators DAPS 413

Quarter turn actuators
DFPD ★

Overview, configuration and ordering
➔ **www.festo.com/catalogue/dfpd** ✓

Additional information, support and user documentation
➔ **www.festo.com/sp/dfpd** ✓

Quick ordering of basic designs
➔ page 390 ✓

Selected types in accordance with the ATEX Directive for explosive atmospheres
➔ **www.festo.com/ex** ✓

+ Flange hole pattern to ISO 5211
+ NAMUR connection pattern for solenoid valves/sensor boxes to VDI/VDE 3845
+ With rack and pinion unit

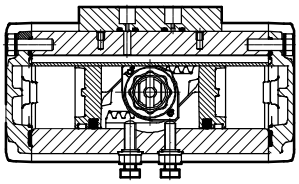
+ Size 10 ... 2300
+ Torque 10 ... 2300 Nm
+ Swivel angle 0 ... 90°, 0 ... 180°

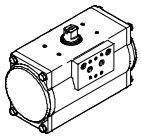
Quarter turn actuators DFPD

Key features

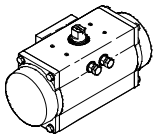
Function

The DFPD series features a rack and pinion combination with a constant torque characteristic across the entire swivel range. Sizes 10 to 2300 are available. The DFPD is suitable for the automation of butterfly valves, ball valves and air dampers. It is also suitable for water/wastewater, beverage, pharmaceutical and process automation. The modular and compact design of the DFPD allows various spring configurations as a suitable solution for different applications.





DFPD-...-D
Double-acting



DFPD-...-S
Single-acting

Types of connection

- Port pattern to NAMUR VDI/VDE 3845 for mounting solenoid valves, position sensors and positioners
- Standards-base connection to ISO 5211

Variants

High temperature
DFPD-...-T4

- Seals made of FKM and plain bearings made of PPS
- For applications up to +150 °C
- II 2G c T3 X
  II 2D c 175°C X
  0 °C <= Ta <= +150 °C

Low temperature
DFPD-...-T6

- Seals made of FVMQ for applications down to –50 °C
- II 2G c T6 X
  II 2D c 85°C X
  –50 °C <= Ta <= +60 °C

Closes to the left and right
DFPD-...-R/L

- The modular system offers the option of closing to the left. This is done by turning the pistons

Spring configuration
DFPD-...-S

- The spring force can be adapted to the system's supply pressure in steps of 0.5 bar through free selection of the number of spring cartridges (4 to 12)

Epoxy coating
DFPD-...-EP

- Actuator with epoxy coating

Stainless steel shaft
DFPD-...-R3

- With stainless steel shaft

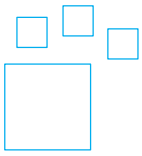
NPT version
DFPD-...-N

- Pneumatic connections with NPT threads

180° version
DFPD-...-180

- Sizes 40, 120, 240, 480 double-acting also available with 180° swivel angle

Ordering data – Product options



Configurable product
This product and all its product options can be ordered using the configurator.

The configurator can be found at
➔ **www.festo.com/catalogue/...**

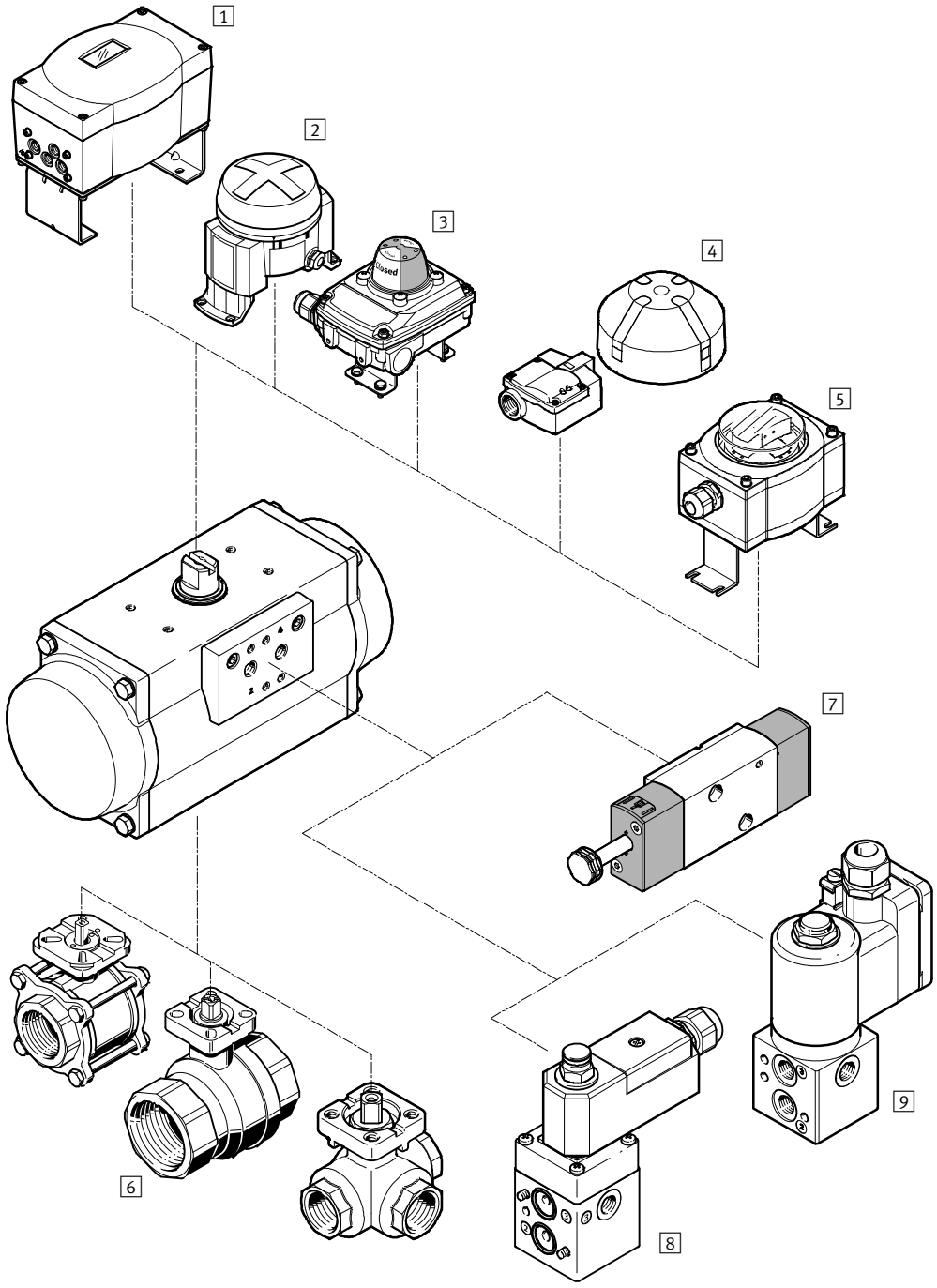
Part No.	Type code
8042184	**DFPD-10**
8042185	**DFPD-20**
8042186	**DFPD-40**
8042187	**DFPD-80**
8042188	**DFPD-120**
8042189	**DFPD-160**
8042190	**DFPD-240**
8042191	**DFPD-300**
8042192	**DFPD-480**
8042193	**DFPD-700**
8042194	**DFPD-900**
8042195	**DFPD-1200**
8042196	**DFPD-2300**

Key features

Size	Flange pattern	Shaft connection	Shaft connection depth [mm]	Pneumatic connection
10	F03	V9	10.7	G 1/8
	F04			1/8 NPT
20	F03	V9	10.7	G 1/8
	F04	V11	13.2	1/8 NPT
	F05			
40	F04	V11	13.2	G 1/8
	F05F07	V14	16.5	1/8 NPT
80	F05F07	V17	19.3	G 1/8
				1/8 NPT
120	F05F07	V17	19.3	G 1/4
				1/4 NPT
160	F07F10	V22	24.3	G 1/4
				1/4 NPT
240	F07F10	V22	24.3	G 1/4
				1/4 NPT
300	F07F10	V22	24.3	G 1/4
				1/4 NPT
480	F10F12	V27	29.5	G 1/4
				1/4 NPT
700	F10F12	V27	29.7	G 1/4
				1/4 NPT
900	F10F12	V27	30.2	G 1/4
	F14	V36	40.2	1/4 NPT
1200	F10F12	V27	31	G 1/4
	F14	V36	40	1/4 NPT
2300	F12F16	V46	50	G 1/4
	F14	V36	40	1/4 NPT

Quarter turn actuators DFPD

Peripherals overview



Peripherals overview

Mounting components and accessories

		Description	➔ Page/Internet
1	Positioner CMSX	For controlling the position of quarter turn actuators in process automation systems	289
2	Limit switch attachment DAPZ	Round design, variant AR, electrical, inductive or inductive and explosion-proof sensing	279
3	Sensor box SRBC	For electrical position feedback and monitoring the position of process valves actuated using quarter turn actuators	217
4	Sensor box SRBG	For electrical position feedback and monitoring the position of process valves actuated using quarter turn actuators	235
5	Sensor box SRAP	Analogue sensor box continuously senses the entire swivel range and reports this back to the controller	269
6	Ball valve VAPB, VZBA	2-way brass or stainless steel, corrosion-resistant; 3-way stainless steel, corrosion-resistant	542, 495
7	Solenoid valve VSNC	For single- and double-acting quarter turn actuators with a port pattern to VDI/VDE 3845	23
8	Solenoid valve VOFC	Solenoid valve with solenoid coil, port pattern to Namur	85
9	Solenoid valve VOFD	Solenoid valve with solenoid coil, port pattern to Namur	151

Quarter turn actuators DFPD

Type codes

DFPD – [ ] – [ ] – [ ] – [ ] – RP – [ ] – [ ] – [ ] – [ ] – [ ] – [ ]

Type	
DFPD	Quarter turn actuator

System of units	
–	Metric
N	Imperial

Version	
–	Standard

Size	
10	10
20	20
40	40
80	80
120	120
160	160
240	240
300	300
480	480
700	700
900	900
1200	1200
2300	2300

Design	
RP	Rack and pinion

Yoke type	
–	None

Swivel angle	
90	90°
180	180°

Swivel direction	
L	To the left
R	To the right

Function	
D	Double-acting
S	Single-acting

Spring configuration	
–	None
20	For connection pressure 2 bar
25	For connection pressure 2.5 bar
30	For connection pressure 3 bar
35	For connection pressure 3.5 bar
40	For connection pressure 4 bar
45	For connection pressure 4.5 bar
50	For connection pressure 5 bar
55	For connection pressure 5.5 bar
60	For connection pressure 6 bar

Type codes

	–		–		–		–		–	

Flange pattern 1

F03	Hole pattern F03
F04	Hole pattern F04
F05	Hole pattern F05
F07	Hole pattern F07
F10	Hole pattern F10
F12	Hole pattern F12
F14	Hole pattern F14

Flange pattern 2

–	None
07	Hole pattern F07
10	Hole pattern F10
12	Hole pattern F12
16	Hole pattern F16

Manual override

–	None

Temperature range

–	Standard
T4	0 ... +150
T6	–50 ... +60

Material shaft

–	Standard
R3	Stainless steel

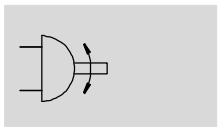
Housing surface treatment

–	None
EP	Epoxy-coated

Quarter turn actuators DFPD, double-acting

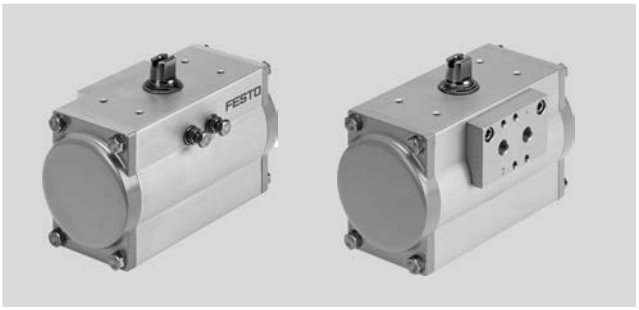
Technical data

Function



Swivel angel
0 ... 90°

Size
10 ... 2300



General technical data										
Size	10		20			40	80	120		160
Mode of operation	Double-acting									
Design	Rack and pinion									
Cushioning	No cushioning									
Mounting position	Any									
Pneumatic connection	G 1/8							G 1/4		
	1/8 NPT							1/4 NPT		
Standards-based connection	ISO 5211									
Valve connection conforms to standard	VDI/VDE 3845 (NAMUR)									
Connection for positioner and position sensor conforms to standard	VDI/VDE 3845 (NAMUR)									
Safety Integrity Level (SIL)	Up to SIL 2 High Demand mode									
Size	AA 1									
Flange hole pattern 1	F03	F04	F03	F04	F05	F04	F05	F05	F05	F07
Flange hole pattern 2	–	–	–	–	–	F07	F07	F07	F07	F10
Swivel angle [°]	90									
	–						120	–	120	–
	–						135	–	135	–
	–						180	–	180	–
End-position adjusting range at 0° [°]	–5 ... +5									
End-position adjusting range at 90° [°]	–5 ... +5									
End-position adjusting range at 180° [°]	–						–5 ... +5	–	–5 ... +5	–
Position sensing	Opto-electrical									
Closing direction	Closes to the right									

Technical data

General technical data								
Size		240	300	480	700	900	1200	2300
Mode of operation		Double-acting						
Design		Rack and pinion						
Cushioning		No cushioning						
Mounting position		Any						
Pneumatic connection		G 1/4						
		1/4 NPT						
Standards-based connection		ISO 5211						
Valve connection conforms to standard		VDI/VDE 3845 (NAMUR)						
Connection for positioner and position sensor conforms to standard		VDI/VDE 3845 (NAMUR)						
Safety Integrity Level (SIL)		Up to SIL 2 High Demand mode						
Size		AA 2				AA 3		
Flange hole pattern 1		F07	F07	F10	F10	F10 F14	F10 F14	F12 F14
Flange hole pattern 2		F10	F10	F12	F12	F12	F12	F16
Swivel angle	[°]	90						
		120	–	120	–			
		135	–	135	–			
		180	–	180	–			
End-position adjusting range at 0°	[°]	–5 ... +5						
End-position adjusting range at 90°	[°]	–5 ... +5						
End-position adjusting range at 180°	[°]	–5 ... +5	–	–5 ... +5	–			
Position sensing		Opto-electrical						
Closing direction		Closes to the right						

Operating and environmental conditions		
Operating pressure	[bar]	2 ... 8
Nominal operating pressure	[bar]	5.5
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Pressure dew point 10 °C below ambient temperature/temperature of medium
		Lubricated operation possible (in which case lubricated operation will always be required)
Ambient temperature	[°C]	–20 ... +80

Quarter turn actuators DFPD, double-acting

Technical data

ATEX	
ATEX category for gas	II 2G
Type of ignition protection for gas	Ex h IIC T4 Gb X
ATEX category for dust	II 2D
Type of ignition protection for dust	Ex h IIIC T105°C Db X
Explosion-proof temperature rating [°C]	–20 <= Ta <= +80
CE marking (see declaration of conformity)	To EU Explosion Protection Directive (ATEX)

Theoretical torque [Nm] as a function of operating pressure

	Operating pressure [bar]										
Size	2	2.5	3	3.5	4	4.5	5	5.5	6	7	8
10	3.7	4.7	5.6	6.6	7.5	8.4	9.4	**10.3**	11.2	13.1	15.0
20	7.3	9.1	11.0	12.8	14.6	16.4	18.3	**20.1**	21.9	25.6	29.2
40	13.9	17.4	20.9	24.4	27.9	31.3	34.8	**38.3**	41.8	48.7	55.7
80	30.0	37.5	44.9	52.4	59.9	67.4	74.9	**82.4**	89.9	104.9	119.9
120	42.7	53.4	64.0	74.7	85.4	96.1	106.7	**117.4**	128.1	149.4	170.8
160	58.5	73.2	87.8	102.5	117.1	131.7	146.4	**161.0**	175.6	204.9	234.2
240	85.2	106.5	127.8	149.1	170.4	191.7	213.0	**234.3**	255.6	298.2	340.8
300	109.8	137.2	164.7	192.1	219.6	247.0	274.5	**301.9**	329.3	384.2	439.1
480	172.4	215.5	258.5	301.6	344.7	387.8	430.9	**474.0**	517.1	603.3	689.5
700	241.2	301.5	361.8	422.1	482.4	542.7	603.0	**663.3**	723.6	844.2	964.8
900	306.2	382.7	459.3	535.8	612.4	688.9	765.4	**842.0**	918.5	1071.6	1224.7
1200	425.2	531.6	637.9	744.2	850.5	956.8	1063.1	**1169.4**	1275.7	1488.4	1701.0
2300	812.1	1015.1	1218.2	1421.2	1624.2	1827.2	2030.3	**2233.3**	2436.3	2842.4	3248.4

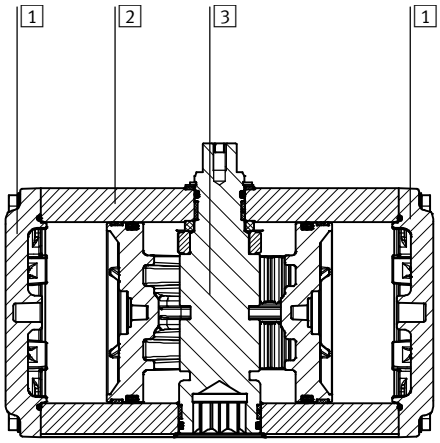
- Note

The operating torque of the actuator must not be greater than the maximum permissible torque listed in ISO 5211 in relation to the size of the mounting flange and of the coupling.

Technical data

Materials

Sectional view



Quarter turn actuators			Material number
1	Cap	Coated die-cast aluminium	EN AC-46100-D
2	Housing	Anodised wrought aluminium alloy	EN AW-6063-T6
3	Shaft	Nickel-plated steel	1.0715
	R3	High-alloy stainless steel	1.4305
–	Mounting plate	Anodised wrought aluminium alloy	EN AW-6063-T6
	Piston/piston rod	Die cast aluminium	EN AC-46100-D
	Seals	NBR	–
	Bearing	POM	–
	Cam	Stainless steel casting (DFPD-10/20/40/80/120/160-90)	1.4308
		Steel (DFPD-240/300/480/700/900/1200/2300-90)	1.0765
	Screws	High-alloy stainless steel	1.4301
	Note on materials	RoHS-compliant	–

Air consumption [l/cycle] at 6 bar

Type code	
DFPD-10-RP-90-D	1
DFPD-20-RP-90-D	1.8
DFPD-40-RP-90-D	3.4
DFPD-40-RP-180-D	5.2
DFPD-80-RP-90-D	7.4
DFPD-120-RP-90-D	10.4
DFPD-120-RP-180-D	12.8
DFPD-160-RP-90-D	14
DFPD-240-RP-90-D	20.3
DFPD-240-RP-180-D	25.7
DFPD-300-RP-90-D	26.4

Type code	
DFPD-480-RP-90-D	40.5
DFPD-480-RP-180-D	61.4
DFPD-700-RP-90-RD	58.8
DFPD-900-RP-90-RD	75.9
DFPD-1200-RP-90-RD	105
DFPD-2300-RP-90-RD	204

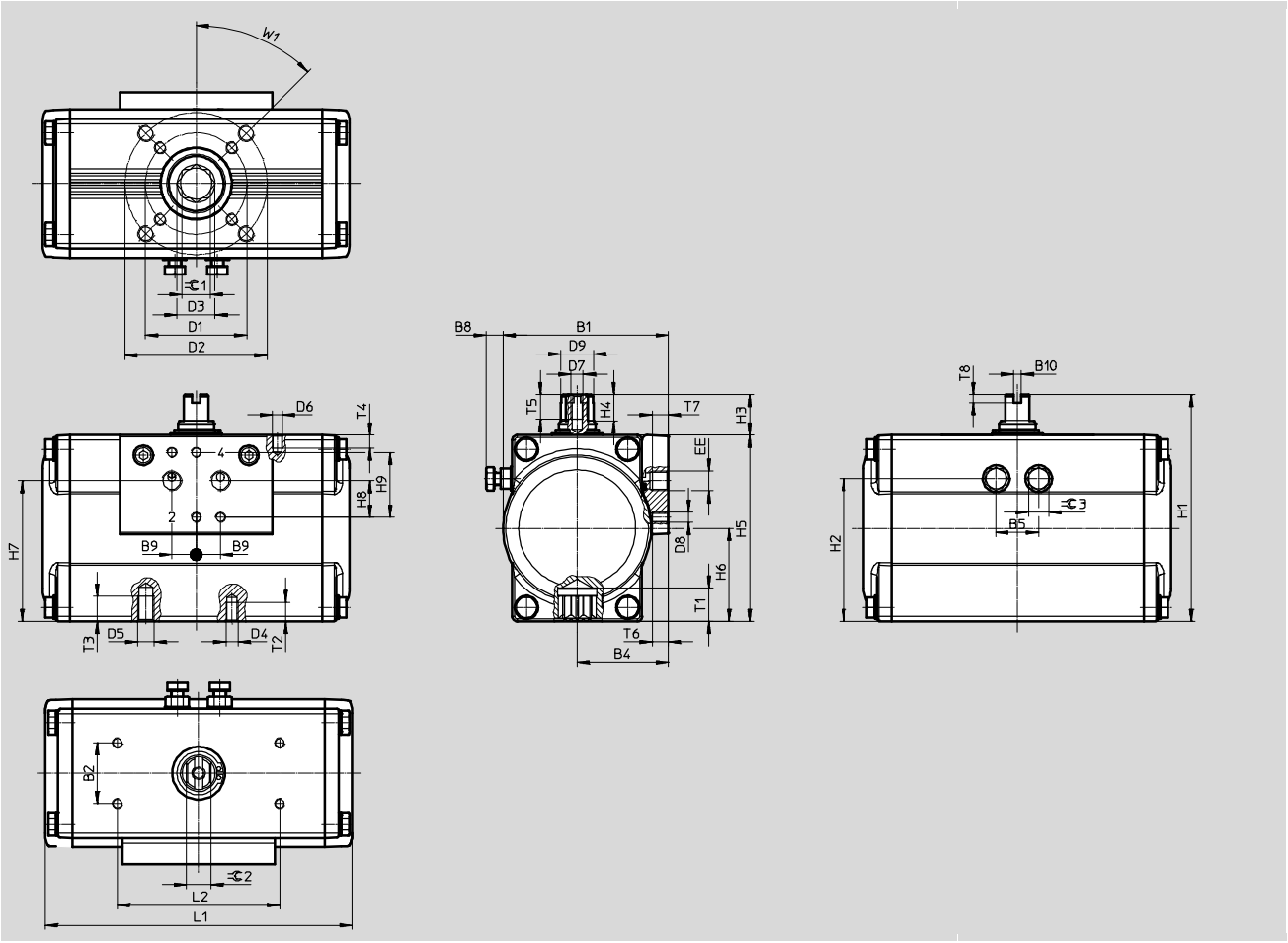
Quarter turn actuators DFPD, double-acting

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

Size 10 ... 80



Technical data

Type code	B1	B2 ±0.1	B4	B5	B8 max.	B9	B10	D1 ∅ ±0.1	D2 ∅ ±0.1	D3 ∅	D4	D5	D6
DFPD-10-F03	59.5	30	35	16	10.7	12	4	36	–	12	M5	–	M5
DFPD-10-F04								42					
DFPD-20-F04	68.5		38.5	19	9.2				–	14.6	M5	–	
DFPD-20-F05								50			M6		
DFPD-40	81.5		45	21	8.2				70	18.7		M8	
DFPD-40-180											M6		
DFPD-80	99		53	26	9					23.3			

Type code	D7	D8	D9 ∅ ±0.1	EE	H1	H2	H3 -0.5	H4 +0.1	H5	H6 ±0.2	H7 ±0.3	H8 ±0.1	H9
DFPD-10-F03	M6	M5	10.9	G 1/8 or 1/8 NPT	90	51	20	10	70	35	47	16	32
DFPD-10-F04													
DFPD-20-F04			12.7		100	59.75		10	80	40	57.5		
DFPD-20-F05													
DFPD-40			16.2		112	70.5		13	92	46	67.5		
DFPD-40-180													
DFPD-80			20.2		130	86		13	110	55	86.5		

Type code	L1	L2 ±0.1	T1 ±0.4	T2	T3	T4	T5	T6	T7	T8 +0.5	⫧ 1 H11	⫧ 2 h11	⫧ 3	W1
DFPD-10-F03	124.7	80	10.7	8	–	8	12	8	8	4	9	9	10	45°
DFPD-10-F04														
DFPD-20-F04	133.3		13.2	8	–						11	9	10	
DFPD-20-F05				9										
DFPD-40	151.4		16.5	9	12						14	12	10	
DFPD-40-180	227													
DFPD-80	189.3		19.3								17	15	13	

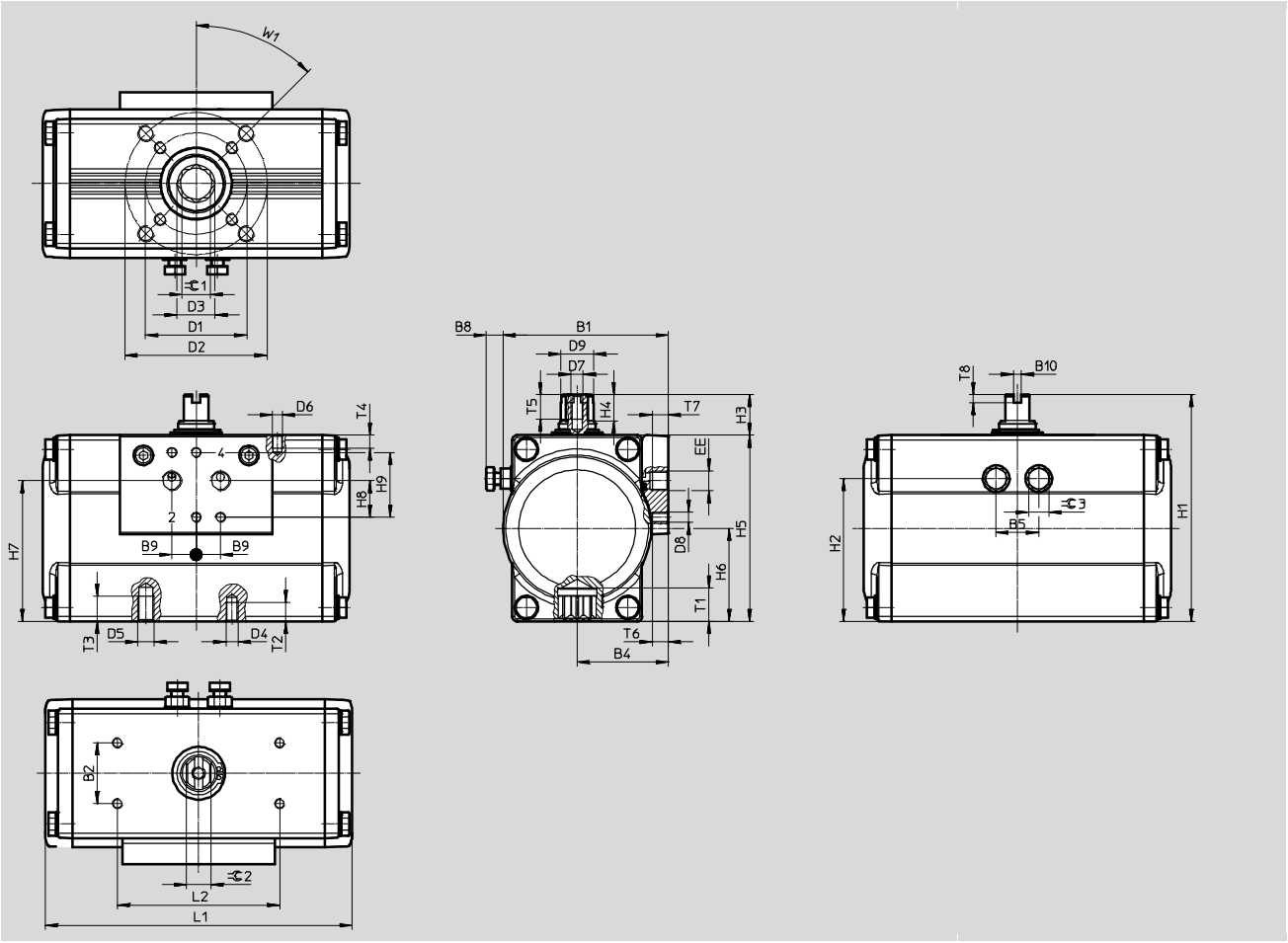
Quarter turn actuators DFPD, double-acting

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

Size 120 ... 480



Technical data

Type code	B1	B2 ±0.1	B4	B5	B8 max.	B9	B10	D1 ∅ ±0.1	D2 ∅ ±0.1	D3 ∅	D4	D5	D6
DFPD-120	111.5	30	60.5	32	12.3	12	4	50	70	23.3	M6	M8	M5
DFPD-120-180										23.2			
DFPD-160	120		63.5	36	13.4			70	102	23.2	M8	M10	
DFPD-240	135.5		71.5	41	18.5					30			
DFPD-240-180										30.3			
DFPD-300	144		74.5	46	17					30			
DFPD-480	163		83	52	19.3			102	125	37.4	M10	M12	
DFPD-480-180													

Type code	D7	D8	D9 ∅ ±0.1	EE	H1	H2	H3 -0.5	H4 +0.1	H5	H6	H7 ±0.3	H8 ±0.1	H9
DFPD-120	M6	M5	22.5	G 1/4 or 1/4 NPT	143	97.75	20	13	123	$61.5_{\pm 0.2}$	98.4	16	32
DFPD-120-180													
DFPD-160			25.5		154	106.25			134	$67_{\pm 0.2}$	109.4		
DFPD-240			31.8		180	120.5	30	19.5	150	$75_{\pm 0.2}$	120.2		
DFPD-240-180													
DFPD-300					192	131			162	$81_{\pm 0.3}$	132.1		
DFPD-480			38		214	149.5			184	$92_{\pm 0.4}$	152.5		
DFPD-480-180													

Type code	L1	L2 ±0.1	T1 ±0.4	T2	T3	T4	T5	T6	T7	T8 +0.5	⌯ 1 H11	⌯ 2 h11	⌯ 3	W1
DFPD-120	213.7	80	19.3	9	12	8	14	8	12	4	17	15	13	45°
DFPD-120-180	326.8													
DFPD-160	230.9		24.3	12	15						22	19	16	
DFPD-240	257											22	18	
DFPD-240-180	395.5													
DFPD-300	334.4													
DFPD-480	374.2		29.5	15	18						27	27	21	
DFPD-480-180	550.3													

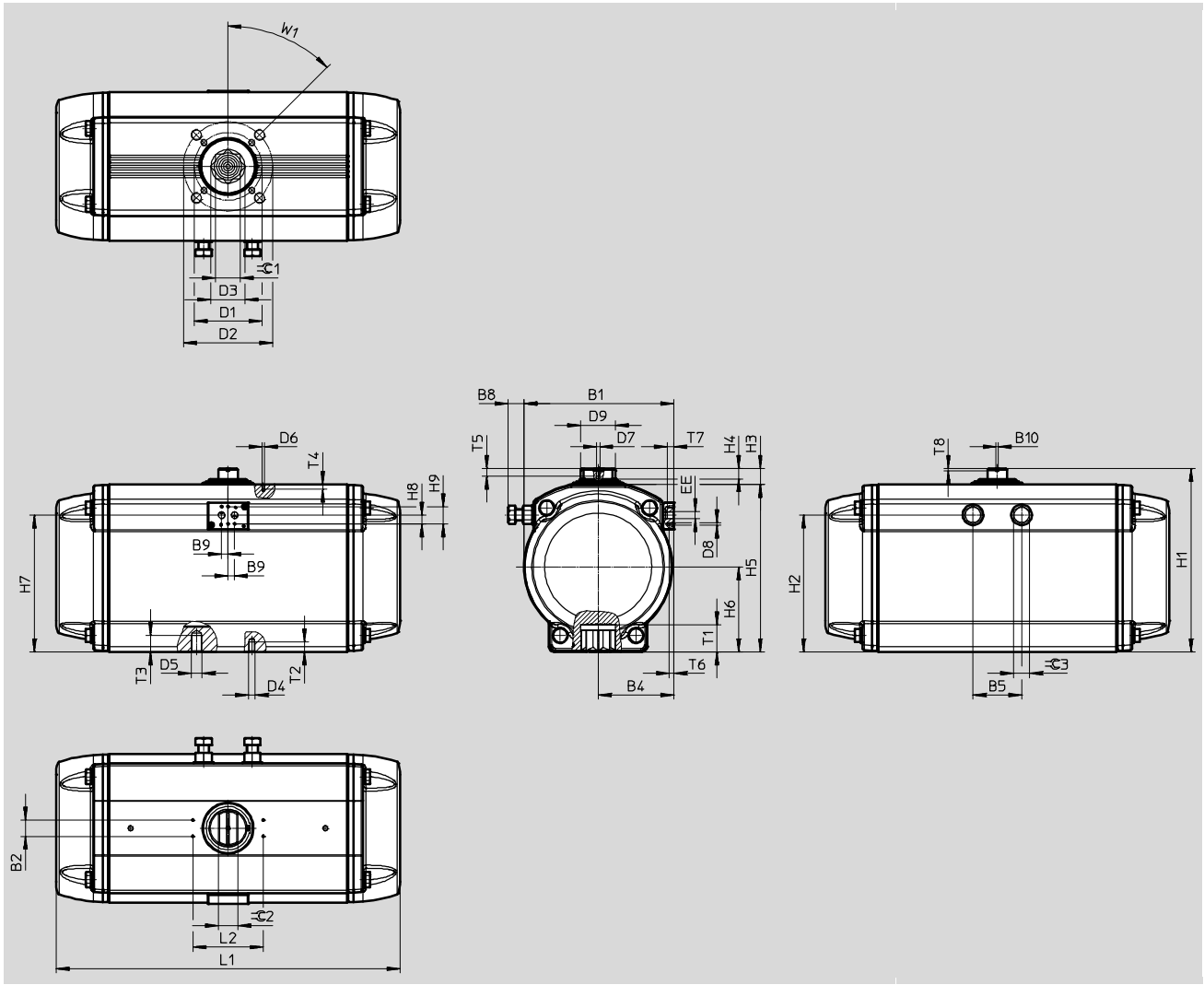
Quarter turn actuators DFPD, double-acting

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

Size 700 ... 2300



Technical data

Type code	B1	B2 ±0.1	B4	B5	B8 max.	B9	B10 ±0.1	D1 ∅	D2 ∅	D3 ∅	D4	D5	D6
DFPD-700- ... -F10/12	184	30	93	57.6	17.5	12	4	102	125	37.4	M10	M12	M5
DFPD-900- ... -F10/12	202		102	64.8	28.6								
DFPD-900- ... -F14								140	–	50.1	M16	–	
DFPD-1200- ... -F10/12	221.5		111.5	72	24			102	125	37.4	M10	M12	
DFPD-1200- ... -F14								140	–	50.1	M16	–	
DFPD-2300- ... -F12/16	277		139.8	90	33			125	165	62.9	M12	M20	
DFPD-2300- ... -F14								140	–	50.1	M16	–	

Type code	D7	D8	D9 ±0.1	EE	H1	H2	H3	H4	H5	H6	H7	H8 ±0.1	H9
DFPD-700- ... -F10/12	M6	M5	41	G 1/4 or 1/4 NPT	232.7	168	29.7	21	203	103	164.9	16	32
DFPD-900- ... -F10/12			44		252.7	182			223	113	178.3		
DFPD-900- ... -F14													
DFPD-1200- ... -F10/12			50		275.7	204			246	125	199.6		
DFPD-1200- ... -F14													
DFPD-2300- ... -F12/16			64		338.7	253		19	309	157	252.3		
DFPD-2300- ... -F14													

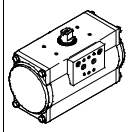
Type code	L1	L2 ±0.1	T1 min.	T2	T3	T4	T5	T6	T7	T8 +0.5	⫧ 1 H11	⫧ 2 h11	⫧ 3	W1
DFPD-700- ... -F10/12	428.2	80	29.7	15	18	8	14	8	12	4	27	30	21	45°
DFPD-900- ... -F10/12	469.6	130	30.2	15.5	18.5	8.5						32	24	
DFPD-900- ... -F14			40.2	24.5	–						36			
DFPD-1200- ... -F10/12	519.3		31	15.5	18.5						27	36		
DFPD-1200- ... -F14			40	24.5	–						36			
DFPD-2300- ... -F12/16	636		50	18.5	30						46		30	
DFPD-2300- ... -F14			40	24.5	–						36			

Quarter turn actuators DFPD, double-acting

Technical data

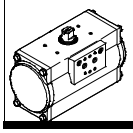
★ Core product range

Ordering data

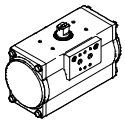
Type code	Size	Product weight [g]	Part No.	Type code
	10	965	★ **8047613**	**DFPD-10-RP-90-RD-F03**
	20	1275	★ **8047614**	**DFPD-20-RP-90-RD-F04**
	40	1882	★ **8047615**	**DFPD-40-RP-90-RD-F0507**
	80	3308	★ **8047616**	**DFPD-80-RP-90-RD-F0507**
	120	4872	★ **8048123**	**DFPD-120-RP-90-RD-F0507**

☆ Core product range

Ordering data

Type code	Size	Product weight [g]	Part No.	Type code
	160	6082	☆ **8048124**	**DFPD-160-RP-90-RD-F0710**
	240	8594	☆ **8048125**	**DFPD-240-RP-90-RD-F0710**
	300	11224	☆ **8048126**	**DFPD-300-RP-90-RD-F0710**
	480	16025	☆ **8048127**	**DFPD-480-RP-90-RD-F1012**

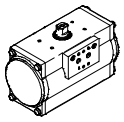
Ordering data

Type code	Size	Product weight [g]	Part No.	Type code
	10	965	**8048010**	**DFPD-10-RP-90-RD-F04**
	20	1275	**8048011**	**DFPD-20-RP-90-RD-F05**
	40	2608	**8065336**	**DFPD-40-RP-180-RD-F0507**
	40	2467	**8065337**	**DFPD-40-RP-135-RD-F0507**
	40	2419	**8065338**	**DFPD-40-RP-120-RD-F0507**
	120	7122	**8065339**	**DFPD-120-RP-180-RD-F0507**
	120	6363	**8065340**	**DFPD-120-RP-135-RD-F0507**
	120	6250	**8065341**	**DFPD-120-RP-120-RD-F0507**
	240	12549	**8065342**	**DFPD-240-RP-180-RD-F0710**
	240	11139	**8065343**	**DFPD-240-RP-135-RD-F0710**
	240	10939	**8065344**	**DFPD-240-RP-120-RD-F0710**
	480	23456	**8065345**	**DFPD-480-RP-180-RD-F1012**
	480	21013	**8065346**	**DFPD-480-RP-135-RD-F1012**
	480	20653	**8065347**	**DFPD-480-RP-120-RD-F1012**
	700	22464	**8065261**	**DFPD-700-RP-90-RD-F1012**
	900	25574	**8065265**	**DFPD-900-RP-90-RD-F14**
	1200	35834	**8065269**	**DFPD-1200-RP-90-RD-F14**
	2300	64900	**8065273**	**DFPD-2300-RP-90-RD-F1216**

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Technical data

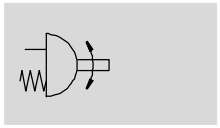
Ordering data

Type code	Size	Product weight [g]	Part No.	Type code
Version R3-EP, epoxy-coated				
	10	965	**8047617**	**DFPD-10-RP-90-RD-F03-R3-EP**
			8048012	**DFPD-10-RP-90-RD-F04-R3-EP**
	20	1275	**8047618**	**DFPD-20-RP-90-RD-F04-R3-EP**
			8048013	**DFPD-20-RP-90-RD-F05-R3-EP**
	40	1882	**8047619**	**DFPD-40-RP-90-RD-F0507-R3-EP**
	80	3308	**8047620**	**DFPD-80-RP-90-RD-F0507-R3-EP**
	120	4872	**8048128**	**DFPD-120-RP-90-RD-F0507-R3-EP**
	160	6082	**8048129**	**DFPD-160-RP-90-RD-F0710-R3-EP**
	240	8594	**8048130**	**DFPD-240-RP-90-RD-F0710-R3-EP**
	300	11224	**8048131**	**DFPD-300-RP-90-RD-F0710-R3-EP**
	480	16025	**8048132**	**DFPD-480-RP-90-RD-F1012-R3-EP**
	700	22464	**8065263**	**DFPD-700-RP-90-RD-F1012-R3-EP**
	900	25574	**8065267**	**DFPD-900-RP-90-RD-F14-R3-EP**
	1200	35834	**8065271**	**DFPD-1200-RP-90-RD-F14-R3-EP**
	2300	64900	**8065275**	**DFPD-2300-RP-90-RD-F1216-R3-EP**

Quarter turn actuators DFPD, single-acting

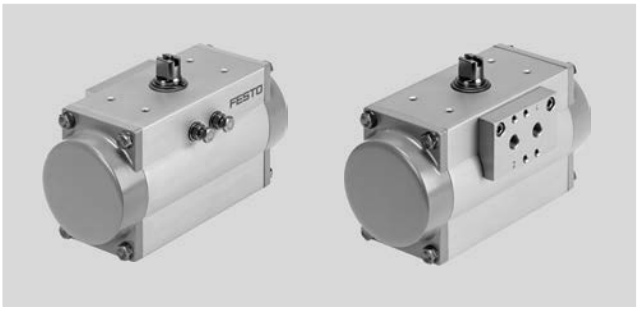
Technical data

Function



Swivel angel
0 ... 90°

Size
20 ... 2300



General technical data																			
Size		20			40		80	120	160	240	300	480	700	900		1200		2300	
Mode of operation		Single-acting																	
Design		Rack and pinion																	
Cushioning		No cushioning																	
Mounting position		Any																	
Pneumatic connection		G 1/8						G 1/4											
		1/8 NPT						1/4 NPT											
Standards-based connection		ISO 5211																	
Valve connection conforms to standard		VDI/VDE 3845 (NAMUR)																	
Connection for positioner and position sensor conforms to standard		VDI/VDE 3845 (NAMUR)																	
Safety Integrity Level (SIL)		Up to SIL 2 High Demand mode																	
Size		AA 1								AA 2				AA 3					
Flange hole pattern 1		F03	F04	F05	F04	F05	F05	F05	F07	F07	F07	F10	F10	F10	F14	F10	F14	F12	F14
Flange hole pattern 2		–	–	–	F07	F07	F07	F07	F10	F10	F10	F12	F12	F12	F12	F12	F12	F16	F16
Swivel angle	[°]	90																	
End-position adjusting range at 0°	[°]	–5 ... +5																	
End-position adjusting range at 90°	[°]	–5 ... +5																	
Position sensing		Opto-electrical																	
Closing direction		Closes to the right																	

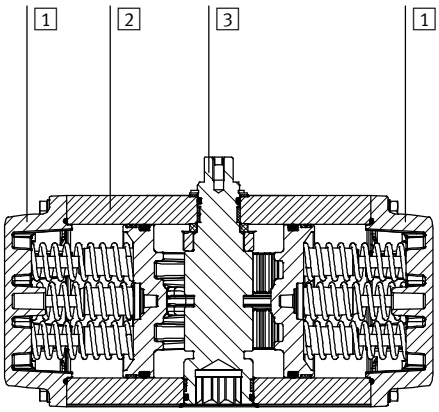
Operating and environmental conditions			
Variant		RS30	RS60
Operating pressure	[bar]	2 ... 8	
Nominal operating pressure	[bar]	3	6
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]	
Note on operating/pilot medium		Pressure dew point 10 °C below ambient temperature/temperature of medium	
		Lubricated operation possible (in which case lubricated operation will always be required)	
Ambient temperature	[°C]	–20 ... +80	

Technical data

ATEX	
ATEX category for gas	II 2G
Type of ignition protection for gas	Ex h IIC T4 Gb X
ATEX category for dust	II 2D
Type of ignition protection for dust	Ex h IIIC T105°C Db X
Explosion-proof temperature rating [°C]	–20 <= Ta <= +80
CE marking (see declaration of conformity)	To EU Explosion Protection Directive (ATEX)

Materials

Sectional view



Quarter turn actuators			Material number
1	Cap	Coated die-cast aluminium	EN AC-46100-D
2	Housing	Anodised wrought aluminium alloy	EN AW-6063-T6
3	Shaft	Nickel-plated steel	1.0715
	R3	High-alloy stainless steel	1.4305
–	Mounting plate	Anodised wrought aluminium alloy	EN AW-6063-T6
	Piston rod	Die cast aluminium	EN AC-46100-D
	Seals	NBR	–
	Spring	Spring steel	–
	Bearing	POM	–
	Cam	Stainless steel casting (DFPD-20...160...-RS)	1.4308
		Steel (DFPD-240 ... 2300...-RS)	1.0765
	Screws	High-alloy stainless steel	1.4301
	Note on materials	RoHS-compliant	–

Air consumption [l/cycle] at 6 bar

Type code	
DFPD-20-RP-90-S	0.60
DFPD-40-RP-90-S	1.80
DFPD-80-RP-90-S	3.60
DFPD-120-RP-90-S	5.40
DFPD-160-RP-90-S	7.20
DFPD-240-RP-90-S	10.20
DFPD-300-RP-90-S	13.20
DFPD-480-RP-90-S	21.00

Type code	
DFPD-700-RP-90-RS60	24.48
DFPD-900-RP-90-RS60	31.5
DFPD-1200-RP-90-RS60	43.44
DFPD-2300-RP-90-RS60	84.3

Quarter turn actuators DFPD, single-acting

Technical data

Theoretical torque [Nm] as a function of operating pressure [bar] and swivel angle [°]

Spring configuration	Nominal swivel angle	Spring torque	Operating pressure [bar]										
	[°]	[Nm]	2	2.5	3	3.5	4	4.5	5	5.5	6	7	8
Size DFPD-20													
20	0	2.4	**4.9**	6.7	8.6	10.4	12.2	14.0	15.9	17.7	19.5	23.2	26.8
	90	4.8	**2.5**	4.4	6.2	8.0	9.9	11.7	13.5	15.3	17.2	20.8	24.5
25	0	3.0	4.3	**6.1**	8.0	9.8	11.6	13.4	15.3	17.1	18.9	22.6	26.2
	90	6.0	1.4	**3.2**	5.0	6.8	8.7	10.5	12.3	14.2	16.0	19.6	23.3
30	0	3.6		5.5	**7.4**	9.2	11.0	12.8	14.7	16.5	18.3	22.0	25.6
	90	7.1		2.0	**3.8**	5.7	7.5	9.3	11.1	13.0	14.8	18.4	22.1
35	0	4.2			6.8	**8.6**	10.4	12.2	14.1	15.9	17.7	21.4	25.0
	90	8.3			2.6	**4.5**	6.3	8.1	9.9	11.8	13.6	17.3	20.9
40	0	4.8				8.0	**9.8**	11.6	13.5	15.3	17.1	20.8	24.4
	90	9.5				3.3	**5.1**	6.9	8.8	10.6	12.4	16.1	19.7
45	0	5.4					9.2	**11.0**	12.9	14.7	16.5	20.2	23.8
	90	10.7					3.9	**5.7**	7.6	9.4	11.2	14.9	18.5
50	0	6.0						10.4	**12.3**	14.1	15.9	19.6	23.2
	90	11.9						4.5	**6.4**	8.2	10.0	13.7	17.3
55	0	6.6							11.7	**13.5**	15.3	19.0	22.6
	90	13.1							5.2	**7.0**	8.8	12.5	16.1
60	0	7.2								12.9	**14.7**	18.4	22.0
	90	14.3								5.8	**7.6**	11.3	15.0
Size DFPD-40													
20	0	4.6	**9.3**	12.8	16.3	19.8	23.3	26.7	30.2	33.7	37.2	44.1	51.1
	90	9.1	**4.8**	8.3	11.8	15.3	18.8	22.3	25.7	29.2	32.7	39.7	46.6
25	0	5.8	8.2	**11.7**	15.1	18.6	22.1	25.6	29.1	32.6	36.0	43.0	50.0
	90	11.4	2.6	**6.1**	9.5	13.0	16.5	20.0	23.5	27.0	30.4	37.4	44.4
30	0	6.9		10.5	**14.0**	17.5	21.0	24.4	27.9	31.4	34.9	41.8	48.8
	90	13.6		3.8	**7.3**	10.8	14.2	17.7	21.2	24.7	28.2	35.1	42.1
35	0	8.1			12.8	**16.3**	19.8	23.3	26.8	30.3	33.7	40.7	47.7
	90	15.9			5.0	**8.5**	12.0	15.4	18.9	22.4	25.9	32.9	39.8
40	0	9.2				15.2	**18.7**	22.1	25.6	29.1	32.6	39.5	46.5
	90	18.2				6.2	**9.7**	13.2	16.7	20.1	23.6	30.6	37.5
45	0	10.4					17.5	**21.0**	24.5	28.0	31.4	38.4	45.4
	90	20.4					7.4	**10.9**	14.4	17.9	21.4	28.3	35.3
50	0	11.5						19.8	**23.3**	26.8	30.3	37.2	44.2
	90	22.7						8.6	**12.1**	15.6	19.1	26.0	33.0
55	0	12.7							22.2	**25.7**	29.1	36.1	43.1
	90	25.0							9.8	**13.3**	16.8	23.8	30.7
60	0	13.8								24.5	**28.0**	34.9	41.9
	90	27.2								11.1	**14.5**	21.5	28.5

- Note

The operating torque of the actuator must not be greater than the maximum permissible torque listed in ISO 5211 in relation to the size of the mounting flange and of the coupling.

Technical data

Theoretical torque [Nm] as a function of operating pressure [bar] and swivel angle [°]

Spring configuration	Nominal swivel angle	Spring torque	Operating pressure [bar]										
	[°]	[Nm]	2	2.5	3	3.5	4	4.5	5	5.5	6	7	8
Size DFPD-80													
20	0	9.9	**20.1**	27.6	35.1	42.6	50.0	57.5	65.0	72.5	80.0	95.0	110.0
	90	19.5	**10.5**	18.0	25.5	33.0	40.4	47.9	55.4	62.9	70.4	85.4	100.4
25	0	12.4	17.6	**25.1**	32.6	40.1	47.6	55.1	62.6	70.1	77.5	92.5	107.5
	90	24.4	5.6	**13.1**	20.6	28.1	35.6	43.1	50.6	58.1	65.5	80.5	95.5
30	0	14.8		22.6	**30.1**	37.6	45.1	52.6	60.1	67.6	75.1	90.1	105.0
	90	29.2		8.2	**15.7**	23.2	30.7	38.2	45.7	53.2	60.7	75.5	90.6
35	0	17.3			27.7	**35.1**	42.6	50.1	57.6	65.1	72.6	87.6	102.6
	90	34.1			10.9	**18.3**	25.8	33.3	40.8	48.3	55.8	70.8	85.8
40	0	19.8				32.7	**40.2**	47.7	55.1	62.6	70.1	85.1	100.1
	90	39.0				13.5	**21.0**	28.5	35.9	43.4	50.9	65.9	80.9
45	0	22.2					37.7	**45.2**	52.7	60.2	67.7	82.6	97.6
	90	43.8					16.1	**23.6**	31.1	38.6	46.1	61.0	76.0
50	0	24.7						42.7	**50.2**	57.7	65.2	80.2	95.2
	90	48.7						18.7	**26.2**	33.7	41.2	56.2	71.2
55	0	27.2							47.7	**55.2**	62.7	77.7	92.7
	90	53.6							21.3	**28.8**	36.3	51.3	66.3
60	0	29.6								52.8	**60.3**	75.2	90.2
	90	58.4								24.0	**31.5**	46.4	61.4
Size DFPD-120													
20	0	14.0	**28.7**	39.3	50.0	60.7	71.3	82.0	92.7	103.4	114.0	135.4	156.7
	90	27.8	**14.9**	25.6	36.3	46.9	57.6	68.3	79.0	89.6	100.3	121.7	143.0
25	0	17.6	25.1	**35.8**	46.5	57.2	67.8	78.5	89.2	99.9	110.5	131.9	153.2
	90	34.7	8.0	**18.7**	29.3	40.0	50.7	61.4	72.0	82.7	93.4	114.7	136.1
30	0	21.1		32.3	**43.0**	53.6	64.3	75.0	85.7	96.3	107.0	128.4	149.7
	90	41.6		11.7	**22.4**	33.1	43.7	54.4	65.1	75.8	86.4	107.8	129.1
35	0	24.6			39.5	**50.1**	60.8	71.5	82.2	92.8	103.5	124.8	146.2
	90	48.6			15.5	**26.1**	36.8	47.5	58.1	68.8	79.5	100.8	122.2
40	0	28.1				46.6	**57.3**	68.0	78.6	89.3	100.0	121.3	142.7
	90	55.5				19.2	**29.9**	40.5	51.2	61.9	72.6	93.9	115.2
45	0	31.6					53.8	**64.5**	75.1	85.8	96.5	117.8	139.2
	90	62.5					22.9	**33.6**	44.3	54.9	65.6	87.0	108.3
50	0	35.1						61.0	**71.6**	82.3	93.0	114.3	135.7
	90	69.4						26.7	**37.3**	48.0	58.7	80.0	101.4
55	0	38.6							68.1	**78.8**	89.5	110.8	132.2
	90	76.3							30.4	**41.1**	51.7	73.1	94.4
60	0	42.1								75.3	**86.0**	107.3	128.6
	90	83.3								34.1	**44.8**	66.1	87.5

- Note

The operating torque of the actuator must not be greater than the maximum permissible torque listed in ISO 5211 in relation to the size of the mounting flange and of the coupling.

Quarter turn actuators DFPD, single-acting

Technical data

Theoretical torque [Nm] as a function of operating pressure [bar] and swivel angle [°]

Spring configuration	Nominal swivel angle	Spring torque	Operating pressure [bar]										
	[°]	[Nm]	2	2.5	3	3.5	4	4.5	5	5.5	6	7	8
Size DFPD-160													
20	0	19.2	**39.3**	53.9	68.6	83.2	97.9	112.5	127.1	141.8	156.4	185.7	214.9
	90	38.1	**20.5**	35.1	49.7	64.4	79.0	93.6	108.3	122.9	137.6	166.8	196.1
25	0	24.1	34.5	**49.1**	63.8	78.4	93.0	107.7	122.3	137.0	151.6	180.9	210.1
	90	47.6	37.6	**25.6**	40.2	54.9	69.5	84.1	98.8	113.4	128.0	157.3	186.6
30	0	28.9		44.3	**59.0**	73.6	88.2	102.9	117.5	132.1	146.8	176.0	205.3
	90	57.1		16.1	**30.7**	45.3	60.0	74.6	89.2	103.9	118.5	147.8	177.1
35	0	33.7			54.1	**68.8**	83.4	98.1	112.7	127.3	142.0	171.2	200.5
	90	66.6			21.2	**35.8**	50.4	65.1	79.7	94.4	109.0	138.3	167.5
40	0	38.5				64.0	**78.6**	93.2	107.9	122.5	137.2	166.4	195.7
	90	76.2				26.3	**40.9**	55.6	70.2	84.8	99.5	128.7	158.0
45	0	43.3					73.8	**88.4**	103.1	117.7	132.3	161.6	190.9
	90	85.7					31.4	**46.0**	60.7	75.3	90.0	119.2	148.5
50	0	48.1						83.6	**98.3**	112.9	127.5	156.8	186.1
	90	95.2						36.5	**51.2**	65.8	80.4	109.7	139.0
55	0	52.9							93.5	**108.1**	122.7	152.0	181.3
	90	104.7							41.6	**56.3**	70.9	100.2	129.5
60	0	57.7								103.3	**117.9**	147.2	176.5
	90	114.2								46.8	**61.4**	90.7	119.9
Size DFPD-240													
20	0	28.0	**57.2**	78.5	99.8	121.1	142.4	163.7	185.0	206.3	227.6	270.2	312.8
	90	55.4	**29.8**	51.1	72.4	93.7	115.0	136.3	157.6	178.9	200.2	242.8	285.4
25	0	35.0	50.2	**71.5**	92.8	114.1	135.4	156.7	178.0	199.3	220.6	263.2	305.8
	90	69.2	16.0	**37.3**	58.6	79.9	101.2	122.5	143.8	165.1	186.4	229.0	271.6
30	0	42.0		64.5	**85.8**	107.1	128.4	149.7	171.0	192.3	213.6	256.2	298.8
	90	83.0		23.5	**44.8**	66.1	87.4	108.7	130.0	151.3	172.6	215.2	257.8
35	0	49.0			78.8	**100.1**	121.4	142.7	164.0	185.3	206.6	249.2	291.8
	90	96.9			30.9	**52.2**	73.5	94.8	116.1	137.5	158.7	201.3	243.9
40	0	56.0				93.1	**114.4**	135.7	157.0	178.3	199.6	242.2	284.8
	90	110.7				38.4	**59.7**	81.0	102.3	123.6	144.9	187.5	230.1
45	0	63.0					107.4	**128.7**	150.0	171.3	192.6	235.2	277.8
	90	124.6					45.8	**67.1**	88.4	109.7	131.0	173.6	216.2
50	0	70.0						121.7	**143.0**	164.3	185.6	228.2	270.8
	90	138.4						53.3	**74.6**	95.9	117.2	159.8	202.4
55	0	77.0							136.0	**157.3**	178.6	221.2	263.8
	90	152.2							60.8	**82.1**	103.4	146.0	188.6
60	0	84.0								150.3	**171.6**	214.2	256.8
	90	166.1								68.2	**89.5**	132.1	174.7

- Note

The operating torque of the actuator must not be greater than the maximum permissible torque listed in ISO 5211 in relation to the size of the mounting flange and of the coupling.

Technical data

Theoretical torque [Nm] as a function of operating pressure [bar] and swivel angle [°]

Spring configuration	Nominal swivel angle	Spring torque	Operating pressure [bar]										
	[°]	[Nm]	2	2.5	3	3.5	4	4.5	5	5.5	6	7	8
Size DFPD-300													
20	0	36.1	**73.7**	101.1	128.6	156.0	183.4	210.9	238.3	265.8	293.2	348.1	403.0
	90	71.4	**38.4**	65.9	93.3	120.8	148.2	175.6	203.1	230.5	258.0	312.9	367.8
25	0	45.2	64.6	**92.1**	119.5	147.0	174.4	201.9	229.3	256.8	284.2	339.1	394.0
	90	89.2	20.6	**48.0**	75.5	102.9	130.4	157.8	185.3	212.7	240.1	295.0	349.9
30	0	54.2		83.0	**110.5**	137.9	165.4	192.8	220.3	247.7	275.2	330.1	384.9
	90	107.0		30.2	**57.6**	85.1	112.5	140.0	167.4	194.9	222.3	277.2	332.1
35	0	63.2			101.5	**128.9**	156.4	183.8	211.2	238.7	266.1	321.0	375.9
	90	124.9			39.8	**67.2**	94.7	122.1	149.6	177.0	204.5	259.4	314.2
40	0	72.2				119.9	**147.3**	174.8	202.2	229.7	257.1	312.0	366.9
	90	142.7				49.4	**76.8**	104.3	131.7	159.2	186.6	241.5	296.4
45	0	81.3					138.3	**165.7**	193.2	220.6	248.1	303.0	357.9
	90	160.6					59.0	**86.4**	113.9	141.3	168.8	223.7	278.6
50	0	90.3						156.7	**184.2**	211.6	239.0	293.9	348.8
	90	178.4						68.6	**96.1**	123.5	150.9	205.8	260.7
55	0	99.3							175.1	**202.6**	230.0	284.9	339.8
	90	196.2							78.2	**105.7**	133.1	188.0	242.9
60	0	108.4								193.5	**221.0**	275.9	330.8
	90	214.1								87.8	**115.3**	170.2	225.0
Size DFPD-480													
20	0	56.7	**115.7**	158.8	201.9	245.0	288.0	331.1	374.2	417.3	460.4	546.6	632.8
	90	112.0	**60.3**	103.4	146.5	189.6	232.7	275.8	318.9	362.0	405.1	491.2	577.4
25	0	70.9	101.5	**144.6**	187.7	230.8	273.9	317.0	360.1	403.2	446.2	532.4	618.6
	90	140.1	32.3	**75.4**	118.5	161.6	204.7	247.8	290.9	334.0	377.0	463.2	549.4
30	0	85.0		130.4	**173.5**	216.6	259.7	302.8	345.9	389.0	432.1	518.3	604.4
	90	168.1		47.4	**90.5**	133.6	176.7	219.8	262.8	305.9	349.0	435.2	521.4
35	0	99.2			159.4	**202.4**	245.5	288.6	331.7	374.8	417.9	504.1	590.3
	90	196.1			62.5	**105.6**	148.7	191.7	234.8	277.9	321.0	407.2	493.4
40	0	113.4				188.3	**231.4**	274.5	317.5	360.6	403.7	489.9	576.1
	90	224.1				77.6	**120.6**	163.7	206.8	249.9	293.0	379.2	465.4
45	0	127.5					217.2	**260.3**	303.4	346.5	389.6	475.7	561.9
	90	252.1					92.6	**135.7**	178.8	221.9	265.0	351.2	437.4
50	0	141.7						246.1	**289.2**	332.3	375.4	461.6	547.8
	90	280.1						107.1	**150.8**	193.9	237.0	323.2	409.4
55	0	155.9							275.0	**318.1**	361.2	447.4	533.6
	90	308.1							122.8	**165.9**	209.0	295.2	381.3
60	0	170.0								304.0	**347.1**	433.2	519.4
	90	336.1								137.9	**181.0**	267.2	353.3

- Note

The operating torque of the actuator must not be greater than the maximum permissible torque listed in ISO 5211 in relation to the size of the mounting flange and of the coupling.

Quarter turn actuators DFPD, single-acting

Technical data

Theoretical torque [Nm] as a function of operating pressure [bar] and swivel angle [°]

Spring configuration	Nominal swivel angle	Spring torque	Operating pressure [bar]										
	[°]	[Nm]	2	2.5	3	3.5	4	4.5	5	5.5	6	7	8
Size DFPD-700													
20	0	78.8	**162.4**	222.7	283.0	343.3	403.6	463.9	524.2	584.5	644.8	765.4	886.0
	90	143.7	**97.5**	157.8	218.1	278.4	338.7	399.0	459.3	519.6	579.9	700.5	821.1
25	0	99.6	141.6	**201.9**	262.2	322.5	382.8	443.1	503.4	563.7	624.0	744.6	865.2
	90	181.7	59.5	**119.8**	180.1	240.4	300.7	361.0	421.3	481.6	541.9	662.5	783.1
30	0	120.9		180.6	**240.9**	301.2	361.5	421.8	482.1	542.4	602.7	723.3	843.9
	90	220.5		81.0	**141.3**	201.6	261.9	322.2	382.5	442.8	503.1	623.7	744.3
35	0	142.6			219.2	**279.5**	339.8	400.1	460.4	520.7	581.0	701.6	822.2
	90	260.1			101.6	**161.9**	222.2	282.5	342.8	403.1	463.4	584.0	704.6
40	0	164.8				257.3	**317.6**	377.9	438.2	498.5	558.8	679.4	800.0
	90	300.6				121.5	**181.8**	242.1	302.4	362.7	423.0	543.6	664.2
45	0	187.4					295.0	**355.3**	415.6	475.9	536.2	656.7	777.3
	90	341.9					140.5	**200.8**	261.1	321.4	381.7	502.3	622.9
50	0	210.5						332.2	**392.5**	452.8	513.1	633.7	754.3
	90	384.0						158.7	**219.0**	279.3	339.6	460.2	580.7
55	0	234.1							368.9	**429.2**	489.5	610.1	730.7
	90	427.0							176.0	**236.3**	296.6	417.2	537.8
60	0	258.1								405.2	**465.5**	586.1	706.7
	90	470.7								192.5	**252.8**	373.4	494.0
Size DFPD-900													
20	0	99.2	**206.9**	283.5	360.0	436.6	513.1	589.7	666.2	742.8	819.3	972.4	1125.5
	90	181.6	**124.6**	201.1	277.6	354.2	430.7	507.3	583.8	660.4	736.9	890.0	1043.1
25	0	125.5	180.7	**257.3**	333.8	410.3	486.9	563.4	640.0	716.5	793.1	946.2	1099.2
	90	229.6	76.5	**153.1**	229.6	306.2	382.7	459.3	535.8	612.4	688.9	842.0	995.1
30	0	152.3		230.5	**307.0**	383.5	460.1	536.6	613.2	689.7	766.3	919.3	1072.4
	90	278.7		104.0	**180.6**	257.1	333.7	410.2	486.8	563.3	639.8	792.9	946.0
35	0	179.6			279.6	**356.2**	432.7	509.3	585.8	662.3	738.9	892.0	1045.1
	90	328.8			130.5	**207.0**	283.6	360.1	436.7	513.2	589.7	742.8	895.9
40	0	207.6				328.2	**404.8**	481.3	557.9	634.4	710.9	864.0	1017.1
	90	379.9				155.9	**232.4**	309.0	385.5	462.1	538.6	691.7	844.8
45	0	236.1					376.2	**452.8**	529.3	605.9	682.4	835.5	988.6
	90	432.1					180.2	**256.8**	333.3	409.9	486.4	639.5	792.6
50	0	265.2						423.7	**500.3**	576.8	653.3	806.4	959.5
	90	485.4						203.5	**280.1**	356.6	433.2	586.3	739.4
55	0	294.8							470.6	**547.1**	623.7	776.8	929.9
	90	539.6							225.8	**302.4**	378.9	532.0	685.1
60	0	325.1								516.9	**593.5**	746.5	899.6
	90	595.0								247.0	**323.6**	476.7	629.8

- Note

The operating torque of the actuator must not be greater than the maximum permissible torque listed in ISO 5211 in relation to the size of the mounting flange and of the coupling.

Technical data

Theoretical torque [Nm] as a function of operating pressure [bar] and swivel angle [°]

Spring configuration	Nominal swivel angle	Spring torque	Operating pressure [bar]										
	[°]	[Nm]	2	2.5	3	3.5	4	4.5	5	5.5	6	7	8
Size DFPD-1200													
20	0	146.4	**278.9**	385.2	491.5	597.8	704.1	810.5	916.8	1023.1	1129.4	1342	1554
	90	243.8	**181.5**	287.8	394.1	500.4	606.7	713.0	819.3	925.7	1032.0	1244	1457
25	0	185.0	240.2	**346.5**	452.8	559.1	665.4	771.8	878.1	984.4	1090.7	1303	1515
	90	308.2	117.0	**223.3**	329.7	436.0	542.3	648.6	754.9	861.2	967.5	1180	1392
30	0	224.6		307.0	**413.3**	519.6	625.9	732.2	838.5	944.9	1051.2	1263	1476
	90	374.1		157.5	**263.8**	370.1	476.4	582.7	689.1	795.4	901.7	1114	1326
35	0	264.9			372.9	**479.2**	585.5	691.9	798.2	904.5	1010.8	1223	1436
	90	441.3			196.6	**302.9**	409.2	515.5	621.8	728.1	834.4	1047	1259
40	0	306.2				438.0	**544.3**	650.6	757.0	863.3	969.6	1182	1394
	90	510.0				234.2	**340.5**	446.8	553.2	659.5	765.8	978.4	1191
45	0	348.2					502.3	**608.6**	714.9	821.2	927.5	1140	1352
	90	580.0					270.5	**376.8**	483.1	589.4	695.7	908.4	1121
50	0	391.1						565.7	**672.0**	778.3	884.6	1097	1309
	90	651.5						305.3	**411.7**	518.0	624.3	836.9	1049
55	0	434.9							628.3	**734.6**	840.9	1053	1266
	90	724.3							338.8	**445.1**	551.4	764.1	976.7
60	0	479.4								690.0	**796.3**	1008	1221
	90	798.6								370.9	**477.2**	689.8	902.4
Size DFPD-2300													
20	0	278.8	**533.3**	736.3	939.4	1142	1345	1548	1751	1954	2157	2563	2969
	90	473.5	**338.6**	541.6	744.7	947.7	1150	1353	1556	1759	1962	2368	2774
25	0	352.5	459.6	**662.6**	865.7	1068	1271	1474	1677	1880	2083	2489	2895
	90	598.7	213.4	**416.4**	619.5	822.5	1025	1228	1431	1634	1837	2243	2649
30	0	427.8		587.3	**790.4**	993.4	1196	1399	1602	1805	2008	2414	2820
	90	726.6		288.5	**491.6**	694.6	897.6	1100	1303	1506	1709	2115	2521
35	0	504.7			713.5	**916.5**	1119	1322	1525	1728	1931	2337	2743
	90	857.2			361.0	**564.0**	767.0	970.0	1173	1376	1579	1985	2391
40	0	583.2				838.0	**1041**	1244	1447	1650	1853	2259	2665
	90	990.5				430.6	**633.7**	836.7	1039	1242	1445	1851	2257
45	0	663.3					960.9	**1163**	1367	1570	1773	2179	2585
	90	1127					497.6	**700.6**	903.6	1106	1309	1715	2121
50	0	745.0						1082	**1285**	1488	1691	2097	2503
	90	1265						561.8	**764.9**	967.9	1170	1577	1983
55	0	828.3							1201	**1405**	1608	2014	2420
	90	1407							623.4	**826.4**	1029	1435	1841
60	0	913.2								1320	**1523**	1929	2335
	90	1551								682.2	**885.2**	1291	1697

- Note

The operating torque of the actuator must not be greater than the maximum permissible torque listed in ISO 5211 in relation to the size of the mounting flange and of the coupling.

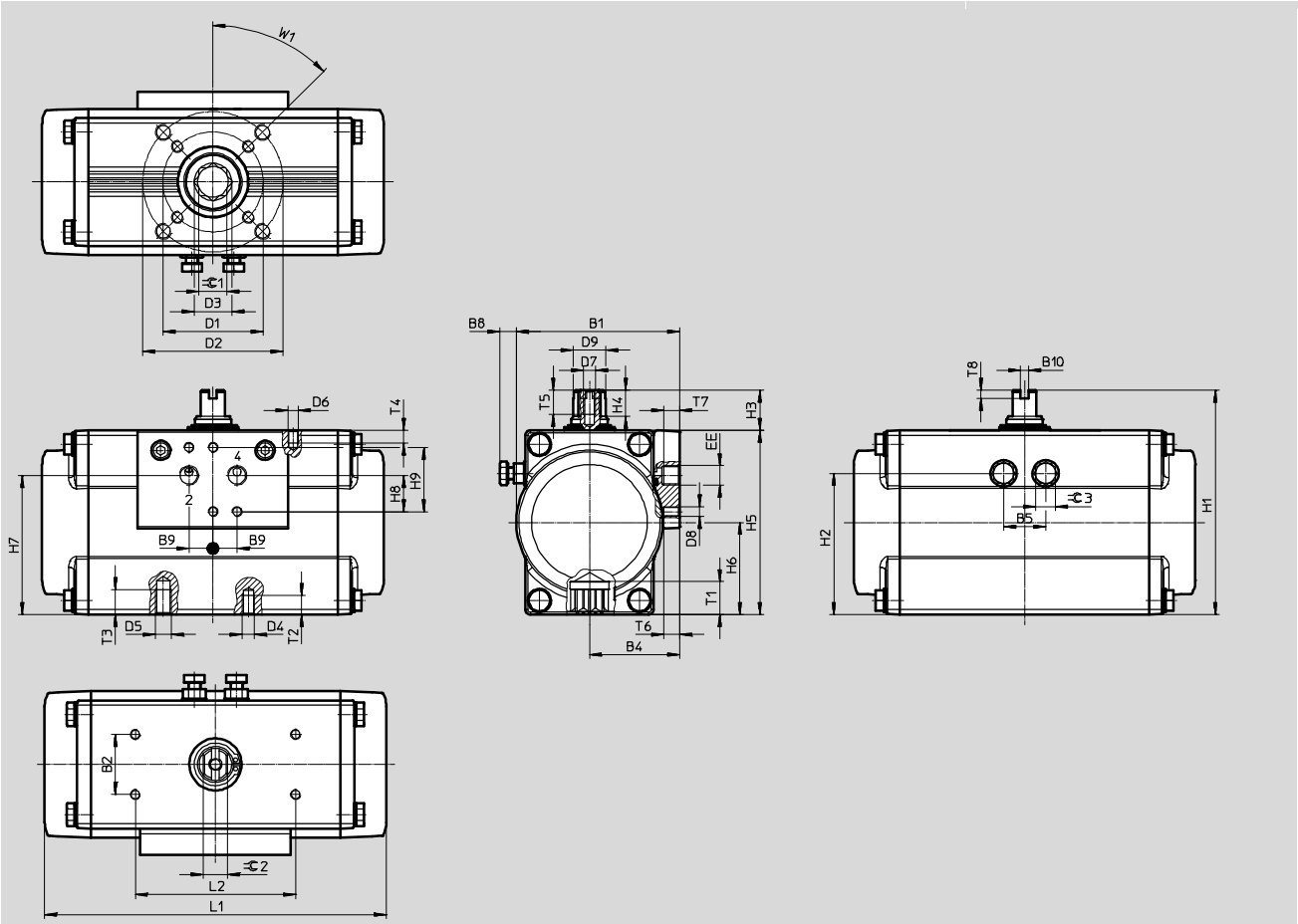
Quarter turn actuators DFPD, single-acting

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

Size 20 ... 80



Technical data

Type code	B1	B2	B4	B5	B8	B9	B10	D1 ∅	D2 ∅	D3 ∅	D4	D5	D6
[mm]		±0.1			max.		+0.1	±0.1	±0.1				
DFPD-20-F03	68.5	30	38.5	19	9.2	12	4	36	–	12	M5	–	M5
DFPD-20-F04								42		14.6			
DFPD-20-F05								50			M6		
DFPD-40-F04	81.5		45	21	8.2			42	70		M5		
DFPD-40-F0507								50		18.7	M6	M8	
DFPD-80-F0507	99		53	26	9					23.3			

Type code	D7	D8	D9 ∅	EE	H1	H2	H3	H4	H5	H6	H7	H8	H9
[mm]			±0.1				–0.5	+0.1		±0.2	±0.3	±0.1	
DFPD-20-F03	M6	M5	12.7	G 1/8 or 1/8 NPT	100	59.8	20	10	80	40	57.5	16	32
DFPD-20-F04													
DFPD-20-F05													
DFPD-40-F04			16.2		112	70.5		13	92	46	67.5		
DFPD-40-F0507													
DFPD-80-F0507			20.2		130	86			110	55	86.5		

Type code	L1	L2	T1	T2	T3	T4	T5	T6	T7	T8	⬡ 1	⬡ 2	⬡ 3	W1
[mm]		±0.1	±0.4							+0.5	H11	h11		
DFPD-20-F03	145.7	80	10 min.	8	–	8	12	8	8	4	9	9	10	45°
DFPD-20-F04			13.2								11			
DFPD-20-F05				9										
DFPD-40-F04	170.4		12 min.	8								12		
DFPD-40-F0507			16.5	9	12						14			
DFPD-80-F0507	223.1	80	19.3								17	15	13	

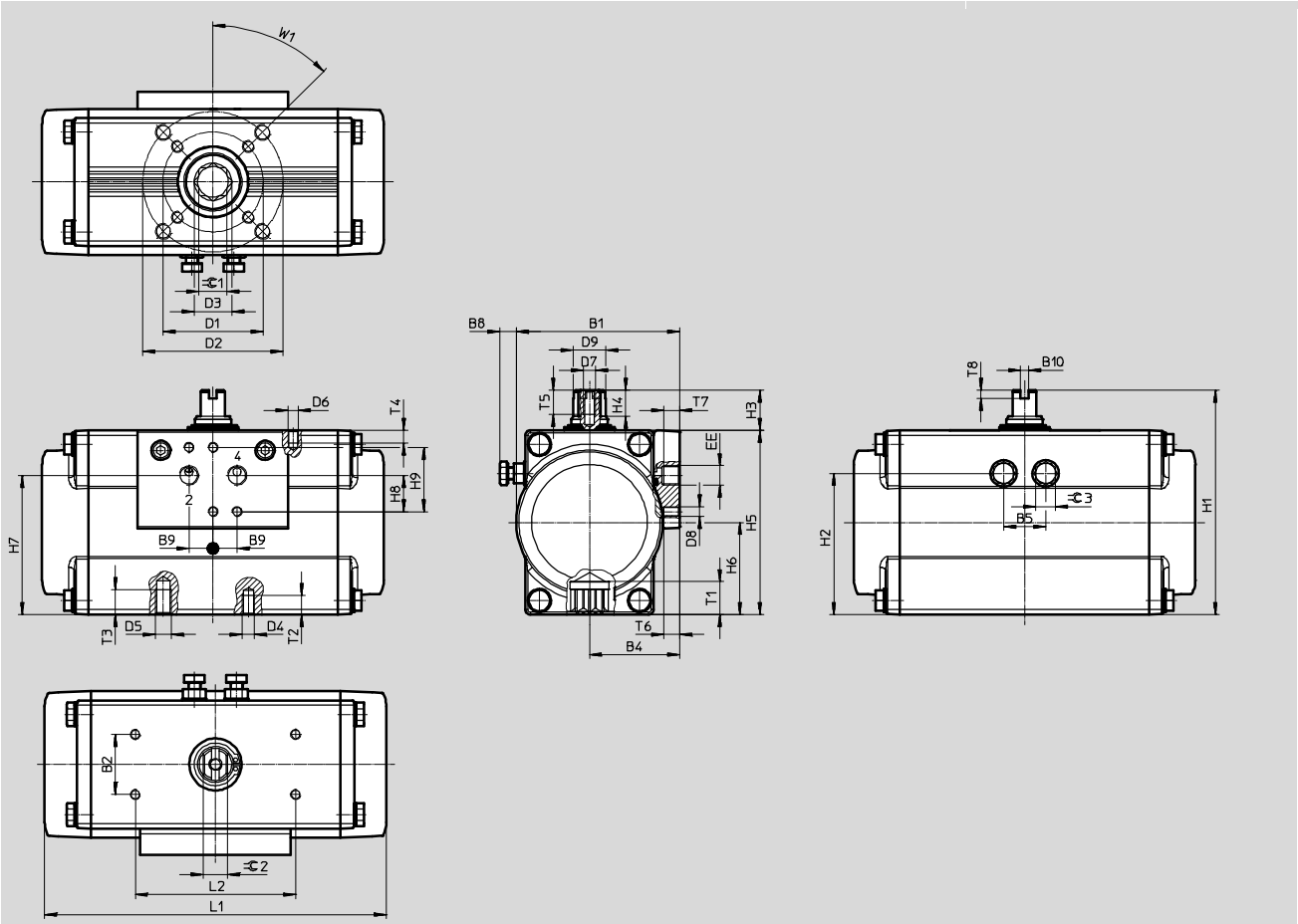
Quarter turn actuators DFPD, single-acting

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

Size 120 ... 480



Technical data

Type code	B1	B2	B4	B5	B8	B9	B10	D1 ∅	D2 ∅	D3 ∅	D4	D5	D6
[mm]		±0.1			max.			±0.1	±0.1				
DFPD-120-F0507	111.5	30	60.5	32	12.3	12	4	50	70	23.2	M6	M8	M5
DFPD-160-F0710	120		63.5	36	13.4			70	102	30	M8	M10	
DFPD-240-F0710	135.5		71.5	41	18.5					30.3			
DFPD-300-F0710	144		74.5	46	17					30			
DFPD-480-F1012	163		83	52	19.3			102	125	37.4	M10	M12	

Type code	D7	D8	D9 ∅	EE	H1	H2	H3	H4	H5	H6	H7	H8	H9
[mm]			±0.1				0.5	+0.1			±0.3	±0.1	
DFPD-120-F0507	M6	M5	22.5	G 1/4 or 1/4 NPT	143	97.75	20	13	123	61.5	98.4	16	32
DFPD-160-F0710			25.5		154	106.25			134	67	109.4		
DFPD-240-F0710			31.8		180	120.5	30	19.5	150	75	120.2		
DFPD-300-F0710					192	131			162	81	132.1		
DFPD-480-F1012			38		214	149.5			184	92	152.5		

Type code	L1	L2	T1	T2	T3	T4	T5	T6	T7	T8	⌀ 1	⌀ 2	⌀ 3	W1
[mm]		±0.1	±0.4							+0.5	H11	h11		
DFPD-120-F0507	252.3	80	19.3	9	12	8	14	8	12	4	17	15	13	45°
DFPD-160-F0710	270.9		24.3	12	15						22	19	16	
DFPD-240-F0710	301.4											22	18	
DFPD-300-F0710	334.4													
DFPD-480-F1012	374.2		29.5	15	18						27	27	21	

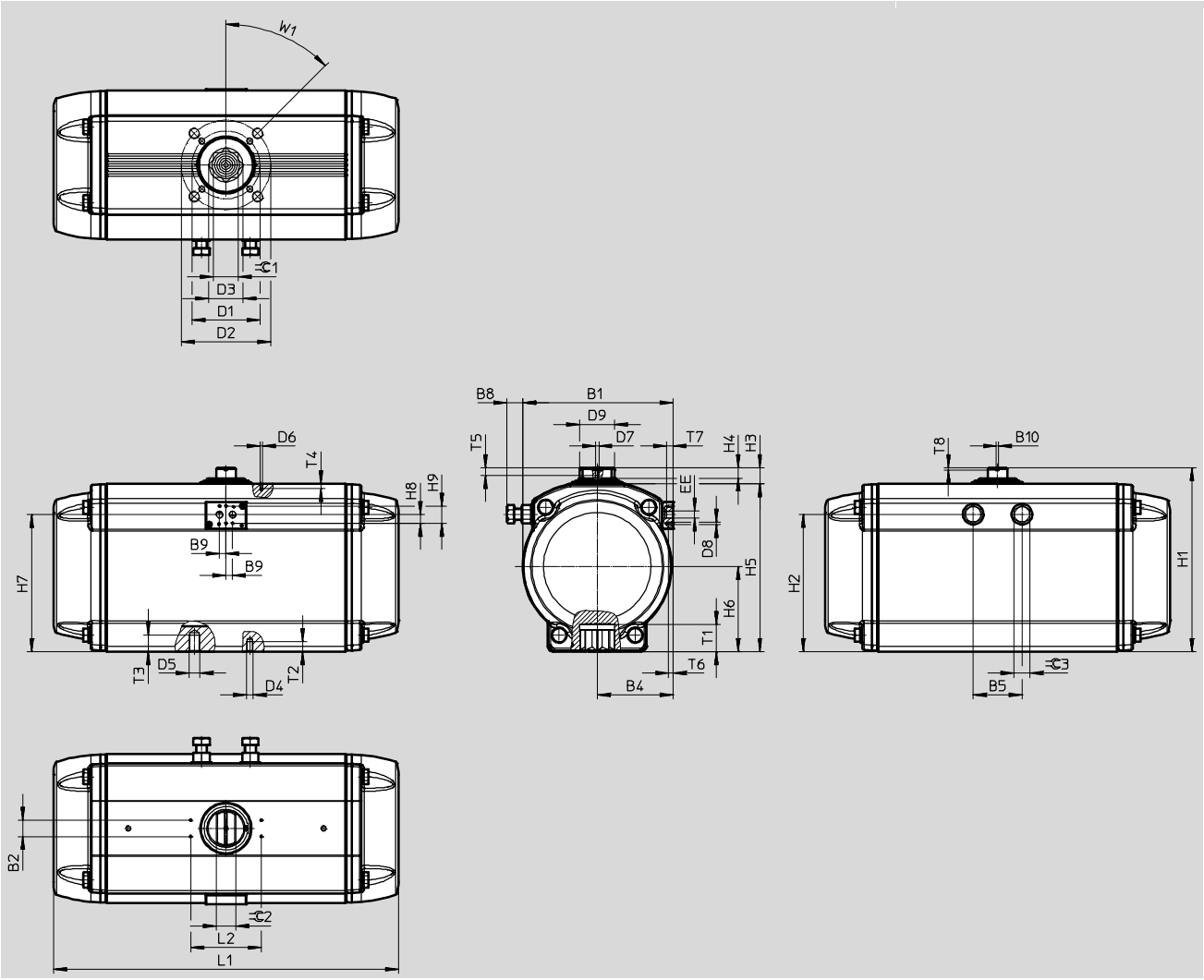
Quarter turn actuators DFPD, single-acting

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

Size 700 ... 2300



Technical data

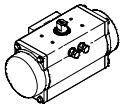
Type code [mm]	B1	B2 ±0.1	B4	B5	B8 max.	B9	B10 ±0.1	D1 ∅	D2 ∅	D3 ∅	D4	D5	D6
DFPD-700-...-F1012	184	30	93	57.6	17.5	12	4	102	125	37.4	M10	M12	M5
DFPD-900-...-F1012	202		102	64.8	28.6								
DFPD-900-...-F14								140	–	50.1	M16	–	
DFPD-1200-...-F1012	221.5		111.5	72	24			102	125	37.4	M10	M12	
DFPD-1200-...-F14								140	–	50.1	M16	–	
DFPD-2300-...-F1216	277		139.8	90	33			125	165	62.9	M12	M20	
DFPD-2300-...-F14								140	–	50.1	M16	–	

Type code [mm]	D7	D8	D9 ∅ ±0.1	EE	H1	H2	H3	H4	H5	H6	H7	H8 ±0.1	H9
DFPD-700-...-F1012	M6	M5	41	G 1/4 or 1/4 NPT	232.7	168	29.7	21	203	103	164.9	16	32
DFPD-900-...-F1012			44		252.7	182			223	113	178.3		
DFPD-900-...-F14													
DFPD-1200-...-F1012			50		275.7	204			246	125	199.6		
DFPD-1200-...-F14													
DFPD-2300-...-F1216			64		338.7	253		19	309	157	252.3		
DFPD-2300-...-F14													

Type code [mm]	L1	L2 ±0.1	T1 Min.	T2	T3	T4	T5	T6	T7	T8 +0.5	⌯ 1 H11	⌯ 2 h11	⌯ 3	W1
DFPD-700-...-F1012	428.2	80	29.7	15	18	8	14	8	12	4	27	30	21	45°
DFPD-900-...-F1012	469.6	130	30.2	15.5	18.5	8.5						32	24	
DFPD-900-...-F14			40.2	24.5	–						36			
DFPD-1200-...-F1012	519.3		31	15.5	18.5						27	36		
DFPD-1200-...-F14			40	24.5	–						36			
DFPD-2300-...-F1216	636		50	18.5	30						46		30	
DFPD-2300-...-F14			40	24.5	–						36			

☆ Core product range

Ordering data

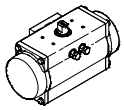
Type code	Size	Product weight [g]	Part No.	Type code
	20	1419	☆ **8047622**	**DFPD-20-RP-90-RS60-F04**
	40	2180	☆ **8047624**	**DFPD-40-RP-90-RS60-F0507**
	80	3960	☆ **8047626**	**DFPD-80-RP-90-RS60-F0507**
	120	5736	☆ **8048134**	**DFPD-120-RP-90-RS60-F0507**
	160	7179	☆ **8048136**	**DFPD-160-RP-90-RS60-F0710**
	240	10036	☆ **8048138**	**DFPD-240-RP-90-RS60-F0710**
	300	12880	☆ **8048140**	**DFPD-300-RP-90-RS60-F0710**
	480	18485	☆ **8048142**	**DFPD-480-RP-90-RS60-F1012**

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

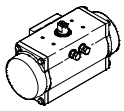
Quarter turn actuators DFPD, single-acting

Technical data

Ordering data

Type code	Size	Product weight [g]	Part No.	Type code
	20	1371	**8047644**	**DFPD-20-RP-90-RS30-F03**
		1419	**8047645**	**DFPD-20-RP-90-RS60-F03**
		1371	**8047621**	**DFPD-20-RP-90-RS30-F04**
		1371	**8048014**	**DFPD-20-RP-90-RS30-F05**
		1419	**8048015**	**DFPD-20-RP-90-RS60-F05**
	40	2087	**8047635**	**DFPD-40-RP-90-RS30-F04**
		2180	**8047636**	**DFPD-40-RP-90-RS60-F04**
		2087	**8047623**	**DFPD-40-RP-90-RS30-F0507**
	80	3746	**8047625**	**DFPD-80-RP-90-RS30-F0507**
	120	5422	**8048133**	**DFPD-120-RP-90-RS30-F0507**
	160	6767	**8048135**	**DFPD-160-RP-90-RS30-F0710**
	240	9442	**8048137**	**DFPD-240-RP-90-RS30-F0710**
	300	12052	**8048139**	**DFPD-300-RP-90-RS30-F0710**
	480	17261	**8048141**	**DFPD-480-RP-90-RS30-F1012**
	700	26268	**8065262**	**DFPD-700-RP-90-RS60-F1012**
	900	30395	**8065266**	**DFPD-900-RP-90-RS60-F14**
	1200	43022	**8065270**	**DFPD-1200-RP-90-RS60-F14**
	2300	77884	**8065274**	**DFPD-2300-RP-90-RS60-F1216**

Ordering data

Type code	Size	Product weight [g]	Part No.	Type code
Version EP, epoxy-coated				
	20	1371	**8047646**	**DFPD-20-RP-90-RS30-F03-R3-EP**
		1419	**8047647**	**DFPD-20-RP-90-RS60-F03-R3-EP**
		1371	**8047627**	**DFPD-20-RP-90-RS30-F04-R3-EP**
		1419	**8047628**	**DFPD-20-RP-90-RS60-F04-R3-EP**
		1371	**8048016**	**DFPD-20-RP-90-RS30-F05-R3-EP**
		1419	**8048017**	**DFPD-20-RP-90-RS60-F05-R3-EP**
	40	2087	**8047642**	**DFPD-40-RP-90-RS30-F04-R3-EP**
		2180	**8047643**	**DFPD-40-RP-90-RS60-F04-R3-EP**
		2087	**8047629**	**DFPD-40-RP-90-RS30-F0507-R3-EP**
		2180	**8047630**	**DFPD-40-RP-90-RS60-F0507-R3-EP**
	80	3746	**8047631**	**DFPD-80-RP-90-RS30-F0507-R3-EP**
		3960	**8047632**	**DFPD-80-RP-90-RS60-F0507-R3-EP**
	120	5422	**8048143**	**DFPD-120-RP-90-RS30-F0507-R3-EP**
		5736	**8048144**	**DFPD-120-RP-90-RS60-F0507-R3-EP**
	160	6767	**8048145**	**DFPD-160-RP-90-RS30-F0710-R3-EP**
		7179	**8048146**	**DFPD-160-RP-90-RS60-F0710-R3-EP**
	240	9442	**8048147**	**DFPD-240-RP-90-RS30-F0710-R3-EP**
		10036	**8048148**	**DFPD-240-RP-90-RS60-F0710-R3-EP**
	300	12052	**8048149**	**DFPD-300-RP-90-RS30-F0710-R3-EP**
		12880	**8048150**	**DFPD-300-RP-90-RS60-F0710-R3-EP**
	480	17261	**8048151**	**DFPD-480-RP-90-RS30-F1012-R3-EP**
		18485	**8048152**	**DFPD-480-RP-90-RS60-F1012-R3-EP**
	700	26268	**8065264**	**DFPD-700-RP-90-RS60-F1012-R3-EP**
	900	30395	**8065268**	**DFPD-900-RP-90-RS60-F14-R3-EP**
	1200	43022	**8065272**	**DFPD-1200-RP-90-RS60-F14-R3-EP**
	2300	77884	**8065276**	**DFPD-2300-RP-90-RS60-F1216-R3-EP**

Ordering data – Modular product system, size 10 ... 80

Ordering table

	Size			10	20	40	80	Condi-tions	Code		Enter code
M	Module No.			**8042184**	**8042185**	**8042186**	**8042187**				
	Function			Quarter turn actuator, based on ISO 5211					**DFPD**		DFPD
O	System of units	Metric									
		Imperial							**-N**		
	Version	Standard									
M	Size	10			–	–	–		**-10**		
		20		–		–	–		**-20**		
		40		–	–		–		**-40**		
		80		–	–	–			**-80**		
M	Design	Rack and pinion							**-RP**		-RP
O	Yoke type	None									
M	Swivel angle	90°							**-90**		
		180°		–	–		–		**-180**		
	Swivel direction	To the left							**-L**		
		To the right							**-R**		
	Function	Double-acting							**D**		
		Single-acting		–				1	☆ **S**		
O	Spring configuration	None									
		Connection pressure	2 bar					5	**20**		
			2.5 bar					5	**25**		
			3 bar					5	**30**		
			3.5 bar					5	**35**		
			4 bar					5	**40**		
			4.5 bar					5	**45**		
			5 bar					5	**50**		
			5.5 bar					5	**55**		
			6 bar					5	☆ **60**		
M	Flange pattern 1	Hole pattern	F03			–	–		**-F03**		
			F04				–		**-F04**		
			F05	–					**-F05**		
O	Flange pattern 2	None									
		Hole pattern	07	–	–			6	**07**		
	Manual override	None									
	Temperature range	Standard									
		0 ... +150 °C		–	–				**-T4**		
		–50 ... +60 °C		–	–				**-T6**		
	Material shaft	Standard									
		High						8	**-R3**		
	Housing surface treatment	None									
		Epoxy-coated						4	**-EP**		

1 **S** Not in combination with swivel angle 180°

4 **EP** Only in combination with material shaft -R3

5 **20, 25, 30, 35, 40, 45, 50, 55, 60** Not in combination with double-acting function, with 2 cylinders (DD), mandatory specification in combination with (function) single-acting (S)

6 **07** Mandatory specification in combination with (torque) 40 Nm, 80 Nm, 120 Nm

8 **R3** Mandatory specification in combination with (housing surface treatment) epoxy-coated -EP

M Mandatory data

O Options

Order code

	DFPD	–		–		–		–		–		–		–		–		–		–		–	

Festo core product range

★ Generally ready for shipping ex works in 24 hours

☆ Generally ready for shipping ex works in 5 days

Quarter turn actuators DFPD

Ordering data – Modular product system, size 120 ... 480

Ordering table

	Size			120	160	240	300	480	Conditions	Code	Enter code
M	Module No.			**8042188**	**8042189**	**8042190**	**8042191**	**8042192**			
	Function			Quarter turn actuator, based on ISO 5211						**DFPD**	DFPD
O	System of units	Metric									
		Imperial								**-N**	
	Version	Standard									
M	Size	120			–	–	–	–		**-120**	
		160		–		–	–	–		☆ **-160**	
		240		–	–		–	–		☆ **-240**	
		300		–	–	–		–		☆ **-300**	
		480		–	–	–	–			☆ **-480**	
M	Design	Rack and pinion								**-RP**	-RP
O	Yoke type	None									
M	Swivel angle	90°								**-90**	
		180°			–		–			**-180**	
	Swivel direction	To the left								**-L**	
		To the right								**-R**	
	Function	Double-acting								**D**	
		Single-acting							1	☆ **S**	
O	Spring configuration	None									
		Connection pressure	2 bar						5	**20**	
			2.5 bar						5	**25**	
			3 bar						5	**30**	
			3.5 bar						5	**35**	
			4 bar						5	**40**	
			4.5 bar						5	**45**	
			5 bar						5	**50**	
			5.5 bar						5	**55**	
↓			6 bar						5	☆ **60**	

1 **S** Not in combination with swivel angle 180°

5 **20, 25, 30, 35, 40, 45, 50, 55, 60** Not in combination with double-acting function, with 2 cylinders (DD), mandatory specification in combination with (function) single-acting (S)

M Mandatory data
O Options

Transfer order code

	DFPD	–		–		–		–		–		–		–	

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Ordering data – Modular product system, size 120 ... 480

Ordering table

Size				120	160	240	300	480	Condi-tions	Code		Enter code
M	Flange pattern 1	Hole pattern	F05		–	–	–	–		-F05		
			F07	–				–		☆ -F07		
			F010	–	–	–	–			☆ -F10		
O	Flange pattern 2	Standard		–	–	–	–	–				
		Hole pattern	F07		–	–	–	–	6	07		
			F10	–				–		☆ 10		
			F12	–	–	–	–			☆ 12		
O	Manual override	None										
	Temperature range	Standard										
		0 ... +150 °C								-T4		
		–50 ... +60 °C								-T6		
	Material shaft	Standard										
		High							8	-R3		
	Housing surface treatment	None										
		Epoxy-coated							4	-EP		

4 **EP** Only in combination with material shaft -R3

6 **07** Mandatory specification in combination with (torque) 40 Nm, 80 Nm, 120 Nm

8 **R3** Mandatory specification in combination with (housing surface treatment) epoxy-coated -EP

M Mandatory data
O Options

Transfer order code

– [ ] – [ ] – [ ] – [ ] – [ ]

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Quarter turn actuators DFPD

Ordering data – Modular product system, size 700 ... 2300

Ordering table

	Size			700	900	1200	2300	Condi-tions	Code		Entry code
M	Module no.			**8042193**	**8042194**	**8042195**	**8042196**				
	Function			Quarter turn actuator, based on ISO 5211					**DFPD**		DFPD
O	System of units	Metric									
		Imperial							**-N**		
	Version	Standard									
M	Size	700			–	–	–		**-700**		
		900		–		–	–		**-900**		
		1200		–	–		–		**-1200**		
		2300		–	–	–			**-2300**		
M	Design	Rack and pinion							**-RP**		-RP
O	Yoke type	None									
M	Swivel angle	90°							**-90**		
	Swivel direction	To the left							**-L**		
		To the right							**-R**		
	Function	Double-acting							**D**		
		Single-acting							**S**		
O	Spring configuration	Without									
		Connection pressure	2 bar					5	**20**		
			2.5 bar					5	**25**		
			3 bar					5	**30**		
			3.5 bar					5	**35**		
			4 bar					5	**40**		
			4.5 bar					5	**45**		
			5 bar					5	**50**		
			5.5 bar					5	**55**		
			6 bar					5	**60**		
M	Flange pattern 1	Hole pattern	F10				–		**-F10**		
			F12	–	–	–			**-F12**		
			F14	–					**-F14**		
O	Flange pattern 2	None									
		Hole pattern	F12				–	2	**12**		
			F16	–	–	–		15	**16**		
	Manual override	None									
	Temperature range	Standard									
	Shaft material	Standard									
		Stainless steel						8	**-R3**		
	Housing surface treatment	None									
		Epoxy-coated						4	**-EP**		

2 **12** Mandatory specification in combination with (flange pattern 1) hole pattern F10 (-F10)
Not in combination with (flange pattern 1) hole pattern F14 (-F14)

4 **EP** Only in combination with shaft material -R3

5 **20, 25, 30, 35, 40, 45, 50, 55, 60**
Not in combination with double-acting function, with 2 cylinders (DD), mandatory specification in combination with (function) single-acting (S)

8 **R3** Mandatory specification in combination with (housing surface treatment) epoxy-coated -EP

15 **16** Mandatory specification in combination with (flange pattern 1) hole pattern F12 (-F12)
Not in combination with (flange pattern 1) hole pattern F14 (-F14)

M Mandatory data
O Options

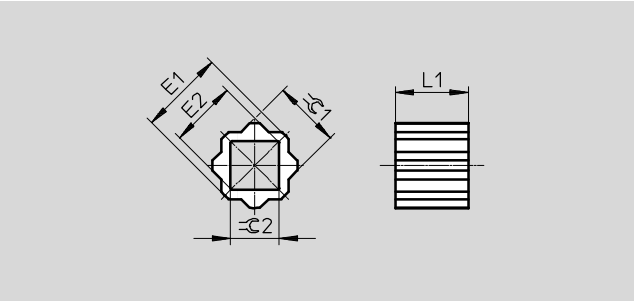
Order code

	DFPD	–		–		–		–		–		–		–		–		–		–	

Accessories

Reducing sleeve square DARQ

- Connection 1, function drive outlet
- Connection 2, function reducing outlet
- Material: Sintered stainless steel
- RoHS-compliant
- Contains paint-wetting impairment substances



DARQ-R-A-...	E1 +0.1/−0.3	E2 +0.3/−0.1	L1 ±0.2	⊂ 1 −0.02/−0.12	⊂ 2 +0.04/+0.18
S11-S8-...	14	11	12	11	8
S11-S9-...	14	12.3	11	11	9
S14-S8-...	18	11	16	14	8
S14-S9-...	18	12.3	16	14	9
S14-S10-...	18	13.3	16	14	10
S14-S11-...	18	14.3	16	14	11
S14-S12-...	18	16.3	16	14	12
S17-S8-...	22	11	17	17	8
S17-S11-...	22	14.3	17	17	11
S17-S12-...	22	16.3	17	17	12
S17-S14-...	22	18.3	17	17	14
S22-S11-...	28	14.3	22	22	11
S22-S14-...	28	18.3	22	22	14
S22-S16-...	28	21.3	22	22	16
S22-S17-...	28	22.3	22	22	17
S27-S17-...	36	22.3	27	27	17
S27-S22-...	36	28.5	27	27	22
S36-S27-...	48	36.1	36	36	27
S46-S36-...	59	48	46	46	36

Quarter turn actuators DFPD

Accessories

Ordering data

Design	Connection		Length [mm]	CRC[1]	Weight/piece [g]	Part No.	Type	PU[2]
	Drive outlet	Reducing outlet						
Internal square and external octagon	Size 11	Size 8	12	2	7	**8082116**	**DARQ-R-A-S11-S8-12**	1
	Size 11	Size 9	11		5	**8082117**	**DARQ-R-A-S11-S9-11**	
	Size 14	Size 8	16		20	**8086383**	**DARQ-R-A-S14-S8-16**	
	Size 14	Size 9	16		18	**8082118**	**DARQ-R-A-S14-S9-16**	
	Size 14	Size 10	16		16	**8082119**	**DARQ-R-A-S14-S10-16**	
	Size 14	Size 11	16		13	**8082120**	**DARQ-R-A-S14-S11-16**	
	Size 14	Size 12	16		10	**8082121**	**DARQ-R-A-S14-S12-16**	
	Size 17	Size 8	17		36	**8086384**	**DARQ-R-A-S17-S8-17**	
	Size 17	Size 11	17		29	**8082122**	**DARQ-R-A-S17-S11-17**	
	Size 17	Size 12	17		25	**8086385**	**DARQ-R-A-S17-S12-17**	
	Size 17	Size 14	17		19	**8082123**	**DARQ-R-A-S17-S14-17**	
	Size 22	Size 11	22		75	**8086386**	**DARQ-R-A-S22-S11-22**	
	Size 22	Size 14	22		62	**8082124**	**DARQ-R-A-S22-S14-22**	
	Size 22	Size 16	22		52	**8082125**	**DARQ-R-A-S22-S16-22**	
	Size 22	Size 17	22		46	**8082126**	**DARQ-R-A-S22-S17-22**	
	Size 27	Size 17	27		121	**8086387**	**DARQ-R-A-S27-S17-27**	
	Size 27	Size 22	27		80	**8082127**	**DARQ-R-A-S27-S22-27**	
	Size 36	Size 27	36		215	**8082128**	**DARQ-R-A-S36-S27-36**	
	Size 46	Size 36	46		410	**8082129**	**DARQ-R-A-S46-S36-46**	
	Size 11	Size 8	12		35	**8082130**	**DARQ-R-A-S11-S8-12-P5**	5
	Size 11	Size 9	11		25	**8082131**	**DARQ-R-A-S11-S9-11-P5**	
	Size 14	Size 8	16		100	**8086388**	**DARQ-R-A-S14-S8-16-P5**	
	Size 14	Size 9	16		90	**8082132**	**DARQ-R-A-S14-S9-16-P5**	
	Size 14	Size 11	16		65	**8082133**	**DARQ-R-A-S14-S11-16-P5**	
	Size 17	Size 11	17		145	**8082134**	**DARQ-R-A-S17-S11-17-P5**	
	Size 17	Size 12	17		125	**8086389**	**DARQ-R-A-S17-S12-17-P5**	
	Size 17	Size 14	17		95	**8082135**	**DARQ-R-A-S17-S14-17-P5**	
	Size 22	Size 14	22		310	**8082136**	**DARQ-R-A-S22-S14-22-P5**	
	Size 22	Size 17	22		230	**8082137**	**DARQ-R-A-S22-S17-22-P5**	
	Size 27	Size 22	27		400	**8082138**	**DARQ-R-A-S27-S22-27-P5**	
	Size 36	Size 27	36		1075	**8082139**	**DARQ-R-A-S36-S27-36-P5**	
	Size 11	Size 9	11		50	**8082140**	**DARQ-R-A-S11-S9-11-P10**	10
	Size 14	Size 9	16		180	**8082141**	**DARQ-R-A-S14-S9-16-P10**	
	Size 14	Size 11	16		130	**8082142**	**DARQ-R-A-S14-S11-16-P10**	
	Size 17	Size 14	17		190	**8082143**	**DARQ-R-A-S17-S14-17-P10**	
	Size 22	Size 17	22		460	**8082144**	**DARQ-R-A-S22-S17-22-P10**	
	Size 11	Size 9	11		250	**8082145**	**DARQ-R-A-S11-S9-11-P50**	50
	Size 14	Size 9	16		900	**8082146**	**DARQ-R-A-S14-S9-16-P50**	
	Size 14	Size 11	16		650	**8082147**	**DARQ-R-A-S14-S11-16-P50**	
	Size 17	Size 11	17		1450	**8082148**	**DARQ-R-A-S17-S11-17-P50**	
	Size 22	Size 17	22		2300	**8082149**	**DARQ-R-A-S22-S17-22-P50**	

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
2) Packaging unit

Quarter turn actuators

DAPS

Overview, configuration and ordering
➔ **www.festo.com/catalogue/daps**

Additional information, support and user documentation
➔ **www.festo.com/sp/daps**

Selected types in accordance with the ATEX Directive for explosive atmospheres
➔ **www.festo.com/ex**

+ Scotch yoke kinematics
+ Flange hole pattern to ISO 5211
+ NAMUR connection pattern for solenoid valves/sensor boxes to VDI/VDE 3845

+ Size 8 ... 8000
+ Torque 7 ... 8000 Nm
+ Swivel angle 0 ... 90°

Quarter turn actuators DAPS

Key features

General
DAPS

➔ page 423, 438

- Size 0008 ... 8000
- Torque 8 ... 8,000 Nm
- Swivel angel 0 ... 90°

The quarter turn actuators DAPS are specially tailored to the requirements of the process industry. The torque is generated via a scotch yoke mechanism, which helps to overcome the valve's high breakaway torques. Given their robustness and graduated torques, the quarter turn actuators DAPS are predominantly used to control valves through which various media flow and whose angle of rotation is limited to 90°, e.g. ball valves and butterfly valves.

- Compact design
- Torque characteristics adapted to the process valves
- For the same housing size, the single-acting drive has half the torque of the double-acting drive
- Low wearing thanks to the simple and robust mechanical system
- Adjustable swivel angle
- Selected types in accordance with ATEX directive for potentially explosive atmospheres
  ➔ www.festo.com/en/ex

- Port pattern to NAMUR VDI/ VDE 3845 for attaching solenoid valves

High-temperature version
DAPS T4

➔ page 423, 438

- Size 0015 ... 0960
- Torque 15 ... 960 Nm
- Swivel angel 0 ... 90°
- Temperature range –20 ... +150 °C

The high temperature version of the quarter turn actuator DAPS-T4 is specifically designed for the requirements for controlling process valves used with hot media flows.

- Compact design
- Torque characteristics adapted to process valves
- The single-acting drive has half the torque of the double-acting drive for the same housing size
- Low wear thanks to the simple and robust mechanical system
- Adjustable swivel angle

- Selected types in accordance with ATEX directive for potentially explosive atmospheres
  ➔ www.festo.com/en/ex
- Port pattern to NAMUR VDI/ VDE 3845 for attaching solenoid valves

Stainless steel variant
DAPS CR

➔ page 455

- Size 0015 ... 0480
- Torque 15 ... 480 Nm
- Swivel angel 0 ... 90°

Single-acting and double-acting quarter turn actuators DAPS in stainless steel are used for automating fittings with a 90° swivel angle. The single-acting variant comes in different spring strengths for different supply pressures.

- Low wearing thanks to the simple and robust mechanical system
- Torque characteristics adapted to the process valves
- Selected types in accordance with ATEX directive for potentially explosive atmospheres
  ➔ www.festo.com/en/ex

- Port pattern to NAMUR VDI/ VDE 3845 for attaching solenoid valves

Variant with handwheel
DAPS MW

➔ page 468

- Size 0106 ... 1920
- Torque 106 ... 1920 Nm
- Swivel angel 0 ... 90°

The position of the process valve or actuator can be manually adjusted using the handwheel when the supply pressure is switched off. The handwheel therefore acts as a manual emergency override.

- Low wearing thanks to the simple and robust mechanical system
- Torque characteristics adapted to the process valves
- Selected types in accordance with ATEX directive for potentially explosive atmospheres
  ➔ www.festo.com/en/ex

- Port pattern to NAMUR VDI/ VDE 3845 for attaching solenoid valves

Product range overview

Flange hole pattern – Connection dimensions to DIN ISO 5211 and NAMUR VDI/VDE 3845

Connection	F03	F03	F04	F04	F05	F05	F05	F07	F07	Shaft
Square	V11	V11	V11	V14	V11	V14	V17	V14	V17	height
DAPS-0008-...-F03	■	–	–	–	–	–	–	–	–	20
DAPS-0015-...-F03	–	■	–	–	–	–	–	–	–	20
DAPS-0015-...-F04	–	–	■	–	–	–	–	–	–	20
DAPS-0030-...-F0305	–	■	–	–	■	–	–	–	–	20
DAPS-0030-...-F04	–	–	■	–	–	–	–	–	–	20
DAPS-0060-...-F04	–	–	–	■	–	–	–	–	–	20
DAPS-0060-...-F0507	–	–	–	–	–	■	–	■	–	20
DAPS-0106-...-F0507	–	–	–	–	–	–	■	–	■	20
Hole pattern for NAMUR	30	30	30	30	30	30	30	30	30	
accessories	30	80	80	80	80	80	80	80	80	

Flange hole pattern – Connection dimensions to DIN ISO 5211 and NAMUR VDI/VDE 3845

Connection	F07	F10	F10	F12	F10	F12	F12	F14	F14	F16	F16	F25	Shaft
Square	V22	V22	V27	V27	V36	V36	V46	V36	V46	V46	V46	V55	height
DAPS-0180-...-F0710	■	■	–	–	–	–	–	–	–	–	–	–	30
DAPS-0240-...-F0710	■	■	–	–	–	–	–	–	–	–	–	–	30
DAPS-0360-...-F0710	■	■	–	–	–	–	–	–	–	–	–	–	30
DAPS-0480-...-F1012	–	–	■	■	–	–	–	–	–	–	–	–	30
DAPS-0720-...-F1012	–	–	■	■	–	–	–	–	–	–	–	–	30
DAPS-0960-...-F1012	–	–	–	–	■	■	–	–	–	–	–	–	30
DAPS-0960-...-F12	–	–	–	–	–	■	–	–	–	–	–	–	30
DAPS-0960-...-F14	–	–	–	–	–	–	–	■	–	–	–	–	30
DAPS-1440-...-F12	–	–	–	–	–	■	–	–	–	–	–	–	30
DAPS-1440-...-F14	–	–	–	–	–	–	–	■	–	–	–	–	30
DAPS-1920-...-F14	–	–	–	–	–	–	–	–	■	–	–	–	30
DAPS-1920-...-F1216	–	–	–	–	–	–	■	–	–	■	–	–	30
DAPS-2880-...-F16	–	–	–	–	–	–	–	–	–	–	■	–	30
DAPS-3840-...-F16	–	–	–	–	–	–	–	–	–	–	■	–	30
DAPS-5760-...-F25	–	–	–	–	–	–	–	–	–	–	–	■	30
DAPS-8000-...-R-F25	–	–	–	–	–	–	–	–	–	–	–	■	30
Hole pattern for NAMUR	30	30	30	30	30	30	30	30	30	30	30	30	
accessories	80	80	80	80	80	80	80	80	80	80	130	130	

Quarter turn actuators DAPS, single-acting

Product range overview

Flange hole pattern – Connection dimensions to DIN ISO 5211 and NAMUR VDI/VDE 3845

Connection	F03	F04	F04	F05	F05	F05	F07	F07	Shaft
Square	V11	V11	V14	V11	V14	V17	V14	V17	height
DAPS-0015-...-F0305	■	–	–	■	–	–	–	–	20
DAPS-0015-...-F04	–	■	–	–	–	–	–	–	20
DAPS-0030-...-F04	–	–	■	–	–	–	–	–	20
DAPS-0030-...-F0507	–	–	–	–	■	–	■	–	20
DAPS-0053-...-F0507	–	–	–	–	–	■	–	■	20
Hole pattern for NAMUR	30	30	30	30	30	30	30	30	
accessories	80	80	80	80	80	80	80	80	

Flange hole pattern – Connection dimensions to DIN ISO 5211 and NAMUR VDI/VDE 3845

Connection	F07	F10	F10	F12	F10	F12	F12	F14	F14	F16	F16	Shaft
Square	V22	V22	V27	V27	V36	V36	V46	V36	V46	V46	V46	height
DAPS-0090-...-F0710	■	■	–	–	–	–	–	–	–	–	–	30
DAPS-0120-...-F0710	■	■	–	–	–	–	–	–	–	–	–	30
DAPS-0180-...-F0710	■	■	–	–	–	–	–	–	–	–	–	30
DAPS-0240-...-F1012	–	–	■	■	–	–	–	–	–	–	–	30
DAPS-0360-...-F1012	–	–	■	■	–	–	–	–	–	–	–	30
DAPS-0480-...-F1012	–	–	–	–	■	■	–	–	–	–	–	30
DAPS-0480-...-F12	–	–	–	–	–	■	–	–	–	–	–	30
DAPS-0480-...-F14	–	–	–	–	–	–	–	■	–	–	–	30
DAPS-0720-...-F12	–	–	–	–	–	■	–	–	–	–	–	30
DAPS-0720-...-F14	–	–	–	–	–	–	–	■	–	–	–	30
DAPS-0960-...-F14	–	–	–	–	–	–	–	–	■	–	–	30
DAPS-0960-...-F1216	–	–	–	–	–	–	■	–	–	■	–	30
DAPS-1440-...-F16	–	–	–	–	–	–	–	–	–	–	■	30
DAPS-1920-...-F16	–	–	–	–	–	–	–	–	–	–	■	30
DAPS-2880-...-F16	–	–	–	–	–	–	–	–	–	–	■	30
DAPS-4000-...-RS1-F25	–	–	–	–	–	–	–	–	–	–	■	30
DAPS-4000-...-RS2-F25	–	–	–	–	–	–	–	–	–	–	■	30
DAPS-4000-...-RS3-F25	–	–	–	–	–	–	–	–	–	–	■	30
DAPS-4000-...-RS4-F25	–	–	–	–	–	–	–	–	–	–	■	30
Hole pattern for NAMUR	30	30	30	30	30	30	30	30	30	30	30	
accessories	80	80	80	80	80	80	80	80	80	80	130	

Product range overview

DAPS CR, double-acting

Flange hole pattern – Connection dimensions to DIN ISO 5211 and NAMUR VDI/VDE 3845

Connection	F03	F03	F05	F05	F05	F07	F07	F07	F10	F10	Shaft height
Square	V09	V11	V11	V14	V17	V14	V17	V22	V17	V22	
DAPS-0015-...-R-F03-CR	■	–	–	–	–	–	–	–	–	–	20 mm
DAPS-0030-...-R-F03-CR	■	–	–	–	–	–	–	–	–	–	20 mm
DAPS-0060-...-R-F0305-CR	–	■	■	–	–	–	–	–	–	–	20 mm
DAPS-0120-...-R-F0507-CR	–	–	–	■	–	■	–	–	–	–	30 mm
DAPS-0240-...-R-F0507-CR	–	–	–	–	■	–	■	–	–	–	30 mm
DAPS-0480-...-R-F0710-CR	–	–	–	–	–	–	–	■	–	■	30 mm
Hole pattern for NAMUR accessories	25	25	25	30	30	30	30	30	30	30	
	50	50	50	80	80	80	80	80	80	80	

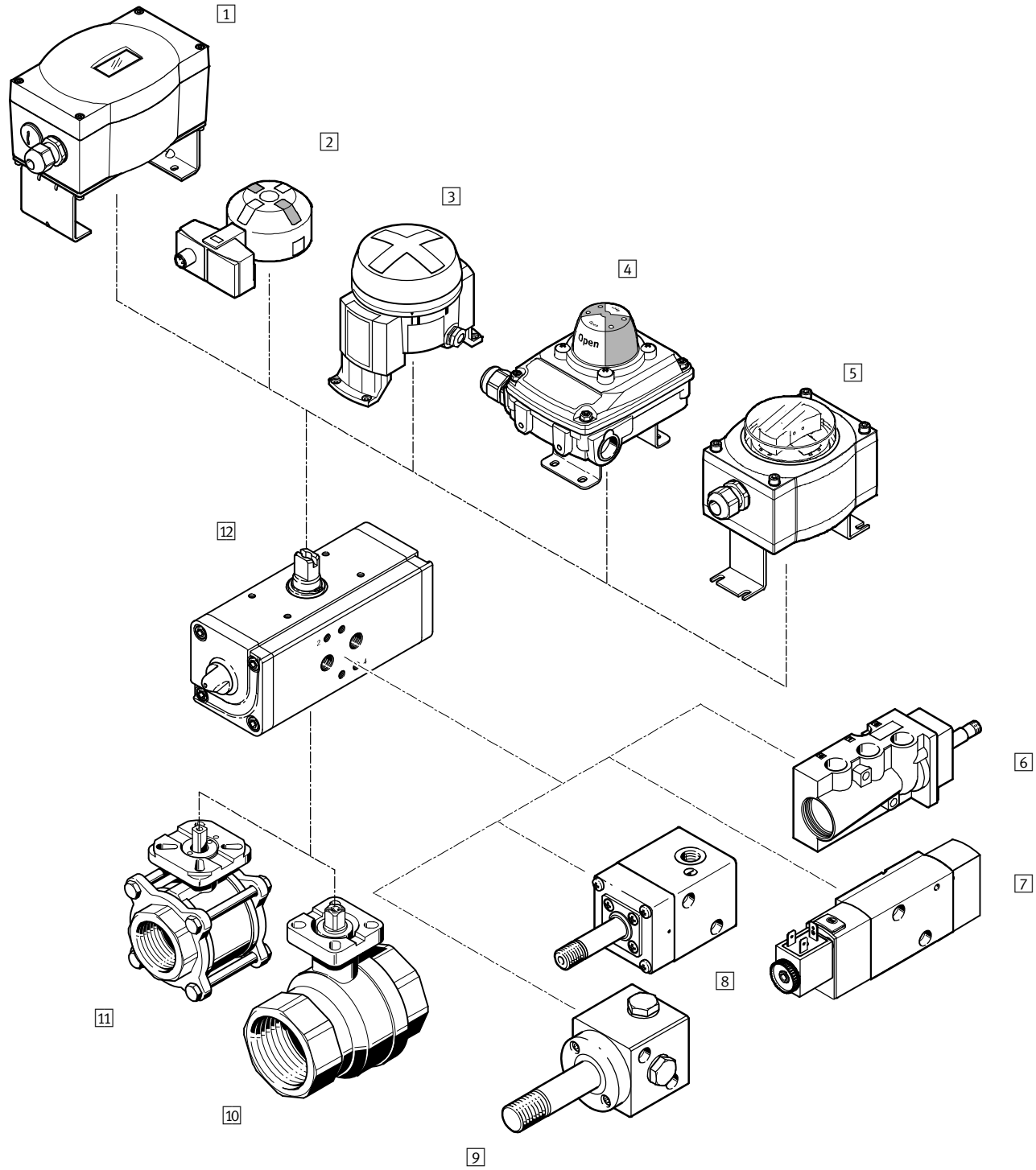
DAPS CR, single-acting

Flange hole pattern – Connection dimensions to DIN ISO 5211 and NAMUR VDI/VDE 3845

Connection	F03	F03	F05	F05	F05	F07	F07	F07	F10	F10	Shaft height
Square	V09	V11	V11	V14	V17	V14	V17	V22	V17	V22	
DAPS-0015-...-RS1-F03-CR	■	–	–	–	–	–	–	–	–	–	20 mm
DAPS-0015-...-RS2-F03-CR	■	–	–	–	–	–	–	–	–	–	20 mm
DAPS-0015-...-RS3-F03-CR	■	–	–	–	–	–	–	–	–	–	20 mm
DAPS-0015-...-RS4-F03-CR	■	–	–	–	–	–	–	–	–	–	20 mm
DAPS-0030-...-RS1-F03-CR	–	■	■	–	–	–	–	–	–	–	20 mm
DAPS-0030-...-RS2-F03-CR	–	■	■	–	–	–	–	–	–	–	20 mm
DAPS-0030-...-RS3-F03-CR	–	■	■	–	–	–	–	–	–	–	20 mm
DAPS-0030-...-RS4-F03-CR	–	■	■	–	–	–	–	–	–	–	20 mm
DAPS-0060-...-RS1-F0305-CR	–	–	–	■	–	■	–	–	–	–	30 mm
DAPS-0060-...-RS2-F0305-CR	–	–	–	■	–	■	–	–	–	–	30 mm
DAPS-0060-...-RS3-F0305-CR	–	–	–	■	–	■	–	–	–	–	30 mm
DAPS-0060-...-RS4-F0305-CR	–	–	–	■	–	■	–	–	–	–	30 mm
DAPS-0120-...-RS1-F0507-CR	–	–	–	–	■	–	■	–	–	–	30 mm
DAPS-0120-...-RS2-F0507-CR	–	–	–	–	■	–	■	–	–	–	30 mm
DAPS-0120-...-RS3-F0507-CR	–	–	–	–	■	–	■	–	–	–	30 mm
DAPS-0120-...-RS4-F0507-CR	–	–	–	–	■	–	■	–	–	–	30 mm
DAPS-0240-...-RS1-F0507-CR	–	–	–	–	–	–	–	■	–	■	30 mm
DAPS-0240-...-RS1-F0507-CR	–	–	–	–	–	–	–	■	–	■	30 mm
DAPS-0240-...-RS1-F0507-CR	–	–	–	–	–	–	–	■	–	■	30 mm
DAPS-0240-...-RS1-F0507-CR	–	–	–	–	–	–	–	■	–	■	30 mm
Hole pattern for NAMUR accessories	25	25	25	30	30	30	30	30	30	30	
	50	50	50	80	80	80	80	80	80	80	

Quarter turn actuators DAPS

Peripherals overview



Peripherals overview

Mounting components and accessories			
		Description	**➔ Page/Internet**
1	Positioner CMSX	For position control of quarter turn actuators in process automation systems	289
2	Sensor boxes SRBG	For electrical feedback and position monitoring of process valves which are actuated with quarter turn actuators	235
3	Limit switch attachments DAPZ	Round design, variant AR Electrical, inductive or inductive and explosion-proof sensing	279
4	Sensor boxes SRBC	For electrical feedback and position monitoring of process valves which are actuated with quarter turn actuators	217
5	Sensor boxes SRAP	Analogue sensor box continuously senses the entire swivel range and reports this back to the controller	269
6	Solenoid valves NVF3[1)]	For F solenoid coil and explosion-proof F solenoid coil	nvf3
7	Solenoid valves VSNC	For single- and double-acting quarter turn actuators with a connection pattern to VDI/VDE 3845	23
8	Solenoid valves VOFC	Solenoid valve with solenoid coil, connection pattern to Namur	85
9	Solenoid valves VOFD	Solenoid valve with solenoid coil, connection pattern to Namur	151
10	Ball valves VAPB	2-way, brass, pipe thread to EN 10226-1	542
11	Ball valves VZBA	2-way, stainless steel, optionally with pipe thread to EN 10226-1 or with welding ends	495
12	Quarter turn actuators DAPS	Connection pattern to VDI/VDE 3845 for attaching solenoid valves	423

1) Direct mounting of solenoid valves only possible from size 0015 onwards

Quarter turn actuators DAPS

Type codes DAPS

DAPS – 0240 – 090 – R S 4 – F10 –

Type	
DAPS	Quarter turn actuator

Size	
0008	Nominal torque 8 Nm
0015	Nominal torque 15 Nm
0030	Nominal torque 30 Nm
0053	Nominal torque 53 Nm
0060	Nominal torque 60 Nm
0090	Nominal torque 90 Nm
0106	Nominal torque 106 Nm
0120	Nominal torque 120 Nm
0180	Nominal torque 180 Nm
0240	Nominal torque 240 Nm
0360	Nominal torque 360 Nm
0480	Nominal torque 480 Nm
0720	Nominal torque 720 Nm
0960	Nominal torque 960 Nm
1440	Nominal torque 1440 Nm
1920	Nominal torque 1920 Nm
2880	Nominal torque 2880 Nm
3840	Nominal torque 3840 Nm
4000	Nominal torque 4000 Nm
5760	Nominal torque 5760 Nm
8000	Nominal torque 8000 Nm

Swivel angle	
090	90°

Closing direction	
R	Closes to right

Mode of operation	
–	Double-acting
S	Single-acting

Spring strength	
–	Not applicable for double-acting
1	For connection pressure 2.8 bar
2	For connection pressure 3.5 bar
3	For connection pressure 4.2 bar
4	For connection pressure 5.6 bar

1st flange hole pattern	
F03	Flange hole pattern F03
F04	Flange hole pattern F04
F05	Flange hole pattern F05
F07	Flange hole pattern F07
F10	Flange hole pattern F10
F12	Flange hole pattern F12
F14	Flange hole pattern F14
F16	Flange hole pattern F16
F25	Flange hole pattern F25

Type codes DAPS

12	–		–	

2nd flange hole pattern	
05	Flange hole pattern F05
07	Flange hole pattern F07
10	Flange hole pattern F10
12	Flange hole pattern F12
16	Flange hole pattern F16

Manual override	
MW	With handwheel

Temperature range	
–	Standard (–20 °C ... +80 °C)
T4	–20 °C ... +150 °C
T6	–50 °C ... +60 °C

Quarter turn actuators DAPS CR

Type codes DAPS CR

DAPS – 0015 – 090 – R S 4 – F03 – 05 – CR

Type	
DAPS	Quarter turn actuator for process automation

Nominal torque in Nm	
0015	15 Nm
0030	30 Nm
0060	60 Nm
0120	120 Nm
0240	240 Nm
0480	480 Nm

Swivel angle in degrees	
90	90°

Closing direction	
R	Closes to right

Mode of operation	
S	Single-acting

Spring strength	
1	Spring strength for connection pressure 2.8 bar
2	Spring strength for connection pressure 3.5 bar
3	Spring strength for connection pressure 4.2 bar
4	Spring strength for connection pressure 5.6 bar

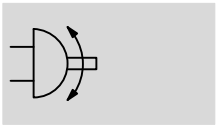
1st flange hole pattern	
F03	Flange hole pattern 03
F05	Flange hole pattern 05
F07	Flange hole pattern 07

2nd flange hole pattern	
05	Flange hole pattern 05
07	Flange hole pattern 07
10	Flange hole pattern 10

Special design	
CR	Stainless steel

Technical data

Function



Swivel angel
0 ... 90°

Wearing parts kits
➔ page 436

Size
0008 ... 8000

Torque
8 ... 8000 Nm

General technical data

Size		0008	0015 ... 0360	0480 ... 0960	1440 ... 1920	2880 ... 5760	8000
Pneumatic connection		G1/8	G1/8	G1/4	G1/4	G1/8	G3/8
Design		Scotch yoke system					
Mode of operation		Double-acting					
Mounting position		Any					
Position sensing		None					
Cushioning		No cushioning					
Swivel angle	[°]	90					
End-position adjusting range at 0°							
DAPS ... R- ...	[°]	–	–1 ... +9			±5	
DAPS ... R- ... T4	[°]	–	–1 ... +9		–		
DAPS ... R- ... T6	[°]	–	–1 ... +9			±5	–
End-position adjusting range at 90°							
DAPS ... R- ...	[°]	–				85 ... 95	
DAPS ... R- ... T4	[°]	–					
DAPS ... R- ... T6	[°]	–				85 ... 95	–
Closing direction		Closes to right					

Operating and environmental conditions

Size		0008	0015 ... 0360	0480 ... 0960	1440 ... 1920	2880 ... 5760	8000
Nominal operating pressure	[bar]	5.6					
Operating pressure							
DAPS ... R- ...	[bar]	1 ... 8.4					1 ... 7
DAPS ... R- ... T4	[bar]	3 ... 8.4			–		
DAPS ... R- ... T6	[bar]	3 ... 8.4					–
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]					
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)					
Ambient temperature							
DAPS ... R- ...	[°C]	–20 ... +80					
DAPS ... R- ... T4	[°C]	–	–20 ... +150		–		
DAPS ... R- ... T6	[°C]	–	–50 ... +60				–
Corrosion resistance class CRC[1)]		3					
Connection to process valve as per standard		ISO 5211					
Valve connection as per standard		VDI/VDE 3845 (NAMUR)					
Safety Integrity Level (SIL)		Up to SIL 2 High Demand mode					
		Up to SIL 2 Low Demand mode					

1) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Quarter turn actuators DAPS, double-acting

Technical data

ATEX		
ATEX category for gas		II 2G
Type of (ignition) protection for gas		Ex h IIC T6 ... T3 Gb X
ATEX category for dust		II 2D
Type of (ignition) protection dust		Ex h IIIC T85°C ... T200°C Db X
Explosion ambient temperature	Standard	−20 °C ≤ Ta ≤ +60 °C
	Variant T4	−20 °C <= Ta <= +150 °C
	Variant T6	−50 °C <= Ta <= +60 °C
CE marking (see declaration of conformity)		To EU Explosion Protection Directive (ATEX)

Air consumption [l/cycle] at 6 bar

Size		Size	
DAPS-0008	0.24	DAPS-0720	24.5
DAPS-0015	0.56	DAPS-0960	34.3
DAPS-0030	1.05	DAPS-1440	53.2
DAPS-0060	2.1	DAPS-1920	71.4
DAPS-0106	3.85	DAPS-2880	140
DAPS-0180	6.65	DAPS-3840	179.2
DAPS-0240	9.1	DAPS-5760	266
DAPS-0360	12.6	DAPS-8000	350
DAPS-0480	18.2		

Weight [g]

Size		Size	
DAPS-0008	300	DAPS-0720	12000
DAPS-0015	750	DAPS-0960	17400
DAPS-0030	1000	DAPS-1440	23000
DAPS-0060	1600	DAPS-1920	32000
DAPS-0106	2500	DAPS-2880	56000
DAPS-0180	4600	DAPS-3840	49000
DAPS-0240	5400	DAPS-5760	86000
DAPS-0360	6500	DAPS-8000	106000
DAPS-0480	9600		

Materials

Quarter turn actuators			Material number
Housing		Wrought aluminium alloy	–
Cap		Wrought aluminum alloy	–
Shaft		High-alloy steel	1.4305
External screws		High-alloy steel	–
Seals	Standard	FPM, NBR, PUR	–
	T4	FPM, PTFE-reinforced	–
	T6	FVMQ, PTFE-reinforced	–
Note on materials	Standard	RoHS-compliant	–
	T4	Contains paint-wetting impairment substances, RoHS-compliant	–
	T6	Contains paint-wetting impairment substances, RoHS-compliant	–

Actual torque [Nm] as a function of operating pressure [bar] and swivel angle [°]

Size	Swivel angle [°]	Operating pressure [bar]							
		2.5	3	4	5	5.6	6	7	8
DAPS-0008	0	3.1	3.8	5	6.3	7	7.5	8.8	10
	50	1.6	1.9	2.5	3.1	3.5	3.8	4.4	5
	90	3.1	3.8	5	6.3	7	7.5	8.8	10
DAPS-0015	0	6.7	8	10.7	13.4	15	16.1	18.8	21.4
	50	3.3	4	5.4	6.7	7.5	8	9.4	10.7
	90	5	6	8.1	10.1	11.3	12.1	14.1	16.1

Technical data

Actual torque [Nm] as a function of operating pressure [bar] and swivel angle [°]

Size	Swivel angle [°]	Operating pressure [bar]							
		2.5	3	4	5	5.6	6	7	8
DAPS-0030	0	13.4	16.1	21.4	26.8	30	32.1	37.5	42.9
	50	6.7	8	10.7	13.4	15	16.1	18.8	21.4
	90	10	12	16.1	20.1	22.5	24.1	28.1	32.1
DAPS-0060	0	26.8	32.1	42.9	53.6	60	64.3	75	85.7
	50	13.4	16.1	21.4	26.8	30	32.1	37.5	42.9
	90	20.1	24.1	32.1	40.2	45	48.2	56.3	64.3
DAPS-0106	0	47.5	57	76	95	106	114	133	151
	50	23.5	28	38	47	53	57	66	76
	90	35.5	43	57	71	80	86	100	114
DAPS-0180	0	80.4	96	128.4	160.8	180	193.2	225.6	264.8
	50	40.2	48	64.8	80.4	90	96	112.8	128.4
	90	60.6	72	97.2	121.2	135	145.2	169.2	193.2
DAPS-0240	0	107.1	128.6	171.4	214.3	240	257.1	300	342.9
	50	53.5	64.3	85.7	107.1	120	128.6	150	171.4
	90	80.3	96.4	128.6	160.7	180	192.9	225	257.1
DAPS-0360	0	160.8	192	256.8	321.6	360	386.4	451.2	513.6
	50	80.4	96	129.6	160.8	180	192	225.6	264.8
	90	121.2	144	194.4	242.4	270	290.4	338.4	386.4
DAPS-0480	0	214.3	257.1	342.9	428.6	480	514.3	600	685.7
	50	107.1	128.6	171.4	214.3	240	257.1	300	342.9
	90	160.7	192.9	257.1	321.4	360	358.7	450	514.3
DAPS-0720	0	321.4	384	513.6	643.2	720	772.8	902.4	1027.2
	50	160.7	192	259.2	321.6	360	384	451.2	529.6
	90	241	288.1	388.8	484.8	540	580.8	676.8	772.8
DAPS-0960	0	428.6	514.3	685.7	857.1	960	1028.6	1200	1371.4
	50	214.3	257.1	342.9	428.6	480	514.3	600	685.7
	90	321.4	385.7	514.3	642.9	720	771.4	900	1028.6
DAPS-1440	0	642.8	768	1027.2	1286.4	1440	1545.6	1804.8	2057.4
	50	321.4	384	518.4	643.2	720	768	902.4	1059.2
	90	482.1	576	777.6	969.9	1080	1161.6	1353.6	1545.6
DAPS-1920	0	857.1	1028.6	1371.4	1714.3	1920	2057.1	2400	2742.9
	50	428.6	514.3	685.8	857.1	960	1028.6	1200	1371.4
	90	642.9	771.4	1028.6	1285.7	1440	1542.9	1800	2057.1
DAPS-2880	0	1285	1,542	2057	2571	2880	3085	3600	4114
	50	642	771	1028	1285	1440	1542	1800	2057
	90	856	1028	1371	1741	1920	2056	2400	2742
DAPS-3840	0	1714	2057	2743	3428	3840	4114	4800	5485
	50	857	1028	1371	1714	1920	2057	2400	2742
	90	1285	1543	2057	2571	2880	3085	3600	4114
DAPS-5760	0	2571	3085	4114	5142	5760	6171	7200	8228
	50	1285	1542	2057	2571	2880	3085	3600	4141
	90	1928	2313	3085	3856	4320	4628	5400	6171
DAPS-8000	0	3571.4	4285.7	5714.3	7142.9	8000	8571.4	10000	–
	50	1785.7	2142.9	2857.1	3571.4	4000	4285.7	5000	–
	90	2678.6	3214.3	4285.7	5357.1	6000	6428.6	7500	–

Torque for size at 5.6 bar and swivel angle 0°

Note

The operating torque of the drive must not be higher than the maximum permissible torque listed in ISO 5211, with reference to the size of the mounting flange and of the coupling.

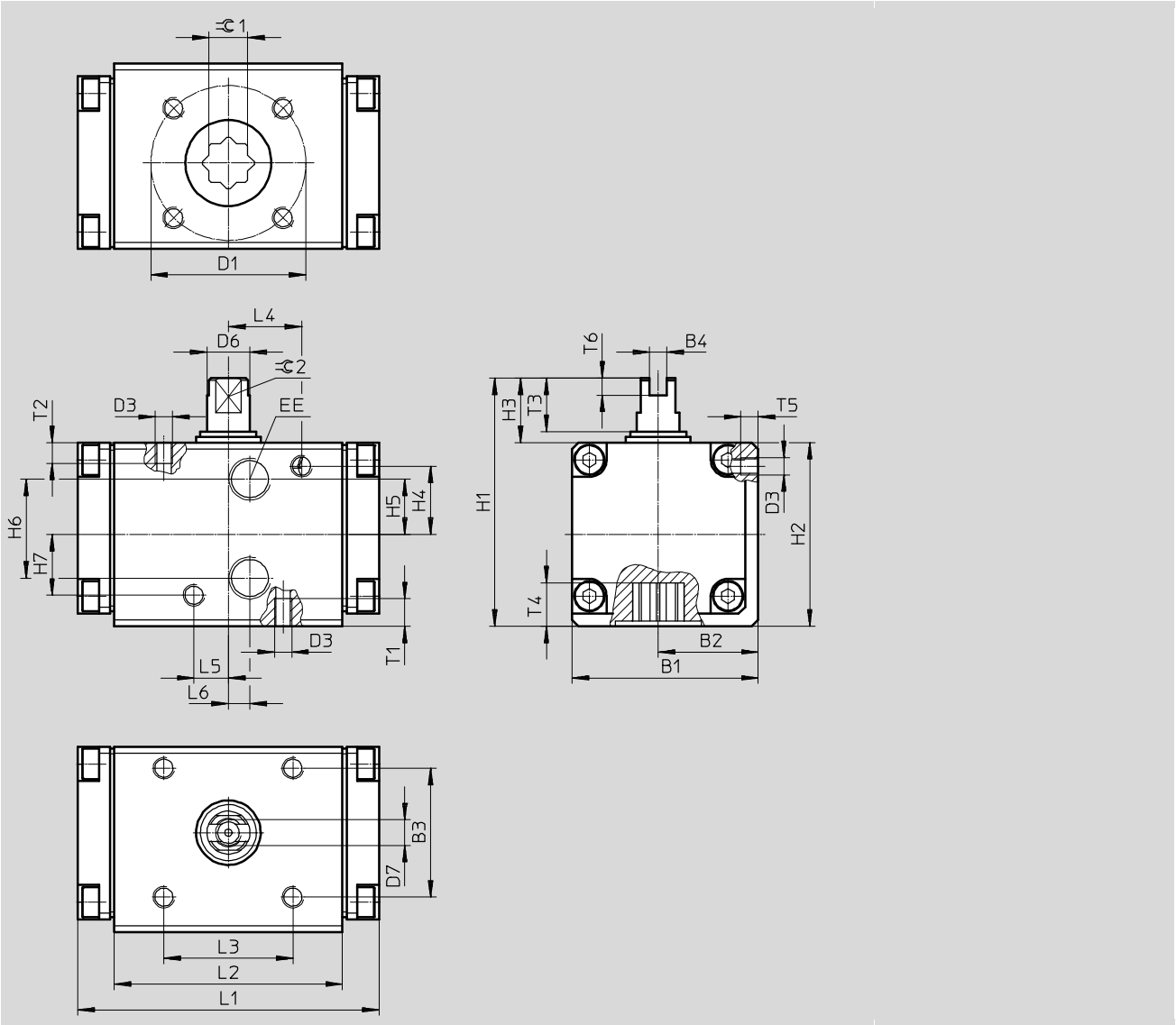
Quarter turn actuators DAPS, double-acting

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

Size 0008



Technical data

Size	B1	B2	B3	B4 +0.1	D1 ∅	D3	D6 ∅	D7	EE	H1	H2	H3	H4	H5	H6
DAPS-008-...	43.2	23.2	30	4	36	M5	10	M6	G1/8	57.7	42.7	15	14.5	11.5	23

Size	H7	L1	L2	L3	L4	L5	L6	T1	T2	T3	T4	T5	T6 +0.5	⌭ 1 H11	⌭ 2 h11
DAPS-008-...	15.5	70	53	30	17	8	5	8	6	12.4	10.1	5	4.5	9	8

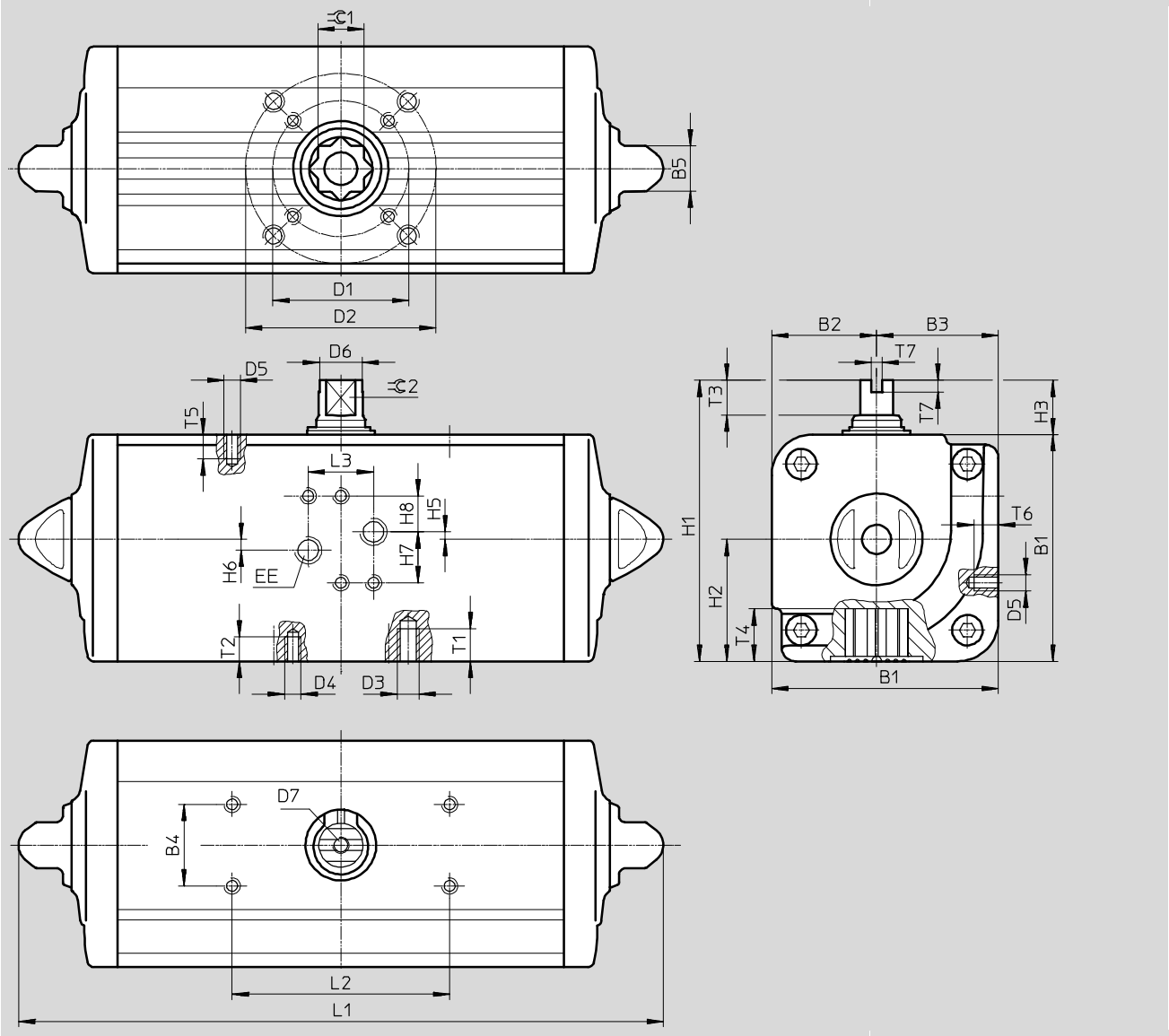
Quarter turn actuators DAPS, double-acting

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

DAPS-0015-090-...-T4



Technical data

Size	B1	B2	B3	B4	B5	D1 ∅ ±0.1	D2 ∅ ±0.1	D3	D4	D5	D6 ∅	D7	EE	H1	H2	H3
DAPS-0015-...-F03	52.2	24.2	28	30	13	36	–	–	M5	M5	9.2	M6	G1/8	72.2	28	20
DAPS-0015-...-F04						42										
DAPS-0030-...-F0305	59.2	27.7	31.5		13	36	50	M6	M5		10.9			79.2	31.5	20
DAPS-0030-...-F04						42	–	–								
DAPS-0060-...-F04	70.4	32.7	37.7		13	42	–	–	M5		14.5			90.4	37.7	20
DAPS-0060-...-F0507						50	70	M8	M6							
DAPS-0106-...-F0507	83.3	38.5	44.8		17	50	70	M8	M6		16.2			103.3	44.8	20
DAPS-0180-...-F0710	107.5	51	56.5		22	70	102	M10	M8		20.2			137.5	56.5	30
DAPS-0240-...-F0710	111.1	51	60.1		22	70	102	M10	M8		22.5			141.1	60.1	30
DAPS-0360-...-F0710	118	56	62		22	70	102	M10	M8		25.5			148	62	30

Size	H5	H6	H7	H8	L1 ±2	L2	L3	T1	T2	T3	T4	T5	T6	T7	⌯ 1	⌯ 2
DAPS-0015-...-F03	0.8	3.2	18	14	159	80	24	–	8	10	13.2	6	7	4	11	8
DAPS-0015-...-F04																
DAPS-0030-...-F0305	0.8	3.2			174			9	8	10	13.2				11	9
DAPS-0030-...-F04								–								
DAPS-0060-...-F04	–	4			198			–	8	13	16.5				14	10
DAPS-0060-...-F0507								12	9							
DAPS-0106-...-F0507	–	4			237.1			12	9	13	19.3				17	12
DAPS-0180-...-F0710	–	4			289.9			15	12	16	24.8				22	15
DAPS-0240-...-F0710	–	4			313.6			15	12	17	24.8				22	15
DAPS-0360-...-F0710	–	4			339.3			15	12	19	24.3				22	19

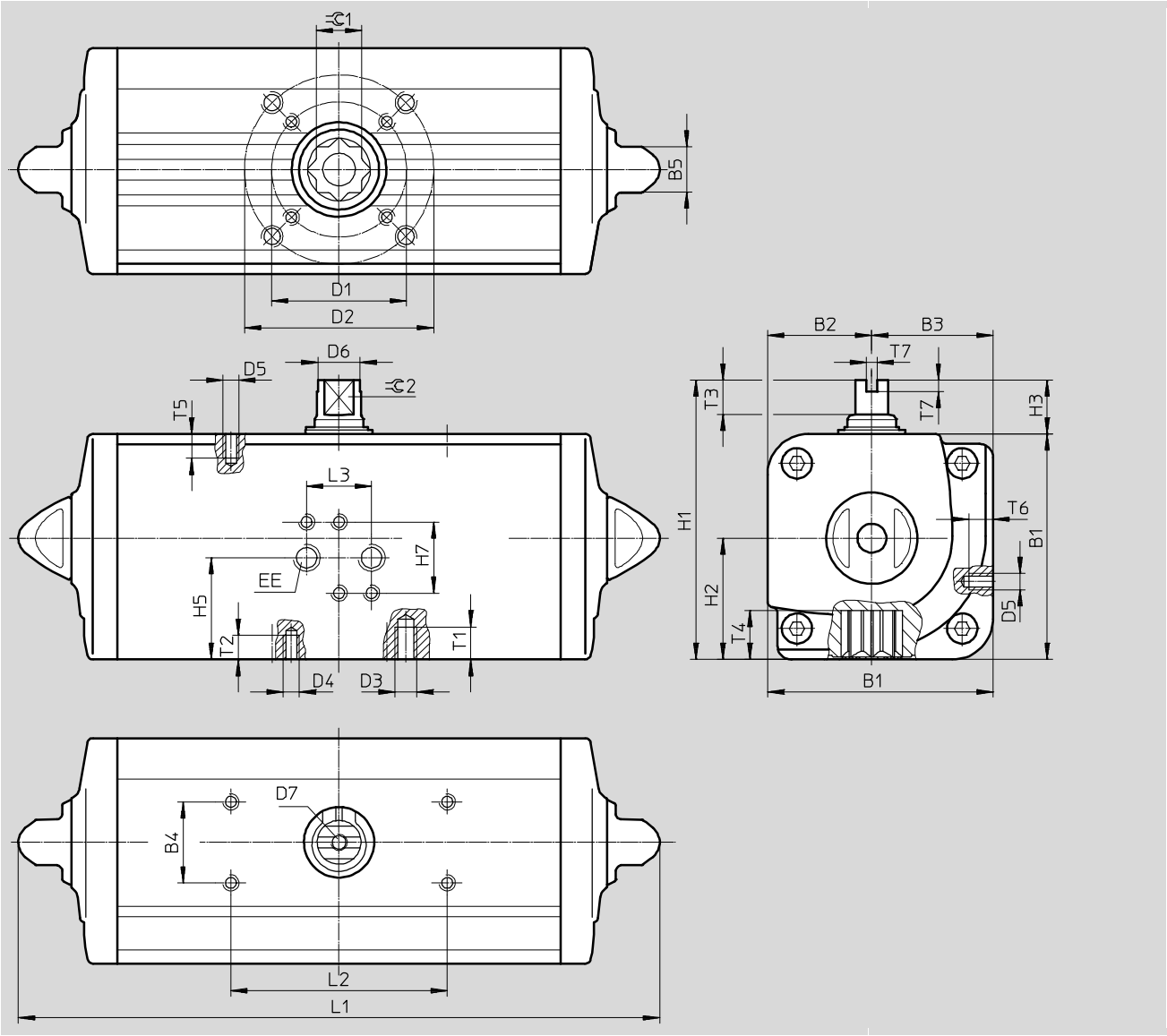
Quarter turn actuators DAPS, double-acting

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

Size 0015 ... 1920



Technical data

Size	B1	B2	B3	B4	B5	D1 ∅ ±0.1	D2 ∅ ±0.1	D3	D4	D5	D6 ∅	D7	EE	H1	H2
DAPS-0015-...-F03	52.2	24.2	28	30	13	36	–	–	M5	M5	9.2	M6	G1/8	72.2	28
DAPS-0015-...-F04						42			M5						
DAPS-0030-...-F0305	59.2	27.7	31.5		13	36	50	M6	M5		10.9			79.2	31.5
DAPS-0030-...-F04						42	–	–	M5						
DAPS-0060-...-F04	70.4	32.7	37.7		13	42	–	–	M5		14.5			90.4	37.7
DAPS-0060-...-F0507						50	70	M8	M6						
DAPS-0106-...-F0507	83.3	38.5	44.8		17	50	70	M8	M6		16.2			103.3	44.8
DAPS-0180-...-F0710	107.5	51	56.5		22	70	102	M10	M8		20.2			137.5	56.5
DAPS-0240-...-F0710	111.1	51	60.1		22	70	102	M10	M8		22.5			141.1	60.1
DAPS-0360-...-F0710	118	56	62		22	70	102	M10	M8		25.5			148	62

Size	H3	H5	H7	L1 ±2	L2	L3	T1	T2	T3	T4	T5	T6	T7	⫩ 1	⫩ 2
DAPS-0015-...-F03	20	28.8	32	159	80	24	–	8	10	13.2	6	7	4	11	8
DAPS-0015-...-F04								8							
DAPS-0030-...-F0305	20	32.3		174			9	8	10	13.2				11	9
DAPS-0030-...-F04							–	8							
DAPS-0060-...-F04	20	37.7		198			–	8	13	16.5				14	10
DAPS-0060-...-F0507							12	9							
DAPS-0106-...-F0507	20	44.8		237.1			12	9	13	19.3				17	12
DAPS-0180-...-F0710	30	56.5		289.9			15	12	16	24.8				22	15
DAPS-0240-...-F0710	30	60.1		313.6			15	12	17	24.8				22	15
DAPS-0360-...-F0710	30	62		339.3			15	12	19	24.3				22	19

Size	B1	B2	B3	B4	B5	D1 ∅ ±0.1	D2 ∅ ±0.1	D3	D4	D5	D6 ∅	D7	EE	H1	H2
DAPS-0480-...-F1012	134.9	62	72.9	30	27	102	125	M12	M10	M5	29	M6	G1/4	164.9	72.9
DAPS-0720-...-F1012	148	69.5	78.5		27	102	125	M12	M10		31.8			178	78.5
DAPS-0960-...-F12	168	74.5	93.5		27	102	125	M12	M10		36.5			198	93.5
DAPS-0960-...-F14					27	140	–	–	M16						
DAPS-1440-...-F12	186	84.5	101.5		36	125	–	–	M12		41			216	101.5
DAPS-1440-...-F14					36	140			M16						
DAPS-1920-...-F14	207.7	93	114.7		36	140	–	–	M16		46			237.7	114.7
DAPS-1920-...-F1216					36	125	165	M20	M12						

Size	H3	H5	H7	L1	L2	L3	T1	T2	T3	T4	T5	T6	T7	⫩ 1	⫩ 2
DAPS-0480-...-F1012	30	57.4	32	387.7	80	24	18	15	19	29.5	6	7	4	27	19
DAPS-0720-...-F1012		61.5		433			18	15	19.5	29.5				27	22
DAPS-0960-...-F12		78		479.4			18	15	19.5	38.5				36	24
DAPS-0960-...-F14							–	24							
DAPS-1440-...-F12		86.5		567			–	18	19.5	38.5				36	27
DAPS-1440-...-F14								24							
DAPS-1920-...-F14		99.2		601			–	24	18.5	48.5				46	32
DAPS-1920-...-F1216							30	18							

Quarter turn actuators DAPS, double-acting

Technical data

Dimensions

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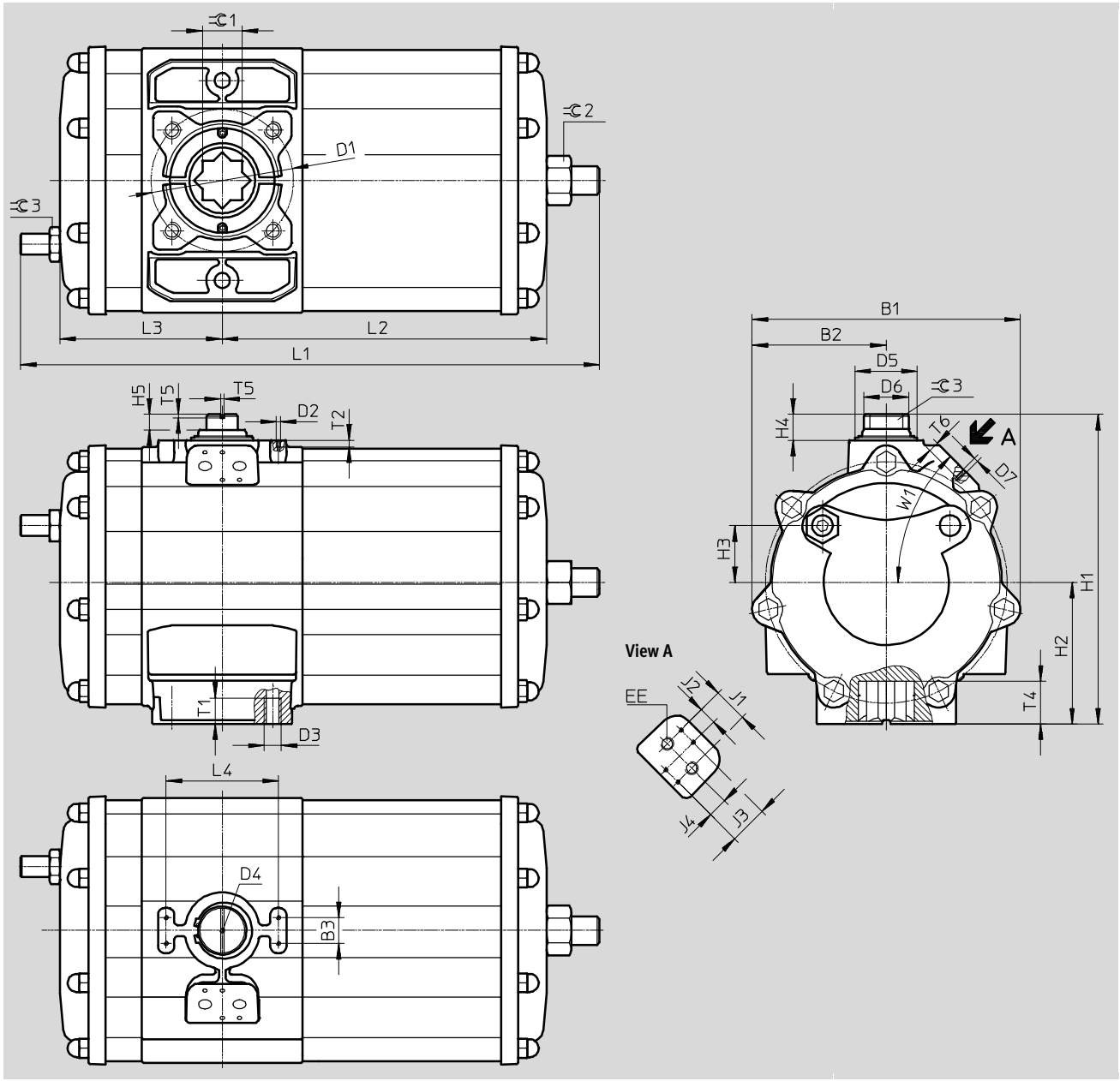
Size 2880



Size	B1	B2	B3	D1 ∅	D2	D3	D4	D5 ∅	D6 ∅	D7	EE	H1	H2	H3	H4	H5	J1
DAPS-2880-...	311	155	30	165	M5	M20	M6	72	52	M6	G3/8	359	164	66	30	18	40

Size	J2	J3	J4	L1 ±2	L2	L3	L4	T1	T2	T4 ±0.8	T5	T6	W1	⌭1	⌭2	⌭3
DAPS-2880-...	20	45	22.5	667	372	188	130	30	8	49.5	4	10	45°	46	50	36

Technical data

Dimensions

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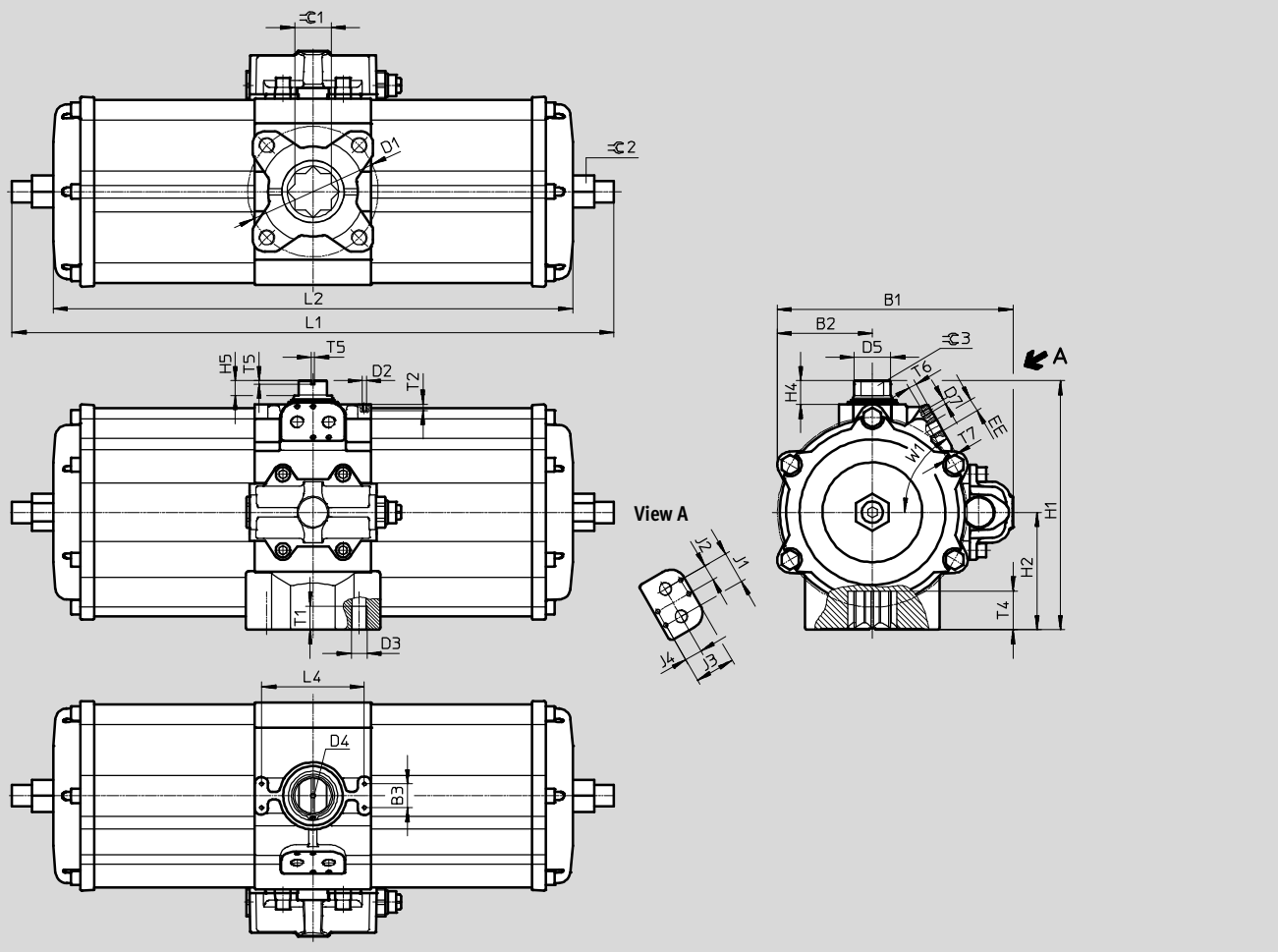
Size 3840



Size	B1	B2	B3	D1 ∅	D2	D3	D4	D5 ∅	D7	EE	H1	H2	H4	H5	J1	J2
DAPS-3840-...	298	120	30	165	M5	M20	M6	46	M6	G3/8	314	148.5	30	18.5	40	20

Size	J3	J4	L1 ±2	L2	L4	T1	T2	T4 ±1	T5	T6	T7	W1	⌀1	⌀2	⌀3
DAPS-3840-...	45	22.5	765	614	130	30	8	49	4	10	13	60°	46	41	32

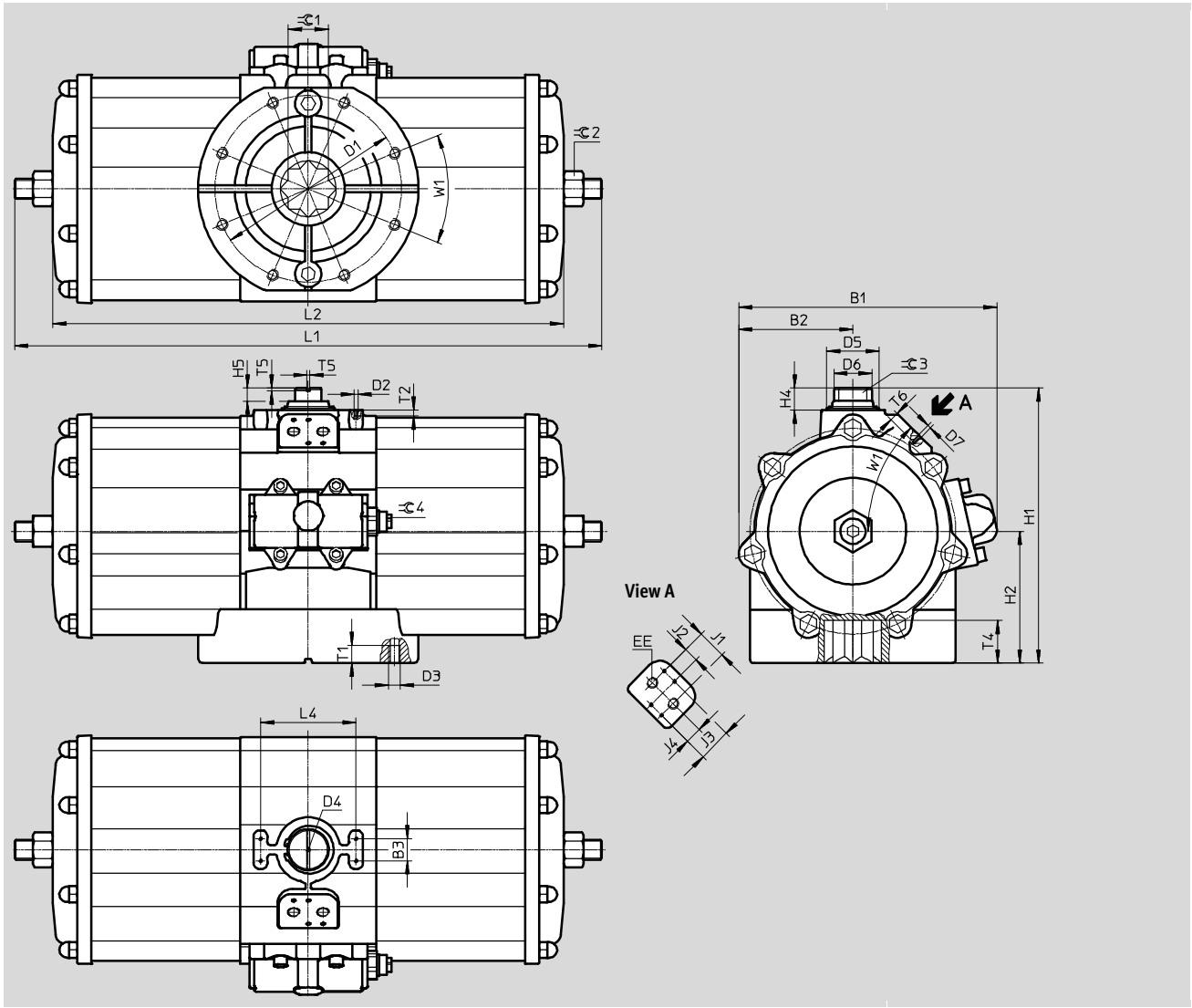
Quarter turn actuators DAPS, double-acting

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

Size 5760



Size	B1	B2	B3	D1 ∅	D2	D3	D4	D5 ∅	D6	D7	EE	H1	H2	H4	H5	J1
DAPS-5760-...	361	155	30	254	M5	M16	M6	72	52	M6	G3/8	374	179	30	18	40

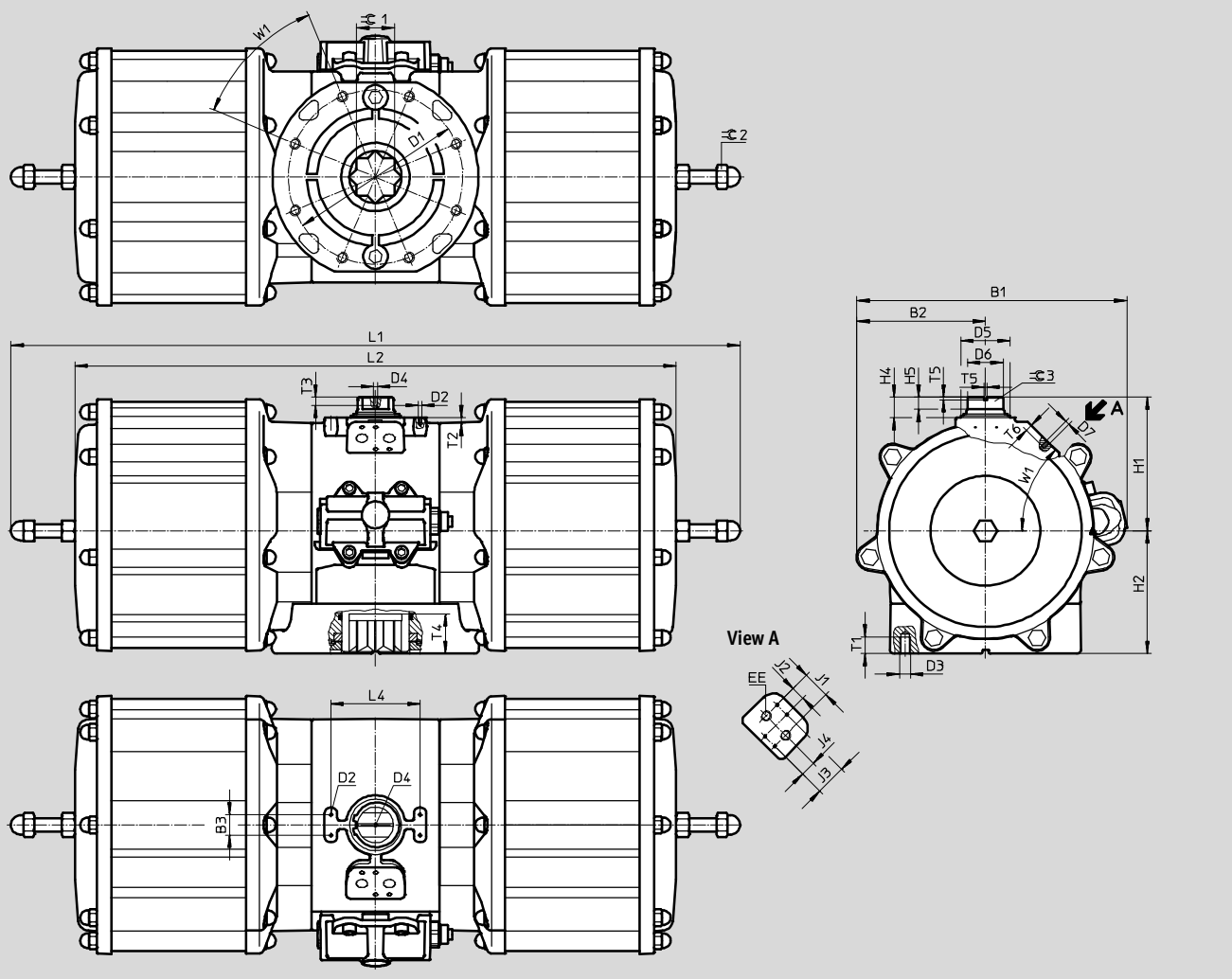
Size	J2	J3	J4	L1 ±2	L2	L4	T1	T2	T4 ±0.8	T5	T6	W1	=C 1	=C 2	=C 3	=C 4
DAPS-5760-...	20	45	22.5	885	744	130	24	8	58	4	10	45°	55	50	36	15

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

Size 8000



Size	B1	B2	B3	D1 ∅	D2	D3	D4	D5 ∅	D6 ∅	D7	EE	H1	H2	H4	H5	J1
DAPS-8000-...	394	188	30	254	M5	M16	M6	72	52	M6	G3/8	195	179	30	18	40

Size	J2	J3	J4	L1	L2	L4	T1	T2	T3	T4	T5	T6	W1	1	2	3
DAPS-8000-...	20	45	22.5	1044	877	130	24	8	12	58	4	10	45°	55	30	36

Quarter turn actuators DAPS, double-acting

Technical data

Ordering data – Drives

Part No.	Type
Size 0008	
549666	**DAPS-0008-090-R-F03**
Size 0015	
533417	**DAPS-0015-090-R-F03**
533475	**DAPS-0015-090-R-F04**
Size 0030	
533418	**DAPS-0030-090-R-F0305**
533476	**DAPS-0030-090-R-F04**
Size 0060	
533419	**DAPS-0060-090-R-F04**
533477	**DAPS-0060-090-R-F0507**
Size 0106	
533420	**DAPS-0106-090-R-F0507**
Size 0180	
533421	**DAPS-0180-090-R-F0710**
Size 0240	
533422	**DAPS-0240-090-R-F0710**
Size 0360	
533423	**DAPS-0360-090-R-F0710**
Size 0480	
533424	**DAPS-0480-090-R-F1012**

Part No.	Type
Size 0720	
549667	**DAPS-0720-090-R-F1012**
Size 0960	
533425	**DAPS-0960-090-R-F1012**
533478	**DAPS-0960-090-R-F14**
Size 1440	
549668	**DAPS-1440-090-R-F12**
549669	**DAPS-1440-090-R-F14**
Size 1920	
533426	**DAPS-1920-090-R-F14**
533479	**DAPS-1920-090-R-F1216**
Size 2880	
549670	**DAPS-2880-090-R-F16**
Size 3840	
549671	**DAPS-3840-090-R-F16**
Size 5760	
549672	**DAPS-5760-090-F25**
Size 8000	
560855	**DAPS-8000-090-R-F25**

Ordering data – Wearing parts kits

Part No.	Type
Size 0015	
397470	**DAPS-0015**
Size 0030	
397471	**DAPS-0030/S0015**
Size 0060	
397472	**DAPS-0060/S0030**
Size 0106	
397473	**DAPS-0106/S0053**
Size 0180	
397474	**DAPS-0180/S0090**

Part No.	Type
Size 0240	
397475	**DAPS-0240/S0120**
Size 0360	
397476	**DAPS-0360/S0180**
Size 0480	
397477	**DAPS-0480/S0240**
Size 0960	
397478	**DAPS-0960/S0480**
Size 1920	
397479	**DAPS-1920/S0960**

Technical data

Ordering data – Drives for variant T4

Part No.	Type
Size 0015	
8030599	**DAPS-0015-090-R-F03-T4**
8030600	**DAPS-0015-090-R-F04-T4**
Size 0030	
8030601	**DAPS-0030-090-R-F0305-T4**
8030602	**DAPS-0030-090-R-F04-T4**
Size 0060	
8030603	**DAPS-0060-090-R-F04-T4**
8030604	**DAPS-0060-090-R-F0507-T4**
Size 0106	
8030605	**DAPS-0106-090-R-F0507-T4**
Size 0180	
8030606	**DAPS-0180-090-R-F0710-T4**

Part No.	Type
Size 0240	
8030607	**DAPS-0240-090-R-F0710-T4**
Size 0360	
8030608	**DAPS-0360-090-R-F0710-T4**
Size 0480	
8030609	**DAPS-0480-090-R-F1012-T4**
Size 0720	
8030610	**DAPS-0720-090-R-F1012-T4**
Size 0960	
8030611	**DAPS-0960-090-R-F1012-T4**
8030612	**DAPS-0960-090-R-F14-T4**

Ordering data – Drives for variant T6

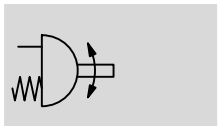
Part No.	Type
Size 0015	
553170	**DAPS-0015-090-R-F03-T6**
553171	**DAPS-0015-090-R-F04-T6**
Size 0030	
553172	**DAPS-0030-090-R-F0305-T6**
553173	**DAPS-0030-090-R-F04-T6**
Size 0060	
553174	**DAPS-0060-090-R-F04-T6**
553175	**DAPS-0060-090-R-F0507-T6**
Size 0106	
553176	**DAPS-0106-090-R-F0507-T6**
Size 0180	
553177	**DAPS-0180-090-R-F0710-T6**
Size 0240	
553178	**DAPS-0240-090-R-F0710-T6**
Size 0360	
553179	**DAPS-0360-090-R-F0710-T6**
Size 0480	
553180	**DAPS-0480-090-R-F1012-T6**

Part No.	Type
Size 0720	
553181	**DAPS-0720-090-R-F1012-T6**
Size 0960	
553182	**DAPS-0960-090-R-F12-T6**
553183	**DAPS-0960-090-R-F14-T6**
Size 1440	
553184	**DAPS-1440-090-R-F12-T6**
553185	**DAPS-1440-090-R-F14-T6**
Size 1920	
553186	**DAPS-1920-090-R-F14-T6**
553187	**DAPS-1920-090-R-F1216-T6**
Size 2880	
553188	**DAPS-2880-090-R-F16-T6**
Size 3840	
553189	**DAPS-3840-090-R-F16-T6**
Size 5760	
553190	**DAPS-5760-090-R-F25-T6**

Quarter turn actuators DAPS, single-acting

Technical data

Function

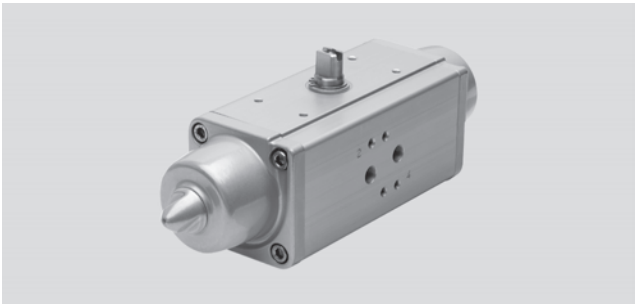


Size
0015 ... 4000

Torque
15 ... 4000 Nm

Swivel angel
0 ... 90°

Wearing parts kits
➔ page 453



General technical data					
Size		0015 ... 0180	0240 ... 0960	1440 ... 2880	4000
Pneumatic connection		G1/8	G1/4	G3/8	G3/8
Design		Scotch yoke system			
Mode of operation		Single-acting			
Mounting position		Any			
Position sensing		None			
Cushioning		No cushioning			
Swivel angle	[°]	90			
End-position adjusting range at 0°					
DAPS ... RS- ...	[°]	One end position adjustable, –1 ... +9		±5	
DAPS ... RS- ... T4	[°]			–	
DAPS ... RS- ... T6	[°]			±5	–
End-position adjusting range at 90°					
DAPS ... RS- ...	[°]	One end position adjustable, 81 ... +91		85 ... 95	
DAPS ... RS- ... T4	[°]			–	
DAPS ... RS- ... T6	[°]			85 ... 95	–
Note regarding end-position adjusting range		One end position optionally adjustable			
Closing direction		Closes to the right			

Operating and environmental conditions				
Size		0015 ... 0480	0720 ... 2880	4000
Nominal operating pressure	[bar]	5.6		
Operating pressure[1]				
DAPS ... RS1- ...	[bar]	2.8 ... 8.4		
DAPS ... RS2- ...	[bar]	3.5 ... 8.4		
DAPS ... RS3- ...	[bar]	4.2 ... 8.4		
DAPS ... RS4- ...	[bar]	5.6 ... 8.4		
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)		
Ambient temperature				
DAPS ... RS- ...	[°C]	–20 ... +80		
DAPS ... RS- ... T4	[°C]	–20 ... +150	–	
DAPS ... RS- ... T6	[°C]	–50 ... +60		–
Corrosion resistance class CRC[2]		3		
Connection to process valve as per standard		ISO 5211		
Valve connection as per standard		VDI/VDE 3845 (NAMUR)		
Safety Integrity Level (SIL)		Up to SIL 2 High Demand mode		
		Up to SIL 2 Low Demand mode		

1) Minimum operating pressures vary for single-acting rotary actuators depending upon spring quantity
2) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Technical data

ATEX		
ATEX category for gas		II 2G
Type of (ignition) protection for gas		Ex h IIC T6 ... T3 Gb X
ATEX category for dust		II 2D
Type of (ignition) protection dust		Ex h IIIC T85°C ... T200°C Db X
Explosion ambient temperature	Standard	−20 °C ≤ Ta ≤ +60 °C
	Variant T4	−20 °C <= Ta <= +150 °C
	Variant T6	−50 °C <= Ta <= +60 °C
CE marking (see declaration of conformity)		To EU Explosion Protection Directive (ATEX)

Air consumption [l/cycle] at 6 bar	
Size	
DAPS-0015	0.63
DAPS-0030	1.19
DAPS-0053	2.1
DAPS-0090	3.85
DAPS-0120	5.6
DAPS-0180	7
DAPS-0240	10.5
DAPS-0360	14
DAPS-0480	19.6
DAPS-0720	29.4
DAPS-0960	41.3
DAPS-1440	77
DAPS-1920	91.7
DAPS-2880	147
DAPS-4000	203.7

Weight [g]	
Size	
DAPS-0015	1200
DAPS-0030	1950
DAPS-0053	3000
DAPS-0090	5900
DAPS-0120	6800
DAPS-0180	8900
DAPS-0240	11800
DAPS-0360	16500
DAPS-0480	22700
DAPS-0720	33000
DAPS-0960	42000
DAPS-1440	74000
DAPS-1920	67000
DAPS-2880	117000
DAPS-4000	183000

Materials			
Quarter turn actuators			Material number
Housing		Wrought aluminium alloy	–
Cap		Wrought aluminum alloy	–
Shaft		High-alloy steel	1.4305
External screws		High-alloy steel	–
Seals	Standard	FPM, NBR, PUR	–
	T4	FPM, PTFE-reinforced	–
	T6	FVMQ, PTFE-reinforced	–
Note on materials	Standard	RoHS-compliant	–
	T4	Contains paint-wetting impairment substances, RoHS-compliant	–
	T6	Contains paint-wetting impairment substances, RoHS-compliant	–

Quarter turn actuators DAPS, single-acting

Technical data

Actual torque [Nm] as a function of operating pressure [bar], spring strength and swivel angle [°]

Spring strength	Spring torque [Nm]			Operating pressure [bar]														
				2.5			2.8			3			3.5			4.2		
	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°
DAPS-0015																		
1	5.0	3.7	7.5	6.2	2.9	3.7	7.5	3.7	5	8.4	4.2	5.9	10.6	5.6	8.1	13.8	7.4	11.3
2	6.3	4.7	9.4	–			–			7.2	3.3	4	9.4	4.7	6.3	12.6	6.5	9.4
3	7.5	5.6	11.3	–			–			–			8.2	3.7	4.4	11.3	5.6	7.5
4	10.0	7.5	15	–			–			–			–			–		
DAPS-0030																		
1	10.0	7.5	15	12.3	5.9	7.3	15	7.5	10	16.8	8.6	11.8	21.3	11.3	16.3	27.5	15	22.5
2	12.5	9.4	18.8	–			–			14.3	6.7	8	18.8	9.4	12.5	25.1	13.2	18.8
3	15.0	11.3	22.5	–			–			–			16.3	7.5	8.8	22.5	11.3	15
4	20.0	15	30	–			–			–			–			–		
DAPS-0053																		
1	17.5	13	26.5	21.8	10.2	12.8	26.5	13	17.5	29.6	14.9	20.6	37.5	19.5	28.5	48.5	26	39.5
2	22	16.5	33	–			–			25.1	11.8	14.1	33	16.5	22	44	23.1	33
3	26	19.5	40	–			–			–			29	13	15	40	19.5	26
4	35	26	53	–			–			–			–			–		
DAPS-0090																		
1	30	22.5	45	37	17.7	22	45	22.5	30	50.4	25.7	35.4	63.8	33.8	48.8	82.5	45	67.5
2	37.5	28.1	56.3	–			–			42.9	20.1	24.1	56.3	28.1	37.5	75.1	39.4	56.3
3	45	33.9	67.5	–			–			–			48.8	22.6	26.3	67.5	33.9	45
4	60	45	90	–			–			–			–			–		
DAPS-0120																		
1	40	30	60	49.3	23.6	29.3	60	30	40	67.1	34.3	47.1	85	45	65	110	60	90
2	50	37.5	75	–			–			57.1	26.8	32.1	75	37.5	50	100	52.5	75
3	60	45	90	–			–			–			65	30	35	90	45	60
4	80	60	120	–			–			–			–			–		
DAPS-0180																		
1	60	45	90	73.9	35.4	43.9	90	45	60	100.7	51.4	70.7	127.5	67.5	97.5	165	90	135
2	75	56.3	112.5	–			–			85.7	40.2	48.2	112.5	56.3	75	150	78.8	112.5
3	90	67.5	135	–			–			–			97.5	45	52.5	135	67.5	90
4	120	90	180	–			–			–			–			–		
DAPS-0240																		
1	80	60	120	98.6	47.1	58.6	120	60	80	134.3	68.6	94.3	170	90	130	220	120	180
2	100	75	150	–			–			114.3	53.6	64.3	150	75	100	200	105	150
3	120	90	180	–			–			–			130	60	70	180	90	120
4	160	120	240	–			–			–			–			–		
DAPS-0360																		
1	120	90	180	147.9	70.7	87.9	180	90	120	201.4	102.9	141.1	255	135	195	330	180	270
2	150	112.5	225	–			–			171.4	80.4	96.4	225	112.5	150	300	157.5	225
3	180	135	270	–			–			–			195	90	105	270	135	180
4	240	180	360	–			–			–			–			–		

Note

The operating torque of the drive must not be higher than the maximum permissible torque listed in ISO 5211, with reference to the size of the mounting flange and of the coupling.

Technical data

Actual torque [Nm] as a function of operating pressure [bar], spring strength and swivel angle [°]

Spring strength	Operating pressure [bar]														
	5			5.6			6			7			8		
	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°
DAPS-0015															
1	–			–			–			–			–		
2	16.1	8.7	13	18.8	10.3	15.7	–			–			–		
3	14.9	7.7	11.1	17.6	9.3	13.8	19.4	10.4	15.6	23.8	13.1	20	28.3	15.7	24.5
4	12.3	5.9	7.3	15	7.5	10	16.8	8.6	11.8	21.3	11.3	16.3	25.7	13.9	20.7
DAPS-0030															
1	–			–			–			–			–		
2	32.2	17.5	25.9	37.6	20.7	31.3	–			–			–		
3	29.6	15.6	22.1	35	18.8	27.5	38.6	21	31.1	47.5	26.4	40	56.4	31.7	48.9
4	24.6	11.8	14.6	30	15	20	33.6	17.1	23.6	42.5	22.5	32.5	51.4	27.9	41.4
DAPS-0053															
1	–			–			–			–			–		
2	56.6	30.6	45.6	66	36.3	55	–			–			–		
3	52.6	26.9	38.6	62	32.5	48	68.3	36.2	54.3	84	45.5	70	99.7	54.8	85.7
4	43.6	20.4	25.6	53	26	35	59.3	29.7	41.3	75	39	57	90	48.3	72.7
DAPS-0090															
1	–			–			–			–			–		
2	96.5	52.2	77.7	112.6	61.9	93.8	–			–			–		
3	88.9	46.8	66.4	105	56.5	82.5	115.7	63	93.2	142.5	79.1	120	169.3	95.2	146.8
4	73.9	35.4	43.9	90	45	60	100.7	51.4	70.7	127.5	67.5	97.5	154.3	83.6	124.3
DAPS-0120															
1	–			–			–			–			–		
2	128.6	69.6	103.6	150	82.5	125	–			–			–		
3	118.6	62.1	88.6	140	75	110	154.3	83.6	124.3	190	105	160	225.7	126.4	195.7
4	98.6	47.1	58.6	120	60	80	134.4	68.6	94.3	170	90	130	205.7	111.4	165.7
DAPS-0180															
1	–			–			–			–			–		
2	192.9	104.5	155.4	225	123.8	187.5	–			–			–		
3	177.9	93.2	132.9	210	112.5	165	231.4	125.4	186.4	285	157.5	240	338.6	189.6	293.6
4	147.9	707.7	87.9	180	90	120	201.4	102.9	141.4	255	135	195	308.6	167.6	284.6
DAPS-0240															
1	–			–			–			–			–		
2	257.1	139.3	207.1	300	165	250	–			–			–		
3	237.1	124.3	177.1	280	150	220	308.6	167.1	248.6	380	210	320	451.4	252.9	391.4
4	197.1	94.3	117.1	240	120	160	268.6	137.1	188.6	340	180	260	411.4	222.9	331.4
DAPS-0360															
1	–			–			–			–			–		
2	385.7	208.9	310.7	450	247.5	375	–			–			–		
3	355.7	186.4	265.7	420	225	330	462.9	250.7	372.9	570	315	480	677.1	379.3	587.1
4	295.7	141.4	175.7	360	180	240	402.9	205.7	282.9	510	270	390	617.1	334.3	497.1

Torque for size at 5.6 bar and swivel angle 0°

Note

The operating torque of the drive must not be higher than the maximum permissible torque listed in ISO 5211, with reference to the size of the mounting flange and of the coupling.

Quarter turn actuators DAPS, single-acting

Technical data

Actual torque [Nm] as a function of operating pressure [bar], spring strength and swivel angle [°]

Spring strength	Spring torque [Nm]			Operating pressure [bar]														
				2.5			2.8			3			3.5			4.2		
	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°
DAPS-0480																		
1	160	120	240	197.1	94.3	117.1	240	120	160	268.6	137.1	188.6	340	180	260	440	240	360
2	200	150	300	–			–			228.6	107.1	128.6	300	150	200	400	210	300
3	240	180	360	–			–			–			260	120	140	360	180	240
4	320	240	480	–			–			–			–			–		
DAPS-0720																		
1	240	180	360	295.7	141.4	175.7	360	180	240	402.9	205.7	282.9	510	270	390	660	360	540
2	300	225	450	–			–			342.9	160.7	192.9	450	225	300	600	315	450
3	360	270	540	–			–			–			390	180	210	540	270	360
4	480	360	720	–			–			–			–			–		
DAPS-0960																		
1	320	240	480	394.3	188.6	234.3	480	240	320	537.1	274.3	377.1	680	360	520	880	480	720
2	400	300	600	–			–			457.1	214.3	257.1	600	300	400	800	420	600
3	480	360	720	–			–			–			520	240	280	720	360	480
4	640	480	960	–			–			–			–			–		
DAPS-1440																		
1	480	360	720	591	282	351	720	360	480	805	411	565	1020	540	780	1320	720	1080
2	600	450	900	–			–			685	321	385	900	450	600	1200	630	900
3	720	540	1080	–			–			–			780	360	420	1080	540	720
4	960	720	1440	–			–			–			–			–		
DAPS-1920																		
1	640	480	960	778	377	468	960	480	640	1074	548	754	1360	720	1040	1760	960	1440
2	800	600	1200	–			–			914	428	514	1200	600	800	1600	840	1200
3	960	720	1440	–			–			–			1040	480	560	1440	720	960
4	1280	960	1920	–			–			–			–			–		
DAPS-2880																		
1	960	720	1440	1183	566	703	1440	720	960	1611	823	1131	2040	1080	1560	2640	1440	2160
2	1200	900	1800	–			–			1370	643	771	1800	900	1200	2400	1260	1800
3	1440	1080	2160	–			–			–			1560	720	840	2160	1080	1440
4	1920	1440	2880	–			–			–			–			–		
DAPS-4000																		
1	1333	1000	2000	1524	714	857	2000	1000	1333	2238	1143	1571	2833	1500	2166	3666	2000	2999
2	1666	1250	2500	–			–			1905	893	1071	2500	1250	1666	3333	1750	2499
3	1999	1500	3000	–			–			–			2167	1000	1166	3000	1500	1999
4	2666	2000	4000	–			–			–			–			–		

Note

The operating torque of the drive must not be higher than the maximum permissible torque listed in ISO 5211, with reference to the size of the mounting flange and of the coupling.

Technical data

Actual torque [Nm] as a function of operating pressure [bar], spring strength and swivel angle [°]

Spring strength	Operating pressure [bar]														
	5			5.6			6			7			8		
	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°
DAPS-0480															
1	–			–			–			–			–		
2	514.3	278.6	414.3	600	330	500	–			–			–		
3	474.3	248.6	354.3	560	300	440	617.1	334.3	497.1	760	420	640	902.9	505.7	782.9
4	394.3	118.6	234.3	480	240	320	537.1	274.3	377.1	680	360	520	822.9	445.7	662.9
DAPS-0720															
1	–			–			–			–			–		
2	771.4	417.9	621.4	900	495	750	–			–			–		
3	711.4	372.9	531.4	840	450	660	925.7	501.4	745.7	1140	630	960	1354	758.6	1174
4	591.4	282.9	351.4	720	360	480	805.7	411.4	565.7	1020	540	780	1234	668.6	994.3
DAPS-0960															
1	–			–			–			–			–		
2	1028.6	557.1	828.6	1200	660	1000	–			–			–		
3	948.6	497.1	708.6	1120	600	880	1234.3	668.6	994.3	1520	840	1280	1805.7	1011.4	1565.7
4	788.6	377.1	468.6	960	480	640	1074.3	548.6	754.3	1360	720	1040	1645.7	891.4	1325.7
DAPS-1440															
1	–			–			–			–			–		
2	1542	835	1242	1800	990	1500	–			–			–		
3	1422	745	1062	1680	900	1320	1851	1002	1491	2280	1260	1920	2708	1517	2348
4	1182	565	702	1440	720	960	1611	822	1131	2040	1080	1560	2468	1337	1988
DAPS-1920															
1	–			–			–			–			–		
2	2057	1114	1657	2400	1320	2000	–			–			–		
3	1897	994	1417	2240	1200	1760	2468	1337	1988	3040	1680	2560	3611	2022	3131
4	1577	754	937	1920	960	1280	2148	1097	1508	2720	1440	2080	3291	1782	2651
DAPS-2880															
1	–			–			–			–			–		
2	3085	1671	2485	3600	1980	3000	–			–			–		
3	2845	1491	2125	3360	1800	2640	3702	2006	2982	4560	2520	3840	5417	3034	4697
4	2365	1131	1405	2880	1440	1920	3222	1645	2262	4080	2160	3120	4937	2674	3977
DAPS-4000															
1	–			–			–			–			–		
2	4285	2321	3451	5000	2750	4166	–			–			–		
3	3952	2071	2951	4666	2500	3665	5143	2786	4141	6333	3500	5332	7523	4214	6522
4	3286	1571	1952	4000	2000	2666	4476	2286	3142	5666	3000	4332	6857	3714	5523

Torque for size at 5.6 bar and swivel angle 0°

Note

The operating torque of the drive must not be higher than the maximum permissible torque listed in ISO 5211, with reference to the size of the mounting flange and of the coupling.

Quarter turn actuators DAPS, single-acting

Technical data

Dimensions

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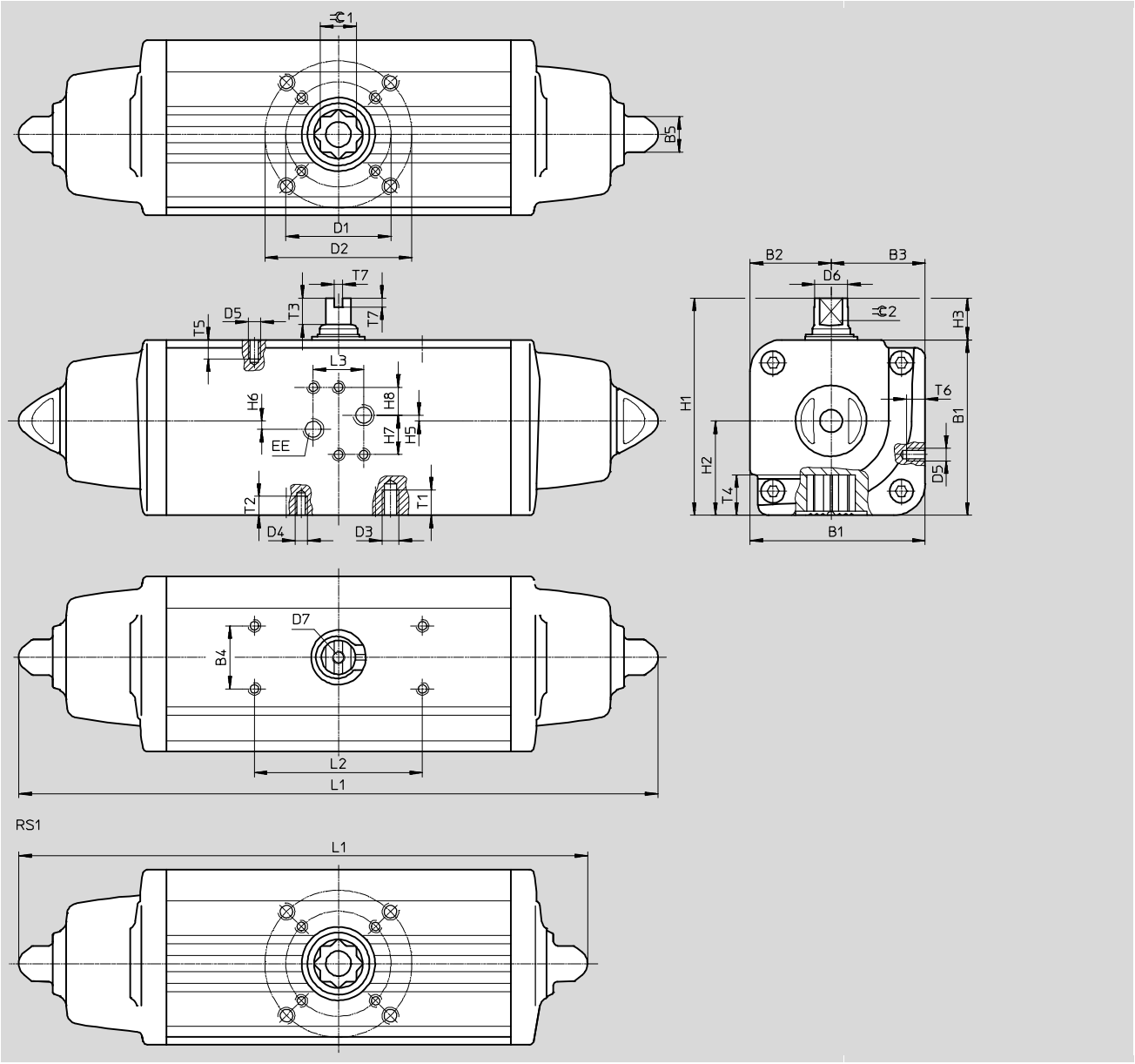
DAPS-0015-090-...-T4



Technical data

Size	B1	B2	B3	B4	B5	D1 ∅ ±0.1	D2 ∅ ±0.1	D3	D4	D5	D6 ∅	D7	EE	H1	H2	H3	H5
DAPS-0015-...-F0305	59.2	27.7	31.5	30	13	36	50	M6	M5	M5	10.9	M6	G1/8	79.2	31.5	20	0.8
DAPS-0015-...-F04						42	–	–									
DAPS-0030-...-F04	70.4	32.7	37.7		13	42	–	–	M5		14.5			90.4	37.7	20	–
DAPS-0030-...-F0507						50	70	M8	M6								
DAPS-0053-...-F0507	83.3	38.5	44.8		17	50	70	M8	M6		16.2			103.3	44.8	20	–
DAPS-0090-...-F0710	107.5	51	56.5		22	70	102	M10	M8		20.2			137.5	56.5	30	–
DAPS-0120-...-F0710	111.1	51	60.1		22	70	102	M10	M8		22.5			141.1	60.1	30	–
DAPS-0180-...-F0710	118	56	62		22	70	102	M10	M8		25.5			148	62	30	–

Size	H6	H7	H8	L1		L2	L3	T1	T2	T3	T4	T5	T6	T7	⫧ 1	⫧ 2
				RS1	RS ...											
DAPS-0015-...-F0305	3.2	18	14	203.8	233.3	80	24	9	8	10	13.2	6	7	4	11	9
DAPS-0015-...-F04								–								
DAPS-0030-...-F04	4			228.5	259			–	8	13	16.5				14	10
DAPS-0030-...-F0507								12	9							
DAPS-0053-...-F0507	4			270.7	304.3			12	9	13	19.3				17	12
DAPS-0090-...-F0710	4			341.8	393.7			15	12	16	24.8				22	15
DAPS-0120-...-F0710	4			361.6	409.6			15	12	17	24.8				22	15
DAPS-0180-...-F0710	4			406.6	474			15	12	19	24.3				22	19

Quarter turn actuators DAPS, single-acting

Technical data

Dimensions

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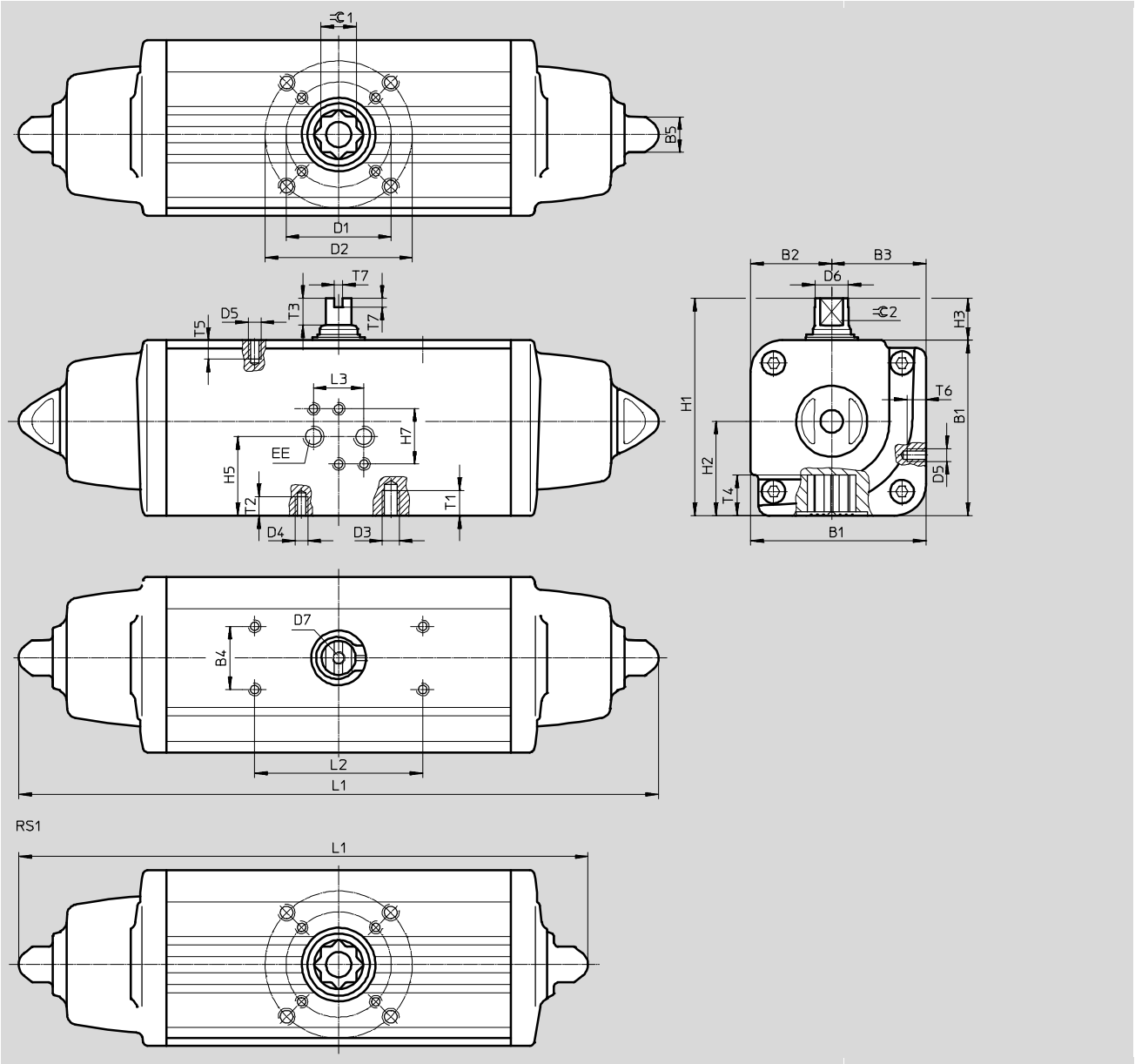
Size 0015 ... 0960



Technical data

Size	B1	B2	B3	B4	B5	D1 ∅ ±0.1	D2 ∅ ±0.1	D3	D4	D5	D6 ∅	D7	EE	H1	H2	H3
DAPS-0015-...-F0305	59.2	27.7	31.5	30	13	36	50	M6	M5	M5	10.9	M6	G1/8	79.2	31.5	20
DAPS-0015-...-F04						42	–	–								
DAPS-0030-...-F04	70.4	32.7	37.7		13	42	–	–	M5		14.5			90.4	37.7	20
DAPS-0030-...-F0507						50	70	M8	M6							
DAPS-0053-...-F0507	83.3	38.5	44.8		17	50	70	M8	M6		16.2			103.3	44.8	20
DAPS-0090-...-F0710	107.5	51	56.5		22	70	102	M10	M8		20.2			137.5	56.5	30
DAPS-0120-...-F0710	111.1	51	60.1		22	70	102	M10	M8		22.5			141.1	60.1	30
DAPS-0180-...-F0710	118	56	62		22	70	102	M10	M8		25.5			148	62	30

Size	H5	H7	L1		L2	L3	T1	T2	T3	T4	T5	T6	T7	⫧1	⫧2
			RS1	RS ...											
DAPS-0015-...-F0305	32.3	32	203.8	233.3	80	24	9	8	10	13.2	6	7	4	11	9
DAPS-0015-...-F04							–								
DAPS-0030-...-F04	37.7		228.5	259			–	8	13	16.5				14	10
DAPS-0030-...-F0507							12	9							
DAPS-0053-...-F0507	44.8		270.7	304.3			12	9	13	19.3				17	12
DAPS-0090-...-F0710	56.5		341.8	393.7			15	12	16	24.8				22	15
DAPS-0120-...-F0710	60.1		361.6	409.6			15	12	17	24.8				22	15
DAPS-0180-...-F0710	62		406.6	474			15	12	19	24.3				22	19

Size	B1	B2	B3	B4	B5	D1 ∅	D2 ∅	D3	D4	D5	D6 ∅	D7	EE	H1	H2	H3
DAPS-0240-...-F1012	134.9	62	72.9	30	27	102	125	M12	M10	M5	29	M6	G1/4	164.9	72.9	30
DAPS-0360-...-F1012	148	69.5	78.5		27	102	125	M12	M10		31.8			178	78.5	
DAPS-0480-...-F1012	168	74.5	93.5		27	102	125	M12	M10		36.5			198	93.5	
DAPS-0480-...-F14						140	–	–	M16							
DAPS-0720-...-F12	186	84.5	101.5		36	125	–	–	M12		41			216	101.5	
DAPS-0720-...-F14						140			M16							
DAPS-0960-...-F14	207.7	93	114.7		36	140	–	–	M16		46			237.7	114.7	
DAPS-0960-...-F1216						125	165	M20	M12							

Size	H5	H7	L1		L2	L3	T1	T2	T3	T4	T5	T6	T7	⫧1	⫧2
			RS1	RS...											
DAPS-0240-...-F1012	57.4	32	454	520.5	80	24	18	15	19	29.5	6	7	4	27	19
DAPS-0360-...-F1012	61.5		523	613			18	15	19.5	29.5				27	22
DAPS-0480-...-F1012	78		563.8	648.2			18	15	19.5	38.5				36	24
DAPS-0480-...-F14							–	24							
DAPS-0720-...-F12	86.5		683	798			–	18	19.5	38.5				36	27
DAPS-0720-...-F14								24							
DAPS-0960-...-F14	99.2		714.4	828			–	24	18.5	48.5				46	32
DAPS-0960-...-F1216							30	18							

Quarter turn actuators DAPS, single-acting

Technical data

Dimensions

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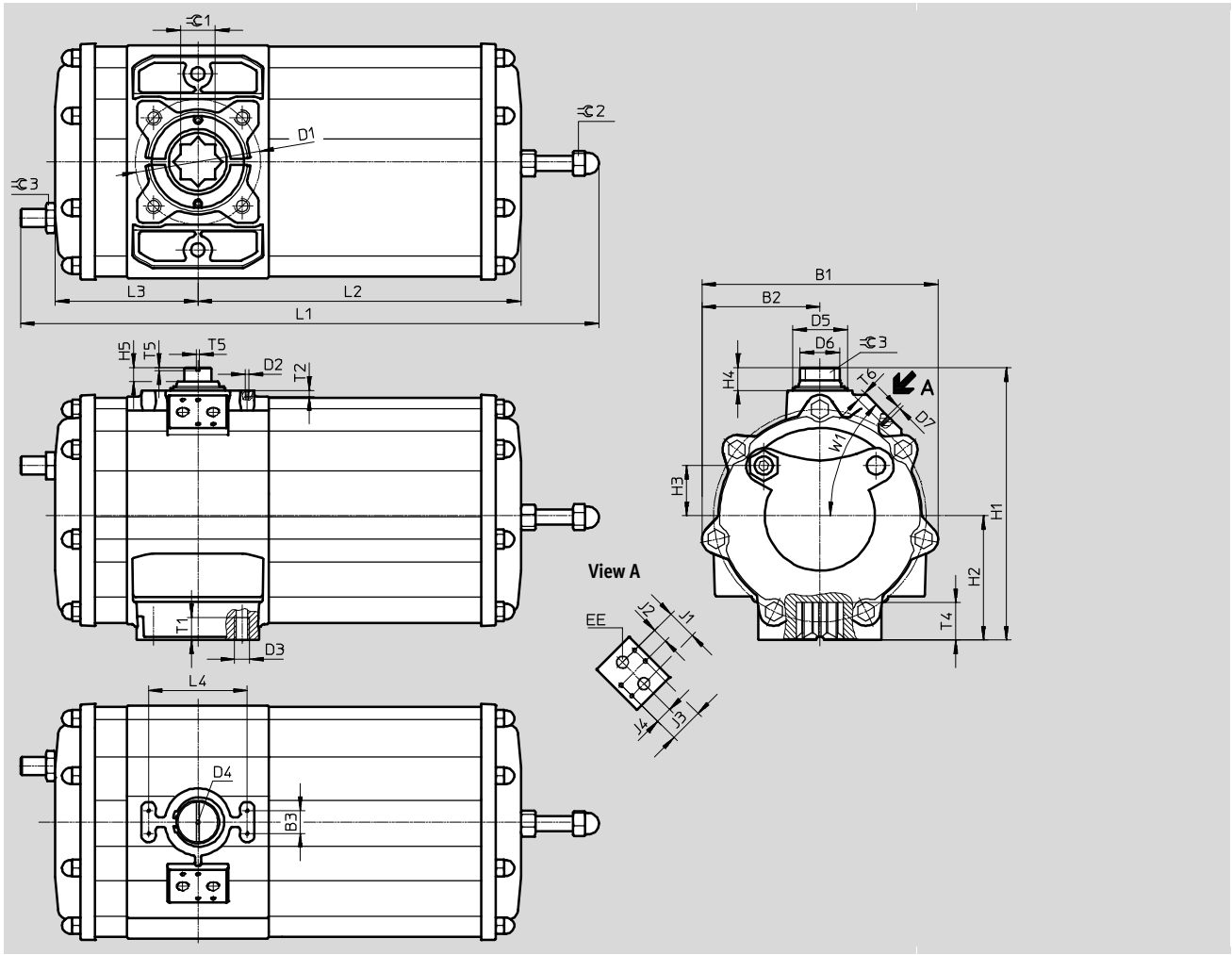
Size 1440



Size	B1	B2	B3	D1 ∅	D2	D3	D4	D5 ∅	D6 ∅	D7	EE	H1	H2	H3	H4	H5	J1
DAPS-1440-...	311	155	30	165	M5	M20	M6	72	52	M6	G3/8	359	164	66	30	18	40

Size	J2	J3	J4	L1 ±3	L2	L3	L4	T1	T2	T4 ±0.8	T5	T6	W1	⌀C1	⌀C2	⌀C3
DAPS-1440-...	20	45	22.5	834	498	188	130	30	8	49.5	4	10	45°	46	30	36

Technical data

Dimensions

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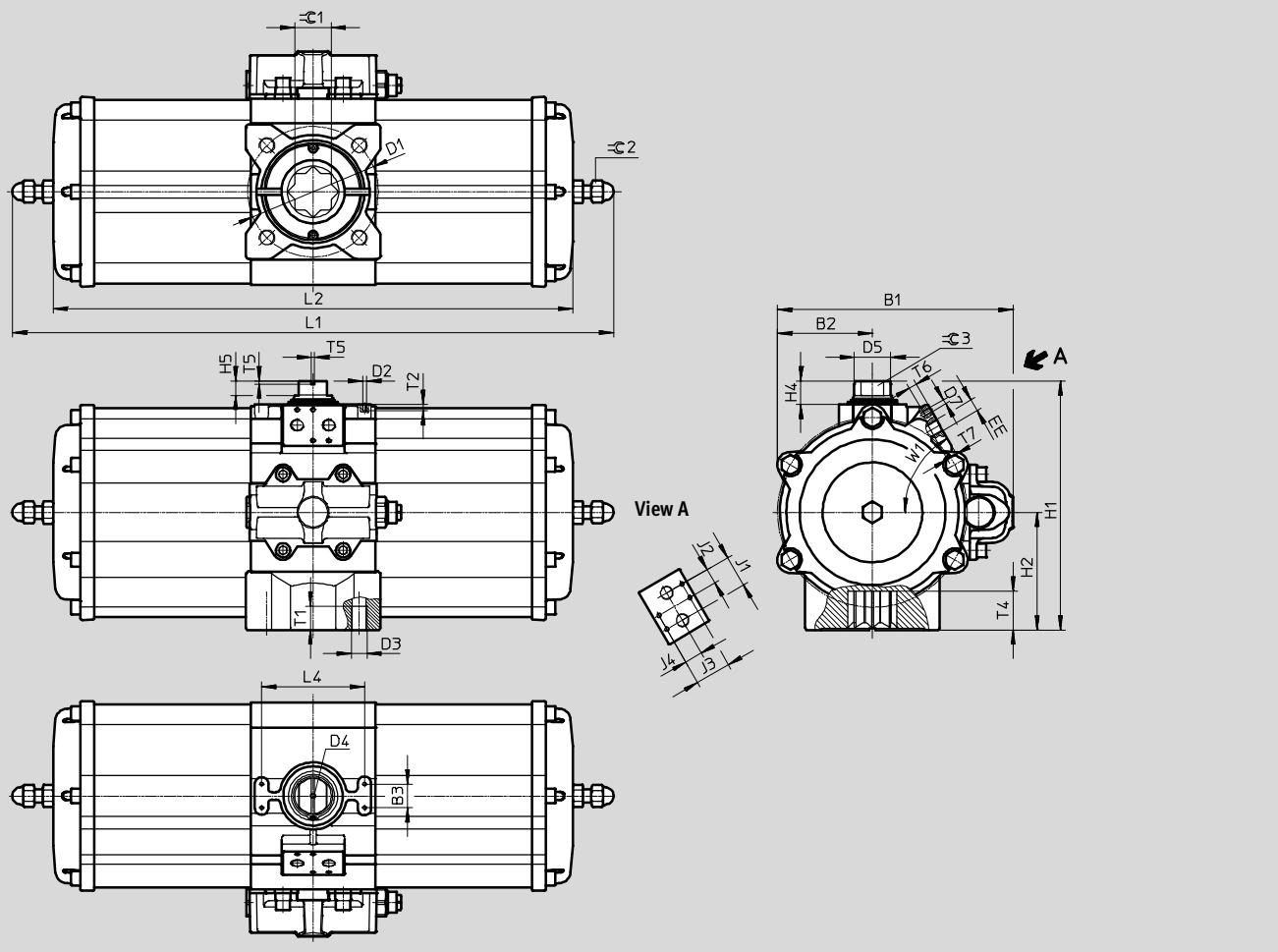
Size 1920



Size	B1	B2	B3	D1 ∅	D2	D3	D4	D5 ∅	D7	EE	H1	H2	H4	H5	J1	J2
DAPS-1920-...	298	120	30	165	M5	M20	M6	46	M6	G3/8	314	148.5	30	18.5	40	20

Size	J3	J4	L1 ±3	L2	L4	T1	T2	T4 ±1	T5	T6	T7	W1	⌀1	⌀2	⌀3
DAPS-1920-...	45	22.5	1001	857	130	30	8	49	4	10	13	60°	46	24	32

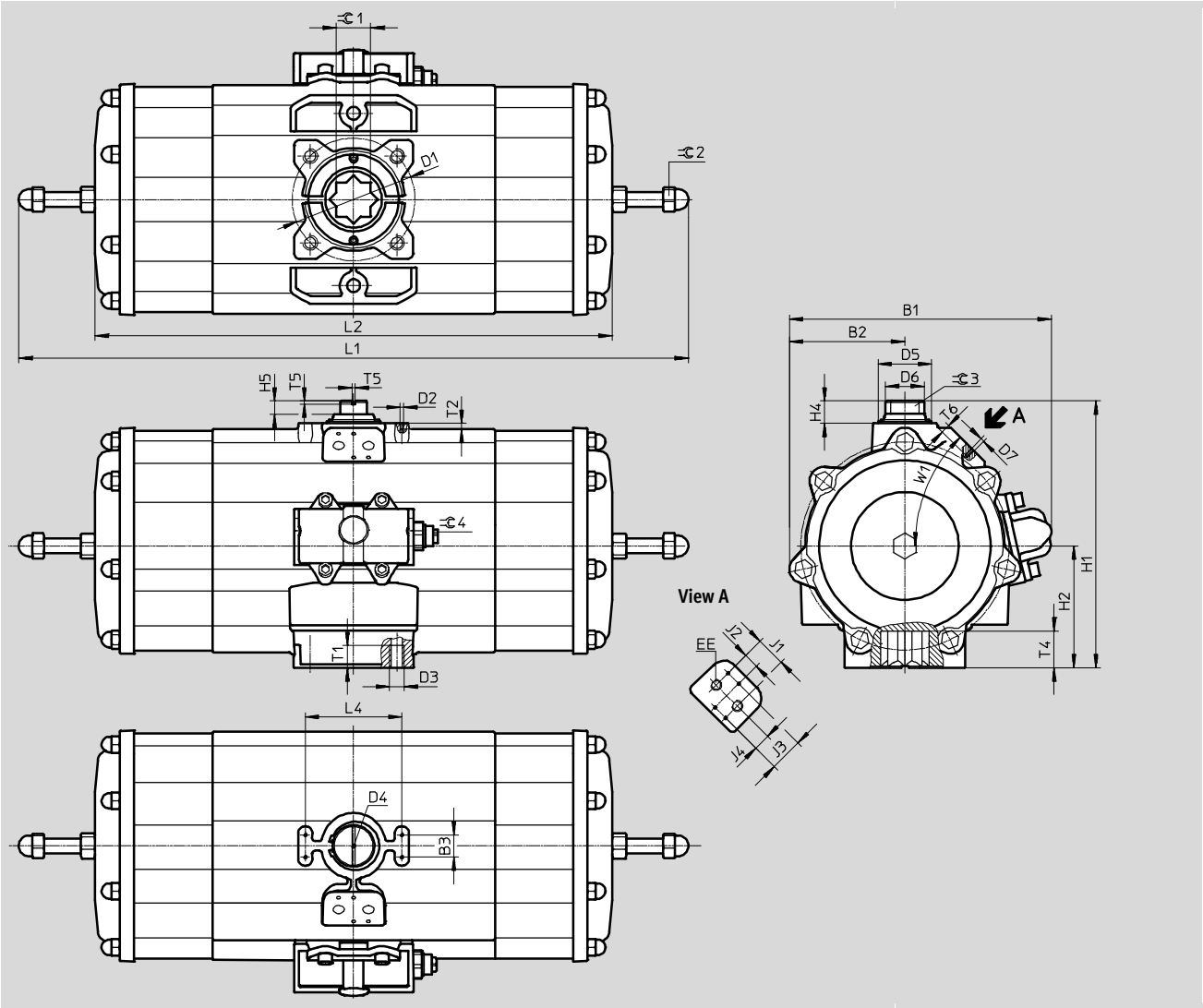
Quarter turn actuators DAPS, single-acting

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

Size 2880



Size	B1	B2	B3	D1 ∅	D2	D3	D4	D5 ∅	D6 ∅	D7	EE	H1	H2	H4	H5	J1
DAPS-2880-...	361	155	30	165	M5	M20	M6	72	52	M6	G3/8	359	164	30	18	40

Size	J2	J3	J4	L1 ±3	L2	L4	T1	T2	T4	T5	T6	W1	⌀ 1	⌀ 2	⌀ 3	⌀ 4
DAPS-2880-...	20	45	22.5	1201	996	130	30	8	49.5	4	10	45°	46	30	36	15

Technical data

Dimensions

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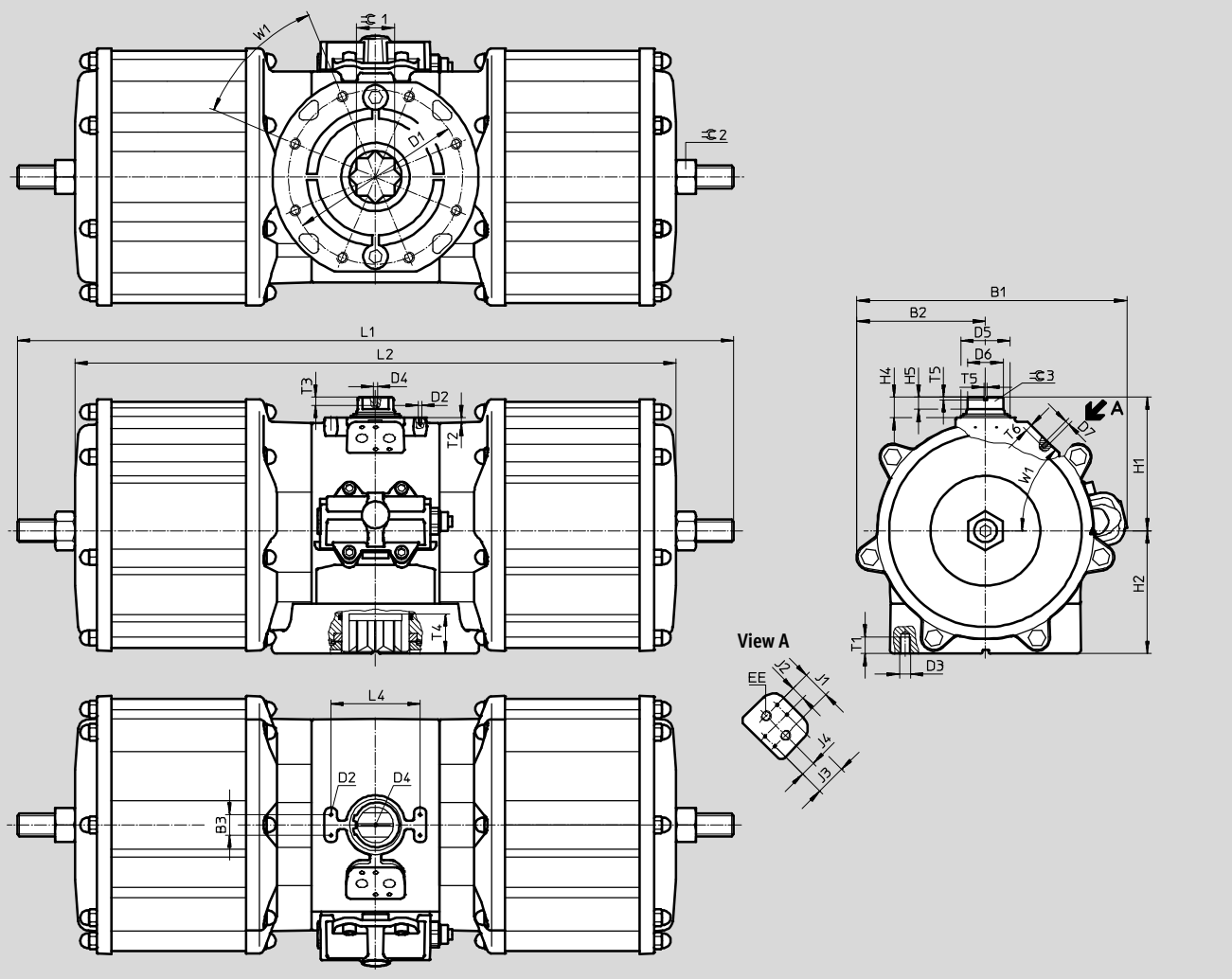
Size 4000



Size	B1	B2	B3	D1 ∅	D2	D3	D4	D5 ∅	D6 ∅	D7	EE	H1	H2	H4	H5	J1
DAPS-4000-...	394	188	30	254	M5	M16	M6	72	52	M6	G3/8	195	179	30	18	40

Size	J2	J3	J4	L1	L2	L4	T1	T2	T3	T4	T5	T6	W1	1	2	3
DAPS-4000-...	20	45	22.5	1370	1184	130	24	8	12	58	4	10	45°	55	50	36

Quarter turn actuators DAPS, single-acting

Technical data

Ordering data

Part No.	Type
Size 0015	
533427	**DAPS-0015-090-RS1-F0305**
533480	**DAPS-0015-090-RS1-F04**
533428	**DAPS-0015-090-RS2-F0305**
533481	**DAPS-0015-090-RS2-F04**
533429	**DAPS-0015-090-RS3-F0305**
533482	**DAPS-0015-090-RS3-F04**
533430	**DAPS-0015-090-RS4-F0305**
533483	**DAPS-0015-090-RS4-F04**
Size 0030	
533431	**DAPS-0030-090-RS1-F04**
533484	**DAPS-0030-090-RS1-F0507**
533432	**DAPS-0030-090-RS2-F04**
533485	**DAPS-0030-090-RS2-F0507**
533433	**DAPS-0030-090-RS3-F04**
533486	**DAPS-0030-090-RS3-F0507**
533434	**DAPS-0030-090-RS4-F04**
533487	**DAPS-0030-090-RS4-F0507**
Size 0053	
533435	**DAPS-0053-090-RS1-F0507**
533436	**DAPS-0053-090-RS2-F0507**
533437	**DAPS-0053-090-RS3-F0507**
533438	**DAPS-0053-090-RS4-F0507**
Size 0090	
533439	**DAPS-0090-090-RS1-F0710**
533440	**DAPS-0090-090-RS2-F0710**
533441	**DAPS-0090-090-RS3-F0710**
533442	**DAPS-0090-090-RS4-F0710**
Size 0120	
533443	**DAPS-0120-090-RS1-F0710**
533444	**DAPS-0120-090-RS2-F0710**
533445	**DAPS-0120-090-RS3-F0710**
533446	**DAPS-0120-090-RS4-F0710**
Size 0180	
533447	**DAPS-0180-090-RS1-F0710**
533448	**DAPS-0180-090-RS2-F0710**
533449	**DAPS-0180-090-RS3-F0710**
533450	**DAPS-0180-090-RS4-F0710**
Size 0240	
533451	**DAPS-0240-090-RS1-F1012**
533452	**DAPS-0240-090-RS2-F1012**
533453	**DAPS-0240-090-RS3-F1012**
533454	**DAPS-0240-090-RS4-F1012**
Size 0360	
549673	**DAPS-0360-090-RS1-F1012**
549674	**DAPS-0360-090-RS2-F1012**
549675	**DAPS-0360-090-RS3-F1012**
549676	**DAPS-0360-090-RS4-F1012**

Part No.	Type
Size 0480	
533455	**DAPS-0480-090-RS1-F1012**
533488	**DAPS-0480-090-RS1-F14**
533456	**DAPS-0480-090-RS2-F1012**
533489	**DAPS-0480-090-RS2-F14**
533457	**DAPS-0480-090-RS3-F1012**
533490	**DAPS-0480-090-RS3-F14**
533458	**DAPS-0480-090-RS4-F1012**
533491	**DAPS-0480-090-RS4-F14**
Size 0720	
549677	**DAPS-0720-090-RS1-F12**
549681	**DAPS-0720-090-RS1-F14**
549678	**DAPS-0720-090-RS2-F12**
549682	**DAPS-0720-090-RS2-F14**
549679	**DAPS-0720-090-RS3-F12**
549683	**DAPS-0720-090-RS3-F14**
549680	**DAPS-0720-090-RS4-F12**
549684	**DAPS-0720-090-RS4-F14**
Size 0960	
533459	**DAPS-0960-090-RS1-F14**
533492	**DAPS-0960-090-RS1-F1216**
533460	**DAPS-0960-090-RS2-F14**
533493	**DAPS-0960-090-RS2-F1216**
533461	**DAPS-0960-090-RS3-F14**
533494	**DAPS-0960-090-RS3-F1216**
533462	**DAPS-0960-090-RS4-F14**
533495	**DAPS-0960-090-RS4-F1216**
Size 1440	
549685	**DAPS-1440-090-RS1-F16**
549686	**DAPS-1440-090-RS2-F16**
549687	**DAPS-1440-090-RS3-F16**
549688	**DAPS-1440-090-RS4-F16**
Size 1920	
549689	**DAPS-1920-090-RS1-F16**
549690	**DAPS-1920-090-RS2-F16**
549691	**DAPS-1920-090-RS3-F16**
549692	**DAPS-1920-090-RS4-F16**
Size 2880	
549693	**DAPS-2880-090-RS1-F16**
549694	**DAPS-2880-090-RS2-F16**
549695	**DAPS-2880-090-RS3-F16**
549696	**DAPS-2880-090-RS4-F16**
Size 4000	
560856	**DAPS-4000-090-RS1-F25**
561694	**DAPS-4000-090-RS2-F25**
561695	**DAPS-4000-090-RS3-F25**
561696	**DAPS-4000-090-RS4-F25**

Technical data

Ordering data – Wearing parts kits

Part No.	Type
Size 0015	
397471	**DAPS-0030/S0015**
Size 0030	
397472	**DAPS-0060/S0030**
Size 0053	
397473	**DAPS-0106/S0053**
Size 0090	
397474	**DAPS-0180/S0090**
Size 0120	
397475	**DAPS-0240/S0120**

Part No.	Type
Size 0180	
397476	**DAPS-0360/S0180**
Size 0240	
397477	**DAPS-0480/S0240**
Size 0480	
397478	**DAPS-0960/S0480**
Size 0960	
397479	**DAPS-1920/S0960**

Ordering data – Drives for variant T4

Part No.	Type
Size 0015	
8030613	**DAPS-0015-090-RS4-F0305-T4**
8030614	**DAPS-0015-090-RS4-F04-T4**
Size 0030	
8030615	**DAPS-0030-090-RS4-F04-T4**
8030616	**DAPS-0030-090-RS4-F0507-T4**
Size 0053	
8030617	**DAPS-0053-090-RS4-F0507-T4**
Size 0090	
8030618	**DAPS-0090-090-RS4-F0710-T4**
Size 0120	
8030619	**DAPS-0120-090-RS4-F0710-T4**

Part No.	Type
Size 0180	
8030620	**DAPS-0180-090-RS4-F0710-T4**
Size 0240	
8030621	**DAPS-0240-090-RS4-F1012-T4**
Size 0360	
8030622	**DAPS-0360-090-RS4-F1012-T4**
Size 0480	
8030623	**DAPS-0480-090-RS4-F1012-T4**
8030624	**DAPS-0480-090-RS4-F14-T4**

Quarter turn actuators DAPS, single-acting

Technical data

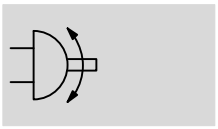
Ordering data – Drives for variant T6

Part No.	Type
Size 0015	
553191	**DAPS-0015-090-RS2-F0305-T6**
553192	**DAPS-0015-090-RS2-F04-T6**
553210	**DAPS-0015-090-RS3-F0305-T6**
553211	**DAPS-0015-090-RS3-F04-T6**
553229	**DAPS-0015-090-RS4-F0305-T6**
553230	**DAPS-0015-090-RS4-F04-T6**
Size 0030	
553193	**DAPS-0030-090-RS2-F04-T6**
553194	**DAPS-0030-090-RS2-F0507-T6**
553212	**DAPS-0030-090-RS3-F04-T6**
553213	**DAPS-0030-090-RS3-F0507-T6**
553231	**DAPS-0030-090-RS4-F04-T6**
553232	**DAPS-0030-090-RS4-F0507-T6**
Size 0053	
553195	**DAPS-0053-090-RS2-F0507-T6**
553214	**DAPS-0053-090-RS3-F0507-T6**
553233	**DAPS-0053-090-RS4-F0507-T6**
Size 0090	
553196	**DAPS-0090-090-RS2-F0710-T6**
553215	**DAPS-0090-090-RS3-F0710-T6**
553234	**DAPS-0090-090-RS4-F0710-T6**
Size 0120	
553197	**DAPS-0120-090-RS2-F0710-T6**
553216	**DAPS-0120-090-RS3-F0710-T6**
553235	**DAPS-0120-090-RS4-F0710-T6**
Size 0180	
553198	**DAPS-0180-090-RS2-F0710-T6**
553217	**DAPS-0180-090-RS3-F0710-T6**
553236	**DAPS-0180-090-RS4-F0710-T6**
Size 0240	
553199	**DAPS-0240-090-RS2-F1012-T6**
553218	**DAPS-0240-090-RS3-F1012-T6**
553237	**DAPS-0240-090-RS4-F1012-T6**
Size 0360	
553200	**DAPS-0360-090-RS2-F1012-T6**
553219	**DAPS-0360-090-RS3-F1012-T6**
553238	**DAPS-0360-090-RS4-F1012-T6**

Part No.	Type
Size 0480	
553201	**DAPS-0480-090-RS2-F12-T6**
553202	**DAPS-0480-090-RS2-F14-T6**
553220	**DAPS-0480-090-RS3-F12-T6**
553221	**DAPS-0480-090-RS3-F14-T6**
553239	**DAPS-0480-090-RS4-F12-T6**
553240	**DAPS-0480-090-RS4-F14-T6**
Size 0720	
553203	**DAPS-0720-090-RS2-F12-T6**
553204	**DAPS-0720-090-RS2-F14-T6**
553222	**DAPS-0720-090-RS3-F12-T6**
553223	**DAPS-0720-090-RS3-F14-T6**
553241	**DAPS-0720-090-RS4-F12-T6**
553242	**DAPS-0720-090-RS4-F14-T6**
Size 0960	
553205	**DAPS-0960-090-RS2-F14-T6**
553206	**DAPS-0960-090-RS2-F1216-T6**
553224	**DAPS-0960-090-RS3-F14-T6**
553225	**DAPS-0960-090-RS3-F1216-T6**
553243	**DAPS-0960-090-RS4-F14-T6**
553244	**DAPS-0960-090-RS4-F1216-T6**
Size 1440	
553207	**DAPS-1440-090-RS2-F16-T6**
553245	**DAPS-1440-090-RS4-F16-T6**
Size 1920	
553208	**DAPS-1920-090-RS2-F16-T6**
553227	**DAPS-1920-090-RS3-F16-T6**
553246	**DAPS-1920-090-RS4-F16-T6**
Size 2880	
553209	**DAPS-2880-090-RS2-F16-T6**
553228	**DAPS-2880-090-RS3-F16-T6**
553247	**DAPS-2880-090-RS4-F16-T6**

Technical data

Function



Swivel angel
0 ... 90°

Size
0015 ... 0480

Torque
15 ... 480 Nm

General technical data							
Size		0015	0030	0060	0120	0240	0480
Pneumatic connection		G1/8					
Design		Scotch yoke system					
Mode of operation		Double-acting					
Mounting position		Any					
Position sensing		None					
Cushioning		No cushioning					
Swivel angle	[°]	90					
Closing direction		Closes to right					

Operating and environmental conditions							
Size		0015	0030	0060	0120	0240	0480
Operating pressure	[bar]	2.5 ... 8.4					
Nominal operating pressure	[bar]	5.6					
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]					
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)					
Ambient temperature	[°C]	–20 ... +80					
Corrosion resistance class CRC[1)]		3					
Connection to process valve as per standard		–		ISO 5211			
Valve connection as per standard		–		VDI/VDE 3845 (NAMUR)			
Safety Integrity Level (SIL)		Up to SIL 2 High Demand mode					
		Up to SIL 2 Low Demand mode					

1) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

ATEX	
ATEX category for gas	II 2G
Explosion ignition protection type for gas	Ex h IIC T6 ... T3 Gb X
ATEX category for dust	II 2D
Explosion ignition protection type for dust	c TX X
Explosion-proof temperature rating	Ex h IIIC T85°C ... T200°C Db X
CE marking (see declaration of conformity)	To EU Explosion Protection Directive (ATEX)

Quarter turn actuators DAPS CR, double-acting

Technical data

Air consumption [l/cycle 0°-90°-0°] at 6 bar

Size		Size	
DAPS-0015	0.55	DAPS-0120	4.06
DAPS-0030	1.04	DAPS-0240	8.26
DAPS-0060	1.96	DAPS-0480	16.66

Weight [g]

Size		Size	
DAPS-0015	800	DAPS-0120	3300
DAPS-0030	1200	DAPS-0240	5600
DAPS-0060	1800	DAPS-0480	9500

Materials

Quarter turn actuators		Material number
Housing	High-alloy stainless steel	1.4408
Cover	High-alloy stainless steel	1.4408
Shaft	High-alloy stainless steel	1.4301
External screws	High-alloy stainless steel	–
Seals	FPM, NBR, PUR	–
Note on materials	Conforms to RoHS	–

Actual torque [Nm] as a function of operating pressure [bar] and swivel angle [°]

Size	Swivel angle [°]	Operating pressure [bar]							
		2.5	3	4	5	5.6	6	7	8
DAPS-0015	0	6.7	8	10.7	13.4	15	16.1	18.8	21.4
	50	3.3	4	5.4	6.7	7.5	8	9.4	10.7
	90	5	6.1	8.1	10.1	11.3	12.1	14.1	16.1
DAPS-0030	0	13.4	16.1	21.4	26.8	30	32.1	37.5	42.9
	50	6.7	8	10.7	13.4	15	16.1	18.8	21.4
	90	10	12.1	16.1	20.1	22.5	24.1	28.1	32.1
DAPS-0060	0	26.8	32.1	42.9	53.6	60	64.3	75	85.7
	50	13.4	16.1	21.4	26.8	30	32.1	37.5	42.9
	90	20.1	24.1	32.1	40.2	45	48.2	56.3	64.3
DAPS-0120	0	53.6	64.3	85.7	107.1	120	128.6	150	171.4
	50	26.8	32.1	42.9	53.6	60	64.3	75	85.7
	90	40.2	48.2	64.3	80.4	90	96.4	112.5	128.6
DAPS-0240	0	107.1	128.6	171.4	214.3	240	257.1	300	342.9
	50	53.6	64.3	85.7	107.1	120	128.6	150	171.4
	90	80.4	96.4	128.6	160.7	180	192.9	225	257.1
DAPS-0480	0	214.3	257.1	342.9	428.6	480	514.3	600	685.7
	50	107.1	128.6	171.4	214.3	240	257.1	300	342.9
	90	160.7	192.9	257.1	321.4	360	385.7	450	514.3

Torque for size at 5.6 bar and swivel angle 0°

Note

The operating torque of the drive must not be higher than the maximum permissible torque listed in ISO 5211, with reference to the size of the mounting flange and of the coupling.

Technical data

Dimensions

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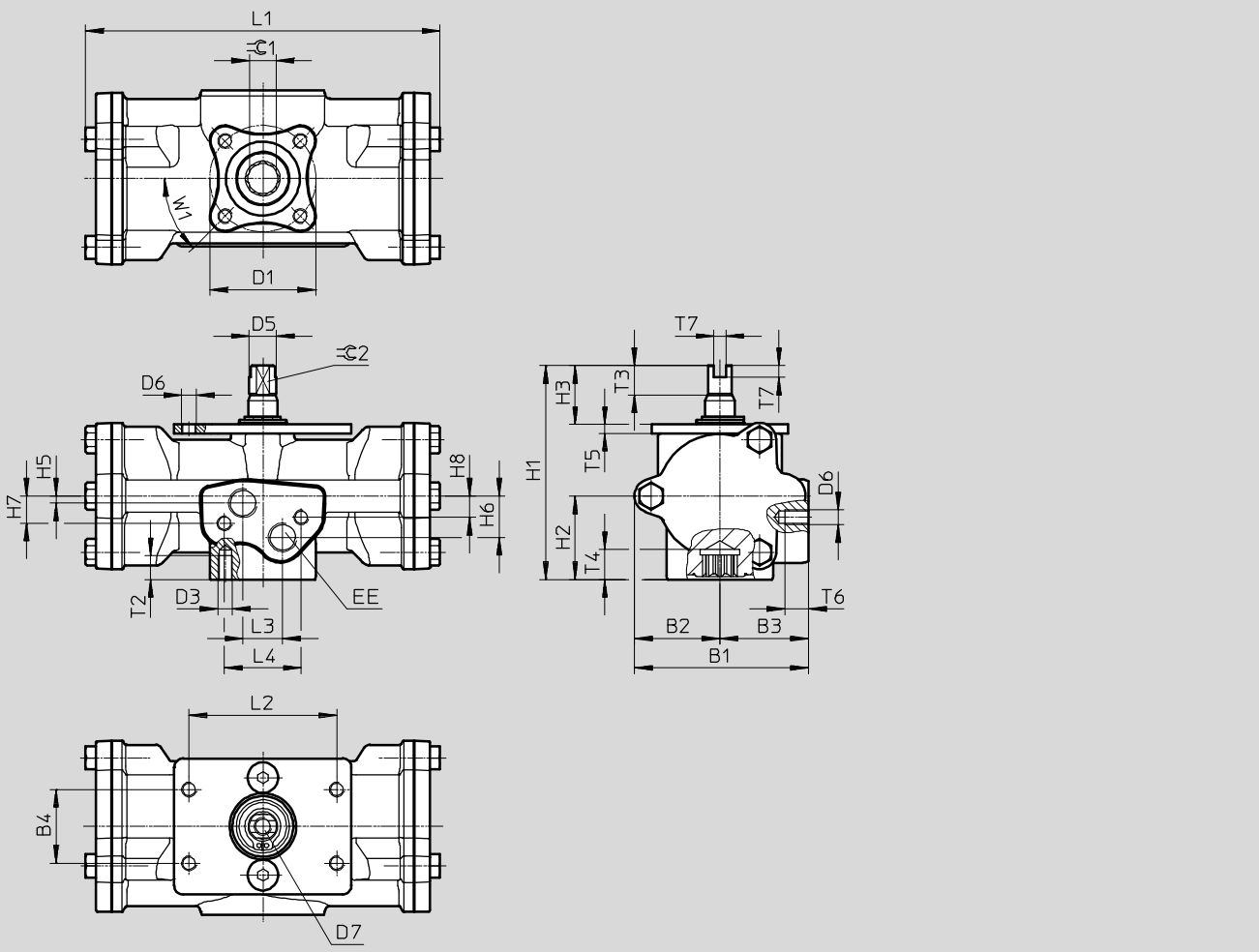
DAPS-...-090-R-F03-CR



Size	B1	B2	B3	B4	D1 ∅	D3	D5 ∅	D6	D7	EE	H1	H2	H3	H5	H6
DAPS-0015-090-R-F03-CR	59	29	30	25	36	M5	9.2	M5	M6	G1/8	72.4	28.2	20	2.4	14
DAPS-0030-090-R-F03-CR	68.1	34.1	34	25	36	M5	10.9	M5	M6	G1/8	80.4	32.7	20	3	16

Size	H7	H8	L1 ±2	L2	L3	L4	T2	T3	T4 ±0.4	T5	T6	T7	⌀C1 H11	⌀C2 h11	W1
DAPS-0015-090-R-F03-CR	9.2	7.2	120	50	13.4	26	8	10	10.1	3	8	4	9	8	45°
DAPS-0030-090-R-F03-CR	10.5	8.5	134.6	50	12	26	8	10	10.2	3	8	4	9	9	45°

Quarter turn actuators DAPS CR, double-acting

Technical data

Dimensions

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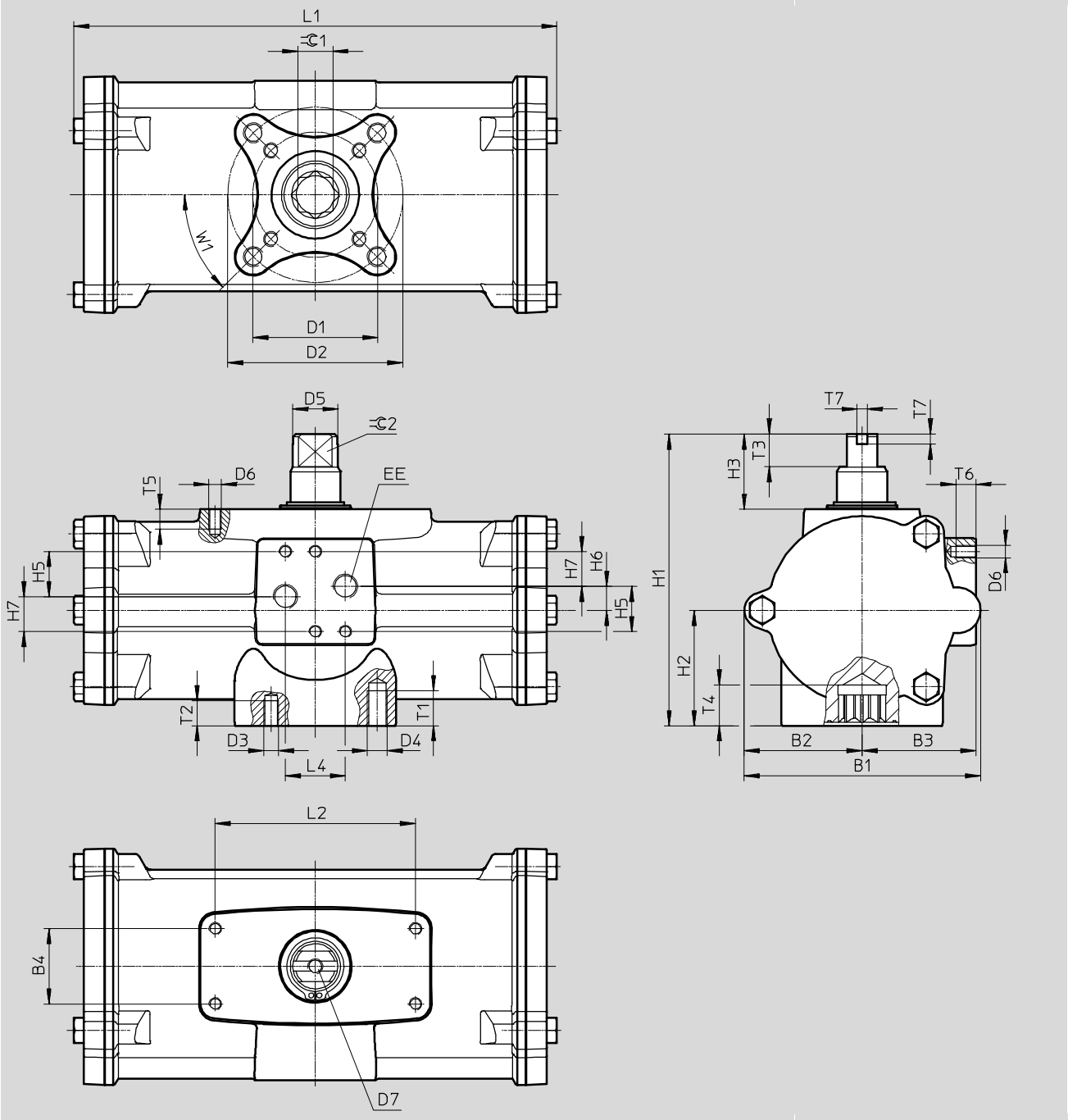
DAPS-...-090-R-...-CR



Technical data

Size	B1	B2	B3	B4	D1 ∅ ±0.1	D2 ∅ ±0.1	D3	D4	D5 ∅	D6	D7	EE	H1	H2	H3	H5
DAPS-0060-...-R-F0305-CR	80.3	41.1	39.2	25	36	50	M5	M6	14.5	M5	M6	G1/8	92.4	37.6	20	18
DAPS-0120-...-R-F0507-CR	94.4	47	45.5	30	50	70	M6	M8	18	M5	M6	G1/8	116.5	46.1	30	18
DAPS-240-...-R-F0507-CR	117	60.2	54.5	30	50	70	M6	M8	22.5	M5	M6	G1/8	136.4	56.1	30	18
DAPS-480-...-R-F0710-CR	139.7	71	67	30	70	102	M8	M10	29	M5	M6	G1/8	160	68	30	18

Size	H6	H7	L1 ±2	L2	L4	T1	T2	T3	T4 ±0.4	T5	T6	T7	⌀ 1 H11	⌀ 2 h11	W1
DAPS-0060-...-R-F0305-CR	9.6	14	158.4	50	24	10	8	13	12.1	8	8	4	11	10	45°
DAPS-0120-...-R-F0507-CR	9.6	14	192.9	80	24	14	10	13	16.3	8	8	4	14	12	45°
DAPS-240-...-R-F0507-CR	10	14	246.7	80	24	14	10	17	19.3	8	8	4	17	15	45°
DAPS-480-...-R-F0710-CR	10	14	298.4	80	24	16	14	19	24.3	8	8	4	22	19	45°

Ordering data

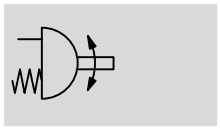
Part No.	Type
Size 0015	
552869	**DAPS-0015-090-R-F03-CR**
Size 0030	
552870	**DAPS-0030-090-R-F03-CR**
Size 0060	
552871	**DAPS-0060-090-R-F0305-CR**

Part No.	Type
Size 0120	
552872	**DAPS-0120-090-R-F0507-CR**
Size 0240	
552873	**DAPS-0240-090-R-F0507-CR**
Size 0480	
552874	**DAPS-0480-090-R-F0710-CR**

Quarter turn actuators DAPS CR, single-acting

Technical data

Function



Size
0015 ... 0240

Torque
15 ... 240 Nm

Swivel angel
0 ... 90°

General technical data						
Size		0015	0030	0060	0120	0240
Pneumatic connection		G1/8				
Design		Scotch yoke system				
Mode of operation		Single-acting				
Mounting position		Any				
Position sensing		None				
Cushioning		No cushioning				
Swivel angle	[°]	90				
Closing direction		Closes to right				

Operating and environmental conditions						
Size		0015	0030	0060	0120	0240
Nominal operating pressure	[bar]	5.6				
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]				
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)				
Ambient temperature	[°C]	–20 ... +80				
Corrosion resistance class CRC[1)]		3				
Connection to process valve as per standard		–	ISO 5211			
Valve connection as per standard		–	VDI/VDE 3845 (NAMUR)			
Safety Integrity Level (SIL)		Up to SIL 2 High Demand mode				
		Up to SIL 2 Low Demand mode				

1) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

ATEX	
ATEX category for gas	II 2G
Explosion ignition protection type for gas	Ex h IIC T6 ... T3 Gb X
ATEX category for dust	II 2D
Explosion ignition protection type for dust	Ex h IIIC T85°C ... T200°C Db X
Explosion-proof temperature rating	–20 °C ≤ Ta ≤ +60 °C
CE marking (see declaration of conformity)	To EU Explosion Protection Directive (ATEX)

Technical data

Pressure ranges [bar]

Type	Connection pressure	Operating pressure
Size 0015		
DAPS-0015-090-RS1-F03-CR	2.8	2.8 ... 8.4
DAPS-0015-090-RS2-F03-CR	3.5	3.5 ... 8.4
DAPS-0015-090-RS3-F03-CR	4.2	4.2 ... 8.4
DAPS-0015-090-RS4-F03-CR	5.6	5.6 ... 8.4
Size 0030		
DAPS-0030-090-RS1-F0305-CR	2.8	2.8 ... 8.4
DAPS-0030-090-RS2-F0305-CR	3.5	3.5 ... 8.4
DAPS-0030-090-RS3-F0305-CR	4.2	4.2 ... 8.4
DAPS-0030-090-RS4-F0305-CR	5.6	5.6 ... 8.4
Size 0060		
DAPS-0060-090-RS1-F0507-CR	2.8	2.8 ... 8.4
DAPS-0060-090-RS2-F0507-CR	3.5	3.5 ... 8.4
DAPS-0060-090-RS3-F0507-CR	4.2	4.2 ... 8.4
DAPS-0060-090-RS4-F0507-CR	5.6	5.6 ... 8.4

Type	Connection pressure	Operating pressure
Size 0120		
DAPS-0120-090-RS1-F0507-CR	2.8	2.8 ... 8.4
DAPS-0120-090-RS2-F0507-CR	3.5	3.5 ... 8.4
DAPS-0120-090-RS3-F0507-CR	4.2	4.2 ... 8.4
DAPS-0120-090-RS4-F0507-CR	5.6	5.6 ... 8.4
Size 0240		
DAPS-0240-090-RS1-F0710-CR	2.8	2.8 ... 8.4
DAPS-0240-090-RS2-F0710-CR	3.5	3.5 ... 8.4
DAPS-0240-090-RS3-F0710-CR	4.2	4.2 ... 8.4
DAPS-0240-090-RS4-F0710-CR	5.6	5.6 ... 8.4

Air consumption [l/cycle] at 6 bar

Size	
DAPS-0015	0.6
DAPS-0030	1.12
DAPS-0060	2.31

Size	
DAPS-0120	4.9
DAPS-0240	9.66

Weight [g]

Size	
DAPS-0015	1600
DAPS-0030	2400
DAPS-0060	4500

Size	
DAPS-0120	7600
DAPS-0240	12900

Materials

Quarter turn actuators		Material number
Housing	High-alloy stainless steel	1.4408
Cover	High-alloy stainless steel	1.4408
Shaft	High-alloy stainless steel	1.4301
External screws	High-alloy stainless steel	–
Seals	FPM, NBR, PUR	–
Note on materials	Conforms to RoHS	–

Quarter turn actuators DAPS CR, single-acting

Technical data

Actual torque [Nm] as a function of operating pressure [bar], spring strength and swivel angle [°]

Spring strength	Spring torque [Nm]			Operating pressure [bar]														
				2.5			2.8			3			3.5			4.2		
	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°
DAPS-0015																		
1	5.0	3.7	7.5	6.2	2.9	3.7	7.5	3.7	5	8.4	4.2	5.9	10.6	5.6	8.1	13.8	7.4	11.3
2	6.3	4.7	9.4	–			–			7.2	3.3	4	9.4	4.7	6.3	12.6	6.5	9.4
3	7.5	5.6	11.3	–			–			–			8.2	3.7	4.4	11.3	5.6	7.5
4	10.0	7.5	15	–			–			–			–			–		
DAPS-0030																		
1	10.0	7.5	15	12.3	5.9	7.3	15	7.5	10	16.8	8.6	11.8	21.3	11.3	16.3	27.5	15	22.5
2	12.5	9.4	18.8	–			–			14.3	6.7	8	18.8	9.4	12.5	25.1	13.2	18.8
3	15.0	11.3	22.5	–			–			–			16.3	7.5	8.8	22.5	11.3	15
4	20.0	15	30	–			–			–			–			–		
DAPS-0060																		
1	20	15	30	24.6	11.8	14.6	30	15	20	33.6	17.1	23.6	42.5	22.5	32.5	55	30	45
2	25	18.8	37.5	–			–			28.6	13.4	16.1	37.5	18.8	25	50	26.3	37.5
3	30	22.5	45	–			–			–			32.5	15	17.5	45	22.5	30
4	40	30	60	–			–			–			–			–		
DAPS-0120																		
1	40	30	60	49.3	23.6	29.3	60	30	40	67.1	34.3	47.1	85	45	65	110	60	90
2	50	37.5	75	–			–			57.1	26.8	32.1	75	37.5	50	100	52.5	75
3	60	45	90	–			–			–			65	30	35	90	45	60
4	80	60	120	–			–			–			–			–		
DAPS-0240																		
1	80	60	120	98.6	47.1	58.6	120	60	80	134.3	68.6	94.3	170	90	130	220	120	180
2	100	75	150	–			–			114.3	53.6	64.3	150	75	100	200	105	150
3	120	90	180	–			–			–			130	60	70	180	90	120
4	160	120	240	–			–			–			–			–		

Note

The operating torque of the drive must not be higher than the maximum permissible torque listed in ISO 5211, with reference to the size of the mounting flange and of the coupling.

Technical data

Actual torque [Nm] as a function of operating pressure [bar], spring strength and swivel angle [°]

Spring strength	Spring torque [Nm]			Operating pressure [bar]														
				5			5.6			6			7			8		
	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°
DAPS-0015																		
1	5.0	3.7	7.5	–			–			–			–			–		
2	6.3	4.7	9.4	16.1	8.7	13	18.8	10.3	15.7	–			–			–		
3	7.5	5.6	11.3	14.9	7.7	11.1	17.6	9.3	13.8	19.4	10.4	15.6	23.8	13.1	20	28.3	15.7	24.5
4	10.0	7.5	15	12.3	5.9	7.3	15	7.5	10	16.8	8.6	11.8	21.3	11.3	16.3	25.7	13.9	20.7
DAPS-0030																		
1	10.0	7.5	15	–			–			–			–			–		
2	12.5	9.4	18.8	32.2	17.5	25.9	37.6	20.7	31.3	–			–			–		
3	15.0	11.3	22.5	29.6	15.6	22.1	35	18.8	27.5	38.6	21	31.1	47.5	26.4	40	56.4	31.7	48.9
4	20.0	15	30	24.6	11.8	14.6	30	15	20	33.6	17.1	23.6	42.5	22.5	32.5	51.4	27.9	41.4
DAPS-0060																		
1	20	15	30	–			–			–			–			–		
2	25	18.8	37.5	64.3	34.9	51.8	75	41.4	62.5	–			–			–		
3	30	22.5	45	59.3	31.1	44.3	70	37.5	55	77.1	41.8	62.1	95	52.5	80	112.9	63.2	97.9
4	40	30	60	49.3	23.6	29.3	60	30	40	67.1	34.3	47.1	85	45	65	102.9	55.7	82.9
DAPS-0120																		
1	40	30	60	–			–			–			–			–		
2	50	37.5	75	128.6	69.6	103.6	150	82.5	125	–			–			–		
3	60	45	90	118.6	62.1	88.6	140	75	110	154.3	83.6	124.3	190	105	160	225.7	126.4	195.7
4	80	60	120	98.6	47.1	58.6	120	60	80	134.3	68.6	94.3	170	90	130	205.7	111.4	165.7
DAPS-0240																		
1	80	60	120	–			–			–			–			–		
2	100	75	150	257.1	139.3	207.1	300	165	250	–			–			–		
3	120	90	180	237.1	124.3	177.1	280	150	220	308.6	167.1	248.6	380	210	320	451.4	252.9	391.4
4	160	120	240	197.1	94.3	117.1	240	120	160	268.6	137.1	188.6	340	180	260	411.4	222.9	331.4

Torque for size at 5.6 bar and swivel angle 0°

Note

The operating torque of the drive must not be higher than the maximum permissible torque listed in ISO 5211, with reference to the size of the mounting flange and of the coupling.

Quarter turn actuators DAPS CR, single-acting

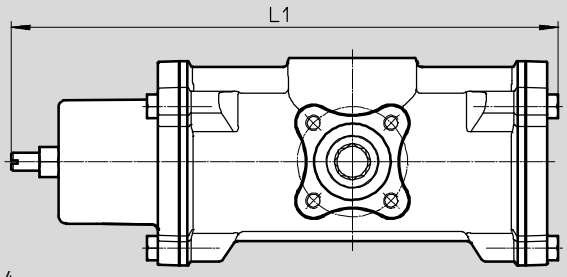
Technical data

Dimensions

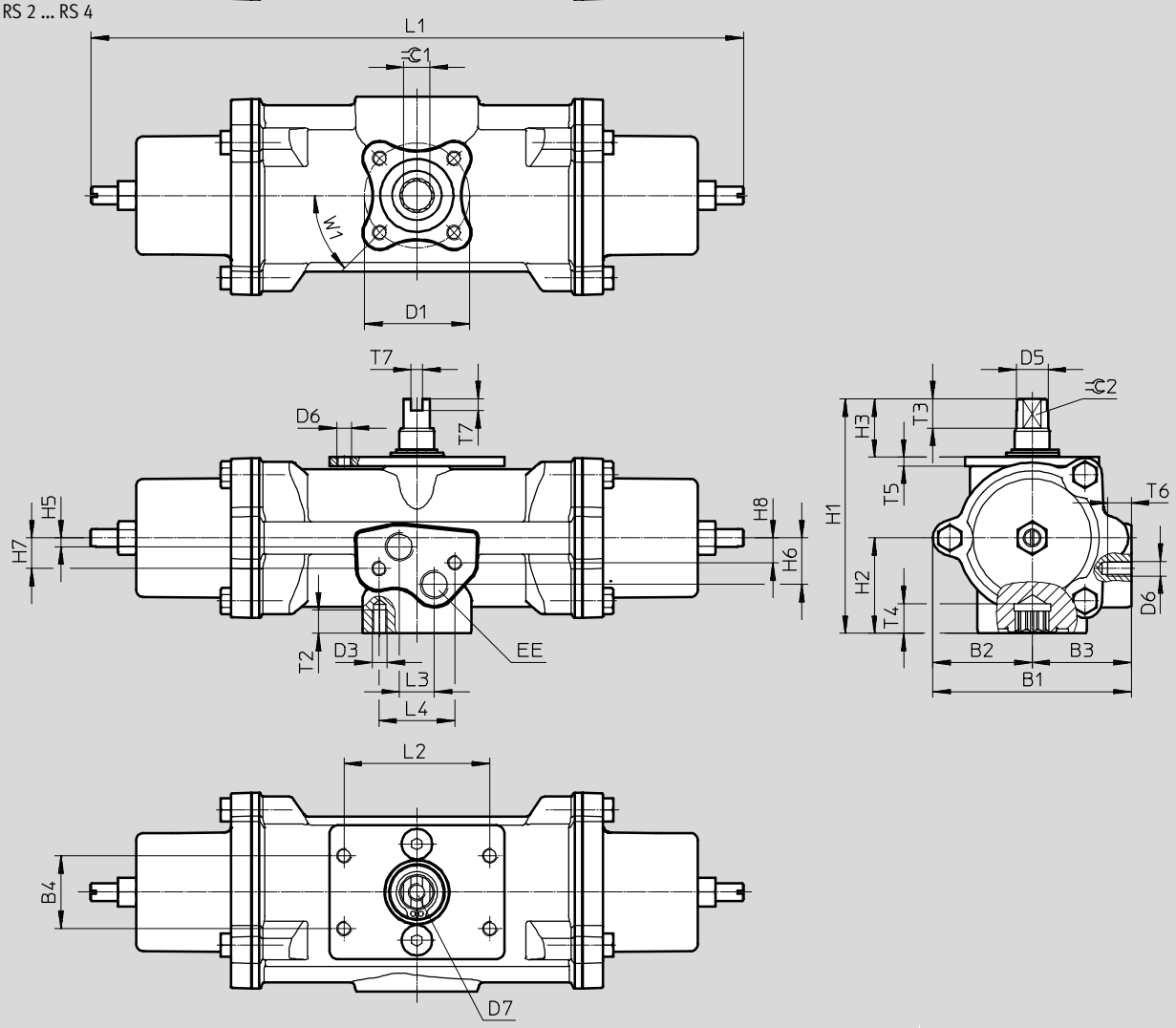
Download CAD data ➔ **www.festo.com**

DAPS-0015-090-...-F03-CR

RS 1



RS 2 ... RS 4



Technical data

Size	B1	B2	B3	B4	D1 ∅	D3	D5 ∅	D6	D7	EE	H1	H2	H3	H5	H6	H7
DAPS-0015-090-RS-F03-CR	68.1	34.1	34	25	36	M5	10.9	M5	M6	G1/8	80.4	32.7	20	3	16	10.5

Size	H8	L1 ±2		L2	L3	L4	T2	T3	T4 ±0.4	T5	T6	T7	⌯1 H11	⌯2 h11	W1
		RS 1	RS 2 ... RS 4												
DAPS-0015-090-RS-F03-CR	8.5	179	224	50	12	26	8	10	10.2	3	8	4	9	9	45°

Quarter turn actuators DAPS CR, single-acting

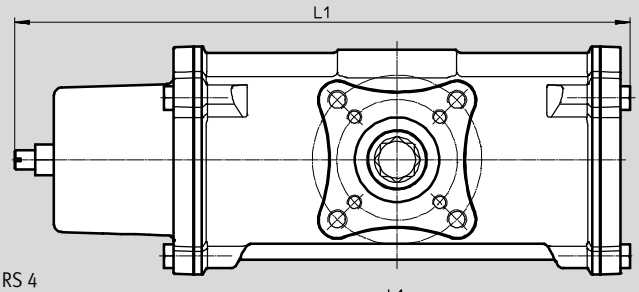
Technical data

Dimensions

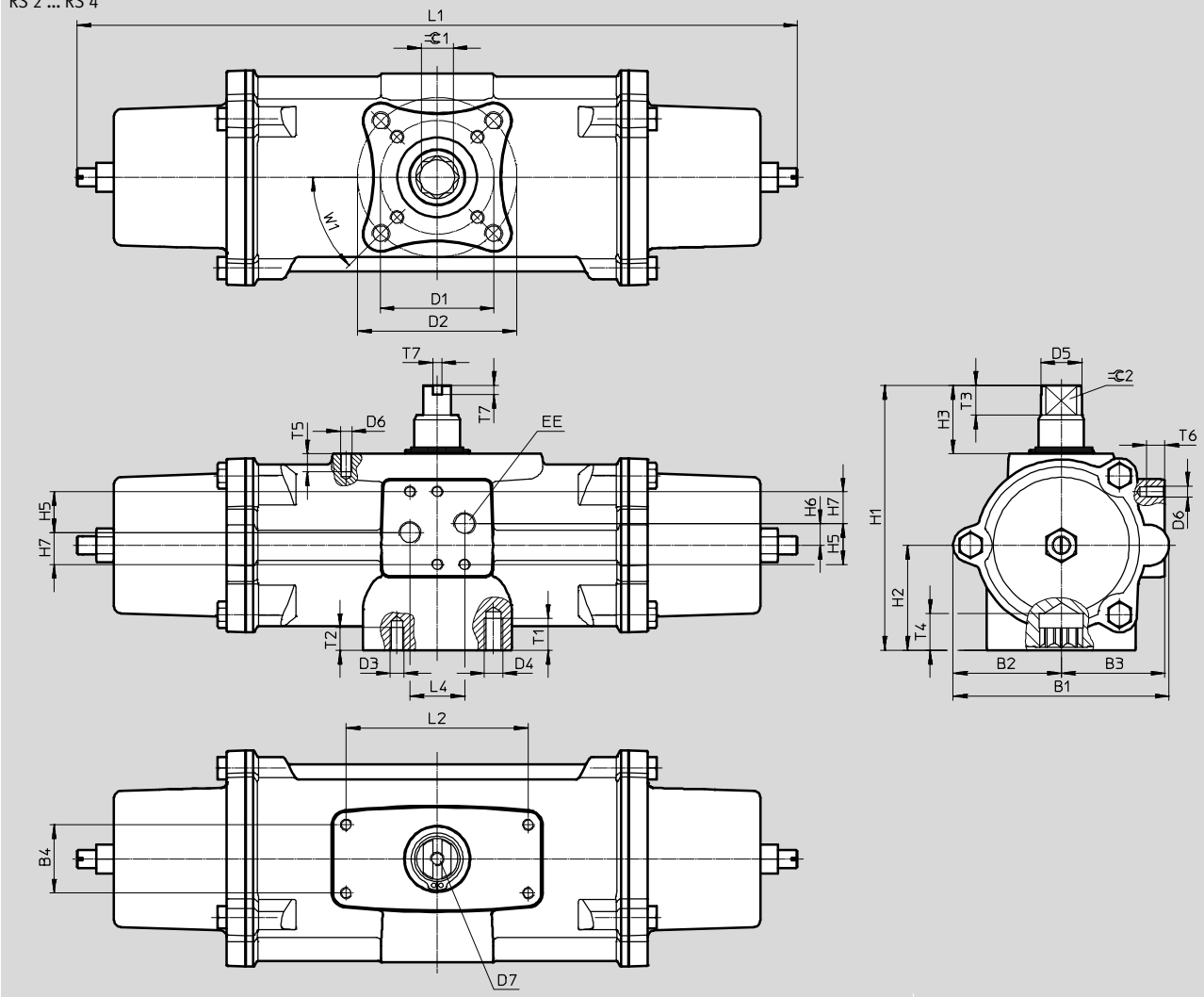
Download CAD data ➔ **www.festo.com/en/engineering**

DAPS-...-090-...-CR

RS 1



RS 2 ... RS 4



Technical data

Size	B1	B2	B3	B4	D1 ∅	D2 ∅	D3	D4	D5 ∅	D6	D7	EE	H1	H2	H3	H5
DAPS-0030- ... -F0305-CR	80.3	41.1	39.2	25	36	50	M5	M6	14.5	M5	M6	G1/8	92.4	37.6	20	18
DAPS-0060- ... -F0507-CR	94.4	47	45.5	30	50	70	M6	M8	18	M5	M6	G1/8	116.4	46.2	30	18
DAPS-0120- ... -F0507-CR	117	60.2	54.5	30	50	70	M6	M8	22.5	M5	M6	G1/8	136.4	56.1	30	18
DAPS-0240- ... -F0710-CR	139.7	70.9	67	30	70	102	M8	M10	29	M5	M6	G1/8	160	67.9	30	18

Size	H6	H7	L1 ±2		L2	L4	T1	T2	T3	T4 ±0.4	T5	T6	T7	⌯ 1 H11	⌯ 2 h11	W1
			RS 1	RS 2 ... RS 4												
DAPS-0030- ... -F0305-CR	9.6	14	202.3	246.2	50	24	10	8	13	12.1	8	8	4	11	10	45°
DAPS-0060- ... -F0507-CR	9.5	14	254.7	316.5	80	24	14	10	13	16.3	8	8	4	14	12	45°
DAPS-0120- ... -F0507-CR	10	14	311.5	376.2	80	24	14	10	17	19.3	8	8	4	17	15	45°
DAPS-0240- ... -F0710-CR	10	14	381	464	80	24	16	14	19	24.3	8	8	4	22	19	45°

Ordering data

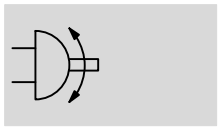
Part No.	Type
Size 0015	
552875	**DAPS-0015-090-RS1-F03-CR**
552876	**DAPS-0015-090-RS2-F03-CR**
552877	**DAPS-0015-090-RS3-F03-CR**
552878	**DAPS-0015-090-RS4-F03-CR**
Size 0030	
552879	**DAPS-0030-090-RS1-F0305-CR**
552880	**DAPS-0030-090-RS2-F0305-CR**
552881	**DAPS-0030-090-RS3-F0305-CR**
552882	**DAPS-0030-090-RS4-F0305-CR**
Size 0060	
552883	**DAPS-0060-090-RS1-F0507-CR**
552884	**DAPS-0060-090-RS2-F0507-CR**
552885	**DAPS-0060-090-RS3-F0507-CR**
552886	**DAPS-0060-090-RS4-F0507-CR**

Part No.	Type
Size 0120	
552887	**DAPS-0120-090-RS1-F0507-CR**
552888	**DAPS-0120-090-RS2-F0507-CR**
552889	**DAPS-0120-090-RS3-F0507-CR**
552890	**DAPS-0120-090-RS4-F0507-CR**
Size 0240	
552891	**DAPS-0240-090-RS1-F0710-CR**
552892	**DAPS-0240-090-RS2-F0710-CR**
552893	**DAPS-0240-090-RS3-F0710-CR**
552894	**DAPS-0240-090-RS4-F0710-CR**

Quarter turn actuators DAPS with handwheel, double-acting

Technical data

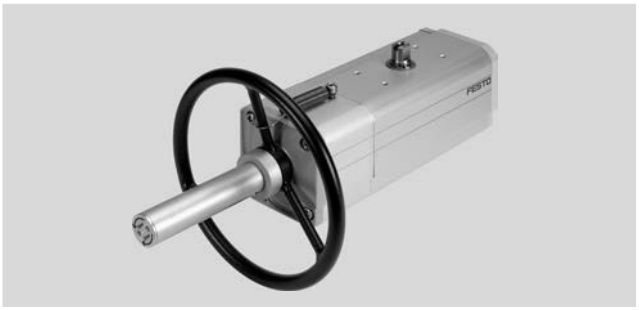
Function



Size
0106 ... 1920

Torque
0106 ... 1920 Nm

Swivel angel
92°



General technical data

Size		0106	0180	0240	0360	0480
Pneumatic connection		G1/8				G1/4
Shaft connection depth		19.3	24.8	24.8	24.3	29.5
Design		Scotch yoke system				
Mode of operation		Double-acting				
Mounting position		Any				
Position sensing		None				
Cushioning		No cushioning				
Swivel angle	[°]	92				
Closing direction		Closes to the right				

Size		0720	0960	1440	1920
Pneumatic connection		G1/4			
Shaft connection depth		29.5	38.5	38.5	48.5
Design		Scotch yoke system			
Mode of operation		Double-acting			
Mounting position		Any			
Position sensing		None			
Cushioning		No cushioning			
Swivel angle	[°]	92			
Closing direction		Closes to the right			

Technical data

Operating and environmental conditions						
Size		0106	0180	0240	0360	0480
Operating pressure[1]	[bar]	1 ... 8.4				
Nominal operating pressure	[bar]	5.6				
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]				
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)				
Ambient temperature	[°C]	–20 ... +80				
Ambient temperature for variant T6	[°C]	–50 ... +60				
Corrosion resistance class CRC[2]		2				
Connection to process valve as per standard		ISO 5211				
Valve connection conforms to standard		VDI/VDE 3845 (NAMUR)				
Safety Integrity Level (SIL)		Up to SIL 2 High Demand mode				
		Up to SIL 2 Low Demand mode				

Size		0720	0960	1440	1920
Operating pressure[1]	[bar]	1 ... 8.4			
Nominal operating pressure	[bar]	5.6			
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]			
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)			
Ambient temperature	[°C]	–20 ... +80			
Ambient temperature for variant T6	[°C]	–50 ... +60			
Corrosion resistance class CRC[2]		2			
Connection to process valve as per standard		ISO 5211			
Valve connection conforms to standard		VDI/VDE 3845 (NAMUR)			
Safety Integrity Level (SIL)		Up to SIL 2 High Demand mode			
		Up to SIL 2 Low Demand mode			

1) Operating pressure for variant T6 3...8.4 bar
2) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

ATEX	
ATEX category for gas	II 2G
Explosion ignition protection type for gas	Ex h IIC T6 ... T3 Gb X
ATEX category for dust	II 2D
Explosion ignition protection type for dust	Ex h IIIC T85°C ... T200°C Db X
Explosion-proof temperature	–20 °C <= Ta <= +60 °C
Explosion-proof temperature [T6]	–50 °C <= Ta <= +60 °C
CE marking (see declaration of conformity)	To EU Explosion Protection Directive (ATEX)

Quarter turn actuators DAPS with handwheel, double-acting

Technical data

Air consumption [l/cycle 0°-90°-0°] at 6 bar

Size	
0106	3.85
0180	8.4
0240	11.55
0360	16.1
0480	22.4

Size	
0720	32.2
0960	42.35
1440	67.9
1920	90.3

Weight [g]

Size	
0106	4000
0180	6000
0240	8000
0360	10200
0480	13200

Size	
0720	17800
0960	23800
1440	33600
1920	43000

Materials

Quarter turn actuators			Material number
Housing		Wrought aluminium alloy	–
Cover		Wrought aluminium alloy	–
	[T6]	Wrought aluminium alloy	–
Shaft		High-alloy steel	1.4305
Screws		High-alloy steel	–
Seals		NBR, PUR, FPM	–
	[T6]	PTFE reinforced, FVMQ	–
Note on materials		Conforms to RoHS	–
	[T6]	Contains PWIS (paint-wetting impairment substances), conforms to RoHS	–

Technical data

Actual torque [Nm] as a function of operating pressure [bar] and swivel angle [°]

Size	Swivel angle [°]	Operating pressure [bar]							
		2.5	3	4	5	5.6	6	7	8
DAPS-0106	0°	47.3	56.8	75.7	94.6	106	113.6	132.5	151.4
	50°	23.7	28.4	37.9	47.3	53	56.8	66.3	75.7
	90°	35.7	72.9	57.1	71.4	80	85.7	100	114.3
DAPS-0180	0°	80.4	96.4	128.6	160.7	180	192.9	225	257.1
	50°	40.2	48.2	64.3	80.4	90	96.4	112.5	128.6
	90°	60.3	72.3	96.4	120.5	135	144.6	168.8	192.9
DAPS-0240	0°	107.1	128.6	171.4	214.3	240	257.1	300	342.9
	50°	53.6	64.3	85.7	107.1	120	128.6	150	171.4
	90°	80.4	96.4	128.6	160.7	180	192.9	225	257.1
DAPS-0360	0°	160.7	192.9	257.1	321.4	360	385.7	450	514.3
	50°	80.4	96.4	128.6	160.7	180	192.9	225	257.1
	90°	120.5	144.6	192.9	241.1	270	289.3	337.5	385.7
DAPS-0480	0°	214.3	257.1	342.9	428.6	480	514.3	600	685.7
	50°	107.1	128.6	171.4	214.3	240	257.1	300	342.9
	90°	160.7	192.9	257.1	321.4	360	385.7	450	514.3
DAPS-0720	0°	321.4	385.7	514.3	642.9	720	771.4	900	1028.6
	50°	160.7	192.9	257.1	321.4	360	385.7	450	514.3
	90°	241.1	289.3	385.7	482.1	540	578.6	675	771.4
DAPS-0960	0°	428.6	514.3	685.7	857.1	960	1028.6	1200	1371.4
	50°	214.3	257.1	342.9	428.6	480	514.3	600	685.7
	90°	321.4	385.7	514.3	642.9	720	771.4	900	1028.6
DAPS-1440	0°	642.9	771.4	1028.6	1285.7	1440	1542.9	1800	2057.1
	50°	321.4	385.7	514.3	642.9	720	771.4	900	1028.6
	90°	482.1	578.6	771.4	964.3	1080	1157.1	1350	1542.9
DAPS-1920	0°	857.1	1028.6	1371.4	1714.3	1920	2057.1	2400	2742.9
	50°	428.6	514.3	685.7	857.1	960	1028.6	1200	1371.4
	90°	642.9	771.4	1028.6	1285.7	1440	1542.9	1800	2057.1

Torque for size at 5.6 bar and swivel angle 0°

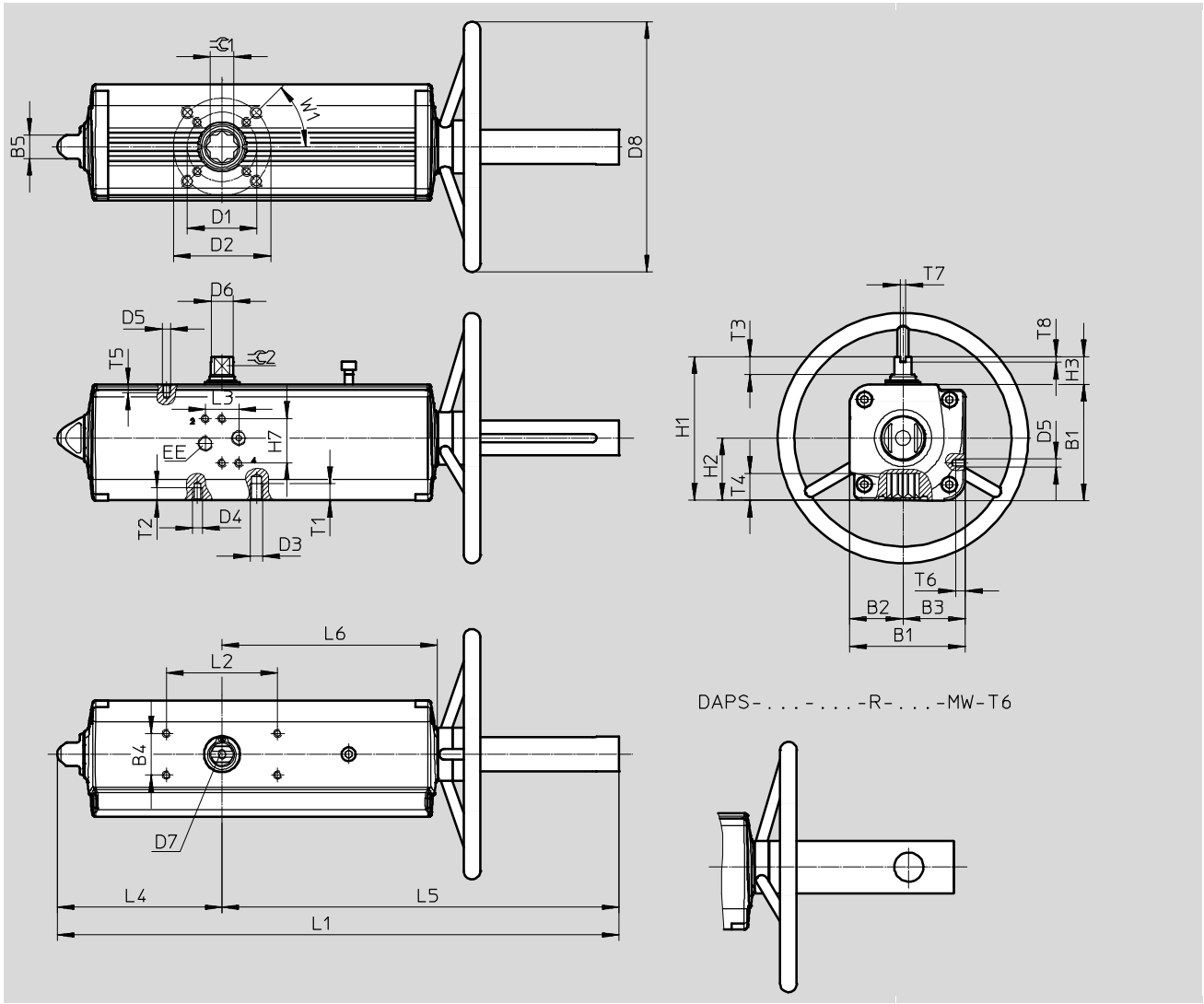
Note

The operating torque of the drive must not be higher than the maximum permissible torque listed in ISO 5211, with reference to the size of the mounting flange and of the coupling.

Quarter turn actuators DAPS with handwheel, double-acting

Technical data

Dimensions Download CAD data ➔ **www.festo.com**



Technical data

Size	B1 ±0.4	B2	B3	B4	B5	D1 ∅	D2 ∅	D3	D4	D5	D6 ∅	D7
DAPS-0106-...-F0507-...	83.3	38.5	44.8	30	17	50	70	M8	M6	M5	16.2	M6x12
DAPS-0180-...-F0710-...	107.5	51	56.5	30	22	70	102	M10	M8	M5	20.2	M6x12
DAPS-0240-...-F0710-...	111.1	51	60.1	30	22	70	102	M10	M8	M5	22.5	M6x12
DAPS-0360-...-F0710-...	118	56	62	30	22	70	102	M10	M8	M5	25.5	M6x12
DAPS-0480-...-F1012-...	134.9	62	72.9	30	27	102	125	M12	M10	M5	29	M6x12
DAPS-0720-...-F1012-...	148	69.5	78.5	30	27	102	125	M12	M10	M5	31.8	M6x12
DAPS-0960-...-F1012-...	168	74.5	93.5	30	27	102	125	M12	M10	M5	36.5	M6x12
DAPS-0960-...-F14-...	168	74.5	93.5	30	27	–	140	M16	–	M5	36.5	M6x12
DAPS-1440-...-F12-...	186	84.5	101.5	30	36	–	125	M12	–	M5	41	M6x12
DAPS-1440-...-F14-...	186	84.5	101.5	30	36	–	140	M16	–	M5	41	M6x12
DAPS-1920-...-F14-...	207.7	93	114.7	30	36	–	140	M16	–	M5	46	M6x12
DAPS-1920-...-F1216-...	207.7	93	114.7	30	36	125	165	M20	M12	M5	46	M6x12

Size	D8 ∅	EE	H1	H2	H3	H7	L1 ±2	L2	L3	L4	L5	L6
DAPS-0106-...-F0507-...	180	G1/8	103.3	44.8	20±0.4	32	403.9	80	24	118.5	285.4	154.8
DAPS-0180-...-F0710-...	220	G1/8	137.5	56.5	30±0.4	32	493.2	80	24	144.9	348.3	183.5
DAPS-0240-...-F0710-...	220	G1/8	141.1	60.1	30±0.4	32	520.6	80	24	156.8	363.9	199.1
DAPS-0360-...-F0710-...	300	G1/8	148	62	30±0.4	32	578.8	80	24	169.6	409.1	220.8
DAPS-0480-...-F1012-...	300	G1/4	164.9	72.9	30±0.4	32	618.8	80	24	193.8	425	236.4
DAPS-0720-...-F1012-...	350	G1/4	178	78.5	30±0.4	32	732.8	80	24	216.6	516.2	282.3
DAPS-0960-...-F1012-...	350	G1/4	198	93.5	30±0.5	32	770.2	80	24	239.7	530.5	297.1
DAPS-0960-...-F14-...	350	G1/4	198	93.5	30±0.5	32	770.2	80	24	239.7	530.5	297.1
DAPS-1440-...-F12-...	400	G1/4	216	101.5	30±0.5	32	936.9	80	24	283.5	653.4	365.6
DAPS-1440-...-F14-...	400	G1/4	216	101.5	30±0.5	32	936.9	80	24	283.5	653.4	365.6
DAPS-1920-...-F14-...	400	G1/4	237.7	114.7	30±0.8	32	970.3	80	24	300.4	670	382.9
DAPS-1920-...-F1216-...	400	G1/4	237.7	114.7	30±0.8	32	970.3	80	24	300.4	670	382.9

Size	T1	T2	T3	T4	T5	T6	T7 +0.1	T8 +0.3	⌯ 1 H11	⌯ 2 h11	W1
DAPS-0106-...-F0507-...	12	9	13	19.3±0.4	6	7	4	4	17	12	45°
DAPS-0180-...-F0710-...	15	12	16	24.8±0.4	6	7	4	4	22	15	45°
DAPS-0240-...-F0710-...	15	12	17	24.8±0.4	6	7	4	4	22	15	45°
DAPS-0360-...-F0710-...	15	12	19	24.3±0.4	6	7	4	4	22	19	45°
DAPS-0480-...-F1012-...	18	15	19	29.5±0.4	6	7	4	4	27	19	45°
DAPS-0720-...-F1012-...	18	15	19.5	29.5±0.4	6	7	4	4	27	22	45°
DAPS-0960-...-F1012-...	18	15	19.5	38.5±0.5	6	7	4	4	36	24	45°
DAPS-0960-...-F14-...	24	–	19.5	38.5±0.5	6	7	4	4	36	24	45°
DAPS-1440-...-F12-...	18	–	19.5	38.5±0.5	6	7	4	4	36	27	45°
DAPS-1440-...-F14-...	24	–	19.5	38.5±0.5	6	7	4	4	36	27	45°
DAPS-1920-...-F14-...	24	–	18.5	48.5±0.8	6	7	4	4	46	32	45°
DAPS-1920-...-F1216-...	30	18	18.5	48.5±0.8	6	7	4	4	46	32	45°

Quarter turn actuators DAPS with handwheel, double-acting

Technical data

Ordering data – Double-acting

Part No.	Type
Size 0106	
8005002	**DAPS-0106-090-R-F0507-MW**
Size 0180	
8005003	**DAPS-0180-090-R-F0710-MW**
Size 0240	
8005004	**DAPS-0240-090-R-F0710-MW**
Size 0360	
8005005	**DAPS-0360-090-R-F0710-MW**
Size 0480	
8005006	**DAPS-0480-090-R-F1012-MW**
Size 0720	
8005007	**DAPS-0720-090-R-F1012-MW**

Part No.	Type
Size 0960	
8005008	**DAPS-0960-090-R-F1012-MW**
8005009	**DAPS-0960-090-R-F14-MW**
Size 1440	
8005010	**DAPS-1440-090-R-F12-MW**
8005011	**DAPS-1440-090-R-F14-MW**
Size 1920	
8005013	**DAPS-1920-090-R-F1216-MW**
8005012	**DAPS-1920-090-R-F14-MW**

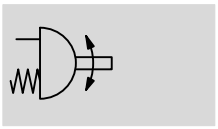
Ordering data – Double-acting T6

Part No.	Type
Size 0106	
8005014	**DAPS-0106-090-R-F0507-MW-T6**
Size 0180	
8005015	**DAPS-0180-090-R-F0710-MW-T6**
Size 0240	
8005016	**DAPS-0240-090-R-F0710-MW-T6**
Size 0360	
8005017	**DAPS-0360-090-R-F0710-MW-T6**
Size 0480	
8005018	**DAPS-0480-090-R-F1012-MW-T6**
Size 0720	
8005019	**DAPS-0720-090-R-F1012-MW-T6**

Part No.	Type
Size 0960	
8005020	**DAPS-0960-090-R-F1012-MW-T6**
8005021	**DAPS-0960-090-R-F14-MW-T6**
Size 1440	
8005022	**DAPS-1440-090-R-F12-MW-T6**
8005023	**DAPS-1440-090-R-F14-MW-T6**
Size 1920	
8005024	**DAPS-1920-090-R-F14-MW-T6**
8005025	**DAPS-1920-090-R-F1216-MW-T6**

Technical data

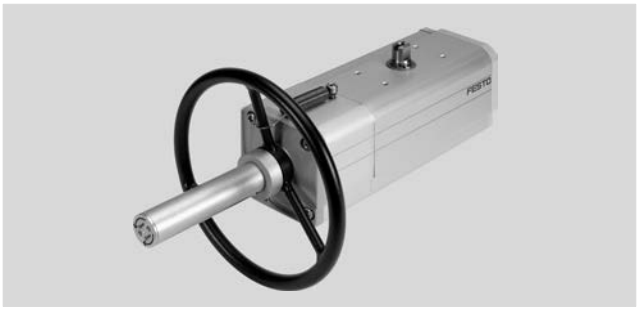
Function



Size
0053 ... 0960

Torque
0053 ... 0960 Nm

Swivel angel
0 ... 92°



General technical data

Size		0053	0090	0120	0180	0240
Pneumatic connection		G1/8				G1/4
Shaft connection depth	[mm]	19.3	24.8	24.8	24.3	29.5
Note regarding the end-position adjusting range		Optionally one end position adjustable				
Design		Scotch yoke system				
Mode of operation		Single-acting				
Mounting position		Any				
Position sensing		None				
Cushioning		No cushioning				
Swivel angle	[°]	92				
Closing direction		Closes to the right				

Size		0360	0480	0720	0960
Pneumatic connection		G1/4			
Shaft connection depth	[mm]	29.5	38.5	38.5	48.5
Note regarding the end-position adjusting range		Optionally one end position adjustable			
Design		Scotch yoke system			
Mode of operation		Single-acting			
Mounting position		Any			
Position sensing		None			
Cushioning		No cushioning			
Swivel angle	[°]	92			
Closing direction		Closes to the right			

Quarter turn actuators DAPS with handwheel, single-acting

Technical data

Operating and environmental conditions						
Size		0053	0090	0120	0180	0240
Nominal operating pressure	[bar]	5.6				
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]				
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)				
Ambient temperature	[°C]	–20 ... +80				
Corrosion resistance class CRC[1)]		2				
Connection to process valve as per standard		ISO 5211				
Valve connection conforms to standard		VDI/VDE 3845 (NAMUR)				
Safety Integrity Level (SIL)		Up to SIL 2 High Demand mode				
		Up to SIL 2 Low Demand mode				

Size		0360	0480	0720	0960
Nominal operating pressure	[bar]	5.6			
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]			
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)			
Ambient temperature	[°C]	–20 ... +80			
Corrosion resistance class CRC[1)]		2			
Connection to process valve as per standard		ISO 5211			
Valve connection conforms to standard		VDI/VDE 3845 (NAMUR)			
Safety Integrity Level (SIL)		Up to SIL 2 High Demand mode			
		Up to SIL 2 Low Demand mode			

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

ATEX	
ATEX category for gas	II 2G
Explosion ignition protection type for gas	Ex h IIC T6 ... T3 Gb X
ATEX category for dust	II 2D
Explosion ignition protection type for dust	Ex h IIIC T85°C ... T200°C Db X
Explosion-proof temperature	-50°C <= Ta <= +60°C
CE marking (see declaration of conformity)	To EU Explosion Protection Directive (ATEX)

Materials		
Quarter turn actuators		Material number
Housing	Wrought aluminium alloy	–
Cover	Wrought aluminium alloy	–
Shaft	High-alloy steel	1.4305
External screws	High-alloy steel	–
Seals	FPM, NBR, PUR	–
Note on materials	Conforms to RoHS	–

Technical data

Pressure ranges [bar]

Type	Connection pressure	Operating pressure
Size 0053		
DAPS-0053-090-RS1-F0507-MW	2.8	2.8 ... 8.4
DAPS-0053-090-RS2-F0507-MW	3.5	3.5 ... 8.4
DAPS-0053-090-RS3-F0507-MW	4.2	4.2 ... 8.4
DAPS-0053-090-RS4-F0507-MW	5.6	5.6 ... 8.4
Size 0090		
DAPS-0090-090-RS1-F0710-MW	2.8	2.8 ... 8.4
DAPS-0090-090-RS2-F0710-MW	3.5	3.5 ... 8.4
DAPS-0090-090-RS3-F0710-MW	4.2	4.2 ... 8.4
DAPS-0090-090-RS4-F0710-MW	5.6	5.6 ... 8.4
Size 0120		
DAPS-0120-090-RS1-F0710-MW	2.8	2.8 ... 8.4
DAPS-0120-090-RS2-F0710-MW	3.5	3.5 ... 8.4
DAPS-0120-090-RS3-F0710-MW	4.2	4.2 ... 8.4
DAPS-0120-090-RS4-F0710-MW	5.6	5.6 ... 8.4
Size 0180		
DAPS-0180-090-RS1-F0710-MW	2.8	2.8 ... 8.4
DAPS-0180-090-RS2-F0710-MW	3.5	3.5 ... 8.4
DAPS-0180-090-RS3-F0710-MW	4.2	4.2 ... 8.4
DAPS-0180-090-RS4-F0710-MW	5.6	5.6 ... 8.4
Size 0240		
DAPS-0240-090-RS1-F1012-MW	2.8	2.8 ... 8.4
DAPS-0240-090-RS2-F1012-MW	3.5	3.5 ... 8.4
DAPS-0240-090-RS3-F1012-MW	4.2	4.2 ... 8.4
DAPS-0240-090-RS4-F1012-MW	5.6	5.6 ... 8.4
Size 0360		
DAPS-0360-090-RS1-F1012-MW	2.8	2.8 ... 8.4
DAPS-0360-090-RS2-F1012-MW	3.5	3.5 ... 8.4
DAPS-0360-090-RS3-F1012-MW	4.2	4.2 ... 8.4
DAPS-0360-090-RS4-F1012-MW	5.6	5.6 ... 8.4

Type	Connection pressure	Operating pressure
Size 0480		
DAPS-0480-090-RS1-F1012-MW	2.8	2.8 ... 8.4
DAPS-0480-090-RS1-F14-MW	2.8	2.8 ... 8.4
DAPS-0480-090-RS2-F1012-MW	3.5	3.5 ... 8.4
DAPS-0480-090-RS2-F14-MW	3.5	3.5 ... 8.4
DAPS-0480-090-RS3-F1012-MW	4.2	4.2 ... 8.4
DAPS-0480-090-RS3-F14-MW	4.2	4.2 ... 8.4
DAPS-0480-090-RS4-F1012-MW	5.6	5.6 ... 8.4
DAPS-0480-090-RS4-F14-MW	5.6	5.6 ... 8.4
Size 0720		
DAPS-0720-090-RS1-F12-MW	2.8	2.8 ... 8.4
DAPS-0720-090-RS1-F14-MW	2.8	2.8 ... 8.4
DAPS-0720-090-RS2-F12-MW	3.5	3.5 ... 8.4
DAPS-0720-090-RS2-F14-MW	3.5	3.5 ... 8.4
DAPS-0720-090-RS3-F12-MW	4.2	4.2 ... 8.4
DAPS-0720-090-RS3-F14-MW	4.2	4.2 ... 8.4
DAPS-0720-090-RS4-F12-MW	5.6	5.6 ... 8.4
DAPS-0720-090-RS4-F14-MW	5.6	5.6 ... 8.4
Size 0960		
DAPS-0960-090-RS1-F1216-MW	2.8	2.8 ... 8.4
DAPS-0960-090-RS1-F14-MW	2.8	2.8 ... 8.4
DAPS-0960-090-RS2-F1216-MW	3.5	3.5 ... 8.4
DAPS-0960-090-RS2-F14-MW	3.5	3.5 ... 8.4
DAPS-0960-090-RS3-F1216-MW	4.2	4.2 ... 8.4
DAPS-0960-090-RS3-F14-MW	4.2	4.2 ... 8.4
DAPS-0960-090-RS4-F1216-MW	5.6	5.6 ... 8.4
DAPS-0960-090-RS4-F1216-MW	5.6	5.6 ... 8.4

Air consumption [l/cycle 0°-90°-0°] at 6 bar

Size	
0053	2.1
0090	3.9
0120	5.6
0180	7
0240	10.5

Size	
0360	14
0480	19.6
0720	29.4
0960	41.3

Weight [g]

Size	
0053	4500
0090	6800
0120	9000
0180	11700
0240	15200

Size	
0360	19500
0480	28100
0720	38800
0960	50600

Quarter turn actuators DAPS with handwheel, single-acting

Technical data

Actual torque [Nm] as a function of operating pressure [bar], spring strength and swivel angle [°]

Spring strength	Spring torque [Nm]			Operating pressure [bar]														
				2.5			2.8			3			3.5			4.2		
	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°
DAPS-0053																		
1	17.5	13	26.5	20.2	9.3	11.2	26.5	13	17.5	29.6	14.9	20.6	37.5	19.5	28.5	48.5	26	39.5
2	22	16.5	33	–			–			25.1	11.8	14.1	33	16.5	22	44	23.1	33
3	26	19.5	40	–			–			–			29	13	15	40	19.5	26
4	35	26	53	–			–			–			–			–		
DAPS-0090																		
1	30	22.5	45	34.3	16.1	19.3	45	22.5	30	50.4	25.7	35.4	63.8	33.8	48.8	82.5	45	67.5
2	37.5	28.1	56.3	–			–			42.9	20.1	24.1	56.3	28.1	37.5	75.1	39.4	56.3
3	45	33.9	67.5	–			–			–			48.8	22.6	26.3	67.5	33.9	45
4	60	45	90	–			–			–			–			–		
DAPS-0120																		
1	40	30	60	45.7	21.4	25.7	60	30	40	67.1	34.3	47.1	85	45	65	110	60	90
2	50	37.5	75	–			–			57.1	26.8	32.1	75	37.5	50	100	52.5	75
3	60	45	90	–			–			–			65	30	35	90	45	60
4	80	60	120	–			–			–			–			–		
DAPS-0180																		
1	60	45	90	68.6	32.1	38.6	90	45	60	100.7	51.4	70.7	127.5	67.5	97.5	165	90	135
2	75	56.3	112.5	–			–			85.7	40.2	48.2	112.5	56.3	75	150	78.8	112.5
3	90	67.5	135	–			–			–			97.5	45	52.5	135	67.5	90
4	120	90	180	–			–			–			–			–		
DAPS-0240																		
1	80	60	120	91.4	42.9	51.4	120	60	80	134.3	68.6	94.3	170	90	130	220	120	180
2	100	75	150	–			–			114.3	53.6	64.3	150	75	100	200	105	150
3	120	90	180	–			–			–			130	60	70	180	90	120
4	160	120	240	–			–			–			–			–		

Note

The operating torque of the drive must not be higher than the maximum permissible torque listed in ISO 5211, with reference to the size of the mounting flange and of the coupling.

Technical data

Actual torque [Nm] as a function of operating pressure [bar], spring strength and swivel angle [°]

Spring strength	Spring torque [Nm]			Operating pressure [bar]														
				5			5.6			6			7			8		
	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°
DAPS-0053																		
1	17.5	13	26.5	–			–			–			–			–		
2	22	16.5	33	56.6	30.6	45.6	66	36.3	55	–			–			–		
3	26	19.5	40	52.6	26.9	38.6	62	32.5	48	68.3	36.2	54.3	84	45.5	70	99.7	54.8	85.7
4	35	26	53	43.6	20.4	25.6	53	26	35	59.3	29.7	41.3	75	39	57	90.7	48.3	72.7
DAPS-0090																		
1	30	22.5	45	–			–			–			–			–		
2	37.5	28.1	56.3	96.5	52.2	77.7	112.6	61.9	93.8	–			–			–		
3	45	33.9	67.5	88.9	46.8	66.4	105	56.5	82.5	115.7	63	93.2	142.5	79.1	120	169.3	95.2	146.8
4	60	45	90	73.9	35.4	43.9	90	45	60	100.7	51.4	70.7	127.5	67.5	97.5	154.3	83.6	124.3
DAPS-0120																		
1	40	30	60	–			–			–			–			–		
2	50	37.5	75	128.6	69.6	103.6	150	82.5	125	–			–			–		
3	60	45	90	118.6	62.1	88.6	140	75	110	154.3	83.6	124.3	190	105	160	225.7	126.4	195.7
4	80	60	120	98.6	47.1	58.6	120	60	80	134.3	68.6	94.3	170	90	130	205.7	111.4	165.7
DAPS-0180																		
1	60	45	90	–			–			–			–			–		
2	75	56.3	112.5	192.9	104.5	155.4	225	123.8	187.5	–			–			–		
3	90	67.5	135	177.9	93.2	132.9	210	112.5	165	231.4	125.4	186.4	285	157.5	240	338.6	189.6	293.6
4	120	90	180	147.9	70.7	87.9	180	90	120	201.4	102.9	141.4	255	135	195	308.6	167.1	248.6
DAPS-0240																		
1	80	60	120	–			–			–			–			–		
2	100	75	150	257.1	139.3	207.1	300	165	250	–			–			–		
3	120	90	180	237.1	124.3	177.1	280	150	220	308.6	167.1	248.6	380	210	320	451.4	252.9	391.4
4	160	120	240	197.1	94.3	117.1	240	120	160	268.6	137.1	188.6	340	180	260	411.4	222.9	331.4

Torque for size at 5.6 bar and swivel angle 0°

Note

The operating torque of the drive must not be higher than the maximum permissible torque listed in ISO 5211, with reference to the size of the mounting flange and of the coupling.

Quarter turn actuators DAPS with handwheel, single-acting

Technical data

Actual torque [Nm] as a function of operating pressure [bar], spring strength and swivel angle [°]

Spring strength	Spring torque [Nm]			Operating pressure [bar]														
				2.5			2.8			3			3.5			4.2		
	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°
DAPS-0360																		
1	120	90	180	137.1	64.3	77.1	180	90	120	201.4	102.9	141.4	255	135	195	330	180	270
2	150	112.5	225	–			–			171.4	80.4	96.4	225	112.5	150	300	157.5	225
3	180	135	270	–			–			–			195	90	105	270	135	180
4	240	180	360	–			–			–			–			–		
DAPS-0480																		
1	160	120	240	182.9	85.7	102.9	240	120	160	268.6	137.1	188.6	340	180	260	440	240	360
2	200	150	300	–			–			228.6	107.1	128.6	300	150	200	400	210	300
3	240	180	360	–			–			–			260	120	140	360	180	240
4	320	240	480	–			–			–			–			–		
DAPS-0720																		
1	240	180	360	274.3	128.6	154.3	360	180	240	402.9	205.7	282.9	510	270	390	660	360	540
2	300	225	450	–			–			342.9	160.7	192.9	450	225	300	600	315	450
3	360	270	540	–			–			–			390	180	210	540	270	360
4	480	360	720	–			–			–			–			–		
DAPS-0960																		
1	320	240	480	366	171	206	480	240	320	537	274	377	680	360	520	880	480	720
2	400	300	600	–			–			457	214	257	600	300	400	800	420	600
3	480	360	720	–			–			–			520	240	280	720	360	480
4	640	480	960	–			–			–			–			–		

Note

The operating torque of the drive must not be higher than the maximum permissible torque listed in ISO 5211, with reference to the size of the mounting flange and of the coupling.

Technical data

Actual torque [Nm] as a function of operating pressure [bar], spring strength and swivel angle [°]

Spring strength	Spring torque [Nm]			Operating pressure [bar]														
				5			5.6			6			7			8		
	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°	0°	50°	90°
DAPS-0360																		
1	120	90	180	–			–			–			–			–		
2	150	112.5	225	385.7	208.9	310.7	450	247.5	375	–			–			–		
3	180	135	270	355.7	186.4	265.7	420	225	330	462.9	250.7	372.9	570	315	480	677.1	379.3	587.1
4	240	180	360	295.7	141.4	175.7	360	180	240	402.9	205.7	282.9	510	270	390	617.1	334.3	497.1
DAPS-0480																		
1	160	120	240	–			–			–			–			–		
2	200	150	300	514.3	278.6	414.3	600	330	500	–			–			–		
3	240	180	360	474.3	248.6	354.3	560	300	440	617.1	334.3	497.1	760	420	640	902.9	505.7	782.9
4	320	240	480	394.3	188.6	234.3	480	240	320	537.1	274.3	377.1	680	360	520	822.9	445.7	662.9
DAPS-0720																		
1	240	180	360	–			–			–			–			–		
2	300	225	450	771.4	417.9	621.4	900	495	750	–			–			–		
3	360	270	540	711.4	372.9	531.4	840	450	660	925.7	501.4	745.7	1140	630	960	1354	758.6	1,174
4	480	360	720	591.4	282.9	351.4	720	360	480	805.7	411.4	565.7	1020	540	780	1234	668.6	994.3
DAPS-0960																		
1	320	240	480	–			–			–			–			–		
2	400	300	600	1029	557	829	1200	660	1000	–			–			–		
3	480	360	720	949	497	709	1120	600	880	1234	669	994	1520	840	1280	1806	1011	1566
4	640	480	960	789	377	469	960	480	640	1074	549	754	1360	720	1040	1646	891	1326

Torque for size at 5.6 bar and swivel angle 0°

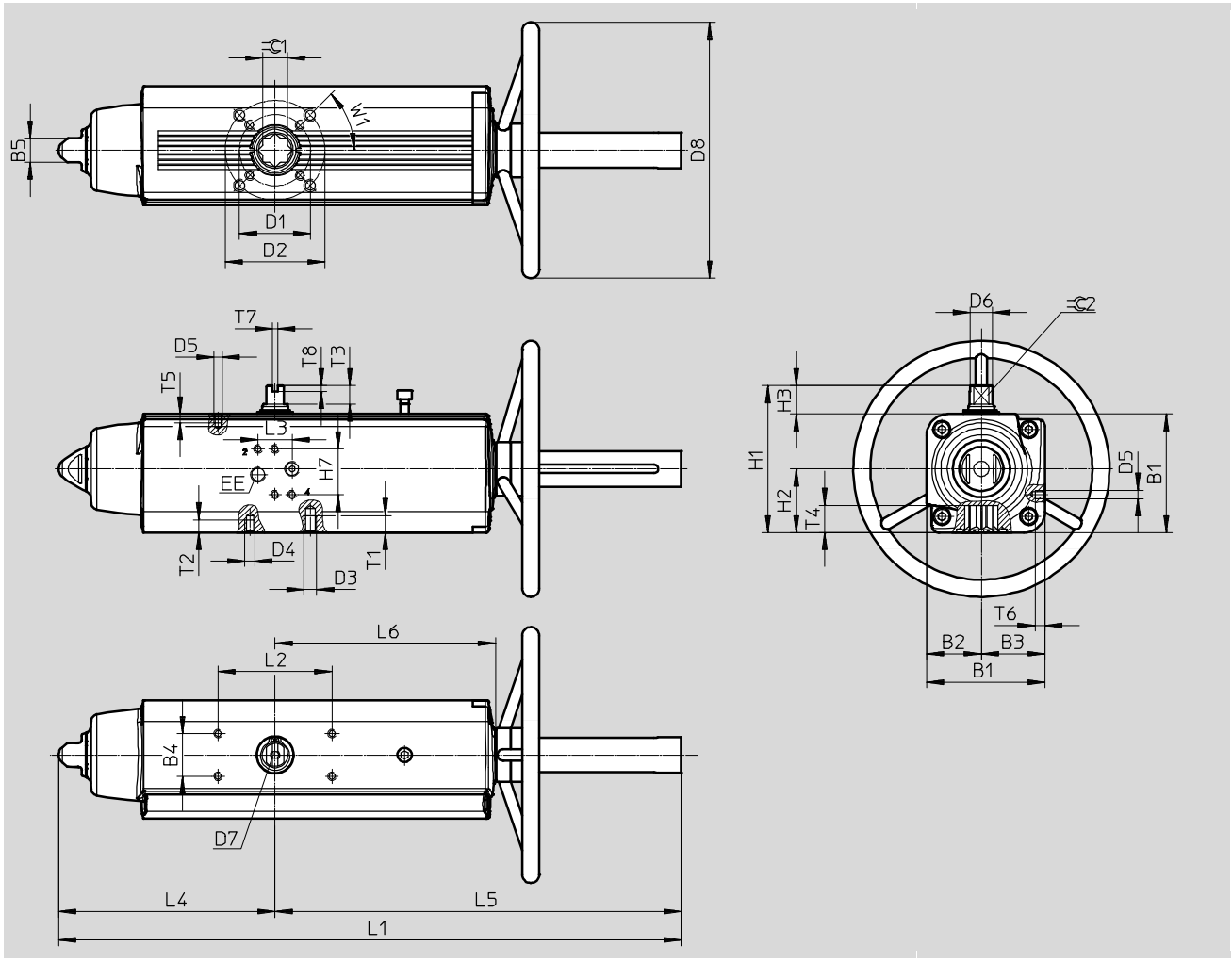
Note

The operating torque of the drive must not be higher than the maximum permissible torque listed in ISO 5211, with reference to the size of the mounting flange and of the coupling.

Quarter turn actuators DAPS with handwheel, single-acting

Technical data

Dimensions Download CAD data ➔ **www.festo.com**



Technical data

Size	B1 ±0.4	B2	B3	B4	B5	D1 ∅	D2 ∅	D3	D4	D5	D6 ∅	D7
DAPS-0053-...-F0507-...	83.3	38.5	44.8	30	17	50	70	M8	M6	M5	16.2	M6x12
DAPS-0090-...-F0710-...	107.5	51	56.5	30	22	70	102	M10	M8	M5	20.2	M6x12
DAPS-0120-...-F0710-...	111.1	51	60.1	30	22	70	102	M10	M8	M5	22.5	M6x12
DAPS-0180-...-F0710-...	118	56	62	30	22	70	102	M10	M8	M5	25.5	M6x12
DAPS-0240-...-F1012-...	134.9	62	72.9	30	27	102	125	M12	M10	M5	29	M6x12
DAPS-0360-...-F1012-...	148	69.5	78.5	30	27	102	125	M12	M10	M5	31.8	M6x12
DAPS-0480-...-F1012-...	168	74.5	93.5	30	27	102	125	M12	M10	M5	36.5	M6x12
DAPS-0480-...-F14-...	168	74.5	93.5	30	27	–	140	M16	–	M5	36.5	M6x12
DAPS-0720-...-F12-...	186	84.5	101.5	30	36	–	125	M12	–	M5	41	M6x12
DAPS-0720-...-F14-...	186	84.5	101.5	30	36	–	140	M16	–	M5	41	M6x12
DAPS-0960-...-F14-...	207.7	93	114.7	30	36	–	140	M16	–	M5	46	M6x12
DAPS-0960-...-F1216-...	207.7	93	114.7	30	36	125	165	M20	M12	M5	46	M6x12

Size	D8 ∅	EE	H1	H2	H3	H7	L1 ±2	L2	L3	L4	L5	L6
DAPS-0053-...-F0507-...	180	G1/8	103.3	44.8	20±0.4	32	437.5	80	24	152.1	285.4	154.8
DAPS-0090-...-F0710-...	220	G1/8	137.5	56.5	30±0.4	32	545.1	80	24	196.8	348.3	183.5
DAPS-0120-...-F0710-...	220	G1/8	141.1	60.1	30±0.4	32	568.6	80	24	204.8	363.9	199.1
DAPS-0180-...-F0710-...	300	G1/8	148	62	30±0.4	32	646.1	80	24	237	409.1	220.8
DAPS-0240-...-F1012-...	300	G1/4	164.9	72.9	30±0.4	32	685.2	80	24	260.2	425	236.4
DAPS-0360-...-F1012-...	350	G1/4	178	78.5	30±0.4	32	822.8	80	24	306.6	516.2	282.3
DAPS-0480-...-F1012-...	350	G1/4	198	93.5	30±0.5	32	854.6	80	24	324.1	530.5	297.1
DAPS-0480-...-F14-...	350	G1/4	198	93.5	30±0.5	32	854.6	80	24	324.1	530.5	297.1
DAPS-0720-...-F12-...	400	G1/4	216	101.5	30±0.5	32	1052.4	80	24	399	653.4	365.6
DAPS-0720-...-F14-...	400	G1/4	216	101.5	30±0.5	32	1052.4	80	24	399	653.4	365.6
DAPS-0960-...-F14-...	400	G1/4	237.7	114.7	30±0.8	32	1084	80	24	414	670	382.9
DAPS-0960-...-F1216-...	400	G1/4	237.7	114.7	30±0.8	32	1084	80	24	414	670	382.9

Size	T1	T2	T3	T4	T5	T6	T7 +0.1	T8 +0.3	⌯ 1 H11	⌯ 2 h11	W1
DAPS-0053-...-F0507-...	12	9	13	19.3±0.4	6	7	4	4	17	12	45°
DAPS-0090-...-F0710-...	15	12	16	24.8±0.4	6	7	4	4	22	15	45°
DAPS-0120-...-F0710-...	15	12	17	24.8±0.4	6	7	4	4	22	15	45°
DAPS-0180-...-F0710-...	15	12	19	24.3±0.4	6	7	4	4	22	19	45°
DAPS-0240-...-F1012-...	18	15	19	29.5±0.4	6	7	4	4	27	19	45°
DAPS-0360-...-F1012-...	18	15	19.5	29.5±0.4	6	7	4	4	27	22	45°
DAPS-0480-...-F1012-...	18	15	19.5	38.5±0.5	6	7	4	4	36	24	45°
DAPS-0480-...-F14-...	24	–	19.5	38.5±0.5	6	7	4	4	36	24	45°
DAPS-0720-...-F12-...	18	–	19.5	38.5±0.5	6	7	4	4	36	27	45°
DAPS-0720-...-F14-...	24	–	19.5	38.5±0.5	6	7	4	4	36	27	45°
DAPS-0960-...-F14-...	24	–	18.5	48.5±0.8	6	7	4	4	46	32	45°
DAPS-0960-...-F1216-...	30	18	18.5	48.5±0.8	6	7	4	4	46	32	45°

Quarter turn actuators DAPS with handwheel, single-acting

Technical data

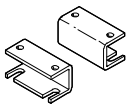
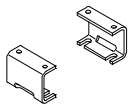
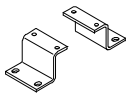
Ordering data – Single-acting

Part No.	Type
Size 0053	
8005026	**DAPS-0053-090-RS1-F0507-MW**
8005027	**DAPS-0053-090-RS2-F0507-MW**
8005028	**DAPS-0053-090-RS3-F0507-MW**
8005029	**DAPS-0053-090-RS4-F0507-MW**
Size 0090	
8005030	**DAPS-0090-090-RS1-F0710-MW**
8005031	**DAPS-0090-090-RS2-F0710-MW**
8005032	**DAPS-0090-090-RS3-F0710-MW**
8005033	**DAPS-0090-090-RS4-F0710-MW**
Size 0120	
8005034	**DAPS-0120-090-RS1-F0710-MW**
8005035	**DAPS-0120-090-RS2-F0710-MW**
8005036	**DAPS-0120-090-RS3-F0710-MW**
8005037	**DAPS-0120-090-RS4-F0710-MW**
Size 0180	
8005038	**DAPS-0180-090-RS1-F0710-MW**
8005039	**DAPS-0180-090-RS2-F0710-MW**
8005040	**DAPS-0180-090-RS3-F0710-MW**
8005041	**DAPS-0180-090-RS4-F0710-MW**
Size 0240	
8005042	**DAPS-0240-090-RS1-F1012-MW**
8005043	**DAPS-0240-090-RS2-F1012-MW**
8005044	**DAPS-0240-090-RS3-F1012-MW**
8005045	**DAPS-0240-090-RS4-F1012-MW**
Size 0360	
8005046	**DAPS-0360-090-RS1-F1012-MW**
8005047	**DAPS-0360-090-RS2-F1012-MW**
8005048	**DAPS-0360-090-RS3-F1012-MW**
8005049	**DAPS-0360-090-RS4-F1012-MW**

Part No.	Type
Size 0480	
8005050	**DAPS-0480-090-RS1-F1012-MW**
8005051	**DAPS-0480-090-RS1-F14-MW**
8005052	**DAPS-0480-090-RS2-F1012-MW**
8005053	**DAPS-0480-090-RS2-F14-MW**
8005054	**DAPS-0480-090-RS3-F1012-MW**
8005055	**DAPS-0480-090-RS3-F14-MW**
8005056	**DAPS-0480-090-RS4-F1012-MW**
8005057	**DAPS-0480-090-RS4-F14-MW**
Size 0720	
8005058	**DAPS-0720-090-RS1-F12-MW**
8005059	**DAPS-0720-090-RS1-F14-MW**
8005060	**DAPS-0720-090-RS2-F12-MW**
8005061	**DAPS-0720-090-RS2-F14-MW**
8005062	**DAPS-0720-090-RS3-F12-MW**
8005063	**DAPS-0720-090-RS3-F14-MW**
8005064	**DAPS-0720-090-RS4-F12-MW**
8005065	**DAPS-0720-090-RS4-F14-MW**
Size 0960	
8005067	**DAPS-0960-090-RS1-F1216-MW**
8005066	**DAPS-0960-090-RS1-F14-MW**
8005069	**DAPS-0960-090-RS2-F1216-MW**
8005068	**DAPS-0960-090-RS2-F14-MW**
8005071	**DAPS-0960-090-RS3-F1216-MW**
8005070	**DAPS-0960-090-RS3-F14-MW**
8005073	**DAPS-0960-090-RS4-F1216-MW**
8005072	**DAPS-0960-090-RS4-F14-MW**

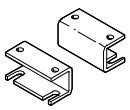
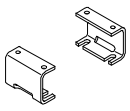
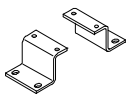
Accessories

Ordering data – Adapter kits for mounting the sensor boxes SRBP, SRAP

	Size	Dimensions [mm]	CRC[1]	Part No.	Type
DAPS – Double-acting					
	DAPS-0015- ... -F03	20x30x80	3	**568275**	**DASB-P1-HA-SB**
	DAPS-0015- ... -F04				
	DAPS-0030- ... -F0305				
	DAPS-0030- ... -F04				
	DAPS-0060- ... -F04				
	DAPS-0060- ... -F0507				
	DAPS-0106- ... -F0507				
	DAPS-0180- ... -F0710	30x30x80		**572418**	**DASB-P1-HB-SB**
	DAPS-0240- ... -F0710				
	DAPS-0360- ... -F0710				
	DAPS-0480- ... -F1012				
	DAPS-0720- ... -F1012				
	DAPS-0960- ... -F12				
	DAPS-0960- ... -F14				
	DAPS-1440- ... -F12				
	DAPS-1440- ... -F14				
	DAPS-1920- ... -F14				
	DAPS-1920- ... -F1216				
	DAPS-2880- ... -F16	30x30x130		**572419**	**DASB-P1-HC-SB**
	DAPS-3840- ... -F16				
	DAPS-5760- ... -F25				
	DAPS-8000- ... -F25				

1) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Ordering data – Adapter kits for mounting the sensor boxes SRBP, SRAP

	Size	Dimensions [mm]	CRC[1]	Part No.	Type
DAPS – Single-acting					
	DAPS-0015- ... -F0305	20x30x80	3	**568275**	**DASB-P1-HA-SB**
	DAPS-0015- ... -F04				
	DAPS-0030- ... -F04				
	DAPS-0030- ... -F0507				
	DAPS-0053- ... -F0507				
	DAPS-0090- ... -F0710	30x30x80		**572418**	**DASB-P1-HB-SB**
	DAPS-0120- ... -F0710				
	DAPS-0180- ... -F0710				
	DAPS-0240- ... -F1012				
	DAPS-0360- ... -F1012				
	DAPS-0480- ... -F12				
	DAPS-0480- ... -F14				
	DAPS-0720- ... -F12				
	DAPS-0720- ... -F14				
	DAPS-0960- ... -F14				
	DAPS-0960- ... -F1216				
	DAPS-1440- ... -F16	30x30x130		**572419**	**DASB-P1-HC-SB**
	DAPS-1920- ... -F16				
	DAPS-2880- ... -F16				
	DAPS-4000- ... -F25				

1) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

06 Ball valves and ball valve units

Brass and stainless steel ball valves as single components or ready assembled with a pneumatic actuator

VZBA

Ball valves

+ 2-way, stainless steel
+ 3-way, stainless steel
+ Thread and weld-on ends

➔ page 495, 511

VZBD

Ball valves

+ 2-way, stainless steel
+ Long weld-on ends and clamp ferrules
+ Electroplated surface

➔ page 523

VZBF

Ball valves

+ With flange to ANSI B16.5 class 150
+ 2-way, stainless steel

➔ page 530

VAPB

Ball valves

+ 2-way, brass

➔ page 542

QH

Ball valves

+ 2-way, manual, brass

➔ page 563

VZBA

Ball valve actuator units

+ 2-way, stainless steel
+ 3-way, stainless steel

➔ page 576, 590

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Ball valve actuator units VZPR, 2-way, brass 607

Ball valves, mechanically actuated

VZB..., VAPB, QH

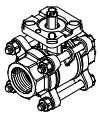
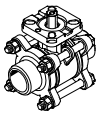
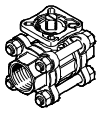
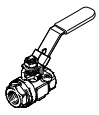
Overview, configuration and ordering
➔ **www.festo.com/catalogue/vzba**

Additional information, support and user documentation
➔ **www.festo.com/sp/vzba**

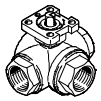
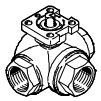
+ Process valve connection: thread, weld-on end, clamp ferrule, ring housing with threaded flange
+ Nominal width DN 8 ... 100, ½"...8"
+ Nominal pressure process valve PN 0 ... 63
+ Flange hole pattern to ISO 5211
+ Corrosion-resistant and acid-resistant versions

Ball valves

Key features and product range overview

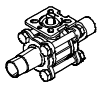
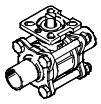
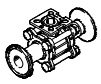
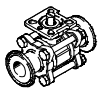
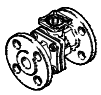
Version		Type	Process valve connection	Nominal width DN	Flange hole pattern to ISO 5211	Process valve nominal pressure PN	➔ Page/Internet
Stainless steel	**2-way, with pipe thread to EN 10226-1**						
		VZBA-...-GG	Rp1/4	8	F0304	63	495
			Rp3/8	10	F0304		
			Rp1/2	15	F0304		
			Rp3/4	20	F0304		
			Rp1	25	F0405		
			Rp1 1/4	32	F0405		
			Rp1 1/2	40	F0507		
			Rp2	50	F0507		
			Rp2 1/2	65	F0710		
			Rp3	80	F0710		
			Rp4	100	F10		
	2-way, with welded ends to EN 12627						
		VZBA-...-WW	Welded end	8	F0304	63	495
				10	F0304		
				15	F0304		
				20	F0304		
				25	F0405		
				32	F0405		
				40	F0507		
				50	F0507		
				65	F0710		
				80	F0710		
				100	F10		
	2-way, with pipe thread to ASME B1.20.1						
		VZBE	1/4 NPT	8	F0304	63	501
			3/8 NPT	10	F0304		
			1/2 NPT	15	F0304		
			3/4 NPT	20	F0304		
			1 NPT	25	F0405		
			1 1/4 NPT	32	F0405		
			1 1/2 NPT	40	F0507		
			2 NPT	50	F0507		
			2 1/2 NPT	65	F0710		
			3 NPT	80	F0710		
			4 NPT	100	F1012		
	2-way, manual, with pipe thread to ASME B1.20.1						
		VZBE	1/4 NPT	8	–	63	507
			3/8 NPT	10			
			1/2 NPT	15			
			3/4 NPT	20			
			1 NPT	25			
			1 1/4 NPT	32			
			1 1/2 NPT	40			
			2 NPT	50			
			2 1/2 NPT	65			
			3 NPT	80			

Key features and product range overview

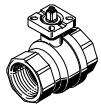
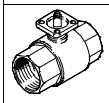
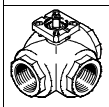
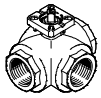
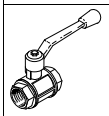
Version		Type	Process valve connection	Nominal width DN	Flange hole pattern to ISO 5211	Process valve nominal pressure PN	→ Page/Internet
Stainless steel	**3-way, L-shaped bore, with pipe thread to EN 10226-1**						
		VZBA	Rp1/4	8	F0304	63	511
			Rp3/8	10	F0304		
			Rp1/2	15	F0304		
			Rp3/4	20	F0405		
			Rp1	25	F0405		
			Rp1 1/4	32	F0405		
			Rp1 1/2	40	F0405		
			Rp2	50	F05		
	3-way, T-shaped bore, with pipe thread to EN 10226-1						
		VZBA	Rp1/4	8	F0304	63	511
			Rp3/8	10	F0304		
			Rp1/2	15	F0304		
			Rp3/4	20	F0405		
			Rp1	25	F0405		
			Rp1 1/4	32	F0405		
			Rp1 1/2	40	F0405		
			Rp2	50	F05		
	3-way, L-shaped bore, with pipe thread to ASME B1.20.1						
		VZBE	1/4 NPT	8	F04	–	517
			3/8 NPT	10	F04		
			1/2 NPT	15	F04		
			3/4 NPT	20	F04		
			1 NPT	25	F05		
			1 1/4 NPT	32	F05		
			1 1/2 NPT	40	F0507		
			2 NPT	50	F0507		
	3-way, T-shaped bore, with pipe thread to ASME B1.20.1						
		VZBE	1/4 NPT	8	F04	–	517
			3/8 NPT	10	F04		
			1/2 NPT	15	F04		
			3/4 NPT	20	F04		
			1 NPT	25	F05		
			1 1/4 NPT	32	F05		
			1 1/2 NPT	40	F0507		
			2 NPT	50	F0507		

Ball valves

Key features and product range overview

Version		Type	Process valve connection	Nominal width DN	Flange hole pattern to ISO 5211	Process valve nominal pressure PN	→ Page/Internet
Stainless steel	**2-way, with extended welded ends to EN 1127**						
		VZBD	Welded end	15	F0304	16	523
				20	F0304		
				25	F0405		
				32	F0405		
				40	F0507		
				50	F0507		
				65	F0710		
	2-way, with extended welded ends to ASME-BPE						
		VZBD	Welded end	15	F0304	16	523
				20	F0304		
				25	F0405		
				40	F0507		
				50	F0507		
				65	F0710		
				80	F0710		
				100	F1012		
	2-way, with clamp ferrule to DIN 32676-B						
		VZBD	Clamp ferrule	15	F0304	16	523
				20	F0304		
				25	F0405		
				32	F0405		
				40	F0507		
				50	F0507		
				65	F0710		
	2-way, with clamp ferrule to ASME-BPE						
		VZBD	Clamp ferrule	15	F0304	16	523
				20	F0304		
				25	F0405		
				40	F0507		
				50	F0507		
				65	F0710		
				80	F0710		
				100	F1012		
	2-way, with flange to ANSI B16.5 class 150						
		VZBF	Ring housing with threaded flange	1/2"	F0304	20	530
				3/4"	F0304		
				1"	F0405		
				1 1/4"	F0405		
				1 1/2"	F0507		
				2"	F0507		
				2 1/2"	F0710		
				3"	F0710		
				4"	F1012		
				6"	F1012		
				8"	F14		
	2-way, compact design with flange to DIN EN 1092-1						
		VZBC-...-FF	Ring housing with threaded flange	15	F0304	40	536
				20	F0304		
				25	F0405		
				32	F0405		
				40	F0507		
				50	F0507		
				65	F07	16	
				80	F07		
				100	F0710		

Key features and product range overview

Version		Type	Process valve connection	Nominal width DN	Flange hole pattern to ISO 5211	Process valve nominal pressure PN	→ Page/Internet
Brass	**2-way, with pipe thread to EN 10226-1**						
		VAPB	Rp1/4	8	F03	40	542
			Rp3/8	10	F03		
			Rp1/2	15	F03		
			Rp3/4	20	F03		
			Rp1	25	F0304		
			Rp1 1/4	32	F0405		
			Rp1 1/2	40	F0405	25	
			Rp2	50	F05		
			Rp2 1/2	65	F07		
	2-way, with pipe thread to EN 10226-1						
		VZBM	Rp1/4	8	F03	40	547
			Rp3/8	10	F03		
			Rp1/2	15	F03	25	
			Rp3/4	20	F03		
			Rp1	25	F03		
			Rp1 1/4	32	F03		
			Rp1 1/2	40	F0305		
			Rp2	50	F0305		
	3-way, L-shaped bore, with pipe thread to EN 10226-1						
		VZBM	Rp1/4	8	F03	40	553
			Rp3/8	10	F03		
			Rp1/2	15	F03		
			Rp3/4	20	F03		
			Rp1	25	F0304		
			Rp1 1/4	32	F0405		
			Rp1 1/2	40	F0405	25	
			Rp2	50	F05		
	3-way, T-shaped bore, with pipe thread to EN 10226-1						
		VZBM	Rp1/4	8	F03	40	553
			Rp3/8	10	F03		
			Rp1/2	15	F03		
			Rp3/4	20	F03		
			Rp1	25	F0304		
			Rp1 1/4	32	F0405		
			Rp1 1/2	40	F0405	25	
			Rp2	50	F05		
	2-way, manual, with pipe thread to EN 10226-1						
		VZBM	Rp1/4	8	–	50	559
			Rp3/8	10			
			Rp1/2	15			
			Rp3/4	20			
			Rp1	25		40	
			Rp1 1/4	32			
			Rp1 1/2	40			
	2-way, manual, with pipe thread to ISO 228-1						
		QH	G1/4	10	–	–	564
			G3/8	10			
			G1/2	15			
			G3/4	20			
			G1	25			
			G1 1/2	40			

Ball valves VZBA, 2-way

Type codes

VZBA	–	1/4"	–	G	G	–	63	–	T	–	22	–	F0304	–	V4	V4	–	T

Type	
VZBA	Ball valve

Nominal width DN	
1/4"	DN8
3/8"	DN10
1/2"	DN15
3/4"	DN20
1"	DN25
11/4"	DN32
11/2"	DN40
2"	DN50
21/2"	DN65
3"	DN80
4"	DN100

Connection type 1	
G	Pipe thread to EN 10226-1
W	Welded end to EN 12627

Connection type 2	
G	Pipe thread to EN 10226-1
W	Welded end to EN 12627

Process valve nominal pressure PN	
63	63 bar

Design	
T	Three parts

Valve function	
22	2/2-way

Flanged connection to ISO 5211	
F0304	Hole pattern 03 and 04
F0405	Hole pattern 04 and 05
F0507	Hole pattern 05 and 07
F07	Hole pattern 07
F0710	Hole pattern 07 and 10
F10	Hole pattern 10

Housing material	
V4	Stainless steel 1.4408

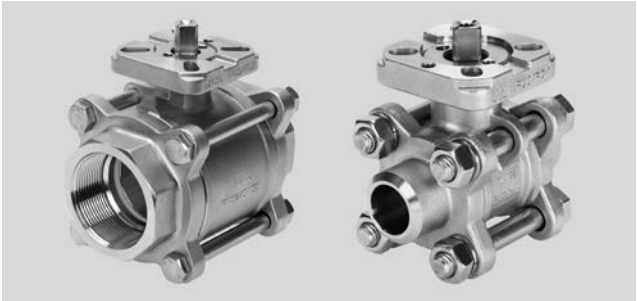
Shut-off element material	
V4	Stainless steel 1.4408

Sealing material	
T	PTFE

Technical data

- Connecting thread Rp1/4 ... Rp4
- Flow rate 7 ... 1414 m³/h

- With pipe thread or welded end



General technical data

Process valve pipe thread connection		Rp1/4	Rp3/8	Rp1/2	Rp3/4	Rp1	Rp11/4	Rp11/2	Rp2	Rp21/2	Rp3	Rp4
Nominal width DN		8	10	15	20	25	32	40	50	65	80	100
Valve function		2/2										
Design		2-way ball valve										
Sealing principle		Soft										
Actuation type		Mechanical										
Manual override		None										
Switching position indication		Slot direction = flow direction										
Flow direction		Reversible										
Type of mounting		In-line installation										
Assembly position		Any										
Based on standard		ISO 5211										
		EN 10226-1										
		EN 558										
		EN 12627										
Actuating torque	[Nm]	6	6	10	14	17	24	29	44	78	112	140
Internal diameter	[mm]	10	12	16	20	25	32	38	50	65	80	100
Flow rate Kv	[m³/h]	7	10	19.4	45.6	71.5	105	170	275	507	905	1414

Operating and environmental conditions

Process valve pipe thread connection	Rp1/4	Rp3/8	Rp1/2	Rp3/4	Rp1	Rp11/4	Rp11/2	Rp2	Rp21/2	Rp3	Rp4
Medium[1]	Compressed air to ISO 8573-1:2010 [-:-:-]										
	Neutral liquids										
	Inert gases										
	Water – no water vapour										
Process valve nominal pressure	PN 63										
Temperature of medium [°C]	–10 ... +200										
Corrosion resistance class CRC[2]	3										
CE marking (see declaration of conformity) ➔ www.festo.com	–					To EU Pressure Equipment Directive					

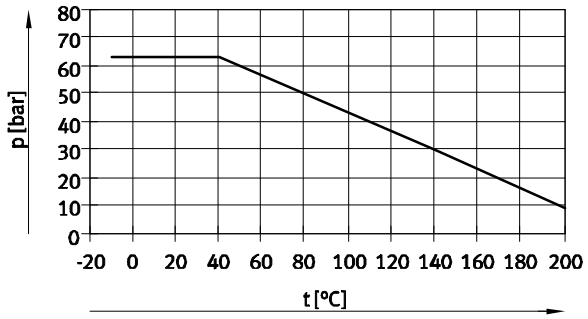
1) Other media on request
2) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Ball valves VZBA, 2-way

Technical data

Materials		Material number
Housing	High-alloy stainless steel	1.4408
Ball		1.4408
Shaft		1.4401
Seals	PTFE	
	PTFE-reinforced	
Note on materials	RoHS compliant	
	Contains paint-wetting impairment substances	

Permissible operating pressure p as a function of the temperature of the medium t

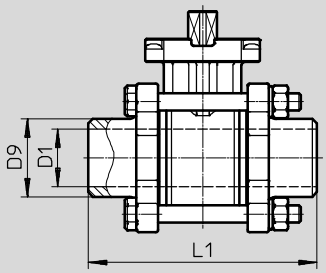


Technical data

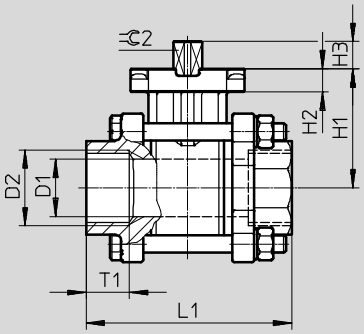
Dimensions

Download CAD data ➔ **www.festo.com**

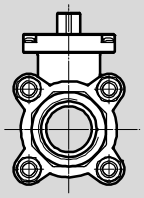
VZBA- ... -WW- ...



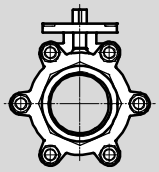
VZBA- ... -GG- ...

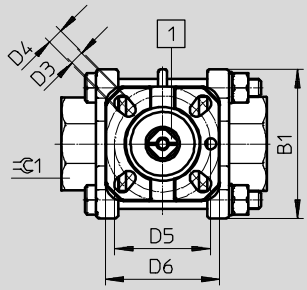


VZBA-1/4 – VZBA-21/2



VZBA-3 – VZBA-4





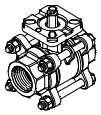
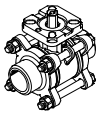
1 Switching position indication: the slot direction corresponds to the flow direction.

Type	B1	D1 ∅ ±0.15	D2	D3 ∅	D4 ∅	D5 ∅	D6 ∅	D9 ∅	H1	H2	H3 ±0.5	L1 ±2	T1	⫷1	⫷2 −0.1
VZBA-1/4"-GG-63-T-22-F0304-V4V4T	42	10	Rp1/4	6	6	36	42	–	40	9	8.5	65	14.5	24	9
VZBA-3/8"-GG-63-T-22-F0304-V4V4T	42	12	Rp3/8	6	6	36	42	–	40	9	8.5	65	14.5	24	9
VZBA-1/2"-GG-63-T-22-F0304-V4V4T	49	16	Rp1/2	6	6	36	42	–	40	9	8.5	75	16	29	9
VZBA-3/4"-GG-63-T-22-F0304-V4V4T	54	20	Rp3/4	6	6	36	42	–	44	9	8.5	80	17	35	9
VZBA-1"-GG-63-T-22-F0405-V4V4T	60.5	25	Rp1	6	7	42	50	–	52	10	11.5	90	19	41	11
VZBA-11/4"-GG-63-T-22-F0405-V4V4T	71.5	32	Rp11/4	6	7	42	50	–	58	10	11.5	110	23	50	11
VZBA-11/2"-GG-63-T-22-F0507-V4V4T	80.5	38	Rp11/2	7	9	50	70	–	68	13	15.5	120	24	58	14
VZBA-2"-GG-63-T-22-F0507-V4V4T	99.5	50	Rp2	7	9	50	70	–	77	13	15.5	140	25.8	73	14
VZBA-21/2"-GG-63-T-22-F0710-V4V4T	127	65	Rp21/2	9	11	70	102	–	98	13	18.5	185	34	90	17
VZBA-3"-GG-63-T-22-F0710-V4V4T	191	80	Rp3	9	11	70	102	–	110	13	18.5	205	36	105	17
VZBA-4"-GG-63-T-22-F10-V4V4T	222	100	Rp4	–	11	–	102	–	138	16	23.5	240	38	135	22
VZBA-1/4"-WW-63-T-22-F0304-V4V4T	42	10	–	6	6	36	42	16	40	9	8.5	70	–	–	9
VZBA-3/8"-WW-63-T-22-F0304-V4V4T	42	12	–	6	6	36	42	18	40	9	8.5	70	–	–	9
VZBA-1/2"-WW-63-T-22-F0304-V4V4T	49	16	–	6	6	36	42	22	40	9	8.5	75	–	–	9
VZBA-3/4"-WW-63-T-22-F0304-V4V4T	54	20	–	6	6	36	42	28	44	9	8.5	90	–	–	9
VZBA-1"-WW-63-T-22-F0405-V4V4T	60.5	25	–	6	7	42	50	35	52	10	11.5	100	–	–	11
VZBA-11/4"-WW-63-T-22-F0405-V4V4T	71.5	32	–	6	7	42	50	44	58	10	11.5	110	–	–	11
VZBA-11/2"-WW-63-T-22-F0507-V4V4T	80.5	38	–	7	9	50	70	50	68	13	15.5	125	–	–	14
VZBA-2"-WW-63-T-22-F0507-V4V4T	99.5	50	–	7	9	50	70	62	77	13	15.5	150	–	–	14
VZBA-21/2"-WW-63-T-22-F0710-V4V4T	127	65	–	9	11	70	102	77	98	13	18.5	190	–	–	17
VZBA-3"-WW-63-T-22-F0710-V4V4T	191	80	–	9	11	70	102	91	110	13	18.5	220	–	–	17
VZBA-4"-WW-63-T-22-F10-V4V4T	222	100	–	–	11	–	102	117	138	16	23.5	270	–	–	22

Ball valves VZBA, 2-way

Technical data

Ordering data

	Version	Process valve connection	Weight [g]	Part No.	Type
	With pipe thread	Rp1/4	650	**1686625**	**VZBA-1/4"-GG-63-T-22-F0304-V4V4T**
		Rp3/8	650	**1686632**	**VZBA-3/8"-GG-63-T-22-F0304-V4V4T**
		Rp1/2	650	**1686636**	**VZBA-1/2"-GG-63-T-22-F0304-V4V4T**
		Rp3/4	850	**1686639**	**VZBA-3/4"-GG-63-T-22-F0304-V4V4T**
		Rp1	1250	**1686640**	**VZBA-1"-GG-63-T-22-F0405-V4V4T**
		Rp11/4	1850	**1686641**	**VZBA-11/4"-GG-63-T-22-F0405-V4V4T**
		Rp11/2	2800	**1686643**	**VZBA-11/2"-GG-63-T-22-F0507-V4V4T**
		Rp2	4550	**1686646**	**VZBA-2"-GG-63-T-22-F0507-V4V4T**
		Rp21/2	9200	**1686648**	**VZBA-21/2"-GG-63-T-22-F0710-V4V4T**
		Rp3	13950	**1686651**	**VZBA-3"-GG-63-T-22-F0710-V4V4T**
		Rp4	22300	**1686654**	**VZBA-4"-GG-63-T-22-F10-V4V4T**
	With welded ends	Welded end	650	**1686656**	**VZBA-1/4"-WW-63-T-22-F0304-V4V4T**
			650	**1686662**	**VZBA-3/8"-WW-63-T-22-F0304-V4V4T**
			650	**1686663**	**VZBA-1/2"-WW-63-T-22-F0304-V4V4T**
			850	**1686665**	**VZBA-3/4"-WW-63-T-22-F0304-V4V4T**
			1250	**1686689**	**VZBA-1"-WW-63-T-22-F0405-V4V4T**
			1850	**1686696**	**VZBA-11/4"-WW-63-T-22-F0405-V4V4T**
			2800	**1686697**	**VZBA-11/2"-WW-63-T-22-F0507-V4V4T**
			4550	**1686699**	**VZBA-2"-WW-63-T-22-F0507-V4V4T**
			9200	**1686702**	**VZBA-21/2"-WW-63-T-22-F0710-V4V4T**
			13950	**1686704**	**VZBA-3"-WW-63-T-22-F0710-V4V4T**
			22300	**1686705**	**VZBA-4"-WW-63-T-22-F10-V4V4T**

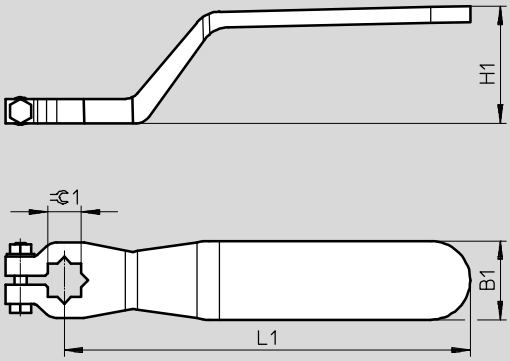
Accessories

Hand lever VAOH

Information on materials:
- High-alloy stainless steel
- Free of copper and PTFE
- Contains paint-wetting impairment substances

Dimensions and ordering data

Download CAD data ➔ **www.festo.com**



For connection	B1 ±5	H1 ±5	L1 ±10	⫃1 ±0.5	Weight [g]	Part No.	Type
Rp1/4 ... Rp3/4	21	36	120	9	100	**542702**	**VAOH-9-H9**
Rp1 ... Rp11/4	26	40	140	11	200	**542703**	**VAOH-11-H9**
Rp11/2 ... Rp2	31	46	180	14	300	**542704**	**VAOH-14-H9**
Rp21/2 ... Rp3	36	55	240	17	450	**542705**	**VAOH-17-H9**
Rp4	36	70	280	22	750	**542706**	**VAOH-22-H9**

Ball valves VZBE, 2-way

Type codes

VZBE – 1/4 – T – 63 – T – 2 – F0304 – – V15 V15

Type	
VZBE	Ball valve

Nominal width DN	
1/4	1/4"
3/8	3/8"
1/2	1/2"
3/4	3/4"
1	1"
11/4	11/4"
11/2	11/2"
2	2"
21/2	21/2"
3	3"
4	4"

Process valve connection type	
T	NPT female thread

Nominal pressure	
63	63 bar

Design	
T	Three parts

Valve function	
2	2/2-way

Flanged connection to ISO 5211	
F0304	Hole pattern 03 and 04
F0405	Hole pattern 04 and 05
F0507	Hole pattern 05 and 07
F0710	Hole pattern 07 and 10
F1012	Hole pattern 10 and 12

Actuation type	
–	Via drive

Housing material	
V15	Stainless steel ASTM A351–CF8M/1.4408

Shut-off element material	
V15	Stainless steel ASTM A351–CF8M/1.4408
V16	Stainless steel ASTM A240–316/1.4401

Technical data

Function

- Connecting thread 1/4 NPT ... 4 NPT
- Flow rate 5.1 ... 435.2 m^3/h

- 2-way ball valve made from stainless steel
- NPT version

General technical data

Process valve connection		1/4 NPT	3/8 NPT	1/2 NPT	3/4 NPT	1" NPT	11/4 NPT	11/2 NPT	2" NPT	21/2 NPT	3" NPT	4" NPT
Nominal width DN		8	10	15	20	25	32	40	50	65	80	100
Valve function		2/2										
Design		2-way ball valve										
Sealing principle		Soft										
Actuation type		Mechanical										
Switching position indication		Slot direction = flow direction										
Flow direction		Reversible										
Type of mounting		In-line installation										
Mounting position		Any										
Based on standard		ISO 5211										
		ASME B1.20.1										
Breakaway torque at differential pressure, nominal pressure, process valve PN	[Nm]	7	7	7	9	15	23	30	44	79	140	170
Inside diameter	[mm]	11.6	12.5	15	20	25	32	38	50	63	76	96
Flow rate Kv	[m^3/h]	5.1	5.8	8.5	15.6	25.1	42.6	61.6	111.8	181.9	264.5	435.2

Operating and environmental conditions

Process valve connection	1/4 NPT	3/8 NPT	1/2 NPT	3/4 NPT	1" NPT	11/4 NPT	11/2 NPT	2" NPT	21/2 NPT	3" NPT	4" NPT
Nominal pressure of process valve PN	63										
Temperature of medium [°C]	–20 ... +200										
Medium[1]	Compressed air to ISO 8573-1:2010 [-:-:-]										
	Inert gases										
	Water										
	Vapour										
	Neutral fluids										
Certification	CRN										
Corrosion resistance class CRC[2]	4										
CE marking (see declaration of conformity)[3]	–					To EU Pressure Equipment Directive					

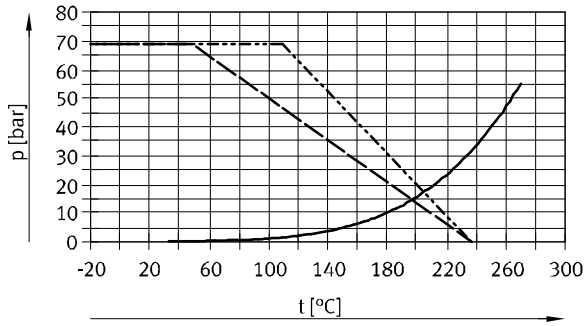
1) Other media on request
2) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (→ also FN 940082) using appropriate media.
3) Additional information www.festo.com/sp → Certificates.

Ball valves VZBE, 2-way

Technical data

Materials			Material number
Housing		Stainless steel casting	1.4408
Ball	21/2NPT ... 4NPT	High-alloy stainless steel	1.4401
	1/4NPT ... 2NPT	Stainless steel casting	1.4408
Shaft		High-alloy stainless steel	1.4401
Seat seal		PTFE	
Seals		FPM	
		PTFE	
Note on materials		RoHS compliant	
		Contains paint-wetting impairment substances	

Permissible operating pressure p as a function of the temperature of the medium t

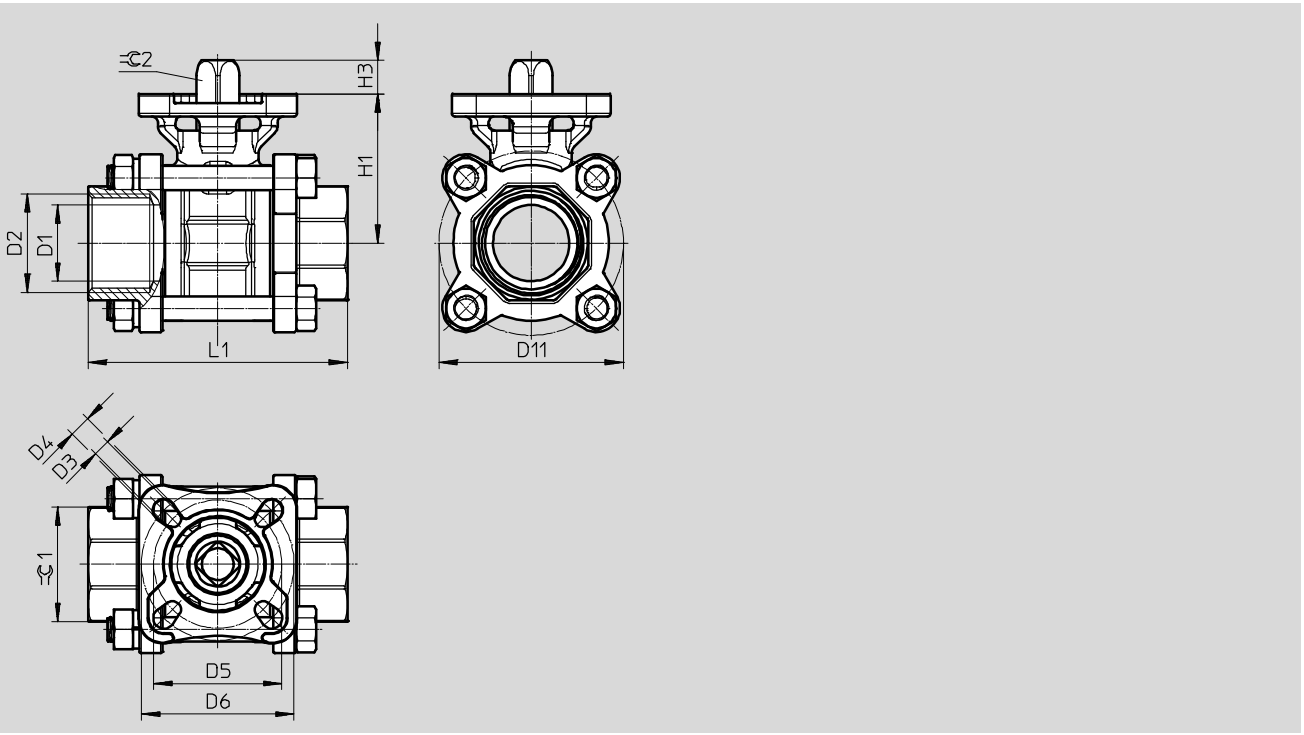


Saturated water vapour
PTFE-reinforced
PTFE, modified

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**



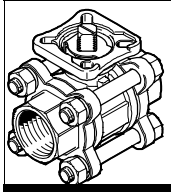
Type	D1 ∅	D2	D3 ∅	D4 ∅	D5 ∅	D6 ∅	D11 ∅	H1	H3	L1 ±2	⌀C1	⌀C2
VZBE-1/4-...	11.6	1/4 NPT	5.5	5.5	36	42	38	35.3	7.5	65	19.2	9
VZBE-3/8-...	12.5	3/8 NPT	5.5	5.5	36	42	38	35.3	7.5	65	22.5	9
VZBE-1/2-...	15	1/2 NPT	5.5	5.5	36	42	44	36.4	7.1	65	26	9
VZBE-3/4-...	20	3/4 NPT	5.5	5.5	36	42	52	39.5	7.3	75	32	9
VZBE-1-...	25	1" NPT	5.5	7	42	50	60.5	49	11	85	37.5	11
VZBE-11/4-...	32	11/4 NPT	5.5	7	42	50	74	54.2	11.5	101	48	11
VZBE-11/2-...	38	11/2 NPT	7	9	50	70	86	64.6	12.4	112	55	14
VZBE-2-...	50	2" NPT	7	9	50	70	102.5	72.5	13.6	130	67	14
VZBE-21/2-...	63	21/2 NPT	9	11	70	102	129	92	16.3	162	85	17
VZBE-3-...	76	3" NPT	9	11	70	102	146.5	100	16.3	188	100	17
VZBE-4-...	96	4" NPT	11	13	102	125	186.4	130	20.5	224	130	22

Ball valves VZBE, 2-way

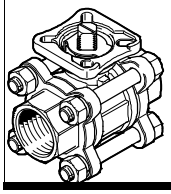
Technical data

☆ Core product range

Ordering data

	Process valve connection	Weight [g]	Part No.	Type
	1/2 NPT	560	☆ **4809117**[1]	**VZBE-1/2-T-63-T-2-F0304-V15V15**
	3/4 NPT	660	☆ **4809118**[1]	**VZBE-3/4-T-63-T-2-F0304-V15V15**
	1 NPT	1000	☆ **4809119**[1]	**VZBE-1-T-63-T-2-F0405-V15V15**
	1 1/2 NPT	2420	☆ **4809121**[1]	**VZBE-11/2-T-63-T-2-F0507-V15V15**
	2 NPT	3520	☆ **4809122**[1]	**VZBE-2-T-63-T-2-F0507-V15V15**

Ordering data

	Process valve connection	Weight [g]	Part No.	Type
	1/4 NPT	460	**4836917**[1]	**VZBE-1/4-T-63-T-2-F0304-V15V15**
	3/8 NPT	460	**4836918**[1]	**VZBE-3/8-T-63-T-2-F0304-V15V15**
	1 1/4 NPT	1600	**4809120**[1]	**VZBE-11/4-T-63-T-2-F0405-V15V15**
	2 1/2 NPT	5050	**4809123**[1]	**VZBE-21/2-T-63-T-2-F0710-V15V16**
	3 NPT	7750	**4809124**[1]	**VZBE-3-T-63-T-2-F0710-V15V16**
	4 NPT	15800	**4809126**[1]	**VZBE-4-T-63-T-2-F1012-V15V16**

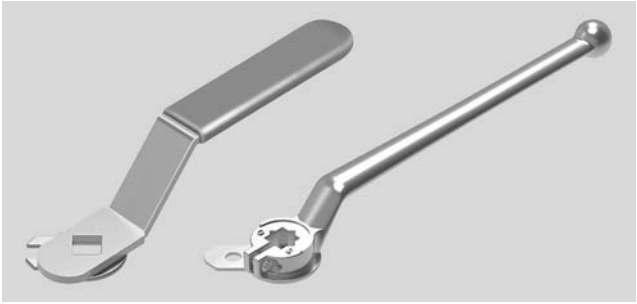
1) Festo is only a retailer of this product, not the manufacturer.

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Accessories

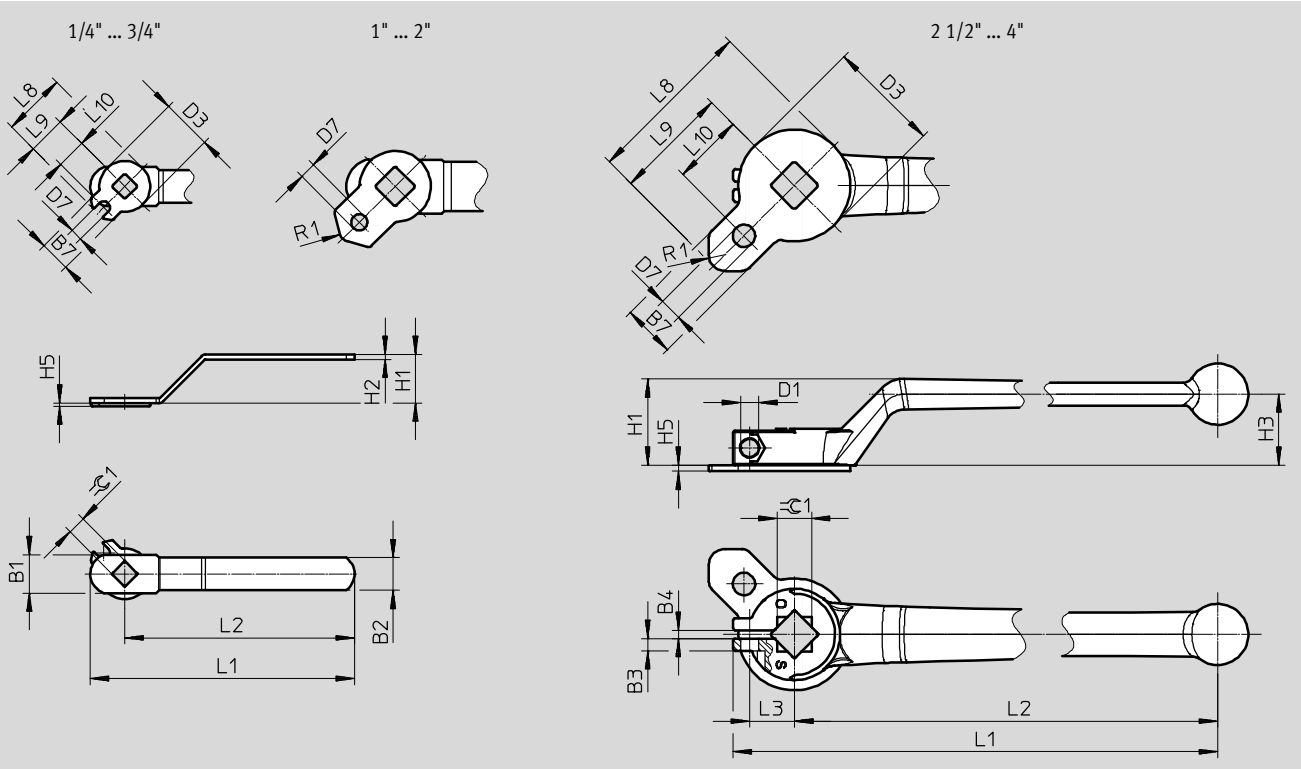
Hand lever VAOH

- High-alloy stainless steel
- Free of copper and PTFE
- RoHS compliant
- Contains paint-wetting impairment substances
- Lockable



Dimensions and ordering data

Download CAD data ➔ **www.festo.com**



Dimensions and ordering data

For connection	B1	B2	B3	B4	B7	D1 ∅	D3 ∅	D7 ∅	H1	H2	H3	H5	L1
1/4" ... 3/4"	19	16	–	–	15.8	–	25	6	24	2.5	–	1.5	130
1" ... 1 1/4"	22.5	20	–	–	17.8	–	29	7	26	4	–	1.8	160
1 1/2" ... 2"	26.5	24	–	–	26	–	35	8	34.5	5	–	2	194
2 1/2" ... 3"	–	–	6	4	27.5	9	55	11	42.5	–	35	3	355
4"	–	–	6	4	27.5	9	70	12	42.5	–	38	3	355

For connection	L2	L3	L8	L9	L10	R1	⬡1 ±0.5	CRC[2]	Weight [g]	Part No.	Type
1/4" ... 3/4"	113	–	33.5	21.1	18	–	9	3	40	**4895383**[1]	**VAOH-F7-9-H9-A-22**
1" ... 1 1/4"	138.5	–	41.5	27	21	6	11	3	100	**4895384**[1]	**VAOH-F7-11-H9-A-22**
1 1/2" ... 2"	170	–	54	36.5	25	5	14	3	180	**4895385**[1]	**VAOH-F7-14-H9-A-22**
2 1/2" ... 3"	325	22	83.6	56.1	35	8	17	3	850	**4895386**[1]	**VAOH-F7-17-H9-A-22**
4"	325	22	102.7	67.7	51	7	22	3	900	**4895387**[1]	**VAOH-F7-22-H9-A-22**

1) Festo is only a retailer of this product, not the manufacturer.
2) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Ball valves VZBE, manual

Type codes

VZBE	–	1/4	–	T	–	63	–	D	–	2	–		–	M	–	V15	V15

Type	
VZBE	Ball valve

Nominal width DN	
1/4	1/4"
3/8	3/8"
1/2	1/2"
3/4	3/4"
1	1"
11/4	11/4"
11/2	11/2"
2	2"
21/2	21/2"
3	3"

Process valve connection type	
T	NPT female thread

Nominal pressure	
63	63 bar

Design	
D	Two parts

Valve function	
2	2/2-way

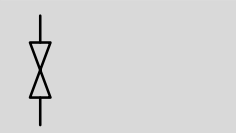
Flanged connection to ISO 5211	
–	Without

Actuation type	
M	With hand lever

Housing material	
V15	Stainless steel ASTM A351–CF8M/1.4408

Shut-off element material	
V15	Stainless steel ASTM A351–CF8M/1.4408
V16	Stainless steel ASTM A240–316/1.4401

Technical data



- Connecting thread 1/4NPT ... 3NPT
- Flow rate 5 ... 264.5 m^3/h

- 2-way ball valve made from stainless steel
- With hand lever
- NPT version

General technical data

Process valve connection		1/4NPT	3/8NPT	1/2NPT	3/4NPT	1NPT	11/4NPT	11/2NPT	2NPT	21/2NPT	3NPT
Nominal width DN		8	10	15	20	25	32	40	50	65	80
Valve function		2/2									
Design		2-way ball valve									
Sealing principle		Soft									
Actuation type		Mechanical									
Switching position indication		Slot direction = flow direction									
Flow direction		Reversible									
Type of mounting		In-line installation									
Mounting position		Any									
Based on standard		ASME B1.20.1									
Breakaway torque at differential pressure, nominal pressure, process valve PN	[Nm]	3.5	4	5.5	7.5	11	15	20	40	60	85
Internal diameter	[mm]	11.6	12.5	15	20	25	32	38	50	63	76
Flow rate Kv	[m^3/h]	5	5.8	8.5	15.6	25.1	42.6	61.6	111.8	181.9	264.5

Operating and environmental conditions

Process valve connection	1/4NPT	3/8NPT	1/2NPT	3/4NPT	1NPT	11/4NPT	11/2NPT	2NPT	21/2NPT	3NPT
Medium[1]	Compressed air to ISO 8573-1:2010 [-:-:-]									
	Inert gases									
	Water									
	Vapour									
	Neutral liquids									
Process valve nominal pressure PN	63									
Temperature of medium [°C]	–20 ... +200									
Certification	CRN									
Corrosion resistance class CRC[2]	3									
CE marking (see declaration of conformity)[3]	–					To EU Pressure Equipment Directive				

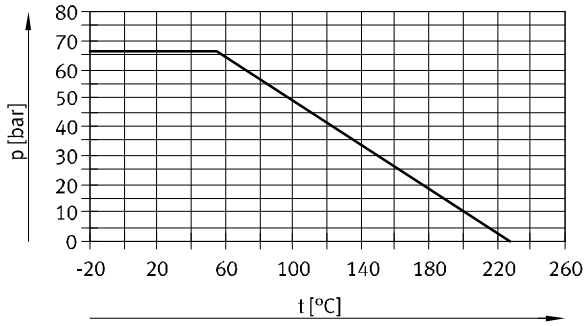
1) Other media on request
2) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.
3) Additional information www.festo.com/sp ➔ Certificates.

Ball valves VZBE, manual

Technical data

Materials		Material number
Housing	Stainless steel casting	1.4408
Ball	Stainless steel casting	1.4408
	High-alloy stainless steel	1.4401
Shaft	High-alloy stainless steel	1.4401
Seals	PTFE	
Note on materials	RoHS compliant	
	Contains paint-wetting impairment substances	

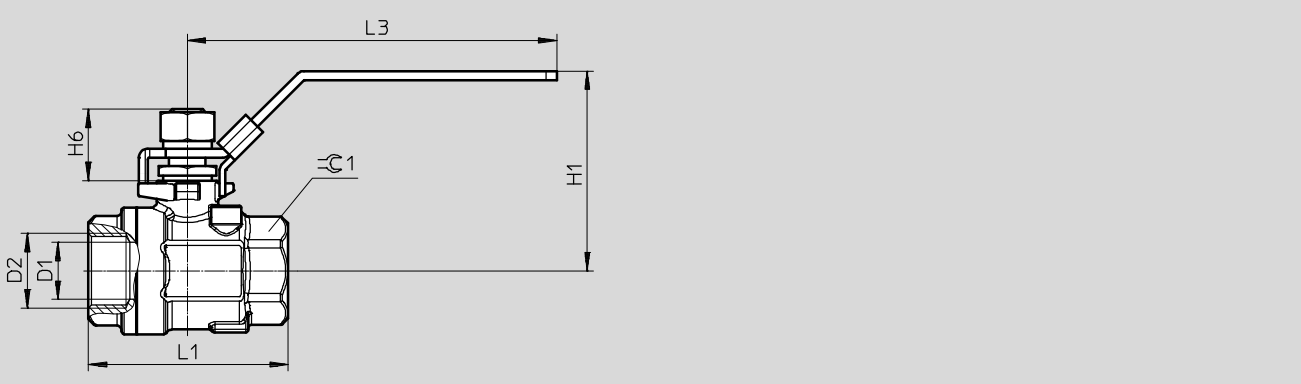
Permissible operating pressure p as a function of the temperature of the medium t



Technical data

Dimensions

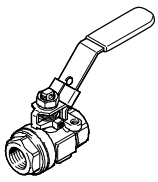
Download CAD data ➔ **www.festo.com**



Type	D1 ∅	D2	H1	H6	L1 ±2	L3	⌀1
VZBE-1/4-...	11.6	1/4 NPT	58.5	18.5	50.8	99.5	19
VZBE-3/8-...	12.5	3/8 NPT	58.5	18.5	50.8	99.5	22.5
VZBE-1/2-...	15	1/2 NPT	60.5	18.8	58	99.5	26
VZBE-3/4-...	20	3/4 NPT	63	23.4	65.6	123	32
VZBE-1-...	25	1 NPT	79.5	26.2	78.7	149	38
VZBE-11/4-...	32	11/4 NPT	86	23.6	90	149	48
VZBE-11/2-...	38	11/2 NPT	101.7	28.2	105	190	54.8
VZBE-2-...	50	2 NPT	109.3	23.4	124	190	67
VZBE-21/2-...	63	21/2 NPT	140	39.4	146	247	85
VZBE-3-...	76	3 NPT	148.5	39.4	163.2	247	100

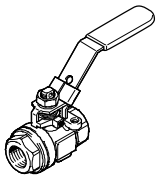
☆ Core product range

Ordering data



Process valve connection	Weight [g]	Part No.	Type
1/2 NPT	300	☆ **4745216**[1]	**VZBE-1/2-T-63-D-2-M-V15V15**
3/4 NPT	500	☆ **4745218**[1]	**VZBE-3/4-T-63-D-2-M-V15V15**
1 NPT	800	☆ **4745219**[1]	**VZBE-1-T-63-D-2-M-V15V15**
1 1/2 NPT	1800	☆ **4745221**[1]	**VZBE-11/2-T-63-D-2-M-V15V15**
2 NPT	2700	☆ **4745223**[1]	**VZBE-2-T-63-D-2-M-V15V15**

Ordering data



Process valve connection	Weight [g]	Part No.	Type
1/4 NPT	200	**4745214**[1]	**VZBE-1/4-T-63-D-2-M-V15V15**
3/8 NPT	200	**4745215**[1]	**VZBE-3/8-T-63-D-2-M-V15V15**
1 1/4 NPT	1100	**4745220**[1]	**VZBE-11/4-T-63-D-2-M-V15V15**
2 1/2 NPT	5600	**4745224**[1]	**VZBE-21/2-T-63-D-2-M-V15V16**
3 NPT	7500	**4745225**[1]	**VZBE-3-T-63-D-2-M-V15V16**

1) Festo is only a retailer of this product, not the manufacturer.

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Ball valves VZBA, 3-way

Type codes

VZBA	–	1/4"	–	G	G	G	–	63	–	32T	–	F0304	–	V4	V4	T

Type

VZBA	Ball valve

Nominal width DN

1/4"	DN8
3/8"	DN10
1/2"	DN15
3/4"	DN20
1"	DN25
11/4"	DN32
11/2"	DN40
2"	DN50

Connection type 1

G	Pipe thread to EN 10226-1

Connection type 2

G	Pipe thread to EN 10226-1

Connection type 3

G	Pipe thread to EN 10226-1

Process valve nominal pressure PN

63	63 bar

Valve function

32T	3/2-way, T-shaped bore
32L	3/2-way, L-shaped bore

Flanged connection to ISO 5211

F0304	Hole pattern 03 and 04
F0405	Hole pattern 04 and 05
F0507	Hole pattern 05 and 07

Housing material

V4	Stainless steel 1.4408

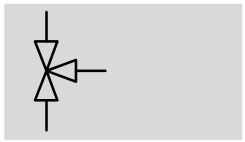
Shut-off element material

V4	Stainless steel 1.4408

Sealing material

T	PTFE-reinforced

Technical data



- With L-shaped bore or T-shaped bore

- Connecting thread Rp1/4 ... Rp2
- Flow rate 4.5 ... 100 m^3/h

General technical data

Process valve connection			Rp1/4	Rp3/8	Rp1/2	Rp3/4	Rp1	Rp11/4	Rp11/2	Rp2
Nominal width DN			8	10	15	20	25	32	40	50
Valve function			3/2							
Design			3-way ball valve							
Sealing principle			Soft							
Actuation type			Mechanical							
Manual override			None							
Switching position indication			Slot direction = flow direction							
Flow direction			Reversible							
Type of mounting			In-line installation							
Mounting position			Any							
Based on standard			EN 10226-1							
			ISO 5211							
Actuating torque		[Nm]	13	13	13	18	22	35	42	68
Internal diameter		[mm]	11.6	12.7	12.7	16	20	25.4	31.8	38.1
Flow rate Kv	Type L[1]	[m^3/h]	4.5	4.5	4.7	5.1	11.8	19.6	33.2	53.7
	Type T[2]	[m^3/h]	8	8	8.3	8.3	22.4	36.5	62	100
	Type T[3]	[m^3/h]	4.5	4.5	4.8	4.8	10.9	18	30	48.8
Flow rate tolerance Kv		[%]	± 20							
Product weight		[g]	700	700	700	1000	1600	2800	3800	7400

1) Ball with L-shaped bore
2) Ball with T-shaped bore, straight flow
3) Ball with T-shaped bore, flow around corner

Operating and environmental conditions

Process valve connection		Rp1/4	Rp3/8	Rp1/2	Rp3/4	Rp1	Rp11/4	Rp11/2	Rp2
Medium[1]		Compressed air to ISO 8573-1:2010 [-:-:-]							
		Neutral liquids							
		Inert gases							
		Water – no water vapour							
Process valve nominal pressure		PN 63							
Temperature of medium	[°C]	–10 ... +200							
Corrosion resistance class CRC[2]		3							
CE marking (see declaration of conformity) ➔ www.festo.com		–					To EU Pressure Equipment Directive		

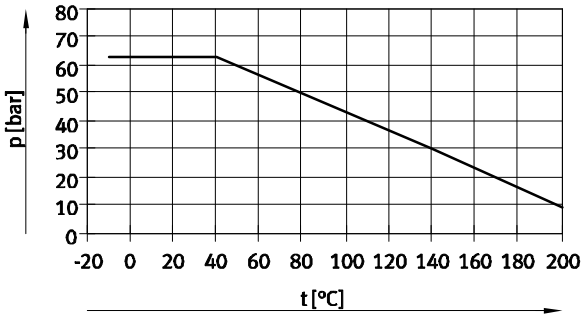
1) Other media on request
2) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Ball valves VZBA, 3-way

Technical data

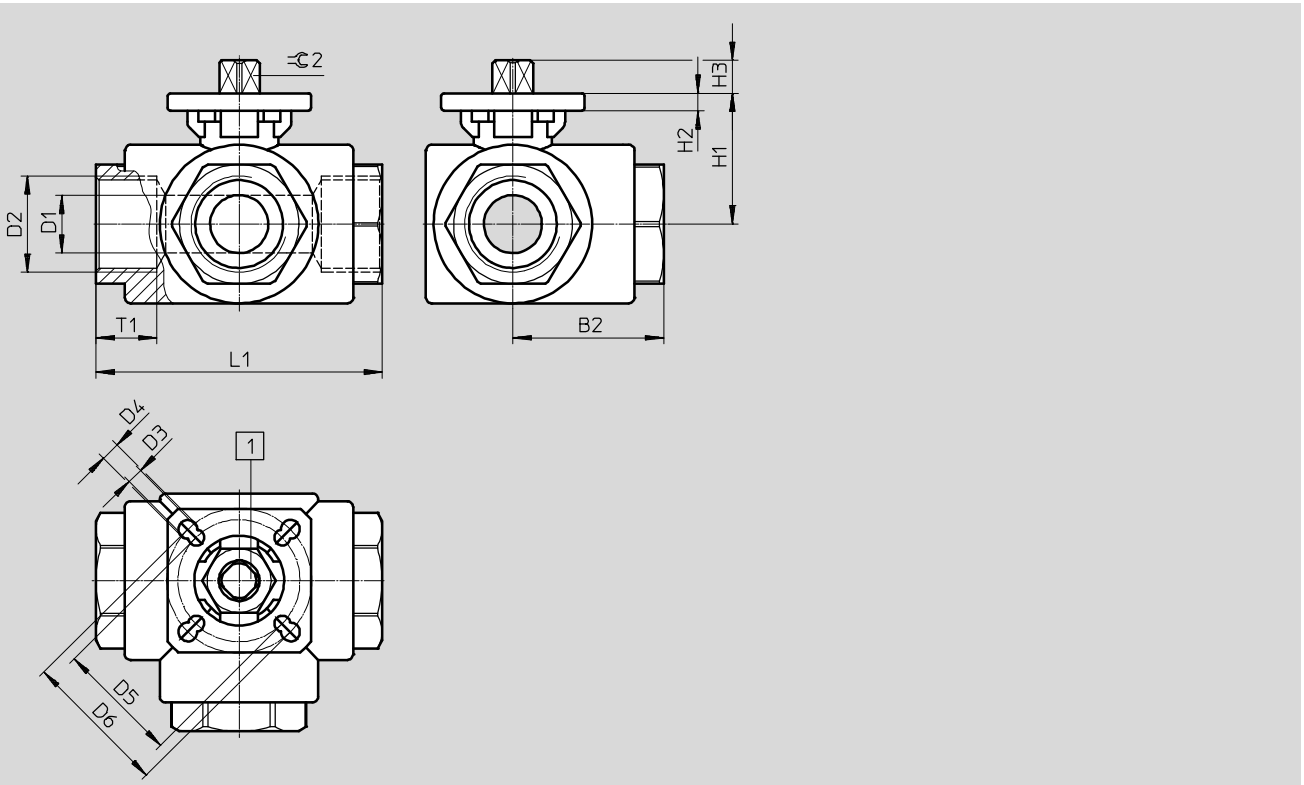
Materials		Material number
Housing	High-alloy stainless steel	1.4408
Ball		1.4408
Shaft		1.4401
Seals	PTFE	
	PTFE-reinforced	
Note on materials	RoHS compliant	
	Contains paint-wetting impairment substances	

Permissible operating pressure p as a function of the temperature of the medium t



Technical data

Dimensions Download CAD data ➔ **www.festo.com**



1 Switching position indication: the slot direction corresponds to the flow direction ➔ page 514

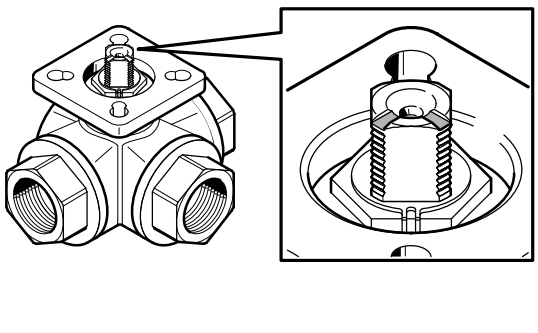
Type	B2 ±2	D1 ∅ ±0.15	D2	D3 ∅	D4 ∅	D5 ∅	D6 ∅	H1	H2 ±1	H3	L1 ±1	T1	⌀2 −0.1
VZBA-1/4"-GGG-63-32L-F0304-V4V4T	40	11.6	Rp1/4	5.5	5.5	36	42	35.9	6	7.4	80	15	9
VZBA-1/4"-GGG-63-32T-F0304-V4V4T													
VZBA-3/8"-GGG-63-32L-F0304-V4V4T	40	12.7	Rp3/8	5.5	5.5	36	42	35.9	6	7.4	80	18	9
VZBA-3/8"-GGG-63-32T-F0304-V4V4T													
VZBA-1/2"-GGG-63-32L-F0304-V4V4T	40	12.7	Rp1/2	5.5	5.5	36	42	35.9	6	7.4	80	17.5	9
VZBA-1/2"-GGG-63-32T-F0304-V4V4T													
VZBA-3/4"-GGG-63-32L-F0405-V4V4T	43.8	16	Rp3/4	5.5	6.5	42	50	40.9	6	12.8	87.5	20	11
VZBA-3/4"-GGG-63-32T-F0405-V4V4T													
VZBA-1"-GGG-63-32L-F0405-V4V4T	50	20	Rp1	5.5	6.5	42	50	45.2	6	11.4	100	21	11
VZBA-1"-GGG-63-32T-F0405-V4V4T													
VZBA-11/4"-GGG-63-32L-F0405-V4V4T	61.5	25.4	Rp11/4	5.5	6.5	42	50	51	6	12.6	123	21	11
VZBA-11/4"-GGG-63-32T-F0405-V4V4T													
VZBA-11/2"-GGG-63-32L-F0405-V4V4T	71.1	31.8	Rp11/2	5.5	6.5	42	50	55.5	6	12.6	142.2	23	11
VZBA-11/2"-GGG-63-32T-F0405-V4V4T													
VZBA-2"-GGG-63-32L-F0507-V4V4T	85.3	38.1	Rp2	6.5	8.5	50	70	66	6	14.3	170.6	26	14
VZBA-2"-GGG-63-32T-F0507-V4V4T													

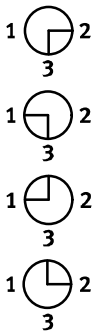
Ball valves VZBA, 3-way

Technical data

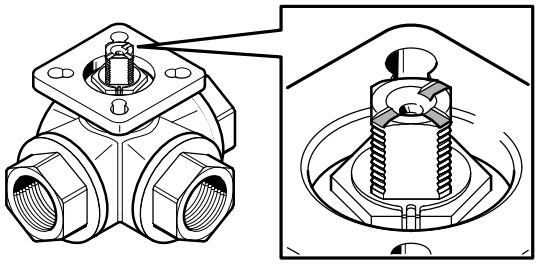
Switching position indication

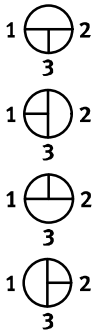
L-shaped bore



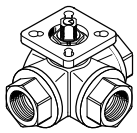


T-shaped bore





Ordering data

	Version	Connecting thread	Weight [g]	Part No.	Type
	L-shaped bore	Rp1/4	700	**1692210**	**VZBA-1/4"-GGG-63-32L-F0304-V4V4T**
		Rp3/8	700	**1692211**	**VZBA-3/8"-GGG-63-32L-F0304-V4V4T**
		Rp1/2	700	**1692212**	**VZBA-1/2"-GGG-63-32L-F0304-V4V4T**
		Rp3/4	1000	**1692214**	**VZBA-3/4"-GGG-63-32L-F0405-V4V4T**
		Rp1	1600	**1692215**	**VZBA-1"-GGG-63-32L-F0405-V4V4T**
		Rp11/4	2800	**1692217**	**VZBA-11/4"-GGG-63-32L-F0405-V4V4T**
		Rp11/2	3800	**1692218**	**VZBA-11/2"-GGG-63-32L-F0405-V4V4T**
		Rp2	7400	**1692219**	**VZBA-2"-GGG-63-32L-F0507-V4V4T**
	T-shaped bore	Rp1/4	700	**1692220**	**VZBA-1/4"-GGG-63-32T-F0304-V4V4T**
		Rp3/8	700	**1692221**	**VZBA-3/8"-GGG-63-32T-F0304-V4V4T**
		Rp1/2	700	**1692224**	**VZBA-1/2"-GGG-63-32T-F0304-V4V4T**
		Rp3/4	1000	**1692226**	**VZBA-3/4"-GGG-63-32T-F0405-V4V4T**
		Rp1	1600	**1692227**	**VZBA-1"-GGG-63-32T-F0405-V4V4T**
		Rp11/4	2800	**1692228**	**VZBA-11/4"-GGG-63-32T-F0405-V4V4T**
		Rp11/2	3800	**1692229**	**VZBA-11/2"-GGG-63-32T-F0405-V4V4T**
		Rp2	7400	**1692230**	**VZBA-2"-GGG-63-32T-F0507-V4V4T**

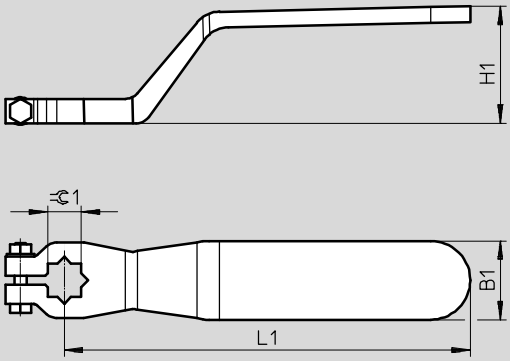
Accessories

Hand lever VAOH

Information on materials:
- High-alloy stainless steel
- Free of copper and PTFE
- Contains paint-wetting impairment substances

Dimensions and ordering data

Download CAD data ➔ **www.festo.com**



For connection	B1 ±5	H1 ±5	L1 ±10	⊂1 ±0.5	Weight [g]	Part No.	Type
Rp1/4 ... Rp1/2	21	36	120	9	100	**542702**	**VAOH-9-H9**
Rp3/4 ... Rp11/2	26	40	140	11	200	**542703**	**VAOH-11-H9**
Rp2	31	46	180	14	300	**542704**	**VAOH-14-H9**

Ball valves VZBE, 3-way

Type codes

VZBE – 1/4 – T – 63 – F – 3L – F04 – – V15 V15

Type	
VZBE	Ball valve

Nominal width DN	
1/4	1/4"
3/8	3/8"
1/2	1/2"
3/4	3/4"
1	1"
11/4	11/4"
11/2	11/2"
2	2"

Process valve connection type	
T	NPT female thread

Nominal pressure	
63	63 bar

Design	
F	Four parts

Valve function	
3L	3/2-way, L-shaped bore
3T	3/2-way, T-shaped bore

Flanged connection to ISO 5211	
F04	Hole pattern 04
F05	Hole pattern 05
F0507	Hole pattern 05 and 07

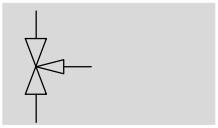
Actuation type	
–	Via drive

Housing material	
V15	Stainless steel ASTM A351–CF8M/1.4408

Shut-off element material	
V15	Stainless steel ASTM A351–CF8M/1.4408

Technical data

Function



- Connecting thread 1/4NPT ... 2NPT
- Flow rate 1.2 ... 22.5 m³/h

- With L-shaped bore or T-shaped bore
- NPT version

General technical data

Process valve connection			1/4NPT	3/8NPT	1/2NPT	3/4NPT	1NPT	11/4NPT	11/2NPT	2NPT
Nominal width DN			8	10	15	20	25	32	40	50
Valve function			3/2							
Design			3-way ball valve							
Sealing principle			Soft							
Actuation type			Mechanical							
Switching position indication			Slot direction = flow direction							
Flow direction			Reversible							
Type of mounting			In-line installation							
Mounting position			Any							
Based on standard			ISO 5211							
			ASME B1.20.1							
Breakaway torque at differential pressure, nominal pressure, process valve PN		[Nm]	9.6	9.6	9.6	14.3	25.2	33	45.5	85
Inside diameter		[mm]	11	11	12.7	16	20	25	32	38.1
Flow rate Kv	Type L	[m³/h]	1.2	1.2	2.5	3.2	4.1	9.9	19.3	20.7
	Type T	[m³/h]	1.4	1.4	2.8	3.7	4.6	10.6	20.2	22.5

Operating and environmental conditions

Process valve connection		1/4NPT	3/8NPT	1/2NPT	3/4NPT	1NPT	11/4NPT	11/2NPT	2NPT
Temperature of medium	[°C]	–20 ... +200							
Medium		Compressed air to ISO 8573-1:2010 [-:-:-]							
		Inert gases							
		Water							
		Vapour							
		Neutral fluids							
Certification		CRN							
Corrosion resistance class CRC[1)]		4							
CE marking (see declaration of conformity)[2)]		–					To EU Pressure Equipment Directive		

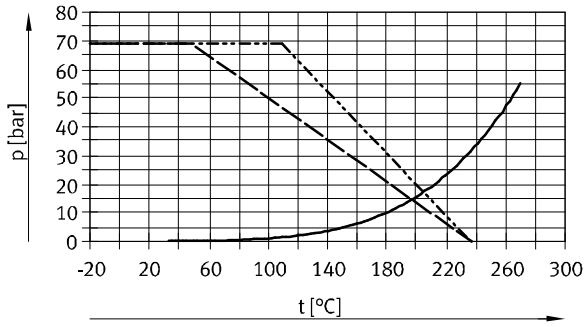
1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.
2) Additional information www.festo.com/sp ➔ Certificates.

Ball valves VZBE, 3-way

Technical data

Materials		Material number
Housing	Stainless steel casting	1.4408
Ball	Stainless steel casting	1.4408
Shaft	High-alloy stainless steel	1.4401
Seals	PTFE	
Note on materials	RoHS compliant	
	Contains paint-wetting impairment substances	

Permissible operating pressure p as a function of the temperature of the medium t

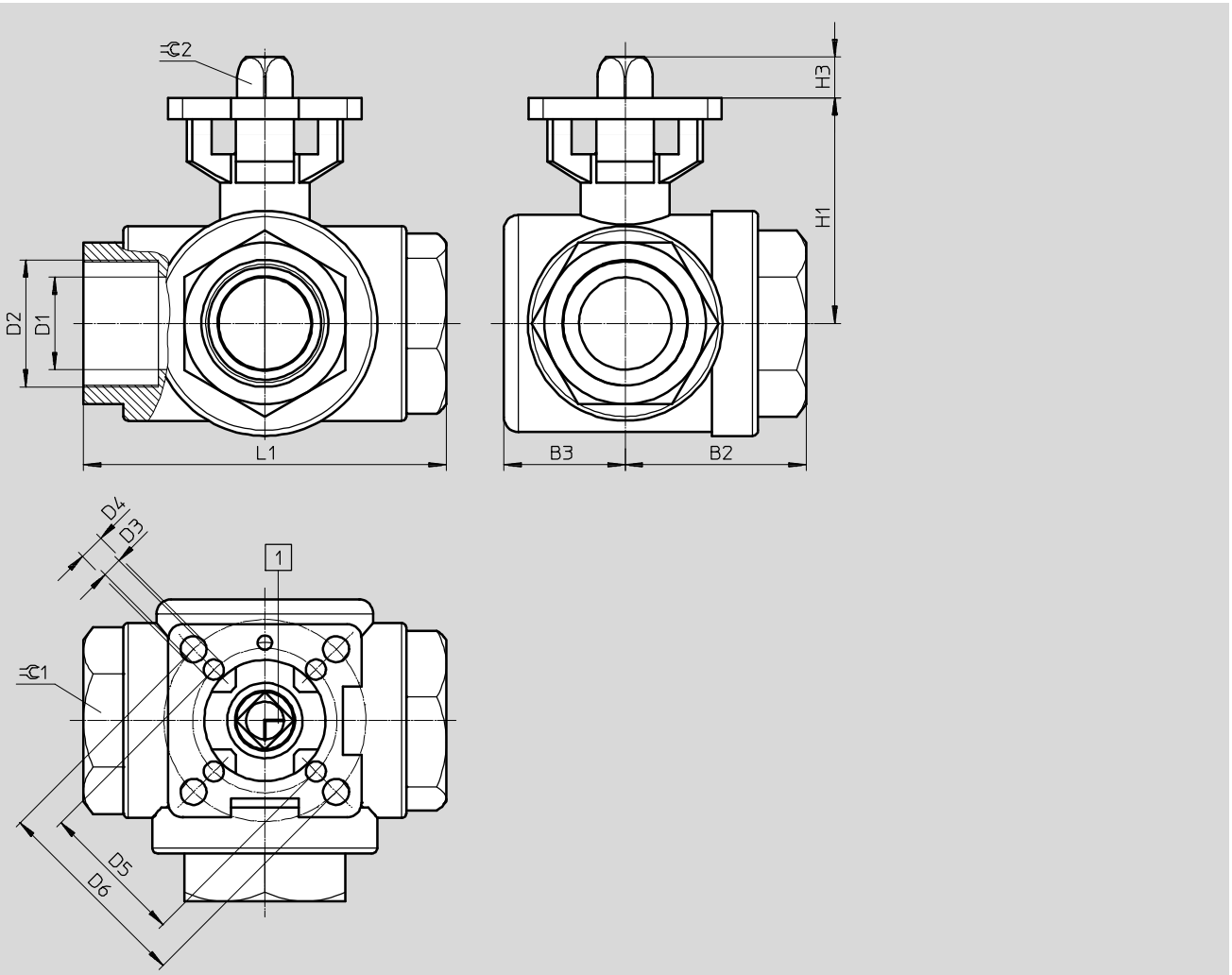


Saturated water vapour
PTFE-reinforced
PTFE, modified

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**



1 Switching position indication: the slot direction corresponds to the flow direction ➔ page 520

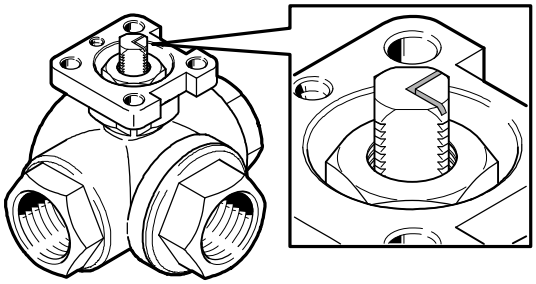
Type	B2 ±2	B3	D1 ∅	D2	D3 ∅	D4 ∅	D5 ∅	D6 ∅	H1	H3	L1 ±2	⊂1	⊂2
VZBE-1/4-...-F04-...	37.3	22.5	11	1/4 NPT	–	6	–	42	38.2	9	75.7	26	9
VZBE-3/8-...-F04-...	37.3	22.5	11	3/8 NPT	–	6	–	42	38.2	9	75.7	26	9
VZBE-1/2-...-F04-...	37.3	22.5	12.7	1/2 NPT	–	6	–	42	38.2	9	75.7	26	9
VZBE-3/4-...-F04-...	44.7	28	16	3/4 NPT	–	6	–	42	45.2	9	86.6	33	9
VZBE-1-...-F05-...	51.4	32.7	20	1 NPT	–	7.1	–	50	56.5	11	102.4	39	11
VZBE-11/4-...-F05-...	57.7	37	25	11/4 NPT	–	7.1	–	50	61.9	11	118.2	49.5	11
VZBE-11/2-...-F0507-...	62.7	42.5	32	11/2 NPT	7.1	9.2	50	70	78.3	14.3	125.8	56	14
VZBE-2-...-F0507-...	74.6	50.5	38.1	2 NPT	7.1	9.2	50	70	87.4	14	149	70	14

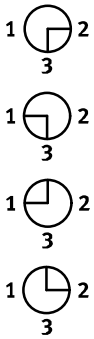
Ball valves VZBE, 3-way

Technical data

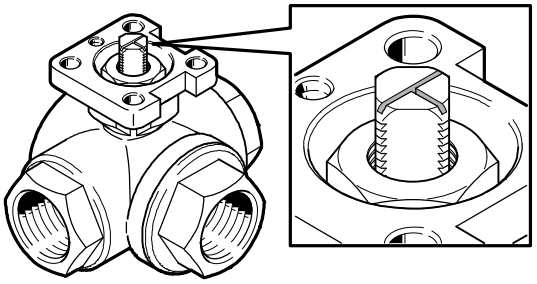
Switching position indication

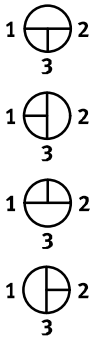
L-shaped bore



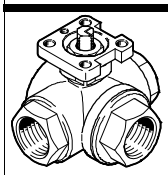


T-shaped bore





Ordering data

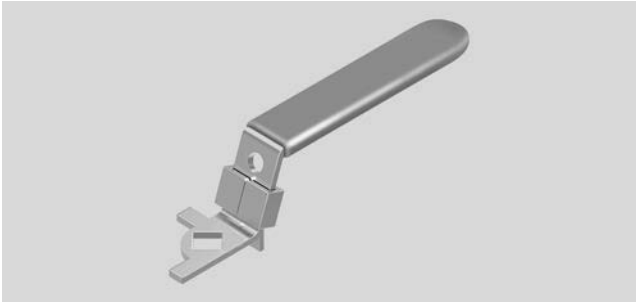
	Version	Process valve connection	Weight [g]	Part No.	Type
	L-shaped bore	1/4NPT	724	**4834288**[1]	**VZBE-1/4-T-63-F-3L-F04-V15V15**
		3/8NPT	624	**4834289**[1]	**VZBE-3/8-T-63-F-3L-F04-V15V15**
		1/2NPT	624	**4834290**[1]	**VZBE-1/2-T-63-F-3L-F04-V15V15**
		3/4NPT	1024	**4834291**[1]	**VZBE-3/4-T-63-F-3L-F04-V15V15**
		1NPT	1618	**4834292**[1]	**VZBE-1-T-63-F-3L-F05-V15V15**
		11/4NPT	2212	**4834293**[1]	**VZBE-11/4-T-63-F-3L-F05-V15V15**
		11/2NPT	3360	**4834294**[1]	**VZBE-11/2-T-63-F-3L-F0507-V15V15**
		2NPT	5560	**4834295**[1]	**VZBE-2-T-63-F-3L-F0507-V15V15**
	T-shaped bore	1/4NPT	724	**4834296**[1]	**VZBE-1/4-T-63-F-3T-F04-V15V15**
		3/8NPT	624	**4834297**[1]	**VZBE-3/8-T-63-F-3T-F04-V15V15**
		1/2NPT	624	**4834298**[1]	**VZBE-1/2-T-63-F-3T-F04-V15V15**
		3/4NPT	1024	**4834299**[1]	**VZBE-3/4-T-63-F-3T-F04-V15V15**
		1NPT	1618	**4834300**[1]	**VZBE-1-T-63-F-3T-F05-V15V15**
		11/4NPT	2212	**4834301**[1]	**VZBE-11/4-T-63-F-3T-F05-V15V15**
		11/2NPT	3360	**4834302**[1]	**VZBE-11/2-T-63-F-3T-F0507-V15V15**
		2NPT	5560	**4834303**[1]	**VZBE-2-T-63-F-3T-F0507-V15V15**

1) Festo is only a retailer of this product, not the manufacturer.

Accessories

Hand lever VAOH

- High-alloy stainless steel
- Free of copper and PTFE
- Contains paint-wetting impairment substances
- Lockable



Dimensions and ordering data

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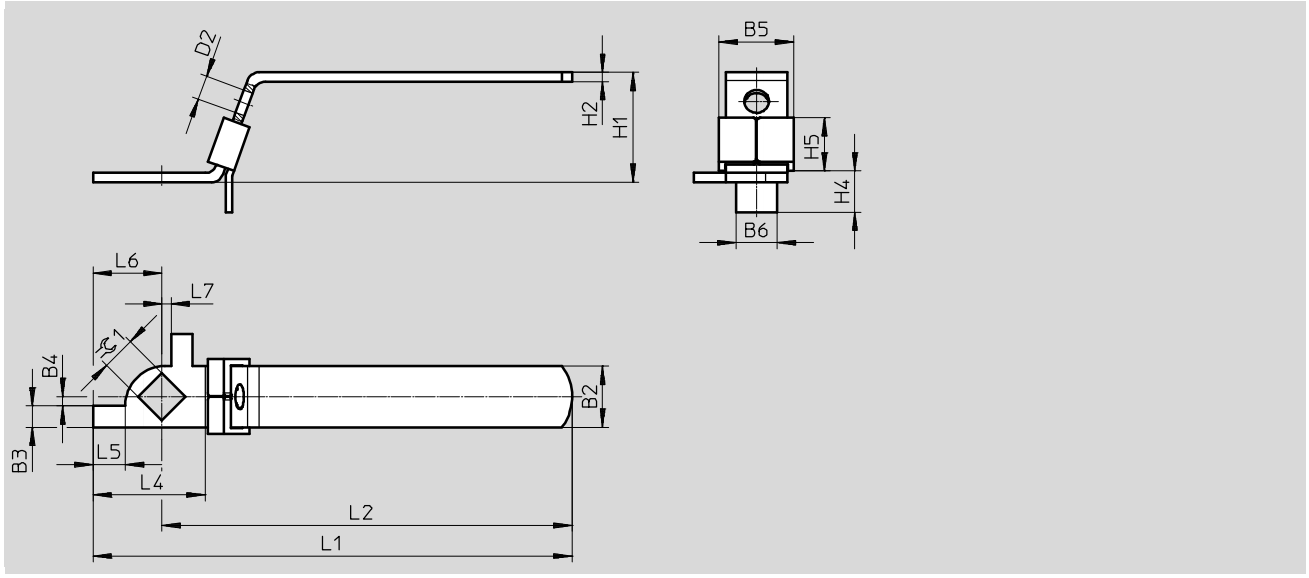


Dimensions and ordering data

For connection	B2	B3	B4	B5	B6	D2 ∅	H1	H2	H4	H5	L1
1/4" ... 3/4"	20	7	3	25	14.5	8	35	3	15	15.2	131
1"	20	7	3	24.5	13.5	8	36	3	13.5	15.3	157
11/4"	25	9.5	3	30	15	8	38	4	11.5	15	211
11/2" ... 2"	30	12	3	35	22	8	39	4	17	17	233

For connection	L2	L4	L5	L6	L7	⌀1	CRC[2]	Weight [g]	Part No.	Type
1/4" ... 3/4"	112	39	8.5	19	3	9	3	76	**4896014**[1]	**VAOH-F7-9-H9-A-32**
1"	134.5	40	10.5	25.5	3	11	3	82	**4896015**[1]	**VAOH-F7-11-H9-A-32**
11/4"	186	48	10.5	25	3	11	3	188	**4896017**[1]	**VAOH-F7-11-211-H9-A-32**
11/2" ... 2"	197.9	59	19.5	35.1	3	14	3	240	**4896016**[1]	**VAOH-F7-14-H9-A-32**

1) Festo is only a retailer of this product, not the manufacturer.
2) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Ball valves VZBD, 2-way

Type codes

VZBD	–	1/2	–	W1	–	16	–	T	–	2	–	F0304	–		–	V14	V14

Type	
VZBD	Ball valve

Nominal width DN	
1/2	1/2"
3/4	3/4"
1	1"
11/4	1 1/4"
11/2	1 1/2"
2	2"
21/2	2 1/2"
3	3"
4	4"

Process valve connection type	
S1	Clamp ferrule to ASME-BPE
S5	Clamp ferrule to DIN 32676-B
W1	Extended welded ends to ASME-BPE
W3	Extended welded ends to ISO 1127

Nominal pressure	
16	16 bar

Design	
T	Three parts

Valve function	
2	2/2-way

Flanged connection to ISO 5211	
–	Without
F0304	Hole pattern 03 and 04
F0405	Hole pattern 04 and 05
F0507	Hole pattern 05 and 07
F0710	Hole pattern 07 and 10
F1012	Hole pattern 10 and 12

Actuation type	
–	Via drive

Housing material	
V14	Stainless steel ASTM A351–CF3M/1.4409

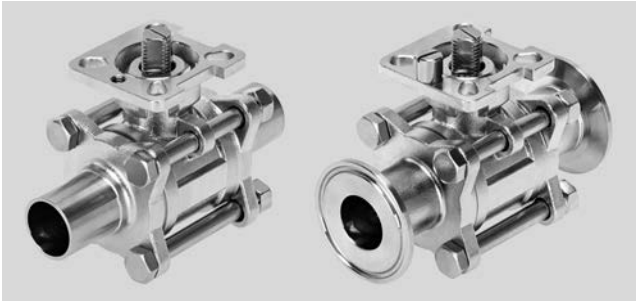
Shut-off element material	
V14	Stainless steel ASTM A351–CF3M/1.4409

Technical data

Function

- Nominal width DN
  DN15 ... DN100
- Flow rate
  3.5 ... 436.3 m³/h

- 2-way ball valve made from stainless steel
- Optionally with extended welded ends to ISO 1127 or to ASME BPE or clamp ferrules to DIN 32676-B or to ASME BPE



General technical data

Nominal width DN		15	20	25	32	40	50	65	80	100
Process valve connection		Welded end to ISO 1127								
		Welded end to ASME-BPE								
		Clamp ferrule to DIN 32676-B								
		Clamp ferrule to ASME-BPE								
Valve function		2/2								
Design		2-way ball valve								
Sealing principle		Soft								
Type of actuation		Mechanical								
Switching position indication		Slot direction = flow direction								
Flow direction		Reversible								
Type of mounting		In-line installation								
Mounting position		Any								
Based on standard		ISO 5211								
		ISO 1127								
		DIN 32676-B								
		ASME BPE								
Welded end to ISO 1127 and clamp ferrule to DIN 32676-B										
Breakaway torque at differential pressure, nominal pressure, process valve PN	[Nm]	7	9	15	23	30	44	79	–	–
Inside ∅	[mm]	18.1	23.7	29.7	38.4	44.3	56.3	72.1	–	–
Flow rate Kv	[m³/h]	12.2	21.9	35.9	61.2	83.3	141.5	238.5	–	–
Welded end to ASME-BPE and clamp ferrule to ASME-BPE										
Breakaway torque at differential pressure, nominal pressure, process valve PN	[Nm]	7	9	15	–	30	44	79	140	170
Inside ∅	[mm]	9.6	15.8	22.1	–	34.8	47.7	60.3	72.9	97.5
Flow rate Kv	[m³/h]	3.5	9.7	19.8	–	50.1	96.8	161.7	243.8	436.3

Ball valves VZBD, 2-way

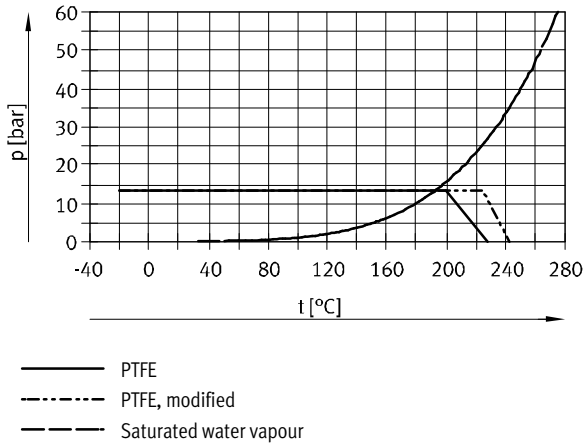
Technical data

Operating and environmental conditions									
Nominal width DN	15	20	25	32	40	50	65	80	100
Nominal pressure of process valve PN	63								
Temperature of medium [°C]	–20 ... +200								
Medium	Compressed air to ISO 8573-1:2010 [-:-:-]								
	Inert gases								
	Vapour								
	Water								
	Neutral fluids								
Certification	CRN								
Corrosion resistance class CRC[1]	4								
CE marking (see declaration of conformity)[2]	–			To EU Pressure Equipment Directive					

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.
2) Additional information www.festo.com/sp ➔ Certificates.

Materials		Material number
Housing	Stainless steel casting	1.4409 (ASTM A351–CF3M)
Ball	Stainless steel casting	1.4409 (ASTM A351–CF3M)
Shaft	High-alloy stainless steel	1.4401 (ASTM A240–316)
Seat seal	PTFE, modified	
Seals	PTFE	
	FPM	
Note on materials	RoHS compliant	
	Contains paint-wetting impairment substances	

Permissible operating pressure p as a function of the temperature of the medium t



Technical data

Dimensions

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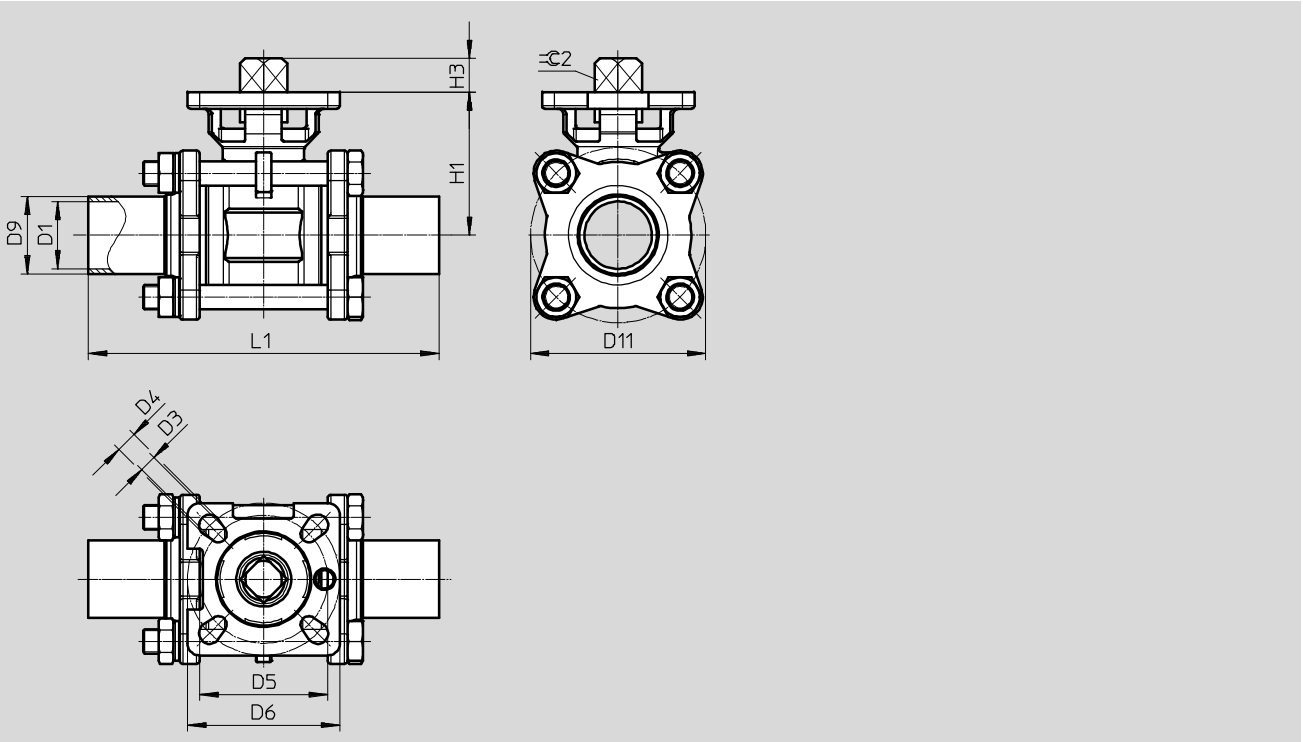
With extended welded ends to ISO 1127 (W3) or to ASME BPE (W1)



Type	D1 ∅	D3 ∅	D4 ∅	D5 ∅	D6 ∅	D9 ∅	D11 ∅	H1	H3	L1 ±2	⌀C2
VZBD-1/2-W3-...	18.1	5.5	5.5	36	42	21.3	52	38.5	9	130	9
VZBD-3/4-W3-...	23.7	5.5	5.5	36	42	26.9	61.9	42.7	9	150	9
VZBD-1-W3-...	29.7	5.5	7	42	50	33.7	70	53.5	11	160	11
VZBD-11/4-W3-...	38.4	5.5	7	42	50	42.4	85	60.1	11	180	11
VZBD-11/2-W3-...	44.3	7	9	50	70	48.3	98.8	70.6	14	200	14
VZBD-2-W3-...	56.3	7	9	50	70	60.3	120	79.8	14	230	14
VZBD-21/2-W3-...	72.1	9	11	70	102	76.1	147	99.4	17	290	17

Type	D1 ∅	D3 ∅	D4 ∅	D5 ∅	D6 ∅	D9 ∅	D11 ∅	H1	H3	L1 ±2	⌀C2
VZBD-1/2-W1-...	9.6	5.5	5.5	36	42	12.7	45.5	34	9	90.7	9
VZBD-3/4-W1-...	15.8	5.5	5.5	36	42	19.1	47	35.3	11	103	9
VZBD-1-W1-...	22.1	5.5	7	42	50	25.4	57.5	47	11	115	11
VZBD-11/2-W1-...	34.8	7	9	50	70	38.1	83	63.5	14	139	14
VZBD-2-W1-...	47.7	7	9	50	70	50.8	100	72	14	158	14
VZBD-21/2-W1-...	60.3	9	11	70	102	63.5	126	90	17	197	17
VZBD-3-W1-...	72.9	9	11	70	102	76.2	148	99	17	228	17
VZBD-4-W1-...	97.5	11	13	102	125	101.6	183	127.5	22	241.8	22

Ball valves VZBD, 2-way

Technical data

Dimensions

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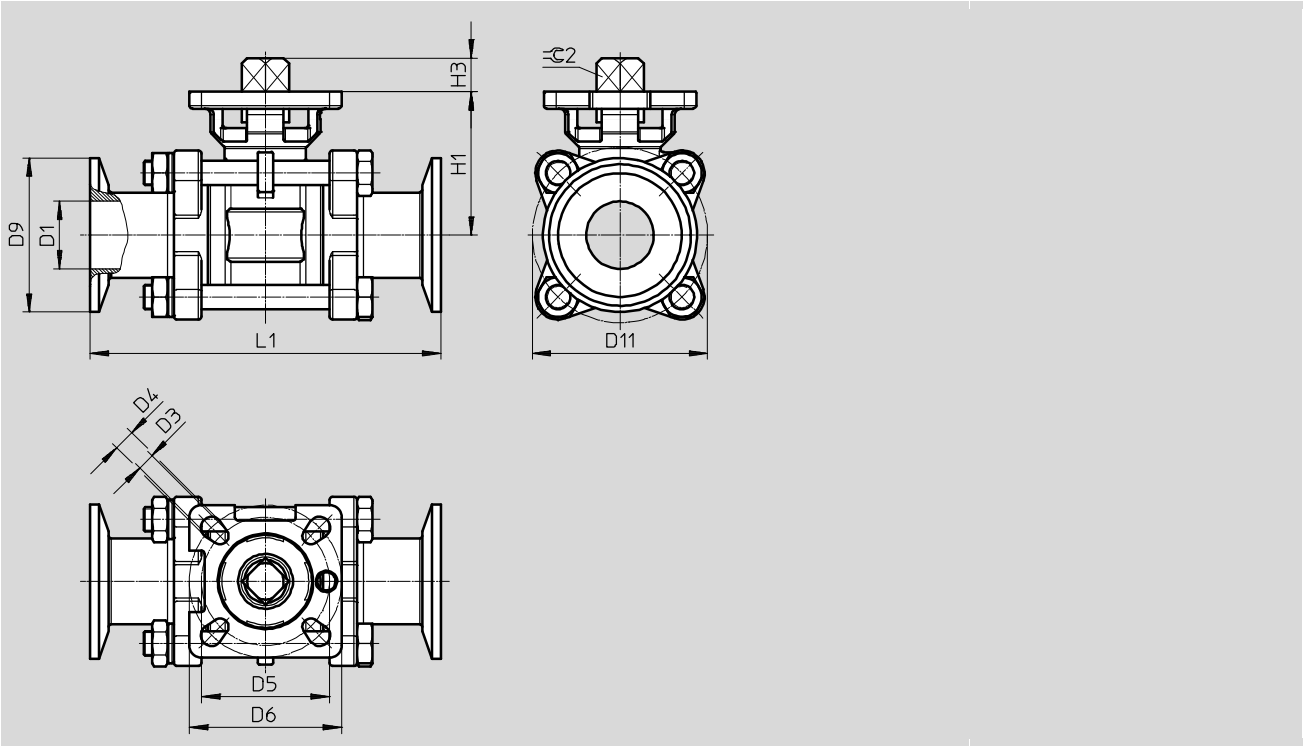
With clamp ferrule to DIN 32676-B (S5) or to ASME-BPE (S1)

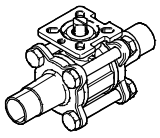
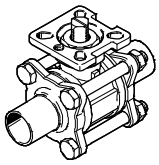
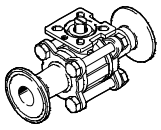
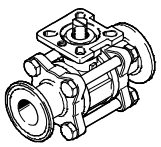


Type	D1 ∅	D3 ∅	D4 ∅	D5 ∅	D6 ∅	D9 ∅	D11 ∅	H1	H3	L1 ±2	⌭2
VZBD-1/2-S5-...	18.1	5.5	5.5	36	42	50.5	52	38.5	9	130	9
VZBD-3/4-S5-...	23.7	5.5	5.5	36	42	50.5	61.9	42.7	9	150	9
VZBD-1-S5-...	29.7	5.5	7	42	50	50.5	70	53.5	11	160	11
VZBD-11/4-S5-...	38.4	5.5	7	42	50	64	85	60.1	11	180	11
VZBD-11/2-S5-...	44.3	7	9	50	70	64	98.8	70.6	14	200	14
VZBD-2-S5-...	56.3	7	9	50	70	77.5	120	79.8	14	230	14
VZBD-21/2-S5-...	72.1	9	11	70	102	91	147	99.4	17	290	17

Type	D1 ∅	D3 ∅	D4 ∅	D5 ∅	D6 ∅	D9 ∅	D11 ∅	H1	H3	L1 ±2	⌭2
VZBD-1/2-S1-...	9.6	5.5	5.5	36	42	25.4	45.5	34	9	90.7	9
VZBD-3/4-S1-...	15.8	5.5	5.5	36	42	25.4	47	35.3	11	103	9
VZBD-1-S1-...	22.1	5.5	7	42	50	50.5	57.5	47	11	115	11
VZBD-11/2-S1-...	34.8	7	9	50	70	50.5	83	63.5	14	139	14
VZBD-2-S1-...	47.7	7	9	50	70	64	100	72	14	158	14
VZBD-21/2-S1-...	60.3	9	11	70	102	77.5	126	90	17	197	17
VZBD-3-S1-...	72.9	9	11	70	102	91	148	99	17	228	17
VZBD-4-S1-...	97.5	11	13	102	125	119	183	127.5	22	241.8	22

Technical data

Ordering data

	Standard	Nominal width DN	Flange hole pattern	Weight [g]	Part No.	Type
Extended welded ends						
	ISO 1127	15	F0304	730	**4783595**[1]	**VZBD-1/2-W3-16-T-2-F0304-V14V14**
		20	F0304	930	**4783596**[1]	**VZBD-3/4-W3-16-T-2-F0304-V14V14**
		25	F0405	1350	**4783597**[1]	**VZBD-1-W3-16-T-2-F0405-V14V14**
		32	F0405	2050	**4783598**[1]	**VZBD-11/4-W3-16-T-2-F0405-V14V14**
		40	F0507	3270	**4783599**[1]	**VZBD-11/2-W3-16-T-2-F0507-V14V14**
		50	F0507	5470	**4783600**[1]	**VZBD-2-W3-16-T-2-F0507-V14V14**
		65	F0710	10080	**4783601**[1]	**VZBD-21/2-W3-16-T-2-F0710-V14V14**
	ASME-BPE	1/2"	F0304	430	**4762847**[1]	**VZBD-1/2-W1-16-T-2-F0304-V14V14**
		3/4"	F0304	530	**4762848**[1]	**VZBD-3/4-W1-16-T-2-F0304-V14V14**
		1"	F0405	950	**4762849**[1]	**VZBD-1-W1-16-T-2-F0405-V14V14**
		1 1/2"	F0507	1970	**4762850**[1]	**VZBD-11/2-W1-16-T-2-F0507-V14V14**
		2"	F0507	3070	**4762851**[1]	**VZBD-2-W1-16-T-2-F0507-V14V14**
		2 1/2"	F0710	6180	**4762852**[1]	**VZBD-21/2-W1-16-T-2-F0710-V14V14**
		3"	F0710	9080	**4762853**[1]	**VZBD-3-W1-16-T-2-F0710-V14V14**
		4"	F1012	16180	**4762854**[1]	**VZBD-4-W1-16-T-2-F1012-V14V14**
Clamp ferrule						
	DIN 32676-B	15	F0304	830	**4802244**[1]	**VZBD-1/2-S5-16-T-2-F0304-V14V14**
		20	F0304	1130	**4802245**[1]	**VZBD-3/4-S5-16-T-2-F0304-V14V14**
		25	F0405	1550	**4802246**[1]	**VZBD-1-S5-16-T-2-F0405-V14V14**
		32	F0405	2250	**4802247**[1]	**VZBD-11/4-S5-16-T-2-F0405-V14V14**
		40	F0507	3370	**4802248**[1]	**VZBD-11/2-S5-16-T-2-F0507-V14V14**
		50	F0507	5670	**4802249**[1]	**VZBD-2-S5-16-T-2-F0507-V14V14**
		65	F0710	10680	**4802250**[1]	**VZBD-21/2-S5-16-T-2-F0710-V14V14**
	ASME-BPE	1/2"	F0304	430	**4795666**[1]	**VZBD-1/2-S1-16-T-2-F0304-V14V14**
		3/4"	F0304	530	**4795667**[1]	**VZBD-3/4-S1-16-T-2-F0304-V14V14**
		1"	F0405	950	**4795668**[1]	**VZBD-1-S1-16-T-2-F0405-V14V14**
		1 1/2"	F0507	1970	**4795669**[1]	**VZBD-11/2-S1-16-T-2-F0507-V14V14**
		2"	F0507	3070	**4795670**[1]	**VZBD-2-S1-16-T-2-F0507-V14V14**
		2 1/2"	F0710	6180	**4795671**[1]	**VZBD-21/2-S1-16-T-2-F0710-V14V14**
		3"	F0710	9080	**4795672**[1]	**VZBD-3-S1-16-T-2-F0710-V14V14**
		4"	F1012	16180	**4795673**[1]	**VZBD-4-S1-16-T-2-F1012-V14V14**

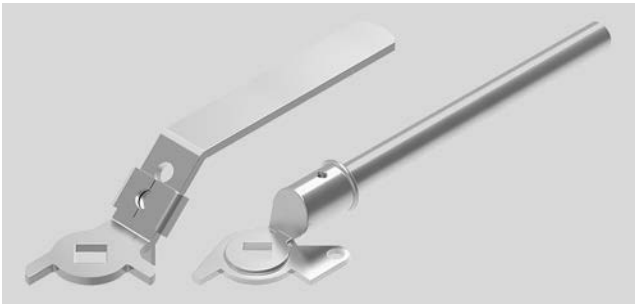
1) Festo is only a retailer of this product, not the manufacturer.

Ball valves VZBD, 2-way

Accessories

Hand lever VAOH

- High-alloy stainless steel
- Free of copper and PTFE
- RoHS compliant
- Contains paint-wetting impairment substances
- Lockable



Dimensions and ordering data

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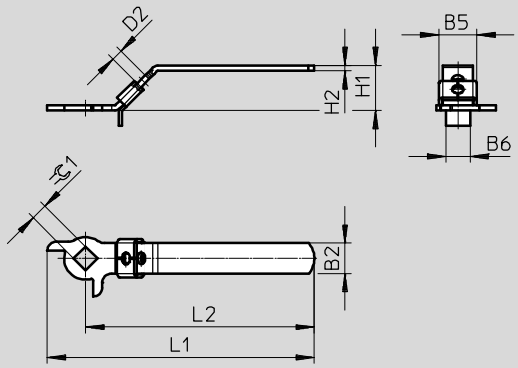
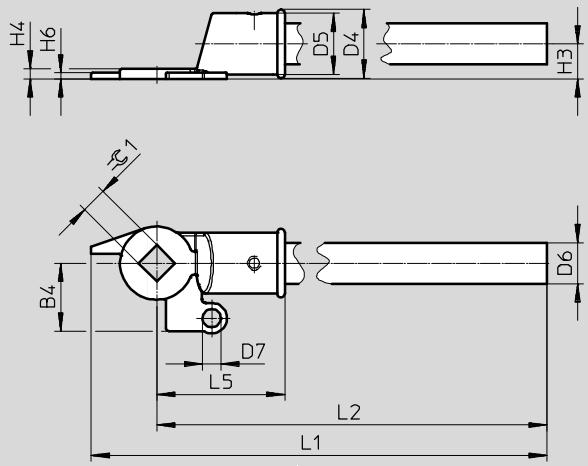
DN15 ... DN50



DN65 ... DN100



Dimensions and ordering data

For connection	B2	B5	B6	D2 ∅	H1	H2	L1	L2	⌀1	CRC[2]	Weight [g]	Part No.	Type
DN15 ... DN20	19	23.8	13	7.5	29	3	144.2	123	9	3	170	**4895358**[1]	**VAOH-F8-9-H9-A**
DN25 ... DN32	20	24.8	16	7.5	30	3.5	176.5	151.5	11	3	250	**4895359**[1]	**VAOH-F8-11-H9-A**
DN40 ... DN50	25	31	22	7.5	31	4	214	182	14	3	530	**4895360**[1]	**VAOH-F8-14-H9-A**

Dimensions and ordering data

For connection	B4	D4 ∅	D5 ∅	D6 ∅	D7 ∅	H3	H4	H6	L1	L2	L5	⌀1	CRC[2]	Weight [g]	Part No.	Type
DN65 ... DN80	44.5	45	40	27	12	23	6.5	4	387	344	84	17	3	820	**4895361**[1]	**VAOH-F8-17-H9-A**
DN100	53.5	45	40	27	14	25	8	5	442.5	389	89.5	22	3	920	**4895363**[1]	**VAOH-F8-22-H9-A**

1) Festo is only a retailer of this product, not the manufacturer.
2) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Type codes

VZBF – 1/2 – P1 – 20 – D – 2 – F0304 – – V15 V15

Type	
VZBF	Ball valve

Nominal width DN	
1/2	1/2"
3/4	3/4"
1	1"
11/4	11/4"
11/2	11/2"
2	2"
21/2	21/2"
3	3"
4	4"
6	6"
8	8"

Process valve connection type	
P1	Flange to ANSI 150

Nominal pressure	
20	20 bar

Design	
D	Two parts

Valve function	
2	2/2-way

Flanged connection to ISO 5211	
F0304	Hole pattern 03 and 04
F0405	Hole pattern 04 and 05
F0507	Hole pattern 05 and 07
F0710	Hole pattern 07 and 10
F1012	Hole pattern 10 and 12
F14	Hole pattern 14

Actuation type	
–	Via drive

Housing material	
V15	Stainless steel ASTM A351–CF8M/1.4408

Shut-off element material	
V15	Stainless steel ASTM A351–CF8M/1.4408
V16	Stainless steel ASTM A240–316/1.4401

Ball valves VZBF, 2-way

Technical data

Function

- Ring housing
  1/2" … 8"
- Flow rate
  8.5 ... 2078.3 m³/h

- 2-way ball valve made from stainless steel

General technical data

Nominal width DN	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"	8"
Process valve connection	Flange to ANSI B16.5 class 150										
Valve function	2/2										
Design	2-way ball valve										
Sealing principle	Soft										
Type of actuation	Mechanical										
Switching position indication	Slot direction = flow direction										
Flow direction	Reversible										
Type of mounting	In-line installation										
Mounting position	Any										
Based on standard	ISO 5211										
	ANSI B16.5 class 150										
Breakaway torque at differential pressure, nominal pressure, process valve PN [Nm]	8	10	12	20	30	40	60	90	130	1020	1080
Inside ∅ [mm]	15	20	24	30	38	50	64	76	98	150	200
Flow rate Kv [m³/h]	8.5	15.6	23.2	37.3	61.6	111.8	187.9	264.5	453.8	1132.3	2078.3

Operating and environmental conditions

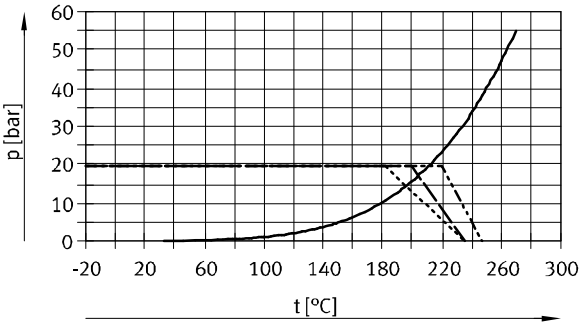
Nominal width DN	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"	8"
Nominal pressure of process valve PN	20										
Temperature of medium [°C]	–20 ... +200										
Medium	Compressed air to ISO 8573-1:2010 [-:-:-]										
	Inert gases										
	Water										
	Vapour										
	Neutral fluids										
Certification	CRN										
Corrosion resistance class CRC[1]	4										
CE marking (see declaration of conformity)[2]	–		To EU Pressure Equipment Directive								

1) Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.
2) Additional information www.festo.com/sp ➔ Certificates.

Technical data

Materials			Material number
Housing		Stainless steel casting	1.4408 (ASTM A351–CF8M)
Ball	1/2" … 4"	Stainless steel casting	1.4408 (ASTM A351–CF8M)
	6" … 8"	High-alloy stainless steel	1.4401 (ASTM A240–316)
Shaft		High-alloy stainless steel	1.4401 (ASTM A240–316)
Seals		FPM	
		Graphite	
		PCTFE	
		PTFE	
Note on materials		RoHS compliant	
		Contains paint-wetting impairment substances	

Permissible operating pressure p as a function of the temperature of the medium t

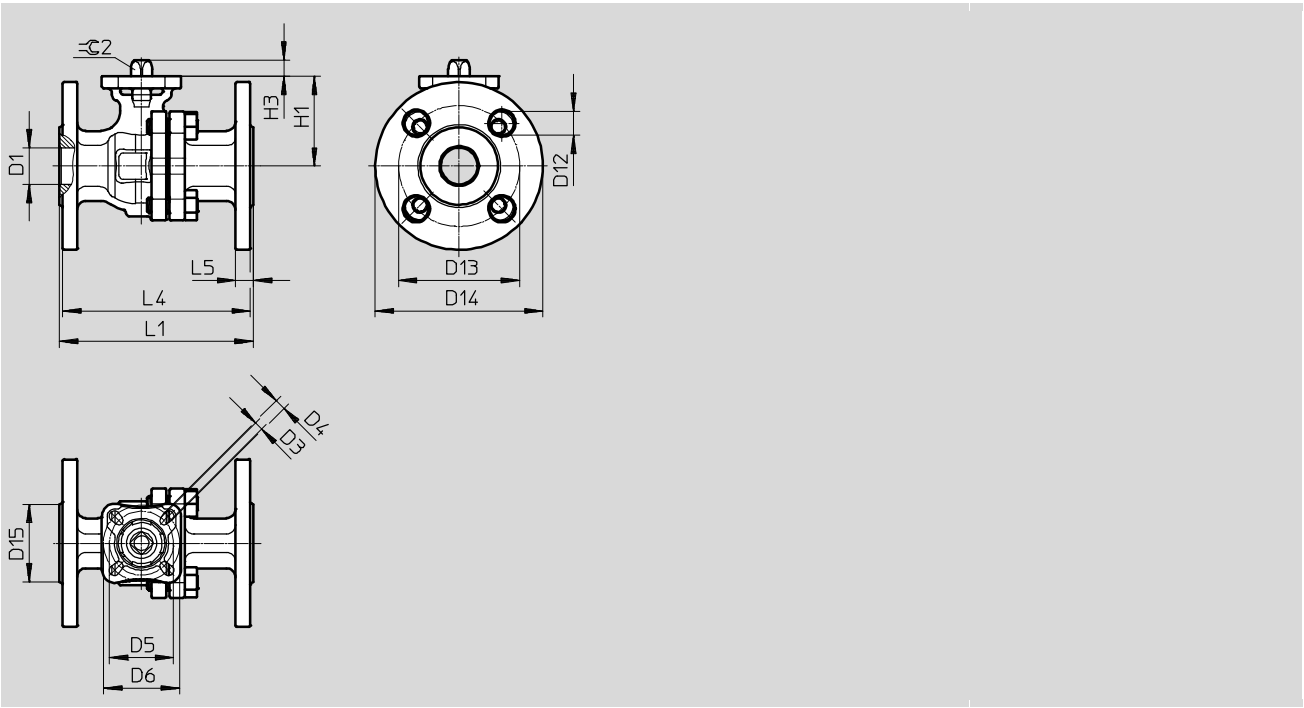


Saturated water vapour
PTFE, modified
PTFE-reinforced
PTFE

Ball valves VZBF, 2-way

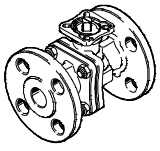
Technical data

Dimensions Download CAD data ➔ **www.festo.com**



Type	D1 ∅	D3 ∅	D4 ∅	D5 ∅	D6 ∅	D12 ∅	D13 ∅	D14 ∅	D15 ∅	H1	H3	L1 ±2	L4	L5	⌀C2
VZBF-1/2-...	15	5.5	5.5	36	42	16	60.5	89	35	50.5	8.5	108	104.8	11.1	9
VZBF-3/4-...	20	5.5	5.5	36	42	16	70	98	43	55	8.5	117	113.8	11.6	9
VZBF-1-...	24	5.5	7	42	50	16	79.5	108	51	59	10.5	127.5	124.3	11.6	11
VZBF-11/4-...	30	5.5	7	42	50	16	89	117	64	62	10.5	140.5	137.3	12.7	11
VZBF-11/2-...	38	7	9	50	70	16	98.5	127	73	76	14	165	161.8	14.3	14
VZBF-2-...	50	7	9	50	70	19	120.5	152	92	84.5	14	178	174.8	16	14
VZBF-21/2-...	64	9	11	70	102	19	139.5	178	105	104.5	17	190.5	187.3	17.5	17
VZBF-3-...	76	9	11	70	102	19	152.5	190.5	127	111.5	17	203	199.8	19.1	17
VZBF-4-...	98	11	13	102	125	19	190.5	229	157	135.5	23	229	225.8	24	22
VZBF-6-...	150	11	13	102	125	22.4	241.5	279	216	201	27.5	394	390.8	25.4	27
VZBF-8-...	200	17	–	140	–	22.4	298.5	343	270	259	36	457	453.8	28.6	36

Ordering data

	Nominal width DN	Weight [g]	Part No.	Type
	1/2"	1550	**4810851**[1]	**VZBF-1/2-P1-20-D-2-F0304-V15V15**
	3/4"	1950	**4810852**[1]	**VZBF-3/4-P1-20-D-2-F0304-V15V15**
	1"	3050	**4810853**[1]	**VZBF-1-P1-20-D-2-F0405-V15V15**
	1 1/4"	3550	**4810854**[1]	**VZBF-11/4-P1-20-D-2-F0405-V15V15**
	1 1/2"	5630	**4810855**[1]	**VZBF-11/2-P1-20-D-2-F0507-V15V15**
	2"	7630	**4810856**[1]	**VZBF-2-P1-20-D-2-F0507-V15V15**
	2 1/2"	13650	**4810857**[1]	**VZBF-21/2-P1-20-D-2-F0710-V15V15**
	3"	17350	**4810859**[1]	**VZBF-3-P1-20-D-2-F0710-V15V15**
	4"	28100	**4810860**[1]	**VZBF-4-P1-20-D-2-F1012-V15V15**
	6"	50200	**4810861**[1]	**VZBF-6-P1-20-D-2-F1012-V15V1 6**
	8"	84200	**4810862**[1]	**VZBF-8-P1-20-D-2-F14-V15V16**

1) Festo is only a retailer of this product, not the manufacturer.

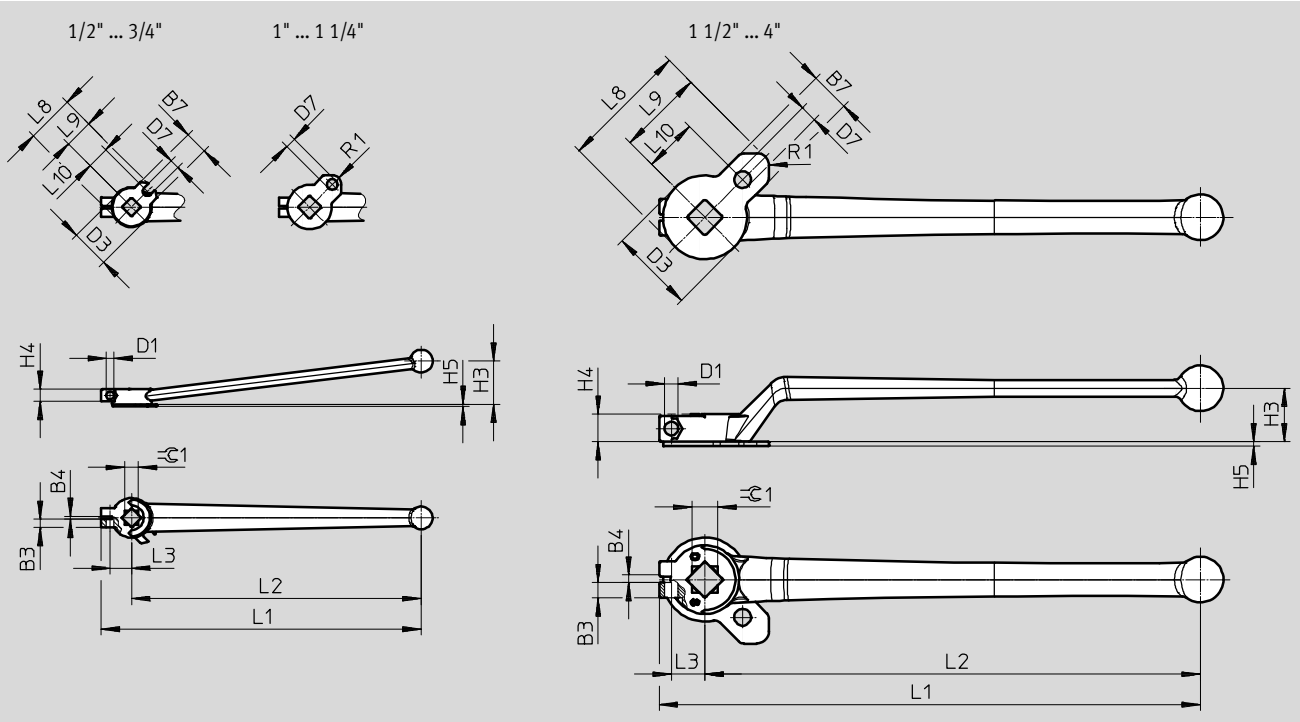
Accessories

Hand lever VAOH

- High-alloy stainless steel
- Free of copper and PTFE
- RoHS compliant
- Contains paint-wetting impairment substances
- Lockable

Dimensions and ordering data

Download CAD data ➔ **www.festo.com**



Dimensions and ordering data

For connection	B3	B4	B7	D1 ∅	D3 ∅	D7 ∅	H3	H4	H5	L1	L2
1/2" ... 3/4"	5.5	2	15.8	5.2	25	6	28.3	8	1.5	210	190
1" ... 1 1/4"	5.5	2	17.8	5.2	29	7	28.3	8	1.8	210	190
1 1/2" ... 2"	5.5	3	26	6.2	35	8	30.5	13.5	2	260	235
2 1/2" ... 3"	10	4	27.5	9	55	11	35	18	3	355	325
4"	10	4	27.5	9	70	12	38	21	3	355	325

For connection	L3	L8	L9	L10	R1	⌀1	CRC[2]	Weight [g]	Part No.	Type
1/2" ... 3/4"	14	33.5	21.1	18	–	9	3	150	**4895982**[1]	**VAOH-F9-9-H9-A**
1" ... 1 1/4"	14	41.5	27	21	6	11	3	150	**4895983**[1]	**VAOH-F9-11-H9-A**
1 1/2" ... 2"	16.2	54	36.5	25	5	14	3	370	**4895984**[1]	**VAOH-F9-14-H9-A**
2 1/2" ... 3"	22	83.6	56.1	35	8	17	3	850	**4895985**[1]	**VAOH-F9-17-H9-A**
4"	22	102.7	67.7	51	7	22	3	900	**4895986**[1]	**VAOH-F9-22-H9-A**

1) Festo is only a retailer of this product, not the manufacturer.
2) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

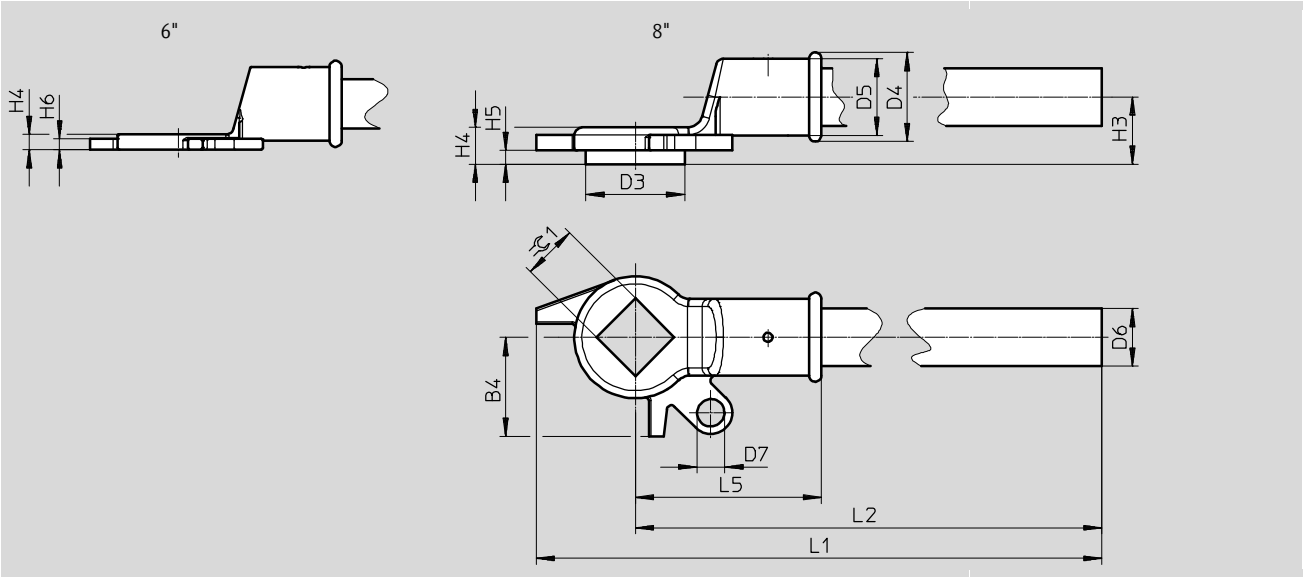
Ball valves VZBF, 2-way

Accessories

Hand lever VAOH

Information on materials:
- High-alloy stainless steel
- Free of copper and PTFE
- RoHS compliant
- Contains paint-wetting impairment substances

Dimensions and ordering data Download CAD data ➔ **www.festo.com**



Dimensions and ordering data

For connection	B4	D3 ∅	D4 ∅	D5 ∅	D6 ∅	D7 ∅	H3	H4	H5
6"	58	–	56,5	48,5	32	14	30	10	–
8"	65	65	58,5	50,5	38	18	43,1	15	9

For connection	H6	L1	L2	L5	⌀C1	CRC[2]	Weight [g]	Part No.	Type
6"	7	815,1	757,1	107	27	3	1800	**4895987**[1]	**VAOH-F9-27-H14-A**
8"	10	928	863	122	36	3	3800	**4895988**[1]	**VAOH-F9-36-H14-A**

1) Festo is only a retailer of this product, not the manufacturer.
2) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Type codes

VZBC	–	15	–	F	F	–	40	–	22	–	F0304	–	V4	V4	T

Type	
VZBC	Ball valve

Nominal width DN	
15	DN15
20	DN20
25	DN25
32	DN32
40	DN40
50	DN50
65	DN65
80	DN80
100	DN100

Connection type 1	
F	Flange to EN 1092-1

Connection type 2	
F	Flange to EN 1092-1

Process valve nominal pressure PN	
40	40 bar
16	16 bar

Valve function	
22	2/2-way

Flanged connection to ISO 5211	
F0304	Hole pattern 03 and 04
F0405	Hole pattern 04 and 05
F0507	Hole pattern 05 and 07
F07	Hole pattern 07
F0710	Hole pattern 07 and 10

Housing material	
V4	Stainless steel 1.4408

Shut-off element material	
V4	Stainless steel 1.4408

Sealing material	
T	PTFE-reinforced

Ball valves VZBC, 2-way, compact design

Technical data

- Ring housing
  DN15 ... DN100
- Flow rate
  19.4 ... 1414 m^3/h

- 2-way ball valve made from stainless steel

General technical data

Process valve connection		Ring housing with threaded flange								
Nominal width DN		15	20	25	32	40	50	65	80	100
Valve function		2/2								
Design		2-way ball valve								
Sealing principle		Soft								
Actuation type		Mechanical								
Manual override		None								
Switching position indication		Slot direction = flow direction								
Flow direction		Reversible								
Type of mounting		In-line installation								
Mounting position		Any								
Based on standard		EN 1092-1								
		ISO 5211								
Actuating torque	[Nm]	10	13	17	24	35	54	85	117	148
Inside diameter	[mm]	15	20	25	32	38	50	64	76	96
Flow rate Kv	[m^3/h]	19.4	45.6	71.5	105	170	275	507	905	1414

Operating and environmental conditions

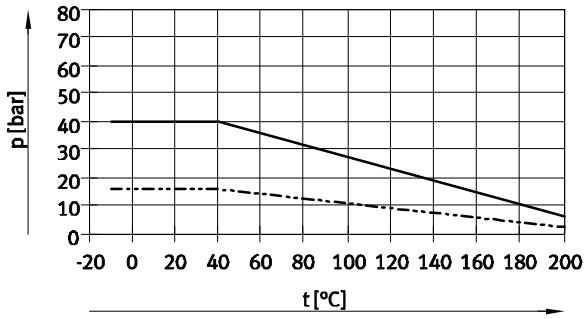
Process valve connection		Ring housing with threaded flange								
Nominal width DN		15	20	25	32	40	50	65	80	100
Operating medium		Compressed air to ISO 8573-1:2010 [-:-:-]								
Process valve operating medium		Neutral liquids								
		Inert gases								
		Water – no water vapour								
Process valve nominal pressure		PN 40						PN 16		
Temperature of medium	[°C]	–10 ... +200								
Corrosion resistance class CRC[1)]		3								
CE marking (see declaration of conformity) ➔ www.festo.com		–			To EU Pressure Equipment Directive					

1) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Technical data

Materials		Material number
Housing	High-alloy stainless steel	1.4408
Ball		1.4408
Shaft		1.4401
Seals	PTFE	
	PTFE-reinforced	
Note on materials	RoHS compliant	
	Contains paint-wetting impairment substances	

Permissible operating pressure p as a function of the temperature of the medium t



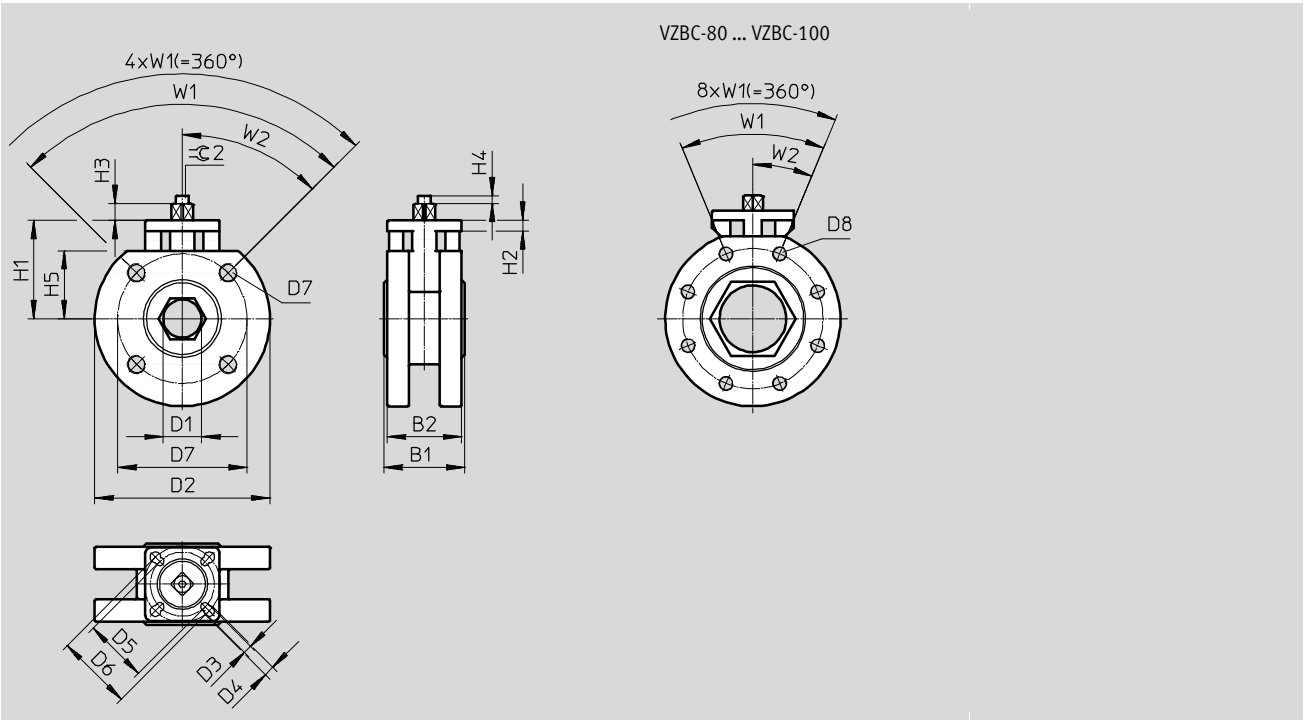
DN15 ... DN50
DN65 ... DN100

Ball valves VZBC, 2-way, compact design

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**



Type	B1 +1.6	B2	D1 ∅	D2 ∅ +5	D3 ∅	D4 ∅	D5 ∅	D6 ∅	D7 ∅
VZBC-15-FF-40-22-F0304-V4V4T	40	36	15	95	6	5.5	36	42	65
VZBC-20-FF-40-22-F0304-V4V4T	44	40	20	105	6	5.5	36	42	75
VZBC-25-FF-40-22-F0405-V4V4T	53	49	25	115	5.5	7	42	50	85
VZBC-32-FF-40-22-F0405-V4V4T	58.4	54.4	32	140	5.5	7	42	50	100
VZBC-40-FF-40-22-F0507-V4V4T	62	56	38	150	7	8.5	50	70	110
VZBC-50-FF-40-22-F0507-V4V4T	78	72	50	165	7	8.5	50	70	125
VZBC-65-FF-16-22-F07-V4V4T	100	94	64	185	–	9	–	70	145
VZBC-80-FF-16-22-F07-V4V4T	120	114	76	200	–	9	–	70	160
VZBC-100-FF-16-22-F0710-V4V4T	152	146	96	220	9	10.5	70	102	180

Type	D8	H1	H2	H3 +1.5 −0.5	H4	H5	W1	W2	⌯2 −0.1
VZBC-15-FF-40-22-F0304-V4V4T	M12	60	6.3	7.86	5	34.5	90°	45°	9
VZBC-20-FF-40-22-F0304-V4V4T	M12	64.3	7	11	5	38.5	90°	45°	9
VZBC-25-FF-40-22-F0405-V4V4T	M12	64.6	7	11	5	44.6	90°	45°	11
VZBC-32-FF-40-22-F0405-V4V4T	M16	69	7	11	–	51	90°	45°	11
VZBC-40-FF-40-22-F0507-V4V4T	M16	76.3	7.2	17	–	55	90°	45°	14
VZBC-50-FF-40-22-F0507-V4V4T	M16	85.5	7.2	15.3	–	63	90°	45°	14
VZBC-65-FF-16-22-F07-V4V4T	M16	105	10.6	14	–	73.5	90°	45°	17
VZBC-80-FF-16-22-F07-V4V4T	M16	123	10.6	18	–	94	45°	22.5°	17
VZBC-100-FF-16-22-F0710-V4V4T	M16	132	12.6	15	–	105	45°	22.5°	17

Technical data

Ordering data

	Process valve connection	Weight [g]	Part No.	Type
	Ring housing with threaded flange	1500	**1692198**	**VZBC-15-FF-40-22-F0304-V4V4T**
		2100	**1692200**	**VZBC-20-FF-40-22-F0304-V4V4T**
		2600	**1692201**	**VZBC-25-FF-40-22-F0405-V4V4T**
		3700	**1692202**	**VZBC-32-FF-40-22-F0405-V4V4T**
		4400	**1692204**	**VZBC-40-FF-40-22-F0507-V4V4T**
		6200	**1692206**	**VZBC-50-FF-40-22-F0507-V4V4T**
		10000	**1692207**	**VZBC-65-FF-16-22-F07-V4V4T**
		14400	**1692208**	**VZBC-80-FF-16-22-F07-V4V4T**
		20600	**1692209**	**VZBC-100-FF-16-22-F0710-V4V4T**

Ball valves VZBC, 2-way, compact design

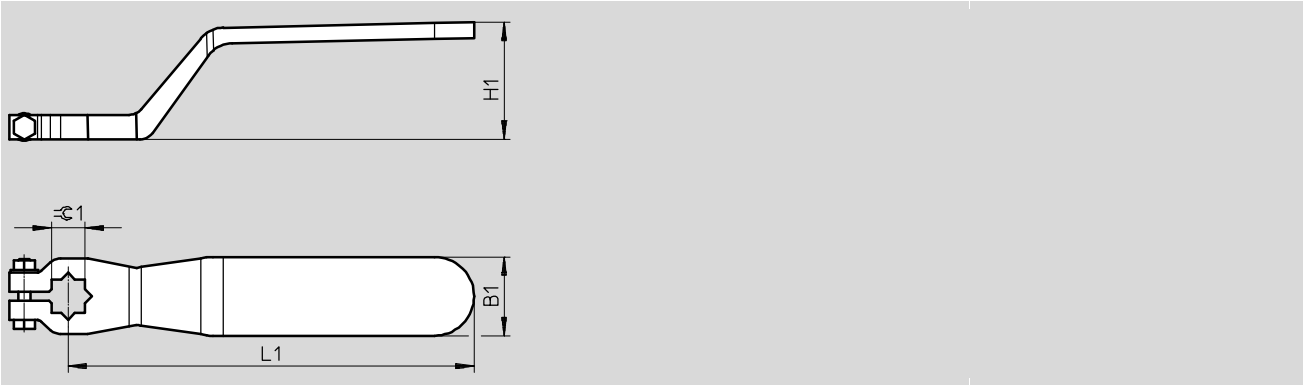
Accessories

Hand lever VAOH

Information on materials:
- High-alloy stainless steel
- Free of copper and PTFE
- Contains paint-wetting impairment substances

Dimensions and ordering data

Download CAD data ➔ **www.festo.com**



For connection	B1 ±5	H1 ±5	L1 ±10	⌀1 ±0.5	Weight [g]	Part No.	Type
DN15 ... DN20	21	36	120	9	100	**542702**	**VAOH-9-H9**
DN25 ... DN32	26	40	140	11	200	**542703**	**VAOH-11-H9**
DN40 ... DN50	31	46	180	14	300	**542704**	**VAOH-14-H9**
DN65 ... DN100	36	55	240	17	450	**542705**	**VAOH-17-H9**

Type codes

VAPB	–	1/2	–	F	–	40	–	F03	–	

Type	
VAPB	Ball valve

Connection to EN 10226-1	
1/4	Barrel with female thread Rp1/4
3/8	Barrel with female thread Rp3/8
1/2	Barrel with female thread Rp1/2
3/4	Barrel with female thread Rp3/4
1	Barrel with female thread Rp1
11/4	Barrel with female thread Rp11/4
11/2	Barrel with female thread Rp11/2
2	Barrel with female thread Rp2
21/2	Barrel with female thread Rp21/2

Connection type	
F	Female thread

Process valve nominal pressure PN	
25	PN 25
40	PN 40

Flange hole pattern to ISO 5211	
F03	1 bolt hole circle with ∅ 36 mm
F0304	2 bolt hole circles with ∅ 36 and 42 mm
F0405	2 bolt hole circles with ∅ 42 and 50 mm
F05	1 bolt hole circle with ∅ 50 mm
F07	1 bolt hole circle with ∅ 70 mm

Material	
–	Brass

Ball valves VAPB, 2-way

Technical data

- Connecting thread Rp1/4 ... Rp21/2
- Flow rate 5.9 ... 535 m^3/h

- Blow-out proof shaft assembled from inside

General technical data										
Connecting thread		Rp1/4	Rp3/8	Rp1/2	Rp3/4	Rp1	Rp11/4	Rp11/2	Rp2	Rp21/2
Nominal width DN		15	15	15	20	25	32	40	50	63
Valve function		2/2								
Design		2-way ball valve								
Sealing principle		Soft								
Actuation type		Mechanical								
Switching position indication		Slot direction = flow direction								
Flow direction		Reversible								
Type of mounting		In-line installation								
Mounting position		Any								
Based on standard		ISO 5211								
		EN 10226-1								
Working port 1, 2		1/4	3/8	1/2	3/4	1	11/4	11/2	2	21/2
Internal diameter	[mm]	15	15	15	20	25	32	40	50	63
Flow rate Kv	[m^3/h]	5.9	9.4	17	41	70	121	200	292	535

Operating and environmental conditions										
Connecting thread		Rp1/4	Rp3/8	Rp1/2	Rp3/4	Rp1	Rp11/4	Rp11/2	Rp2	Rp21/2
Medium		Compressed air to ISO 8573-1:2010 [-:-:-]								
		Neutral fluids								
		Inert gases								
		Water								
Process valve nominal pressure		PN 40	PN 40	PN 40	PN 40	PN 40	PN 40	PN 25	PN 25	PN 25
Temperature of medium	[°C]	–20 ... +150								
Breakaway torque at a differential pressure of 0 bar		3.1	3.1	3.1	4.6	6.5	10.8	13.5	20	30
Breakaway torque at a differential pressure of 10 bar		3.5	3.5	3.5	5.1	7.2	11.9	14.9	22	33
Breakaway torque at process valve differential pressure PN		5	5	5	6	8.5	15	19	29	45
CE mark (see declaration of conformity)[1)]		–							To EU Pressure Equipment Directive	

1) Additional information www.festo.com/sp ➔ Certificates.

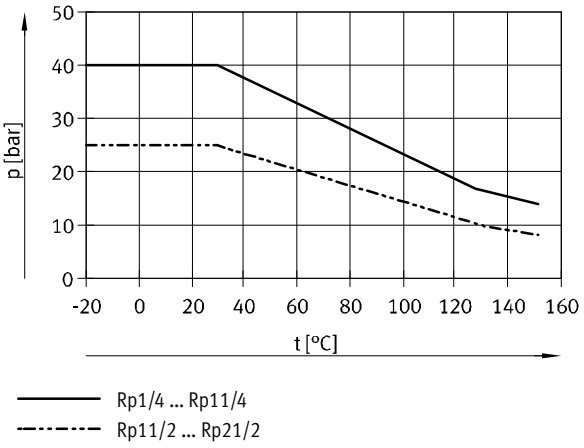
Technical data

Materials			Material number
Housing		Nickel-plated brass	CW617N
Ball		Brass, hard-chromium plated	Up to RP1/2 CW614N, and above Rp3/4 CW617N
Shaft		Nickel-plated brass	CW614N
Seals	Ball	PTFE	
		HNBR	
	Shaft	PTFE	
Note on materials		RoHS compliant	
		Contains paint-wetting impairment substances	

Torque[1] [Nm]									
Connecting thread	Rp1/4	Rp3/8	Rp1/2	Rp3/4	Rp1	Rp11/4	Rp11/2	Rp2	Rp21/2
Δp = 0 bar	3.1	3.1	3.1	4.6	6.5	10.8	13.5	20	30
Δp = 10 bar	3.5	3.5	3.5	5.1	7.2	11.9	14.9	22	33
Δp = pN	5	5	5	6	8.5	15	19	29	45

1) Torque required for actuating the ball valve

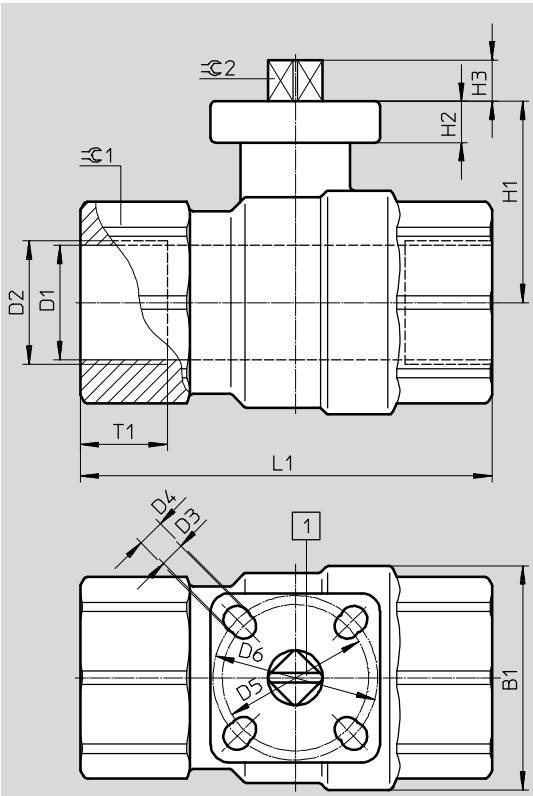
Permissible operating pressure p as a function of the temperature of the medium t



Ball valves VAPB, 2-way

Technical data

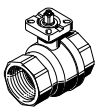
Dimensions Download CAD data ➔ **www.festo.com**



1 Switching position indication: the slot direction corresponds to the flow direction.

Type	B1	D1 ∅ ±0.15	D2	D3 ∅	D4 ∅	D5 ∅	D6 ∅	H1	H2	H3	L1 ±2	T1	⌀1 -0.1	⌀2
VAPB-¼-F-40-F03	35	15	Rp1/4	5.5	–	36	–	40	9	9	75	15	26	9
VAPB-⅜-F-40-F03	35	15	Rp3/8	5.5	–	36	–	40	9	9	75	15	26	9
VAPB-½-F-40-F03	35	15	Rp1/2	5.5	–	36	–	40	9	9	75	15	26	9
VAPB-¾-F-40-F03	45	20	Rp3/4	5.5	–	36	–	45	9	9	80	16	32	9
VAPB-1-F-40-F0304	55	25	Rp1	5.5	–	36	42	45	9	9	90	19	41	9
VAPB-1¼-F-40-F0405	65	32	Rp11/4	5.5	6.5	42	50	60	10	11	110	21	50	11
VAPB-1½-F-40-F0405	75	40	Rp11/2	5.5	6.5	42	50	65	10	11	120	21	55	11
VAPB-2-F-25-F05	90	50	Rp2	6.5	–	50	–	75	12	14	140	25	70	14
VAPB-2½-F-25-F07	110	65	Rp21/2	8.5	–	70	–	85	10	15.5	143	24	83	14

Ordering data

Version	Process valve connection	Weight [g]	Part No.	Type
	Rp1/4	500	**534302**	**VAPB-1/4-F-40-F03**
	Rp3/8	500	**534303**	**VAPB-3/8-F-40-F03**
	Rp1/2	400	**534304**	**VAPB-1/2-F-40-F03**
	Rp3/4	500	**534305**	**VAPB-3/4-F-40-F03**
	Rp1	800	**534306**	**VAPB-1-F-40-F0304**
	Rp11/4	1300	**534307**	**VAPB-11/4-F-40-F0405**
	Rp11/2	1900	**534308**	**VAPB-11/2-F-25-F0405**
	Rp2	3100	**534309**	**VAPB-2-F-25-F05**
	Rp21/2	3100	**534310**	**VAPB-21/2-F-25-F07**

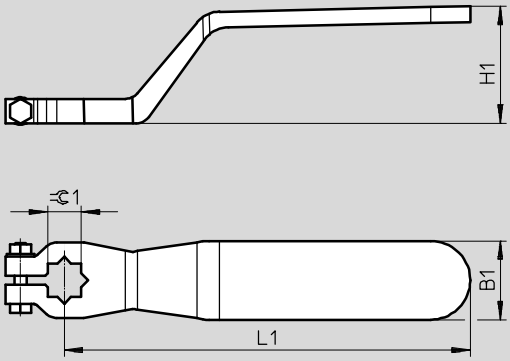
Accessories

Hand lever VAOH

Information on materials:
- High-alloy stainless steel
- Free of copper and PTFE
- Contains paint-wetting impairment substances

Dimensions and ordering data

Download CAD data ➔ **www.festo.com**



For connection	B1 ±5	H1 ±5	L1 ±10	⫧1 ±0.5	Weight [g]	Part No.	Type
Rp1/4 ... Rp1	21	36	120	9	100	**542702**	**VAOH-9-H9**
Rp11/4 ... Rp11/2	26	40	140	11	200	**542703**	**VAOH-11-H9**
Rp2 ... Rp21/2	31	46	180	14	300	**542704**	**VAOH-14-H9**

Ball valves VZBM, 2-way

Type codes

VZBM – 1/4 – RP – 40 – D – 2 – F03 – – B2 B3

Type	
VZBM	Ball valves

Nominal width DN	
1/4	DN8
3/8	DN10
1/2	DN15
3/4	DN20
1	DN25
11/4	DN32
11/2	DN40
2	DN50

Process valve connection type	
RP	Pipe thread to EN 10226-1

Nominal pressure	
25	25 bar
40	40 bar

Design	
D	Two parts

Valve function	
2	2/2-way

Flanged connection to ISO 5211	
F03	Hole pattern 03
F0305	Hole pattern 03 and 05

Actuation type	
–	Via drive

Housing material	
B2	Nickel-plated brass

Shut-off element material	
B3	Chrome-plated brass

Technical data

Function

- Connecting thread Rp1/4 ... Rp2
- Flow rate 5.9 ... 243 m^3/h

- 2-way ball valve made from brass

General technical data

Connecting thread	Rp1/4	Rp3/8	Rp1/2	Rp3/4	Rp1	Rp11/4	Rp11/2	Rp2
Nominal width DN	8	10	15	20	25	32	40	50
Valve function	2/2							
Design	2-way ball valve							
Sealing principle	Soft							
Actuation type	Mechanical							
Switching position indication	Slot direction = flow direction							
Flow direction	Reversible							
Type of mounting	In-line installation							
Mounting position	Any							
Based on standard	ISO 5211							
	EN 10226-1							
Breakaway torque at differential pressure, nominal pressure, process valve PN [Nm]	2	2	3	3.5	4	5	7	10
Inside diameter [mm]	10	10	15	20	25	32	40	50
Flow rate Kv [m^3/h]	5.9	9.4	15	28	39	84	156	243

Operating and environmental conditions

Connecting thread	Rp1/4	Rp3/8	Rp1/2	Rp3/4	Rp1	Rp11/4	Rp11/2	Rp2
Process valve nominal pressure PN	40	40	25	25	25	25	25	25
Temperature of medium [°C]	–15 ... +90							
Medium	Compressed air to ISO 8573-1:2010 [-:-:-]							
	Inert gases							
	Water – no water vapour							
	Neutral fluids							
CE mark (see declaration of conformity)[1)]	To EU Pressure Equipment Directive							

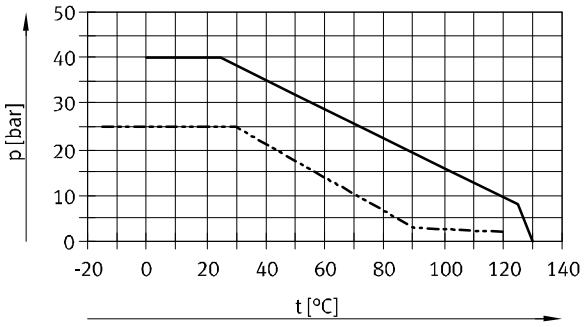
1) Additional information www.festo.com/sp ➔ Certificates.

Ball valves VZBM, 2-way

Technical data

Materials			Material number
Housing		Nickel-plated brass	CW617N
Ball	Rp1/4 ... Rp3/8	Chrome-plated brass	CW614N
	Rp1/2 ... Rp2	Chrome-plated brass	CW617N
Shaft	Rp1/4 ... Rp3/8	Brass	CW614N
	Rp1/2 ... Rp2	Brass	CW617N
Seals	Rp1/4 ... Rp3/8	PTFE	
	Rp1/2 ... Rp2	PTFE	
		FPM	
		HNBR	
Note on materials		RoHS compliant	
		Contains paint-wetting impairment substances	

Permissible operating pressure p as a function of the temperature of the medium t

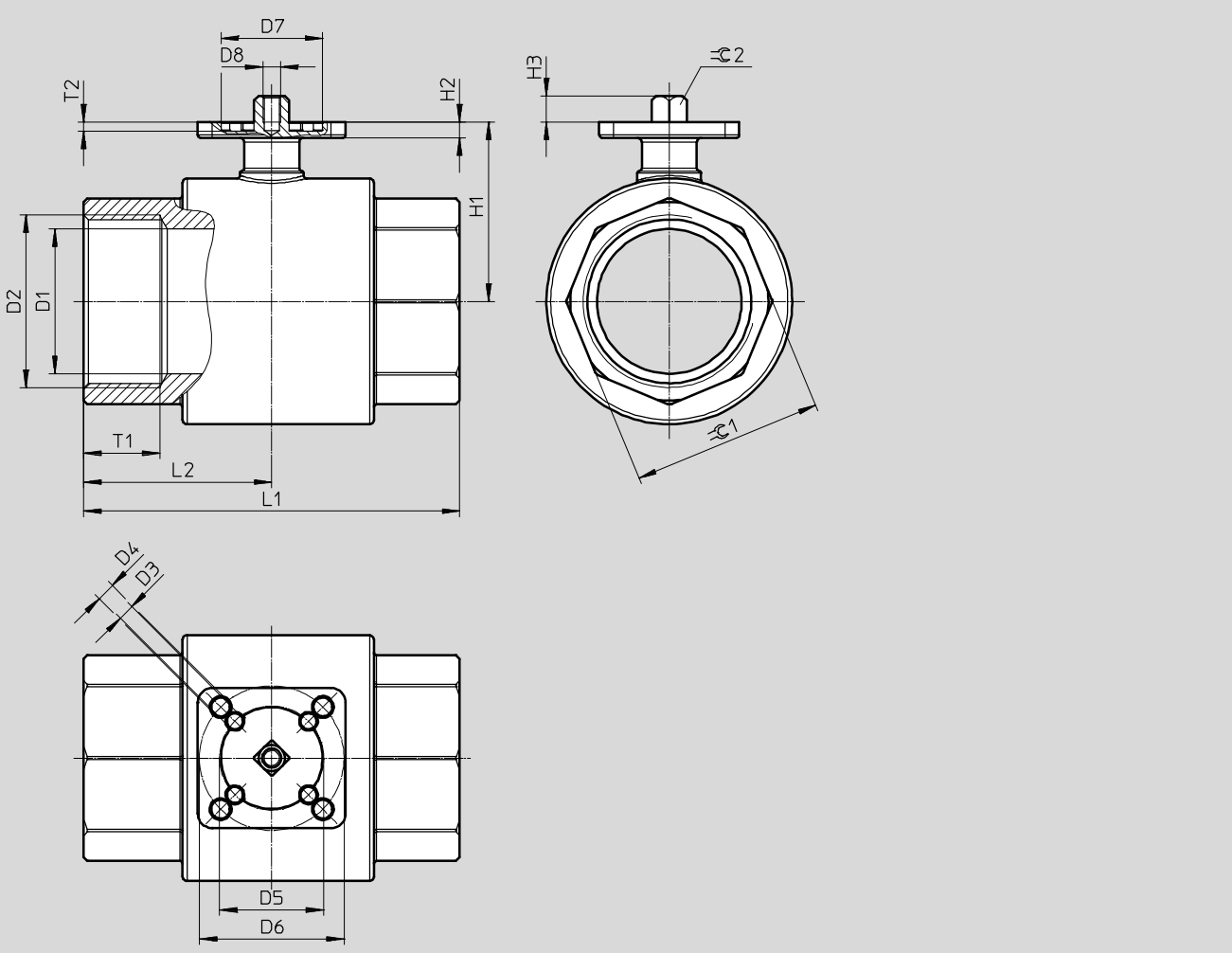


Rp1/4 ... Rp3/8
Rp1/2 ... Rp2

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**



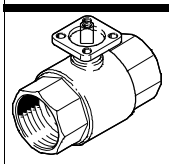
Type	D1 ∅ ±0.15	D2	D3 ∅ +0.2	D4 ∅ +0.2	D5 ∅ ±0.15	D6 ∅ ±0.15	D7 ∅	D8
VZBM-1/4-RP-40-D-2-F03-B2B3	10	Rp1/4	5.5	–	36	–	25^{H8}	M4
VZBM-3/8-RP-40-D-2-F03-B2B3	10	Rp3/8					25^{H8}	M4
VZBM-1/2-RP-25-D-2-F03-B2B3	15	Rp1/2					$25.2_{\pm 0.1}$	M6
VZBM-3/4-RP-25-D-2-F03-B2B3	20	Rp3/4					$25.2_{\pm 0.1}$	
VZBM-1-RP-25-D-2-F03-B2B3	25	Rp1					$25.2_{\pm 0.1}$	
VZBM-11/4-RP-25-D-2-F03-B2B3	32	Rp11/4					$25.2_{\pm 0.1}$	
VZBM-11/2-RP-25-D-2-F0305-B2B3	40	Rp11/2		6.5		50	$35.2_{\pm 0.1}$	
VZBM-2-RP-25-D-2-F0305-B2B3	50	Rp2					$35.2_{\pm 0.1}$	

Type	H1	H2	H3	L1 ±2	L2	T1 Min.	T2 ±0.1	⌀C1 ±1	⌀C2 h11
VZBM-1/4-RP-40-D-2-F03-B2B3	38	9	9	75	32.5	15	3.2	26	9
VZBM-3/8-RP-40-D-2-F03-B2B3	38	9		75	32.5				
VZBM-1/2-RP-25-D-2-F03-B2B3	32	5.5		61	30.5			25	
VZBM-3/4-RP-25-D-2-F03-B2B3	36			70	35	16.3		31	
VZBM-1-RP-25-D-2-F03-B2B3	44			84	42	19.1		38	
VZBM-11/4-RP-25-D-2-F03-B2B3	49			97	48.5	21.4		47	
VZBM-11/2-RP-25-D-2-F0305-B2B3	54			108	54	22		54	
VZBM-2-RP-25-D-2-F0305-B2B3	62			130	65	26.3		66	

Ball valves VZBM, 2-way

Technical data

Ordering data

	Connecting thread	Weight [g]	Part No.	Type
	Rp1/4	412	**4405646**[1]	**VZBM-1/4-RP-40-D-2-F03-B2B3**
	Rp3/8	390	**4405647**[1]	**VZBM-3/8-RP-40-D-2-F03-B2B3**
	Rp1/2	206	**4405648**[1]	**VZBM-1/2-RP-25-D-2-F03-B2B3**
	Rp3/4	306	**4405649**[1]	**VZBM-3/4-RP-25-D-2-F03-B2B3**
	Rp1	473	**4405650**[1]	**VZBM-1-RP-25-D-2-F03-B2B3**
	Rp11/4	730	**4405651**[1]	**VZBM-11/4-RP-25-D-2-F03-B2B3**
	Rp11/2	1135	**4405652**[1]	**VZBM-11/2-RP-25-D-2-F0305-B2B3**
	Rp2	1770	**4405653**[1]	**VZBM-2-RP-25-D-2-F0305-B2B3**

1) Festo is only a retailer of this product, not the manufacturer.

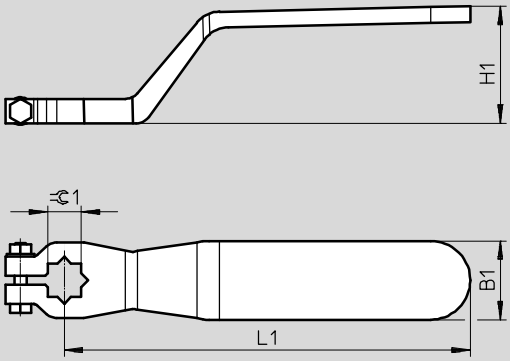
Accessories

Hand lever VAOH

Information on materials:
- High-alloy stainless steel
- Free of copper and PTFE
- Contains paint-wetting impairment substances

Dimensions and ordering data

Download CAD data ➔ **www.festo.com**



For connection	B1 ±5	H1 ±5	L1 ±10	⫃1 ±0.5	Weight [g]	Part No.	Type
Rp1/4 ... Rp2	21	36	120	9	100	**542702**	**VAOH-9-H9**

Ball valves VZBM, 3-way

Type codes

VZBM – 2 – RP – 25 – F – 3L – F05 – – B2 B3

Type	
VZBM	Ball valves

Nominal width DN	
1/4	DN8
3/8	DN10
1/2	DN15
3/4	DN20
1	DN25
11/4	DN32
11/2	DN40
2	DN50

Process valve connection type	
RP	Pipe thread to EN 10226-1

Nominal pressure	
25	25 bar
40	40 bar

Design	
F	Four-part

Valve function	
3L	3/2-way, L-shaped bore
3T	3/2-way, T-shaped bore

Flanged connection to ISO 5211	
F03	Hole pattern 03
F0304	Hole pattern 03 and 04
F0405	Hole pattern 04 and 05
F05	Hole pattern 05

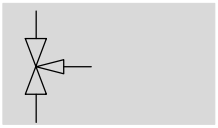
Actuation type	
–	Via drive

Housing material	
B2	Brass, nickel-plated/CW617N

Shut-off element material	
B3	Brass, chrome-plated/CW614N

Technical data

Function



- With L-shaped bore or T-shaped bore

- Connecting thread Rp1/4 ... Rp2
- Flow rate 5.9 ... 292 m^3/h

General technical data

Connecting thread	Rp1/4	Rp3/8	Rp1/2	Rp3/4	Rp1	Rp1 1/4	Rp1 1/2	Rp2
Nominal width DN	8	10	15	20	25	32	40	50
Valve function	3/2							
Design	3-way ball valve							
Sealing principle	Soft							
Type of actuation	Mechanical							
Switching position indication	Slot direction = flow direction							
Flow direction	Reversible							
Type of mounting	In-line installation							
Mounting position	Any							
Based on standard	ISO 5211							
	EN 10226-1							
Breakaway torque at differential pressure, nominal pressure, process valve PN [Nm]	6	6	6.9	8	11	16.7	26.7	36
Inside diameter [mm]	8	10	14.1	17.6	25	32	38	45
Flow rate Kv [m^3/h]	5.9	9.4	17	41	70	121	200	292

Operating and environmental conditions

Connecting thread	Rp1/4	Rp3/8	Rp1/2	Rp3/4	Rp1	Rp1 1/4	Rp1 1/2	Rp2
Process valve nominal pressure PN	40	40	40	40	40	40	25	25
Temperature of medium [°C]	–20 ... +130							
Medium	Compressed air to ISO 8573-1:2010 [-:-:-]							
	Inert gases							
	Water – no water vapour							
	Neutral fluids							
CE mark (see declaration of conformity)[1)]	To EU Pressure Equipment Directive							

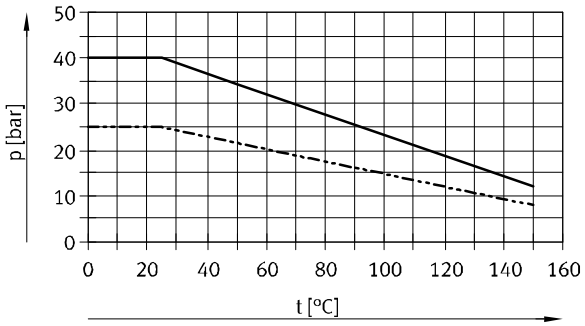
1) Additional information www.festo.com/sp → Certificates.

Ball valves VZBM, 3-way

Technical data

Materials		Material number
Housing	Brass, nickel-plated	CW617N
Ball	Brass, chrome-plated	CW614N
Shaft	Brass	CW614N
Seals	PTFE	
	HNBR	
Note on materials	RoHS-compliant	
	Contains paint-wetting impairment substances	

Permissible operating pressure p as a function of the temperature of the medium t

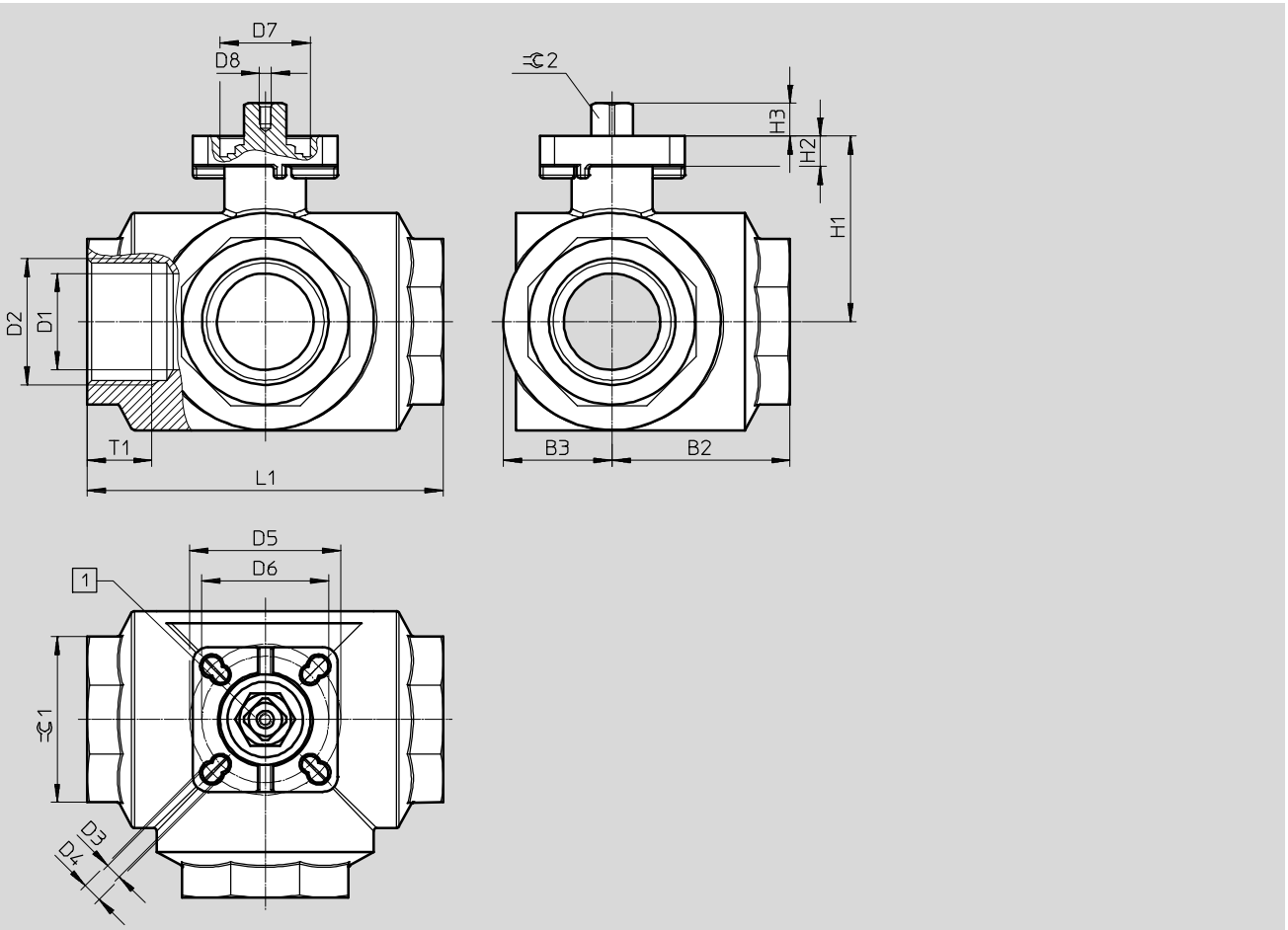


Rp1/4 ... Rp1 1/4
Rp1 1/2 ... Rp2

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**



1 Switching position indication: the slot direction corresponds to the flow direction ➔ page 556

Type	B2	B2	D1 ∅	D2	D3 ∅	D4 ∅	D5 ∅	D6 ∅	D7 ∅ H8	D8
VZBM-1/4-RP-40-F-3...-F03-B2B3	32.5	17	8	Rp1/4	5.5	–	36	–	25	M4
VZBM-3/8-RP-40-F-3...-F03-B2B3			10	Rp3/8						
VZBM-1/2-RP-40-F-3...-F03-B2B3			14.1	Rp1/2						
VZBM-3/4-RP-40-F-3...-F03-B2B3	38	21.5	17.6	Rp3/4						
VZBM-1-RP-40-F-3...-F0304-B2B3	48.5	26	25	Rp1				42		
VZBM-11/4-RP-40-F-3...-F0405-B2B3	59	36.5	32	Rp1 1/4		5.5	42	50	30	
VZBM-11/2-RP-25-F-3...-F0405-B2B3	67.5	38	38	Rp1 1/2		6.5				
VZBM-2-RP-25-F-3...-F05-B2B3	78.5	43	45	Rp2	6.5		50	–	35	M5

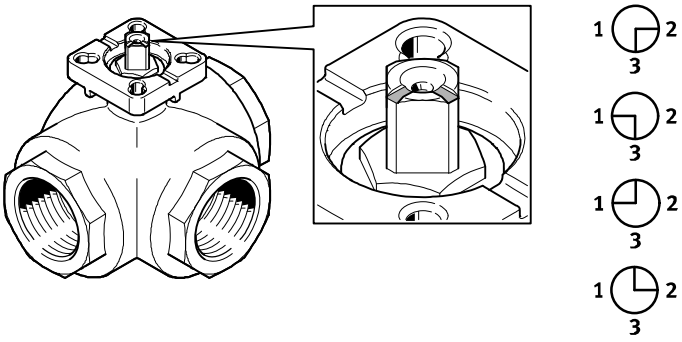
Type	H1	H2	H3	L1 ±2	T1 Min.	⫧1	⫧2 -0.1
VZBM-1/4-RP-40-F-3...-F03-B2B3	38	9	9	64.5	15	25	9
VZBM-3/8-RP-40-F-3...-F03-B2B3							
VZBM-1/2-RP-40-F-3...-F03-B2B3							
VZBM-3/4-RP-40-F-3...-F03-B2B3	42			76	16.3	31	
VZBM-1-RP-40-F-3...-F0304-B2B3	46.5			97	19.1	41	
VZBM-11/4-RP-40-F-3...-F0405-B2B3	61.3	10	11	118	21.4	55	11
VZBM-11/2-RP-25-F-3...-F0405-B2B3	63.5			134.5			
VZBM-2-RP-25-F-3...-F05-B2B3	74	12	14	157	25.7	67	14

Ball valves VZBM, 3-way

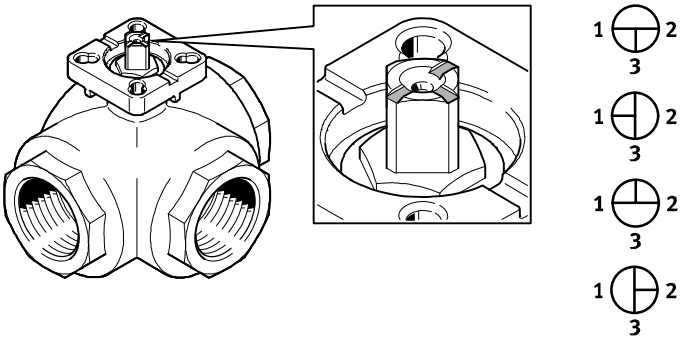
Technical data

Switching position indication

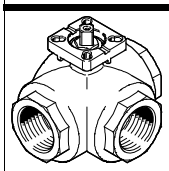
L-hole



T-hole



Ordering data

	Version	Connecting thread	Weight [g]	Part No.	Type
	L-hole	Rp1/4	530	**4451869**[1]	**VZBM-1/4-RP-40-F-3L-F03-B2B3**
		Rp3/8	500	**4451868**[1]	**VZBM-3/8-RP-40-F-3L-F03-B2B3**
		Rp1/2	460	**4451867**[1]	**VZBM-1/2-RP-40-F-3L-F03-B2B3**
		Rp3/4	720	**4451866**[1]	**VZBM-3/4-RP-40-F-3L-F03-B2B3**
		Rp1	1280	**4451862**[1]	**VZBM-1-RP-40-F-3L-F0304-B2B3**
		Rp1 1/4	3000	**4451863**[1]	**VZBM-11/4-RP-40-F-3L-F0405-B2B3**
		Rp1 1/2	3260	**4451864**[1]	**VZBM-11/2-RP-25-F-3L-F0405-B2B3**
		Rp2	4470	**4451865**[1]	**VZBM-2-RP-25-F-3L-F05-B2B3**
	T-hole	Rp1/4	530	**4451861**[1]	**VZBM-1/4-RP-40-F-3T-F03-B2B3**
		Rp3/8	460	**4451854**[1]	**VZBM-3/8-RP-40-F-3T-F03-B2B3**
		Rp1/2	460	**4451855**[1]	**VZBM-1/2-RP-40-F-3T-F03-B2B3**
		Rp3/4	710	**4451856**[1]	**VZBM-3/4-RP-40-F-3T-F03-B2B3**
		Rp1	1250	**4451857**[1]	**VZBM-1-RP-40-F-3T-F0304-B2B3**
		Rp1 1/4	2930	**4451858**[1]	**VZBM-11/4-RP-40-F-3T-F0405-B2B3**
		Rp1 1/2	3190	**4451859**[1]	**VZBM-11/2-RP-25-F-3T-F0405-B2B3**
		Rp2	4320	**4451860**[1]	**VZBM-2-RP-25-F-3T-F05-B2B3**

1) Festo is only a retailer of this product, not the manufacturer.

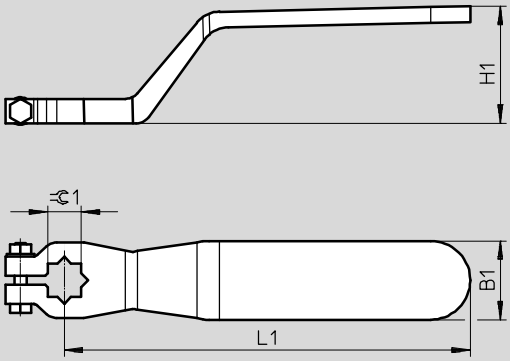
Accessories

Hand lever VAOH

Information on materials:
- High-alloy stainless steel
- Free of copper and PTFE
- Contains paint-wetting impairment substances

Dimensions and ordering data

Download CAD data ➔ **www.festo.com**



For connection	B1 ±5	H1 ±5	L1 ±10	⫧1 ±0.5	Weight [g]	Part No.	Type
Rp1/4 ... Rp1	21	36	120	9	100	**542702**	**VAOH-9-H9**
Rp1 1/4 ... Rp1 1/2	26	40	140	11	200	**542703**	**VAOH-11-H9**
Rp2	31	46	180	14	300	**542704**	**VAOH-14-H9**

Ball valves VZBM, manual

Type codes

VZBM – 1/4 – RP – 40 – D – 2 – – M – B2 B3

Type	
VZBM	Ball valves

Nominal width DN	
1/4	DN8
3/8	DN10
1/2	DN15
3/4	DN20
1	DN25
11/4	DN32
11/2	DN40

Process valve connection type	
RP	Pipe thread to EN 10226-1

Nominal pressure	
40	40 bar
50	50 bar

Design	
D	Two parts

Valve function	
2	2/2-way

Flanged connection to ISO 5211	
–	Without

Actuation type	
M	With hand lever

Housing material	
B2	Nickel-plated brass

Shut-off element material	
B3	Chrome-plated brass

Technical data

Function

- With hand lever

- Connecting thread Rp1/4 ... Rp11/2
- Flow rate 6 ... 156 m^3/h

General technical data

Process valve connection		Rp1/4	Rp3/8	Rp1/2	Rp3/4	Rp1	Rp11/4	Rp11/2
Nominal width DN		8	10	15	20	25	32	40
Valve function		2/2						
Design		2-way ball valve						
Sealing principle		Soft						
Actuation type		Mechanical						
Switching position indication		Slot direction = flow direction						
Flow direction		Reversible						
Type of mounting		In-line installation						
Mounting position		Any						
Based on standard		EN 10226-1						
Actuating torque at differential pressure, nominal pressure, process valve	[Nm]	7.5	7.5	9	20	25	37	50
Inside diameter	[mm]	10	10	15	20	25	32	40
Flow rate Kv	[m^3/h]	6	8	15	28	39	84	156

Operating and environmental conditions

Process valve connection		Rp1/4	Rp3/8	Rp1/2	Rp3/4	Rp1	Rp11/4	Rp11/2
Process valve nominal pressure PN		50	50	50	50	40	40	40
Temperature of medium	[°C]	–15 ... +120						
Medium		Compressed air to ISO 8573-1:2010 [-:-:-]						
		Inert gases						
		Water – no water vapour						
		Neutral fluids						
Certification		DVGW Gas						
		DVGW Water						
CE mark (see declaration of conformity)[1)]		To EU Pressure Equipment Directive						

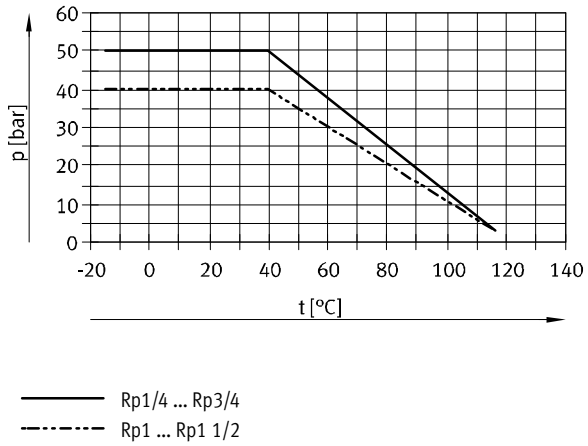
1) Additional information www.festo.com/sp ➔ Certificates.

Ball valves VZBM, manual

Technical data

Materials		Material number
Housing	Nickel-plated brass	CW617N
Ball	Chrome-plated brass	CW617N
Shaft	Brass	CW617N
Seals	PTFE	
	NBR	
Note on materials	RoHS compliant	
	Contains paint-wetting impairment substances	

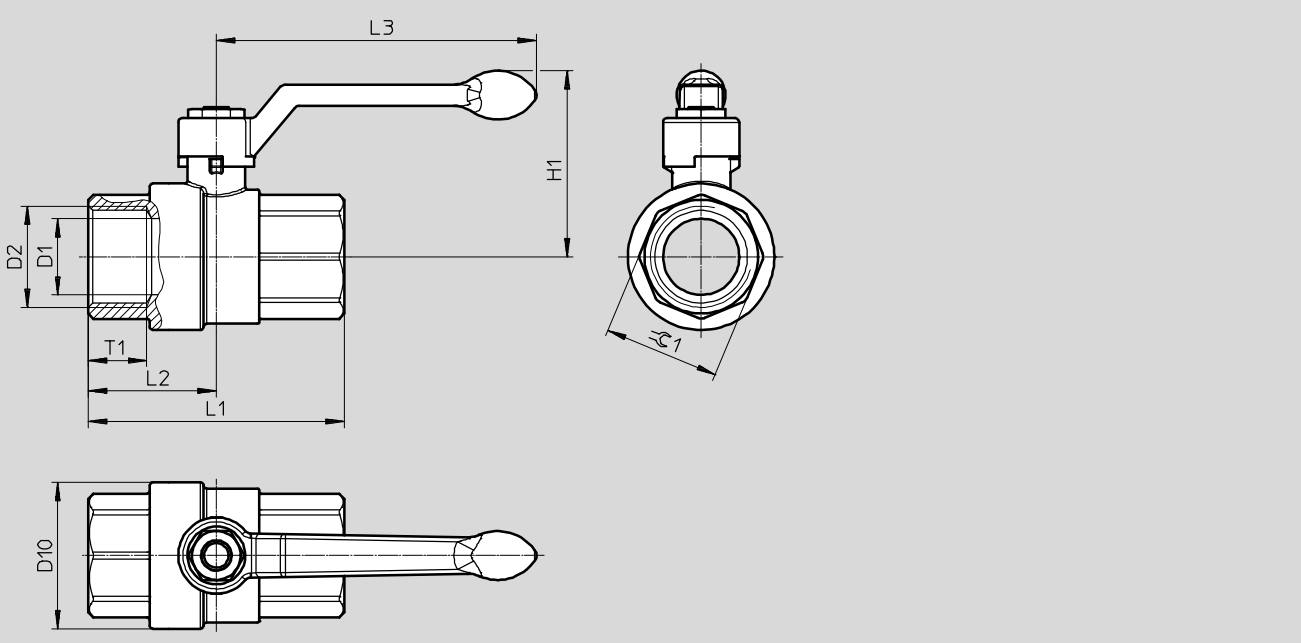
Permissible operating pressure p as a function of the temperature of the medium t



Technical data

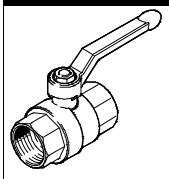
Dimensions

Download CAD data ➔ **www.festo.com**



Type	D1 ∅	D2	D10 ∅	H1	L1	L2	L3	T1 Min.	⫃1
VZBM-1/4-RP-50-D-2-M-B2B3	10	Rp1/4	23	41	49	23	85	12	18
VZBM-3/8-RP-50-D-2-M-B2B3	10	Rp3/8	24	41	50.5	23.5	85	12	21
VZBM-1/2-RP-50-D-2-M-B2B3	15	Rp1/2	32	49	61	30.5	85	15	26
VZBM-3/4-RP-50-D-2-M-B2B3	20	Rp3/4	40	57	69.5	35	105	16.3	32
VZBM-1-RP-40-D-2-M-B2B3	25	Rp1	48	61	84	42	105	19.1	38
VZBM-11/4-RP-40-D-2-M-B2B3	32	Rp11/4	60	75	98	49	130	21.4	47
VZBM-11/2-RP-40-D-2-M-B2B3	40	Rp11/2	72.5	81	108	54	130	22	54

Ordering data

	Connecting thread	Weight [g]	Part No.	Type
	Rp1/4	130	**4405684**[1]	**VZBM-1/4-RP-50-D-2-M-B2B3**
	Rp3/8	120	**4405685**[1]	**VZBM-3/8-RP-50-D-2-M-B2B3**
	Rp1/2	200	**4405686**[1]	**VZBM-1/2-RP-50-D-2-M-B2B3**
	Rp3/4	335	**4405687**[1]	**VZBM-3/4-RP-50-D-2-M-B2B3**
	Rp1	480	**4405689**[1]	**VZBM-1-RP-40-D-2-M-B2B3**
	Rp11/4	770	**4405690**[1]	**VZBM-11/4-RP-40-D-2-M-B2B3**
	Rp11/2	1116	**4405691**[1]	**VZBM-11/2-RP-40-D-2-M-B2B3**

1) Festo is only a retailer of this product, not the manufacturer.

Ball valves VZBM, manual

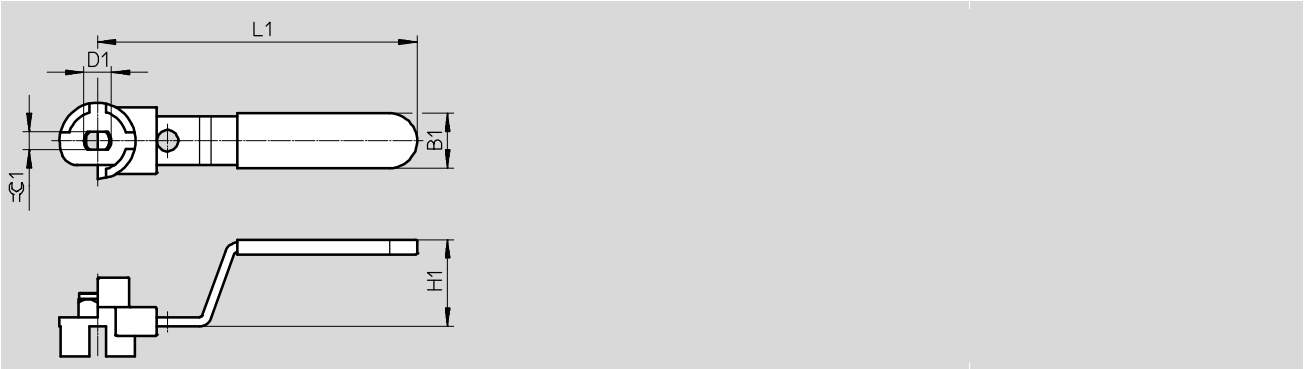
Accessories

Hand lever VAOH

- Galvanised steel
- Free of copper and PTFE
- Contains paint-wetting impairment substances
- RoHS compliant
- Lockable for VZBM, manual

Dimensions and ordering data

Download CAD data ➔ **www.festo.com**



For connection	B1	D1 ∅	H1	L1	⌀C 1	Weight [g]	Part No.	Type
Rp1/4 ... Rp1/2	16	7	24.5	89	5	50	**4650069**[1)]	**VAOH-F10-D7-H9-A**
Rp3/4 ... Rp1	18	9	28.5	105	6	75	**4650070**[1)]	**VAOH-F10-D9-H9-A**
Rp11/4 ... Rp11/2	22	12	32	130	8	145	**4650071**[1)]	**VAOH-F10-D12-H9-A**

1) Festo is only a retailer of this product, not the manufacturer.

Type codes

QH	–	1/4	–	

Type	
QH	Ball valve

Pneumatic port 1	
1/4	Female thread G1/4
3/8	Female thread G3/8
1/2	Female thread G1/2
3/4	female thread G3/4
1	Female thread G1
11/2	Female thread G11/2

Pneumatic port 2	
–	Same connection size as pneumatic port 1

Ball valves QH, manual

Technical data

Function

- Connecting thread G1/4 ... G11/2
- Standard nominal flow rate 3400 ... 84000 l/min

- With hand lever
- Pipe thread to ISO 228-1

General technical data							
Pneumatic port 1		G1/4	G3/8	G1/2	G3/4	G1	G11/2
Pneumatic port 2		G1/4	G3/8	G1/2	G3/4	G1	G11/2
Nominal width	[mm]	10	10	15	20	25	40
Design		Ball valve					
Type of mounting		In-line installation					
Mounting position		Any					
Valve function		2/2-way valve, double solenoid					
Type of actuation		Manual					
Sealing principle		Soft					
Standard nominal flow rate qnN	[l/min]	3400	7500	11500	21000	33000	84000

Operating and environmental conditions		
Medium[1)]		Compressed air according to ISO 8573-1:2010 [7:–:–]
		Water
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Ambient temperature	[°C]	–20 ... +180

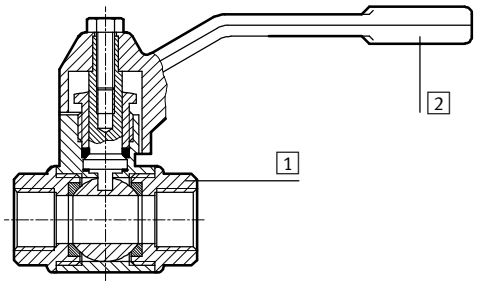
1) Other media on request

Note

Not permitted for toxic gases such as natural gas, mains gas etc.

Materials

Sectional view

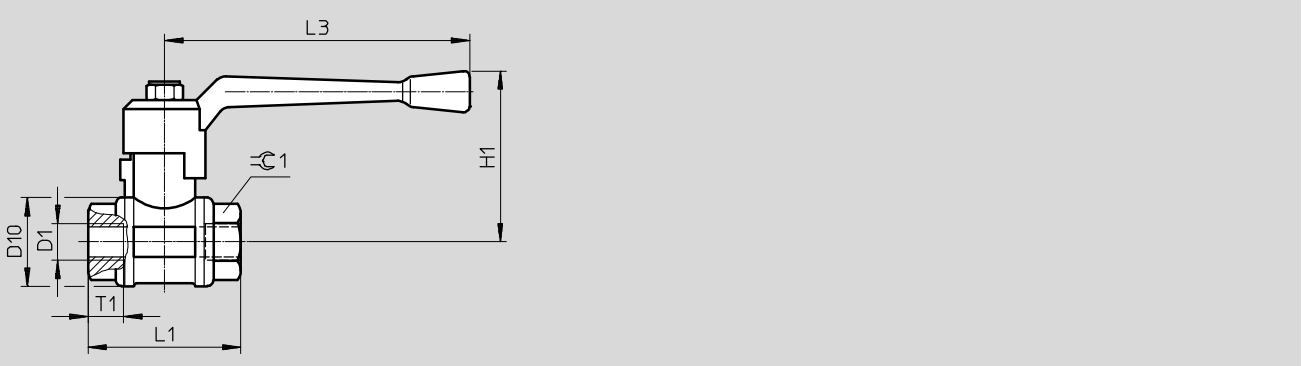


Ball valve		
1	Housing	Brass
2	Lever	Aluminium

Technical data

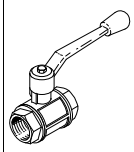
Dimensions – Female thread at both ends

Download CAD data ➔ **www.festo.com**



Type	D1	D10 ∅	H1	L1	L3	T1	⌀C1
QH-1/4	G1/4	30	56	52	100	11.5	21.5
QH-3/8	G3/8	30	56	52	100	11.5	21.5
QH-1/2	G1/2	35	59	64	100	15	27
QH-3/4	G3/4	44	72	74	120	16.3	32
QH-1	G1	51	77	88	120	19.1	41
QH-11/2	G11/2	73	100	105.5	150	21.4	55

Ordering data

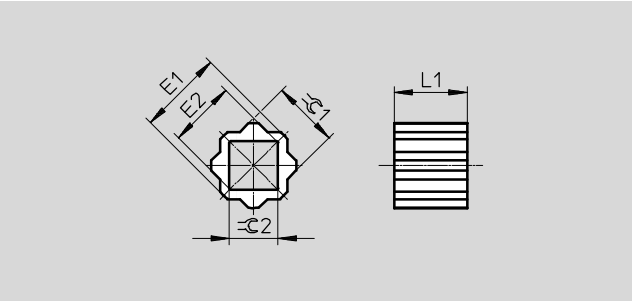
Version		Pneumatic port 1	Pneumatic port 2	Weight [g]	Part No.	Type
	Female thread at both ends	G1/4	G1/4	175	**9541**	**QH-1/4**
		G3/8	G3/8	180	**9542**	**QH-3/8**
		G1/2	G1/2	340	**9543**	**QH-1/2**
		G3/4	G3/4	590	**9544**	**QH-3/4**
		G1	G1	815	**9545**	**QH-1**
		G11/2	G11/2	1750	**6837**	**QH-11/2**

Ball valves

Accessories

Reducing sleeve square DARQ

- Connection 1, function drive outlet
- Connection 2, function reducing outlet
- Material: Sintered stainless steel
- RoHS-compliant
- Contains paint-wetting impairment substances



DARQ-R-A-...	E1 +0,1/–0,3	E2 +0,3/–0,1	L1 ±0,2	⫧1 –0,02/–0,12	⫧2 +0,04/+0,18
S11-S8-...	14	11	12	11	8
S11-S9-...	14	12,3	11	11	9
S14-S8-...	18	11	16	14	8
S14-S9-...	18	12,3	16	14	9
S14-S10-...	18	13,3	16	14	10
S14-S11-...	18	14,3	16	14	11
S14-S12-...	18	16,3	16	14	12
S17-S8-...	22	11	17	17	8
S17-S9-...	22	12,3	17	17	9
S17-S11-...	22	14,3	17	17	11
S17-S12-...	22	16,3	17	17	12
S17-S14-...	22	18,3	17	17	14
S22-S11-...	28	14,3	22	22	11
S22-S14-...	28	18,3	22	22	14
S22-S16-...	28	21,3	22	22	16
S22-S17-...	28	22,3	22	22	17
S27-S14-...	36	18,3	27	27	14
S27-S17-...	36	22,3	27	27	17
S27-S22-...	36	28,5	27	27	22
S36-S22-...	48	28,5	36	36	22
S36-S27-...	48	36,1	36	36	27
S46-S36-...	59	48	46	46	36

Accessories

Ordering data

Design	Connection		Length [mm]	CRC[1]	Weight/piece [g]	Part No.	Type	PU[2]
	Drive outlet	Reducing outlet						
Internal square and external octagon	Size 11	Size 8	12	2	7	**8082116**	**DARQ-R-A-S11-S8-12**	1
	Size 11	Size 9	11		5	**8082117**	**DARQ-R-A-S11-S9-11**	
	Size 14	Size 8	16		20	**8086383**	**DARQ-R-A-S14-S8-16**	
	Size 14	Size 9	16		18	**8082118**	**DARQ-R-A-S14-S9-16**	
	Size 14	Size 10	16		16	**8082119**	**DARQ-R-A-S14-S10-16**	
	Size 14	Size 11	16		13	**8082120**	**DARQ-R-A-S14-S11-16**	
	Size 14	Size 12	16		10	**8082121**	**DARQ-R-A-S14-S12-16**	
	Size 17	Size 8	17		36	**8086384**	**DARQ-R-A-S17-S8-17**	
	Size 17	Size 9	17		34	**8096914**	**DARQ-R-A-S17-S9-17**	
	Size 17	Size 11	17		29	**8082122**	**DARQ-R-A-S17-S11-17**	
	Size 17	Size 12	17		25	**8086385**	**DARQ-R-A-S17-S12-17**	
	Size 17	Size 14	17		19	**8082123**	**DARQ-R-A-S17-S14-17**	
	Size 22	Size 11	22		75	**8086386**	**DARQ-R-A-S22-S11-22**	
	Size 22	Size 14	22		62	**8082124**	**DARQ-R-A-S22-S14-22**	
	Size 22	Size 16	22		52	**8082125**	**DARQ-R-A-S22-S16-22**	
	Size 22	Size 17	22		46	**8082126**	**DARQ-R-A-S22-S17-22**	
	Size 27	Size 14	27		140	**8096913**	**DARQ-R-A-S27-S14-27**	
	Size 27	Size 17	27		121	**8086387**	**DARQ-R-A-S27-S17-27**	
	Size 27	Size 22	27		80	**8082127**	**DARQ-R-A-S27-S22-27**	
	Size 36	Size 22	36		286	**8096915**	**DARQ-R-A-S36-S22-36**	
	Size 36	Size 27	36		215	**8082128**	**DARQ-R-A-S36-S27-36**	
	Size 46	Size 36	46		410	**8082129**	**DARQ-R-A-S46-S36-46**	
	Size 11	Size 8	12		35	**8082130**	**DARQ-R-A-S11-S8-12-P5**	5
	Size 11	Size 9	11		25	**8082131**	**DARQ-R-A-S11-S9-11-P5**	
	Size 14	Size 8	16		100	**8086388**	**DARQ-R-A-S14-S8-16-P5**	
	Size 14	Size 9	16		90	**8082132**	**DARQ-R-A-S14-S9-16-P5**	
	Size 14	Size 11	16		65	**8082133**	**DARQ-R-A-S14-S11-16-P5**	
	Size 17	Size 11	17		145	**8082134**	**DARQ-R-A-S17-S11-17-P5**	
	Size 17	Size 12	17		125	**8086389**	**DARQ-R-A-S17-S12-17-P5**	
	Size 17	Size 14	17		95	**8082135**	**DARQ-R-A-S17-S14-17-P5**	
	Size 22	Size 14	22		310	**8082136**	**DARQ-R-A-S22-S14-22-P5**	
	Size 22	Size 17	22		230	**8082137**	**DARQ-R-A-S22-S17-22-P5**	
	Size 27	Size 22	27		400	**8082138**	**DARQ-R-A-S27-S22-27-P5**	
	Size 36	Size 27	36		1075	**8082139**	**DARQ-R-A-S36-S27-36-P5**	
	Size 11	Size 9	11		50	**8082140**	**DARQ-R-A-S11-S9-11-P10**	10
	Size 14	Size 9	16		180	**8082141**	**DARQ-R-A-S14-S9-16-P10**	
	Size 14	Size 11	16		130	**8082142**	**DARQ-R-A-S14-S11-16-P10**	
	Size 17	Size 14	17		190	**8082143**	**DARQ-R-A-S17-S14-17-P10**	
	Size 22	Size 17	22		460	**8082144**	**DARQ-R-A-S22-S17-22-P10**	
	Size 11	Size 9	11		250	**8082145**	**DARQ-R-A-S11-S9-11-P50**	50
	Size 14	Size 9	16		900	**8082146**	**DARQ-R-A-S14-S9-16-P50**	
	Size 14	Size 11	16		650	**8082147**	**DARQ-R-A-S14-S11-16-P50**	
	Size 17	Size 11	17		1450	**8082148**	**DARQ-R-A-S17-S11-17-P50**	
	Size 22	Size 17	22		2300	**8082149**	**DARQ-R-A-S22-S17-22-P50**	

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
2) Packaging unit

Ball valve actuator units

VZBA, VZBC, VZBM

Overview, configuration and ordering
➔ **www.festo.com/catalogue/vzba**

Additional information, support and user documentation
➔ **www.festo.com/sp/vzba**

Selected types in accordance with the ATEX Directive for explosive atmospheres
➔ **www.festo.com/ex**

+ Combination of a pneumatic quarter turn actuator and a ball valve
+ Process valve connection thread, weld-on end, ring housing with threaded flange
+ Nominal width DN 8 ... 100
+ Nominal pressure process valve PN 0 ... 63
+ Flange hole pattern to ISO 5211
+ Corrosion-resistant and acid-resistant versions

Ball valve actuator units

Key features and product range overview

General

- Connecting thread Rp1/4 ... Rp4
- Flow rate 5.9 ... 1414 m^3/h

Flexible

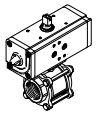
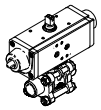
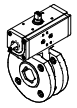
- Electric or pneumatic actuation
- Flange hole pattern to ISO 5211
- Connection pattern to NAMUR VDI/VDE 3845
- Corrosion- and acid-resistant designs
- Versions with ATEX certification

Design

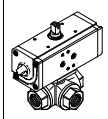
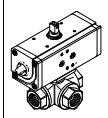
- 2-way ball valve actuator units made from stainless steel or brass with pipe thread or with weld-on ends
- 2-way ball valve actuator units made from stainless steel in compact design
- 3-way ball valve actuator units made from stainless steel or brass

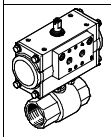
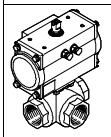
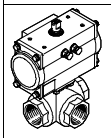
Characteristics

- Combination of a pneumatic quarter turn actuator and a ball valve
- Flow is fully opened or closed in both directions
- Sensor boxes or limit switches can be mounted directly on the actuator unit for sensing the end positions

Design		Type	Quarter turn actuator	Process valve connection	Nominal width DN	Flange hole pattern to ISO 5211	Nominal pressure of process valve PN	➔ Page/Internet
Stainless steel	**2-way ball valve actuator units with pipe thread to EN 10226-1**							
		VZBA-...-GG	DAPS double-acting or single-acting	Rp1/4	8	F0304	63	576
				Rp3/8	10	F0304		
				Rp1/2	15	F0304		
				Rp3/4	20	F0304		
				Rp1	25	F0405		
				Rp1 1/4	32	F0405		
				Rp1 1/2	40	F0507		
				Rp2	50	F0507		
				Rp2 1/2	65	F0710		
				Rp3	80	F0710		
				Rp4	100	F10		
	2-way ball valve actuator units with weld-on ends to EN 12627							
		VZBA-...-WW	DAPS double-acting or single-acting	Weld-on end	8	F0304	63	576
					10	F0304		
					15	F0304		
					20	F0304		
					25	F0405		
					32	F0405		
					40	F0507		
					50	F0507		
					65	F0710		
					80	F0710		
					100	F10		
	2-way ball valve actuator units in compact design with flange to DIN EN 1092-1							
		VZBC-...-FF	DAPS double-acting or single-acting	Ring housing with threaded flange	15	F0304	40	584
					20	F0304		
					25	F0405		
					32	F0405		
					40	F0507		
					50	F0507		
					65	F07	16	
					80	F07		
					100	F0710		

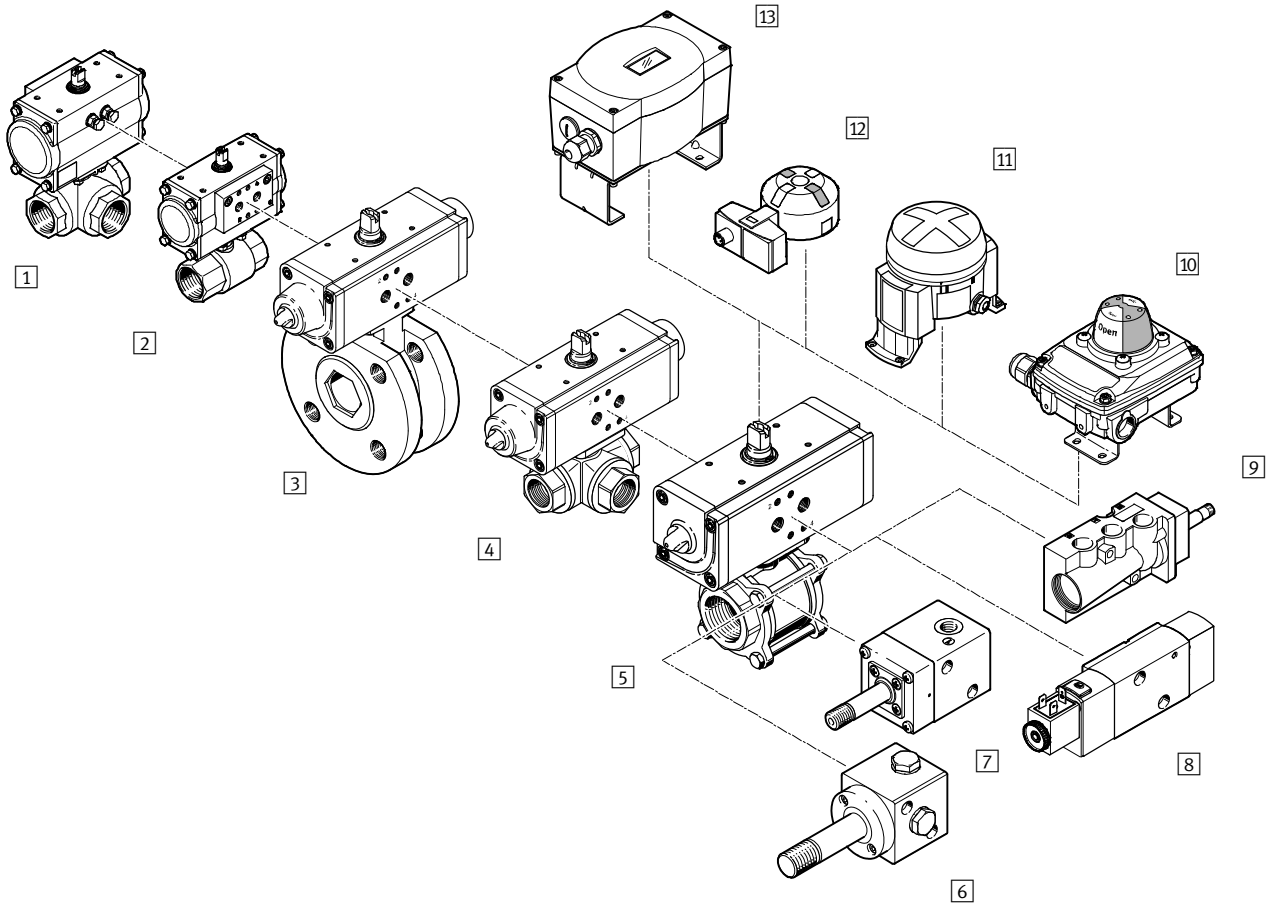
Key features and product range overview

Design		Type	Quarter turn actuator	Process valve connection	Nominal width DN	Flange hole pattern to ISO 5211	Nominal pressure of process valve PN	➔ Page/Internet
Stainless steel	**3-way ball valve actuator units with L-shaped bore and pipe thread to EN 10226-1**							
		VZBA	DAPS double-acting or single-acting	Rp1/4	8	F0304	63	590
				Rp3/8	10	F0304		
				Rp1/2	15	F0304		
				Rp3/4	20	F0405		
				Rp1	25	F0405		
				Rp1 1/4	32	F0405		
				Rp1 1/2	40	F0405		
				Rp2	50	F05		
	3-way ball valve actuator units with T-shaped bore and pipe thread to EN 10226-1							
		VZBA	DAPS double-acting or single-acting	Rp1/4	8	F0304	63	590
				Rp3/8	10	F0304		
				Rp1/2	15	F0304		
				Rp3/4	20	F0405		
				Rp1	25	F0405		
				Rp1 1/4	32	F0405		
				Rp1 1/2	40	F0405		
				Rp2	50	F05		

Design		Type	Quarter turn actuator	Process valve connection	Nominal width DN	Flange hole pattern to ISO 5211	Nominal pressure of process valve PN	➔ Page/Internet
Brass	**2-way ball valve actuator units with pipe thread to EN 10226-1**							
		VZBM	DFPD double-acting or single-acting	Rp1/4	8	F03	40	596
				Rp3/8	10	F03		
				Rp1/2	15	F03	25	
				Rp3/4	20	F03		
				Rp1	25	F03		
				Rp1 1/4	32	F03		
				Rp1 1/2	40	F0305		
				Rp2	50	F0305		
	3-way ball valve actuator units with L-shaped bore and pipe thread to EN 10226-1							
		VZBM	DFPD double-acting or single-acting	Rp1/4	8	F03	40	602
				Rp3/8	10	F03		
				Rp1/2	15	F03		
				Rp3/4	20	F03		
				Rp1	25	F0304		
				Rp1 1/4	32	F0405		
				Rp1 1/2	40	F0405	25	
				Rp2	50	F05		
	3-way ball valve actuator units with T-shaped bore and pipe thread to EN 10226-1							
		VZBM	DFPD double-acting or single-acting	Rp1/4	8	F03	40	602
				Rp3/8	10	F03		
				Rp1/2	15	F03		
				Rp3/4	20	F03		
				Rp1	25	F0304		
				Rp1 1/4	32	F0405		
				Rp1 1/2	40	F0405	25	
				Rp2	50	F05		

Ball valve actuator units

Peripherals overview



Peripherals overview

Mounting components and accessories

		Brief description	→ Page/Internet
1	Ball valve actuator unit VZBM	Combination of double-acting or single-acting quarter turn actuator DFPD and 3-way ball valve, brass	602
2	Ball valve actuator unit VZBM	Combination of double-acting or single-acting quarter turn actuator DFPD and 2-way ball valve, brass	596
3	Ball valve actuator unit VZBC	Combination of double-acting or single-acting quarter turn actuator DAPS and 2-way ball valve, stainless steel, compact design	584
4	Ball valve actuator unit VZBA	Combination of double-acting or single-acting quarter turn actuator DAPS and 3-way ball valve, stainless steel	590
5	Ball valve actuator unit VZBA	Combination of double-acting or single-acting quarter turn actuator DAPS and 2-way ball valve, stainless steel	576
6	Solenoid valves VOFD	Solenoid valve with solenoid coil, connection pattern to NAMUR	151
7	Solenoid valves VOFC	Solenoid valve with solenoid coil, connection pattern to NAMUR	85
8	Solenoid valves VSNC	For single-acting and double-acting quarter turn actuators with a connection pattern to VDI/VDE 3845	23
9	Solenoid valve NVF3	For F solenoid coil and explosion-proof F solenoid coil	nvf3
10	Sensor boxes SRBC	For electrical position feedback and monitoring the position of process valves actuated using quarter turn actuators	217
11	Limit switch attachments DAPZ	Round design, variant AR Electrical, inductive or inductive and explosion-proof sensing	279
12	Sensor boxes SRBG	For electrical position feedback and monitoring the position of process valves actuated using quarter turn actuators	235
13	Positioner CMSX	For controlling the position of quarter turn actuators in process automation systems	289

Ball valve actuator units VZBA, 2-way, stainless steel

Type codes

VZBA – 1/4 – G G – 63 – T – 22 – F0304 –

Type	
VZBA	Ball valve

Nominal width DN	
1/4"	DN8
3/8"	DN10
1/2"	DN15
3/4"	DN20
1"	DN25
11/4"	DN32
11/2"	DN40
2"	DN50
21/2"	DN65
3"	DN80
4"	DN100

Connection type 1	
G	Pipe thread to DIN EN 10226-1
W	Weld-on end

Connection type 2	
G	Pipe thread to DIN EN 10226-1
W	Weld-on end

Nominal pressure of process valve PN	
63	63 bar

Design	
T	Three-part

Valve function	
22	2/2-way

Flanged connection to ISO 5211	
F0304	2 bolt circles with ∅ 36 mm and ∅ 42 mm
F0405	2 bolt circles with ∅ 42 mm and ∅ 50 mm
F0507	2 bolt circles with ∅ 50 mm and ∅ 70 mm
F07	1 bolt circle with ∅ 70 mm
F0710	2 bolt circles with ∅ 70 mm and ∅ 102 mm
F10	1 bolt circle with ∅ 102 mm

Type codes

V4	V4	T	–	PS	15	–	R	–	90	–	4	–	C

Housing material

V4	Stainless steel 1.4401/1.4404 (AISI 316L)/1.4408

Shut-off element material

V4	Stainless steel 1.4401/1.4404 (AISI 316L)/1.4408

Sealing material

T	PTFE reinforced

Actuator

PP	DAPS, double-acting
PS	DAPS, single-acting

Torque

15	15 Nm
30	30 Nm
53	53 Nm
60	60 Nm
90	90 Nm
106	106 Nm
120	120 Nm
180	180 Nm
240	240 Nm

Swivel direction

R	Right

Nominal swivel angle

90	90°

Spring configuration

–	Not applicable for double-acting
1	Spring force for connection pressure 2.8 bar
2	Spring force for connection pressure 3.5 bar
3	Spring force for connection pressure 4.2 bar
4	Spring force for connection pressure 5.6 bar

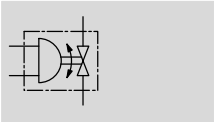
End-position adjustment

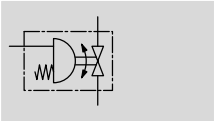
C	Closed

Ball valve actuator units VZBA, 2-way, stainless steel

Technical data

Function





Swivel angel
0 ... 90°

Flow rate
7 ... 1414 m^3/h

Connecting thread
Rp1/4 ... Rp4

General technical data												
Nominal width DN		8	10	15	20	25	32	40	50	65	80	100
Quarter turn actuator												
Type of mounting		In-line installation										
Mounting position		Any										
Swivel angle	[°]	90										
Closing direction		Closes to the right										
Ball valve												
Design		2-way ball valve, quarter turn actuator										
Type of actuation		Pneumatic										
Switching position indication		Slot direction = flow direction										
Nominal pressure of process valve PN		63										
Flow rate Kv	[m^3/h]	7	10	19.4	45.6	71.5	105	170	275	507	905	1414

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Operating pressure	[bar]	6 ... 8.4
Ambient temperature	[°C]	–10 ... +80
Temperature of medium[1]	[°C]	–10 ... +200
Medium		Compressed air to ISO 8573-1:2010 [-:-:-]
		Inert gases
		Neutral fluids
		Water – no water vapour
Note on the operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Corrosion resistance class CRC[2]		3

1) As a function of operating pressure
2) Corrosion resistance class CRC 3 according to Festo standard 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional surface requirements which are in direct contact with a normal industrial environment.

Technical data

ATEX	
ATEX category for gas	II 2G
ATEX category for dust	II 2D
Max. surface temperature of assembly	TX
Explosion group of assembly	II C
Explosion-proof temperature rating	–10°C <= Ta <= +60°C

Materials	Information on materials	Material number
Housing	High-alloy stainless steel	1.4408
Ball		
Shaft	High-alloy stainless steel	1.4401
Seals	PTFE reinforced	
	PTFE	
Note on materials	RoHS-compliant	
	Contains paint-wetting impairment substances	

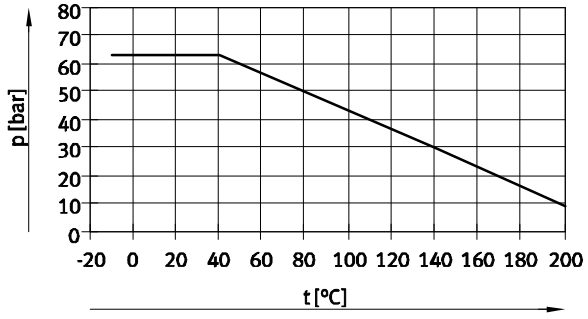
Weight – Double-acting

Nominal width DN	Process valve connection		Weight [g]	Nominal width DN	Process valve connection		Weight [g]
8	Rp1/4	Weld-on ends	1450	40	Rp1 1/2	Weld-on ends	4800
10	Rp3/8		1450	50	Rp2		6600
15	Rp1/2		1450	65	Rp2 1/2		11,700
20	Rp3/4		1900	80	Rp3		18,200
25	Rp1		2300	100	Rp4		27,700
32	Rp1 1/4		3800				

Weight – Single-acting

Nominal width DN	Process valve connection		Weight [g]	Nominal width DN	Process valve connection		Weight [g]
8	Rp1/4	Weld-on ends	2000	40	Rp1 1/2	Weld-on ends	6100
10	Rp3/8		2000	50	Rp2		10,000
15	Rp1/2		2000	65	Rp2 1/2		16,300
20	Rp3/4		3100	80	Rp3		22,900
25	Rp1		3500	100	Rp4		33,500
32	Rp1 1/4		5150				

Permissible operating pressure p as a function of temperature of medium t



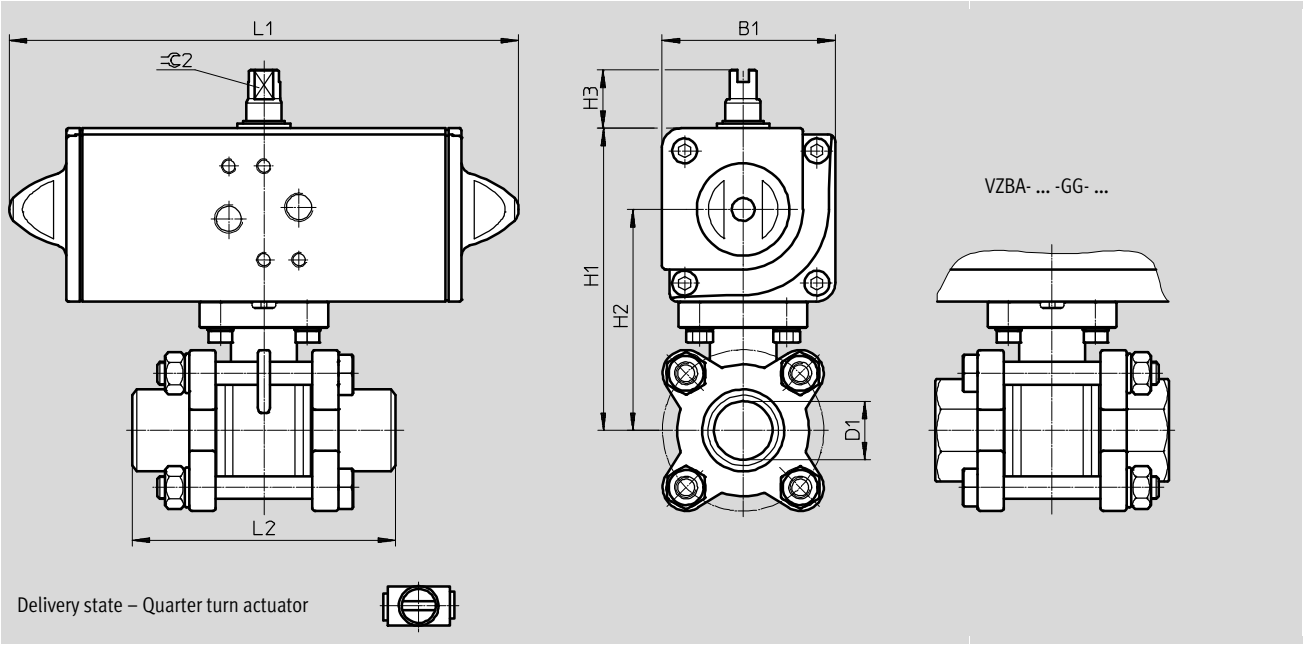
Ball valve actuator units VZBA, 2-way, stainless steel

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

DAPS – Double-acting



Delivery state – Quarter turn actuator

Type	B1	D1 ∅	H1	H2	H3	L1	L2	⌀C 2
VZBA-1/4"-WW-63-T-22-F0304-V4V4T-PP15-R-90-C	52.2	10	92.2	68	20	159	70	8
VZBA-3/8"-WW-63-T-22-F0304-V4V4T-PP15-R-90-C	52.2	12	92.2	68	20	159	70	8
VZBA-1/2"-WW-63-T-22-F0304-V4V4T-PP15-R-90-C	52.2	16	92.2	68	20	159	75	8
VZBA-3/4"-WW-63-T-22-F0304-V4V4T-PP30-R-90-C	59.2	20	103.2	75.5	20	174	90	9
VZBA-1"-WW-63-T-22-F0405-V4V4T-PP30-R-90-C	59.2	25	111.2	83.5	20	174	100	9
VZBA-11/4"-WW-63-T-22-F0405-V4V4T-PP60-R-90-C	70.4	32	128.4	95.7	20	198	110	10
VZBA-11/2"-WW-63-T-22-F0507-V4V4T-PP60-R-90-C	70.4	38	138.4	105.7	20	198	125	10
VZBA-2"-WW-63-T-22-F0507-V4V4T-PP60-R-90-C	70.4	50	147.7	114.7	20	198	150	10
VZBA-21/2"-WW-63-T-22-F0710-V4V4T-PP106-R-90-C	83.3	65	181.3	142.8	20	237.1	190	12
VZBA-3"-WW-63-T-22-F0710-V4V4T-PP180-R-90-C	107.5	80	217.5	166.5	30	289.9	220	15
VZBA-4"-WW-63-T-22-F10-V4V4T-PP240-R-90-C	111.1	100	249.1	198.1	30	313.6	270	15

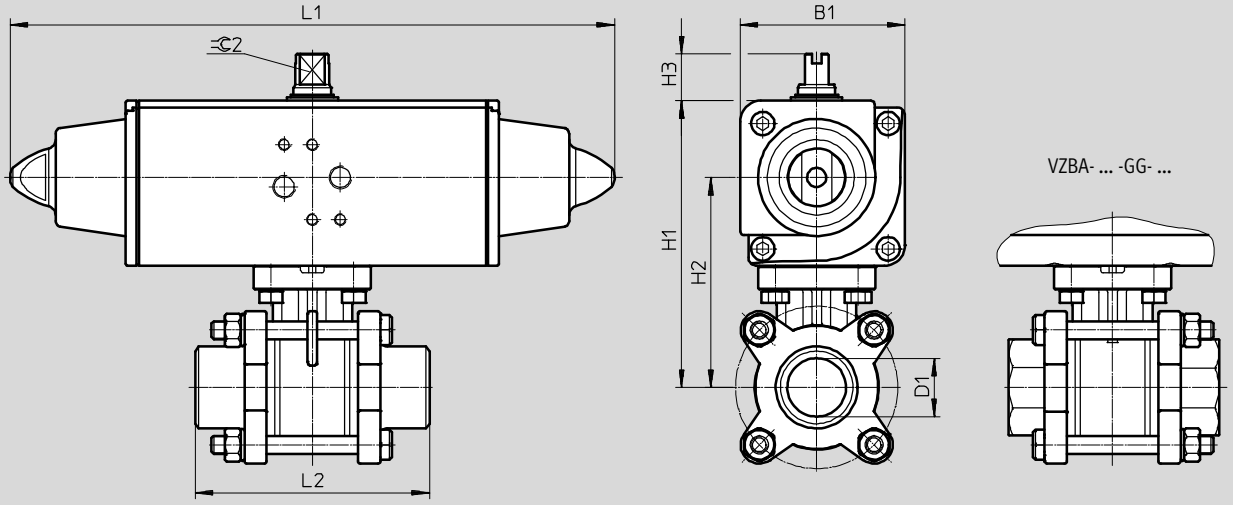
Type	B1	D1 ∅	H1	H2	H3	L1	L2	⌀C 2
VZBA-1/4"-GG-63-T-22-F0304-V4V4T-PP15-R-90-C	52.2	10	99.2	68	20	159	65	8
VZBA-3/8"-GG-63-T-22-F0304-V4V4T-PP15-R-90-C	52.2	12	99.2	68	20	159	65	8
VZBA-1/2"-GG-63-T-22-F0304-V4V4T-PP15-R-90-C	52.2	16	99.2	68	20	159	75	8
VZBA-3/4"-GG-63-T-22-F0304-V4V4T-PP30-R-90-C	59.2	20	103.2	75.5	20	174	80	9
VZBA-1"-GG-63-T-22-F0405-V4V4T-PP30-R-90-C	59.2	25	111.2	83.5	20	174	90	9
VZBA-11/4"-GG-63-T-22-F0405-V4V4T-PP60-R-90-C	70.4	32	128.4	95.7	20	198	110	10
VZBA-11/2"-GG-63-T-22-F0507-V4V4T-PP60-R-90-C	70.4	38	138.4	105.7	20	198	120	10
VZBA-2"-GG-63-T-22-F0507-V4V4T-PP60-R-90-C	70.4	50	147.7	114.7	20	198	140	10
VZBA-21/2"-GG-63-T-22-F0710-V4V4T-PP106-R-90-C	83.3	65	181.3	142.8	20	237.1	185	12
VZBA-3"-GG-63-T-22-F0710-V4V4T-PP180-R-90-C	107.5	80	217.5	166.5	30	289.9	205	15
VZBA-4"-GG-63-T-22-F10-V4V4T-PP240-R-90-C	111.1	100	249.1	198.1	30	313.6	240	15

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

DAPS – Single-acting



Delivery state – Quarter turn actuator

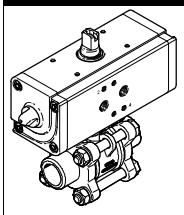
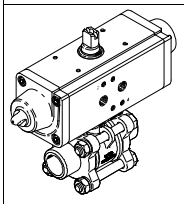
Type	B1	D1 ∅	H1	H2	H3	L1	L2	⌀2
VZBA-1/4"-WW-63-T-22-F0304-V4V4T-PS15-R-90-4-C	59.2	10	99.2	71.5	20	233.3	70	9
VZBA-3/8"-WW-63-T-22-F0304-V4V4T-PS15-R-90-4-C	59.2	12	99.2	71.5	20	233.3	70	9
VZBA-1/2"-WW-63-T-22-F0304-V4V4T-PS15-R-90-4-C	59.2	16	99.2	71.5	20	233.3	75	9
VZBA-3/4"-WW-63-T-22-F0304-V4V4T-PS30-R-90-4-C	70.4	20	114.4	81.7	20	259	90	10
VZBA-1"-WW-63-T-22-F0405-V4V4T-PS30-R-90-4-C	70.4	25	122.4	89.7	20	259	100	10
VZBA-11/4"-WW-63-T-22-F0405-V4V4T-PS53-R-90-4-C	83.3	32	141.3	102.8	20	304.3	110	12
VZBA-11/2"-WW-63-T-22-F0507-V4V4T-PS53-R-90-4-C	83.3	38	151.3	112.8	20	304.3	125	12
VZBA-2"-WW-63-T-22-F0507-V4V4T-PS90-R-90-4-C	107.5	50	184.5	133.5	30	393.7	150	15
VZBA-21/2"-WW-63-T-22-F0710-V4V4T-PS120-R-90-4-C	111.1	65	209.1	158.1	30	409.6	190	15
VZBA-3"-WW-63-T-22-F0710-V4V4T-PS180-R-90-4-C	118	80	228	172	30	474	220	19
VZBA-4"-WW-63-T-22-F10-V4V4T-PS240-R-90-4-C	134.9	100	272.9	210.9	30	520.5	270	19

Type	B1	D1 ∅	H1	H2	H3	L1	L2	⌀2
VZBA-1/4"-GG-63-T-22-F0304-V4V4T-PS15-R-90-4-C	59.2	10	99.2	71.5	20	233.3	65	9
VZBA-3/8"-GG-63-T-22-F0304-V4V4T-PS15-R-90-4-C	59.2	12	99.2	71.5	20	233.3	65	9
VZBA-1/2"-GG-63-T-22-F0304-V4V4T-PS15-R-90-4-C	59.2	16	99.2	71.5	20	233.3	75	9
VZBA-3/4"-GG-63-T-22-F0304-V4V4T-PS30-R-90-4-C	70.4	20	114.4	81.7	20	259	80	10
VZBA-1"-GG-63-T-22-F0405-V4V4T-PS30-R-90-4-C	70.4	25	122.4	89.7	20	259	90	10
VZBA-11/4"-GG-63-T-22-F0405-V4V4T-PS53-R-90-4-C	83.3	32	141.3	102.8	20	304.3	110	12
VZBA-11/2"-GG-63-T-22-F0507-V4V4T-PS53-R-90-4-C	83.3	38	151.3	112.8	20	304.3	120	12
VZBA-2"-GG-63-T-22-F0507-V4V4T-PS90-R-90-4-C	107.5	50	184.5	133.5	30	393.7	140	15
VZBA-21/2"-GG-63-T-22-F0710-V4V4T-PS120-R-90-4-C	111.1	65	209.1	158.1	30	409.6	185	15
VZBA-3"-GG-63-T-22-F0710-V4V4T-PS180-R-90-4-C	118	80	228	172	30	474	205	19
VZBA-4"-GG-63-T-22-F10-V4V4T-PS240-R-90-4-C	134.9	100	272.9	210.9	30	520.5	240	19

Ball valve actuator units VZBA, 2-way, stainless steel

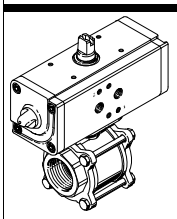
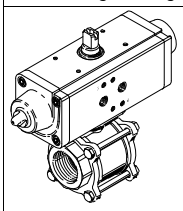
Technical data

Ordering data

DAPS – Double-acting	Connection	Nominal width DN	Part No.	Type
	With weld-on ends	8	**1810730**	**VZBA-1/4"-WW-63-T-22-F0304-V4V4T-PP15-R-90-C**
		10	**1810731**	**VZBA-3/8"-WW-63-T-22-F0304-V4V4T-PP15-R-90-C**
		15	**1810732**	**VZBA-1/2"-WW-63-T-22-F0304-V4V4T-PP15-R-90-C**
		20	**1810733**	**VZBA-3/4"-WW-63-T-22-F0304-V4V4T-PP30-R-90-C**
		25	**1810734**	**VZBA-1"-WW-63-T-22-F0405-V4V4T-PP30-R-90-C**
		32	**1810735**	**VZBA-11/4"-WW-63-T-22-F0405-V4V4T-PP60-R-90-C**
		40	**1810736**	**VZBA-11/2"-WW-63-T-22-F0507-V4V4T-PP60-R-90-C**
		50	**1810737**	**VZBA-2"-WW-63-T-22-F0507-V4V4T-PP60-R-90-C**
		65	**1810738**	**VZBA-21/2"-WW-63-T-22-F0710-V4V4T-PP106-R-90-C**
		80	**1810739**	**VZBA-3"-WW-63-T-22-F0710-V4V4T-PP180-R-90-C**
		100	**1810740**	**VZBA-4"-WW-63-T-22-F10-V4V4T-PP240-R-90-C**
DAPS – Single-acting				
	With weld-on ends	8	**1774103**	**VZBA-1/4"-WW-63-T-22-F0304-V4V4T-PS15-R-90-4-C**
		10	**1774104**	**VZBA-3/8"-WW-63-T-22-F0304-V4V4T-PS15-R-90-4-C**
		15	**1774105**	**VZBA-1/2"-WW-63-T-22-F0304-V4V4T-PS15-R-90-4-C**
		20	**1774106**	**VZBA-3/4"-WW-63-T-22-F0304-V4V4T-PS30-R-90-4-C**
		25	**1774107**	**VZBA-1"-WW-63-T-22-F0405-V4V4T-PS30-R-90-4-C**
		32	**1774108**	**VZBA-11/4"-WW-63-T-22-F0405-V4V4T-PS60-R-90-4-C**
		40	**1774109**	**VZBA-11/2"-WW-63-T-22-F0507-V4V4T-PS60-R-90-4-C**
		50	**1774110**	**VZBA-2"-WW-63-T-22-F0507-V4V4T-PS60-R-90-4-C**
		65	**1774111**	**VZBA-21/2"-WW-63-T-22-F0710-V4V4T-PS106-R-90-4-C**
		80	**1774112**	**VZBA-3"-WW-63-T-22-F0710-V4V4T-PS180-R-90-4-C**
		100	**1774113**	**VZBA-4"-WW-63-T-22-F10-V4V4T-PS240-R-90-4-C**

Technical data

Ordering data

DAPS – Double-acting	Connecting thread	Part No.	Type
	Rp1/4	**1809651**	**VZBA-1/4"-GG-63-T-22-F0304-V4V4T-PP15-R-90-C**
	Rp3/8	**1809652**	**VZBA-3/8"-GG-63-T-22-F0304-V4V4T-PP15-R-90-C**
	Rp1/2	**1809653**	**VZBA-1/2"-GG-63-T-22-F0304-V4V4T-PP15-R-90-C**
	Rp3/4	**1809654**	**VZBA-3/4"-GG-63-T-22-F0304-V4V4T-PP30-R-90-C**
	Rp1	**1809655**	**VZBA-1"-GG-63-T-22-F0405-V4V4T-PP30-R-90-C**
	Rp1 1/4	**1809656**	**VZBA-11/4"-GG-63-T-22-F0405-V4V4T-PP60-R-90-C**
	Rp1 1/2	**1809657**	**VZBA-11/2"-GG-63-T-22-F0507-V4V4T-PP60-R-90-C**
	Rp2	**1809658**	**VZBA-2"-GG-63-T-22-F0507-V4V4T-PP60-R-90-C**
	Rp2 1/2	**1809659**	**VZBA-21/2"-GG-63-T-22-F0710-V4V4T-PP106-R-90-C**
	Rp3	**1809660**	**VZBA-3"-GG-63-T-22-F0710-V4V4T-PP180-R-90-C**
	Rp4	**1809661**	**VZBA-4"-GG-63-T-22-F10-V4V4T-PP240-R-90-C**
DAPS – Single-acting			
	Rp1/4	**1758069**	**VZBA-1/4"-GG-63-T-22-F0304-V4V4T-PS15-R-90-4-C**
	Rp3/8	**1758070**	**VZBA-3/8"-GG-63-T-22-F0304-V4V4T-PS15-R-90-4-C**
	Rp1/2	**1758071**	**VZBA-1/2"-GG-63-T-22-F0304-V4V4T-PS15-R-90-4-C**
	Rp3/4	**1758072**	**VZBA-3/4"-GG-63-T-22-F0304-V4V4T-PS30-R-90-4-C**
	Rp1	**1758073**	**VZBA-1"-GG-63-T-22-F0405-V4V4T-PS30-R-90-4-C**
	Rp1 1/4	**1758074**	**VZBA-11/4"-GG-63-T-22-F0405-V4V4T-PS53-R-90-4-C**
	Rp1 1/2	**1758075**	**VZBA-11/2"-GG-63-T-22-F0507-V4V4T-PS53-R-90-4-C**
	Rp2	**1758076**	**VZBA-2"-GG-63-T-22-F0507-V4V4T-PS90-R-90-4-C**
	Rp2 1/2	**1758077**	**VZBA-21/2"-GG-63-T-22-F0710-V4V4T-PS120-R-90-4-C**
	Rp3	**1758078**	**VZBA-3"-GG-63-T-22-F0710-V4V4T-PS180-R-90-4-C**
	Rp4	**1758079**	**VZBA-4"-GG-63-T-22-F10-V4V4T-PS240-R-90-4-C**

Ball valve actuator units VZBC, 2-way, compact design, stainless steel

Type codes

VZBC – 15 – F F – 40 – 22 – F0304 – V4 V4 T –

Type	
VZBC	Ball valve

Nominal width DN	
15	DN15
20	DN20
25	DN25
32	DN32
40	DN40
50	DN50
65	DN65
80	DN80
100	DN100

Connection type 1	
F	Flange to DIN EN 1092-1

Connection type 2	
F	Flange to DIN EN 1092-1

Nominal pressure of process valve PN	
40	40 bar
16	16 bar

Valve function	
22	2/2-way

Flanged connection to ISO 5211	
F0304	2 bolt circles with ∅ 36 mm and ∅ 42 mm
F0405	2 bolt circles with ∅ 42 mm and ∅ 50 mm
F0507	2 bolt circles with ∅ 50 mm and ∅ 70 mm
F07	1 bolt circle with ∅ 70 mm
F0710	2 bolt circles with ∅ 70 mm and ∅ 102 mm

Housing material	
V4	Stainless steel 1.4401/1.4404 (AISI 316L)/1.4408

Shut-off element material	
V4	Stainless steel 1.4401/1.4404 (AISI 316L)/1.4408

Sealing material	
T	PTFE reinforced

Type codes

PS	15	–	R	–	90	–	4	–	C

Actuator	
PP	DAPS, double-acting
PS	DAPS, single-acting

Torque	
15	15 Nm
30	30 Nm
53	53 Nm
60	60 Nm
90	90 Nm
106	106 Nm
120	120 Nm
180	180 Nm
240	240 Nm

Swivel direction	
R	Right

Nominal swivel angle	
90	90°

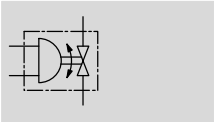
Spring configuration	
–	Not applicable for double-acting
1	Spring force for connection pressure 2.8 bar
2	Spring force for connection pressure 3.5 bar
3	Spring force for connection pressure 4.2 bar
4	Spring force for connection pressure 5.6 bar

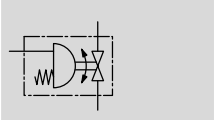
End-position adjustment	
C	Closed

Ball valve actuator units VZBC, 2-way, compact design, stainless steel

Technical data

Function





Swivel angel
0 ... 90°

Flow rate
19.4 ... 1414 m^3/h

Connecting thread
Rp1/2 ... Rp4

General technical data										
Nominal width DN		15	20	25	32	40	50	65	80	100
Quarter turn actuator										
Type of mounting		In-line installation								
Mounting position		Any								
Swivel angle	[°]	90								
Closing direction		Closes to the right								
Ball valve										
Design		2-way ball valve								
Type of actuation		Pneumatic								
Switching position indication		Slot direction = flow direction								
Type of mounting		In-line installation								
Nominal pressure of process valve PN		40						16		
Flow rate Kv	[m^3/h]	19.4	45.6	71.5	105	170	275	507	905	1414

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Operating pressure	[bar]	6 ... 8.4
Ambient temperature	[°C]	–10 ... +80
Temperature of medium[1]	[°C]	–10 ... +200
Medium		Compressed air to ISO 8573-1:2010 [-:-:-]
		Inert gases
		Neutral fluids
		Water – no water vapour
Note on the operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Corrosion resistance class CRC[2]		3

1) As a function of operating pressure
2) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Technical data

ATEX	
ATEX category for gas	II 2G
ATEX category for dust	II 2D
Max. surface temperature of assembly	TX
Explosion group of assembly	IIC
Explosion ambient temperature	–10 °C <= Ta <= +60 °C

Materials		Material number
Housing	High-alloy stainless steel	1.4408
Ball		
Shaft	High-alloy stainless steel	1.4401
Seals	PTFE reinforced	
	PTFE	
Note on materials	RoHS-compliant	
	Contains paint-wetting impairment substances	

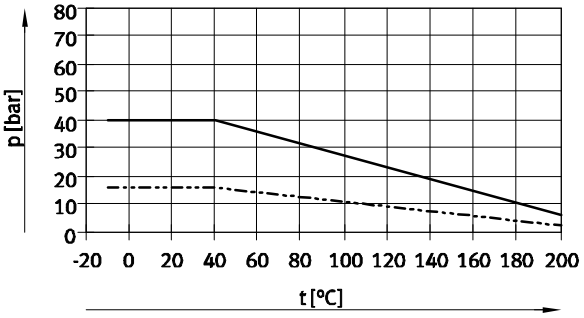
Weight – Double-acting

Nominal width DN	Process valve connection	Weight [g]
15	Ring housing with threaded flange	2300
20		3200
25		3700
32		5700
40		6400
50	Ring housing with threaded flange	8600
65		14,300
80		18,700
100		26,000

Weight – Single-acting

Nominal width DN	Process valve connection	Weight [g]
15	Ring housing with threaded flange	2850
20		4350
25		4850
32		7000
40		7700
50	Ring housing with threaded flange	11,800
65		18,900
80		23,300
100		31,900

Permissible operating pressure p as a function of the temperature of the medium t



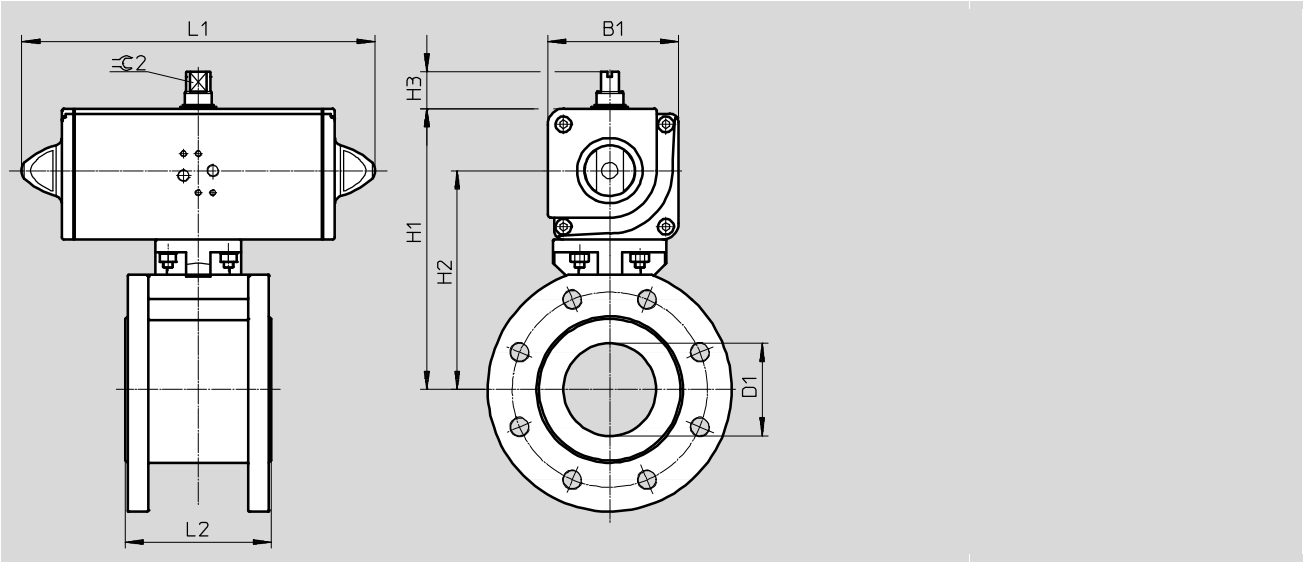
Ball valve actuator units VZBC, 2-way, compact design, stainless steel

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

DAPS – Double-acting

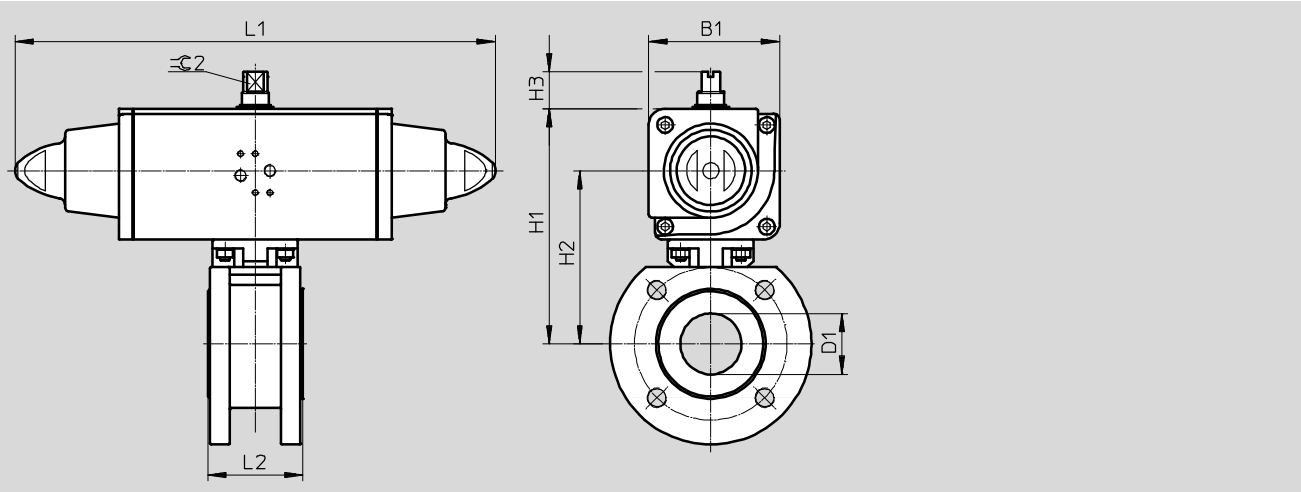


Type	B1	D1 ∅	H1	H2	H3	L1	L2	⌭ 2
VZBC-15-FF-40-22-F0304-V4V4T-PP15-R-90-C	52.2	15	112.2	88	20	159	40	8
VZBC-20-FF-40-22-F0304-V4V4T-PP30-R-90-C	59.2	20	123.5	95.8	20	174	44	9
VZBC-25-FF-40-22-F0405-V4V4T-PP30-R-90-C	59.2	25	123.8	96.1	20	174	53	9
VZBC-32-FF-40-22-F0405-V4V4T-PP60-R-90-C	70.4	32	139.4	106.7	20	198	58.4	10
VZBC-40-FF-40-22-F0507-V4V4T-PP60-R-90-C	70.4	38	146.7	114	20	198	62	10
VZBC-50-FF-40-22-F0507-V4V4T-PP106-R-90-C	83.3	50	168.8	130.3	20	237.1	78	12
VZBC-65-FF-16-22-F07-V4V4T-PP180-R-90-C	107.5	64	212.5	161.5	30	289.9	100	15
VZBC-80-FF-16-22-F07-V4V4T-PP180-R-90-C	107.5	76	229.5	178.5	30	289.9	120	15
VZBC-100-FF-16-22-F0710-V4V4T-PP240-R-90-C	111.1	96	243.1	192.1	30	313.6	152	15

Technical data

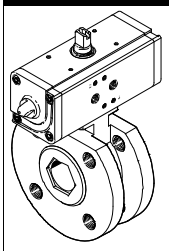
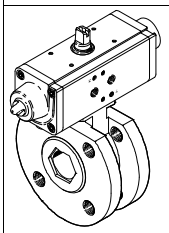
Dimensions Download CAD data ➔ **www.festo.com**

DAPS – Single-acting



Type	B1	D1 ∅	H1	H2	H3	L1	L2	⌀2
VZBC-15-FF-40-22-F0304-V4V4T-PS15-R-90-4-C	59.2	15	119.2	91.5	20	233.3	40	9
VZBC-20-FF-40-22-F0304-V4V4T-PS30-R-90-4-C	70.4	20	134.7	102	20	259	44	10
VZBC-25-FF-40-22-F0405-V4V4T-PS30-R-90-4-C	70.4	25	135	102.3	20	259	53	10
VZBC-32-FF-40-22-F0405-V4V4T-PS53-R-90-4-C	83.3	32	152.3	113.8	20	304.3	58.4	12
VZBC-40-FF-40-22-F0507-V4V4T-PS53-R-90-4-C	83.3	38	159.6	121.1	20	304.3	62	12
VZBC-50-FF-40-22-F0507-V4V4T-PS90-R-90-4-C	107.5	50	193	142	30	393.7	78	15
VZBC-65-FF-16-22-F07-V4V4T-PS180-R-90-4-C	118	64	223	167	30	474	100	19
VZBC-80-FF-16-22-F07-V4V4T-PS180-R-90-4-C	118	76	241	185	30	474	120	19
VZBC-100-FF-16-22-F0710-V4V4T-PS240-R-90-4-C	134.9	96	266.9	204.9	30	520.5	152	19

Ordering data

DAPS – Double-acting	Connection	Nominal width DN	Part No.	Type
	Ring housing with threaded flange	15	**1913365**	**VZBC-15-FF-40-22-F0304-V4V4T-PP15-R-90-C**
		20	**1913367**	**VZBC-20-FF-40-22-F0304-V4V4T-PP30-R-90-C**
		25	**1913368**	**VZBC-25-FF-40-22-F0405-V4V4T-PP30-R-90-C**
		32	**1913369**	**VZBC-32-FF-40-22-F0405-V4V4T-PP60-R-90-C**
		40	**1913370**	**VZBC-40-FF-40-22-F0507-V4V4T-PP60-R-90-C**
		50	**1913371**	**VZBC-50-FF-40-22-F0507-V4V4T-PP106-R-90-C**
		65	**1913372**	**VZBC-65-FF-16-22-F07-V4V4T-PP180-R-90-C**
		80	**1913373**	**VZBC-80-FF-16-22-F07-V4V4T-PP180-R-90-C**
		100	**1913374**	**VZBC-100-FF-16-22-F0710-V4V4T-PP240-R-90-C**
DAPS – Single-acting				
	Ring housing with threaded flange	15	**1915401**	**VZBC-15-FF-40-22-F0304-V4V4T-PS15-R-90-4-C**
		20	**1915402**	**VZBC-20-FF-40-22-F0304-V4V4T-PS30-R-90-4-C**
		25	**1915403**	**VZBC-25-FF-40-22-F0405-V4V4T-PS30-R-90-4-C**
		32	**1915404**	**VZBC-32-FF-40-22-F0405-V4V4T-PS53-R-90-4-C**
		40	**1915406**	**VZBC-40-FF-40-22-F0507-V4V4T-PS53-R-90-4-C**
		50	**1915407**	**VZBC-50-FF-40-22-F0507-V4V4T-PS90-R-90-4-C**
		65	**1915408**	**VZBC-65-FF-16-22-F07-V4V4T-PS180-R-90-4-C**
		80	**1915409**	**VZBC-80-FF-16-22-F07-V4V4T-PS180-R-90-4-C**
		100	**1915410**	**VZBC-100-FF-16-22-F0710-V4V4T-PS240-R-90-4-C**

Ball valve actuator units VZBA, 3-way, stainless steel

Type codes

VZBA – 2 – G G G – 63 – 32L – F0507 –

Type	
VZBA	Ball valve

Nominal width DN	
1/4"	DN8
3/8"	DN10
1/2"	DN15
3/4"	DN20
1"	DN25
11/4"	DN32
11/2"	DN40
2"	DN50

Connection type 1	
G	Pipe thread to DIN EN 10226-1

Connection type 2	
G	Pipe thread to DIN EN 10226-1

Connection type 3	
G	Pipe thread to DIN EN 10226-1

Nominal pressure of process valve PN	
63	63 bar

Valve function	
32T	3/2-way, T-shaped bore
32L	3/2-way, L-shaped bore

Flanged connection to ISO 5211	
F0304	2 bolt circles with ∅ 36 mm and ∅ 42 mm
F0405	2 bolt circles with ∅ 42 mm and ∅ 50 mm
F0507	2 bolt circles with ∅ 50 mm and ∅ 70 mm

Type codes

V4	V4	T	–	PS	80	–	90	–	5	–	C

Housing material

V4	Stainless steel 1.4401/1.4404 (AISI 316L)/1.4408

Shut-off element material

V4	Stainless steel 1.4401/1.4404 (AISI 316L)/1.4408

Sealing material

T	PTFE reinforced

Actuator

PP	DAPS, double-acting
PS	DAPS, single-acting

Torque

30	30 Nm
53	53 Nm
60	60 Nm
90	90 Nm
106	106 Nm

Nominal swivel angle

90	90°

Spring configuration

–	Not applicable for double-acting
3	Spring force for connection pressure 3 bar
4	Spring force for connection pressure 4 bar
5	Spring force for connection pressure 5 bar

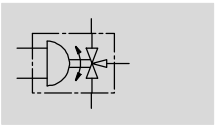
End-position adjustment

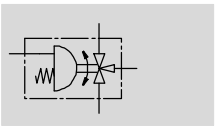
C	Closed

Ball valve actuator units VZBA, 3-way, stainless steel

Technical data

Function





Swivel angel
0 ... 90°

Flow rate
4.5 ... 100 m^3/h

Connecting thread
Rp1/4 ... Rp4

General technical data									
Nominal width DN		8	10	15	20	25	32	40	50
Quarter turn actuator									
Type of mounting		In-line installation							
Mounting position		Any							
Swivel angle	[°]	90							
Closing direction		Closes to the right							
Ball valve									
Design		3-way ball valve with L-shaped bore, T-shaped bore							
Type of actuation		Pneumatic							
Switching position indication		Slot direction = flow direction							
Type of mounting		In-line installation							
Nominal pressure of process valve PN		63							
Flow rate Kv	[m^3/h]	➔ Page 594							

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Operating pressure	[bar]	6 ... 8.4
Ambient temperature	[°C]	–10 ... +80
Temperature of medium[1]	[°C]	–10 ... +200
Medium		Compressed air to ISO 8573-1:2010 [-:-:-]
		Inert gases
		Neutral fluids
		Water – no water vapour
Note on the operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Note on materials		Contains paint-wetting impairment substances, RoHS-compliant
Corrosion resistance class CRC[2]		3

1) As a function of operating pressure
2) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Technical data

ATEX	
ATEX category for gas	II 2G
ATEX category for dust	II 2D
Max. surface temperature of assembly	TX
Explosion group of assembly	IIC
Explosion ambient temperature	–10 °C <= Ta <= +60 °C

Materials		Material number
Housing	High-alloy stainless steel	1.4408
Ball		
Shaft	High-alloy stainless steel	1.4401
Seals	PTFE reinforced	
	PTFE	
Note on materials	RoHS-compliant	
	Contains paint-wetting impairment substances	

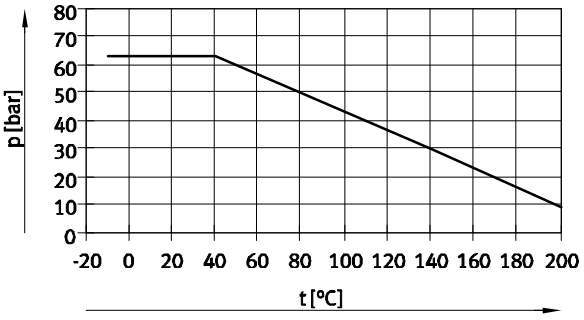
Weight – Double-acting

Nominal width DN	Process valve connection	Weight [g]	Nominal width DN	Process valve connection	Weight [g]
8	Rp1/4	1750	25	Rp1	2650
10	Rp3/8	1750	32	Rp1 1/4	4750
15	Rp1/2	1750	40	Rp1 1/2	5750
20	Rp3/4	2050	50	Rp2	9800

Weight – Single-acting

Nominal width DN	Process valve connection	Weight [g]	Nominal width DN	Process valve connection	Weight [g]
8	Rp1/4	2950	25	Rp1	3850
10	Rp3/8	2950	32	Rp1 1/4	6070
15	Rp1/2	2950	40	Rp1 1/2	10,812
20	Rp3/4	3250	50	Rp2	12,900

Permissible operating pressure p as a function of the temperature of the medium t



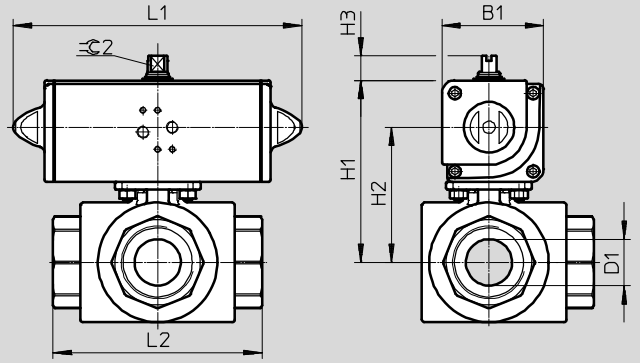
Ball valve actuator units VZBA, 3-way, stainless steel

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

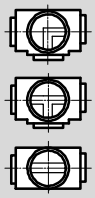
DAPS – Double-acting



Delivery condition – L-shaped bore

Delivery condition – T-shaped bore

Delivery condition – Quarter turn actuator



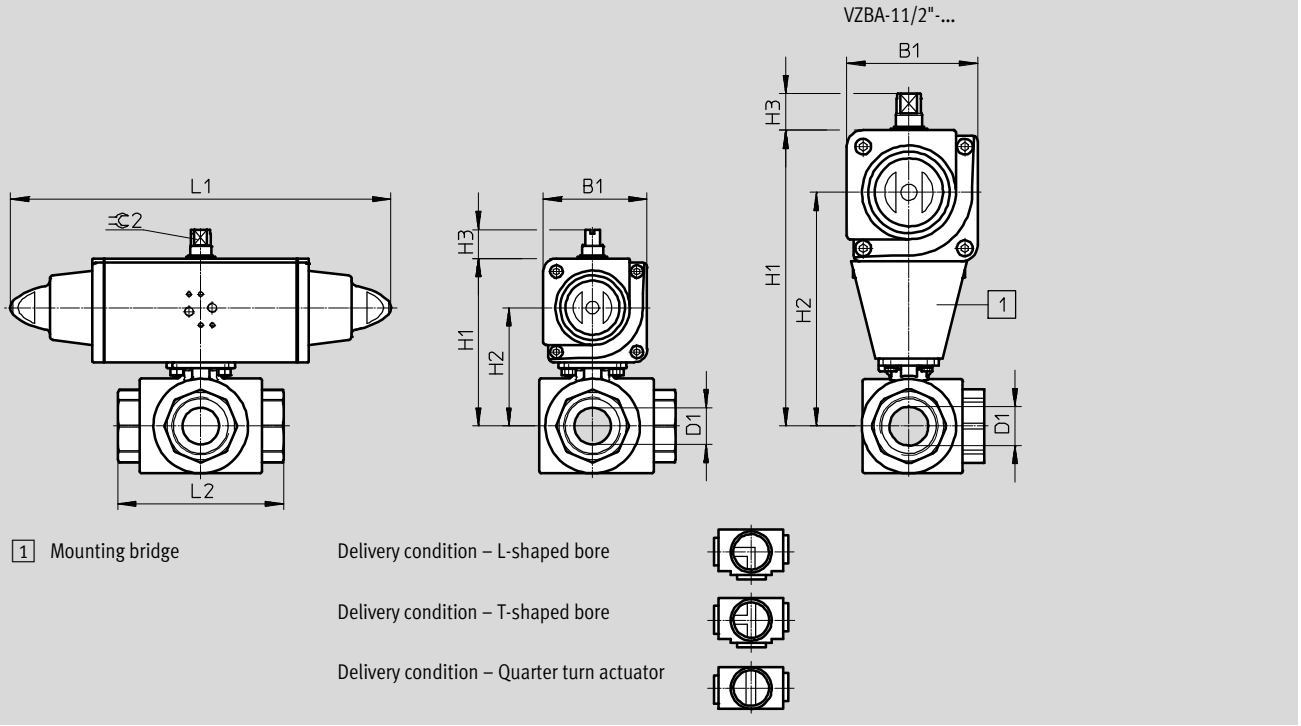
Type	B1	D1 ∅	H1	H2	H3	L1	L2	⌀2
VZBA-1/4"-GGG-63-32L-F0304-V4V4T-PP30-R-90-C VZBA-1/4"-GGG-63-32T-F0304-V4V4T-PP30-R-90-C	59.2	11.6	95.1	67.4	20	174	80	9
VZBA-3/8"-GGG-63-32L-F0304-V4V4T-PP30-R-90-C VZBA-3/8"-GGG-63-32T-F0304-V4V4T-PP30-R-90-C	59.2	12.7	95.1	67.4	20	174	80	9
VZBA-1/2"-GGG-63-32L-F0304-V4V4T-PP30-R-90-C VZBA-1/2"-GGG-63-32T-F0304-V4V4T-PP30-R-90-C	59.2	12.7	95.1	67.4	20	174	80	9
VZBA-3/4"-GGG-63-32L-F0405-V4V4T-PP30-R-90-C VZBA-3/4"-GGG-63-32T-F0405-V4V4T-PP30-R-90-C	59.2	16	100.1	72.4	20	174	87.5	9
VZBA-1"-GGG-63-32L-F0405-V4V4T-PP30-R-90-C VZBA-1"-GGG-63-32T-F0405-V4V4T-PP30-R-90-C	59.2	20	104.35	76.65	20	174	100	9
VZBA-11/4"-GGG-63-32L-F0405-V4V4T-PP60-R-90-C VZBA-11/4"-GGG-63-32T-F0405-V4V4T-PP60-R-90-C	70.4	25.4	121.4	88.7	20	198	123	10
VZBA-11/2"-GGG-63-32L-F0405-V4V4T-PP60-R-90-C VZBA-11/2"-GGG-63-32T-F0405-V4V4T-PP60-R-90-C	70.4	31.8	125.9	93.2	20	198	142.2	10
VZBA-2"-GGG-63-32L-F0507-V4V4T-PP106-R-90-C VZBA-2"-GGG-63-32T-F0507-V4V4T-PP106-R-90-C	83.3	38.1	149.3	110.8	20	237.1	170.6	12

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

DAPS – Single-acting

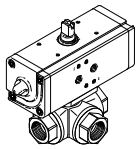
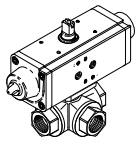


Type	B1	D1 ∅	H1	H2	H3	L1	L2	⫷2
VZBA-1/4"-GGG-63-32L-F0304-V4V4T-PS30-R-90-4-C VZBA-1/4"-GGG-63-32T-F0304-V4V4T-PS30-R-90-4-C	70.4	11.6	106.3	73.6	20	259	80	10
VZBA-3/8"-GGG-63-32L-F0304-V4V4T-PS30-R-90-4-C VZBA-3/8"-GGG-63-32T-F0304-V4V4T-PS30-R-90-4-C	70.4	12.7	106.3	73.6	20	259	80	10
VZBA-1/2"-GGG-63-32L-F0304-V4V4T-PS30-R-90-4-C VZBA-1/2"-GGG-63-32T-F0304-V4V4T-PS30-R-90-4-C	70.4	12.7	106.3	73.6	20	259	80	10
VZBA-3/4"-GGG-63-32L-F0405-V4V4T-PS30-R-90-4-C VZBA-3/4"-GGG-63-32T-F0405-V4V4T-PS30-R-90-4-C	70.4	16	111.3	78.6	20	259	87.5	10
VZBA-1"-GGG-63-32L-F0405-V4V4T-PS30-R-90-4-C VZBA-1"-GGG-63-32T-F0405-V4V4T-PS30-R-90-4-C	70.4	20	115.55	82.85	20	259	100	10
VZBA-11/4"-GGG-63-32L-F0405-V4V4T-PS53-R-90-4-C VZBA-11/4"-GGG-63-32T-F0405-V4V4T-PS53-R-90-4-C	83.3	25.4	134.3	95.8	20	304.3	123	12
VZBA-11/2"-GGG-63-32L-F0405-V4V4T-PS90-R-90-4-C VZBA-11/2"-GGG-63-32T-F0405-V4V4T-PS90-R-90-4-C	107.5	31.8	243	192	30	393.7	142.2	15
VZBA-2"-GGG-63-32L-F0507-V4V4T-PS90-R-90-4-C VZBA-2"-GGG-63-32T-F0507-V4V4T-PS90-R-90-4-C	107.5	38.1	173.5	122.5	30	393.7	170.6	15

Ball valve actuator units VZBA, 3-way, stainless steel

Technical data

Ordering data

DAPS – Double-acting	Connection Process valve	Bore	Flow rate Kv [m³/h] Type L	T right-angled	T straight	Part No.	Type
	Rp1/4	L	4.5	–	–	**1914785**	**VZBA-1/4"-GGG-63-32L-F0304-V4V4T-PP30-R-90-C**
	Rp3/8		4.5			**1914786**	**VZBA-3/8"-GGG-63-32L-F0304-V4V4T-PP30-R-90-C**
	Rp1/2		4.7			**1914787**	**VZBA-1/2"-GGG-63-32L-F0304-V4V4T-PP30-R-90-C**
	Rp3/4		5.1			**1914788**	**VZBA-3/4"-GGG-63-32L-F0405-V4V4T-PP30-R-90-C**
	Rp1		11.8			**1914789**	**VZBA-1"-GGG-63-32L-F0405-V4V4T-PP30-R-90-C**
	Rp1 1/4		19.6			**1914790**	**VZBA-11/4"-GGG-63-32L-F0405-V4V4T-PP60-R-90-C**
	Rp1 1/2		33.2			**1914791**	**VZBA-11/2"-GGG-63-32L-F0405-V4V4T-PP60-R-90-C**
	Rp2		53.7			**1914792**	**VZBA-2"-GGG-63-32L-F0507-V4V4T-PP106-R-90-C**
	Rp1/4	T	–	4.5	8	**1915072**	**VZBA-1/4"-GGG-63-32T-F0304-V4V4T-PP30-R-90-C**
	Rp3/8			4.5	8	**1915073**	**VZBA-3/8"-GGG-63-32T-F0304-V4V4T-PP30-R-90-C**
	Rp1/2			4.8	8.3	**1915074**	**VZBA-1/2"-GGG-63-32T-F0304-V4V4T-PP30-R-90-C**
	Rp3/4			4.8	8.3	**1915075**	**VZBA-3/4"-GGG-63-32T-F0405-V4V4T-PP30-R-90-C**
	Rp1			10.9	22.4	**1915076**	**VZBA-1"-GGG-63-32T-F0405-V4V4T-PP30-R-90-C**
	Rp1 1/4			18	36.5	**1915077**	**VZBA-11/4"-GGG-63-32T-F0405-V4V4T-PP60-R-90-C**
	Rp1 1/2			30	62	**1915078**	**VZBA-11/2"-GGG-63-32T-F0405-V4V4T-PP60-R-90-C**
	Rp2			48.8	100	**1915079**	**VZBA-2"-GGG-63-32T-F0507-V4V4T-PP106-R-90-C**
DAPS – Single-acting							
	Rp1/4	L	4.5	–	–	**1915543**	**VZBA-1/4"-GGG-63-32L-F0304-V4V4T-PS30-R-90-4-C**
	Rp3/8		4.5			**1915544**	**VZBA-3/8"-GGG-63-32L-F0304-V4V4T-PS30-R-90-4-C**
	Rp1/2		4.7			**1915545**	**VZBA-1/2"-GGG-63-32L-F0304-V4V4T-PS30-R-90-4-C**
	Rp3/4		5.1			**1915546**	**VZBA-3/4"-GGG-63-32L-F0405-V4V4T-PS30-R-90-4-C**
	Rp1		11.8			**1915547**	**VZBA-1"-GGG-63-32L-F0405-V4V4T-PS30-R-90-4-C**
	Rp1 1/4		19.6			**1915548**	**VZBA-11/4"-GGG-63-32L-F0405-V4V4T-PS53-R-90-4-C**
	Rp1 1/2		33.2			**1915549**	**VZBA-11/2"-GGG-63-32L-F0405-V4V4T-PS90-R-90-4-C**
	Rp2		53.7			**1915550**	**VZBA-2"-GGG-63-32L-F0507-V4V4T-PS90-R-90-4-C**
	Rp1/4	T	–	4.5	8	**1915744**	**VZBA-1/4"-GGG-63-32T-F0304-V4V4T-PS30-R-90-4-C**
	Rp3/8			4.5	8	**1915745**	**VZBA-3/8"-GGG-63-32T-F0304-V4V4T-PS30-R-90-4-C**
	Rp1/2			4.8	8.3	**1915746**	**VZBA-1/2"-GGG-63-32T-F0304-V4V4T-PS30-R-90-4-C**
	Rp3/4			4.8	8.3	**1915747**	**VZBA-3/4"-GGG-63-32T-F0405-V4V4T-PS30-R-90-4-C**
	Rp1			10.9	22.4	**1915748**	**VZBA-1"-GGG-63-32T-F0405-V4V4T-PS30-R-90-4-C**
	Rp1 1/4			18	36.5	**1915749**	**VZBA-11/4"-GGG-63-32T-F0405-V4V4T-PS53-R-90-4-C**
	Rp1 1/2			30	62	**1915750**	**VZBA-11/2"-GGG-63-32T-F0405-V4V4T-PS90-R-90-4-C**
	Rp2			48.8	100	**1915751**	**VZBA-2"-GGG-63-32T-F0507-V4V4T-PS90-R-90-4-C**

Ball valve actuator units VZBM, 2-way, brass

Type codes

VZBM – A – 3/4" – RP – 25 – D – 2 – B2 – PA 10

Type	
VZBM	Ball valve

Design	
A	Ball valve actuator unit

Nominal width DN	
1/4"	DN8
3/8"	DN10
1/2"	DN15
3/4"	DN20
1"	DN25
11/4"	DN32
11/2"	DN40
2"	DN50

Process valve connection type	
RP	Rp thread

Nominal pressure	
25	25 bar
40	40 bar

Design	
D	Two-part

Valve function	
2	2/2-way

Housing material	
B2	Brass, nickel-plated

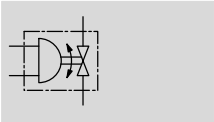
Actuator	
PA	DFPD, double-acting
PB	DFPD, single-acting

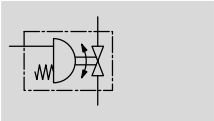
Size	
10	10
20	20
40	40
80	80

Ball valve actuator units VZBM, 2-way, brass

Technical data

Function





Swivel angel
0 ... 90°

Flow rate
5.9 ... 243 m^3/h

Connecting thread
Rp1/4 ... Rp2

General technical data									
Nominal width DN		8	10	15	20	25	32	40	50
Quarter turn actuator									
Type of mounting		In-line installation							
Mounting position		Any							
Swivel angle	[°]	90							
Closing direction		Closes to the right							
Ball valve									
Design		2-way ball valve							
Type of actuation		Pneumatic							
Switching position indication		Slot direction = flow direction							
Nominal pressure of process valve PN		40		25					
Flow rate Kv	[m^3/h]	5.9	9.4	15	28	39	84	156	243

Operating and environmental conditions									
Nominal width DN		8	10	15	20	25	32	40	50
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]							
Operating pressure	[bar]	5.5 ... 8							
Ambient temperature	[°C]	–20 ... +80							
Temperature of medium[1]	[°C]	–20 ... +130		–15 ... +90					
Medium		Compressed air to ISO 8573-1:2010 [-:-:-]							
		Inert gases							
		Water – no water vapour							
		Neutral fluids							
Note on the operating/pilot medium		Pressure dew point 10°C below ambient/medium temperature							
		Lubricated operation possible (in which case lubricated operation will always be required)							
Corrosion resistance class CRC[2]		1							

1) As a function of operating pressure
2) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Technical data

Materials		Material number
Housing	Brass, nickel-plated	CW617N
Ball	Brass, chrome-plated	CW614N
Shaft	Brass	CW614N
Seals		
	HNBR	
	PTFE	
With Rp1/2 ... Rp2 additionally	FPM	
Note on materials	RoHS-compliant	
	Contains paint-wetting impairment substances	

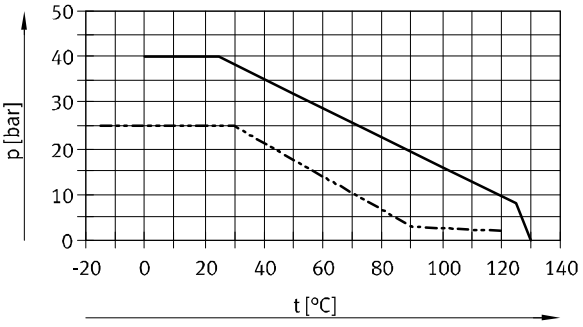
Weight – Double-acting

Nominal width DN	Process valve connection	Weight [g]	Nominal width DN	Process valve connection	Weight [g]
8	Rp1/4	1393	25	Rp1	1454
10	Rp3/8	1371	32	Rp1 1/4	1711
15	Rp1/2	1187	40	Rp1 1/2	2443
20	Rp3/4	1287	50	Rp2	3694

Weight – Single-acting

Nominal width DN	Process valve connection	Weight [g]	Nominal width DN	Process valve connection	Weight [g]
8	Rp1/4	1839	25	Rp1	1900
10	Rp3/8	1817	32	Rp1 1/4	2157
15	Rp1/2	1363	40	Rp1 1/2	3329
20	Rp3/4	1733	50	Rp2	5723

Permissible operating pressure p as a function of the temperature of the medium t



Rp1/4 ... Rp3/8
Rp1/2 ... Rp2

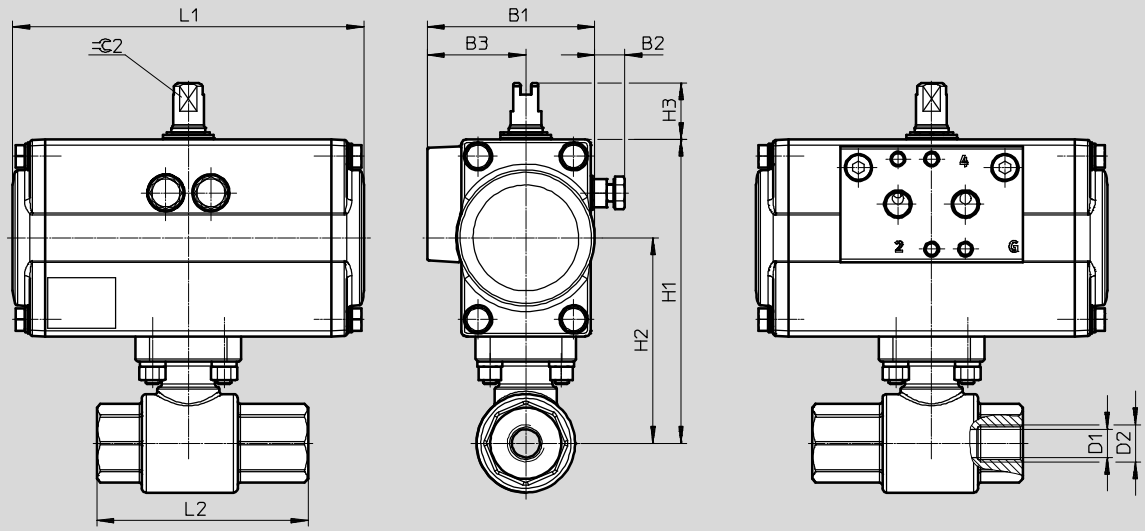
Ball valve actuator units VZBM, 2-way, brass

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

DFPD – Double-acting



Delivery condition – Ball valve

Delivery condition – Quarter turn actuator

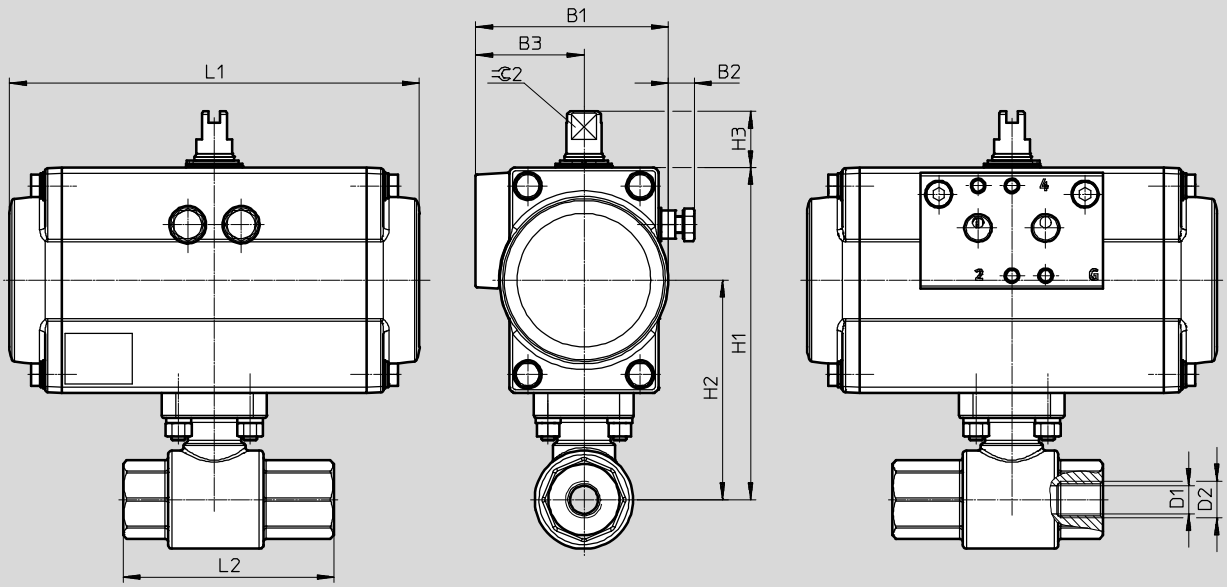
Type	B1	B2	B3	D1 ∅	D2	H1	H2	H3	L1	L2	⫧2 h11
VZBM-A-1/4"-...	59.5	10.7	35	10	RP1/4	108	73	20	124.7	75	9
VZBM-A-3/8"-...	59.5	10.7	35	10	RP3/8	108	73	20	124.7	75	9
VZBM-A-1/2"-...	59.5	10.7	35	15	RP1/2	102	67	20	124.7	61	9
VZBM-A-3/4"-...	59.5	10.7	35	20	RP3/4	106	71	20	124.7	70	9
VZBM-A-1"-...	59.5	10.7	35	25	RP1	114	79	20	124.7	84	9
VZBM-A-11/4"-...	59.5	10.7	35	32	RP1 1/4	119	84	20	124.7	97	9
VZBM-A-11/2"-...	68.5	9.2	38.5	40	RP1 1/2	134	94	20	133.3	108	9
VZBM-A-2"-...	81.5	8.2	45	50	RP2	152	108	20	151.4	130	12

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

DFPD – Single-acting



Delivery condition – Ball valve

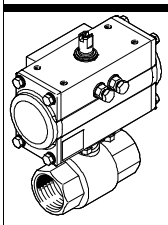
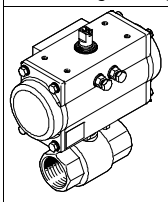
Delivery condition – Quarter turn actuator

Type	B1	B2	B3	D1 ∅	D2	H1	H2	H3	L1	L2	⌀2 h11
VZBM-A-1/4"-...	68.5	9.2	38.5	10	RP1/4	118	78	20	145.7	75	9
VZBM-A-3/8"-...	68.5	9.2	38.5	10	RP3/8	118	78	20	145.7	75	9
VZBM-A-1/2"-...	68.5	9.2	38.5	15	RP1/2	112	72	20	145.7	61	9
VZBM-A-3/4"-...	68.5	9.2	38.5	20	RP3/4	116	76	20	145.7	70	9
VZBM-A-1"-...	68.5	9.2	38.5	25	RP1	124	84	20	145.7	84	9
VZBM-A-11/4"-...	68.5	9.2	38.5	32	RP1 1/4	129	89	20	145.7	97	9
VZBM-A-11/2"-...	81.5	8.2	45	40	RP1 1/2	146	100	20	170.4	108	9
VZBM-A-2"-...	99	9	53	50	RP2	172	117	20	223.1	130	12

Ball valve actuator units VZBM, 2-way, brass

Technical data

Ordering data

DFPD – Double-acting	Connecting thread	Part No.	Type
	Rp1/4	**8070234**	**VZBM-A-1/4"-RP-40-D-2-B2-PA10**
	Rp3/8	**8070235**	**VZBM-A-3/8"-RP-40-D-2-B2-PA10**
	Rp1/2	**8070236**	**VZBM-A-1/2"-RP-25-D-2-B2-PA10**
	Rp3/4	**8070237**	**VZBM-A-3/4"-RP-25-D-2-B2-PA10**
	Rp1	**8070238**	**VZBM-A-1"-RP-25-D-2-B2-PA10**
	Rp1 1/4	**8070239**	**VZBM-A-11/4"-RP-25-D-2-B2-PA10**
	Rp1 1/2	**8070240**	**VZBM-A-11/2"-RP-25-D-2-B2-PA20**
	Rp2	**8070241**	**VZBM-A-2"-RP-25-D-2-B2-PA40**
DFPD – Single-acting			
	Rp1/4	**8070242**	**VZBM-A-1/4"-RP-40-D-2-B2-PB20**
	Rp3/8	**8070243**	**VZBM-A-3/8"-RP-40-D-2-B2-PB20**
	Rp1/2	**8070244**	**VZBM-A-1/2"-RP-25-D-2-B2-PB20**
	Rp3/4	**8070245**	**VZBM-A-3/4"-RP-25-D-2-B2-PB20**
	Rp1	**8070246**	**VZBM-A-1"-RP-25-D-2-B2-PB20**
	Rp1 1/4	**8070247**	**VZBM-A-11/4"-RP-25-D-2-B2-PB20**
	Rp1 1/2	**8070248**	**VZBM-A-11/2"-RP-25-D-2-B2-PB40**
	Rp2	**8070249**	**VZBM-A-2"-RP-25-D-2-B2-PB80**

Type codes

VZBM – A – 3/4" – RP – 25 – F – 3L – B2 – PA 20

Type	
VZBM	Ball valve

Design	
A	Ball valve actuator unit

Nominal width DN	
1/4"	DN8
3/8"	DN10
1/2"	DN15
3/4"	DN20
1"	DN25
11/4"	DN32
11/2"	DN40
2"	DN50

Process valve connection type	
RP	Rp thread

Nominal pressure	
25	25 bar
40	40 bar

Design	
F	Four-part

Valve function	
3L	3/2-way, L-shaped bore
3T	3/2-way, T-shaped bore

Housing material	
B2	Brass, nickel-plated

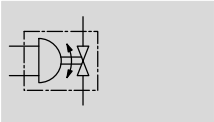
Actuator	
PA	DFPD, double-acting
PB	DFPD, single-acting

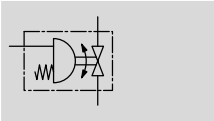
Size	
10	10
20	20
40	40
80	80
120	120

Ball valve actuator units VZBM, 3-way, brass

Technical data

Function





Swivel angel
0 ... 90°

Flow rate
5.9 ... 292 m^3/h

Connecting thread
Rp1/4 ... Rp2

General technical data									
Nominal width DN		8	10	15	20	25	32	40	50
Quarter turn actuator									
Type of mounting		In-line installation							
Mounting position		Any							
Swivel angle	[°]	90							
Closing direction		Closes to the right							
Ball valve									
Design		3-way ball valve							
Type of actuation		Pneumatic							
Switching position indication		Slot direction = flow direction							
Nominal pressure of process valve PN		25							
Flow rate Kv	[m^3/h]	5.9	9.4	17	41	70	121	200	292

Operating and environmental conditions									
Nominal width DN		8	10	15	20	25	32	40	50
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]							
Operating pressure	[bar]	5.5 ... 8							
Ambient temperature	[°C]	–20 ... +80							
Temperature of medium[1]	[°C]	–20 ... +130							
Medium		Compressed air to ISO 8573-1:2010 [-:-:-]							
		Inert gases							
		Water – no water vapour							
		Neutral fluids							
Note on the operating/pilot medium		Pressure dew point 10°C below ambient/medium temperature							
		Lubricated operation possible (in which case lubricated operation will always be required)							
Corrosion resistance class CRC[2]		1							

1) As a function of operating pressure
2) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Technical data

Materials		Material number
Housing	Brass, nickel-plated	CW617N
Ball	Brass, chrome-plated	CW614N
Shaft	Brass	CW614N
Seals	HNBR	
	PTFE	
Note on materials	RoHS-compliant	
	Contains paint-wetting impairment substances	

Weight – Double-acting, type L

Nominal width DN	Process valve connection	Weight [g]	Nominal width DN	Process valve connection	Weight [g]
8	Rp1/4	1511	25	Rp1	2584
10	Rp3/8	1481	32	Rp1 1/4	4911
15	Rp1/2	1441	40	Rp1 1/2	6597
20	Rp3/4	2011	50	Rp2	7807

Weight – Single-acting, type L

Nominal width DN	Process valve connection	Weight [g]	Nominal width DN	Process valve connection	Weight [g]
8	Rp1/4	1957	25	Rp1	3461
10	Rp3/8	1927	32	Rp1 1/4	6953
15	Rp1/2	1887	40	Rp1 1/2	8973
20	Rp3/4	2914	50	Rp2	10183

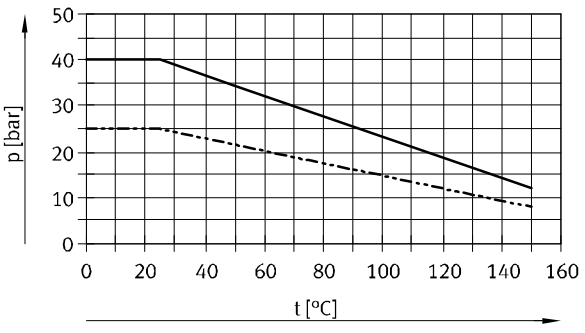
Weight – Double-acting, type T

Nominal width DN	Process valve connection	Weight [g]	Nominal width DN	Process valve connection	Weight [g]
8	Rp1/4	1511	25	Rp1	2554
10	Rp3/8	1441	32	Rp1 1/4	4841
15	Rp1/2	1441	40	Rp1 1/2	6527
20	Rp3/4	2001	50	Rp2	7657

Weight – Single-acting, type T

Nominal width DN	Process valve connection	Weight [g]	Nominal width DN	Process valve connection	Weight [g]
8	Rp1/4	1957	25	Rp1	3431
10	Rp3/8	1887	32	Rp1 1/4	6883
15	Rp1/2	1887	40	Rp1 1/2	8903
20	Rp3/4	2904	50	Rp2	10033

Permissible operating pressure p as a function of the temperature of the medium t



Rp1/4 ... Rp1 1/4
Rp1 1/2 ... Rp2

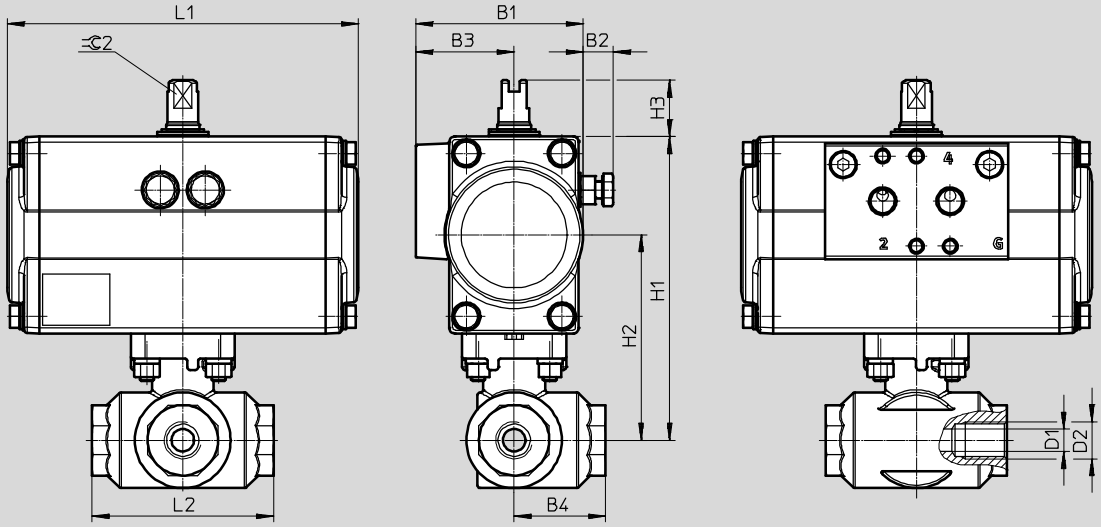
Ball valve actuator units VZBM, 3-way, brass

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

DFPD – Double-acting



Delivery condition – L-shaped bore

Delivery condition – T-shaped bore

Delivery condition – Quarter turn actuator

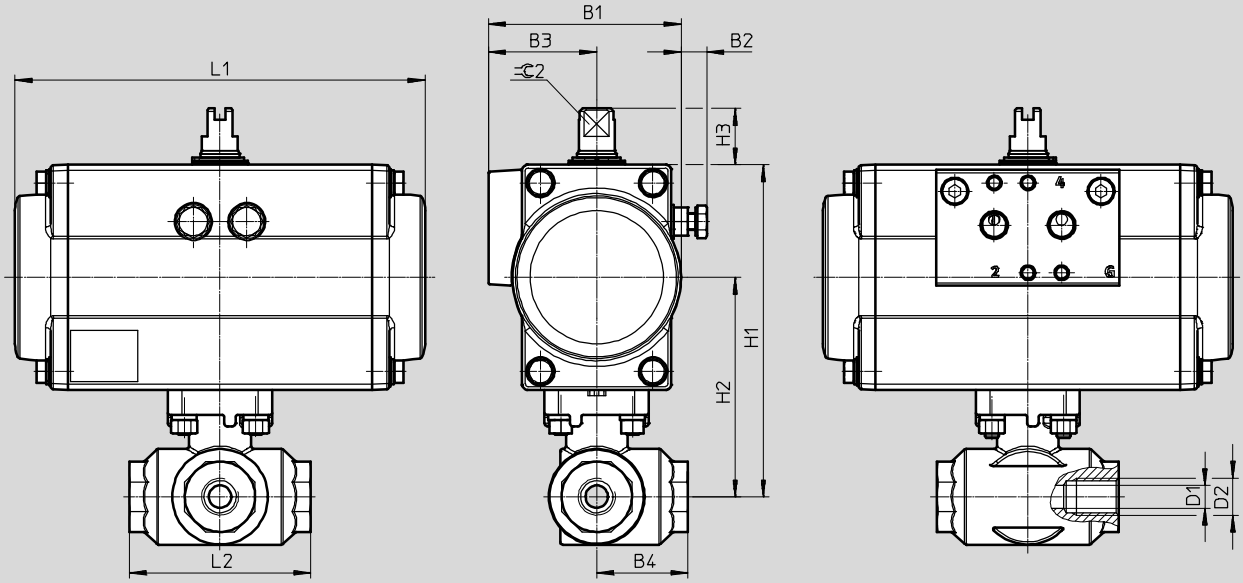
Type	B1	B2	B3	B4	D1 ∅	D2	H1	H2	H3	L1	L2	⌀2 h11
VZBM-A-1/4"-...	59.5	10.7	35	32.5	8	RP1/4	108	73	20	124.7	64.5	9
VZBM-A-3/8"-...	59.5	10.7	35	32.5	10	RP3/8	108	73	20	124.7	64.5	9
VZBM-A-1/2"-...	59.5	10.7	35	32.5	14.1	RP1/2	108	73	20	124.7	64.5	9
VZBM-A-3/4"-...	68.5	9.2	38.5	38	17.6	RP3/4	122	82	20	133.3	76	9
VZBM-A-1"-...	68.5	9.2	38.5	48.5	25	RP1	126.5	86.5	20	133.3	97	9
VZBM-A-11/4"-...	81.5	8.2	45	59	32	RP1 1/4	153.3	107.3	20	151.4	118	12
VZBM-A-11/2"-...	99	9	53	67.5	38	RP1 1/2	155.5	118.5	20	189.3	134.5	15
VZBM-A-2"-...	99	9	53	78.5	45	RP2	166	129	20	189.3	157	15

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

DFPD – Single-acting



Delivery condition – L-shaped bore

Delivery condition – T-shaped bore

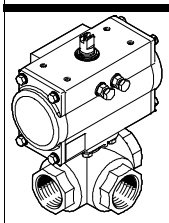
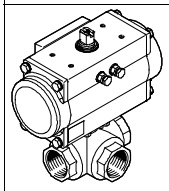
Delivery condition – Quarter turn actuator

Type	B1	B2	B3	B4	D1 ∅	D2	H1	H2	H3	L1	L2	⌀C2 h11
VZBM-A-1/4"-...	68.5	9.2	38.5	32.5	8	RP1/4	118	78	20	145.7	64.5	9
VZBM-A-3/8"-...	68.5	9.2	38.5	32.5	10	RP3/8	118	78	20	145.7	64.5	9
VZBM-A-1/2"-...	68.5	9.2	38.5	32.5	14.1	RP1/2	118	78	20	145.7	64.5	9
VZBM-A-3/4"-...	81.5	8.2	45	38	17.6	RP3/4	132	88	20	170.4	76	12
VZBM-A-1"-...	81.5	8.2	45	48.5	25	RP1	138.5	92.5	20	170.4	97	12
VZBM-A-11/4"-...	99	9	53	59	32	RP1 1/4	171.3	116.3	20	223.1	118	15
VZBM-A-11/2"-...	111.5	12.3	60.5	67.5	38	RP1 1/2	186.5	124.5	20	252.3	134.5	15
VZBM-A-2"-...	111.5	12.3	60.5	78.5	45	RP2	197	135.5	20	252.3	157	15

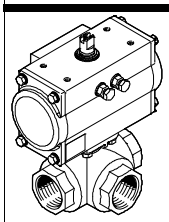
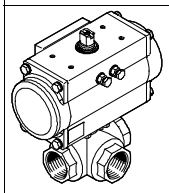
Ball valve actuator units VZBM, 3-way, brass

Technical data

Ordering data

DFPD – Double-acting, type L	Connecting thread	Part No.	Type
	Rp1/4	**8070250**	**VZBM-A-1/4"-RP-25-F-3L-B2-PA10**
	Rp3/8	**8070251**	**VZBM-A-3/8"-RP-25-F-3L-B2-PA10**
	Rp1/2	**8070252**	**VZBM-A-1/2"-RP-25-F-3L-B2-PA10**
	Rp3/4	**8070253**	**VZBM-A-3/4"-RP-25-F-3L-B2-PA20**
	Rp1	**8070254**	**VZBM-A-1"-RP-25-F-3L-B2-PA20**
	Rp1 1/4	**8070255**	**VZBM-A-11/4"-RP-25-F-3L-B2-PA40**
	Rp1 1/2	**8070256**	**VZBM-A-11/2"-RP-25-F-3L-B2-PA80**
	Rp2	**8070257**	**VZBM-A-2"-RP-25-F-3L-B2-PA80**
DFPD – Single-acting, type L			
	Rp1/4	**8070266**	**VZBM-A-1/4"-RP-25-F-3L-B2-PB20**
	Rp3/8	**8070267**	**VZBM-A-3/8"-RP-25-F-3L-B2-PB20**
	Rp1/2	**8070268**	**VZBM-A-1/2"-RP-25-F-3L-B2-PB20**
	Rp3/4	**8070269**	**VZBM-A-3/4"-RP-25-F-3L-B2-PB40**
	Rp1	**8070270**	**VZBM-A-1"-RP-25-F-3L-B2-PB40**
	Rp1 1/4	**8070271**	**VZBM-A-11/4"-RP-25-F-3L-B2-PB80**
	Rp1 1/2	**8070272**	**VZBM-A-11/2"-RP-25-F-3L-B2-PB120**
	Rp2	**8070273**	**VZBM-A-2"-RP-25-F-3L-B2-PB120**

Ordering data

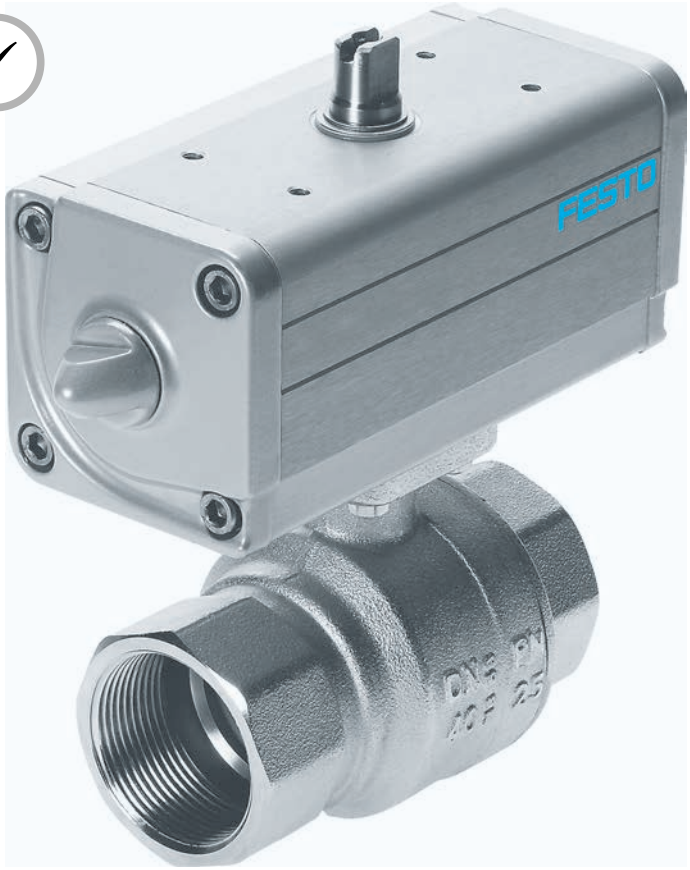
DFPD – Double-acting, type T	Connecting thread	Part No.	Type
	Rp1/4	**8070258**	**VZBM-A-1/4"-RP-25-F-3T-B2-PA10**
	Rp3/8	**8070259**	**VZBM-A-3/8"-RP-25-F-3T-B2-PA10**
	Rp1/2	**8070260**	**VZBM-A-1/2"-RP-25-F-3T-B2-PA10**
	Rp3/4	**8070261**	**VZBM-A-3/4"-RP-25-F-3T-B2-PA20**
	Rp1	**8070262**	**VZBM-A-1"-RP-25-F-3T-B2-PA20**
	Rp1 1/4	**8070263**	**VZBM-A-11/4"-RP-25-F-3T-B2-PA40**
	Rp1 1/2	**8070264**	**VZBM-A-11/2"-RP-25-F-3T-B2-PA80**
	Rp2	**8070265**	**VZBM-A-2"-RP-25-F-3T-B2-PA80**
DFPD – Single-acting, type T			
	Rp1/4	**8070274**	**VZBM-A-1/4"-RP-25-F-3T-B2-PB20**
	Rp3/8	**8070275**	**VZBM-A-3/8"-RP-25-F-3T-B2-PB20**
	Rp1/2	**8070276**	**VZBM-A-1/2"-RP-25-F-3T-B2-PB20**
	Rp3/4	**8070277**	**VZBM-A-3/4"-RP-25-F-3T-B2-PB40**
	Rp1	**8070278**	**VZBM-A-1"-RP-25-F-3T-B2-PB40**
	Rp1 1/4	**8070279**	**VZBM-A-11/4"-RP-25-F-3T-B2-PB80**
	Rp1 1/2	**8070280**	**VZBM-A-11/2"-RP-25-F-3T-B2-PB120**
	Rp2	**8070281**	**VZBM-A-2"-RP-25-F-3T-B2-PB120**

Ball valve actuator units

VZPR

Overview, configuration and ordering
➔ **www.festo.com/catalogue/vzpr**

Additional information, support and user documentation
➔ **www.festo.com/sp/vzpr**



+ Combination of a pneumatic quarter turn actuator and a ball valve
+ Connecting thread Rp¼ ... Rp2½
+ Flow rate 5.9 ... 535 m^3/h
+ Brass version
+ Connection pattern to NAMUR VDI/VDE 3845
+ PN class to DIN EN 1333

Ball valve actuator units VZPR

Key features and product range overview

General

- Connecting thread Rp¼ ... Rp2½
- Flow rate Kv 5.9 ... 535 m^3/h

Construction

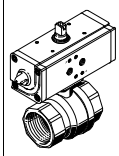
- Brass design VZPR-...
- Port pattern to NAMUR VDI/VDE 3845
- PN class to DIN EN 1333

Characteristics

- Combination of a pneumatic quarter-turn actuator and a ball valve
- Flow is fully opened or closed in both directions
- 5/2-way valve with NAMUR port pattern can be mounted directly on the drive unit
- Limit switch attachments for end-position sensing can be mounted directly on the drive unit

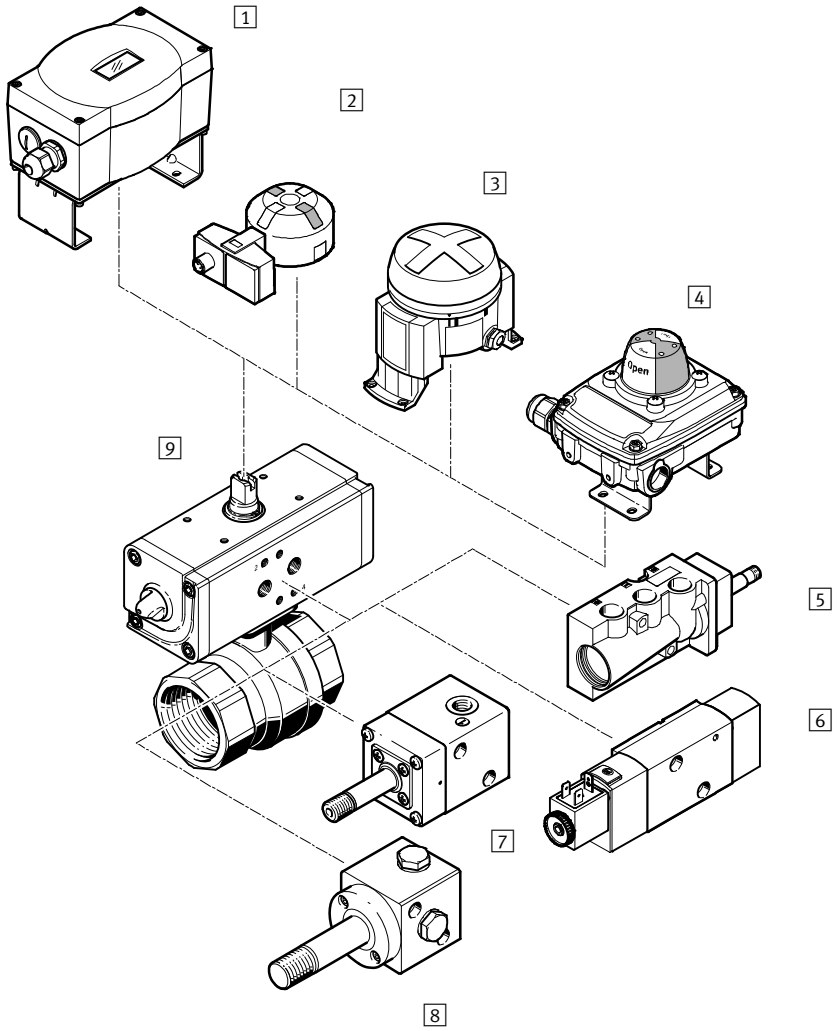
Valves with NAMUR port pattern
➔ Internet: namur

Limit switch attachments with NAMUR mounting-hole pattern
➔ page 279

Version	Type	Connecting thread[1)]	Nominal diameter [mm]	Nominal pressure of process valve [bar]	➔ Page/Internet
Brass					
	VZPR-BPD-...	Rp¼	15	PN 40	611
		Rp⅜	15	PN 40	
		Rp½	15	PN 40	
		Rp¾	20	PN 40	
		Rp1	25	PN 40	
		Rp1¼	32	PN 40	
		Rp1½	40	PN 25	
		Rp2	50	PN 25	
		Rp2½	63	PN 25	

1) Cylindrical barrel with female thread to DIN ISO 228-1

Peripherals overview



Mounting components and accessories

	Brief description	➔ Page/Internet
1 Positioner CMSX	For position control of quarter turn actuators in process automation systems	289
2 Sensor boxes SRBG	For electrical feedback and position monitoring of process valves which are actuated with quarter turn actuators	235
3 Limit switch attachments DAPZ	Round design, variant AR Electrical, inductive or inductive and explosion-proof sensing	279
4 Sensor boxes SRBC	For electrical feedback and position monitoring of process valves which are actuated with quarter turn actuators	217
5 Solenoid valves NVF3	For F solenoid coil and explosion-proof F solenoid coil	nvf3
6 Solenoid valves VSNC	For single- and double-acting quarter turn actuators with a connection pattern to VDI/VDE 3845	23
7 Solenoid valves VOFC	Solenoid valve with solenoid coil, connection pattern to Namur	85
8 Solenoid valves VOFD	Solenoid valve with solenoid coil, connection pattern to Namur	151
9 Ball valve actuator unit VZPR	Combination of quarter turn actuator and ball valve, versions in brass	611

Ball valve actuator units VZPR

Type codes

VZPR	–	B	P	D	–	22	–	R	38

Type	
VZPR	Ball valve actuator

Valve	
B	Ball valve

Drive	
P	Quarter-turn actuator DAPS

Mode of operation	
D	Double-acting

Valve function	
22	2/2-way valve

Closing direction	
R	Closes to right

Connecting thread	
14	Rp¼
38	Rp⅜
12	Rp½
34	Rp¾
1	Rp1
114	Rp1¼
112	Rp1½
2	Rp2
212	Rp2½

Technical data

Function

Swivel angel
0 ... 90°

Flow rate Kv
5.9 ... 535 m^3/h

Connecting thread
Rp¼ ... Rp2½

Torque
15 ... 180 Nm

General technical data										
Connecting thread		Rp¼	Rp⅜	Rp½	Rp¾	Rp1	Rp1¼	Rp1½	Rp2	Rp2½
Quarter-turn actuator										
Pneumatic connection		G⅛								
Constructional design		Scotch yoke mechanism, double-acting								
Type of mounting		Via female threads								
Mounting position		Any								
Swivel angle	[°]	90								
Closing direction		Closes to right								
Torque at 5.6 bar and 0° swivel angle	[Nm]	15	15	15	30	30	60	60	106	180
Ball valve										
Valve function		2/2								
Constructional design		2-way ball valve								
Sealing principle		Soft								
Actuation type		Pneumatic								
Direction of flow		Reversible								
Nominal diameter	[mm]	15	15	15	20	25	32	40	50	63
Flow rate Kv	[m^3/h]	5.9	9.4	17	41	70	121	200	292	535

Operating and environmental conditions										
Connecting thread		Rp¼	Rp⅜	Rp½	Rp¾	Rp1	Rp1¼	Rp1½	Rp2	Rp2½
Ambient temperature	[°C]	–20 ... +80								
Temperature of medium	[°C]	–20 ... +150								
Quarter-turn actuator										
Operating pressure[1]	[bar]	1 ... 8.4								
Operating medium		Dried air, lubricated or unlubricated								
Ball valve										
Nominal pressure of process valve[2]		PN 40	PN 40	PN 40	PN 40	PN 40	PN 40	PN 25	PN 25	PN 25
Operating medium		Compressed air, water, neutral gasses, neutral fluids, vacuum								

1) Minimum operating pressures vary for single-acting quarter-turn actuators depending upon spring quantity.
2) PN class to DIN EN 1333.

Ball valve actuator units VZPR-BPD

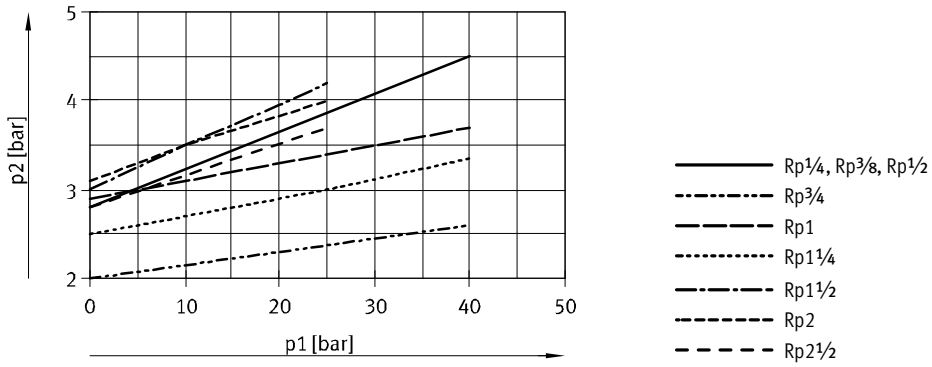
Technical data

Materials		
Housing		Brass
Ball		Brass
Seals	Housing	Polytetrafluoroethylene, fibre glass reinforced
	Shaft	Fluoro elastomer

Weight [g]

Connecting thread		Connecting thread	
Rp¼	1300	Rp1¼	3200
Rp⅜	1300	Rp1½	3800
Rp½	1200	Rp2	5400
Rp¾	1500	Rp2½	7300
Rp1	1800		

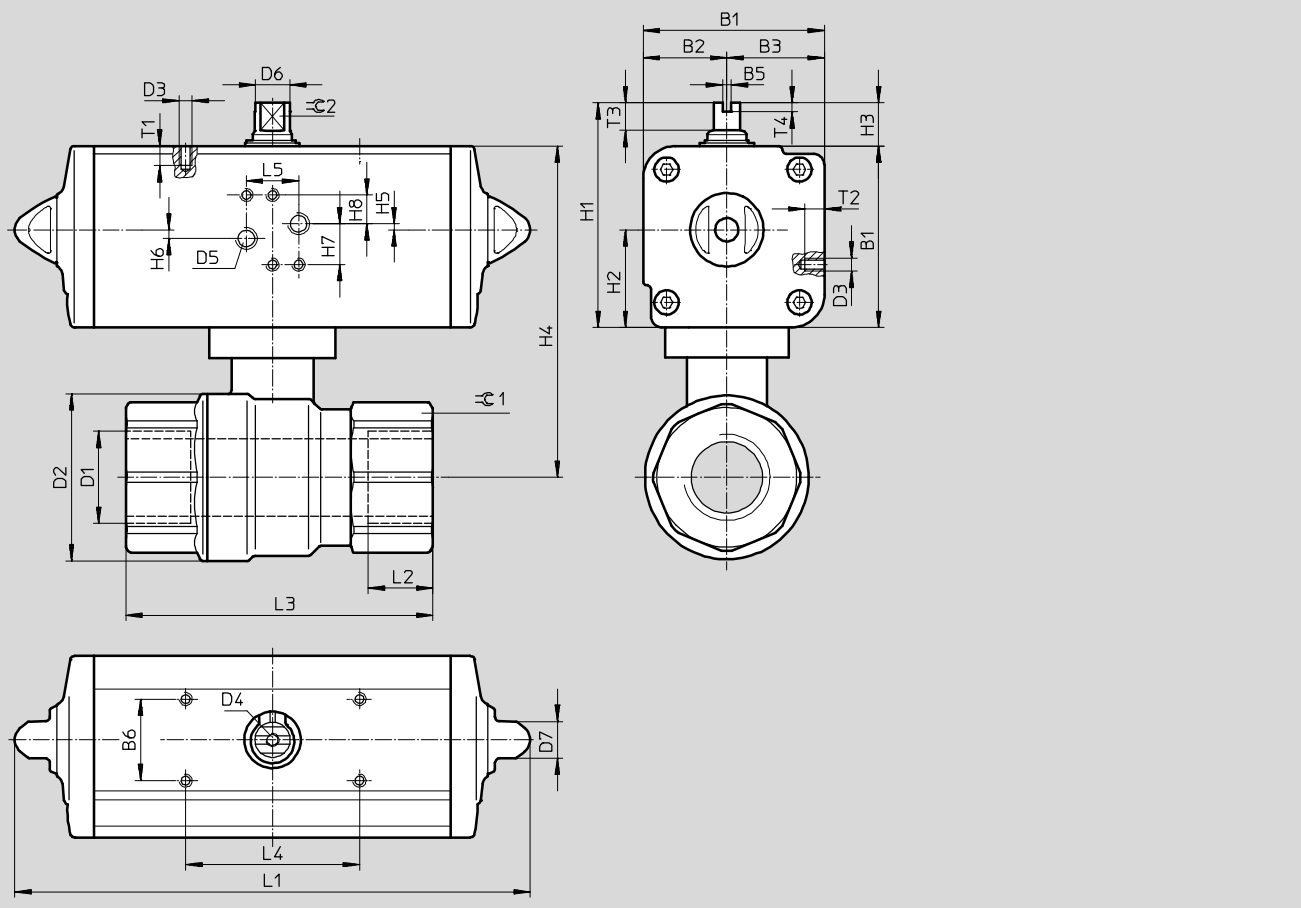
Operating pressure p2 as a function of nominal operating pressure p1



Technical data

Dimensions

Download CAD data ➔ **www.festo.com**



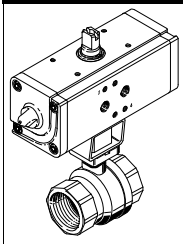
Connecting thread D1	B1	B2	B3	B5	B6	D2 ∅ max.	D3	D4	D5	D6 ∅	D7 ∅	H1	H2	H3	H4
Rp¼	52.2	24.2	28	4	30	35	M5	M6	G⅛	9.2	13	72.2	28	20	92.2
Rp⅜															
Rp½															
Rp¾	59.2	27.7	31.5			45				10.9	13	79.2	31.5	20	104.2
Rp1						55									
Rp1¼	70.4	32.7	37.7			65				14.5	13	90.4	37.7	20	130.2
Rp1½						75									135.4
Rp2	83.3	38.5	44.8			90				16.2	17	103.3	44.8	20	158.3
Rp2½	107.5	51	56.5			110				20.2	22	137.5	56.5	30	192.5

Connecting thread D1	H5	H6	H7	H8	L1	L2	L3	L4	L5	T1	T2	T3	T4	⫧1	⫧2
Rp¼	0.8	3.2	18	14	159	15	75	80	24	6	7	10	4	26	8
Rp⅜															
Rp½															
Rp¾					174	16	80					10		32	9
Rp1						19	90							41	
Rp1¼	–	4			198	21	110					13		50	10
Rp1½						21	120							55	
Rp2	–	4			236.5	25	140					13		70	12
Rp2½					289.9	24	143					16		83	15

Ball valve actuator units VZPR-BPD

Technical data

Ordering data – Ball valve actuators

	Connecting thread	Part No.	Type
	Rp¼	**540510**	**VZPR-BPD-22-R14**
	Rp⅜	**540511**	**VZPR-BPD-22-R38**
	Rp½	**540512**	**VZPR-BPD-22-R12**
	Rp¾	**540513**	**VZPR-BPD-22-R34**
	Rp1	**540514**	**VZPR-BPD-22-R1**
	Rp1¼	**540515**	**VZPR-BPD-22-R114**
	Rp1½	**540516**	**VZPR-BPD-22-R112**
	Rp2	**540517**	**VZPR-BPD-22-R2**
	Rp2½	**540874**	**VZPR-BPD-22-R212**

07 Angle seat valves

Angle seat valves made of gunmetal (red brass) and stainless steel, fully assembled and actuated by a direct supply of compressed air

VZXF ★

Angle seat valves

+ Sturdy design
+ Easy-to-clean design

➔ page 619

VZXA

Angle seat valves

+ Modular design
+ Sturdy and easy-to-clean stainless-steel process valve
+ Single- or double-acting

➔ page 655

Contents

Angle seat valves VZXF 619
Angle seat valves VZXA 655

Angle seat valves
VZXF ★

Overview, configuration and ordering
➔ **www.festo.com/catalogue/vzxf**

Additional information, support and user documentation
➔ **www.festo.com/sp/vzxf**

Quick ordering of basic designs
➔ page 629, 644

Selected types in accordance with the ATEX Directive for explosive atmospheres
➔ **www.festo.com/ex**

+ Connection 1/2, 3/4, 1, 1 1/4, 11/2, 2
+ G thread or NPT thread
+ Pressure range 0 ... 40 bar
+ Valve function 2/2-way NC
+ Can also be used with lightly contaminated media
+ Can be used for vapour applications
+ Direct pilot air supply

Angle seat valves VZXF

Key features

Function

Angle seat valves are externally controlled valves. These valves are actuated by a direct supply of compressed air. In this process, the seat of the process valve is raised by a pneumatic actuator. In the normal position, the valve is closed by a spring. When the actuator is supplied with operating pressure, it raises the control piston as well as the valve disc – the valve opens. The valve seat is slanted at an angle of approx. 50° in relation to the media flow. The flow direction is determined by the design of the valve. Angle seat valves are used in applications in which absolute purity of the medium cannot be ensured, in which high-viscosity media are to be controlled or in vapour applications.

Design

- Connecting thread G1/2 ... G2
- Flow rate Kv 3.3 ... 47.5 m^3/h

- Gunmetal (red brass) variant
- Stainless steel casting variant
- Stainless steel casting variant, nickel-plated actuator head

General

- Angle seat valves are simple and sturdy and are thus perfectly suitable for almost all media with a viscosity of up to 600 mm^2/s
- Angle seat valves control suitable gaseous and liquid media in rigid piping systems without the need for any pressure differential
- No differential pressure required between the input and output
- Low flow resistance
- Insensitive to vapour or slightly contaminated media
- Long service life
- Low maintenance
- The valves have a high chemical and thermal resistance thanks to their design
- The NC function ensures that the valve is closed in the event of pressure loss in the control circuit
- Different designs of angle seat valves are available depending on the pressure of the medium
- There is a choice of two versions: "closing in the direction of media flow" is used for gaseous media. "Closing against the direction of media flow" is used for liquid media

Explosion protection

- ATEX certification is used in production areas which are potentially in certain conditions. The VZXF angle seat valves are certified for use in equipment group II, equipment category 2

PWIS-free

- PWIS-free is chosen for use in production areas in which the influence of paint-wetting impairment substances must be avoided at all costs

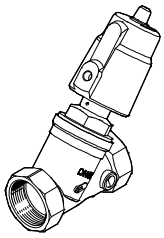
Vacuum version

- The variant that is suitable for vacuum is used in packaging machines which need to generate a vacuum

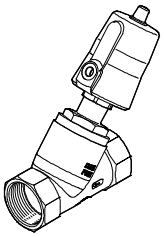
Key features

Variants

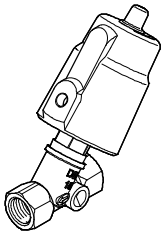
VZXF-L-...-M-A-G112-350-H3B1-50-8



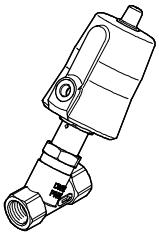
VZXF-L-...-M-A-G112-350-M1-V4V4T-50-7



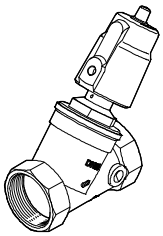
VZXF-L-...-M-A-G12-120-M1-H3B1-50-16



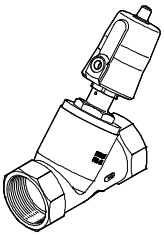
VZXF-L-...-M-B-G12-130-M1-V4V4T-50-40



VZXF-L-...-M-B-G2-430-H3B1-50-3

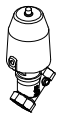
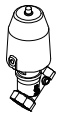
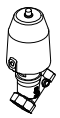
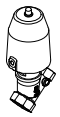
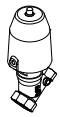


VZXF-L-...-M-B-G2-450-M1-V4V4T-50-3

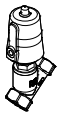
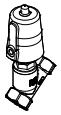
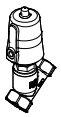
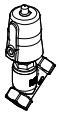


Angle seat valves VZXF

Product range overview

Version		Type code	Process valve connection	Nominal width DN	Temperature of medium [°C]	Flow rate Kv [m³/h]	Process valve nominal pressure PN	➔ Page/Internet
Gunmetal (red brass)	**Temperature of medium –10 … +80°C**							
		VZXF-L-…-H3B1-…	G1/2	15	–10 … +80	3.5 … 28	16	626
			G3/4	20				
			G1	25				
			G1 1/4	32				
			G1 1/2	40				
			G2	50				
	Temperature of medium –40 … +200°C							
		VZXF-L-…-H3B1T-…, VZXF-L-…-H3ALT-…	G1/2	15	–40 … +200	3.5 … 40	16	630
			G3/4	20				
			G1	25				
			G1 1/4	32				
			G1 1/2	40				
			G2	50				
	Vacuum version							
		VZXF-L-…-H3B1V-…, VZXF-L-…-H3ALV-…	G1/2	15	–10 … +80	3.5 … 40	16	634
			G3/4	20				
			G1	25				
			G1 1/4	32				
			G1 1/2	40				
			G2	50				
	PWIS-free							
		VZXF-L-…-H3B1V-…	G1/2	15	–10 … +80	3.7 … 16.5	16	636
			G3/4	20				
			G1	25				
			G1 1/2	40				
	With EX certification							
		VZXF-L-…-H3B1V-…-EX4	G1/2	15	–10 … +80	3.5 … 28	16	638
			G3/4	20				
			G1	25				
			G1 1/4	32				
			G1 1/2	40				
			G2	50				

Product range overview

Version		Type code	Process valve connection	Nominal width DN	Temperature of medium [°C]	Flow rate Kv [m³/h]	Process valve nominal pressure PN	➔ Page/Internet
Stainless steel casting	**Temperature of medium –40 ... +200°C**							
		VZXF-L-...-V4V4T-...	G1/2	15	–40 ... +200	3.3 ... 43	40	642
			G3/4	20				
			G1	25				
			G1 1/4	32				
			G1 1/2	40				
			G2	50				
	Nickel-plated actuator head							
		VZXF-L-...-V4B2T-..., VZXF-L-...-V4ANT-...	G1/2	15	–40 ... +200	3.3 ... 43	40	645
			G3/4	20				
			G1	25				
			G1 1/4	32				
			G1 1/2	40				
			G2	50				
	Vacuum version							
		VZXF-L-...-V4B2V-..., VZXF-L-...-V4ANV-...	G1/2	15	–10 ... +80	3.8 ... 43	40	648
			G3/4	20				
			G1	25				
			G1 1/4	32				
			G1 1/2	40				
			G2	50				
	With EX certification							
		VZXF-L-...-V4V4T-...-EX4	G1/2	15	–40 ... +200	3.3 ... 34.5	40	650
			G3/4	20				
			G1	25				
			G1 1/4	32				
			G1 1/2	40				
			G2	50				

Angle seat valves VZXF

Type codes

VZXF – L – M22C – M – A – G12 – 120 – –

Type code	
VZXF	Angle seat valve, externally controlled

Type of directional control valve	
L	In-line valve

Valve function	
M22C	2/2-way valve, normally closed

Reset method for monostable valves	
M	Mechanical spring

Flow direction	
A	Over valve seat, for gaseous media
B	Below valve seat, for gaseous and liquid media

Line connection	
G12	G1/2 thread
G34	G3/4 thread
G1	G1 thread
G114	G1 1/4 thread
G112	G1 1/2 thread
G2	G2 thread

Nominal width DN	
120	12 mm
130	13 mm
160	16 mm
180	18 mm
230	23 mm
240	24 mm
290	29 mm
310	31 mm
350	35 mm
430	43 mm
450	45 mm

Temperature range of medium	
–	Standard, –10 ... +80 °C
M1	–40 ... +200 °C

Type code

H3	B1		–	50	–	16	–		–	EX4

Housing materials

H3	Gunmetal (red brass)
V4	Stainless steel

Actuator housing material

AL	Aluminium
AN	Aluminium, nickel-plated
B1	Brass
B2	Brass, nickel-plated
V4	Stainless steel

Sealing material

–	Standard, NBR
T	PTFE
V	FPM

Actuator size

50	50 mm
80	80 mm

Pressure of medium

V	–0.9 ... 0 bar
3	Max. 3 bar
4	Max. 4 bar
5	Max. 5 bar
6	Max. 6 bar
7	Max. 7 bar
8	Max. 8 bar
9	Max. 9 bar
10	Max. 10 bar
12	Max. 12 bar
16	Max. 16 bar
20	Max. 20 bar
22	Max. 22 bar
25	Max. 25 bar
40	Max. 40 bar

PWIS content

–	Standard
C	PWIS-free

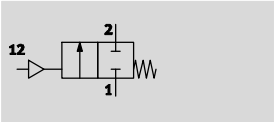
EU certification

–	None
EX4	II 2GD

Angle seat valves VZXF

Gunmetal (red brass), temperature of medium –10 ... +80 °C

Function



- Flow rate Kv
  3.5 ... 28 m³/h

- Connecting thread
  G1/2 ... G2

General technical data							
Line connection		G1/2	G3/4	G1	G1 1/4	G1 1/2	G2
Nominal width DN	[mm]	12	16	23	29	35	43
Design		Poppet valve with piston actuator					
Type of actuation		Pneumatic					
Type of mounting		In-line installation					
Line connection		Threaded collar to DIN ISO 228-1					
Sealing principle		Soft					
Mounting position		Any					
Valve function		2/2-way, closed, monostable					
Pneumatic connection		Female thread G1/8					
Flow direction		Non-reversible					
Type of control		Externally controlled					
Reset method		Mechanical spring					
Exhaust function		Without flow control option					
Flow direction	VZXF-...-A-...	Over valve seat, for gaseous media					
	VZXF-...-B-...	Under valve seat, for gaseous and liquid media					

Gunmetal (red brass), temperature of medium –10 ... +80 °C

Operating and environmental conditions							
Line connection		G1/2	G3/4	G1	G1 1/4	G1 1/2	G2
Nominal pressure of process valve PN		16					
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]					
Operating pressure	[bar]	6 ... 10					
Medium		Vapour					
		Inert gases					
		Filtered compressed air, grade of filtration 200 µm					
	VZXF-...-B-... additionally	Mineral oil-based hydraulic fluid					
		Mineral oil					
		Neutral fluids					
		Water					
Max. viscosity	[mm^2/s]	600					
Ambient temperature	[°C]	–10 ... +60					
Temperature of medium	[°C]	–10 ... +80					
CE marking (see declaration of conformity)[1]		–			To EU Pressure Equipment Directive		

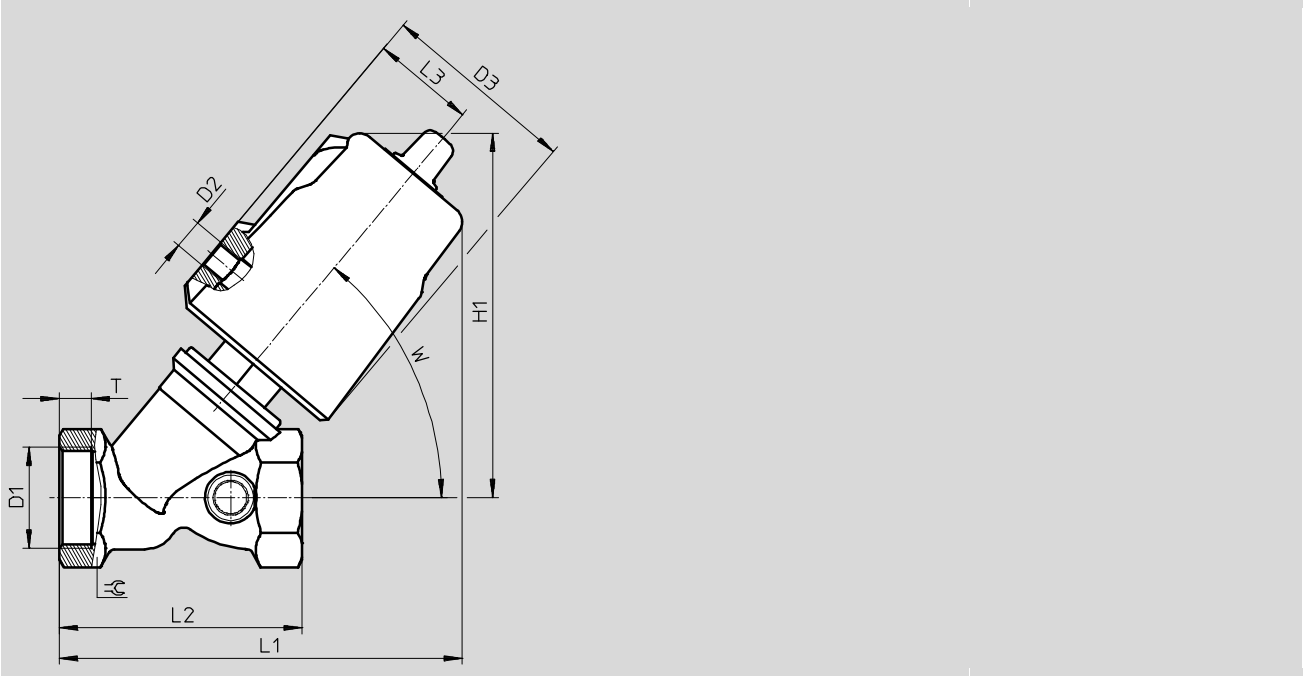
1) Additional information www.festo.com/sp ➔ Certificates.

Materials		**Material number**
Process valve housing	Gunmetal (red brass)	CC499K
Actuator housing	Brass	
Spindle washer	NBR	
Seat seal	PTFE	
Note on materials	Contains PWIS (paint-wetting impairment substances)	
	RoHS-compliant	

Angle seat valves VZXF

Gunmetal (red brass), temperature of medium –10 ... +80 °C

Dimensions Download CAD data ➔ **www.festo.com**

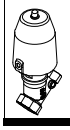


Type code	D1	D2	D3 ∅	H1	L1	L2	L3	T	W	⌯
VZXF-L-...-G12-...	G1/2	G1/8	62	112	123	66	34	8	50°	27
VZXF-L-...-G34-...	G3/4			117	130	75		9		33
VZXF-L-...-G1-...	G1			121	133	80		10.5		41
VZXF-L-...-G114-...	G1 1/4			139	154	97		12.5		50
VZXF-L-...-G112-...	G1 1/2			145	161	107		14.5		56
VZXF-L-...-G2-...	G2			154	171	124		16.5		68

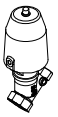
Gunmetal (red brass), temperature of medium –10 ... +80°C

★ Core product range

Ordering data

	Line connection	Flow rate Kv [m³/h]	Pressure of medium [bar]	Corrosion resistance CRC[1)]	Product weight [g]	Part no.	Type code
	G1/2	3.7	0 ... 16	1	1200	★ **1002501**	**VZXF-L-M22C-M-B-G12-120-H3B1-50-16**
	G3/4	5.2	0 ... 16		1300	★ **1002503**	**VZXF-L-M22C-M-B-G34-160-H3B1-50-16**
	G1	9.6	0 ... 10		1500	★ **1002505**	**VZXF-L-M22C-M-B-G1-230-H3B1-50-10**

Ordering data

	Line connection	Flow rate Kv [m³/h]	Pressure of medium [bar]	Corrosion resistance CRC[1)]	Product weight [g]	Part no.	Type code
	G1/2	3.5	0 ... 16	1	1200	**1002500**	**VZXF-L-M22C-M-A-G12-120-H3B1-50-16**
	G3/4	6.7	0 ... 16		1300	**1002502**	**VZXF-L-M22C-M-A-G34-160-H3B1-50-16**
	G1	10.8	0 ... 16		1500	**1002504**	**VZXF-L-M22C-M-A-G1-230-H3B1-50-16**
	G1 1/4	6	0 ... 7		1900	**1002507**	**VZXF-L-M22C-M-B-G114-290-H3B1-50-7**
		19	0 ... 10			**1002506**	**VZXF-L-M22C-M-A-G114-290-H3B1-50-10**
	G1 1/2	16.5	0 ... 6		2300	**1002509**	**VZXF-L-M22C-M-B-G112-350-H3B1-50-6**
		23				**1002508**	**VZXF-L-M22C-M-A-G112-350-H3B1-50-8**
	G2	23	0 ... 3		2800	**1002511**	**VZXF-L-M22C-M-B-G2-430-H3B1-50-3**
		28	0 ... 4			**1002510**	**VZXF-L-M22C-M-A-G2-430-H3B1-50-4**

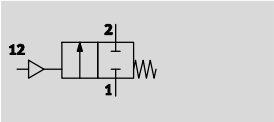
1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Angle seat valves VZXF

Gunmetal (red brass), temperature of medium –40 ... +200 °C

Function



- Flow rate Kv
  3.5 ... 40 m³/h

- G1/2 ... G2

General technical data

Line connection		G1/2	G3/4	G1	G1 1/4	G1 1/2	G2
Nominal width DN	[mm]	12	16	23	29	35	43
Design		Poppet valve with piston actuator					
Type of actuation		Pneumatic					
Type of mounting		In-line installation					
Line connection		Threaded collar to DIN ISO 228-1					
Sealing principle		Soft					
Mounting position		Any					
Valve function		2/2-way, closed, monostable					
Pneumatic connection		Female thread G1/8					
Flow direction		Non-reversible					
Type of control		Externally controlled					
Reset method		Mechanical spring					
Exhaust function		Without flow control option					
Flow direction	VZXF-...-A-...	Over valve seat, for gaseous media					
	VZXF-...-B-...	Under valve seat, for gaseous and liquid media					

Gunmetal (red brass), temperature of medium –40 ... +200 °C

Operating and environmental conditions							
Line connection		G1/2	G3/4	G1	G1 1/4	G1 1/2	G2
Nominal pressure of process valve PN		16					
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]					
Operating pressure	[bar]	6 ... 10					
Medium		Vapour					
		Inert gases					
		Filtered compressed air, grade of filtration 200 µm					
	VZXF-...-B-... additionally	Mineral oil-based hydraulic fluid					
		Mineral oil					
		Neutral fluids					
		Water					
Max. viscosity	[mm^2/s]	600					
Ambient temperature	[°C]	–10 ... +60					
Temperature of medium	[°C]	–40 ... +200					
CE marking (see declaration of conformity)[1]		–			To EU Pressure Equipment Directive		

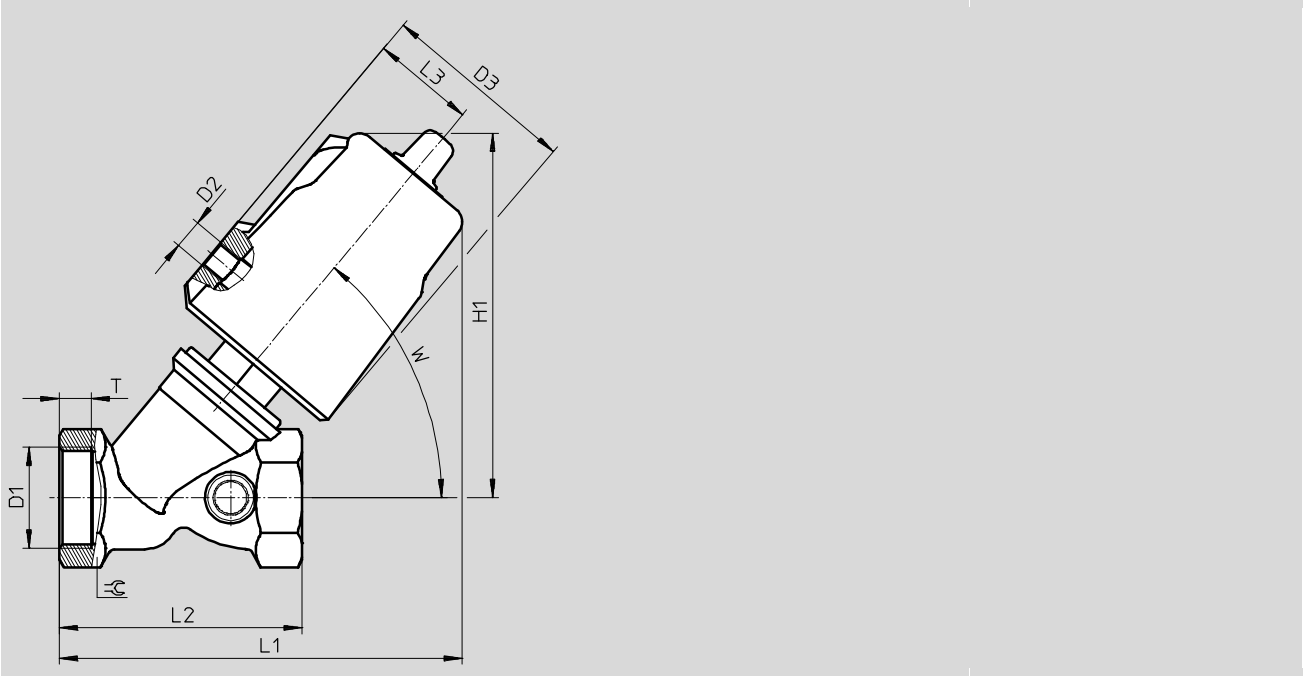
1) Additional information www.festo.com/sp ➔ Certificates.

Materials			**Material number**
Process valve housing		Gunmetal (red brass)	CC499K
Actuator housing	...-H3ALT-...	Aluminium	
	...-H3B1T-...	Brass	
Spindle washer		PTFE	
Seat seal		PTFE	
Note on materials		Contains paint-wetting impairment substances	
		RoHS-compliant	

Angle seat valves VZXF

Gunmetal (red brass), temperature of medium –40 ... +200 °C

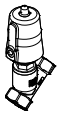
Dimensions Download CAD data ➔ **www.festo.com**



Type code	D1	D2	D3 ∅	H1	L1	L2	L3	T	W	⌯
VZXF-L-...-G12-...-H3B1T-50-...	G1/2	G1/8	62	130	135.5	66	34	13	50°	27
VZXF-L-...-G34-...-H3B1T-50-...	G3/4			130	140	75		14.5		32
VZXF-L-...-G1-...-H3B1T-50-...	G1			133	143	80		10.5		41
VZXF-L-...-G114-...-H3B1T-50-...	G1 1/4			148	160	97		12.5		50
VZXF-L-...-G114-...-H3ALT-80-...	G1 1/4		94	180	190	97	49	12.5		50
VZXF-L-...-G112-...-H3B1T-50-...	G1 1/2		62	152.5	167	107	34	14.5		55
VZXF-L-...-G112-...-H3ALT-80-...	G1 1/2		94	186	197	107	49	14.5		55
VZXF-L-...-G2-...-H3B1T-50-...	G2		62	162	178	124	34	16.5		67
VZXF-L-...-G2-...-H3ALT-80-...	G2		94	196	207.5	124	49	16.5		67

Gunmetal (red brass), temperature of medium –40 ... +200 °C

Ordering data

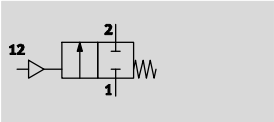
	Line connection	Flow rate Kv [m³/h]	Pressure of medium [bar]	Corrosion resistance CRC[1)]	Product weight [g]	Part no.	Type code
	G1/2	3.5	0 ... 16	1	1200	**3535619**	**VZXF-L-M22C-M-A-G12-120-M1-H3B1T-50-16**
		3.7				**3535620**	**VZXF-L-M22C-M-B-G12-120-M1-H3B1T-50-16**
	G3/4	5.2	0 ... 16	1	1300	**3535644**	**VZXF-L-M22C-M-B-G34-160-M1-H3B1T-50-16**
		6.7				**3535643**	**VZXF-L-M22C-M-A-G34-160-M1-H3B1T-50-16**
	G1	9.6	0 ... 10	1	1500	**3535665**	**VZXF-L-M22C-M-B-G1-230-M1-H3B1T-50-10**
		10.8	0 ... 16			**3535664**	**VZXF-L-M22C-M-A-G1-230-M1-H3B1T-50-16**
		14.5	0 ... 16	0	2000	**3540768**	**VZXF-L-M22C-M-B-G1-230-M1-H3ALT-80-16**
	G1 1/4	6	0 ... 7	1	1900	**3535689**	**VZXF-L-M22C-M-B-G114-290-M1-H3B1T-50-7**
		19	0 ... 10			**3535684**	**VZXF-L-M22C-M-A-G114-290-M1-H3B1T-50-10**
		19	0 ... 12	0	2300	**3535712**	**VZXF-L-M22C-M-B-G114-290-M1-H3ALT-80-12**
		21.5	0 ... 16			**3535711**	**VZXF-L-M22C-M-A-G114-290-M1-H3ALT-80-16**
	G1 1/2	16.5	0 ... 6	1	2300	**3535721**	**VZXF-L-M22C-M-B-G112-350-M1-H3B1T-50-6**
		23	0 ... 7			**3535720**	**VZXF-L-M22C-M-A-G112-350-M1-H3B1T-50-7**
		29.5	0 ... 8	0	2600	**3535825**	**VZXF-L-M22C-M-B-G112-350-M1-H3ALT-80-8**
		30.5	0 ... 16			**3535824**	**VZXF-L-M22C-M-A-G112-350-M1-H3ALT-80-16**
	G2	23	0 ... 3	1	2800	**3535838**	**VZXF-L-M22C-M-B-G2-430-M1-H3B1T-50-3**
		28	0 ... 4			**3535837**	**VZXF-L-M22C-M-A-G2-430-M1-H3B1T-50-4**
		30	0 ... 5	0	2900	**3536436**	**VZXF-L-M22C-M-B-G2-430-M1-H3ALT-80-5**
		40	0 ... 16			**3536435**	**VZXF-L-M22C-M-A-G2-430-M1-H3ALT-80-16**

1) Corrosion resistance class CRC 0 to Festo standard FN 940070
No corrosion stress. Applies to small, optically irrelevant standard parts such as threaded pins, circlips and clamping sleeves which are usually only available in a phosphated or burnished version (and possibly oiled) as well as to ball bearings (for components ‹ CRC 3) and plain bearings.
Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Angle seat valves VZXF

Gunmetal (red brass), vacuum version

Function



- Flow rate Kv
  3.5 ... 40 m³/h

- G1/2 ... G2

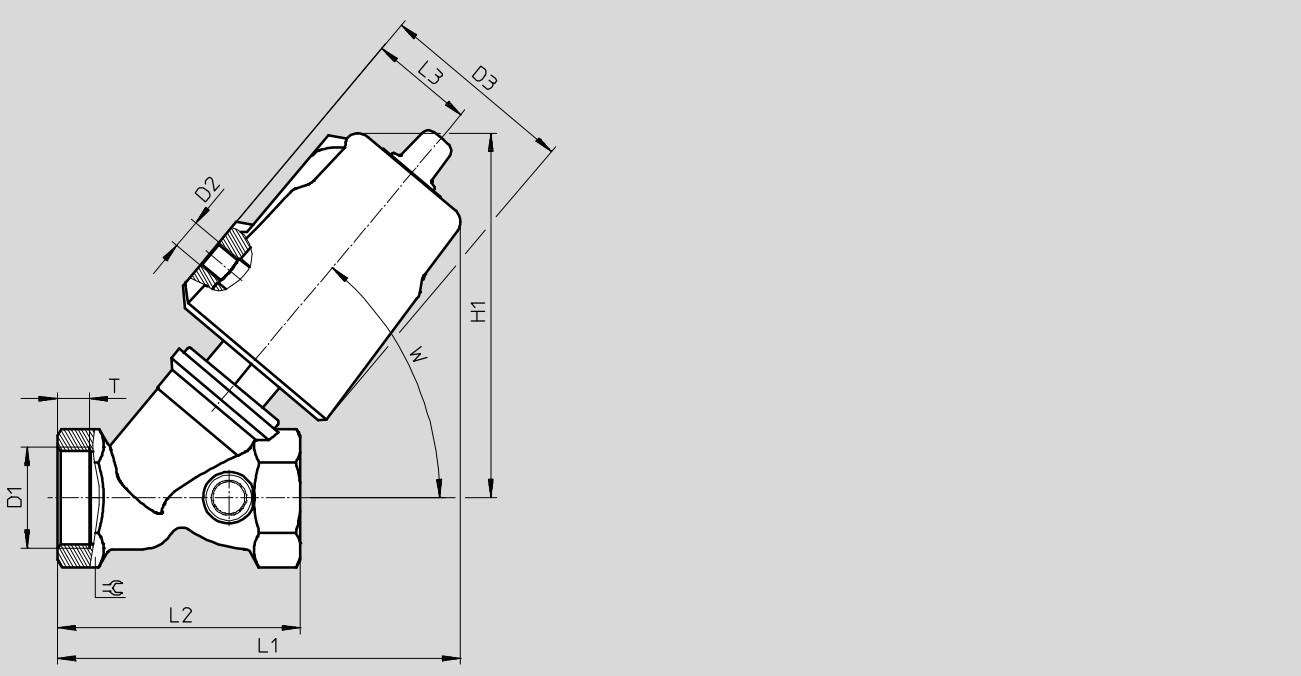
General technical data							
Line connection		G1/2	G3/4	G1	G1 1/4	G1 1/2	G2
Nominal width DN	[mm]	12	16	23	29	35	43
Design		Poppet valve with piston actuator					
Type of actuation		Pneumatic					
Type of mounting		In-line installation					
Line connection		Threaded collar to DIN ISO 228-1					
Sealing principle		Soft					
Mounting position		Any					
Valve function		2/2-way, closed, monostable					
Pneumatic connection		Female thread G1/8					
Flow direction		Non-reversible					
Type of control		Externally controlled					
Reset method		Mechanical spring					
Exhaust function		Without flow control option					
Flow direction		Over valve seat, for gaseous media					

Operating and environmental conditions							
Line connection		G1/2	G3/4	G1	G1 1/4	G1 1/2	G2
Nominal pressure of process valve PN		16					
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]					
Operating pressure	[bar]	6 ... 10					
Medium		Vapour					
		Inert gases					
		Filtered compressed air, grade of filtration 200 µm					
Max. viscosity	[mm²/s]	600					
Ambient temperature	[°C]	–10 ... +60					
Temperature of medium	[°C]	–10 ... +80					

Materials			Material number
Process valve housing		Gunmetal (red brass)	CC499K
Actuator housing	...-H3ALV-...	Aluminium	
	...-H3B1V-...	Brass	
Spindle washer		FPM	
Seat seal		FPM	
Note on materials		Contains paint-wetting impairment substances	
		RoHS-compliant	

Gunmetal (red brass), vacuum version

Dimensions Download CAD data ➔ **www.festo.com**



Type code	D1	D2	D3 ∅	H1	L1	L2	L3	T	W	⌭
VZXF-L-...-G12-...-H3B1V-50-...	G1/2	G1/8	62	113.5	123	66	34	13	50°	27
VZXF-L-...-G34-...-H3B1V-50-...	G3/4			118	130	75	34	14.5		32
VZXF-L-...-G1-...-H3B1V-50-...	G1			121	133	80	34	10.5		41
VZXF-L-...-G1-...-H3ALV-80-...	G1		94	168	174.5	80	49	10.5		41
VZXF-L-...-G114-...-H3B1V-50-...	G1 1/4		62	138.5	153.5	97	34	12.5		50
VZXF-L-...-G114-...-H3ALV-80-...	G1 1/4		94	174.5	185	97	49	12.5		50
VZXF-L-...-G112-...-H3B1V-50-...	G1 1/2		62	146	160	107	34	14.5		55
VZXF-L-...-G112-...-H3ALV-80-...	G1 1/2		94	180.5	192	107	49	14.5		55
VZXF-L-...-G2-...-H3ALV-80-...	G2		94	190	202.5	124	49	16.5		68

Ordering data

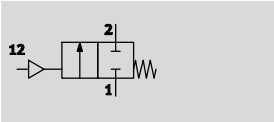
	Line connection	Flow rate Kv [m³/h]	Pressure of medium [bar]	Corrosion resistance CRC[1)]	Product weight [g]	Part no.	Type code
	G1/2	3.5	–0.9	1	1200	**3538869**	**VZXF-L-M22C-M-A-G12-120-H3B1V-50-V**
	G3/4	6.7		1	1300	**3539178**	**VZXF-L-M22C-M-A-G34-160-H3B1V-50-V**
	G1	10.8		1	1500	**3539247**	**VZXF-L-M22C-M-A-G1-230-H3B1V-50-V**
		12		0	2000	**3536819**	**VZXF-L-M22C-M-A-G1-230-H3ALV-80-V**
	G1 1/4	19		1	1900	**3539352**	**VZXF-L-M22C-M-A-G114-290-H3B1V-50-V**
		21.5		0	2300	**3536830**	**VZXF-L-M22C-M-A-G114-290-H3ALV-80-V**
	G1 1/2	23		1	2300	**3539367**	**VZXF-L-M22C-M-A-G112-350-H3B1V-50-V**
		30.5		0	2600	**3536850**	**VZXF-L-M22C-M-A-G112-350-H3ALV-80-V**
	G2	40		0	2900	**3540796**	**VZXF-L-M22C-M-A-G2-430-H3ALV-80-V**

1) Corrosion resistance class CRC 0 to Festo standard FN 940070
No corrosion stress. Applies to small, optically irrelevant standard parts such as threaded pins, circlips and clamping sleeves which are usually only available in a phosphated or burnished version (and possibly oiled) as well as to ball bearings (for components ‹ CRC 3) and plain bearings.
Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Angle seat valves VZXF

Gunmetal (red brass), PWIS-free

Function



- Flow rate Kv
  3.7 ... 16.5 m^3/h

- G1/2 ... G1 1/2

General technical data					
Line connection		G1/2	G3/4	G1	G1 1/2
Nominal width DN	[mm]	12	16	23	35
Design		Poppet valve with piston actuator			
Type of actuation		Pneumatic			
Type of mounting		In-line installation			
Line connection		Threaded collar to DIN ISO 228-1			
Sealing principle		Soft			
Mounting position		Any			
Valve function		2/2-way, closed, monostable			
Pneumatic connection		Female thread G1/8			
Flow direction		Non-reversible			
Type of control		Externally controlled			
Reset method		Mechanical spring			
Exhaust function		Without flow control option			
Flow direction		Under valve seat, for gaseous and liquid media			

Operating and environmental conditions					
Line connection		G1/2	G3/4	G1	G1 1/2
Nominal pressure of process valve PN		16			
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]			
Operating pressure	[bar]	6 ... 10			
Medium		Vapour			
		Inert gases			
		Filtered compressed air, grade of filtration 200 µm			
		Mineral oil-based hydraulic fluid			
		Mineral oil			
		Neutral fluids			
		Water			
Max. viscosity	[mm^2/s]	600			
Ambient temperature	[°C]	–10 ... +60			
Temperature of medium	[°C]	–10 ... +80			
CE marking (see declaration of conformity)[1)]		–			To EU Pressure Equipment Directive

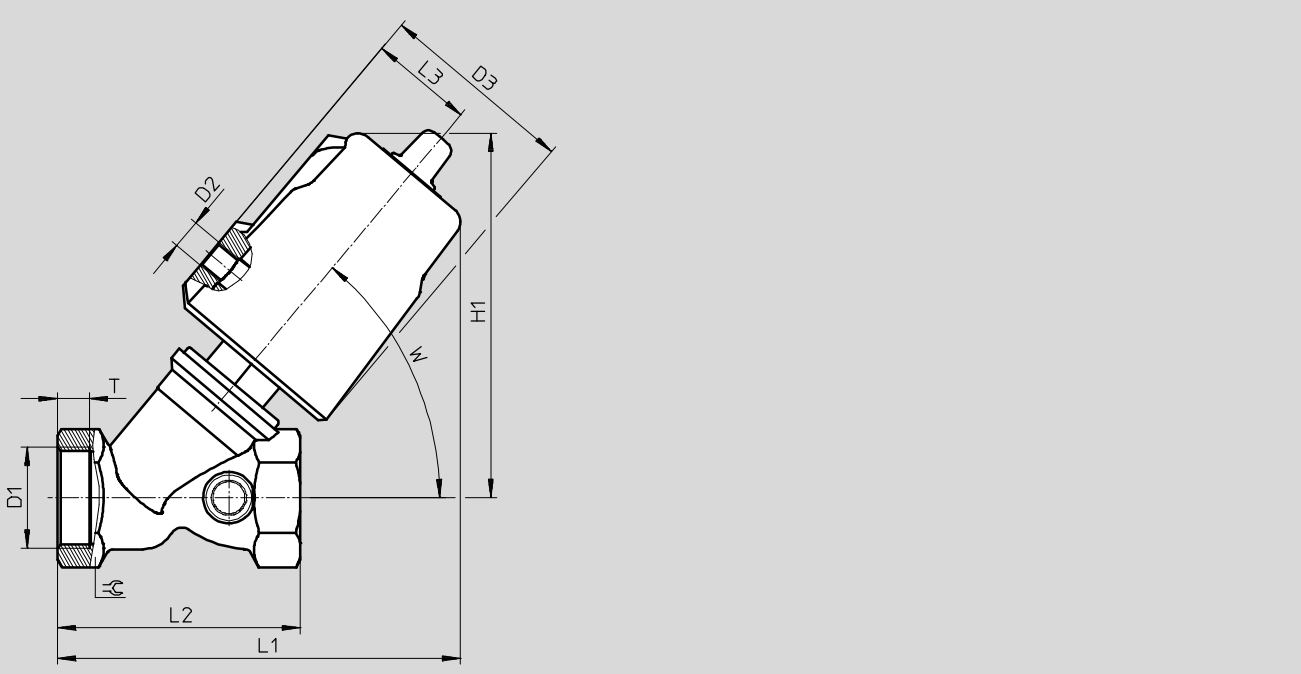
1) Additional information www.festo.com/sp ➔ Certificates.

Materials		Material number
Process valve housing	Gunmetal (red brass)	CC499K
Actuator housing	Brass	
Spindle washer	FPM	
Seat seal	FPM	
Note on materials	RoHS-compliant	

Gunmetal (red brass), PWIS-free

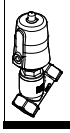
Dimensions

Download CAD data ➔ **www.festo.com**



Type code	D1	D2	D3 ∅	H1	L1	L2	L3	T	W	⌯
VZXF-L-...-G12-...	G1/2	G1/8	62	113.5	123	66	34	13	50°	27
VZXF-L-...-G34-...	G3/4			118	130	75	34	14.5		32
VZXF-L-...-G1-...	G1			121	133	80	34	10.5		41
VZXF-L-...-G112-...	G1 1/2		62	146	160	107	34	14.5		55

Ordering data

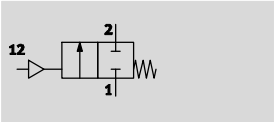
	Line connection	Flow rate Kv [m³/h]	Pressure of medium [bar]	Corrosion resistance CRC[1)]	Product weight [g]	Part no.	Type code
	G1/2	3.7	0 ... 16	1	1200	**3539036**	**VZXF-L-M22C-M-B-G12-120-H3B1V-50-16-C**
	G3/4	5.2	0 ... 16		1300	**3539179**	**VZXF-L-M22C-M-B-G34-160-H3B1V-50-16-C**
	G1	9.6	0 ... 10		1500	**3539248**	**VZXF-L-M22C-M-B-G1-230-H3B1V-50-10-C**
	G1 1/2	16.5	0 ... 6		2300	**3539368**	**VZXF-L-M22C-M-B-G112-350-H3B1V-50-6-C**

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Angle seat valves VZXF

Gunmetal (red brass) with EX certification

Function



- Flow rate Kv
  3.5 ... 28 m³/h

- G1/2 ... G2

General technical data								
Line connection			G1/2	G3/4	G1	G1 1/4	G1 1/2	G2
Nominal width DN		[mm]	12	16	23	29	35	43
Design			Poppet valve with piston actuator					
Type of actuation			Pneumatic					
Type of mounting			In-line installation					
Line connection			Threaded collar to DIN ISO 228-1					
Sealing principle			Soft					
Mounting position			Any					
Valve function			2/2-way, closed, monostable					
Pneumatic connection			Female thread G1/8					
Flow direction			Non-reversible					
Type of control			Externally controlled					
Reset method			Mechanical spring					
Exhaust function			Without flow control option					
Flow direction	VZXF-...-A-...		Over valve seat, for gaseous media					
	VZXF-...-B-...		Under valve seat, for gaseous and liquid media					

Operating and environmental conditions								
Line connection			G1/2	G3/4	G1	G1 1/4	G1 1/2	G2
Nominal pressure of process valve PN			16					
Operating medium			Compressed air to ISO 8573-1:2010 [7:4:4]					
Operating pressure		[bar]	6 ... 10					
Medium			Vapour					
			Inert gases					
			Filtered compressed air, grade of filtration 200 µm					
	VZXF-...-B-... additionally		Mineral oil-based hydraulic fluid					
			Mineral oil					
			Neutral fluids					
			Water					
Max. viscosity		[mm²/s]	600					
Ambient temperature		[°C]	–10 ... +60					
Temperature of medium		[°C]	–10 ... +80					
CE marking (see declaration of conformity)[1)]			–			To EU Pressure Equipment Directive		

1) Additional information www.festo.com/sp ➔ Certificates.

Gunmetal (red brass) with EX certification

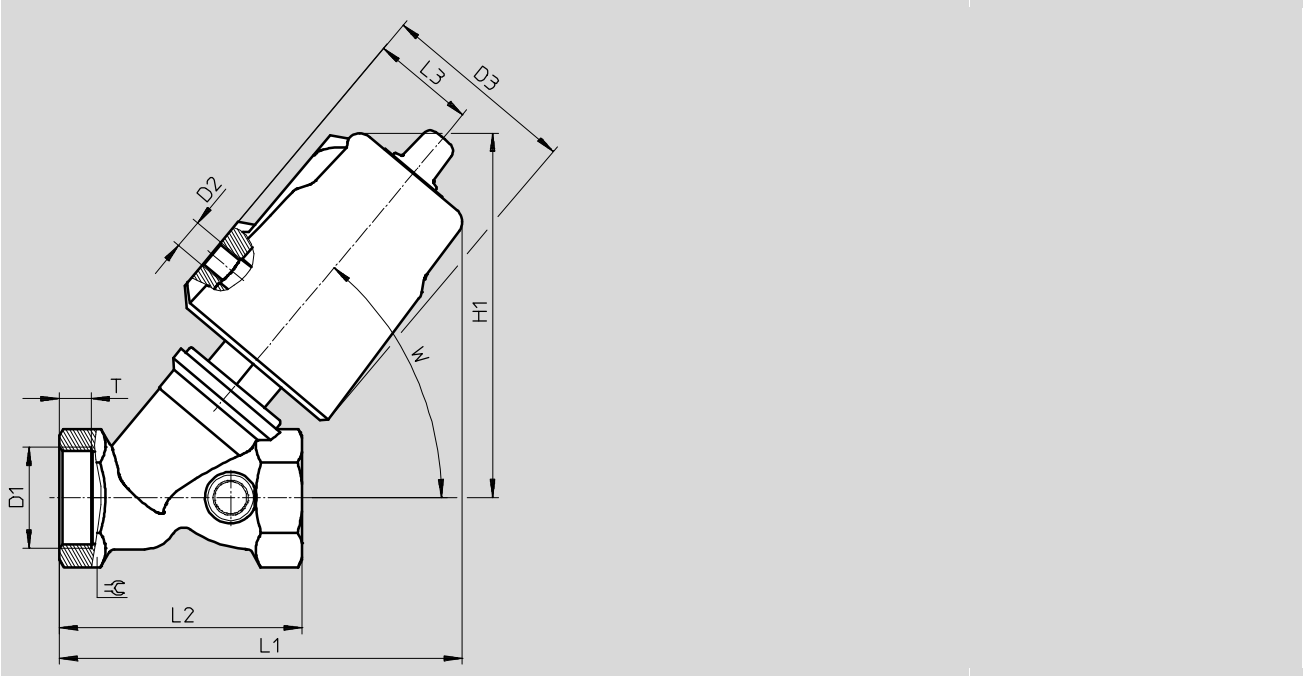
ATEX	
ATEX category for gas	II 2G
Type of ignition protection for gas	c TX X
ATEX category for dust	II 2D
Type of ignition protection for dust	c TX X
Explosion-proof ambient temperature rating [°C]	-10°C <= Ta <= +60°C
CE marking (see declaration of conformity)	To EU Explosion Protection Directive (ATEX)

Materials		Material number
Process valve housing	Gunmetal (red brass)	CC499K
Actuator housing	Brass	
Spindle washer	NBR	
Seat seal	PTFE	
Note on materials	Contains paint-wetting impairment substances	
	RoHS-compliant	

Angle seat valves VZXF

Gunmetal (red brass) with EX certification

Dimensions Download CAD data ➔ **www.festo.com**



Type code	D1	D2	D3 ∅	H1	L1	L2	L3	T	W	⌯
VZXF-L-...-G12-...	G1/2	G1/8	62	112	123	66	34	8	50°	27
VZXF-L-...-G34-...	G3/4			117	130	75	34	9		33
VZXF-L-...-G1-...	G1			121	133	80	34	10.5		41
VZXF-L-...-G114-...	G1 1/4			139	154	97	34	12.5		50
VZXF-L-...-G112-...	G1 1/2			145	161	107	34	14.5		56
VZXF-L-...-G2-...	G2			154	171	124	34	16.5		68

Gunmetal (red brass) with EX certification

Ordering data

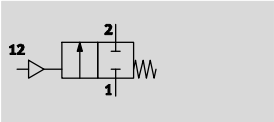
	Line connection	Flow rate Kv [m³/h]	Pressure of medium [bar]	Corrosion resistance CRC[1)]	Product weight [g]	Part no.	Type code
	G1/2	3.5	0 … 16	1	1200	**3539021**	**VZXF-L-M22C-M-A-G12-120-H3B1-50-16-EX4**
		3.7				**3539037**	**VZXF-L-M22C-M-B-G12-120-H3B1-50-16-EX4**
	G3/4	5.2	0 … 16		1300	**3539181**	**VZXF-L-M22C-M-B-G34-160-H3B1-50-16-EX4**
		6.7				**3539180**	**VZXF-L-M22C-M-A-G34-160-H3B1-50-16-EX4**
	G1	9.6	0 … 10		1500	**3539250**	**VZXF-L-M22C-M-B-G1-230-H3B1-50-10-EX4**
		10.8	0 … 16			**3539249**	**VZXF-L-M22C-M-A-G1-230-H3B1-50-16-EX4**
	G1 1/4	6	0 … 7		1900	**3539354**	**VZXF-L-M22C-M-B-G114-290-H3B1-50-7-EX4**
		19	0 … 10			**3539353**	**VZXF-L-M22C-M-A-G114-290-H3B1-50-10-EX4**
	G1 1/2	16.5	0 … 6		2300	**3539370**	**VZXF-L-M22C-M-B-G112-350-H3B1-50-6-EX4**
		23	0 … 7			**3539369**	**VZXF-L-M22C-M-A-G112-350-H3B1-50-7-EX4**
	G2	23	0 … 3		2800	**3540293**	**VZXF-L-M22C-M-B-G2-430-H3B1-50-3-EX4**
		28	0 … 4			**3540292**	**VZXF-L-M22C-M-A-G2-430-H3B1-50-4-EX4**

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Angle seat valves VZXF

Stainless steel casting, temperature of medium –40 ... +200°C

Function



- Flow rate Kv
  3.3 ... 43 m³/h

- Connecting thread
  G1/2 ... G2

General technical data							
Line connection		G1/2	G3/4	G1	G1 1/4	G1 1/2	G2
Nominal width DN	[mm]	13	18	24	31	35	45
Design		Poppet valve with piston actuator					
Type of actuation		Pneumatic					
Type of mounting		In-line installation					
Line connection		Threaded collar to DIN ISO 228-1					
Sealing principle		Soft					
Mounting position		Any					
Valve function		2/2-way, closed, monostable					
Pneumatic connection		Female thread G1/8					
Flow direction		Non-reversible					
Type of control		Externally controlled					
Reset method		Mechanical spring					
Exhaust function		Without flow control option					
Flow direction	VZXF-...-A-...	Over valve seat, for gaseous media					
	VZXF-...-B-...	Under valve seat, for gaseous and liquid media					

Operating and environmental conditions							
Line connection		G1/2	G3/4	G1	G1 1/4	G1 1/2	G2
Nominal pressure of process valve PN		40					
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]					
Operating pressure	[bar]	6 ... 10					
Medium		Vapour					
		Inert gases					
		Filtered compressed air, grade of filtration 200 µm					
	VZXF-...-B-... additionally	Mineral oil-based hydraulic fluid					
		Mineral oil					
		Neutral fluids					
		Water					
Max. viscosity	[mm²/s]	600					
Ambient temperature	[°C]	–10 ... +60					
Temperature of medium	[°C]	–40 ... +200					
CE marking (see declaration of conformity)[1)]		–			To EU Pressure Equipment Directive		

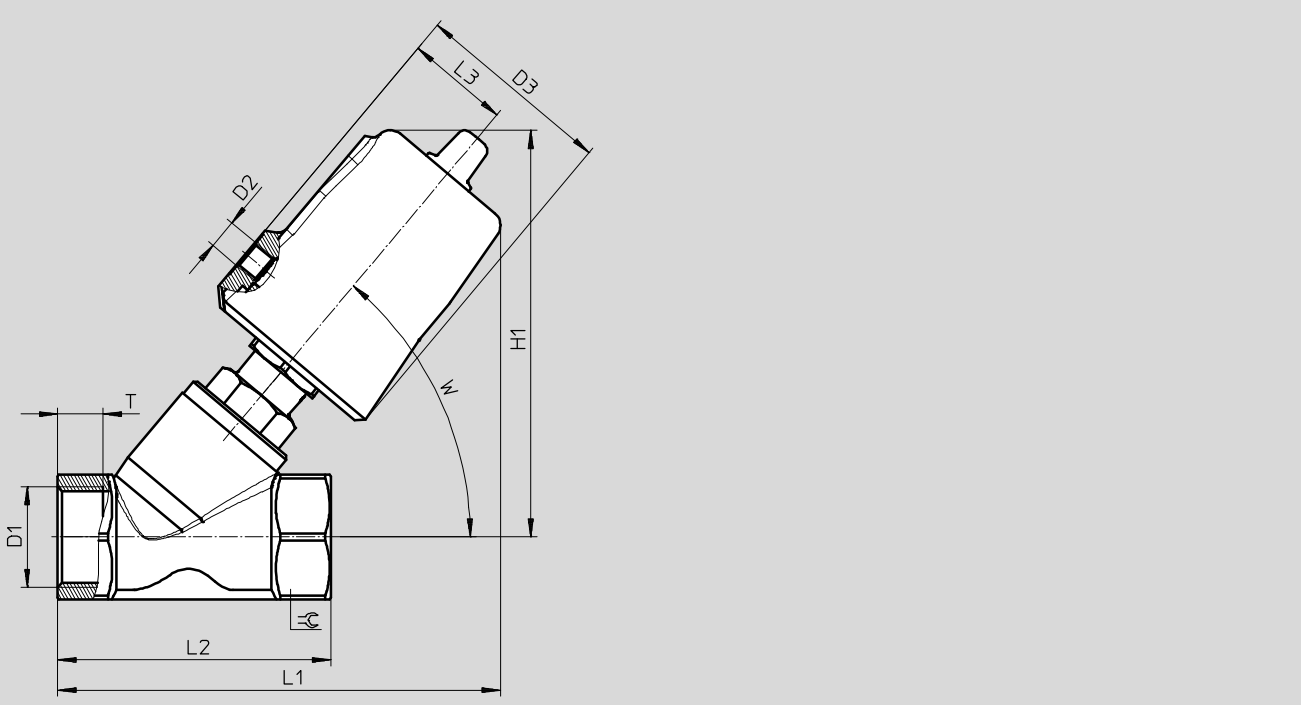
1) Additional information www.festo.com/sp ➔ Certificates.

Materials		Material number
Process valve housing	Stainless steel casting	1.4408
Actuator housing	High-alloy stainless steel	
Spindle washer	PTFE	
Seat seal	PTFE	
Note on materials	Contains PWIS (paint-wetting impairment substances)	
	RoHS-compliant	

Stainless steel casting, temperature of medium –40 ... +200°C

Dimensions

Download CAD data ➔ **www.festo.com**



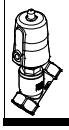
	D1	D2	D3 ∅	H1	L1	L2	L3	T	W	⫷
VZXF-L-...-G12-...-V4V4T-50-...	G1/2	G1/8	62	129	135	65	34	12	50°	27
VZXF-L-...-G34-...-V4V4T-50-...	G3/4		62	130	138	75	34	13		32
VZXF-L-...-G1-...-V4V4T-50-...	G1		62	135	146	90	34	15		42
VZXF-L-...-G1-...-V4V4T-80-...	G1		94	177	184		48			
VZXF-L-...-G114-...-V4V4T-50-...	G1 1/4		62	151	155	110	34	17		50
VZXF-L-...-G114-...-V4V4T-80-...	G1 1/2		94	183	194		48			
VZXF-L-...-G112-...-V4V4T-50-...	G1 1/2		62	155	174	120	34	19		55
VZXF-L-...-G112-...-V4V4T-80-...	G1 1/2		94	187	202		48			
VZXF-L-...-G2-...-V4V4T-50-...	G2		62	167	193	150	34	21		70
VZXF-L-...-G2-...-V4V4T-80-...	G2		94	199	222		48			

Angle seat valves VZXF

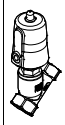
Stainless steel casting, temperature of medium –40 ... +200°C

★ Core product range

Ordering data

	Line connection	Flow rate Kv [m³/h]	Pressure of medium [bar]	Corrosion resistance CRC[1)]	Product weight [g]	Part no.	Type code
	G1/2	3.3	0 ... 40	3	1300	★ **1002513**	**VZXF-L-M22C-M-B-G12-130-M1-V4V4T-50-40**
	G3/4	6.5	0 ... 20		1400	★ **1002515**	**VZXF-L-M22C-M-B-G34-180-M1-V4V4T-50-20**
	G1	11	0 ... 10		1600	★ **1002517**	**VZXF-L-M22C-M-B-G1-240-M1-V4V4T-50-10**

Ordering data

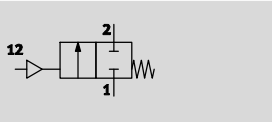
	Line connection	Flow rate Kv [m³/h]	Pressure of medium [bar]	Corrosion resistance CRC[1)]	Product weight [g]	Part no.	Type code
	G1/2	3.8	0 ... 16	3	1300	**1002512**	**VZXF-L-M22C-M-A-G12-130-M1-V4V4T-50-16**
	G3/4	7.5	0 ... 16		1400	**1002514**	**VZXF-L-M22C-M-A-G34-180-M1-V4V4T-50-16**
	G1	12	0 ... 16		1600	**1002516**	**VZXF-L-M22C-M-A-G1-240-M1-V4V4T-50-16**
		12	0 ... 22		3600	**1002526**	**VZXF-L-M22C-M-B-G1-240-M1-V4V4-T-80-22**
		12.5	0 ... 16			**1002525**	**VZXF-L-M22C-M-A-G1-240-M1-V4V4T-80-16**
	G1 1/4	10.7	0 ... 7		2200	**1002519**	**VZXF-L-M22C-M-B-G114-310-M1-V4V4T-50-7**
		17.5	0 ... 10		3800	**1002528**	**VZXF-L-M22C-M-B-G114-310-M1-V4V4T-80-10**
		18.5	0 ... 9		2200	**1002518**	**VZXF-L-M22C-M-A-G114-310-M1-V4V4T-50-9**
		19	0 ... 16		3800	**1002527**	**VZXF-L-M22C-M-A-G114-310-M1-V4V4T-80-16**
	G1 1/2	17.5	0 ... 6		2500	**1002521**	**VZXF-L-M22C-M-B-G112-350-M1-V4V4T-50-6**
		25	0 ... 7			**1002520**	**VZXF-L-M22C-M-A-G112-350-M1-V4V4T-50-7**
		28	0 ... 8		4300	**1002530**	**VZXF-L-M22C-M-B-G112-350-M1-V4V4T-80-8**
		29	0 ... 16			**1002529**	**VZXF-L-M22C-M-A-G112-350-M1-V4V4T-80-16**
	G2	19.5	0 ... 3		3500	**1002523**	**VZXF-L-M22C-M-B-G2-450-M1-V4V4T-50-3**
		34.5	0 ... 4			**1002522**	**VZXF-L-M22C-M-A-G2-450-M1-V4V4T-50-4**
		39	0 ... 5		5400	**1002532**	**VZXF-L-M22C-M-B-G2-450-M1-V4V4T-80-5**
		43	0 ... 12			**1002531**	**VZXF-L-M22C-M-A-G2-450-M1-V4V4T-80-12**

1) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Stainless steel casting, nickel-plated actuator head

Function



- Flow rate Kv
  3.3 ... 43 m³/h

- G1/2 ... G2

General technical data							
Line connection		G1/2	G3/4	G1	G1 1/4	G1 1/2	G2
Nominal width DN	[mm]	13	18	24	31	35	45
Design		Poppet valve with actuator actuator					
Type of actuation		Pneumatic					
Type of mounting		In-line installation					
Line connection		Threaded collar to DIN ISO 228-1					
Sealing principle		Soft					
Mounting position		Any					
Valve function		2/2-way, closed, monostable					
Pneumatic connection		Female thread G1/8					
Flow direction		Non-reversible					
Type of control		Externally controlled					
Reset method		Mechanical spring					
Exhaust function		Without flow control option					
Flow direction	VZXF-...-A-...	Over valve seat, for gaseous media					
	VZXF-...-B-...	Under valve seat, for gaseous and liquid media					

Operating and environmental conditions							
Line connection		G1/2	G3/4	G1	G1 1/4	G1 1/2	G2
Nominal pressure of process valve PN		40					
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]					
Operating pressure	[bar]	6 ... 10					
Medium		Vapour					
		Inert gases					
		Filtered compressed air, grade of filtration 200 µm					
	VZXF-...-B-... additionally	Mineral oil-based hydraulic fluid					
		Mineral oil					
		Neutral fluids					
		Water					
Max. viscosity	[mm²/s]	600					
Ambient temperature	[°C]	–10 ... +60					
Temperature of medium	[°C]	–40 ... +200					
CE marking (see declaration of conformity)[1)]		–			To EU Pressure Equipment Directive		

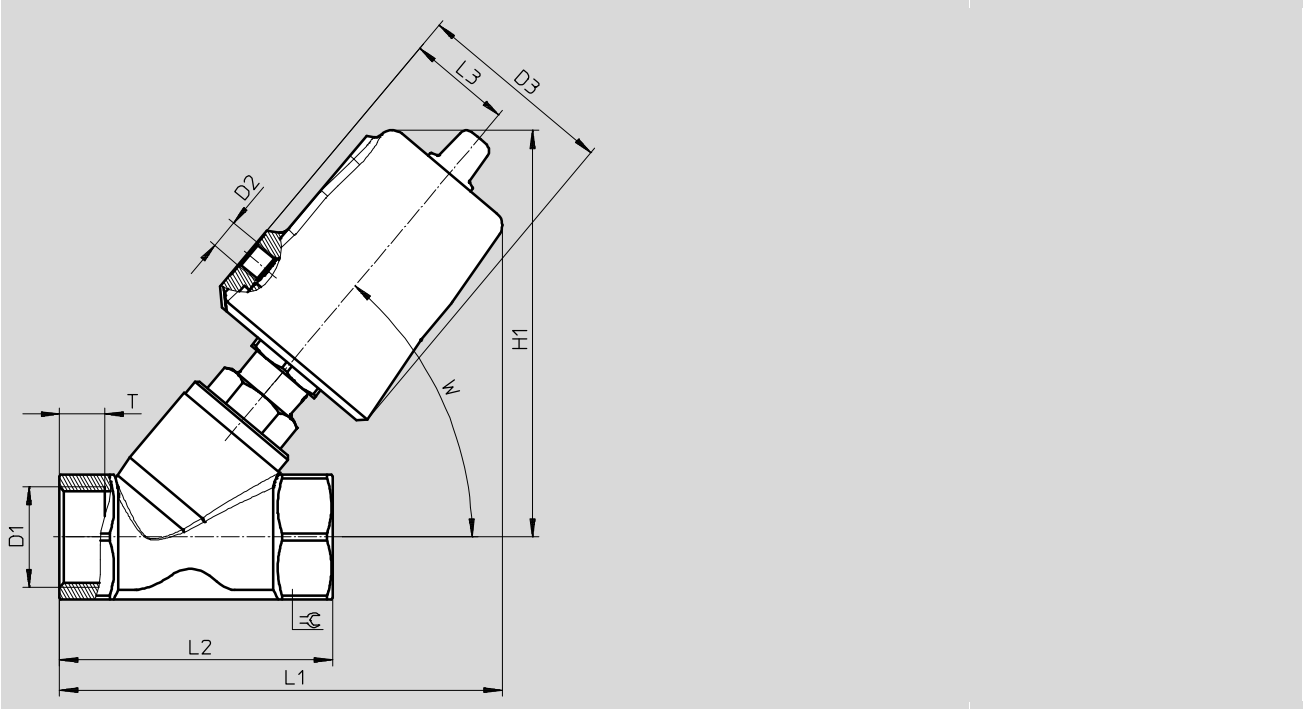
1) Additional information www.festo.com/sp ➔ Certificates.

Materials			Material number
Process valve housing		Stainless steel casting	1.4408
Actuator housing	...-V4ANT- ...	Aluminium, nickel-plated	
	...-V4B2T- ...	Brass, nickel-plated	
Spindle washer		PTFE	
Seat seal		PTFE	
Note on materials		Contains paint-wetting impairment substances	
		RoHS-compliant	

Angle seat valves VZXF

Stainless steel casting, nickel-plated actuator head

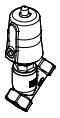
Dimensions Download CAD data ➔ **www.festo.com**



Type code	D1	D2	D3 ∅	H1	L1	L2	L3	T	W	⫧
VZXF-L-...-G12-...-V4B2T-50-...	G1/2	G1/8	62	128	133	65	34	12	50°	27
VZXF-L-...-G34-...-V4B2T-50-...	G3/4		62	128	136.5	75		13		32
VZXF-L-...-G1-...-V4B2T-50-...	G1		62	133	145	90		15		41
VZXF-L-...-G1-...-V4ANT-80-...			94	176.5	183	90	49	15		41
VZXF-L-...-G114-...-V4B2T-50-...	G1 1/4		62	150	163.5	110	34	17		50
VZXF-L-...-G114-...-V4ANT-80-...			94	183	193	110		17		50
VZXF-L-...-G112-...-V4B2T-50-...	G1 1/2		62	153	172	120		19		55
VZXF-L-...-G112-...-V4ANT-80-...			94	187	202	120		19		55
VZXF-L-...-G2-...-V4B2T-50-...	G2		62	167	193	150		21		70
VZXF-L-...-G2-...-V4ANT-80-...			94	199	221.5	150	49	21		70

Stainless steel casting, nickel-plated actuator head

Ordering data

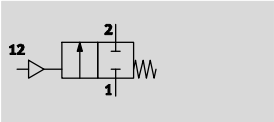
	Line connection	Flow rate Kv [m³/h]	Pressure of medium [bar]	Corrosion resistance CRC[1)]	Product weight [g]	Part no.	Type code
	G1/2	3.3	0 ... 40	2	1300	**3539720**	**VZXF-L-M22C-M-B-G12-130-M1-V4B2T-50-40**
	G3/4	6.5	0 ... 20	2	1400	**3538842**	**VZXF-L-M22C-M-B-G34-180-M1-V4B2T-50-20**
		7.5	0 ... 16			**3539745**	**VZXF-L-M22C-M-A-G34-180-M1-V4B2T-50-16**
	G1	11	0 ... 10	2	1600	**3539783**	**VZXF-L-M22C-M-B-G1-240-M1-V4B2T-50-10**
		12	0 ... 16	2	1600	**3539782**	**VZXF-L-M22C-M-A-G1-240-M1-V4B2T-50-16**
		12	0 ... 22	1	3600	**3540198**	**VZXF-L-M22C-M-B-G1-240-M1-V4ANT-80-22**
	G1 1/4	10.7	0 ... 7	2	2200	**3539816**	**VZXF-L-M22C-M-B-G114-310-M1-V4B2T-50-7**
		17.5	0 ... 10	1	3800	**3540818**	**VZXF-L-M22C-M-B-G114-310-M1-V4ANT-80-10**
		18.5	0 ... 9	2	2200	**3539815**	**VZXF-L-M22C-M-A-G114-310-M1-V4B2T-50-9**
		19	0 ... 16	1	3800	**3540817**	**VZXF-L-M22C-M-A-G114-310-M1-V4ANT-80-16**
	G1 1/2	17.5	0 ... 6	2	2500	**3539927**	**VZXF-L-M22C-M-B-G112-350-M1-V4B2T-50-6**
		25	0 ... 7	2	2500	**3539926**	**VZXF-L-M22C-M-A-G112-350-M1-V4B2T-50-7**
		28	0 ... 8	1	4300	**3540250**	**VZXF-L-M22C-M-B-G112-350-M1-V4ANT-80-8**
		29	0 ... 16	1	4300	**3540248**	**VZXF-L-M22C-M-A-G112-350-M1-V4ANT-80-16**
	G2	19.5	0 ... 3	2	3500	**3540146**	**VZXF-L-M22C-M-B-G2-450-M1-V4B2T-50-3**
		34.5	0 ... 4	2	3500	**3540145**	**VZXF-L-M22C-M-A-G2-450-M1-V4B2T-50-4**
		39	0 ... 5	1	5400	**3540277**	**VZXF-L-M22C-M-B-G2-450-M1-V4ANT-80-5**
		43	0 ... 12	1	5400	**3540276**	**VZXF-L-M22C-M-A-G2-450-M1-V4ANT-80-12**

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).
Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Angle seat valves VZXF

Stainless steel casting, vacuum version

Function



- Flow rate Kv
  3.8 ... 43 m³/h

- G1/2 ... G2

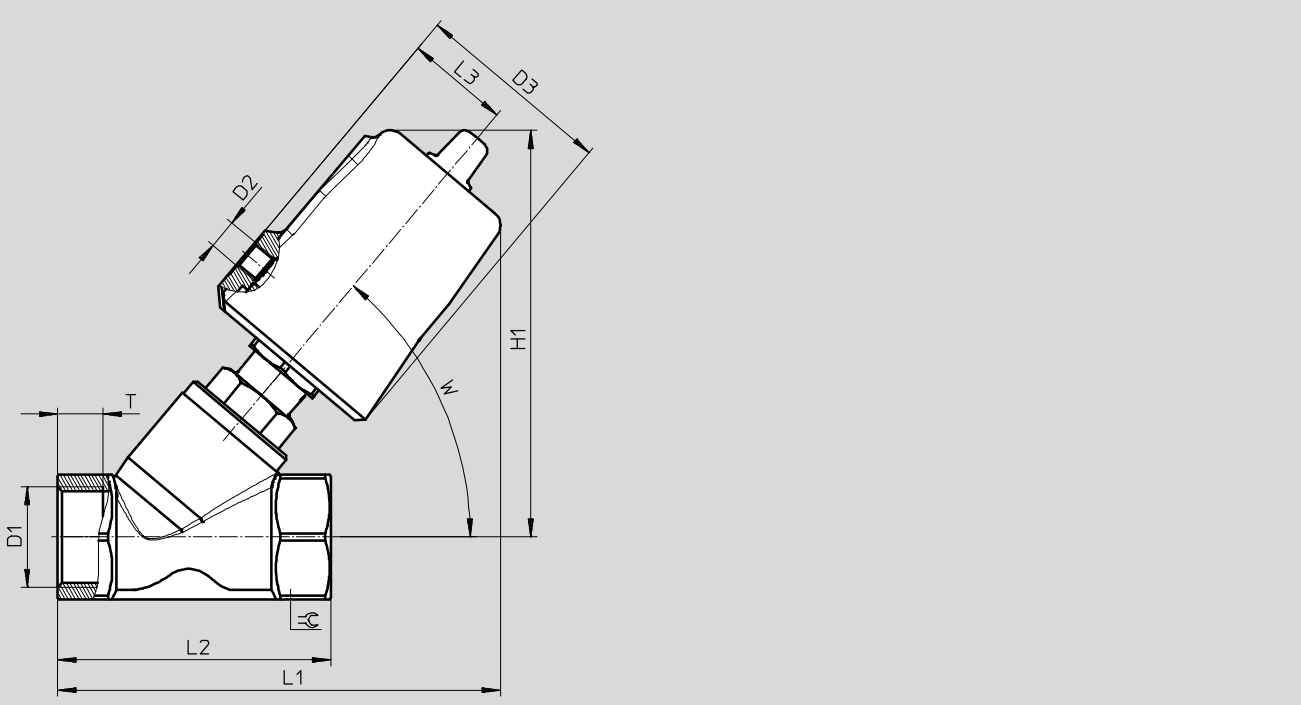
General technical data							
Line connection		G1/2	G3/4	G1	G1 1/4	G1 1/2	G2
Nominal width DN	[mm]	13	18	24	31	35	45
Design		Poppet valve with piston actuator					
Type of actuation		Pneumatic					
Type of mounting		In-line installation					
Line connection		Threaded collar to DIN ISO 228-1					
Sealing principle		Soft					
Mounting position		Any					
Valve function		2/2-way, closed, monostable					
Pneumatic connection		Female thread G1/8					
Flow direction		Non-reversible					
Type of control		Externally controlled					
Reset method		Mechanical spring					
Exhaust function		Without flow control option					
Flow direction		Over valve seat, for gaseous media					

Operating and environmental conditions							
Line connection		G1/2	G3/4	G1	G1 1/4	G1 1/2	G2
Nominal pressure of process valve PN		40					
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]					
Operating pressure	[bar]	6 ... 10					
Medium		Vapour					
		Inert gases					
		Filtered compressed air, grade of filtration 200 µm					
Max. viscosity	[mm²/s]	600					
Ambient temperature	[°C]	–10 ... +60					
Temperature of medium	[°C]	–10 ... +80					

Materials			Material number
Process valve housing		Stainless steel casting	1.4408
Actuator housing	...-V4ANV-...	Aluminium, nickel-plated	
	...-V4B2V-...	Brass, nickel-plated	
Spindle washer		FPM	
Seat seal		FPM	
Note on materials		Contains paint-wetting impairment substances	
		RoHS-compliant	

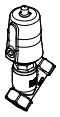
Stainless steel casting, vacuum version

Dimensions Download CAD data ➔ **www.festo.com**



Type code	D1	D2	D3 ∅	H1	L1	L2	L3	T	W	⫧
VZXF-L-...-G12-...-V4B2V-50-...	G1/2	G1/8	62	112	119	65	34	12	50°	27
VZXF-L-...-G34-...-V4B2V-50-...	G3/4		62	118	126.5	75	34	13		32
VZXF-L-...-G1-...-V4B2V-50-...	G1		62	121.5	135	90	34	15		41
VZXF-L-...-G1-...-V4ANV-80-...			94	169	176	90	49	15		41
VZXF-L-...-G114-...-V4B2V-50-...	G1 1/4		62	142.5	156.5	110	34	17		50
VZXF-L-...-G114-...-V4ANV-80-...			94	177	188	110	49	17		50
VZXF-L-...-G112-...-V4B2V-50-...	G1 1/2		62	146	165	120	34	19		55
VZXF-L-...-G112-...-V4ANV-80-...			94	181	197	120	49	19		55
VZXF-L-...-G2-...-V4ANV-80-...	G2		94	193	216.5	150	49	21		70

Ordering data

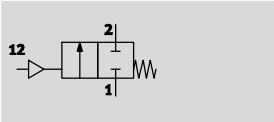
	Line connection	Flow rate Kv [m³/h]	Pressure of medium [bar]	Corrosion resistance CRC[1)]	Product weight [g]	Part no.	Type code
	G1/2	3.8	–0.9	2	1300	**3536502**	**VZXF-L-M22C-M-A-G12-130-V4B2V-50-V**
	G3/4	7.5		2	1400	**3536650**	**VZXF-L-M22C-M-A-G34-180-V4B2V-50-V**
	G1	12		2	1600	**3536659**	**VZXF-L-M22C-M-A-G34-180-V4B2V-50-V**
		12.5		1	3600	**3536677**	**VZXF-L-M22C-M-A-G1-240-V4ANV-80-V**
	G1 1/4	18.5		2	2200	**3536686**	**VZXF-L-M22C-M-A-G114-310-V4B2V-50-V**
		19		1	3800	**3536711**	**VZXF-L-M22C-M-A-G114-310-V4ANV-80-V**
	G1 1/2	25		2	2500	**3536717**	**VZXF-L-M22C-M-A-G112-350-V4B2V-50-V**
		29		1	4300	**3536771**	**VZXF-L-M22C-M-A-G112-350-V4ANV-80-V**
	G2	43		1	5400	**3536786**	**VZXF-L-M22C-M-A-G2-450-V4ANV-80-V**

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).
Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Angle seat valves VZXF

Stainless steel casting with EX certification

Function



- Flow rate Kv
  3.3 ... 34.5 m^3/h

- G1/2 ... G2

General technical data							
Line connection		G1/2	G3/4	G1	G1 1/4	G1 1/2	G2
Nominal width DN	[mm]	13	18	24	31	35	45
Design		Poppet valve with piston actuator					
Type of actuation		Pneumatic					
Type of mounting		In-line installation					
Line connection		Threaded collar to DIN ISO 228-1					
Sealing principle		Soft					
Mounting position		Any					
Valve function		2/2-way, closed, monostable					
Pneumatic connection		Female thread G1/8					
Flow direction		Non-reversible					
Type of control		Externally controlled					
Reset method		Mechanical spring					
Exhaust function		Without flow control option					
Flow direction	VZXF-...-A-...	Over valve seat, for gaseous media					
	VZXF-...-B-...	Under valve seat, for gaseous and liquid media					

Stainless steel casting with EX certification

Operating and environmental conditions							
Line connection		G1/2	G3/4	G1	G1 1/4	G1 1/2	G2
Nominal pressure of process valve PN		40					
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]					
Operating pressure	[bar]	6 ... 10					
Medium		Vapour					
		Inert gases					
		Filtered compressed air, grade of filtration 200 µm					
	VZXF-...-B-... additionally	Mineral oil-based hydraulic fluid					
		Mineral oil					
		Neutral fluids					
		Water					
Max. viscosity	[mm²/s]	600					
Ambient temperature	[°C]	–10 ... +60					
Temperature of medium	[°C]	–40 ... +200					
CE marking (see declaration of conformity)[1)]		–			To EU Pressure Equipment Directive		

1) Additional information www.festo.com/sp ➔ Certificates.

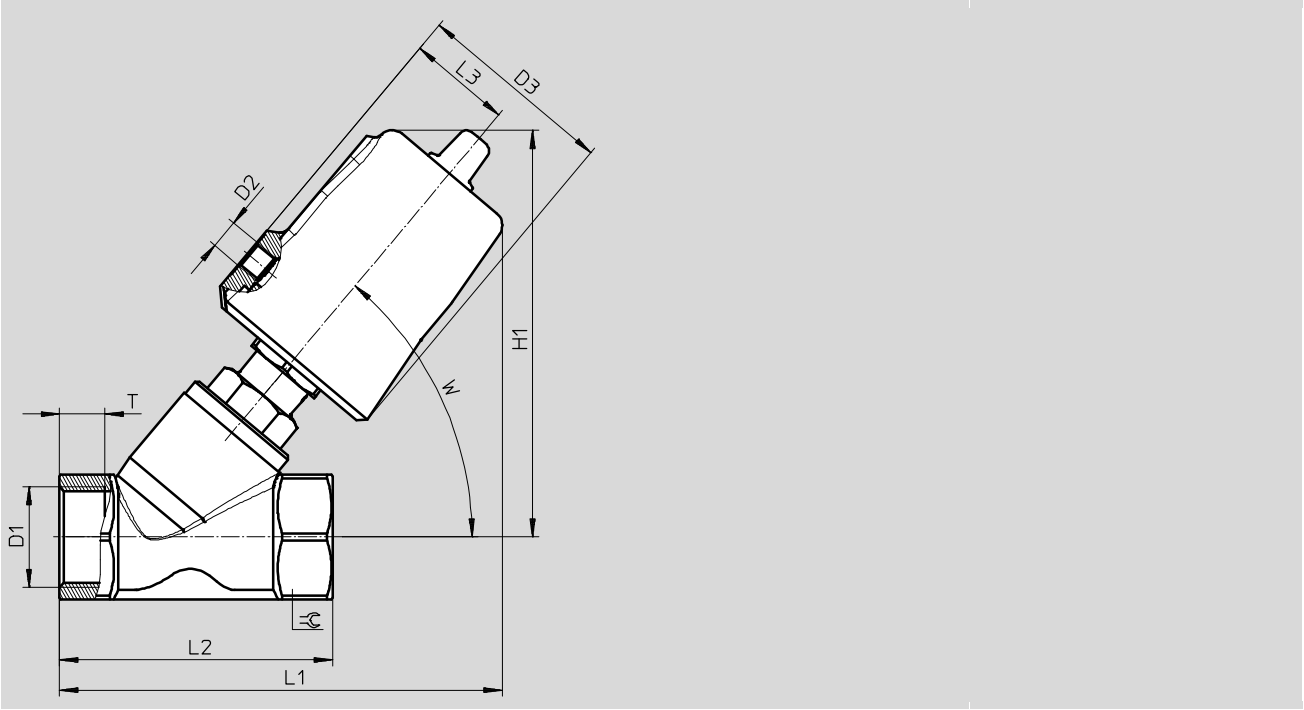
ATEX	
ATEX category for gas	II 2G
Type of ignition protection for gas	c TX X
ATEX category for dust	II 2D
Type of ignition protection for dust	c TX X
Explosion-proof ambient temperature rating [°C]	-10°C <= Ta <= +60°C
CE marking (see declaration of conformity)	To EU Explosion Protection Directive (ATEX)

Materials		**Material number**
Process valve housing	Stainless steel casting	1.4408
Actuator housing	High-alloy stainless steel	
Spindle washer	PTFE	
Seat seal	PTFE	
Note on materials	Contains paint-wetting impairment substances	
	RoHS-compliant	

Angle seat valves VZXF

Stainless steel casting with EX certification

Dimensions Download CAD data ➔ **www.festo.com**



	D1	D2	D3 ∅	H1	L1	L2	L3	T	W	⫧
VZXF-L-...-G12-...-V4V4T-50-...	G1/2	G1/8	62	129	135	65	34	12	50°	27
VZXF-L-...-G34-...-V4V4T-50-...	G3/4			130	138	75		13		32
VZXF-L-...-G1-...-V4V4T-50-...	G1			135	146	90		15		42
VZXF-L-...-G114-...-V4V4T-50-...	G1 1/4			151	155	110		17		50
VZXF-L-...-G112-...-V4V4T-50-...	G1 1/2			155	174	120		19		55
VZXF-L-...-G2-...-V4V4T-50-...	G2			167	193	150		21		70

Stainless steel casting with EX certification

Ordering data

	Line connection	Flow rate Kv [m³/h]	Pressure of medium [bar]	Corrosion resistance CRC[1)]	Product weight [g]	Part no.	Type code
	G1/2	3.3	0 ... 40	3	1300	**3539723**	**VZXF-L-M22C-M-B-G12-130-M1-V4V4T-50-40-EX4**
	G3/4	6.5	0 ... 20		1400	**3539749**	**VZXF-L-M22C-M-B-G34-180-M1-V4V4T-50-20-EX4**
		7.5	0 ... 16			**3539748**	**VZXF-L-M22C-M-A-G34-180-M1-V4V4T-50-16-EX4**
	G1	11	0 ... 10		1600	**3539787**	**VZXF-L-M22C-M-B-G1-240-M1-V4V4T-50-10-EX4**
		12	0 ... 16			**3539786**	**VZXF-L-M22C-M-A-G1-240-M1-V4V4T-50-16-EX4**
	G1 1/4	10.7	0 ... 7		2200	**3539820**	**VZXF-L-M22C-M-B-G114-310-M1-V4V4T-50-7-EX4**
		18.5	0 ... 9			**3539819**	**VZXF-L-M22C-M-A-G114-310-M1-V4V4T-50-9-EX4**
	G1 1/2	17.5	0 ... 6		2500	**3539931**	**VZXF-L-M22C-M-B-G112-350-M1-V4V4T-50-6-EX4**
		25	0 ... 7			**3539930**	**VZXF-L-M22C-M-A-G112-350-M1-V4V4T-50-7-EX4**
	G2	19.5	0 ... 3		3500	**3540148**	**VZXF-L-M22C-M-B-G2-450-M1-V4V4T-50-3-EX4**
		34.5	0 ... 4			**3540147**	**VZXF-L-M22C-M-A-G2-450-M1-V4V4T-50-4-EX4**

1) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Angle seat valves
VZXA

Overview, configuration and ordering
➔ **www.festo.com/catalogue/vzxa**

Additional information, support and user documentation
➔ **www.festo.com/sp/vzxa**

Selected types in accordance with the ATEX Directive for explosive atmospheres
➔ **www.festo.com/ex**

+ Connection DN13, 1/2"; DN20, 3/4"; DN25, 1"; DN32, 1 1/4"; DN40, 1 1/2"; DN50, 2"
+ G thread to DIN ISO 228-1 or NPT thread to ANSI/ASME B 1.20.1 or Rc thread to DIN 10226-2
+ Pressure of medium 0 ... 30 bar
+ Valve function 2/2-way, NC (normally closed), NO (normally open), DA (double acting)
+ Suitable for almost all media
+ High chemical and thermal resistance
+ ATEX certification

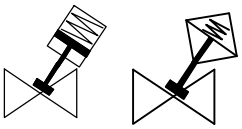
Angle seat valves VZXA

Key features

Function

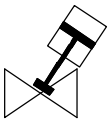
The angle seat valves VZXA are externally actuated valves which are controlled by a direct supply of compressed air and are used to shut off gaseous or liquid media in pipe systems. In the process, a spindle with a soft-sealing valve disc is raised and lowered with the aid of a pneumatic actuator. In all the versions mentioned below, the valve seat is slanted around 40° toward the medium flow. The flow direction is determined by the design of the valve (process valve and actuator).

NC version (normally closed)



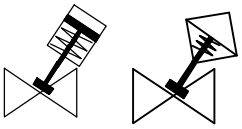
In the normal position, the valve is closed by springs. When the actuator is supplied with operating pressure, it raises the control piston and, at the same time, the valve disc too – this opens the valve.

DA version (double acting)



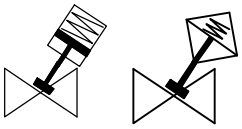
The control function is performed by reciprocal pneumatic actuation of the actuator chambers. Only available with the piston actuator.

NO version (normally open)



In the normal position, the valve is opened by a spring. When the actuator is supplied with operating pressure, it lowers the control piston and, at the same time, the valve disc, too – this closes the valve.

NC version (normally closed) with reduced spring force



In the normal position the valve is closed by a spring (reduced spring force for low operating pressures). When the actuator is supplied with operating pressure, it raises the control piston and, at the same time, the valve disc too – this opens the valve.

Economical

- Modular design
- Hygienic design, insensitive to dirt
- Long service life
- Quick and easy maintenance
- High flow rates achievable

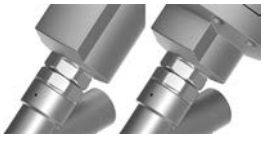
Flexible

- Control of medium flows (gaseous and liquid) in closed and open circuits
- The angle seat valves VZXA are simple and sturdy and are thus perfectly suitable for almost all media with a viscosity of up to 600 mm²/s
- Angle seat valves VZXA made from stainless steel with PTFE seals have high chemical and thermal resistance
- Temperature of medium −10 ... +180 °C

Design

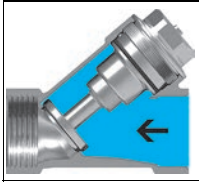
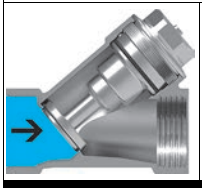
- G thread to DIN ISO 228-1
  Parallel Whitworth pipe thread, non-metallic seal: must either be provided with an annular seal outside the thread or must be sealed by wrapping the thread with PTFE or hemp
- NPT thread to ANSI/ASME B 1.20.1
  American tapered pipe thread with sealing material in the thread, female thread tapered, male thread tapered
- Rc thread to DIN 10226-2
  Pipe thread for fittings sealing in the thread, female thread tapered, male thread tapered
- Connection sizes
  DN13 ... DN50 and 1/2" ... 2"
- Medium pressure: 0 ... 30 bar
- Operating pressure: 5 ... 10 bar
- Threaded collar connection
- ATEX

- Piston actuator with low space requirement, can close against pressures up to 10 bar, in actuator sizes 46 mm and 75 mm
- Diaphragm actuator without stick-slip effect, ideal for high force requirements and control applications, in actuator size 90 mm
- Note: The interface screws between the valve body and the piston and diaphragm actuators are identical to spanner size AF46

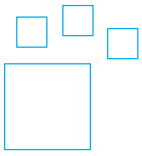


Product range overview

Product range overview

	Type code	Control function	Flow direction
	VZXA-A-...	• Closed via reduced spring force, N/C	• Over valve seat • For gaseous media, “closing in the direction of medium flow” is used
	VZXA-B-...	• Closed via spring force, NC • Opened via spring force, NO • Double-acting, DA	• Under valve seat • For gaseous and liquid media, “closing against the direction of medium flow” is used in order to prevent or reduce water hammer effects

Ordering data – Product options



Configurable product
This product and all its product options can be ordered using the configurator.

The configurator can be found at
→ **www.festo.com/catalogue/...**

Part No.	Type code
3539410	**VZXA**

Angle seat valves VZXA

Type codes

VZXA	–	A	–		–	T	S7	–	1/2"	–	M2	–	V14	T

Type	
VZXA	Process valve

Direction of flow	
A	Above valve seat for gaseous media
B	Below valve seat for gaseous and liquid media

Control of the medium	
–	On/off operation

Line connection	
T	Threaded collar

Connection standard	
S6	DIN ISO 228-1
S7	ANSI/ASME B 1.20.1
S13	DIN 10226

Connection size	
1/2"	1/2"
3/4"	3/4"
1"	1"
11/2"	11/2"
11/4"	11/4"
2"	2"
13	DN13
20	DN20
25	DN25
32	DN32
40	DN40
50	DN50

Temperature of medium	
M2	–10 to +180 °C

Valve housing material	
V13	Stainless steel 1.4409
V14	Stainless steel ASTM A351-CF3M

Seat seal material	
T	PTFE

Type codes

– 16 – K – 46 – 17 – PR – [ ] – V4 – [ ]

Medium pressure	
4	0 ... 4 bar
4,4	0 ... 4.4 bar
4,8	0 ... 4.8 bar
5,6	0 ... 5.6 bar
5,8	0 ... 5.8 bar
6	0 ... 6 bar
6,2	0 ... 6.2 bar
6,8	0 ... 6.8 bar
7,5	0 ... 7.5 bar
8	0 ... 8 bar
8,3	0 ... 8.3 bar
9,3	0 ... 9.3 bar
10	0 ... 10 bar
11,5	0 ... 11.5 bar
12,2	0 ... 12.2 bar
12,8	0 ... 12.8 bar
13,5	0 ... 13.5 bar
14,5	0 ... 14.5 bar
15,5	0 ... 15.5 bar
16	0 ... 16 bar
23	0 ... 23 bar
25	0 ... 25 bar
30	0 ... 30 bar

Actuator	
K	Piston actuator
M	Diaphragm actuator

Actuator size	
46	46 mm
75	75 mm
90	90 mm

Stroke	
17	17 mm
20	20 mm
26	26 mm

Control function	
–	Closed via spring force, NC
D	Double-acting
S	Opened via spring force, NO
PR	Closed via reduced spring force, NC

Position sensing	
–	With mechanical indicator

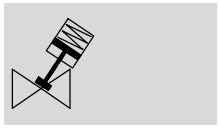
Actuator housing material	
V4	Stainless steel 1.4408

EU certification	
–	None
EX4	II 2GD

Angle seat valves VZXA with piston actuator

Technical data

Function



- Poppet valve with piston actuator
- Line connection
  1/2" ... 2", DN13 ... DN50
- Stroke
  17 ... 20 mm

General technical data

Line connection			DN13, 1/2"	DN20, 3/4"		DN25, 1"		DN32, 11/4"		DN40, 11/2"	DN50, 2"
Actuator			D46	D46	D75	D46	D75	D46	D75	D75	D75
Flow rate Kv	VZXA-A-...	[m3/h]	6.6	–	14.5	–	21.5	–	–	–	–
	VZXA-B-...	[m3/h]	6	13.3	13.5	20.3	22.6	27.9	30.3	41.4	50.1
Design			Poppet valve with piston actuator								
Type of actuation			Pneumatic								
Type of mounting			In-line installation								
Mounting position			Any								
Valve function			2/2								
Pneumatic connection			Female thread G1/8								
Flow direction			Non-reversible								
Reset method			Mechanical spring								
Type of actuation			Externally actuated								
Position sensing			With mechanical indicator								
Control of the medium			On/off operation								
Control function	VZXA-A-...		Closed via reduced spring force, NC								
	VZXA-B-...		Closed via spring force, NC								
Direction of flow	VZXA-A-...		Above valve seat for gaseous media								
	VZXA-B-...		Below valve seat for gaseous and liquid media								

Technical data

Operating and environmental conditions		
Operating pressure	[bar]	5 ... 10
Ambient temperature	[°C]	0 ... +60
Temperature of medium	[°C]	–10 ... +180
Storage temperature	[°C]	–10 ... +60
CE mark (see declaration of conformity)[1]		To EU Machinery Directive
Degree of protection		IP65
		IP67
		IP69K
Max. viscosity	[mm²/s]	600
Medium		Vapour
		Inert gases
		Filtered compressed air, grade of filtration 200 µm
VZXA-B-... additionally		Mineral oil-based hydraulic oil
		Mineral oil
		Water
		Neutral fluids
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Safety Integrity Level (SIL)		SIL 2
PFH		0.00000014
PFD		0.000595
Certificate issuing authority		TÜV 968/V 1039.00/18

1) Additional information www.festo.com/sp ➔ Certificates.

ATEX[1]						
Connection size	DN13, 1/2"	DN20, 3/4"	DN25, 1"	DN32, 11/4"	DN40, 11/2"	DN50, 2"
ATEX category for gas	II 2G					
Type of ignition protection for gas	c T6 ... T3 X					
ATEX category for dust	II 2D					
Type of ignition protection for dust	c T80°C ... T200°C X					
Explosion ambient temperature [°C]	0°C ≤ Ta ≤ +60°C					

1) Specified types ➔ www.festo.com

Angle seat valves VZXA with piston actuator

Technical data

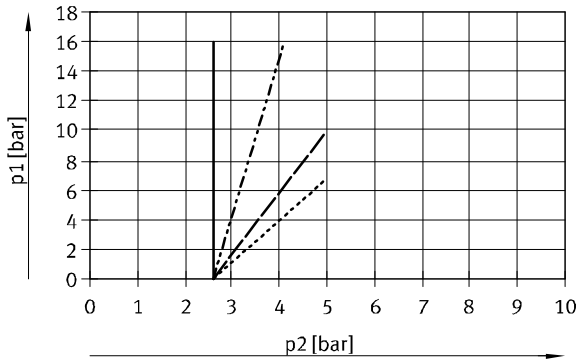
Materials		Material number
Piston rod	High-alloy stainless steel	
End cap	Stainless steel casting	
Seals	FPM	
Spindle washer	PTFE	
Seat seal	PTFE	
Actuator housing	Stainless steel casting	1.4408
Valve housing	Stainless steel casting	1.4409
		ASTM A351-CF3M
Note on materials	Contains paint-wetting impairment substances	
	RoHS compliant	

Permissible operating pressure as a function of medium pressure for control function NC, VZXA-B-...

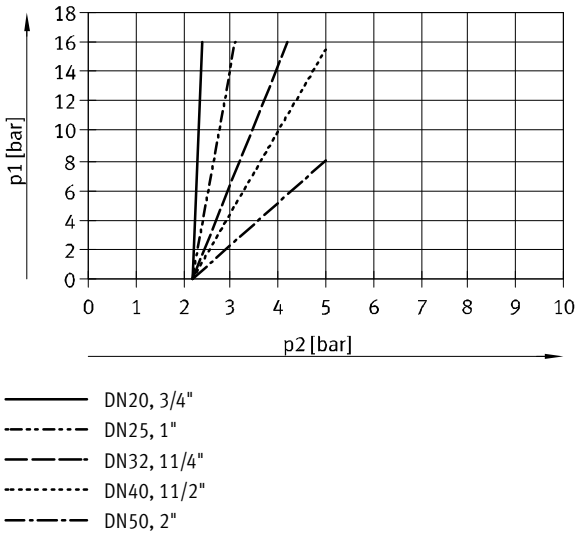
	Max. medium pressure [bar]		Min. operating pressure [bar]	
Actuator size	46 mm	75 mm	46 mm	75 mm
DN13, 1/2"	30	–	4.8	–
DN20, 3/4"	12.8	30	4.8	4.6
DN25, 1"	8.3	23	4.8	4.6
DN32, 11/4"	4.4	13.5	4.8	4.6
DN40, 11/2"	–	9.3	–	4.6
DN50, 2"	–	5.6	–	4.6

Permissible operating pressure p2 as a function of medium pressure p1 for control function NC, VZXA-A-...

Piston actuator size 46 mm



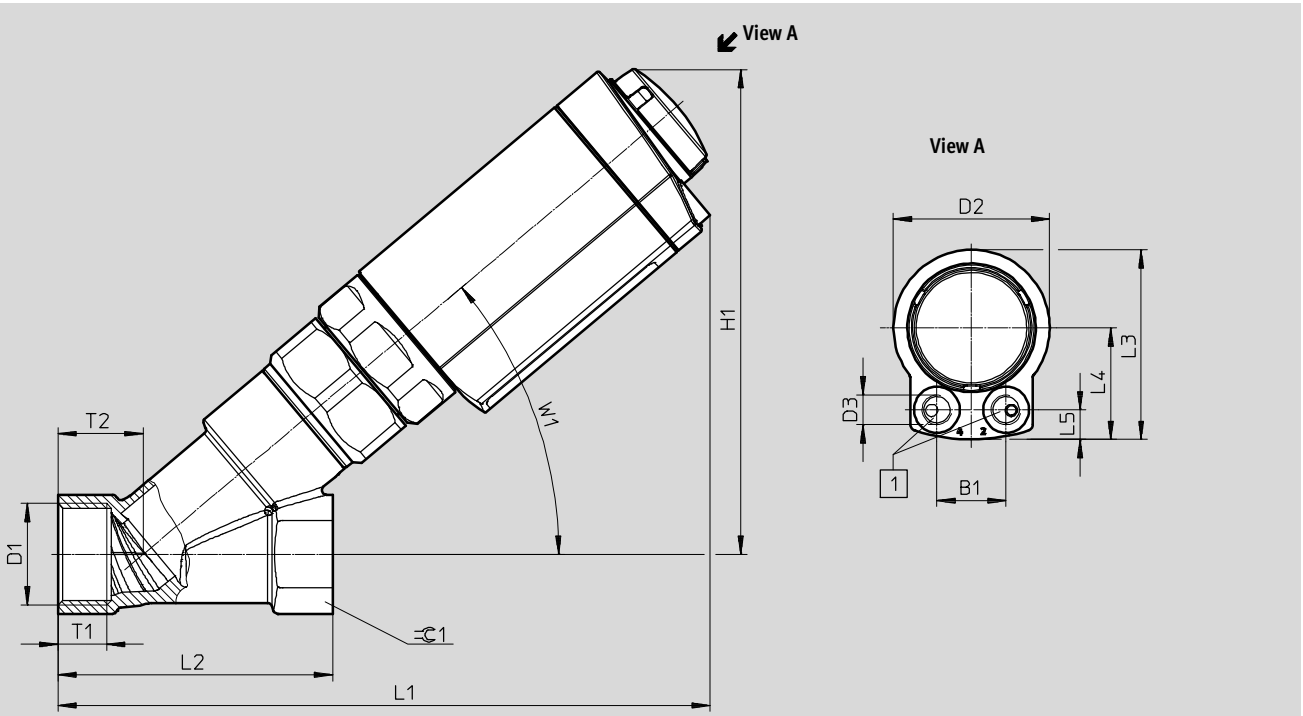
Piston actuator size 75 mm



Technical data

Dimensions

Download CAD data ➔ **www.festo.com**



1 Pneumatic connection

Type	B1	D1			D2	D3	H1	L1	L2
		S6	S7	S13	∅				
VZXA-A-...-13-...-16-...-46-17-...	22.6	G1/2	1/2 NPT	Rc1/2	51	G1/8	159	202	65
VZXA-A-...-20-...-16-...-75-20-...	41	G3/4	3/4NPT	Rc3/4	82.6		187	234	75
VZXA-A-...-25-...-16-...-75-20-...	41	G1	1" NPT	Rc1	82.6		192	244	90
VZXA-B-...-13-...-30-...-46-17-...	22.6	G1/2	1/2 NPT	Rc1/2	51		159	202	65
VZXA-B-...-20-...-12.8-...-46-17-...	22.6	G3/4	3/4 NPT	Rc3/4	51		158	203	75
VZXA-B-...-20-...-30-...-75-20-...	41	G3/4	3/4 NPT	Rc3/4	82.6		187	234	75
VZXA-B-...-25-...-8.3-...-46-17-...	22.6	G1	1" NPT	Rc1	51		164	214	90
VZXA-B-...-25-...-23-...-75-20-...	41	G1	1" NPT	Rc1	82.6		192	244	90
VZXA-B-...-32-...-4.4-...-46-17-...	22.6	G11/4	11/4 NPT	Rc11/4	51		168	218	110
VZXA-B-...-32-...-13.5-...-75-20-...	41	G11/4	11/4 NPT	Rc11/4	82.6		198	248	110
VZXA-B-...-40-...-9.3-...-75-20-...	41	G11/2	11/2 NPT	Rc11/2	82.6		216	270	120
VZXA-B-...-50-...-5.6-...-75-20-...	41	G2	2" NPT	Rc2	82.6		215	286	150

Type	L3	L4	L5	T1			T2	W1	⫩1
				S6	S7	S13			
VZXA-A-...-13-...-16-...-46-17-...	62	36.5	26.8	14	13.7	13.2	21.5	40	25
VZXA-A-...-20-...-16-...-75-20-...	94.4	53.1	41	16	14	14.5	24	40	32
VZXA-A-...-25-...-16-...-75-20-...	94.4	53.1	41	16	16.8	16.8	28	40	41
VZXA-B-...-13-...-30-...-46-17-...	62	36.5	26.8	14	13.7	13.2	21.5	40	25
VZXA-B-...-20-...-12.8-...-46-17-...	62	36.5	26.8	16	14	14.5	24	40	32
VZXA-B-...-20-...-30-...-75-20-...	94.4	53.1	41	16	14	14.5	24	40	32
VZXA-B-...-25-...-8.3-...-46-17-...	62	36.5	26.8	16	16.8	16.8	28	40	41
VZXA-B-...-25-...-23-...-75-20-...	94.4	53.1	41	16	16.8	16.8	28	40	41
VZXA-B-...-32-...-4.4-...-46-17-...	62	36.5	26.8	20	17.3	19.1	36	42	50
VZXA-B-...-32-...-13.5-...-75-20-...	94.4	53.1	41	20	17.3	19.1	36	42	50
VZXA-B-...-40-...-9.3-...-75-20-...	94.4	53.1	41	22	17.3	19.1	38	42	55
VZXA-B-...-50-...-5.6-...-75-20-...	94.4	53.1	41	24	17.6	23.4	43	40	65

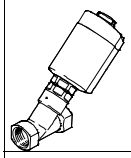
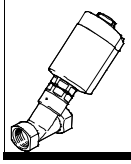
Angle seat valves VZXA with piston actuator

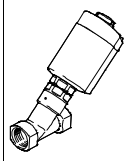
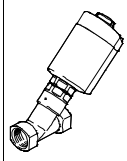
Technical data

Ordering data

Key features:

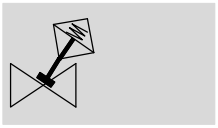
- Control function closed via spring force, NC
- Without ATEX certification

VZXA-A-..., flow direction above valve seat		Flow rate Kv [m^3/h]	Medium pressure [bar]	Weight [g]	Part No.	Type
G thread to DIN ISO 228-1						
	DN13, 46 mm actuator	6.6	0 ... 16	1775	**8060513**	**VZXA-A-TS6-13-M2-V13T-16-K-46-17-PR-V4**
	DN20, 75 mm actuator	14.5		3155	**8060514**	**VZXA-A-TS6-20-M2-V13T-16-K-75-20-PR-V4**
	DN25, 75 mm actuator	21.5		3395	**8060515**	**VZXA-A-TS6-25-M2-V13T-16-K-75-20-PR-V4**
NPT thread to ANSI/ASME B 1.20.1						
	1/2", 46 mm actuator	6.6	0 ... 16	1775	**8060520**	**VZXA-A-TS7-1/2"-M2-V14T-16-K-46-17-PR-V4**
	3/4", 75 mm actuator	14.5		3155	**8060521**	**VZXA-A-TS7-3/4"-M2-V14T-16-K-75-20-PR-V4**
	1", 75 mm actuator	21.5		3395	**8060522**	**VZXA-A-TS7-1"-M2-V14T-16-K-75-20-PR-V4**

VZXA-B-..., flow direction below valve seat		Flow rate Kv [m^3/h]	Medium pressure [bar]	Weight [g]	Part No.	Type
G thread to DIN ISO 228-1						
	DN13, 46 mm actuator	6	0 ... 30	1830	**8060527**	**VZXA-B-TS6-13-M2-V13T-30-K-46-17-V4**
	DN20, 46 mm actuator	13.3	0 ... 12.8	1910	**8060528**	**VZXA-B-TS6-20-M2-V13T-12.8-K-46-17-V4**
	DN20, 75 mm actuator	13.5	0 ... 30	3360	**8060529**	**VZXA-B-TS6-20-M2-V13T-30-K-75-20-V4**
	DN25, 46 mm actuator	20.3	0 ... 8.3	2150	**8060530**	**VZXA-B-TS6-25-M2-V13T-8.3-K-46-17-V4**
	DN25, 75 mm actuator	22.6	0 ... 23	3600	**8060531**	**VZXA-B-TS6-25-M2-V13T-23-K-75-20-V4**
	DN32, 46 mm actuator	27.9	0 ... 4.4	2480	**8060533**	**VZXA-B-TS6-32-M2-V13T-4.4-K-46-17-V4**
	DN32, 75 mm actuator	30.3	0 ... 13.5	3930	**8060534**	**VZXA-B-TS6-32-M2-V13T-13.5-K-75-20-V4**
	DN40, 75 mm actuator	41.4	0 ... 9.3	4610	**8060536**	**VZXA-B-TS6-40-M2-V13T-9.3-K-75-20-V4**
	DN50, 75 mm actuator	50.1	0 ... 5.6	5430	**8060538**	**VZXA-B-TS6-50-M2-V13T-5.6-K-75-20-V4**
NPT thread to ANSI/ASME B 1.20.1						
	1/2", 46 mm actuator	6	0 ... 30	1830	**8060541**	**VZXA-B-TS7-1/2"-M2-V14T-30-K-46-17-V4**
	3/4", 46 mm actuator	13.3	0 ... 12.8	1910	**8060542**	**VZXA-B-TS7-3/4"-M2-V14T-12.8-K-46-17-V4**
	3/4", 75 mm actuator	13.5	0 ... 30	3360	**8060543**	**VZXA-B-TS7-3/4"-M2-V14T-30-K-75-20-V4**
	1", 46 mm actuator	20.3	0 ... 8.3	2150	**8060544**	**VZXA-B-TS7-1"-M2-V14T-8.3-K-46-17-V4**
	1", 75 mm actuator	22.6	0 ... 23	3600	**8060545**	**VZXA-B-TS7-1"-M2-V14T-23-K-75-20-V4**
	1 1/4", 46 mm actuator	27.9	0 ... 4.4	2480	**8060547**	**VZXA-B-TS7-11/4"-M2-V14T-4.4-K-46-17-V4**
	1 1/4", 75 mm actuator	30.3	0 ... 13.5	3930	**8060548**	**VZXA-B-TS7-11/4"-M2-V14T-13.5-K-75-20-V4**
	1 1/2", 75 mm actuator	41.4	0 ... 9.3	4610	**8060550**	**VZXA-B-TS7-11/2"-M2-V14T-9.3-K-75-20-V4**
	2", 75 mm actuator	50.1	0 ... 5.6	5430	**8060552**	**VZXA-B-TS7-2"-M2-V14T-5.6-K-75-20-V4**

Technical data

Function



- Poppet valve with diaphragm actuator
- In-line installation
  1/2" ... 2", DN13 ... DN50
- Stroke
  26 mm

General technical data

In-line installation			DN25, 1"	DN32, 1 1/4"	DN40, 1 1/2"	DN50, 2"
Actuator size		[mm]	90			
Flow rate Kv	VZXA-A-...	[m³/h]	–	35.4	47.4	68.5
	VZXA-B-...	[m³/h]	23.6	33.1	49	60.4
Design			Poppet valve with diaphragm actuator			
Actuation type			Pneumatic			
Type of mounting			In-line installation			
Mounting position			Any			
Valve function			2/2			
Pneumatic connection			Female thread G1/8			
Flow direction			Non-reversible			
Reset method			Mechanical spring			
Type of control			Externally controlled			
Position sensing			Via mechanical indicator			
Control of the medium			On/off operation			
Control function	VZXA-A-...		–	Closed via reduced spring force, NC		
	VZXA-B-...		Closed via spring force, NC			
Flow direction	VZXA-A-...		–	Over valve seat, for gaseous media		
	VZXA-B-...		Under valve seat, for gaseous and liquid media			

Angle seat valves VZXA, with diaphragm actuator

Technical data

Operating and environmental conditions		
Operating pressure	[bar]	5 ... 7
Ambient temperature	[°C]	0 ... +60
Temperature of medium	[°C]	–10 ... +180
Storage temperature	[°C]	–10 ... +60
CE marking (see declaration of conformity)[1]		To the EU Machinery Directive
Degree of protection		IP65
		IP67
		IP69K
Max. viscosity	[mm²/s]	600
Medium		Vapour
		Inert gases
		Filtered compressed air, grade of filtration 200 µm
	VZXA-B-... additionally	Mineral oil-based hydraulic oil
		Mineral oil
		Water
		Neutral fluids
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Safety integrity level (SIL)		SIL 2
PFH		0.00000014
PFD		0.000595
Certificate issuing authority		TÜV 968/V 1039.00/18

1) Additional information www.festo.com/sp ➔ Certificates.

ATEX[1]		
ATEX category for gas		II 2G
Type of ignition protection for gas		c T6 ... T3 X
ATEX category for dust		II 2D
Type of ignition protection for dust		c T80°C ... T200 °C X
Explosion ambient temperature	[°C]	0°C ≤ Ta ≤ +60 °C

1) Selected types ➔ www.festo.com

Technical data

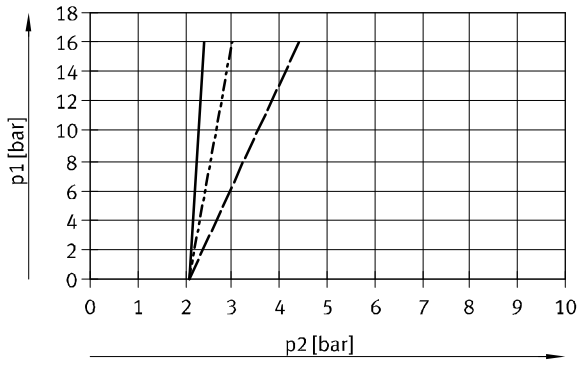
Materials		Material number
Piston rod	High-alloy stainless steel	
Cover	Stainless steel casting	
Seals	NBR	
Stem seal	PTFE	
Seat seal	PTFE	
Actuator housing	Stainless steel casting	1.4408
Valve housing	Stainless steel casting	1.4409
		ASTM A351-CF3M
Note on materials	Contains paint-wetting impairment substances	
	RoHS-compliant	

Permissible operating pressure as a function of medium pressure for control function NC, VZXA-B-...

	Min. operating pressure [bar]	Max. medium pressure [bar]
Actuator size	90 mm	
DN25, 1"	5	30
DN32, 1 1/4"	5	25
DN40, 1 1/2"	5	16
DN50, 2"	5	10

Permissible operating pressure p2 as a function of medium pressure p1 for control function NC, VZXA-A-...

Diaphragm actuator size 90 mm



DN32, 1 1/4"
DN40, 1 1/2"
DN50, 2"

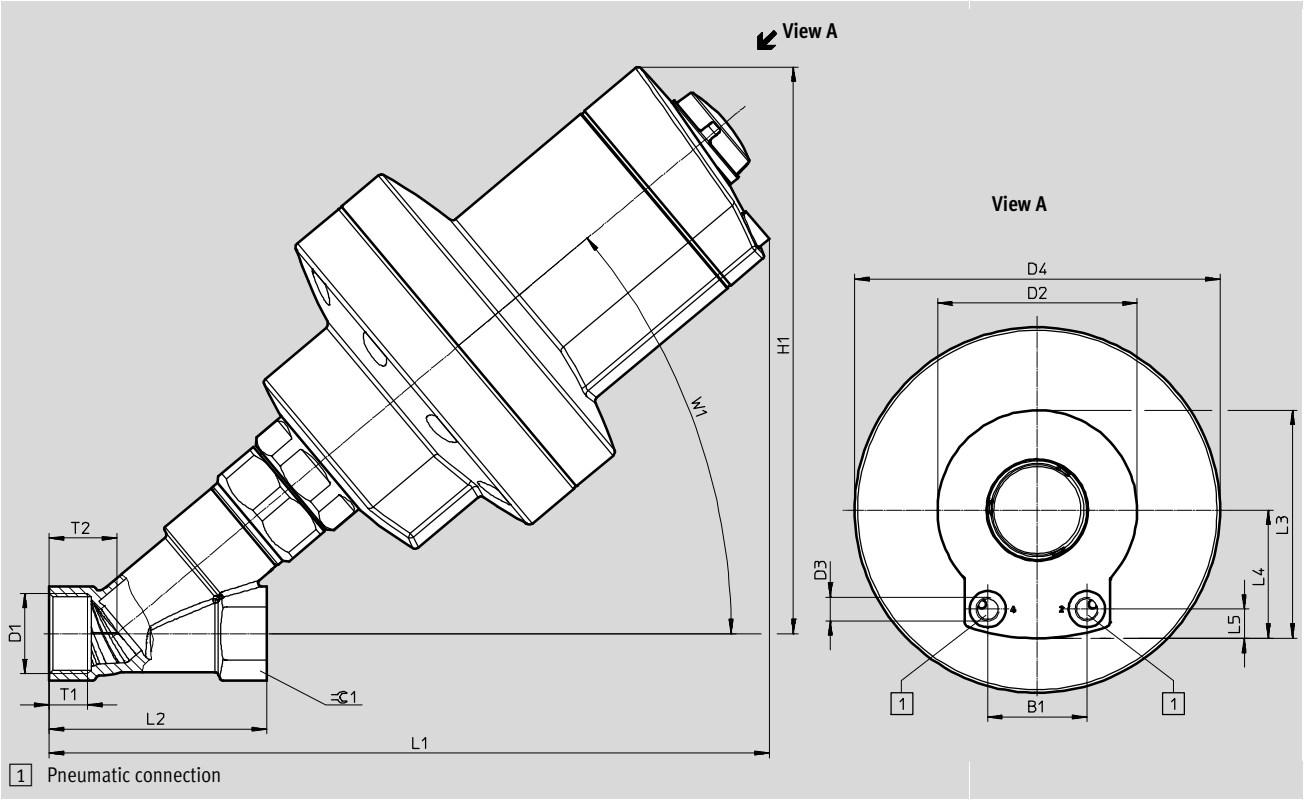
Angle seat valves VZXA, with diaphragm actuator

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

Size 90 mm



1 Pneumatic connection

Type	B1	D1			D2	D3	D4	H1	L1	L2
		S6	S7	S13	∅		∅			
VZXA-A-...-32-...-16-...-PR-...	41	G1 1/4	1 1/4 NPT	Rc1 1/4	82.6	G1/8	151.3	245	300	110
VZXA-A-...-40-...-16-...-PR-...	41	G1 1/2	1 1/2 NPT	Rc1 1/2	82.6	G1/8	151.3	263	322	120
VZXA-A-...-50-...-16-...-PR-...	41	G2	2 NPT	Rc2	82.6	G1/8	151.3	260	340	150
VZXA-A-...-65-...-8-...-PR-...	41	G2 1/2	2 1/2 NPT	Rc2 1/2	82.6	G1/8	151.3	273	366	190
VZXA-B-...-25-...-30-...	41	G1	1 NPT	Rc1	82.6	G1/8	151.3	238	298	90
VZXA-B-...-32-...-25-...	41	G1 1/4	1 1/4 NPT	Rc1 1/4	82.6	G1/8	151.3	245	300	110
VZXA-B-...-40-...-16-...	41	G1 1/2	1 1/2 NPT	Rc1 1/2	82.6	G1/8	151.3	263	322	120
VZXA-B-...-50-...-10-...	41	G2	2 NPT	Rc2	82.6	G1/8	151.3	260	340	150

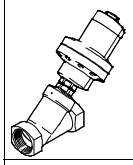
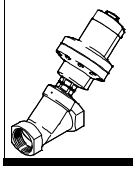
Type	L3	L4	L5	T1			T2	W1	=C1
				S6	S7	S13			
VZXA-A-...-32-...-16-...-PR-...	94.4	53.1	12.1	20	17.3	19.1	36	42	50
VZXA-A-...-40-...-16-...-PR-...	94.4	53.1	12.1	22	17.3	19.1	38	42	55
VZXA-A-...-50-...-16-...-PR-...	94.4	53.1	12.1	24	17.6	23.4	43	40	65
VZXA-A-...-65-...-8-...-PR-...	94.4	53.1	12.1	27	24	27	53	40	85
VZXA-B-...-25-...-30-...	94.4	53.1	12.1	16	16.8	16.8	28	40	41
VZXA-B-...-32-...-25-...	94.4	53.1	12.1	20	17.3	19.1	36	42	50
VZXA-B-...-40-...-16-...	94.4	53.1	12.1	22	17.3	19.1	38	42	55
VZXA-B-...-50-...-10-...	94.4	53.1	12.1	24	17.6	23.4	43	40	65

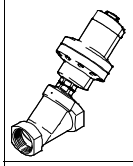
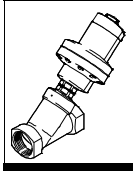
Technical data

Ordering data

Key features:

- Control function closed via spring force, NC
- Without ATEX certification

VZXA-A-..., flow direction above the valve seat		Flow rate Kv [m³/h]	Medium pressure [bar]	Weight [g]	Part No.	Type
G thread to DIN ISO 228-1						
	DN32, 90 mm actuator	35.4	0 ... 16	6595	**8060516**	**VZXA-A-TS6-32-M2-V13T-16-M-90-26-PR-V4**
	DN40, 90 mm actuator	47.4	0 ... 16	7275	**8060517**	**VZXA-A-TS6-40-M2-V13T-16-M-90-26-PR-V4**
	DN50, 90 mm actuator	68.5	0 ... 16	8095	**8060518**	**VZXA-A-TS6-50-M2-V13T-16-M-90-26-PR-V4**
NPT thread to ANSI/ASME B 1.20.1						
	1 1/4", 90 mm actuator	35.4	0 ... 16	6595	**8060523**	**VZXA-A-TS7-11/4"-M2-V14T-16-M-90-26-PR-V4**
	1 1/2", 90 mm actuator	47.4	0 ... 16	7275	**8060524**	**VZXA-A-TS7-11/2"-M2-V14T-16-M-90-26-PR-V4**
	2", 90 mm actuator	68.5	0 ... 16	8095	**8060525**	**VZXA-A-TS7-2"-M2-V14T-16-M-90-26-PR-V4**

VZXA-B-..., flow direction below the valve seat		Flow rate Kv [m³/h]	Medium pressure [bar]	Weight [g]	Part No.	Type
G thread to DIN ISO 228-1						
	DN25, 90 mm actuator	23.6	0 ... 30	6780	**8060532**	**VZXA-B-TS6-25-M2-V13T-30-M-90-26-V4**
	DN32, 90 mm actuator	33.1	0 ... 25	7110	**8060535**	**VZXA-B-TS6-32-M2-V13T-25-M-90-26-V4**
	DN40, 90 mm actuator	49	0 ... 16	7790	**8060537**	**VZXA-B-TS6-40-M2-V13T-16-M-90-26-V4**
	DN50, 90 mm actuator	60.4	0 ... 10	8610	**8060539**	**VZXA-B-TS6-50-M2-V13T-10-M-90-26-V4**
NPT thread to ANSI/ASME B 1.20.1						
	1", 90 mm actuator	23.6	0 ... 30	6780	**8060546**	**VZXA-B-TS7-1"-M2-V14T-30-M-90-26-V4**
	1 1/4", 90 mm actuator	33.1	0 ... 25	7110	**8060549**	**VZXA-B-TS7-11/4"-M2-V14T-25-M-90-26-V4**
	1 1/2", 90 mm actuator	49	0 ... 16	7790	**8060551**	**VZXA-B-TS7-11/2"-M2-V14T-16-M-90-26-V4**
	2", 90 mm actuator	60.4	0 ... 10	8610	**8060553**	**VZXA-B-TS7-2"-M2-V14T-10-M-90-26-V4**

Angle seat valves VZXA

Ordering data – Modular product system

Ordering table

	VZXA-...			Conditions	Code		Entry code
M	Module no.		**3539410**				
	Product type		VZXA		**VZXA**		VZXA
	Flow direction		Over valve seat, for gaseous media		**–A**		
			Under valve seat, for gaseous and liquid media		**–B**		
O	Control of the medium		On/off operation				
M	Line connection		Threaded collar		**–T**		–T
	Connection standard		DIN ISO 228-1		**S6**		
			ANSI/ASME B 1.20.1		**S7**		
			DIN 10226-2		**S13**		
	Connection size		DN13	4	**–13**		
			DN20	4	**–20**		
			DN25	4	**–25**		
			DN32	4	**–32**		
			DN40	4	**–40**		
			DN50	4	**–50**		
			1/2"	1	**–1/2"**		
			3/4"	1	**–3/4"**		
			1"	1	**–1"**		
			1 1/4"	1	**–1 1/4"**		
			1 1/2"	1	**–1 1/2"**		
			2"	1	**–2"**		
	Temperature of medium	[°C]	–10 ... +180		**–M2**		
	Valve housing material		Stainless steel 1.4409	2	**–V13**		
			Stainless steel ASTM A351-CF3M	3	**–V14**		
↓	Seat seal material		PTFE		**T**		

1 **1/2",3/4",1",1 1/4",1 1/2",2"** Not with connection standard S6, S13
2 **V13** Not with imperial connection size
3 **V14** Not with metric connection size
4 **DN13, 20, 25, 32, 40, 50** Not with connection standard S7

M Mandatory data
O Options

Transfer order code

VZXA	–		–		–	**T**		–		–		–			

Ordering data – Modular product system

Ordering table

	VZXA-...			Condi-tions	Code		Entry code
↓	Medium pressure	[bar]	0 ... 4	5	**–4**		
M		[bar]	0 ... 4.4	5	**–4.4**		
		[bar]	0 ... 4.8	5	**–4.8**		
		[bar]	0 ... 5.6	5	**–5.6**		
		[bar]	0 ... 5.8	5	**–5.8**		
		[bar]	0 ... 6	5	**–6**		
		[bar]	0 ... 6.2	5	**–6.2**		
		[bar]	0 ... 6.8	6	**–6.8**		
		[bar]	0 ... 7.5	5	**–7.5**		
		[bar]	0 ... 8	6	**–8**		
		[bar]	0 ... 8.3	5	**–8.3**		
		[bar]	0 ... 9.3	5	**–9.3**		
		[bar]	0 ... 10	5	**–10**		
		[bar]	0 ... 11.5	5	**–11.5**		
		[bar]	0 ... 12.2	5	**–12.2**		
		[bar]	0 ... 12.8	5	**–12.8**		
		[bar]	0 ... 13.5	5	**–13.5**		
		[bar]	0 ... 14.5	5	**–14.5**		
		[bar]	0 ... 15.5	6	**–15.5**		
		[bar]	0 ... 16		**–16**		
		[bar]	0 ... 23	7, 5	**–23**		
		[bar]	0 ... 25	7, 5	**–25**		
		[bar]	0 ... 30	8, 5	**–30**		
	Actuator		Piston actuator		**–K**		
			Diaphragm actuator		**–M**		
	Actuator size	[mm]	46	13	**–46**		
		[mm]	75	13	**–75**		
		[mm]	90	14	**–90**		
	Stroke	[mm]	17	9	**–17**		
		[mm]	20	10	**–20**		
		[mm]	26	11	**–26**		
O	Control function		Closed via spring force, NC				
			Double-acting	13	**–D**		
			Opened via spring force, NO		**–S**		
			Closed via reduced spring force, NC	12	**–PR**		
	Position sensing		Via mechanical indicator				
M	Actuator housing material		Stainless steel 1.4408		**–V4**		–V4
O	EU certification		None				
			II 2GD		**–EX4**		

5	**4...6.2, 7.5, 8.3, 9.3, 11.5...14.5, 23...30**	Not in conjunction with flow direction A
6	**6.8, 8, 15.5**	Not in conjunction with flow direction B
7	**18, 20, 23, 25**	Not with connection size DN50, 2", DN40, 1 1/2" or flow direction A
8	**30**	Not with connection size DN50, 2", DN40, 1 1/2", DN32, 1 1/4" or flow direction A
9	**Stroke 17**	Only with drive K and size 46
10	**Stroke 20**	Only with drive K and size 75
11	**Stroke 26**	Only with drive M
12	**Control function PR**	Must be in combination with flow direction A
13	**Control function D, S**	Must be in combination with flow direction B
14	**Size: 90**	Not with drive K

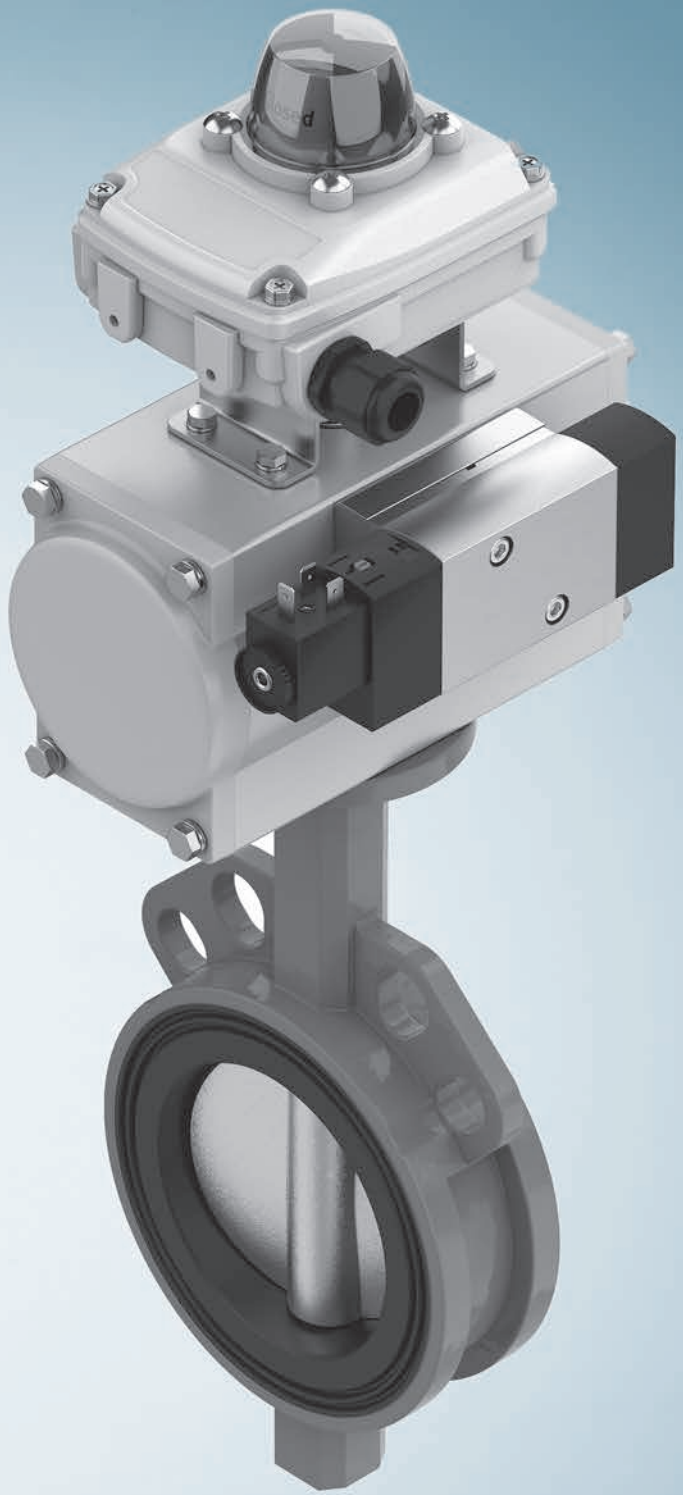
M Mandatory data
O Options

Transfer order code

– [ ] – [ ] – [ ] – [ ] – [ ] – [V4] – [ ]

08 Butterfly valves

Butterfly valves for versatile use in various industry sectors



KVZA

Butterfly valves, manually actuated

+ With hand lever
+ Butterfly valve type wafer or lug

➔ page 675

KVZA

Butterfly valve units, automatically actuated

+ With quarter turn actuator
+ Butterfly valve type wafer or lug

➔ page 675

KVZA

Butterfly valve units with controlled operation

+ With quarter turn actuator and positioner
+ Butterfly valve type wafer or lug

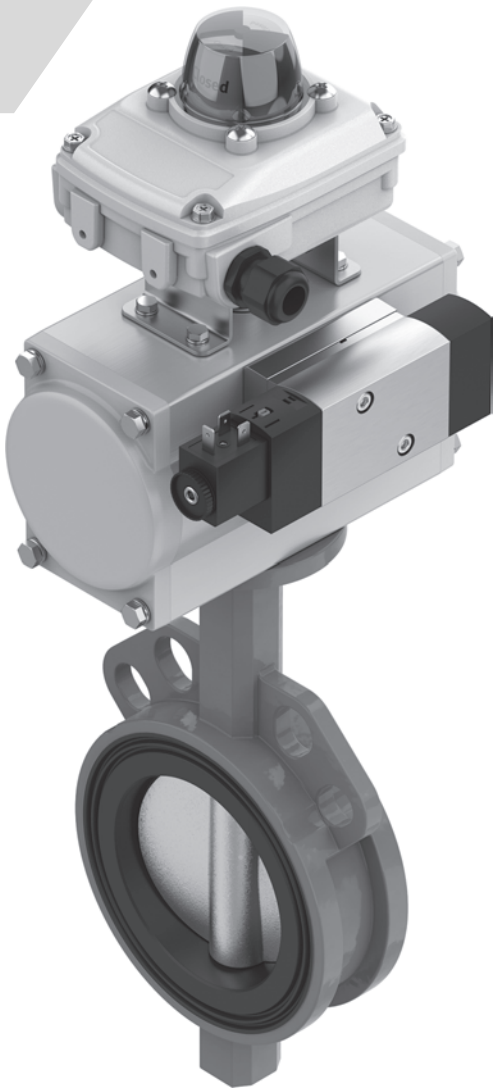
➔ page 675

Contents

Butterfly valves KVZA 675

Butterfly valves

KVZA



Overview, configuration and ordering
➔ **www.festo.com/catalogue/**kvza

Additional information, support and user documentation
➔ **www.festo.com/sp/**kvza

+ Butterfly valve with hand lever
+ Butterfly valve with quarter turn actuator
+ Butterfly valve with quarter turn actuator and positioner
+ Configure complete units easily online at
  ➔ www.festo.com/kvza

+ Butterfly valve type wafer or lug
+ Nominal width DN25 ... DN300
+ Connection standard DIN EN 1092-1 or ANSI CLASS 150

Butterfly valve units KVZA

Key features

At a glance

The new configurator supports you with requests for customised process valve units, and supports the engineering department with processing these requests. It is now possible to find, select, size and order process valve units without waiting times. Access to prices and delivery times is provided immediately after configuration. Configuration-compatible data sheets are also available, as well as 2D -CAD data and 3D -CAD models in many native and neutral formats. The complete units of course also come with certificates.

Innovative

- The new configurator provides support throughout the entire process, from searching for products to ordering
- Configuration, sizing, documentation, RFQ, ordering and delivery of the process valve unit are combined in a single tool

Function

- Direct link to the Festo Online Shop
- User-friendly user interface
- Advice on solutions
- Specific 2D/3D CAD files available for download after configuration
- Configuration-compatible bill of materials available for download
- Delivery date query possible

Possible variants

Butterfly valve type, wafer

Butterfly valve type, lug

Hand lever

Quarter turn actuator

Key features

Possible variants

Quarter turn actuator, pilot valve

Quarter turn actuator, sensor box

Quarter turn actuator, opto-electronic sensor box

Quarter turn actuator, optical position indicator

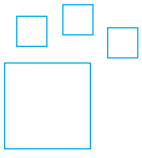
Quarter turn actuator, pilot valve, sensor box

Quarter turn actuator, pilot valve, opto-electronic sensor box

Quarter turn actuator, pilot valve, optical position indicator

Quarter turn actuator, positioner

Ordering data – Product options



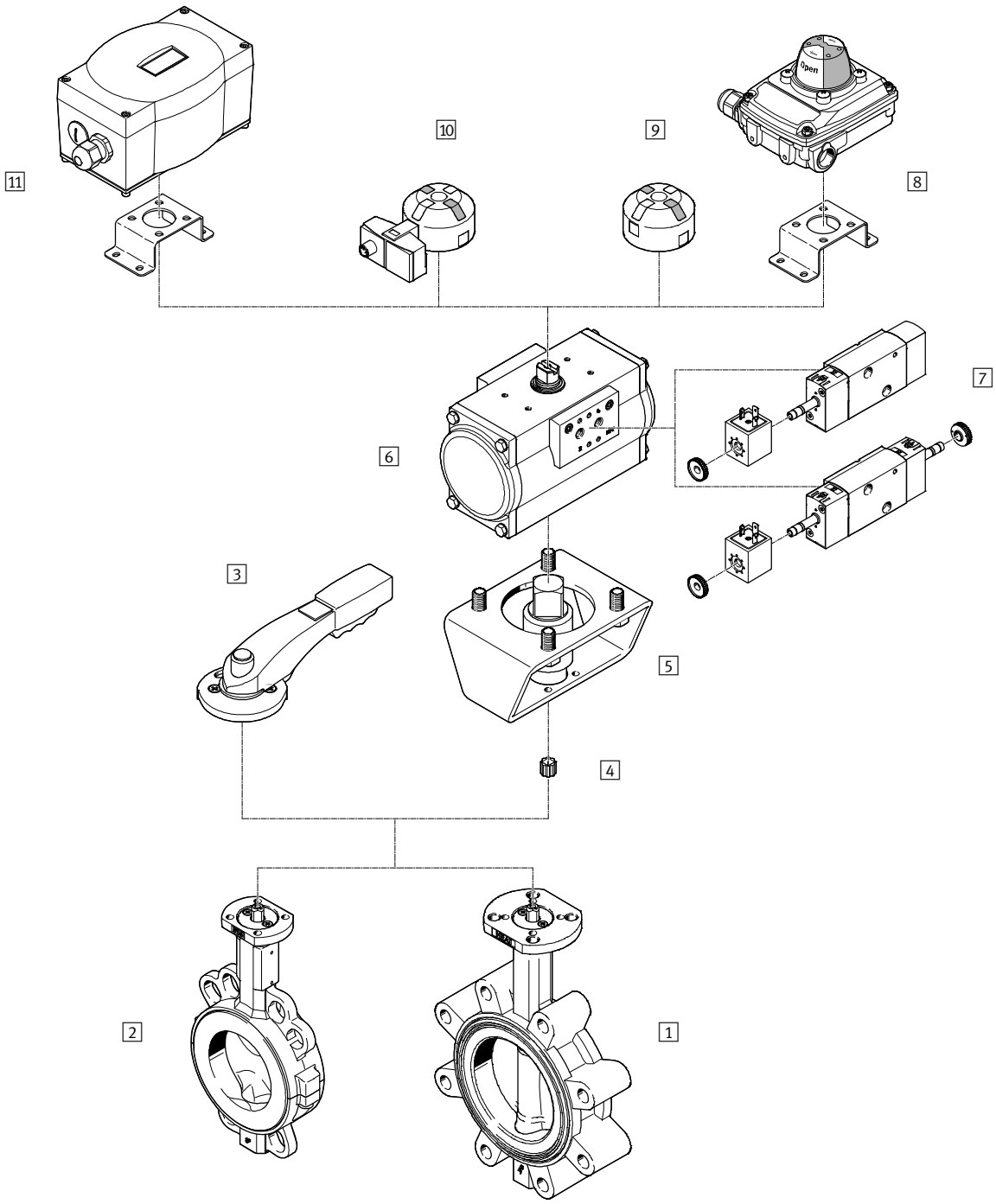
Configurable product
This product and all its product options can be ordered using the configurator.

The configurator can be found at
➔ **www.festo.com/catalogue/...**

Part No.	Type code
8073655	**KVZA**

Butterfly valve units KVZA

Peripherals overview using a sample configuration



Peripherals overview using a sample configuration

System components		Brief description	➔ Page/ Internet
1	Butterfly valves VZAV	In wafer or lug versions, in nominal widths DN25 ... DN300, with connection standards DIN EN 1092-1 or ASME B 16.5 Class 150	vzav
2	Butterfly valves VZAF	In wafer or lug versions, in nominal widths DN25 ... DN300, with connection standards DIN EN 1092-1 or ASME B 16.5 Class 150	vzaf
3	Hand lever VAOH	For manual actuation of butterfly valves, with lock, detenting in 10 positions	vaoh
4	Reducing sleeve squares DARQ-R	For adjustment of butterfly valves	411
5	Mounting kits DARQ-K	For connecting quarter turn actuators and butterfly valves	267
6	Quarter turn actuators DFPD	In single-acting or double-acting version, features a rack and pinion combination with a constant torque characteristic across the entire swivel range, connection pattern to VDI/VDE 3845	373
7	Solenoid valves VSNC	Pilot valves with solenoid coils VACF for single-acting and double-acting quarter turn actuators with a connection pattern to VDI/VDE 3845, conversion from 3/2-way to 5/2-way valve simply by turning the seal	23
8	Sensor boxes SRBC	For electrical position feedback and monitoring the position of process valves, with mounting adapter, sturdy, corrosion-resistant design, clearly visible 3D position indicator allows rapid detection of the current position of the quarter turn actuator	217
9	Position indicators SASF	The compact solution, direct mounting means that they require minimal space, with four fixed actuating lugs at intervals of 90°	sasf
10	Sensor boxes SRBG	For electrical position feedback and monitoring the position of process valves, mounted directly without other accessories on quarter turn actuators with connection pattern to VDI/VDE 3845, with M12 plug or terminal rail connection	235
11	Positioners CMSX	Based on the PID control algorithm, for controlling the position of single-acting and double-acting pneumatic quarter turn actuators, with mechanical interface to VDI/VDE 3845	289

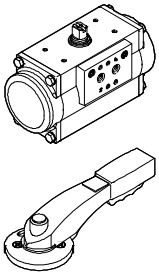
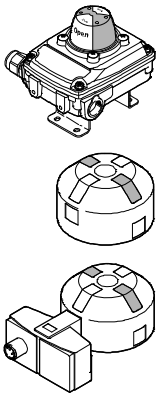
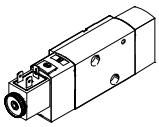
Butterfly valve units KVZA

System components

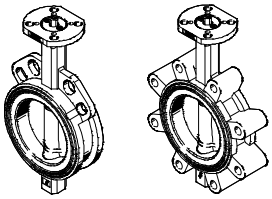
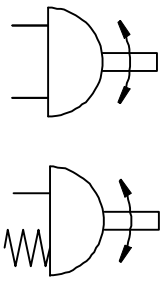
Ordering using the configurator

The configurator for butterfly valve units comprises a number of tried and tested components from Festo. The scope and specifications can be selected on the "System", "Valve & medium", "Application" and "Additional electrical specifications" pages.

System › Valve & medium › Application › Overview

System components	Description
Actuation 	• Automatic actuation via a pneumatic quarter turn actuator • Manual actuation possible using a hand lever
Application	**Controlled** • The desired position of the process valve is specified via an analogue positioning signal, e.g. 4 ... 20 mA **Open/Closed** • The process valve is moved into both end positions
Position indicator 	Shows the current end position of the process valve unit • Optically via a mechanical, inductive or magnetic sensor box, mounted using a mounting adapter • Optically via a position indicator, directly mounted on the quarter turn actuator • Optically/electrically via an inductive dual sensor with M12 connection or terminal rail connection, directly mounted on the quarter turn actuator
Pilot valve 	The pneumatic pilot valve is mounted using the NAMUR interface, either on a valve terminal, which can be housed in a control cabinet, for example, or directly on the actuator.

System components

System components	Description	Technical data
Butterfly valve type 	**Wafer** • With centring holes for installation between two pipe flanges, extremely lightweight housing **Lug** • With threaded flange holes for installation between two pipe flanges or at the end of a pipeline, one-sided disconnection possible	• Nominal diameter DN25 ... DN300 • Nominal diameter 1" ... 12"
Shut-off element material	**Ductile cast iron, PA coated** • Ductile cast iron with polyamide coating is used to refine and protect metallic surfaces, is highly resistant to wear and exhibits excellent insulation properties **Stainless steel, PFA coated** • The perfluoroalkoxy alkane coating is resistant to aggressive organic and inorganic chemicals as well as solvents across a wide temperature range **Stainless steel** • Suitable for extracting almost all organic fluids, 50% caustic soda up to 90 °C, cathodic dip coating, pure phosphoric acid, dry chlorine, liquid sulphur, PSA and many other media	• Ductile cast iron EN-GJS-400-15, PA coated 250 µ • Stainless steel 1.4408, PFA coated • Stainless steel 1.4408
Sealing element material	**EPDM** • Resistant to acids and alkalis, water, hot water and vapour, not resistant to oil and grease **NBR** • Can be used for oils, greases, fuel, oil gas, CO2, CO and H2 **PTFE/silicone** • Excellent chemical resistance, electrical properties, great resistance to high and low temperatures, and exceptional adhesion and flame resistance, with silicone base layer for standard applications	–
Mode of operation 	**Double-acting** • The double-acting quarter turn actuator requires compressed air for every direction of movement. In this operating mode, the torque for opening or closing the process valve is generated purely via the compressed air **Single-acting** • In the single-acting quarter turn actuator, the incoming compressed air moves the piston in one direction. This generates the torque of the actuator. At the same time, the springs installed in the actuator are pretensioned. This spring force generates torque in the opposite direction of rotation when the pressure chambers of the actuator are exhausted. This causes the process valve to move to the required initial position	–

Butterfly valve units KVZA

System components

System components	Description	Technical data
Safety function	**Closing** • In the event of a system crash (failure of the operating voltage supply or compressed air), the process valve is closed. **Opening** • In the event of a system crash (failure of the operating voltage supply or compressed air), the process valve is opened. **Maintain position** • In the event of a system crash (failure of the operating voltage supply or compressed air), the process valve is held in the current position. This means the quarter turn actuator must be pressurised on both sides.	–
Operating pressure	The operating pressure available for actuating the quarter turn actuator.	• 2 ... 8 bar
Safety factor	The specification of a safety factor is recommended when configuring a quarter turn actuator because this increases the torque reserve available.	–
Closing torque factor	Specification is optional • The torque required for actuating the process valve is at its greatest at the start of the movement (breakaway torque). The closing torque of the process valve may be smaller than the breakaway torque under certain conditions. If this difference is known, it can be taken into account by specifying a closing torque factor.	–
High corrosion resistance	Higher corrosion resistance through epoxy coating of the pneumatic quarter turn actuator, the drive shaft is stainless steel.	–
Nominal operating voltage	Configuration-dependent specification required, e.g. when selecting a position indicator or a pilot valve.	• 24 V DC • 250 V AC • 110 V AC/50 ... 60 Hz

Pipeline medium	Safety factor	
	Ball valves	Butterfly valves
Liquid	1.2	1.35
Sticky/viscous	1.6	1.75
Gaseous	1.5	1.5

Technical data

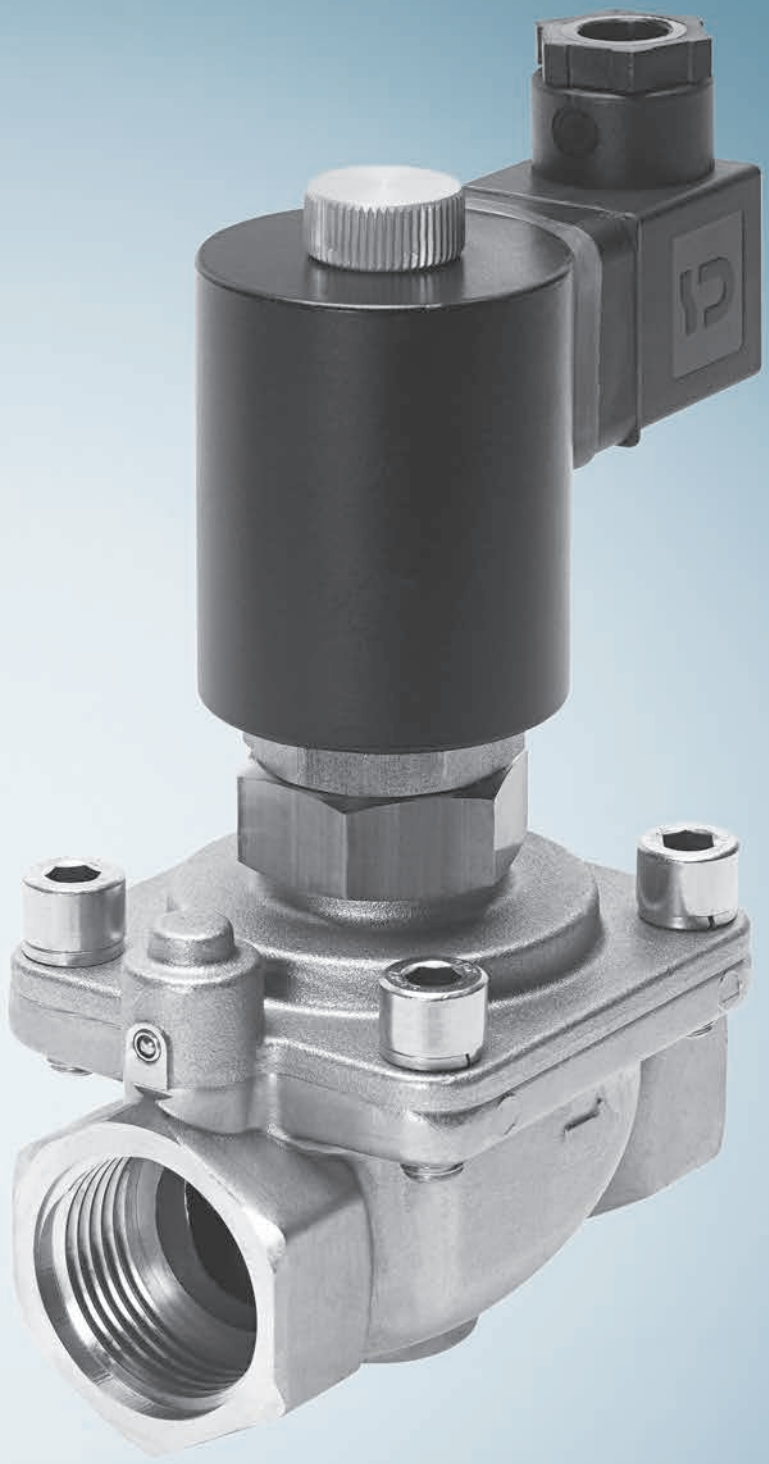
- Butterfly valves nominal diameter DN25 ... DN300 or 1" ... 12"
- Swivel angle 0 ... 90°
- Medium pressure 10 ... 16 bar
- Operating pressure 2 ... 8 bar
- Safety factor 0 ... 2

General technical data		
Product weight	[kg]	1 ... 140

Operating and environmental conditions	
Note on materials	Contains paint-wetting impairment substances
	RoHS-compliant

09 Solenoid-actuated media valves

Directly operated, pilot operated and force pilot operated media valves in brass and stainless steel for controlling various liquid and gaseous media



VZWD ★

Solenoid valves

+ Extensive pressure range
+ Directly actuated poppet valve
+ Suitable for vacuum

➔ page 687

VZWF ★

Solenoid valves

+ High flow rates
+ Suitable for vacuum
+ Force pilot operated solenoid valve

➔ page 705

VZWM-L ★

Solenoid valves

+ Brass or stainless steel casting version
+ Electrical connection via separate magnets
+ Servo-controlled solenoid valve

➔ page 717

Contents

Solenoid valves VZWD 687
Solenoid valves VZWF 705
Solenoid valves VZWM-L 717
Solenoid valves MN1H-MS 731
Solenoid valves VZWP 739
Reverse jet pulse valves VZWE 747

Solenoid valves, directly actuated
VZWD ★

Overview, configuration and ordering
➔ **www.festo.com/catalogue/vzwd**

Additional information, support and user documentation
➔ **www.festo.com/sp/vzwd**

Quick ordering of basic designs
➔ page 694, 698

+ Connection 1/8", 1/4"
+ G thread or NPT thread
+ Operating pressure 0 ... 90 bar
+ Nominal pressure 40 bar
+ Electrical actuation
+ Voltage 24 V DC, 110 V AC, 230 V AC
+ 2/2-way poppet valve (NC), directly actuated
+ Suitable for applications with high pressure and low flow rates
+ Suitable for vacuum
+ Sealing material FKM

Solenoid valves VZWD, directly actuated

Key features and overview

General

Directly actuated solenoid valves VZWD are mainly intended for applications with high pressure ranges and low flow rates. This type of valve switches the sealing element directly via the solenoid system. The seal generally has to lift away from the seat against the effective operating pressure using just the drive. A closing spring keeps the valve closed assisted by the pressure of the medium. The function is dependent on the seat size, the effective operating pressure and the magnetic force. The differentiation from force pilot operated solenoid valves (VZWF) lies in the flow rate.

General

- Connecting thread G 1/4, G 1/8
- Flow rate Kv 0.06 ... 0.4 m^3/h

- Note

The valves are suitable for vacuum with Pabs > 100 mbar. Please ensure the direction of flow corresponds to the direction of the arrow.

Areas of application

- Use in vacuum technology
- Venting gas and tank systems
- Safety shut-offs for burner controllers

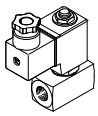
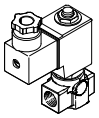
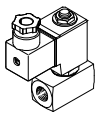
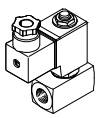
Design

- Design insensitive to slight contamination of the media

Advantages

- Valves respond from 0 bar up to the max. operating pressure
- Excellent tightness

Key features and overview

Version	Type	Process valve connection	Nominal size (DN)	Medium pressure[1] [bar]	→ Page/Internet
Brass housing					
	VZWD-L-...	G 1/4	1	0 ... 50	691
			1.5	0 ... 30	
			2	0 ... 15	
			2.5	0 ... 8	
		G 1/8	1	0 ... 50	691
			1.5	0 ... 30	
			2	0 ... 15	
Brass housing					
	VZWD-L-...	G 1/4	1	0 ... 90	695
			1.5	0 ... 85	
			2	0 ... 40	
			2.5	0 ... 22	
			3	0 ... 15	
			4	0 ... 8	
			5	0 ... 5	
			6	0 ... 4	
		G 1/8	1	0 ... 90	695
			1.5	0 ... 85	
			2	0 ... 40	
			2.5	0 ... 22	
			3	0 ... 15	
			4	0 ... 8	
			5	0 ... 5	
			6	0 ... 4	
Stainless steel housing					
	VZWD-L-...-R1	G 1/4	1	0 ... 90	700
			1.5	0 ... 85	
			2	0 ... 40	
			2.5	0 ... 22	
			3	0 ... 15	
			4	0 ... 8	
			5	0 ... 5	
			6	0 ... 4	
	VZWD-L-...-R1	G 1/8	1	0 ... 90	700
			1.5	0 ... 85	
			2	0 ... 40	
			2.5	0 ... 22	
			3	0 ... 15	
			4	0 ... 8	
			5	0 ... 5	
			6	0 ... 4	

1) The valves are suitable for vacuum with Pabs > 100 mbar. Please ensure the direction of flow corresponds to the direction of the arrow.

Solenoid valves VZWD, directly actuated

Type codes

VZWD – L – M22C – M – G18 – 15 – V – 2AP4 – 40 – R1

Type	
VZWD	Solenoid valve, directly actuated

Type of directional control valve	
L	In-line valve

Valve function	
M22C	2/2-way valve, normally closed, mechanical reset

Reset method	
M	Mechanical spring

Process valve connection	
G18	Thread G 1/8
G14	Thread G 1/4

Nominal size	
10	1.0 mm
15	1.5 mm
20	2.0 mm
25	2.5 mm
30	3.0 mm
40	4.0 mm
50	5.0 mm
60	6.0 mm

Sealing material	
V	FPM

Nominal operating voltage	
1	24 V DC
2A	110 V AC/50-60 Hz
3A	230 V AC/50-60 Hz

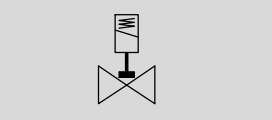
Electrical connection	
P4	Plug socket, 3-pin

Medium pressure	
4	Max. 4 bar
5	Max. 5 bar
8	Max. 8 bar
15	Max. 15 bar
22	Max. 22 bar
30	Max. 30 bar
40	Max. 40 bar
50	Max. 50 bar
85	Max. 85 bar
90	Max. 90 bar

Corrosion protection	
–	Brass
R1	Stainless steel

Technical data – Brass housing, nominal pressure PN 50

Function



- Flow rate Kv
  0.06 ... 0.16 m^3/h

- Connecting thread
  G 1/4, G 1/8

General technical data					
Nominal size (DN)		1.0	1.5	2.0	2.5
Valve function		2/2-way, single solenoid, closed			
Design		Directly actuated poppet valve			
Type of mounting		In-line installation			
Actuation type		Electric			
Reset method		Mechanical spring			
Direction of flow		Non-reversible			
Type of control		Direct			
Manual override		None			
Mounting position		Any			
Sealing principle		Soft			
Max. viscosity	[mm^2/s]	22			
Protection class		IP65			

Operating and environmental conditions					
Nominal size (DN)		1.0	1.5	2.0	2.5
Standard nominal flow rate	[l/min]	60	95	140	170
Flow rate Kv	[m^3/h]	0.06	0.09	0.13	0.16
Process valve nominal pressure (PN)		50			
Medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]			
		Inert gases			
		Mineral oil			
		Neutral liquids			
		Water			
		Further media upon request			
Pressure differential	[bar]	0			
Ambient temperature	[°C]	–10 ... +35 °C			
Temperature of medium	[°C]	–10 ... +80 °C			
Leak rate to EN 12266-1		A			
Corrosion resistance class CRC[1)]		1			

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Solenoid valves VZWD, directly actuated

Technical data – Brass housing, nominal pressure PN 50

Electrical data				
Operating voltage		24 V DC	110 V AC	230 V AC
Electrical connection		Plug to EN 175301-803 type A, square design		
CE marking		–	73/23/EEC	73/23/EEC
Insulation class		H	F	F
Duty cycle	[%]	100		
Permissible voltage fluctuations	[%]	±10		
Switching time on	[ms]	25		
Switching time off	[ms]	10		
Coil characteristics				
Direct current DC	[V]	24	–	–
Alternating current AC	[V]	–	110	230
Power consumption	[W]	6.8	–	–
Switching power	[VA]	–	10.5	10.5
Holding power	[VA]	–	8	7.6
	[Hz]	–	50, 60	50, 60

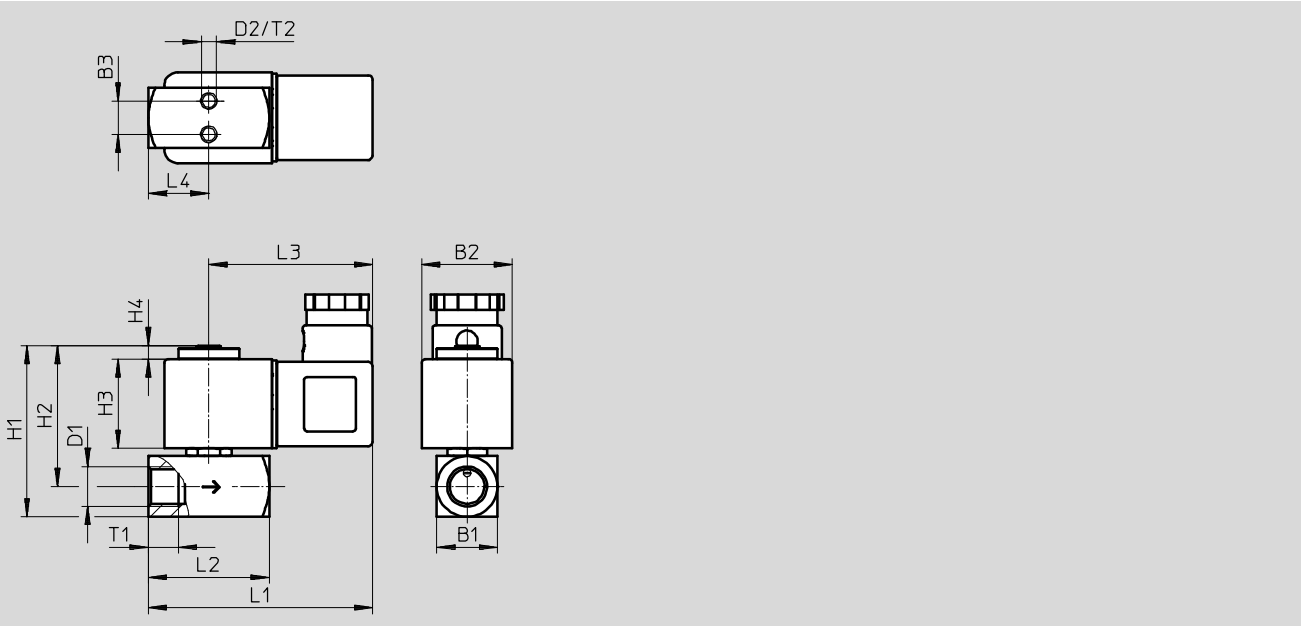
Materials		
Solenoid valves		Material number
Housing	High-alloy stainless steel	1.4305
	Brass	CW614N
Seals	FPM	
Note on materials	Contains PWIS (paint-wetting impairment substances)	
	RoHS-compliant	

Technical data – Brass housing, nominal pressure PN 50

Dimensions

Download CAD data ➔ **www.festo.com**

Milled brass housing



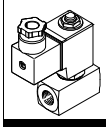
Type	B1	B2	B3	D1	D2	H1	H2	H3	H4	L1	L2	L3	L4	L5	T1	T2
VZWD-...-G1/8-10-...-50	15	30	8	G 1/8	M3	52	44	30	5	70	32	54	16	–	8	4.5
VZWD-...-G1/8-15-...-30																
VZWD-...-G1/8-20-...-15																
VZWD-...-G1/4-10-...-50	20	30	11	G 1/4	M5	57	47	30	5	74	40	54	20	–	10	5.5
VZWD-...-G1/4-15-...-30																
VZWD-...-G1/4-20-...-15																
VZWD-...-G1/4-25-...-8																

Solenoid valves VZWD, directly actuated

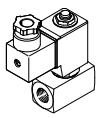
Technical data – Brass housing, nominal pressure PN 50

★ Core product range

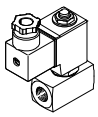
Ordering data

	Process valve connection	Nominal size DN	Medium pressure[1] [bar]	Product weight [g]	Operating voltage	Brass housing Part No.	Type
	G 1/8	1	0 ... 50	300	24 V DC	★ **1491825**	**VZWD-L-M22C-M-G18-10-V-1P4-50**
		2	0 ... 15	300	24 V DC	★ **1491827**	**VZWD-L-M22C-M-G18-20-V-1P4-15**

Ordering data

	Process valve connection	Nominal size DN	Medium pressure[1] [bar]	Product weight [g]	Operating voltage	Brass housing Part No.	Type
	G 1/4	1	0 ... 50	350	24 V DC	**1491828**	**VZWD-L-M22C-M-G14-10-V-1P4-50**
					110 V AC	**1491906**	**VZWD-L-M22C-M-G14-10-V-2AP4-50**
					230 V AC	**1491984**	**VZWD-L-M22C-M-G14-10-V-3AP4-50**
		1.5	0 ... 30	350	24 V DC	**1491829**	**VZWD-L-M22C-M-G14-15-V-1P4-30**
					110 V AC	**1491907**	**VZWD-L-M22C-M-G14-15-V-2AP4-30**
					230 V AC	**1491985**	**VZWD-L-M22C-M-G14-15-V-3AP4-30**
		2	0 ... 15	350	24 V DC	**1491830**	**VZWD-L-M22C-M-G14-20-V-1P4-15**
					110 V AC	**1491908**	**VZWD-L-M22C-M-G14-20-V-2AP4-15**
					230 V AC	**1491986**	**VZWD-L-M22C-M-G14-20-V-3AP4-15**
		2.5	0 ... 8	350	24 V DC	**1491831**	**VZWD-L-M22C-M-G14-25-V-1P4-8**
					110 V AC	**1491909**	**VZWD-L-M22C-M-G14-25-V-2AP4-8**
					230 V AC	**1491987**	**VZWD-L-M22C-M-G14-25-V-3AP4-8**

Ordering data

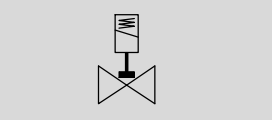
	Process valve connection	Nominal size DN	Medium pressure[1] [bar]	Product weight [g]	Operating voltage	Brass housing Part No.	Type
	G 1/8	1	0 ... 50	300	110 V AC	**1491903**	**VZWD-L-M22C-M-G18-10-V-2AP4-50**
					230 V AC	**1491981**	**VZWD-L-M22C-M-G18-10-V-3AP4-50**
		1.5	0 ... 30	300	24 V DC	**1491826**	**VZWD-L-M22C-M-G18-15-V-1P4-30**
					110 V AC	**1491904**	**VZWD-L-M22C-M-G18-15-V-2AP4-30**
					230 V AC	**1491982**	**VZWD-L-M22C-M-G18-15-V-3AP4-30**
		2	0 ... 15	300	110 V AC	**1491905**	**VZWD-L-M22C-M-G18-20-V-2AP4-15**
					230 V AC	**1491983**	**VZWD-L-M22C-M-G18-20-V-3AP4-15**

1) The valves are suitable for vacuum with Pabs > 100 mbar. Please ensure the direction of flow corresponds to the direction of the arrow.

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Technical data – Brass housing, nominal pressure PN 100

Function



- Flow rate Kv
  0.06 ... 0.4 m^3/h

  Nominal size (DN)
  1.0 ... 6.0 mm

- Connecting thread
  G 1/4, G 1/8

General technical data

Nominal size (DN)		1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0
Valve function		2/2-way, single solenoid, closed							
Design		Directly actuated poppet valve							
Type of mounting		In-line installation							
Actuation type		Electric							
Reset method		Mechanical spring							
Direction of flow		Non-reversible							
Type of control		Direct							
Manual override		None							
Mounting position		Any							
Sealing principle		Soft							
Max. viscosity	[mm^2/s]	22							
Protection class		IP65							

Operating and environmental conditions

Nominal size (DN)		1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0
Standard nominal flow rate	[l/min]	60	95	140	170	210	310	375	430
Flow rate Kv	[m^3/h]	0.06	0.09	0.13	0.16	0.2	0.3	0.35	0.4
Process valve nominal pressure (PN)		100							
Pressure differential	[bar]	0							
Medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]							
		Inert gases							
		Mineral oil							
		Neutral liquids							
		Water							
		Further media upon request							
Ambient temperature	[°C]	–10 ... +35 °C							
Temperature of medium	[°C]	–10 ... +80 °C							
Leak rate to EN 12266-1		A							
Corrosion resistance class CRC[1)]		1							

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Solenoid valves VZWD, directly actuated

Technical data – Brass housing, nominal pressure PN 100

Electrical data				
Operating voltage		24 V DC	110 V AC	230 V AC
Electrical connection		Plug to EN 175301-803 type A, square design		
CE marking		–	73/23/EEC	73/23/EEC
Insulation class		H	F	F
Duty cycle	[%]	100		
Permissible voltage fluctuations	[%]	±10		
Switching time on	[ms]	20		
Switching time off	[ms]	18		
Coil characteristics				
Direct current DC	[V]	24	–	–
Alternating current AC	[V]	–	110	230
Power consumption	[W]	11	–	–
Switching power	[VA]	–	19	18
Holding power	[VA]	–	16	15
	[Hz]	–	50, 60	50, 60

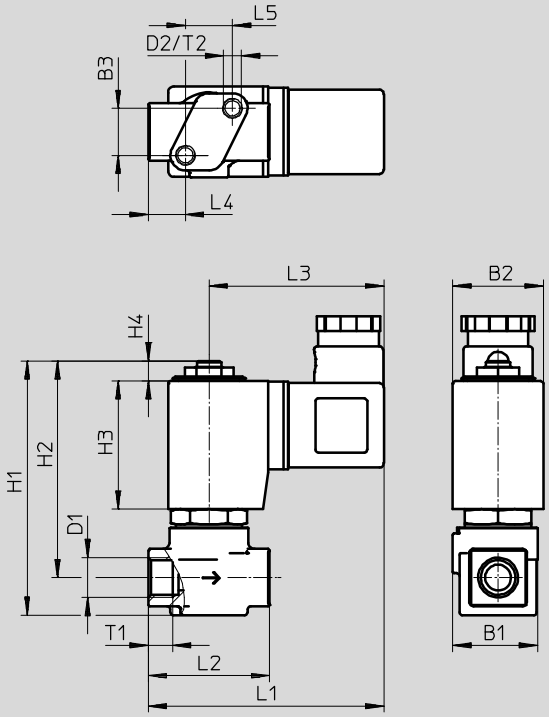
Materials		
Solenoid valves		Material number
Housing	High-alloy stainless steel	1.4305
	Brass	CW614N
Seals	FPM	
Note on materials	Contains PWIS (paint-wetting impairment substances)	
	RoHS-compliant	

Technical data – Brass housing, nominal pressure PN 100

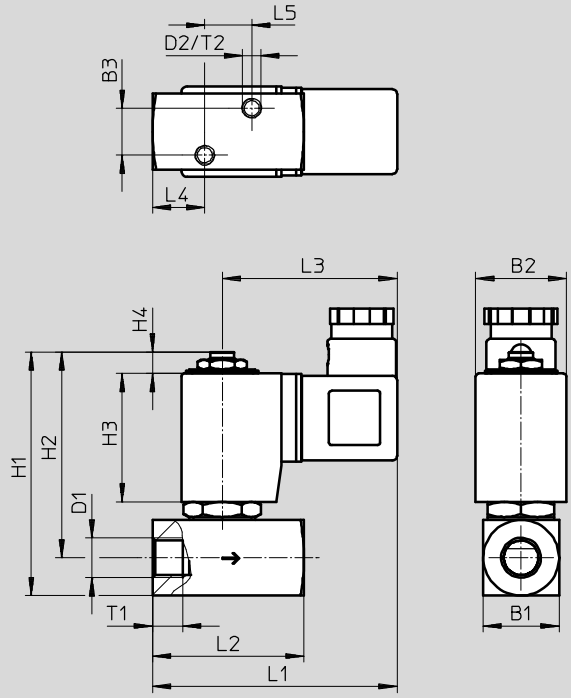
Dimensions

Download CAD data ➔ **www.festo.com**

Die-cast brass housing



Milled brass housing



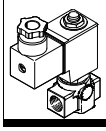
Type	B1	B2	B3	D1	D2	H1	H2	H3	H4	L1	L2	L3	L4	L5	T1	T2
VZWD-...-G1/8-10-...-90	28	30	15.5	G 1/8	M6	84	72	42.5	6.5	78	40	58	12	15.5	8	6
VZWD-...-G1/8-15-...-85																
VZWD-...-G1/8-20-...-40																
VZWD-...-G1/8-25-...-22																
VZWD-...-G1/8-30-...-15																
VZWD-...-G1/8-40-...-8																
VZWD-...-G1/4-10-...-90	28	30	15.5	G 1/4	M6	84	72	42.5	6.5	78	40	58	12	15.5	10	6
VZWD-...-G1/4-15-...-85																
VZWD-...-G1/4-20-...-40																
VZWD-...-G1/4-25-...-22																
VZWD-...-G1/4-30-...-15																
VZWD-...-G1/4-40-...-8																
VZWD-...-G1/8-50-...-5	25	30	15.5	G 1/8	M6	81	68	42.5	7	78	40	58	12	15.5	8	6
VZWD-...-G1/8-60-...-4																
VZWD-...-G1/4-50-...-5	25	30	15.5	G 1/4	M6	81	68	42.5	7	85	50	58	17	15.5	10	6
VZWD-...-G1/4-60-...-4																

Solenoid valves VZWD, directly actuated

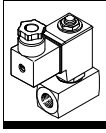
Technical data – Brass housing, nominal pressure PN 100

★ Core product range

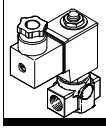
Ordering data

	Process valve connection	Nominal size DN	Medium pressure[1] [bar]	Product weight [g]	Operating voltage	Brass housing Part No.	Type
	G 1/4	3	0 ... 15	550	24 V DC	★ **1491844**	**VZWD-L-M22C-M-G14-30-V-1P4-15**
		4	0 ... 8	550	24 V DC	★ **1491845**	**VZWD-L-M22C-M-G14-40-V-1P4-8**

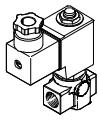
Ordering data

	Process valve connection	Nominal size DN	Medium pressure[1] [bar]	Product weight [g]	Operating voltage	Brass housing Part No.	Type
	G 1/4	6	0 ... 4	600	24 V DC	★ **1491847**	**VZWD-L-M22C-M-G14-60-V-1P4-4**

Ordering data

	Process valve connection	Nominal size DN	Medium pressure[1] [bar]	Product weight [g]	Operating voltage	Brass housing Part No.	Type
	G 1/8	3	0 ... 15	550	24 V DC	★ **1491836**	**VZWD-L-M22C-M-G18-30-V-1P4-15**
		4	0 ... 8	550	24 V DC	★ **1491837**	**VZWD-L-M22C-M-G18-40-V-1P4-8**

Ordering data

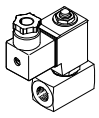
	Process valve connection	Nominal size DN	Medium pressure[1] [bar]	Product weight [g]	Operating voltage	Brass housing Part No.	Type
	G 1/4	1	0 ... 90	550	24 V DC	**1491840**	**VZWD-L-M22C-M-G14-10-V-1P4-90**
					110 V AC	**1491918**	**VZWD-L-M22C-M-G14-10-V-2AP4-90**
					230 V AC	**1491996**	**VZWD-L-M22C-M-G14-10-V-3AP4-90**
		1.5	0 ... 85	550	24 V DC	**1491841**	**VZWD-L-M22C-M-G14-15-V-1P4-85**
					110 V AC	**1491919**	**VZWD-L-M22C-M-G14-15-V-2AP4-85**
					230 V AC	**1491997**	**VZWD-L-M22C-M-G14-15-V-3AP4-85**
		2	0 ... 40	550	24 V DC	**1491842**	**VZWD-L-M22C-M-G14-20-V-1P4-40**
					110 V AC	**1491920**	**VZWD-L-M22C-M-G14-20-V-2AP4-40**
					230 V AC	**1491998**	**VZWD-L-M22C-M-G14-20-V-3AP4-40**
		2.5	0 ... 22	550	24 V DC	**1491843**	**VZWD-L-M22C-M-G14-25-V-1P4-22**
					110 V AC	**1491921**	**VZWD-L-M22C-M-G14-25-V-2AP4-22**
					230 V AC	**1491999**	**VZWD-L-M22C-M-G14-25-V-3AP4-22**
		3	0 ... 15	550	110 V AC	**1491922**	**VZWD-L-M22C-M-G14-30-V-2AP4-15**
					230 V AC	**1492000**	**VZWD-L-M22C-M-G14-30-V-3AP4-15**
		4	0 ... 8	550	110 V AC	**1491923**	**VZWD-L-M22C-M-G14-40-V-2AP4-8**
					230 V AC	**1492001**	**VZWD-L-M22C-M-G14-40-V-3AP4-8**

1) The valves are suitable for vacuum with Pabs > 100 mbar. Please ensure the direction of flow corresponds to the direction of the arrow.

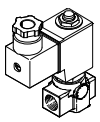
Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Technical data – Brass housing, nominal pressure PN 100

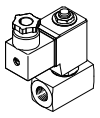
Ordering data

	Process valve connection	Nominal size DN	Medium pressure[1] [bar]	Product weight [g]	Operating voltage	Brass housing Part No.	Type
	G 1/4	5	0 ... 5	600	24 V DC	**1491846**	**VZWD-L-M22C-M-G14-50-V-1P4-5**
					110 V AC	**1491924**	**VZWD-L-M22C-M-G14-50-V-2AP4-5**
					230 V AC	**1492002**	**VZWD-L-M22C-M-G14-50-V-3AP4-5**
		6	0 ... 4	600	110 V AC	**1491925**	**VZWD-L-M22C-M-G14-60-V-2AP4-4**
					230 V AC	**1492003**	**VZWD-L-M22C-M-G14-60-V-3AP4-4**

Ordering data

	Process valve connection	Nominal size DN	Medium pressure[1] [bar]	Product weight [g]	Operating voltage	Brass housing Part No.	Type
	G 1/8	1	0 ... 90	550	24 V DC	**1491832**	**VZWD-L-M22C-M-G18-10-V-1P4-90**
					110 V AC	**1491910**	**VZWD-L-M22C-M-G18-10-V-2AP4-90**
					230 V AC	**1491988**	**VZWD-L-M22C-M-G18-10-V-3AP4-90**
		1.5	0 ... 85	550	24 V DC	**1491833**	**VZWD-L-M22C-M-G18-15-V-1P4-85**
					110 V AC	**1491911**	**VZWD-L-M22C-M-G18-15-V-2AP4-85**
					230 V AC	**1491989**	**VZWD-L-M22C-M-G18-15-V-3AP4-85**
		2	0 ... 40	550	24 V DC	**1491834**	**VZWD-L-M22C-M-G18-20-V-1P4-40**
					110 V AC	**1491912**	**VZWD-L-M22C-M-G18-20-V-2AP4-40**
					230 V AC	**1491990**	**VZWD-L-M22C-M-G18-20-V-3AP4-40**
		2.5	0 ... 22	550	24 V DC	**1491835**	**VZWD-L-M22C-M-G18-25-V-1P4-22**
					110 V AC	**1491913**	**VZWD-L-M22C-M-G18-25-V-2AP4-22**
					230 V AC	**1491991**	**VZWD-L-M22C-M-G18-25-V-3AP4-22**
		3	0 ... 15	550	110 V AC	**1491914**	**VZWD-L-M22C-M-G18-30-V-2AP4-15**
					230 V AC	**1491992**	**VZWD-L-M22C-M-G18-30-V-3AP4-15**
		4	0 ... 8	550	110 V AC	**1491915**	**VZWD-L-M22C-M-G18-40-V-2AP4-8**
					230 V AC	**1491993**	**VZWD-L-M22C-M-G18-40-V-3AP4-8**

Ordering data

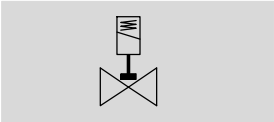
	Process valve connection	Nominal size DN	Medium pressure[1] [bar]	Product weight [g]	Operating voltage	Brass housing Part No.	Type
	G 1/8	5	0 ... 5	600	24 V DC	**1491838**	**VZWD-L-M22C-M-G18-50-V-1P4-5**
					110 V AC	**1491916**	**VZWD-L-M22C-M-G18-50-V-2AP4-5**
					230 V AC	**1491994**	**VZWD-L-M22C-M-G18-50-V-3AP4-5**
		6	0 ... 4	600	24 V DC	**1491839**	**VZWD-L-M22C-M-G18-60-V-1P4-4**
					110 V AC	**1491917**	**VZWD-L-M22C-M-G18-60-V-2AP4-4**
					230 V AC	**1491995**	**VZWD-L-M22C-M-G18-60-V-3AP4-4**

1) The valves are suitable for vacuum with Pabs > 100 mbar. Please ensure the direction of flow corresponds to the direction of the arrow.

Solenoid valves VZWD, directly actuated

Technical data – Stainless steel housing, nominal pressure PN 100

Function



- Flow rate Kv
  0.06 ... 0.4 m^3/h

- Connecting thread
  G 1/4, G 1/8

General technical data									
Nominal size (DN)		1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0
Valve function		2/2-way, single solenoid, closed							
Design		Directly actuated poppet valve							
Type of mounting		In-line installation							
Actuation type		Electric							
Reset method		Mechanical spring							
Type of control		Direct							
Manual override		None							
Mounting position		Any							
Sealing principle		Soft							
Direction of flow		Non-reversible							
Max. viscosity	[mm^2/s]	22							
Protection class		IP65							

Operating and environmental conditions									
Nominal size (DN)		1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0
Standard nominal flow rate	[l/min]	60	95	140	170	210	310	375	430
Flow rate Kv	[m^3/h]	0.06	0.09	0.13	0.16	0.2	0.3	0.35	0.4
Process valve nominal pressure (PN)		100							
Medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]							
		Inert gases							
		Mineral oil							
		Neutral liquids							
		Water							
		Further media upon request							
Pressure differential	[bar]	0							
Ambient temperature	[°C]	–10 ... +35 °C							
Temperature of medium	[°C]	–10 ... +80 °C							
Leak rate to EN 12266-1		A							
Corrosion resistance class CRC[1)]		3							

1) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Technical data – Stainless steel housing, nominal pressure PN 100

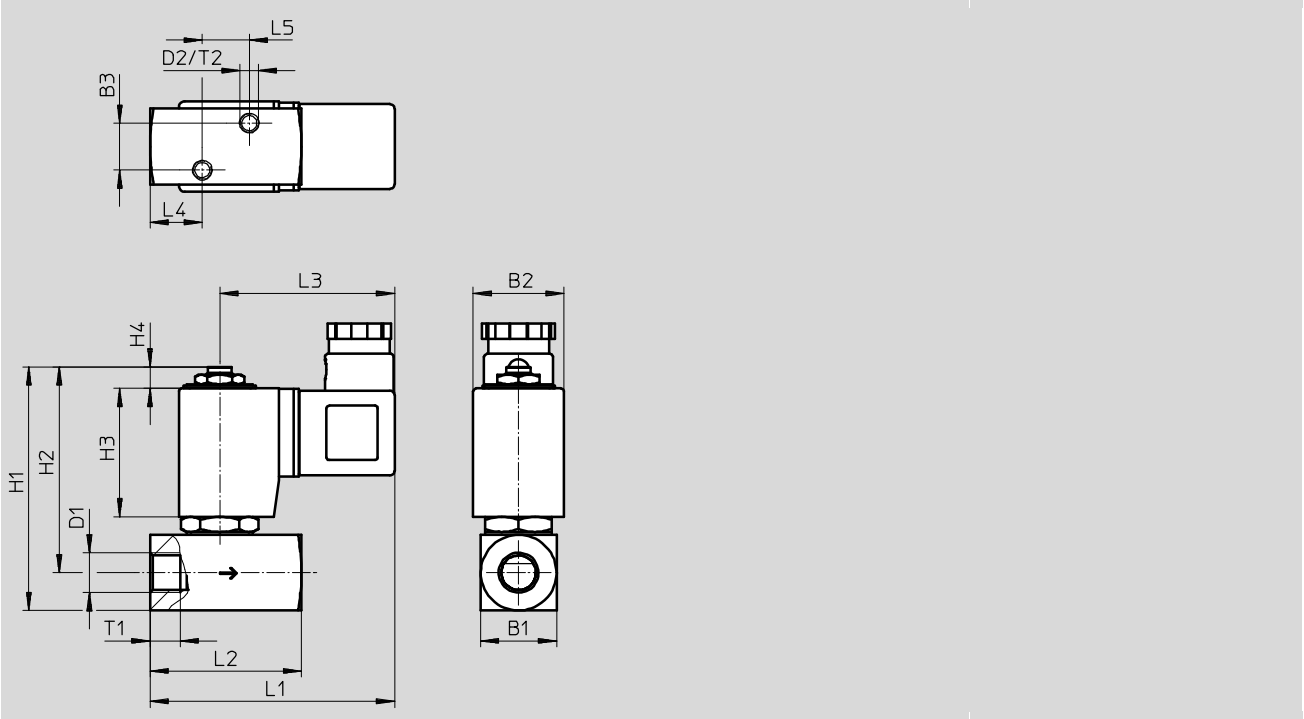
Electrical data					
Operating voltage			24 V DC	110 V AC	230 V AC
Electrical connection			Plug to EN 175301-803 type A, square design		
CE marking			–	73/23/EEC	73/23/EEC
Insulation class			H	F	F
Duty cycle		[%]	100		
Permissible voltage fluctuations		[%]	±10		
Switching time on		[ms]	20		
Switching time off		[ms]	18		
Coil characteristics					
Direct current DC		[V]	24	–	–
Alternating current AC		[V]	–	110	230
Power consumption	VACS-H0P	[W]	6.8	–	–
solenoid coil type	VACS-H1P	[W]	11	–	–
Switching power	VACS-H0P	[VA]	–	10.5	10.5
solenoid coil type	VACS-H1P	[VA]	–	19	18
Holding power	VACS-H0P	[VA]	–	8	7.6
solenoid coil type	VACS-H1P	[VA]	–	16	15
		[Hz]	–	50, 60	50, 60

Materials		
Solenoid valves		Material number
Housing	High-alloy stainless steel	1.4305
Seals	FPM	
Note on materials	Contains PWIS (paint-wetting impairment substances)	
	RoHS-compliant	

Solenoid valves VZWD, directly actuated

Technical data – Stainless steel housing, nominal pressure PN 100

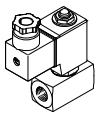
Dimensions Download CAD data ➔ **www.festo.com**



Type	B1	B2	B3	D1	D2	H1	H2	H3	H4	L1	L2	L3	L4	L5	T1	T2
VZWD-...-G1/8-50-...-5	25	30	15.5	G 1/8	M6	81	68	42.5	7	78	40	58	12	15.5	8	6
VZWD-...-G1/8-60-...-4																
VZWD-...-G1/4-50-...-5	25	30	15.5	G 1/4	M6	81	68	42.5	7	85	50	58	17	15.5	10	6
VZWD-...-G1/4-60-...-4																

Technical data – Stainless steel housing, nominal pressure PN 100

Ordering data – Solenoid valve VZWD

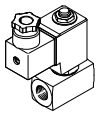
	Process valve connection	Nominal size DN	Medium pressure[1] [bar]	Product weight [g]	Operating voltage	Stainless steel casting housing Part No.	Type
	G 1/4	1	0 ... 90	650	24 V DC	**1491856**	**VZWD-L-M22C-M-G14-10-V-1P4-90-R1**
					110 V AC	**1491934**	**VZWD-L-M22C-M-G14-10-V-2AP4-90-R1**
					230 V AC	**1492012**	**VZWD-L-M22C-M-G14-10-V-3AP4-90-R1**
		1.5	0 ... 85	650	24 V DC	**1491857**	**VZWD-L-M22C-M-G14-10-V-1P4-90-R1**
					110 V AC	**1491935**	**VZWD-L-M22C-M-G14-15-V-2AP4-85-R1**
					230 V AC	**1492013**	**VZWD-L-M22C-M-G14-15-V-3AP4-85-R1**
		2	0 ... 40	650	24 V DC	**1491858**	**VZWD-L-M22C-M-G14-20-V-1P4-40-R1**
					110 V AC	**1491936**	**VZWD-L-M22C-M-G14-20-V-2AP4-40-R1**
					230 V AC	**1492014**	**VZWD-L-M22C-M-G14-20-V-3AP4-40-R1**
		2.5	0 ... 22	650	24 V DC	**1491859**	**VZWD-L-M22C-M-G14-25-V-1P4-22-R1**
					110 V AC	**1491937**	**VZWD-L-M22C-M-G14-25-V-2AP4-22-R1**
					230 V AC	**1492015**	**VZWD-L-M22C-M-G14-25-V-3AP4-22-R1**
		3	0 ... 15	650	24 V DC	**1491860**	**VZWD-L-M22C-M-G14-30-V-1P4-15-R1**
					110 V AC	**1491938**	**VZWD-L-M22C-M-G14-30-V-2AP4-15-R1**
					230 V AC	**1492016**	**VZWD-L-M22C-M-G14-30-V-3AP4-15-R1**
		4	0 ... 8	650	24 V DC	**1491861**	**VZWD-L-M22C-M-G14-40-V-1P4-8-R1**
					110 V AC	**1491939**	**VZWD-L-M22C-M-G14-40-V-2AP4-8-R1**
					230 V AC	**1492017**	**VZWD-L-M22C-M-G14-40-V-3AP4-8-R1**
		5	0 ... 5	650	24 V DC	**1491862**	**VZWD-L-M22C-M-G14-50-V-1P4-5-R1**
					110 V AC	**1491940**	**VZWD-L-M22C-M-G14-50-V-2AP4-5-R1**
					230 V AC	**1492018**	**VZWD-L-M22C-M-G14-50-V-3AP4-5-R1**
		6	0 ... 4	650	24 V DC	**1491863**	**VZWD-L-M22C-M-G14-60-V-1P4-4-R1**
					110 V AC	**1491941**	**VZWD-L-M22C-M-G14-60-V-2AP4-4-R1**
					230 V AC	**1492019**	**VZWD-L-M22C-M-G14-60-V-3AP4-4-R1**

1) The valves are suitable for vacuum with Pabs > 100 mbar. Please ensure the direction of flow corresponds to the direction of the arrow.

Solenoid valves VZWD, directly actuated

Technical data – Stainless steel housing, nominal pressure PN 100

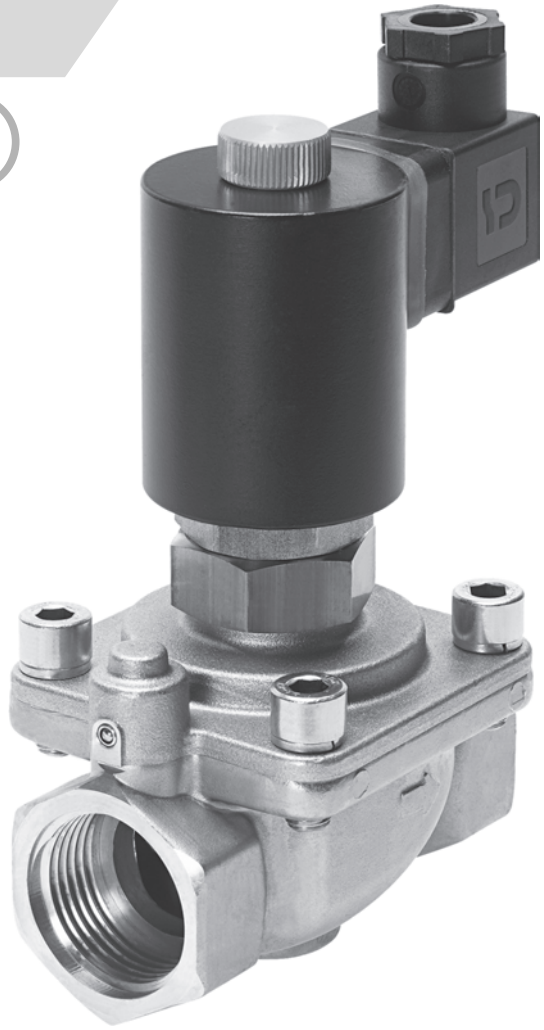
Ordering data – Solenoid valve VZWD

	Process valve connection	Nominal size DN	Medium pressure[1] [bar]	Product weight [g]	Operating voltage	Stainless steel casting housing Part No.	Type
	G 1/8	1	0 ... 90	500	24 V DC	**1491848**	**VZWD-L-M22C-M-G18-10-V-1P4-90-R1**
					110 V AC	**1491926**	**VZWD-L-M22C-M-G18-10-V-2AP4-90-R1**
					230 V AC	**1492004**	**VZWD-L-M22C-M-G18-10-V-3AP4-90-R1**
		1.5	0 ... 85	500	24 V DC	**1491849**	**VZWD-L-M22C-M-G18-15-V-1P4-85-R1**
					110 V AC	**1491927**	**VZWD-L-M22C-M-G18-15-V-2AP4-85-R1**
					230 V AC	**1492005**	**VZWD-L-M22C-M-G18-15-V-3AP4-85-R1**
		2	0 ... 40	500	24 V DC	**1491850**	**VZWD-L-M22C-M-G18-20-V-1P4-40-R1**
					110 V AC	**1491928**	**VZWD-L-M22C-M-G18-20-V-2AP4-40-R1**
					230 V AC	**1492006**	**VZWD-L-M22C-M-G18-20-V-3AP4-40-R1**
		2.5	0 ... 22	500	24 V DC	**1491851**	**VZWD-L-M22C-M-G18-25-V-1P4-22-R1**
					110 V AC	**1491929**	**VZWD-L-M22C-M-G18-25-V-2AP4-22-R1**
					230 V AC	**1492007**	**VZWD-L-M22C-M-G18-25-V-3AP4-22-R1**
		3	0 ... 15	500	24 V DC	**1491852**	**VZWD-L-M22C-M-G18-30-V-1P4-15-R1**
					110 V AC	**1491930**	**VZWD-L-M22C-M-G18-30-V-2AP4-15-R1**
					230 V AC	**1492008**	**VZWD-L-M22C-M-G18-30-V-3AP4-15-R1**
		4	0 ... 8	500	24 V DC	**1491853**	**VZWD-L-M22C-M-G18-40-V-1P4-8-R1**
					110 V AC	**1491931**	**VZWD-L-M22C-M-G18-40-V-2AP4-8-R1**
					230 V AC	**1492009**	**VZWD-L-M22C-M-G18-40-V-3AP4-8-R1**
		5	0 ... 5	500	24 V DC	**1491854**	**VZWD-L-M22C-M-G18-50-V-1P4-5-R1**
					110 V AC	**1491932**	**VZWD-L-M22C-M-G18-50-V-2AP4-5-R1**
					230 V AC	**1492010**	**VZWD-L-M22C-M-G18-50-V-3AP4-5-R1**
		6	0 ... 4	500	24 V DC	**1491855**	**VZWD-L-M22C-M-G18-60-V-1P4-4-R1**
					110 V AC	**1491933**	**VZWD-L-M22C-M-G18-60-V-2AP4-4-R1**
					230 V AC	**1492011**	**VZWD-L-M22C-M-G18-60-V-3AP4-4-R1**

1) The valves are suitable for vacuum with Pabs > 100 mbar. Please ensure the direction of flow corresponds to the direction of the arrow.

Solenoid valves, force pilot operated

VZWF ★



Overview, configuration and ordering
➔ **www.festo.com/catalogue/vzwf**

Additional information, support and user documentation
➔ **www.festo.com/sp/vzwf**

★ Quick ordering of basic designs
➔ page 710

- + Connection 1/4", 3/8", 1/2", 3/4", 1", 1 1/4", 1 1/2", 2"
- + G thread
- + Operating pressure 0 ... 10 bar
- + Electrical actuation
- + Voltage 24 V DC, 110 V AC, 230 V AC
- + 2/2-way diaphragm valve (NC), force pilot operated
- + Suitable for closed applications such as cooling or filling systems
- + Suitable for vacuum
- + Sealing material NBR, EPDM, FKM

Solenoid valves VZWF, force pilot operated

Key features and overview

Function

Normally closed solenoid valve with diaphragm and forced lifting. When the solenoid is energised, the differential pressure from the secondary side of the diaphragm is reduced via the servo hole. The effective differential pressure lifts the diaphragm away from the valve seat. If there is no differential pressure, the diaphragm is lifted directly by the solenoid. The valve opens and closes without a differential pressure between the inlet and outlet.

General

- Connecting thread G1/4 ... G2
- Flow rate Kv 1.8 ... 28 m^3/h

Application

- Suitable for closed applications such as cooling or filling systems
- Vacuum
- Liquid gas
- Bottling systems

Design

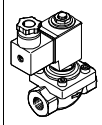
- Diaphragm valves
- Forced lifting of the valve diaphragm
- 2/2-way valve, normally closed

Advantages

- Choice of sealing materials for different fields of applications
- Medium pressure 0 bar or higher

Note

The valves are suitable for vacuum with Pabs > 100 mbar. Please ensure the direction of flow corresponds to the direction of the arrow.

Version	Type	Process valve connection	Nominal size (DN)	Process valve nominal pressure (PN)	➔ Page/Internet
	VZWF-...	G1/4	13.5	40	708
		G3/8	13.5		
		G1/2	13.5		
		G3/4	27.5		
		G1	27.5		
	VZWF-...	G1 1/4	40	40	712
		G1 1/2	40		
		G2	50		

Type codes

VZWF – B – L – M22C – G14 – 135 – V – 2AP4 – 10 – R1

Type	
VZWF	Solenoid valve, force pilot operated

Product version	
–	Standard
B	Optimised function

Type of directional control valve	
L	In-line valve

Valve function	
M22C	2/2-way valve, normally closed

Process valve connection	
G14	Thread G1/4
G38	Thread G3/8
G12	Thread G1/2
G34	Thread G3/4
G1	Thread G1
G114	Thread G1 1/4
G112	Thread G1 1/2
G2	Thread G2

Nominal size (DN)	
135	13.5 mm
275	27.5 mm
400	40 mm
500	50 mm

Sealing material	
–	Standard (NBR)
E	EPDM
V	FPM

Nominal operating voltage	
1	24 V DC
2A	110 V AC/50-60 Hz
3A	230 V AC/50-60 Hz

Electrical connection	
P4	Plug socket, 3-pin

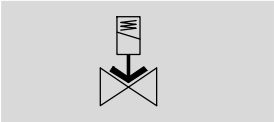
Medium pressure	
6	Max. 6 bar
10	Max. 10 bar

Corrosion protection	
–	Standard (brass)
R1	Stainless steel

Solenoid valves VZWF, force pilot operated

Technical data – Connecting thread G1/4 ... G1

Function



- Flow rate Kv
  1.8 ... 11 m^3/h

- Connecting thread
  G1/4 ... G1

General technical data						
Process valve connection		G1/4	G3/8	G1/2	G3/4	G1
Nominal size (DN)		13.5	13.5	13.5	27.5	27.5
Valve function		2/2-way, single solenoid, closed				
Design		Diaphragm valve, force pilot operated				
Type of mounting		In-line installation				
Actuation type		Electric				
Manual override		None				
Mounting position		Solenoid vertical				
Sealing principle		Soft				
Direction of flow		Non-reversible				
Max. viscosity	[mm^2/s]	22				
Protection class		IP 65				
Product weight	[g]	1000			1500	

Technical data – Connecting thread G1/4 ... G1

Operating and environmental conditions						
Process valve connection		G1/4	G3/8	G1/2	G3/4	G1
Switching time on	[ms]	130			275	
Switching time off	[ms]	180			290	
Standard nominal flow rate	[l/min]	1920	2350	2660	8020	11750
Flow rate	[m^3/h]	1.8	2.2	2.5	7.5	11
Process valve nominal pressure (PN)		40				
Differential pressure	[bar]	0				
Medium pressure[2)]	[bar]	0 ... 10			0 ... 6	
Medium		Compressed air in accordance with ISO 8573-1:2010 [7:–:–]				
		Inert gases				
		Mineral oil				
		Water				
		Neutral liquids				
		Further media upon request				
Ambient temperature	[°C]	–10 ... +35 °C				
Temperature of medium	[°C]	–10 ... +80 °C				
Leak rate to EN 12266-1		A				
Corrosion resistance class CRC[1)] Stainless steel		3				

1) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

2) The valves are suitable for vacuum with Pabs > 100 mbar. Please ensure the direction of flow corresponds to the direction of the arrow.

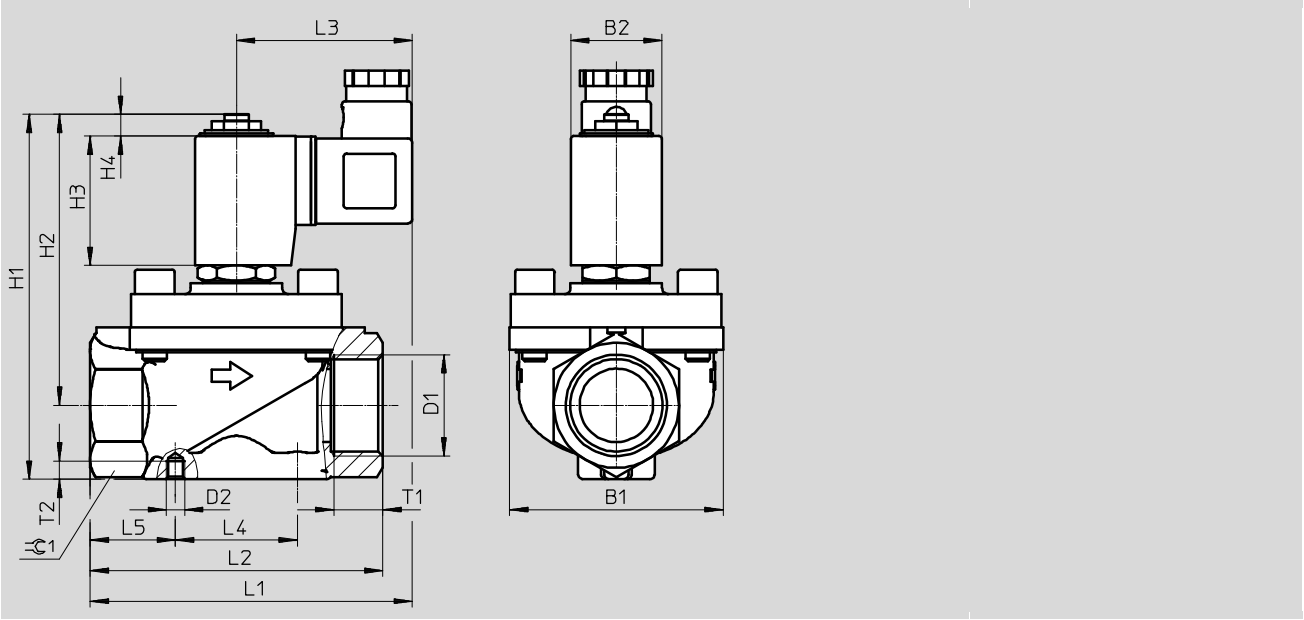
Materials		
Solenoid valves		Material number
Housing	Brass casting	CW617N
	Stainless steel casting	1.4581
Screws	High-alloy stainless steel	1.4301
Seals	NBR	–
	FPM	–
	EPDM	–
Note on materials	Contains PWIS (paint-wetting impairment substances)	
	RoHS-compliant	

Electrical data				
		VZWF- ... 1	VZWF- ... 2A	VZWF- ... 3A
Electrical connection		Plug to EN 175301-803 type A, square design		
CE mark as per EU Pressure Equipment Directive		–	Yes	Yes
Coil characteristics				
Direct current DC	[V]	24	–	–
Alternating current AC	[V]	–	110	230
	[W]	11	–	–
Switching power	[VA]	–	19	18
Holding power	[VA]	–	16	15
	[Hz]	–	50, 60	50, 60
Permissible voltage fluctuations	[%]	±10		

Solenoid valves VZWF, force pilot operated

Technical data – Connecting thread G1/4 ... G1

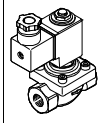
Dimensions Download CAD data ➔ **www.festo.com**



	B1	B2	D1	D2	H1	H2	H3	H4	L1	L2	L3	L4	L5	T1	T2	⌀
VZWF-B-L-M22C-G14-135-...	48	30	G1/4	M4	101	86	42	7	92	67	58	25	21	12	4	27
VZWF-B-L-M22C-G14-135-...-R1	44	30	G1/4	M4	101	86	42	7	94	67	58	25	21	12	4	27
VZWF-B-L-M22C-G38-135-...	48	30	G3/8	M4	101	86	42	7	92	67	58	25	21	12	4	27
VZWF-B-L-M22C-G38-135-...-R1	44	30	G3/8	M4	101	86	42	7	94	67	58	25	21	12	4	27
VZWF-B-L-M22C-G12-135-...	48	30	G1/2	M4	101	86	42	7	92	67	58	25	21	12	4	27
VZWF-B-L-M22C-G12-135-...-R1	44	30	G1/2	M4	101	86	42	7	94	67	58	25	21	12	4	27
VZWF-B-L-M22C-G34-275-...	70	30	G3/4	M6	120	96	42	7	106	96	58	40	28	16	6	41
VZWF-B-L-M22C-G1-275-...	70	30	G1	M6	120	96	42	7	106	96	58	40	28	16	6	41

★ Core product range

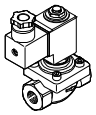
Ordering data – Solenoid valve VZWF

	Process valve connection	Brass housing Part No.	Type
	G1/4	★ **1492110**	**VZWF-B-L-M22C-G14-135-1P4-10**
	G3/8	★ **1492111**	**VZWF-B-L-M22C-G38-135-1P4-10**
	G1/2	★ **1492112**	**VZWF-B-L-M22C-G12-135-1P4-10**
	G3/4	★ **1492113**	**VZWF-B-L-M22C-G34-275-1P4-6**
	G1	★ **1492114**	**VZWF-B-L-M22C-G1-275-1P4-6**

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Technical data – Connecting thread G1/4 ... G1

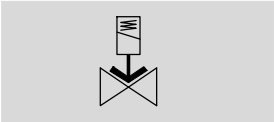
Ordering data – Solenoid valve VZWF

	Process valve connection	Brass housing		Stainless steel casting housing	
		Part No.	Type	Part No.	Type
	G1/4	1492126	VZWF-B-L-M22C-G14-135-E-1P4-10	1492118	VZWF-B-L-M22C-G14-135-1P4-10-R1
		1492142	VZWF-B-L-M22C-G14-135-V-1P4-10	1492134	VZWF-B-L-M22C-G14-135-E-1P4-10-R1
		1492206	VZWF-B-L-M22C-G14-135-2AP4-10	1492150	VZWF-B-L-M22C-G14-135-V-1P4-10-R1
		1492222	VZWF-B-L-M22C-G14-135-E-2AP4-10	1492214	VZWF-B-L-M22C-G14-135-2AP4-10-R1
		1492238	VZWF-B-L-M22C-G14-135-V-2AP4-10	1492230	VZWF-B-L-M22C-G14-135-E-2AP4-10-R1
		1492302	VZWF-B-L-M22C-G14-135-3AP4-10	1492246	VZWF-B-L-M22C-G14-135-V-2AP4-10-R1
		1492318	VZWF-B-L-M22C-G14-135-E-3AP4-10	1492310	VZWF-B-L-M22C-G14-135-3AP4-10-R1
		1492334	VZWF-B-L-M22C-G14-135-V-3AP4-10	1492326	VZWF-B-L-M22C-G14-135-E-3AP4-10-R1
				1492342	VZWF-B-L-M22C-G14-135-V-3AP4-10-R1
	G3/8	1492127	VZWF-B-L-M22C-G38-135-E-1P4-10	1492119	VZWF-B-L-M22C-G38-135-1P4-10-R1
		1492143	VZWF-B-L-M22C-G38-135-V-1P4-10	1492135	VZWF-B-L-M22C-G38-135-E-1P4-10-R1
		1492207	VZWF-B-L-M22C-G38-135-2AP4-10	1492151	VZWF-B-L-M22C-G38-135-V-1P4-10-R1
		1492223	VZWF-B-L-M22C-G38-135-E-2AP4-10	1492215	VZWF-B-L-M22C-G38-135-2AP4-10-R1
		1492239	VZWF-B-L-M22C-G38-135-V-2AP4-10	1492231	VZWF-B-L-M22C-G38-135-E-2AP4-10-R1
		1492303	VZWF-B-L-M22C-G38-135-3AP4-10	1492247	VZWF-B-L-M22C-G38-135-V-2AP4-10-R1
		1492319	VZWF-B-L-M22C-G38-135-E-3AP4-10	1492311	VZWF-B-L-M22C-G38-135-3AP4-10-R1
		1492335	VZWF-B-L-M22C-G38-135-V-3AP4-10	1492327	VZWF-B-L-M22C-G38-135-E-3AP4-10-R1
				1492343	VZWF-B-L-M22C-G38-135-V-3AP4-10-R1
	G1/2	1492128	VZWF-B-L-M22C-G12-135-E-1P4-10	1492120	VZWF-B-L-M22C-G12-135-1P4-10-R1
		1492144	VZWF-B-L-M22C-G12-135-V-1P4-10	1492136	VZWF-B-L-M22C-G12-135-E-1P4-10-R1
		1492208	VZWF-B-L-M22C-G12-135-2AP4-10	1492152	VZWF-B-L-M22C-G12-135-V-1P4-10-R1
		1492224	VZWF-B-L-M22C-G12-135-E-2AP4-10	1492216	VZWF-B-L-M22C-G12-135-2AP4-10-R1
		1492240	VZWF-B-L-M22C-G12-135-V-2AP4-10	1492232	VZWF-B-L-M22C-G12-135-E-2AP4-10-R1
		1492304	VZWF-B-L-M22C-G12-135-3AP4-10	1492248	VZWF-B-L-M22C-G12-135-V-2AP4-10-R1
		1492320	VZWF-B-L-M22C-G12-135-E-3AP4-10	1492312	VZWF-B-L-M22C-G12-135-3AP4-10-R1
		1492336	VZWF-B-L-M22C-G12-135-V-3AP4-10	1492328	VZWF-B-L-M22C-G12-135-E-3AP4-10-R1
				1492344	VZWF-B-L-M22C-G12-135-V-3AP4-10-R1
	G3/4	1492129	VZWF-B-L-M22C-G34-275-E-1P4-6	1492121	VZWF-B-L-M22C-G34-275-1P4-6-R1
		1492145	VZWF-B-L-M22C-G34-275-V-1P4-6	1492137	VZWF-B-L-M22C-G34-275-E-1P4-6-R1
		1492209	VZWF-B-L-M22C-G34-275-2AP4-6	1492153	VZWF-B-L-M22C-G34-275-V-1P4-6-R1
		1492225	VZWF-B-L-M22C-G34-275-E-2AP4-6	1492217	VZWF-B-L-M22C-G34-275-2AP4-6-R1
		1492241	VZWF-B-L-M22C-G34-275-V-2AP4-6	1492233	VZWF-B-L-M22C-G34-275-E-2AP4-6-R1
		1492305	VZWF-B-L-M22C-G34-275-3AP4-6	1492249	VZWF-B-L-M22C-G34-275-V-2AP4-6-R1
		1492321	VZWF-B-L-M22C-G34-275-E-3AP4-6	1492313	VZWF-B-L-M22C-G34-275-3AP4-6-R1
		1492337	VZWF-B-L-M22C-G34-275-V-3AP4-6	1492329	VZWF-B-L-M22C-G34-275-E-3AP4-6-R1
				1492345	VZWF-B-L-M22C-G34-275-V-3AP4-6-R1
	G1	1492130	VZWF-B-L-M22C-G1-275-E-1P4-6	1492122	VZWF-B-L-M22C-G1-275-1P4-6-R1
		1492146	VZWF-B-L-M22C-G1-275-V-1P4-6	1492138	VZWF-B-L-M22C-G1-275-E-1P4-6-R1
		1492210	VZWF-B-L-M22C-G1-275-2AP4-6	1492154	VZWF-B-L-M22C-G1-275-V-1P4-6-R1
		1492226	VZWF-B-L-M22C-G1-275-E-2AP4-6	1492218	VZWF-B-L-M22C-G1-275-2AP4-6-R1
		1492242	VZWF-B-L-M22C-G1-275-V-2AP4-6	1492234	VZWF-B-L-M22C-G1-275-E-2AP4-6-R1
		1492306	VZWF-B-L-M22C-G1-275-3AP4-6	1492250	VZWF-B-L-M22C-G1-275-V-2AP4-6-R1
		1492322	VZWF-B-L-M22C-G1-275-E-3AP4-6	1492314	VZWF-B-L-M22C-G1-275-3AP4-6-R1
		1492338	VZWF-B-L-M22C-G1-275-V-3AP4-6	1492330	VZWF-B-L-M22C-G1-275-E-3AP4-6-R1
				1492346	VZWF-B-L-M22C-G1-275-V-3AP4-6-R1

Solenoid valves VZWF, force pilot operated

Technical data – Connecting thread G1 1/4 ... G2

Function



- Connecting thread G1 1/4 ... G2

- Flow rate Kv 20 ... 28 m^3/h

General technical data				
Process valve connection		G1 1/4	G1 1/2	G2
Nominal size (DN)		40	40	50
Valve function		2/2-way, single solenoid, closed		
Design		Diaphragm valve, force pilot operated		
Type of mounting		In-line installation		
Actuation type		Electric		
Manual override		None		
Mounting position		Solenoid vertical		
Sealing principle		Soft		
Direction of flow		Non-reversible		
Max. viscosity	[mm^2/s]	22		
Protection class		IP 65		
Product weight	[g]	4500		6500

Technical data – Connecting thread G1 ¼ ... G2

Operating and environmental conditions				
Process valve connection		G1 1/4	G1 1/2	G2
Switching time on	[ms]	620		1220
Switching time off	[ms]	1140		2140
Standard nominal flow rate	[l/min]	21370	23500	29900
Flow rate	[m^3/h]	20	22.5	28
Process valve nominal pressure (PN)		40		
Differential pressure	[bar]	0		
Medium pressure[2)]	[bar]	0 ... 10		0 ... 6
Medium		Compressed air in accordance with ISO 8573-1:2010 [7:–:–]		
		Inert gases		
		Mineral oil		
		Water		
		Neutral liquids		
		Further media upon request		
Ambient temperature	[°C]	–10 ... +35 °C		
Temperature of medium	[°C]	–10 ... +80 °C		
Leak rate to EN 12266-1		A		
Corrosion resistance class CRC[1)] Stainless steel		3		

1) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

2) The valves are suitable for vacuum with Pabs > 100 mbar. Please ensure the direction of flow corresponds to the direction of the arrow.

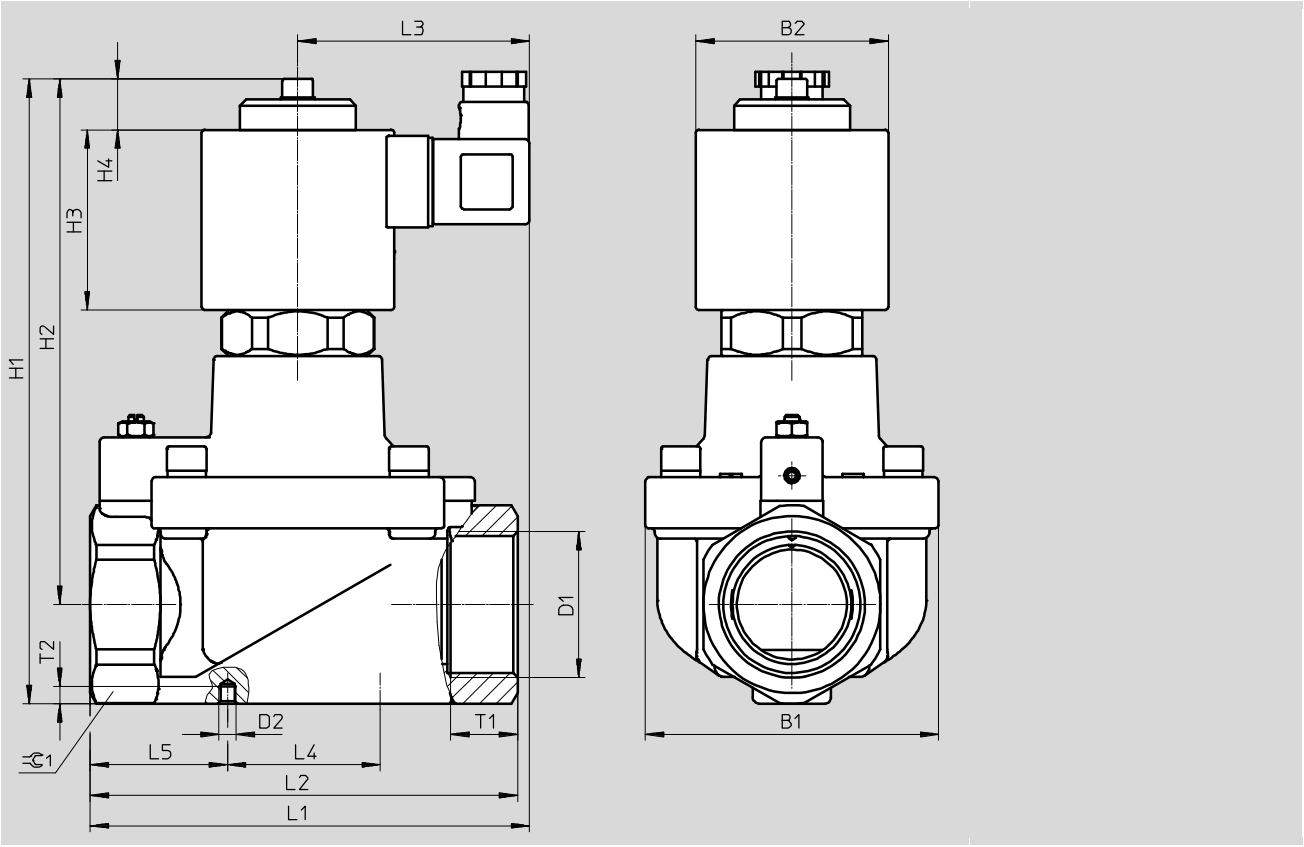
Materials		
Solenoid valves		Material number
Housing	Brass casting	CW617N
	Stainless steel casting	1.4581
Screws	High-alloy stainless steel	1.4301
Seals	NBR	–
	FPM	–
	EPDM	–
Note on materials	Contains PWIS (paint-wetting impairment substances)	
	RoHS-compliant	

Solenoid valves VZWF, force pilot operated

Technical data – Connecting thread G1 1/4 ... G2

Electrical data				
		VZWF- ... 1	VZWF- ... 2A	VZWF- ... 3A
Electrical connection		Plug to EN 175301-803 type A, square design		
CE mark as per EU Pressure Equipment Directive		–	Yes	Yes
Coil characteristics				
Direct current DC	[V]	24	–	–
Alternating current AC	[V]	–	110	230
	[W]	30	–	–
Switching power	[VA]	–	30	30
Holding power	[VA]	–	30	30
	[Hz]	–	50, 60	50, 60
Permissible voltage fluctuations	[%]	±10		

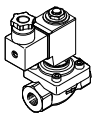
Dimensions Download CAD data ➔ **www.festo.com**



	B1	B2	D1	D2	H1	H2	H3	H4	L1	L2	L3	L4	L5	T1	T2	⌀
VZWF-L-M22C-G114-400-...	96	63	G1 1/4	–	205	173	59	17	148	140	76	–	–	22	–	58
VZWF-L-M22C-G112-400-...	96	63	G1 1/2	–	205	173	59	17	148	140	76	–	–	22	–	58
VZWF-L-M22C-G2-500-...	112	63	G2	M6	218	179	59	17	159	168	76	60	55	25	6	70

Technical data – Connecting thread G1 1/4 ... G2

Ordering data – Solenoid valve VZWF

	Process valve connection	Brass housing		Stainless steel casting housing	
		Part No.	Type	Part No.	Type
	G1 1/4	**1492115**	**VZWF-L-M22C-G114-400-1P4-10**	**1492123**	**VZWF-L-M22C-G114-400-1P4-10-R1**
		1492131	**VZWF-L-M22C-G114-400-E-1P4-10**	**1492139**	**VZWF-L-M22C-G114-400-E-1P4-10-R1**
		1492147	**VZWF-L-M22C-G114-400-V-1P4-10**	**1492155**	**VZWF-L-M22C-G114-400-V-1P4-10-R1**
		1492211	**VZWF-L-M22C-G114-400-2AP4-10**	**1492219**	**VZWF-L-M22C-G114-400-2AP4-10-R1**
		1492227	**VZWF-L-M22C-G114-400-E-2AP4-10**	**1492235**	**VZWF-L-M22C-G114-400-E-2AP4-10-R1**
		1492243	**VZWF-L-M22C-G114-400-V-2AP4-10**	**1492251**	**VZWF-L-M22C-G114-400-V-2AP4-10-R1**
		1492307	**VZWF-L-M22C-G114-400-3AP4-10**	**1492315**	**VZWF-L-M22C-G114-400-3AP4-10-R1**
		1492323	**VZWF-L-M22C-G114-400-E-3AP4-10**	**1492331**	**VZWF-L-M22C-G114-400-E-3AP4-10-R1**
		1492339	**VZWF-L-M22C-G114-400-V-3AP4-10**	**1492347**	**VZWF-L-M22C-G114-400-V-3AP4-10-R1**
	G1 1/4	**1492116**	**VZWF-L-M22C-G112-400-1P4-10**	**1492124**	**VZWF-L-M22C-G112-400-1P4-10-R1**
		1492132	**VZWF-L-M22C-G112-400-E-1P4-10**	**1492140**	**VZWF-L-M22C-G112-400-E-1P4-10-R1**
		1492148	**VZWF-L-M22C-G112-400-V-1P4-10**	**1492156**	**VZWF-L-M22C-G112-400-V-1P4-10-R1**
		1492212	**VZWF-L-M22C-G112-400-2AP4-10**	**1492220**	**VZWF-L-M22C-G112-400-2AP4-10-R1**
		1492228	**VZWF-L-M22C-G112-400-E-2AP4-10**	**1492236**	**VZWF-L-M22C-G112-400-E-2AP4-10-R1**
		1492244	**VZWF-L-M22C-G112-400-V-2AP4-10**	**1492252**	**VZWF-L-M22C-G112-400-V-2AP4-10-R1**
		1492308	**VZWF-L-M22C-G112-400-3AP4-10**	**1492316**	**VZWF-L-M22C-G112-400-3AP4-10-R1**
		1492324	**VZWF-L-M22C-G112-400-E-3AP4-10**	**1492332**	**VZWF-L-M22C-G112-400-E-3AP4-10-R1**
		1492340	**VZWF-L-M22C-G112-400-V-3AP4-10**	**1492348**	**VZWF-L-M22C-G112-400-V-3AP4-10-R1**
	G2	**1492117**	**VZWF-L-M22C-G2-500-1P4-6**	**1492125**	**VZWF-L-M22C-G2-500-1P4-6-R1**
		1492133	**VZWF-L-M22C-G2-500-E-1P4-6**	**1492141**	**VZWF-L-M22C-G2-500-E-1P4-6-R1**
		1492149	**VZWF-L-M22C-G2-500-V-1P4-6**	**1492157**	**VZWF-L-M22C-G2-500-V-1P4-6-R1**
		1492213	**VZWF-L-M22C-G2-500-2AP4-6**	**1492221**	**VZWF-L-M22C-G2-500-2AP4-6-R1**
		1492229	**VZWF-L-M22C-G2-500-E-2AP4-6**	**1492237**	**VZWF-L-M22C-G2-500-E-2AP4-6-R1**
		1492245	**VZWF-L-M22C-G2-500-V-2AP4-6**	**1492253**	**VZWF-L-M22C-G2-500-V-2AP4-6-R1**
		1492309	**VZWF-L-M22C-G2-500-3AP4-6**	**1492317**	**VZWF-L-M22C-G2-500-3AP4-6-R1**
		1492325	**VZWF-L-M22C-G2-500-E-3AP4-6**	**1492333**	**VZWF-L-M22C-G2-500-E-3AP4-6-R1**
		1492341	**VZWF-L-M22C-G2-500-V-3AP4-6**	**1492349**	**VZWF-L-M22C-G2-500-V-3AP4-6-R1**

Solenoid valves
VZWM-L ★

Overview, configuration and ordering
➔ **www.festo.com/catalogue/vzwm**

Additional information, support and user documentation
➔ **www.festo.com/sp/vzwm**

★ Quick ordering of basic designs
➔ page 723

+ Connection G1/4...G2, also available with NPT thread
+ Flow rate KV 1400 ... 31,000 l/min
+ Electrically actuated, piloted, pneumatic spring return
+ For controlling gaseous and liquid media
+ In-line mounting
+ Brass or stainless steel housing

Solenoid valves VZWM-L

Key features and type codes

Brief description

- Indirectly controlled poppet valve with diaphragm control
- Connection, valve G14 ... G2
- Flow rate 1400 ... 31000 l/min
- Available in brass or stainless steel casting
- Varied range of coils

VZWM	–	L	–	M22C	–	G14	–	F4	–	

Type	
VZWM	Solenoid valve, process directional control valve

Design	
L	In-line valve

Valve function	
M22C	2/2-way valve, normally closed

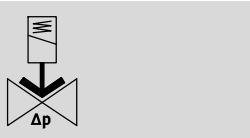
Connection, valve	
G14	G 1/4
G38	G 3/8
G12	G 1/2
G34	G 3/4
G1	G 1
G114	G 1 1/4
G112	G 1 1/2
G2	G 2

Electrical connection	
F4	With armature tube for solenoid coil MD-2- ... -PA
F5	With armature tube for solenoid coil MH-2- ... -PA

Housing material	
R1	Stainless steel casting
	Brass

Technical data

Function



Flow rate
1400 ... 31000 l/min

Voltage
24 V DC
110/230 V AC

General technical data

Connection, valve			G 1/4	G 3/8	G 1/2	G 3/4	G 1	G 1 1/4	G 1 1/2	G 2
Nominal size DN (housing: brass)		[mm]	13.5	13.5	13.5	27.5	27.5	40	40	50
Nominal size DN (housing: stainless steel casting)		[mm]	13	13	13	25	25	40	40	50
Valve function			2/2, single solenoid							
Constructional design			Poppet valve with diaphragm control							
Sealing principle			Soft							
Actuation type			Electrical							
Reset method			Pneumatic spring							
Control type			Piloted							
Direction of flow			Non-reversible							
Exhaust function			No flow control							
Manual override			None							
Type of mounting			In-line installation							
Mounting position			Preferably vertical							
Standard nominal flow rate		[l/min]	1400	2100	2400	10000	11700	24000	26400	31000
Flow rate Kv		[m^3/h]	1.6	2	2.4	8.5	10.7	21.3	27.4	39
C value		[l/sbar]	6	8.8	9.8	39	41	75	82	110
b value			0.3	0.35	0.37	0.5	0.57	0.6	0.67	0.68
Differential pressure		[bar]	0.5	0.5	0.5	0.5	0.7	0.7	0.7	0.7
Materials	Housing		Brass or stainless steel casting							
	Diaphragm		NBR							
	Plunger tube		High-alloy steel							
Note on materials			Contains paint wetting impairment substances							
Max. tightening torque	Connecting thread	[Nm]	35	60	105	200	350	450	540	620
	Cover screw	[Nm]	20	20	20	30	30	30	30	30
	Coil mounting	[Nm]	2	2	2	2	2	2	2	2

Solenoid valves VZWM-L

Technical data

Operating and environmental conditions										
Connection, valve			G 1/4	G 3/8	G 1/2	G 3/4	G 1	G 1 1/4	G 1 1/2	G 2
Medium			Compressed air in accordance with ISO 8573-1:2010 [7:4:4]							
			Neutral liquids							
			Inert gases							
			Water							
Ambient temperature[1]		[°C]	–10 … +60							
Medium pressure	Gases	[bar]	0.5 … 10					0.7 … 10		
	Fluids	[bar]	0.5 … 6					0.7 … 6		
Temperature of medium	Gases	[°C]	–10 … +60							
	Fluids	[°C]	5 … 50							
Max. viscosity		[mm²/s]	22							
CE mark (see declaration of conformity)			To EU Pressure Equipment Directive							
Corrosion resistance class CRC[2]	Brass		1							
	Stainless steel casting		3							

1) Note ambient temperature of solenoid coils
2) Corrosion resistance class 1 to Festo standard 940 070
Components requiring low corrosion resistance. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.
Corrosion resistance class 3 to Festo standard 940 070
Components with heavy corrosion exposure. Externally visible components in direct contact with normal industrial atmosphere or media such as solvents and cleaning agents, where the surface requirement is predominantly functional.

Valve response times										
Connection, valve			G 1/4	G 3/8	G 1/2	G 3/4	G 1	G 1 1/4	G 1 1/2	G 2
Gases										
Response time	off	[ms]	10	10	10	12	12	20	20	21
	on	[ms]	8	8	8	15	15	26	26	62
Fluids										
Response time	off	[ms]	200	210	220	930	930	1900	2000	2800
	on	[ms]	100	110	110	400	400	1400	1400	2100
Response time, variant R1	off	[ms]	210	190	200	950	950	1900	2000	2800
	on	[ms]	80	110	110	420	300	1400	1400	2100

Electrical data										
Connection, valve			G 1/4	G 3/8	G 1/2	G 3/4	G 1	G 1 1/4	G 1 1/2	G 2
Electrical connection			With armature tube for solenoid coil MD-2- … -PA, order separately					With armature tube for solenoid coil MH-2- … -PA, order separately		
Operating voltage	DC voltage	[V DC]	24							
	AC voltage	[V AC]	110/230 (50 … 60 Hz)							
Coil characteristics	DC voltage	[W]	6.8					7.9		
	AC voltage	[VA]	Pull: 14.5 Hold: 10.5					14		
Protection class to EN 60529			IP65 (with plug socket)							

Technical data

Weights [g]				
Brass housing			Stainless steel casting housing	
VZWM-...-G14-F4	500		VZWM-...-G14-F5-R1	400
VZWM-...-G38-F4	480		VZWM-...-G38-F5-R1	400
VZWM-...-G12-F4	450		VZWM-...-G12-F5-R1	360
VZWM-...-G34-F4	1270		VZWM-...-G34-F5-R1	1200
VZWM-...-G1-F4	1200		VZWM-...-G1-F5-R1	1100
VZWM-...-G114-F5	2850		VZWM-...-G114-F5-R1	2650
VZWM-...-G112-F5	2570		VZWM-...-G112-F5-R1	2400
VZWM-...-G2-F5	3800		VZWM-...-G2-F5-R1	3660

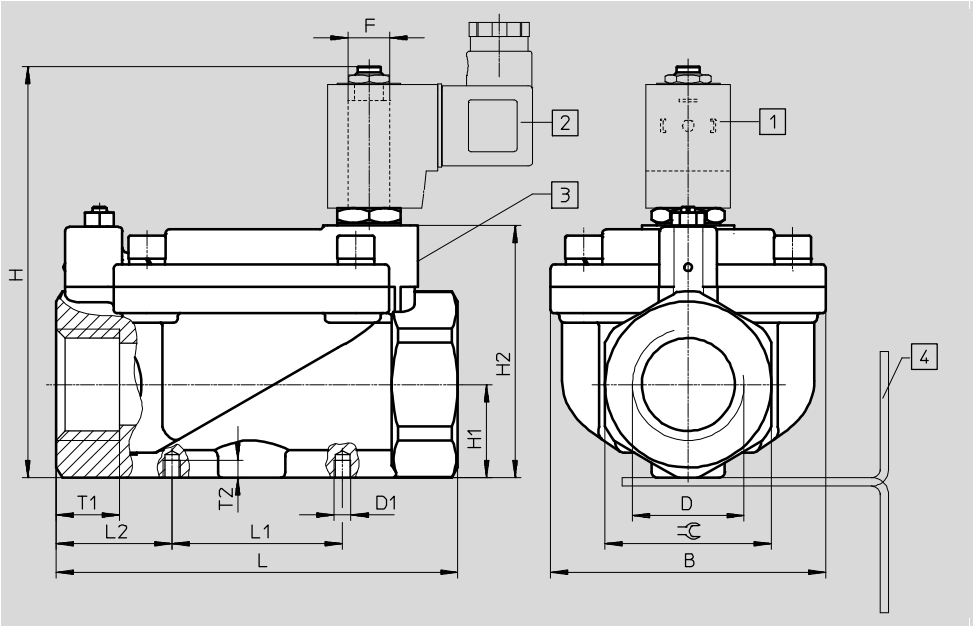
Solenoid valves VZWM-L

Technical data

Dimensions

Download CAD data ➔ **www.festo.com**

2/2-way valve



1 Plug socket connection to DIN EN 17301-803, type A
2 Plug socket MSSD-N
3 Location for inscription labels
4 Mounting bracket HRM-...

Type	B ±1.5	D	D1	H ±2	H1 ±1.5	H2 ±1	L ±2	L1 ±1.5	L2	F	T1	T2 ±0.5	⌀
VZWM-...-G14-F4	48	G 1/4	M4	85.5	15	49	67	25	21	F4	12	4	27
VZWM-...-G38-F4	48	G 3/8	M4	85.5	15	49	67	25	21	F4	12	4	27
VZWM-...-G12-F4	48	G 1/2	M4	85	15	49	67	25	21	F4	12	4	27
VZWM-...-G34-F4	70	G 3/4	M6	107	24.2	70.5	96	40	28	F4	16	6	41
VZWM-...-G1-F4	70	G 1	M6	107	24.2	70.5	96	40	28	F4	16	6	41
VZWM-...-G114-F5	96	G 1 1/4	M6	143.5	32.5	88	140	59.5	40.25	F5	22	6	58
VZWM-...-G112-F5	96	G 1 1/2	M6	143.5	32.5	88	140	59.5	40.25	F5	22	6	58
VZWM-...-G2-F5	112	G 2	M6	159	38.5	103.5	168	59.5	54.25	F5	25	6	70
VZWM-...-G14-F5-R1	44	G 1/4	M4	106	15.6	51	67	25	21	F5	–	4	27
VZWM-...-G38-F5-R1	44	G 3/8	M4	106	15.6	51	67	25	21	F5	–	4	27
VZWM-...-G12-F5-R1	44	G 1/2	M4	106	15.6	51	67	25	21	F5	–	4	27
VZWM-...-G34-F5-R1	70	G 3/4	M6	126	24.2	70	96	40	28	F5	–	6	41
VZWM-...-G1-F5-R1	70	G 1	M6	126	24.2	70	96	40	28	F5	–	6	41
VZWM-...-G114-F5-R1	96	G 1 1/4	M6	145	34	89.5	140	59.5	40.25	F5	–	6	58
VZWM-...-G112-F5-R1	96	G 1 1/2	M6	145	34	89.5	140	59.5	40.25	F5	–	6	58
VZWM-...-G2-F5-R1	112	G 2	M6	159	38.5	104	168	59.5	54.25	F5	–	6	70

Technical data

★ Core product range

Ordering data		
Connection, valve	Brass housing	
	Part No.	Type
G 1/4	★ 546146	VZWM-L-M22C-G14-F4
G 3/8	★ 546147	VZWM-L-M22C-G38-F4
G 1/2	★ 546148	VZWM-L-M22C-G12-F4
G 3/4	★ 546149	VZWM-L-M22C-G34-F4
G 1	★ 546150	VZWM-L-M22C-G1-F4

Ordering data		
Connection, valve	Part No.	Type
Brass housing		
G 1 1/4	546151	VZWM-L-M22C-G114-F5
G 1 1/2	546152	VZWM-L-M22C-G112-F5
G 2	546153	VZWM-L-M22C-G2-F5
Stainless steel casting housing		
G 1/4	546162	VZWM-L-M22C-G14-F5-R1
G 3/8	546163	VZWM-L-M22C-G38-F5-R1
G 1/2	546164	VZWM-L-M22C-G12-F5-R1
G 3/4	546165	VZWM-L-M22C-G34-F5-R1
G 1	546166	VZWM-L-M22C-G1-F5-R1
G 1 1/4	546167	VZWM-L-M22C-G114-F5-R1
G 1 1/2	546168	VZWM-L-M22C-G112-F5-R1
G 2	546169	VZWM-L-M22C-G2-F5-R1

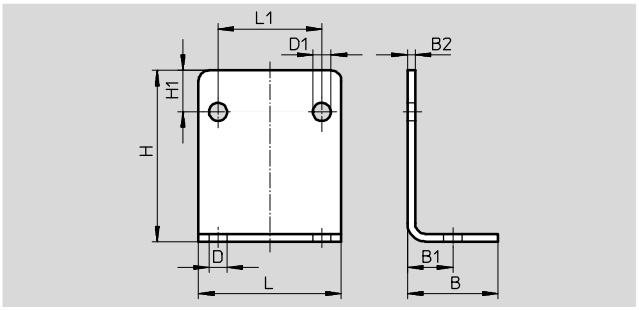
Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Solenoid valves VZWM-L

Accessories

Mounting bracket HRM

Material:
Galvanised steel



Dimensions and ordering data

B	B1	B2	D ∅	D1 ∅	H	H1	L	L1	Weight [g]	Part No.	Type
25	12.5	2	6	5	37	10	40	25	39	**9769**	**HRM-1**
35	17.5	3	7	7	66	16	55	40	130	**9770**	**HRM-2**
47	23.5	3	9	7	87	23	75	59.5	246	**9771**	**HRM-3**

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Type codes

MH-2 – 24VDC – PA

Type	
MH-2	Solenoid coil with lock nut (hex nut) G1/8

Operating voltage	
24VDC	24 V DC
110VAC	110 V AC
230VAC	230 V AC

Electrical connection	
PA	Connection pattern to EN 175301-803, type A

Solenoid coils MH-2

Technical data

- Voltage
  24 V DC
  110, 230 V AC

- Temperature range
  –20 ... +50 °C

- Can be replaced without interrupting the pneumatic circuit
- Connection pattern to EN 175301-803, type A

General technical data		
Type of mounting		Via lock nut
Max. tightening torque of fitting	[Nm]	2
Mounting position		Any
Product weight	[g]	150

Materials	
Solenoid coil	Duroplast, copper, steel
Winding	Copper
Note on materials	Contains paint-wetting impairment substances

Electrical data		
Electrical connection		Plug pins with connection pattern to EN 175301-803, type A
Min. pickup time	[ms]	12
Permissible voltage fluctuations	[%]	–10 / +10
Duty cycle	[%]	100
Degree of protection to EN 60529		IP65 with plug socket

Characteristic coil data				
Operating voltage		24 V DC	110 V AC	230 V AC
Power	[W]	7.9	–	–
	[VA]	–	14	14
Power factor cos(phi)		–	0.7	0.7
Frequency	[Hz]	–	50/60	50/60
Permissible frequency fluctuations	[%]	–10 / +10	–10 / +10	–10 / +10

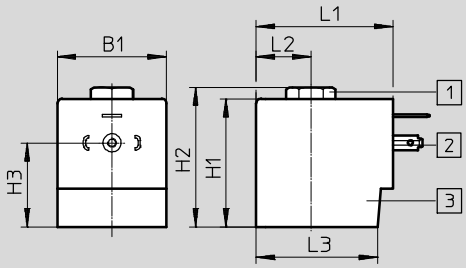
Operating and environmental conditions				
Operating voltage		24 V DC	110 V AC	230 V AC
Ambient temperature	[°C]	–20 ... 50	–20 ... 50	
CE mark (see declaration of conformity)[1)]		–	To EU Low Voltage Directive	

2) Additional information www.festo.com/sp ➔ Certificates.

Technical data

★ Core product range

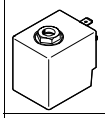
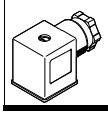
Dimensions Download CAD data ➔ **www.festo.com**



1 Lock nut (hex nut) G⅛
2 Plug pattern to EN 175301-803, type A
3 Solenoid coil

Type	B1	H1	H2	H3	L1	L2	L3
MH-2-...	35.8	42.1	45.9	27.6	45.5	18	39.8

Ordering data

	Description		Part No.	Type
Solenoid coil				
	Without plug socket, connection pattern to EN 175301-803, type A	24 V DC	**549906**	**MH-2-24VDC-PA**
		110 V AC	**549907**	**MH-2-110VAC-PA**
		230 V AC	**549908**	**MH-2-230VAC-PA**
Plug socket				
	3-pin, square design, connection pattern to EN 175301-803, type A		★ **550067**	**MSSD-N**

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Solenoid coils MD-2

Type codes

MD-2 – 24VDC – PA

Type	
MD-2	Solenoid coil with knurled nut M8x0.75

Operating voltage	
24VDC	24 V DC
110VAC	110 V AC
230VAC	230 V AC

Electrical connection	
PA	Connection pattern to EN 175301-803, type A

Technical data

- Voltage
  24 V DC
  110, 230 V AC

- Temperature range
  –20 ... +50 °C

- Can be replaced without interrupting the pneumatic circuit
- Connection pattern to EN 175301-803, type A

General technical data		
Type of mounting		Via knurled nut
Max. tightening torque of fitting	[Nm]	0.5
Mounting position		Any
Product weight	[g]	110

Materials	
Solenoid coil	Duroplast, copper, steel
Winding	Copper

Electrical data		
Electrical connection		Plug pins with connection pattern to EN 175301-803, type A
Permissible voltage fluctuations	[%]	–10 / +10
Duty cycle	[%]	100
Degree of protection to EN 60529		IP65 with plug socket

Characteristic coil data				
Operating voltage		24 V DC	110 V AC	230 V AC
Power	[W]	6.8	–	–
Pick-up power, 50 Hz	[VA]	–	14.5	14.5
Holding power, 50 Hz	[VA]	–	10.5	10.5
Power factor cos(phi)		–	0.7	0.7
Frequency	[Hz]	–	50/60	50/60
Permissible frequency fluctuations	[%]	–	–10 / +10	–10 / +10

Operating and environmental conditions				
Operating voltage		24 V DC	110 V AC	230 V AC
Ambient temperature	[°C]	–20 ... 50	–20 ... 50	
CE mark (see declaration of conformity)[1)]		–	To EU Low Voltage Directive	

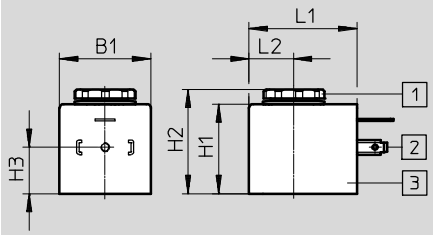
1) Additional information www.festo.com/sp ➔ Certificates.

Solenoid coils MD-2

Technical data

★ Core product range

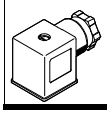
Dimensions Download CAD data ➔ **www.festo.com**



1 Knurled nut M8x0.75
2 Plug pattern to EN 175301-803, type A
3 Solenoid coil

Type	B1	H1	H2	H3	L1	L2
MD-2-...	30	29.5	34.3	15.3	35.5	14.7

Ordering data

	Description		Part No.	Type
Solenoid coil				
	Without plug socket, connection pattern to EN 175301-803, type A	24 V DC	★ **549903**	**MD-2-24VDC-PA**
		110 V AC	**549904**	**MD-2-110VAC-PA**
		230 V AC	**549905**	**MD-2-230VAC-PA**
Plug socket				
	3-pin, square design, connection pattern to EN 175301-803, type A		★ **550067**	**MSSD-N**

Solenoid-actuated media valves

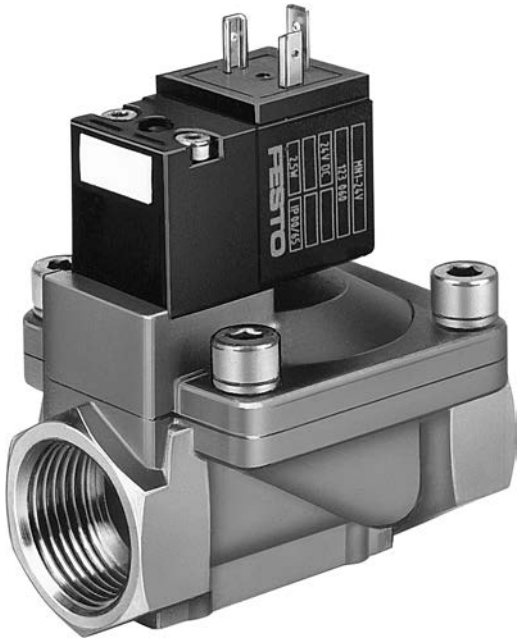
09

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Solenoid valves, brass version
MN1H-MS

Overview, configuration and ordering
➔ **www.festo.com/catalogue/mn1h**

Additional information, support and user documentation
➔ **www.festo.com/sp/mn1h**

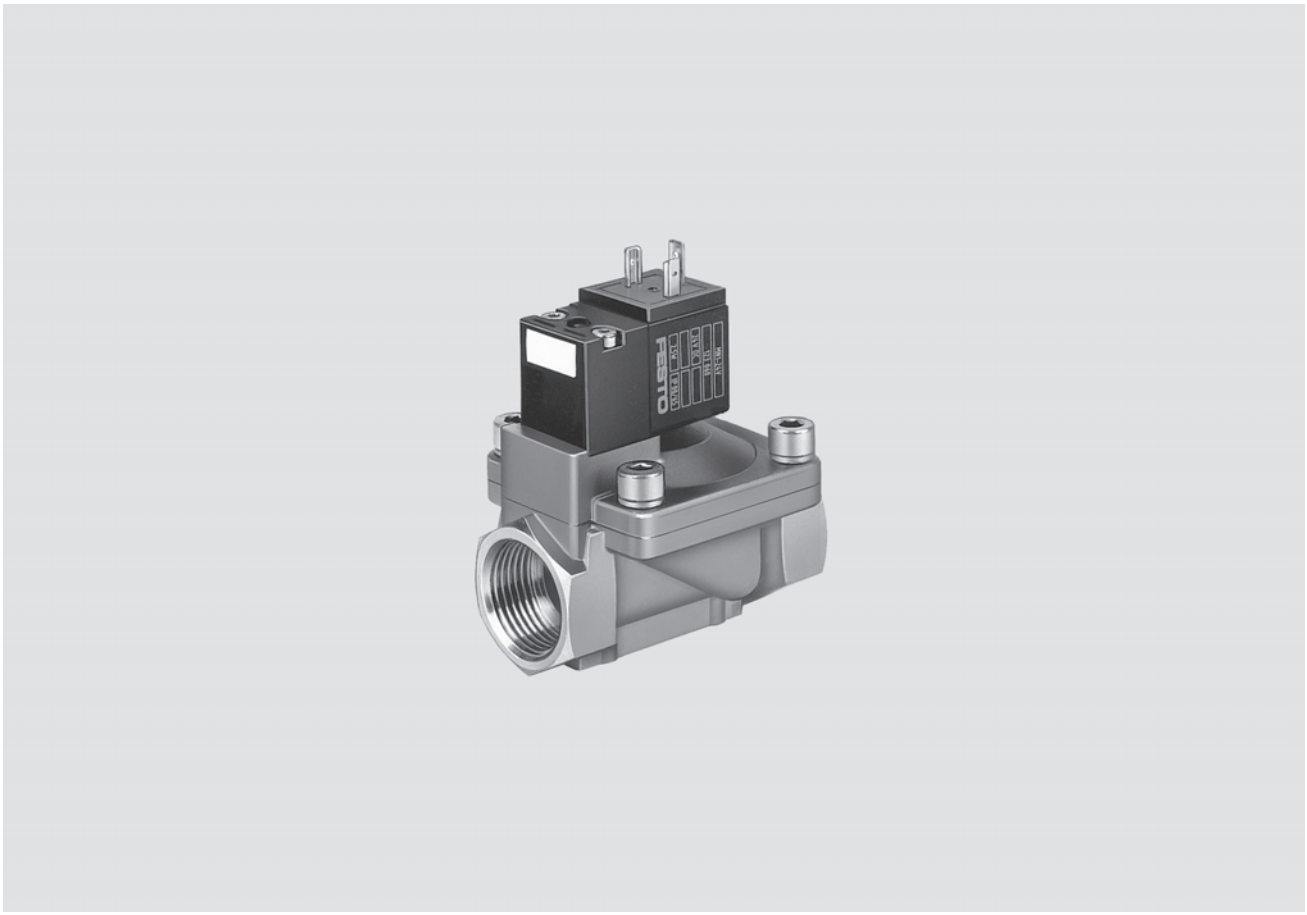


+ Connection G1/4 ... G1 1/2
+ Flow rate 2000 ... 30500 l/min
+ Voltage 24 V DC, 110 ... 230 V AC

+ For controlling gaseous media
+ In-line mounting electrically actuated, piloted, pneumatic spring return
+ Connection via plug/socket

Solenoid valves MN1H-MS, brass design

Key features

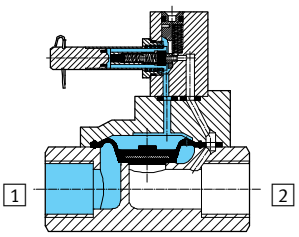


Function

When the solenoid is energised, the valve is actuated.

The valve MN1H-2-1½-MS is equipped with adjustable closing cushioning.

1 Supply port
2 Working or outlet line



- Note

The diaphragm opens briefly when pressure is connected.

Type codes

MN1H – 2 – 1/4 – MS

Type	
MN1H	Single pilot, for N1 solenoid coil

Valve function	
2	2/2-way valve

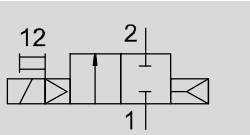
Connection, valve	
1/4	G 1/4
3/8	G 3/8
1/2	G 1/2
3/4	G 3/4
1	G 1
1 1/2	G 1 1/2

Housing material	
MS	Brass

Solenoid valves MN1H-MS, brass design

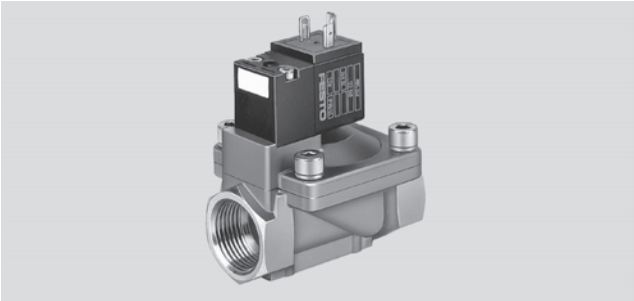
Technical data

Function



Flow rate
2000 ... 30500 l/min

Voltage
24 V DC
110, 230 V AC



General technical data								
Connection, valve			G 1/4	G 3/8	G 1/2	G 3/4	G 1	G 1 1/2
Valve function			2/2-way, single pilot					
Constructional design			Diaphragm valve					
Sealing principle			Soft					
Actuation type			Electrical					
Type of reset			Air spring					
Type of pilot control			Piloted					
Direction of flow			Non-reversible					
Exhaust function			No flow control					
Manual override			Non-detenting, detenting via accessory					
Type of mounting			In-line installation					
Mounting position			Any					
Nominal size		[mm]	13	13	13	20	25	40
Standard nominal flow rate		[l/min]	2000	2900	3100	10000	11500	30500
Product weight		[g]	450	450	400	1100	1000	2600
Materials	Housing		Brass					
	Diaphragm		Nitrile rubber					
Max. tightening torque[1)]		[Nm]	35	60	105	200	380	850

1) Ports 1 and 2
Note: This product conforms to ISO 1179-1 and to ISO 228-1

Operating and environmental conditions		
Medium		Filtered compressed air, lubricated or unlubricated
Note about operating/pilot medium		Lubricated operation possible (subsequently required for further operation)
Medium pressure	[bar]	0.5 ... 10
Ambient temperature	[°C]	–10 ... +60
Temperature of medium	[°C]	–10 ... +60

Valve response times		
Connection, valve	On	Off
G¼	30	100
G⅜	30	100
G½	30	100
G¾	120	180
G1	120	180
G1½	230 ... 440	300 ... 1000

Materials		
Solenoid valves		Material number
Housing	Brass	
Screws	High-alloy stainless steel	1.4301

Technical data

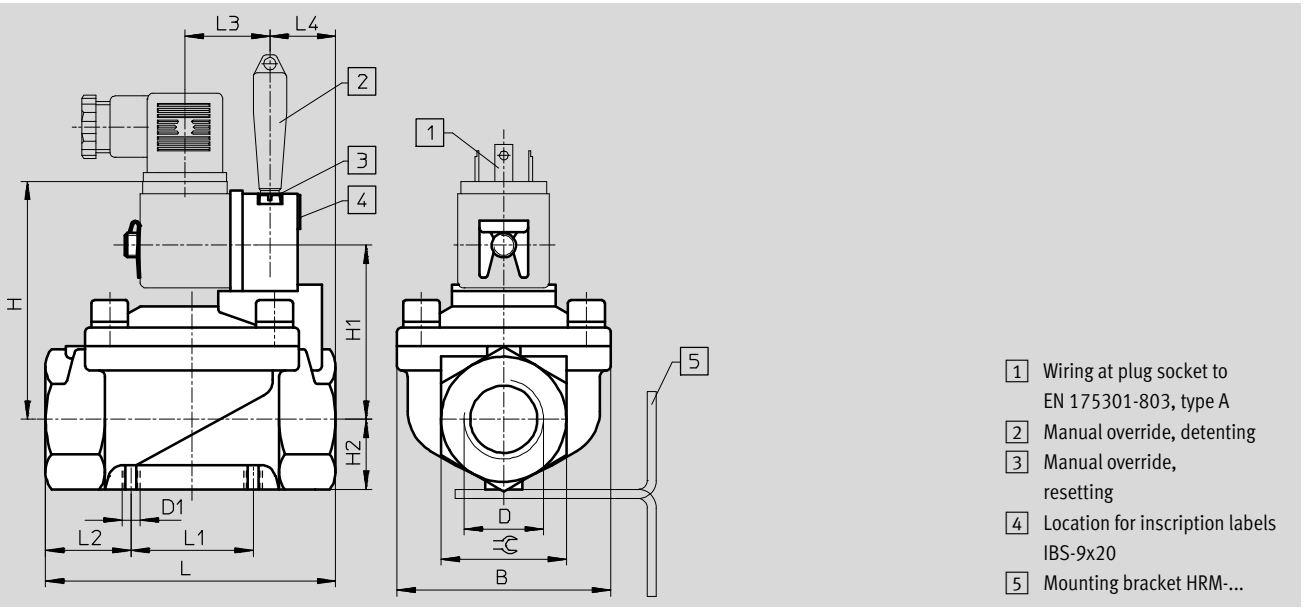
Electrical data
N1 solenoid coil

Electrical connection			Plug, square design to EN 175301-803, type A
Operating voltage	D.C. voltage	[V DC]	24
	A.C. voltage	[V AC]	110/230 (50 ... 60 Hz)
Coil characteristics	D.C. voltage	[W]	2.5
	A.C. voltage	[VA]	Pull: 5 Hold: 3.7
Protection class to EN 60 529			IP65 (with plug socket)

Dimensions

Download CAD data ➔ **www.festo.com**

2/2-way valve

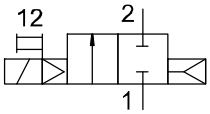


1 Wiring at plug socket to EN 175301-803, type A
2 Manual override, detenting
3 Manual override, resetting
4 Location for inscription labels IBS-9x20
5 Mounting bracket HRM-...

Connection, valve D	B	D1	H	H1	H2	L	L1	L2	L3	L4	⌀
G 1/4	48	M4	67	46	15	67	25	21	26.5	20	27
G 3/8	48	M4	67	46	15	67	25	21	26.5	20	27
G 1/2	48	M4	67	46	15	67	25	21	26.5	20	27
G 3/4	70	M6	78	57	23	95	40	27.5	26.5	21.5	41
G 1	70	M6	78	57	23	95	40	27.5	26.5	21.5	41
G 1 1/2	96	M6	91.5	70.5	31.5	140	59.5	38.3	26.5	30	58

Note: This product conforms to ISO 1179-1 and to ISO 228-1

Ordering data

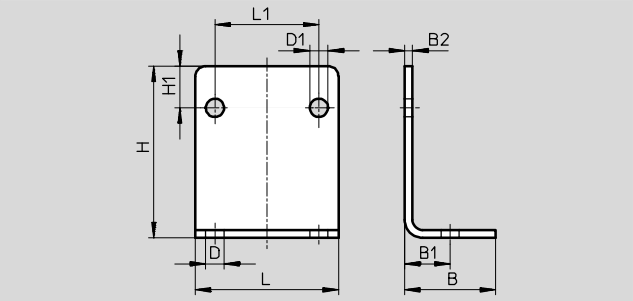
Circuit symbol	Pneumatic connection	Part No.	Type
	G 1/4	**161725**	**MN1H-2-1/4-MS**
	G 3/8	**161727**	**MN1H-2-3/8-MS**
	G 1/2	**161728**	**MN1H-2-1/2-MS**
	G 3/4	**161731**	**MN1H-2-3/4-MS**
	G 1	**161732**	**MN1H-2-1-MS**
	G 1 1/2	**161734**	**MN1H-2-11/2-MS**

Solenoid valves MN1H-MS, brass design

Accessories

Mounting bracket HRM

Material:
Galvanised steel

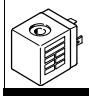


Dimensions and ordering data

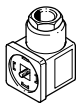
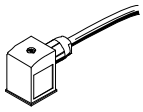
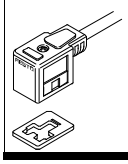
For valve with pneumatic connection	B	B1	B2	D ∅	D1 ∅	H	H1	L	L1	Weight [g]	Part No.	Type
G¼ ... G½	25	12.5	2	6	5	37	10	40	25	39	**9769**	**HRM-1**
G ¾ ... G1	35	17.5	3	7	7	66	16	55	40	130	**9770**	**HRM-2**
G1½	47	23.5	3	9	7	87	23	75	59.5	246	**9771**	**HRM-3**

Accessories

Ordering data – Solenoid coils — Technical data ➔ Internet: msn1g

	Voltage	Part No.	Type
	24 V DC	**123060**	**MSN1G-24DC-OD**
	110 V AC, 50 ... 60 Hz	**123061**	**MSN1W-110AC-OD**
	230 V AC, 50 ... 60 Hz	**123062**	**MSN1W-230AC-OD**

Ordering data – Plug sockets, connecting cables

	Voltage	Cable length [m]	Switching status display with LED	Part No.	Type
Plug socket without cable					Technical data ➔ Internet: mssd-c
	–	–	–	**34583**	**MSSD-C**
Plug socket without cable with insulation displacement technology					Technical data ➔ Internet: mssd-c
	–	–	–	**192748**	**MSSD-C-S-M16**
Connecting cables					Technical data ➔ Internet: kmc-1
	24 V DC	2.5	■	**30931**	**KMC-1-24DC-2,5-LED**
	24 V DC	5	■	**30933**	**KMC-1-24DC-5-LED**
	24 V DC	10	■	**193459**	**KMC-1-24DC-10-LED**
	Up to 230 V	2.5	–	**30932**	**KMC-1-230AC-2,5**
	Up to 230 V	5	–	**30934**	**KMC-1-230AC-5**

Ordering data – Illuminating seal — Technical data ➔ Internet: mc-ld

	Voltage	Part No.	Type
	12 ... 24 V DC	**19145**	**MC-LD-12-24DC**
	230 V DC/V AC	**19146**	**MC-LD-230AC**

Ordering data – General accessories

		Part No.	Type
Manual override tool			
	For N1 coils	**157651**	**AHB-MD/MF/MV**
Inscription labels			
	Scope of delivery 20 labels in frame	**18182**	**IBS-9x20**

Solenoid valves, servo-controlled

VZWP

Overview, configuration and ordering
➔ **www.festo.com/catalogue/vzwp**

Additional information, support and user documentation
➔ **www.festo.com/sp/vzwp**

+ Connection 1/4", 3/8", 1/2", 3/4", 1"
+ G thread or NPT thread
+ Pressure of medium 0.5 ... 40 bar
+ Electrical actuation
+ Voltage 24 V DC, 110 V AC, 230 V AC
+ 2/2-way shut-off valve (NC)
+ For controlling gaseous and liquid media in open circuits
+ Sealing material NBR, FKM

Solenoid valves VZWP, servo-controlled

Key features and overview

Function

The solenoid valve VZWP-L-... is a servo-controlled 2/2-way valve with solenoid coil. The solenoid valve is closed when de-energised. When energised, the differential pressure from the secondary side of the piston is reduced via the servo hole. The differential pressure lifts the piston away from the valve seat.

General

- Connecting thread G 1/4 ... G 1
- Flow rate Kv 1.5 ... 11.5 m^3/h

Application

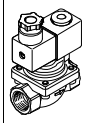
- All applications with a differential pressure of 0.5 bar
- Applications with an open medium circuit

Design

- The valve features a simple, sturdy design. The valve drive only fulfils a pilot control function, which relieves the burden on the main sealing element

Advantages

- High pressures can be controlled with large nominal diameters using small magnets
- The valves can be operated with air, neutral gases and neutral liquids
- The N/C version guarantees that the valve will be closed in the event of a voltage failure

Version	Type	Process valve connection	Nominal size (DN)	Process valve nominal pressure (PN)	→ Page/Internet
	VZWP-L-...	G 1/4	13	40	742
		G 3/8	13		
		G 1/2	13		
		G 3/4	25		
		G 1	25		

Type codes

VZWP – L – M22C – G14 – 130 – V – 1 – P4 – 40

Type	
VZWP	Electrically actuated process valve, servo-controlled

Valve type	
L	In-line valve

Valve function	
M22C	2/2-way valve, normally closed (N/C), mechanical reset

Process valve connection	
G14	Thread G 1/4
G38	Thread G 3/8
G12	Thread G 1/2
G34	Thread G 3/4
G1	Thread G 1

Nominal size (DN)	
130	13 mm
250	25 mm

Sealing material	
–	NBR
V	FPM

Nominal voltage	
1	24 V DC
2A	110 V AC
3A	230 V AC

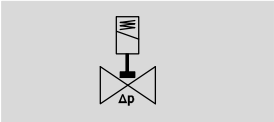
Electrical connection	
P4	Plug socket, 3-pin

Medium pressure	
40	Max. 40 bar

Solenoid valves VZWP, servo-controlled

Technical data

Function



Flow rate Kv
1.5 ... 11.5 m^3/h

Connecting thread
G 1/4 ... G 1

General technical data

Process valve connection		G 1/4	G 3/8	G 1/2	G 3/4	G 1
Nominal size (DN)		13	13	13	25	25
Valve function		2/2-way, single solenoid, closed				
Design		Piloted piston poppet valve				
Type of mounting		In-line installation				
Actuation type		Electric				
Type of control		Piloted				
Manual override		None				
Mounting position		Coil preferably on top				
Sealing principle		Soft				
Direction of flow		Non-reversible				
Max. viscosity	[mm^2/s]	22				
Protection class		IP65				
Product weight	[g]	600	575	550	1500	1400

Operating and environmental conditions

Process valve connection		G 1/4	G 3/8	G 1/2	G 3/4	G 1
Switching time on	[ms]	100	100	100	130	130
Switching time off	[ms]	250	250	250	300	300
Standard nominal flow rate	[l/min]	1600	2100	2650	8750	12250
Flow rate	[m^3/h]	1.5	2	2.5	8.2	11.5
Medium pressure	[bar]	0.5 ... 40				
Process valve nominal pressure (PN)		40				
Differential pressure	[bar]	0.5				
Medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]				
		Neutral liquids				
		Inert gases				
		Further media upon request				
Ambient temperature	[°C]	–10 ... 35				
Temperature of medium	[°C]	–10 ... 80				
Leak rate to EN 12266-1		A				
Corrosion resistance class CRC[1)]		1				

1) Corrosion resistance class 1 according to Festo standard 940 070
Components subject to low corrosion stress. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.

Materials

Solenoid valves		Material number
Housing	Cast brass	CW617N
Screws	High-alloy stainless steel	1.4301
Seals	NBR, FPM	–
Note on materials	Contains PWIS (paint-wetting impairment substances)	–
	RoHS-compliant	–

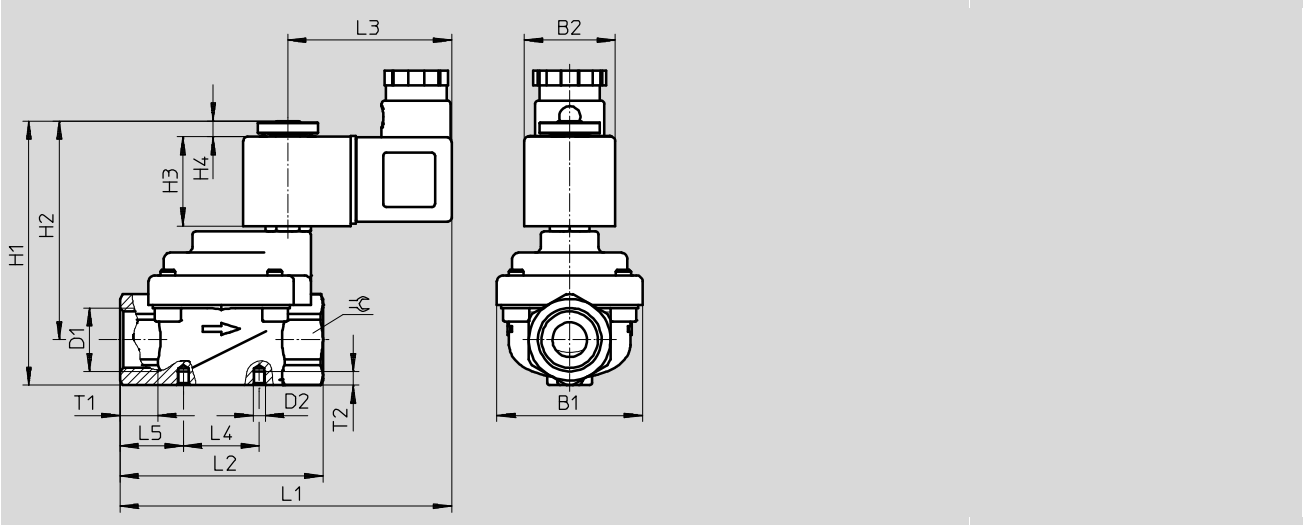
Technical data

Electrical data				
		24 V DC	110 V DC	230 V DC
Electrical connection		Type A	Type A	Type A
		Plug	Plug	Plug
		To EN 175301-803	To EN 175301-803	To EN 175301-803
Coil characteristics				
Direct current DC	[V]	24	–	–
	[W]	6.8	–	–
Alternating current AC	[V]	–	110	230
	[Hz]	–	50, 60	50, 60
Pick-up power	[VA]	–	10.5	10.5
Holding power	[VA]	–	8	7.6
Permissible voltage fluctuations	[%]	±10	±10	±10
Duty cycle	[%]	100	100	100
Protection class		IP65	IP65	IP65
CE marking (see declaration of conformity)		–	To EU Low Voltage Directive	To EU Low Voltage Directive

Solenoid valves VZWP, servo-controlled

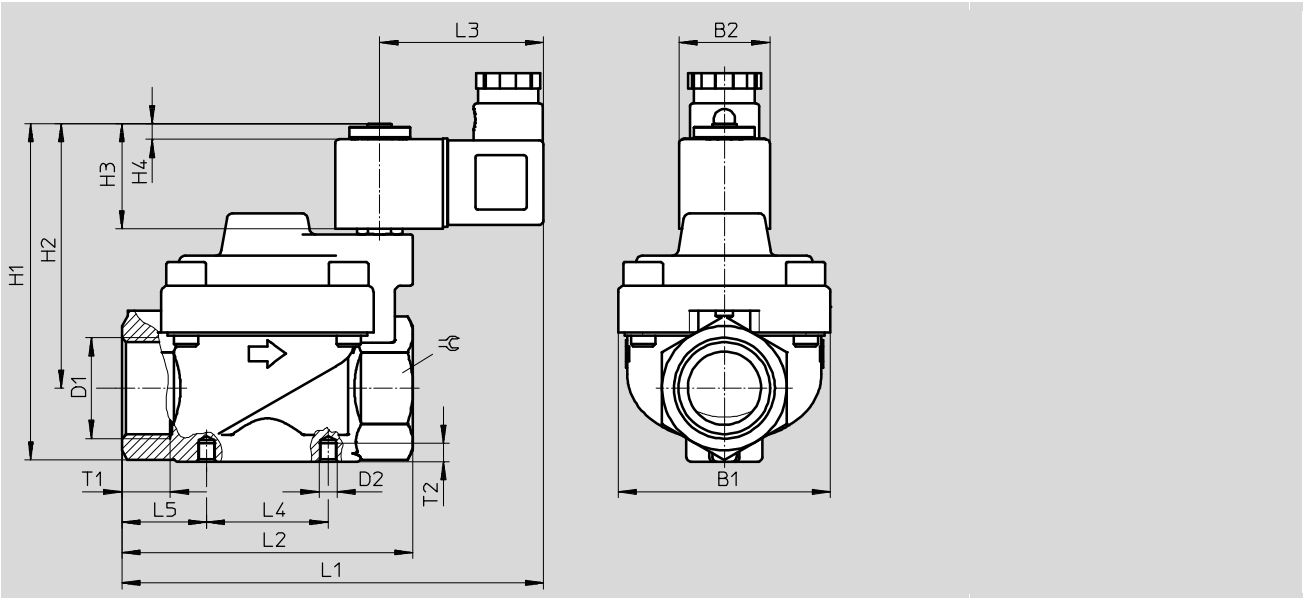
Technical data

Dimensions Download CAD data ➔ **www.festo.com**



	B1	B2	D1	D2	H1	H2	H3	H4	L1	L2	L3	L4	L5	T1	T2	⌀
VZWP-L-M22C-G14-130-...	48	30	G 1/4	M4	88	73	30	5	110	67	54	25	21	12.5	4.5	27
VZWP-L-M22C-G38-130-...	48	30	G 3/8	M4	88	73	30	5	110	67	54	25	21	12.5	4.5	27
VZWP-L-M22C-G12-130-...	48	30	G 1/2	M4	88	73	30	5	110	67	54	25	21	12.5	4.5	27

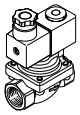
Dimensions Download CAD data ➔ **www.festo.com**



	B1	B2	D1	D2	H1	H2	H3	H4	L1	L2	L3	L4	L5	T1	T2	⌀
VZWP-L-M22C-G34-250-...	70	30	G 3/4	M6	112	88	30	5	139	96	54	40	28	16	6	41
VZWP-L-M22C-G1-250-...	70	30	G 1	M6	112	88	30	5	139	96	54	40	28	16	6	41

Technical data

Ordering data

	Process valve connection	Part No.	Type
	G 1/4	1489940	VZWP-L-M22C-G14-130-1P4-40
		1489950	VZWP-L-M22C-G14-130-2AP4-40
		1489960	VZWP-L-M22C-G14-130-3AP4-40
		1489945	VZWP-L-M22C-G14-130-V-1P4-40
		1489955	VZWP-L-M22C-G14-130-V-2AP4-40
		1489965	VZWP-L-M22C-G14-130-V-3AP4-40
	G 3/8	1489941	VZWP-L-M22C-G38-130-1P4-40
		1489951	VZWP-L-M22C-G38-130-2AP4-40
		1489961	VZWP-L-M22C-G38-130-3AP4-40
		1489946	VZWP-L-M22C-G38-130-V-1P4-40
		1489956	VZWP-L-M22C-G38-130-V-2AP4-40
		1489966	VZWP-L-M22C-G38-130-V-3AP4-40
	G 1/2	1489942	VZWP-L-M22C-G12-130-1P4-40
		1489952	VZWP-L-M22C-G12-130-2AP4-40
		1489962	VZWP-L-M22C-G12-130-3AP4-40
		1489947	VZWP-L-M22C-G12-130-V-1P4-40
		1489957	VZWP-L-M22C-G12-130-V-2AP4-40
		1489967	VZWP-L-M22C-G12-130-V-3AP4-40
	G 3/4	1489943	VZWP-L-M22C-G34-250-1P4-40
		1489953	VZWP-L-M22C-G34-250-2AP4-40
		1489963	VZWP-L-M22C-G34-250-3AP4-40
		1489948	VZWP-L-M22C-G34-250-V-1P4-40
		1489958	VZWP-L-M22C-G34-250-V-2AP4-40
		1489968	VZWP-L-M22C-G34-250-V-3AP4-40
	G 1	1489944	VZWP-L-M22C-G1-250-1P4-40
		1489954	VZWP-L-M22C-G1-250-2AP4-40
		1489964	VZWP-L-M22C-G1-250-3AP4-40
		1489949	VZWP-L-M22C-G1-250-V-1P4-40
		1489959	VZWP-L-M22C-G1-250-V-2AP4-40
		1489969	VZWP-L-M22C-G1-250-V-3AP4-40

Reverse jet pulse valves, solenoid actuated
VZWE

Overview, configuration and ordering
➔ **www.festo.com/catalogue/vzwe**

Additional information, support and user documentation
➔ **www.festo.com/sp/vzwe**

+ Connection 3/4", 1", 11/2", 2", 21/2"
+ G thread
+ Flange diameter 60, 75, 89 mm
+ Operating pressure 0.35 ... 8 bar
+ 2/2-way poppet valve (NC), piloted
+ Sealing material NBR

Reverse jet pulse valves VZWE, solenoid actuated

Key features and product range overview

Function

Reverse jet pulse valves VZWE are piloted 2/2-way valves. They generate pulses of compressed air using a suitable solenoid coil for mechanically cleaning filters and dust filter systems. The valves are actuated using short electrical pulses.

These pulses generate short pulses of compressed air at the output of the valve, which travel through the filter against the normal direction of flow of the filter system to release adhering particles from the filter.

General information

- Connecting thread G 3/4 ... G 2 1/2
- Flow rate Kv 15 ... 210 m^3/h

Design

- 2/2-way NC valve with diaphragm

Advantages

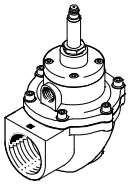
- High flow rates
- Fast opening and closing times
- Sturdy pilot system

Application

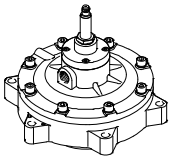
- Used in various filter systems for cleaning the filter elements
- Product filter systems
- Supply air filter systems
- Exhaust air filter systems

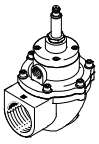
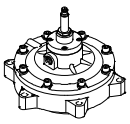
Variants

Angle valve, angle design

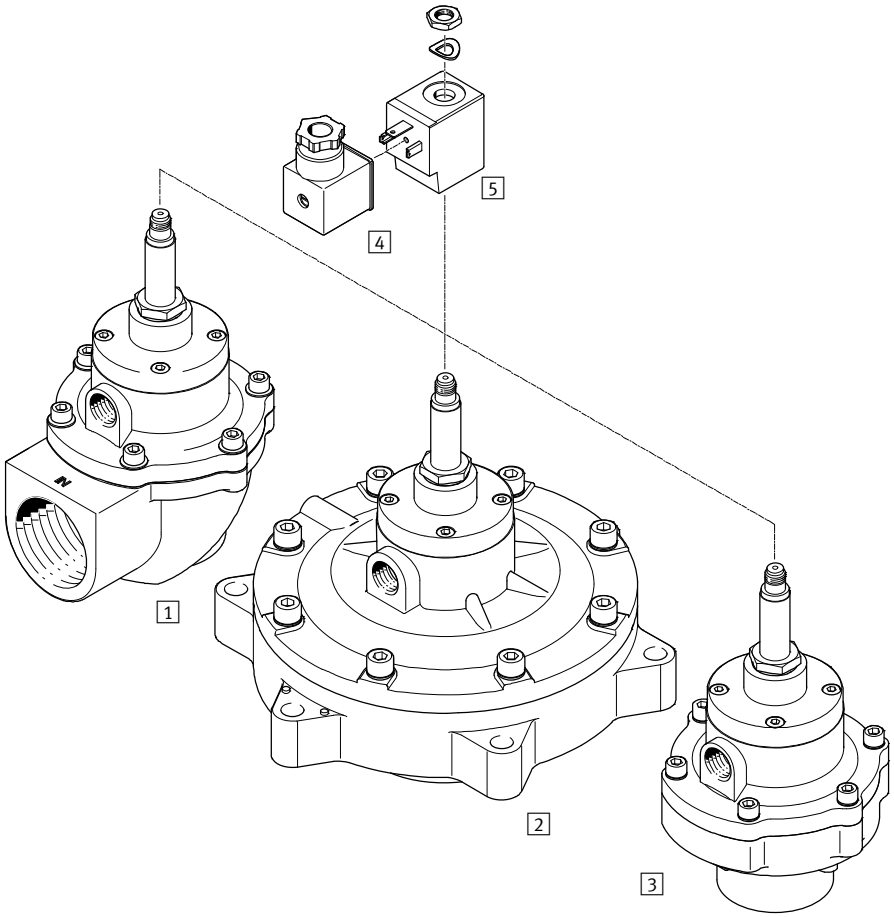


Flanged valve, straight design



Design	Type	Process valve connection	Nominal size DN	➔ Page/Internet
Angle valve, angle design				
	VZWE-E-...	G 3/4	20	626
		G 1	25	
		G 1 1/2	40	
		G 2	50	
		G 2 1/2	62	
Flanged valve, straight design				
	VZWE-F-...	G 1	25	754
		G 1 1/2	40	
		F600	50	
		F750	62	
		F890	76	

Peripherals overview



Mounting components and accessories

	Brief description	➔ Page/Internet
1 Angle valve VZWE-E-...-M-...-H	Angle design, 2/2-way valve, normally closed	626
2 Flanged valve VZWE-F-...-M-...-H	Straight design, 2/2-way valve, normally closed	754
3 Angle valve VZWE-E-...-M-...-H	Straight design, 2/2-way valve, normally closed	626
4 Plug socket MSSD-C	Plug socket for valves with N1 solenoid coils	760
5 Solenoid coil VACN	With connection to EN 175301-803	759

Reverse jet pulse valves VZWE, solenoid actuated

Type codes

VZWE – E – M22C – M – G2 – 500 – H

Type	
VZWE	Reverse jet pulse valves, solenoid actuated

Type of directional control valve	
E	Angle valve (angle design)
F	Flanged valve (straight design)

Valve function	
M22C	2/2-way valve, single solenoid

Reset method for single solenoid valves	
M	Mechanical spring

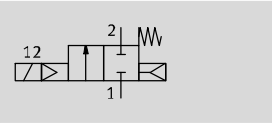
Process valve connection	
Pipe thread to DIN ISO 228	
G34	Thread G 3/4
G1	Thread G 1
G112	Thread G 1 1/2
G2	Thread G 2
G212	Thread G 2 1/2
Flange diameter	
F600	60 mm
F750	75 mm
F890	89 mm

Nominal size	
200	20 mm
250	25 mm
400	40 mm
500	50 mm
620	62 mm
760	76 mm

Electrical connection	
H	14 mm, with armature tube

Technical data – Angle valve

Function



- Flow rate Kv
  15 ... 95 m³/h

- Connecting thread
  G 3/4 ... G 2 1/2

General technical data						
Nominal size	[mm]	20	25	40	50	62
Valve function		2/2-way, single solenoid, closed				
Manual override		None				
Design		Diaphragm valve, angle design				
Reset method		Mechanical spring				
Type of control		Piloted				
Actuation type		Electric				
Type of mounting		Via thread, screwed in				
Mounting position		Any				
Direction of flow		Non-reversible				
Switching time on	[ms]	≤30				
Switching time off	[ms]	≤100				
Flow rate Kv	[m³/h]	15	22	48	78	95
Process valve connection 1		G 3/4	G 1	G 1 1/2	G 2	G 2 1/2
Process valve connection 2		G 3/4	G 1	G 1 1/2	G 2	G 2 1/2

Operating and environmental conditions		
Medium		Compressed air according to ISO 8573-1:2010 [7:4:4]
Note about the operating/pilot medium		Lubricated operation not possible
Medium pressure	[bar]	0.35 ... 8
Differential pressure	[bar]	0.35
Ambient temperature	[°C]	–20 ... 60
Protection class		IP65
Corrosion resistance class CRC[1)]		3

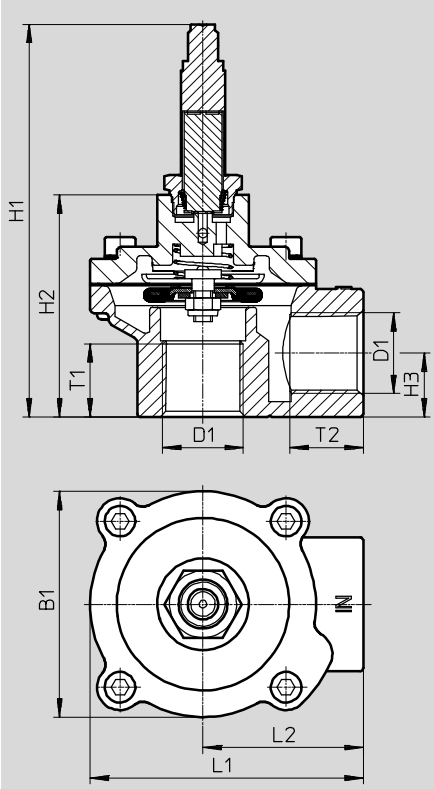
1) Corrosion resistance class 3 according to Festo standard 940 070
Components subject to high corrosion stress. Externally visible parts with primarily functional surface requirements which are in direct contact with a normal industrial environment or media such as solvents and cleaning agents.

Materials			
Reverse jet pulse valves			Material number
1	Valve housing	Die-cast aluminium	EN AC-47100D
2	Screws	High-alloy steel	1.4301
3	Armature tube	High-alloy steel	–
–	Seal	Nitrile rubber	–
–	Diaphragm	Nitrile rubber/polyamide	–
–	Note on materials	Contains PWIS (paint-wetting impairment substances), RoHS-compliant	–

Reverse jet pulse valves VZWE, solenoid actuated

Technical data – Angle valve

Dimensions Download CAD data ➔ **www.festo.com**

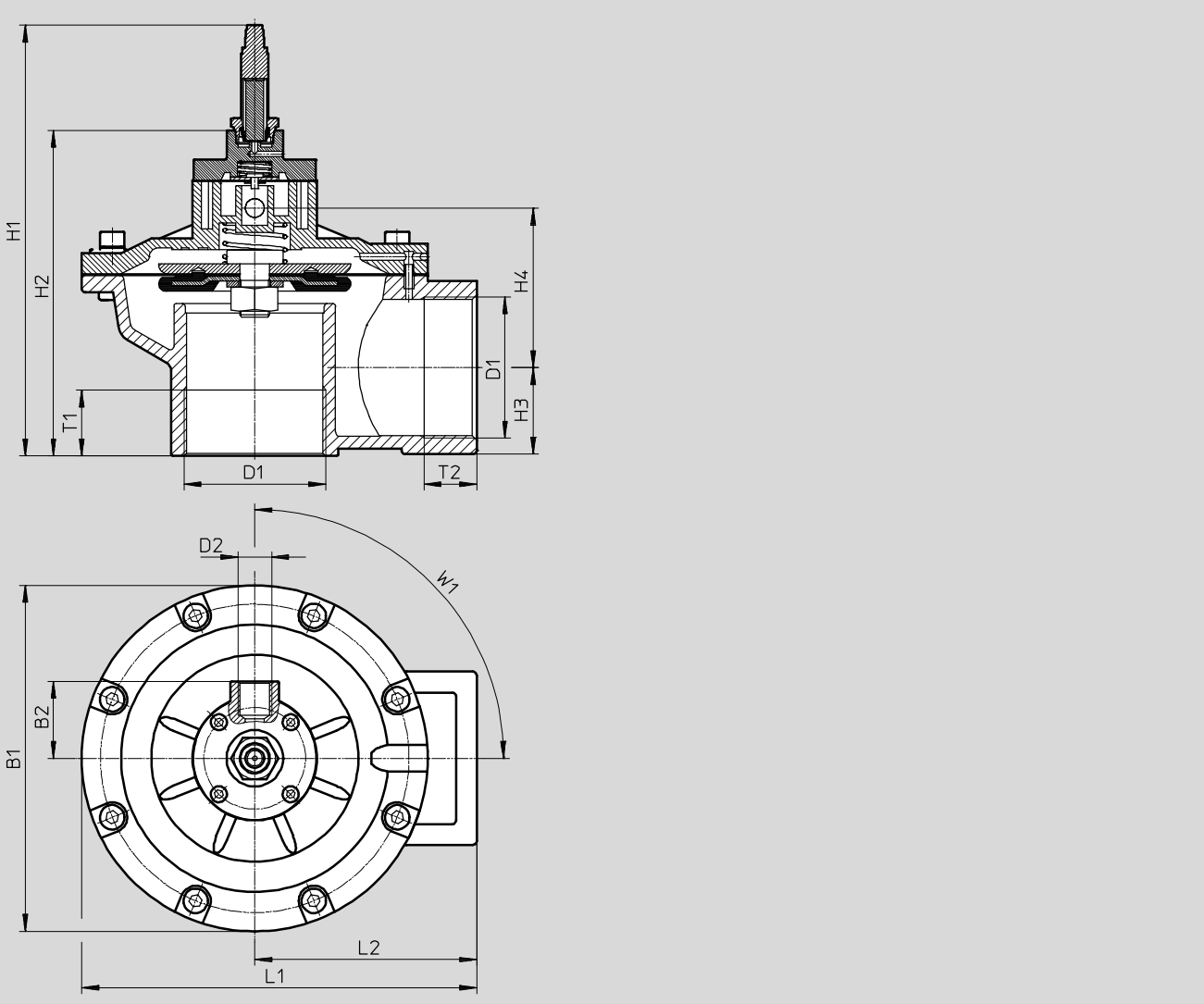


Type	B1	D1	H1	H2	H3	L1	L2	T1	T2
VZWE-E-M22C-M-G34-200-H	74	G 3/4	128.8	72.8	21	89.5	52.5	24	24
VZWE-E-M22C-M-G1-250-H	74	G 1	128.8	72.8	21	89.5	52.5	24	21.5

Technical data – Angle valve

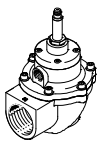
Dimensions

Download CAD data ➔ **www.festo.com**



Type	B1	B2	D1	D2	H1	H2	H3	H4	L1	L2	T1	T2	W1
VZWE-E-M22C-M-G112-400-H	112	39	G 1 1/2	G 3/8	187	131.5	31.5	59.8	124	74	34	34	0
VZWE-E-M22C-M-G2-500-H	184	41	G 2	G 3/8	210	154	40	72.8	205	92	25	25	90
VZWE-E-M22C-M-G212-620-H	184	41	G 2 1/2	G 3/8	229	173	47	131.8	210	92	35	28	90

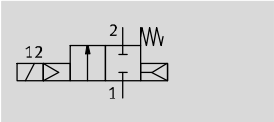
Ordering data –Reverse jet pulse valves VZWE

	Process valve connection	Weight [g]	Part No.	Type
	G 3/4	420	**1794182**	**VZWE-E-M22C-M-G34-200-H**
	G 1	420	**1795142**	**VZWE-E-M22C-M-G1-250-H**
	G 1 1/2	1300	**1239565**	**VZWE-E-M22C-M-G112-400-H**
	G 2	2800	**1276955**	**VZWE-E-M22C-M-G2-500-H**
	G 2 1/2	3100	**1281702**	**VZWE-E-M22C-M-G212-620-H**

Reverse jet pulse valves VZWE, solenoid actuated

Technical data – Flanged valve

Function



- Flow rate Kv
  22 ... 210 m³/h

- Connecting thread
  ∅ 92 ... 162

General technical data						
Nominal size	[mm]	25	40	50	62	76
Valve function		2/2-way, single solenoid, closed				
Manual override		None				
Design		Diaphragm valve, straight design with flange				
Reset method		Mechanical spring				
Type of control		Piloted				
Actuation type		Electric				
Type of mounting		Via thread, screwed in				
Mounting position		Any				
Direction of flow		Non-reversible				
Switching time on	[ms]	≤30				
Switching time off	[ms]	≤100				
Flow rate	[m³/h]	22	48	78	95	210
Process valve connection 1	[mm]	G 1	G 1 1/2	60	75	89
Process valve connection 2	[mm]	59	74	145.5	145.5	162

Operating and environmental conditions		
Medium		Compressed air according to ISO 8573-1:2010 [7:4:4]
Note about the operating/pilot medium		Lubricated operation not possible
Medium pressure	[bar]	0.35 ... 8
Differential pressure	[bar]	0.35
Ambient temperature	[°C]	–20 ... 60
Protection class		IP65
Corrosion resistance class CRC[1)]		3

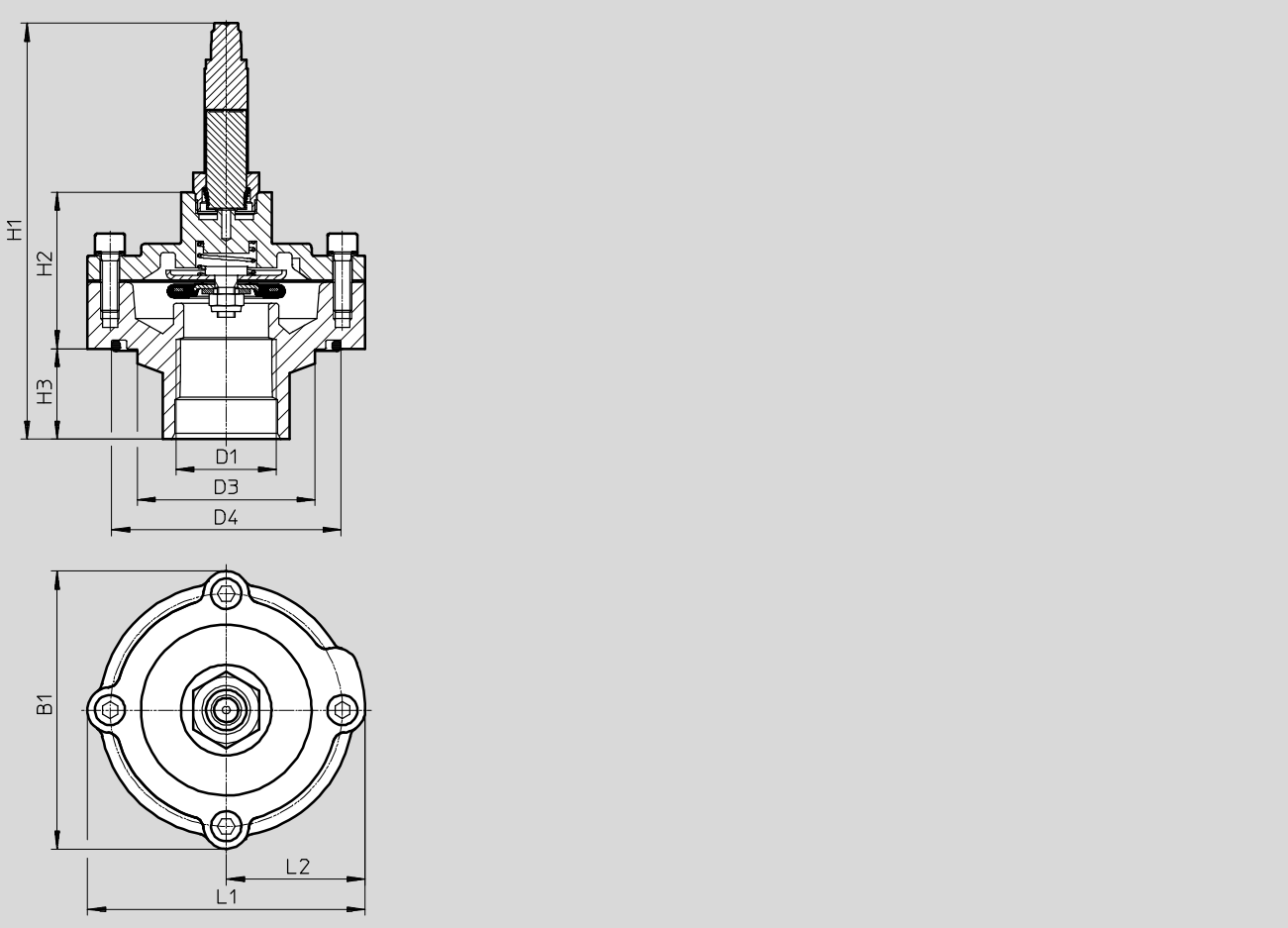
1) Corrosion resistance class 3 according to Festo standard 940 070
Components subject to high corrosion stress. Externally visible parts with primarily functional surface requirements which are in direct contact with a normal industrial environment or media such as solvents and cleaning agents.

Materials			
Reverse jet pulse valves			Material number
1	Housing	Die-cast aluminium	EN AC-47100D
2	Screws	High-alloy steel	1.4301
3	Armature tube	High-alloy steel	–
–	Seal	Nitrile rubber	–
–	Diaphragm	Nitrile rubber/polyamide	–
–	Note on materials	Contains PWIS (paint-wetting impairment substances), RoHS-compliant	–

Technical data – Flanged valve

Dimensions

Download CAD data ➔ **www.festo.com**

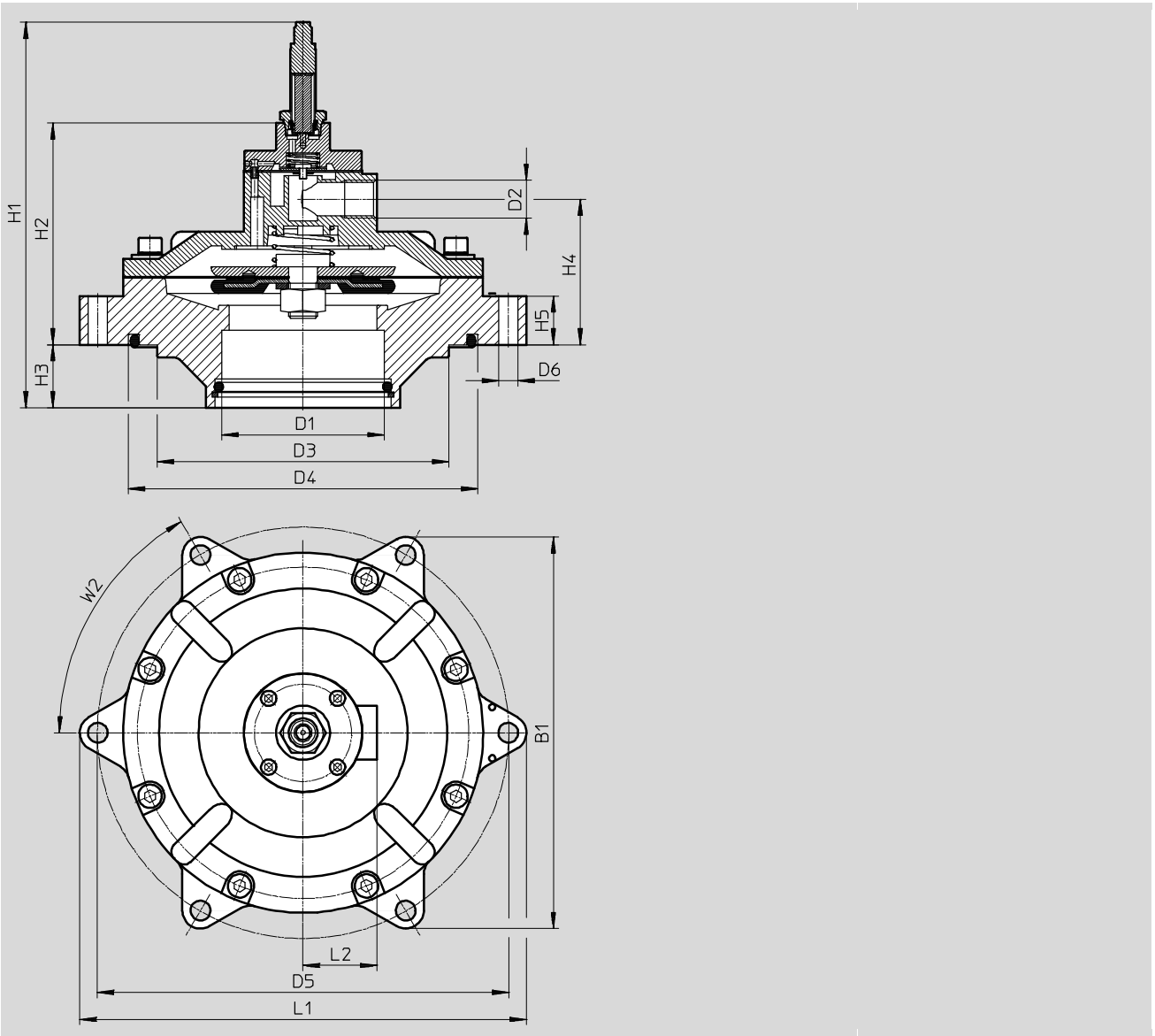


Type	B1	D1	D3 ∅	D4 ∅	H1	H2	H3	L1	L2
VZWE-F-M22C-M-G1-250-H	92	G 1	59	76	137.8	51.8	30	92	46

Reverse jet pulse valves VZWE, solenoid actuated

Technical data – Flanged valve

Dimensions Download CAD data ➔ **www.festo.com**

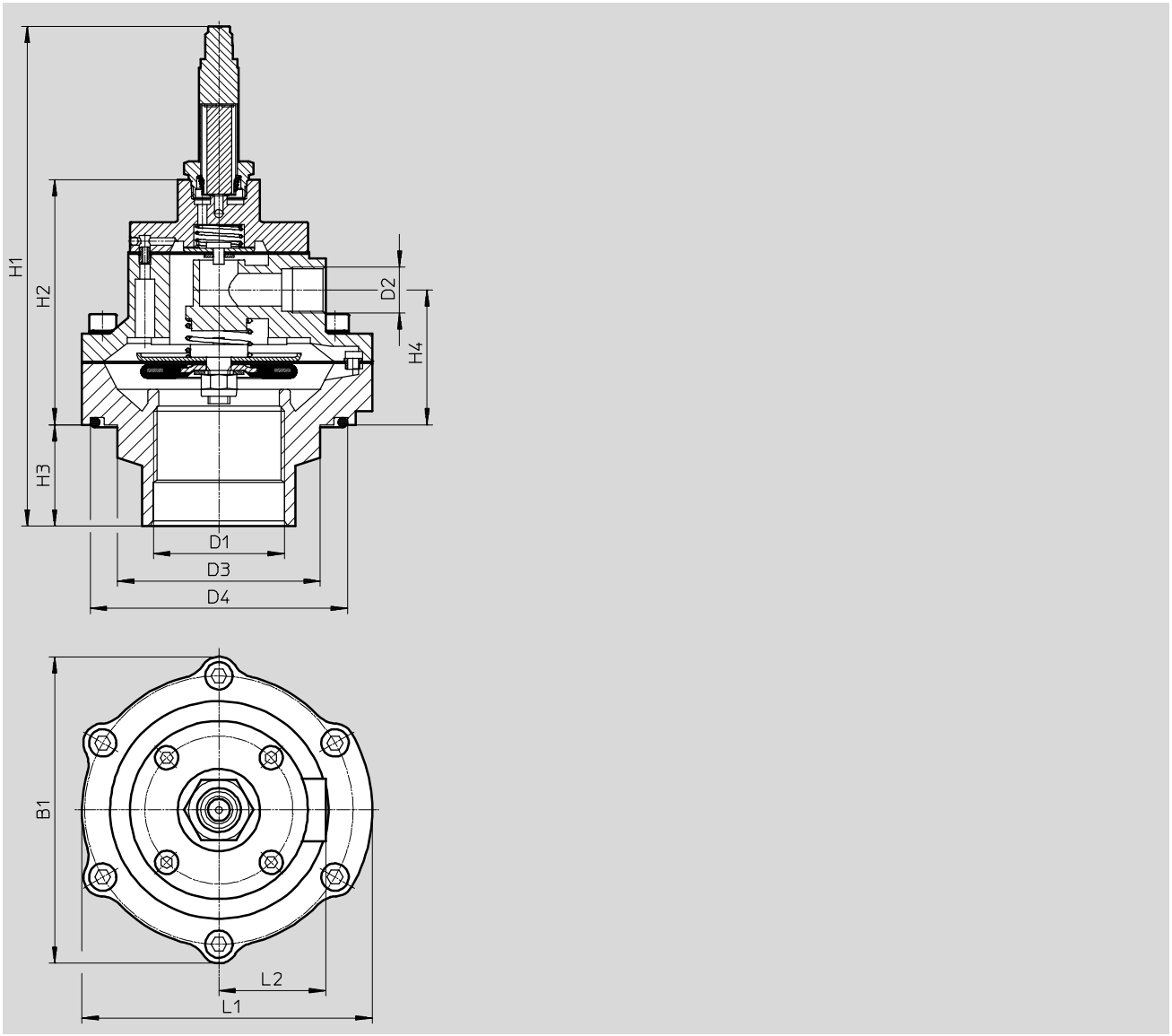


Type	B1	D1 ∅	D2	D3 ∅	D4 ∅	D5 ∅	D6 ∅	H1	H2	H3	H4	H5	L1	L2	W2
VZWE-F-M22C-M-F600-500-H	200	60	G 3/8	145.5	174	208	11	205	114	35	72.8	27	228	41	60
VZWE-F-M22C-M-F750-620-H	200	75	G 3/8	145.5	174	208	11	205	114	35	72.8	27	228	41	60
VZWE-F-M22C-M-F890-760-H	217	89	G 1/2	162	194	228	11	214	123	35	80.8	27	248	41	60

Technical data – Flanged valve

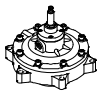
Dimensions

Download CAD data ➔ **www.festo.com**



Type	B1	D1	D2	D3 ∅	D4 ∅	H1	H2	H3	H4	L1	L2
VZWE-F-M22C-M-G112-400-H	112	G 1 1/2	G 3/8	74	94	182.5	89.6	37	49.3	112	39

Ordering data – Reverse jet pulse valves VZWE

	Process valve connection	Weight [g]	Part No.	Type
	G 1	430	**1795190**	**VZWE-F-M22C-M-G1-250-H**
	G 1 1/2	950	**1804475**	**VZWE-F-M22C-M-G112-400-H**
	F600	3300	**1808248**	**VZWE-F-M22C-M-F600-500-H**
	F750	3100	**1810664**	**VZWE-F-M22C-M-F750-620-H**
	F890	3600	**1214036**	**VZWE-F-M22C-M-F890-760-H**

Accessories for reverse jet pulse valves VZWE – solenoid coils VACN-H1, VACN-X

Type codes

VACN – H1 – A1 – 1

Type	
VACN	Solenoid coil, N series

Solenoid coil type	
H1	H1 solenoid coil, for 14 mm armature tube
X	X solenoid coil, for 14 mm armature tube

Electrical connection	
A1	Connection pattern type A, to EN 175301

Operating voltage	
1	24 V DC
2A	110 V AC, 50/60 Hz
3A	230 V AC, 50/60 Hz

Technical data

- Voltage
  24 V DC
  110, 240 V AC

- Can be replaced without interrupting the pneumatic circuit
- Connection pattern to EN 175301-803, type A
- For 14 mm armature tube

General technical data			
Type		VACN-H1	VACN-X
Type of mounting		Via lock nut	Via lock nut
Max. tightening torque of fitting	[Nm]	2	2
Mounting position		Any	Any
Switching position indication		No	No
Product weight	[g]	150	148

Materials		
Type	VACN-H1	VACN-X
Solenoid coil	Copper	Copper
	Steel	Steel
	Thermoplastic	Duroplast
Winding	Copper	Copper
Note on materials	Contains paint-wetting impairment substances	Contains paint-wetting impairment substances
	RoHS-compliant	RoHS-compliant

Electrical data		
Electrical connection		Plug
		Square design
		To EN 175301-803
		Type A
Permissible voltage fluctuations	[%]	–10 / +10
Duty cycle	[%]	100
Degree of protection		IP65
Note on degree of protection		In assembled state

Characteristic coil data							
		VACN-H1			VACN-X		
		24 V DC	110 V AC	230 V AC	24 V DC	110 V AC	230 V AC
Frequency	[Hz]	–	50	50/60	–	60	60
Permissible frequency fluctuations	[%]	–10 / +10	–10 / +10	–10 / +10	–10 / +10	–10 / +10	–10 / +10
Power	[W]	11.9	–	–	12.0	–	–
	[VA]	–	–	–	–	18.5	18.8
Pickup power	[VA]	–	36	36	–	–	–
Holding power	[VA]	–	21.4	21.8	–	–	–
Power factor cos(phi)		0.7	0.7	0.7	0.7	0.7	0.7
Surge resistance	[kV]	–	2.5	4	–	2.5	4
Min. pickup time	[ms]	12	12	12	12	12	12

Accessories for reverse jet pulse valves VZWE – solenoid coils VACN-H1, VACN-X

Data sheet

Operating and environmental conditions

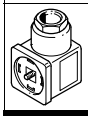
		VACN-H1			VACN-X		
		24 V DC	110 V AC	230 V AC	24 V DC	110 V AC	230 V AC
Ambient temperature	[°C]	–20 ... +50			–20 ... +60		
	[°C]	–20 ... +60 (with limited duty cycle)			–		
Corrosion resistance class CRC[1)]		4			2		
Contamination level		–	3		–	3	
CE marking (see declaration of conformity)[2)]		–	To EU Low Voltage Directive		To EU Low Voltage Directive		

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
Corrosion resistance class CRC 4 to Festo standard FN 940070
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (➔ also FN 940082) using appropriate media.
2) Additional information www.festo.com/sp ➔ Certificates.

Dimensions Download CAD data ➔ **www.festo.com**

Type	B1	D1	H1	H2	H3	H4	L1	L2	L3	L4	⫧C 1
VACN-H1-A1-...	35.8	G1/8	45.9	42.1	27.6	12.5	57	45	39.8	17.9	A/F 14
VACN-X-A1-...	29.5	M10x1	46.9	42	27.4	12.4	50.4	38.4	32.9	14.5	A/F 14

Ordering data

	Description		Retaining nut thread	Part no.	Type
Solenoid coil					
	Without plug socket, connection pattern to EN 175301-803, type A	24 V DC	G1/8	**8022877**	**VACN-H1-A1-1**
			M10x1	**8049752**	**VACN-X-A1-1**
		110 V AC	G1/8	**8022878**	**VACN-H1-A1-2A**
			M10x1	**8049753**	**VACN-X-A1-2A**
		230 V AC	G1/8	**8022879**	**VACN-H1-A1-3A**
			M10x1	**8049754**	**VACN-X-A1-3A**
Plug socket without cable					
	Cable connection with screw terminal			**34583**	**MSSD-C**

10 Pneumatically actuated media valves

Pinch valves for various media, from gaseous to highly viscous and abrasive media

VZQA ★

Pinch valves

+ For critical, abrasive and viscous media
+ Easy-to-clean design
+ Flow direction is freely selectable
+ Choice of NO (normally open) or NC (normally closed) variant

➔ page 765

Contents

Pinch valves VZQA 765
Pneumatic valves VLX 781

Pinch valves
VZQA ★

Overview, configuration and ordering
➔ **www.festo.com/catalogue/vzqa**

Additional information, support and user documentation
➔ **www.festo.com/sp/vzqa**

Quick ordering of basic designs
➔ page 772

+ Connection 1/4", 1/2", clamp
+ G thread or NPT thread
+ Pressure range 0 ... 6 bar
+ Pneumatic actuation
+ 2/2-way pinch valve
+ Housing made of aluminium, stainless steel (clean design)
+ For controlling liquid/powdery media, solids and mixed materials
+ Sealing material EPDM, NBR, silicone

Pinch valves VZQA

Key features

Application

- The pinch valve is a 2/2-way valve used to control liquid and powdery media, solids as well as a mixture of substances.

Design

- Easy-to-clean housing (clean design)
- Open or closed in normal position
- Shut-off element made of elastomer

Areas of application

- Filling systems
- Dosing and weighing systems
- Powder coating systems
- Suction and compressed air control units
- Pneumatic delivery systems
- Sandblast systems

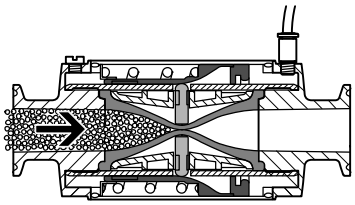
Examples of operating media:

- Granules
- Powder
- Dust
- Liquids containing solids
- Fibrous products
- Highly viscous media
- Abrasive media
- Corrosive media
- Paste-like media

Function

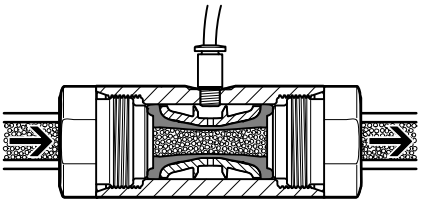
The pinch valve is a 2/2-way valve with a tubular pinch sleeve made of elastomer. The free passage when the valve is opened ensures minimum flow resistance and prevents the valve becoming blocked or clogged.

VZQA-C-M22C (normally closed)



In the normal position, the pinch valve is closed. The pinch valve sleeve opens when the valve is pressurised, releasing the material flow. When pressure is no longer applied, a spring closes the valve. The valve can be used to shut off liquid and gaseous media.

VZQA-C-M22U (normally open)

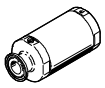
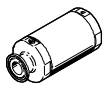
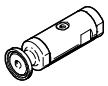
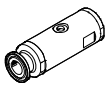
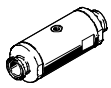


In the normal position, the pinch valve is open. The pinch valve sleeve closes when the valve is pressurised, shutting off the material flow. When pressure is no longer applied, the valve opens due to the inherent stress of the pinch valve sleeve or the pressure of the medium. The valve can be used to shut off liquid and powdery media, solids (granules) as well as a mixture of substances.

Note

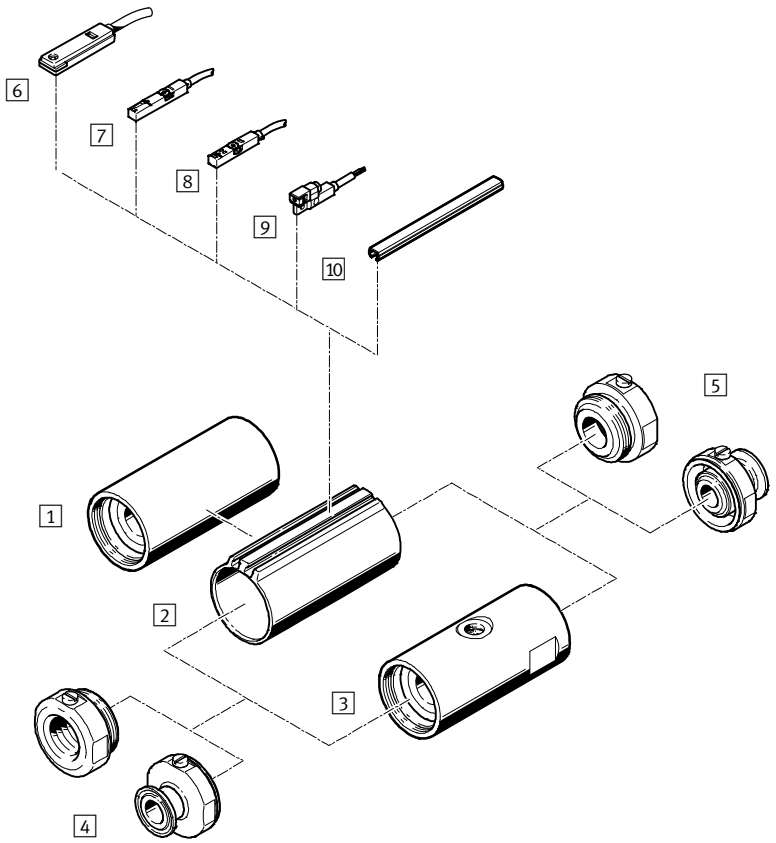
The hermetic separation between the media circuit and control circuit is no longer guaranteed if wear causes the pinch valve sleeve to leak. The flow medium can then get into the control circuit, from where it can escape. Any potential hazard (e.g. due to aggressive or hot media) must be ruled out. The compressed air supply to the control valve must be protected against the ingress of the flow medium using a suitable check valve, or suitable protection against return flow must be integrated in the pilot line in the immediate vicinity of the media valve. Pilot medium can get into the media circuit if the pinch valve sleeve fails. The media circuit must therefore be sized for the set operating pressure. Any potential hazard must be ruled out.

Product range overview

Version		Type	Nominal width DN	Process valve connection	Flow rate [m³/h]	Pilot air connection 12, max. permissible screw-in depth	➔ Page/ Internet
Normally closed	**M22C**						
		VZQA-C-M22C-...	6	G1/4 1/4 NPT Clamp ferrule to DIN 32676, series A Clamp ferrule to ASME-BPE, type A	0.7	M3, 3 mm	770
		VZQA-C-M22C-...	15	G1/2 1/2 NPT Clamp ferrule to DIN 32676, series A Clamp ferrule to ASME-BPE, type A	5	M5, 5 mm	770
Normally open	**M22U**						
		VZQA-C-M22U-...	6	G1/4 1/4 NPT Clamp ferrule to DIN 32676, series A Clamp ferrule to ASME-BPE, type A	0.7	M5, 4.5 mm	773
		VZQA-C-M22U-...	15	G1/2 1/2 NPT Clamp ferrule to DIN 32676, series A Clamp ferrule to ASME-BPE, type A	5	G1/8, 5 mm	773
		VZQA-C-M22U-...	25	G1 1 NPT Clamp ferrule to DIN 32676, series A Clamp ferrule to ASME-BPE, type A Clamp ferrule to ASME-BPE, type B	18	G1/8, 6 mm	773

Pinch valves VZQA

Peripherals overview



Accessories		Description	➔ Page/Internet
	Basic body		770
1	VZQA-C-M22C	• Normally closed • "Stainless steel housing material" variant	
2	VZQA-C-M22C	• Normally closed • "Aluminium housing material" variant (always with T-slots) • Integrated ring magnet only available when "End-position sensing type" is selected	
3	Basic body VZQA-C-M22U	Normally open	773
4	Connection 1	Various connections are available: • G female thread • NPT female thread • Clamp ferrule DIN 32676, series A • Clamp ferrule ASME-BPE, type A • Clamp ferrule ASME-BPE, type B	–
5	Connection 2	Various connections are available: • G female thread • NPT female thread • Clamp ferrule DIN 32676, series A • Clamp ferrule ASME-BPE, type A • Clamp ferrule ASME-BPE, type B	–
	Proximity sensors for T-slot		778
6	SME-8	Magnetic reed, insertable in the slot lengthwise	
7	SME-8M	Magnetic reed, insertable in the slot from above	
8	SMT-8M	Magnetoresistive, insertable in the slot from above, to EU Explosion Protection Directive	
9	SMT-8G	Magnetoresistive, insertable in the slot lengthwise	
10	Slot cover ABP-5-S	To protect the sensor cables and slots from contamination	779

Type codes

VZQA	–	C	–	M22U	–	6	–	G	G	–	V4	V4	N	–	4	–	E

Type

VZQA	Pinch valve, pneumatically actuated

Product version

C	Easy-to-clean design

Valve function

M22C	2/2-way valve, normally closed
M22U	2/2-way valve, normally open

Nominal diameter DN

6	6 mm
15	15 mm
25	25 mm

Process valve connection type 1

G	G female thread
T	NPT female thread
S1	Clamp ferrule to ASME-BPE, type A
S5	Clamp ferrule to DIN 32676, series A
S12	Clamp ferrule to ASME-BPE, type B

Process valve connection type 2

G	G female thread
T	NPT female thread
S1	Clamp ferrule to ASME-BPE, type A
S5	Clamp ferrule to DIN 32676, series A
S12	Clamp ferrule to ASME-BPE, type B

Housing material

AL	Aluminium
V2	Stainless steel (chrome-nickel, austenitic)
V4	Stainless steel (chrome-nickel-molybdenum, austenitic)

Housing cover material

Al	Aluminium
V4	Stainless steel (chrome-nickel-molybdenum, austenitic)
POM	Polyoxymethylene

Shut-off element material

E	EPDM
N	NBR
S1	Silicone

Pressure range of media

4	0 ... 4 bar
6	0 ... 6 bar

Sensing type

–	None
E	End positions

Pinch valves VZQA

Technical data M22C

Function

General technical data			
Nominal width DN		6	15
Process valve nominal pressure PN		10	
Design		Pinch valve, pneumatically actuated	
Actuation type		Pneumatic	
Sealing principle		Soft	
Mounting position		Any	
Valve function		2/2-way, closed, monostable	
Flow direction		Reversible	
Reset method		Mechanical spring	
Type of control		Externally controlled	
Type of mounting		In-line installation	
Auxiliary pilot air connection 12		M3	M5
Switching time on	[ms]	125	150
Switching time off	[ms]	125	250
Flow rate Kv	[m^3/h]	0.7	5
Max. viscosity	[mm^2/s]	4000	

Operating and environmental conditions			
Nominal width DN		6	15
Operating pressure	[bar]	3.5 ... 6	
Burst pressure	[bar]	16	
Pressure of medium	[bar]	0 ... 4	0 ... 6
Ambient temperature	[°C]	–5 ... +60	
Temperature of medium	[°C]	–15 ... +50	–5 ... +100
Storage temperature	[°C]	6 ... 8	
Food-safe[1)]		See supplementary material information	
Pilot medium		Compressed air to ISO 8573-1:2010 [7:4:1]	
Medium		Compressed air to ISO 8573-1:2010 [-:-:1]	
		Water	

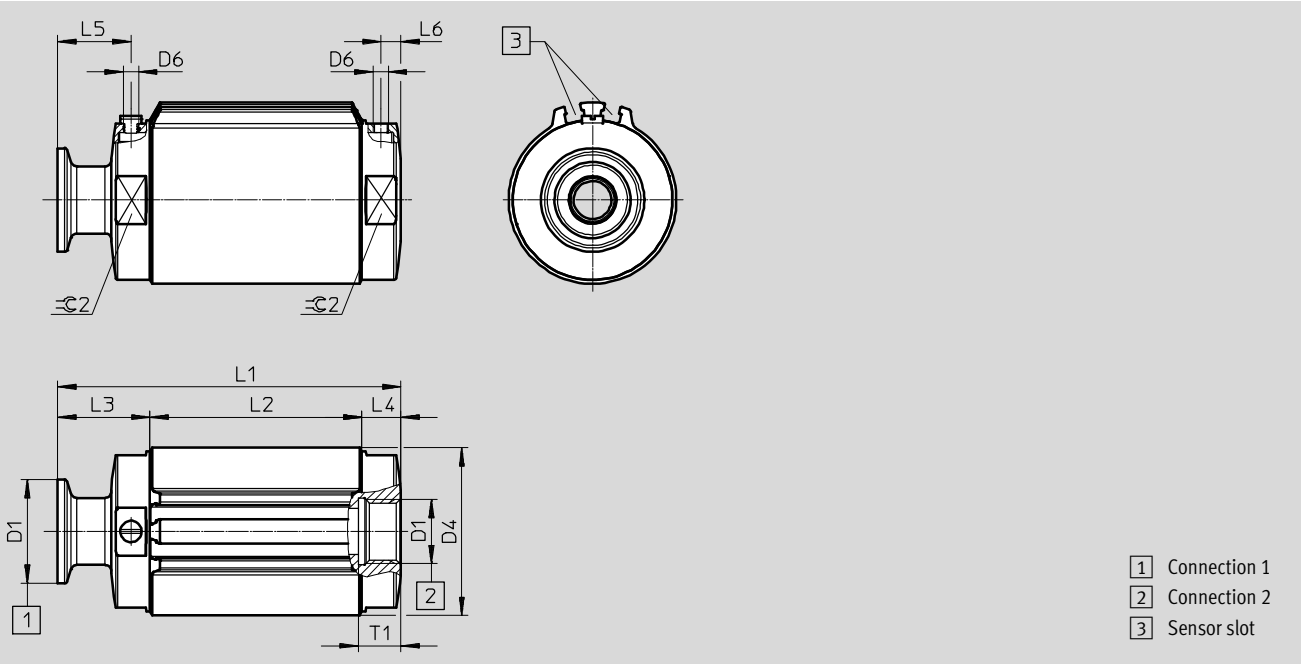
1) Additional information www.festo.com/sp ➔ Certificates.

Materials		Material number
Housing		
V2V4	High-alloy stainless steel	1.4301
ALV4	Wrought aluminium alloy	–
Housing cover	High-alloy stainless steel	1.4435
Bowl	PA6	
Seals	FPM	
Shut-off element	EPDM	
Note on materials	RoHS-compliant	
	Contains PWIS (paint-wetting impairment substances)	

Technical data M22C

Dimensions Download CAD data ➔ **www.festo.com**

Illustration – connection 1: clamp ferrule to DIN 32676, series A; connection 2: G1/2



Process valve connection	D1	Material Housing	D4 ∅	D6	L2	L3	L4	L5	L6	T1	⌭ 2
Nominal width DN6											
G	G1/4	V2	33.6	M3	47.2	10.9	10.9	4.8	4.8	12	32
T	1/4 NPT					10.9	10.9	4.8	4.8	10	
S5	DIN 32676, series A					24	24	17.9	17.9	–	
S1	ASME-BPE, type A					24	24	17.9	17.9	–	
Nominal width DN15											
G	G1/2	V2	52.4	M5	69.5	12.8	12.8	6.6	6.6	14	50
		AL	55			12.8	12.8	6.6	6.6		
T	1/2 NPT	V2	52.4			12.8	12.8	6.6	6.6		
		AL	55			12.8	12.8	6.6	6.6		
S5	DIN 32676, series A	V2	55			30.3	30.3	24	24		
S1	ASME-BPE, type A	V2	55			30.3	30.3	24	24		

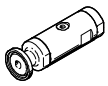
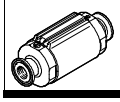
Process valve combinations	L1
Nominal width DN6	
GG	69
GT, TT, TG	69
S1S1, S1S5, S5S5, S5S1	95.1
S1G, S1T, GS1, TS1, S5G, S5T, GS5, TS5	82.1
Nominal width DN15	
GG	95
GT, TT, TG	95
S1S1, S1S5, S5S5, S5S1	130
S1G, S1T, GS1, TS1, S5G, S5T, GS5, TS5	112.5

Pinch valves VZQA

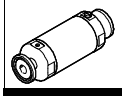
Technical data M22C

★ Core product range

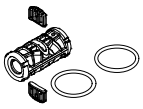
Ordering data

Pinch valves	Nominal width DN	Process valve connection	Material shut-off element	Weight [g]	Part no.	Type
	15	G1/2	EPDM	536	★ 3412426	VZQA-C-M22C-15-GG-V2V4E-6
		Clamp ferrule to DIN 32676, series A		666	★ 3412424	VZQA-C-M22C-15-S5S5-V2V4E-6
With integrated ring magnet for sensing the end positions						
	15	Clamp ferrule to DIN 32676, series A	EPDM	607	★ 3412425	VZQA-C-M22C-15-S5S5-ALV4E-6-E

Ordering data

Pinch valves	Nominal width DN	Process valve connection	Material shut-off element	Weight [g]	Part no.	Type
	6	G1/4	EPDM	253	8091739	VZQA-C-M22C-6-GG-V2V4E-4
		1/4 NPT		253	4748311	VZQA-C-M22C-6-TT-V2V4E-4
	6	Clamp ferrule to DIN 32676, series A	EPDM	302	8079858	VZQA-C-M22C-6-S1S1-V2V4E-4
		Clamp ferrule to ASME-BPE, type A		311	8079857	VZQA-C-M22C-6-S5S5-V2V4E-4

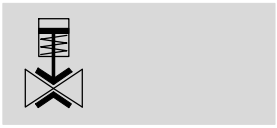
Ordering data

Seal cartridge	Nominal width DN	Storage temperature [°C]	Shut-off element material	Note on materials	Part no.	Type
	15	6 ... 8	EPDM	RoHS-compliant	3418619	VAVC-Q2-M22C-15-E

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Technical data M22U

Function



General technical data				
Nominal width DN		6	15	25
Process valve nominal pressure PN		10		
Design		Pinch valve, pneumatically actuated		
Actuation type		Pneumatic		
Sealing principle		Soft		
Mounting position		Any		
Valve function		2/2-way, open, monostable		
Flow direction		Reversible		
Reset method		Rebound resilience		
Type of control		Externally controlled		
Type of mounting		In-line installation		
Auxiliary pilot air connection 12		M5	G1/8	G1/8
Switching time on	[ms]	125	250	250
Switching time off	[ms]	125	250	250
Flow rate Kv	[m^3/h]	0.7	5	18
Max. viscosity	[mm^2/s]	4000		

Materials				
VZQA-C-M22U-...	V4V4	ALAL	ALV4	ALPOM
Housing	High-alloy stainless steel	Wrought aluminium alloy		
Housing cover	High-alloy stainless steel	Wrought aluminium alloy	High-alloy stainless steel	POM
Bowl	PA6			
Seals	FPM			
Note on materials				
For shut-off element NBR, EPDM or VMQ	RoHS-compliant			
For shut-off element VMQ	Contains PWIS (paint-wetting impairment substances)			

Pinch valves VZQA

Technical data M22U

Operating and environmental conditions				
Nominal width DN		6	15	25
Operating pressure	[bar]	1 ... 6.5		
Overload pressure	[bar]	7.8		
Pressure of medium	[bar]	0 ... 4		
Differential pressure				
For shut-off element NBR or EPDM	[bar]	2.5	2.5	2.5
For shut-off element VMQ	[bar]	2.5	2.5	3
Burst pressure	[bar]	16		
Ambient temperature	[°C]	−5 ... +60		
Temperature of medium				
For shut-off element NBR	[°C]	−5 ... +60		
For shut-off element EPDM	[°C]	−5 ... +100		
For shut-off element VMQ	[°C]	−5 ... +150		
Storage temperature				
For shut-off element NBR or EPDM	[°C]	6 ... 8		
For shut-off element VMQ	[°C]	0 ... 25		
Food-safe				
For shut-off element EPDM		See supplementary material information[1)]		
For shut-off element NBR or VMQ		See declaration of conformity		
Pilot medium				
For shut-off element EPDM		Compressed air to ISO 8573-1:2010 [7:4:1]		
For shut-off element NBR or VMQ		Compressed air to ISO 8573-1:2010 [7:4:4]		
Medium				
For shut-off element EPDM		Compressed air to ISO 8573-1:2010 [-:-:1]		
		Water		
For shut-off element NBR or VMQ		Compressed air to ISO 8573-1:2010 [-:-:-]		

1) Additional information www.festo.com/sp ➔ Certificates.

Technical data M22U

Dimensions Download CAD data ➔ **www.festo.com**

Illustration – connection 1: clamp ferrule to DIN 32676, series A; connection 2: G1/2

1 Connection 1
2 Connection 2

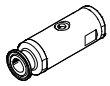
Process valve connection	D1	Material housing cover	D2	D3 ∅	D4 ∅	L2	L3	L4	T1	⌭1	⌭2
Nominal width DN6											
G	G1/4	V4, AL	M5	9	24	49	8	8	12	22	22
T	1/4 NPT	V4, AL					8	8			
S5	DIN 32676, series A	V4					23	23			
S1	ASME-BPE, type A	V4					23	23			
Nominal width DN15											
G	G1/2	V4, AL	G1/8	15	38	81	7	7	14	36	36
		POM					12	12			
T	1/2 NPT	V4, AL					7	7			
		POM					12	12			
S5	DIN 32676, series A	V4					24.5	24.5			
S1	ASME-BPE, type A	V4					24.5	24.5			
Nominal width DN25											
G	G1	V4, AL	G1/8	15	58	109	10.5	10.5	18	55	55
		POM					15.5	15.5			
T	1 NPT	V4, AL					10.5	10.5			
		POM					15.5	15.5			
S5	DIN 32676, series A	V4					28	28			
S1	ASME-BPE, type A	V4					28	28			
S12	ASME-BPE, type B	V4					28	28			

Process valve combinations	L1		
	Nominal width DN6	Nominal width DN15	Nominal width DN25
GG, GT, TT, TG made of V4 or AL	65	95	130
GG, GT, TT, TG made of POM	–	105	140
GG, GT, TT, TG made of V4 or AL with POM	–	100	135
S1S1, S1S5, S5S5, S5S1, S1S12, S12S1, S5S12, S12S5, S12S12	80	130	165
S1G, S1T, GS1, TS1, S5G, S5T, GS5, TS5, S12G, S12T, GS12, TS12	95	112.5	147.5

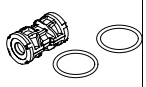
Pinch valves VZQA

Technical data M22U

Ordering data

Pinch valves	Nominal width DN	Process valve connection	Material shut-off element	Weight [g]	Part no.	Type
	6	G1/4	NBR	105.5	**2931679**	**VZQA-C-M22U-6-GG-ALV4N-4**
			EPDM	157	**2931678**	**VZQA-C-M22U-6-GG-V4V4E-4**
			Silicone	157	**2931683**	**VZQA-C-M22U-6-GG-V4V4S1-4**
		1/4 NPT	Silicone	157	**2931685**	**VZQA-C-M22U-6-TT-V4V4S1-4**
		Clamp ferrule to DIN 32676, series A	EPDM	215	**2931681**	**VZQA-C-M22U-6-S5S5-V4V4E-4**
			Silicone	215	**2931682**	**VZQA-C-M22U-6-S5S5-V4V4S1-4**
		Clamp ferrule to ASME-BPE, type A	Silicone	195	**2931684**	**VZQA-C-M22U-6-S1S1-V4V4S1-4**
	15	G1/2	NBR	431	**3022830**	**VZQA-C-M22U-15-GG-V4V4N-4**
			NBR	265	**3022831**	**VZQA-C-M22U-15-GG-ALV4N-4**
			NBR	158	**3022832**	**VZQA-C-M22U-15-GG-ALPOMN-4**
			EPDM	431	**3022829**	**VZQA-C-M22U-15-GG-V4V4E-4**
			Silicone	431	**3022835**	**VZQA-C-M22U-15-GG-V4V4S1-4**
		1/2 NPT	Silicone	431	**3022838**	**VZQA-C-M22U-15-TT-V4V4S1-4**
		Clamp ferrule to DIN 32676, series A	EPDM	559	**3022833**	**VZQA-C-M22U-15-S5S5-V4V4E-4**
			Silicone	559	**3022834**	**VZQA-C-M22U-15-S5S5-V4V4S1-4**
		Clamp ferrule to ASME-BPE, type A	Silicone	495	**3022837**	**VZQA-C-M22U-15-S1S1-V4V4S1-4**
	25	G1	EPDM	1178	**3968922**	**VZQA-C-M22U-25-GG-V4V4E-4**
			EPDM	480	**3968923**	**VZQA-C-M22U-25-GG-ALALE-4**
			Silicone	1178	**3968926**	**VZQA-C-M22U-25-GG-V4V4S1-4**
		1 NPT	Silicone	1178	**3968928**	**VZQA-C-M22U-25-TT-V4V4S1-4**
		Clamp ferrule to DIN 32676, series A	EPDM	1474	**3968924**	**VZQA-C-M22U-25-S5S5-V4V4E-4**
			Silicone	1474	**3968925**	**VZQA-C-M22U-25-S5S5-V4V4S1-4**
		Clamp ferrule to ASME-BPE, type B	Silicone	1516	**3968927**	**VZQA-C-M22U-25-S12S12-V4V4S1-4**

Ordering data

Seal cartridge	Nominal width DN	Material shut-off element	Storage temperature [°C]	Note on materials		Food-safe	Part no.	Type
	6	NBR	6 ... 8	–	RoHS-compliant	–	**2392881**	**VAVC-Q2-M22U-6-N**
		EPDM				1)	**2392882**	**VAVC-Q2-M22U-6-E**
		VMQ (silicone)	0 ... 25	Contains PWIS (paint-wetting impairment substances)		2)	**2392883**	**VAVC-Q2-M22U-6-S1**
	15	NBR	6 ... 8	–		–	**3019151**	**VAVC-Q2-M22U-15-N**
		EPDM				1)	**3019148**	**VAVC-Q2-M22U-15-E**
		VMQ (silicone)	0 ... 25	Contains PWIS (paint-wetting impairment substances)		2)	**3019144**	**VAVC-Q2-M22U-15-S1**
	25	NBR	6 ... 8	–		–	★ **3970092**	**VAVC-Q2-M22U-25-N**
		EPDM				–	**3970093**	**VAVC-Q2-M22U-25-E**
		VMQ (silicone)	0 ... 25	Contains PWIS (paint-wetting impairment substances)		2)	**3970094**	**VAVC-Q2-M22U-25-S1**

1) See supplementary material information
Additional information www.festo.com/sp ➔ Certificates.
2) See declaration of conformity

Festo core product range
★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Ordering data – Modular product system

Ordering table

	VZQA-C-...	M22C	M22U	Conditions	Code	Enter code
M	Module no.	**3174282**	**2037881**			
	Product type	Pinch valve			**VZQA**	VZQA
	Version	Easy-to-clean design			**-C**	-C
	Valve function	2/2-way valve, normally closed	–		**-M22C**	
		–	2/2-way valve, normally open		**-M22U**	
	Nominal diameter DN	6			**-6**	
		15			**-15**	
		–	25		**-25**	
	Process valve connection type 1	G female thread			**-G**	
		Clamp ferrule to ASME-BPE, type A		1 4	**-S1**	
		Clamp ferrule to DIN 32676, series A		1	**-S5**	
		NPT female thread			**-T**	
		Clamp ferrule to ASME-BPE, type B		1 3 4 6	**-S12**	
	Process valve connection type 2	G female thread			**G**	
		Clamp ferrule to ASME-BPE, type A		1 4	**S1**	
		Clamp ferrule to DIN 32676, series A		1	**S5**	
		NPT female thread			**T**	
		Clamp ferrule to ASME-BPE, type B		1 3 4 6	**S12**	
	Housing material	Aluminium			**-AL**	
		Stainless steel (chrome-nickel, austenitic)	–		**-V2**	
		–	Stainless steel (chrome-nickel-molybdenum, austenitic)		**-V4**	
	Housing cover material	Aluminium			**AL**	
		–	Polyoxymethylene	3	**POM**	
		Stainless steel (chrome-nickel-molybdenum, austenitic)			**V4**	
	Shut-off element material	EPDM			**E**	
		–	NBR		**N**	
		–	Silicone		**S1**	
	Pressure range of media [bar]	0 ... 4		7	**-4**	
		0 ... 6	–	3	**-6**	
O	Sensing type	None	–			
		End positions	–	2 5	**-E**	

1 **S1, S5, S12** Only in combination with housing cover material V4 (stainless steel)
2 **E** Only in combination with valve function M22C
3 **POM, S12, 6** Not in combination with nominal diameter DN6
4 **S1, S12** Not in combination with nominal diameter DN25 with valve function M22C
5 **E** Not in combination with housing material V2 (stainless steel)
6 **S12** Not in combination with nominal diameter DN15
7 **4** Not in combination with nominal diameter DN15 with valve function M22C

M Mandatory data
O Options

Transfer order code

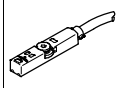
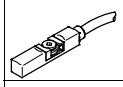
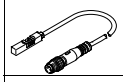
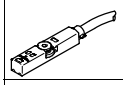
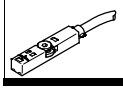
	VZQA	–	C	–		–		–		–				–		–	

Pinch valves VZQA

Accessories

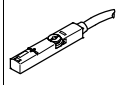
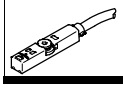
Ordering data – Proximity sensors for T-slot, magnetoresistive

Technical data ➔ Internet: smt-8

	Switching output	Electrical connection			Cable length	Part no.	Type
		Cable	Cable with plug, rotatable thread				
			M8x1	M12x1	[m]		
N/O contact							
	PNP	–	3-pin	–	0.3	★ 574334	SMT-8M-A-PS-24V-E-0,3-M8D
		3-wire	–	–	2.5	★ 574335	SMT-8M-A-PS-24V-E-2,5-OE
		3-wire	–	–	5	★ 574336	SMT-8M-A-PS-24V-E-5,0-OE
		–	–	3-pin	0.3	★ 574337	SMT-8M-A-PS-24V-E-0,3-M12
	NPN	3-wire	–	–	2.5	★ 574338	SMT-8M-A-NS-24V-E-2,5-OE
		–	3-pin	–	0.3	★ 574339	SMT-8M-A-NS-24V-E-0,3-M8D
	To EU Explosion Protection Directive (ATEX)						
	Non-contacting	2-wire	–	–	5	★ 574341	SMT-8M-A-ZS-24V-E-5,0-OE-EX2
	PNP	–	3-pin	–	0.3	574342	SMT-8M-A-PS-24V-E-0,3-M8D-EX2
N/O contact, corrosion resistant							
	PNP	3-wire	–	–	5	574380	CRSMT-8M-PS-24V-K-5,0-OE
		3-wire	–	–	10	574381	CRSMT-8M-PS-24V-K-10,0-OE
	PNP	–	–	3-pin	0.3	574382	CRSMT-8M-PS-24V-K-0,3-M12
		–	3-pin	–	0.3	574383	CRSMT-8M-PS-24V-K-0,3-M8D
N/C contact							
	PNP	3-wire	–	–	7.5	★ 574340	SMT-8M-A-PO-24V-E-7,5-OE
Switchable							
	PNP/NPN	–	3-pin	–	0.3	574343	SMT-8M-A-PNS-24V-E-0,3-M8D
	PNP PS/PO	–	3-pin	–	0.3	574344	SMT-8M-A-PSO-24V-E-0,3-M8D

Ordering data – Proximity sensors for T-slot, magnetic reed

Technical data ➔ Internet: sme-8

	Switching output	Electrical connection		Cable length	Part no.	Type
		Cable	Cable with plug, rotatable thread			
			M8x1	[m]		
N/O contact						
	Contacting, bipolar	–	3-pin	0.3	★ 543861	SME-8M-DS-24V-K-0,3-M8D
		3-wire	–	2.5	★ 543862	SME-8M-DS-24V-K-2,5-OE
		3-wire	–	5	★ 543863	SME-8M-DS-24V-K-5,0-OE
		2-wire	–	2.5	★ 543872	SME-8M-ZS-24V-K-2,5-OE
		3-wire	–	7.5	543876	SME-8M-DS-24V-K-7,5-OE
N/C contact						
	Contacting, bipolar	3-wire	–	7.5	★ 546799	SME-8M-DO-24V-K-7,5-OE

Festo core product range

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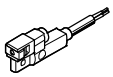
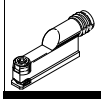
☆ Generally ready for shipping ex works in 5 days

Accessories

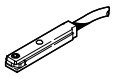
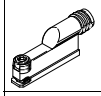
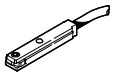
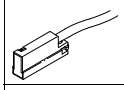
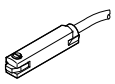
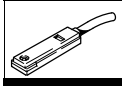
Ordering data – Proximity sensors for T-slot, magnetoresistive

Technical data ➔ Internet: smt-8

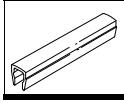
	Switching output	Electrical connection		Cable length [m]	Part no.	Type
		Cable	Plug M8x1			
N/O contact						
	PNP	3-wire	–	2.5	**547859**	**SMT-8G-PS-24V-E-2,5Q-OE**
		–	3-pin	0.3	**547860**	**SMT-8G-PS-24V-E-0,3Q-M8D**
	PNP	–	3-pin	–	**562019**	**SMT-8-SL-PS-LED-24-B**

Ordering data – Proximity sensors for T-slot, magnetic reed

Technical data ➔ Internet: sme-8

	Switching output	Electrical connection		Cable length [m]	Part no.	Type
		Cable	Plug M8x1			
N/O contact						
	Contacting, bipolar	3-wire	–	2.5	**150855**	**SME-8-K-LED-24**
		3-wire	–	5.0	**175404**	**SME-8-K5-LED-24**
		3-wire	–	7.5	**530491**	**SME-8-K-7,5-LED-24**
		–	3-pin	0.3	**150857**	**SME-8-S-LED-24**
		2-wire	–	2.5	**171169**	**SME-8-ZS-KL-LED-24**
	Contacting, bipolar	–	3-pin	–	**526622**	**SME-8-SL-LED-24**
	Contacting, bipolar, heat-resistant	2-wire	–	2.5	**161756**	**SME-8-K-24-S6**
	Contacting, bipolar, operating voltage range up to 230 V AC/DC	2-wire	–	2.5	**152820**	**SME-8-K-LED-230**
	Contacting, bipolar	3-wire	–	1	**562515**	**SME-8-FM-DS-24V-K-1,0-OE**
		2-wire	–	1	**562516**	**SME-8-FM-ZS-24V-K-1,0-OE**
N/C contact						
	Contacting, bipolar	3-wire	–	7.5	**160251**	**SME-8-O-K-LED-24**

Ordering data – Slot cover for T-slot

	Mounting	Length [m]	Part no.	Type
	Insertable	2x 0.5	**151680**	**ABP-5-S**

Pneumatic valves

VLX

Overview, configuration and ordering
➔ **www.festo.com/catalogue/vlx**

Additional information, support and user documentation
➔ **www.festo.com/sp/vlx**

+ Poppet valve, indirectly actuated with diaphragm control
+ Connection G1/4 ... G1, also available with NPT thread
+ Flow rate 2400 ... 14,000 l/min

+ Pneumatically actuated

Pneumatic valves VLX

Product range overview and type codes

General information

- G¼ ... G1

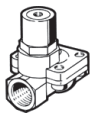
- Standard nominal flow rate 2,400 ... 14,000 l/min

Design

- Poppet valve, indirectly actuated with diaphragm control

- Note

Attention: If the pressure is switched on, the valve will open briefly.

Design	Type	Process valve connection	Nominal size DN	➔ Page/Internet
	VLX-2-...	G¼	13	783
		G⅜	13	
		G½	13	
		G¾	20	
		G1	25	

VLX – 2 – ¼ – MS –

Type	
VLX	Pneumatic valve

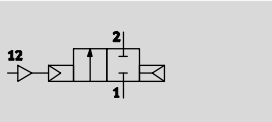
Connection	
G14	Thread G¼
G38	Thread G⅜
G12	Thread G½
G34	Thread G¾
G1	Thread G1

Material	
MS	Brass

Design	
–	G thread

Technical data

Function



Standard nominal flow rate
2,400 ... 14,000 l/min

G¼ ... G1

General technical data

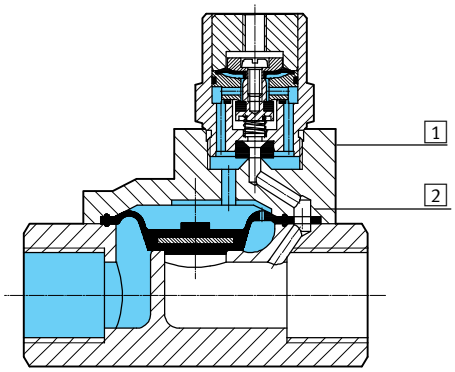
	VLX-2-1/4-MS	VLX-2-3/8-MS	VLX-2-1/2-MS	VLX-2-3/4-MS	VLX-2-1-MS
Process valve connection	G¼	G⅜	G½	G¾	G1
Nominal size DN	13	13	13	20	25
Auxiliary pilot air port 12	M5				
Valve function	2/2-way, single pilot, closed				
Design	Diaphragm valve				
Type of mounting	In-line installation				
Actuation type	Pneumatic				
Type of control	Piloted				
Reset method	Pneumatic spring				
Mounting position	Any				
Sealing principle	Soft				
Direction of flow	Non-reversible				
Exhaust function	No flow control				
Product weight [g]	490	470	450	1,135	1,010

Operating and environmental conditions

	VLX-2-1/4-MS	VLX-2-3/8-MS	VLX-2-1/2-MS	VLX-2-3/4-MS	VLX-2-1-MS
Standard nominal flow rate [l/min]	2,400	3,800	4,000	10,500	14,000
Operating pressure [bar]	1 ... 10				
Medium	Filtered compressed air, degree of filtration 200 µm				
Pilot medium	Compressed air to ISO 8573-1:2010 [7:-:-]				
Ambient temperature [°C]	–10 ... 60				
Temperature of medium [°C]	–10 ... 80				

Materials

Sectional view

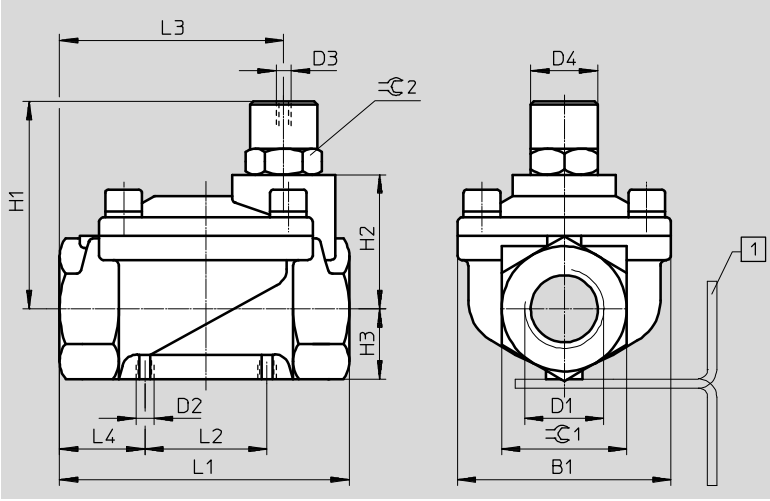


Pneumatic valves	
1 Housing	Brass
2 Screws	High-alloy stainless steel
– Material number, screw	1.4301

Pneumatic valves VLX

Technical data

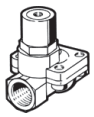
Dimensions Download CAD data ➔ **www.festo.com**



1 Mounting bracket HRM

Type	B1	D1	D2	D3	D4 ∅	H1	H2	H3	L1	L2	L3	L4	1	2
VLX-2-1/4-MS	48	G1/4	M4	M5	22	56.5	32.5	15.5	67	25	47	21	27	22
VLX-2-3/8-MS	48	G3/8	M4	M5	22	56.5	32.5	15.5	67	25	47	21	27	22
VLX-2-1/2-MS	48	G1/2	M4	M5	22	56.5	32.5	15.5	67	25	47	21	27	22
VLX-2-3/4-MS	70	G3/4	M6	M5	22	68	44	23	95	40	73.5	28	41	22
VLX-2-1-MS	70	G1	M6	M5	22	68	44	23	95	40	73.5	28	41	22

Ordering data

	Process valve connection	Part No.	Type
	G¼	**34432**	**VLX-2-1/4-MS**
	G⅜	**34433**	**VLX-2-3/8-MS**
	G½	**34434**	**VLX-2-1/2-MS**
	G¾	**34435**	**VLX-2-3/4-MS**
	G1	**34436**	**VLX-2-1-MS**

Accessories

Dimensions

Download CAD data ➔ **www.festo.com**

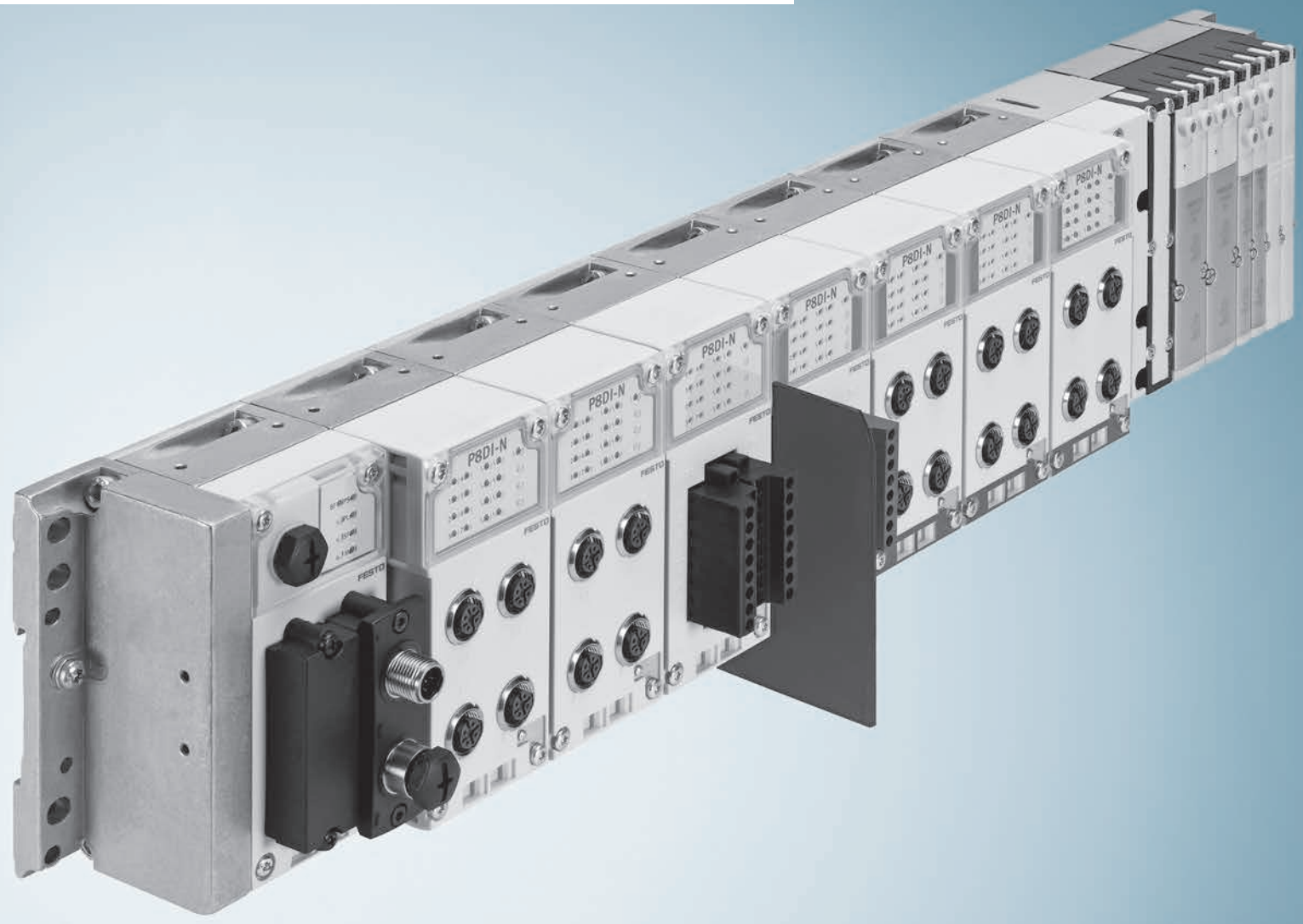
Type	B1	B2	B3	D1 ∅	D2 ∅	H1	H2	L1	L2 ±0.1
HRM-1	25	12.5	2	6	5	37	10	40	25
HRM-2	35	17.5	3	7	7	66	16	55	40

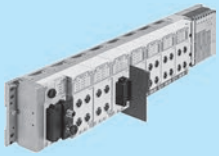
Ordering data

	Mounting bracket	Part No.	Type
	For type VLX-2-1/4, VLX-2-3/8, VLX-2-1/2	**9769**	**HRM-1**
	For type VLX-2-3/4, VLX-2-1	**9770**	**HRM-2**

11 Other devices

- Control technology and remote I/O
- Sensors
- Motion Terminal
- Valve terminals
- Compressed air preparation
- Pneumatic fittings system
- Electrical connector technology
- Control cabinets





Control technology and remote I/O

+ Pneumatic and electropneumatic controllers

➔ page 788

Sensors

+ Position sensors
+ Pressure and vacuum sensors
+ Force sensors
+ Sensor boxes

➔ page 795

Motion Terminal

+ Combines the advantages of electric and pneumatic technologies

➔ page 798

Valve terminals

+ Universal valve terminals
+ Standards-based valve terminals
+ Application-specific valve terminals
+ Electrical peripherals

➔ page 799

Compressed air preparation

+ Service units
+ Filter regulators
+ Lubricators
+ On/off valves and soft start valves

➔ page 803

Connection technology

+ Pneumatic
+ Electric

➔ page 815

Control cabinets

+ Individually tailored to the application

➔ page 834

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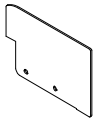
Sensors 795
Motion Terminal 798
Valve terminals 799
Compressed air preparation 803
Pneumatic fittings system 799
Electrical connector technology 825
Control cabinets 834

Product overview – Control technology and remote I/O

For Terminal CPX

Type	**Control blocks** **CPX-CEC-M1-V3, CPX-CEC-S1-V3, CPX-CEC-C1-V3**
CPU data	256 MB RAM, 32 MB flash, 800 MHz processor
Configuration support	CODESYS V3
Processing time	Approx. 200 µs/1 k instructions
Degree of protection	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 drives via CANopen • SoftMotion functions for coordinated multi-axis movements
➔ online	cpx-cec-m1

For Terminal CPX

Type	**Input modules** **CPX-P-8DE**	**Connection blocks** **CPX-P-AB**	 **Insulating plates** **CPX-P-AB-IP**
Degree of protection	Dependent on the manifold 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

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

Software tool

CODESYS		CODESYS for standardised programming of embedded devices to IEC 61131-3. It makes your life easier with simple commissioning, fast programming and parameterisation. Advantages • Hardware-neutral software platform for quick and easy configuration, programming and commissioning of pneumatic and electric 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 • Convenient IEC function element extension • Re-use of existing application parts The parameterisation software can be found in the support portal at www.festo.com/sp › enter search term "CODESYS" › start "Search" › select "Software" tab.

Electronic controllers

Type	Controllers CECC-D, CECC-LK, CECC-S	Controllers CECX-X-M1, CECX-X-C1	Input/output modules CECX-D-E8A, CECX-A-4E4A	Input modules CECX-D-16E, CECX-A-4E-V, CECX-E-E-T-P
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, type	CAN bus	CAN bus		
Ethernet, connector plug	RJ45	8-pin, socket, RJ45		
Description	• Compact programmable logic controller • Programming with CODESYS to IEC 61131-3 • 12 digital inputs, 8 digital outputs, additionally two 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-m1	cecx	cecx

Product overview – Control technology and remote I/O

Electronic controllers

Type	**Output modules CECX-D-14A-2, CECX-A-4A-V**	**Encoder interfaces CECX-C-2G**	**Bus interfaces CECX-F-PB-S-V, CECX-F-PB-V1, CECX-B-CO**
Operating voltage	24 V DC +25%/-15%	19.2 ... 30 V DC	19.2 ... 30 V DC
CPU data			
Fieldbus interface, type			CAN bus, PROFIBUS master DP-V1, PROFIBUS slave DP-V0, PROFIBUS slave DP-V1
Ethernet, connector plug		9-pin, socket, RJ45	8-pin, socket, 9-pin, plug connector
Description	• Digital modules: 14 digital outputs • Analogue modules: 4 analogue voltage outputs	• Displacement measurement function • Pulse counter • Speed measurement function • Shaft encoder monitoring function • Counter reading latch 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

Type	**Electrical interfaces CECX-C-2S1**	**AS-Interface® modules CESA**
Operating voltage	9.2 ... 30 V DC	AS-Interface® voltage 30 V DC
CPU data		
Fieldbus interface, type		CANopen device specification CiA DS-301, PROFIBUS to DIN 19245 Part 3
Ethernet, connector plug	8-pin	
Description	• For extending the controller with two RS232 serial interfaces	• AS-Interface® master gateway • Duplicate address recognition • Direct operation via pushbuttons • Graphic display • Comprehensive diagnostics via LED and display • Specification 3.0
→ online	**cecx**	**cesa**

Electrical peripherals

Type	**Terminal CPX**	**Automation systems CPX-E**	**Terminal CPX-P**	**Electrical interfaces CPX-CTEL**
Max. no. of inputs	Digital 512, analogue 32	Digital 512, analogue 32	512	256
Max. no. of outputs	Digital 512, analogue 18	Digital 512, analogue 32	512	256
No. of module positions	Max. 9 electric input/output modules	10	10	Max. 4 modules with I-Port interface
Electric actuation	Fieldbus, integrated controller	Fieldbus, integrated controller	Fieldbus, integrated controller	I-Port
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 programming system CODESYS V3 to IEC 61131-3 • Integration of motion functions (SoftMotion) • High I/O component density • Easy mounting of the control system on an H-rail	• 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 maintenance functions • Analogue inputs and outputs with HART protocol	• CPX-CTEL master module with 4 I-Port connections • Decentralised point-to-point connection to input modules and/or valve terminals possible • Standardised M12 connections
→ online	cpx	cpx-e	cpx-p	cpx-ctel

Electrical peripherals

Type	**Measuring modules CPX-CMIX**	**Input modules CTSL**	**CPI installation system CTEC**
Max. no. of inputs	6x8	16	128
Max. no. of outputs	6x8		128
No. of module positions	9		
Electric actuation	Via fieldbus	IO-Link®, I-Port	Fieldbus, integrated controller
Description	• Pneumatics and electrics – movement and measurement on one platform • Innovative measurement technology – piston rod drives, rodless drives, rotary drives • Actuation via fieldbus • Remote maintenance, remote diagnostics, web server, SMS and e-mail alert are all possible via TCP/IP • Modules can be quickly exchanged and expanded without altering the wiring	• For installation system CTEL • For recording sensor input signals • Display of the input status for each input signal via an assigned LED • Diagnostic LED for short circuit/overload of sensor supply	• 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	cpc-cmix	ctsl	ctec

Product overview – Control technology and remote I/O

Electrical peripherals

Type	**Fieldbus modules CTEU**	**AS-Interface® components ASI, CACC**
Max. no. of inputs	128	4, 8
Max. no. of outputs	128	8
No. of module positions	32	
Electric actuation	CANopen, DeviceNet, AS-Interface®, CC-Link, PROFIBUS, EtherCAT, Ethernet/IP, PROFINET, CPI-B, I-Port	AS-Interface®
Description	• For valve terminals VTUB-12, VTUG, MPA-L, CPV, VTOC • Can be expanded into installation system CTEL • Fieldbus-typical LEDs, interfaces and switching elements available • Isolated power supply for electronics and valves	• Accessories for the AS-Interface® installation system • Cable distributor ASI-KVT • Addressing device ASI-PRG-ADR • Compact I/O modules (IP65, IP67)
➔ online	**cteu**	**as-interface**

Operator units

Type	**Operator units, with touchscreen CDPX**	**Simulators CDSM**
Display	Colour TFT	
Display size	4.3", 7", 10.4", 13.3"	
Recipe memory	32 KB	
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 • With touchscreen	• Straightforward design of human-machine dialogues • Semi-graphical display of process values makes them easier to read • Suitable for commissioning the following motor controllers: CMMO-ST, CMMP-AS, CMMS-ST • To simulate input and output signals during commissioning
➔ online	**cdpx**	**cdsm**

Documentation

Type	**Manuals GDCW, GDCP, GDCC, GSIB, P.BE, P.BP**
Description	• For software • For control blocks • For motors and controllers • For valve terminals and electrical peripherals • For vision systems
➔ online	**documentation**

Software

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

Software

Type	Software licenses GSLO	FluidDraw® software GSWF	EPLAN projects GDDE
Description	• 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 diagrams, cable lists, parts lists • Dimensioning function for preparing simple control cabinet and system layouts • Consistent equipment identification • Multi-level project tree	• The EPLAN documentation for a complex Festo product can be created within a few minutes • Automated generation to IEC 61355, IEC 81346 and ISO 1219 • Available at any time via the web service
→ online	gslo	gswf	gdde

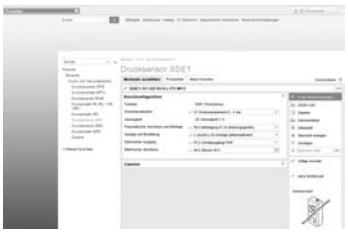
Software

Type	**Motion Apps GAMM**
NEW	
Description	• A new dimension in flexibility thanks to Motion Apps – one valve, numerous functions • Accelerated engineering processes • Short response times without adjusting the hardware • Reduced system complexity • Shorter market launch times for your application • Control programs for VEVM valves
➔ online	gamm

Software

Type	**App World**	**Smartenance GASM**
Description	• As a customer, you can use this portal to buy directly online and, with your type code, see the apps that are relevant for your system. • Simply log in via the link provided • Order and receive your digital product immediately • View your App World order history - it's quick, convenient and transparent	• Digital maintenance manager for production managers and system operators • Maintenance management is finally paperless • Clear schedule and evaluation for your system maintenance • Fast and easy transition to digital maintenance • Clear structures • Easy to use • 2 parts: 1 dashboard for production managers to manage and document and 1 mobile maintenance app for the shop floor • Transform the maintenance tasks for every system directly into a digital solution and offer customers added value for the system
➔ online	www.festo.com/appworld	www.festo.com/smartenance

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		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 parts in a single box. As a result, your bill of materials is considerably shortened and downstream processes such as product ordering, order picking and assembly are significantly simplified.	All ordering options are available in the following countries: AT, BE, CH, CZ, DE, DK, ES, 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-online in the above listed countries.

Proximity sensors, for T-slot

Type	**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	2-wire, 3-wire, 3-pin, cable, cable with plug, M8x1, plug
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/O contact, N/C contact
Switching output	Non-contacting, 2-wire, NPN, PNP, PNP/NPN switchable	Contacting, bipolar, without LED function
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 operating reserve indication • Cable length 0.1 … 30 m	• Measuring principle: magnetic reed • SME-8-...-S6: heat-resistant design • Variants suitable for use with energy chains and robots • Screw-clamped or clamped in 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**	**sme**

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Product overview – Sensors

Proximity sensors, for T-slot

Type	**Proximity sensors SMT-8F, SMT-8G, SMT-8-SL**	**Proximity sensors CRSMT-8**
Electrical connection	2-wire, 3-wire, 3-pin, cable, cable with plug, M8x1, plug, rotatable thread	3-wire, cable
Operating voltage range DC	10 ... 30 V	10 ... 30 V
Switching element function	NAMUR, N/O contact	N/O contact
Switching output	PNP, NAMUR	PNP
Description	• Measuring principle: magneto-resistive • SMT-8-F: in accordance with the ATEX Directive for explosive atmospheres • SMT-8G: design ideally matched to gripper sensing • SMT-8-SL: sturdy thanks to long guides and plug directly at the sensor • Variants suitable for use with energy chains and robots • Insertable in the slot lengthwise or from above • LED switching status indication • Cable length 0.3, 2.5, 5 m	• Measuring principle: magneto-resistive • Corrosion-resistant design • Suitable for use in the food industry (see www.festo.com/sp/crsmt-8 › "Certificates" tab), resistant to acids, lye 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

Type	**Proximity sensors SME-10, SME-10M** ★
Electrical connection	2-pin, 3-pin, 3-wire, cable, cable with plug, M12, M8x1, snap collar, plug, rotatable thread, open end
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**

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Pressure and vacuum sensors

Type	**Pressure sensors SPAU**	**Pressure sensors SPAW**	**Pressure transmitters SPTW**
Pressure measuring range	-1 ... 16 bar	-1 ... 100 bar	-1 ... 10 bar
Switching element function	N/C or N/O contact, switchable	Switchable	
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	4-pin, M12x1, M8x1, plug, to EN 60947-5-2, round design	Plug, to EN 60947-5-2, M12x1, 4-pin, 5-pin, round design	4-pin, M12x1, plug, to EN 60947-5-2, round design
Display type	LED, illuminated LCD	4-character alphanumeric, LED indicator	
Description	• For monitoring compressed air and non-corrosive gases • With and without display • Transfer of the pressure value as switching signal, analogue signal or via IO-Link® to the connected control system • Maximum flexibility through various pneumatic adaptation options and switchable electric outputs	• Highly robust • For liquid and gaseous media • Quick and easy setting of the switching outputs using three pushbuttons • Optimum legibility: 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 • No seal: pressure measuring cell and stainless steel interfaces • IP67 degree of protection
➔ online	**spau**	**spaw**	**sptw**

Flow sensors

Type	**Flow sensors SFAW**	**Flow sensors SFAB**
Flow measuring range	1.8 ... 100 l/min	10 ... 1000 l/min
Operating medium	Liquid media, water, neutral liquids	Compressed air to ISO 8573-1:2010 [6:4:4], compressed air to ISO 8573-1:2010 [7:4:4], nitrogen
Operating pressure	0 ... 12 bar	0 ... 10 bar
Pneumatic connection		QS-5/16, QS-1/4, QS-3/8, QS-6, QS-8, QS-10, QS-12
Electrical connection	Straight plug, M12x1, 5-pin, A-coded	5--pin, M12x1, straight plug
NEW		
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, c UL us Listed (OL) • Display is rotatable 90° anti-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**

Product overview – Motion Terminal

Motion Terminal

Type	 **Motion Terminal VTEM**
Valve terminal design	Fixed grid
Grid dimension	28 mm
Max. no. of valve positions	8
Standard nominal flow rate	480 l/min
Pneumatic connection 1	G3/8
Operating pressure	3 ... 8 bar
Pilot pressure	3 ... 8 bar
Actuation type	Electric
Nominal operating voltage DC	24 V
Temperature of medium	–5 ... +50 °C
Description	• Many functions in one component – thanks to apps • Combines the benefits of electric and pneumatic components • Maximum standardisation • Reduced complexity and time to market • Increasing profitability and know-how protection • Minimal installation • Increased energy efficiency
➔ online	**vtem**

Motion Apps

Type	 **Motion Apps GAMM**
Description	• A new dimension in flexibility thanks to Motion Apps – delivering a wide range of different functions in a single valve • Faster engineering processes • Short response times without the need to adapt the hardware • Reduced system complexity • Shorter time-to-market for your application • Control programs for VEVM valves
➔ online	**gamm**

Software tool

Product Finder for valve terminals		Find the right valve terminal quickly with the help of the Product Finder. Start the Product Finder via the blue icons in the product tree. 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 the Internet at www.festo.com/catalogue by clicking on the blue "Product Finder" button

Universal valve terminals

Type	 **Valve terminals with individual electrical connection VUVG-S** ★	 **Valve terminals with multi-pin plug or fieldbus connection VTUG**	 **Valve manifolds VTUS**
Width	10 mm, 14 mm, 18 mm	10 mm, 14 mm, 18 mm	21 mm, 26.5 mm, 30 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	600... 2300 l/min
Max. no. of valve positions	16	24	16
Electrical actuation	Individual connection	Multi-pin plug, I-Port interface, IO-Link, fieldbus	Individual connection
Valve terminal design	Fixed grid	Fixed grid	Fixed grid
Description	• Compact with small valves VUVG • Connection technology easy to change via the electrical connection 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 multi-pin plug	• Robust valves VUVS with long service life • Individual electrical connection • Pilot air supply in the manifold rail • Comprehensive range of accessories
→ online	vuvg-s	vtug	vtus

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Product overview – Valve terminals

Universal valve terminals

Type	Valve terminals MPA-L	Valve terminals MPA-S	Valve terminals VTSA-F	Valve terminals, Compact Performance CPV
Width	10 mm, 14 mm, 20 mm	10 mm, 20 mm	18 mm, 26 mm, 42 mm, 52 mm, 65 mm	10 mm, 14 mm, 18 mm
Standard nominal flow rate	360 l/min at 10 mm, 670 l/min at 14 mm, 870 l/min at 20 mm	360 l/min at 10 mm, 700 l/min at 20 mm	700 l/min at 18 mm, 1350 l/min at 26 mm, 1860 l/min at 42 mm, 2900 l/min at 52 mm, 4000 l/min at 65 mm	400 l/min at 10 mm, 800 l/min at 14 mm, 1600 l/min at 18 mm
Max. no. of valve positions	32	64	32	8
Electrical actuation	Fieldbus, multi-pin plug, electrical terminal CPX, IO-Link, I-Port	Fieldbus, multi-pin plug, electrical terminal CPX, AS-Interface®, CP installation system	Ethernet, fieldbus, multi-pin plug, electrical terminal CPX, integrated controller, AS-Interface® connection	AS-Interface, CP installation system, individual connection, fieldbus, multi-pin plug, IO-Link®
Valve terminal design	Modular, valve sizes can be mixed	Modular, valve sizes can be mixed	Modular, valve sizes can be mixed	Fixed grid
Description	• Maximum modularity • Single granular • Polymer sub-base • Three valve sizes • Max. 32 valves • Fieldbus connection via CPX • IO-Link capable	• Valve terminals for universal applications • High-performance valves in a sturdy metal housing • Metal linking • Two valve sizes can be combined • Excellent communication thanks to serial linking • Fieldbus connection via CPX	• Flow rate-optimised VTSA valve terminal • Linking with increased flow rates • Functions as per 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-l**	**mpa-s**	**vtsa**	**cpv**

Universal valve terminals

Type	Valve terminals, Smart Cubic CPV-SC	Valve manifolds, Compact Performance CPV10-EX-VI	Valve terminals VTUB-12
Width	10 mm	10 mm	12 mm, 24 mm
Standard nominal flow rate	170 l/min	400 l/min	400 l/min
Max. no. of valve positions	16	8	35
Electrical actuation	CP installation system, individual connection, fieldbus, multi-pin plug	Individual connection	Multi-pin plug, IO-Link, fieldbus
Valve terminal design	Fixed grid	Fixed grid	Fixed grid
Description	• Small and compact • High flow rate even with compact design • Suitable for vacuum • Multi-pin or fieldbus control	• Intrinsically safe valve manifold design to ATEX Category 2 (Zone 1) • Optimised for control cabinet assembly • Optimal for pilot control of process valves	• Compact dimensions • Poppet valves in polymer technology • Multi-pin or fieldbus control • IO-Link capable
➔ online	**cpv-sc**	**cpv10-ex**	**vtub-12**

Standards-based valve terminals

Type	**Valve terminals, ISO 15407-2/ISO 5599-2 VTSA**	**Valve manifolds, ISO 15407-1 VTIA**
Width	18 mm, 26 mm, 42 mm, 52 mm, 65 mm	18 mm, 26 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	1100 l/min at 26 mm, 550 l/min at 18 mm
Max. no. of valve positions	32	16
Electrical actuation	Ethernet, fieldbus, multi-pin plug, integrated controller	Individual connection
Valve terminal design	Modular, valve sizes can be mixed	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 • Integratable safety functions	• Conforms to ISO 15407-1 • Wide range of individual electrical connections • Two valve sizes can be combined
➔ online	**vtsa**	**vtia**

Electrical peripherals

Type	**Terminal CPX**	**Fieldbus modules CTEU Installation system CTEL**	**CPI installation system CTEC**	**Automation systems CPX-E**
Protocol	INTERBUS, DeviceNet, PROFIBUS, CANopen, CC-Link, Ether-Net/IP, PROFINET, EtherCAT, ModbusTCP	AS-Interface®, CANopen, CC-Link, DeviceNet, EtherCAT, PROFINET, PROFIBUS DP, CPI-B	INTERBUS, DeviceNet, PROFIBUS, CANopen, CC-Link, Ether-Net/IP, PROFINET, EtherCAT, ModbusTCP	
Max. address volume for inputs	64 bytes	2 ... 64 bytes	16 bytes	64 bytes
Max. address volume for outputs	64 bytes	2 ... 64 bytes	16 bytes	64 bytes
Parameterisation	Diagnostic behaviour, failsafe response, forcing of channels, signal setup	Activate diagnostics, diagnostic behaviour, failsafe and idle response, failsafe response, watchdog disable, watchdog enable		
Degree of protection	IP65, IP67	IP65, IP67	IP65, IP67	IP20
Nominal operating voltage DC	24 V	24 ... 30 V	24 V	24 V
Operating voltage range DC	18 ... 30 V	18 ... 31.6 V	18 ... 30 V	
Description	• Automation platform • Open to all common fieldbus protocols and Ethernet • Integrated diagnostic and maintenance functions • Can be used as stand-alone as remote I/O or with valve terminals MPA-S, MPA-L, VTSA/VTSA-F • Choice of polymer or metal housing with individual linking	• For valve terminals VTUB-12, VTUG, MPA-L, CPV, VTOC • Can be expanded into installation system CTEL • Fieldbus-typical LEDs, interfaces and switching elements available • Isolated power supply for electronics and valves	• CPX master module for four CPI strings • Combination of centralised and decentralised installation possible • Decentralised pneumatic components and sensors for fast processes • Can be connected to valve terminal CPV, MPA-S, CPV-SC	• 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 programming system CODESYS V3 to IEC 61131-3 • Integration of motion functions (SoftMotion) • High I/O component density • Easy mounting of the control system on an H-rail
➔ online	**cpx**	**cteu**	**ctec**	**cpx-e**

Product overview – Valve terminals

Electrical peripherals

Type	Terminal CPX-P	AS-Interface® components ASI, CACC	Electrical interfaces CPX-CTEL	AS-Interface® modules CESA
Protocol	DeviceNet, PROFIBUS, EtherNet/IP, PROFINET, ModbusTCP		I-Port, IO-Link	AS-Interface®, CANopen, PROFIBUS
Max. address volume for inputs	64 bytes		32	
Max. address volume for outputs	64 bytes		32	
Parameterisation	Diagnostic behaviour, failsafe response, forcing of channels, signal setup		Diagnostic behaviour, fail-safe mode per channel, force mode per channel, idle mode per channel, module parameter, tool changeover mode	
Degree of protection	IP20, IP65	IP65	IP65, IP67	IP20
Nominal operating voltage DC	24 V	24 V	24 V	AS-Interface® voltage 30 V DC
Operating voltage range DC	18 ... 30 V	26.5 ... 31.6 V	18 ... 30 V	
Description	• Use of harmonised 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 maintenance functions	• Accessories for the AS-Interface® installation system • Cable distributor ASI-KVT • Addressing device ASI-PRG-ADR • Compact I/O modules (IP65, IP67) • AS-Interface® power supply unit CACN	• CPX-CTEL master module with 4 I-Port connections • Decentralised pneumatic components and sensors for fast processes • Standardised M12 connections	• AS-Interface® master gateway • Duplicate address recognition • Direct operation via pushbuttons • Graphic display • Comprehensive diagnostics via LED and display • Specification 3.0
➔ online	cpx-p	as-interface	cpx-ctel	cesa

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.
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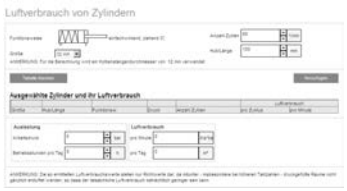
Software tool

Air consumption		Calculate your system's air consumption quickly and conveniently. Simply enter all the drives and tubing, set the cycle times and working pressure and the air consumption per minute and per day will be calculated for you. It includes a feature for exporting the input table together with the result directly to Excel.	This tool can be found • on the Internet at www.festo.com/catalogue by clicking on the blue "Engineering" button
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 unit combinations: MS series

Type	 **Service unit combinations MSB4, MSB6, MSB9** ★	 **Service unit combinations MSE6**
Pneumatic connection 1	G1, G1 1/2, G1 1/4, G1/2, G1/4, G1/8, G3/4	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 MS-LFR, lubricator MS-LOE, on-off valve MS-EM, MS-EE, soft-start valve MS-DL, branching module MS-FRM • Sizes: 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	**, msb9**	**mse6**

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Product overview – Compressed air preparation

Service unit combinations: D series, polymer

Type	Service unit combinations FRC-K	Service unit combinations 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

Type	Service unit combinations MSB4-FRC, MSB6-FRC ★
Pneumatic connection 1	G1/8, G1/4, G3/8, G1/2
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 regulation characteristics with minimal pressure hysteresis • Sizes: 4, 6
➔ online	msb4-frc

Filter regulators/lubricators: D series, polymer

Type	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

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Filter regulators: MS series

Type	**Filter regulators** **MS4-LFR, MS6-LFR, MS9-LFR, MS12-LFR** ★
Pneumatic connection 1	G1/8, G1/4, G3/8, G1/2, 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 primary pressure compensation and minimal hysteresis • Good particle and condensate separation • With or without secondary exhausting • High flow rate • Lockable rotary knob • Return flow option for exhausting from output 2 to input 1 already integrated • Sizes: 4, 6, 9, 12
→ online	ms4-lfr

Filter regulators: D series, polymer

Type	**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

Filter regulators: D series, metal

Type	**Filter regulators** **LFR-EX4**
Pneumatic connection 1	G1/4, G1/2, NPT-1/4-18, NPT-1/2-14
Standard nominal flow rate	1150 ... 3400 l/min
Pressure regulation range	0.5 ... 16 bar
Operating pressure	1 ... 20 bar
Grade of filtration	5 ... 40 µm
Description	• Filter regulators D series, metal • Sturdy thanks to full metal design • High corrosion resistance (corrosion resistance class CRC 3 to Festo standard 940 070) • Ambient temperature –40...+80 °C • Resistant to UV radiation and corrosive environments • Use in zone 1, 21, 2, 22 • Reliable manual drain • Energy efficient: excellent leakage values • Attractively priced • Size midi
→ online	lfr

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Product overview – Compressed air preparation

Filter regulators: Individual devices

Type	Filter regulators PCRP
Pneumatic connection 1	G1/4, G1/2, NPT1/4-18, NPT1/2-14
Standard nominal flow rate	1920 ... 4115 l/min
Pressure regulation range	0.5 ... 12 bar
Operating pressure	1 ... 20 bar
Grade of filtration	5 ... 40 µm
Description	• Sturdy housing for the specific requirements of the process automation industry • Suitable for use outdoors and at temperatures down to –60 °C • Resistant to UV radiation and corrosive environments • Size: 64
➔ online	**pcrp**

Filters: MS series

Type	Filters MS4-LF, MS6-LF, MS9-LF, MS12-LF	Fine filters MS4-LFM-B, MS6-LFM-B, MS9-LFM-B, MS12-LFM-B	Micro filters MS4-LFM-A, MS6-LFM-A, MS9-LFM-A, MS12-LFM-A	Activated carbon filters MS4-LFX, MS6-LFX, MS9-LFX, MS12-LFX
Pneumatic connection 1	G1/8, G1/4, G3/8, G1/2, internal	G1/8, G1/4, G3/8, G1/2, G3/4, G1, manifold module	G1/8, G1/4, G3/8, G1/2, G3/4, G1, manifold module	G1/2, G1/4, G1/8, G3/8
Standard nominal flow rate	1000 ... 16,000 l/min	54 ... 23,300 l/min	54 ... 23,300 l/min	360 ... 7090 l/min
Operating pressure	0 ... 20 bar	0 ... 20 bar	0 ... 20 bar	0 ... 20 bar
Grade of filtration	5 ... 40 µm	1 µm	0.01 µm	
Description	• Good particle and condensate separation • High flow rate with minimal pressure drop • Optionally with manual, semi-automatic, fully automatic or fully automatic, electrically actuated condensate drain • Sizes: 4, 6, 9, 12	• High-efficiency filter for exceptionally clean compressed air • Removal of oil aerosols from compressed air • Optionally with differential pressure indicator for indication of contamination • Optionally with electronic filter pollution indicator • Sizes: 4, 6, 9, 12	• High-efficiency filter for exceptionally clean compressed air • Removal of oil aerosols from compressed air • Optionally with differential pressure indicator for indication of contamination • Optionally with electronic filter pollution indicator • Sizes: 4, 6, 9, 12	• Removal of gaseous oil particles from compressed air using activated carbon • Air quality class at the output [1.4.1] to ISO 8573-1 • Elimination of odours and vapours • Residual oil content ≤ 0.003 mg/m³ • Sizes: 4, 6, 9, 12
➔ online	**ms4-lf**	**ms4-lfm-b**	**ms4-lfm-a**	**ms4-lfx**

Filters: individual devices

Type	Micro filters PFML	Filter silencers LFU
Size	90 mm, 186 mm	G1/4, G3/8
Grade of filtration	0.01 µm	1 µm
Operating pressure	0 ... 50 bar	0 ... 16 bar
Flow rate with respect to atmosphere	3406 ... 138,233 l/min	4000 ... 12,500 l/min
Noise reduction		Reduction by 40 dB
Description	• For high-pressure applications • For use with food see www.festo.com/sp/pfml › tab "Certificates"	• Removes up to 99.99% of oil and other contaminants from exhaust air • Manual rotary condensate drain • Reduced exhaust noise regardless of frequency
➔ online	**pfml**	**lfu**

Regulators: MS series

Type	**Pressure regulators MS4-LR, MS6-LR, MS9-LR** ★	**Pressure regulators MS12-LR**	**Pressure regulators MS4-LRB, MS6-LRB**
Pneumatic connection 1	G1/8, G1/4, G3/8, G1/2	Connecting plate	G1/4, G1/2
Standard nominal flow rate	1000 ... 26,000 l/min	12000 ... 22,000 l/min	300 ... 7300 l/min
Pressure regulation range	0.3 ... 16 bar	0.15 ... 16 bar	0.3 ... 16 bar
Operating pressure	0.8 ... 20 bar	0.8 ... 21 bar	0.8 ... 20 bar
Max. pressure hysteresis	0.25 ... 0.4 bar	0.04 ... 0.4 bar	0.25 bar
Description	• High flow rate with minimal pressure drop • Good regulation characteristics with minimal hysteresis and primary pressure compensation • Available with or without secondary exhausting • Lockable rotary knob • Optional pressure sensor and rotary knob pressure gauge • Sizes: 4, 6, 9	• High flow rate with minimal pressure drop • Good regulation characteristics with minimal hysteresis and primary pressure compensation • With secondary exhausting • Lockable rotary knob • MS12-LR-...-PO: pneumatically actuated (pressure range determined by means of pilot regulator) • MS12-LR-...-PE6: solenoid actuated (pilot control by proportional pressure regulator) • Size: 12	• To build up a regulator manifold with through air supply for pressure ranges that can be adjusted independently of another • Good regulation characteristics with minimal hysteresis and primary pressure compensation • Lockable rotary knob • With and without secondary exhausting • Integrated return flow option for exhausting from output 2 to input 1 • Optional pressure sensor and rotary knob pressure gauge • Sizes: 4, 6
→ online	ms4-lr	ms12-lr	ms4-lrb

Regulators: MS series

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

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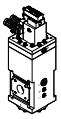
Product overview – Compressed air preparation

Regulators: D series, polymer

Type	Pressure regulators LR-DB	Pressure regulator combinations LRB-DB
Pneumatic connection 1	G1/4	G1/2
Standard nominal flow rate	≥1300 l/min	≥1000 l/min
Pressure regulation range	0.5 ... 7 bar	0.5 ... 7 bar
Operating pressure	1.5 ... 10 bar	1.5 ... 10 bar
Max. pressure hysteresis	0.5 bar	0.5 bar
Description	• Set values are secured by the detent on the rotary knob • Optionally with pressure gauge • Size: mini	• Regulator manifold with through air supply for pressure ranges that can be adjusted independently of another • Set values are secured by the detent on the rotary knob • Without pressure gauge • Size: mini
➔ online	**lr-db**	**lrb-db**

Regulators: individual devices

Type	Precision pressure regulators LRP, LRPS ★	 Electrical pressure regulators PREL
Pneumatic connection 1	G1/8, G1/4, for connecting plate Ø 7 mm	G1
Standard nominal flow rate	240 ... 2300 l/min	
Pressure regulation range	0.05 ... 10 bar	0.2 ... 40 bar
Operating pressure	1 ... 12 bar	0 ... 50 bar
Max. pressure hysteresis	0.02 bar	0.1 bar
Description	• Lockable design • Good regulation characteristics with minimal hysteresis and primary pressure compensation • High secondary exhausting	• For high-pressure applications • For use with food see www.festo.com/sp/prel › tab "Certificates" • Size: 186 mm
➔ online	**lrp**	**prel**

Other devices

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Lubricators: MS series

Type	**Lubricators MS4-LOE, MS6-LOE, MS9-LOE, MS12-LOE**
Pneumatic connection 1	G1/4, G1/8, G3/8, G1/2, internal
Standard nominal flow rate	1100 ... 27,000 l/min
Operating pressure	1 ... 16 bar
Minimum flow rate for lubricator function	40 ... 400 l/min
Description	• Proportional lubricator with precision oil metering • Quick and easy top-up even under pressure • Oil capacity 30 ... 1500 cm³ • Sizes: 4, 6, 9, 12
➔ online	**ms4-loe**

On-off and soft-start valves: MS series

Type	**Soft-start/quick exhaust valves MS6-SV-E, MS6-SV-D**	**Soft-start/quick exhaust valves MS6-SV-C, MS9-SV-C** ★	**On-off valves MS4-EM1, MS6-EM1, MS9-EM, MS12-EM** ★
Pneumatic connection 1	G1/2	G1/2	Manifold module, G1/8, G1/4, G3/8, G1/2
Standard nominal flow rate	4300 l/min	5700 ... 16,550 l/min	1200 ... 32,000 l/min
Operating pressure	3.5 ... 10 bar	3 ... 16 bar	0 ... 20 bar
Type of actuation	Electric	Electric	Manual
Description	• Reliable 2-channel exhausting with self-monitoring up to Performance Level e and category 4 to EN ISO 13849-1 • SIL 3 • For reducing pressure quickly and reliably and for building up pressure gradually • Adjustable pressure build-up time • Optionally with silencer • Supply voltage 24 V DC • Size: 6	• Single-channel exhausting up to Performance Level c and category 1 to EN ISO 13849-1 • For reducing pressure quickly and reliably and for building up pressure gradually • Adjustable pressure build-up time • Adjustable switch-through pressure • Supply voltage 24 V DC • Sizes: 6, 9	• Manual 3/2-way valve for pressurising and exhausting pneumatic systems • A silencer can be attached or the exhaust air can be ducted at port 3 • Switching position is immediately recognisable • Optionally with pressure gauge and pressure sensor • Sizes: 4, 6, 9, 12
➔ online	**ms6-sv-e**	**ms6-sv-c**	**ms4-em1**

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Product overview – Compressed air preparation

On-off and soft-start valves: MS series

Type	On-off valves MS4-EE, MS6-EE, MS9-EE, MS12-EE ★	Soft-start valves MS4-DL, MS6-DL, MS12-DL ★	Soft-start valves MS4-DE, MS6-DE, MS12-DE
Pneumatic connection 1	Manifold module, G1/8, G1/4, G3/8, G1/2	Manifold module, G1/8, G1/4, G3/8, G1/2	Manifold module, G1/8, G1/4, G3/8, G1/2
Standard nominal flow rate	1000 ... 32,000 l/min	1000 ... 42,000 l/min	1000 ... 42,000 l/min
Operating pressure	3 ... 18 bar	2 ... 20 bar	3 ... 18 bar
Type of actuation	Electric	Pneumatic	Electric
Description	• Electrical 3/2-way valve for pressurising and exhausting pneumatic systems • A silencer can be attached or the exhaust air can be ducted at port 3 • Supply voltage 24 V DC, 110, 230 V AC • Optionally with pressure gauge and pressure sensor • With solenoid coil, without plug socket • Sizes: 4, 6, 9, 12	• 2/2-way valve for slowly pressurising pneumatic systems (for use with on-off valves EM1 and EE) • For building up pressure gradually • Adjustable pressure build-up time • Sizes: 4, 6, 12	• 2/2-way valve for slowly pressurising pneumatic systems with electrically switchable pressure switchover point • Supply voltage 24 V DC, 110, 230 V AC • Switchable pressure switching point • For advancing the drives slowly and reliably into the initial position • For avoiding sudden and unexpected movements • Adjustable pressure build-up time • Sizes: 4, 6, 12
➔ online	**ms4-ee**	**ms4-dl**	**ms4-de**

On-off and soft-start valves: D series, polymer

Type	On-off valves HE-DB
Pneumatic connection 1	G1/4
Standard nominal flow rate	2300 l/min
Operating pressure	0 ... 10 bar
Type of actuation	Manual
Description	• 3/2-way manual on-off valve • The switching position is recognisable • Commercially available padlock for security
➔ online	**he-db**

On-off and soft-start valves: individual devices

Type	On-off valves PVEL	Shut-off valves HE-LO
Pneumatic connection 1	SAE flange	G3/8, G1/2, G3/4, G1
Standard nominal flow rate		5200 ... 10,000 l/min
Operating pressure	0 ... 50 bar	1 ... 10 bar
Nominal size DN		54
Type of actuation	Manual, pneumatic	Manual
Description	• For use with food see www.festo.com/sp/pvel › tab "Certificates" • For high-pressure applications • Size: 124 mm	• 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	**pvel**	**he-lo**

Festo core product range

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Air dryers: MS series

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

Air dryers: individual devices

Type	**Adsorption dryers PDAD**
Pneumatic connection 1	G3/8, G1/2
Input pressure 1	4 ... 16 bar
Pressure dew point	–40°C
Description	• Ideal for decentralised compressed air drying • Integrated filtering of oil and particulates • Defined pressure dew point • Low purge air consumption
➔ online	pdad

Compressed air distributors: MS series

Type	**Branching modules MS4-FRM, MS6-FRM, MS9-FRM, MS12-FRM** ★	**Distributor blocks MS4-FRM-FRZ, MS6-FRM-FRZ** ★
Pneumatic connection 1	G1, G1 1/2, G1 1/4, G1/2, G1/4, G1/8, G3/4, G3/8, manifold module	G1/4, G1/2
Standard nominal flow rate in main flow direction 1->2	1200 ... 50,000 l/min	4050 ... 14,600 l/min
Operating pressure	0 ... 20 bar	0 ... 20 bar
Description	• Optionally with integrated non-return function and pressure switch • Outlet at top and bottom • Can be used as an intermediate distributor for varying air qualities • Optionally with pressure sensor • Sizes: 4, 6, 9, 12	• Slim pneumatic distributor • Outlet at top and bottom • Can be used as an intermediate distributor for varying air qualities • Can be used as an adapter between two pressure regulators with large rotary knob with pressure gauge on size MS4 • Sizes: 4, 6
➔ online	ms4-frm	ms4-frm-frz

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Product overview – Compressed air preparation

Compressed air distributors: individual devices

Type	Branching modules PMBL
Pneumatic connection 3	G1
Pneumatic connection 4	G1
Operating pressure	0 ... 50 bar
Description	• For high-pressure applications • For use with food see www.festo.com/sp/pmbl › tab "Certificates" • Sizes: 90 mm, 186 mm
➔ online	pmbl

Condensate drain

Type	Water separators MS6-LWS, MS9-LWS, MS12-LWS	Condensate drain PWEA	Condensate drain WA
Pneumatic connection		G1/2	M9
Pneumatic connection 1	G1/4, G3/8, G1/2		
Operating pressure	0.8 ... 16 bar	0.8 ... 16 bar	1.5 ... 16 bar
Description	• Replacement of filter cartridges not required • Constantly high condensate separation (99%) up to the maximum flow rate • Optionally with fully automatic or fully automatic, electrically actuated condensate drain • Sizes: 6, 9, 12	• Fully automatic condensate drain with independent electrical controller • Interface for communicating with higher-order control device • Reliable thanks to non-contacting capacitive sensor • Can be used with service units or simply in piping systems • Ready status and switching status indicated via LEDs and electrical interface	• For attachment to service units and compressed air networks/systems • Automatic emptying after the max. fill level has been reached • Automatic emptying after the operating pressure p < 0.5 bar is switched off • Manual actuation during operation is possible
➔ online	ms6-lws	pwea	wa

Pressure boosters

Type	Pressure boosters DPA
Pneumatic connection 1	G1/4, G3/8, G1/2, QS-10, QS-12, QS-16
Output pressure 2	4 ... 16 bar
Input pressure 1	2 ... 10 bar
Description	• Pneumatic pressure increase up to the double input pressure • Optionally as pressure booster/air pressure reservoir combinations • Any mounting position • Short filling times • Long service life • Compact design • Optionally with sensing option
➔ online	dpa

Pressure indicators

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

Pressure indicators

Type	Pressure gauge kits DPA-MA-SET	Vacuum gauges VAM, FVAM	Pressure gauges PAGL
Type of mounting	Via male thread	Front panel mounting, screw-in	Front panel mounting, screw-in
Indicating range		-1 ... 9 bar	0 ... 60 bar
Pneumatic connection	G1/8, G1/4, R1/8	G1/8, G1/4, R1/8, R1/4	G1/4
Operating pressure	10 ... 16 bar	-1 ... 9 bar	0 ... 60 bar
Measurement accuracy class	2.5, 4	2.5	1.6
Description	• For pressure booster DPA • For monitoring the input and output pressure • Pneumatic connection via R or G thread	• Designs based on DIN EN 837-1, available with red-green range • Screw-in or front panel mounting • Pneumatic connection via R or G thread • Double or single scale • Display units bar, in Hg, psi	• For high-pressure applications • Display units bar, psi, MPa
➔ online	dpa	vam	pagl

Product overview – Compressed air preparation

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.

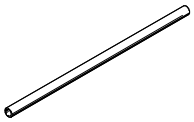
Common product modifications:
- Modified pressure range
- Rotary knob: in a special colour, with protection against rotation
- Fitting: integrated throttling port, special thread
- Tubing with special printing
- Pressure gauge with red-green range

Many additional variants are possible. Ask your Festo sales engineer, who will be happy to help.
➔ **www.festo.com/contact**

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 the Internet at www.festo.com/catalogue by clicking on the blue "Product Finder" button
Festo Design Tool 3D		The Festo Design Tool 3D is a 3D product configurator for generating specific CAD product combinations from Festo. The configurator makes your search for the right accessory easier, more reliable and faster. You can then order the module that has been created with a single order item – either completely pre-assembled or as individual parts in a single box. As a result, your bill of materials is considerably shortened and downstream processes such as product ordering, order picking and assembly are significantly simplified.	All ordering options are available in the following countries: AT, BE, CH, CZ, DE, DK, ES, 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-online in the above listed countries

Standard O.D. tubing

Type	 **Plastic tubing, DUO plastic tubing PUN, PUN-DUO** ★	 **Plastic tubing, DUO plastic tubing PUN-H, PUN-H-DUO** ★	 **Plastic tubing PTFEN**	 **Plastic tubing PUN-CM**
O.D.	3 … 16 mm	2 … 16 mm	4 … 16 mm	4 … 12 mm
I.D.	2.1 … 11 mm	1.2 … 11 mm	2.9 … 11 mm	2.5 … 8 mm
Temperature-dependent operating pressure	-0.95 … 10 bar	-0.95 … 10 bar	-0.95 … 15 bar	-0.95 … 10 bar
Ambient temperature	-35 … 60°C	-35 … 60°C	-20 … 150°C	-35 … 60°C
Description	• Polyurethane • High resistance to stress cracks • Suitable for energy chains • Also available as DUO plastic tubing • Operating media compressed air, vacuum	• Polyurethane • High resistance to microbes and hydrolysis • For use with food see www.festo.com/sp/pun-h › tab "Certificates" • Suitable for energy chains • Also available as DUO plastic tubing • Operating media compressed air, vacuum, water	• Polytetrafluoroethylene • For use with food see www.festo.com/sp/ptfen › tab "Certificates" • High resistance to chemicals • High temperature resistance • Operating media compressed air, vacuum	• Polyurethane • Plastic tubing, antistatic, electrically conductive • Suitable for energy chains • Operating media compressed air, vacuum
→ online	**pun**	**pun-h**	**ptfen**	**pun-cm**

Festo core product range

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Product overview – Pneumatic fittings system

Standard O.D. tubing

Type	Plastic tubing PUN-V0	Plastic tubing PEN	Plastic tubing PAN
O.D.	4 ... 16 mm	4 ... 16 mm	4 ... 16 mm
I.D.	2 ... 11.8 mm	2.7 ... 10.8 mm	2.5 ... 12 mm
Temperature-dependent operating pressure	-0.95 ... 30 bar	-0.95 ... 10 bar	-0.95 ... 19 bar
Ambient temperature	-35 ... 60°C	-30 ... 60°C	-30 ... 80°C
Description	• Polyurethane • Flame retardant to UL 94 V0 ... V2 • For use in the immediate vicinity of welding applications • High resistance to microbes and hydrolysis • Suitable for energy chains • Operating media compressed air, vacuum, water	• Polyethylene • High resistance to chemicals and very high resistance to hydrolysis • Resistant to most cleaning agents and lubricants • Suitable for energy chains • Operating media compressed air, vacuum, water	• Polyamide • High thermal and mechanical load capacities • High resistance to microbes • Operating media compressed air, vacuum
➔ online	**pun-v0**	**pen**	**pan**

Standard O.D. tubing

Type	Plastic tubing PAN-MF	Heavy-duty tubing PAN-R	Plastic tubing PAN-V0
O.D.	4 ... 16 mm	4 ... 28 mm	6 ... 14 mm
I.D.	2.5 ... 12 mm	2.5 ... 23 mm	2.5 ... 9 mm
Temperature-dependent operating pressure	-0.95 ... 31 bar	-0.95 ... 35 bar	-0.95 ... 12 bar
Ambient temperature	-60 ... 100°C	-30 ... 80°C	-30 ... 90°C
Description	• Polyamide • High thermal and mechanical load capacities • Meets the requirements to DIN 73378 "Polyamide tubing for use in motor vehicles" • Operating media compressed air, mineral oil	• Polyamide • For applications with a high pressure range • High resistance to microbes • Operating media compressed air, vacuum	• PVC, polyamide • Flame retardant to UL 94 V0 • High resistance to microbes and UV radiation • Double-sheath tubing • Operating media compressed air, vacuum, water, mineral oil • Resistant to welding spatter
➔ online	**pan**	**pan-r**	**pan-v0**

Standard O.D. tubing

Type	Plastic tubing PLN	Plastic tubing PFAN	Customised tubing PAN, PEN, PLN, PUN
O.D.	4 ... 16 mm	3 ... 12 mm	3 ... 16 mm
I.D.	2.9 ... 12 mm	2.3 ... 8.4 mm	2.1 ... 12 mm
Temperature-dependent operating pressure	-0.95 ... 14 bar	-0.95 ... 16 bar	-0.95 ... 16 bar
Ambient temperature	-30 ... 80°C	-20 ... 150°C	-35 ... 80°C
Description	• Polyethylene • High resistance to chemicals, microbes and hydrolysis • For use with food see www.festo.com/sp/pln › tab "Certificates" • Resistant to most cleaning agents and lubricants • Operating media compressed air, vacuum, water	• Perfluoroalkoxy alkane • Pneumatic tubing with resistance to high temperatures and chemicals • For use with food see www.festo.com/sp/pfan › tab "Certificates" • High resistance to chemicals, microbes, UV radiation, hydrolysis and stress cracks • Operating media compressed air, vacuum, water	• Individual lengths: delivered in units of 25, 50, 100, 200 ... 500 m • Minimum quantity: 3000 m • Individual design: labelled with your company name and/or your part number • Easy to recognise and handle: individual colour selection • Choose from 9 basic colours; further colours available on request • Simple to order with the configurator
➔ online	**pln**	**pfan**	**tubing**

Standard I.D. tubing

Type	Plastic tubing PU
O.D.	11.6 ... 17,6 mm
I.D.	9 ... 13.1 mm
Temperature-dependent operating pressure	-0.95 ... 10 bar
Ambient temperature	-35 ... 60°C
Description	• Polyurethane with reinforcing fabric • High resistance to abrasion and kinks • Operating media compressed air, vacuum (PU-13)
➔ online	**pu**

Spiral tubing

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

Product overview – Pneumatic fittings system

Push-in fittings

Type	**Push-in fittings, mini series QSM, QSMC, QSMF, QSML, QSMS, QSML, QSMP, QSMS, QSMT, QSMX, QSMY** ★	**Push-in fittings, standard series QS, QSF, QSS, QSC, QSH, QSL, QST, QSW, QSX, QSY** ★	**Push-in fittings NPQH**	**Push-in fittings/connectors, metal, standard series NPQM**
Pneumatic connection 1	Male thread G1/8, M3, M5, M6, M6x0.75, M7, M8x0.75, R1/8, M8x1.25, female thread M3, M5, push-in sleeve QS-3, QS-4, QS-6, for tubing O.D. 2, 3, 4, 6 mm	Male thread G1/8, G1/4, G3/8, G1/2, G3/4, M5, R1/8, R1/4, R3/8, R1/2, female thread G1/8, G1/4, G3/8, G1/2, push-in sleeve QS-4, QS-6, QS-8, QS-10, QS-12, QS-16, for tubing O.D. 4, 6, 8, 10, 12, 16 mm	Male thread M5, M7, G1/8, G1/4, G3/8, G1/2, for tubing O.D. 4 mm, 6 mm, 8 mm, 10 mm, 12 mm, 14 mm, female thread G1/8, G1/4, push-in sleeve QS-10, QS-12, QS-14, QS-4, QS-6, QS-8	G1/8, G1/4, G3/8, G1/2, M5, M7, push-in sleeve QS-4, QS-6, QS-8, QS-10, QS-12, for tubing O.D. 4, 6, 8, 10, 12 mm
Pneumatic connection 2	For tubing O.D. 2, 3, 4, 6 mm	Female thread G1/8, G1/4, G3/8, G1/2, for tubing O.D. 4, 6, 8, 10, 12, 16 mm	For tubing O.D. 4 mm, 6 mm, 8 mm, 10 mm, 12 mm, 14 mm, push-in sleeve QS-10, QS-12, QS-14, QS-4, QS-6, QS-8	For tubing O.D. 3, 4, 6, 8, 10, 12 mm
Temperature-dependent operating pressure	-0.95 ... 14 bar	-0.95 ... 14 bar		
Operating pressure for entire temperature range	-0.95 ... 6 bar	-0.95 ... 6 bar	-0.95 ... 20 bar	-0.95 ... 16 bar
Ambient temperature	-10 ... 80°C	-10 ... 80°C	0 ... 150°C	-20 ... 70°C
Description	• Mini series • Compact for maximum component density in confined spaces • PBT 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)	• All-metal brass, chemically nickel-plated • High corrosion and chemical resistance • High resistance to temperatures and pressure • For use with food see www.festo.com/sp/npqh › tab "Certificates" • Operating media compressed air, vacuum, water	• All-metal brass, nickel-plated • Attractively priced metal push-in fitting • Sturdy • Operating media compressed air, vacuum
→ online	qsm	qs	npqh	npqm

Other devices

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Festo core product range

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Push-in fittings

Type	**Push-in fittings/connectors, resistant to media NPQP**	**Cartridges, polymer, black QSPK, QSPLK**	**Cartridges, polymer, grey QSPKG, QSPLKG**	**Push-in fittings, stainless steel CRQS, CRQSL, CRQSS, CRQST, CRQSY**
Pneumatic connection 1	Male thread R1/8, R1/4, R3/8, R1/2, push-in sleeve QS-4, QS-6, QS-8, QS-10, QS-12, for tubing O.D. 4, 6, 8, 10, 12 mm	Cartridge 10 mm, 18 mm	Cartridge 10 mm, 14 mm, 18 mm, 20 mm	Male thread M5, R1/8, R1/4, R3/8, R1/2, for tubing O.D. 4, 6, 8, 10, 12, 16 mm
Pneumatic connection 2	For tubing O.D. 4, 6, 8, 10, 12 mm	For tubing O.D. 3, 4, 6, 8, 10 mm	For tubing O.D. 3, 4, 6, 8, 10, 12 mm	For tubing O.D. 4, 6, 8, 10, 12, 16 mm
Temperature-dependent operating pressure	-0.95 ... 10 bar			
Operating pressure for entire temperature range		-0.95 ... 10 bar	-0.95 ... 10 bar	-0.95 ... 10 bar
Ambient temperature	-20 ... 60°C	-5 ... 60°C	-5 ... 60°C	-15 ... 120°C
Description	• Polypropylene • Low-cost alternative to stainless steel: resistant to most cleaning agents in combination with tubing PLN • For use with extreme media influences • For use with food see www.festo.com/sp/npqp › tab "Certificates" • Operating media compressed air, vacuum	• Compact fitting space • Threadless assembly	• Compact fitting space • Threadless assembly	• Maximum corrosion resistance (corrosion resistance class 4 to Festo standard 940 070) and chemical resistance • For use with food see www.festo.com/sp/crqs › tab "Certificates" • Operating media compressed air, vacuum, (water) • Stainless steel
➔ online	**npqp**	**qsp**	**qsp**	**crqs**

Push-in fittings

Type	**Push-in fittings, resistant to welding spatter QS-V0, QSL-V0, QST-V0**	**Self-sealing push-in fittings and connectors QSK, QSSK, QSKL**	**Rotary push-in fittings QSR, QSRL**	**Fluid separators CQA**
Pneumatic connection 1	G1/8, G1/4, G3/8, G1/2, R1/8, R1/4, R3/8, R1/2, for tubing O.D. 4, 6, 8, 10, 12 mm	Male thread M5, G1/8, G1/4, G3/8, G1/2, R1/8, R1/4, R3/8, R1/2, for tubing O.D. 4, 6, 8, 10, 12 mm	Male thread M5, G1/8, G1/4, G3/8, G1/2, R1/8, R1/4, R3/8, R1/2	Push-in sleeve CQ-28, for pipe/ tubing O.D. 22 mm
Pneumatic connection 2	For tubing O.D. 4, 6, 8, 10, 12 mm	For tubing O.D. 4, 6, 8, 10, 12 mm	For tubing O.D. 4, 6, 8, 10, 12 mm	Push-in sleeve CQ-28, for pipe/ tubing O.D. 22 mm
Temperature-dependent operating pressure		-0.95 ... 14 bar	-0.95 ... 14 bar	-0.95 ... 15 bar
Operating pressure for entire temperature range	-0.95 ... 10 bar	-0.95 ... 6 bar	-0.95 ... 6 bar	-0.95 ... 7 bar
Ambient temperature	0 ... 60°C	-10 ... 80°C	0 ... 60°C	-25 ... 70°C
Description	• PBT-reinforced • Resistant to welding spatter • For use in all areas where there is a risk of fire • Reliable even for applications in close proximity to welding spatter • Operating 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 • Operating media compressed air, vacuum	• Rotatable push-in fitting with swivel connection: rotatable by 360° with max. 500 rpm • Compact fitting space	• Assembly and disassembly without tools • Sturdy and leakproof connection
➔ online	**qs-v0**	**qsk**	**qsr**	**cqa**

Product overview – Pneumatic fittings system

Barbed fittings

Type	Fittings NPCK	Barbed fittings CN, CRCN, FCN, L-PK, LCN, N, RTU, SCN, LCNH, T-PK, TCN, Y-PK	Barbed hose fittings C-P, N-P, N-MS	Quick connectors ACK, CK, QCK, SCK, CV-PK, GCK-KU, LCK, TCK, FCK-KU, MCK
Nominal width	2 ... 6.2 mm	1.3 ... 5.3 mm	4 ... 16.5 mm	2 ... 11.7 mm
Pneumatic connection 1	Male thread M5, G1/8, G1/4, G3/8	Male thread G1/4, G1/8, G3/8, M3, M5, for tubing O.D. 3 mm, 4 mm, 6 mm, 8 mm	Male thread G1, G1/2, G1/4, G1/8, G3/4, G3/8, female thread G1/2, G1/4, G1/8, G3/8, NPT1-11 1/2, NPT3/4-14	Male thread G1/2, G1/4, G1/8, G3/8, M5, R1/4, R1/8, R3/8, female thread G1/2, G1/4, G1/8, G3/8, M5, for barbed connector I.D. 3 mm with union nut, 4 mm, 6 mm, 9 mm with union nut
Pneumatic connection 2	For tubing O.D. 10 mm, 4 mm, 6 mm, 8 mm	For tubing O.D. 3 mm, 4 mm, 6 mm, 8 mm	For tubing O.D. 8 mm, for tubing I.D. 6 mm, 9 mm, 19 mm, 13 mm	For tubing O.D. 4 mm, 6 mm, 8 mm, for tubing I.D. 13 mm, 9 mm, for barbed fitting I.D. 13 mm with union nut, 3 mm, 4 mm, 6 mm, 9 mm with union nut
Operating pressure	-0.95 ... 12 bar	-0.95 ... 10 bar	-0.95 ... 16 bar	-0 ... 16 bar
Ambient temperature	-20 ... 120°C	0 ... 60°C		-10 ... 80°C
Description	• Stainless steel design • For use with food see www.festo.-com/sp/npck › tab "Certificates" • Fulfils all Clean Design require-ments • Straight shape • Operating media compressed air, vacuum, water	• Straight shape, T-shape, L-shape, Y-shape • Operating media compressed air, vacuum • Brass, POM, aluminium or stain-less steel	• Female hose connector with or without sealing ring • Tubing clip to DIN 3017 • Operating media compressed air, vacuum • Brass or aluminium, steel	• Bulkhead quick connector • Sealing cap for plastic tube fit-tings and barbed connectors • Multiple distributor • Union nut for CK tube fitting • Operating media compressed air, vacuum, (water) • Aluminium, steel, POM or zinc
➔ online	npck	n_070302f	n_cnp	ck

Threaded fittings

Type	Threaded fittings NPFC	Blanking plugs B ★	Adapters NPFV
Pneumatic connection 1	G1/8, G1/4, G3/8, G1/2, G3/4, G1, M5, M7, R1/8, R1/4, R3/8, R1/2, R3/4, R1	Male thread G1, G1/2, G1/4, G1/8, G3/4, G3/8, M3, M5, M7	G1/4, NPT1/4-18
Pneumatic connection 2	G1/8, G1/4, G3/8, G1/2, G3/4, M5, R1/8, R1/4, R3/8, R1/2, R3/4, R1		G1/4, NPT1/4-18
Operating pressure	-0.95 ... 50 bar		2 ... 8 bar
Operating pressure for entire temperature range			
Ambient temperature	-20 ... 150°C		
Nominal width			6 mm
Description	• Nickel-plated brass • Sleeve • Reducing sleeve • Extension • Double nipple • Reducing nipple • L-, T-, Y- or X-fitting • Operating media compressed air, vacuum	• Aluminium, stainless steel • With sealing ring	• Aluminium • Adapter with filter • From G1/4 to NPT1/4 or G1/4 • Operating media compressed air, vacuum
➔ online	npfc	b-1	npfv

Festo core product range

★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Threaded fittings

Type	**Reducers, sleeves, double nipples D, ESK, FR, G, LJK, QM, QSP10, TJK**	**Ring pieces, hollow bolts LK, TK, VT**
Pneumatic connection 1	G1/8, G1/4, G3/8, G1/2, G3/4, G1, M3, M5, M7, R1/8, R1/4, R3/8, R1/2	Male thread G1/4, G1/8, G3/8, M5
Pneumatic connection 2	G1/8, G1/4, G3/8, G1/2, G3/4, G1, M3, M5, M7, R1/8, R1/4, R3/8, R1/2	For barbed connector I.D. 3 mm with union nut, 4 mm with union nut, 6 mm with union nut
Operating pressure		
Operating pressure for entire temperature range		0 ... 10 bar
Nominal width		
Ambient temperature	2.6 ... 10.7 mm	
Description	• Brass or aluminium • Reducing nipple • Double nipple • Distributor block • Sleeve • Operating media compressed air, vacuum	• Multiple distributor consisting of hollow bolt VT and ring piece LK or TK • With two to six outlets and one common air feed • Operating media compressed air, vacuum • Galvanised steel
➔ online	**esk**	**lk**

Click fittings

Type	**Click fittings NPKA**
Pneumatic connection 1	Male thread G1/8
Pneumatic connection 2	For tubing O.D. 6 mm
Temperature-dependent operating pressure	-0.95 ... 10 bar
Nominal width	4 mm
Ambient temperature	-10 ... 60°C
Description	• POM, polyamide 66 • Quick and simple tube installation using one hand • Completely plastic • For use with food see www.festo.com/sp/npka -› tab "Certificates" • Operating media compressed air, vacuum, water • Free from copper, fluorine and silicone • Cleanroom-compatible • Easy-to-clean design with few corners and edges
➔ online	**npka**

Product overview – Pneumatic fittings system

Pipes

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

Push-in fittings for piping PQ

Type	**Push-in fittings CQ, CQC, CQH, CQL, CQT**
Pneumatic connection 1	Male thread G3/8, G1/2, G3/4, G1, female thread G1/2, push-in sleeve CQ-12, CQ-15, CQ-18, CQ-22, CQ-28, push-in sleeve QS-16, for pipe/tube O.D. 12, 15, 18, 22, 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 ... 75°C
Description	• For pipes PQ-PA, PQ-AL and tubing PAN and PUN • Operating media compressed air, vacuum, liquid media • POM
→ online	**cq**

Couplings

Type	**Quick coupling sockets, quick coupling plugs NPHS-D6, NPHS-S6** ★	**Quick coupling sockets, quick coupling plugs KD1, KD2, KD3, KD4, KS1, KS2, KS3, KS4** ★	**Multiple connectors KSV, KDVF, KDV**	**Multi-tube connectors KM**
Pneumatic connection			PK-2, PK-3, PK-4, PK-6, for tubing O.D. 3 mm, 4 mm, 6 mm	PK-2, PK-3, PK-4
Pneumatic connection 1	Male thread G1/2, G1/4, G3/8, female thread G1/2, G1/4, G3/8, for plug-in nipple I.D. 9 mm	Male thread M3, M5, G1/8, G1/4, G1/2, G3/8, female thread G1/4, G3/8, G1/2, CK-3, CK-4, CK-6, CK-9, CK13, N6, N-9		
Standard nominal flow rate	875 ... 2083 l/min	44 ... 1350 l/min		
Operating pressure			-0.95 ... 16 bar	-0.95 ... 8 bar
Ambient temperature	-20 ... 80°C	-10 ... 80°C	-10 ... 60°C	-10 ... 60°C
Description	• Safety coupling • Shut-off on one side • Metal or plastic releasing sleeve • Exhausting of the air on the plug side without having to undo the coupling • Combination of coupling and hand slide valve • Can be used as an on-off valve	• 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	• POM, aluminium, brass • Multi-plug, multi-socket • Terminal plug and terminal socket • Operating media compressed air, vacuum	• Polymer, brass • For max. 22 lines • Used as control cabinet outlets • Operating media compressed air, vacuum
→ online	nphs	kd1	ksv	km

Distributors

Type	**Multiple distributors QSLV, QSQ, QST3**	**Multiple distributors QSYTF**	**Distributor blocks FR**
Pneumatic connection 1	Male thread G1/8, G1/4, G3/8, G1/2, R1/8, R1/4, R3/8, R1/2, for tubing O.D. 6, 8, 10 mm	Male thread G1/8, G1/4, G3/8, G1/2, R1/8, R1/4, R3/8, R1/2	Female thread G1/4, G3/8, G1/2, G3/4
Pneumatic connection 2	For tubing O.D. 4, 6, 8, 10, 12 mm	Female thread G1/8, G1/4, G3/8, G1/2, for tubing O.D. 6, 8, 10, 12 mm	Female thread M3, M5, G1/8, G3/8, G1/2, for tubing O.D. 4 mm, 6 mm
No. of supply lines	1	1	1
No. of outlets	2, 3, 4, 6	3	3, 8, 9, 12
Max. rotational speed			
Description	• PBT and nickel-plated brass • L-shape, T-shape • Rotatable 360° • Reducing design • Operating media compressed air, vacuum, (water)	• PBT and nickel-plated brass • Y-shape • Rotatable 360° • Operating media compressed air, vacuum, (water)	• Aluminium • 4, 8, 9 or 12 connections • Operating media compressed air, vacuum
→ online	qslv	qsytf	fr

Festo core product range
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Product overview – Pneumatic fittings system

Distributors

Type	**Distributors CQD**	**Rotary distributors GF**
Pneumatic connection 1	Female thread G1/2	Male thread G1/8, G1/4, G3/8, G1/2
Pneumatic connection 2	Female thread G1/2	Female thread M5, G1/8, G1/4, G3/8, G1/2
No. of supply lines	1	1
No. of outlets	4	2, 4
Max. rotational speed		300 ... 3000 rpm
Description	• POM • Operating media compressed air, vacuum	• 4 outlets or 2 axial and radial outlets • Single or multiple rotary distributor • Operating media compressed air, vacuum • Brass, hardened steel
→ online	cq	gf

Protective conduit systems

Type	**Protective conduits MK, MKG, MKR, MKV**	**Protective conduit fittings HMZAS, HMZV, MKA, MKGV, MKM, MKRL, MKRS, MKRT, MKRV, MKVM, MKVV, MKY**
I.D.	7.5 ... 48 mm	
O.D.	10 ... 56 mm	
Connecting thread		Pg 9, Pg 11, Pg 13.5, Pg 16, Pg 21, Pg 29, Pg 36, Pg 48
Design	Strip-wound metal conduit, internally and externally corrugated all-plastic conduit, separable	
Ambient temperature	-20 ... 100°C	-40 ... 200°C
Description	• For protecting pneumatic tubing and electrical cables • Galvanised steel, PA, PP, PVC spring steel • Metal or plastic design • High alternate bending strength	• Installation kit • Junction box • Reducing connector • Protective conduit fitting • Lock nut • Protective conduit connector • Y-distributor • Polymer, polyamide, nickel-plated brass
→ online	mkg	mka

Accessories

Type	**Sealing material CRO, GWB, O, OK, OL**	**Pipe and tubing cutters PAN-VOS, ZDS, ZMS, ZR, ZRS**	**Pipe clamps PQ**	**Tubing accessories KK, NPAW, PB, PKB, PKS, QSO, SK**
Description	• Sealing ring • Sealing ring assortment • Thread sealing tape	• Tubing cutter • Disconnecting pliers • Connecting pliers • Pipe cutter • Pipe and tubing cutter	• For pipes with an O.D. of 12 ... 28 mm	• Tubing strap • Spiral wrap for tubing • Tubing support • Multi-tube holder
→ online	cro	zds	pq	npaw

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.

Connecting cables, universal

Type	**Connecting cables NEBU** ★	**Connecting cables/plug sockets with cable SIM**	**Connecting cables KM12**
Electrical connection	Socket: straight, angled, rotatable, plug: straight, angled, M8x1, M12x1, 3-pin, 4-pin, 5-pin, 8-pin, rotatable thread, open end	Straight, angled socket, angled socket/open end, straight socket/open end, M12x1, M8x1, clip-on, 3-pin, 4-pin, 5--pin, 3-wire, 4-wire, 5-wire,	8--pin/8-pin, M12x1/M12x1, plug: straight/ socket: straight
Cable length	0.1 ... 30 m	2 ... 10 m	2 m
Description	• Designs for static, standard, energy chain and robot applications • Designs with switching status indication • Designs for connecting sensors and actuators	• Pre-assembled at both ends	• For connecting inputs and outputs • Type of mounting: union nut, threaded connector
→ online	nebu	sim	km12

Connecting cables for controllers

Type	**Connecting cables NEBC**	**Connecting cables NEBP**	**Connecting cables, diagnostic cables SBOA**	**Cables FEC-KBG**
Electrical connection	Straight plug, socket, M12.x, Sub-D, 5-pin, 9-pin, 25-pin, square design/ angled, Sub-D/Sub-D	Angled socket, M16x0.75, 6-pin; angled plug, M9x0.5, 5-pin	Straight plug/straight socket/ straight socket	Open end, for RS232 interface
Cable length	0.25 ... 20 m	2 m	2 m	2.5 ... 5 m
Description	• For I/O interface • For connecting motor controller CMMS-ST to any controllers	• Connection between displacement encoder MME and measuring module CPX-CMIX	• Used as Ethernet diagnostic cable, for integration in a CPI system, for I/O extension, for compact vision system type SBOC-Q, SBOI-Q	• For connecting to control block CPX-FEC • Connection between displacement encoder MME and measuring module CPX-CMIX
→ online	nebc	nebp	sboa	fec-kbg

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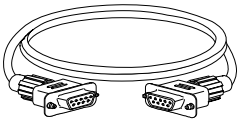
Product overview – Electrical connector technology

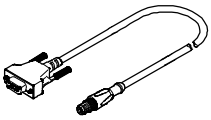
Connecting cables for control systems

Type	**Control cables KES**	**Programming cables KDI**	 **Programming cables PS1-ZK11**	**Connecting cables KV-M12**
Electrical connection	15-pin, straight socket, Sub-D, cable, open end, 15-pin, 18-pin	4-pin, 9-pin, straight socket, straight plug, M8x1, Sub-D	Sub-D, 9-pin	Socket, plug, straight, round, M12x1 A-coded to EN 61076-2-101
Cable length	2.5 ... 10 m	3 m	2 m	1.5 ... 3.5 m
Description	• For I/O interface for connecting motor controller SFC-DC to any controller	• Pre-assembled at both ends • For diagnostic interface	• The null modem cable ZK11 is intended exclusively as a programming cable for direct connection to a PC • Among other things for motor controller CMMS-ST	• Plug socket with cable for diagnostic interface (to CPX terminal) • Pre-assembled at both ends • 5-pin/4-wire • Round plug • Mounting via union nut M12
➔ online	**kes**	**kdi**	**cmms-st**	**kv-m12**

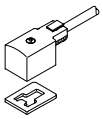
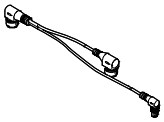
Connecting cables for motors

Type	**Motor, encoder, resolver cables NEBM**	**Control cables KES**	**Motor cables KMTR**
Electrical connection	Socket, cable, plug, straight, angled, connection pattern L4, connection pattern L5, RJ45, ITT M3, Sub-D, M12x1 A-coded to EN 61076-2-101, M16x0.75, open end, M23x1, M40x1.5	15-pin, straight socket, Sub-D, cable, open end, 15-pin, 18-pin	11-pin, 12-pin, straight socket, M12x1, A-coded to EN 61076-2-101, 11-pin, 15-pin, straight plug, Sub-D
Cable length	1 ... 25 m	2.5 ... 10 m	2.5 ... 10 m
Description	• For servo motor EMMS-AS and stepper motor EMMS-ST • Suitable for energy chains	• For I/O interface for connecting motor controller SFC-DC to any controller	• For motor controller SFC-DC
➔ online	**nebm**	**kes**	**kmtr**

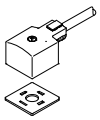
Connecting cables for motors

Type	**Power supply cables KPWR**	 **Fieldbus adapters fba**
Electrical connection	6-pin, 7-pin, straight socket, Sub-D mixed, 6-pin, cable, open end	9-pin Sub-D plug to 5-pin round plug/socket M12, plus round plug M12 for logic voltage supply
Cable length	2.5 ... 10 m	0.1 m
Description	• For motor controller SFC-DC for connecting load and logic supply	• 9-pin Sub-D plug to 5-pin round plug/socket M12
➔ online	**kpwr**	**fba**

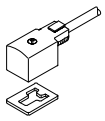
Connecting cables for valves

Type	**Connecting cables NEBV** ★	**Plug sockets with cable KMEB-1, KMEB-2, KMEB-3** ★	 **Plug sockets with cable KMF** ★	 **Connecting cables NEDV**
Electrical connection	M8x1, socket, straight socket, M12, 8-pin, straight plug, M12, 4-pin, 2-pin, angled socket/straight plug, angled socket/cable, straight socket/straight plug, M8x1/M8x1, M12x1/M12x1, 4-pin/3-pin, 8-pin/4-pin, 4-pin/2-wire, socket/plug/plug, M12x1/M12x1/M12x1, 8-pin/4-pin/4-pin	2-pin, 3-pin, 4-pin, 5-pin, angled socket, type C, to DIN EN 175301-803	Socket	M12, 3-pin, 2x angled socket, 1x angled plug, M8, 4-pin
Cable length	0.2 ... 30 m	0.5 ... 10 m	2.5 ... 10 m	0.2 m
Description	• For valves with ZC solenoid coil • Pre-assembled at both ends	• For valves with EB solenoid coil • Mounting via central screw • Polyvinyl chloride cable • Ambient temperature -20 ... +80 °C	• For valves with F solenoid coil • Mounting via central screw • Polyvinyl chloride cable • Temperature range –20 ... +80 °C	• For proportional valves VPWP • For connecting to sub-base VAPV-S3 • Pre-assembled
➔ online	nebv	kmeb-1	kmf	nedv

Connecting cables for valves

Type	**Plug sockets with cable KMYZ-2, KMYZ-4**	**Plug sockets with cable KME**	 **Plug sockets with cable KMC**
Electrical connection	Angled socket/straight plug, angled socket/cable, square design/M8x1, square design/open end, 2-pin/3-pin, 2-pin/2-wire Cable, angled socket, square design MSZB/MSZC	Angled socket, square design, 3-pin, type C	Socket, type A
Cable length	0.5 ... 10 m	2.5 ... 10 m	2.5 ... 10 m
Description	• For valves with ZB solenoid coil • For valves with ZC solenoid coil • Mounting via central screw	• For valves with E solenoid coil • Mounting via central screw • Polyvinyl chloride cable • Ambient temperature –20 ... +80 °C	• For valves with D solenoid coil • For valves with N1 solenoid coil • Polyvinyl chloride cable • Mounting via central screw • Ambient temperature –20 ... +80 °C
➔ online	kmyz-2	kme	kmc

Connecting cables for valves

Type	 **Plug sockets with cable KMV**	**Connecting cables KRP**	**Electrical plug-in bases MHAP-PI**
Electrical connection	Socket, type B	2-pin, angled socket	2-pin, 3-pin, socket
Cable length	2.5 ... 10 m	2.5 ... 5 m	0.5 ... 1 m
Description	• For valves with V solenoid coil • Mounting via central screw M3 • Polyvinyl chloride cable • Ambient temperature –20 ... +80 °C	• Plug socket with cable for connecting relay plates (valve terminal CPV10 and CPV14) • Pre-assembled • Mounting via self-tapping central screw	• Plug base with cable for connecting individual valves • Pre-assembled • Mounting via clip
➔ online	kmv	krp	mhap

Festo core product range ★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Product overview – Electrical connector technology

Connecting cables for valves

Type	Plug sockets with cable KMPPE	Connecting cables KMPYE-AIF, KMPYE-5, KMPYE-...	Connecting cables MHJ9-KMH
Electrical connection	8-pin		2-pin/2-pin/4-wire, straight socket/straight socket/cable
Cable length	2.5 ... 5 m	0.3 ... 5 m	0.5 ... 2.5 m
Description	• For proportional pressure regulators MPPE and MPPES • Mounting via union nut M16x0.75 • Polyvinyl chloride cable • Ambient temperature –30 ... +80 °C	• Plug socket with cable, screened, for proportional directional control valves MPYE	• For valves MHJ9 • With plug sockets KMH • With control electronics for two valves
→ online	**kmppe**	**kmpye**	**mhj9-kmh**

Connecting cables for valve terminals

Type	Connecting cables/plug sockets with cable NEBV-S1W37	Flat cables KASI	Addressing cables KASI-ADR
Electrical connection	Socket, cable, Sub-D, open end	2-pin, open cable end	4-pin/4-pin/2-pin, straight socket/angled plug/straight socket
Cable length	2.5 ... 10 m	100 m	2.5 m
Description	• For multi-pin plug connection to valve terminal VTSA and VTSA-F • Pre-assembled at one end	• For AS-Interface® • Reverse polarity protected • Contact using insulation displacement technology • No need to strip cable and wire insulation • Two different colours: yellow (preferred for the AS-Interface® network) and black (for auxiliary power supply)	• For AS-Interface® • For any slaves such as individual valve interface, valve terminal with AS-Interface® connection • Reverse polarity protected
→ online	**nebv**	**kasi**	**kasi-adr**

Connecting cables for valve terminals

Type	Connecting cables KMP3, KMP4, KMP6	Connecting cables KV-M12	Plug sockets with cable KMPV
Electrical connection	15-pin, 25-pin, 26-pin, 9-pin, socket, Sub-D	Straight socket, M12, 5-pin, A-coded, straight plug, M12x1, 5-pin, A-coded	Cable with socket, Sub-D, 15-pin
Cable length	2.5 ... 10 m	1.5 ... 3.5 m	5 m ... 10 m
Description	• Plug socket with cable for multi-pin plug connection • Pre-assembled • Mounting via union nut, with 2 screws	• Plug socket with cable for diagnostic interface (to CPX terminal) • Pre-assembled at both ends • 5-pin/4-wire • Round plug • Mounting via union nut M12	• Connecting cable for multi-pin plug connection • Pre-assembled
→ online	**kmp**	**kv-m12**	**nebv**

Connecting cables for valve terminals

Type	Connecting cables KVI	Connecting cables KVIA	Connecting cables VMPA-KMS1, VMPA-KMS2, VMPAL-KM, VMPAL-KMSK
Electrical connection	M9, plug, socket, 5-pin, straight socket/straight plug	Straight plug, straight plug/straight socket, straight plug/angled socket	Cable with plug
Cable length	0.25 ... 8 m	5 ... 10 m	2.5 ... 10 m
Description	• For fieldbus connection (for valve terminal CPV and installation system CPI) • Pre-assembled at both ends • Suitable for energy chains	• For inputs/outputs (analogue connections) • Pre-assembled at both ends • 4-pin/5-pin round plug • Suitable for energy chains	• Plug socket with cable for multi-pin connection (to valve terminal MPA) • Variant suitable for use with energy chains • Cable outlet straight or to side • Pre-assembled at one end • Polyvinyl chloride or polyurethane cable
→ online	kvi	kvia	vmpa-kms

Connecting cables for sensors

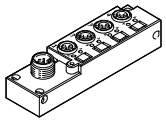
Type	Connecting cables NEBB	Connecting cables NEBS
Electrical connection	Straight socket, angled socket, M8x1 A-coded to EN 61076-2-104, M12x1 A-coded to EN 61076-2-101, cable, open end	Straight socket, M12x1, 12-pin, A-coded, straight socket, M12x1, 5-pin, A-coded, socket, square design L1, 4-pin, open end, 12-wire, open end, 4-wire, open end, 5-wire
Cable length	2.5 ... 10 m	0.3 ... 10 m
Description	• Degree of protection IP65, IP68, IP69K, in mounted condition	• Degree of protection IP40
→ online	nebs	nebs

Universal plug connectors

Type	Sensor/actuator distributors NEDY	Cable sockets NEFU
Electrical connection	Controller side: plug M8x1, A-coded, EN 61076-2-104, plug M12x1, A-coded, EN 61076-2-101, open end Field device side: socket M8x1, A-coded, EN 61076-2-104, socket type A, EN 175301-803, socket type B, EN 175301-803, socket type B, industry standard 11 mm, socket type C, EN 175301-803, socket type C, industry standard 9.4 mm, socket connection pattern H, socket connection pattern ZB, self-tapping screw, socket connection pattern ZC, self-tapping screw, socket connection pattern ZC, metric screw, open end	Angled socket, RJ45, 4-pin, straight socket, M12x1, 4-pin, D-coded
Connection cross section		
Degree of protection	IP65, IP67, IP68, IP69K	IP20, IP65, IP67, in mounted condition, to IEC 60529
Description	• Collecting signals between field devices (sensors) and double-assigned controller inputs • Distributing signals between double-assigned controller outputs and field devices (actuators, e.g. valves)	• Cable socket for branching the AS-Interface® network at any required point • Reconnecting AS-Interface® flat cable to 5-pin M12 socket • Reverse polarity protected
→ online	nedy	nefu

Product overview – Electrical connector technology

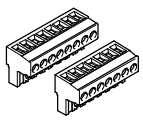
Universal plug connectors

Type	**Plugs** **NECU, NECU-HX**	**Push-in T-connectors** **NEDU**	 **Multi-pin plug distributors** **NEDU**
Electrical connection	3-pin, 4-pin, 5-pin, 8-pin, 9-pin, Sub-D, straight socket, straight plug, spring-loaded terminal, screw terminal, insulation displacement connector, 7/8", AIDA push-pull, M8x1, M12x1, for self-assembly, can be screened, square design	Socket/socket/plug, M12x1/M12x1/M12x1, 4-pin/4-pin/4-pin, A-coded/A-coded/A-coded	Straight socket, M8, 3-pin, Straight plug, M12x1, 8-pin
Connection cross section	0.08 ... 2.5 mm²		
Degree of protection	IP20, IP40, IP65, IP67	IP65, IP67	IP68
Description	• Power supply socket for fieldbus connection • Plug and socket for power supply • Can be assembled with any cable lengths • NECU-HX: reconnectable M8 and M12 round plug connectors with Harax® quick connection technology for low-voltage applications	• For fieldbus connection • Branch line for connecting and disconnecting fieldbus components	• Particularly compact
➔ online	**necu**	**nedu**	**nedu**

Universal plug connectors

Type	**Plugs** **SEA**	**Cable distributors** **ASI-KVT**	**Cable sockets** **ASI-SD**
Electrical connection	3-pin, 4-pin, 5-pin, angled socket, straight plug, screw terminal, insulation displacement connector, solder connection, type A, M8x1, M12x1, M12x1 round plug connector	Insulation displacement technology	2-pin, 4-pin, straight socket, screw terminal
Connection cross section	0.08 ... 0.75 mm²	1.5 mm²	0.75 ... 1.5 mm²
Degree of protection	IP65, IP67	IP65	IP65, IP67
Description	• Sensor plug and socket for inputs/outputs • Can be assembled with any cable lengths	• Flat cable distributor for branching or for re-connecting AS-Interface® flat cables • Reverse polarity protected	• For AS-Interface® • Flat-cable socket for connecting AS-Interface® stations to the AS-Interface® bus system • M12 connection • Reverse polarity protected • Detachable connection
➔ online	**sea**	**asi-kvt**	**asi-sd**

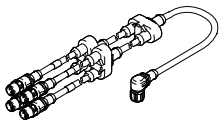
Plug connectors for controllers

Type	 **Plug assortments** **NEKM**	**Plugs** **NECC**
Electrical connection	2 ... 9-pin, screw connector	11-pin, 9-pin/9-pin, plug, Sub-D/screw terminal
Connection cross section	0.2 ... 2.5 mm²	0.2 ... 2.5 mm²
Degree of protection		IP40
Description	• For motor controller CMMS-ST, CMMO-ST, CMMP-AS	• Encoder plug for motor controller CMMS-ST • Plug for multi-axis controller CMXR for interface housing CAMI-C, 11-pin • Plug for multi-axis controller CMXR and for modular controller CECX for peripheral modules • 2-pin, 4-pin, 6-pin, 8-pin, 11-pin, 18-pin
➔ online	**nekm**	**necc**

Plug connectors for control systems

Type	Plugs PS1-SAC, PS1-ZC	Plugs FBS-SUB-9-WS	Plugs FBS-RJ45
Electrical connection	10-pin/10-pin/10-pin, 30-pin, socket/terminal strip	5-pin, type A, M12x1, straight plug/screw terminal	5-pin, type A, M12x1, straight plug/screw terminal
Connection cross section	0.08 ... 0.75 mm²	0.75 mm²	0.75 mm²
Degree of protection		IP40	IP65, IP67, to IEC 60529
Description	• For power supply • Cable connection using clamping technology • Individually or as a set	• Plug connector for bus connection CAN bus and PROFIBUS • Cable connection 2x horizontal or 2x vertical • Printed circuit terminal block with screw connector	• Ethernet plug with 8-pin RJ45 connection • High transmission quality • Detachable connection
➔ online	**ps1**	**fbs-sub-9-ws**	**fbs-rj**

Plug connectors for valves

Type	Plug sockets MSSD ★	 Adapters NEFV	Soldering bases PCBC	Multi-pin plug sockets NECA
Electrical connection	3-pin, 4-pin, angled socket, type A, type B, type C, to DIN EN 175301-803, to DIN EN 61984, square design	Socket, round, angled, M12x1, A-coded to EN 61076-2-101, 8-pin	2-pin	Socket, Sub-D, 9-pin
Connection cross section	0.25 ... 1.5 mm²			0.34 ... 1 mm²
Degree of protection	IP50, IP65, IP67, in mounted state, to IEC 60529	IP65, IP67	IP40	IP65, 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	• Adapter for connecting a proportional valve to the controller	• For mounting miniature valves MHA1 and MHP1 on a PCB with plug connection underneath (-PI)	• For soft-start/quick exhaust valves MS6-SV, MS series • Electrical connection via 9-pin Sub-D, 9-pin screw terminal
➔ online	**mssd**	**nefv**	**pcbc**	**ms6-sv**

Plug connectors for valves

Type	Angled plug sockets MPPE-3-B	Time delay adapters MFZ	Illuminating seals MF-LD, MC-LD, MV-LD, ME-LD, MEB-LD	Indicating inserts MCL, MCLZ, MFL, MFLZ
Electrical connection	8-pin, angled socket, solderable	For connector socket or device plug, type F	Type A, B, C, to DIN EN 175301-803, square design, MSC/MSE/MSEB/MSF/MSV	Plug, to DIN 43650
Connection cross section	0.75 mm²			
Degree of protection	IP67	IP64	IP65	IP65
Description	• For proportional pressure regulators MPPE and MPPES • Mounting via union nut	• Electronic timer with adjustable time delay of between 0 ... 10 s • For mounting between the solenoid coil and connector socket and plug	• The seal is illuminated yellow when the power is switched on • For mounting between the plug socket and solenoid coil • For F, D, N1, V, E and EB solenoid coils	• Variant with integrated protective circuit • For mounting between the solenoid coil and plug connection • With yellow LED display
➔ online	**mppe-3-b**	**mfz**	**mc-ld**	**mcl**

Festo core product range ★ Generally ready for shipping ex works in 24 hours
☆ Generally ready for shipping ex works in 5 days

Product overview – Electrical connector technology

Plug connectors for valve terminals

Type	Plug sockets FBSD-GD, FBSD-WD	Plug sockets NTSD-GD, NTSD-WD	T-adapters FB-TA
Electrical connection	4--pin, 5--pin, socket: straight, angled, screw terminal, type A, M12x1	4-pin, 5-pin, socket: straight, angled, plug: straight, screw terminal	Plug/socket, M12x1/M12x1, 5-pin/5-pin
Connection cross section	0.75 mm²	0.75 ... 2.5 mm²	
Degree of protection	IP20, IP67	IP67	IP67
Description	• For fieldbus connection • Straight or angled design • Can be assembled with any cable lengths	• Straight or angled design • For power supply • Can be assembled with any cable lengths	• Branch line for connecting and disconnecting fieldbus components
➔ online	**fbs**	**ntsd**	**fb-ta**

Plug connectors for valve terminals

Type	Bus connections FBA-1, FBA-2	Plugs FBS-SUB, FBS-SCRJ, FBS-M12	Sensor sockets SIE-GD, SIE-WD
Electrical connection	9-pin/5-pin, straight socket/straight plug, straight socket/plug and socket, Sub-D/-, Sub-D/M12x1	5-pin, type A, M12x1, straight plug/screw terminal	4-pin, straight socket, angled socket, M12x1
Connection cross section		0.75 mm²	0.25 ... 0.75 mm²
Degree of protection	IP40, IP65, to IEC 60529	IP65, IP67, in mounted condition, to IEC 60529	IP67
Description	• Can be assembled with any cable lengths	• Variants for PROFIBUS DP, INTERBUS® nodes CPX and CPV, CC-LINK® CPX and CPV, CPX-FEC • Position of DIL switches can be read externally • Easy assembly	• For customised fabrication of cables • Pin adapter for fieldbus connection • With screw terminals • Straight or angled design
➔ online	**fba-1**	**fbs-sub**	**sie-gd**

Plug connectors for valve terminals

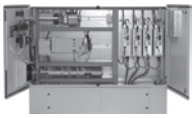
Type	Cover caps ISK	Plug sockets, plugs SD-SUB	Bus connections FBSD-KL
Electrical connection		25-pin, plug, Sub-D	Angled socket, screw terminal
Connection cross section			0.2 ... 2.5 mm²
Degree of protection	IP65	IP65	IP20
Description	• For sealing unused ports/openings • Thread M8, M12	• Socket for multi-pin plug connection • Plug for inputs/outputs • Can be assembled with any cable lengths	• 5-pin angled socket, 5-pin screw terminal
➔ online	**isk**	**sd-sub**	**fbsd-kl**

Plug connectors for sensors

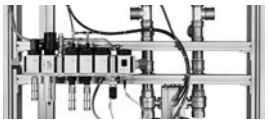
Type	**Angled plug sockets PEV-WD**	**Plug sockets SD-4-WD**
Electrical connection	4-pin, angled socket	4-pin, plug, Sub-D
Connection cross section		
Degree of protection	IP65	IP65, to IEC 60529
Description	• For pressure switch PEV • 15 ... 30, 180 V DC, 230 V AC • Optionally with LED display • Angled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

Product overview – Control cabinets

Control cabinets

Type	Factory automation	Process automation	 Control cabinets for handling 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 electro-pneumatic) – UL-508A • Implementation of safety functions • Different bus technologies	• Simple to complex control cabinet designs • Application-specific combination of components • Different operating voltages possible • 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 electro-pneumatic) – UL-508A • Implementation of safety functions • Wide range of bus technologies • Compliance with special cleanliness and hygiene requirements • Special materials • Protected against the ingress of liquids and foreign matter • Heating or cooling elements • Intrinsically safe valve terminal technology • Hot swap inspection window	• Simple to complex control cabinet designs • Control of motion sequences with up to 6 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 electro-pneumatic) – UL-508A • Implementation of safety functions • Wide range of bus technologies • Function modules for motion applications • Host modules for easy connection to the customer's control environment
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 ➔ www.festo.com/handling
➔ online	cmcz	cmcz	cmcz

Mounting and installation plates

Type	Mounting plates	 Hall installation plates (HIP) for body assembly	Robot installation plates (RIP) for body assembly
Technical data	• Customised support plate shape • Support plate 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 electro-pneumatic) – UL-508A • Implementation of safety functions	• Media supply for compressed air and cooling water for welding cells • Made to measure: profile as support element, design perfectly adapted to the installation space, for installation within safety barriers • Labelling: customised labelling for safe operation • Fast installation: thanks to assembly according to the customer's specification • Medium water: fittings for liquid media	• Media supply for compressed air and cooling water for welding robots • Protection against ambient conditions through the use of special materials, such as hoses and fittings resistant to welding spatter • Protection against environmental influences to prevent damage to the installation • Made to measure: profile as support element, design perfectly adapted to the installation space • Cooling water suction cylinder for drawing in cooling water when changing welding caps • Water flow sensor: measures flow rate, volume and cooling water temperature – to monitor the welding process • Easy to maintain thanks to removable fittings
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	• Controls and monitors the compressed air and cooling water supply for whole welding cells	• Controls and monitors the compressed air and cooling water supply for individual welding guns
→ online	cmcz	www.festo.com/sp/hip	www.festo.com/sp/rip

Product overview – Control cabinets

Assemblies

Type	Assemblies	Cartridge solutions	Sheet-metal structures and special housings
Technical data	• Combination of a wide range of pneumatic and/or electric components into one unit • Application-specific combination of components • Accessories mounted on the 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 electro-pneumatic) – UL-508A • Implementation of safety functions	• Space saving thanks to extremely compact design • Pneumatic functions integrated in a single compact housing • Housing available in different materials • No tubing required • Minimal cabling required • Significant design freedom • Flexible integration options on and within the machine • Sturdy design • Fully tested • Ready to install • Complete documentation	• Sheet-metal structures – Customised shape and size – Reduced weight and number of assembly parts • Special housing – Customised shape – Customised dimensions – Different materials – Compact, space-saving format – Protection against environmental influences and unauthorised access • In combination – Alternative to conventional control cabinets – Variable integration options on and within the machine – Short tubing and cable lengths – Attractive design
Description	• Pneumatic and electric components pre-assembled to create a function unit • Can be combined from around 30,000 catalogue components • Connections included • For integration in machines	• Integration of various pneumatic functions in one component • No need for individual housings • Ideal for applications that require a highly compact design	• Reduced weight thanks to optimal use of materials with sheet-metal structures • Protection against environmental influences and unauthorised access in the special housing • Ideally combined as a control cabinet directly in the system
→ online	cmcz	cmcz	cmcz

Assemblies

Type	Function blocks	Profile solutions
Technical data	• No tubing required thanks to drilled ducts • Housing available in different materials • Customised design of the pneumatic interfaces for the system • Ideal for a small number of components and variable connection options • Extremely economical, even for small quantities	• Profiles in customised cross sections and lengths • Integrated ducts for straight-line routing of the compressed air • Common air supply for multiple valves or valve terminals via a single duct • Combination of exhaust air and supply air without tubing, even over long distances • Supply of compressed air at different locations • No tubing required • Significantly reduced cabling • Modular structure easy to achieve • Optional: profile as mechanical mounting element for other components or as a supporting part of the machine frame
Description	• Compressed air supply for pneumatic components via drilled ducts • Ideal for small number of pneumatic components and variable connection options • Compact and easy to service	• Extruded profiles in combination with valves as a valve terminal • For the distribution of compressed air in the machine concept • Customised profile cross sections available
→ online	cmcz	cmcz

12 Services

+ After Sales Services:
  from commissioning through to maintenance and repair
+ Energy Saving Services:
  energy efficiency as a modular service. PreAudit and Audit to suit your specific requirements
+ Technical Support Services:
  technical advice and technical customer support

Commissioning service

+ Configuration and parameterisation on site
+ Fast, reliable, optimised

➔ page 840

Maintenance

+ Inspection and preventive maintenance measures
+ Corrective maintenance

➔ page 841

PreAudit – Energy Saving Services

+ Comprehensive report on your compressed air system
+ Determine savings potential for compressed air and define measures

➔ page 844

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Technical support 843
PreAudit 844
Analysis of compressed air generation 845
Compressed air quality analysis 846
Pressure drop measurement 847
Compressed air consumption analysis 848
Leakage detection and elimination 849
Maintenance Machine analysis for energy efficiency 850

Commissioning service

- Professional commissioning of Festo automation solutions
- Competent briefing of staff responsible for the machine
- Fast – reliable – optimised

Objectives

- Professional commissioning of Festo components and solutions in your plant
- Competent briefing of staff responsible for the machine

Services

- Mechanical, pneumatic and electrical integration and configuration of Festo automation solutions
- Configuration and parameterisation
- Optimisation with test run
- Data backup and documentation
- Technical guidance and briefing of staff responsible for the machine

Requirements and prerequisites

Optimum prerequisites

- Use of Festo components
- Access to the machine or system
- Mechanical, pneumatic and electrical work is complete
- Qualified personnel responsible for the machine present on the agreed date

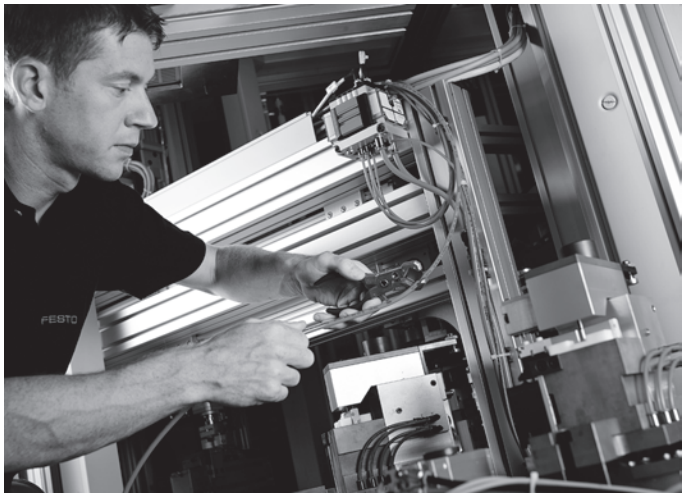
The benefits to you

- Optimum configuration and parameterisation
- Time saving
- Maximum system availability

Are you interested in this service?

Ask your Festo sales engineer or visit our website ➔ **www.festo.com/services**

Maintenance



- Preventive and corrective maintenance
- Directly at your system
- For high system availability and rapid assistance should the worst happen

Objectives

- Optimal preventive maintenance of pneumatic and electrical automation components and systems
- Prevention of unplanned production downtime
- Fast and effective support in the event of malfunctions or production downtime
- Reduced energy consumption

Services

Implementation of the following preventive maintenance measures to DIN 31051:

- Inspections
  - Checking for damage and wear characteristics
  - Checking mechanical, pneumatic and electrical connections and connectors
  - Checking lubrication
  - Checking compressed air preparation
  - Carrying out component-specific inspections
- Maintenance
  - Lubrication/relubrication of guides
  - Tightening of connectors
  - Replacement of air filters
  - Replacement of silencers
  - Carrying out component-specific preventive maintenance tasks
- Repair
  - Troubleshooting
  - Solution finding
  - Error elimination
  - Elimination of leakages
  - Replacement or repair of components

The benefits to you

- Professional implementation of preventive maintenance measures for optimum machine operation by specialists from Festo
- The entire compressed air system is always in a good condition
- High system availability and prevention of unplanned downtimes
- Reduced workload for your maintenance personnel
- Individual services available on request

Are you interested in this service?
Ask your Festo sales engineer or visit our website → **www.festo.com/services**

Repair service

- Extended service life
- Reduced costs

Objectives

- Cost-effective extension of the service life of high-quality components and assemblies

Services

- Inspection
- Analysis of economic efficiency
- Repair or replacement of faulty components or wearing parts
- Leakage testing
- Functional testing

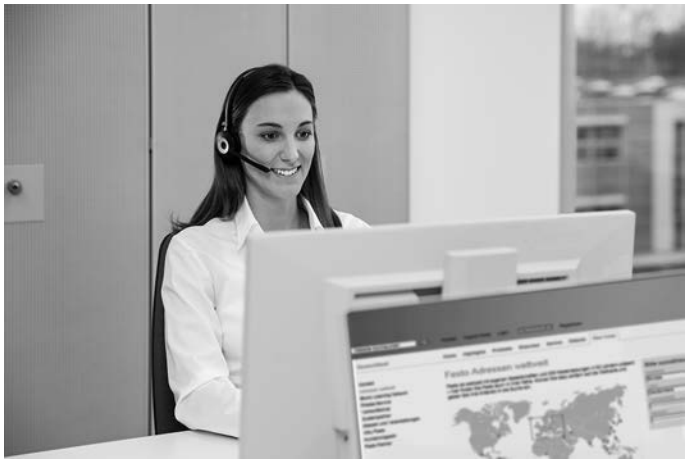
Please send the faulty component and a detailed error description to your Festo national company.
Detailed spare parts lists can be found on the Festo website.

The benefits to you

- Extension of the service life of components and assemblies through replacement or repair of defective or worn parts
- Also available in some countries as an Express Repair Service (e.g. repair within 2 hours) and at a fixed price

Are you interested in this service?
Ask your Festo sales engineer or visit our website ➔ **www.festo.com/services**

Technical support



- Your technical questions answered
- Technical support on site

Services

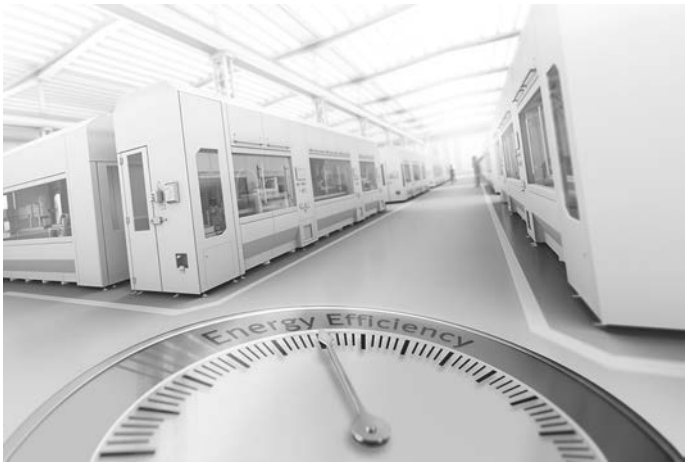
- Technical advice:
  answering technical questions or solving technical problems using Festo automation solutions
  - Online support
  - Hotline support
- Technical customer support:
  technical support on site
  - Remote support
  - On-site support

The benefits to you

- Worldwide availability of technical support services
- Time saving when answering technical questions and solving problems
- Optimum sizing and increased availability of your system

Are you interested in this service?
Ask your Festo sales engineer or visit our website ➔ **www.festo.com/services**

PreAudit



- Implementation of the Festo Energy Saving Services to DIN ISO 11011
- Analysis of your compressed air system by experts on site
- Important advice and recommendations on the topic of energy efficiency – immediate identification of worthwhile measures

Objectives

- Determine a detailed picture of the energy situation in your compressed air system
- Demonstrate potential improvements and possible weaknesses

Services

Implementation of the Festo Energy Saving Services to DIN ISO 11011:

- Analysis of compressed air generation – assessment
  - Assessment of the compressors – utilisation
  - Documentation of compressor-specific performance data and all relevant maintenance data
- Compressed air quality analysis
  ➔ Page 846 "Compressed air quality analysis"
- Pressure drop measurement
  ➔ Page 847 "Pressure drop measurement"
- Compressed air consumption analysis
  ➔ Page 848 "Compressed air consumption analysis"
- Leakage detection – quick check
  - Systematic identification of leaks in the compressed air system
  - Leakage detection and documentation on one machine by way of example
- Machine analysis for energy efficiency – quick check
  - Review of one machine's pneumatic energy efficiency by way of example
  - Documentation of the analysed compressed air applications
  - Comprehensive report on the analysis with weighted recommendations on what to do next

General technical conditions

- Duration approx. 1 to 1 ½ days on site, 1 day for evaluation and report, ½ day for presentation of the results
- Access required to the compressor station, the systems and the plant. Accompanied by one of the customer's employees, provision of the data requested in advance.
- See Energy Saving Services for further general requirements

The benefits to you

- Important advice and recommendations on how to improve energy efficiency
- Immediate identification of weaknesses and worthwhile measures

Are you interested in this service?
Ask your Festo sales engineer or visit our website ➔ **www.festo.com/energysaving**

Analysis of compressed air generation

The Festo Energy Saving Services offer a tailored range of services for identifying and exploiting potential compressed air savings. Part of this is the analysis of compressed air generation:

- Determination of a clear consumption profile
- Information about the output reserves of the compressed air system
- Measurement during operation

Objectives

- Determine a clear consumption profile for compressed air requirements including fluctuations in consumption at different operating times
- Identify potential savings

Services

- Measurement of compressor operating times as well as load/idling times
- Power consumption measurement
- Flow measurement/consumption measurement
- Pressure measurement (level and band width)
- If possible, estimation of leakage volume
- Comparison of energy consumption and compressed air volume supplied

General technical conditions

- Simultaneous power consumption measurement on up to 6 compressors
- Simultaneous power consumption measurement on 6 to 12 compressors on request
- Pressure measurement up to 16 bar
- Volumetric flow rate measurement in main line up to DN 300 (approx. 39,500 Nm3/h)
- Flow sensor can be installed during operation and under pressure
- Measurement duration 1 week (different measurement duration on request)
- Documentation of results as a PDF file and printout in colour

The benefits to you

- Information about compressed air costs and potential savings
- Transparent energy consumption of the entire system
- Information about the output reserves of the compressed air system
- Manufacturer-independent measurement
- Installation of the measuring devices during operation

Are you interested in this service?
Ask your Festo sales engineer or visit our website ➔ **www.festo.com/energysaving**

Compressed air quality analysis

The Festo Energy Saving Services offer a tailored range of services for identifying and exploiting potential compressed air savings. Part of this is the compressed air quality analysis:

- Assurance of optimum compressed air quality
- Increased service life of components
- Minimisation of unexpected production downtimes

Objectives

- Optimise the current compressed air quality of the compressed air system
- Increase machine availability and process reliability
- Reduce maintenance costs

Services

- Inspection of decentralised air preparation at point of usage
- Measurement of residual oil content
- Measurement of pressure dew point
- Analysis of measurement results and if applicable recommendation of improvement measures
- Documentation of all measurement results
- 3 hours on-site service (max. 3 measurements; additional time on request)
- General technical requirements: sampling ideally using standard push-pull fittings or standard O.D. tubing
- Brief interruption of the compressed air supply necessary to install the measurement technology
- Pressure range up to 10 bar
- Measurement of the residual oil content up to class 2 (ISO 8573-1:2010)
- Measurement of the pressure dew point up to class 2 (ISO 8573-1:2010)
- Measurement of pressure dew points and residual oil class 1 (ISO 8573-1:2010) on request and in accordance with individual quotation

The benefits to you

- Assurance of optimum compressed air quality
- Targeted adaptation of compressed air preparation to requirements
- Minimisation of unexpected production downtimes
- Increased service life of pneumatic components and process reliability
- Analysis and documentation of measurement results by compressed air specialists

Are you interested in this service?
Ask your Festo sales engineer or visit our website ➔ **www.festo.com/energysaving**

Pressure drop measurement

The Festo Energy Saving Services offer a tailored range of services for identifying and exploiting potential compressed air savings. Part of this is the pressure drop measurement:

- Record the pressure drop in the system
- Up to 8% energy saving in generated compressed air through pressure reduction

Objectives

- Record the pressure drop in the system
- Reduce pressure

Services

- Measurement of the pressure in the compressor room (input), in production (draw off) and storage of the results
- Recording of the pressure drop using multiple pressure sensors with data loggers
- Evaluation and comparison of the pressure profiles
- Controlled pressure reduction following evaluation
- Demonstration of pressure fluctuations in production

The benefits to you

- Process reliability thanks to constant pressure level
- Potential savings from pressure reduction: up to 8% of the energy for generated compressed air

Are you interested in this service?
Ask your Festo sales engineer or visit our website ➔ **www.festo.com/energysaving**

Compressed air consumption analysis

The Festo Energy Saving Services offer a tailored range of services for identifying and exploiting potential compressed air savings. Part of this is the compressed air consumption analysis:

- Determination of exact compressed air consumption
- Optimal configuration of compressed air supply
- No pressure drop due to undersupply
- No unnecessary energy costs due to oversupply

Objectives

- Determine and analyse compressed air consumption and leakage of machines and machine lines
- Identify inappropriate compressed air usage and of improvement potential

Services

- Installation and removal of the measuring equipment with standard components (fittings, tubing, etc.)
- Measurement of flow rate, consumption and pressure with machine running and idle
- Determination and analysis of different characteristics
  - Consumption per machine cycle
  - Average consumption per minute
  - Average pressure
  - Max./min. pressure
  - Max./min. rate of air flow
- Documentation of measurement results including graphical representation of measurement results, optionally available as a PDF file or colour printout
- 3 hours on-site service (additional time on request)

General technical conditions

- Measurement of flow rates from 6 l/min ... 5000 l/min (higher flow rates on request)
- Accuracy of flow rate measurements: +/–4.5%
- Flow measurements in 1" ... 12" lines on request
- Applied measuring principles: usually calorimetric, sometimes differential pressure method
- Pressure range 1 ... 10 bar
- Pressure range up to 50 bar on request
- Sensor installation in supply line or bypass as special solution
- Brief interruption of the compressed air supply line necessary to install/remove the measurement technology
- Compressed air quality min. class 7:4:2 (to ISO 8573-1:2010)
- Provision of measurement results as a CSV file and as a colour printout
- Parallel measurement of multiple flow rates and pressures, including documentation, on request

The benefits to you

- Information about potential compressed air savings
- Use of state-of-the-art, highly accurate pressure and flow measurement technology
- All relevant measuring ranges are covered
- Analysis of measurement results by compressed air specialists

Are you interested in this service?

Ask your Festo sales engineer or visit our website ➔ **www.festo.com/energysaving**

Leakage detection and elimination

The Festo Energy Saving Services offer a tailored range of services for identifying and exploiting potential compressed air savings. Part of this is leakage detection and elimination:

- Detection and repair of leakages in production plants
- Immediate energy and operating cost savings

Objectives

- Transparency of energy and money losses as well as CO_2 emissions
- Assess and classify the individual leaks
- Lower compressed air requirements and thus lower operating costs

Services

- Detection of compressed air leakages using highly sensitive ultrasound detectors during operation
- Checking the complete compressed air system from the compressor to the pneumatic application
- Classification of the leakages according to size and cost
- Documentation of defective components
- Leakage report
  - Recommended measures
  - Required spare parts
  - Estimate of repair time
  - Prioritisation of measures
  - Assessment as to whether repair can be carried out while machine is in operation
- Information on optimisation options
- Documentation of measures carried out
- Online access to all results and repair data via the Energy Saving Assessment Portal

General technical conditions

- Contactless ultrasound detection and classification of compressed air leakages (other gases on request)
- Detection while the machines are running, usually no or only short production downtimes required
- Max. detection distance: 20 m
- Documentation of the results in the Energy Saving Assessment Portal

The benefits to you

- No production downtime required
- Fast and professional checking of your entire plant for compressed air leakages
- Detailed documentation of required measures, including spare parts
- Online access to the prepared data via the Energy Saving Assessment Portal
- Software tools for optimum planning of leakage rectification
- No investment in measurement technology for leakage detection needed
- Experience from many major projects

Are you interested in this service?
Ask your Festo sales engineer or visit our website ➔ **www.festo.com/energysaving**

Machine analysis for energy efficiency

The Festo Energy Saving Services offer a tailored range of services for identifying and exploiting potential compressed air savings. Part of this is the machine analysis for energy efficiency:

- Reviewing of systems with respect to possible energy optimisation potential
- Documentation of the analysed compressed air applications

Objectives

- Analyse and establish recommendations for optimising the energy consumption of your compressed air applications
- Determine and analyse compressed air consumption and of leakage of applications and machines
- Identify inappropriate compressed air usage and of improvement potential

Services

- Identification and analysis of the pneumatic applications of relevance to energy consumption
- Measurement of flow rate, consumption and pressure of the relevant compressed air applications
- Ascertain and recommendation of optimisation measures
- Estimation of the costs and savings, including the predicted amortisation time
- Installation and removal of the measuring equipment with standard components (fittings, tubing, etc.)
- Measurement of flow rate, consumption and pressure with machine running and idle
- Documentation of the measurement results including graphical representation

General technical conditions

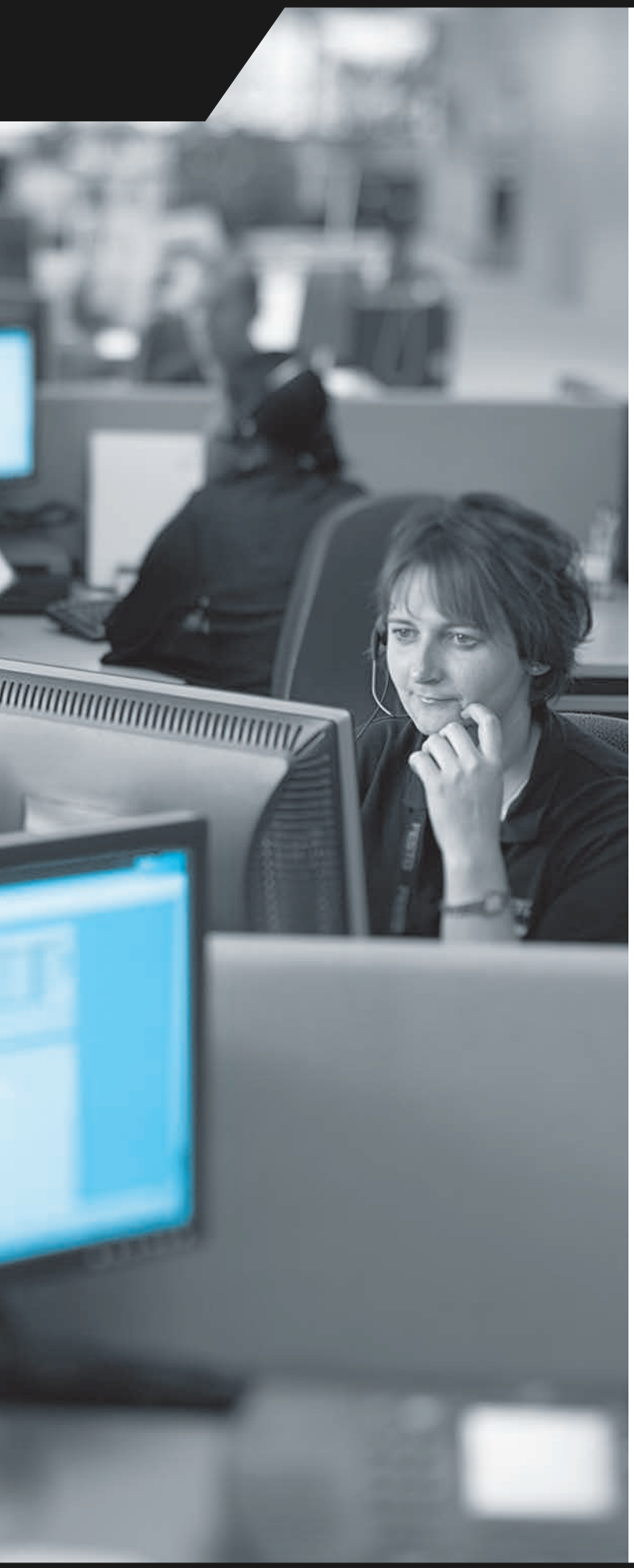
- Sensor installation in supply line or bypass as special solution
- Brief interruption of the compressed air supply line necessary to install/remove the measurement technology
- Compressed air quality min. class 7:4:2 (to ISO 8573-1:2010)
- Parallel measurement of multiple flow rates and pressures, including documentation, on request
- On request: installation and commissioning of the developed solutions

The benefits to you

- Systematic review by experienced pneumatic specialists
- Rapid identification of measures that are economically sensible and technically feasible
- Certification of the energy efficiency of pneumatic solutions

Are you interested in this service?
Ask your Festo sales engineer or visit our website ➔ **www.festo.com/energysaving**

Appendix



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Conditions for using, storing and transporting Festo products

What must be taken into account when using Festo products?

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

The pneumatic components must be supplied with correctly prepared compressed air free of aggressive media ➔ page 856 ff.
Take the ambient conditions at the place of use into consideration. Corrosive, abrasive and dusty environments (e.g. water, ozone, grinding dust) will reduce the service life of the product.
Check the resistance of the materials of Festo products with respect to the media used and surrounding media ➔ page 872.

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

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

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

All technical data is correct at the time of going to print.
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All technical data is subject to change according to technical updates.

Storage conditions

Temperature
The temperature range in storage areas must be between 10 °C and 40 °C all year round. Rapid changes of temperature in the storage area should be avoided. Heat sources such as heating elements, heating pipes and the like should be shielded to ensure the stored goods are not directly subject to radiant heat.

UV radiation
No direct sunlight (skylights, vent flaps, etc.) and no high-UV artificial lighting. Use fluorescent tubes with UV protection.

Ambient air
Air circulation and permanently feeding (proportionally) ambient air to the storage room is absolutely essential. You must prevent any media that may affect the materials, e.g. solvents and the like arising from production processes, from entering the storage areas. The storage location should not contain any equipment that generates ozone such as indoor air ionisers or high-voltage equipment.
The relative humidity should not exceed 75%. Condensation must be avoided in all cases.

Dust
The parts must be stored in suitable containers. The storage room must as far as possible be free of dust. Attention should be paid in particular to using abrasion-resistant, non-porous floor coverings, and ingress of dust particles from external sources (ambient air) should be prevented.
When repairs are being made to the building technology systems in the warehouse (welding, grinding etc.), the stored goods should be protected from welding spatter, chips etc.

Adding to/removing from storage
The parts should not be exposed to any extreme fluctuations in temperature.

Mechanical effect
All products, including packs of spare parts/wearing parts for example, should be stored in such a way that they are not mechanically deformed or damaged, i.e. no buckling or sagging, no point loads. Direct contact between elastomer products and copper or manganese for an extended period should also be avoided because of possible reciprocal effects.

Stock management
To avoid storing parts for long periods of time, the first-in first-out principle should be followed. The total storage duration should be kept as short as possible. In principle, the specified guarantee periods apply.

Transport conditions

In principle, there are no restrictions in terms of operating conditions during land/sea or air transport, provided the products are sufficiently protected in accordance with the specifications in the product data sheet by using appropriate product and shipping packaging. If necessary, special transport such as temperature-controlled transport can be organised. However, this should be agreed contractually and as a separate financial matter.

Standards in pneumatics

Standards are also of great importance in pneumatics. Standards mean harmonisation. Standardisation is also the basis for the free trade of goods and services between companies nationally as well as internationally. Standards in industry describe the latest state of technology. They provide a common basis for the evaluation of technical aspects. Standards relevant for pneumatics deal with dimensions, safety and quality. Festo has for many years been actively working with the relevant national and international standards organisations.

Pneumatic drives

- Standards-based cylinders to ISO 6432
- Standards-based cylinders to ISO 21287
- Standards-based cylinders to ISO 15552 (ISO 6431, DIN ISO 6431, VDMA 24 562), NFE 49003.1 and UNI 10290.
- Rod clevises to ISO 8140 and DIN 71752
- Rod eyes to ISO 12240-4, dimension series K

Valves/valve terminals

- Valve terminals for standard valves
- Solenoid and pneumatic valves with port pattern to ISO 15407-1
- Valve sub-bases to ISO 15407-1
- Valve terminals with port pattern to ISO 15407-2
- Solenoid and pneumatic valves with port pattern to ISO 5599-1
- Valve terminals with port pattern to DIN ISO 5599-2
- Valve sub-bases with port pattern to ISO 5599-1 and external dimensions to VDMA 24345
- Solenoid valves with port pattern to VDI/VDE 3845 (NAMUR)

Compressed air preparation

- Compressed air quality according to ISO 8573-1 (2010)
- Bourdon tube pressure gauge to EN 837-1
- Capsule pressure gauge to EN 837-3
- Reservoirs to directive 2014/68/EU, 2014/29/EU or EN 286-1.

Compressed air preparation

Why compressed air preparation?

Properly prepared compressed air helps to prevent faults in pneumatic components. It increases the service life of the components and reduces machine failures and downtime, thereby increasing process reliability.
Compressed air contains contaminants in the form of

- particles,
- water and
- oil.

Water and oil can be in liquid or gaseous form and change from one state to another within the compressed air system.
An actual compressed air system will not have any of these contaminants in their pure form; they will occur in a mixture. The composition of this mixture can vary greatly at different times in different places in the system. For example, water can collect in branch lines or particles can become deposited in empty spaces over time, and then suddenly be propelled along by a pressure surge.

Poorly prepared compressed air causes faults such as:

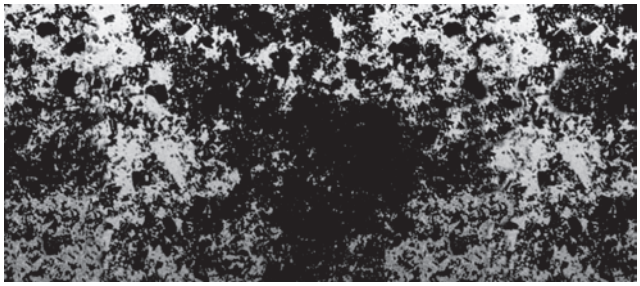
- Accelerated wearing of seals
- Oil-fouled valves in the control section
- Dirty silencers

Possible effects for the user and machine:

- Reduced machine availability
- Higher energy costs due to leakages
- Higher maintenance costs
- Shorter component and system service life

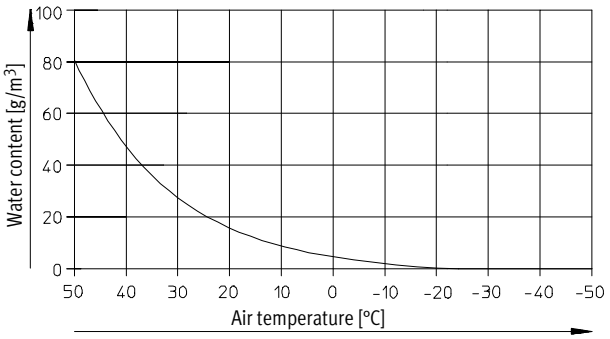
Particles

Particles in the compressed air usually occur in the form of dust (carbon black, abraded and corrosion particles). Metal chips (e.g. from conversion work) and residues of sealants such as PFTE tape can also occasionally get into the compressed air via the compressed air system.
The particles are classified as
fine dust: size 0.1 ... 5 µm and
coarse dust: size > 5 µm
in accordance with ISO 8573-1:2010.



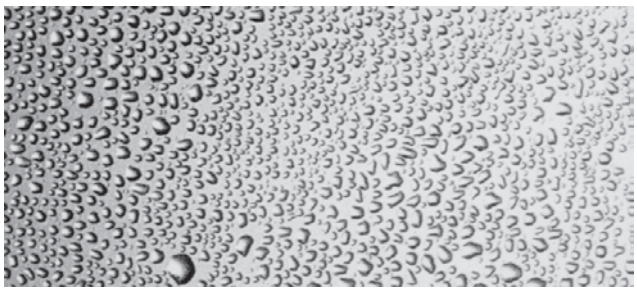
Water content in air

The maximum water content in air (100% relative air humidity) is dependent on temperature. Air can only absorb a certain amount of water (in g) per volumetric unit (in m³), irrespective of pressure.
The warmer the air, the more water it can absorb. Excessive humidity manifests itself as condensation. If the air temperature drops, for example from 20 °C to 3 °C, the maximum water content of compressed air is reduced from 18 g/m³ to 6 g/m³. The compressed air can therefore only absorb approx. 1/3 as much water as before. The rest (12 g/m^3) is precipitated as drops (dew) and must be drawn off so that it cannot cause any malfunctions.



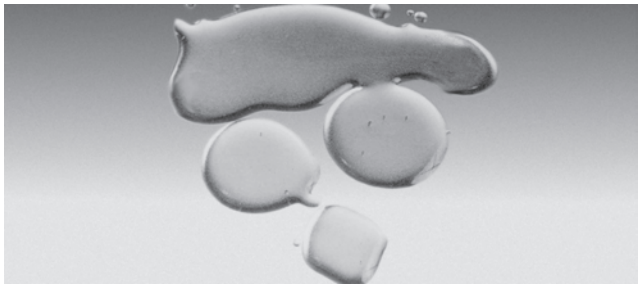
Water condensation

Water is always present in the air in the form of humidity. When compressed air is cooled, water is released in large quantities. Drying helps to prevent corrosion damage in compressed air systems and prevents malfunctions in the connected consuming devices.



Oil contamination

Similarly, in the case of compressors that operate without oil, oil aerosols present in the drawn-in air also lead to a residue of oil pollutants. However, this oil is not suitable for the lubrication of drives and can even lead to the clogging of sensitive parts.



How clean should compressed air be?

The compressed air quality is determined by the requirements

The answer is quite simple: compressed air must be so clean that it cannot cause any malfunctions or damage.

As each filter also creates a flow resistance, compressed air should be as clean as possible for economic reasons.

The wide application range of compressed air places many different requirements on compressed air quality.

If high quality is required, several filtration stages are necessary ➔ page 860.
If just a single "fine" filter were used, it would quickly become ineffective.

Sizing

- Note

Equipment at an air branching/ air distribution input should have a high flow rate as it must supply the total demand for air.

More information
➔ **www.festo.com/catalogue**
› Compressed air preparation

The size of the service unit depends on the system's air consumption. Undersizing leads to pressure fluctuations and to reduced filter service life.
For cost reasons, high quality compressed air should only be used where it is absolutely necessary. Branching modules between the individual filter stages enable the user to tap off compressed air of various qualities.

Service unit functions

Compressed air filters remove particles and moisture droplets from the air. Particles > 40 ... 5 µm (depending on the grade of filtration) are retained by a sintered filter. Liquids are separated by centrifugal force. The condensate which accumulates in the filter bowl must be emptied from time to time, because it would otherwise be drawn in by the air flow.

Several industries often require finely filtered air. Fine and micro filters are used for this. Fine filters are used for prefiltering down to a particle size of 1 µm.

Micro filters further purify pilot air, removing practically all remaining water and oil droplets and contamination particles. The degree of compressed air filtration is 99.999% relative to a particle size of 0.01 µm.

The pressure regulator maintains a constant working pressure (secondary side), regardless of the pressure variations in the system (primary side) and the air consumption. Inlet pressure must always be greater than working pressure.

The compressed air lubricator provides pneumatic components with adequate lubricant if required. Oil is drawn from a reservoir and atomised when it comes into contact with the air stream. The lubricator is only functional when the air flow is sufficiently strong.

Compressed air preparation

Lubricated compressed air

The following notes must be observed when lubricated compressed air is used:

- Use Festo special oil OFSW-32 or the alternatives listed in the Festo catalogue (as specified in DIN 51524-HLP 32, viscosity 32 cSt at 40 °C).
- If lubricated compressed air is used, additional lubrication must not exceed 25 mg/m³ (ISO 8573-1:2010). The quality of compressed air downstream of the compressor must correspond to that of unlubricated compressed air.
- The lifetime lubrication required for unlubricated operation can be "flushed out" when products are operated using lubricated compressed air. This can result in malfunctions if a system is switched back to unlubricated operation after lubricated operation.
- The lubricators should, where possible, always be installed directly upstream of the cylinders used in order to prevent operating the entire system with lubricated air.
- Never over-lubricate the system. To determine the correct lubricator settings, the following "oil form test" can be implemented: hold a piece of white card approx. 10 cm away from the exhaust port (without silencer) of a working valve of the cylinder furthest away. Allow the system to work for some time; the card should only show a pale yellow colouration. If oil droplets appear, this is an indication that too much oil has been used.
- The colour and condition of the exhaust silencer provide further evidence of over-lubrication. Marked yellow coloration and dripping oil indicate that the lubrication setting is too high.
- Dirty or incorrectly lubricated compressed air will reduce the service life of the pneumatic components.
- Service units must be inspected at least twice a week for condensate and correct lubrication settings. These inspections should be included in the machine maintenance plan.
- To protect the environment, as little lubrication as possible should be used. Festo pneumatic valves and cylinders have been designed in such a manner that, under permitted operating conditions, additional lubrication is not required and yet a long service life is guaranteed.

Oil content

A differentiation must be made between residual oil for operation with unlubricated air and additional oil for operation with lubricated air.

Unlubricated operation:
Examinations involving residual oil content have revealed that the various types of oil have entirely different effects. A distinction must therefore be made between the following oil types when analysing the residual oil content:

- Bio-oils: oils based on synthetic or natural ester (e.g. rapeseed oil methyl ester). In this case, residual oil content must not exceed 0.1 mg/m³. This corresponds to ISO 8573-1:2010 class 2 ➔ www.festo.com/catalogue › Compressed air preparation. Larger amounts of oil result in damage to O-rings, seals and other component parts (e.g. filter bowls) in pneumatic systems, and may result in premature product failure.
- Mineral oils (e.g. HLP oils to DIN 51524, part 2) or similar oils based on polyalphaolefins (PAO). In this case, residual oil content must not exceed 5 mg/m³. This corresponds to ISO 8573-1:2010 class 4 ➔ www.festo.com/catalogue › Compressed air preparation. A higher residual oil content is not permitted, regardless of the compressor oil, because permanent lubrication would otherwise be flushed out over a period of time.

This can lead to malfunctions.

Humidity

Max. pressure dew point 3 °C. Corresponds to ISO 8573-1:2010, at least class 4 ➔ www.festo.com/catalogue › Compressed air preparation.

- Note

The pressure dew point must be at least 10 K lower than the temperature of the medium, since ice would otherwise form in the expanded compressed air.

Solids

Permissible particle load max. 10 mg/m³, particle size max. 40 µm. Corresponds to ISO 8573-1:2010 class 7 ➔ www.festo.com/catalogue › Compressed air preparation.

Suitable oils

Special oil in 1 litre containers:
Order code OFSW-32

- Note

Optimum compressed air preparation means fewer machine failures and greater process reliability. See **Compressed air quality analysis** ➔ page 846

Purity classes for particles to ISO 8573-1:2010

Class	Maximum number of particles per m³ as a function of particle size d		
	0.1 µm < d ≤ 0.5 µm	0.5 µm < d ≤ 1.0 µm	1.0 µm < d ≤ 5.0 µm
0	As stipulated by the user or supplier of the equipment, stricter requirements than class 1		
1	≤ 20,000	≤ 400	≤ 10
2	≤ 400,000	≤ 6,000	≤ 100
3	Not specified	≤ 90,000	≤ 1,000
4	Not specified	Not specified	≤ 10,000
5	Not specified	Not specified	≤ 100,000

Class	Mass concentration C_p [mg/m³]
6[1)]	$0 < C_p \leq 5$
7[1)]	$5 < C_p \leq 10$
X	$C_p > 10$

1) Air cleaned using universal filters designed for particle sizes of 5 µm (class 6) and 40 µm (class 7) is normally used for the compressed air supply to industrial tools and pneumatic machines. These designs have been used for many years, before the latest systems for measuring particle sizes were developed, and have enabled satisfactory operation while minimising pressure (and therefore performance) losses. These filters are not 100% efficient; they offer an efficiency of at least 95% based on the specified particle size, i.e. for class 6, 95% of all particles of size 5 µm are filtered; for class 7, 95% of all particles of size 40 µm are filtered (measured as per ISO 12500-3).

Purity classes for humidity and liquid water to ISO 8573-1:2010

Class	Pressure dew point [°C]
0	As stipulated by the user or supplier of the equipment, stricter requirements than class 1
1	≤ −70
2	≤ −40
3	≤ −20
4	≤ +3
5	≤ +7
6	≤ +10

Class	Concentration of liquid water C_w [g/m³]
7	$C_w \leq 0.5$
8	$0.5 < C_w \leq 5$
9	$5 < C_w \leq 10$
X	$C_w > 10$

Purity classes for total oil content to ISO 8573-1:2010

Class	Total concentration of oil (liquid, aerosol and vapour) [mg/m³]
0	As stipulated by the user or supplier of the equipment, stricter requirements than class 1
1	≤ 0.01
2	≤ 0.1
3	≤ 1
4	≤ 5
X	> 5

Compressed air preparation

Compressed air quality in use

Designation to ISO 8573-1:2010 [particle:water:oil]

The class that can be achieved with compressed air preparation depends on the quality of the compressed air downstream of the compressor. The specifications apply to typical compressed air systems (this list is not exhaustive).

Central air preparation		Air distribution	Decentralised air preparation		Typical applications
Component	Class	Class	Component	Class[3]	
Compressor	[–:–:–]	[–:–:–]	Water separator	[–:7:4]	All applications requiring virtually condensate-free compressed air. No defined particle filtering.
Compressor + pre-filter + air dryer	[7:4:4][1]	[–:4:–][2]	Filter 40 µm	[7:4:4]	Operating medium for valves, cylinders, secondary packaging (standard)
			Filter 5 µm	[6:4:4]	Servo-pneumatic positioning with proportional directional control valves, compressed air tools
			Filter 5 + 1 µm	[5:4:3]	Applications with a residual oil content < 0.5 mg/m³, textile industry, pneumatic spinning machines, paper industry
			Filter 5 + 1 + 0.01 µm	[1:4:2]	Applications with a residual oil content < 0.01 mg/m³, e.g. air bearings, painting, powder coating
			Filter 5 + 1 + 0.01 µm + activated carbon filter	[1:4:1]	Applications with a residual oil content < 0.003 mg/m³, reduction of oil vapours and odours, optical instruments, sealing air for precision glass scales/lasers, primary packaging
			Filter 5 + 1 + 0.01 µm + activated carbon filter + membrane air dryer	[1:3:1]	Semiconductor industry, pharmaceutical products
			Filter 5 + 1 µm + adsorption dryer	[2:2:2]	Applications in the low-temperature range, dry process air, powder transportation, food production [1:2:1]

1) Much higher classes are possible with suitable air preparation downstream of the compressor.
2) Pipe systems can increase the particle content of the compressed air (chips, rust, etc.), liquid oil can accumulate in some lines of the compressed air distribution system. Specifications apply at normal room temperature.
If parts in the compressed air system are subject to lower temperatures, the humidity class must be chosen so that the pressure dew point is 10 K below the minimum expected temperature.
3) Class to ISO 8573-1:2010 at room temperature (20°C).

Definition of the compressed air purity class to ISO 8573-1:2010

The quality of the compressed air is determined by
- solid contaminants (particles),
- humidity and water, and
- oil content.

The air purity class is specified as follows:
A = Particles
B = Humidity
C = Oil content

Example:
ISO 8573-1:2010 [–:7:–]

Particles:	Not defined
Humidity:	≤ 0.5 g/m³
Oil content:	Not defined

Working conditions for valves

Medium

Under normal working conditions, pneumatic valves from Festo can be operated with lubricated or unlubricated compressed air.
If any particular product requires a different quality of compressed air, this is indicated in the technical data for the relevant product.

Operation with unlubricated compressed air is made possible by the selection of the material combination, the shape of the dynamic seals and the basic lubrication applied ex works.
Operation with unlubricated compressed air is not possible under the following working conditions:

- Once the valves have been operated with lubricated compressed air, it is essential that lubricated compressed air is always used subsequently since the oil in the lubricated air will have flushed away the basic lubrication.
- In all cases, a grade of filtration is required that removes contaminants up to 40 µm (standard filter cartridge version).

Micro compressed air filtration may be required for special applications.

Nominal size

The nominal width provides information about the smallest cross section in the main flow of the valve. It specifies the diameter of the orifice and is expressed in mm. This is a measurement that only provides a limited comparison between different components. To compare products, the standard nominal flow rate must also be considered.

Standard nominal flow rate

The standard nominal flow rate qnN is the flow rate characteristic used by Festo for a device or component expressed in l/min.

The standard nominal flow rate qnN is the flow rate based on standard conditions (to DIN 1343) under the following measurement conditions:

- Test medium air
- Temperature 20 ±3 °C (temperature of medium)
- Test specimen at ambient temperature
- The pressures to be set are for components with constant cross section (e.g. directional control valves):
  Input pressure p_1 = 6 bar
  Output pressure p_2 = 5 bar

Standard conditions to DIN 1343:

- t_n = 0 °C (standard temperature)
- p_n = 1.013 bar (standard pressure)

Exception 1:
Silencers
Input pressure p_1 = 6 bar
Output pressure $p_2 = p_{amb}$
p_{amb} = atmospheric pressure

Exception 2:
Low-pressure components
Input pressure p_1 = 0.1 bar
Output pressure $p_2 = p_{amb}$

Exception 3:
For pressure regulators:
Input pressure p_1 = 10 bar (constant) and output pressure p_2 = 6 bar at q = 0 l/min are set for the test specimen. Subsequently, the flow rate is slowly and constantly increased using the flow control valve until the output pressure reaches a value of p_2 = 5 bar. The resulting flow rate is measured.

Pressure and pressure ranges

Pressure

Force per area. There is a difference between differential pressure with respect to atmosphere and absolute pressure. Pressure specifications for pneumatic devices must normally be assumed to be the differential pressure with respect to atmosphere, unless expressly indicated otherwise.

Symbols
Differential pressure with respect to atmosphere p
Absolute pressure p_{abs}
Unit: bar, Pa (pascal)
1 bar = 100000 Pa

Operating pressure

Data quoted as "max." or "max. permissible" values refer to the maximum safe pressure at which a component or system can be operated.

Operating pressure range

This is the range between the lowest required and highest permissible operating pressure for safe operation of a component or system. In pneumatics, this pressure range is also referred to as the working pressure range.

Pilot pressure range

The range between the lowest required and highest permissible pilot pressure for correct operation of a valve or system.
The following pressures, for example, have been standardised to ISO 4399: 2.5, 6.3, 10, 16, 40 and 100 bar.

Drop-off pressure

Pressure which, if no longer maintained, causes a monostable directional control valve to return to the normal position by its spring.

Absolute pressure

Zero pressure occurs in a completely air-free space (100% vacuum). Pressure that is calculated from this theoretical zero point is absolute pressure.

Response pressure

Pressure at which a directional control valve is actuated. Catalogue specifications for response pressure signify that the indicated minimum pressure must be present at the signal input to safely switch the valve.

Port designations of pneumatic components to ISO 5599

Port designations

	Using ISO 5599 numbers (5/2-way and 5/3-way valves)	Using letters[1)]
Supply port	1	P
Working ports	2	B
	4	A
		C
Exhaust ports	3	S
	5	R
		T
Pilot ports (signal)	10[2)]	Z[2)]
	12	Y
	14	Z
Pilot air ports (power supply)	81 (12)	
	81 (14)	
Pilot exhaust ports	83 (82)	
	83 (84)	
Leakage lines		L

1) Still frequently used.
2) Clears the output signal.

Working conditions for drives

Medium

Under normal working conditions, pneumatic drives from Festo can be operated with lubricated or unlubricated dried compressed air. If any particular product requires a different quality of compressed air, this is indicated in the technical data for the relevant product.
Operation with unlubricated compressed air is made possible by the choice of materials used, the material combinations, the shape of the dynamic seals and the basic lubrication applied ex works. Operation with unlubricated compressed air is not possible under the following working conditions:
Once the drives have been operated with lubricated compressed air, it is essential that lubricated compressed air is always used subsequently since the oil in the lubricated air will have flushed away the basic lubrication.

Ambient conditions

Take the ambient conditions at the place of use into consideration. Corrosive, abrasive and dusty environments (e.g. water, ozone, grinding dust) will reduce the service life of the product.
Check the resistance of the materials of Festo products with respect to the media used and surrounding media
➔ page 872.

Intended use

Pneumatic drives are intended to convert pressure energy into motion energy; this process involves the transmission and transfer of forces. "Intended use" does not include use as a spring or cushioning component, since this would involve additional loads.

Frequency

If pneumatic drives are operated at maximum possible speed, a pause time must be taken into account between the stroke movements.

Assembly position

In general, drives from Festo can be installed in any position. Any limitations or special measures are indicated in the technical data for the relevant product.

Operating pressure

"Max." or "max. permissible" values refer to the maximum safe pressure at which a drive or system can be operated.

Operating pressure range

This is the range between the lowest required and highest permissible operating pressure for safe operation of a component or system. In pneumatics, this pressure range is also referred to as the working pressure range.

Effective force with single-acting cylinders

Permissible deviation of spring forces in accordance with DIN 2095, quality class 2, must be taken into consideration for the cylinders' effective force.
The effective force is also reduced by the value of prevailing frictional forces.
The degree of friction depends on the mounting position and the type of load involved. Lateral forces increase friction.
Frictional force must be lower than the spring return force. Single-acting cylinders should as far as possible be operated without lateral forces.

Permissible stroke deviations for standard cylinders

ISO 15552 (corresponds to the withdrawn standards ISO 6431, DIN ISO 6431, VDMA 24562, NF E 49003.1, UNI 10290), ISO 6432 and ISO 21287 permit a certain amount of stroke length deviation from the nominal value due to manufacturing tolerances. These tolerances are always positive. Refer to the table for details regarding precise permissible deviations.

Standard	Piston ∅ [mm]	Stroke length [mm]	Permissible stroke deviation [mm]
ISO 6432	8, 10, 12, 16, 20, 25	0 ... 500	+1.5
ISO 15552	32	0 ... 500	+2
	40, 50	500 ... 12,500	+3.2
	63	0 ... 500	+2
	80, 100	500 ... 12,500	+4
	125, 160	0 ... 500	+4
	200, 250, 320	500 ... 2,000	+5
ISO 21287	20, 25	0 ... 500	+1.5
	32, 40, 50	0 ... 500	+2
	63, 80, 100	0 ... 500	+2.5

- - Note
In the case of stroke lengths larger than those shown in the table, the tolerances must be agreed upon between the manufacturer and the user.

Contactless position sensing

Pneumatic drives from Festo with contactless position sensing are fitted with a permanent magnet on the cylinder piston, the magnetic field of which is used to actuate proximity sensors.
Proximity sensors can be used to detect end or intermediate positions of cylinders. One or more proximity sensors can be clamped to a cylinder, either directly or using mounting kits.

Piston diameter

- ∅ -

This pictogram is used to indicate the piston diameter. This is just represented by ∅ in the dimensions table.

Pressure/force table

Piston force [N]								
∅	Operating pressure [bar]							
	1	2	3	4	5	6	7	8
2.5	0.4	0.9	1.3	1.8	2.2	2.7	3.1	3.5
3.5	0.9	1.7	3.8	3.5	4.3	5.2	6.1	6.9
5.35	2	4	6.1	8.1	10.1	12.1	14.2	16.2
6	2.5	5.1	7.6	10.2	12.7	15.3	17.8	20.4
8	4.5	9	13.6	18.1	22.6	27.1	31.7	36.2
10	7.1	14.1	21.2	28.3	35.3	42.4	49.5	56.5
12	10.2	20.4	30.5	40.7	50.9	61.0	71.3	81.4
16	18.1	36.5	54.3	72.4	90.5	109	127	145
20	28.3	56.5	84.8	113	141	170	198	226
25	44.2	88.4	133	177	221	265	309	353
32	72.4	145	217	290	362	434	507	579
40	113	226	339	452	565	679	792	905
50	177	353	530	707	884	1,060	1,240	1,410
63	281	561	842	1,120	1,400	1,680	1,960	2,240
80	452	905	1,360	1,810	2,260	2,710	3,170	3,620
100	707	1,410	2,120	2,830	3,530	4,240	4,950	5,650
125	1,100	2,210	3,310	4,420	5,520	6,630	7,730	8,840
160	1,810	3,620	5,430	7,240	9,050	10,900	12,700	14,500
200	2,830	5,650	8,480	11,300	14,100	17,000	19,800	22,600
250	4,420	8,840	13,300	17,700	22,100	26,500	30,900	35,300
320	7,240	14,500	21,700	29,000	36,200	43,400	50,700	57,900

Piston force [N]							
∅	Operating pressure [bar]						
	9	10	11	12	13	14	15
2.5	4	4.4	4.9	5.3	5.7	6.2	6.6
3.5	7.8	8.7	9.5	10.4	11.3	12.1	13
5.35	18.2	20.2	22.2	24.3	26.3	28.3	30.3
6	22.9	25.4	28	30.5	33.1	35.6	38.2
8	40.7	45.2	49.8	54.3	58.8	63.3	67.9
10	63.6	70.7	77.8	84.8	91.9	99	106
12	91.6	101	112	122	132	143	153
16	163	181	199	217	235	253	271
20	254	283	311	339	368	396	424
25	398	442	486	530	574	619	663
32	651	724	796	869	941	1,010	1,090
40	1,020	1,130	1,240	1,360	1,470	1,580	1,700
50	1,590	1,770	1,940	2,120	2,300	2,470	2,650
63	2,520	2,810	3,090	3,370	3,650	3,930	4,210
80	4,070	4,520	4,980	5,430	5,880	6,330	6,790
100	6,360	7,070	7,780	8,480	9,190	9,900	10,600
125	9,940	11,000	12,100	13,300	14,400	15,500	16,600
160	16,300	18,100	19,900	21,700	23,500	25,300	27,100
200	25,400	28,300	31,100	33,900	36,800	39,600	42,400
250	39,800	44,200	48,600	53,000	57,400	61,900	66,300
320	65,100	72,400	79,600	86,900	94,100	101,000	109,000

The piston force F can be calculated from the piston area A, the operating pressure p and the friction R using the following formulae:

Piston force (final pressure)

$F = p \cdot A - R$

$F = p \cdot 10 \cdot \frac{d^2 \cdot \pi}{4} - R$

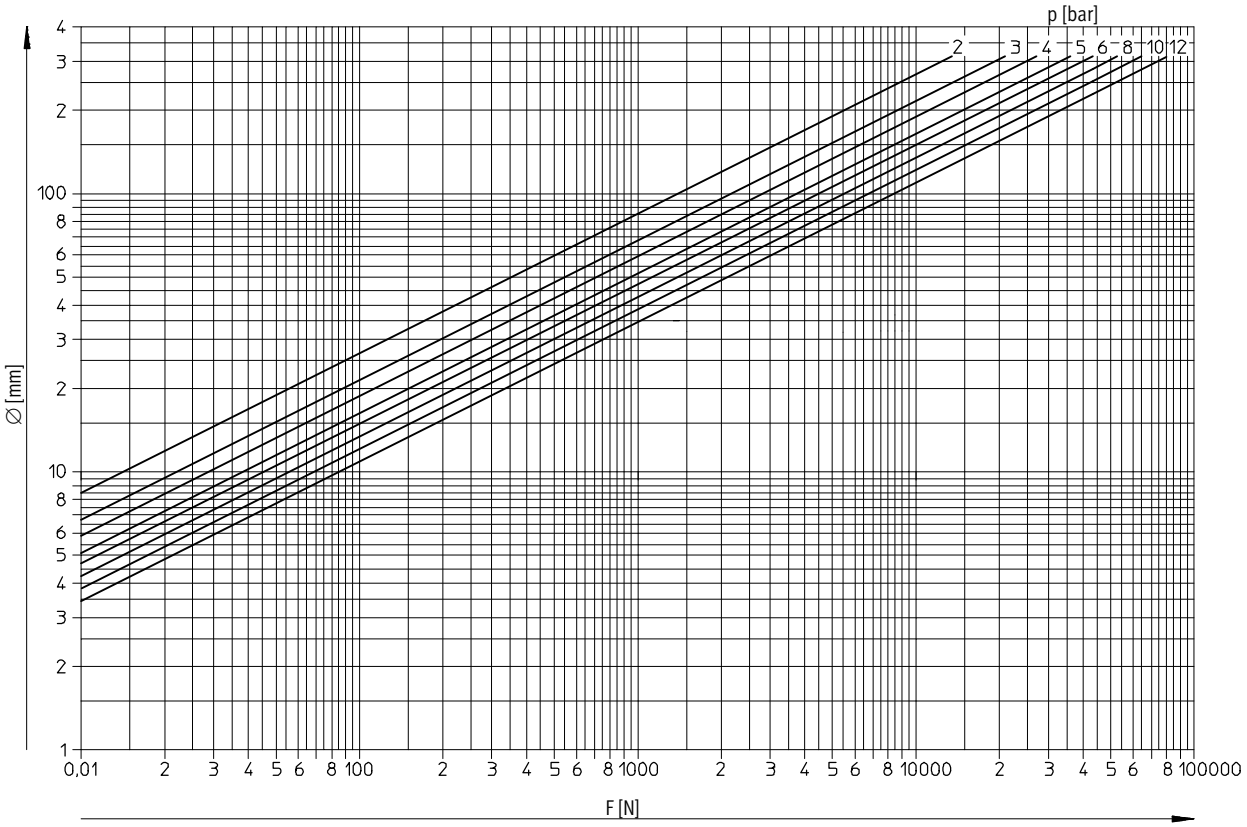
p	= Operating pressure	[bar]
d	= Piston diameter	[cm]
R	= Friction ~10%	[N]
A	= Piston area	[cm²]
F	= Effective piston force	[N]

ProPneu software tool for sizing can be found at ➔ www.festo.com

Pressure/force graph

Operating pressure p as a function of piston diameter and force F

An allowance of 10% has been included for frictional force



Given:
Load: 800 N
Available system pressure: 6 bar

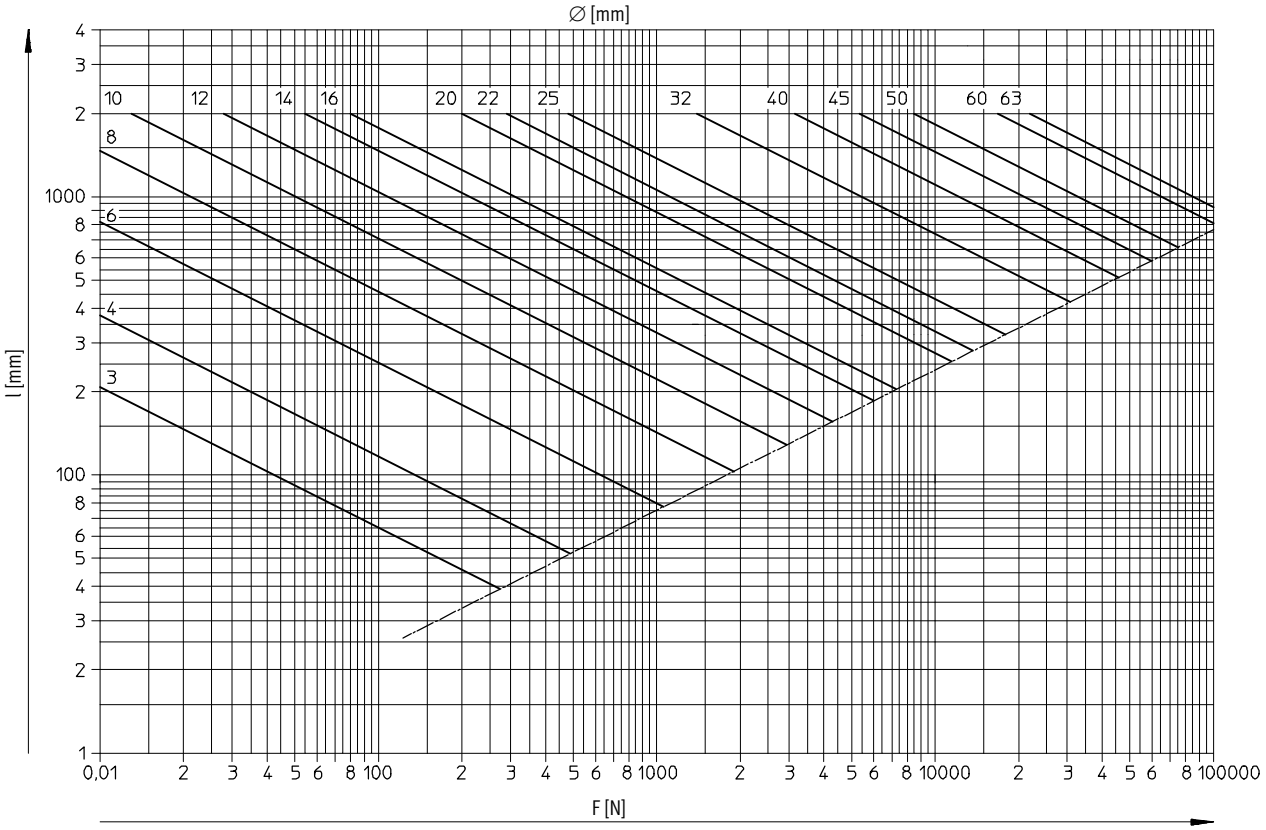
To be calculated:
Required piston diameter
Operating pressure to be set

Procedure:
From F = 800 N go straight up where it intersects the 6 bar line. The next largest piston diameter, 50 mm, lies between the lines for 4 and 5 bar, which means that the operating pressure should be set to approx. 4.5 bar.

The selection of pneumatic drives is determined primarily by the forces to be overcome and the distances to be travelled. A small percentage of the piston force is used to overcome friction, the remainder is used to drive the load.
Only approximate values can be given, since friction force depends on numerous factors (lubrication, operating pressure, back pressure, seal design, etc.). Back pressure generates a force which acts in the opposite direction and partially cancels out the effective force. Back pressure occurs in particular when exhaust air flow controls are used or the exhaust port is constricted.

Buckling load graph

Piston rod diameter as a function of stroke length l and force F



Given:
Load: 800 N
Stroke length: 500 mm
Piston diameter: 50 mm

To be calculated:
Piston rod diameter
Cylinder type: Standard cylinder

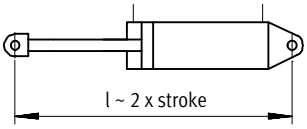
Procedure:
From F = 800 N go straight up where it intersects the horizontal line through l = 500 mm. The next largest piston rod diameter in the graph is 16 mm. The standard cylinder DNC-50-500 with a piston rod diameter of 20 mm is suitable for this stroke length.

Due to buckling stress, the maximum permissible load for a piston rod with a long stroke length is lower than the value suggested by the maximum permissible operating pressure and piston area.
This load must not exceed certain maximum values. These depend on stroke length and piston rod diameter.

The graph shows this relationship based on the following formula:

$$F_K = \frac{\pi^2 \cdot E \cdot J}{l^2 \cdot S}$$

F_K = Permissible buckling force [N]
E = Modulus of elasticity [N/mm²]
J = Moment of inertia [cm⁴]
l = Buckling length
= 2x stroke length [cm]
S = Safety factor (selected value: 5)



Note
The least satisfactory type of mounting for this kind of stress is a swivel mounting. The permissible load is higher for other types of mounting.

Air Consumption engineering software

The "Air Consumption" engineering software determines the air consumption of a cylinder (approximate value), taking into consideration the following parameters:

- Mode of operation of the cylinder
- Piston diameter
- Number of cycles
- Stroke length
- Operating pressure

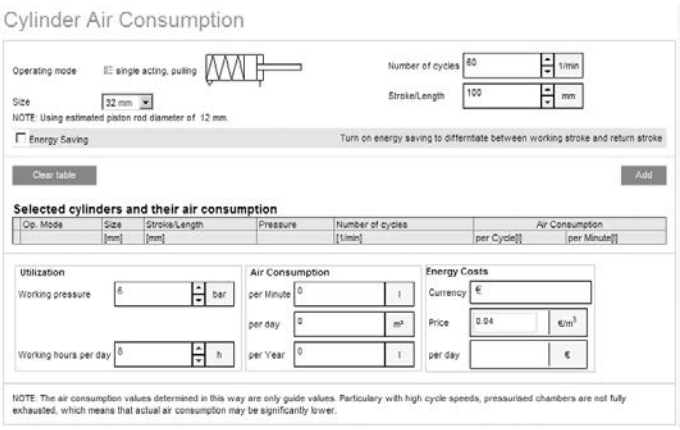
This tool can be found online under Support in the Engineering design area.

Calculating air consumption using the engineering software

Given:
Cylinder: DNC-32-500
Piston diameter: 32 mm
Piston rod diameter: 12 mm
Stroke length: 500 mm
Operating pressure: 6 bar
Number of cycles per minute: 60 1/min

To be calculated:
Air consumption

Result:
Once the parameters have been entered, the following values are returned for the air consumption:
Per cycle: 5.23 l
Per minute: 314.03 l



Calculating air consumption using the formula

$$Q = \frac{\pi}{4} \cdot (d1^2 - d2^2) \cdot h \cdot (p + 1) \cdot 10^{-6}$$

Q = Air consumption per cm stroke [l]
d1 = Piston diameter [mm]
d2 = Piston rod diameter [mm]
h = Stroke [mm]
p = Operating pressure, relative [bar]

Forward stroke:

$$Q = \frac{\pi}{4} \cdot (32mm)^2 \cdot 500mm \cdot (6bar + 1bar) \cdot 10^{-6}$$

$$Q = 2,815l$$

Return stroke:

$$Q = \frac{\pi}{4} \cdot ((32mm)^2 - (12mm)^2) \cdot 500mm \cdot (6bar + 1bar) \cdot 10^{-6}$$

$$Q = 2,419l$$

Air consumption per cycle:

$$Q = 2,815l + 2,419l = 5,234l$$

Pneumatics and explosion protection – ATEX

What does ATEX mean?

Explosive atmospheres are a constant hazard in the chemical and petrochemical industries because of the processing techniques used. These explosive atmospheres are caused by escaping gas, vapours and mist, for example. Explosive atmospheres can also occur in mills, silos and sugar and feed processing plants because of the dust/oxygen mixtures there. Electrical equipment in potentially explosive areas is therefore subject to a special directive, 2014/34/EU. This directive was also extended to non-electrical equipment on 1 July 2003.

ATEX - Directive 2014/34/EU

ATEX is an acronym of the French expression "Atmosphère explosible".

- Directive 2014/34/EU stipulates the minimum safety requirements for equipment and protective systems that are to be operated in explosive atmospheres and that have their own ignition sources.
- It applies to the sale of equipment and protective systems within the European Economic Area.
- It relates to both electrical and non-electrical devices, if they have their own potential ignition source.

Dual responsibility

When equipment for explosion protection areas is being produced, system manufacturers and component suppliers must work closely together to ensure that the correct category and explosion protection zone are chosen.

Explosion protection documentation from system manufacturer	Festo/equipment supplier
System rating Directive 1999/92/EC Result: • Zone classification • Temperature classes • Explosion groups • Ambient temperature	Equipment rating Directive 2014/34/EU Result: • Equipment categories • Temperature classes • Explosion groups • Ambient temperature
Zone	**Category**

Explosion protection classes

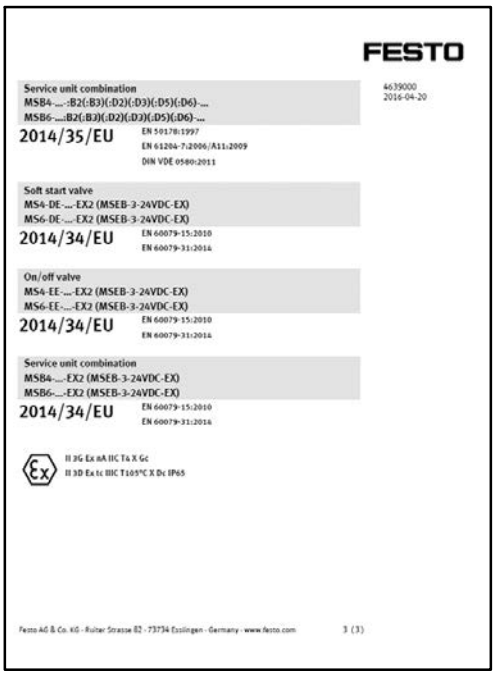
Zone Gas	Zone Dust	Frequency	Equipment group	Equipment category	Area of application
–	–	–	I	M	Mining
				M1	
				M2	
			II	–	All non-mining areas of application
0	–	Constant, frequent, long-term	II	1G	Gas, mist, vapour
–	20		II	1D	Dust
1	–	Occasional	II	2G	Gas, mist, vapour
–	21		II	2D	Dust
2	–	Seldom, short-term in the event of a fault	II	3G	Gas, mist, vapour
–	22		II	3D	Dust

ATEX at Festo

➔ **www.festo.com/atex**

Products requiring approval

Products requiring approval are those that have their own potential ignition risk. They are labelled with the CE marking and the explosion protection hexagon; operating instructions and the EU declaration of conformity are provided.


FESTO

Service unit combination
MSB4-...-:B2(:B3)(:D2)(:D3)(:D5)(:D6)-...
MSB6-...:B2(:B3)(:D2)(:D3)(:D5)(:D6)-...
4639000
2016-04-20
2014/35/EU
EN 50178:1997
EN 61204-7:2006/A11:2009
DIN VDE 0580:2011

Soft start valve
MS4-DE-...-EX2 (MSEB-3-24VDC-EX)
MS6-DE-...-EX2 (MSEB-3-24VDC-EX)
2014/34/EU
EN 60079-15:2010
EN 60079-31:2014

On/off valve
MS4-EE-...-EX2 (MSEB-3-24VDC-EX)
MS6-EE-...-EX2 (MSEB-3-24VDC-EX)
2014/34/EU
EN 60079-15:2010
EN 60079-31:2014

Service unit combination
MSB4-...-EX2 (MSEB-3-24VDC-EX)
MSB6-...-EX2 (MSEB-3-24VDC-EX)
2014/34/EU
EN 60079-15:2010
EN 60079-31:2014

II 3G Ex nA IIC T6 X Gc
II 3D Ex tc IIIC T105°C X Dc IP65

Festo AG & Co. KG · Ruiter Strasse 82 · 73734 Esslingen · Germany · www.festo.com 3 (3)

Products not requiring approval

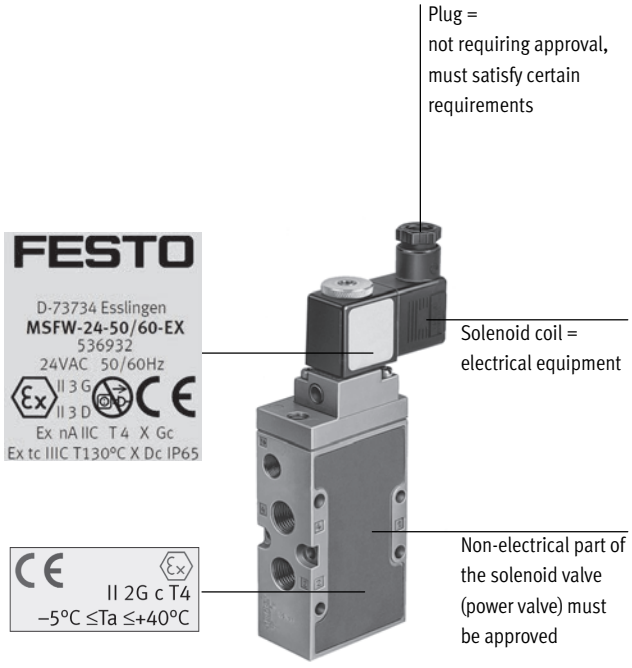
Products not requiring approval are those that do not have their own potential ignition source. These products can be used in specific explosion zones in compliance with our manufacturer's instructions:

- Pneumatic accessories
- Tubing
- Fittings
- Pneumatic sub-bases
- Flow control and shut-off valves
- Non-electrical service units
- Mechanical accessories

Festo's product range for explosion protection includes products for equipment category II

According to Directive 2014/34/EU, both the solenoid coil and the power valve require approval. At Festo, each has a separate rating plate so that it is possible to tell at a glance where the valve may be used.

Important: The equipment with the lowest equipment category defines the category for the module.



For the module in this example:
II 3G T4

- Note

The permissible technical catalogue data for the equipment in question as well as the warning notices and safety information in the special documentation provided (including operating instructions or, if applicable, device documentation) must be observed.

EC directives/approvals

EC directives (CE marking)

As a fundamental principle, Festo AG & Co. KG adheres to all applicable regulations and standards. All information is based on the current level of knowledge and is subject to change. We carefully follow any amendments/additions to these regulations and will produce our products accordingly. This guarantees that products from Festo AG & Co. KG always comply with the currently valid requirements.

Most pneumatic products are not subject to any EC directive and must therefore not be given a CE marking. Currently, products from the sales range of Festo AG & Co. KG that are labelled with the CE marking are subject to one or more of the following six EC directives in Europe.

1. EC Machinery Directive 2006/42/EC, including amendments: 2006/42/EC:2007-03-16 and 2009/127/EC:2009-10-21
Pneumatic products from Festo AG & Co. KG are designed in accordance with the standard for pneumatic systems EN ISO 4414 "Pneumatic fluid power – General rules and safety requirements for systems and their components". Our pneumatic products do not fall within the scope of application specified in the Machinery Directive.

They must therefore not be labelled with the CE marking in accordance with the Machinery Directive. Exceptions to this are safety devices. As of 29 December 2009, incomplete machines also fall under the scope of the Machinery Directive. These include handling systems intended for installation in machines, for example. Incomplete machines are not labelled with the CE marking. A declaration of incorporation is enclosed with the machines instead of a declaration of conformity.

2. EU Electromagnetic Compatibility Directive (2014/30/EU), including amendments.
The directive must be applied to our electronic and electronic/pneumatic products. The corresponding products have the CE marking and the corresponding declaration of conformity is available. For you, this means a guarantee that this equipment complies with the fundamental requirements in industrial areas. The use of this equipment in residential areas is restricted if no additional measures are taken to guarantee compliance with the fundamental requirements of the directive for residential areas.
Solenoid coils are not affected by the EMC Directive.

3. EU Low Voltage Directive (2014/35/EU), including amendments.
Electrical and electronic products from Festo designated for use within specific voltage limits
(50 ... 1,000 V AC and
75 ... 1,500 V DC) must be labelled with the CE marking. The corresponding declarations of conformity are available.

4. EU Directive on Simple Pressure Vessels (2014/29/EU), including amendments.
The simple pressure vessels made from non-alloyed steel offered by Festo AG & Co. KG comply with the requirements of this directive.
These air reservoirs require CE marking above a certain volume.
These products are labelled with the CE marking. The declaration of conformity is available.

5. EU Directive on Pressure Equipment (2014/68/EU), including amendments.
The pressure vessels offered by Festo AG & Co. KG comply with the requirements of this directive. These pressure vessels require CE marking above a certain pressure/volume product or pressure/diameter product.
These products are labelled with the CE marking. The declaration of conformity is available.
Reservoirs made from stainless steel are subject to the Directive on Pressure Equipment rather than the Directive on Simple Pressure Vessels.

6. EU Directive on Equipment and Protective Systems for Use in Explosive Atmospheres - ATEX (2014/34/EC).
The products offered by Festo AG & Co. KG which are intended for use in potentially explosive atmospheres and which have their own potential ignition hazards comply with the requirements of this directive. Products that are subject to this directive are correspondingly labelled with the CE marking and identified in compliance with the directive. The corresponding declaration of conformity and the operating instructions are available.

Product markings	
CE	See above
Ex	To EU Directive 2014/34/EU (ATEX) Additional marking for equipment and protective systems for use in accordance with regulations in a potentially explosive atmosphere.
c US	UL certification for use in Canada and the USA. Recognized Product intended for installation, for example MPA-S valve terminal.
c UL US	UL certification for use in Canada and the USA. Listed Product, a ready-to-use device, for example limit switch with cable and plug.
c SA US	CSA certification for Canada and the USA.

Design – Cleanroom suitability

Design awards

product design award

reddot

Festo products appear regularly on the winners' podium in major design competitions. There is much more to good design than being "pleasing to the eye". The design emphasises and symbolises the cutting-edge technology and long-standing value of Festo products.

Cleanroom suitability

➔ www.festo.com/sp › enter search term "cleanroom"

Cost-effective series for cleanroom class 7
At Festo, cost-effective standard pneumatic components take the place of complex special designs because the quality concept applies to virtually all series-produced products. These standard pneumatic components are suitable for use in a class 7 cleanroom to
ISO 14644-1.

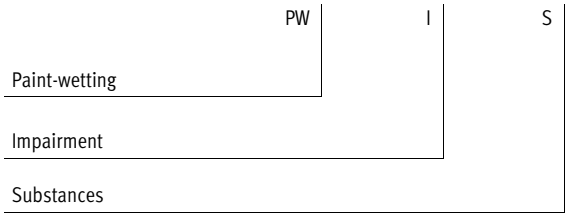
Close-to-standard products for cleanrooms to class 4
Stringent requirements but still an optimum cost/benefit ratio. At Festo, class 4 also means standard products – with just one restriction: they are not available ex-stock. However, they can be delivered to you within the shortest possible time.

Individuality made to measure
If you need to go as far as class 1, the products will be manufactured according to your specific requirements. Festo integrates these application-oriented solutions in close-to-standard production, which means they will be available the next time you need them.

The reliability to meet the highest requirements
Festo works with the Fraunhofer Institute for Production Technology and Automation (IPA) and the renowned Nanyang Technological University in Singapore to ensure that its products meet the high requirements for use in cleanrooms.
A dedicated Competence Centre for Cleanroom Technology at Festo Singapore offers the necessary infrastructure for the production of pneumatic cleanroom products.

Paint-wetting impairment substances and resistance to media

PWIS-free products



PWIS are substances that cause small concave indentations at various points in the paint layer when surfaces are painted.
Silicone, fluoric materials, certain oils and greases may contain substances of this kind.

Components used in the automotive industry, and especially in painting equipment, must be free of paint-wetting impairment substances.
Because it is impossible to determine the level of paint-wetting impairment substances contained in substances and components with the naked eye, Volkswagen developed the testing standard PV 3.10.7.
All products from Festo and the lubricants used in them undergo this test.
Products from Festo are free of paint-wetting impairment substances as standard.
However, grease containing paint-wetting impairment substances needs to be used for some products for functional and other reasons.

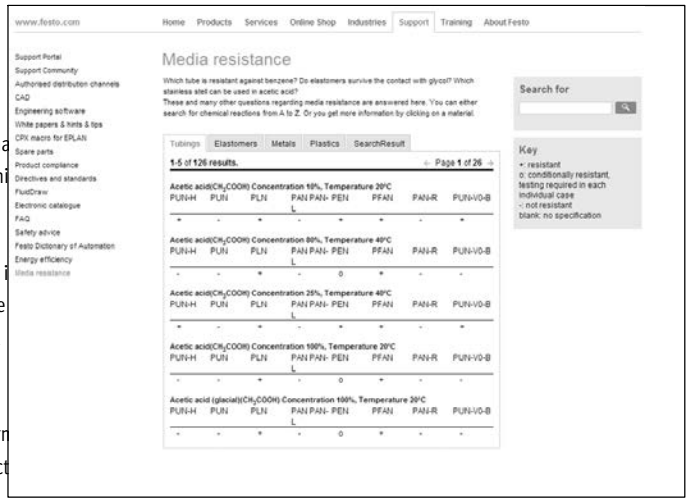
The following are PWIS-free

- Individual parts and modules that are manufactured without using materials, consumables or sundries containing paint-wetting impairment substances. Tests carried out during the sampling procedure as well as random sample tests of incoming goods by extracting them must not cause any paint-wetting impairment effects.
- Liquid or paste-like sundry materials (e.g. lubricating greases) that do not cause any paint-wetting impairment effects through application as a result of the test.
- Products that consist of PWIS-free parts and contain PWIS-free lubricants.

Media resistance database

➔ www.festo.com › Services › Conceptualise › Directives and standards › Media resistance

It is well known that the resistance of materials depends on many parameters such as concentration of contact medium, temperature, pressure, duration of contact, stroke speed and switching frequency, surface finish in the case of mating frictional parts, flow velocity and stress as well as ageing.
This applies in particular to the compatibility of elastomers with special chemical compounds.
The Festo resistance database shows you the suitable material and its resistance to chemical substances.
The information contained in this database is based on lab tests from raw material manufacturers, material tables from semi-finished product and seal suppliers and practical experience.
The information is evaluated and the tables are created based on the knowledge available. Although every effort ha been made to ensure the accuracy of thi database, its contents should only be used for reference purposes.
Please note that the recommendations i this resistance database can neither be guaranteed nor serve as the basis for a warranty claim.
Wherever possible and especially in cases of doubt, it is advisable to perform a practical test with the desired product under actual working conditions.



Corrosion resistance class CRC

Corrosion resistance class CRC to Festo standard FN 940070

CRC	Corrosion resistance	Description
0	No corrosion stress	Applies to small, visually irrelevant standard parts such as threaded pins, circlips and clamping sleeves which are usually only available on the market in a phosphated or burnished version (and possibly oiled) as well as to ball bearings (for components ‹ CRC 3) and plain bearings.
1	Low corrosion stress	Dry indoor applications or transport and storage protection. Also applies to parts behind covers, in non-visible interior areas, and parts which are covered in the application (e.g. drive trunnions).
2	Moderate corrosion stress	Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.
3	High corrosion stress	Outdoor exposure under moderate corrosive conditions. External visible parts in direct contact with the ambient atmosphere typical for industrial applications, with primarily functional requirements for the surface.
4	Particularly high corrosion stress	Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be safeguarded by special testing (➔ also FN 940082) using appropriate media.

Protection classes to IEC/EN 60529

Protection of electrical equipment

The term "IP" (International Protection) is defined by IEC/EN 60529 "Degree of Protection Provided by Enclosures (IP Code)" and DIN 40050 "IP Protection Classes" (standard for electrical equipment in road vehicles). These standards describe the classification of the protection classes provided by enclosures for electrical equipment with rated voltages of up to and including 72.5 kV. They set forth the following:

- Protection of individuals against contact with live or moving components within enclosures (protection against accidental contact).
- Protection of equipment inside the enclosure against ingress of solid foreign matter, including dust (protection against foreign matter).
- Protection of electrical equipment against damage that would result if water were to enter the enclosure (protection against water).

The IP code to IEC/EN 60529

The degree of protection provided by an enclosure is established using standardised testing methods. The IP code is used for classifying this degree of protection. The IP code is made up of the letters IP and a two-digit code number. The definition of both digits is explained in the table below ➔ page 875.

Meaning of digit 1:
Digit 1 denotes firstly the protection of individuals. It specifies the extent to which the enclosure prevents individuals from coming into contact with dangerous parts. The enclosure prevents or restricts the entry of body parts or of objects held by an individual. Secondly, digit 1 specifies the extent to which the equipment is protected against the ingress of solid foreign objects.

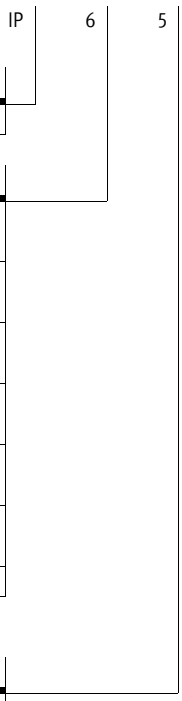
Meaning of digit 2:
Digit 2 refers to the protection of equipment. It rates the protection class of the enclosure with respect to the harmful effects on the equipment due to water entering the enclosure.

Note

The food industry generally uses components with degree of protection IP65 (dustproof and water-jet proof) or IP67 (dustproof and capable of brief submersion). The use of IP65 or IP67
depends on the specific application, as each is governed by completely different test criteria. IP67 is not necessarily better than IP65.
A component that fulfils the IP67 criteria does not therefore automatically meet the criteria for IP65.

Protection classes to IEC/EN 60529

IP codes



Code letters	
IP	International Protection

Digit 1	Brief description	Definition
0	Not protected	–
1	Protected against solid foreign objects, 50 mm and larger	A probing object, a ball of 50 mm in diameter, must not enter or penetrate the enclosure.
2	Protected against solid foreign objects, 12.5 mm and larger	A probing object, a ball of 12.5 mm in diameter, must not enter or penetrate the enclosure.
3	Protected against solid foreign objects, 2.5 mm and larger	A probing object, a ball of 2.5 mm in diameter, must not penetrate at all.
4	Protected against solid foreign objects, 1.0 mm and larger	A probing object, a ball of 1 mm in diameter, must not penetrate at all.
5	Protected against dust	The ingress of dust is not completely prevented. The quantity of dust that enters must not impair the safety or satisfactory operation of the equipment.
6	Dustproof	No ingress of dust

Digit 2	Brief description	Definition
0	Not protected	–
1	Protected against water droplets	Vertically falling droplets must not have any harmful effect.
2	Protected against water droplets	Vertically falling droplets must not have any harmful effect when the enclosure is at an angle of 15° either side of the vertical.
3	Protected against spraying water	Water sprayed at any angle of up to 60° either side of the vertical must not have any harmful effect.
4	Protected against splash-water	Water splashing against the enclosure from any angle must not have any harmful effect.
5	Protected against hose water	Water jets directed at the enclosure from any angle must not have any harmful effect.
6	Protected against powerful water jets	Powerful water jets directed against the enclosure from any angle must not have any harmful effect.
7	Protected against the effect of brief submersion in water	Water must not enter the equipment in amounts that can have a harmful effect if the enclosure is briefly submerged in water under standardised pressure and time conditions.
8	Protected against the effect of continuous submersion in water	Water must not enter the equipment in amounts that can have a harmful effect if the enclosure is continuously submerged in water. The conditions must be agreed on between the manufacturer and the user. The conditions must, however, be more stringent than code 7.
9K	Protected against water from high-pressure and steam jet cleaning	Water directed at the enclosure from any angle under high pressure must not have any harmful effect.

Functional earth – protective earth – PELV

Concepts for ensuring protection against electric shock to IEC 60364-4-41/VDE 0100 Part 410

Definitions

Protection against electric shock means protection against indirect and direct contact.

Protection against direct contact implies that under normal operating conditions, live parts which are not insulated are protected against accidental contact.

Protection against indirect contact implies that in the event of an insulation fault between live parts and bodies or enclosures, contact voltages outside of the permissible range cannot occur or are disconnected promptly.

The three best-known and most widely used concepts for ensuring protection against electric shock are also referred to as protection class I to III in specialist literature and standardisation documentation.

Protection class I – Protective earth conductor

In the case of electrical equipment in protection class I, protection against direct contact is ensured by basic insulation.

Protection against indirect contact is provided by prompt disconnection of the fault voltage. This disconnection is ensured by the contact with the protective earth conductor on the equipment enclosure via protective earth. If an insulation fault occurs in the equipment, the fault current flows via the protective circuit against the earth potential, thereby triggering the upstream fuse element (e.g. residual current device protection or circuit-breaker).

Equipment in protection class I includes lights, white goods (washing machines, dryers, etc.) and industrial machinery. Symbol:

Protection class II – Protective insulation

In the case of equipment in protection class II, the protection refers to direct and indirect contact with the improved enclosure insulation. The enclosure insulation is reinforced or doubled so that it is not possible to come into contact with contact voltages outside of the permissible range either in the event of a fault or during operation.

Equipment in protection class II r be connected to the protective ci Therefore the equipment does nc protective contact on the plug.

Equipment in protection class II includes hi-fi components, electric power tools and household appliances and is identified with the following symbol:

Protection class III – Protective extra-low voltage

In the case of equipment in protection class III, protection against direct and indirect contact is ensured both by a sufficiently high IP degree of protection (protection against direct contact with live parts) and electrical supply of the component with PELV (protective extra-low voltage) or SELV (safety extra-low voltage) (protection against indirect contact in the event of a fault).

Equipment in protection class III is frequently identified (no mandatory identification) with the following symbol:

Functional earth – protective earth – PELV

Special protection class for components from Festo
Protection class III

On the basis of the information currently available, all 24 V DC valve terminals (e.g. CPV, MPA), position controllers (e.g. PLCs), sensors (proximity sensors, pressure switches, pressure sensors) and proportional valves from Festo belong to protection class III.

This means that, in the case of the 24 V DC components from Festo, protection against direct and indirect contact is ensured by a sufficiently high IP degree of protection as well as a protective extra-low voltage supply to the component: PELV "Protective Extra-Low Voltage".

The use of a PELV supply ensures that no contact voltages outside of the permissible range can occur in the event of a fault due to the high dielectric strength (4 kV) from the primary to the secondary side.

The earth terminal therefore is a functional earthing (discharge of electromagnetic disturbances) rather than a protective earth function and must always make contact.

Why does Festo use protection class III?

Due to the increasingly compact designs of modern automation components, protection class I is no longer the optimum solution with respect to design size. This is because the standards specify minimum distances for the air and leakage paths, which means that further minimising the size of the components is no longer possible.

It is for this reason that protection class III (no protective earth conductor, as protection against electric shock is provided by protective extra-low voltage) is used in modern automation components.

What do customers need to know about installing equipment in protection class III?

The electrical supply to the equipment must only be provided by PELV circuits to IEC/EN 60204-1. The general requirements for PELV circuits to IEC/EN 60204-1 must be taken into account. Power sources are permitted if reliable electrical isolation of the operating voltage to IEC/EN 60204-1 is guaranteed.
The earth terminals on the components, where available, are used for discharging electromagnetic disturbances, equipotential bonding and thus ensuring proper functioning. They must be connected to the earth potential with low resistance (short cables with large cross section).

Spark arresting

Spark arresting of switch contacts in circuits with solenoid coils

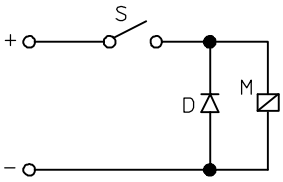
The inductance of solenoid coils stores electromagnetic energy when the circuit is switched on and this is discharged when switched off. Depending on the switch used, this energy is either converted to a voltage peak (switch-off overvoltage), which can cause a breakdown in the insulation, or an arc which can burn away the contacts (material creep). Various types of components can be used to avoid these effects by slowly and constantly discharging the electromagnetic energy.

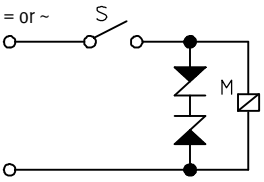
Electronic arc arrestors

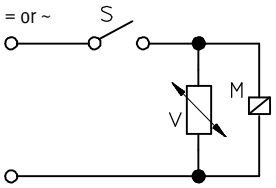
If the polarity in DC circuits is clearly defined, a simple diode can be used, wired parallel to the coil. It must be noted that this considerably increases the solenoid switch-off time.

A more suitable arrangement consists of two breakdown diodes, wired with opposing polarity parallel to the coil, which can be used for DC and AC. This prevents switch-off delay. However, several breakdown diodes must be wired in series for voltages over 150 V.

Varistors are ideal elements for reducing switch-off overvoltage; their leakage current only rises if the rated voltage is exceeded. They are suitable for DC and AC.







100% duty cycle

Within DIN VDE 0580, the 100% duty cycle test covers only the electrical part of the solenoid coil. Festo also includes the pneumatic part in this test.

The worst-case scenario is reviewed in the test. The test constitutes a functional test of the solenoid. If the solenoid is also used on valve terminals, the 100% duty cycle test is performed on the individual device and on equipment in a manifold assembly.

Conditions

- The solenoids are operated with the maximum permissible voltage (continuous operation S1 to DIN VDE 0580).
- The solenoids are subjected to the maximum permissible ambient temperature in a temperature cabinet (non-convecting).
- The solenoids are supplied with the maximum permissible operating pressure with sealed working ports.

Procedure

The solenoids are operated for at least 72 hours under the above conditions. At the end of this period, the following tests are carried out:

- Drop-off current measurement: drop-off behaviour when switched to de-energised state.
- Starting behaviour when immediately energised with the minimum operating voltage and with the least favourable pressure ratios for excitation.
- Leakage measurements.
- Once the results have been recorded, this process is repeated again until the units being tested have reached a total duty cycle of at least 1,000 hours or a termination criterion has been fulfilled.
- Following completion of the 100% duty cycle test, the sealing nipples are inspected visually for damage.

Termination criterion

The drop-off behaviour, starting behaviour or leakage exceeds or falls below the following limit values:

- Drop-off current: > 1.0 mA
- Starting voltage: > UN+10%
- Leakage: > 10 l/h

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