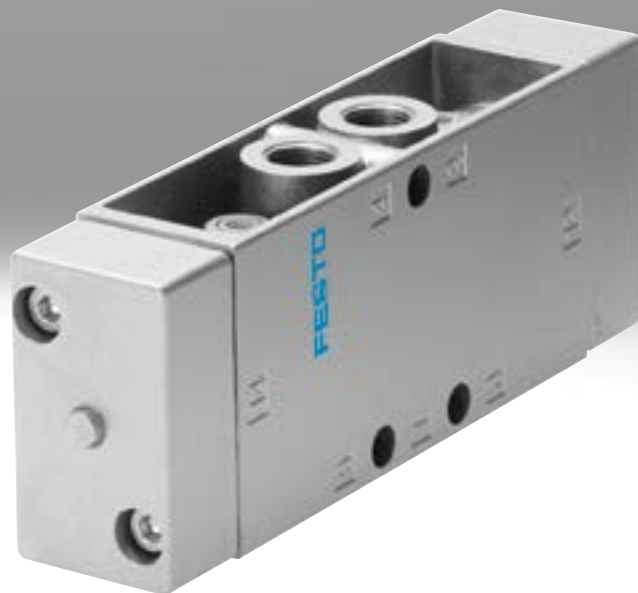


## Solenoid/pneumatic valves, Tiger Classic

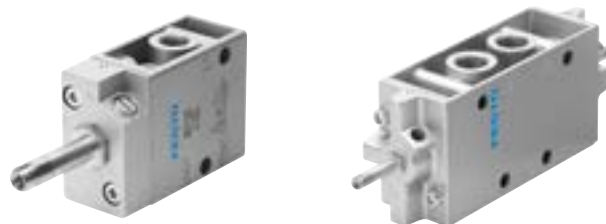
**FESTO**



## Key features

### General

- Very sturdy poppet valve concept for all 3/2 and 5/2-way valves
- Pneumatic or electrical actuation with F solenoid coil
- With flow rates of up to 7500 l/min
- Pipe thread in sizes G1/8, G1/4, G1/2 and G3/4
- Tried-and-tested mounting using hollow bolt on PAL or PRS rail
- Optimised response times with patented U-ring and servo control



### Solenoid coils

#### F solenoid coils

- |  |  |  |  |
|--|--|--|--|
| <p>Voltage:</p> <ul style="list-style-type: none"> <li>• 12 to 230 V DC</li> <li>• 12 to 240 V AC (50 to 60 Hz)</li> </ul> | <p>Power consumption:</p> <ul style="list-style-type: none"> <li>• 4.1 to 5.5 W DC</li> <li>• 3.85 to 9 VA AC</li> </ul> | <ul style="list-style-type: none"> <li>• Selected types conform to the ATEX directive for potentially explosive atmospheres</li> </ul> | <ul style="list-style-type: none"> <li>• Solenoid coil can be easily exchanged later</li> <li>• Solenoid coil not included in scope of delivery</li> </ul> |
|--|--|--|--|

### Variants

#### VL/O-3-...

Depending on selected connections:  
Normally closed or normally open

#### MFH-3-..., MOFH-3-...

- MFH-3-...  
Normally closed
- MOFH-3-...  
Normally open

These valves can be converted from one function to the other by rotating the seal under the cover.

#### MFH-3-...-S

This valve type can be used within a range of 0 to 0.8 MPa and also as MOFH (through flow when not actuated) with a separate pilot line.

#### MFH-5-...-S

The external pilot air connection means that these valves can also be used with low operating pressures.

## Key features

**Manifold assembly**

With PAL manifold rail



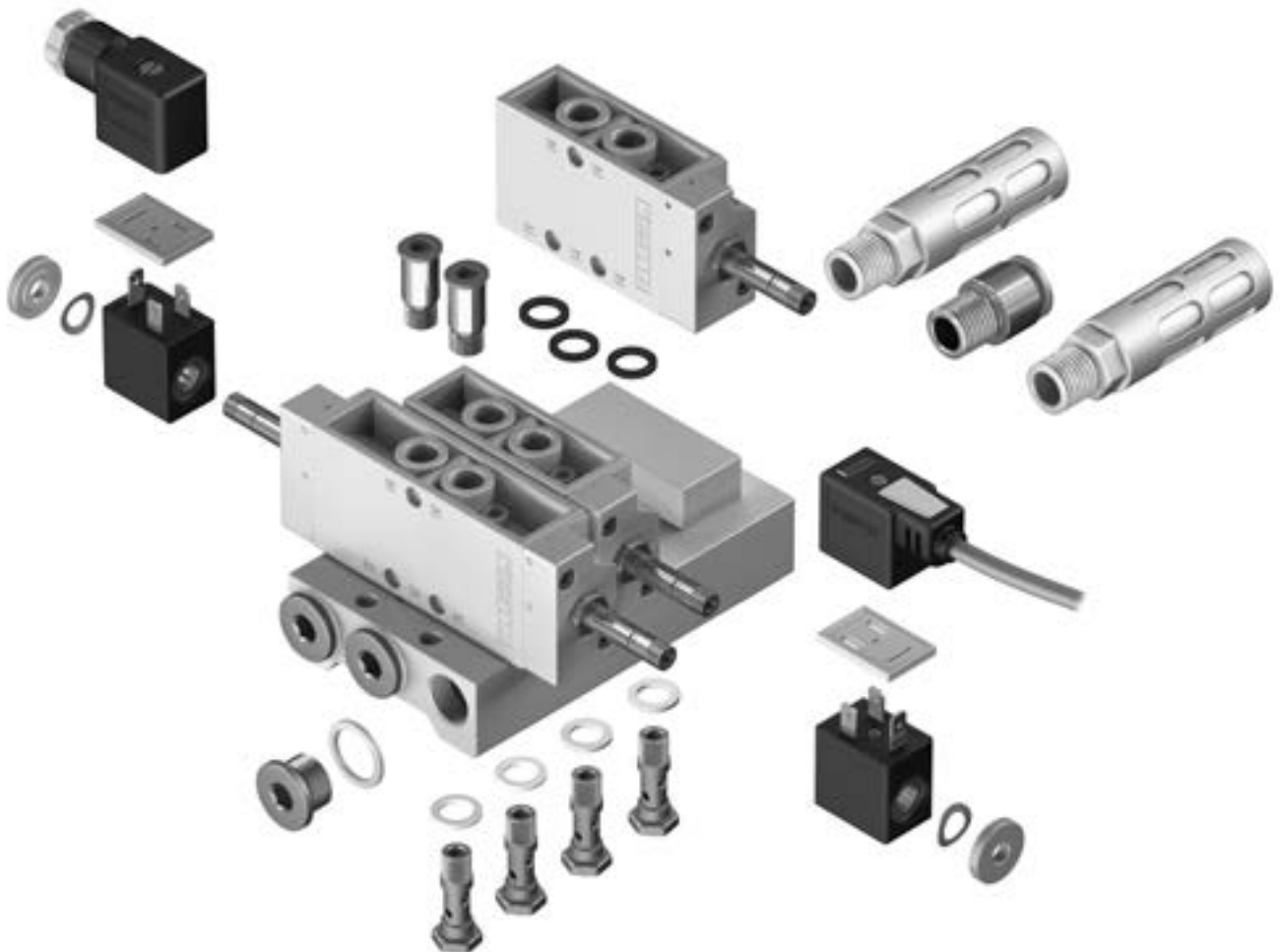
With PRS manifold block



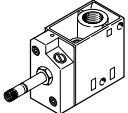
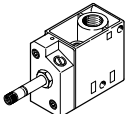
The Tiger Classic valves can be mounted on manifold rails PAL with common supply port or on manifold blocks PRS with common supply port and common exhausts. The valves are mounted on the rails and blocks with hollow bolts. The manifold rail and manifold block have 2 to 6 valve positions.

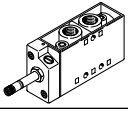
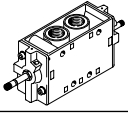
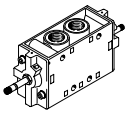
Vacant positions can be sealed on manifold rails PAL with cap nuts, or with cover plates on manifold blocks PRS.

A separate pressure level can be supplied to individual valves via hollow bolts with threaded connection.



Product range overview

Function	Design	Type	Pneumatic connection	Operating voltage	
				[V DC]	[V AC]
3/2-way valves	<b>Solenoid valve</b>				
		MFH	G1/8	12, 24, 42, 48	24, 42, 48, 110, 230, 240
			G1/4		
			G1/2		
			G3/4		
		MOFH	G1/8	12, 24, 42, 48	24, 42, 48, 110, 230, 240
			G1/4		
			G1/2		
G3/4					

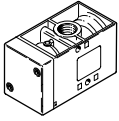
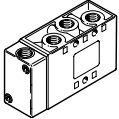
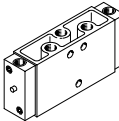
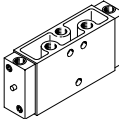
Function	Design	Type	Pneumatic connection	Operating voltage	
				[V DC]	[V AC]
5/2-way valves	<b>Solenoid valve</b>				
		MFH	G1/8	12, 24, 42, 48	24, 42, 48, 110, 230, 240
			G1/4		
			G1/2		
	<b>Double solenoid valve</b>				
		JMFH	G1/8	12, 24, 42, 48	24, 42, 48, 110, 230, 240
			G1/4		
			G1/2		
	<b>Double solenoid valve with dominant signal</b>				
		JMFDH	G1/8	12, 24, 42, 48	24, 42, 48, 110, 230, 240
G1/4					

## Product range overview

Type	Normal position		Pilot air supply		Reset method		→ Page
	Closed	Open	Internal	External	Pneumatic spring	Mechanical spring	
<b>Solenoid valve</b>							
<b>MFH</b>	■	–	■	■	–	■	12
	■	–	■	■	–	■	
	■	–	■	■	–	■	
	■	–	■	■	–	■	
<b>MOFH</b>	–	■	■	–	–	■	12
	–	■	■	–	–	■	
	–	■	■	–	–	■	
	–	■	■	–	–	■	

Type	Pilot air supply		Reset method		→ Page
	Internal	External	Pneumatic spring	Mechanical spring	
<b>Solenoid valve</b>					
<b>MFH</b>	■	■	–	■	18
	■	■	–	■	
	■	■	–	■	
<b>Double solenoid valve</b>					
<b>JMFH</b>	■	■	–	–	24
	■	■	–	–	
	■	■	–	–	
<b>Double solenoid valve with dominant signal</b>					
<b>JMFDH</b>	–	■	–	–	24
	–	■	–	–	

Product range overview

Function	Design	Type	Pneumatic connection	Reset method		→ Page/Internet
				Pneumatic spring	Mechanical spring	
3/2-way valves		VL/O	G1/8	-	■	31
			G1/4	-	■	
			G1/2	-	■	
			G3/4	-	■	
			<b>Pneumatic valve</b>			
5/2-way valves		VL	G1/8	-	■	37
			G1/4	-	■	
			G1/2	-	■	
			<b>Pneumatic double pilot valve</b>			
		JH	G1/8	-	-	41
			G1/4	-	-	
			G1/2	-	-	
	<b>Pneumatic bistable valve with dominant signal</b>					
		JDH	G1/8	-	-	41
			G1/4	-	-	

## Type codes

001	Series
<b>MCH</b>	Solenoid valve, with armature tube for C solenoid coil, single solenoid, normally closed
<b>MFH</b>	Solenoid valve, with armature tube for F solenoid coil, single solenoid, normally closed
<b>MOCH</b>	Solenoid valve, with armature tube for C solenoid coil, single solenoid, normally open
<b>MOFH</b>	Solenoid valve, with armature tube for F solenoid coil, single solenoid, normally open
<b>JMFH</b>	Solenoid valve, with armature tube for F solenoid coil, double solenoid
<b>JMFDH</b>	Solenoid valve, with armature tube for F solenoid coil, with dominant signal, double solenoid
<b>JH</b>	Pneumatic double pilot valve
<b>JDH</b>	Pneumatic double pilot valve with dominant signal
<b>VL/O</b>	Pneumatic valve, monostable, normally open or closed
<b>VL</b>	Pneumatic valve, monostable

002	Valve function
<b>3</b>	3/2-way valve
<b>5</b>	5/2-way valve

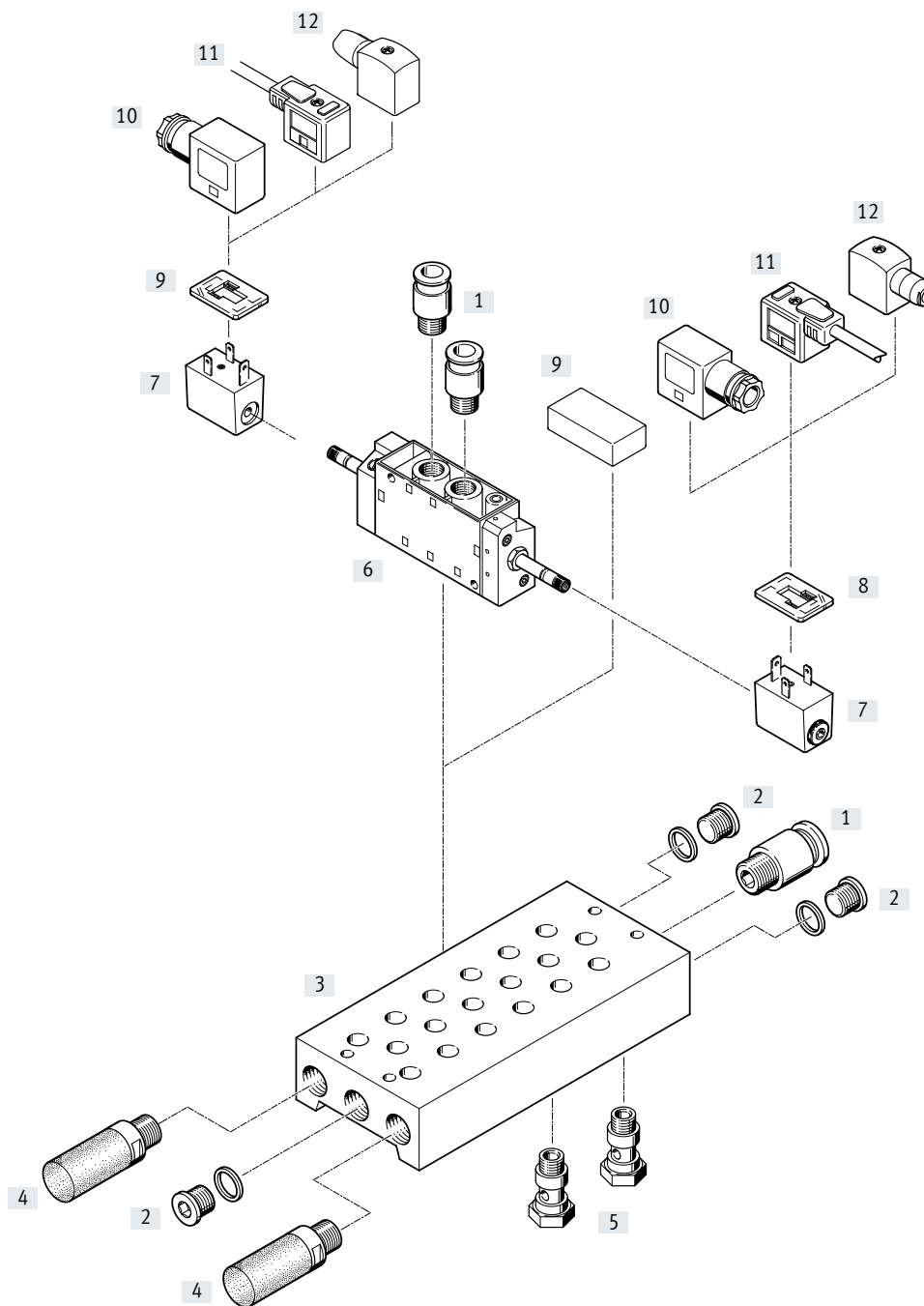
003	Pneumatic connection
<b>G18</b>	G1/8
<b>G14</b>	G1/4
<b>G12</b>	G1/2
<b>G34</b>	G3/4

004	EU certification
	None
<b>EX4</b>	II 2GD

005	Pilot air
<b>S</b>	External
	Internal

Peripherals overview solenoid valves

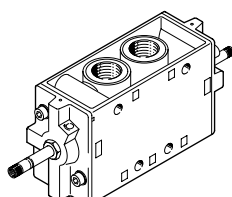
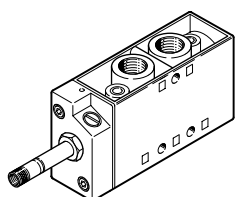
Mounting on manifold block



Variants

MFH-5-...

JMFH-5-...



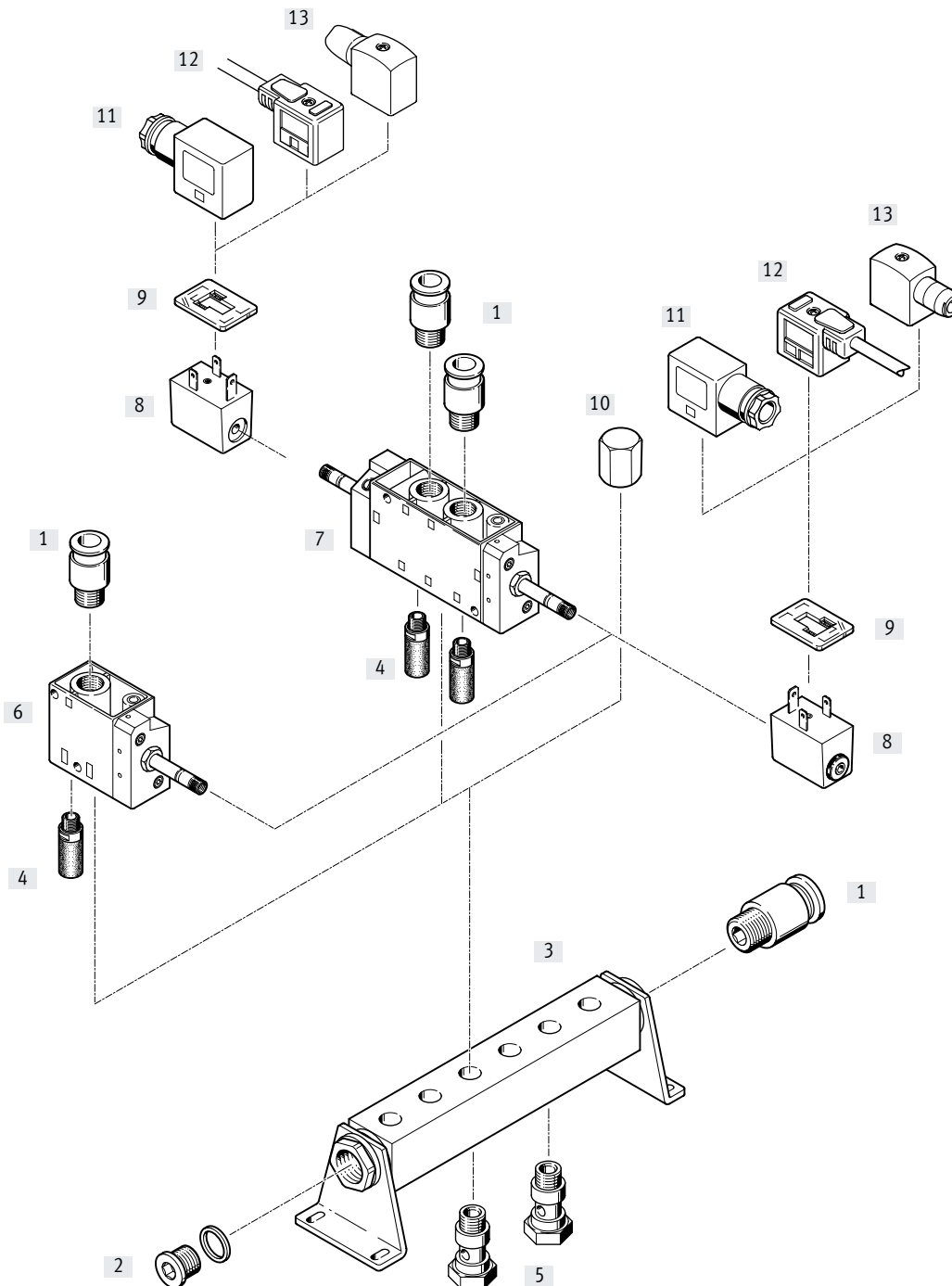


## Peripherals overview solenoid valves

Accessories	Brief description	→ Page/Internet
[1] Push-in fitting QS	For connecting compressed air tubing with standard O.D.	qs
[2] Blanking plug B	3 included in the scope of delivery of the manifold block PRS	blanking plug
[3] Manifold block PRS		48
[4] Silencer	For mounting in exhaust ports	-
[5] Hollow bolt VT	For distributing compressed air or for separate compressed air supply	47
[6] Solenoid valve JMFH	For F solenoid coil	-
[7] F solenoid coil MSFG, MSFW		50
[8] Illuminating seal M...-LD	For indicating the switching status	51
[9] Cover plate PRSB	For covering a vacant position	49
[10] Plug socket MSSD-F	For valves MFH, JMFH	50
[11] Connecting cable KMF	For valves MFH, JMFH	50
[12] Plug socket MSSD-F-S	For valves MFH, JMFH	50

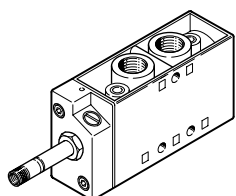
Peripherals overview solenoid valves

Mounting on manifold rail

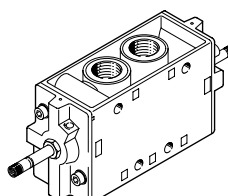


Variants

MFH-5-...





JMFH-5-...



## Peripherals overview solenoid valves

Accessories	Brief description	→ Page/Internet
[1] Push-in fitting QS	For connecting compressed air tubing with standard O.D.	qs
[2] Blanking plug B	1 included in the scope of delivery of the manifold rail PAL	blanking plug
[3] Manifold rail PAL		46
[4] Silencer	For mounting in exhaust ports	-
[5] Hollow bolt VT	For distributing compressed air or for separate compressed air supply	47
[6] Solenoid valve MFH	For F solenoid coil	4
[7] Solenoid valve JMFH	For F solenoid coil	4
[8] F solenoid coil MSFG, MSPW		50
[9] Illuminating seal M...-LD	For indicating the switching status	51
[10] Cap nut VTM	For blanking a vacant position	47
[11] Plug socket MSSD-F	For valves MFH, JMFH	50
[12] Connecting cable KMF	For valves MFH, JMFH	50
[13] Plug socket MSSD-F-S	For valves MFH, JMFH	50

Data sheet – 3/2-way valves

-  Flow rate  
500 ... 7500 l/min
-  Voltage  
12, 24, 42, 48 V DC  
24, 42, 48, 110, 230,  
240 V AC

Sets of wearing parts → page 17



General technical data		G1/8	G1/4	G1/2	G3/4
Pneumatic connection		G1/8	G1/4	G1/2	G3/4
Valve function		3/2-way, single solenoid			
Design		Poppet seat			
Overlap		Negative overlap			
Sealing principle		Soft			
Actuation type		Electrical			
Reset method		Mechanical spring			
Type of control		Piloted			
Pilot air supply		Internal or external			
Flow direction		Non-reversible (reversible/reversible with restrictions with external pilot air supply)			
Exhaust function		Can be throttled			
Manual override		Detenting			
Type of mounting		Via through-hole or on manifold rail/manifold block <sup>1)</sup>			
Mounting position		Any			
Electrical connection		Via F solenoid coil, to be ordered separately			
Port for venting hole		M5 (only ATEX types)			
Pilot exhaust air port 82/84		M5			
Pilot air port 12		M5	M5	G1/8	G1/8
b value		–	–	0.3	–
Nominal width	[mm]	5	7	14	19
Standard nominal flow rate	[l/min]	500	800	3700	7500
Product weight	[g]	240	320	1100	1260

1) Types MFH-3-3/4- and MOFH-3-3/4- can only be mounted via through-hole

Safety data		MFH- ... -EX	MOFH- ... -EX	JMFH- ... -EX	JMFDH- ... -EX
Type		MFH- ... -EX	MOFH- ... -EX	JMFH- ... -EX	JMFDH- ... -EX
Max. switching frequency	[Hz]	3	–	25	16
Max. positive test pulse with 0 signal	[s]	2200			
Max. negative test pulse with 1 signal	[s]	3700 <sup>1)</sup>			

1) Not valid for types MFH-3-3/4- and MOFH-3-3/4-

ATEX		MFH- ... -EX, JMFH- ... -EX
Type		MFH- ... -EX, JMFH- ... -EX
ATEX category for gas		II 2G
Type of ignition protection for gas		Ex h IIC T4 Gb
ATEX category for dust		II 2D
Type of ignition protection for dust		Ex h IIIC T130°C Db
Explosion-proof ambient temperature	[°C]	–5 ≤ Ta ≤ +40
CE marking (see declaration of conformity)		To EU Explosion Protection Directive (ATEX)
UKCA marking (see declaration of conformity)		To UK EX instructions
Explosion protection certification outside the EU		EPL Db (GB)
		EPL Gb (GB)
Degree of protection		IP65 (in assembled state)

## Data sheet – 3/2-way valves

Operating and environmental conditions			G1/8	G1/4	G1/2	G3/4	G1/8-EX	G1/4-EX	G1/2-EX	G3/4-EX	
Operating medium			Compressed air to ISO 8573-1:2010 [7:4:4]								
Pilot medium			Compressed air to ISO 8573-1:2010 [7:4:4] (with external pilot air supply)								
Note on operating/pilot medium			Lubricated operation possible (in which case lubricated operation will always be required)								
Operating pressure	Internal pilot air supply	[MPa]	0.15 ... 0.8		0.2 ... 0.8		0.15 ... 0.8		0.2 ... 0.8		
		[bar]	1.5 ... 8		2 ... 8		1.5 ... 8		2 ... 8		
	External pilot air supply	[MPa]	-0.095 ... 1								
		[bar]	-0.95 ... 10								
Pilot pressure (external pilot air supply)			[MPa]	0.1 ... 0.8							
			[bar]	1 ... 8							
Ambient temperature	[°C]	[°C]	-5 ... +40								
Temperature of medium	[°C]	[°C]	-10 ... +60				-5 ... +40				
Storage temperature	[°C]	[°C]	-20 ... +60								
Certification			c UL us - Recognized (OL)				-				
Note on materials			RoHS-compliant								
Corrosion resistance class CRC <sup>1)</sup>			1								

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 coverings, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

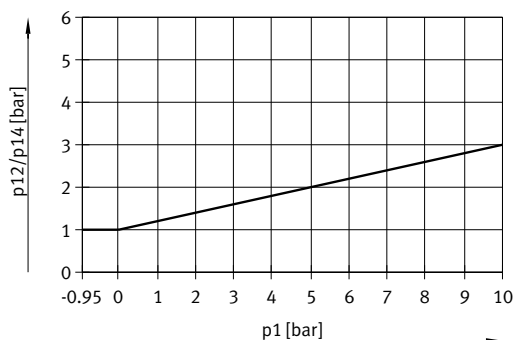
Electrical data		
<b>F solenoid coil</b>		
Electrical connection		Plug pins for plug sockets MSSD-F, KMF
Operating voltage	Direct voltage	[V DC] 12, 24, 42, 48
	Alternating voltage	[V AC] 24, 42, 48, 110, 230, 240 (50 ... 60 Hz)
Characteristic coil data	Direct voltage	[W] 4.5
	Alternating voltage	[VA] Pull: 7.5 Hold: 6
Degree of protection to EN 60529		IP65 (in combination with plug socket)

Valve switching times [ms]									
Pneumatic connection	G1/8		G1/4		G1/2		G3/4		Normal position
	Closed	Open	Closed	Open	Closed	Open	Closed	Open	
<b>Internal pilot air supply</b>									
On	9	9	10	14	18	18	36	40	
Off	29	29	29	41	90	90	32	29	
<b>External pilot air supply</b>									
On	9	-	10	-	18	-	36	-	
Off	29	-	29	-	90	-	32	-	

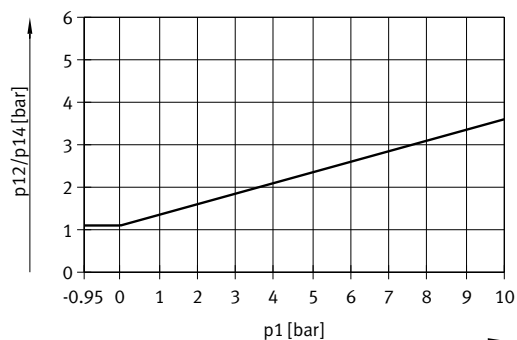
Data sheet – 3/2-way valves

Minimum pilot pressure  $p_{12}/p_{14}$  as a function of operating pressure  $p_1$  (external pilot air supply)

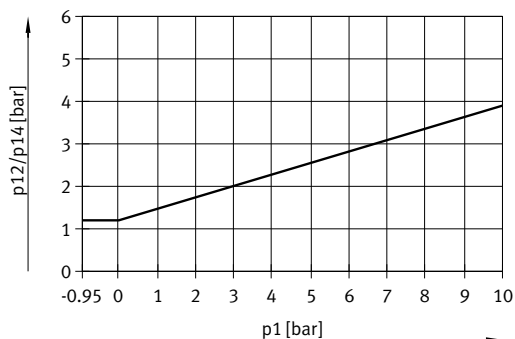
MFH-3-1/8-S



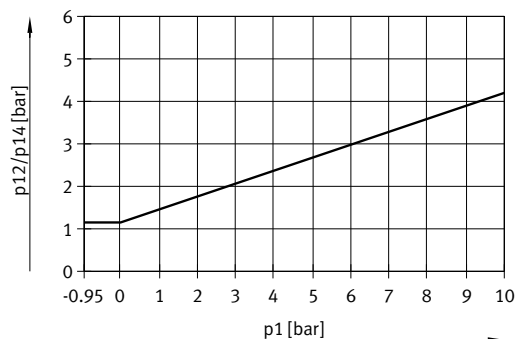
MFH-3-1/4-S



MFH-3-1/2-S

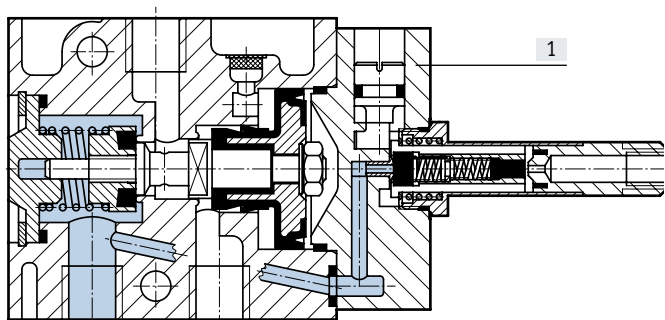


MFH-3-3/4-S



Materials

Sectional view



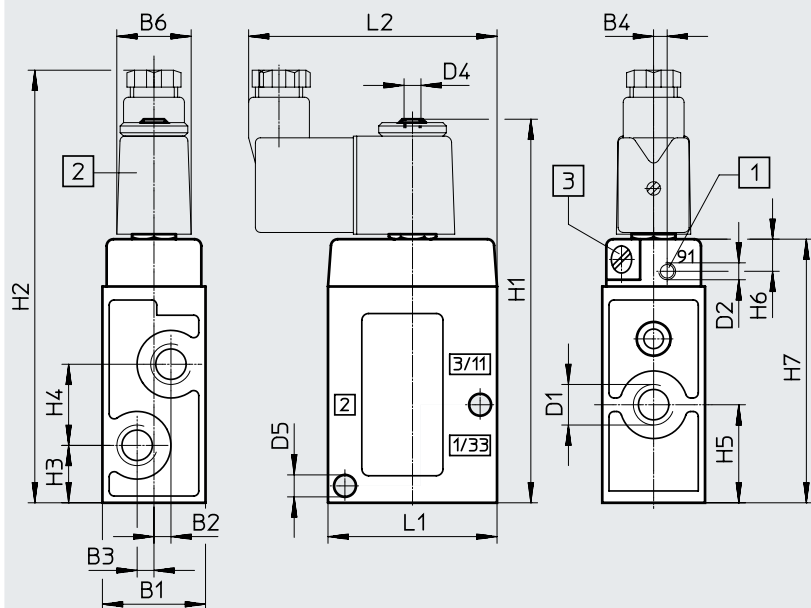
[1]	Housing	Die-cast aluminium
-	Seals	NBR

Data sheet – 3/2-way valves

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

MFH, MOFH



- [1] Additional connection for external pilot air with MFH-3... /MOFH-3...
- [2] Solenoid coil can be rotated 360°
- [3] Manual override can be turned 180°

Type	B1	B2	B3	B4	B6	D1	D2	D4	D5 ∅
M...-3-1/8	26 +0.2	3.5	3.5	-	22	G1/8	-	M5	5.5
M...-3-1/8-S				2.7			M5		
M...-3-1/4	30.4 ±0.15	5	5	-		G1/4	-	M5	6.5
M...-3-1/4-S				30.4			M5		
M...-3-1/2	52 ±0.15	8	8	-		G1/2	-	M5	8.6
M...-3-1/2-S				52			G1/8		
M...-3-3/4	68 ±0.15	8	8	-		G3/4	-	M5	8.6
M...-3-3/4-S				68			G1/8		

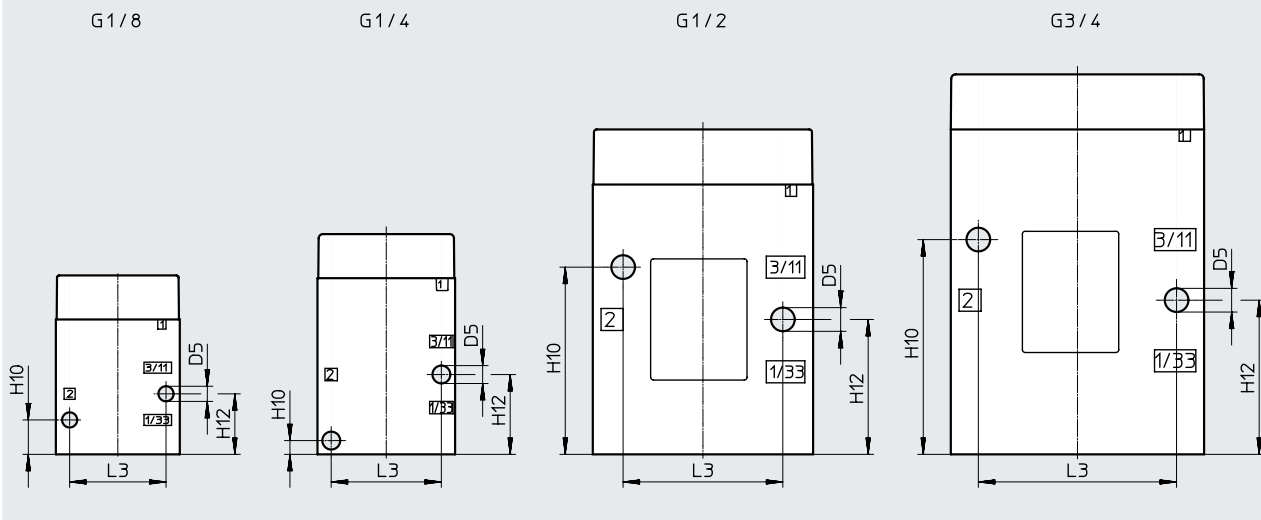
Type	H1	H2	H3	H4	H5	H6	H7	L1	L2
M...-3-1/8	97	111	12.5	19 ±0.15	22	-	63	45 ±0.15	71
M...-3-1/8-S						9.5			
M...-3-1/4	112	126	17	24 ±0.15	29	-	78	50 ±0.15	73.5
M...-3-1/4-S				24		9.5		50	
M...-3-1/2	151	165	30 ±0.15	38 ±0.15	49 ±0.15	-	117	80 ±0.2	88.5
M...-3-1/2-S			30	38	49	10.5		80	
M...-3-3/4	171	187	34	44 ±0.15	56	-	137	92 ±0.2	94.5
M...-3-3/4-S				44		11		92	

Data sheet – 3/2-way valves

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

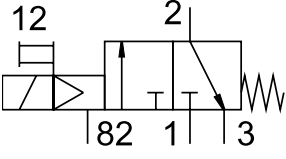
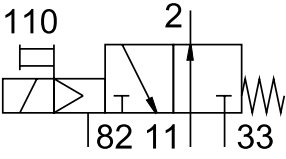
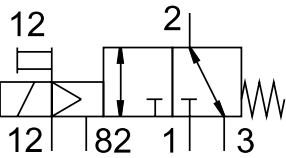
Mounting diagram



Type	D5 ø	H10	H12	L3
M...-3-1/8	5.5	12.5	22	35 ±0.15
M...-3-1/8-S				
M...-3-1/4	6.5	5	29	40 ±0.15
M...-3-1/4-S				
M...-3-1/2	8.6	68	49	58 ±0.2
M...-3-1/2-S				
M...-3-3/4	8.6	78	56	72 ±0.2
M...-3-3/4-S				



## Data sheet – 3/2-way valves

Ordering data Circuit symbol	Description	Pneumatic connection	ATEX category	Part no.	Type
	Without F solenoid coil <sup>1)</sup> , internal pilot air supply	G1/8	–	<b>7802</b>	<b>MFH-3-1/8</b>
			ATEX category → Page 12	<b>535897</b>	<b>MFH-3-1/8-EX</b>
		G1/4	–	<b>9964</b>	<b>MFH-3-1/4</b>
			ATEX category → Page 12	<b>535898</b>	<b>MFH-3-1/4-EX</b>
		G1/2	–	<b>9857</b>	<b>MFH-3-1/2</b>
			ATEX category → Page 12	<b>535899</b>	<b>MFH-3-1/2-EX</b>
		G3/4	–	<b>11967</b>	<b>MFH-3-3/4</b>
			ATEX category → Page 12	<b>536190</b>	<b>MFH-3-3/4-EX</b>
	Without F solenoid coil <sup>1)</sup> , internal pilot air supply	G1/8	–	<b>7877</b>	<b>MOFH-3-1/8</b>
			ATEX category → Page 12	<b>535903</b>	<b>MOFH-3-1/8-EX</b>
		G1/4	–	<b>7876</b>	<b>MOFH-3-1/4</b>
			ATEX category → Page 12	<b>535904</b>	<b>MOFH-3-1/4-EX</b>
		G1/2	–	<b>7884</b>	<b>MOFH-3-1/2</b>
			ATEX category → Page 12	<b>535905</b>	<b>MOFH-3-1/2-EX</b>
		G3/4	–	<b>11969</b>	<b>MOFH-3-3/4</b>
			ATEX category → Page 12	<b>536192</b>	<b>MOFH-3-3/4-EX</b>
	Without F solenoid coil <sup>1)</sup> , external pilot air supply, reversible (no restrictions with vacuum at port 1, restrictions with vacuum at port 3)	G1/8 <sup>2)</sup>	–	<b>7958</b>	<b>MFH-3-1/8-S</b>
			ATEX category → Page 12	<b>535900</b>	<b>MFH-3-1/8-S-EX</b>
		G1/4 <sup>3)</sup>	–	<b>7959</b>	<b>MFH-3-1/4-S</b>
			ATEX category → Page 12	<b>535901</b>	<b>MFH-3-1/4-S-EX</b>
		G1/2 <sup>4)</sup>	–	<b>7960</b>	<b>MFH-3-1/2-S</b>
			ATEX category → Page 12	<b>535902</b>	<b>MFH-3-1/2-S-EX</b>
		G3/4 <sup>5)</sup>	–	<b>11968</b>	<b>MFH-3-3/4-S</b>
			ATEX category → Page 12	<b>536191</b>	<b>MFH-3-3/4-S-EX</b>

1) F solenoid coils → page 50

2) Restrictions with vacuum at port 3: (0 ... -0.7 bar)

3) Restrictions with vacuum at port 3: (0 ... -0.6 bar)



4) Restrictions with vacuum at port 3: (0 ... -0.55 bar)

5) Restrictions with vacuum at port 3: (0 ... -0.4 bar)

## Ordering data – Sets of wearing parts

Pneumatic connection	Part no.	Type
G1/8	<b>104206</b>	<b>MFH-3-1/8</b>
G1/4	<b>104207</b>	<b>MFH-3-1/4</b>
G1/2	<b>104208</b>	<b>MFH-3-1/2</b>

Data sheet – 5/2-way valves

-  - Flow rate  
500 ... 3700 l/min
-  - Voltage  
12, 24, 42, 48 VDC  
24, 42, 48, 110, 230,  
240 V AC

Sets of wearing parts → page 23



General technical data			
Pneumatic connection	G1/8	G1/4	G1/2
Valve function	5/2-way, single solenoid		
Design	Poppet seat		
Overlap	Negative overlap		
Sealing principle	Soft		
Actuation type	Electrical		
Reset method	Mechanical spring		
Type of control	Piloted		
Flow direction	Not reversible		
Pilot air supply	Internal or external		
Exhaust function	Can be throttled		
Manual override	Detenting		
Type of mounting	Via through-hole or on manifold rail/manifold block		
Mounting position	Any		
Electrical connection	Via F solenoid coil, to be ordered separately		
Port for venting hole	M5 (only ATEX types)		
Pilot exhaust air port 82/84	M5		
Pilot air port 14	M5	M5	G1/8
b value	–	0.19	0.32
c value	[l/sbar]	–	–
Nominal width	[mm]	5	7
Standard nominal flow rate	[l/min]	500	1000
Product weight	[g]	270	290
			1135

Safety data		
Max. switching frequency	[Hz]	–
Max. positive test pulse with 0 signal	[µs]	2200
Max. negative test pulse with 1 signal	[µs]	3700

## Data sheet – 5/2-way valves

Operating and environmental conditions			G1/8	G1/4	G1/2	G1/8-EX	G1/4-EX	G1/2-EX
Operating medium			Compressed air to ISO 8573-1:2010 [7:4:4]					
Note on operating/pilot medium			Lubricated operation possible (in which case lubricated operation will always be required)					
Operating pressure	Internal pilot air supply	[MPa]	0.18 ... 0.8	0.22 ... 0.8	0.2 ... 0.8	0.18 ... 0.8	0.22 ... 0.8	0.2 ... 0.8
		[bar]	1.8 ... 8	2.2 ... 8	2 ... 8	1.8 ... 8	2.2 ... 8	2 ... 8
	External pilot air supply	[MPa]	0 ... 1	0 ... 0.8	0 ... 0.8	0 ... 1	0 ... 0.8	0 ... 1
		[bar]	0 ... 10	0 ... 8	0 ... 8	0 ... 10	0 ... 8	0 ... 10
Pilot pressure (external pilot air supply)		[MPa]	0.12 ... 0.8	0.15 ... 0.8	0.15 ... 0.8	0.12 ... 0.8	0.15 ... 0.8	0.1 ... 0.8
		[bar]	1.2 ... 8	1.5 ... 8	1.5 ... 8	1.2 ... 8	1.5 ... 8	1 ... 8
Ambient temperature		[°C]	-5 ... +40					
Temperature of medium		[°C]	-10 ... +60			-5 ... +40		
Storage temperature		[°C]	-20 ... +60					
Note on materials			RoHS-compliant					
Corrosion resistance class CRC <sup>1)</sup>			1					
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 coverings, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Electrical data			
<b>F solenoid coil</b>			
Electrical connection		Plug pins for plug sockets MSSD-F, KMF	
Operating voltage	Direct voltage	[V DC]	12, 24, 42, 48
	Alternating voltage	[V AC]	24, 42, 48, 110, 230, 240 (50 ... 60 Hz)
Characteristic coil data	Direct voltage	[W]	4.5
	Alternating voltage	[VA]	Pull: 7.5 Hold: 6
Degree of protection to EN 60529		IP65 (in combination with plug socket)	

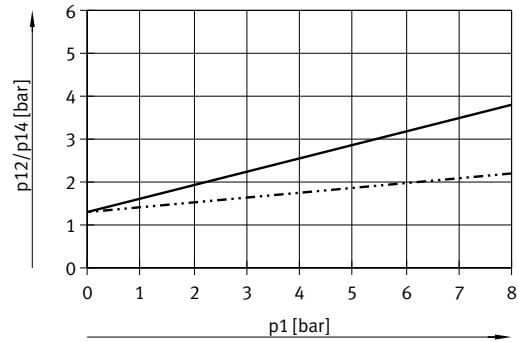
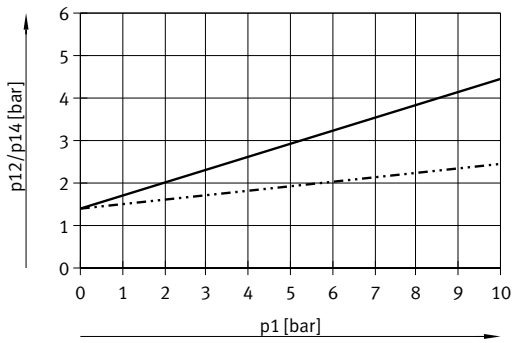
Valve switching times [ms]				
Pneumatic connection		G1/8	G1/4	G1/2
On		8	9	21
Off		36	29	150

Data sheet – 5/2-way valves

Minimum pilot pressure  $p_{12}$ ,  $p_{14}$  as a function of operating pressure  $p_1$  (external pilot air supply)

MFH-5-1/8-S

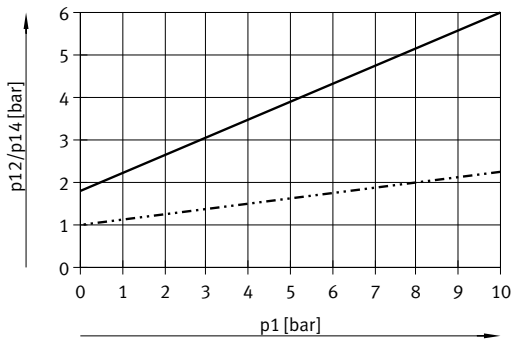
MFH-5-1/4-S



— Exhaust throttled  
 - - - - - Exhaust unthrottled

— Exhaust throttled  
 - - - - - Exhaust unthrottled

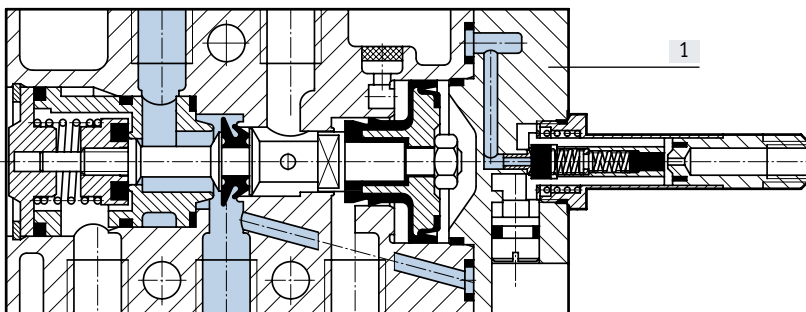
MFH-5-1/2-S



— Exhaust throttled  
 - - - - - Exhaust unthrottled

Materials

Sectional view



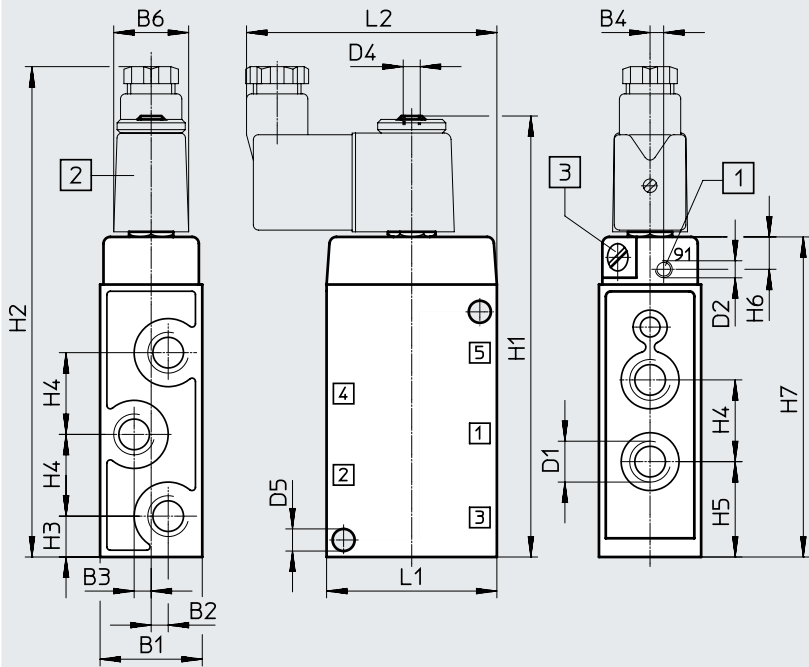
[1]	Housing	Die-cast aluminium
-	Seals	NBR, TPE-U(PU)

Data sheet – 5/2-way valves

Dimensions

MFH

Download CAD data → [www.festo.com](http://www.festo.com)



- [1] Additional connection for external pilot air with MFH-5-...-S
- [2] Solenoid coil can be rotated 360°
- [3] Manual override can be turned 180°

Type	B1	B2	B3	B4	B6	D1	D2	D4	D5 ø
MFH-5-1/8	26 +0.2	3.5 ±0.15	3.5 ±0.15	-	22	G1/8	M5	M5	5.5
MFH-5-1/8-S		3.5	3.5	2.7					5.5 – 6.2
MFH-5-1/4	30.4 ±0.1	-	5 ±0.15	-		G1/4	M5		6.5 ±0.14
MFH-5-1/4-S				4					Min. 6.5
MFH-5-1/2	52 ±0.15	-	8	-		G1/2	G1/8		8.5
MFH-5-1/2-S									

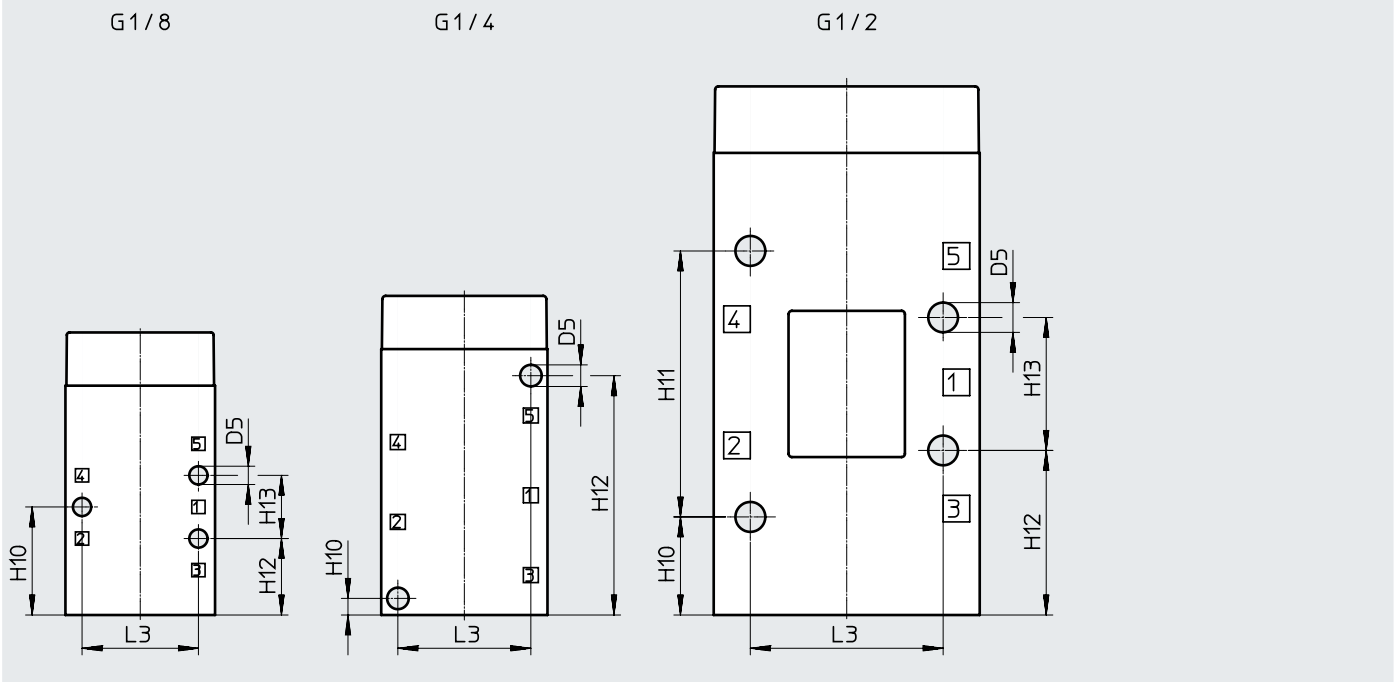
Type	H1	H2	H3	H4	H5	H6	H7	L1	L2
MFH-5-1/8	117	131	13.5	19	23	-	83	45 ±0.15	71
MFH-5-1/8-S		134		19 ±0.15		9.5			71.5
MFH-5-1/4	128	143	12	24 ±0.15	28 +0.1/-0.2	-	94	50 +0.4/-0.2	73.5
MFH-5-1/4-S						9.5			
MFH-5-1/2	192	208.5	32 ±0.15	38 ±0.15	51 ±0.15	-	158	80 +0.4/-0.2	87.5
MFH-5-1/2-S						10.5			

Data sheet – 5/2-way valves

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

Mounting diagram



Type	D5 ø	H10	H11	H12	H13	L3
MFH-5-1/8	5.5	32.5	-	23	19 ±0.15	35 ±0.15
MFH-5-1/8-S	5.5 – 6.2					
MFH-5-1/4	6.5 ±0.14	5	-	72	-	40 ±0.15
MFH-5-1/4-S	Min. 6.5					
MFH-5-1/2	8.5	29.5	80 ±0.15	49.5	40 ±0.1	58 ±0.15
MFH-5-1/2-S						

## Data sheet – 5/2-way valves

Ordering data					
Circuit symbol	Description	Pneumatic connection	ATEX category	Part no.	Type
	Without F solenoid coil <sup>1)</sup> , internal pilot air supply	G1/8	–	<b>9982</b>	<b>MFH-5-1/8</b>
			ATEX category → Page 12	<b>535906</b>	<b>MFH-5-1/8-EX</b>
		G1/4	–	<b>6211</b>	<b>MFH-5-1/4</b>
			ATEX category → Page 12	<b>535907</b>	<b>MFH-5-1/4-EX</b>
		G1/2	–	<b>6420</b>	<b>MFH-5-1/2</b>
			ATEX category → Page 12	<b>535908</b>	<b>MFH-5-1/2-EX</b>
	Without F solenoid coil <sup>1)</sup> , external pilot air supply	G1/8	–	<b>10348</b>	<b>MFH-5-1/8-S</b>
			ATEX category → Page 12	<b>535909</b>	<b>MFH-5-1/8-S-EX</b>
		G1/4	–	<b>10349</b>	<b>MFH-5-1/4-S</b>
			ATEX category → Page 12	<b>535910</b>	<b>MFH-5-1/4-S-EX</b>
		G1/2	–	<b>35547</b>	<b>MFH-5-1/2-S</b>
			ATEX category → Page 12	<b>535911</b>	<b>MFH-5-1/2-S-EX</b>



1) F solenoid coils → page 50

## Ordering data – Sets of wearing parts

Pneumatic connection	Part no.	Type
G1/8	<b>104209</b>	<b>MFH-5-1/8<sup>1)2)</sup></b>
G1/4	<b>104211</b>	<b>MFH-5-1/4<sup>3)4)</sup></b>

- 1) Order assembly sleeve part no. 228389 separately
- 2) Use up to series E602
- 3) Order assembly sleeve part no. 229363 separately
- 4) Use from series 1/81

Data sheet – 5/2-way valves, double solenoid valves

-  - Flow rate  
600 ... 4500 l/min
-  - Voltage  
12, 24, 42, 48 VDC  
24, 42, 48, 110, 230,  
240 V AC

Sets of wearing parts → page 29



General technical data			
Pneumatic connection	G1/8	G1/4	G1/2
Valve function	5/2-way, double solenoid		
Design	Poppet seat		
Overlap	Negative overlap		
Sealing principle	Soft		
Actuation type	Electrical		
Type of control	Piloted		
Flow direction	Not reversible		
Pilot air supply	Internal or external		
Exhaust function	Can be throttled		
Manual override	Detenting		
Type of mounting	Via through-hole or on manifold rail/manifold block		
Mounting position	Any		
Electrical connection	Via F solenoid coil, to be ordered separately		
Port for venting hole	M5 (only ATEX types)		
b value	-	-	0.3
c value	[l/sbar]	-	19.5
Pilot exhaust air port 82/84	M5		
Pilot air port 12/14	M5	M5	G1/2
Nominal width	[mm]	5	7
Standard nominal flow rate	[l/min]	600	1100
Product weight	[g]	260	530
			1210

Safety data			
Type	JMFH- ... -EX	JMFDH- ... -EX	
Max. switching frequency	[Hz]	25	16
Max. positive test pulse with 0 signal	[µs]	2200	
Max. negative test pulse with 1 signal	[µs]	3700	



## Data sheet – 5/2-way valves, double solenoid valves

Operating and environmental conditions			G1/8	G1/4	G1/2	G1/8-EX	G1/4-EX	G1/2-EX
Pneumatic connection								
Operating medium			Compressed air to ISO 8573-1:2010 [7:4:4]					
Note on operating/pilot medium			Lubricated operation possible (in which case lubricated operation will always be required)					
Operating pressure	Internal pilot air supply	[MPa]	0.15 ... 0.8		0.2 ... 0.8	0.15 ... 0.8		0.2 ... 0.8
		[bar]	1.5 ... 8		2 ... 8	1.5 ... 8		2 ... 8
	External pilot air supply	[MPa]	0 ... 1		0 ... 0.8	0 ... 1		0 ... 0.8
		[bar]	0 ... 10		0 ... 8	0 ... 10		0 ... 8
	With dominant signal	[MPa]	0.25 ... 0.8		–	0.25 ... 0.8		–
		[bar]	2.5 ... 8		–	2.5 ... 8		–
Pilot pressure		[MPa]	0.12 ... 0.8		0.05 ... 0.8	0.12 ... 0.8		0.1 ... 0.8
		[bar]	1.2 ... 8		0.5 ... 8	1.2 ... 8		1 ... 8
Ambient temperature		[°C]	–5 ... +40					
Temperature of medium		[°C]	–10 ... +60			–5 ... +40		
Storage temperature		[°C]	–20 ... +60					
Certification			c UL us - Recognized (OL)			–		
Note on materials			RoHS-compliant					
Corrosion resistance class CRC <sup>1)</sup>			1					

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 coverings, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

## Electrical data

F solenoid coil		
Electrical connection		Plug pins for plug sockets MSSD-F, KMF
Operating voltage	Direct voltage	[V DC] 12, 24, 42, 48
	Alternating voltage	[V AC] 24, 42, 48, 110, 230, 240 (50 ... 60 Hz)
Characteristic coil data	Direct voltage	[W] 4.5
	Alternating voltage	[VA] Pull: 7.5 Hold: 6
Degree of protection to EN 60529		IP65 (in combination with plug socket)

## Valve switching times [ms]

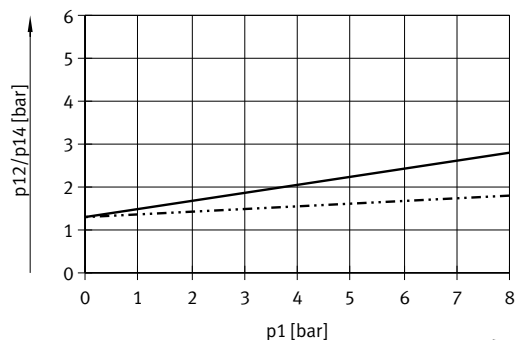
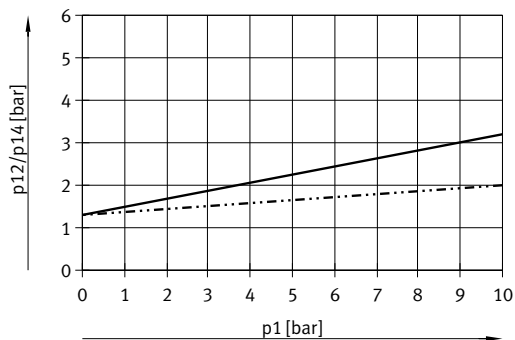
Pneumatic connection	G1/8		G1/4		G1/2	
		Dominant signal at 14		Dominant signal at 14		Dominant signal at 14
Changeover	10	16	11	16	20	–

Data sheet – 5/2-way valves, double solenoid valves

Minimum pilot pressure  $p_{12}$ ,  $p_{14}$  as a function of operating pressure  $p_1$  (external pilot air supply)

JMFH-5-1/8-S

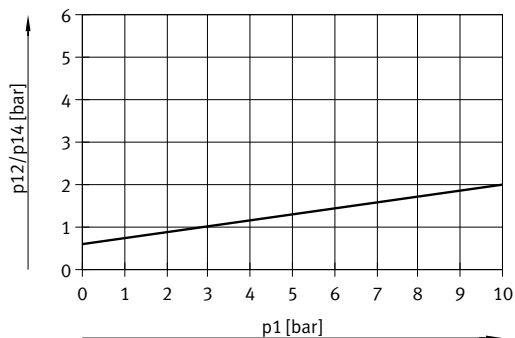
JMFH-5-1/4-S



— Exhaust throttled  
 - - - - - Exhaust unthrottled

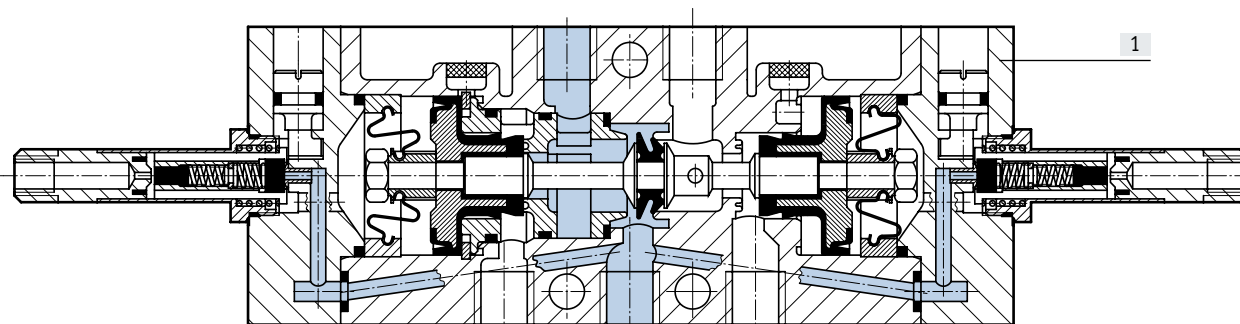
— Exhaust throttled  
 - - - - - Exhaust unthrottled

JMFH-5-1/2-S



Materials

Sectional view

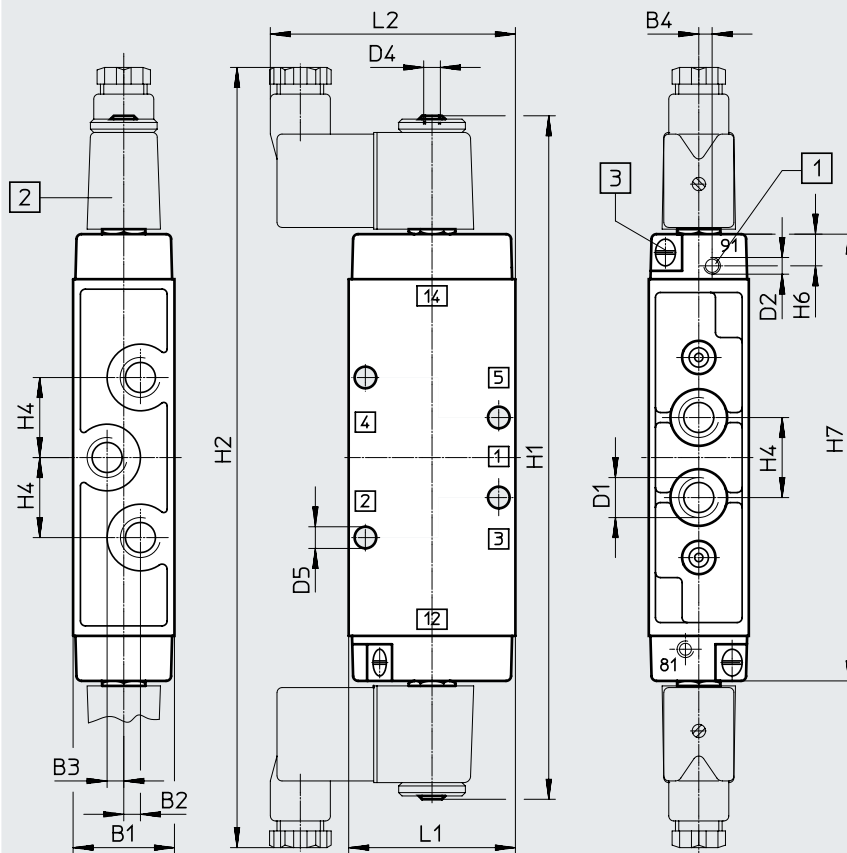


[1]	Housing	Die-cast aluminium
-	Seals	NBR, TPE-U(PU)

## Data sheet – 5/2-way valves, double solenoid valves

## Dimensions

JMFH, JMFHDH

Download CAD data → [www.festo.com](http://www.festo.com)

- [1] Additional connection for external pilot air with JMF...H-5-...S
- [2] Solenoid coil can be rotated 360°
- [3] Manual override can be turned 180°

Type	B1	B2	B3	B4	D1	D2	D4	D5 ∅
JMF...-5-1/8	26 +0.2	3.5 +0.15	3.5 +0.15	–	G1/8	–	M5	5.5
JMF...-5-1/8-S				2.7		M5		
JMF...-5-1/4	30.4 ±0.1	–	5	–	G1/4	–	M5	Min. 6.5
JMF...-5-1/4-S				4		M5		
JMF...-5-1/2	52	–	8	–	G1/2	–	M5	9.6 +0.2
JMF...-5-1/2-S	52 ±0.15					G1/8		8.5

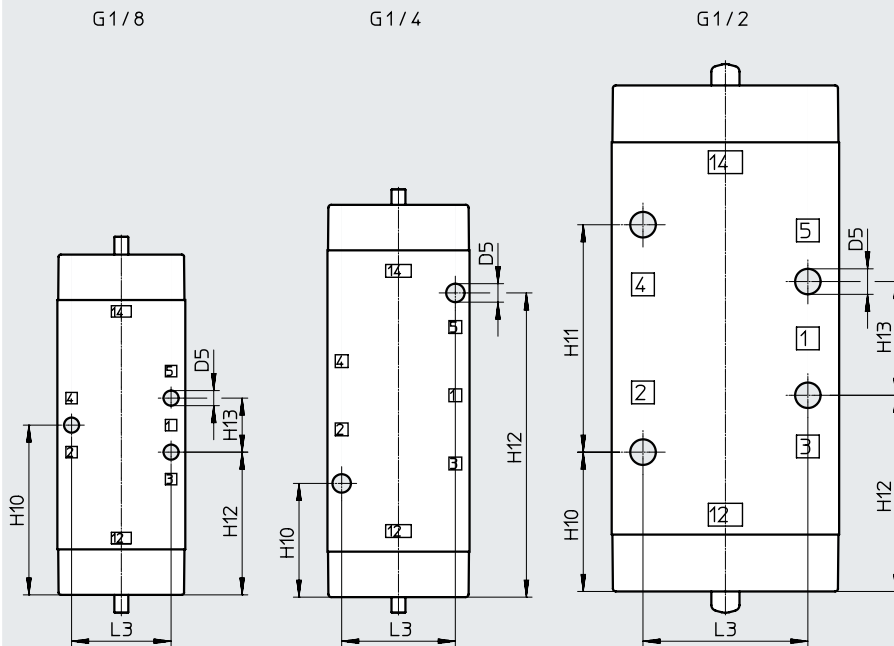
Type	H1	H2	H4	H6	H7	L1	L2
JMF...-5-1/8	184	217	19 ±0.15	–	116.5	45 ±0.15	71.5
JMF...-5-1/8-S				9.5			
JMF...-5-1/4	202	235	24 -0.3	–	134	50 +0.4/-0.2	74
JMF...-5-1/4-S				9.5			
JMF...-5-1/2	244	272	38	–	176	80	88.5
JMF...-5-1/2-S		277	38 ±0.1	10.5		80 +0.4/-0.2	87.5

Data sheet – 5/2-way valves, double solenoid valves

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

Mounting diagram



Type	D5 ∅	H10	H12	H13	L3
JMF...-5-1/8	5.5	19	58.3	-	35
JMF...-5-1/8-S					
JMF...-5-1/4	Min. 6.5	67	67	-	40
JMF...-5-1/4-S					
JMF...-5-1/2	9.6 +0.2	40	88	80	58
JMF...-5-1/2-S	8.5				

## Data sheet – 5/2-way valves, double solenoid valves

Ordering data					
Circuit symbol	Description	Pneumatic connection	ATEX category	Part no.	Type
	Without F solenoid coil <sup>1)</sup> , internal pilot air supply	G1/8	–	<b>8820</b>	<b>JMFH-5-1/8</b>
			ATEX category → Page 12	<b>535912</b>	<b>JMFH-5-1/8-EX</b>
		G1/4	–	<b>10410</b>	<b>JMFH-5-1/4</b>
			ATEX category → Page 12	<b>535913</b>	<b>JMFH-5-1/4-EX</b>
		G1/2	–	<b>10166</b>	<b>JMFH-5-1/2</b>
			ATEX category → Page 12	<b>535914</b>	<b>JMFH-5-1/2-EX</b>
	Without F solenoid coil <sup>1)</sup> , external pilot air supply	G1/8	–	<b>14008</b>	<b>JMFH-5-1/8-S</b>
			ATEX category → Page 12	<b>535915</b>	<b>JMFH-5-1/8-S-EX</b>
		G1/4	–	<b>14009</b>	<b>JMFH-5-1/4-S</b>
			ATEX category → Page 12	<b>535916</b>	<b>JMFH-5-1/4-S-EX</b>
		G1/2	–	<b>35548</b>	<b>JMFH-5-1/2-S</b>
			ATEX category → Page 12	<b>535917</b>	<b>JMFH-5-1/2-S-EX</b>
	Without F solenoid coil <sup>1)</sup> , internal pilot air supply, with dominant signal at 14	G1/8	–	<b>8821</b>	<b>JMFDH-5-1/8</b>
			ATEX category → Page 12	<b>536193</b>	<b>JMFDH-5-1/8-EX</b>
		G1/4	–	<b>10411</b>	<b>JMFDH-5-1/4</b>
			ATEX category → Page 12	<b>536194</b>	<b>JMFDH-5-1/4-EX</b>

1) F solenoid coils → page 50

## Ordering data – Sets of wearing parts

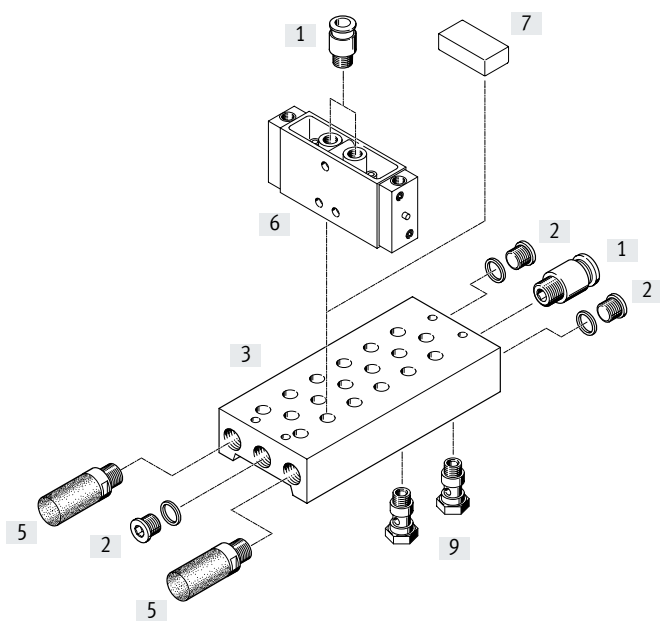
Pneumatic connection	Part no.	Type
G1/8	<b>104891</b>	<b>JMFH-5-1/8<sup>1)</sup></b>
G1/4	<b>104892</b>	<b>JMFH-5-1/4<sup>2)</sup></b>

1) Order assembly sleeve part no. 228389 separately

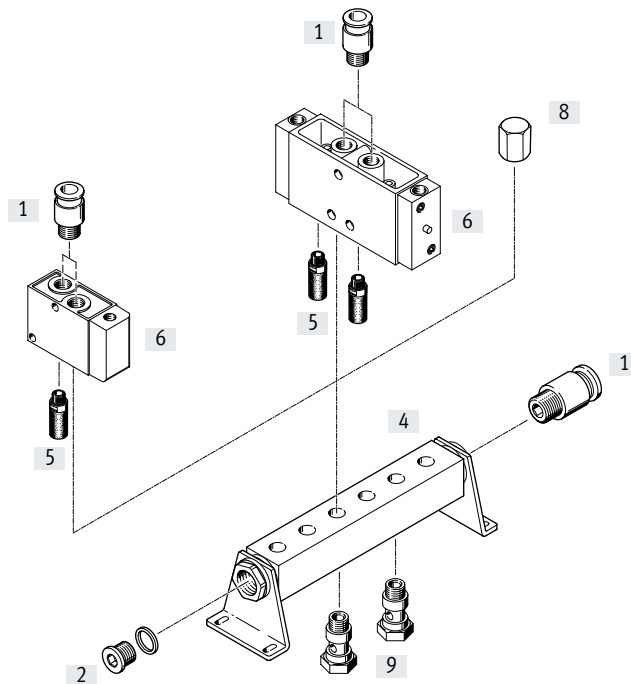
2) Order assembly sleeve part no. 229363 separately

## Peripherals overview pneumatic valves

### Mounting on manifold block




### Mounting on manifold rail

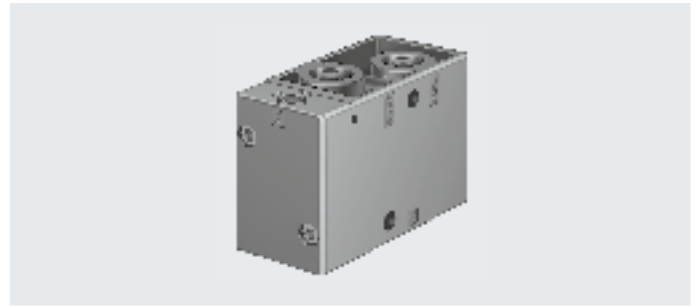


Accessories	Brief description	→ Page/Internet
[1] Push-in fitting QS	For connecting compressed air tubing with standard O.D.	quick star
[2] Blanking plug B	3 included in the scope of delivery of the manifold block PRS 1 included in the scope of delivery of the manifold rail PAL	blanking plug
[3] Manifold block PRS		48
[4] Manifold rail PAL		46
[5] Silencer	For mounting in exhaust ports	u
[6] Pneumatic valve VL, JH		
[7] Cover plate PRSB	For covering a vacant position	49
[8] Cap nut VTM	For blanking a vacant position	47
[9] Hollow bolt VT	For distributing compressed air or for separate compressed air supply	47

## Data sheet – 3/2-way valves

-  - Flow rate  
500 ... 7500 l/min

Sets of wearing parts → page 36



General technical data		G1/8	G1/4	G1/2	G3/4
Pneumatic connection		G1/8	G1/4	G1/2	G3/4
Valve function		3/2-way, monostable			
Design		Poppet seat			
Overlap		Negative overlap			
Sealing principle		Soft			
Actuation type		Pneumatic			
Reset method		Mechanical spring			
Type of control		Direct			
Pilot air supply		External			
Flow direction		Reversible with restrictions			
Exhaust function		Can be throttled			
Manual override		None			
Type of mounting		Via through-hole or on manifold rail/manifold block			
Mounting position		Any			
Port for venting hole		M5 (only ATEX types)			
Pilot air port 11 0/12		G1/8	G1/8	G1/4	G1/4
b value		–	–	0.3	–
Nominal width	[mm]	5	7	14	19
Standard nominal flow rate	[l/min]	500	800	3700	7500
Product weight	[g]	150	230	860	1200

Safety data		G1/8	G1/4	G1/2	G3/4
Type		G1/8	G1/4	G1/2	G3/4
Max. switching frequency	[Hz]	12	–	–	–
Max. positive test pulse with 0 signal	[s]	2200	–	–	–
Max. negative test pulse with 1 signal	[s]	3700	–	–	–

ATEX		VL ... -EX, J- ... -EX
Type		VL ... -EX, J- ... -EX
ATEX category for gas		II 2G
Type of ignition protection for gas		Ex h IIC T4 Gb
ATEX category for dust		II 2D
Type of ignition protection for dust		Ex h IIIC T130°C Db
Explosion-proof ambient temperature	[°C]	–10°C ≤ Ta ≤ +60°C
CE marking (see declaration of conformity)		To EU Explosion Protection Directive (ATEX)
UKCA marking (see declaration of conformity)		To UK EX instructions
Explosion protection certification outside the EU		EPL Db (GB) EPL Gb (GB)

## Data sheet – 3/2-way valves

Operating and environmental conditions			G1/8	G1/4	G1/2	G3/4
Pneumatic connection						
Operating medium			Compressed air to ISO 8573-1:2010 [7:4:4]			
Pilot medium			Compressed air to ISO 8573-1:2010 [7:4:4]			
Note on operating/pilot medium			Lubricated operation possible (in which case lubricated operation will always be required)			
Operating pressure	Normal position	[MPa]	-0.095 ... 1			
	Closed	[bar]	-0.95 ... 10			
	Normally open	[bar]	0 ... 10			
Pilot pressure		[MPa]	0.1 ... 1			
		[bar]	1 ... 10			
			See diagram (max. 10 bar)			
Ambient temperature		[°C]	-10 ... +60			
Temperature of medium		[°C]	-10 ... +60			
Storage temperature		[°C]	-20 ... +60			
Note on materials			RoHS-compliant			
Corrosion resistance class CRC <sup>1)</sup>			1			

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 coverings, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

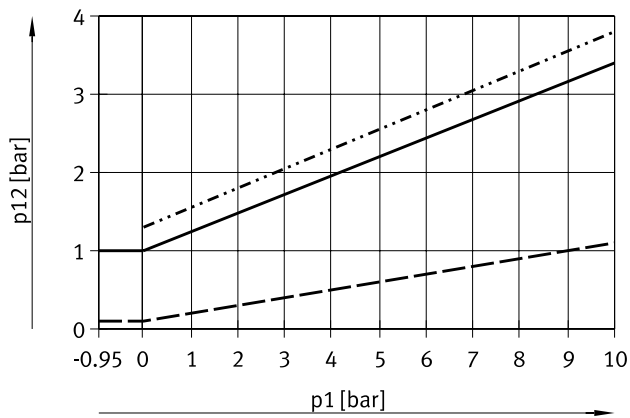
Valve switching times [ms]					
Pneumatic connection		G1/8	G1/4	G1/2	G3/4
On		4	7	17	12
Off		10	26	30	35



## Data sheet – 3/2-way valves

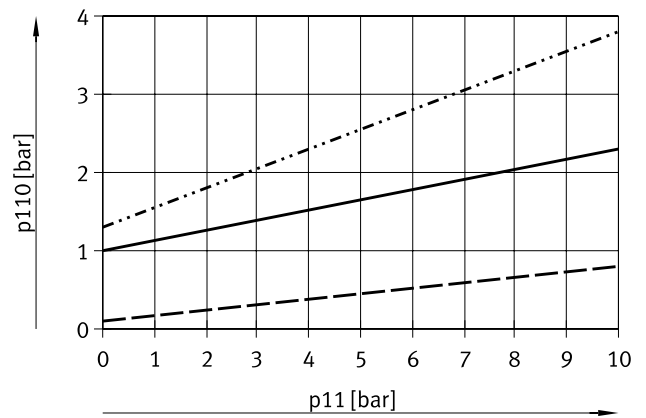
### Minimum pilot pressure $p_{12}/p_{14}/p_{110}$ as a function of operating pressure $p_1/p_{11}$

VL/O-3-1/8 – normally closed



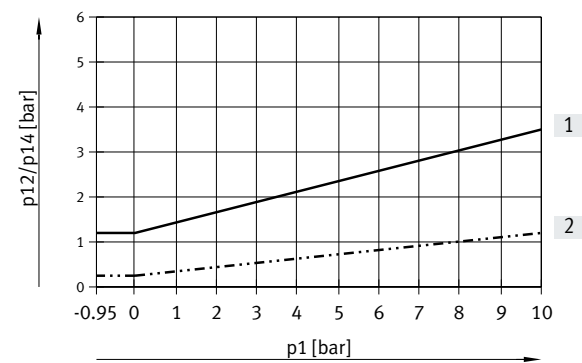
— Switch-on pressure  
 - · - · - Exhaust air flow control  
 - - - Switch-off pressure

VL/O-3-1/8 – normally open



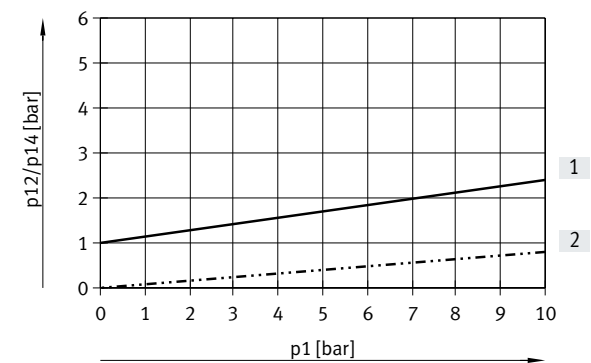
— Switch-on pressure  
 - · - · - Exhaust air flow control  
 - - - Switch-off pressure

VL/O-3-1/4 – normally closed



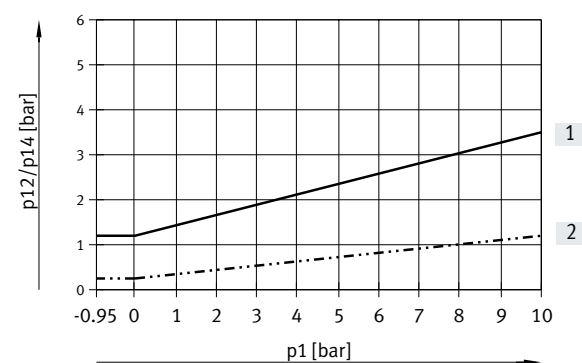
[1] Switch-on pressure  
 [2] Switch-off pressure

VL/O-3-1/4 – normally open



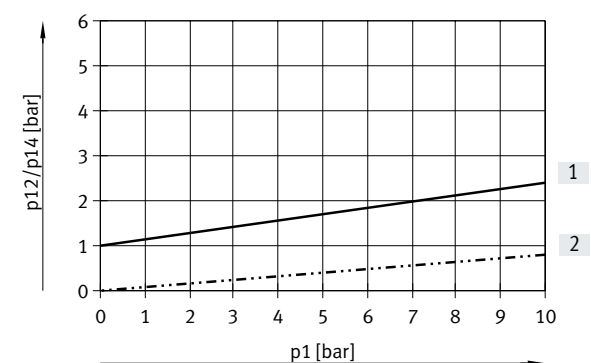
[1] Switch-on pressure  
 [2] Switch-off pressure

VL/O-3-1/2 – normally closed



[1] Switch-on pressure  
 [2] Switch-off pressure

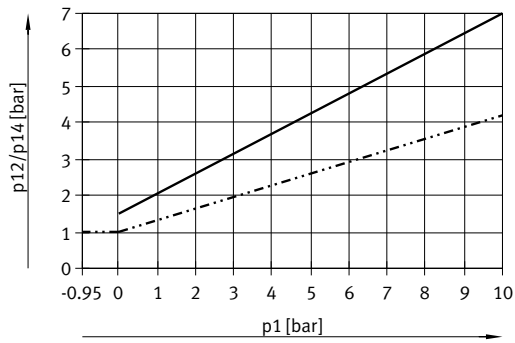
VL/O-3-1/2 – normally open



[1] Switch-on pressure  
 [2] Switch-off pressure

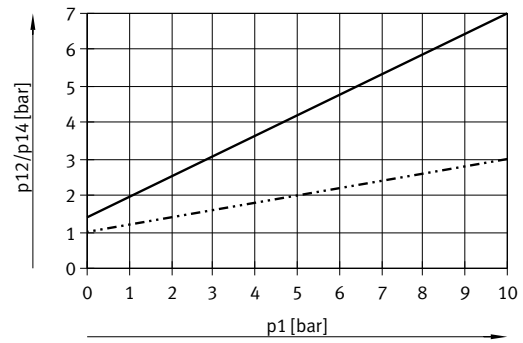
Data sheet – 3/2-way valves

VL/O-3-3/4 – normally closed



— Exhaust throttled  
 - - - - - Exhaust unthrottled

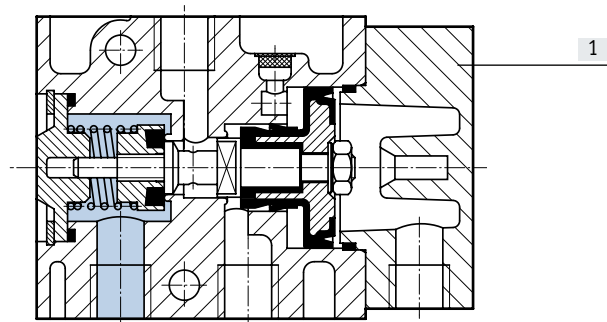
VL/O-3-3/4 – normally open



— Exhaust throttled  
 - - - - - Exhaust unthrottled

Materials

Sectional view



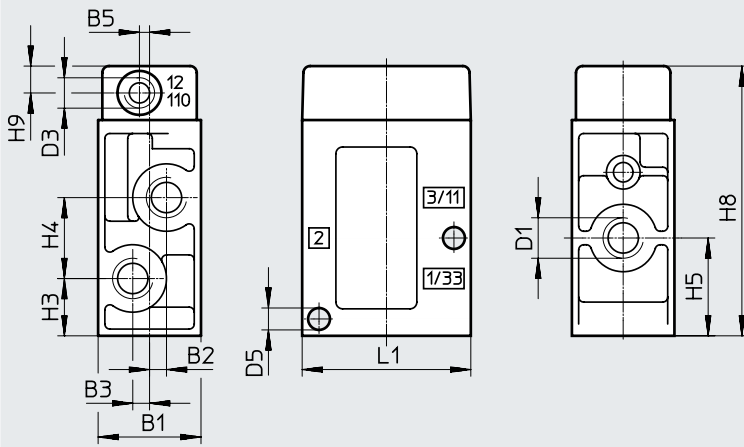
[1]	Housing	Die-cast aluminium
-	Seals	NBR

Data sheet – 3/2-way valves

Dimensions

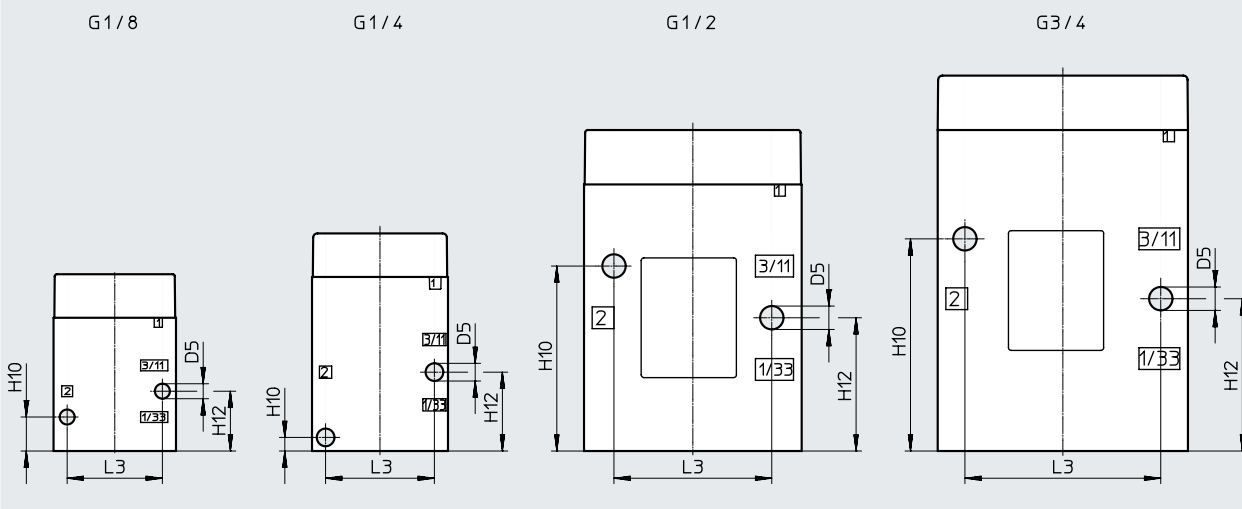
Download CAD data → [www.festo.com](http://www.festo.com)

VL/O



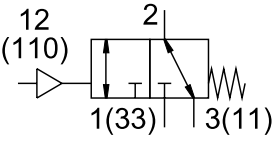
Type	B1	B2	B3	B5	D1	D3	D5 ∅	H3	H4	H5	H8	H9	L1
VL/O-3-1/8	26	3.5	3.5	3	G1/8	G1/8	5.5	12.5	19	22	65	8	45
VL/O-3-1/4	30.4	5	5	-	G1/4	G1/8	6.5	17	24	29	80	8	50
VL/O-3-1/2	52	8	8	-	G1/2	G1/4	8.6	30	38	49	118	10	80
VL/O-3-3/4	68	8	8	-	G3/4	G1/4	8.6	34	44	56	138	10	92

Mounting diagram



Type	D5 ∅	H10	H12	L3
VL/O-3-1/8	5.5	12.5	22	35 ±0.15
VL/O-3-1/4	6.5	5	29	40 ±0.15
VL/O-3-1/2	8.6	68	49	58 ±0.2
VL/O-3-3/4	8.6	78	56	72 ±0.2

## Data sheet – 3/2-way valves


Ordering data					
Circuit symbol	Description	Pneumatic connection	ATEX category	Part no.	Type
	Reset method: mechanical, optionally normally open or normally closed reversible (no restrictions with vacuum at port 1, restrictions with vacuum at port 3)	G1/8 <sup>1)</sup>	–	<b>7803</b>	<b>VL/O-3-1/8-B</b>
			ATEX category → Page 12	<b>536028</b>	<b>VL/O-3-1/8-B-EX</b>
		G1/4 <sup>2)</sup>	–	<b>9984</b>	<b>VL/O-3-1/4</b>
			ATEX category → Page 12	<b>536029</b>	<b>VL/O-3-1/4-EX</b>
		G1/2 <sup>3)</sup>	–	<b>9983</b>	<b>VL/O-3-1/2</b>
			ATEX category → Page 12	<b>536030</b>	<b>VL/O-3-1/2-EX</b>
		G3/4 <sup>4)</sup>	–	<b>10049</b>	<b>VL/O-3-3/4</b>
			ATEX category → Page 12	<b>536031</b>	<b>VL/O-3-3/4-EX</b>

- 1) Restrictions with vacuum at port 3: (0 ... –0.7 bar)
- 2) Restrictions with vacuum at port 3: (0 ... –0.6 bar)
- 3) Restrictions with vacuum at port 3: (0 ... –0.55 bar)
- 4) Restrictions with vacuum at port 3: (0 ... –0.4 bar)

### Ordering data – Sets of wearing parts

Pneumatic connection	Part no.	Type
G1/8	<b>104222</b>	<b>VL/O-3-1/8-B</b>
G1/4	<b>104207</b>	<b>VL/O-3-1/4</b>
G1/2	<b>104208</b>	<b>VL/O-3-1/2</b>

## Data sheet – 5/2-way valves

-  - Flow rate  
500 ... 3700 l/min

Sets of wearing parts → page 40



General technical data		G1/8	G1/4	G1/2
Pneumatic connection		G1/8	G1/4	G1/2
Valve function		5/2-way, monostable		
Design		Poppet seat		
Overlap		Negative overlap		
Sealing principle		Soft		
Actuation type		Pneumatic		
Reset method		Mechanical spring		
Type of control		Direct		
Pilot air supply		External		
Flow direction		Not reversible		
Manual override		None		
Exhaust function		Can be throttled		
Type of mounting		Via through-hole or on manifold rail/manifold block		
Mounting position		Any		
Port for venting hole		M5 (only ATEX types)		
Pilot air connection 14		G1/8	G1/8	G1/4
b value		–	–	0.32
c value	[l/sbar]	–	–	17.65
Nominal width	[mm]	5	7	14
Standard nominal flow rate	[l/min]	500	800	3700
Product weight	[g]	220	220	1070

Safety data		G1/8	G1/4	G1/2
Type		G1/8	G1/4	G1/2
Max. switching frequency	[Hz]	12	–	–
Max. positive test pulse with 0 signal	[ $\mu$ s]	2200		
Max. negative test pulse with 1 signal	[ $\mu$ s]	3700		

Operating and environmental conditions		G1/8	G1/4	G1/2
Pneumatic connection		G1/8	G1/4	G1/2
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Pilot medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)		
Operating pressure	[MPa]	0 ... 1	0 ... 0.8	0 ... 1
	[bar]	0 ... 10	0 ... 8	0 ... 10
Pilot pressure	[MPa]	0.12 ... 1		
	[bar]	1.2 ... 10		
		See diagram (max. 10 bar)		
Ambient temperature	[°C]	–10 ... +60		
Temperature of medium	[°C]	–10 ... +60		
Storage temperature	[°C]	–20 ... +60		
Note on materials		RoHS-compliant		
Corrosion resistance class CRC <sup>1)</sup>		1		

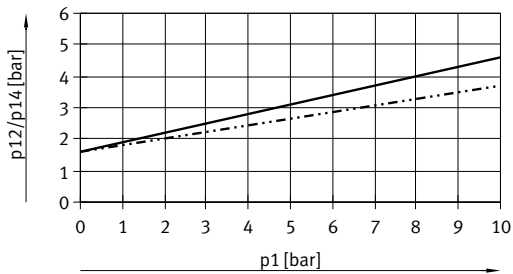
1) Corrosion resistance class CRC 1 to Festo standard FN 940070

Low corrosion stress. Dry indoor application or transport and storage protection. Also applies to parts behind coverings, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

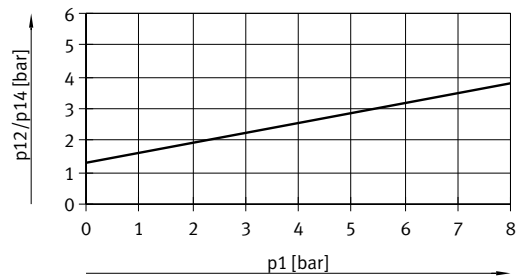
## Data sheet – 5/2-way valves

### Minimum pilot pressure $p_{12}/p_{14}$ as a function of operating pressure $p_1$

VL-5-1/8

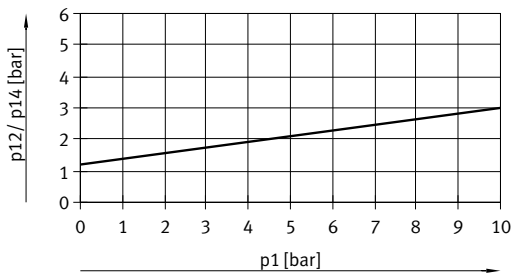


VL-5-1/4



- Exhaust throttled
- - - - - Exhaust unthrottled

VL-5-1/2

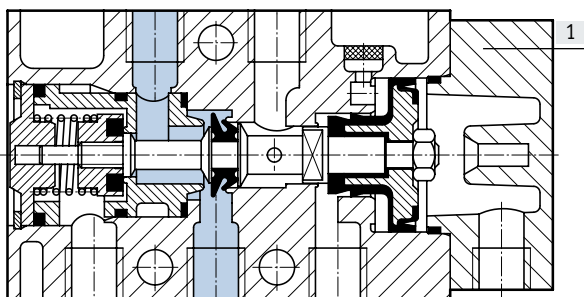


### Valve switching times [ms]

Pneumatic connection	G1/8	G1/4	G1/2
On	5	7	3
Off	16	11	27

### Materials

Sectional view



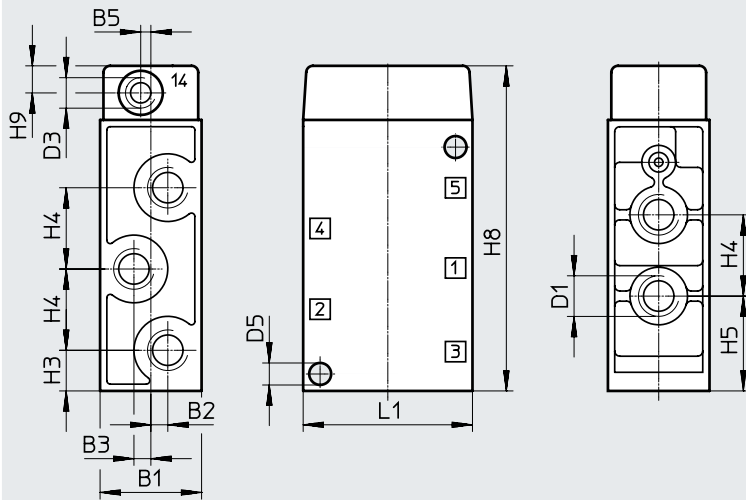
[1]	Housing	Die-cast aluminium
-	Seals	NBR, TPE-U(PU)

Data sheet – 5/2-way valves

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

VL



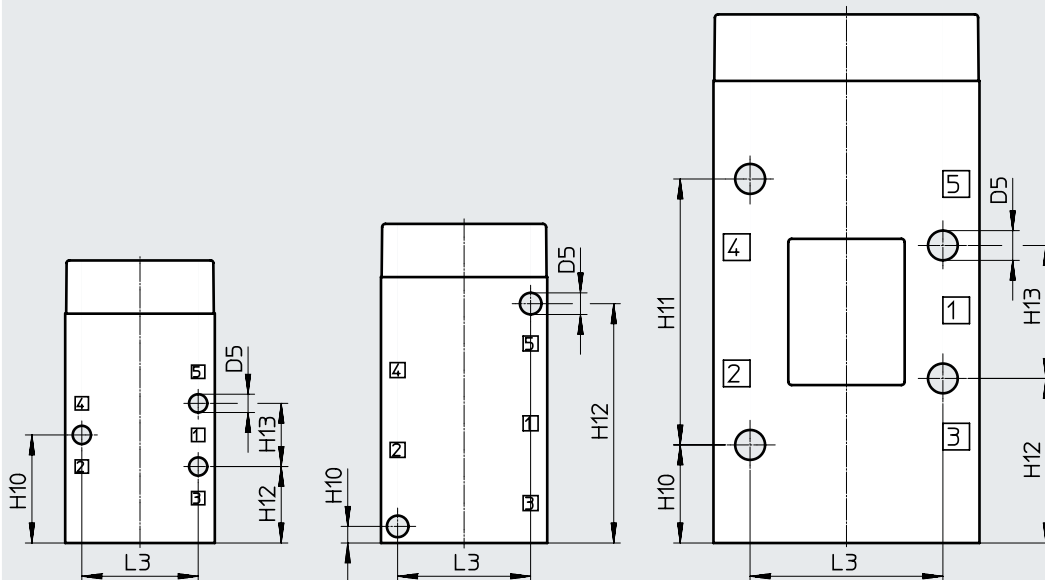
Type	B1	B2	B3	B5	D1	D3	D5 ∅	H3	H4	H5	H8	H9	L1
VL-5-1/8	26	3.5	3.5	3	G1/8	G1/8	5.5	13.5	19	23	85	8	45
VL-5-1/4	30.4 ±0.1	–	5.2	–	G1/4	G1/8	6.5	12	24	28	96	8	50
VL-5-1/2	52	–	8	–	G1/2	G1/4	9	32	38	51	159	10	80

Mounting diagram

G 1 / 8

G 1 / 4

G 1 / 2



Type	D5 ∅	H10	H11	H12	H13	L3
VL-5-1/8	5.5	32.5	–	23	19 ±0.15	35 ±0.15
VL-5-1/4	6.5	5	–	72	–	40 ±0.15
VL-5-1/2	9	29.5	80 ±0.15	49.5	40 ±0.1	58 ±0.15

Data sheet – 5/2-way valves


Ordering data					
Circuit symbol	Description	Pneumatic connection	ATEX category	Part no.	Type
	Reset method: mechanical	G1/8	–	<b>9764</b>	<b>VL-5-1/8</b>
			ATEX category → Page 12	<b>536032</b>	<b>VL-5-1/8-EX</b>
		G1/4	–	<b>9199</b>	<b>VL-5-1/4</b>
			ATEX category → Page 12	<b>536033</b>	<b>VL-5-1/4-EX</b>
		G1/2	–	<b>9445</b>	<b>VL-5-1/2</b>
			ATEX category → Page 12	<b>536034</b>	<b>VL-5-1/2-EX</b>

Ordering data – Sets of wearing parts		
Pneumatic connection	Part no.	Type
G1/8	<b>104209</b>	<b>VL-5-1/8<sup>1)</sup></b>
G1/4	<b>104211</b>	<b>VL-5-1/4<sup>2)3)</sup></b>
G1/2	<b>104212</b>	<b>VL-5-1/2</b>

- 1) Order assembly sleeve part no. 228389 separately
- 2) Order assembly sleeve part no. 229363 separately
- 3) Use from series 1/81



## Data sheet – 5/2-way valves, double pilot valves

-  - Flow rate  
600 ... 4500 l/min

Sets of wearing parts → page 45



General technical data		G1/8	G1/4	G1/2
Pneumatic connection		G1/8	G1/4	G1/2
Valve function		5/2-way, bistable		
Design		Poppet seat		
Overlap		Negative overlap		
Sealing principle		Soft		
Actuation type		Pneumatic		
Type of control		Direct		
Pilot air supply		External		
Flow direction		Not reversible		
Exhaust function		Can be throttled		
Manual override		–	–	Detenting
Type of mounting		Via through-hole or on manifold rail/manifold block		
Mounting position		Any		
Port for venting hole		M5 (only ATEX types)		
Pilot air port 12/14		G1/8	G1/8	G1/4
b value		–	–	0.3
Nominal width	[mm]	5	7	14
Standard nominal flow rate	[l/min]	600	1100	4500
Product weight	[g]	330	330	1130

Safety data		G1/8	G1/4	G1/2
Type		G1/8	G1/4	G1/2
Max. switching frequency	[Hz]	12		
Max. positive test pulse with 0 signal	[is]	2200		
Max. negative test pulse with 1 signal	[is]	3700		

Operating and environmental conditions		G1/8	G1/4	G1/2
Pneumatic connection		G1/8	G1/4	G1/2
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Pilot medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)		
Operating pressure	[MPa]	0 ... 1	0 ... 0.8	0 ... 1
	[bar]	0 ... 10	0 ... 8	0 ... 10
	With dominant signal [MPa]	0 ... 1	0 ... 0.8	–
	[bar]	0 ... 10	0 ... 8	–
Pilot pressure	[MPa]	0.12 ... 1		
	[bar]	1.2 ... 10		
		See diagram (max. 10 bar)		
	With dominant signal [MPa]	0.23 ... 1		–
	[bar]	2.3 ... 10		–
Ambient temperature	[°C]	–10 ... +60		
Temperature of medium	[°C]	–10 ... +60		
Storage temperature	[°C]	–20 ... +60		
Note on materials		RoHS-compliant		
Corrosion resistance class CRC <sup>1)</sup>		1		

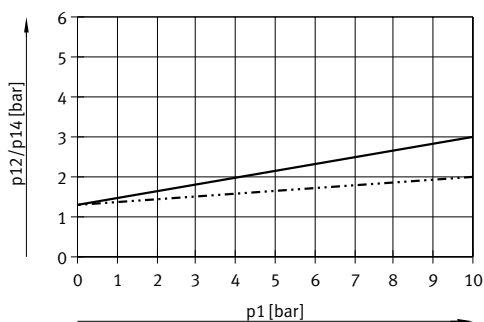
1) Corrosion resistance class CRC 1 to Festo standard FN 940070

Low corrosion stress. Dry indoor application or transport and storage protection. Also applies to parts behind coverings, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

## Data sheet – 5/2-way valves, double pilot valves

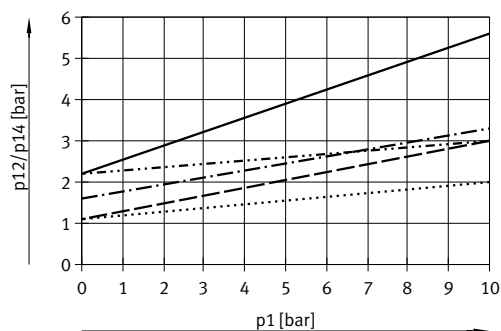
### Minimum pilot pressure $p_{12}/p_{14}$ as a function of operating pressure $p_1$

JH-5-1/8



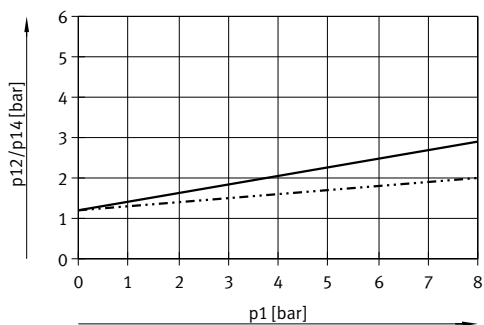
— Exhaust throttled  
- - - Exhaust unthrottled

JDH-5-1/8



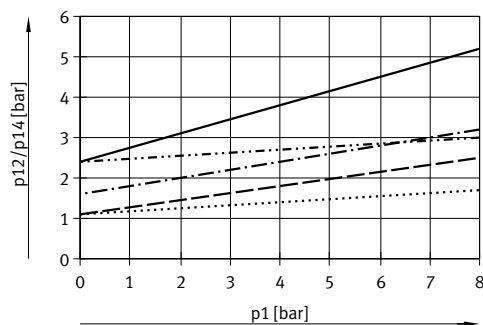
— Exhaust throttled  
- - - Exhaust unthrottled

JH-5-1/4



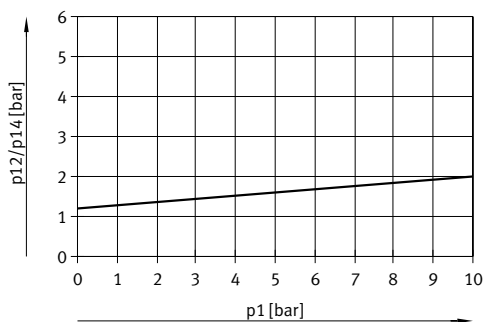
— Exhaust throttled  
- - - Exhaust unthrottled

JDH-5-1/4



— Exhaust throttled  
- - - Exhaust unthrottled

JH-5-1/2



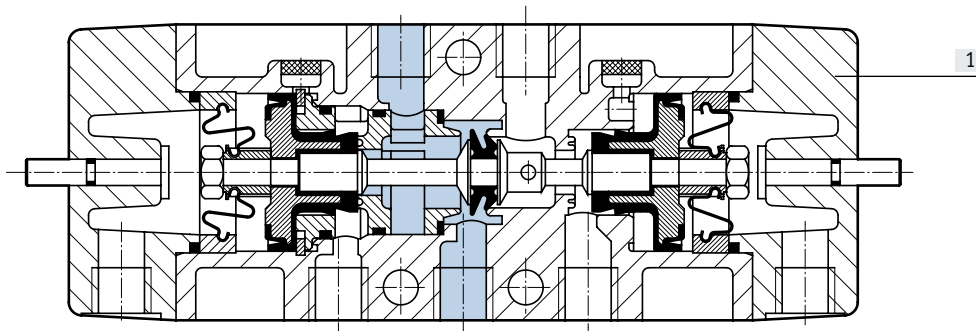
### Valve switching times [ms]

Pneumatic connection	G1/8		G1/4		G1/2	
		Dominant signal at 14		Dominant signal at 14		Dominant signal at 14
Changeover	7	7	7	12	3	–

## Data sheet – 5/2-way valves, double pilot valves

### Materials

Sectional view

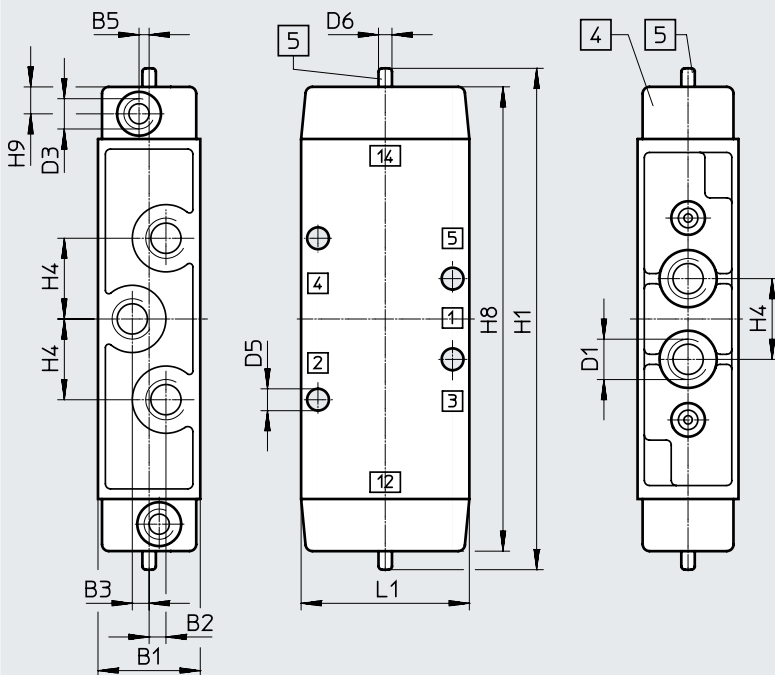


[1] Housing	Die-cast aluminium
- Seals	NBR, TPE-U(PU)

### Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

JH, JDH



- [4] Cover can be turned 180°
- [5] Manual override

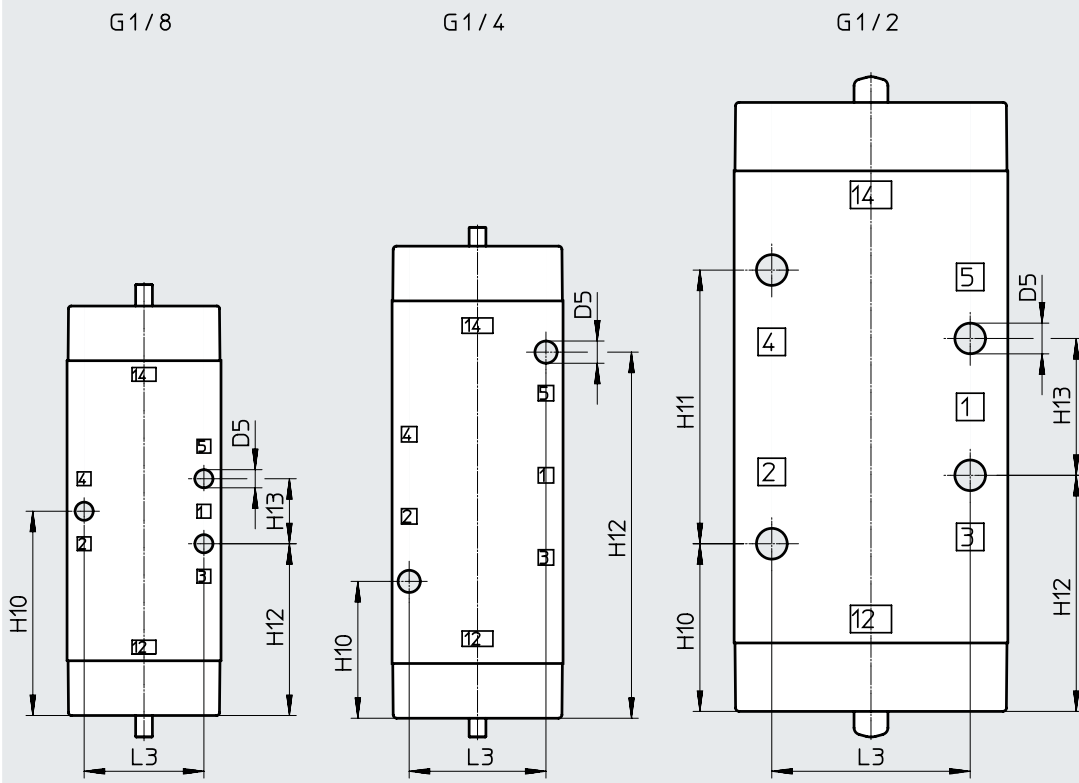
Type	B1	B2	B3	B5	D1	D3	D5 ∅	D6 ∅	H1	H4	H8	H9	L1
J...-5-1/8	26	3.5	3.5	3	G1/8	G1/8	5.3	5	132	19	120	8	45
J...-5-1/4	30.4	-	5	-	G1/4	G1/8	6.5	5	149	24	138	8	50
J...-5-1/2	52	-	8	-	G1/2	G1/4	9.6+0.2	9.9	193	38	178	10	80

Data sheet – 5/2-way valves, double pilot valves

Dimensions

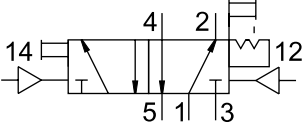
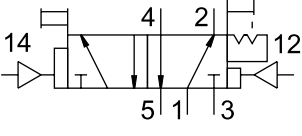
Download CAD data → [www.festo.com](http://www.festo.com)

Mounting diagram



Type	D5 ∅	H10	H11	H12	H13	L3
J...-5-1/8	5.3	60	-	50.5	19	35
J...-5-1/4	6.5	40	-	107	-	40 ±0.2
J...-5-1/2	9.6 +0.2	49	80 ±0.15	69	40 ±0.1	58 ±0.15

## Data sheet – 5/2-way valves, double pilot valves

Ordering data					
Circuit symbol	Description	Pneumatic connection	ATEX category	Part no.	Type
		G1/8	–	<b>8823</b>	<b>JH-5-1/8</b>
			ATEX category → Page 31	<b>536035</b>	<b>JH-5-1/8-EX</b>
		G1/4	–	<b>10408</b>	<b>JH-5-1/4</b>
			ATEX category → Page 31	<b>536036</b>	<b>JH-5-1/4-EX</b>
		G1/2	–	<b>10165</b>	<b>JH-5-1/2</b>
			ATEX category → Page 31	<b>536037</b>	<b>JH-5-1/2-EX</b>
	With dominant signal at 14	G1/8	–	<b>8824</b>	<b>JDH-5-1/8</b>
			ATEX category → Page 31	<b>536038</b>	<b>JDH-5-1/8-EX</b>
		G1/4	–	<b>10409</b>	<b>JDH-5-1/4</b>
			ATEX category → Page 31	<b>536039</b>	<b>JDH-5-1/4-EX</b>
Ordering data – Sets of wearing parts					
Pneumatic connection				Part no.	Type
G1/8				<b>104891</b>	<b>JH-5-1/8<sup>1)</sup></b>
G1/4				<b>104892</b>	<b>JH-5-1/4<sup>2)</sup></b>

- 1) Order assembly sleeve part no. 228389 separately  
 2) Order assembly sleeve part no. 229363 separately

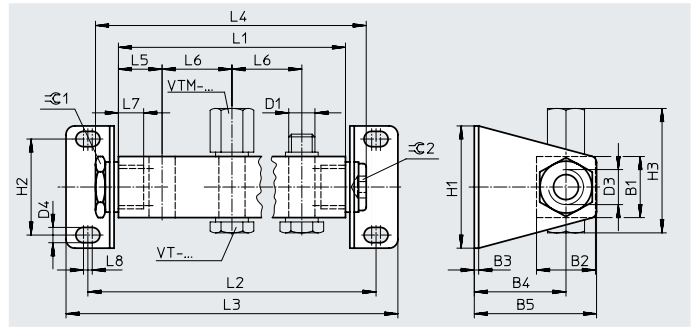
## Accessories

### Manifold rail PAL

Materials:

Rail: Anodised aluminium

Mounting bracket: Galvanised steel



Type	B1	B2	B3	B4	B5	D1	D3	D4	H1	H2	H3	L5	L6	L7	L8	∅1	∅2
PAL-1/8-...	20	21	2	33.5	44.5	G1/8	G1/4	5.2	44	32	43	18	34	12	4	19	8
PAL-1/4-...	28	27	2	42	56	G1/4	G3/8	7	56	44	56	20	32	14	4	24	10
PAL-1/2-...	40	40	3	73	93	G1/2	G3/4	11	80	60	75	35	69	16	5	36	17

No. of valve ports	L1	L2	L3	L4	Weight [g]	Part no.	Type
<b>Pneumatic connection G1/8</b>							
2	70	96	114	89	145	8601	PAL-1/8-2
3	104	130	148	123	170	8602	PAL-1/8-3
4	138	164	182	157	190	8603	PAL-1/8-4
5	172	198	216	191	215	8604	PAL-1/8-5
6	206	232	250	225	240	9767	PAL-1/8-6
<b>Pneumatic connection G1/4<sup>1)</sup></b>							
2	72	100	120	94	330	9188	PAL-5-1/4-2
3	104	132	152	126	405	9189	PAL-5-1/4-3
4	136	164	184	158	480	9190	PAL-5-1/4-4
5	168	196	216	190	555	9191	PAL-5-1/4-5
6	200	228	248	222	630	9192	PAL-5-1/4-6
<b>Pneumatic connection G1/2</b>							
2	139	181	213	164	770	9492	PAL-1/2-2
3	208	250	282	233	915	9493	PAL-1/2-3
4	277	319	351	302	1 060	9494	PAL-1/2-4
5	346	388	420	371	1 220	9495	PAL-1/2-5
6	415	457	489	440	1 370	9496	PAL-1/2-6

1) MOFH-3-1/4 is not suitable for manifold assembly

## Accessories

### Hollow bolt VT

For manifold rail PAL

Note on materials:  
RoHS-compliant



Ordering data				
Pneumatic connection	Weight [g]	Material	Part no.	Type
G1/8	6	Chromated steel	<b>8626</b>	<b>VT-1/8</b>
G1/8	15	Anodised aluminium	<b>5928</b>	<b>VT-1/8-1<sup>1)2)</sup></b>
G1/4	15	Chromated steel	<b>206147</b>	<b>VT-1/4-2</b>
G1/2	30	Anodised aluminium	<b>9986</b>	<b>VT-1/2</b>

- 1) For valves with G1/8 connection  
2) Sealing rings included in the scope of delivery

### Cap nut VTM

For blanking vacant positions

Material:  
Wrought aluminium alloy



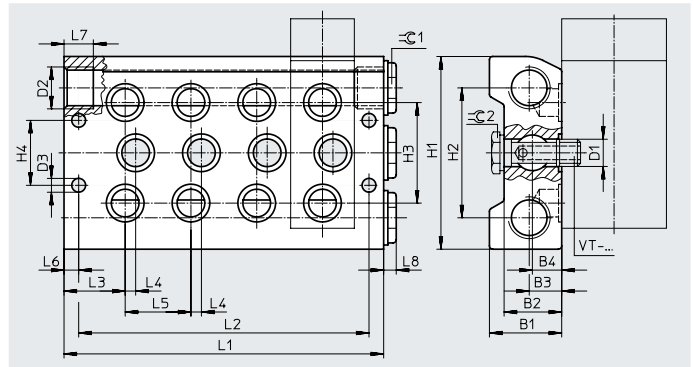
Ordering data				
Pneumatic connection	Weight [g]	Material	Part no.	Type
G1/8	5		<b>9768</b>	<b>VTM-1/8<sup>1)</sup></b>
G1/4	7		<b>3099</b>	<b>VTM-1/4</b>
G1/2	28		<b>9987</b>	<b>VTM-1/2</b>

- 1) For valves with G1/8 connection

## Accessories

### Manifold block PRS

Material:  
Anodised aluminium



Type	B1	B2	B3	B4	D1	D2	D3	H1	H2	H3	H4	L3	L4	L5	L6	L7	L8	±G 1	±G 2
PRS-1/8-...	28.5	22	12.5	10.8	G1/8	G3/8	6.6	80	56	38	28	23.5	7	27	7	12	5	8	14
PRS-1/4-...	34.5	27.5	14	14	G1/4	G1/2	6.6	92	62	48	31	29.2	5	31.4	7	14	6	10	17

No. of valve ports	L1	L2	Weight [g]	Part no.	Type
<b>Pneumatic connection G1/8</b>					
2	81	67	360	11898	PRS-1/8-2-B
3	108	94	460	11899	PRS-1/8-3-B
4	135	121	625	11900	PRS-1/8-4-B
5	162	148	650	11901	PRS-1/8-5-B
6	189	175	750	11902	PRS-1/8-6-B
<b>Pneumatic connection G1/4</b>					
2	89.8	75.8	590	10185	PRS-1/4-2
3	121.2	107.2	750	10186	PRS-1/4-3
4	152.6	138.6	900	10187	PRS-1/4-4
5	184	170	1070	10188	PRS-1/4-5
6	215.4	201.4	1 230	10189	PRS-1/4-6

### Hollow bolt VT

For manifold block PRS

Material:  
Chromated steel



<b>Ordering data</b>			
Pneumatic connection	Weight [g]	Part no.	Type
G1/8	17	11539	VT-1/8-PRSK
G1/4	32	9499	VT-1/4-PRS



## Accessories

### Cover plate PRSB

For blanking vacant positions

Material:

Aluminium



Ordering data			
Pneumatic connection	Weight [g]	Part no.	Type
G1/8	55	11687	PRSB-1/8
G1/4	80	11688	PRSB-1/4

### Hollow bolt VT

For separate compressed air supply on valve

Material:

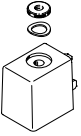
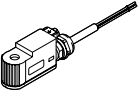
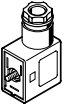

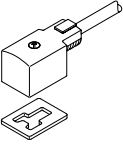
Chromated steel




Ordering data			
Pneumatic connection	Weight [g]	Part no.	Type
G1/8	16	12634	VT-1/8-AJK-P
G1/4	24	12910	VT-1/8-AJS-P <sup>1)</sup>
G1/4	45	12635	VT-1/4-AJ-P

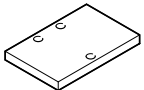
1) For valves with G1/8 connection

## Accessories

Ordering data – Solenoid coils					
	Description	Voltage	Cable length [m]	Part no.	Type
<b>F solenoid coils, without plug socket</b>					Data sheets → Internet: msfg
	–	12 V DC	–	<b>34410</b>	<b>MSFG-12-OD</b>
		24 V DC and 42 V AC, 50 ... 60 Hz	–	<b>34411</b>	<b>MSFG-24/42-50/60-OD</b>
		42 V DC	–	<b>34413</b>	<b>MSFG-42-OD</b>
		24 V AC	–	<b>34415</b>	<b>MSFW-24-50/60-OD</b>
		48 V AC, 50 ... 60 Hz	–	<b>34418</b>	<b>MSFW-48-50/60-OD</b>
		110 V AC, 50 ... 60 Hz and 120 V AC, 60 Hz	–	<b>34420</b>	<b>MSFW-110-50/60-OD</b>
		230 V AC, 50 ... 60 Hz and 240 V AC, 60 Hz	–	<b>34422</b>	<b>MSFW-230-50/60-OD</b>
		240 V AC, 50 ... 60 Hz	–	<b>34424</b>	<b>MSFW-240-50/60-OD</b>
	Explosion-proof	24 V DC	–	<b>536931</b>	<b>MSFG-24-EX</b>
		24 V AC	–	<b>536932</b>	<b>MSFW-24-50/60-EX</b>
		110 V AC	–	<b>536933</b>	<b>MSFW-110-50/60-EX</b>
230 V AC		–	<b>536934</b>	<b>MSFW-230-50/60-EX</b>	
<b>F solenoid coils, cable with open end, 3-wire</b>					
	Explosion-proof	24 V DC	1	<b>8059804</b>	<b>VACF-B-K1-1-1-EX4-M</b>
			5	<b>8059805</b>	<b>VACF-B-K1-1-5-EX4-M</b>
			10	<b>8059806</b>	<b>VACF-B-K1-1-10-EX4-M</b>
			20	<b>8059807</b>	<b>VACF-B-K1-1-20-EX4-M</b>
		24 V AC	1	<b>8059808</b>	<b>VACF-B-K1-1A-1-EX4-M</b>
			1	<b>8059811</b>	<b>VACF-B-K1-16B-1-EX4-M</b>
		110 V AC	5	<b>8059812</b>	<b>VACF-B-K1-16B-5-EX4-M</b>
			1	<b>8059809</b>	<b>VACF-B-K1-3A-1-EX4-M</b>
		5	<b>8059810</b>	<b>VACF-B-K1-3A-5-EX4-M</b>	
<b>Ordering data – Plug sockets/connecting cable for F solenoid coils</b>					
	Description	Voltage	Cable length [m]	Part no.	Type
<b>Plug socket without cable, cable connection with</b>					Data sheets → Internet: mssd
	Locking screws (cable connector Pg9)	–	–	<b>34431</b>	<b>MSSD-F</b>
	Locking screws (cable connector M16)	–	–	<b>539710</b>	<b>MSSD-F-M16</b>
	Insulation displacement technology (cable connector M16)	–	–	<b>192746</b>	<b>MSSD-FS-M16</b>
<b>Connecting cable</b>					Data sheets → Internet: kmf
	Signal status display with LED	24 V DC	2.5	<b>30935</b>	<b>KMF-1-24DC-2.5-LED</b>
			5	<b>30937</b>	<b>KMF-1-24DC-5-LED</b>
			10	<b>193458</b>	<b>KMF-1-24DC-10-LED</b>
	Without signal status display	Up to 240 V	2.5	<b>30936</b>	<b>KMF-1-230AC-2.5</b>
			5	<b>30938</b>	<b>KMF-1-230AC-5</b>

## Accessories

Ordering data – Illuminating seals			Data sheets → Internet: mf-ld	
	Description	Voltage	Part no.	Type
	For F solenoid coils	12 ... 24 V DC	<b>19143</b>	<b>MF-LD-12-24DC</b>
		230 V DC/V AC	<b>19144</b>	<b>MF-LD-230AC</b>

Ordering data – Plate					
	Description		Pneumatic connection	Part no.	Type
<b>For wide solenoid coils</b>					
	As spacer when using wider solenoid coils from other manufacturers (thickness: 6.35 mm)	For 3/2-way valves	G1/8	<b>541667</b>	<b>MPL-TC-3-18</b>
			G1/4	<b>541669</b>	<b>MPL-TC-3-14</b>
		For 5/2-way valves	G1/8	<b>541668</b>	<b>MPL-TC-5-18</b>
			G1/4	<b>541670</b>	<b>MPL-TC-5-14</b>