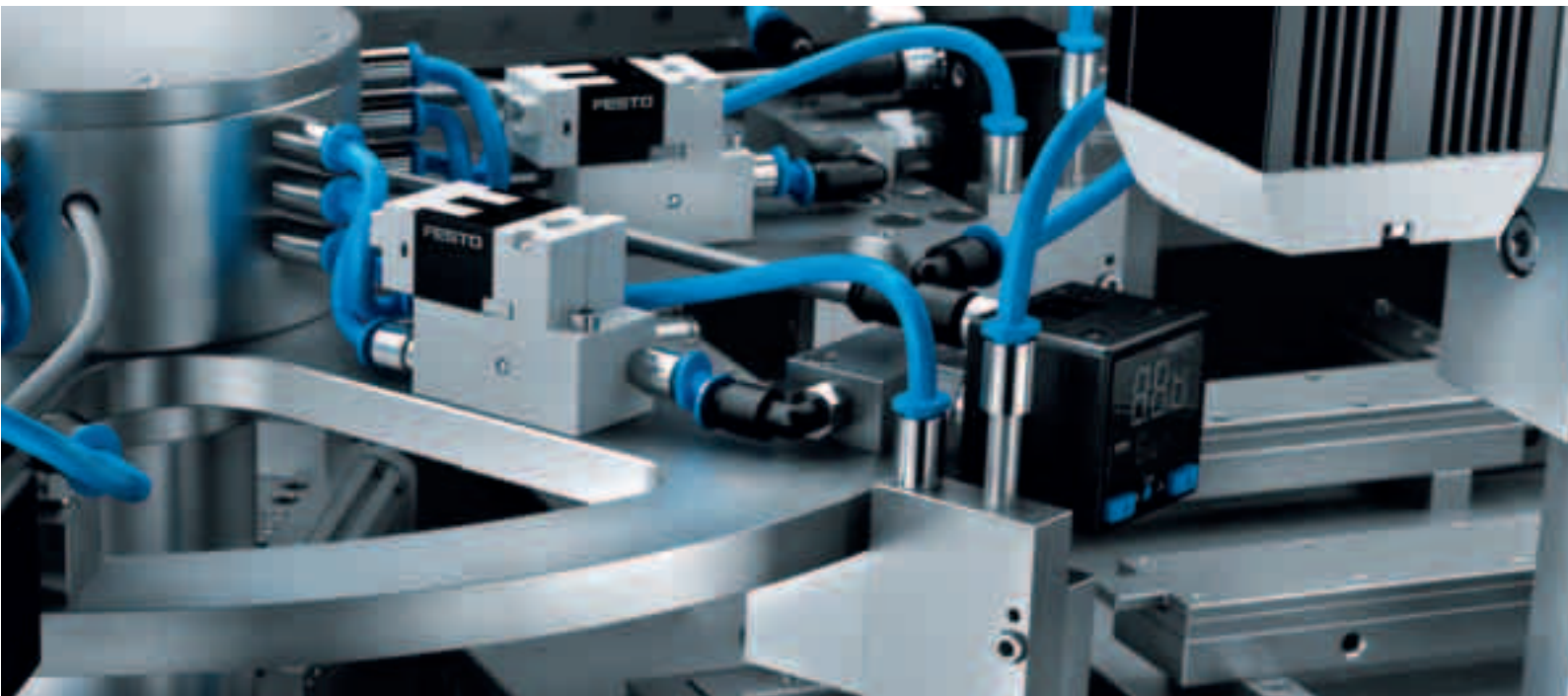


# Valves

**FESTO**





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## Valves from Festo – extremely universal and efficient

Quality only manifests itself when the right product is used in the right place. That's why valve quality at Festo is based on four principles to ensure that Festo products are the benchmark for quality.

First of all: a great variety of valves with an all-encompassing range of applications. All in all, the most complete, comprehensive and largest spectrum anywhere. Thus, there is always the right and most efficient valve for any application.

Secondly: maximised service life and cost-efficiency as a result of standardised, long-term function and endurance testing over the product's entire life cycle.

And thirdly: valve design. Flexible use – as individual valves, on manifolds or as valve terminals – as well as quick and easy installation and commissioning, are extremely important to us.

Last but not least, we have more than 1000 sales engineers to ensure that these benefits work for you. They would be more than happy to advise you!

The patented cartridge concept. Used in most of our standard valves, it opens up new dimensions.

The internal sealing structure, the contour of the seals and the special seal materials make valves with the cartridge concept:

- Extremely durable
- Highly reliable
- Very efficient
- Exceptionally versatile

On the whole, this greatly reduces your costs – for ordering as well as for logistics.

- Up to 100 % more flow
- Compact: more performance and less space
- Higher pressures of up to 10 bar
- Vacuum compatible
- Reversible – two pressures at a single valve at the same time
- No overlap – for reliable separation of the air ducts during dual pressure operation
- Minimal leakage





## New: VUVB/VTUB – for attractively priced flexibility

Our response to price-sensitive applications: valve range VB with variants VUVB and VTUB in sizes VB20 and, as a new addition, VB12. It offers outstanding value for money and an excellent size-to-flow rate ratio. These valves are characterised by extremely easy installation and reduced assembly work as well as flexible valve position attachment and integrated QS threaded connectors.

### Light, flexible and universal

From individual valves to valve terminals – individualised configuration for maximum flexibility during use is a distinguishing feature of the VUVB/VTUB, as is ease of operation. The ultralight housing made of reinforced polymer and the weight-optimised metal manifold strip are cut out for use on, for example, cantilevers and robot arms.

### New – valve range VUVB/VTUB-12: for surprisingly simple solutions

It includes all the advantages of the VB valve range, of course. And in addition to this, it can easily be converted from a 5/2 to a 3/2-way function and is thus perfect for the logistics manager within us all. This means that by stocking this basic valve, you'll be able to cover a multitude of

applications, from components right up to multi-pin valve terminals!

- VUVB/VTUB-20: 1 basic valve – 4 different flow rate ranges by changing the QS connections
- VUVB/VTUB-20: easy conversion from 4/2 to 3/2-way function
- VUVB/VTUB-12: easy conversion from 5/2 to 3/2 way function



VTUB-12



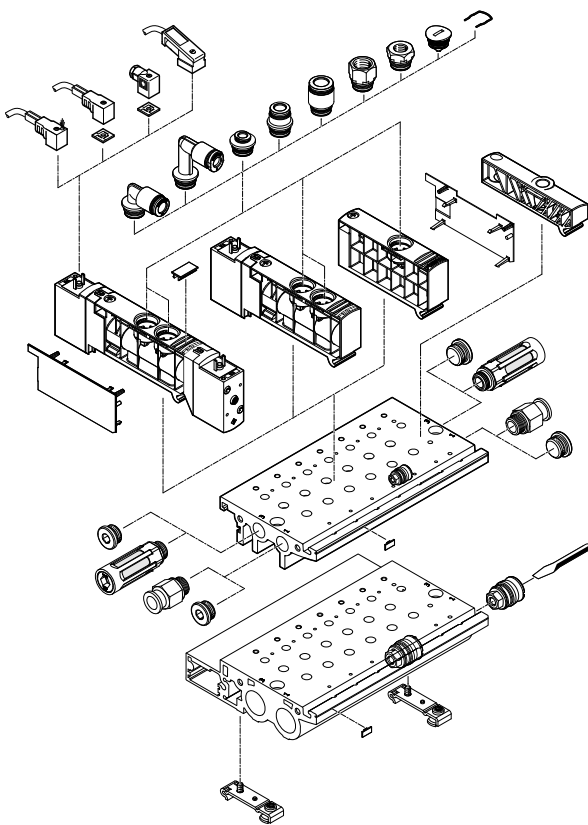
VTUB-20



VTUB-20



VUVB-20



| Technical data                                    | VUVB/VTUB-12   | VUVB/VTUB-20   |
|---|--|--|
| Valve functions                                   | 3/2-NC<br>3/2-NO<br>5/2 single solenoid<br>5/2 double solenoid | 3/2-NC<br>3/2-NO<br>4/2 single solenoid<br>4/2 double solenoid |
| Constructional design                             | Poppet valve   | Piston spool   |
| Pneumatic connection                              | QS4/6  | QS4/6/8/10   |
| Flow rate   | 400 l/min  | 200 – 1,000 l/min  |
| Operating pressure range                          | 2.8 ... 8 bar  | 2 ... 8 bar (internal)<br>-0.9 ... 8 bar (external)            |
| Temperature range                                 | -5 ... 60 °C   | -5 ... 50 °C   |
| Operating voltage                                 | 24 V DC  | 12 V DC<br>24 V AC<br>24 V DC<br>110 V AC<br>230 V AC          |
| Power consumption                                 | 1 W  | 1.5 W  |
| Number of valve positions<br>– Multi-pin terminal | 2 ... 35   | 2 ... 16<br>Valve manifold<br>4 ... 16<br>Multi-pin terminal   |
| Width   | 12 mm  | 20 mm  |
| Manual override                                   | Non-detenting  | Non-detenting/<br>detenting                                    |
| Protection  | IP65   | IP65   |



## MH.. and MHJ.. – high speed guaranteed

### MH 2...4: extremely reliable high speed

The global frontrunner! Extremely short cycle times and comparatively low investment costs are combined with exceptionally high levels of process reliability, sturdiness and durability.

- Switching time:  $\leq 2$  ms for maximised dynamics and precision
- Repetition accuracy:  $\leq 0.2$  ms
- For 24 hour continuous operation and well over 500 million cycles

#### Process-optimised control

High output and excellent machine utilisation thanks to

extremely short cycle times and highly accurate switching, both of which are essential for precise control of sequenced process steps. And extremely good repetition accuracy ensures continuously uniform processes, improves process and parts quality and significantly reduces scrap and rework.

### Small and easy to expand

Maximised planning density – whether just expansion or an entirely new concept is involved. Indispensable for:

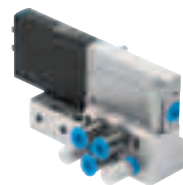
- Sorting by blowing out
- Flap control systems
- Bonding
- Dosing
- Packaging
- Vacuum applications

| Technical data                                  | MH..2   | MH..3  | MH..4                                       |
|---|---|--|---|
| Medium  | Filtered, lubricated or unlubricated compressed air or vacuum |  |   |
| Medium/ambient temperature                      | -5 ... +60 °C (100 % duty cycle)                              |  |   |
| Operating pressure range                        | -0.9 ... +8 bar   |  |   |
| Protection                                      | IP65/IP40   |  |   |
| Standard nominal flow rate                      | 100 l/min   | 200 l/min  | 400 l/min                                   |
| Width   | 10 mm   | 14 mm  | 18 mm                                       |
| Power consumption                               | 5 W<br>for approx. 3 ms<br>and then 1.25 W                    | 6.5 W<br>for approx. 4.5 ms<br>and then 1.6 W            | 8.5 W<br>for approx. 6 ms<br>and then 2.1 W |
| <b>Solenoid valve with electronics</b>          |   |  |   |
| Switching time on/off                           | 1.7 ms/2 ms<br>(+10/-30 %)                                    | 2.3 ms/2 ms<br>(+10/-30 %)<br>2.8 ms/2 ms<br>(+10/-40 %) | 3.5 ms/3.5 ms<br>(+10/-30 %)                |
| Max. switching frequency (brief)*               | 330 Hz  | 280 Hz   | 210 Hz                                      |
| <b>Solenoid valve without electronics</b>       |   |  |   |
| Switching time on/off<br>(with spark arresting) | 7 ms/3.5 ms   | 8 ms/4.5   | 9 ms/5 ms                                   |

\* Max. switching frequency during continuous operation on request



5/2-way individual valve



5/2-way sub-base valve on individual sub-base



Valve manifold with 5/2-way valves



### MHJ – the new dimension in sensor technology

Ultra fast, ultra long service life, ultra reproducible: type MHJ9 and MHJ10 blowing valves have been created for a new dimension in sorting technology thanks to extremely refined characteristics:

- Very short switching times: < 1 ms
- Flow rates of 50 to 150 litres per minute
- Outstanding repetition accuracy of less than 0.1 ms
- Unbeatably long service life of more than 5 billion switching cycles!

### Know-how generates innovation

These revolutionary characteristics are the result of continuous testing and ceaseless optimisation of an established product range.

### Custom-made for you

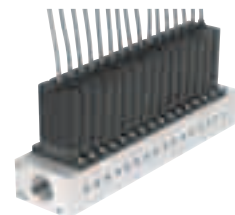
Choose from the following features to open up the range of possible applications and create

a perfect match for your system:

- Flow rate
- Valve layout
- Manifold design
- Pneumatic connections
- Electrical actuation
- Output/nozzle design

Or just tell us what your requirements are and our experts will recommend the best possible solution.

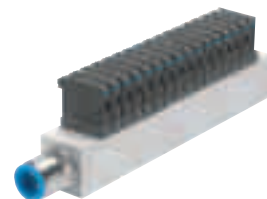
| Technical data                                   | MHJ-LF  | MHJ-MF        | MHJ-HF        |
|--|---|---------------|---------------|
| Standard nominal flow rate                       | 50 l/min  | 100 l/min     | 150 l/min     |
| Medium   | Filtered (40 µm), unlubricated compressed air                           |               |               |
| Type   | 2/2-way poppet valve, directly actuated, pneumatic return               |               |               |
| Operating pressure range                         | 0.5 ... 6 bar (higher on request)                                       |               |               |
| Medium/ambient temperature                       | -5 ... +60 °C (lower on request)  |               |               |
| Width  | MHJ9: 9 mm/MHJ10: 10 mm   |               |               |
| Grid dimension                                   | MHJ9: 9.5 mm/MHJ10: 10.5 mm   |               |               |
| Individual valve weight                          | MHJ9: 35g/MHJ10: 44g  |               |               |
| Sub-base valve weight                            | MHJ9: 24g/MHJ10: 34g  |               |               |
| Dimensions                                       |   |               |               |
| Individual valve (LxWxH)                         | MHJ9: 51 x 9 x 31 mm/MHJ10: 67.5 x 10 x 31 mm                           |               |               |
| Sub-base valve                                   | MHJ9: 32 x 9 x 31 mm/MHJ10: 53.5 x 10 x 46 mm                           |               |               |
| Connection                                       | MHJ9: KMH plug/MHJ10: 3-pin cable                                       |               |               |
| Operating voltage                                | 24 V DC for MHJ10/2 ... 48 V DC for MHJ9 (with cable current regulator) |               |               |
| Protection                                       | IP65 for cable version/IP40 for plug version                            |               |               |
| Manual override                                  | None  |               |               |
| Repetition accuracy                              | 0.1 ms  |               |               |
| Service life                                     | 5 billion (2 billion for HF)  |               |               |
| Power consumption (high current/holding current) | 7 W/2 W   | 7 W/2 W       | nn            |
| Switching time at 4 bar and 24 V (on/off)        | 0.8 ms/0.5 ms   | 0.8 ms/0.4 ms | 1.0 ms/0.8 ms |
| Pneumatic connection, individual valve           | QS4   | QS4           | QS6           |



“Valve manifold with MHJ10 valves”



2/2-way valve MHJ10



“Valve manifold with MHJ9 valves”



2/2-way valve MHJ9



## CPE – the classic solution with high flow rates

With millions of units in use, this valve has been tried and tested for many years. With a higher flow rate relative to size than any other valve, the CPE is still the champion in its class.

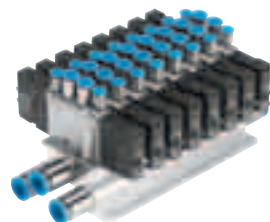
High system availability and a long service life of 100 million

switching cycles make the CPE a favourite component for systems and machines. Its compact performance, high flow rate and small size facilitate easy on-site installation, even under cramped conditions.

### **Energy saving!**

Whether used as an individual valve or on a sturdy, aluminium valve manifold, the CPE valve range is characterised by minimal temperature rise thanks to low electrical power consumption of 1 or 1.5 watts.

And not only that, but its soft sealing cartridge concept ensures minimal leakage, thus providing excellent pneumatic efficiency while its high flow rates and large pressure range of -0.9 to 10 bar ensure economic efficiency.







**New range of connections –  
new range of applications**

New: the 3-way, aluminium manifold strip for 2 to 10 valve positions. Traditional: 5-way manifold strips made of aluminium, or laid out as plastic linking modules.

New for CPE10 and CPE14: the internationally popular, 4-pin electrical M8 plug connector for 24 V DC for extremely easy and safe handling and assembly. Including:

- Manual override, non-detenting and non-detenting/detenting

- 10 mm wide pilot control without LED
- Suitable M8 cable with or without LED
- Suitable cable for chain link trunking is available
- IP40/IP65

New for CPE18: more voltage variants thanks to standardised Cnomo interface for 15 mm

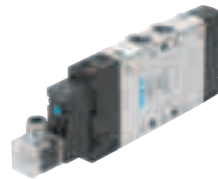
Cnomo pilot controls and suitable cable with or without LED.



CPE10-M1BH



CPE10-M1CH



CPE18-P1  
with Cnomo pilot control



CPE24-M1H

| Valve size            | CPE 10                | CPE 14                | CPE 18   | CPE 24                       |
|-----------------------|-----------------------|-----------------------|--|------------------------------|
| Width [mm]            | 10                    | 14                    | 18   | 24                           |
| Threaded connection   | M5/M7                 | G1/8                  | G1/4   | G3/8                         |
| Push-in connector     | QS-4/6                | QS-6/8                | QS-8/10  | QS-10/12                     |
| Max. flow rate*       | 350                   | 800                   | 1,500  | 3,200                        |
| Voltage               | 24 VDC                | 24 VDC                | 24 VDC<br>110 VAC<br>230 VAC   | 24 VDC<br>110 VAC<br>230 VAC |
| Electrical connection | Blade connector<br>M8 | Blade connector<br>M8 | Blade connector<br>Cnomo pilot valve**<br>M12 adapter<br>(Cnomo pilot valve) | Blade connector              |

\* 5/2-way valve \*\* DIN EN 175301-803 type C



## VSVA – high level of integration

Standard yet flexible for maximised function and system integration. From valve mixing by directly connecting the valve to the PLC to complete installation solution on a valve manifold or valve terminal with extremely high flow rates – anything's possible with VSVA valves. And they are not expensive either. All versions are also available as pneumatically actuated valves

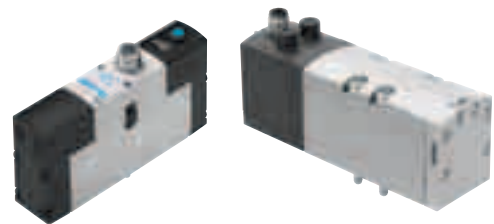
and can be expanded right up to the VTSA, the big sister of the VSVA.

**Integration has high priority**  
With components such as regulator, throttle plates and pressure shut-off plates, pneumatic functions can be easily integrated on the valve via vertical stacking. A pressure gauge for manual pressure

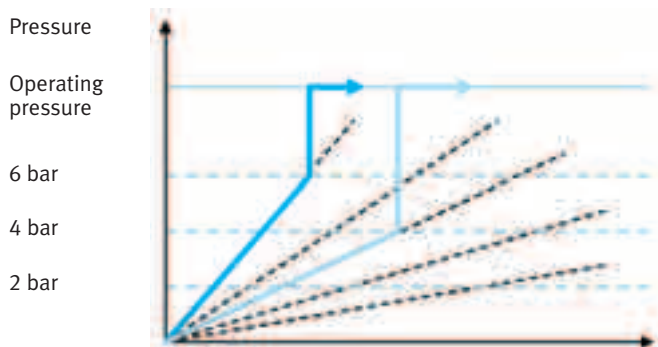
regulation is included. The M12 central plug is a new feature. Further variants: square plug connection for sizes 01 (26 mm) and 02 (18 mm), as well as time-saving M8 and M12 connections.

**Reverse operation: shorter cycles, longer service life**  
Reversible regulators offer genuine advantages: 50 %

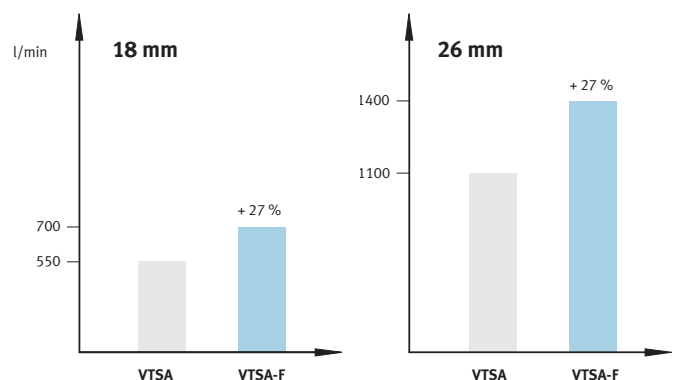
greater exhaust performance, shortened cycle times and two pressures at the same valve at the same time. Pressure can be adjusted and read independently of the valve's switching position and this ensures a longer service life. Generously dimensioned exhaust cross-sections for optimised, simultaneous switching.



VSVA with M12 central plug



The soft-start valve can be configured with one or several pressure zones on the standard valve terminal VTSA. Up to 5 soft-start valves can be integrated onto a single terminal.



Flow optimised VSVA valves provide for maximum flow rates – even in comparison with standard valves offered by the competition.



**Safety first – safety@Festo!**

Standard pneumatics and safety pneumatics from a single source: at press controls, for example, the valves provide maximum safety thanks to switching position sensing (1 or 2-channel).

Integrated into the valve terminal VTSA and combined

with soft-start valve VAFB, position sensing of the piston spool offers the necessary safety. When the soft-start valve is unactuated, compressed air supply (channel 1 on the terminal) is vented via the exhaust outlet at the soft-start valve. This solution is used in, amongst other sectors, the automotive industry.

**VSVA sizes**

- 18 mm (ISO02) ISO15407-1
- 26 mm (ISO01) ISO15407-1
- 42 mm (ISO1) ISO 5599-1
- 52 mm (ISO2) ISO 5599-1



VSPA – pneumatically actuated valves



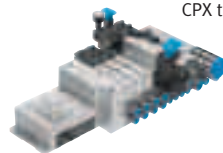
Individual sub-base, metal version



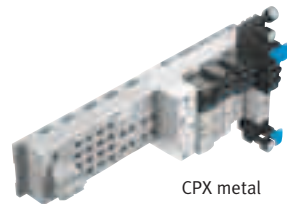
VTIA – pre-assembled valve manifold with pneumatic function integration



Multi-pin connection



CPX terminal



CPX metal to AIDA

**Technical data**

| Electrical                     |  |                       |                           |                           |
|--------------------------------|--|-----------------------|---------------------------|---------------------------|
| Operating voltage, valves      | 24 V DC and 110 V AC   |                       |                           |                           |
| Valve function                 | 5/2, 5/3, 2x 3/2   |                       |                           |                           |
| Number of valve solenoids      | Max. 32  |                       |                           |                           |
| Fieldbus connection            |  |                       |                           |                           |
| Fieldbus nodes                 | Interbus, DeviceNet, Profibus-DP, CANopen, CC-Link via CPX terminal, AS-interface  |                       |                           |                           |
| Industrial Ethernet            | Modbus/TCP, Ethernet/IP, TCP/IP, Profinet via CPX terminal, Profinet to AIDA via CPX metal   |                       |                           |                           |
| Electronics modules            |  |                       |                           |                           |
| I/O modules                    | Analogue and digital I/O modules with variable connection technology (up to 512 I/O)<br>Metal connection block, 4 x M12 or 8 x M12 via CPX metal |                       |                           |                           |
| Technology modules             | FEC controller, CPI installation system  |                       |                           |                           |
| Protection                     | IP65   |                       |                           |                           |
| Power supply                   | 24 VDC, max. 16 A  |                       |                           |                           |
| Auxiliary power supplies       | Several as options with max. 16 A  |                       |                           |                           |
| Pneumatics                     |  | Valves to ISO 15407-1 |                           | Valves to ISO 5599-1      |
| Size                           | 18 mm (ISO-02)   | 26 mm (ISO-01)        | 42 mm (ISO-1)             | 52 mm (ISO-2)             |
| Flow rates up to               | 550 l/min  | 1,100 l/min           | 1,300 l/min               | 2,900 l/min               |
| Working ports                  | G1/8 (NAW)   | G1/4 (NAW)            | G1/4 (NAV)<br>G3/8 (VTSA) | G3/8 (NAV)<br>G1/2 (VTSA) |
| Operating pressure with        |  |                       |                           |                           |
| – Internal auxiliary pilot air | 3 ... 10 bar   |                       |                           |                           |
| – External auxiliary pilot air | -0.9 ... 10 bar (auxiliary pilot air: 3 to 10 bar)   |                       |                           |                           |



## Valve range VUVG – the new standard

With the VUVG, the new benchmark for standard valves, it has never been easier to make your selection. And never easier to complete tasks efficiently and effectively.

### Outstanding size – more flow, less space

Up to 100 % more flow, greater energy density thanks to pressures of up to 10 bar and minimised space requirements. More applications can be

covered with a single valve type, thereby reducing logistics and ordering costs. VUVG paves the way to more compact layouts and new applications – even in imperial dimensions!

### Long service life with cartridge concept

Extremely durable, exceptionally sturdy – and compressed air quality with 40 µm filtering is entirely adequate! The VUVG is reversible, making two different

pressures possible. And vacuum applications are part of the package too.

### Easy installation, easy replacement

Quick to install, quick to replace, reliable and with a long service life: in a word, extremely easy installation is another advantage of the VUVG. Captive screws and higher torques make for more secure attachment and captive seals or

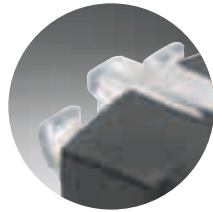
manual override are a standard feature.

### Maximum connection diversity: variable E-box

One basic valve and numerous electrical connections. Maximum diversity meets easy logistics and ordering. Just a single click and the E-box is installed. Or replaced. Additional advantage: choice of outlet direction to the side or the top.

#### Technical data

|                            |  |
|----------------------------|--|
| Valve functions            | 5/2, 5/3, 2 x 3/2-way                            |
| Constructional design      | Reversible piston spool valves                   |
| Standard nominal flow rate | 100, 220, 380, 750 l/min                         |
| Connection sizes           | M3, M5, M7, G1/8                                 |
| Working ports              | QS 3, 4, 6, 8                                    |
| Operating pressure         | 1.5 ... 8 bar (-0.9 ... 10 bar for type S)       |
| Valve sizes                | 10 and 14 mm                                     |
| Ambient temperature        | -5 ... 60 °C                                     |
| Power consumption          | Reduced with holding current reduction of 0.35 W |
| Protection                 | IP40/IP65  |



Standard equipment: non-detenting/detenting manual override for easy commissioning.

E-box with patented contact system.

Integrated: LED with 360° view – convenient for quick status review as well as reduced downtime.

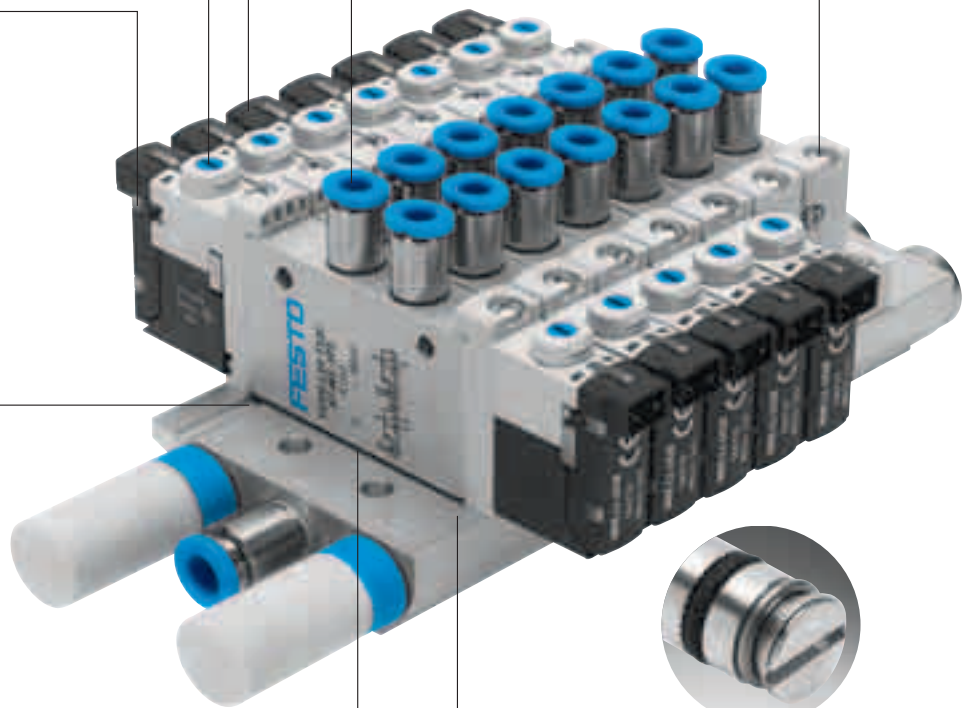
Imperial connections (inches) can be implemented seamlessly using hybrid fittings.



Captive screws. Strong and robust – with higher torque for secure mounting.



Direction indicator: locking for correct valve installation.



Captive: seal integrated into the valve.



Several pressure zones are possible: can be implemented easily and quickly with separators.

Take full advantage of installation space with diverse connection options and various functions.



Highly flexible: individual valves can be mounted in series without an additional manifold strip or bracket thanks to holes at the sides.



An individual valve is converted into a valve manifold without any additional elements.



## Valve range VOVG – individuality as a standard feature

Standards have never been more individual! Space-saving, high flow rates and universal in its use: the VG valve range is compact and high-performing in every installation situation. And thus it's ideal for all simple or less challenging handling applications, or for solutions with extremely high component density.

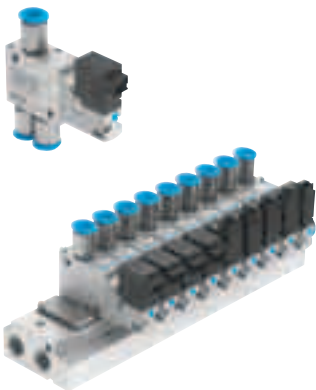
### Systematically and individually convincing

- From individual valves to valve manifolds with various functions
- More than 50 million switching cycles, extremely minimal leakage and highly reliable thanks to time-tested cartridge sealing system with piston spool

- Open for application-specific variants
- Compact for reduced machine dimensions
- Customer-specific direct integration as individual VOVG valve is possible, for example positioning of inputs/outputs, valve width in pilot valves
- Excellent value for the money

### Performance counts – and so does efficient use of resources

200 litres per minute with a width of 10 mm results in high cylinder speeds and on-site assembly improves response characteristics, reduces operating pressure and tubing requirements.



### Technical data

|                            |  |
|----------------------------|--|
| Valve function             | 3/2-way valve closed + open, 5/2-way valve                             |
| Type                       | Pilot actuated piston spool valve with cartridge seal                  |
| Nominal size               | 2 mm   |
| Standard nominal flow rate | 200 l/min  |
| Operating pressure range   | -0.9 ... 8 bar (suitable for vacuum with external auxiliary pilot air) |
| Switching time on/off      | 12/10 ms   |
| Ambient temperature        | -5 ... 50 °C   |
| Width                      | 10 or 12 mm (depending on type)  |
| Grid                       | 13 mm  |
| Operating voltage          | 5 V DC, 12 V DC, 24 V DC (in each case ±10 %)                          |
| Power consumption          | 1 W  |
| Duty cycle                 | 100 % ED   |
| Protection                 | IP40   |
| Manual override            | Non-detenting/detenting  |
| Display components         | LED for 24 V DC, on the valve or in the plug                           |
| Medium                     | Filtered (40 µm), lubricated or unlubricated compressed air, vacuum    |



## VPPM – proportional-pressure regulators redefined

### Fast, sturdy, universal control – it's all a matter of course with the VPPM

- Highly reliable and precise results
- No overshooting
- Outstanding value for money
- Can be used in all areas

It has the latest technology for the best results, regardless of whether accuracy or speed is required by simply pressing a button, or whether force and pressure in a process need to be accurately and flexibly measured on-site.

### Unique: multi-sensor control inside

Only from Festo: integrated multi-sensor control for improved control precision and sturdy regulating performance. As a 2-stage control circuit, cascade control subdivides the overall controlled system into two sub-systems. The trick: it's temperature compensated – pressure doesn't fade away with changes in temperature! Unrivalled: individual pressure regulation with a combination of modules for pressure acquisition and pressure control.

### Only from Festo: rugged regulation at the field-bus/Ethernet

Great distances are bridged using the VPPM on a valve terminal MPA. The controller's analogue setpoint can be reliably transmitted over hundreds of metres via the fieldbus with a digitised control signal – thanks to CPX in all fieldbus protocols. The comprehensive diagnostics are a further advantage.

### New for simple regulating tasks: VPPE with display

The compact proportional pressure regulator with good performance characteristics for simple regulating tasks. You only pay for what you actually need. And what you get is a reliable proportional valve, slimmed down to include the functions you require.



| Technical data       |  |
|----------------------|--|
| Valve functions      | 3/2-way proportional-pressure regulator  |
| Flow rate per valve  | At least 1.400 l/min. at 10 bar<br>At least 900 l/min. at 6 bar<br>At least 380 l/min. at 2 bar                                    |
| Pressure range [bar] | 0 ... 2, 0 ... 6, 0 ... 10   |
| Switching outputs    | NPN or PNP   |
| Pneumatic connection | G1/8 or NPT  |
| Design               | Inline (1/8") or flange (NW6)  |
| Electrical interface | M12 8-pin plug   |
| Diagnostic function  | Actual value<br>Setpoint achieved<br>Upper/lower limit value reached   |
| 3 presets            | Fast, universal, precise   |
| Display/control      | VPPM-LED: regulator presets can be selected using push-buttons<br>VPPM-LCD: numerous editing functions                             |
| Connector cable      | Pre-assembled Y connector cable, M12 8-pin to 2 each M12 5-pin for direct connection to analogue I/O (CPX) with IP65/67 protection |



## Flow control – invisible but indispensable

Three newcomers to the range of one-way flow control valves are causing a sensation. The small, lightweight VFOV is first choice for limited budgets, as well as limited installation space. Regardless of the selected flow rate, the height remains unchanged.

The new VFOC range with push-in sleeve is installed in just a matter of seconds. Push it into the cylinder with integrated push-in connector – align – done! A variety of valve functions – exhaust or supply air flow control – creates added value, in particular when installation space is not easily accessible.

By contrast, the GRLSA valve stands for continuously available reproducibility. The scale on the product clearly documents the selected flow rate value and thus significantly reduces costs for commissioning or service.

### Other valves

| Type Function  | Pneumatic connection | Actuation Flow Pressure             | Description  |
|--|----------------------|-------------------------------------|--|
| VFOV<br>One-way flow control valve   | G1/8                 | Manual<br>288<br>0.5 ... 10         | <ul style="list-style-type: none"> <li>• Rotatable 360° after installation</li> <li>• Constant height thanks to innovative design concept</li> <li>• Flow rate regulation</li> </ul> |
| VFOC<br>One-way flow control valve   | QS4, 6               | Manual<br>0 ... 400<br>0.5 ... 10   | <ul style="list-style-type: none"> <li>• Rotatable 360° after installation</li> <li>• Plug-in</li> <li>• Installation without tools</li> </ul>                                       |
| GRLSA<br>One-way flow control valve  | G1/8, G1/4           | Manual<br>300 ... 650<br>0.5 ... 10 | <ul style="list-style-type: none"> <li>• Rotatable 360° after installation</li> <li>• With scale</li> <li>• Reproducible settings</li> </ul>   |
| Other valves:<br>Non-return valves H, HA, HB (non-return)<br>Non-return valve HGL (non-return, piloted)<br>On-off valve HE (2/2 double solenoid, 3/2 double solenoid)<br>Hand slide valve W (3/2 double solenoid)<br>Ball valves QH, QHS (2/2 double solenoid) |                      |                                     |  |



VFOV



VFOC



GRLSA





## Mechanically and manually actuated valves

They offer the greatest possible functionality while being simple to operate. From manual workstations to large systems, mechanically and manually actuated valves from Festo are the right choice for actuating pneumatic systems.

### Convincing and high-performing

A large product range with different actuation and installation variants: front panel valves, direct actuation, plunger, roller, idle return roller lever, push-button, finger lever, hand

lever, foot or whisker actuation – detenting or non-detenting. Their common features are:

- Universal and robust
- High flow rates
- Metal or plastic design – also suitable for harsh environments

### Hand lever valves VHER

Lockable for safe service and maintenance work, position detection via sensors, outlet directions underneath or to the side, and a practical labelling system directly at the hand lever.

### Front panel valves and actuator attachments

For manual control of pneumatic power valves, made of plastic or metal. A mushroom push-button with detent, which can be locked for additional safety, is also available



VHER

### Valves with barbed fittings

Mechanically or manually actuated valves made of plastic for actuating pneumatic power valves with comprehensive actuation options.

### Valves with threaded connection

These metal valves can be directly or indirectly actuated, and can be used universally thanks to a broad range of actuation options.

### Technical data, VHER

| Type  | Ergonomic plastic lever,<br>outlet direction underneath or to the side   |      |       |                    | Ergonomic metal lever,<br>outlet direction underneath or to the side |                  |                  |
|---|--|------|-------|--------------------|--|------------------|------------------|
|   | M5   | G1/8 | G1/4  | G1/2               | G1/8<br>G1/8-NPT   | G1/4<br>G1/4-NPT | G1/2<br>G1/2-NPT |
| Nominal size [mm]   | 4  | 6    | 8     | 12                 | 6  | 8                | 12               |
| Standard nominal flow rate [l/min.]<br>Outlet direction to the side | 170  | 600  | 1.150 | 3.500              | 600  | 1.150            | 3.500            |
| Standard nominal flow rate [l/min.]<br>Outlet direction underneath  | 260  | 800  | 1.500 | 4.300              | 800  | 1.500            | 4.300            |
| Housing material  | Plastic  |      |       | Die-cast aluminium | Die-cast aluminium   |                  |                  |
| Design  | Flat slide valve   |      |       |                    |  |                  |                  |
| Operating pressure range [bar]                                      | -0.95 ... +10  |      |       |                    |  |                  |                  |
| Temperature range [°C]  | -20 ... +80  |      |       |                    |  |                  |                  |
| Functions   | <ul style="list-style-type: none"> <li>• 4/3-way valve <ul style="list-style-type: none"> <li>Mid-position closed</li> <li>Mid-position exhausted</li> </ul> </li> <li>• Lockable hand lever</li> <li>• Position detection by sensor possible</li> </ul> |      |       |                    |  |                  |                  |



## A perfect match: your requirements and our solutions

Solving your individual tasks quickly and competently is a challenge that our experts worldwide would be glad to take on.

Customer-specific solutions with series features considerably reduce your time-to-market, regardless of whether you're an OEM or an end user. You can count on reduced lead-time for

project engineering, design, assembly, function tests documentation and delivery.

Of course the solution will be state-of-the-art and have defined interfaces for effortless installation. And it's been subjected to functional testing so that you can get things going without delay.





### Your task – our challenge

As an internationally unique, single-source supplier, Festo offers solutions that are based on the task at hand. Whether standard components, systems, application-specific products or customised services are the best way forward depends entirely on the task.

### Individualised services

Service from A to Z: our numerous services can help you find the right answer for your tasks, throughout the entire value creation chain.

### Individualised assemblies and systems

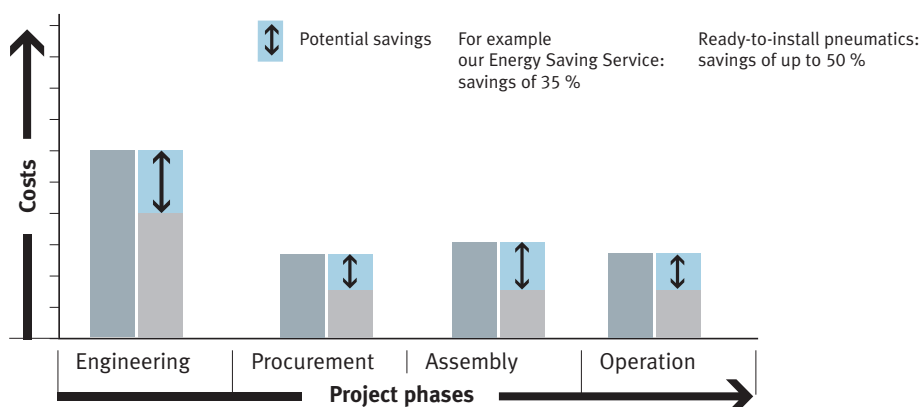
Reduce your vertical manufacturing integration and concentrate on your core business. Save time and money with simple PrePack services, pre-assembled modules or ready-to-install complete solutions.

### Individualised product variants

100 % freedom: application-optimised solutions for customer-specific requirements with regard to function and size – from simple modifications to completely new designs.



### Reduced overall costs in accordance with TCO through targeted use of services from Festo





## Everything from a single source – for valves too

Valves for every conceivable situation – this great diversity has a purpose. It is the basis for maximised process reliability, it covers all requirements and enhances the interconnection between components.

That's why Festo offers everything from a single source: highly versatile, impressive electrical and pneumatic concepts for technically optimised solutions at a reasonable price.


Your advantages with valves from Festo:

- As individual valves, on valve manifolds, or as pre-assembled and tested valve terminals with customer-specific configuration – Festo plug and work®
- Comprehensive documentation
- Maximum diversity for any application
- Maximum quality and service life
- Optimised design

### Where do I use which valve? A quick overview ...

| Universal, comprehensive range of valves        |  |
|---|--|
| Standardised, highly modular, Vertical stacking | VSVA   |
| Non-standardised, compact design                | CPE (high flow rates)<br>VUVG (lower flow rates) |
| Polymer housings, weight-optimised              | VUVB   |

| Specifically developed valve ranges                |              |
|--|--------------|
| Directly actuated, basic functions                 | MHx          |
| Easy to clean, resistant ...                       | CDVS         |
| Fast-switching valves, extremely long service life | MH2...4, MHJ |
| Very compact, pilot actuated                       | VOVG, CPA-SC |

| Range/type  | Flow rate                  | Pneumatic connection                    |
|---|----------------------------|---|
| VSVA - ISO 15407-1, ISO 5599-1           | 500, 1.000, 1.300          | M5, G1/4, G1/8                          |
| ISO 5599-1 (MDH, MFH, FEBH, MN1H)        | 1.200, 2.300, 4.500, 6.000 | G1/4, G3/8, G1/2, G3/4                  |
| CPE                                      | 400, 800, 1.500, 3.200     | M5, M7, G1/8, G1/4, G3/8, QS4/6/8/10/12 |
| Tiger (MFH, MVH)                         | 500 ... 7.500              | G1/8, G1/4, G3/8                        |
| VUVB/VTUB-20                             | 200, 500, 800, 1.000       | G1/4, G1/2, QS4/6/8/10                  |
| VUVB/VTUB-12                             | 400                        | G1/4, QS4/6                             |
| Midi MEBH, MEH                           | 200 ... 700                | G1/8                                    |
| Miniature valve MH1                      | 10 ... 14                  | M3, QS3/4                               |
| Fast-switching valves MH2...4            | 100, 200, 400              | M5, M7, G1/8, G1/4, QS4/6/8             |
| Fast-switching valves MHJ                | 50 ... 150                 | QS4/6                                   |
| VOVG                                     | 200                        | M5, QS3/4/6                             |
| VUVG                                     | 100 ... 750                | M3, M5, M7, G1/8, QS3/4/6/8             |
| CPA-SC                                   | 180                        | M5, QS3/4                               |
| CDSV                                     | 650                        | M7, G1/8, QS6                           |
| Micro/Mini (MZH/MYH)                     | 40 ... 190                 | M3, M5                                  |
| Manually and mechanically actuated VHER  | 130 ... 4.300              | M5, G1/8, G1/4, G1/2                    |
| Manually actuated                        | 65 ... 3.500               | M5, G1/8, G1/4, G1/2                    |
| On-off valves QH                         | 120 ... 84.000             | G1/4, G3/8, G1/2, G3/4, G1, G11/2       |

Overview: Festo valves and their primary characteristics



| Pressure range,<br>max. external (internal)<br>auxiliary pilot air | Valve functions |      |      |        |      |      |      |      |      |       |                   | Pneumatically actuated |                   |                       |        |        |         |         | Electrical connection,<br>design | Protection class |       |                                 |              |
|--|-----------------|------|------|--------|------|------|------|------|------|-------|-------------------|------------------------|-------------------|-----------------------|--------|--------|---------|---------|----------------------------------|------------------|-------|---------------------------------|--------------|
|  | 2/2G/O          | 3/2G | 3/2O | 3/2G/O | 5/2M | 5/2J | 5/3G | 5/3B | 5/3E | Other | Directly actuated | Pilot actuated         | Vertical stacking | Electrically actuated |        |        |         |         |                                  |                  | Other |                                 |              |
|  |                 |      |      |        |      |      |      |      |      |       |                   |                        |                   | 5V DC                 | 12V DC | 24V DC | 110V AC | 230V AC |                                  |                  |       |                                 |              |
| -0.9 ... 16 (3 ... 10)   |                 | ■    | ■    | ■      | ■    | ■    | ■    | ■    | ■    |       |                   | ■                      | ■                 | ■                     | ■      |        | ■       |         |                                  |                  |       | M8, M12<br>type C               | IP65         |
| -0.9 ... 16 (3 ... 10)   |                 |      |      |        | ■    | ■    | ■    | ■    | ■    |       |                   | ■                      |                   | ■                     |        | ■      |         | ■       |                                  | ■                |       | M12,<br>DESINA<br>type A, BI, C | IP65<br>ex   |
| -0.9 ... 10 (2.5 ... 10)   |                 | ■    | ■    | ■      | ■    | ■    | ■    | ■    | ■    |       |                   |                        |                   |                       |        |        |         | ■       |                                  | ■                |       | type C,<br>KMYZ-9,<br>M8, CNOMO | IP65         |
| -0.9 ... 10 (1.5 ... 10)   |                 | ■    | ■    |        | ■    | ■    | ■    | ■    | ■    |       |                   | ■                      |                   | ■                     |        | ■      |         | ■       |                                  | ■                |       | type B, BI                      | IP65<br>ex   |
| -0.9 ... 8 (2 ... 8)   |                 | ■    | ■    |        | 4/2  | 4/2  |      |      |      |       |                   | ■                      |                   |                       |        |        |         | ■       |                                  | ■                |       | type C                          | IP65         |
| 2.8 ... 8  |                 | ■    | ■    |        | ■    | ■    |      |      |      |       |                   | ■                      |                   |                       |        |        |         |         | ■                                |                  |       |                                 | IP65         |
| -0.9 ... 10 (2 ... 8)  |                 | ■    | ■    |        | ■    | ■    | ■    | ■    | ■    |       |                   | ■                      |                   | ■                     |        | ■      |         | ■       |                                  | ■                |       | M8                              | IP65         |
| -0.9 ... 8   | ■               | ■    | ■    |        |      |      |      |      |      |       | ■                 |                        |                   |                       |        |        | ■       |         | ■                                |                  |       | type C                          | IP40         |
| -0.9 ... 8   |                 | ■    | ■    |        | ■    |      |      |      |      |       | ■                 |                        |                   |                       |        |        |         |         | ■                                |                  |       | KMH,<br>Soldering<br>base       | IP65         |
| 0.5 ... 6  | ■               |      |      |        |      |      |      |      |      |       | ■                 |                        |                   |                       |        |        | ■       |         | ■                                |                  | ■     | KMH,<br>KMYZ-3,<br>type C       | IP40<br>IP65 |
| 1.5 ... 8  |                 | ■    | ■    |        | ■    |      |      |      |      |       |                   | ■                      |                   |                       |        |        |         |         | ■                                |                  |       |                                 | IP40         |
| -0.3 ... 10 (1.5 ... 8)  |                 | ■    | ■    |        | ■    | ■    | ■    | ■    | ■    |       |                   | ■                      |                   |                       |        |        | ■       |         | ■                                |                  |       | KMH                             | IP40<br>IP65 |
| -0.9 ... 10 (3 ... 8)  | ■               | ■    | ■    |        | ■    | ■    | ■    | ■    | ■    |       |                   | ■                      |                   |                       |        |        |         |         | ■                                |                  |       |                                 | IP40         |
| -0.9 ... 10 (3 ... 6)  |                 | ■    | ■    | ■      | ■    | ■    | ■    | ■    | ■    |       |                   | ■                      |                   |                       |        |        |         |         | ■                                |                  |       | KMH                             | IP67         |
| 2 ... 8  |                 | ■    | ■    |        | ■    | ■    | ■    | ■    | ■    |       |                   | ■                      | ■                 |                       |        |        |         |         | ■                                |                  |       | Clean<br>Design                 | IP40         |
| -0.9 ... 10  |                 |      |      |        |      |      | 4/3  | 4/3  | ■    | ■     |                   |                        |                   |                       |        |        |         |         |                                  |                  |       | KMYZ-1                          | IP65<br>ex   |
| -0.9 ... 10  |                 | ■    | ■    |        | ■    |      |      |      |      | ■     | ■                 | ■                      |                   |                       |        |        |         |         |                                  |                  |       |                                 | IP40         |
| -0.9 ... 30  | ■               |      |      |        |      |      |      |      |      |       | ■                 |                        |                   |                       |        |        |         |         |                                  |                  |       |                                 | IP65         |

Footnotes: M8 and M12 = to ISO 20401, type A, B, C = port patterns to EN 175301, BI = industry standard (MF coil), K... = specific port patterns, ex = explosion-proof



## Valve terminals – increased productivity, reduced installation costs

Function integration as a mega-trend: the valve terminal is becoming the automation platform of the 21<sup>st</sup> century.

Of course there's still demand for valves; they'll never completely lose their position within the market. But there's hardly an innovation that has shaped automation to such a great extent, or succeeded in reducing installation costs and improving productivity in such a lasting fashion as the valve

terminal, which is actually the sum total of numerous, densely packed valves.

As a market leader and the inventor of the valve terminal, we know where potential still exists, and where new potential can be exploited – to your advantage. This may be through function integration, new flexibility for installation concepts and significantly increased reliability by means of diagnostics and special valves.

| Type                          |   | Flow rate<br>(litre/min per valve)          |
|-------------------------------|---|---|
| VSVA                          |  | 500, 1.000, 1.300, 2.900                    |
| VTSA/VTSA-F                   |  | 500, 700, 1.000, 1.800, 2.900               |
| MPA/MPM/MPA-S/<br>MPA-L/MPA-F |  | 360, 700, 900                               |
| CPX/MPA                       |  | 360, 700, 900                               |
| CPV                           |  | 400, 800, 1.600                             |
| VUVB, VTUB (VB)               |  | VB12: 400<br>VB20: 200, 500, 800, 1.000     |
| CPV-SC                        |  | 170   |
| CPA-SC                        |  | 180   |
| MH1                           |  | 10, 14                                      |
| MHJ/MH2/3/4                   |  | MHJ: 50, 100, 150<br>MH2/3/4: 100, 200, 400 |
| CDVI                          |  | 650   |
| VTOC                          |  | 10  |
| CPX-Terminal                  |  |   |
| CPI-System                    |  |   |

Overview: Festo valve terminals and their primary characteristics



| Number of solenoid coils<br>(max. per valve terminal) | 512 decentralised | Electrical inputs<br>(max. per valve terminal) |    |    |    |     |     | Electrical connection |          |              |           |          |          |         |         |          |                       | Valve properties  |         |        |                         | Protection |      |                 | Diagnostics |                 |                  |                          |                        |   |   |   |
|---|-------------------|--|----|----|----|-----|-----|-----------------------|----------|--------------|-----------|----------|----------|---------|---------|----------|-----------------------|-------------------|---------|--------|-------------------------|------------|------|-----------------|-------------|-----------------|------------------|--------------------------|------------------------|---|---|---|
|   |                   | 8  | 16 | 72 | 92 | 144 | 512 | Individual connection | Multipin | AS-Interface | DeviceNet | Profibus | Interbus | CANopen | CC-Link | Ethernet | Integrated controller | Directly actuated | Piloted | Vacuum | Multiple pressure zones | IP40       | IP65 | Explosion-proof | Status bit  | Module-oriented | channel oriented | Preventative maintenance | Web-based, Web monitor |   |   |   |
| 1-32  |                   |  |    |    |    |     |     | ■                     |          |              |           |          |          |         |         |          |                       |                   | ■       | ■      | ■                       |            | ■    |                 |             |                 |                  |                          |                        |   |   |   |
| 1-32  | ■                 | ■  | ■  | ■  | ■  | ■   | ■   |                       |          | ■            | ■         | ■        | ■        | ■       | ■       | ■        | ■                     | ■                 | ■       | ■      | ■                       | ■          | ■    |                 | ■           | ■               | ■                | ■                        | ■                      | ■ | ■ | ■ |
| 2-24  | ■                 |  |    |    |    |     |     |                       | ■        | ■            |           |          |          |         |         |          |                       |                   | ■       | ■      | ■                       |            | ■    |                 |             |                 |                  |                          |                        |   |   |   |
| 2-128   | ■                 | ■  | ■  | ■  | ■  | ■   | ■   |                       |          |              | ■         | ■        | ■        | ■       | ■       | ■        | ■                     | ■                 | ■       | ■      | ■                       | ■          | ■    |                 | ■           | ■               | ■                | ■                        | ■                      | ■ | ■ | ■ |
| 2-16  |                   | ■  | ■  |    |    |     |     | ■                     | ■        | ■            | ■         | ■        | ■        | ■       | ■       |          |                       |                   | ■       | ■      | ■                       |            | ■    | ■               | ■           |                 |                  |                          | ■                      |   |   |   |
| 1-24  |                   |  |    |    |    |     |     | ■                     | ■        |              |           |          |          |         |         |          |                       |                   | ■       | ■      | ■                       |            | ■    |                 |             |                 |                  |                          |                        |   |   |   |
| 2-16  |                   | ■  | ■  |    |    |     |     | ■                     | ■        | ■            | ■         |          |          |         |         |          |                       |                   | ■       | ■      | ■                       | ■          |      | ■               | ■           |                 |                  |                          | ■                      |   |   |   |
| 2-24  |                   | ■  | ■  |    |    |     |     | ■                     | ■        | ■            | ■         |          |          |         |         |          |                       |                   | ■       | ■      | ■                       | ■          | ■    | ■               | ■           |                 |                  |                          | ■                      |   |   |   |
| 1-22  |                   |  |    |    |    |     |     | ■                     | ■        |              |           |          |          |         |         |          |                       |                   | ■       | ■      | ■                       |            |      |                 |             |                 |                  |                          |                        |   |   |   |
| 1-10  |                   |  |    |    |    |     |     | ■                     |          |              |           |          |          |         |         |          |                       |                   | ■       | ■      | ■                       |            | ■    |                 |             |                 |                  |                          |                        |   |   |   |
| 4-24  |                   | ■  | ■  |    |    |     |     |                       | ■        | ■            |           |          |          |         |         |          |                       |                   | ■       | ■      | ■                       |            | ■    |                 | ■           | ■               |                  |                          | ■                      |   |   |   |
| 16-48   |                   |  |    |    |    |     |     |                       | ■        |              |           |          |          |         |         |          |                       |                   | ■       |        |                         |            | ■    |                 |             |                 |                  |                          |                        |   |   |   |
|   |                   | ■  | ■  | ■  | ■  | ■   | ■   |                       |          |              | ■         | ■        | ■        | ■       | ■       | ■        | ■                     |                   |         |        |                         |            | ■    | ■               | ■           | ■               | ■                | ■                        | ■                      | ■ | ■ | ■ |
|   | ■                 |  |    |    |    |     |     |                       |          |              | ■         | ■        | ■        | ■       | ■       | ■        | ■                     |                   |         |        |                         |            | ■    | ■               |             | ■               | ■                |                          |                        |   |   | ■ |

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