

Solenoid/pneumatic valves, Tiger Classic



## Key features

### General

- Very sturdy poppet valve concept for all 3/2- and 5/2-way valves
- Pneumatically or electrically actuated with F solenoid coil
- With flow rates of up to 7500 l/min
- With internal or external pilot air
- 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 (no ATEX category)
- Optimised switching times thanks to patented U-ring and servo control



### Note

Valves for potentially explosive atmospheres (ATEX category) are not suitable for mounting on manifold rails PAL or manifold blocks PRS.

### 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-...	MFH-3-..., MOFH-3-...	MFH-3-...S
<p>Depending on selected connections: Normally closed or normally open</p>	<ul style="list-style-type: none"> <li>• MFH-3-... Normally closed</li> <li>• MOFH-3-... Normally open</li> </ul>	<p>These valves can be converted from one function to the other by rotating the seal under the cover.</p>
		<p>Between 0 and 0.8 bar this valve can also be used as MOFH (normally open) with a separate pilot line.</p>

### 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 manifold rail PAL



With manifold block PRS

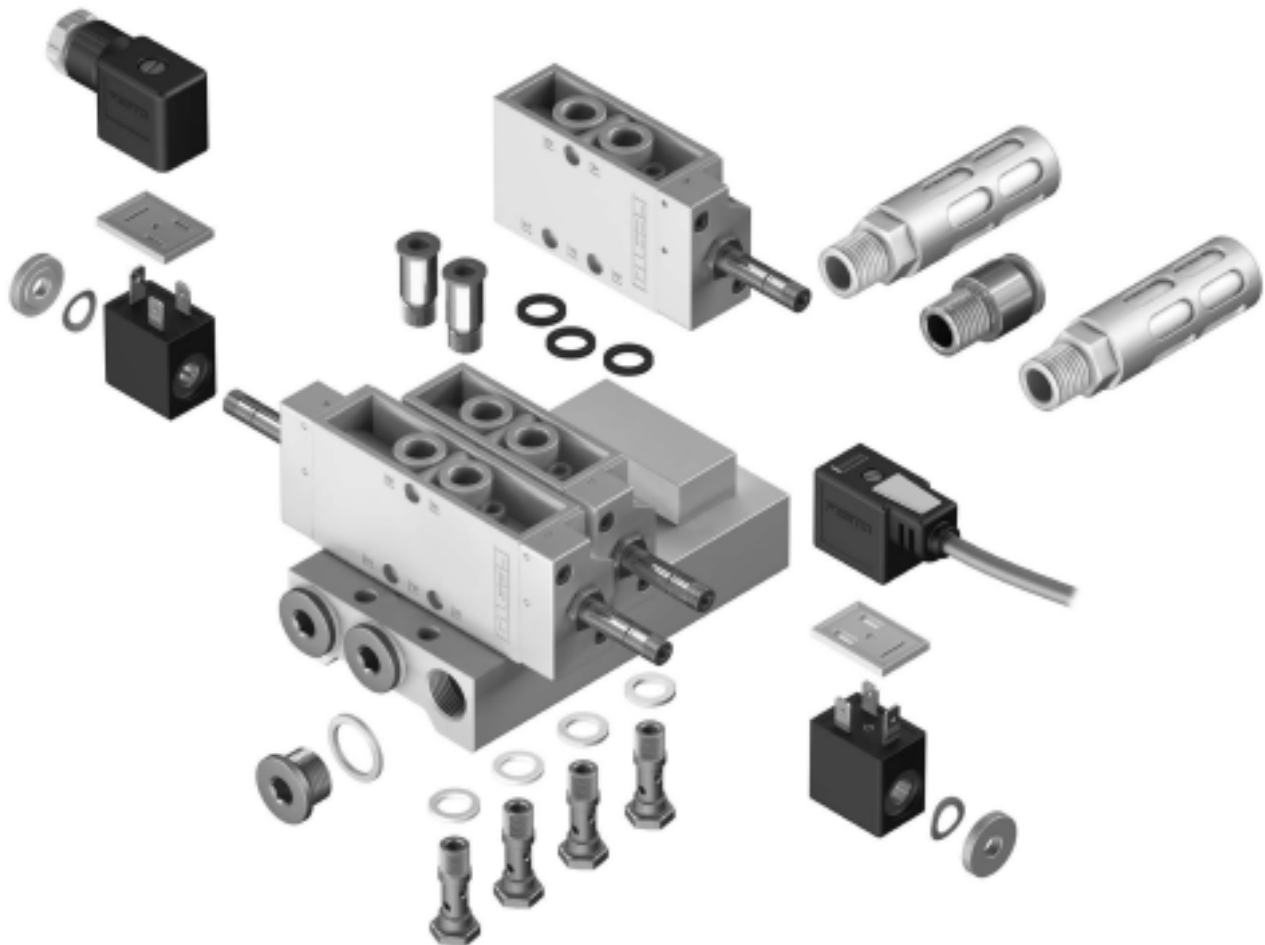


The Tiger Classic valves can be mounted on manifold rails PAL with common supply port or on manifold blocks PRS with common supply port and common exhausts. The valves are mounted on the rails and blocks using hollow bolts.



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




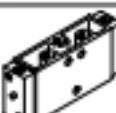
Function	Version	Type	Pneumatic connection	Operating voltage	
				[V DC]	[V AC]
5/2-way valves	Solenoid valve				
		MFH	G1/8 G1/4 G1/2	12, 24, 42, 48	24, 42, 48, 110, 230, 240
	Double solenoid valve				
		JMFH	G1/8 G1/4 G1/2	12, 24, 42, 48	24, 42, 48, 110, 230, 240
	Double solenoid valve with dominant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

## Product range overview

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

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

Product range overview

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

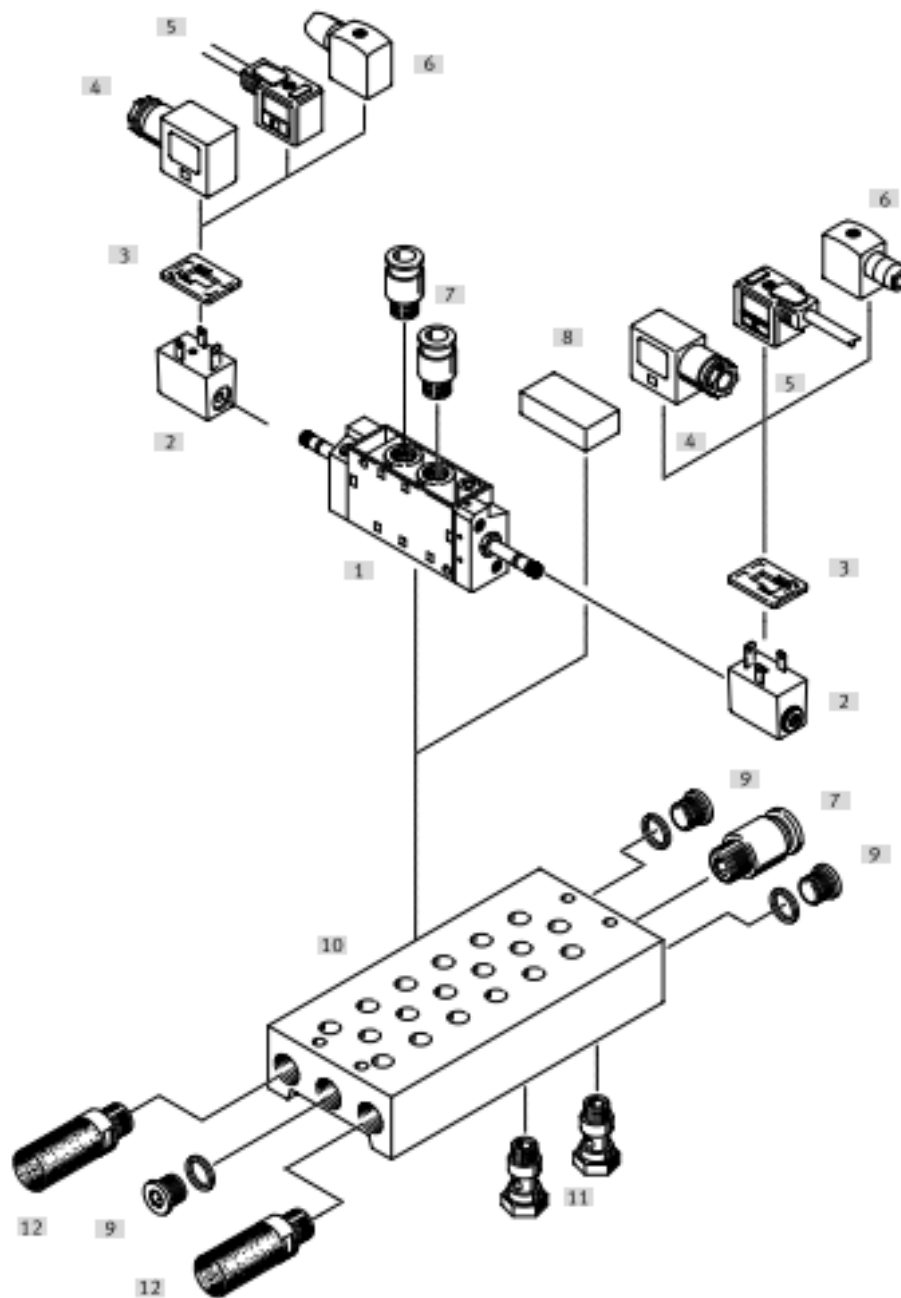
003	Pneumatic connection
<b>G18</b>	G1/8
<b>G14</b>	G1/4
<b>G12</b>	G1/2
<b>G34</b>	G3/4

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

005	Pilot air
<b>5</b>	External
	Internal

Peripherals overview: Solenoid valves

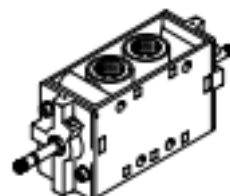
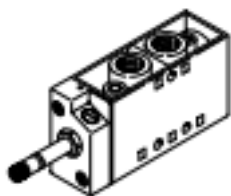
Mounting on manifold block



Variants

MFH-5-...

IMFH-5-...

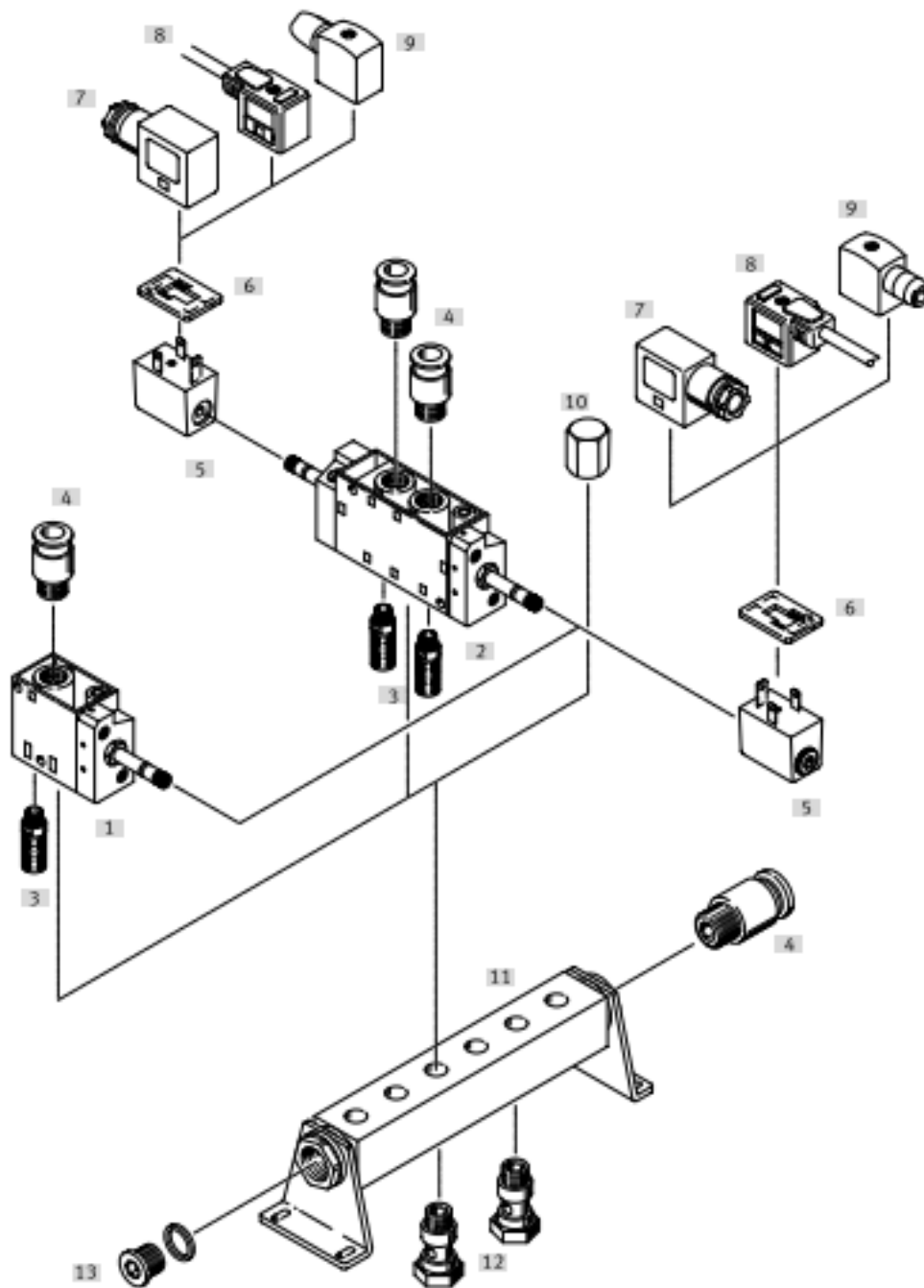


## Peripherals overview: Solenoid valves

Accessories	Brief description	→ Page/Internet
[1] Solenoid valve JMFH	For F solenoid coil	–
[2] F solenoid coil MSFG, MSPW	–	50
[3] Illuminating seal M...LD	For indicating the switching status	51
[4] Plug socket MSSD-F	For valves MFH, JMFH	50
[5] Connecting cable KWF	For valves MFH, JMFH	50
[6] Plug socket MSSD-FS	For valves MFH, JMFH	50
[7] Push-in fitting QS	For connecting tubing with standard O.D.	46
[8] Cover plate PRSB	For covering a vacant position	49
[9] Blanking plug B	3 included in the scope of delivery of the manifold block PRS	blanking plug
[10] Manifold block PRS	–	48
[11] Hollow bolt VT	For distributing compressed air or for separate compressed air supply	47
[12] Silencer	For mounting in exhaust ports	–

Peripherals overview: Solenoid valves

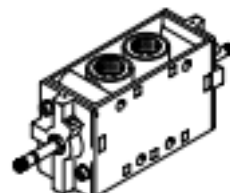
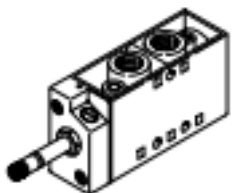
Mounting on manifold rail



Variants

MFH-S...



JMFH-S...



## Peripherals overview: Solenoid valves

Accessories	Brief description	→ Page/Internet
[1] Solenoid valve MFH	For F solenoid coil	4
[2] Solenoid valve JMFH	For F solenoid coil	4
[3] Silencer	For mounting in exhaust ports	–
[4] Push-in fitting QS	For connecting tubing with standard O.D.	95
[5] F solenoid coil MSFG, MSPW	–	50
[6] Illuminating seal M...LD	For indicating the switching status	51
[7] Plug socket MSSD-F	For valves MFH, JMFH	50
[8] Connecting cable KMF	For valves MFH, JMFH	50
[9] Plug socket MSSD-F-S	For valves MFH, JMFH	50
[10] Cap nut VTM	For blanking a vacant position	47
[11] Manifold rail PAL	–	46
[12] Hollow bolt VT	For distributing compressed air or for separate compressed air supply	47
[13] Blanking plug B	1 included in the scope of delivery of the manifold rail PAL	blanking plug

## Datasheet – 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				
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 air 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			
Connection 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 MOPH-3-3/4- can only be mounted via through-hole

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

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

ATEX	
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 IIC T130°C Db
Explosion-proof ambient temperature [°C]	–5 ≤ T <sub>a</sub> ≤ +40
CE marking (see declaration of conformity)	To EU Explosion Protection Directive (ATEX)
UKCA marking (see declaration of conformity)	According to UK explosion regulations
Explosion protection certification outside the EU	EPL Db (GB) EPL Gb (GB)
Degree of protection	IP65 (when mounted)

## Datasheet – 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 the 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]	-20 ... +60									
Certification	c UL us - Recognized (OL)						-					
Note on materials			RoHS-compliant									
Corrosion resistance class CRC <sup>1)</sup>			1									
LABS (PWS) conformity			VDMA24364-B1/B2-L									

1) More information: [www.festo.com/~/top/c/crc](http://www.festo.com/~/top/c/crc)

## Electrical data

F solenoid coil			
Electrical connection			Plug pins for plug sockets: M5SD-F, KWF
Operating voltage	DC voltage	[V DC]	12, 24, 42, 48
	Alternating voltage	[V AC]	24, 42, 48, 110, 230, 240 (50 ... 60 Hz)
Characteristic coil data	DC voltage	[W]	4.5
	Alternating voltage	[VA]	Pull: 7.5 Hold: 6
Degree of protection to EN 60529			IP65 (in combination with plug socket)

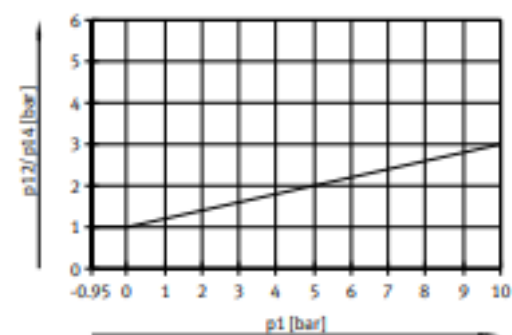
## Valve switching times [ms]

Pneumatic connection	G1/8		G1/4		G1/2		G3/4	
	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	-

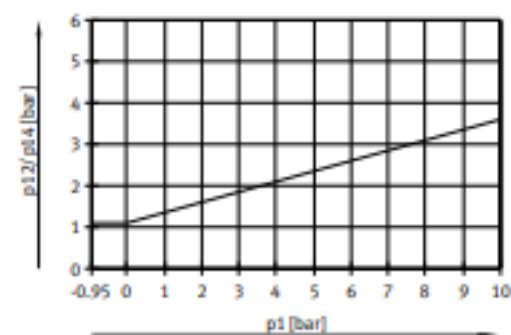
## Datasheet – 3/2-way valves

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

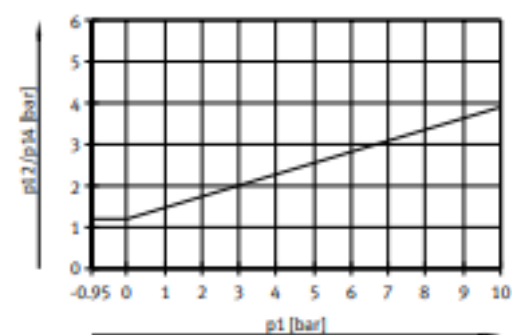
MFH-3-1/8-5



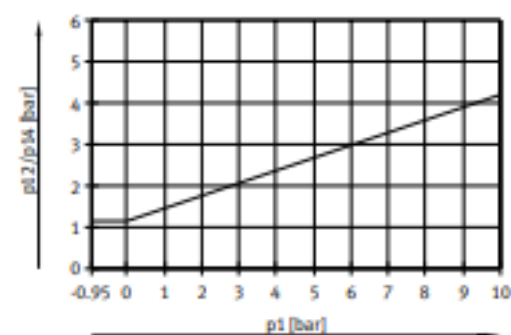
MFH-3-1/4-5



MFH-3-1/2-5

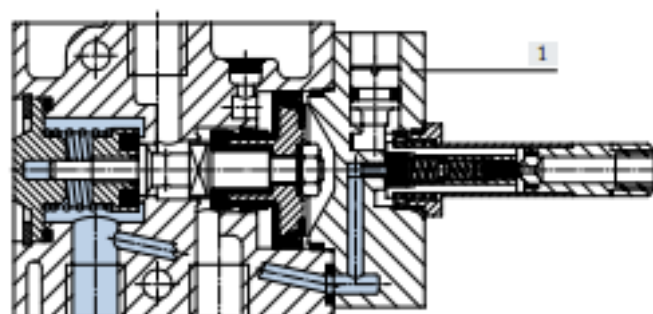


MFH-3-3/4-5



### Materials

Sectional view



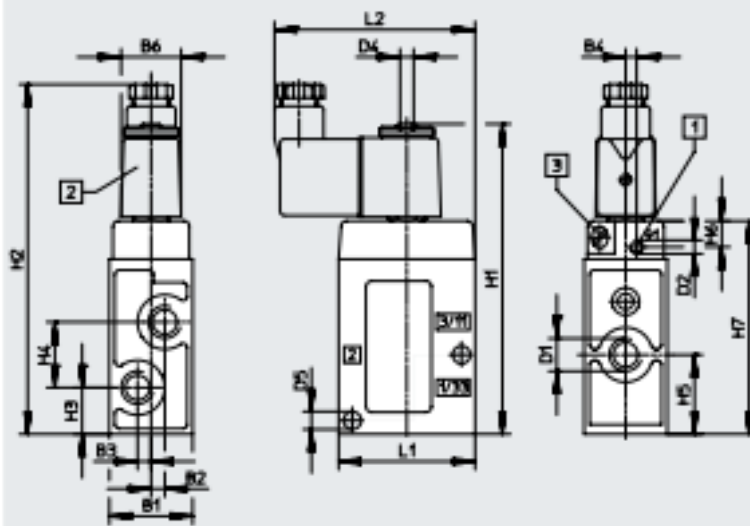
[1] Housing	Die-cast aluminium
- Seals	NBR

## Datasheet – 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 ø
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	–	29	G1/4	–	M5	6.5
M...-3-1/4-S	30.4			4			M5		
M...-3-1/2	52 ±0.15	8	8	–	49	G1/2	–	M5	8.6
M...-3-1/2-S	52						G1/8		
M...-3-3/4	68 ±0.15	8	8	–	56	G3/4	–	M5	8.6
M...-3-3/4-S	68						G1/8		

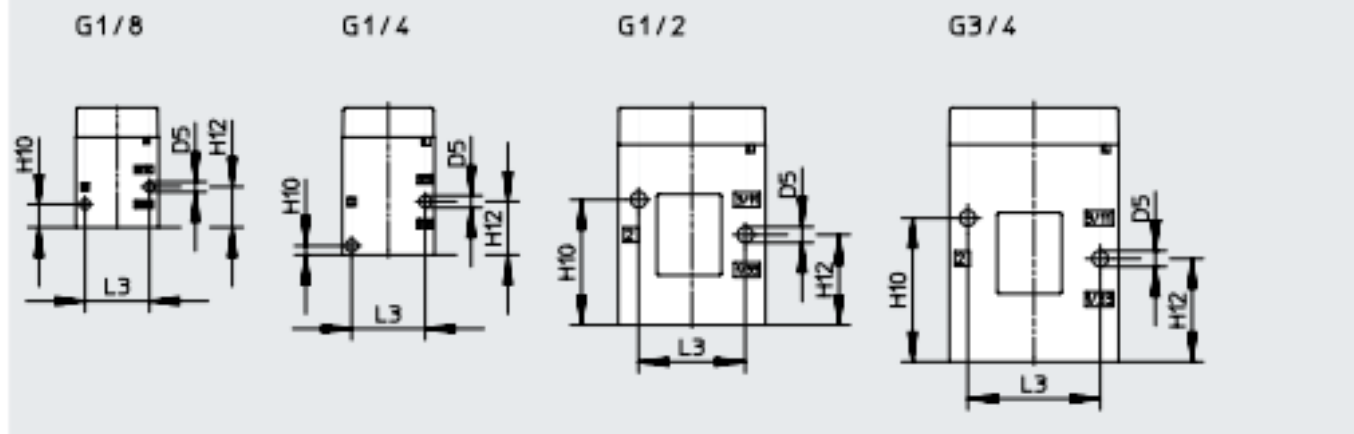
Type	H1	H2	H3	H4	H5	H6	H7	L1	L2
M...-3-1/8	97	111	12.5	19 ±0.15	22	–	63	45 ±0.15	71
M...-3-1/8-S						9.5			
M...-3-1/4	112	126	17	24 ±0.15	29	–	78	50 ±0.15	73.5
M...-3-1/4-S						24			
M...-3-1/2	151	165	30 ±0.15	38 ±0.15	49 ±0.15	–	117	80 ±0.2	88.5
M...-3-1/2-S				30	38	49		10.5	
M...-3-3/4	171	187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

## Datasheet – 3/2-way valves

## Dimensions

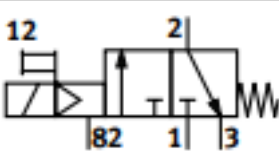
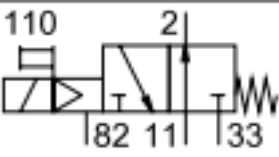
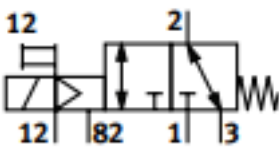
Download CAD data → [www.festo.com](http://www.festo.com)

## Mounting diagram



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

## Datasheet – 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	--	7802	MFH-3-1/8
			ATEX category → Page 12	535897	MFH-3-1/8-EX
		G1/4	--	9964	MFH-3-1/4
			ATEX category → Page 12	535898	MFH-3-1/4-EX
G1/2	--	9857	MFH-3-1/2		
	ATEX category → Page 12	535899	MFH-3-1/2-EX		
G3/4	--	11967	MFH-3-3/4		
	ATEX category → Page 12	536190	MFH-3-3/4-EX		
	Without F solenoid coil <sup>1)</sup> , Internal pilot air supply	G1/8	--	7877	MORF-3-1/8
			ATEX category → Page 12	535903	MORF-3-1/8-EX
		G1/4	--	7876	MORF-3-1/4
			ATEX category → Page 12	535904	MORF-3-1/4-EX
G1/2	--	7884	MORF-3-1/2		
	ATEX category → Page 12	535905	MORF-3-1/2-EX		
G3/4	--	11969	MORF-3-3/4		
	ATEX category → Page 12	536192	MORF-3-3/4-EX		
	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>	--	7958	MFH-3-1/8-S
			ATEX category → Page 12	535900	MFH-3-1/8-S-EX
		G1/4 <sup>3)</sup>	--	7959	MFH-3-1/4-S
			ATEX category → Page 12	535901	MFH-3-1/4-S-EX
G1/2 <sup>4)</sup>	--	7960	MFH-3-1/2-S		
	ATEX category → Page 12	535902	MFH-3-1/2-S-EX		
G3/4 <sup>5)</sup>	--	11968	MFH-3-3/4-S		
	ATEX category → Page 12	536191	MFH-3-3/4-S-EX		

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	104206	MFH-3-1/8
G1/4	104207	MFH-3-1/4
G1/2	104208	MFH-3-1/2

## Datasheet – 5/2-way valves

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

Sets of wearing parts → page 23



General technical data		G1/8	G1/4	G1/2
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 air 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		
Connection 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]		–	4.49	–
Nominal width [mm]		5	7	14
Standard nominal flow rate [l/min]		500	1000	3700
Product weight [g]		270	290	1135
<b>Safety characteristics</b>				
Max. switching frequency [Hz]		–		
Max. positive test pulse with 0 signal [µs]		2200		
Max. negative test pulse with 1 signal [µs]		3700		

## Datasheet – 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 the 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 (DL)			-		
LABS (PWS) conformity			VDMA24364-B1/B2-L					

1) More information: [www.festo.com/c/topic/crc](http://www.festo.com/c/topic/crc)

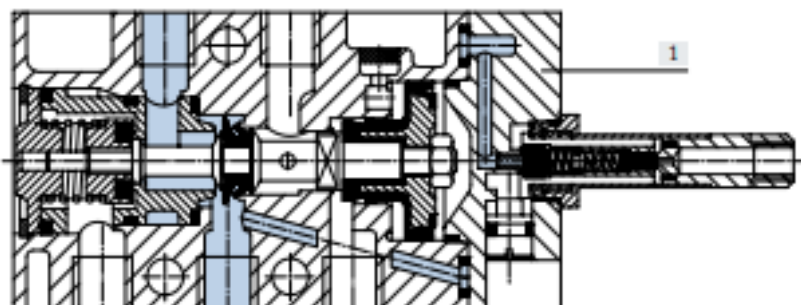
Electrical data			
<b>F solenoid coil</b>			
Electrical connection			
Plug pins for plug sockets: MSSD-F, KWF			
Operating voltage	DC voltage	[V DC]	12, 24, 42, 48
	Alternating voltage	[V AC]	24, 42, 48, 110, 230, 240 (50 ... 60 Hz)
Characteristic coil data	DC voltage	[W]	4.5
	Alternating voltage	[VA]	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

## Datasheet – 5/2-way valves

## Materials

## Sectional view



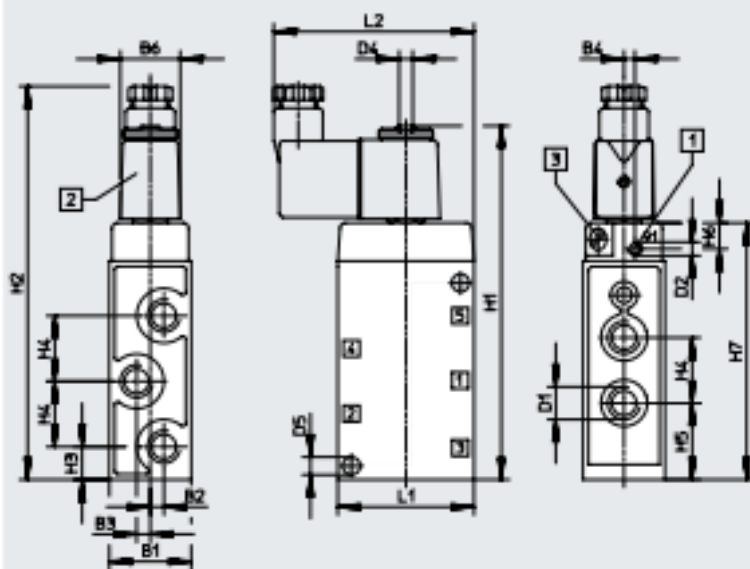
[1]	Housing	Die-cast aluminium
-	Seals	NBR, TPE-U/PU

## Datasheet – 5/2-way valves

## Dimensions

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

MFH



- [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 ∅
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					
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									

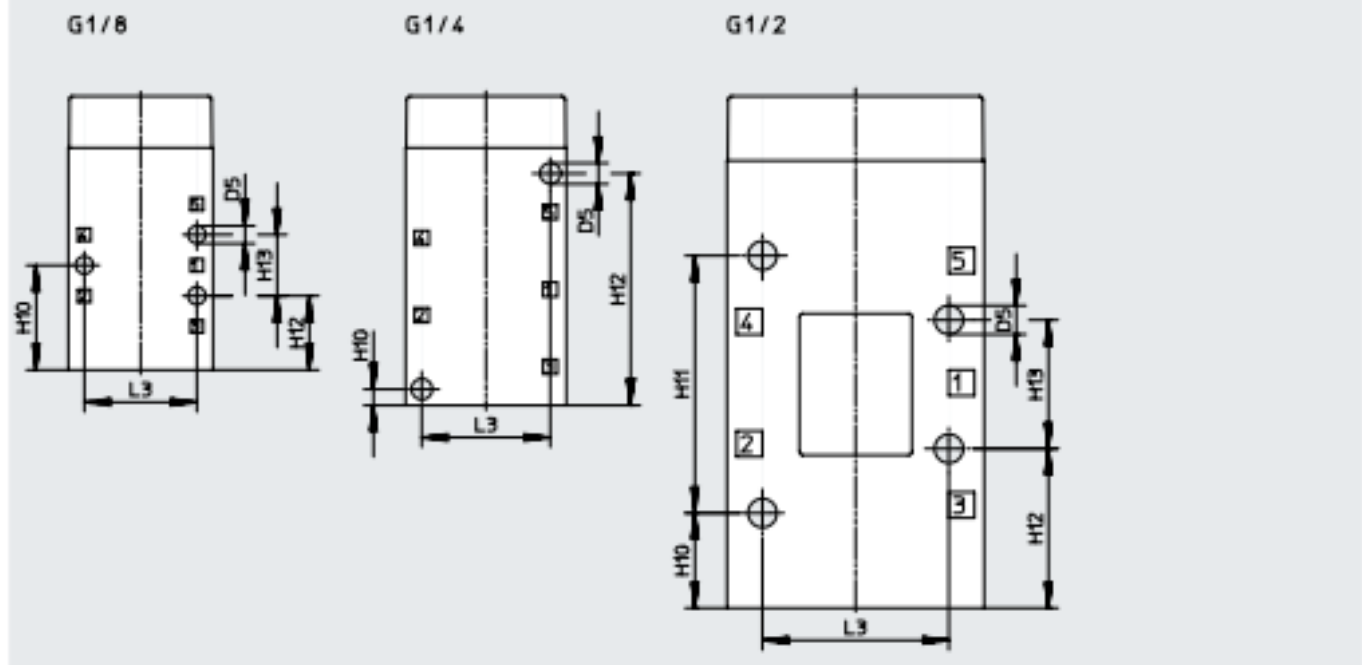
Type	H1	H2	H3	H4	H5	H6	H7	L1	L2
MFH-5-1/8	117	131	13.5	19	23	–	83	45 ±0.15	71
MFH-5-1/8-S		134		19 ±0.15					9.5
MFH-5-1/4	128	143	12	24 ±0.15	28 +0.1/-0.2	–	94	50 +0.4/-0.2	73.5
MFH-5-1/4-S									
MFH-5-1/2	192	208.5	32 ±0.15	38 ±0.15	51 ±0.15	–	158	80 +0.4/-0.2	87.5
MFH-5-1/2-S									

## Datasheet – 5/2-way valves

## Dimensions

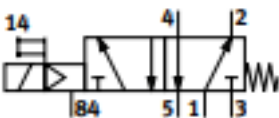
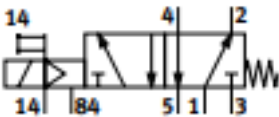
Download CAD data → [www.festo.com](http://www.festo.com)

## 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						

## Datasheet – 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	–	9982	MFH-5-1/8
			ATEX category → Page 12	535906	MFH-5-1/8-EX
		G1/4	–	6211	MFH-5-1/4
			ATEX category → Page 12	535907	MFH-5-1/4-EX
		G1/2	–	6420	MFH-5-1/2
			ATEX category → Page 12	535908	MFH-5-1/2-EX
	Without F solenoid coil <sup>1)</sup> , external pilot air supply	G1/8	–	10348	MFH-5-1/8-S
			ATEX category → Page 12	535909	MFH-5-1/8-S-EX
		G1/4	–	10349	MFH-5-1/4-S
			ATEX category → Page 12	535910	MFH-5-1/4-S-EX
		G1/2	–	35547	MFH-5-1/2-S
			ATEX category → Page 12	535911	MFH-5-1/2-S-EX

1) F solenoid coils → page 50

## Ordering data – Sets of wearing parts

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



1) Order assembly sleeve part no. 228189 separately

2) Use up to series T602

3) Order assembly sleeve part no. 229163 separately

4) Use from series 1/81

## Datasheet – 5/2-way valves, double solenoid valves

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

Sets of wearing parts → page 29



General technical data		G1/8	G1/4	G1/2
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 air 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		
Connection 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	14
Standard nominal flow rate	[l/min]	600	1100	4500
Product weight	[g]	260	530	1210

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

## Datasheet – 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 the 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					
LABS (PWS) conformity			VDMA24364-B1/B2-L					

1) More information: [www.festo.com/1/top/c/crc](http://www.festo.com/1/top/c/crc)

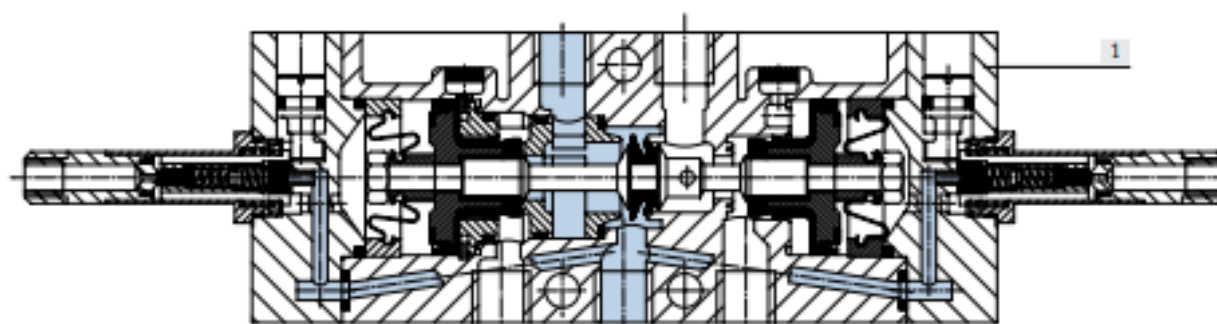
Electrical data			
<b>F solenoid coil</b>			
Electrical connection		Plug pins for plug sockets MSSD-F, KMf	
Operating voltage	DC voltage	[V DC]	12, 24, 42, 48
	Alternating voltage	[V AC]	24, 42, 48, 110, 230, 240 (50 ... 60 Hz)
Characteristic coil data	DC voltage	[W]	4.5
	Alternating voltage	[VA]	Pull: 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	
Changeover	10	16	11	16	20	–

## Datasheet – 5/2-way valves, double solenoid valves

### Materials

Sectional view

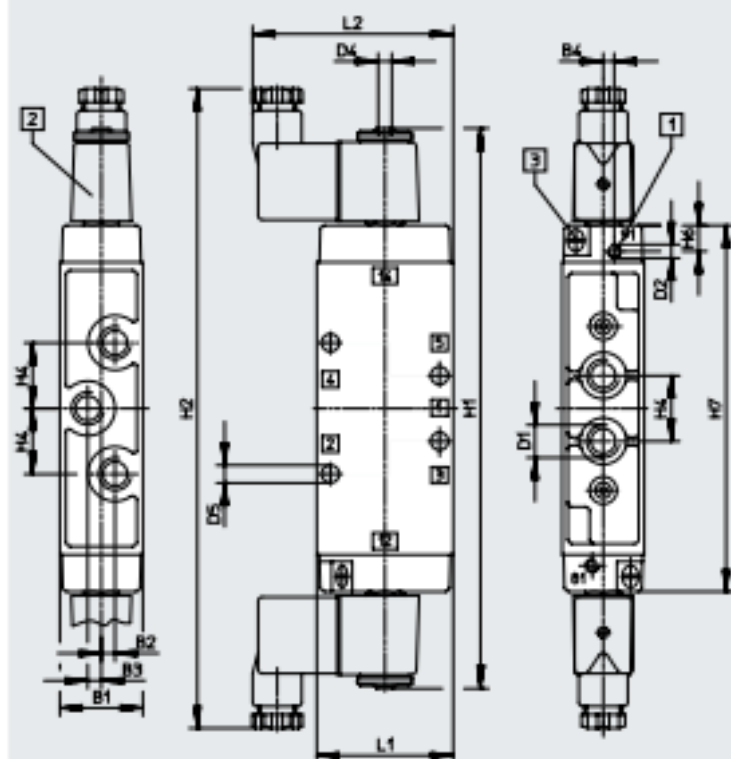


[1]	Housing	Die-cast aluminium
-	Seals	NBR, TPE-U(PI)

## Datasheet – 5/2-way valves, double solenoid valves

## Dimensions

JMFH, JMFDH

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

- [1] Additional connection for external pilot air with JME\_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 ∅
JME...-5-1/8	26 ±0.2	3.5 ±0.15	3.5 ±0.15	–	G1/8	–	M5	5.5
JME...-5-1/8 S				2.7		M5		
JME...-5-1/4	30.4 ±0.1	–	5	–	G1/4	–	M5	Min. 6.5
JME...-5-1/4 S				4		M5		
JME...-5-1/2	52	–	8	–	G1/2	–	M5	9.6 ±0.2
JME...-5-1/2 S	52 ±0.15					G1/8		8.5

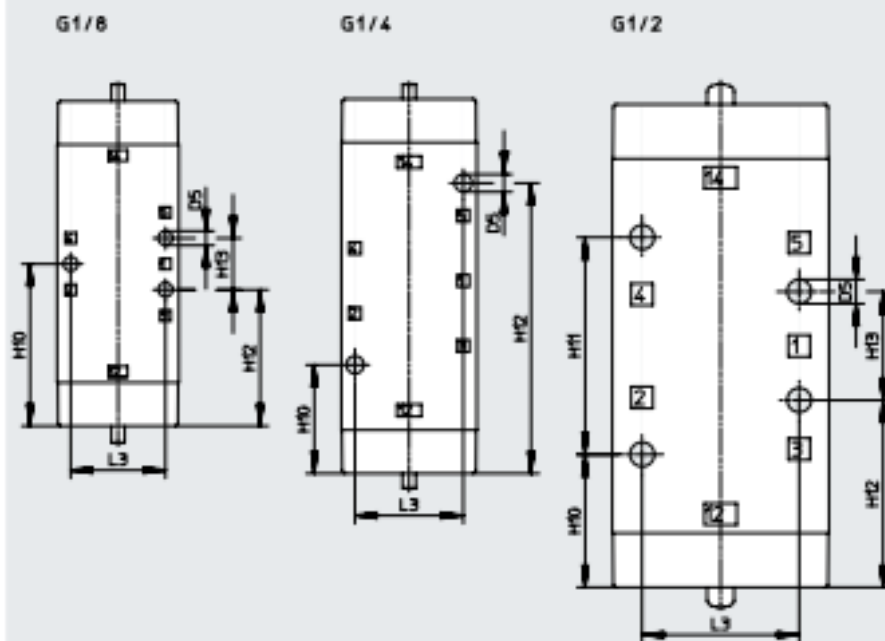
Type	H1	H2	H4	H6	H7	L1	L2
JME...-5-1/8	184	217	19 ±0.15	–	116.5	45 ±0.15	71.5
JME...-5-1/8 S				9.5			
JME...-5-1/4	202	235	24 ±0.3	–	134	50 ±0.4/-0.2	74
JME...-5-1/4 S				9.5			
JME...-5-1/2	244	272	38	–	176	80	88.5
JME...-5-1/2 S		277	38 ±0.1	10.5		80 ±0.4/-0.2	87.5

## Datasheet – 5/2-way valves, double solenoid valves

## Dimensions

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

## Mounting diagram



Type	D5 ø	H10	H11	H12	H13	L3
JMF...-5-1/8	5.5	19	58.3	-	-	35
JMF...-5-1/8S						
JMF...-5-1/4	Min. 6.5	67	67	-	-	40
JMF...-5-1/4S						
JMF...-5-1/2	9.6 +0.2	40	88	80	80	58
JMF...-5-1/2S	8.5					

## Datasheet – 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

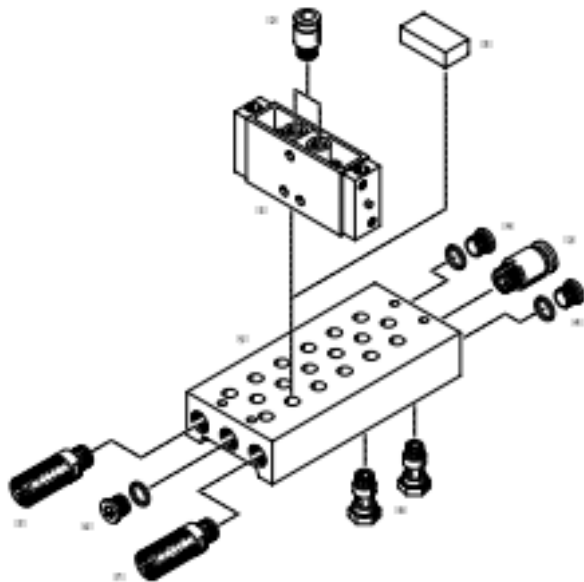
Pneumatic connection	Part no.	Type
G1/8	<b>104891</b>	<b>JMFH-5-1/8<sup>1)</sup></b>
G1/4	<b>104892</b>	<b>JMFH-5-1/4<sup>2)</sup></b>

1) Order assembly sleeve part no. 228389 separately

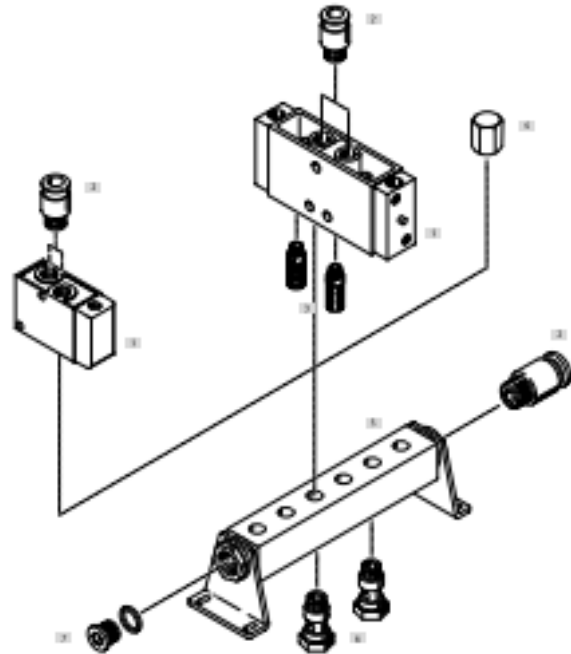
2) Order assembly sleeve part no. 229363 separately

## Peripherals overview: Pneumatic valves

### Mounting on manifold block




### Mounting on manifold rail



Accessories	Brief description	→ Page/Internet
[1] Pneumatic valve VL, JH	--	--
[2] Push-in fitting QS	For connecting tubing with standard O.D.	quick star
[3] Cover plate PR5B	For covering a vacant position	49
[4] 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
[5] Manifold block PRS	--	48
[6] Hollow bolt VT	For distributing compressed air or for separate compressed air supply	47
[7] Silencer	For mounting in exhaust ports	u

Accessories	Brief description	→ Page/Internet
[1] Pneumatic valve VL, JH	--	--
[2] Push-in fitting QS	For connecting tubing with standard O.D.	quick star
[3] Silencer	For mounting in exhaust ports	u
[4] Cap nut VTM	For blanking a vacant position	47
[5] Manifold rail PAL	--	46
[6] Hollow bolt VT	For distributing compressed air or for separate compressed air supply	47
[7] 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

## Datasheet – 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 air function		Can be throttled			
Manual override		None			
Type of mounting		Via through-hole or on manifold rail/manifold block			
Mounting position		Any			
Connection for venting hole		M5 (only ATEX types)			
Pilot air port 110/12		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 characteristics		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	[µs]	2200	–	–	–
Max. negative test pulse with 1 signal	[µs]	3700	–	–	–

ATEX	
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 IIC 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)	According to UK explosion regulations
Explosion protection certification outside the EU	EPL Db (GB) EPL Gb (GB)

## Datasheet – 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 the operating/pilot medium			Lubricated operation possible (in which case lubricated operation will always be required)			
Operating pressure	Normally closed	[MPa]	-0.095 ... 1			
		[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			
LABS (PWIS) conformity			VDMA24364 B1/B2-L			

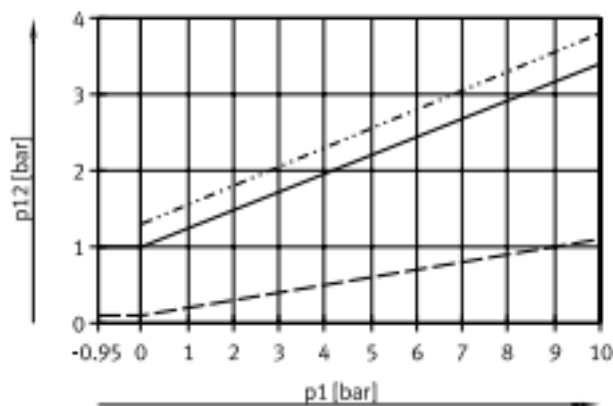
1) More information: [www.festo.com/it/topic/crc](http://www.festo.com/it/topic/crc)

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

## Datasheet – 3/2-way valves

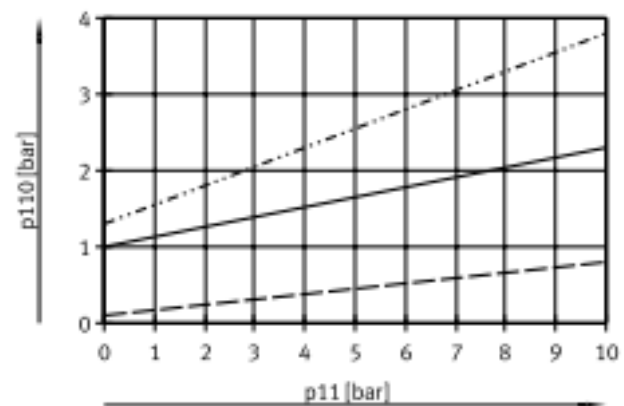
Minimum pilot pressure  $p_{12}/p_{14}/p_{110}$  as a function of operating pressure  $p_1/p_{11}$ 

VL/O-3-1/8 – normally closed



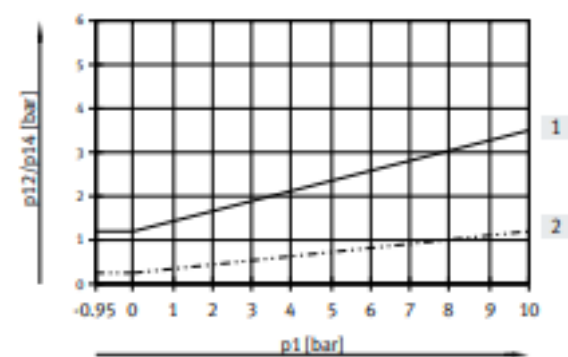
— Switch-on pressure  
 - - - - - Exhaust air flow control  
 - · - · - · Switch-off pressure

VL/O-3-1/8 – normally open



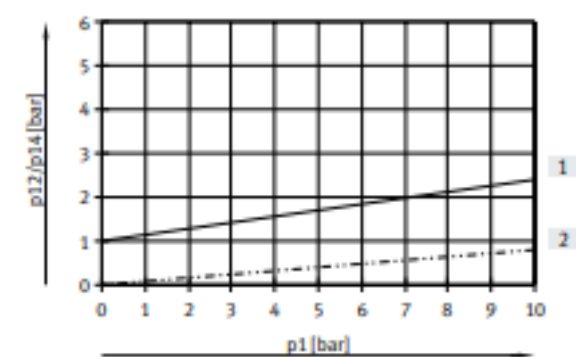
— Switch-on pressure  
 - - - - - Exhaust air flow control  
 - · - · - · Switch-off pressure

VL/O-3-1/4 – normally closed



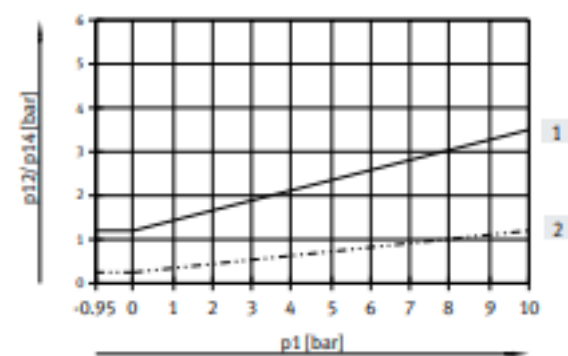
[1] Switch-on pressure  
 [2] Switch-off pressure

VL/O-3-1/4 – normally open



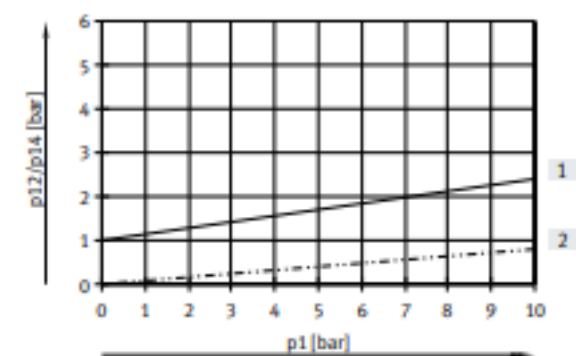
[1] Switch-on pressure  
 [2] Switch-off pressure

VL/O-3-1/2 – normally closed



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

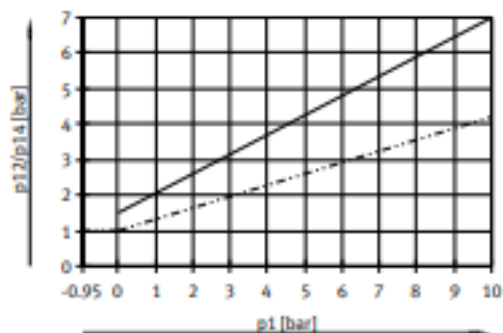
VL/O-3-1/2 – normally open



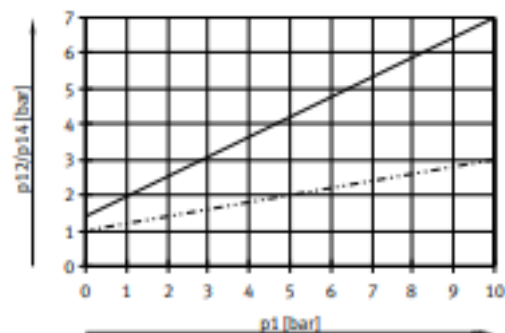
[1] Switch-on pressure  
 [2] Switch-off pressure

## Datasheet – 3/2-way valves

VL/O-3-3/4 – normally closed



VL/O-3-3/4 – normally open

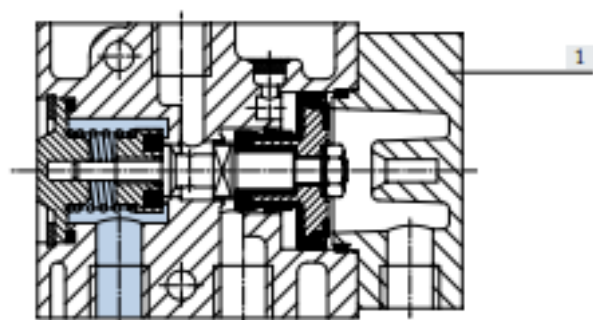


— Exhaust throttled  
 - - - - - Exhaust unthrottled

— Exhaust throttled  
 - - - - - Exhaust unthrottled

### Materials

#### Sectional view



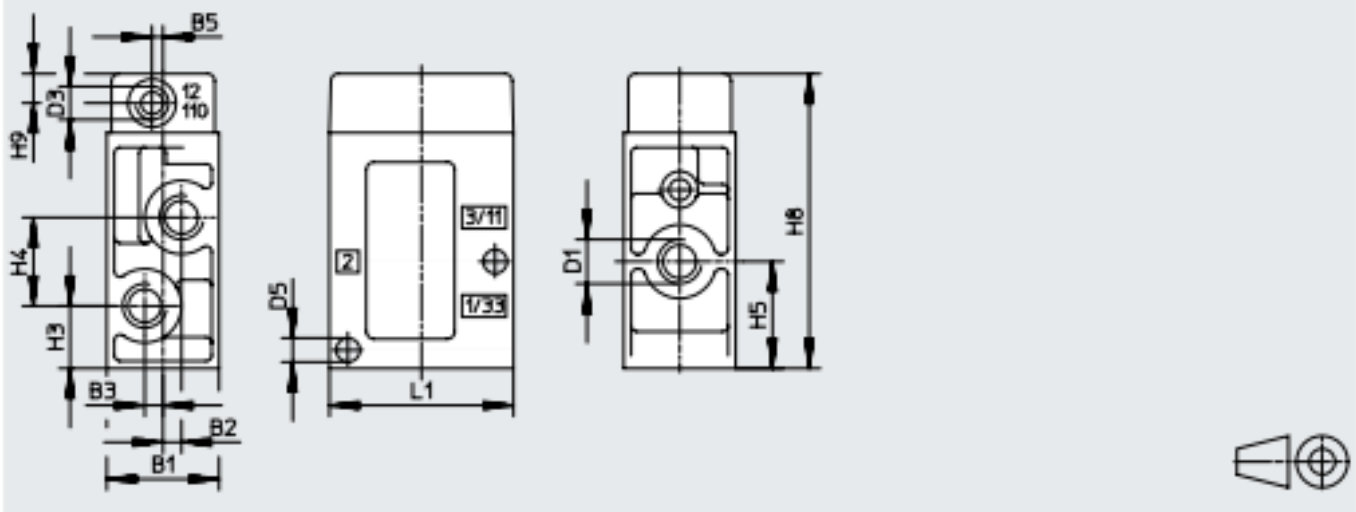
[1]	Housing	Die-cast aluminium
-	Seals	NBR

## Datasheet – 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 ø	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

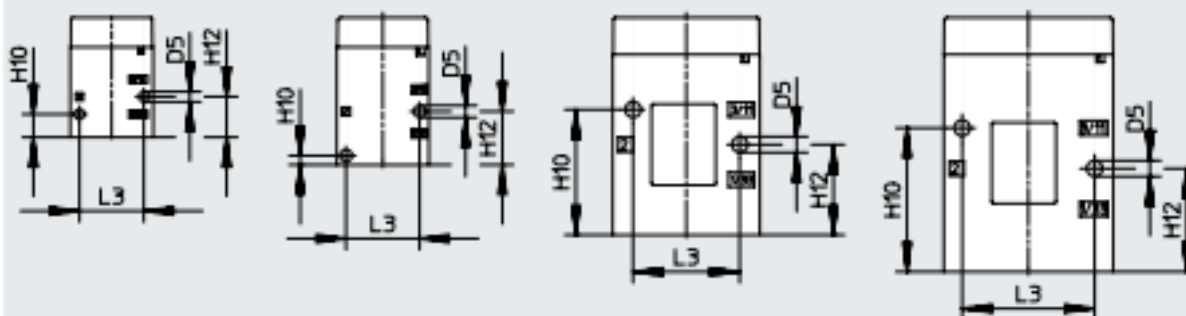
## Mounting diagram

G1/8

G1/4

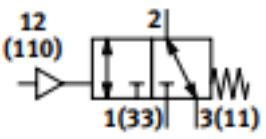
G1/2

G3/4



Type	D5 ø	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

## Datasheet – 3/2-way valves

Ordering data					
Circuit symbol	Description	Pneumatic connection	ATEX category	Part no.	Type
	Mechanical reset method, 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>	VL/O-3-1/8-B
			ATEX category → Page 12	<b>536028</b>	VL/O-3-1/8-B-EX
		G1/4 <sup>2)</sup>	--	<b>9984</b>	VL/O-3-1/4
			ATEX category → Page 12	<b>536029</b>	VL/O-3-1/4-EX
		G1/2 <sup>3)</sup>	--	<b>9983</b>	VL/O-3-1/2
			ATEX category → Page 12	<b>536030</b>	VL/O-3-1/2-EX
		G3/4 <sup>4)</sup>	--	<b>10049</b>	VL/O-3-3/4
			ATEX category → Page 12	<b>536031</b>	VL/O-3-3/4-EX

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

Ordering data – Sets of wearing parts		
Pneumatic connection	Part no.	Type
G1/8	<b>104222</b>	VL/O-3-1/8-B
G1/4	<b>104207</b>	VL/O-3-1/4
G1/2	<b>104208</b>	VL/O-3-1/2

## Datasheet – 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 air function		Can be throttled		
Type of mounting		Via through-hole or on manifold rail/manifold block		
Mounting position		Any		
Connection for venting hole		M5 (only ATEX types)		
Pilot air port 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 characteristics		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	[µs]	2200	–	–
Max. negative test pulse with 1 signal	[µs]	3700	–	–

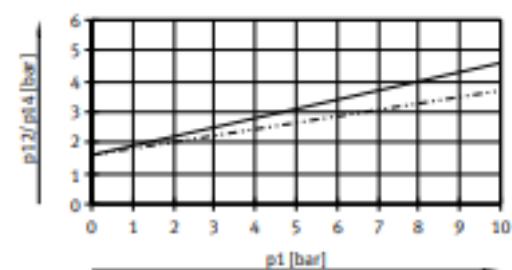
Operating and environmental conditions		G1/8	G1/4	G1/2
Pneumatic connection		G1/8	G1/4	G1/2
Operating medium		Compressed air to ISO 8573-1:2010 [7:4-4]		
Pilot medium		Compressed air to ISO 8573-1:2010 [7:4-4]		
Note on the operating/pilot medium		Lubricated operation possible (in which case lubricated 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		
LABS (PWTS) conformity		VDMA24364 B1/B2-L		

1) More information: [www.festo.com/qs/topic/crc](http://www.festo.com/qs/topic/crc)

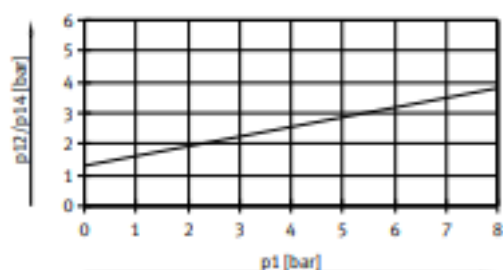
## Datasheet – 5/2-way valves

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

VL-5-1/8

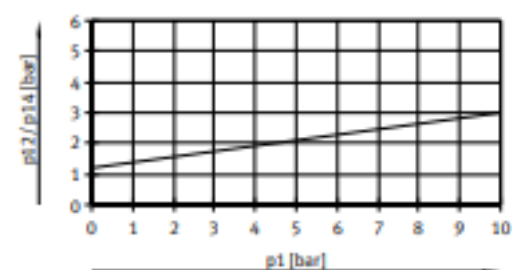


VL-5-1/4



— Exhaust throttled  
 - - - - - Exhaust unthrottled

VL-5-1/2

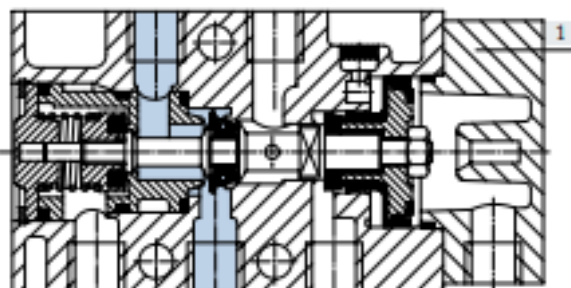


### Valve switching times [ms]

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

### Materials

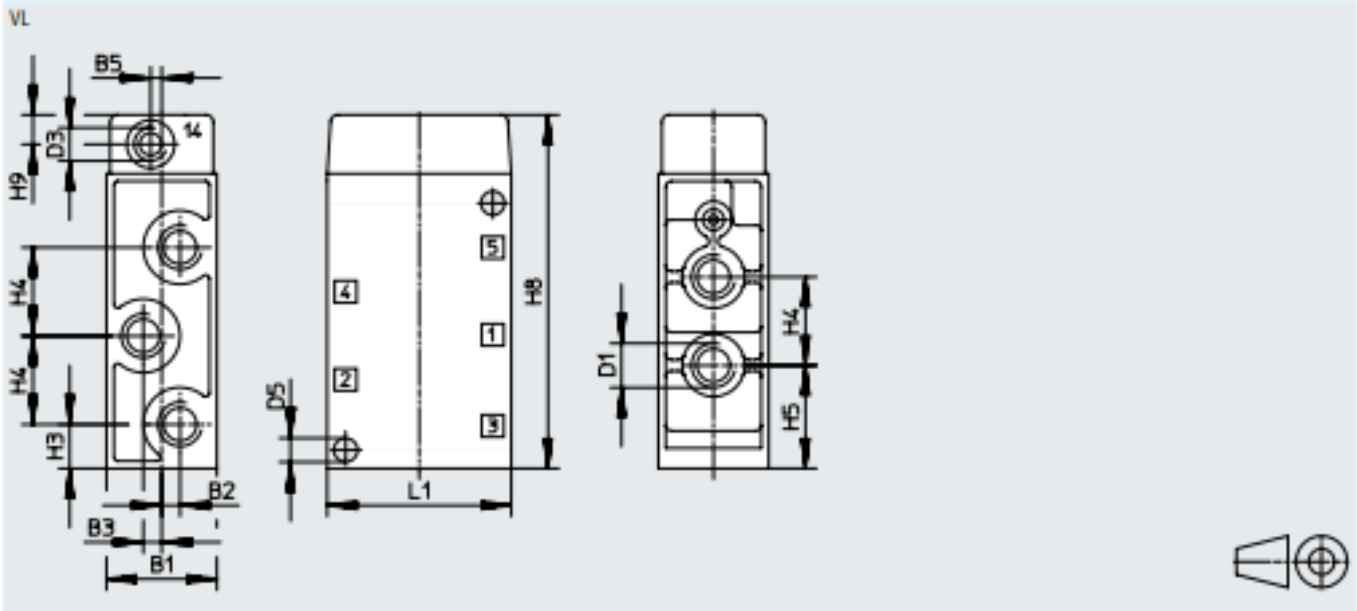
Sectional view



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

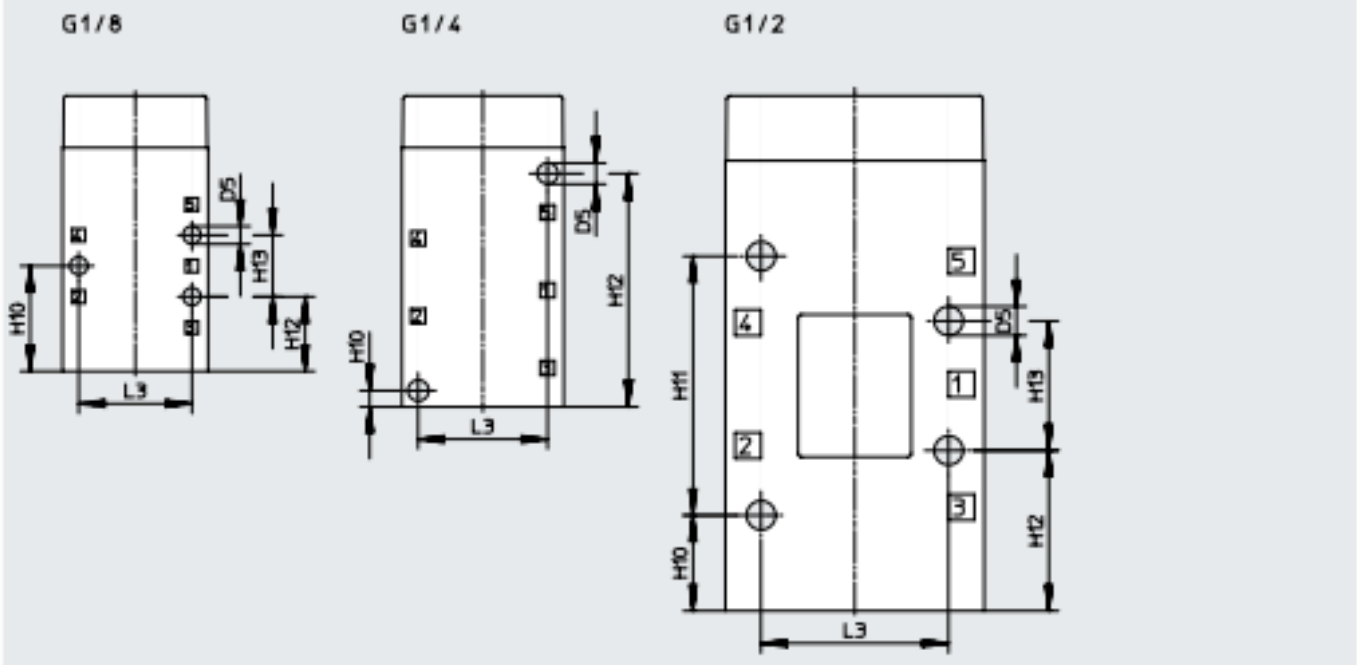
## Datasheet – 5/2-way valves

## Dimensions

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


Type	B1	B2	B3	B5	D1	D3	D5 ø	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



Type	D5 ø	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

## Datasheet – 5/2-way valves

Ordering data					
Circuit symbol	Description	Pneumatic connection	ATEX category	Part no.	Type
	Mechanical reset method	G1/8	--	9764	VL-5-1/8
			ATEX category → Page 12	536032	VL-5-1/8-EX
		G1/4	--	9199	VL-5-1/4
			ATEX category → Page 12	536033	VL-5-1/4-EX
		G1/2	--	9445	VL-5-1/2
			ATEX category → Page 12	536034	VL-5-1/2-EX

## Ordering data – Sets of wearing parts

Pneumatic connection	Part no.	Type
G1/8	104209	VL-5-1/8 <sup>1)</sup>
G1/4	104211	VL-5-1/4 <sup>2)</sup>
G1/2	104212	VL-5-1/2

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

## Datasheet – 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 air function		Can be throttled		
Manual override		–		Detenting
Type of mounting		Via through-hole or on manifold rail/manifold block		
Mounting position		Any		
Connection 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 characteristics		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	[µs]	2200		
Max. negative test pulse with 1 signal	[µs]	3700		

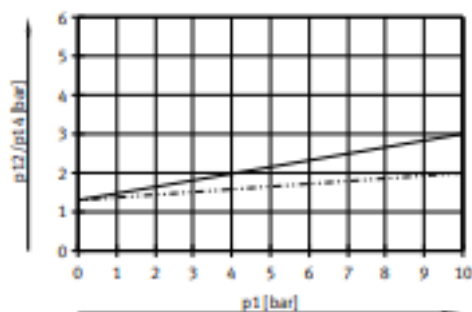
Operating and environmental conditions		G1/8	G1/4	G1/2	
Pneumatic connection		G1/8	G1/4	G1/2	
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]			
Pilot medium		Compressed air to ISO 8573-1:2010 [7:4:4]			
Note on the operating/pilot medium		Lubricated operation possible (in which case lubricated 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			
LABS (PWS) conformity		VDMA24364-B1/B2-L			

1) More information: [www.festo.com/~/top/c/crc](http://www.festo.com/~/top/c/crc)

## Datasheet – 5/2-way valves, double pilot valves

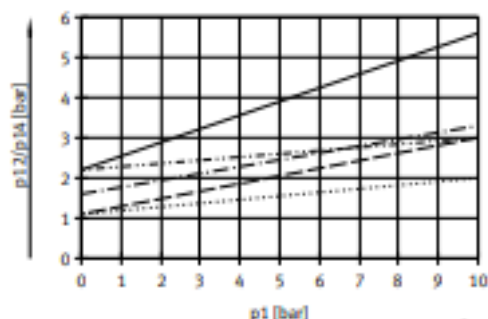
### Minimum pilot pressure $p_{12}/p_{14}$ as a function of operating pressure $p_1$

JH-5-1/8



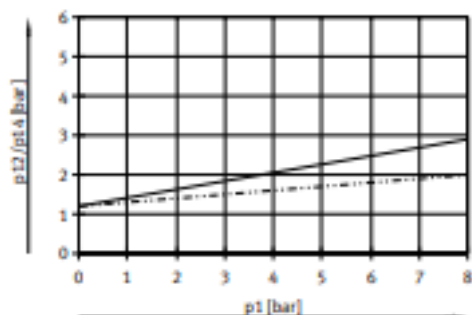
— Exhaust throttled  
- - - Exhaust unthrottled

JDH-5-1/8



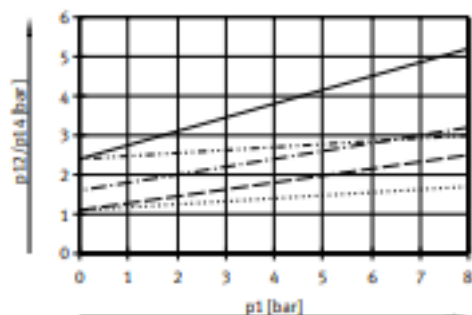
— Exhaust throttled  
- - - Exhaust unthrottled

JH-5-1/4



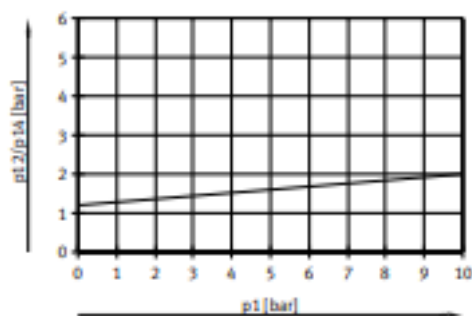
— Exhaust throttled  
- - - Exhaust unthrottled

JDH-5-1/4



— Exhaust throttled  
- - - Exhaust unthrottled

JH-5-1/2



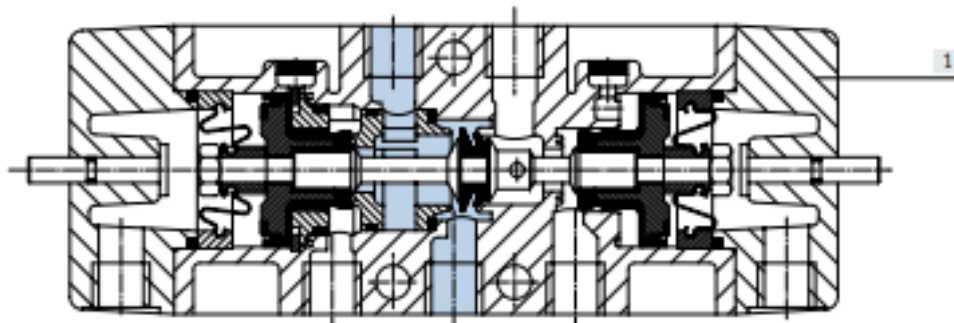
### Valve switching times [ms]

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	-

## Datasheet – 5/2-way valves, double pilot valves

## Materials

Sectional view

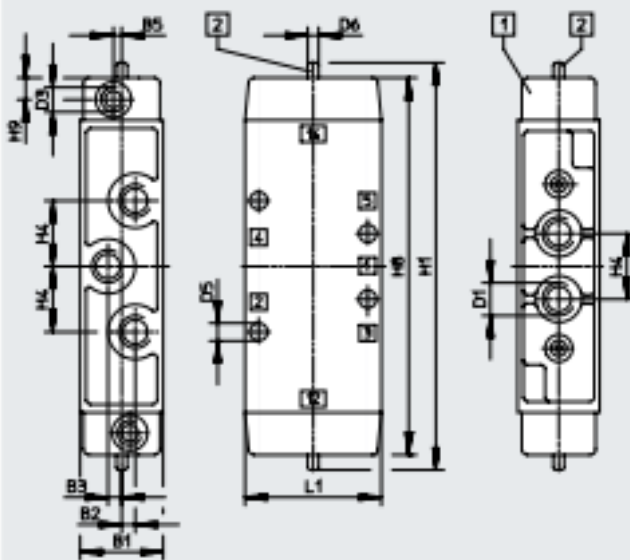


[1] Housing	Die-cast aluminium
- Seals	NBR, TPE-U/PU

## Dimensions

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

JH, JDH



[4] Cover can be turned 180°

[5] Manual override

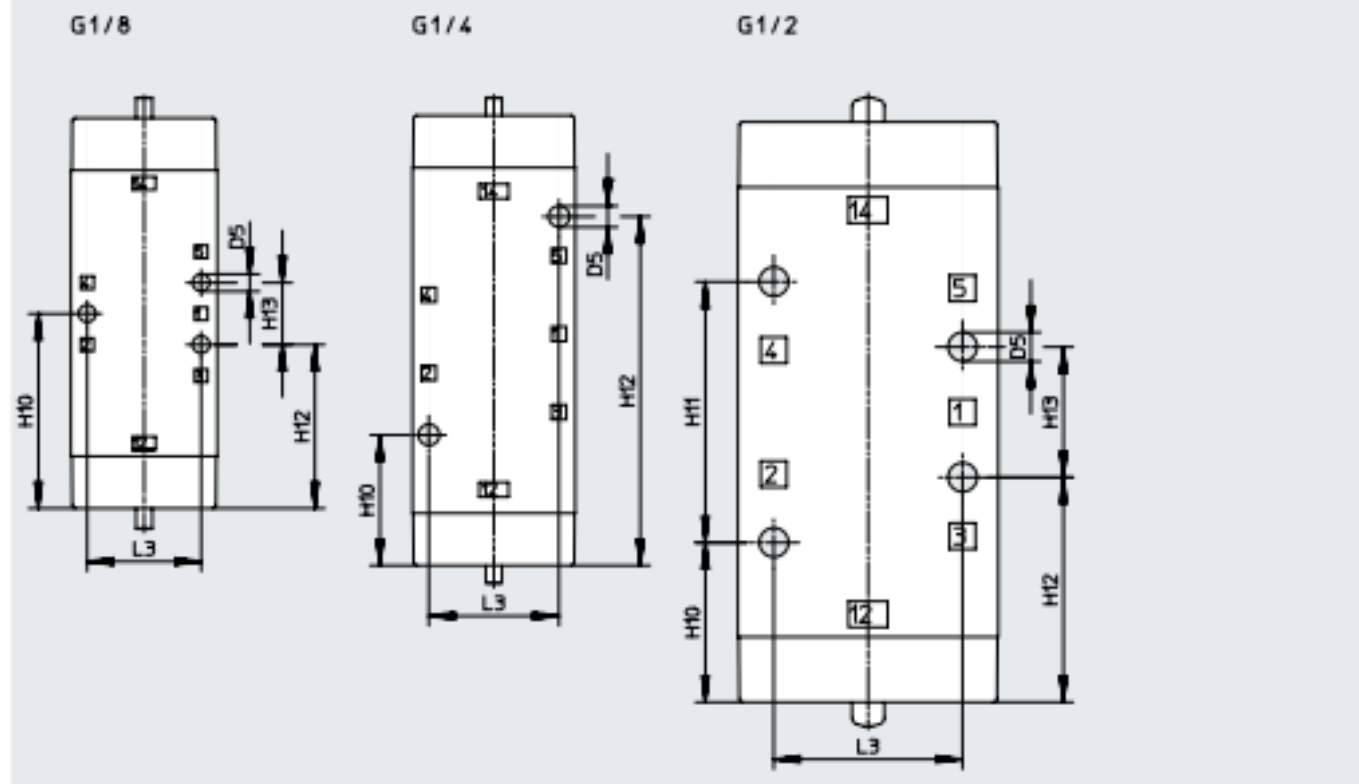
Type	B1	B2	B3	B5	D1	D3	D5 ø	D6 ø	H1	H4	H8	H9	L1
J...5-1/8	26	3.5	3.5	3	G1/8	G1/8	5.3	5	132	19	120	8	45
J...5-1/4	30.4	-	5	-	G1/4	G1/8	6.5	5	149	24	138	8	50
J...5-1/2	52	-	8	-	G1/2	G1/4	9.6 +0.2	9.9	193	38	178	10	80

## Datasheet – 5/2-way valves, double pilot valves

## Dimensions

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

## Mounting diagram



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

## Datasheet – 5/2-way valves, double pilot valves

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

1) Order assembly sleeve part no. 228389 separately

2) Order assembly sleeve part no. 229363 separately

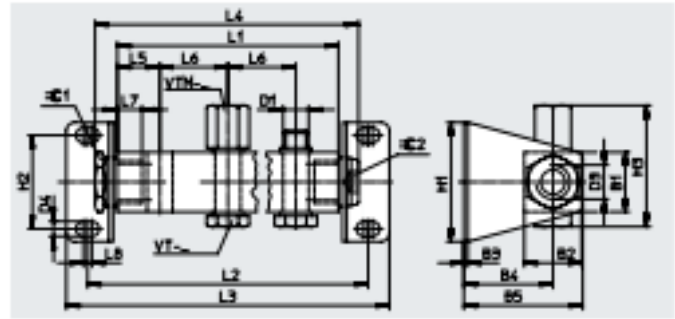
## Accessories

## 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) BDPH-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	Steel, chromed	8626	VT-1/8
G1/8	15	Anodised aluminium	5928	VT-1/8-1 <sup>(1)</sup>
G1/4	15	Steel, chromed	206147	VT-1/4-2
G1/2	30	Anodised aluminium	9986	VT-1/2

- 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



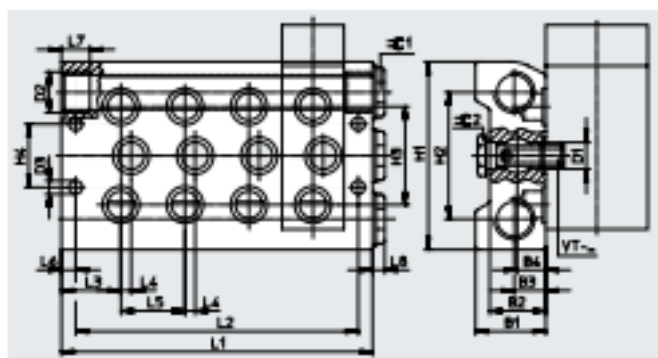
Ordering data				
Pneumatic connection	Weight [g]	Material	Part no.	Type
G1/8	5		9768	VTM-1/8 <sup>(1)</sup>
G1/4	7		3099	VTM-1/4
G1/2	28		9987	VTM-1/2

- 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	±1	±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:  
Steel, chromed



<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:  
Steel, chromed





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>					Datasheets → Internet: msfg
	–	12 VDC	–	34410	MSFG-12-00
		24 VDC and 42 VAC, 50 ... 60 Hz	–	34411	MSFG-24/42-50/60-00
		42 VDC	–	34413	MSFG-42-00
		24 VAC	–	34415	MSFW-24-5 0/60-00
		48 VAC, 50 ... 60 Hz	–	34418	MSFW-48-5 0/60-00
		110 VAC, 50 ... 60 Hz and 120 VAC, 60 Hz	–	34420	MSFW-110-5 0/60-00
		230 VAC, 50 ... 60 Hz and 240 VAC, 60 Hz	–	34422	MSFW-230-5 0/60-00
		240 VAC, 50 ... 60 Hz	–	34424	MSFW-240-5 0/60-00
	Explosion-proof	24 VDC	–	536931	MSFG-24-EX
		24 VAC	–	536932	MSFW-24-5 0/60-EX
		110 VAC	–	536933	MSFW-110-5 0/60-EX
		230 VAC	–	536934	MSFW-230-5 0/60-EX
<b>F solenoid coils, cable with open end, 3-core</b>					
	Explosion-proof	24 VDC	1	8059804	VACF-B-K1-1-1-EX4-M
			5	8059805	VACF-B-K1-1-5-EX4-M
			10	8059806	VACF-B-K1-1-10-EX4-M
			20	8059807	VACF-B-K1-1-20-EX4-M
		24 VAC	1	8059808	VACF-B-K1-1A-1-EX4-M
			5	8059811	VACF-B-K1-16B-1-EX4-M
		110 VAC	1	8059811	VACF-B-K1-16B-1-EX4-M
			5	8059812	VACF-B-K1-16B-5-EX4-M
		230 VAC	1	8059809	VACF-B-K1-3A-1-EX4-M
			5	8059810	VACF-B-K1-3A-5-EX4-M
<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>					Datasheets → Internet: mssd
	Locking screws (cable connector Pg9)	–	–	34431	MSSD-F
	Locking screws (cable connector M16)	–	–	539710	MSSD-F-M16
<b>Connecting cable</b>					Datasheets → Internet: kmf
	Signal status indication with LED	24 VDC	2.5	30935	KMF-1-24DC-2.5-LED
			5	30937	KMF-1-24DC-5-LED
			10	193458	KMF-1-24DC-10-LED
	Without signal status indication	Up to 240 V	2.5	30936	KMF-1-230AC-2.5
			5	30938	KMF-1-230AC-5

## Accessories

Ordering data – Illuminating seal				Datasheets → Internet: mf/id	
	Description	Voltage	Part no.	Type	
	For F solenoid coils	12 ... 24 V DC 230 V DC/V AC	19143	MF-LD-12-24DC	
			19144	MF-LD-230AC	
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	541667	MPL-TC-3-18
			G1/4	541669	MPL-TC-3-14
		For 5/2-way valves	G1/8	541668	MPL-TC-5-18
			G1/4	541670	MPL-TC-5-14