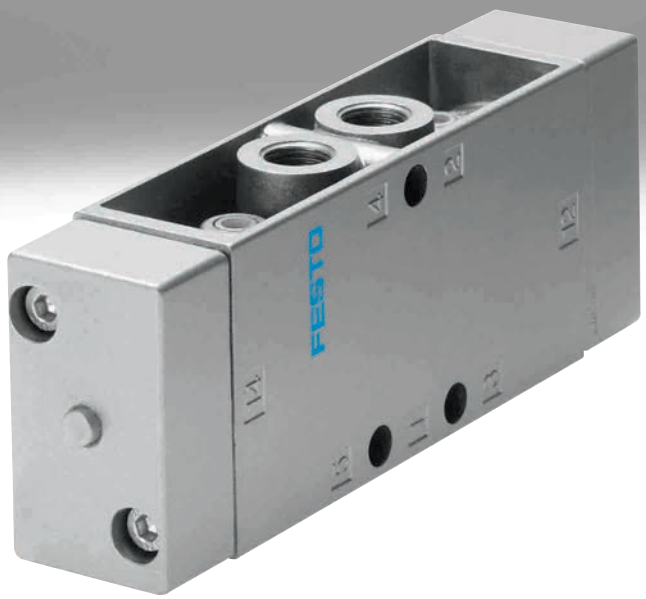
Solenoid/pneumatic valves, Tiger Classic



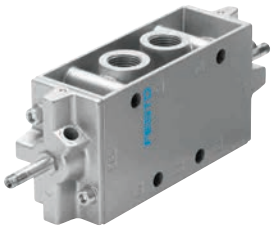
- Electrically or pneumatically actuated valves
- With internal or external pilot air
- Sturdy and reliable

Selected types conform to the ATEX directive for potentially explosive atmospheres
➔ www.festo.com/en/ex

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

Voltage:
- 12 to 230 V DC
- 12 to 240 V AC (50 to 60 Hz)

Power consumption:
- 4.1 to 5.5 W DC
- 3.85 to 9 VA AC

- Selected types conform to the ATEX directive for potentially explosive atmospheres
- Solenoid coil can be easily exchanged later
- Solenoid coil not included in scope of delivery

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 8 bar 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

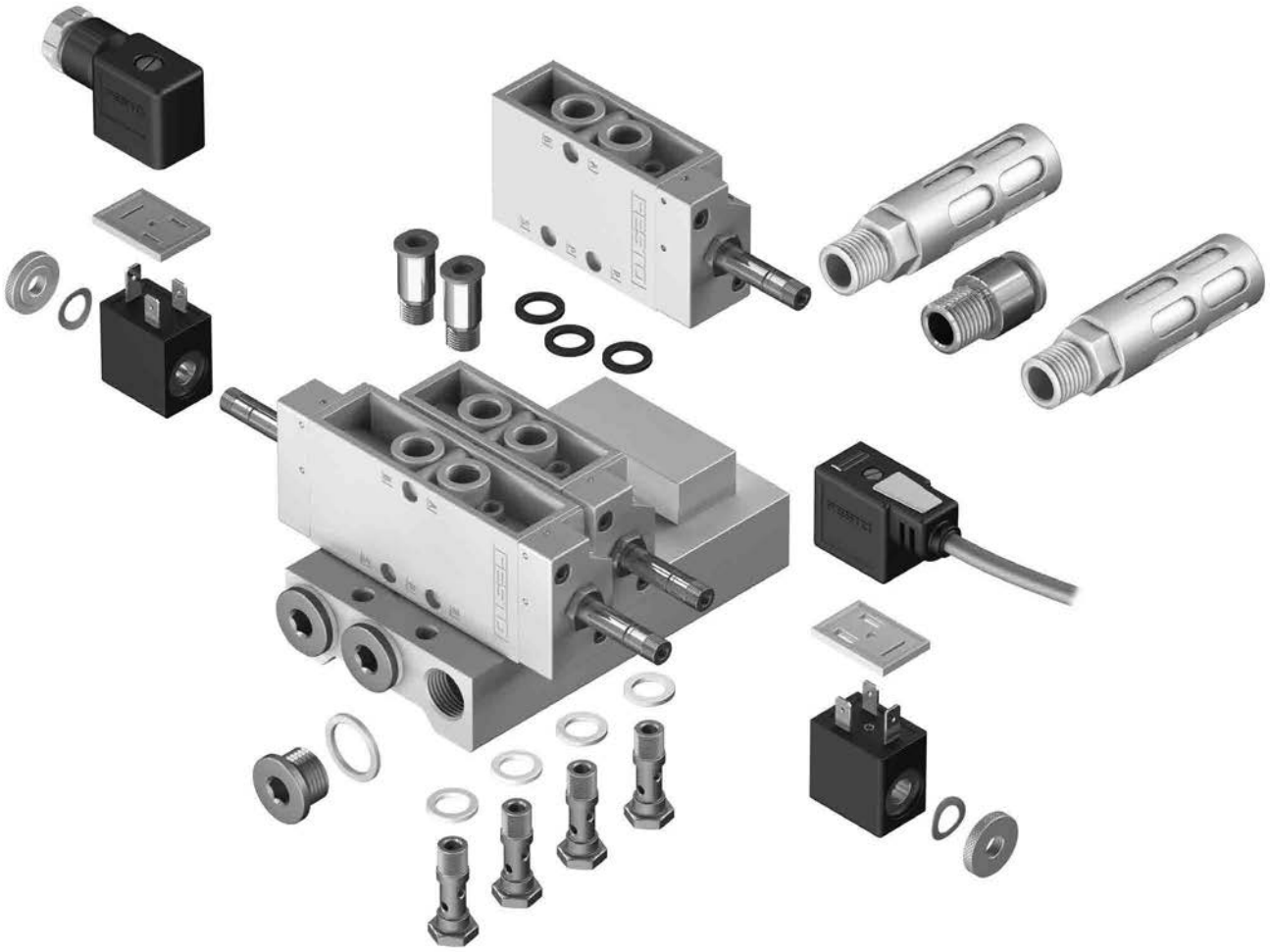
Manifold assembly

With PAL manifold rail

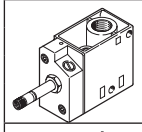
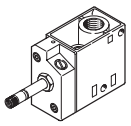
With PRS manifold block

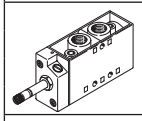
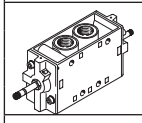
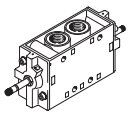
The Tiger Classic valves can be mounted on manifold rails PAL with common supply port or on manifold blocks PRS with common supply port and common exhausts. The valves are mounted on the rails and blocks with hollow bolts. The manifold rail and manifold block have 2 to 6 valve positions.
Vacant positions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

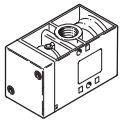
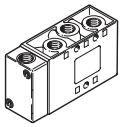
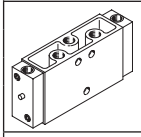
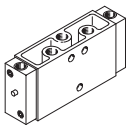
Function	Design	Type	Pneumatic connection	Operating voltage	
				[V DC]	[V AC]
5/2-way valves	**Solenoid valve**				
		**MFH**	G1/8	12, 24, 42, 48	24, 42, 48, 110, 230, 240
			G1/4		
			G1/2		
	Double solenoid valve				
		**JMFH**	G1/8	12, 24, 42, 48	24, 42, 48, 110, 230, 240
			G1/4		
			G1/2		
	Double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

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

Product range overview

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

002	Valve function	
3	3/2-way valve	
5	5/2-way valve	

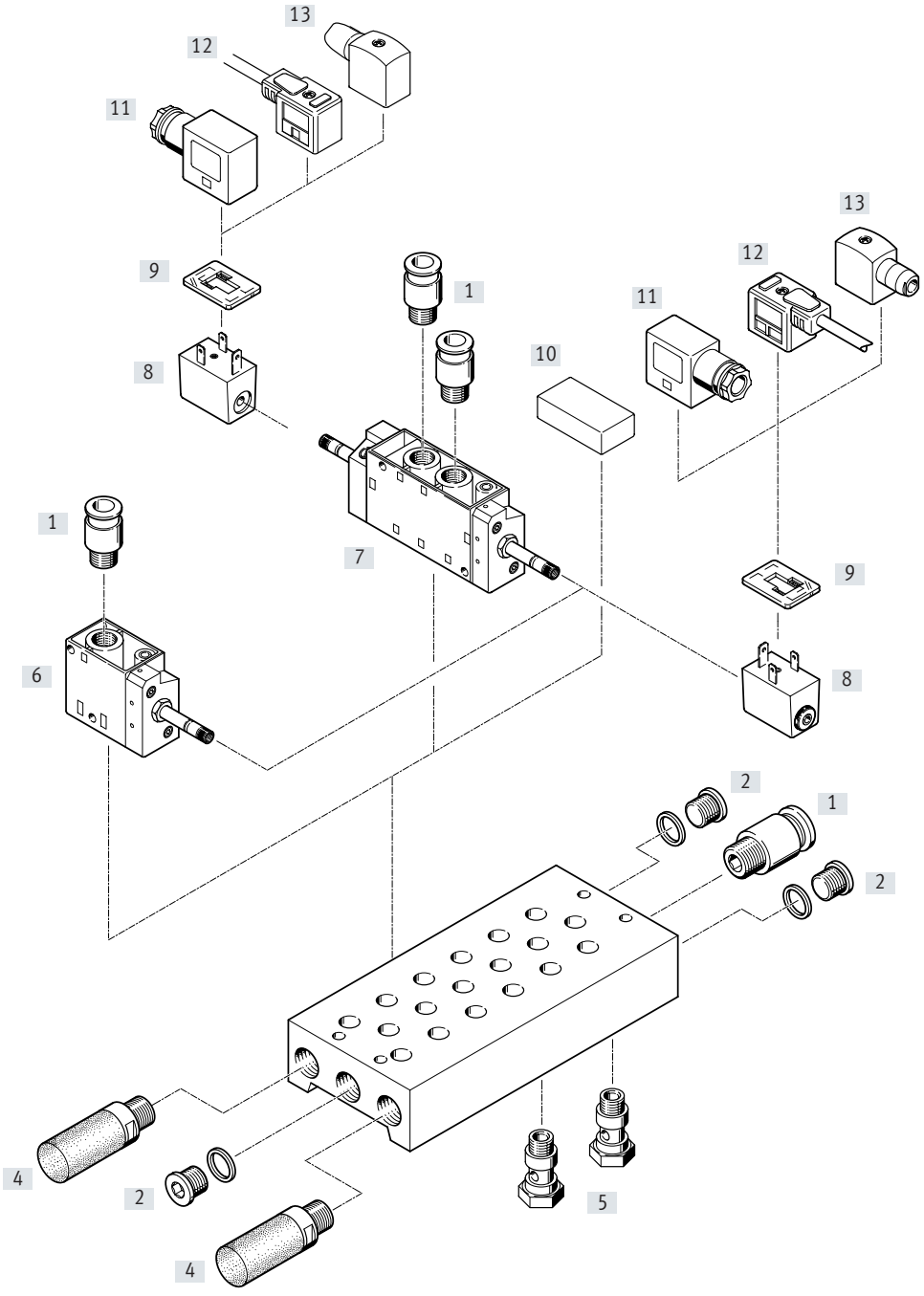
003	Pneumatic connection	
G18	G1/8	
G14	G1/4	
G12	G1/2	
G34	G3/4	

004	EU certification	
	None	
EX4	II 2GD	

005	Pilot air	
S	External	
	Internal	

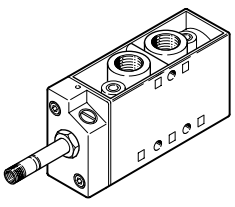
Peripherals overview

Mounting on manifold block

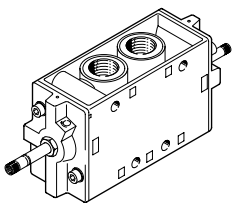


Variants

MFH-5-...



JMFH-5-...

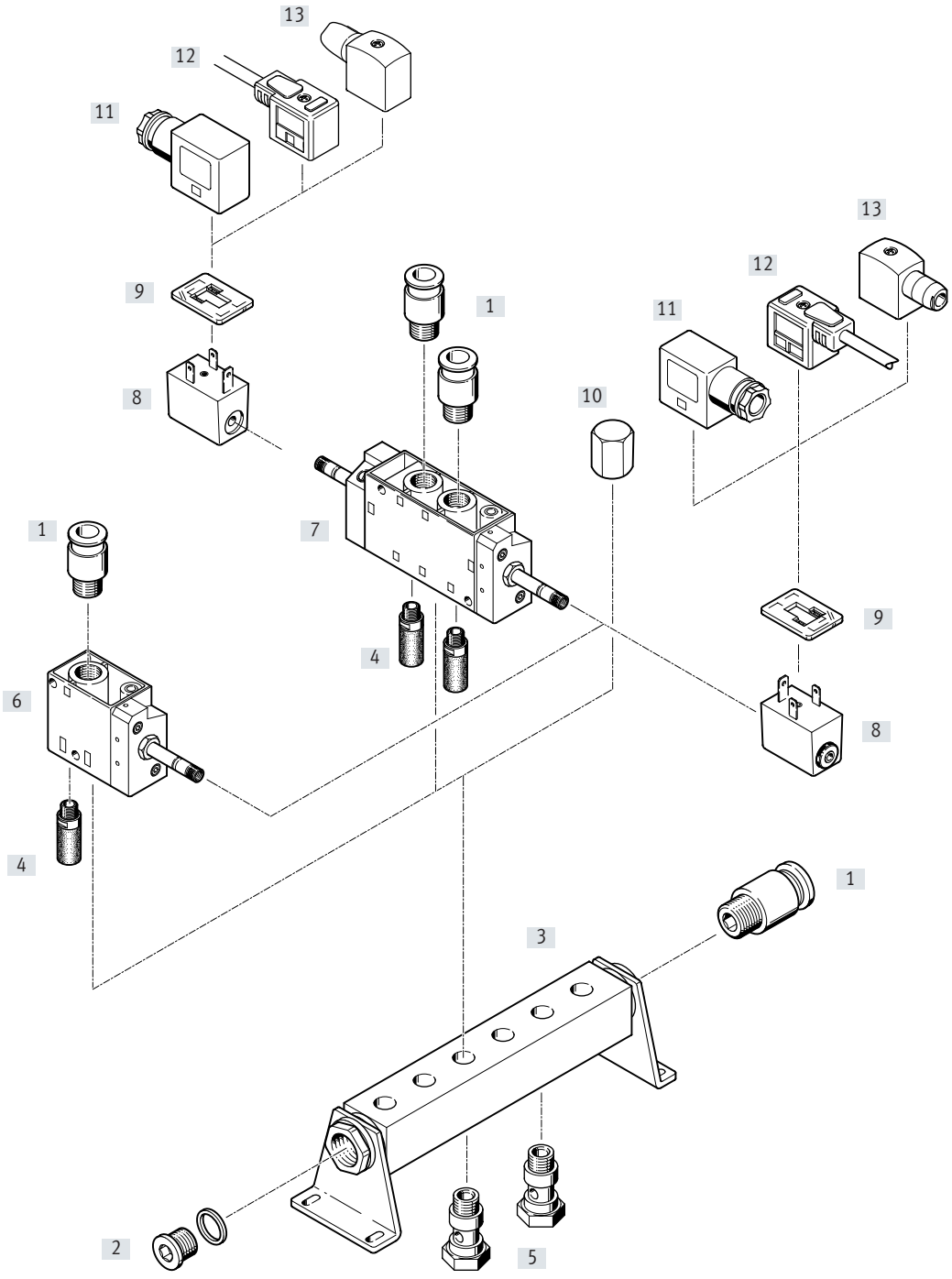


Peripherals overview

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 MFH	For F solenoid coil	–
[7]	Solenoid valve JMFH	For F solenoid coil	–
[8]	F solenoid coil MSFG, MSFW		50
[9]	Illuminating seal M...-LD	For indicating the switching status	51
[10]	Cover plate PRSB	For covering a vacant position	49
[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

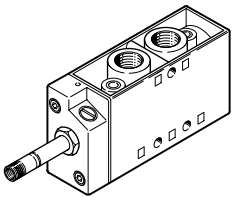
Peripherals overview

Mounting on manifold rail

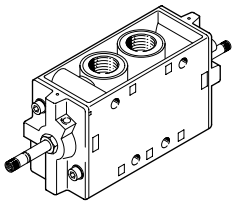


Variants

MFH-5-...



JMFH-5-...



Peripherals overview

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, MSFW		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					
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[1)]			
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					
Type		MFH- ... -EX	MOFH- ... -EX	JMFH- ... -EX	JMFDH- ... -EX
Max. switching frequency	[Hz]	3	–	25	16
Max. positive test pulse with 0 signal	[ìs]	2200			
Max. negative test pulse with 1 signal	[ìs]	3700[1)]			

1) Not valid for types MFH-3-3/4- and MOFH-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 IIIC T130°C Db
Explosion-proof ambient temperature	[°C]	–5 <= Ta <= +40
CE marking (see declaration of conformity)		To EU Explosion Protection Directive (ATEX)
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	[bar]	1.5 ... 8			2 ... 8	1.5 ... 8			2 ... 8
	External pilot air supply	[bar]	–0.95 ... +10							
Pilot pressure (external pilot air supply)		[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[1)]			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).

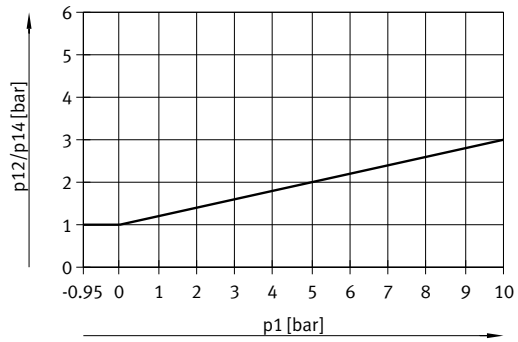
Electrical data			
F solenoid coil			
Electrical connection			Plug pins for plug sockets MSSD-F, KMF
Operating voltage	Direct voltage	[V DC]	12, 24, 42, 48
	Alternating voltage	[V AC]	24, 42, 48, 110, 230, 240 (50 ... 60 Hz)
Characteristic coil data	Direct voltage	[W]	4.5
	Alternating voltage	[VA]	Pull: 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		G3/4	
Normal position	Closed	Open	Closed	Open	Closed	Open	Closed	Open
Internal pilot air supply								
On	9	9	10	14	18	18	36	40
Off	29	29	29	41	90	90	32	29
External pilot air supply								
On	9	–	10	–	18	–	36	–
Off	29	–	29	–	90	–	32	–

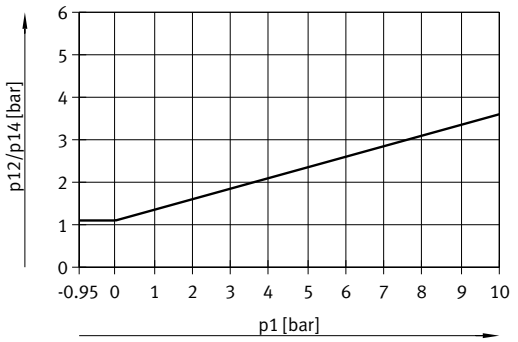
Data sheet – 3/2-way valves

Minimum pilot pressure p12/p14 as a function of operating pressure p1 (external pilot air supply)

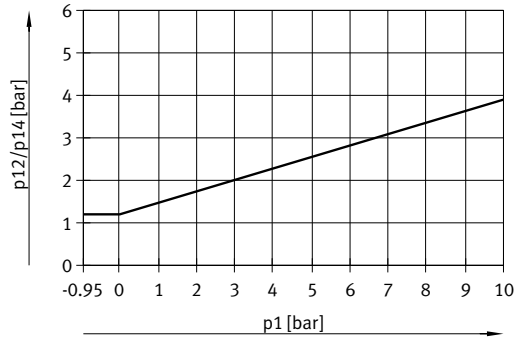
MFH-3-1/8-S



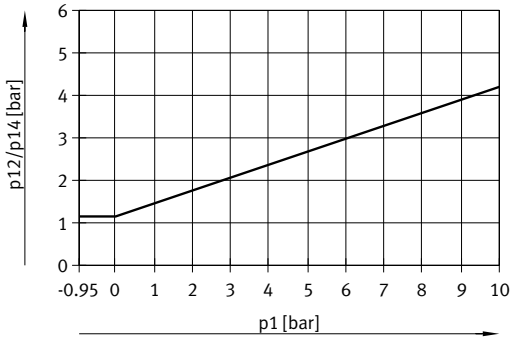
MFH-3-1/4-S



MFH-3-1/2-S

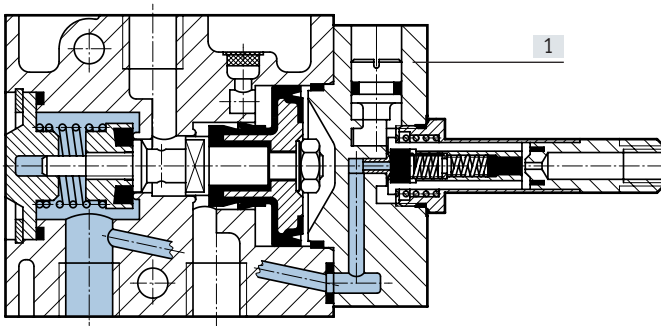


MFH-3-3/4-S



Materials

Sectional view

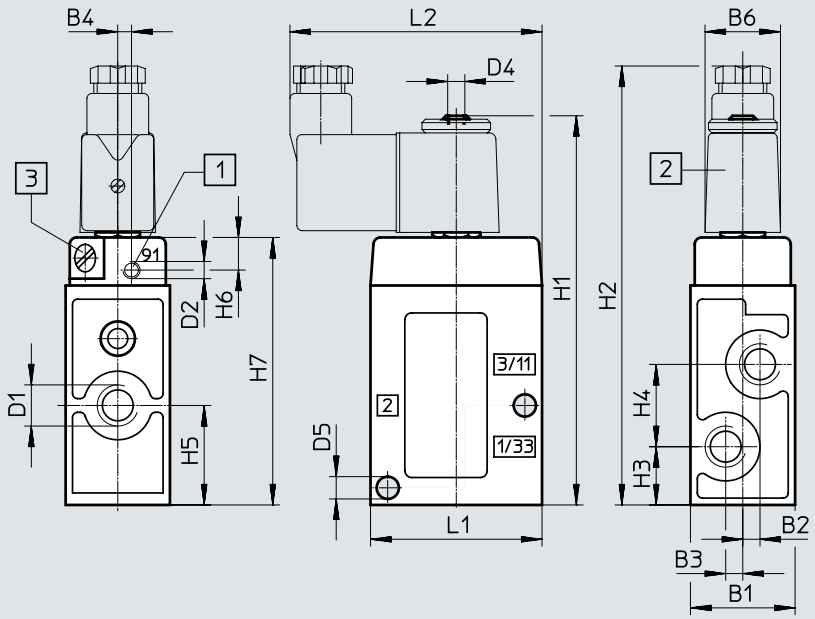


[1]	Housing	Die-cast aluminium
–	Seals	NBR

Data sheet – 3/2-way valves

Dimensions Download CAD data ➔ www.festo.com

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°

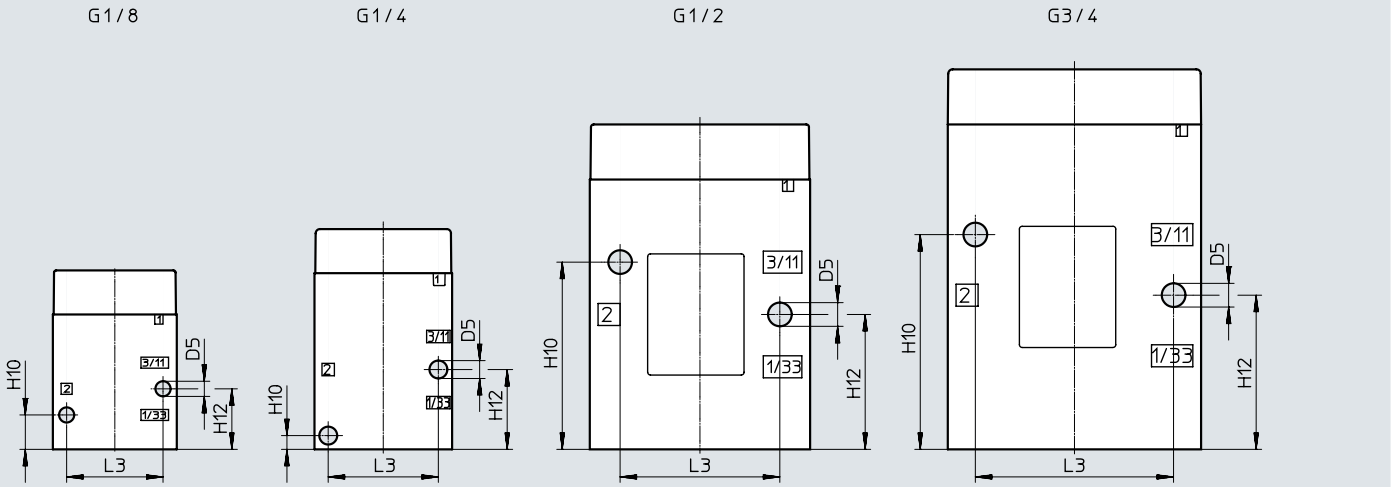
Type	B1	B2	B3	B4	B6	D1	D2	D4	D5 ø
M...-3-1/8	26 +0.2	3.5	3.5	–	22	G1/8	–	M5	5.5
M...-3-1/8-S				2.7			M5		
M...-3-1/4	30.4 ±0.15	5	5	–		G1/4	–	M5	6.5
M...-3-1/4-S	30.4			4			M5		
M...-3-1/2	52 ±0.15	8	8	–		G1/2	–	M5	8.6
M...-3-1/2-S	52						G1/8		
M...-3-3/4	68 ±0.15	8	8	–		G3/4	–	M5	8.6
M...-3-3/4-S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

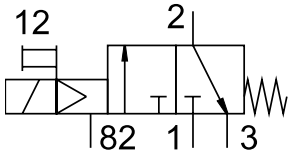
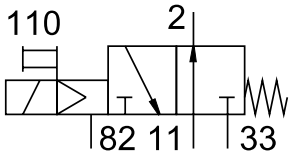
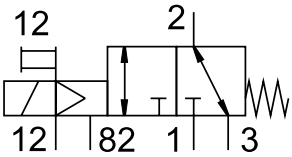
Mounting diagram



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[1], 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[1], internal pilot air supply	G1/8	–	**7877**	**MOFH-3-1/8**
			ATEX category → Page 12	**535903**	**MOFH-3-1/8-EX**
		G1/4	–	**7876**	**MOFH-3-1/4**
			ATEX category → Page 12	**535904**	**MOFH-3-1/4-EX**
		G1/2	–	**7884**	**MOFH-3-1/2**
			ATEX category → Page 12	**535905**	**MOFH-3-1/2-EX**
		G3/4	–	**11969**	**MOFH-3-3/4**
			ATEX category → Page 12	**536192**	**MOFH-3-3/4-EX**
	Without F solenoid coil[1], external pilot air supply, reversible (no restrictions with vacuum at port 1, restrictions with vacuum at port 3)	G1/8[2]	–	**7958**	**MFH-3-1/8-S**
			ATEX category → Page 12	**535900**	**MFH-3-1/8-S-EX**
		G1/4[3]	–	**7959**	**MFH-3-1/4-S**
			ATEX category → Page 12	**535901**	**MFH-3-1/4-S-EX**
		G1/2[4]	–	**7960**	**MFH-3-1/2-S**
			ATEX category → Page 12	**535902**	**MFH-3-1/2-S-EX**
		G3/4[5]	–	**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**

Data sheet – 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				
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]	–	4.49	–
Nominal width	[mm]	5	7	14
Standard nominal flow rate	[l/min]	500	1000	3700
Product weight	[g]	270	290	1135

Safety data		
Max. switching frequency	[Hz]	–
Max. positive test pulse with 0 signal	[is]	2200
Max. negative test pulse with 1 signal	[is]	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	[bar]	1.8 ... 8	2.2 ... 8	2 ... 8	1.8 ... 8	2.2 ... 8	2 ... 8
	External pilot air supply	[bar]	0 ... 10	0 ... 8	0 ... 8	0 ... 10	0 ... 8	0 ... 10
Pilot pressure (external pilot air supply)		[bar]	1 ... 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[1)]			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).

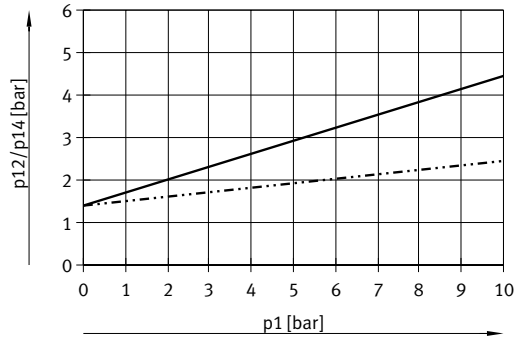
Electrical data			
F solenoid coil			
Electrical connection			Plug pins for plug sockets MSSD-F, KMF
Operating voltage	Direct voltage	[V DC]	12, 24, 42, 48
	Alternating voltage	[V AC]	24, 42, 48, 110, 230, 240 (50 ... 60 Hz)
Characteristic coil data	Direct voltage	[W]	4.5
	Alternating voltage	[VA]	Pull: 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
On	8	9	21
Off	36	29	150

Data sheet – 5/2-way valves

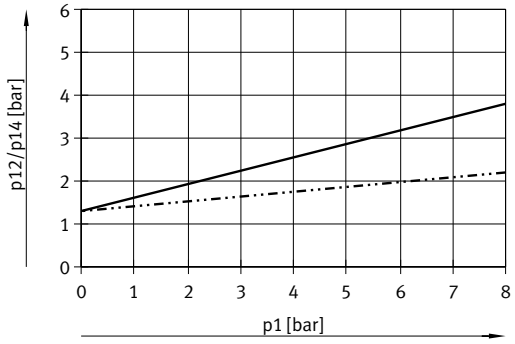
Minimum pilot pressure p12, p14 as a function of operating pressure p1 (external pilot air supply)

MFH-5-1/8-S



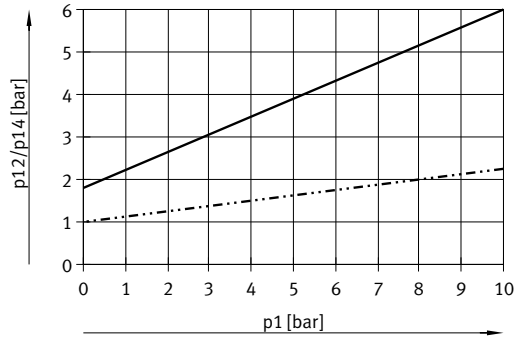
Exhaust throttled
Exhaust unthrottled

MFH-5-1/4-S



Exhaust throttled
Exhaust unthrottled

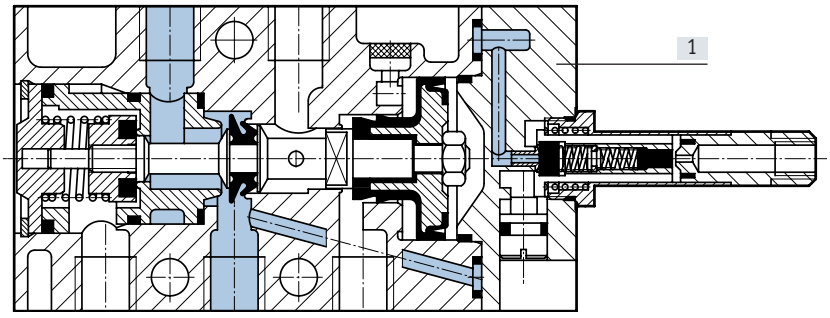
MFH-5-1/2-S



Exhaust throttled
Exhaust unthrottled

Materials

Sectional view

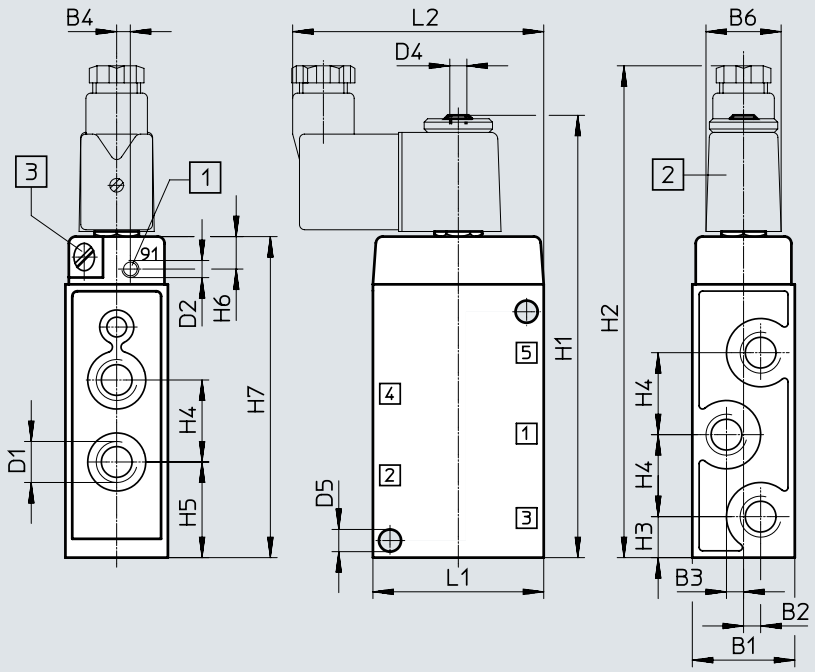


[1]	Housing	Die-cast aluminium
–	Seals	NBR, TPE-U(PU)

Data sheet – 5/2-way valves

Dimensions Download CAD data ➔ 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°

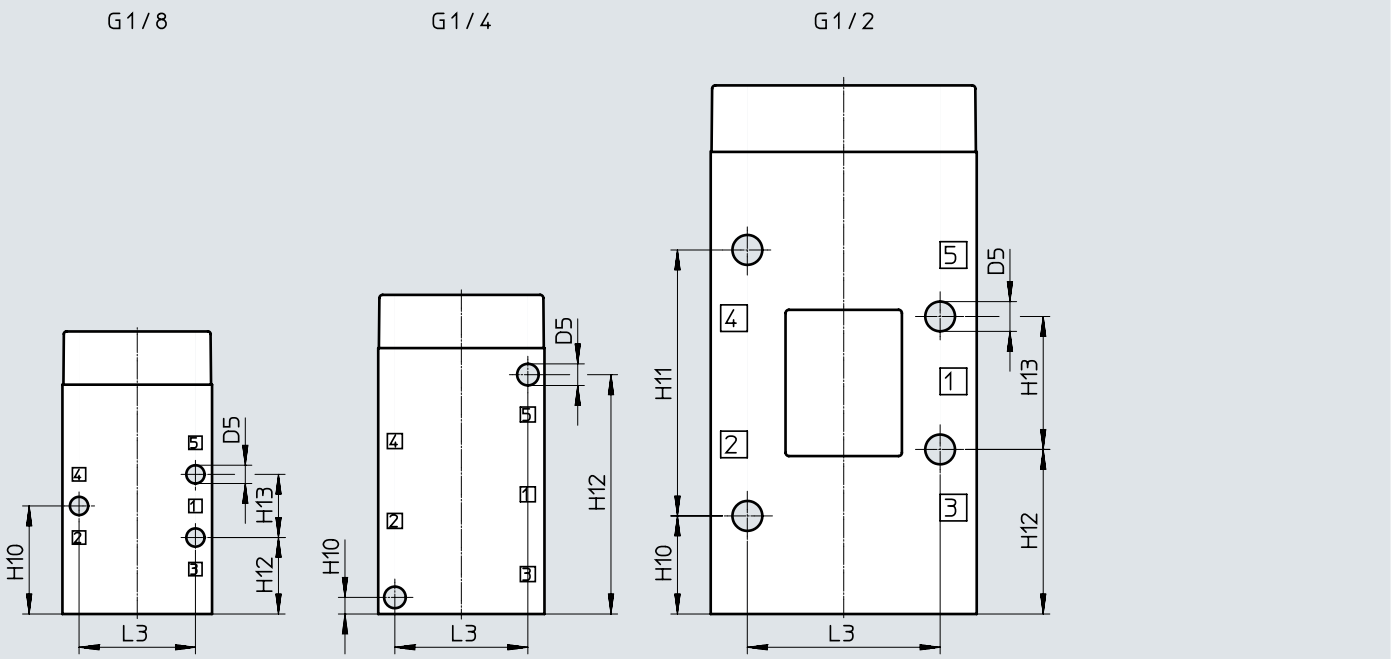
Type	B1	B2	B3	B4	B6	D1	D2	D4	D5 Ø
MFH-5-1/8	26 +0.2	3.5 ±0.15	3.5 ±0.15	–	22	G1/8	M5	M5	5.5
MFH-5-1/8-S		3.5	3.5	2.7					5.5 – 6.2
MFH-5-1/4	30.4 ±0.1	–	5 ±0.15	–		G1/4	M5		6.5 ±0.14
MFH-5-1/4-S				4					Min. 6.5
MFH-5-1/2	52 ±0.15	–	8	–		G1/2	G1/8		8.5
MFH-5-1/2-S									

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

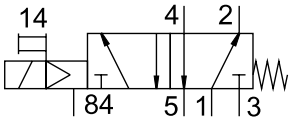
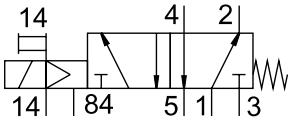
Mounting diagram



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[1], 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[1], 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

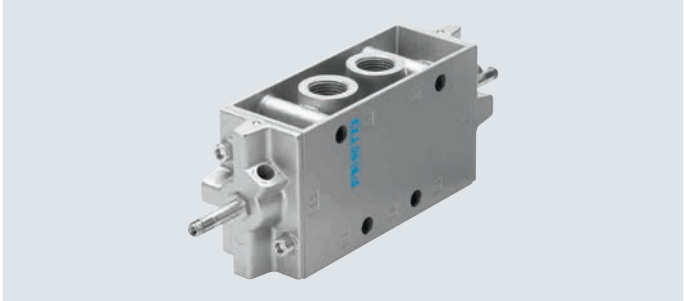
Pneumatic connection	Part no.	Type
G1/8	**104209**	**MFH-5-1/8[1)2)]**
G1/4	**104211**	**MFH-5-1/4[3)4)]**

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 V DC
  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	14
Standard nominal flow rate	[l/min]	600	1100	4500
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	[is]	2200	
Max. negative test pulse with 1 signal	[is]	3700	

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

Operating and environmental conditions								
Pneumatic connection			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	[bar]	1.5 ... 8		2 ... 8	1.5 ... 8		2 ... 8
	External pilot air supply	[bar]	0 ... 8					
	With dominant signal	[bar]	2.5 ... 8		–	2.5 ... 8		–
Pilot pressure		[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[1)]			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).

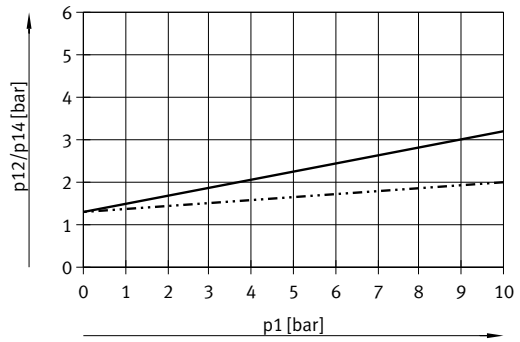
Electrical data			
F solenoid coil			
Electrical connection			Plug pins for plug sockets MSSD-F, KMF
Operating voltage	Direct voltage	[V DC]	12, 24, 42, 48
	Alternating voltage	[V AC]	24, 42, 48, 110, 230, 240 (50 ... 60 Hz)
Characteristic coil data	Direct voltage	[W]	4.5
	Alternating voltage	[VA]	Pull: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

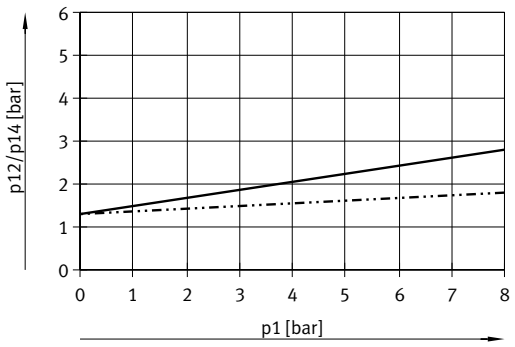
Minimum pilot pressure p12, p14 as a function of operating pressure p1 (external pilot air supply)

JMFH-5-1/8-S



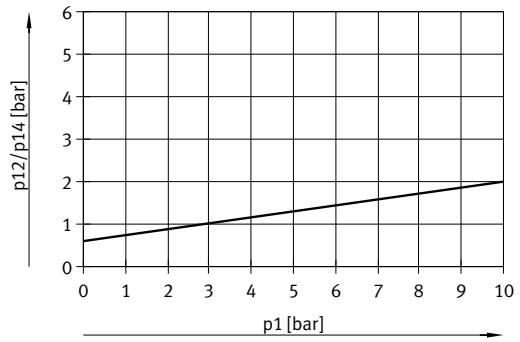
Exhaust throttled
Exhaust unthrottled

JMFH-5-1/4-S



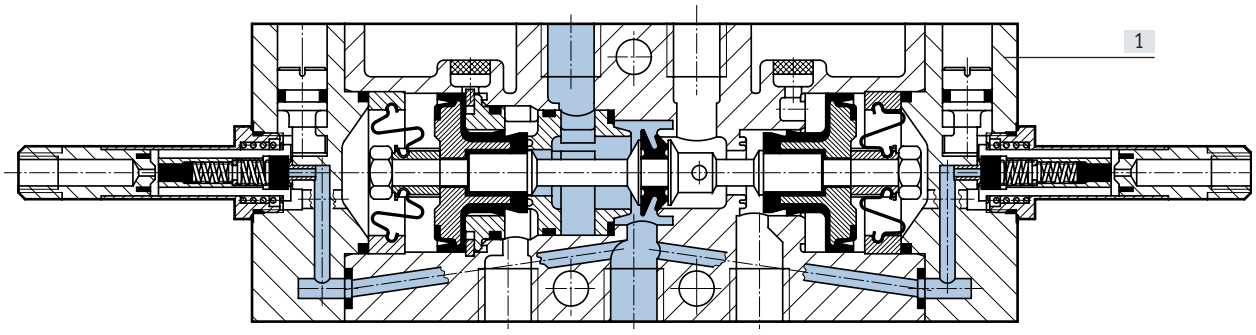
Exhaust throttled
Exhaust unthrottled

JMFH-5-1/2-S



Materials

Sectional view

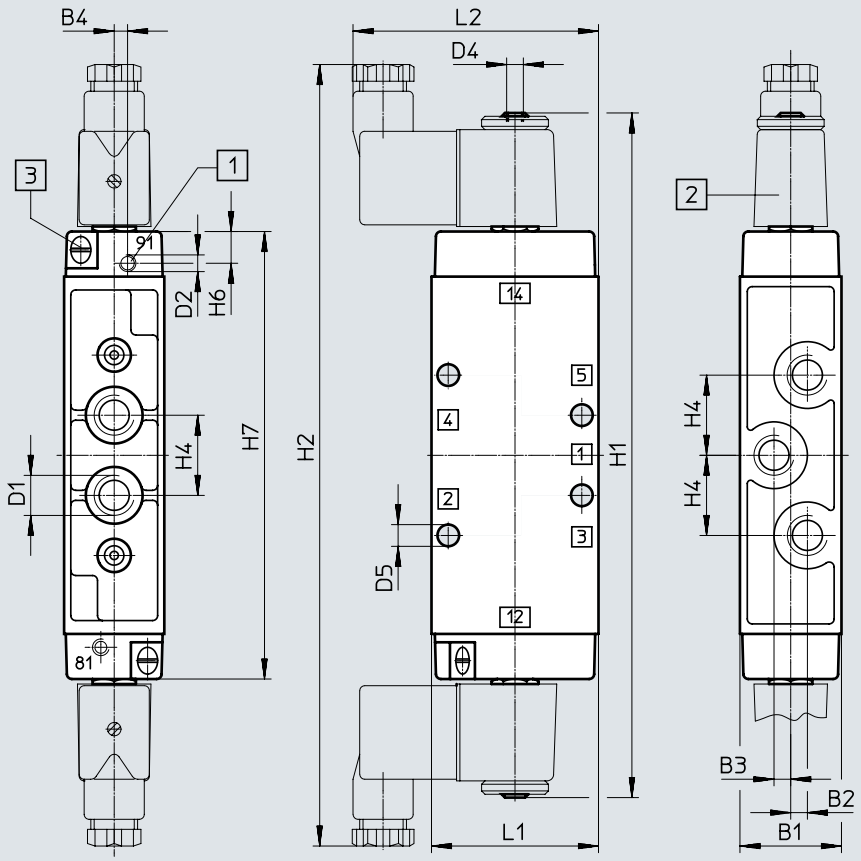


[1]	Housing	Die-cast aluminium
–	Seals	NBR, TPE-U(PU)

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

Dimensions Download CAD data ➔ www.festo.com

JMFH, JMFDH



[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°

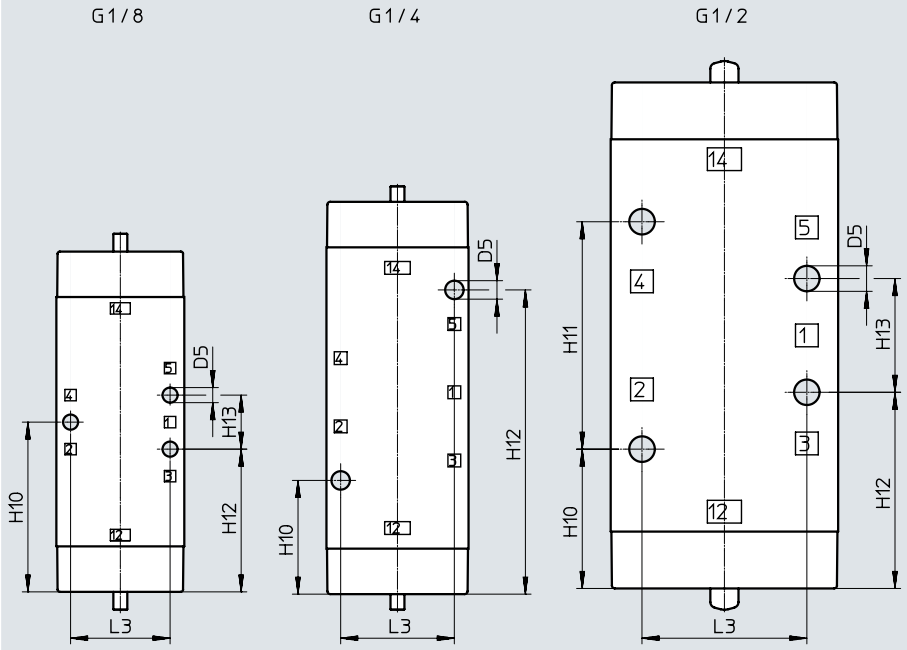
Type	B1	B2	B3	B4	D1	D2	D4	D5 Ø
JMF...-5-1/8	26 +0.2	3.5 +0.15	3.5 +0.15	–	G1/8	–	M5	5.5
JMF...-5-1/8-S				2.7		M5		
JMF...-5-1/4	30.4 ±0.1	–	5	–	G1/4	–	M5	Min. 6.5
JMF...-5-1/4-S				4		M5		
JMF...-5-1/2	52	–	8	–	G1/2	–	M5	9.6 +0.2
JMF...-5-1/2-S	52 ±0.15					G1/8		8.5

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

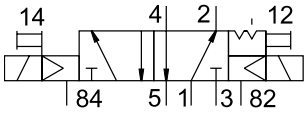
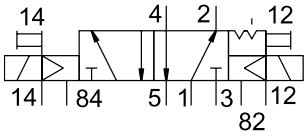
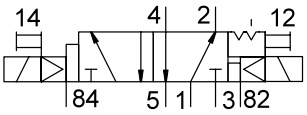
Mounting diagram



Type	D5 ø	H10	H12	H13	L3
JME...-5-1/8	5.5	19	58.3	–	35
JME...-5-1/8-S					
JME...-5-1/4	Min. 6.5	67	67	–	40
JME...-5-1/4-S					
JME...-5-1/2	9.6 +0.2	40	88	80	58
JME...-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[1], internal pilot air supply	G1/8	–	**8820**	**JMFH-5-1/8**
			ATEX category → Page 12	**535912**	**JMFH-5-1/8-EX**
		G1/4	–	**10410**	**JMFH-5-1/4**
			ATEX category → Page 12	**535913**	**JMFH-5-1/4-EX**
		G1/2	–	**10166**	**JMFH-5-1/2**
			ATEX category → Page 12	**535914**	**JMFH-5-1/2-EX**
	Without F solenoid coil[1], external pilot air supply	G1/8	–	**14008**	**JMFH-5-1/8-S**
			ATEX category → Page 12	**535915**	**JMFH-5-1/8-S-EX**
		G1/4	–	**14009**	**JMFH-5-1/4-S**
			ATEX category → Page 12	**535916**	**JMFH-5-1/4-S-EX**
		G1/2	–	**35548**	**JMFH-5-1/2-S**
			ATEX category → Page 12	**535917**	**JMFH-5-1/2-S-EX**
	Without F solenoid coil[1], internal pilot air supply, with dominant signal at 14	G1/8	–	**8821**	**JMFDH-5-1/8**
			ATEX category → Page 12	**536193**	**JMFDH-5-1/8-EX**
		G1/4	–	**10411**	**JMFDH-5-1/4**
			ATEX category → Page 12	**536194**	**JMFDH-5-1/4-EX**

1) F solenoid coils → page 50

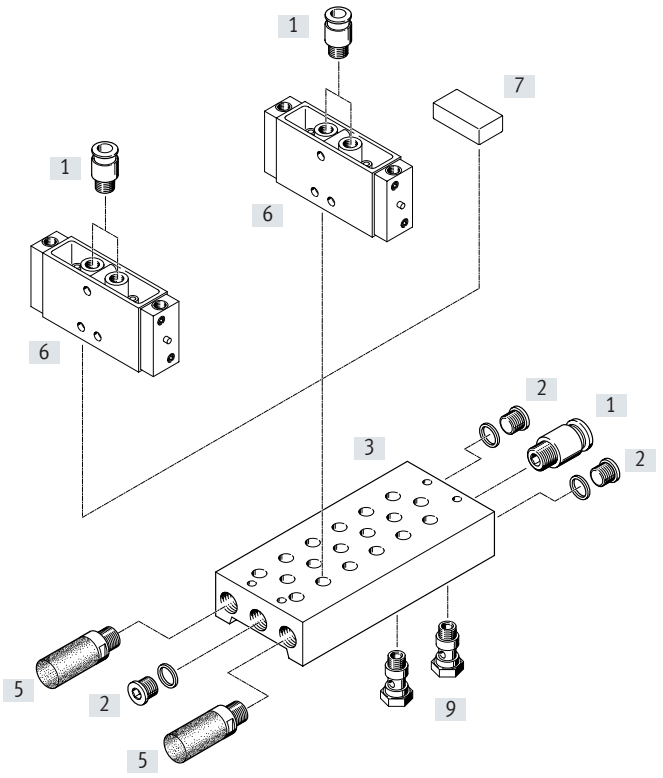
Ordering data – Sets of wearing parts

Pneumatic connection	Part no.	Type
G1/8	**104891**	**JMFH-5-1/8[1]**
G1/4	**104892**	**JMFH-5-1/4[2]**

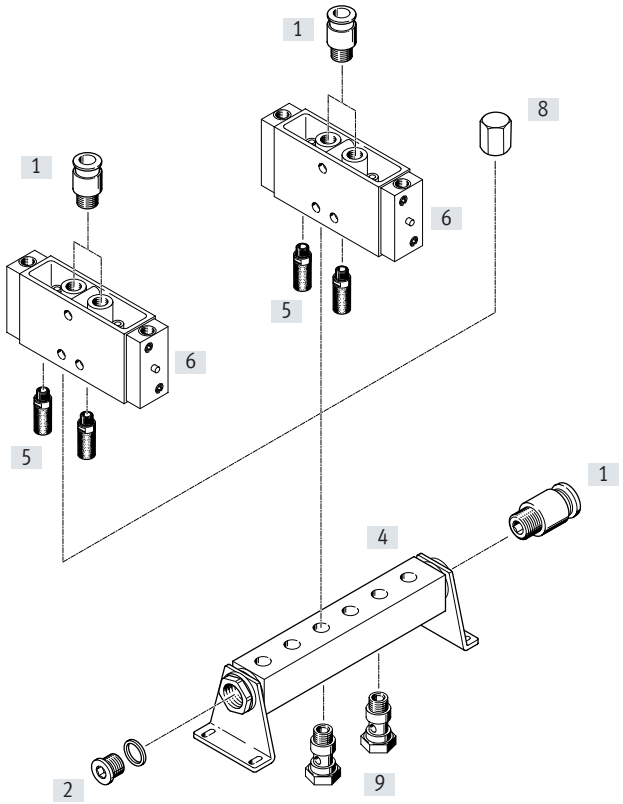
1) Order assembly sleeve part no. 228389 separately
2) Order assembly sleeve part no. 229363 separately

Peripherals overview

Mounting on manifold block



Mounting on manifold rail



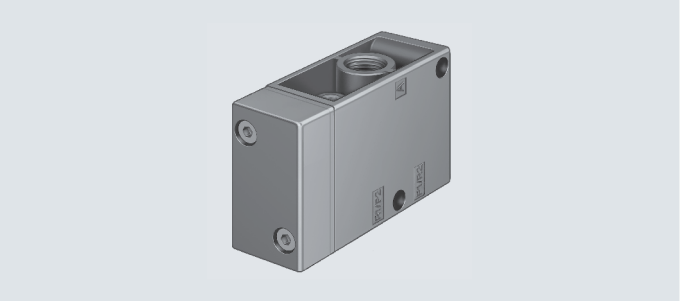
Accessories

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

Data sheet – 3/2-way valves

Operating and environmental conditions						
Pneumatic connection			G1/8	G1/4	G1/2	G3/4
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 Closed	[bar]	–0.95 ... +10	–0.95 ... +10	–0.95 ... +10	–0.95 ... +10
	Normally open	[bar]	0 ... 10	0 ... 10	0 ... 10	0 ... 10
Pilot pressure			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[1)]			1			

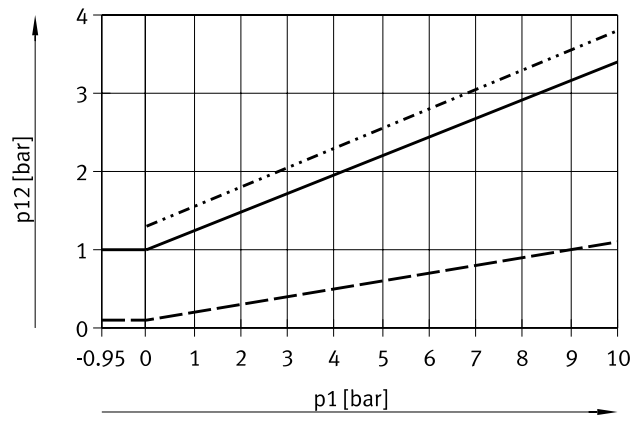
1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. Dry indoor application or transport and storage protection. Also applies to parts behind coverings, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

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

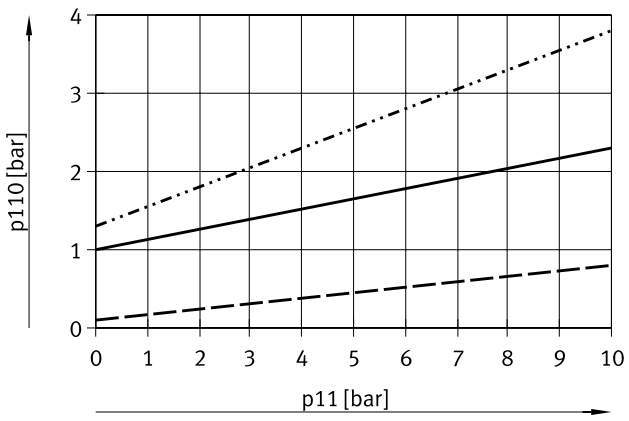
Minimum pilot pressure p12/p14/p110 as a function of operating pressure p1/p11

VL/O-3-1/8 – normally closed



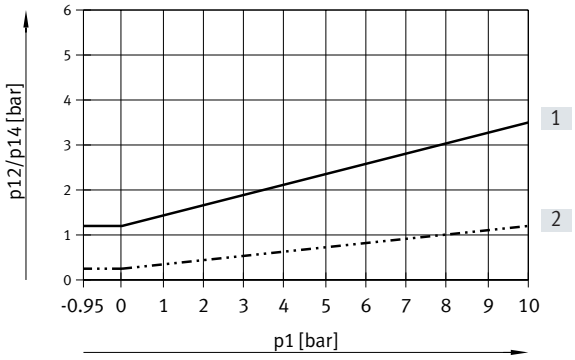
Switch-on pressure
Exhaust air flow control
Switch-off pressure

VL/O-3-1/8 – normally open



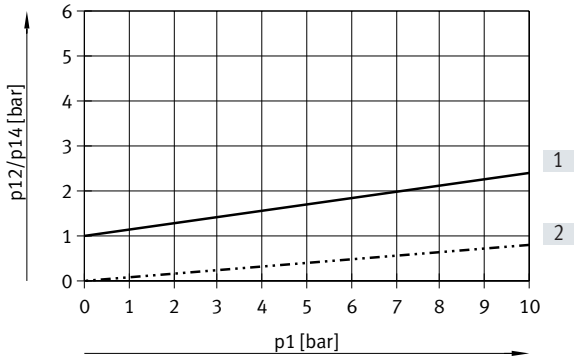
Switch-on pressure
Exhaust air flow control
Switch-off pressure

VL/O-3-1/4 – normally closed



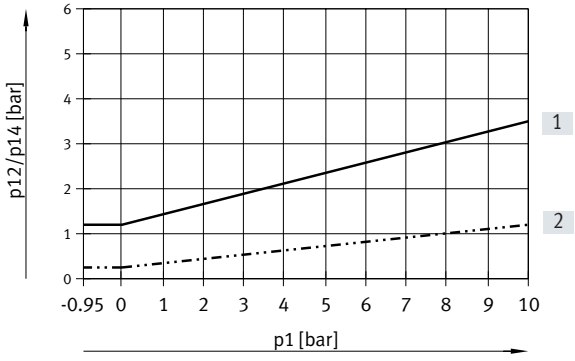
[1] Switch-on pressure
[2] Switch-off pressure

VL/O-3-1/4 – normally open



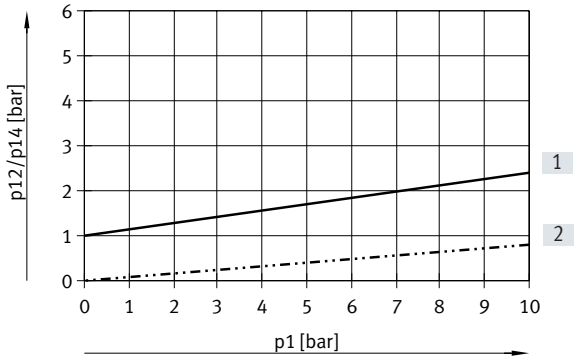
[1] Switch-on pressure
[2] Switch-off pressure

VL/O-3-1/2 – normally closed



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

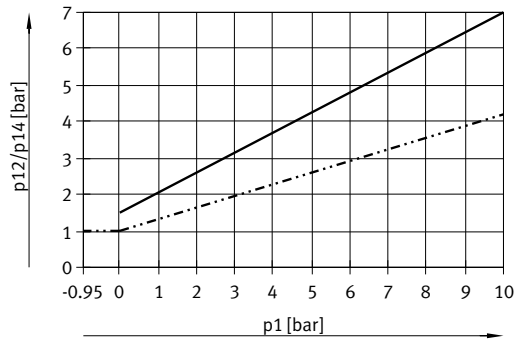
VL/O-3-1/2 – normally open



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

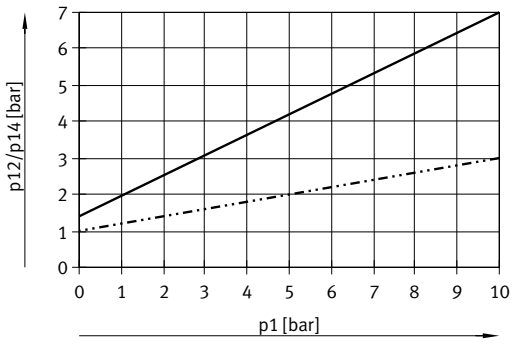
Data sheet – 3/2-way valves

VL/O-3-3/4 – normally closed



Exhaust throttled
Exhaust unthrottled

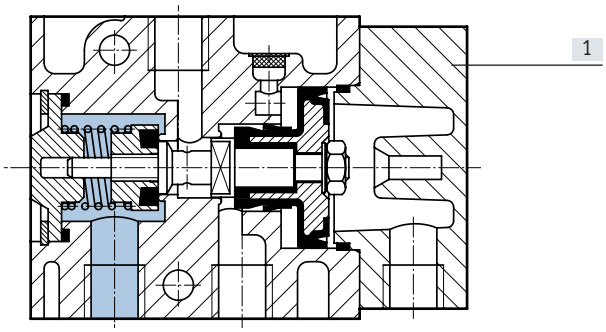
VL/O-3-3/4 – normally open



Exhaust throttled
Exhaust unthrottled

Materials

Sectional view

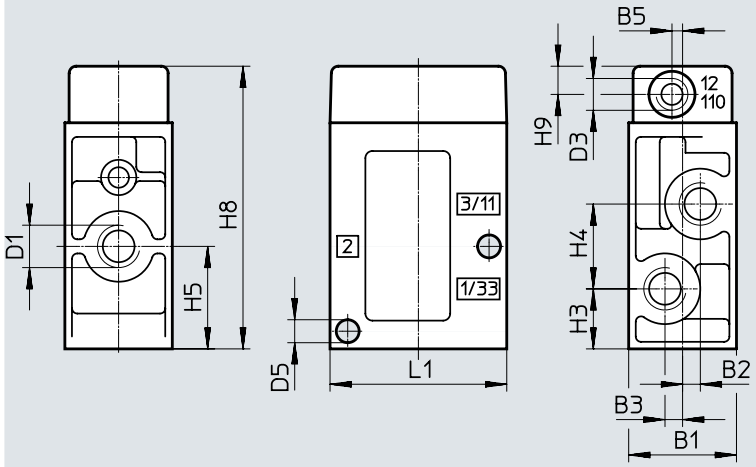


[1]	Housing	Die-cast aluminium
–	Seals	NBR

Data sheet – 3/2-way valves

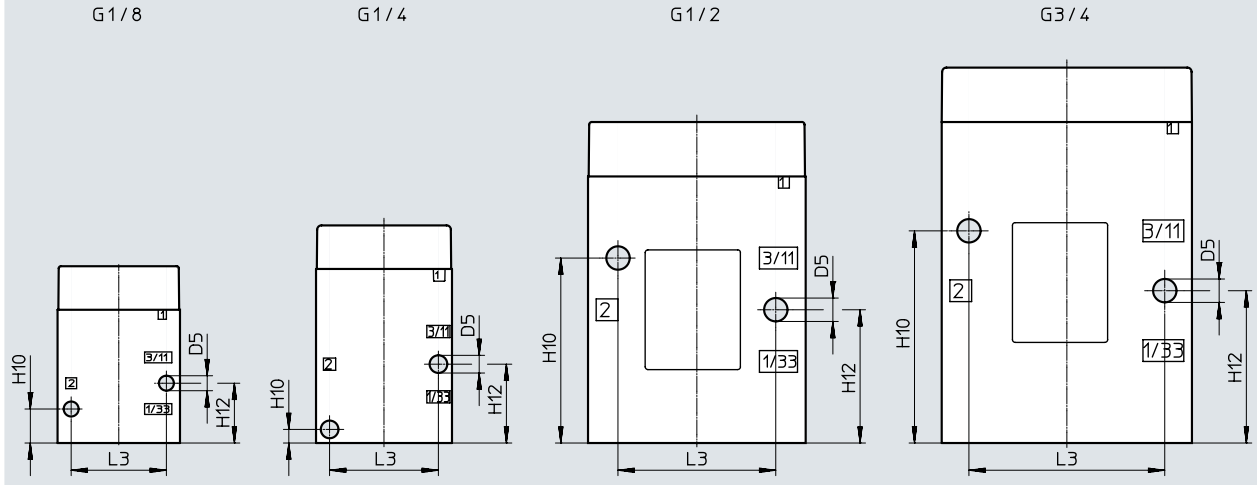
Dimensions Download CAD data ➔ www.festo.com

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	–	G1/8	G1/8	6.5	17	24	29	80	8	50
VL/O-3-1/2	52	8	8	–	G1/4	G1/4	8.6	30	38	49	118	10	80
VL/O-3-3/4	68	8	8	–	G1/4	G1/4	8.6	34	44	56	138	10	92

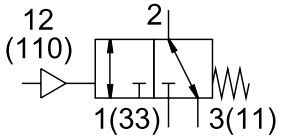
Mounting diagram



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

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[1]	–	**7803**	**VL/O-3-1/8-B**
			ATEX category ➔ Page 12	**536028**	**VL/O-3-1/8-B-EX**
		G1/4[2]	–	**9984**	**VL/O-3-1/4**
			ATEX category ➔ Page 12	**536029**	**VL/O-3-1/4-EX**
		G1/2[3]	–	**9983**	**VL/O-3-1/2**
			ATEX category ➔ Page 12	**536030**	**VL/O-3-1/2-EX**
		G3/4[4]	–	**10049**	**VL/O-3-3/4**
			ATEX category ➔ Page 12	**536031**	**VL/O-3-3/4-EX**

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	**104222**	**VL/O-3-1/8-B**
G1/4	**104207**	**VL/O-3-1/4**
G1/2	**104208**	**VL/O-3-1/2**

Data sheet – 5/2-way valves

- Flow rate
  500 ... 3700 l/min

Sets of wearing parts → page 40

General technical data				
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				
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		

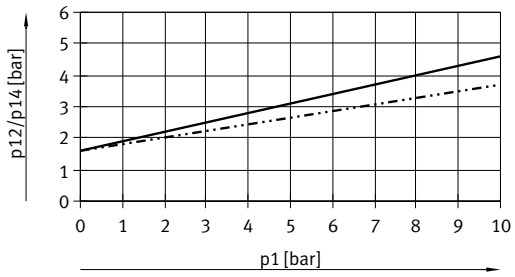
Operating and environmental conditions				
Pneumatic connection		G1/8	G1/4	G1/2
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Pilot medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)		
Operating pressure	[bar]	0 ... 10	0 ... 8	0 ... 10
Pilot pressure	[bar]	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[1)]		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).

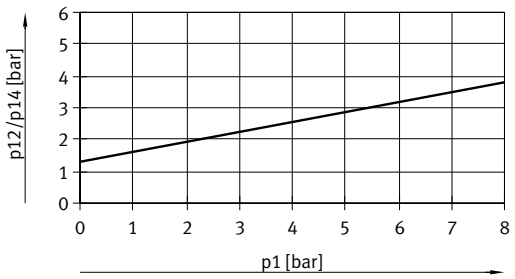
Data sheet – 5/2-way valves

Minimum pilot pressure p12/p14 as a function of operating pressure p1

VL-5-1/8

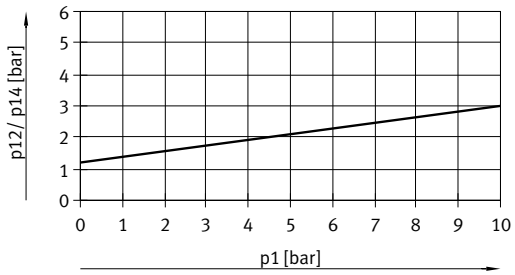


VL-5-1/4



Exhaust throttled
Exhaust unthrottled

VL-5-1/2

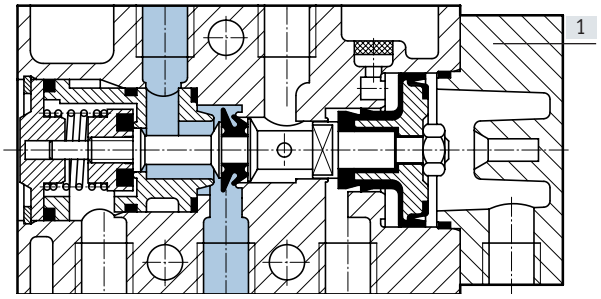


Valve switching times [ms]

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

Materials

Sectional view

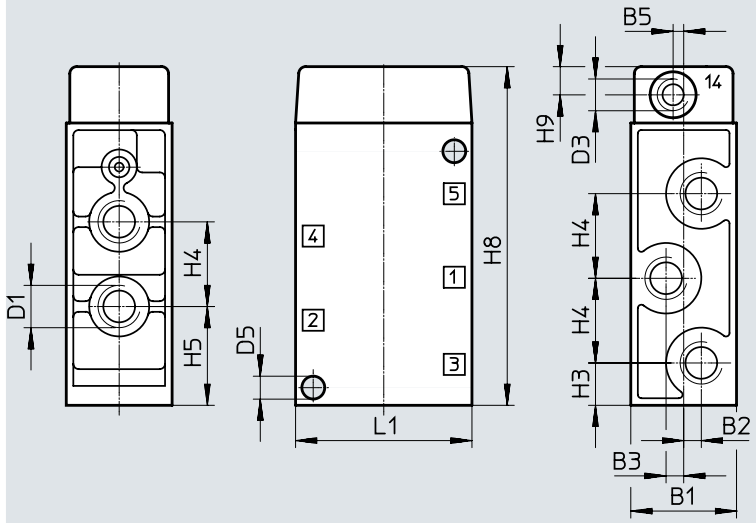


[1]	Housing	Die-cast aluminium
–	Seals	NBR, TPE-U(PU)

Data sheet – 5/2-way valves

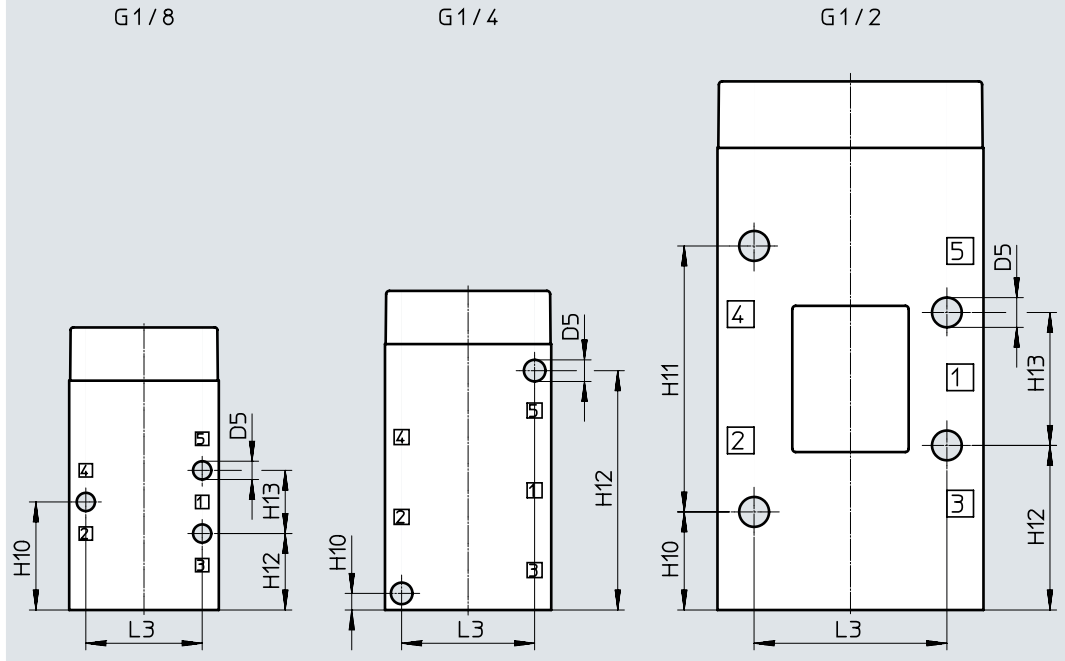
Dimensions Download CAD data ➔ www.festo.com

VL



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	–	G1/8	G1/8	6.5	12	24	28	96	8	50
VL-5-1/2	52	–	8	–	G1/4	G1/4	9	32	38	51	159	10	80

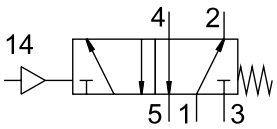
Mounting diagram



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

Data sheet – 5/2-way valves

Ordering data

Circuit symbol	Description	Pneumatic connection	ATEX category	Part no.	Type
	Reset method: mechanical	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**[1]
G1/4	**104211**	**VL-5-1/4**[2)3)]
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

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

- Flow rate
  600 ... 4500 l/min

Sets of wearing parts → page 45

General technical data				
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				
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		

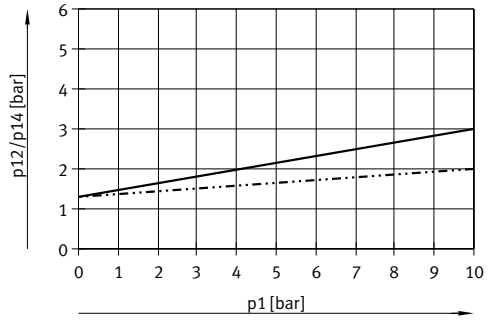
Operating and environmental conditions				
Pneumatic connection		G1/8	G1/4	G1/2
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Pilot medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)		
Operating pressure	[bar]	0 ... 10	0 ... 8	0 ... 10
Pilot pressure	[bar]	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[1)]		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

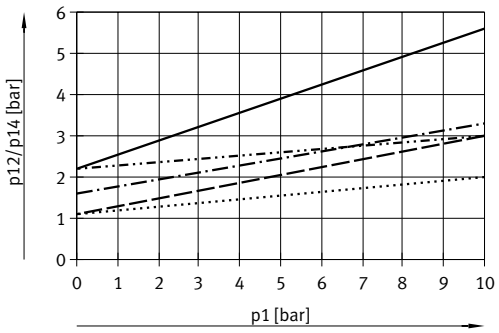
Minimum pilot pressure p12/p14 as a function of operating pressure p1

JH-5-1/8



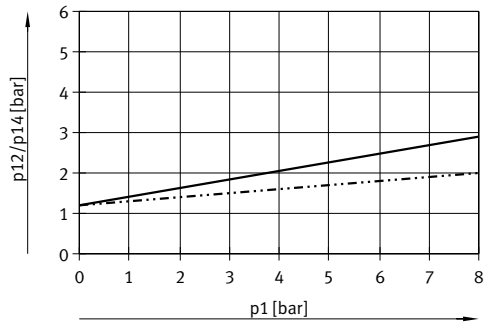
Exhaust throttled
Exhaust unthrottled

JDH-5-1/8



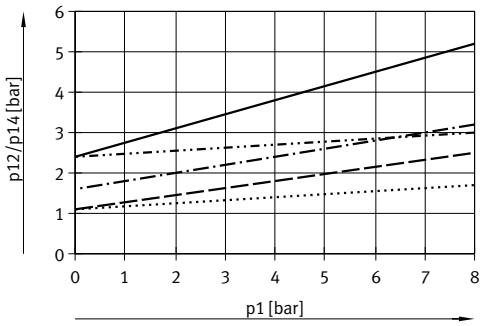
Exhaust throttled
Exhaust unthrottled

JH-5-1/4



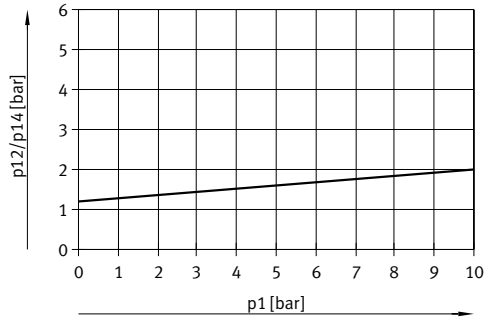
Exhaust throttled
Exhaust unthrottled

JDH-5-1/4



Exhaust throttled
Exhaust unthrottled

JH-5-1/2



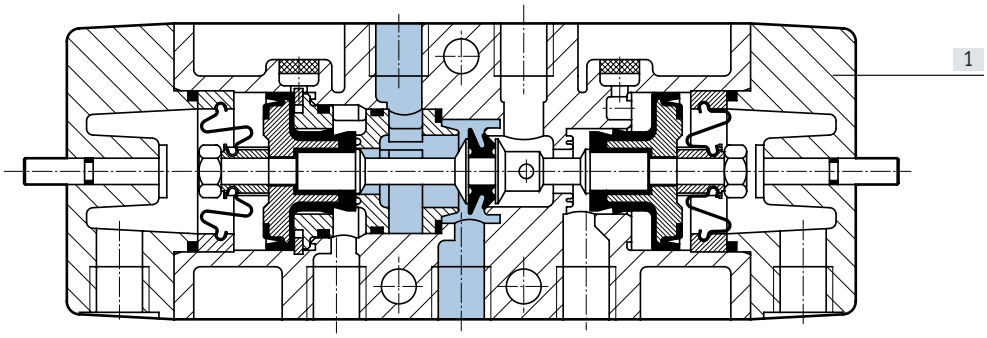
Valve switching times [ms]

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

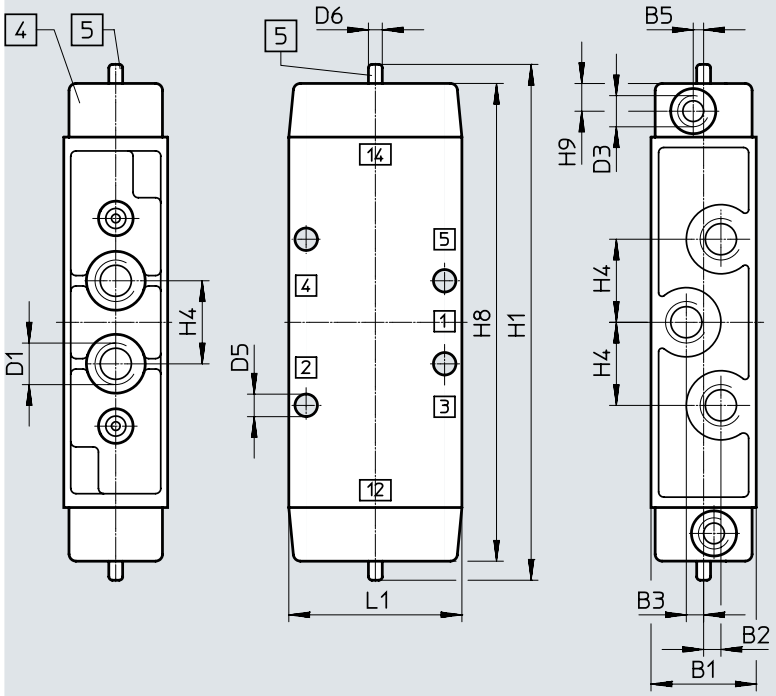


[1]	Housing	Die-cast aluminium
–	Seals	NBR, TPE-U(PU)

Dimensions

Download CAD data ➔ www.festo.com

JH, JDH



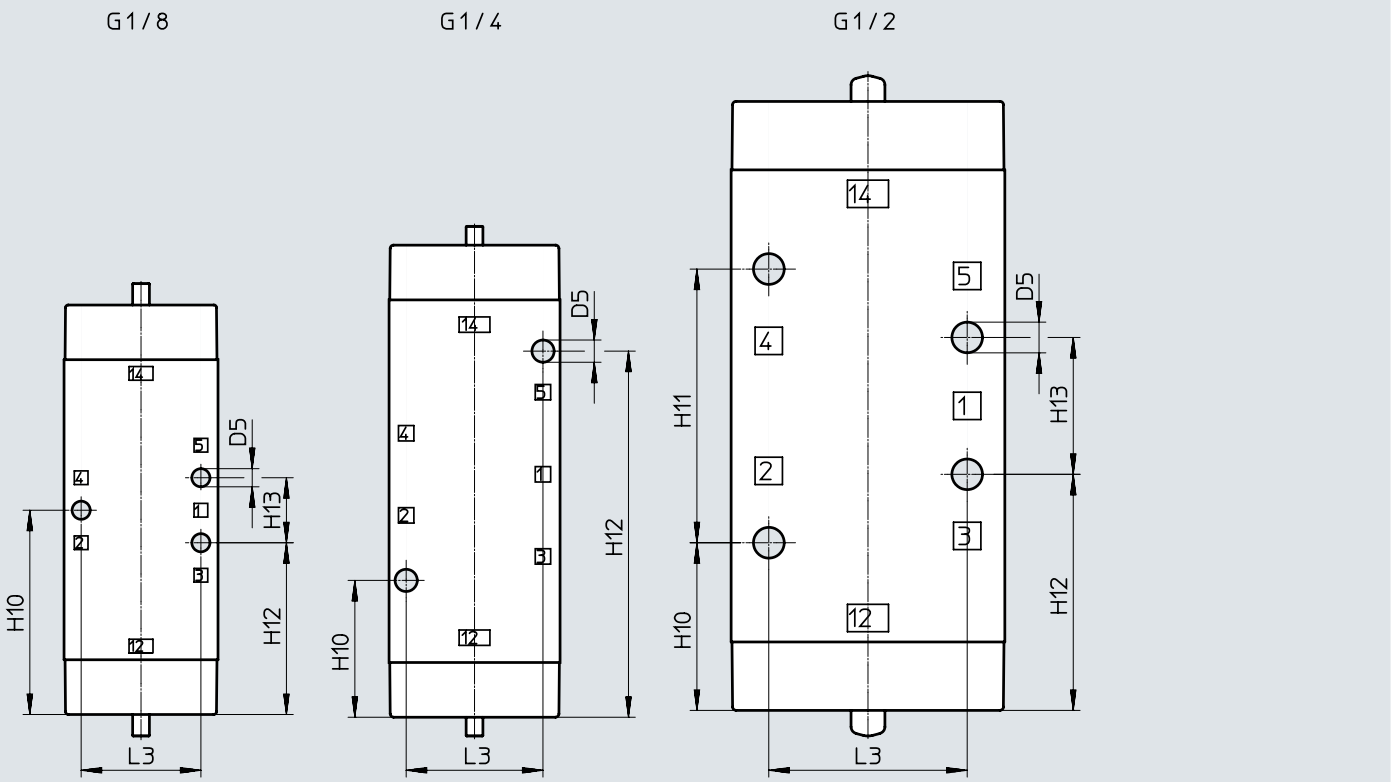
[4] Cover can be turned 180°
[5] Manual override

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	–	G1/8	G1/8	6.5	5	149	24	138	8	50
J...-5-1/2	52	–	8	–	G1/4	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

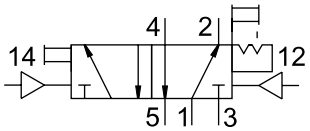
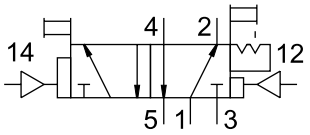
Mounting diagram



Type	D5 ø	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	–	**8823**	**JH-5-1/8**
			ATEX category → Page 31	**536035**	**JH-5-1/8-EX**
		G1/4	–	**10408**	**JH-5-1/4**
			ATEX category → Page 31	**536036**	**JH-5-1/4-EX**
		G1/2	–	**10165**	**JH-5-1/2**
			ATEX category → Page 31	**536037**	**JH-5-1/2-EX**
	With dominant signal at 14	G1/8	–	**8824**	**JDH-5-1/8**
			ATEX category → Page 31	**536038**	**JDH-5-1/8-EX**
		G1/4	–	**10409**	**JDH-5-1/4**
			ATEX category → Page 31	**536039**	**JDH-5-1/4-EX**

Ordering data – Sets of wearing parts

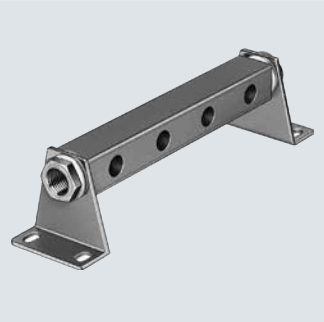
Pneumatic connection	Part no.	Type
G1/8	**104891**	**JH-5-1/8**[1]
G1/4	**104892**	**JH-5-1/4**[2]

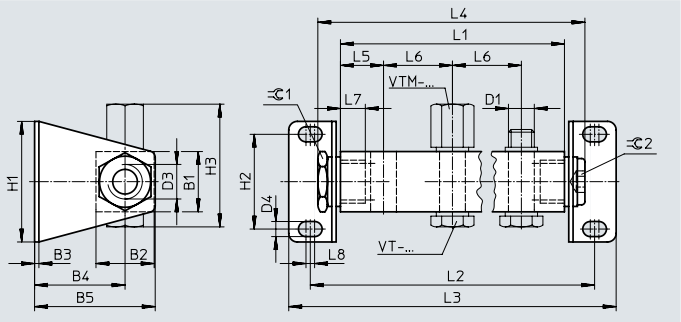
1) Order assembly sleeve part no. 228389 separately
2) Order assembly sleeve part no. 229363 separately

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
Pneumatic connection G1/8							
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**
Pneumatic connection G1/4[1)]							
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**
Pneumatic connection G1/2							
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

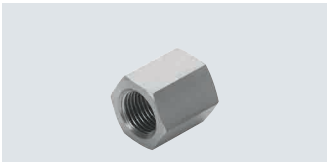
Ordering data

Pneumatic connection	Weight [g]	Material	Part no.	Type
G1/8	6	Chromated steel	**8626**	**VT-1/8**
G1/8	15	Anodised aluminium	**5928**	**VT-1/8-1**[1)2)]
G1/4	15	Chromated steel	**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

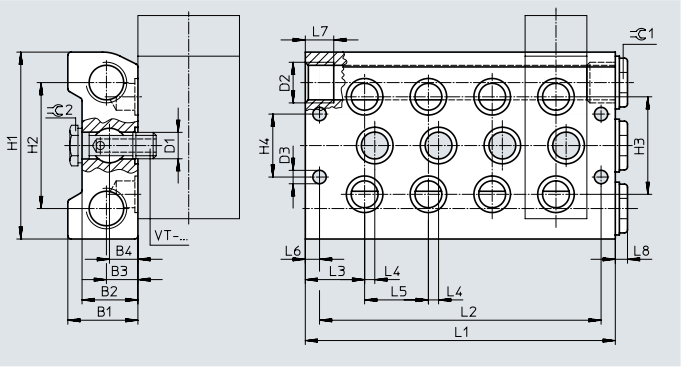
Pneumatic connection	Weight [g]	Part no.	Type
G1/8	5	**9768**	**VTM-1/8**[1)]
G1/4	7	**3099**	**VTM-1/4**
G1/2	28	**9987**	**VTM-1/2**

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
Pneumatic connection G1/8					
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**
Pneumatic connection G1/4					
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

Ordering data

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

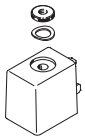
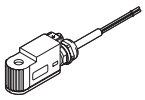
Ordering data

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**[1]
G1/4	45	**12635**	**VT-1/4-AJ-P**

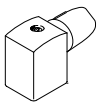
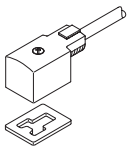
1) For valves with G1/8 connection

Accessories

Ordering data – Solenoid coils

	Description	Voltage	Cable length [m]	Part no.	Type
F solenoid coils, without plug socket					Data sheets ➔ Internet: msfg
	–	12 V DC	–	**34410**	**MSFG-12-OD**
		24 V DC and 42 V AC, 50 ... 60 Hz	–	**34411**	**MSFG-24/42-50/60-OD**
		42 V DC	–	**34413**	**MSFG-42-OD**
		24 V AC	–	**34415**	**MSFW-24-50/60-OD**
		48 V AC, 50 ... 60 Hz	–	**34418**	**MSFW-48-50/60-OD**
		110 V AC, 50 ... 60 Hz and 120 V AC, 60 Hz	–	**34420**	**MSFW-110-50/60-OD**
		230 V AC, 50 ... 60 Hz and 240 V AC, 60 Hz	–	**34422**	**MSFW-230-50/60-OD**
		240 V AC, 50 ... 60 Hz	–	**34424**	**MSFW-240-50/60-OD**
	Explosion-proof	24 V DC	–	**536931**	**MSFG-24-EX**
		24 V AC	–	**536932**	**MSFW-24-50/60-EX**
		110 V AC	–	**536933**	**MSFW-110-50/60-EX**
		230 V AC	–	**536934**	**MSFW-230-50/60-EX**
F solenoid coils, cable with open end, 3-wire					
	Explosion-proof	24 V DC	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 V AC	1	**8059808**	**VACF-B-K1-1A-1-EX4-M**
		110 V AC	1	**8059811**	**VACF-B-K1-16B-1-EX4-M**
			5	**8059812**	**VACF-B-K1-16B-5-EX4-M**
		230 V AC	1	**8059809**	**VACF-B-K1-3A-1-EX4-M**
			5	**8059810**	**VACF-B-K1-3A-5-EX4-M**

Ordering data – Plug sockets/connecting cable for F solenoid coils

	Description	Voltage	Cable length [m]	Part no.	Type
Plug socket without cable, cable connection with					Data sheets ➔ Internet: mssd
	Locking screws (cable connector Pg9)	–	–	**34431**	**MSSD-F**
	Locking screws (cable connector M16)	–	–	**539710**	**MSSD-F-M16**
	Insulation displacement technology (cable connector M16)	–	–	**192746**	**MSSD-F-S-M16**
Connecting cable					Data sheets ➔ Internet: kmf
	Signal status display with LED	24 V DC	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 display	Up to 240 V	2.5	**30936**	**KMF-1-230AC-2.5**
			5	**30938**	**KMF-1-230AC-5**

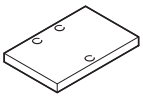
Accessories

Ordering data – Illuminating seals

Data sheets → Internet: mf-ld

	Description	Voltage	Part no.	Type
	For F solenoid coils	12 ... 24 V DC	**19143**	**MF-LD-12-24DC**
		230 V DC/V AC	**19144**	**MF-LD-230AC**

Ordering data – Plate

	Description		Pneumatic connection	Part no.	Type
For wide solenoid coils					
	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**

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