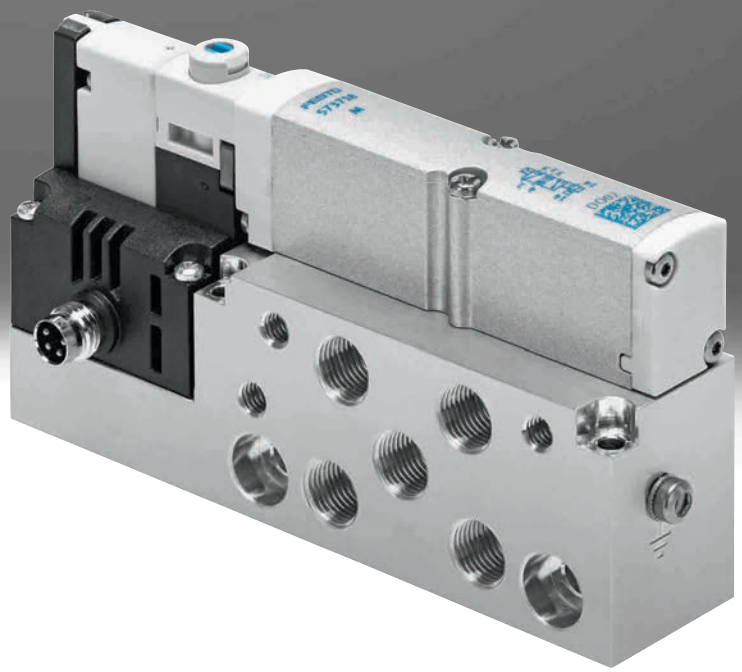
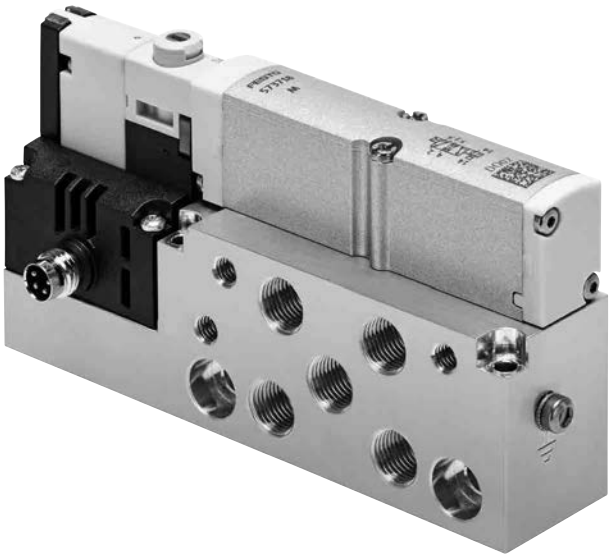
Solenoid valves VMPA



Key features



Innovative

- Compact high-performance valves in sturdy metal housing
- MPA1 (width 10 mm) flow rate up to 360 l/min
- MPA14 (width 14 mm) flow rate up to 670 l/min
- MPA2 (width 20 mm) flow rate up to 870 l/min

The valves are identical to the valves in the valve terminal MPA-S and MPA-L. This simplifies planning, ordering and warehousing.

Versatile

- High pressure range
- –0.09 ... +1 MPa
- Wide range of valve functions

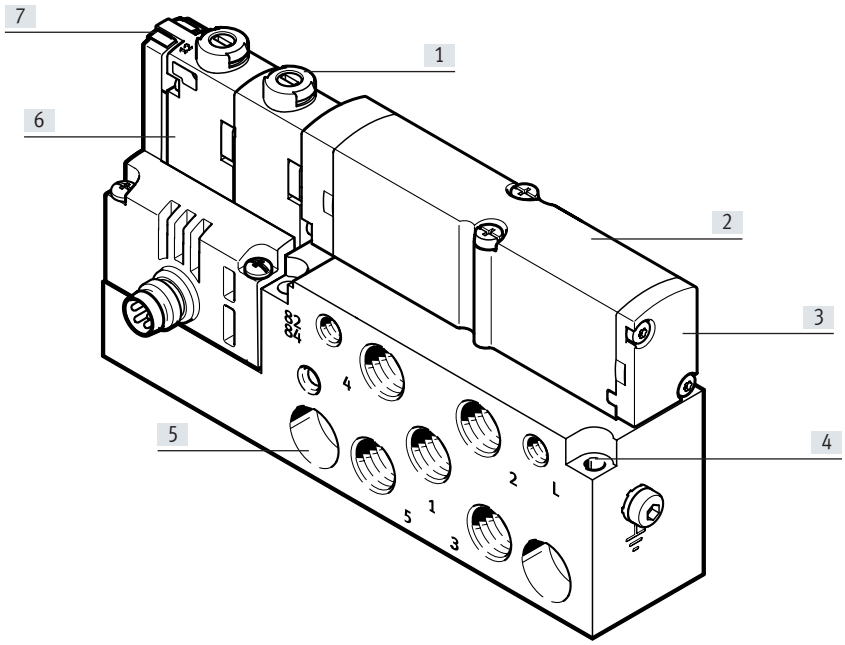
Reliable

- Fast troubleshooting thanks to LEDs on the valves
- Extensive operating voltage range ±25%
- Easy to service thanks to replaceable valves and electronic modules
- Manual override either non-detenting, detenting or secured against unauthorised activation (concealed)

Easy to mount

- Secure wall mounting

Key features



[1] Safe operation: Manual override, non-detenting/detenting or concealed
[2] Space-saving: Flat valves
[3] Wide range of valve functions
[4] Quick to mount: directly using screws
[5] Practical: robust metal thread
[6] Width 10, 14 and 20 mm
[7] Reduced downtimes: LED diagnostics locally

Equipment options

Valve functions

- 5/2-way valve, single solenoid
- 5/2-way valve, double solenoid
- 2x 3/2-way valve, normally open
- 2x 3/2-way valve, normally closed
- 2x 3/2-way valve, 1x normally open, 1x normally closed
- 5/3-way valve Mid-position pressurised
- 5/3-way valve Mid-position closed
- 5/3-way valve Mid-position exhausted
- 2x 2/2-way valve Normally closed

Special features

- Electrical M8 connection, 4-pin with screw connection
- Detachable electronics module with integrated holding current reduction

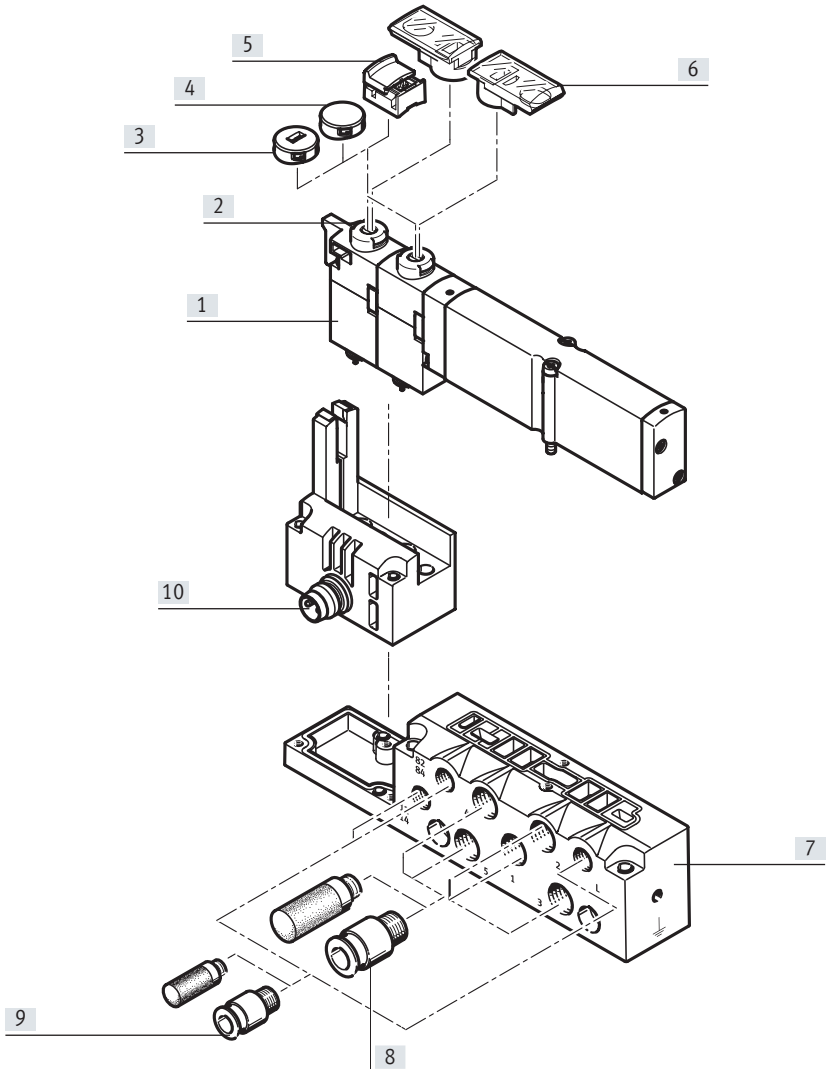
Peripherals overview

Individual sub-base for solenoid valve, width 10 mm

Ordering:
- Using individual part numbers

Individual sub-bases of type VMPA1-IC-... can be equipped with any solenoid valve VMPA1 of width 10 mm.

The electrical connection is established using a standard 4-pin M8 plug (EN 60947-5-2).



Designation		Brief description	→ Page/Internet
[1]	Solenoid valve	VMPA1...	27
[2]	Manual override (MO)	Non-detenting/detenting by turning, per solenoid coil	–
[3]	Cover cap, coded	After fitting the cover cap, manual override operation is non-detenting only	29
[4]	Cover cap, concealed	After fitting the cover cap, manual override is blocked	29
[5]	Cover cap, manual override detenting	After fitting the cover cap, manual override is detenting and can be operated without tools	29
[6]	Identification holder	Can be pushed onto manual override	29
[7]	Sub-base	For solenoid valve VMPA1...	29
[8]	Fittings, silencers or blanking plugs	M7 for working ports (2, 4) and air supply/exhaust ports (1, 3, 5)	30
[9]	Fittings and/or silencers	M5 for pilot air supply/pilot exhaust air (12/14, 82/84) and pressure compensation	30
[10]	Electrical connection M8	4-pin	–

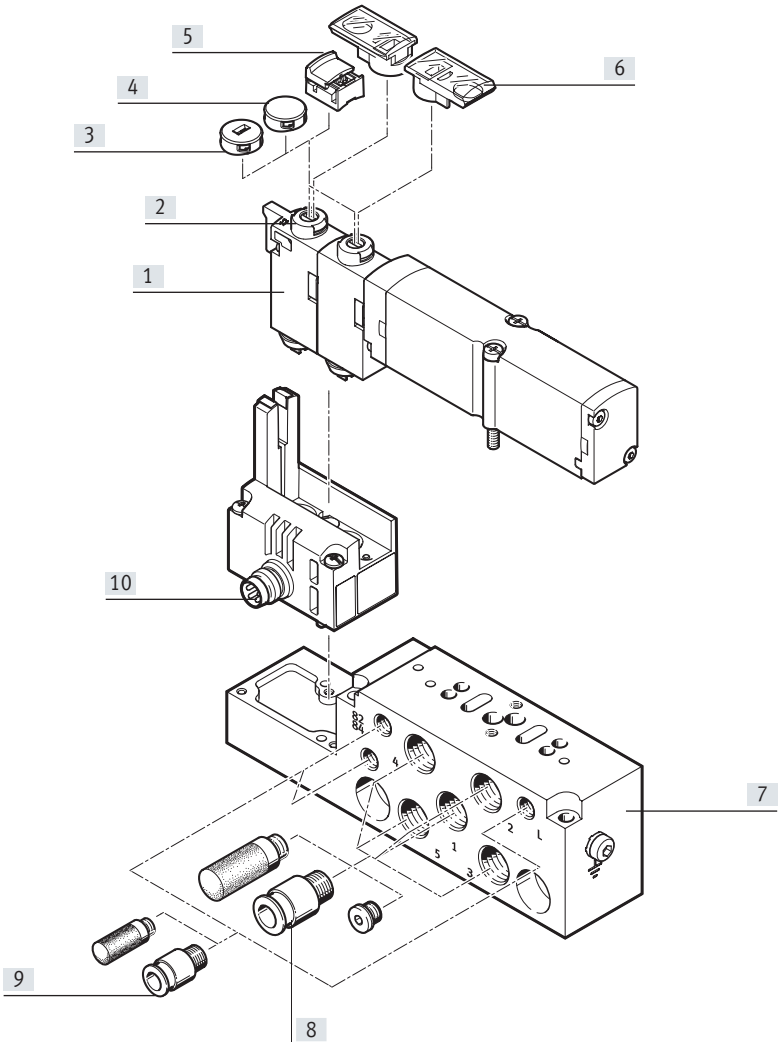
Peripherals overview

Individual sub-base for solenoid valve, width 14 mm

Ordering:
- Using individual part numbers

Individual sub-bases of type VMPA14-IC-... can be equipped with any solenoid valve VMPA14 of width 14 mm.

The electrical connection is established using a standard 4-pin M8 plug (EN 60947-5-2).



Designation		Brief description	→ Page/Internet
[1]	Solenoid valve	VMPA14...	27
[2]	Manual override (MO)	Non-detenting/detenting by turning, per solenoid coil	–
[3]	Cover cap, coded	After fitting the cover cap, manual override operation is non-detenting only	29
[4]	Cover cap, concealed	After fitting the cover cap, manual override is blocked	29
[5]	Cover cap, manual override detenting	After fitting the cover cap, manual override is detenting and can be operated without tools	29
[6]	Identification holder	Can be pushed onto manual override	29
[7]	Sub-base	For solenoid valve VMPA14...	29
[8]	Fittings, silencers or blanking plugs	G1/8 for working ports (2, 4) and air supply/exhaust ports (1, 3, 5)	30
[9]	Fittings and/or silencers	M5 for pilot air supply/pilot exhaust air (12/14, 82/84) and pressure compensation	30
[10]	Electrical connection M8	4-pin	–

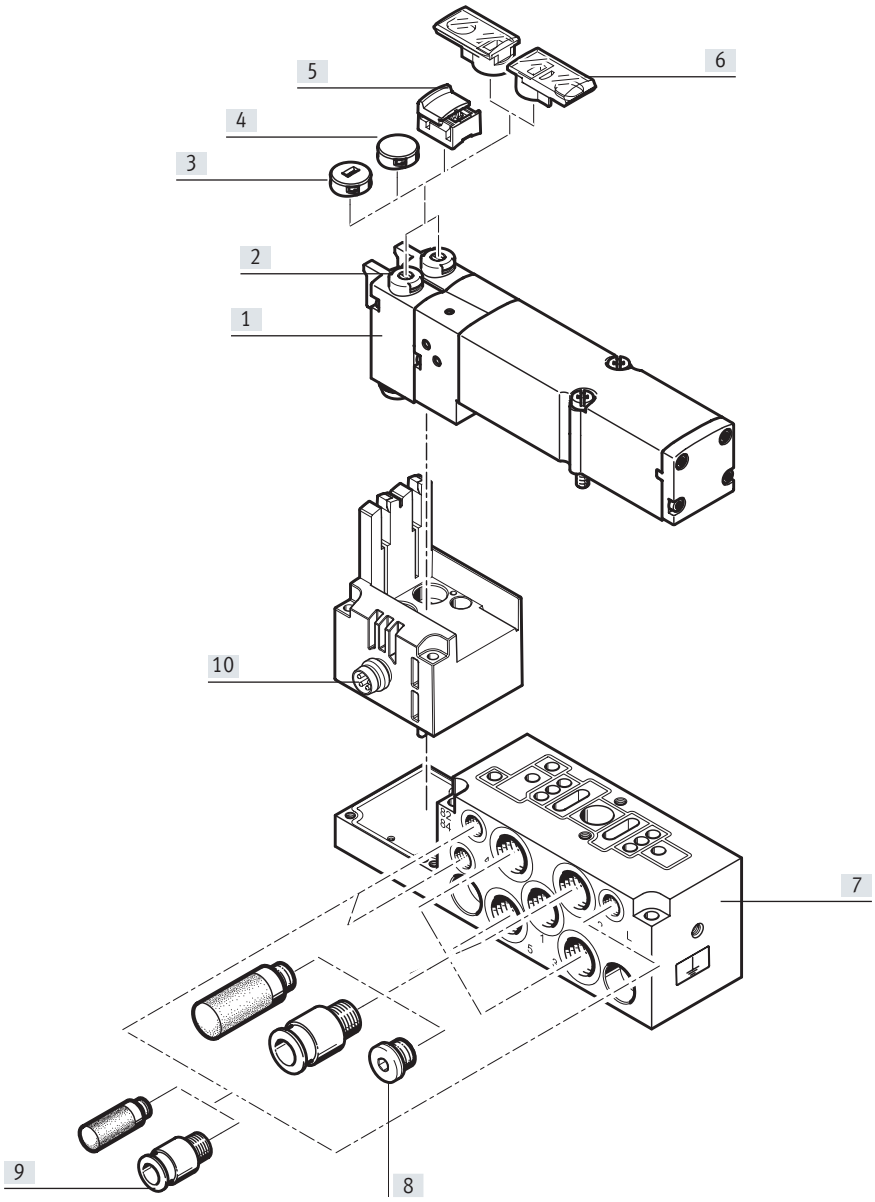
Peripherals overview

Individual sub-base for solenoid valve, width 20 mm

Ordering:
- Using individual part numbers

Individual sub-bases of type VMPA2-IC-... can be equipped with any solenoid valve VMPA2 of width 20 mm

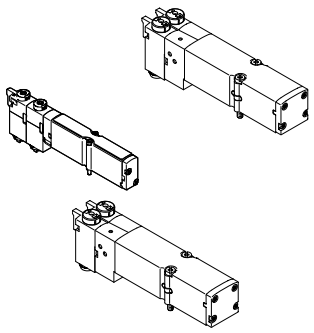
The electrical connection is established using a standard 4-pin M8 plug (EN 60947-5-2).



Designation		Brief description	→ Page/Internet
[1]	Solenoid valve	VMPA2...	27
[2]	Manual override (MO)	Non-detenting/detenting by turning, per solenoid coil	–
[3]	Cover cap, coded	After fitting the cover cap, manual override operation is non-detenting only	29
[4]	Cover cap, concealed	After fitting the cover cap, manual override is blocked	29
[5]	Cover cap, manual override detenting	After fitting the cover cap, manual override is detenting and can be operated without tools	29
[6]	Identification holder	Can be pushed onto manual override	29
[7]	Sub-base	For solenoid valve VMPA2...	29
[8]	Fittings, silencers or blanking plugs	G1/8 for working ports (2, 4) and air supply/exhaust ports (1, 3, 5)	30
[9]	Fittings and/or silencers	M5 for pilot air supply/pilot exhaust air (12/14, 82/84) and pressure compensation	30
[10]	Electrical connection M8	4-pin	–

Key features – Pneumatic components

Solenoid valve



VMPA offers a comprehensive range of valve functions. All valves have a patented sealing system, which ensures efficient sealing, a broad pressure range and a long service life. They have a pneumatic pilot control for optimising performance. Compressed air is supplied via a pilot air supply port.

Solenoid valves can be replaced quickly since the tubing connections remain on the sub-base.
This design is also very flat.

Whatever valve function is required, there are solenoid valves with one solenoid coil (single solenoid) or with two solenoid coils (double solenoid or two single solenoid valves in one housing).

Design

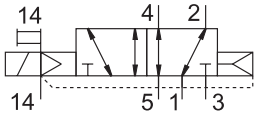
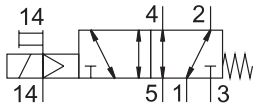
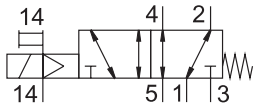
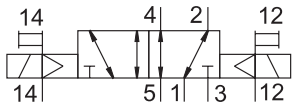
Valve replacement

The valves are attached to the metal sub-base using two screws, which means that they can be easily replaced. The mechanical sturdiness of the sub-base guarantees good long-term sealing.

Valve code

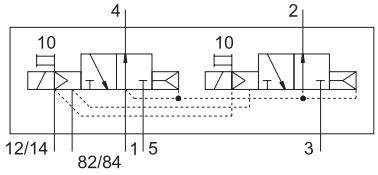
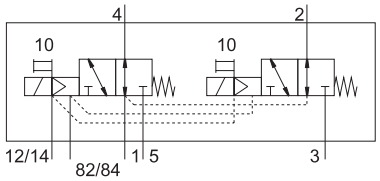
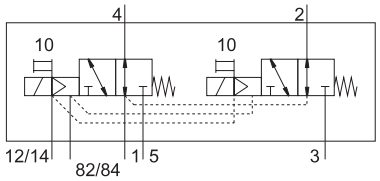
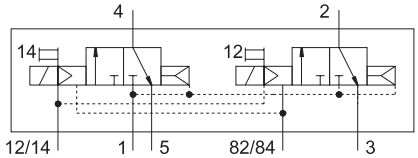
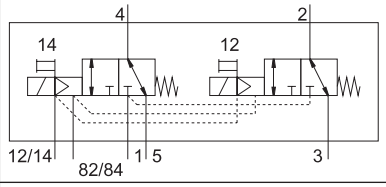
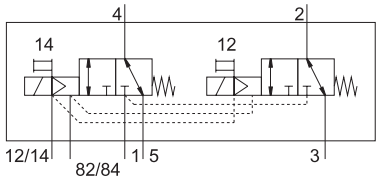
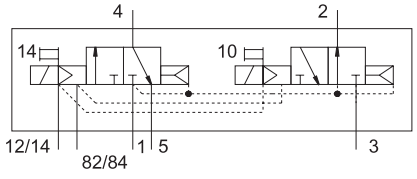
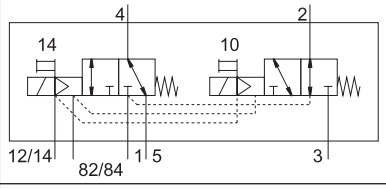
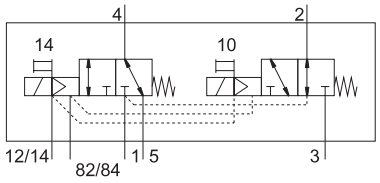
The valve code (M, MS, MU, J, N, NS, NU, K, KS, KU, H, HS, HU, B, G, E, X, W, D, DS, I) is located on the front of the valve beneath the manual override

5/2-way valve

Type	Circuit symbol	Width [mm]	Description
M		10, 14, 20	• Single solenoid • Pneumatic spring return • Reversible • Operating pressure –0.09 ... +1 MPa
MS		10, 14, 20	• Single solenoid • Mechanical spring return • Reversible • Operating pressure –0.09 ... +0.8 MPa
MU		10	• Single solenoid • Polymer poppet valve • Mechanical spring return • Reversible • Operating pressure –0.09 ... +1 MPa
J		10, 14, 20	• Double solenoid • Reversible • Operating pressure –0.09 ... +1 MPa

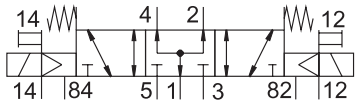
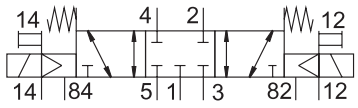
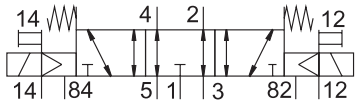
Key features – Pneumatic components

2x 3/2-way valve

Type	Circuit symbol	Width [mm]	Description
N		10, 14, 20	• Single solenoid • Normally open • Pneumatic spring return • Operating pressure 0.3 ... 1 MPa
NS		10, 14, 20	• Single solenoid • Normally open • Mechanical spring return • Reversible • Operating pressure –0.09 ... +0.8 MPa
NU		10	• Single solenoid • Polymer poppet valve • Normally open • Mechanical spring return • Reversible • Operating pressure –0.09 ... +1 MPa
K		10, 14, 20	• Single solenoid • Normally closed • Pneumatic spring return • Operating pressure 0.3 ... 1 MPa
KS		10, 14, 20	• Single solenoid • Normally closed • Mechanical spring return • Reversible • Operating pressure –0.09 ... +0.8 MPa
KU		10	• Single solenoid • Polymer poppet valve • Normally closed • Mechanical spring return • Reversible • Operating pressure –0.09 ... +1 MPa
H		10, 14, 20	• Single solenoid • Normal position – 1x closed – 1x open • Pneumatic spring return • Operating pressure 0.3 ... 1 MPa
HS		10, 14, 20	• Single solenoid • Normal position – 1x closed – 1x open • Mechanical spring return • Reversible • Operating pressure –0.09 ... +0.8 MPa
HU		10	• Single solenoid • Polymer poppet valve • Normal position – 1x closed – 1x open • Mechanical spring return • Reversible • Operating pressure –0.09 ... +1 MPa

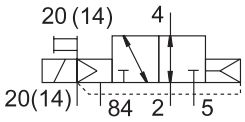
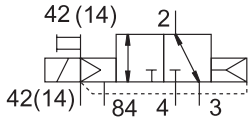
Key features – Pneumatic components

5/3-way valve

Type	Circuit symbol	Width [mm]	Description
B		10, 14, 20	• Mid-position pressurised[1)] • Mechanical spring return • Reversible • Operating pressure –0.09 ... +1 MPa
G		10, 14, 20	• Mid-position closed[1)] • Mechanical spring return • Reversible • Operating pressure –0.09 ... +1 MPa
E		10, 14, 20	• Mid-position exhausted[1)] • Mechanical spring return • Reversible • Operating pressure –0.09 ... +1 MPa

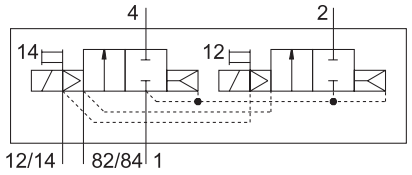
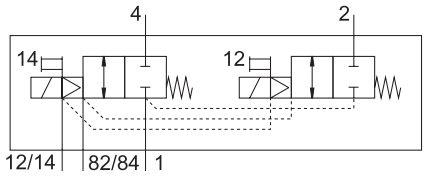
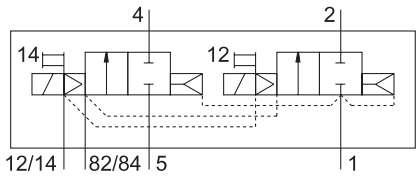
1) If neither solenoid coil is energised, the valve assumes its mid-position by spring force.
If both coils are energised at the same time, the valve remains in the previously assumed switching position.

3/2-way valve

Type	Circuit symbol	Width [mm]	Description
W		10, 14, 20	• Single solenoid • Normally open • External compressed air supply • Pneumatic spring return • Reversible • Operating pressure –0.09 ... +1 MPa Compressed air (–0.09 ... +1 MPa) supplied at working port 2 can be switched with both internal and external pilot air supply.
X		10, 14, 20	• Single solenoid • Normally closed • External compressed air supply • Pneumatic spring return • Reversible • Operating pressure –0.09 ... +1 MPa Compressed air (–0.09 ... +1 MPa) supplied at working port 4 can be switched with both internal and external pilot air supply.

Key features – Pneumatic components

2x 2/2-way valve

Type	Circuit symbol	Width [mm]	Description
D		10, 14, 20	• Single solenoid • Normally closed • Pneumatic spring return • Operating pressure 0.3 ... 1 MPa
DS		10, 14, 20	• Single solenoid • Normally closed • Mechanical spring return • Reversible • Operating pressure –0.09 ... +0.8 MPa
I		10, 14, 20	• Single solenoid • 1x normally closed • 1x normally closed, reversible only • Pneumatic spring return • Operating pressure 0.3 ... 1 MPa • Vacuum at port 3/5 only

Note

A filter must be installed upstream of valves operated in vacuum mode. This prevents any foreign matter in the intake air getting into the valve (e.g. when operating a suction cup with connector).

Pilot air supply

The pneumatic connection is located on the individual sub-base.
The ports differ for the following types of pilot air supply:
- internal pilot air and
- external pilot air.

Internal pilot air supply
If the required working pressures are between 0.3 and 0.8 MPa, internal pilot air supply can be selected.
In this case, the pilot air supply in the sub-base is branched from the compressed air supply 1 using an internal connection. Port 12/14 is sealed at the factory with a blanking plug.

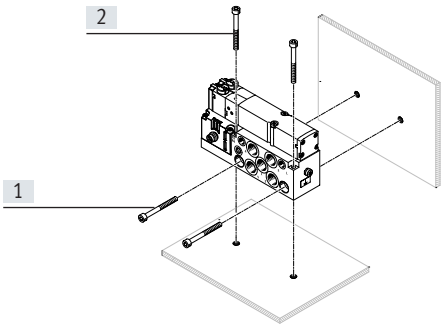
External pilot air supply
If the supply pressure is less than 0.3 MPa or greater than 0.8 MPa, you must operate your VMPA valve using external pilot air.
The pilot air is then supplied via port 12/14 of the sub-base.

Note

If a gradual pressure build-up is required in the system by using a soft-start valve, then external pilot air should be selected whereby the pilot pressure is already applied at the point of switch-on.

Key features – Mounting and operation

Mounting



[1] Horizontal mounting holes
[2] Vertical mounting holes

The individual sub-base for wall mounting is designed for integration into a system or machine. It can be mounted horizontally or vertically.

Display and operation

Each valve solenoid coil is allocated an LED which indicates its operating status.

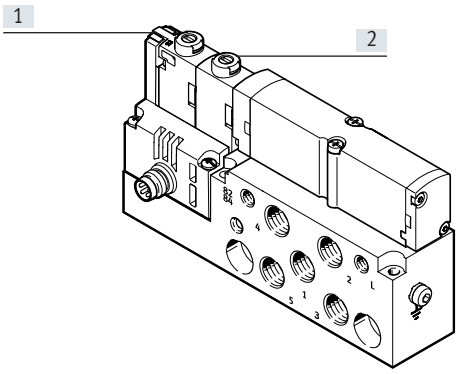
- Indicator 12 shows the signal status of the coil for output 2
- Indicator 14 shows the signal status of the coil for output 4

Manual override

The manual override (MO) enables the valve to be switched when not electrically activated or energised.
The pilot valve is switched by pushing the manual override. The set switching status can also be locked by turning the manual override.
Alternatives:

- A covering (VMPA-HBT-B) prevents the manual override from being locked. The manual override can then only be activated by pushing it.
- A covering (VMPA-HBV-B) can be fitted over the manual override to prevent it from being accidentally activated.
- The cover cap (VAMC-L1-CD) can be used to operate the manual override

in detenting mode without additional tools.



[1] LED indicator
[2] Manual override

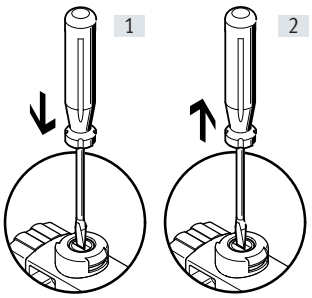
Note

A manually operated valve (manual override) cannot be reset electrically. Conversely, an electrically actuated valve cannot be reset using the mechanical manual override.

Key features – Mounting and operation

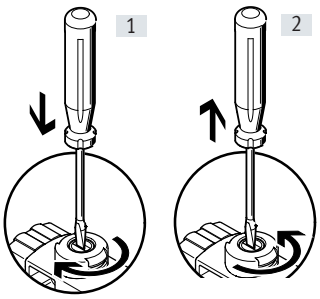
Manual override (MO)

MO with automatic return (non-detenting)



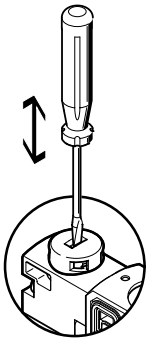
[1] Press in the stem of the MO with a pointed object or screwdriver.
The pilot valve switches and actuates the main valve.
[2] Remove the pointed object or screwdriver.
The spring force pushes the stem of the MO back.
The pilot valve returns to its normal position as does the single solenoid main valve (not the case with double solenoid valve code J).

MO with detent (locking)



[1] Press in the stem of the MO with a pointed object or screwdriver until the valve switches and then turn the stem clockwise by 90° until the stop is reached.
The valve remains actuated
[2] Turn the plunger anti-clockwise by 90° until the stop is reached and then remove the pointed object or screwdriver. The spring force pushes the stem of the MO back.
The valve returns to its normal position (not the case with double solenoid valve code J).

MO with automatic return (non-detenting)

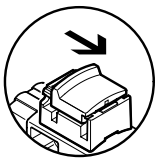


MO is actuated by pushing it with a pointed object or screwdriver and reset by spring force (detenting position prevented by coded cover cap).

MO with lock – Assembly

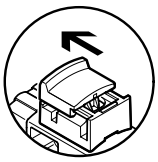
Clip MO with detent onto the pilot valve.
The MO cap can then be operated (detenting) without tools.

MO with lock – Actuation



By sliding the cap for the MO with detent in the direction of the arrow:
- Cap locks into the end position
- The pilot valve switches and actuates the main valve.

MO with lock – Actuation



By sliding the cap for the MO with detent in the direction of the arrow:
- Cap locks into the end position
- The spring force pushes the stem of the MO back.
- The pilot valve returns to its normal position as does the single solenoid main valve (not the case with double solenoid valve code J).

Key features – Electrical components

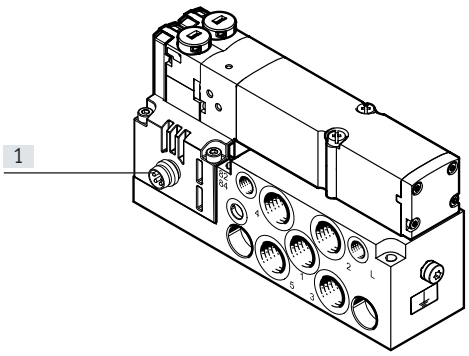
Electrical power as a result of current reduction

Each MPA solenoid coil is protected with a spark arresting protective circuit as well as against polarity reversal.

All valve types are additionally equipped with integrated current reduction.

MPA valves are supplied with operating voltage in the range 18 ... 30 V (24 V +/–25%). This high tolerance is made possible by the integrated control electronics and offers additional safety, e.g. in the case of a drop in operating voltage.

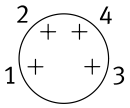
Electrical connection



[1] Electrical connection, plug 4-pin, M8, to EN 60947-5-2

Tightening torque for M8 plug: 0.25 ... 0.5 Nm (manual torque)

Pin allocation to ISO 20401



Pin	With positive logic	With negative logic
1	n.c.	n.c.
2	U_B for coil 12	0 V for coil 12
3	0 V for coil 12 and 14	U_B for coil 12 and 14
4	U_B for coil 14	0 V for coil 14

Application notes

System equipment

Operate your system with unlubricated compressed air if possible. Festo valves and cylinders are designed so that, if used as designated, they will not require additional lubrication and will still achieve a long service life. The quality of compressed air downstream of the compressor must correspond to that of unlubricated compressed air. If possible, do not operate the entire system with lubricated compressed air. The lubricators should, where possible, always be installed directly upstream of the actuator requiring them.

Incorrect additional oil and too high an oil content in the compressed air reduce the service life of the valve terminal.
Use Festo special oil OFSW-32 or the alternatives listed in the Festo catalogue (as specified in DIN 51524 HLP32; basic oil viscosity 32 CST at 40°C).

Bio-oils

When using bio-oils (oils which are based on synthetic or native esters, e.g. rapeseed oil methyl ester), the maximum residual oil content of 0.1 mg/m^3 must not be exceeded (see ISO 8573-1 Class 2).

Mineral oils

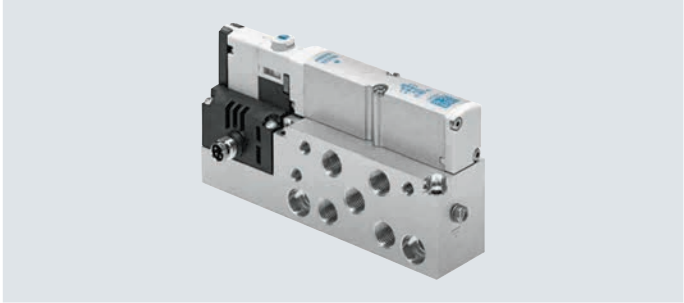
When using mineral oils (e.g. HLP oils to DIN 51524, parts 1 to 3) or similar oils based on poly-alpha-olefins (PAO), the maximum residual oil content of 5 mg/m^3 must not be exceeded (see ISO 8573-1 Class 4).
A higher residual oil content is not permitted, regardless of the compressor oil, because permanent lubrication would otherwise be flushed out over a period of time.

Data sheet – Solenoid valve on sub-base

- Flow rate
  VMPA1: up to 360 l/min
  VMPA14: up to 670 l/min
  VMPA2: up to 870 l/min

- Voltage
  24 V DC

- Valve width
  VMPA1: 10 mm
  VMPA14: 14 mm
  VMPA2: 20 mm



General technical data					
Width		10 mm	14 mm	20 mm	
Lubrication		Life-time lubrication, PWIS-free (free of paint-wetting impairment substances)			
Type of mounting		With through-holes			
Mounting position		Any			
Manual override		Non-detenting, detenting			
Weight of sub-base	[g]	92	184	233	
Pneumatic connections					
Pneumatic connection		Via sub-base			

Technical data – Valve width 10 mm														
Code			M	J	N	K	H	B	G	E	X	W	D	I
Design			Piston spool valve											
Sealing principle			Soft											
Overlap			Positive overlap											
Reset method			Pneumatic spring	–	Pneumatic spring			Mechanical spring			Pneumatic spring			
Switching times	On	[ms]	10	10	10	10	10	10	10	10	10	10	10	8
	Off	[ms]	20	–	20	20	20	35	35	35	20	20	20	20
	Change-over	[ms]	–	15	–	–	–	15	15	15	–	–	–	–
Standard nominal flow rate		[l/min]	360	360	300	230	300	300	320	240	255	255	230	260
Operating pressure		[MPa]	–0.09 ... +1		0.3 ... 1			–0.09 ... +1			–0.09 ... +1		0.3 ... 1	
		[bar]	–0.9 ... +10		3 ... 10			–0.9 ... +10			–0.9 ... +10		3 ... 10	
Pilot pressure		[MPa]	0.3 ... 0.8											
		[bar]	3 ... 8											
Max. tightening torque for valve mounting		[Nm]	0.25											
Materials			Die-cast aluminium											
Product weight		[g]	49	56	56	56	56	56	56	56	49	49	56	56

Data sheet – Solenoid valve

Technical data – Valve width 10 mm											
Code			MS	NS	KS	HS	DS	MU	NU	KU	HU
Design			Piston spool valve					Poppet valve with spring return			
Sealing principle			Soft					Soft			
Overlap			Positive overlap					Negative overlap			
Reset method			Mechanical spring					Mechanical spring			
Switching times	On	[ms]	10	14	14	14	14	10	10	8	10
	Off	[ms]	27	16	16	16	16	14	8	10	10
	Change-over	[ms]	–	–	–	–	–	–	–	–	–
Standard nominal flow rate		[l/min]	360	300	230	300	230	140 ... 190	190	160	140 ... 190
Note on standard nominal flow rate			–					1 → 2: 190 l/min 1 → 4: 140 l/min	–	–	1 → 2: 190 l/min 1 → 4: 140 l/min
Operating pressure		[MPa]	–0.09 ... +0.8					–0.09 ... +1			
		[bar]	–0.9 ... +8					–0.9 ... +10			
Pilot pressure		[MPa]	0.3 ... 0.8					0.4 ... 0.8			
		[bar]	3 ... 8					4 ... 8			
Max. tightening torque for valve mounting		[Nm]	0.25					0.25			
Materials			Die-cast aluminium					PPA reinforced			
Product weight		[g]	56					35	42	42	42

Technical data – Valve width 14 mm								
Code			M	J	N	K	H	B
Design			Piston spool valve					
Sealing principle			Soft					
Overlap			Positive overlap					
Reset method			Pneumatic spring					Mechanical spring
Switching times	On	[ms]	13	9	12	12	12	16
	Off	[ms]	30	–	38	38	38	50
	Change-over	[ms]	–	24	–	–	–	26
Standard nominal flow rate		[l/min]	550 ... 670	550 ... 670	550 ... 650	550 ... 600	550 ... 650	550 ... 630
Note on standard nominal flow rate			MPA-S: 550 l/min MPA-L: 670 l/min	MPA-S: 550 l/min MPA-L: 670 l/min	MPA-S: 550 l/min MPA-L: 650 l/min	MPA-S: 550 l/min MPA-L: 600 l/min	MPA-S: 550 l/min MPA-L: 650 l/min	MPA-S: 550 l/min MPA-L: 630 l/min
Operating pressure		[MPa]	–0.09 ... +1		0.3 ... 1			–0.09 ... +1
		[bar]	–0.9 ... +10		3 ... 10			–0.9 ... +10
Pilot pressure		[MPa]	0.3 ... 0.8					
		[bar]	3 ... 8					
Max. tightening torque for valve mounting		[Nm]	0.65					
Materials			Die-cast aluminium					
Product weight		[g]	77					

Data sheet – Solenoid valve

Technical data – Valve width 14 mm								
Code			G	E	X	W	D	I
Design			Piston spool valve					
Sealing principle			Soft					
Overlap			Positive overlap					
Reset method			Mechanical spring		Pneumatic spring			
Switching times	On	[ms]	13	13	12	12	12	10
	Off	[ms]	52	50	20	20	30	28
	Change-over	[ms]	26	26	–	–	–	–
Standard nominal flow rate		[l/min]	500 ... 610	420 ... 480	360 ... 400	300 ... 340	550 ... 650	550 ... 670
Note on standard nominal flow rate			MPA-S: 500 l/min MPA-L: 610 l/min	MPA-S: 420 l/min MPA-L: 480 l/min	MPA-S: 360 l/min MPA-L: 400 l/min	MPA-S: 340 l/min MPA-L: 300 l/min	MPA-S: 550 l/min MPA-L: 650 l/min	MPA-S: 550 l/min MPA-L: 670 l/min
Operating pressure		[MPa]	–0.09 ... +1				0.3 ... 1	
		[bar]	–0.9 ... +10				3 ... 10	
Pilot pressure		[MPa]	0.3 ... 0.8					
		[bar]	3 ... 8					
Max. tightening torque for valve mounting		[Nm]	0.65					
Materials			Die-cast aluminium					
Product weight		[g]	77					

Technical data – Valve width 14 mm							
Code			MS	NS	KS	HS	DS
Design			Piston spool valve				
Sealing principle			Soft				
Overlap			Positive overlap				
Reset method			Mechanical spring				
Switching times	On	[ms]	13	12	12	12	10
	Off	[ms]	30	23	23	23	25
	Change-over	[ms]	–	–	–	–	–
Standard nominal flow rate		[l/min]	550 ... 670	470 ... 520	470 ... 560	470 ... 520	500 ... 570
Note on standard nominal flow rate			MPA-S: 550 l/min MPA-L: 670 l/min	MPA-S: 470 l/min MPA-L: 520 l/min	MPA-S: 470 l/min MPA-L: 560 l/min	MPA-S: 470 l/min MPA-L: 520 l/min	MPA-S: 500 l/min MPA-L: 570 l/min
Operating pressure		[MPa]	–0.09 ...+0.8				
		[bar]	–0.9 ... +8				
Pilot pressure		[MPa]	0.3 ... 0.8				
		[bar]	3 ... 8				
Max. tightening torque for valve mounting		[Nm]	0.65	0.25			
Materials			Die-cast aluminium				
Product weight		[g]	77				

Data sheet – Solenoid valve

Technical data – Valve width 20 mm								
Code			M	J	N	K	H	B
Design			Piston spool valve					
Sealing principle			Soft					
Overlap			Positive overlap					
Reset method			Pneumatic spring					Mechanical spring
Switching times	On	[ms]	15	9	8	8	8	11
	Off	[ms]	28	–	28	28	28	46
	Change-over	[ms]	–	22	–	–	–	23
Standard nominal flow rate		[l/min]	700	670	550	500	550	510
Operating pressure		[MPa]	–0.09 ... +1		0.3 ... 1			–0.09 ... +1
		[bar]	–0.9 ... +10		3 ... 10			–0.9 ... +10
Pilot pressure		[MPa]	0.3 ... 0.8					
		[bar]	3 ... 8					
Max. tightening torque for valve mounting		[Nm]	0.65					
Materials			Die-cast aluminium					
Product weight		[g]	100					

Technical data – Valve width 20 mm								
Code			G	E	X	W	D	I
Design			Piston spool valve					
Sealing principle			Soft					
Overlap			Positive overlap					
Reset method			Mechanical spring		Pneumatic spring			
Switching times	On	[ms]	10	11	13	13	7	7
	Off	[ms]	40	47	22	22	25	23
	Change-over	[ms]	21	23	–	–	–	–
Standard nominal flow rate		[l/min]	610	590	470	470	650	650
Operating pressure		[MPa]	–0.09 ... +1				0.3 ... 1	
		[bar]	–0.9 ... +10				3 ... 10	
Pilot pressure		[MPa]	0.3 ... 0.8					
		[bar]	3 ... 8					
Max. tightening torque for valve mounting		[Nm]	0.65					
Materials			Die-cast aluminium					
Product weight		[g]	100					

Data sheet – Solenoid valve

Technical data – Valve width 20 mm							
Code			MS	NS	KS	HS	DS
Design			Piston spool valve				
Sealing principle			Soft				
Overlap			Positive overlap				
Reset method			Mechanical spring				
Switching times	On	[ms]	8	12	12	12	12
	Off	[ms]	36	25	25	25	25
	Change-over	[ms]	–	–	–	–	–
Standard nominal flow rate		[l/min]	670 ... 840	550 ... 620	500	550	650 ... 820
Note on standard nominal flow rate			MPA-S: 670 l/min MPA-L: 840 l/min	MPA-S: 550 l/min MPA-L: 620 l/min	–	–	MPA-S: 650 l/min MPA-L: 820 l/min
Operating pressure		[MPa]	–0.09 ...+0.8				
		[bar]	–0.9 ... +8				
Pilot pressure		[MPa]	0.3 ... 0.8				
		[bar]	3 ... 8				
Max. tightening torque for valve mounting		[Nm]	0.65				
Materials			Die-cast aluminium				
Product weight		[g]	100				

Data sheet – Solenoid valve

Safety characteristics				
		Valve width 10 mm	Valve width 14 mm	Valve width 20 mm
Max. positive test pulse with 0 signal	[µs]	400	400	400
Max. negative test pulse with 1 signal	[µs]	200	200	900
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		

Current consumption per solenoid coil at nominal voltage				
Width		10 mm	14 mm	20 mm
Nominal pick-up current	[mA]	50	50	110
Nominal current with current reduction	[mA]	10	10	23
Time until current reduction	[ms]	20	20	20

Electrical data		
Nominal voltage	[V DC]	24
Operating voltage range	[V DC]	18 ... 30
Residual ripple	[Vss]	4
Degree of protection to EN 60529		IP67 (for all types of signal transmission in assembled state)

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)
Ambient temperature	[°C]	–5 ... +50
Temperature of medium	[°C]	–5 ... +50
Storage temperature	[°C]	–20 ... +40
Relative humidity		Max. 90% at 40°C
Corrosion resistance class CRC[1)]		1
CE marking (see declaration of conformity)		To EU EMC Directive[2)]
Certification		c UL us - Recognized (OL)

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. Dry indoor application 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).

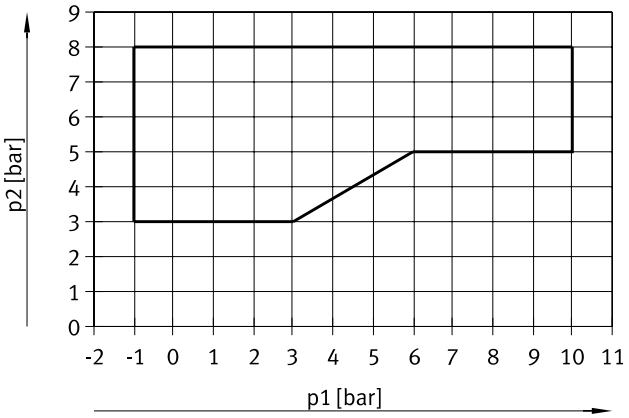
2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... → Support/Downloads.
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Materials	
Housing	Die-cast aluminium, reinforced PPA
Seals	NBR
Note on materials	RoHS-compliant

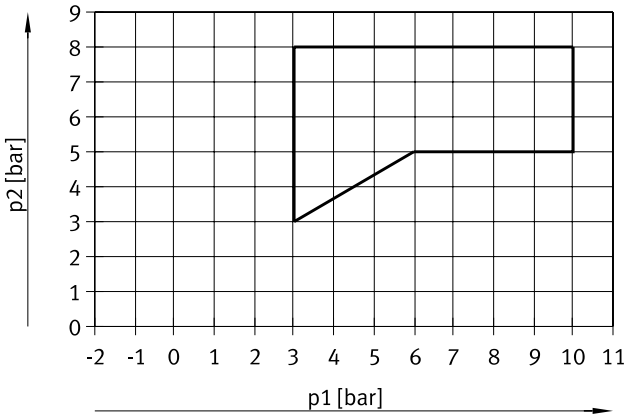
Data sheet – Solenoid valve

Pilot pressure p2 as a function of working pressure p1 with external pilot air supply

For valves with code: M, J, B, G, E, W, X

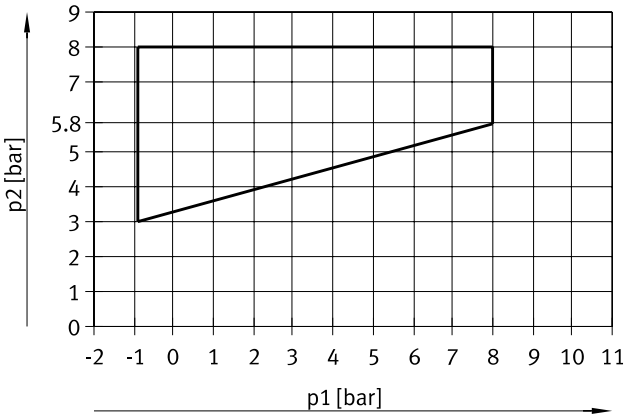


For valves with code: N, K, H, D, I

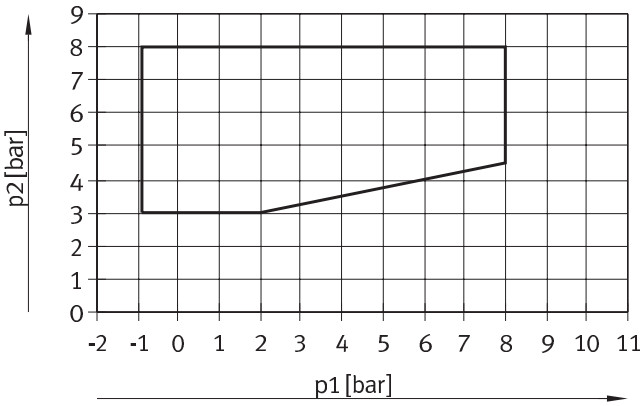


Pilot pressure p2 as a function of working pressure p1 for valves with mechanical spring return

For valves in width 10 mm with code: MS, NS, KS, HS, DS

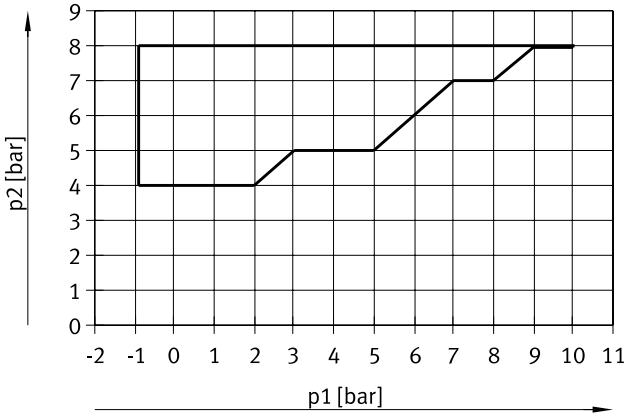


For valves in width 20 mm with code: MS, NS, KS, HS, DS



For valves in width 14 mm with code: NS, KS, HS, DS

For polymer poppet valves in width 10 mm with code: MU, NU, KU, HU

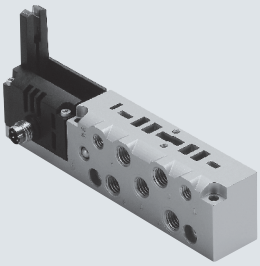


Data sheet – Sub-base

- Flow rate
  VMPA1: up to 360 l/min
  VMPA14: up to 670 l/min
  VMPA2: up to 870 l/min

- Voltage
  24 V DC

- Valve width
  VMPA1: 10 mm
  VMPA14: 14 mm
  VMPA2: 20 mm



General technical data					
Width			10 mm	14 mm	20 mm
Electrical connection			Plug M8x1, 4-pin, to EN 60947-5-2		
Type of mounting			With through-hole		
Mounting position			Any		
Pneumatic connections					
Supply port		1	M7	G1/8	G1/8
Exhaust port		3	M7	G1/8	G1/8
		5	M7	G1/8	G1/8
Working ports		2	M7	G1/8	G1/8
		4	M7	G1/8	G1/8
Pilot air connection		12/14	M5	M5	M5
Pilot exhaust air port		82/84	M5	M5	M5

Operating and environmental conditions				
Type			VMPA...-1	VMPA...-EX1E
Operating medium			Compressed air to ISO 8573-1:2010 [7:4:4]	
Note on the operating/pilot medium			Lubricated operation possible (in which case lubricated operation will always be required)	
Operating pressure	Internal pilot air supply	[MPa]	0.3 ... 0.8	
		[bar]	3 ... 8	
	External pilot air supply	[MPa]	–0.09 ... +1	
		[bar]	–0.9 ... +10	
Pilot pressure		[bar]	3 ... 8	
Ambient temperature		[°C]	–5 ... +50	
CE marking (see declaration of conformity)			To EU EMC Directive[1)]	To EU EMC Directive[1)]
			–	To EU Explosion Protection Directive (ATEX)

1) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... → Support/Downloads.
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

ATEX[1)]			
Type		VMPA...-EX1E	
ATEX category gas		II 3G	**Note**
Type of ignition protection for gas		Ex nA IIC T4 X Gc	Also applies to the sub-base for individual connection type VMPA...EX1E with retrofitted valve (see declaration of conformity).
Explosion-proof ambient temperature	[°C]	–5 ≤ Ta ≤ +50	
CE marking (see declaration of conformity)		To EU Explosion Protection Directive (ATEX)	

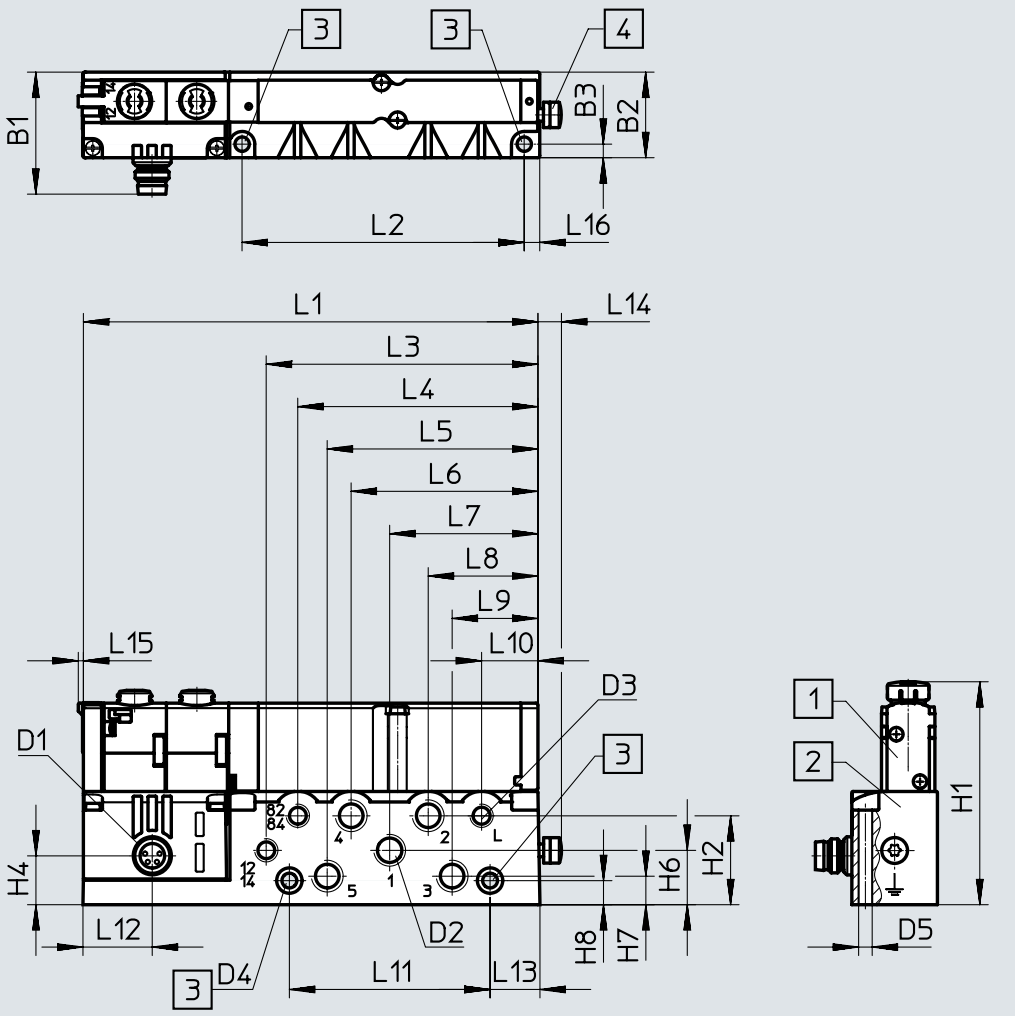
1) For special ATEX applications please speak to your technical consultant

Materials	
Sub-base	Die-cast aluminium
Note on materials	RoHS-compliant

Data sheet

Dimensions Download CAD data ➔ www.festo.com

Solenoid valve, width 10 mm, on individual sub-base



[1] Solenoid valve
[2] Individual sub-base
[3] 4x mounting holes for screw M3
[4] Earthing screw

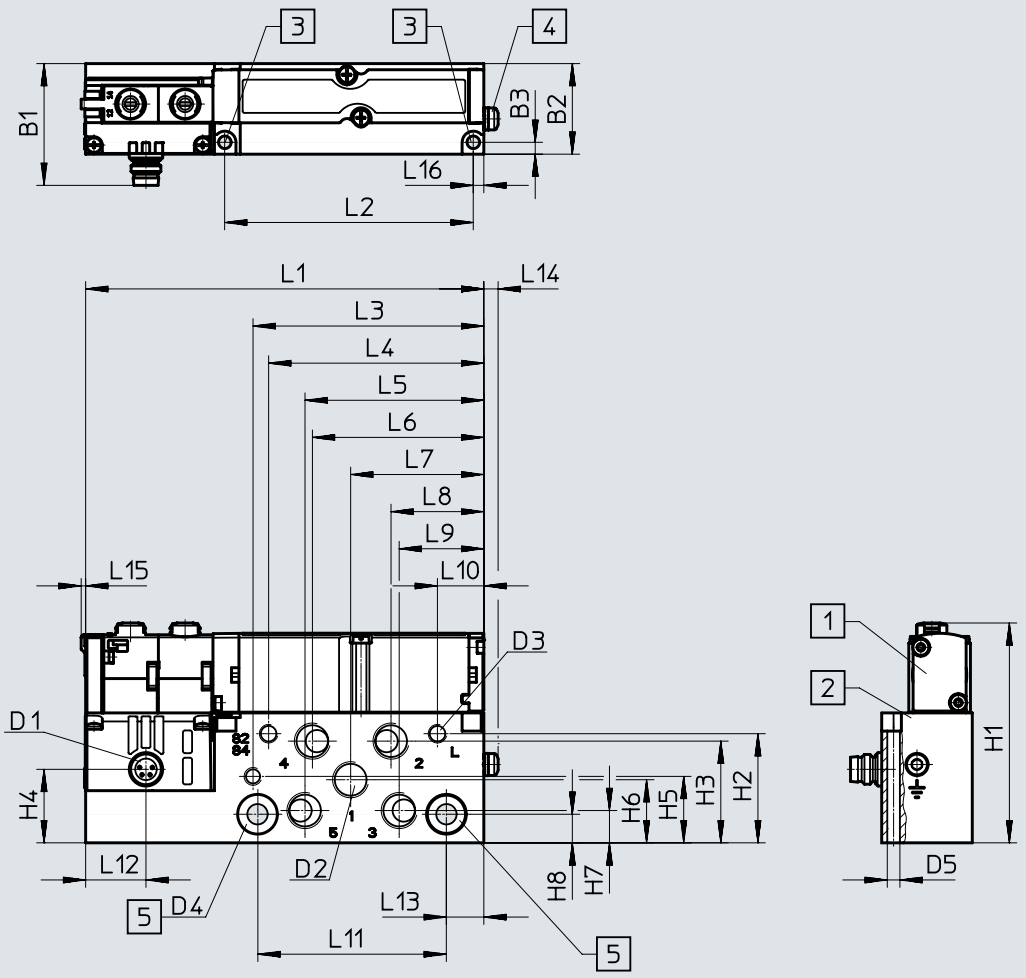
Type	B1	B2	B3	D1	D2	D3	D4 ⌀	D5 ⌀	H1	H2	H4	H6	H7	H8
VMPA1-...	28.8	20.2	3.2	M8x1	M7	M5	3.4	3.4	52.2	21	11.6	12.9	6.8	5.7

Type	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16
VMPA1-...	107.3	66.6	64.2	56.7	49.8	44.1	35	25.9	20.3	13.3	47.4	16.4	11.3	5.6	1.2	3.2

Data sheet

Dimensions Download CAD data ➔ www.festo.com

Solenoid valve, width 14 mm, on individual sub-base



[1] Solenoid valve
[2] Individual sub-base
[3] 4x mounting holes for screw M3
[4] Earthing screw
[5] 2x mounting holes for screw M5

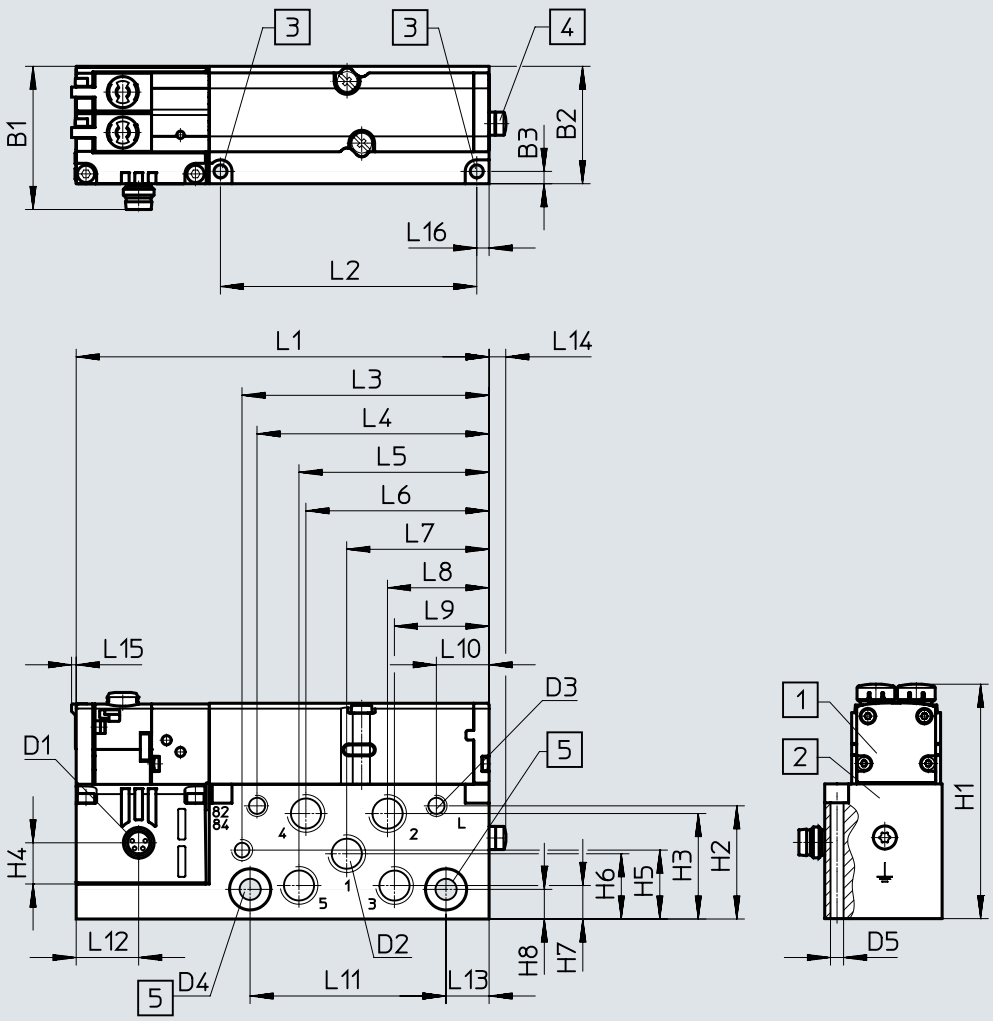
Type	B1	B2	B3	D1	D2	D3	D4 ⌀	D5 ⌀	H1	H2	H3	H4	H5	H6	H7	H8
VMPA14-...	35.1	24.4	3.2	M8x1	G1/8	M5	5.5	3.4	59	29.4	27.4	19.8	17.9	17	8.7	7.7

Type	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16
VMPA14-...	107.3	67	62.2	58	48.2	46.2	35.9	25	22.8	12.5	50.9	16.3	10.1	3.9	1.2	2.9

Data sheet

Dimensions Download CAD data ➔ www.festo.com

Solenoid valve, width 20 mm, on individual sub-base



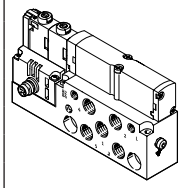
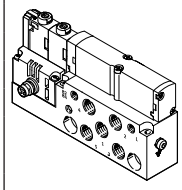
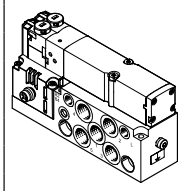
[1] Solenoid valve
[2] Individual sub-base
[3] 2x mounting holes for screw M3
[4] Earthing screw
[5] 2x mounting holes for screw M5

Type	B1	B2	B3	D1	D2	D3	D4 ⌀	D5 ⌀	H1	H2	H3	H4	H5	H6	H7	H8
VMPA2-...	37.2	30.5	3.2	M8x1	G1/8	M5	5.5	3.4	60.5	29.4	27.4	10.7	17.9	17	8.7	7.7

Type	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16
VMPA2-...	107.3	66.6	64.2	60.3	49.4	47.6	37	26.4	24.6	13.7	50.9	16.3	11.2	4.4	1.2	3.2

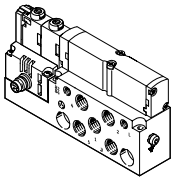
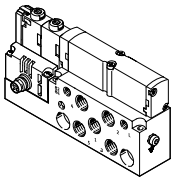
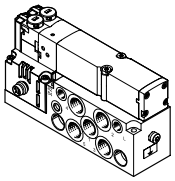
Ordering data

Ordering data

	Valve function	Width [mm]	Part no.	Type
Internal pilot air supply – Set comprising solenoid valve on individual sub-base				
	**5/2-way valve**			
	Single solenoid	10	**533376**	**VMPA1-M1H-M-M7-PI**
		14	**8023543**	**VMPA14-M1H-M-G1/8-PI**
		20	**537963**	**VMPA2-M1H-M-G1/8-PI**
	Single solenoid, mechanical reset	14	**8023554**	**VMPA14-M1H-MS-G1/8-PI**
	Double solenoid	10	**533377**	**VMPA1-M1H-J-M7-PI**
		14	**8023542**	**VMPA14-M1H-J-G1/8-PI**
		20	**537964**	**VMPA2-M1H-J-G1/8-PI**
	**2x 3/2-way valve**			
	Normally open	10	**533382**	**VMPA1-M1H-N-M7-PI**
		14	**8023550**	**VMPA14-M1H-N-G1/8-PI**
		20	**537969**	**VMPA2-M1H-N-G1/8-PI**
	Normally open, mechanical reset	14	**8023556**	**VMPA14-M1H-NS-G1/8-PI**
	Normally closed	10	**533381**	**VMPA1-M1H-K-M7-PI**
		14	**8023549**	**VMPA14-M1H-K-G1/8-PI**
		20	**537968**	**VMPA2-M1H-K-G1/8-PI**
	Normally closed, mechanical reset	14	**8023555**	**VMPA14-M1H-KS-G1/8-PI**
	1x normally open 1x normally closed	10	**533383**	**VMPA1-M1H-H-M7-PI**
		14	**8023551**	**VMPA14-M1H-H-G1/8-PI**
		20	**537970**	**VMPA2-M1H-H-G1/8-PI**
	1x normally open 1x normally closed, mechanical reset	14	**8023558**	**VMPA14-M1H-HS-G1/8-PI**
	5/3-way valve			
	Mid-position pressurised	10	**533378**	**VMPA1-M1H-B-M7-PI**
		14	**8023544**	**VMPA14-M1H-B-G1/8-PI**
		20	**537965**	**VMPA2-M1H-B-G1/8-PI**
	Mid-position closed	10	**533379**	**VMPA1-M1H-G-M7-PI**
		14	**8023546**	**VMPA14-M1H-G-G1/8-PI**
		20	**537966**	**VMPA2-M1H-G-G1/8-PI**
	Mid-position exhausted	10	**533380**	**VMPA1-M1H-E-M7-PI**
		14	**8023545**	**VMPA14-M1H-E-G1/8-PI**
		20	**537967**	**VMPA2-M1H-E-G1/8-PI**
	2x 2/2-way valve			
	Normally closed	10	**533384**	**VMPA1-M1H-D-M7-PI**
		14	**8023552**	**VMPA14-M1H-D-G1/8-PI**
		20	**537971**	**VMPA2-M1H-D-G1/8-PI**
	Normally closed, mechanical reset	14	**8023557**	**VMPA14-M1H-DS-G1/8-PI**
	1x normally closed 1x normally closed, reversible	10	**545230**	**VMPA1-M1H-I-M7-PI**
		14	**8023553**	**VMPA14-M1H-I-G1/8-PI**
		20	**545232**	**VMPA2-M1H-I-G1/8-PI**

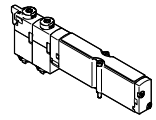
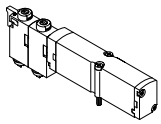
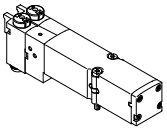
Ordering data

Ordering data

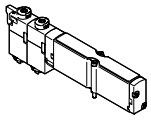
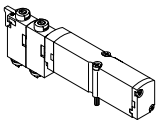
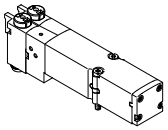
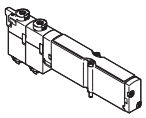
	Valve function	Width [mm]	Part no.	Type
External pilot air supply – Set comprising solenoid valve on individual sub-base				
	**5/2-way valve**			
	Single solenoid	10	**533385**	**VMPA1-M1H-M-S-M7-PI**
		14	**8023560**	**VMPA14-M1H-M-S-G1/8-PI**
		20	**537972**	**VMPA2-M1H-M-S-G1/8-PI**
	Single solenoid, mechanical reset	14	**8023571**	**VMPA14-M1H-MS-S-G1/8-PI**
	Double solenoid	10	**533386**	**VMPA1-M1H-J-S-M7-PI**
		14	**8023559**	**VMPA14-M1H-J-S-G1/8-PI**
		20	**537973**	**VMPA2-M1H-J-S-G1/8-PI**
	**2x 3/2-way valve**			
	Normally open	10	**533391**	**VMPA1-M1H-N-S-M7-PI**
		14	**8023567**	**VMPA14-M1H-N-S-G1/8-PI**
		20	**537978**	**VMPA2-M1H-N-S-G1/8-PI**
	Normally open, mechanical reset	14	**8023573**	**VMPA14-M1H-NS-S-G1/8-PI**
	Normally closed	10	**533390**	**VMPA1-M1H-K-S-M7-PI**
		14	**8023566**	**VMPA14-M1H-K-S-G1/8-PI**
		20	**537977**	**VMPA2-M1H-K-S-G1/8-PI**
	Normally closed, mechanical reset	14	**8023572**	**VMPA14-M1H-KS-S-G1/8-PI**
	1x normally open 1x normally closed	10	**533392**	**VMPA1-M1H-H-S-M7-PI**
		14	**8023568**	**VMPA14-M1H-H-S-G1/8-PI**
		20	**537979**	**VMPA2-M1H-H-S-G1/8-PI**
	1x normally open 1x normally closed, mechanical reset	14	**8023575**	**VMPA14-M1H-HS-S-G1/8-PI**
	5/3-way valve			
	Mid-position pressurised	10	**533387**	**VMPA1-M1H-B-S-M7-PI**
		14	**8023561**	**VMPA14-M1H-B-S-G1/8-PI**
		20	**537974**	**VMPA2-M1H-B-S-G1/8-PI**
	Mid-position closed	10	**533388**	**VMPA1-M1H-G-S-M7-PI**
		14	**8023563**	**VMPA14-M1H-G-S-G1/8-PI**
		20	**537975**	**VMPA2-M1H-G-S-G1/8-PI**
	Mid-position exhausted	10	**533389**	**VMPA1-M1H-E-S-M7-PI**
		14	**8023562**	**VMPA14-M1H-E-S-G1/8-PI**
		20	**537976**	**VMPA2-M1H-E-S-G1/8-PI**
	2x 2/2-way valve			
	Normally closed	10	**533393**	**VMPA1-M1H-D-S-M7-PI**
		14	**8023569**	**VMPA14-M1H-D-S-G1/8-PI**
		20	**537980**	**VMPA2-M1H-D-S-G1/8-PI**
	Normally closed, mechanical reset	14	**8023574**	**VMPA14-M1H-DS-S-G1/8-PI**
	1x normally closed 1x normally closed, reversible only	10	**545231**	**VMPA1-M1H-I-S-M7-PI**
		14	**8023570**	**VMPA14-M1H-I-S-G1/8-PI**
		20	**545233**	**VMPA2-M1H-I-S-G1/8-PI**

Ordering data

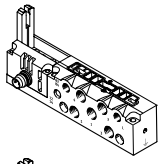
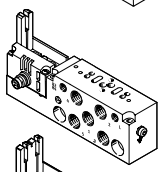
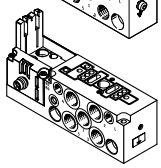
Ordering data

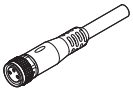
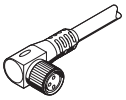
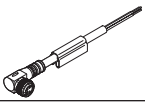
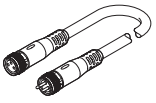
	Valve function	Width [mm]	Part no.	Type
Individual solenoid valve, piston spool valve				
	**5/2-way valve**			
	Single solenoid	10	**533342**	**VMPA1-M1H-M-PI**
		14	**573718**	**VMPA14-M1H-M-PI**
		20	**537952**	**VMPA2-M1H-M-PI**
	Single solenoid, mechanical spring return	10	**571334**	**VMPA1-M1H-MS-PI**
		14	**573974**	**VMPA14-M1H-MS-PI**
		20	**571333**	**VMPA2-M1H-MS-PI**
	Double solenoid	10	**533343**	**VMPA1-M1H-J-PI**
		14	**573717**	**VMPA14-M1H-J-PI**
		20	**537953**	**VMPA2-M1H-J-PI**
	**2x 3/2-way valve**			
	Normally open	10	**533348**	**VMPA1-M1H-N-PI**
		14	**573725**	**VMPA14-M1H-N-PI**
		20	**537958**	**VMPA2-M1H-N-PI**
	Normally open, mechanical spring return	10	**556839**	**VMPA1-M1H-NS-PI**
		14	**575977**	**VMPA14-M1H-NS-PI**
		20	**568655**	**VMPA2-M1H-NS-PI**
	Normally closed	10	**533347**	**VMPA1-M1H-K-PI**
		14	**573724**	**VMPA14-M1H-K-PI**
		20	**537957**	**VMPA2-M1H-K-PI**
	Normally closed, mechanical spring return	10	**556838**	**VMPA1-M1H-KS-PI**
		14	**575976**	**VMPA14-M1H-KS-PI**
		20	**568656**	**VMPA2-M1H-KS-PI**
	1x normally open, 1x normally closed	10	**533349**	**VMPA1-M1H-H-PI**
		14	**573726**	**VMPA14-M1H-H-PI**
		20	**537959**	**VMPA2-M1H-H-PI**
	1x normally open, 1x normally closed, mechanical spring return	10	**556840**	**VMPA1-M1H-HS-PI**
		14	**575979**	**VMPA14-M1H-HS-PI**
		20	**568658**	**VMPA2-M1H-HS-PI**
	5/3-way valve			
	Mid-position pressurised	10	**533344**	**VMPA1-M1H-B-PI**
		14	**573719**	**VMPA14-M1H-B-PI**
		20	**537954**	**VMPA2-M1H-B-PI**
	Mid-position closed	10	**533345**	**VMPA1-M1H-G-PI**
		14	**573721**	**VMPA14-M1H-G-PI**
		20	**537955**	**VMPA2-M1H-G-PI**
	Mid-position exhausted	10	**533346**	**VMPA1-M1H-E-PI**
		14	**573720**	**VMPA14-M1H-E-PI**
		20	**537956**	**VMPA2-M1H-E-PI**

Ordering data

Ordering data	Valve function	Width [mm]	Part no.	Type
Individual solenoid valve, piston spool valve				
	**3/2-way valve**			
	Normally open, external compressed air supply	10	**540050**	**VMPA1-M1H-W-PI**
		14	**573723**	**VMPA14-M1H-W-PI**
		20	**540051**	**VMPA2-M1H-W-PI**
	Normally closed, external compressed air supply	10	**534415**	**VMPA1-M1H-X-PI**
		14	**573722**	**VMPA14-M1H-X-PI**
		20	**537961**	**VMPA2-M1H-X-PI**
	2x 2/2-way valve			
	Normally closed	10	**533350**	**VMPA1-M1H-D-PI**
		14	**573727**	**VMPA14-M1H-D-PI**
		20	**537960**	**VMPA2-M1H-D-PI**
	Normally closed, mechanical spring return	10	**556841**	**VMPA1-M1H-DS-PI**
		14	**575978**	**VMPA14-M1H-DS-PI**
		20	**568657**	**VMPA2-M1H-DS-PI**
	1x normally closed 1x normally closed, reversible	10	**543605**	**VMPA1-M1H-I-PI**
		14	**573728**	**VMPA14-M1H-I-PI**
		20	**543703**	**VMPA2-M1H-I-PI**
Individual solenoid valve, polymer poppet valve				
	**5/2-way valve**			
	Single solenoid, mechanical spring return	10	**553113**	**VMPA1-M1H-MU-PI**
	2x 3/2-way valve			
	Normally open, mechanical spring return	10	**553111**	**VMPA1-M1H-NU-PI**
	Normally closed, mechanical spring return	10	**553110**	**VMPA1-M1H-KU-PI**
	1x normally open, 1x normally closed, mechanical spring return	10	**553112**	**VMPA1-M1H-HU-PI**

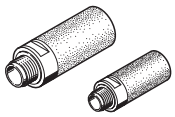
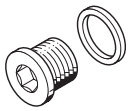
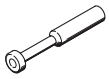
Ordering data

Ordering data Designation			Width [mm]	Part no.	Type
Sub-base for individual connection					
	Without ATEX specification	Internal pilot air supply	10	**533394**	**VMPA1-IC-AP-1**
			14	**8023666**	**VMPA14-IC-AP-1**
			20	**537981**	**VMPA2-IC-AP-1**
		External pilot air supply	10	**533395**	**VMPA1-IC-AP-S-1**
			14	**8023667**	**VMPA14-IC-AP-S-1**
			20	**537982**	**VMPA2-IC-AP-S-1**
	With ATEX category ➔ 21	Internal pilot air supply	10	**8005149**	**VMPA1-IC-AP-1-EX1E**
			14	**8023668**	**VMPA14-IC-AP-1-EX1E**
			20	**8005151**	**VMPA2-IC-AP-1-EX1E**
		External pilot air supply	10	**8005150**	**VMPA1-IC-AP-S-1-EX1E**
			14	**8023669**	**VMPA14-IC-AP-S-1-EX1E**
			20	**8005152**	**VMPA2-IC-AP-S-1-EX1E**

Ordering data Designation		Part no.	Type	PU[1]
Cover				
	Cover cap for manual override with coded cover cap, manual override non-detenting	**540897**	**VMPA-HBT-B**	10
	Cover cap for manual override, concealed, manual override blocked	**540898**	**VMPA-HBV-B**	10
	Cover cap for manual override, manual override detenting, can be operated manually without accessories	**8002234**	**VAMC-L1-CD**	10
	Inscription label holder for an inscription label and cover for the switching status indication and the manual override (blocked)	**570818**	**ASLR-D-L1**	10
Connecting cable, individual connection				
	• Straight socket, M8x1, 4-pin, • Open end, 4-wire	2.5 m	**158960**	**SIM-M8-4GD-2.5-PU**	1
		5 m	**158961**	**SIM-M8-4GD-5-PU**	1
	• Angled socket, M8x1, 4-pin • Open end, 4-wire	2.5 m	**158962**	**SIM-M8-4WD-2.5-PU**	1
		5 m	**158963**	**SIM-M8-4WD-5-PU**	1
	• Straight socket, M8x1, 4-pin, • Open end, 4-wire	2.5 m	**541342**	**NEBU-M8G4-K-2.5-LE4**	1
		5 m	**541343**	**NEBU-M8G4-K-5-LE4**	1
	• Angled socket, M8x1, 4-pin • Open end, 4-wire	2.5 m	**541344**	**NEBU-M8W4-K-2.5-LE4**	1
		5 m	**541345**	**NEBU-M8W4-K-5-LE4**	1
	Modular system for a choice of connecting cables		–	**➔ Internet: nebu**	

1) Packaging unit.

Accessories

Ordering data Designation			Part no.	Type	PU[1]
Push-in fitting					
	Connecting thread M5 for tubing O.D.	3 mm	**153313**	**QSM-M5-3-I**	10
		4 mm	**153315**	**QSM-M5-4-I**	10
			578370	**NPQH-DK-M5-Q4-P10**	10
		6 mm	**153317**	**QSM-M5-6-I**	10
			578371	**NPQH-DK-M5-Q6-P10**	10
	Connecting thread M7 for tubing O.D.	4 mm	**153319**	**QSM-M7-4-I**	10
			578372	**NPQH-DK-M7-Q4-P10**	10
		6 mm	**153321**	**QSM-M7-6-I**	10
			132919	**QSM-M7-6-I-R-100**	100
			578373	**NPQH-DK-M7-Q6-P10**	10
	Connecting thread G1/8 for tubing O.D.	6 mm	**186107**	**QS-G1/8-6-I**	10
			578375	**NPQH-DK-G18-Q6-P10**	10
		8 mm	**186109**	**QS-G1/8-8-I**	10
			578376	**NPQH-DK-G18-Q8-P10**	10
Silencer					
	Connecting thread	M5	**165003**	**UC-M5**	1
		M7	**161418**	**UC-M7**	1
		G1/8	**161419**	**UC-1/8**	1
	Push-in sleeve connection	3 mm	**165005**	**UC-QS-3H**	1
		4 mm	**165006**	**UC-QS-4H**	1
		6 mm	**165007**	**UC-QS-6H**	1
		8 mm	**175611**	**UC-QS-8H**	1
Blanking plug					
	M5 thread		**578404**	**NPQH-BK-M5-P10**	10
	M7 thread		**174309**	**B-M7**	10
			578405	**NPQH-BK-M7-P10**	10
	G1/8 thread		**3568**	**B-1/8**	10
			578406	**NPQH-BK-G18-P10**	10
Plug					
	Blanking plug for tubing O.D.	4 mm	**153267**	**QSC-4H**	10
		6 mm	**153268**	**QSC-6H**	10
		8 mm	**153269**	**QSC-8H**	10

1) Packaging unit.

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