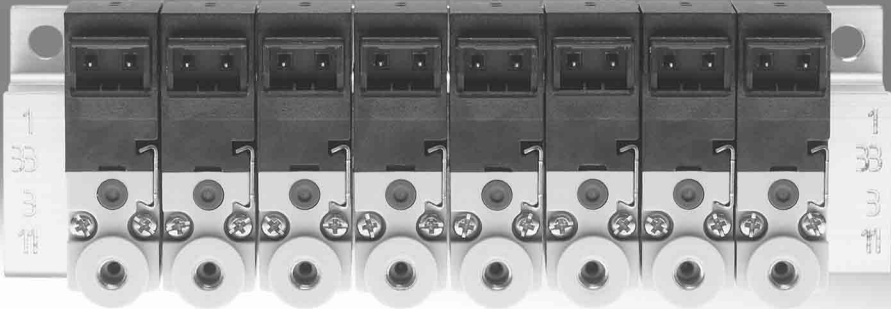
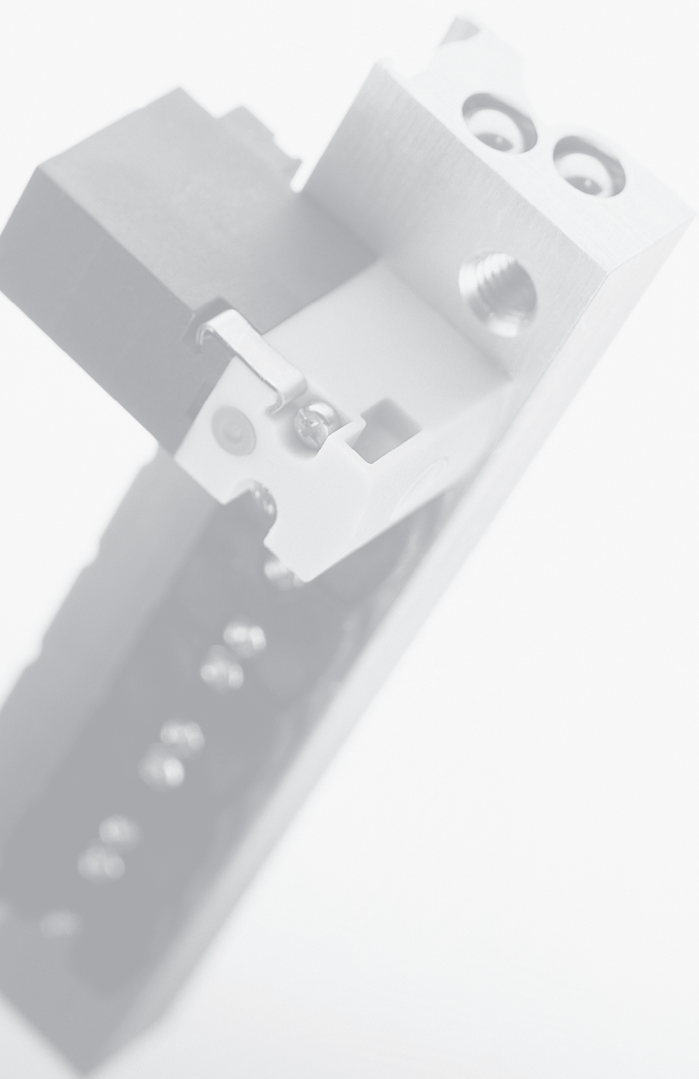


Solenoid valves MH1, miniature



Complete product range for a variety of applications

FESTO



Extremely small

The new miniaturised generation of poppet valves offers flow rates of 14 l/min in the 2/2-way version or 10 l/min in the 3/2-way version. Available either as an individual sub-base valve or pre-assembled on a PR manifold rail. In addition, mounting on a PR manifold rail enables very compact assembly. For increased requirements and speed, the bigger MH2 with a flow rate of up to 100 l/min is the ideal solution.

Extremely versatile and fast

The miniature valves can be linked together via a pneumatic multiple connector plate or electrical multi-pin connection. There is also a choice between horizontal electrical connections, on top and underneath. Furthermore, a connection for mounting on a PCB is available. All components are tested and assembled for Festo plug and work. Need a system to run as fast as possible? No problem! The response time of the miniature valves is an impressive 4 ms.

Totally coordinated

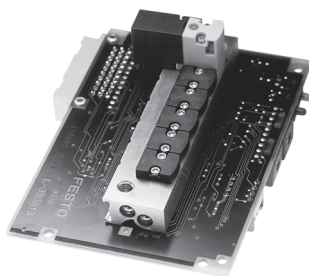
Festo offers an extensive product range including drives, rodless drives, mini slides, rotary drives and accessories under the umbrella term "compact". Perfectly coordinated and geared towards all production areas for the manufacture and processing of very small products. All the components comply with the proven quality standards from Festo and include the added value that only a global company can offer.

Miniature valves not just for the electronics industry ...

... but also for the light assembly, medical technology and semiconductor industries and wherever extremely compact and fast-switching valves or pilot valves are required for valves coming into contact with media (e.g. process industry). With response times of approx. 4 ms, these valves satisfy all requirements for speed. Vacuum functions can also be easily implemented. A 100% duty cycle and even a three-shift operation guarantee maximum cost-effectiveness.

With flow rates of 10 and 14 l/min for the miniature valves, there is always sufficient volume for pilot control of process valves. The flow rate is also adequate for the wide range of compact cylinders, rotary drives and slides from Festo.

For increased requirements of up to 100 l/min: MH2.




Solenoid valves MH1, miniature

Key features – Pneumatic components

Operation with different pressures

Vacuum operation		Reverse operation
The flow direction of the MH1 valves is clearly defined and cannot be reversed.	This flow direction needs to be observed even when operating the valve with vacuum.	Reverse operation is not possible; the direction of flow cannot be reversed.

 Note
Vacuum must not be connected to port 1.

2/2-way valve, MH...-2/2G-...

- Vacuum operation is established by connecting vacuum at port 2
- An ejector pulse can only be realised with another valve

3/2-way valve, MH...-3/2G-...

- Vacuum operation is established by connecting vacuum at port 3
- Venting (or pressurisation) takes place via port 1
- Normally open with vacuum operation

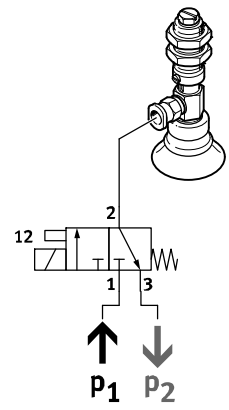
3/2-way valve, MH...-3/2O-...

- Vacuum operation is established by connecting vacuum at port 33
- Venting (or pressurisation) takes place via port 11
- Normally closed with vacuum operation

2x2/2-way valve, MHA1-2X2/2G-...

- Vacuum operation is established by connecting vacuum at port 11
- The ejector pulse is connected at port 1

Example



With the 3/2-way valve, normally closed, vacuum operation is established by connecting the vacuum (P2) to port 3 and connecting e.g. a silencer for venting (P1) to port 1. This changes the normal position from "closed" to "open".

Solenoid valves MH1, miniature

Product range overview



Function	Circuit symbol	Version	Operating voltage				→ Page/ Internet
			5 V DC	12 V DC	24 V DC	24 V AC	
2/2-way valve		Standard nominal flow rate 14 l/min					
		Semi in-line valve	■	■	■	–	10
		Sub-base valve without LED	■	■	■	–	24
		Standard nominal flow rate 30 l/min, controls vacuum or ejector pulse					
		Sub-base valve with LED	–	–	■	–	60
3/2-way valve ¹⁾		Standard nominal flow rate 10 l/min					
		Semi in-line valve	■	■	■	–	10
		Sub-base valve without LED	■	■	■	–	24
		Sub-base valve with E-box	■	■	■	■	37
		Sub-base valve with LED	–	–	■	–	46
2x2/2-way valve		Standard nominal flow rate 30 l/min, controls vacuum and ejector pulse					
		Sub-base valve with LED	–	–	■	–	60

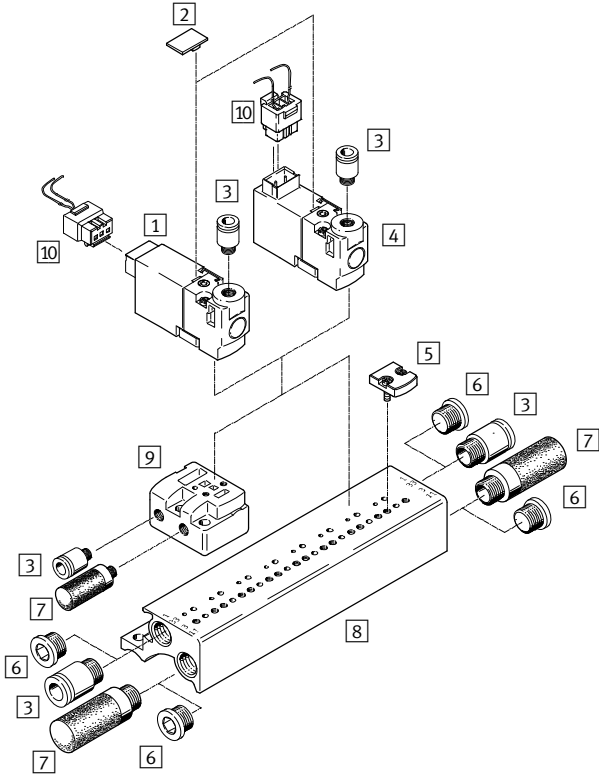
1) Can be used as a 2/2-way valve by sealing port 1 or 3

Mounting options					
Design		Semi in-line valve		Sub-base valve	
		Without LED	With LED	With E-box	With LED
Electrical connection					
Plug connection at rear (HC)					
	Individual sub-base	■	■	–	■
	Manifold assembly	■	■	–	■
	Sub-base with 2x2/2-way valve fully assembled	–	–	–	■
Plug connection on top (TC)					
	Individual sub-base	■	■	■	■
	Manifold assembly	■	■	■	■
Plug connection underneath (PI)					
	Individual sub-base with plug base	■	■	–	■
	Manifold assembly with plug bases	■	■	–	■
	Manifold assembly with plug bases and electrical multi-pin plug	■	■	–	■
	Manifold assembly on PCB with soldering bases	■	■	–	■
	Manifold assembly on PCB with soldering bases and pneumatic multiple connector plate	–	■	–	■

Solenoid valves MH1, semi in-line valve

Peripherals overview

Valves with plug connection at rear, plug connection on top

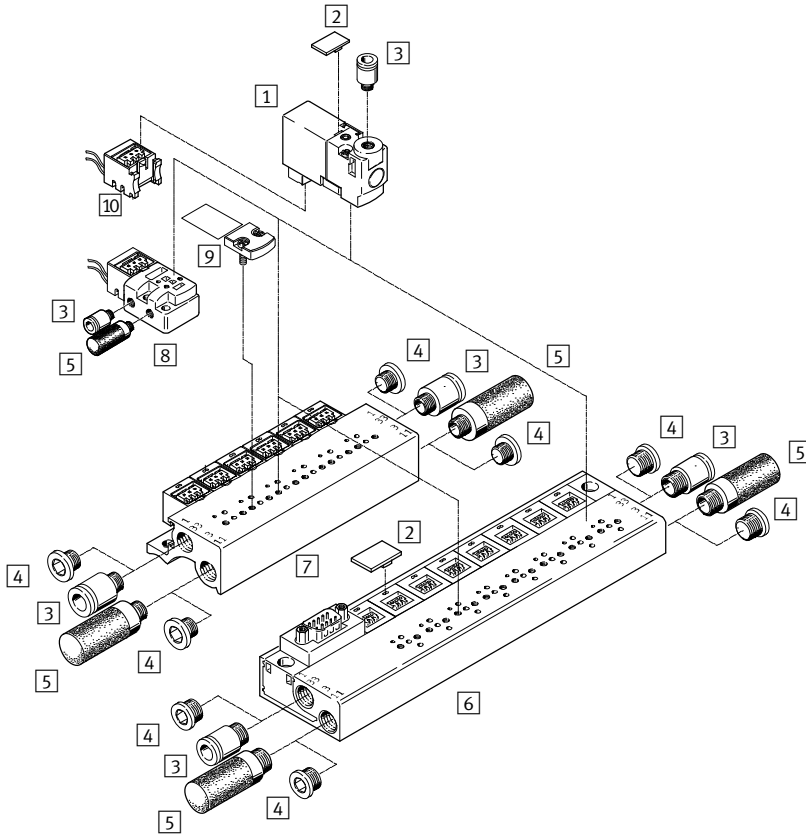


Designation	Brief description	→ Page/Internet
1 Solenoid valve	Valve with plug connection at rear	16
2 Inscription label	For identifying the valve positions	18
3 Push-in fitting	For connecting compressed air tubing with standard O.D.	18
4 Solenoid valve	Valve with plug connection on top	16
5 Blanking plate	For manifold rail without plug bases	17
6 Blanking plug	For sealing ports that are not required	18
7 Silencer	For exhaust ports	18
8 Manifold rail	Without plug bases	17
9 Individual sub-base	For valves with plug connection at rear, plug connection on top	17
10 Plug socket with cable	Straight socket, connection pattern H, 3-pin	19

Solenoid valves MH1, semi in-line valve

Peripherals overview

Valves with plug connection underneath

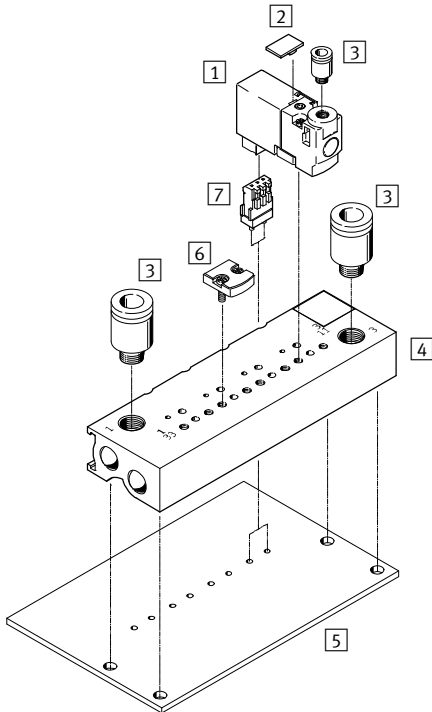


Designation	Brief description	→ Page/Internet
1 Solenoid valve	Valve with plug connection underneath	16
2 Inscription label	For identifying the valve positions	18
3 Push-in fitting	For connecting compressed air tubing with standard O.D.	18
4 Blanking plug	For sealing ports that are not required	18
5 Silencer	For exhaust ports	18
6 Manifold rail	With plug bases and electrical multi-pin plug, Sub-D	17
7 Manifold rail	With plug bases	17
8 Individual sub-base	For valves with plug connection underneath	17
9 Blanking plate	For manifold rail with plug bases	17
10 Electrical plug-in base	Straight socket, connection pattern H, 3-pin	19

Solenoid valves MH1, semi in-line valve

Peripherals overview

Valves with plug connection underneath, PCB mounting



Designation	Brief description	→ Page/Internet
1 Solenoid valve	Valve with plug connection underneath	16
2 Inscription label	For identifying the valve positions	18
3 Push-in fitting	For connecting compressed air tubing with standard O.D.	18
4 Manifold rail	Without plug bases, for PCB mounting	17
5 PCB	Not included in the scope of delivery	-
6 Blanking plate	For manifold rail without plug bases	17
7 Soldering base	For PCB mounting, 3-pin	19

Solenoid valves MH1, semi in-line valve

Type codes

MH P 1 - M 4 H - 3/2 0 - M3 - HC

Valve series

MH	Miniature and fast-switching valves
----	-------------------------------------

Design

P	Semi in-line valve
---	--------------------

Size

1	Flow rate 10 ... 14 l/min
---	---------------------------

Drive system

M	Solenoid, switching
---	---------------------

Operating voltage

4	5 V DC
5	12 V DC
1	24 V DC

Manual override

H	Non-detenting/detenting
---	-------------------------

Valve function

2/2	2/2-way valve
3/2	3/2-way valve

Normal position


G	Closed
0	Open

Pneumatic connection

M3	M3 thread
----	-----------

Electrical connection

HC	Plug connection at rear for plug socket NEBV-H1G2
TC	Plug connection on top for plug socket NEBV-H1G2
PI	Plug connection underneath for plug-in connection

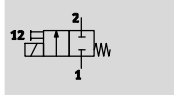
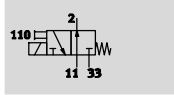
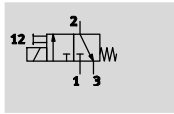
 Note
Further variants and accessories can be configured and ordered online using the modular product system.

Solenoid valves MH1, semi in-line valve

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Technical data

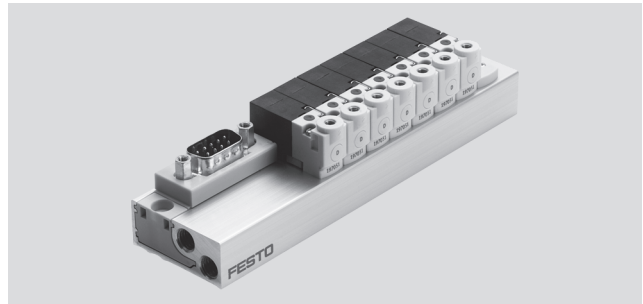
Function



- - Voltage
5 V DC
12 V DC
24 V DC

- - Pressure
-0.9 ... +8 bar

- - Temperature range
-5 ... +40 °C



General technical data				
Type		MHP1-...-2/2G-...	MHP1-...-3/2G-...	MHP1-...-3/20-...
Valve function		2/2-way solenoid valve	3/2-way solenoid valve	3/2-way solenoid valve
		Normally closed	Normally closed	Normally open
		Single solenoid	Single solenoid	Single solenoid
Design		Poppet valve with spring return		
Sealing principle		Soft		
Actuation type		Electric		
Reset method		Mechanical spring		
Type of control		Direct		
Direction of flow		Non-reversible		
Suitability for vacuum		Yes	-	-
Exhaust function		No flow control	With flow control	With flow control
Manual override		Non-detenting		
Type of mounting		On sub-base via through-hole		
Mounting position		Any		
Nominal size	[mm]	Q.9	Q.65	Q.7
Standard nominal flow rate	[l/min]	14 (2 bar → 0 bar)	10	10
Grid dimension	[mm]	10	10	10
Pneumatic connection	1	Sub-base	Sub-base	-
	2	M3	M3	M3
	3	-	Sub-base	-
	11	-	-	Sub-base
	33	-	-	Sub-base
Product weight	[g]	10	10	10

Operating and environmental conditions				
Type		MHP1-...-2/2G-...	MHP1-...-3/2G-...	MHP1-...-3/20-...
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	[bar]	-0.9 ... +2	0 ... 8 ¹⁾	0 ... 6 ¹⁾
Ambient temperature	[°C]	-5 ... +40		
Temperature of medium	[°C]	-5 ... +40		
Storage temperature	[°C]	-20 ... +60		
Corrosion resistance class CRC ²⁾		2		
Certification		c UL us Recognized (OL)		
		c CSA us Recognized (OL)		

1) Vacuum operation possible with special connection method

2) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Solenoid valves MH1, semi in-line valve

Technical data

Safety data				
Operating voltage		5 V DC	12 V DC	24 V DC
Note on forced checking procedure	Switching frequency min. 1/week			
Max. positive test pulse with 0 signal	[μ s]	-	-	500
Max. negative test pulse with 1 signal	[μ s]	-	-	400
Resistance to shocks	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27			
Vibration resistance	Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6			

Electrical data			
Operating voltage	[V DC]	5	
	[V DC]	12	
	[V DC]	24	
Permissible voltage fluctuations	[%]	± 10	
Connection type	Plug connection		
Power consumption	[W]	1	
Duty cycle	[%]	100	
Degree of protection to EN 60529	IP40		

Switching times and frequencies					
Type			MHP1-...-2/2G-...	MHP1-...-3/2G-...	MHP1-...-3/2O-...
Switching time	On	[ms]	4	4	4
	Off	[ms]	5	4	4
Maximum switching frequency		[Hz]	20	20	20

Materials	
Housing	Reinforced PA, reinforced PPS
Sub-base	Aluminium
Seals	FPM, HNBR, NBR
Note on materials	RoHS-compliant Free of copper and PTFE

Dimensions

Download CAD data → www.festo.com

Plug connection on top

1 Plug socket NEBV-H1G2
2 Manual override
3 Coding pin

Plug connection at rear

1 Plug socket NEBV-H1G2

Plug connection underneath

Type	B1	H1	H2	H4	H5	L1	L2	L3
MHP1	9.8	16.5	3.6	30.5	27.4	31	28.5	44

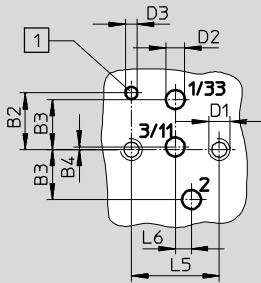
Solenoid valves MH1, semi in-line valve

Technical data



Dimensions – Hole pattern on sub-bases

Download CAD data → www.festo.com



1 Hole for coding pin

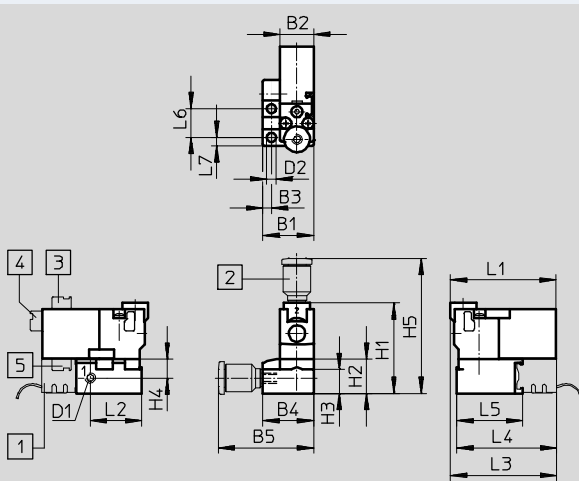
- With semi in-line valves, port 2 is not used.
- If used as a 2/2-way valve, normally closed, port 3/11 are not used.
- If used as a 2/2-way valve, normally open, port 1/33 are not used.

Type	B2	B3	B4	D1	D2	D3	L5	L6
MHP1	4.2	3.7	0.2	M1.6	1.4	0.9	6.5	1.2

Dimensions – Assembly on individual sub-base

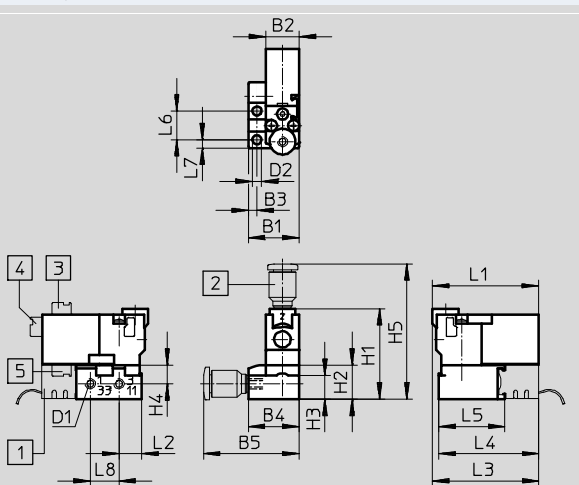
Download CAD data → www.festo.com

2/2-way valve



- 1 Plug base MHAP-PI
- 2 Fitting
- 3 Plug connection on top
- 4 Plug connection at rear
- 5 Plug connection underneath

3/2-way valve



- 1 Plug base MHAP-PI
- 2 Fitting
- 3 Plug connection on top
- 4 Plug connection at rear
- 5 Plug connection underneath

Type	B1	B2	B3	B4	B5	D1	D2	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5	L6	L7	L7
2/2-way valve	14.9	9.8	2.5	14.9	28	M3	2.7	26.5	10	7	5.5	39.6	31	15.1	31.2	29.3	19.3	8.4	2.5	2.5
3/2-way valve	14.9	9.8	2.5	14.9	28	M3	2.7	26.5	10	7	5.5	39.6	31	6.7	31.2	29.3	19.3	8.4	2.5	8.4

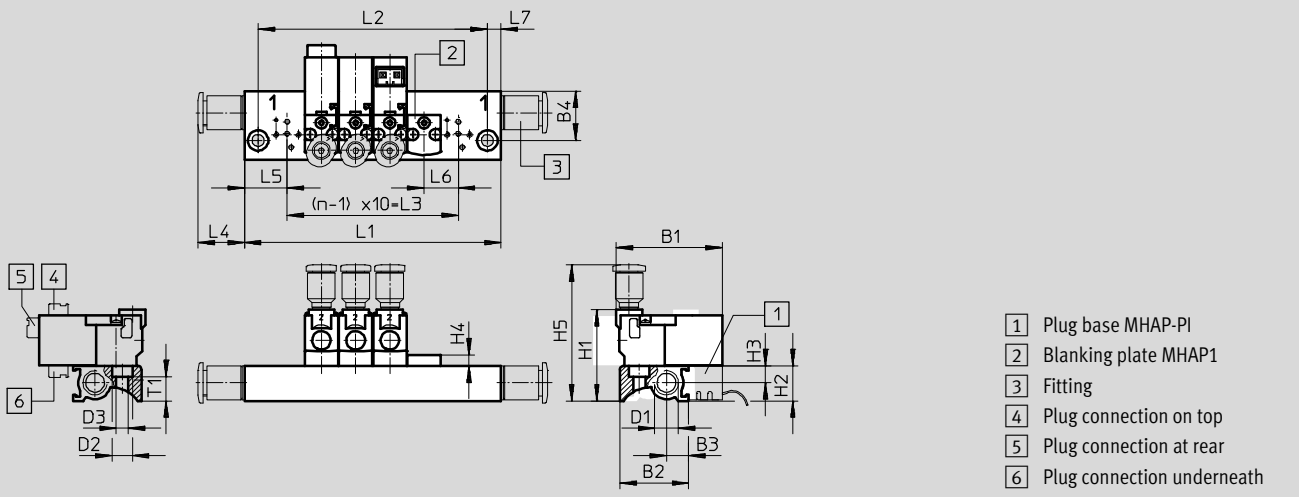
Solenoid valves MH1, semi in-line valve

Technical data

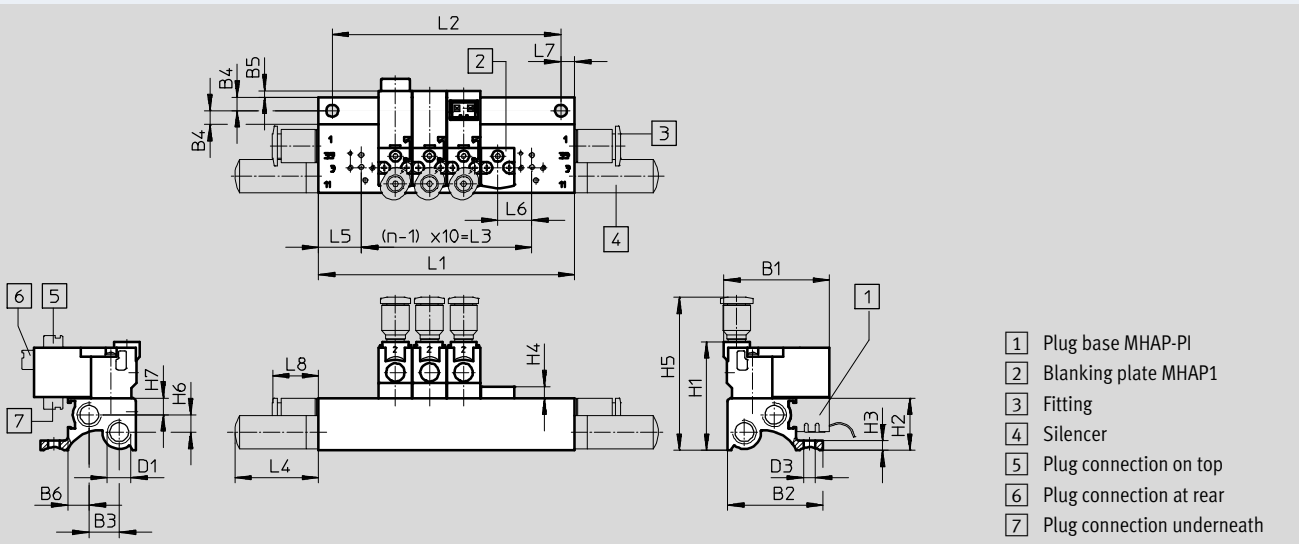
Dimensions – Manifold assembly

Download CAD data → www.festo.com

2/2-way valve



3/2-way valve



Type	B1	B2	B3	B4	B5	B6	D1	D2	D3	H1	H2	H3	H4	H5	H6	H7	L4	L5	L6	L7	L8	T1
2/2-way valve	31	20	6.3	14.4	-	-	M7	6	3.5	26.7	10.2	4.9	3.3	39.8	-	-	13.5	12.5	10	4	-	7
3/2-way valve	31	28	8.8	4	1.9	6.3	M7	-	3.5	31.8	15.3	2.8	3.3	44.9	5.1	4.9	24.5	12.5	10	4	13.5	-

Valve positions	L1	L2	L3
n	±0.15	±0.1	
2	35	27	10
3	45	37	20
4	55	47	30
5	65	57	40
6	75	67	50
7	85	77	60
8	95	87	70

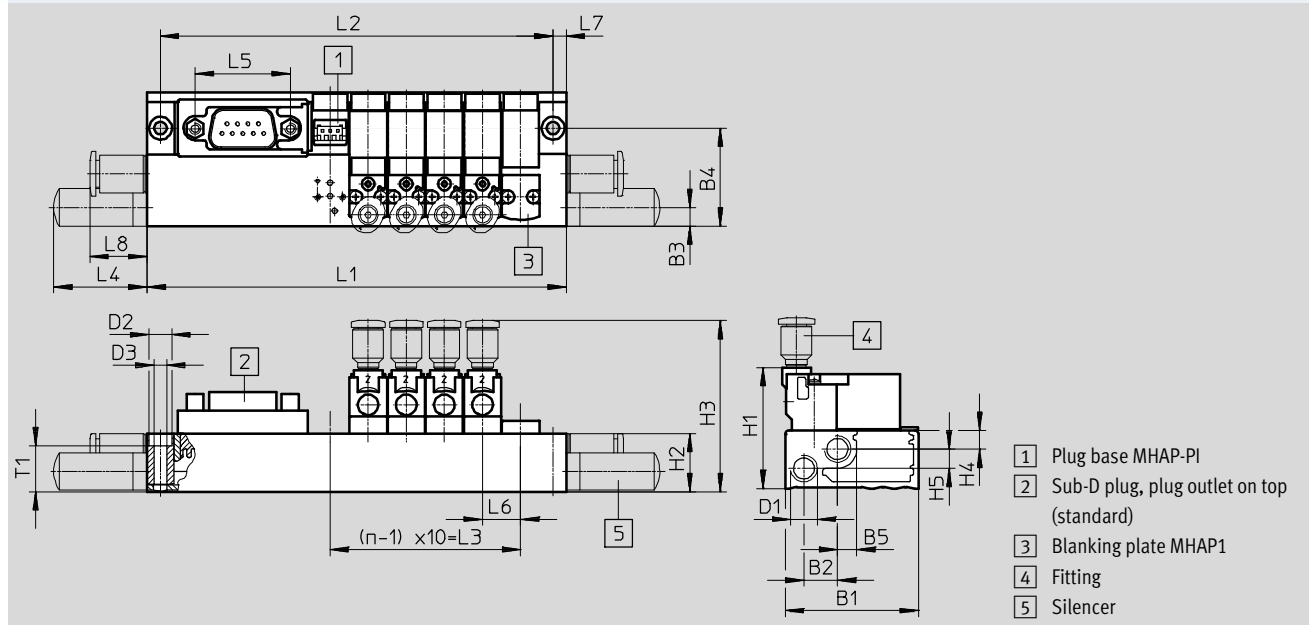
Valve positions	L1	L2	L3
n	±0.15	±0.1	
9	105	97	80
10	115	107	90
11	125	117	100
12	135	127	110
13	145	137	120
14	155	147	130
15	165	157	140

Valve positions	L1	L2	L3
n	±0.15	±0.1	
16	175	167	150
17	185	177	160
18	195	187	170
19	205	197	180
20	215	207	190
21	225	217	200
22	235	227	210

Solenoid valves MH1, semi in-line valve

Technical data

Dimensions – Manifold assembly with electrical multi-pin plug Download CAD data → www.festo.com
 3/2-way valve

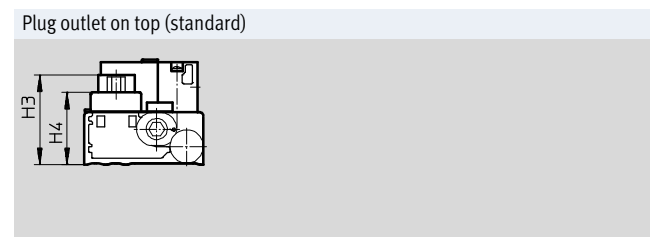
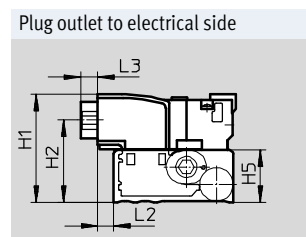
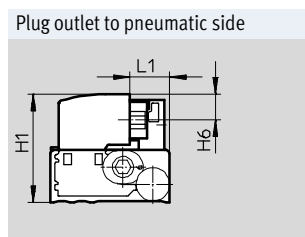


Type	B1	B2	B3	B4	B5	D1	D2	D3	H1	H2	H3	H4	H5	L4	L5	L6	L7	L8	T1
MHP1	35	8.8	5.3	25.7	5.2	M7	6	3.3	31.8	15.3	44.9	4.9	5.1	54.5	25	10	3.5	15	12.1

Valve positions	L1	L2	L3
n	±0.15	±0.1	
2	70	63	10
4	90	83	30
6	110	103	50
8	130	123	70

Valve positions	L1	L2	L3
n	±0.15	±0.1	
10	172	165	90
12	192	185	110
14	212	205	130
16	232	225	150

Valve positions	L1	L2	L3
n	±0.15	±0.1	
18	252	245	170
20	272	265	190
22	292	285	210

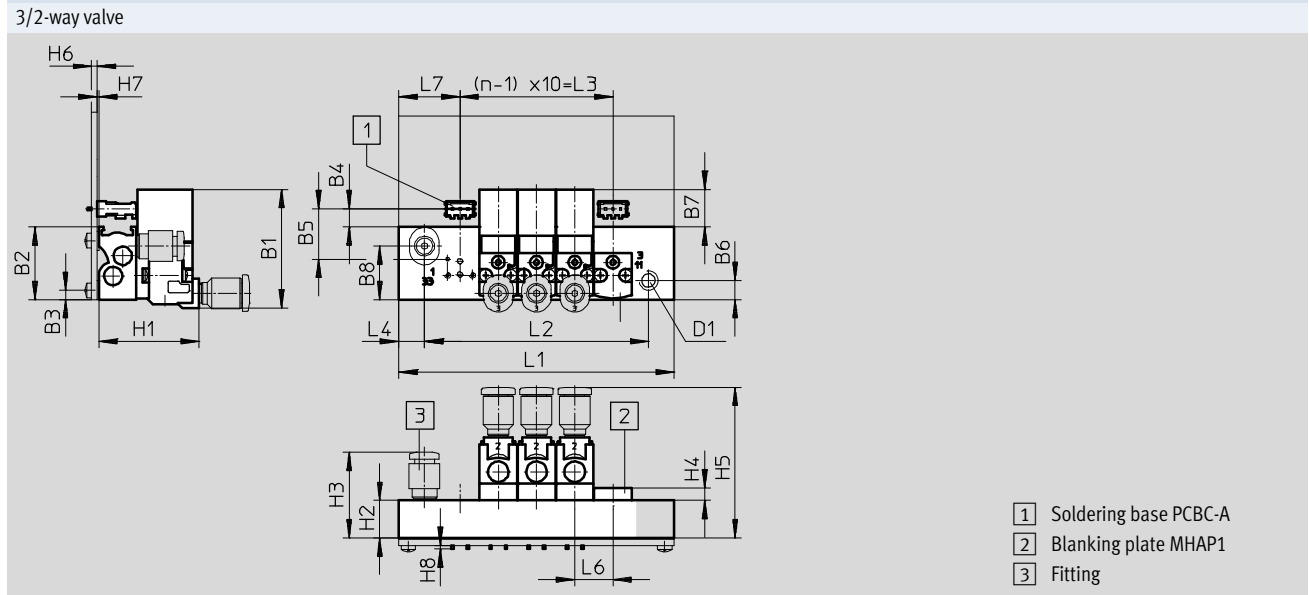


Type	H1	H2	H3	H4	H5	H6	L1	L2	L3
MHP1	31.8	24.2	26.2	21.2	15.3	7.6	11.7	4.8	5

Solenoid valves MH1, semi in-line valve

Technical data

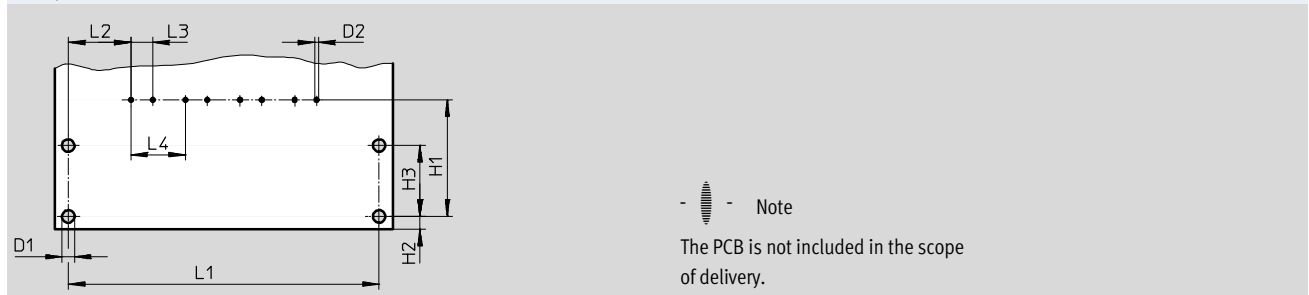
Dimensions – Manifold assembly on PCB Download CAD data → www.festo.com



Type	B1	B2	B3	B4	B5	B6	B7	B8	D1	H1	H2	H3	H4	H5	H6	H7	H8	L4	L6	L7
MHP1	31	19	2.4	4.8	13.2	5	9.9	14	M5	26.3	9.8	22.4	3.3	39.4	1.5	0.4	1	6.7	10	16

Valve positions	L1	L2	L3
n	±0.15	±0.1	
2	42	28.6	10
4	62	48.6	30
6	82	68.6	50
8	102	88.6	70
10	122	108.6	90

Hole pattern on PCB

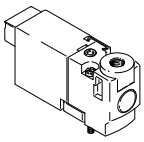
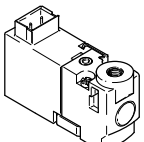
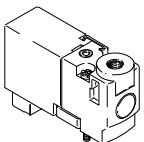


Type	D1	D2	H1	H2	H3	L2	L3	L4
PCB	2.3	0.7	21.4	2.4	13	11.5	4	10

Valve positions	L1
n	±0.1
2	37
4	57
6	77
8	97
10	117

Solenoid valves MH1, semi in-line valve

Technical data

Ordering data										
		Valve function	Normal position		Part No.	Type				
Solenoid valve										
	Plug connection at rear	2/2-way solenoid valve	Closed	5 V DC	197045	MHP1-M4H-2/2G-M3-HC				
				12 V DC	197046	MHP1-M5H-2/2G-M3-HC				
				24 V DC	197047	MHP1-M1H-2/2G-M3-HC				
				3/2-way solenoid valve	Closed	5 V DC	197009	MHP1-M4H-3/2G-M3-HC		
						12 V DC	197010	MHP1-M5H-3/2G-M3-HC		
						24 V DC	197011	MHP1-M1H-3/2G-M3-HC		
							Open	5 V DC	197027	MHP1-M4H-3/2O-M3-HC
								12 V DC	197028	MHP1-M5H-3/2O-M3-HC
								24 V DC	197029	MHP1-M1H-3/2O-M3-HC
	Plug connection on top	2/2-way solenoid valve	Closed	5 V DC	197048	MHP1-M4H-2/2G-M3-TC				
				12 V DC	197049	MHP1-M5H-2/2G-M3-TC				
				24 V DC	197050	MHP1-M1H-2/2G-M3-TC				
				3/2-way solenoid valve	Closed	5 V DC	197012	MHP1-M4H-3/2G-M3-TC		
						12 V DC	197013	MHP1-M5H-3/2G-M3-TC		
						24 V DC	197014	MHP1-M1H-3/2G-M3-TC		
							Open	5 V DC	197030	MHP1-M4H-3/2O-M3-TC
								12 V DC	197031	MHP1-M5H-3/2O-M3-TC
								24 V DC	197032	MHP1-M1H-3/2O-M3-TC
	Plug connection underneath	2/2-way solenoid valve	Closed	5 V DC	197051	MHP1-M4H-2/2G-M3-PI				
				12 V DC	197052	MHP1-M5H-2/2G-M3-PI				
				24 V DC	197053	MHP1-M1H-2/2G-M3-PI				
				3/2-way solenoid valve	Closed	5 V DC	197015	MHP1-M4H-3/2G-M3-PI		
						12 V DC	197016	MHP1-M5H-3/2G-M3-PI		
						24 V DC	197017	MHP1-M1H-3/2G-M3-PI		
							Open	5 V DC	197033	MHP1-M4H-3/2O-M3-PI
								12 V DC	197034	MHP1-M5H-3/2O-M3-PI
								24 V DC	197035	MHP1-M1H-3/2O-M3-PI



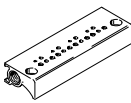
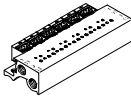
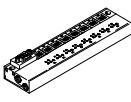
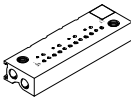




Note

Valves of the type 3/2G and 3/2O must not be mixed on a manifold rail.

Solenoid valves MH1, semi in-line valve

Technical data

Ordering data				Part No.	Type		
Individual sub-base							
	For valves with plug connection at rear or on top	For 2/2-way solenoid valve	1 valve position	197188	MHP1-AS-2-M3		
		For 3/2-way solenoid valve	1 valve position	197184	MHP1-AS-3-M3		
	For valves with plug connection underneath	For 2/2-way solenoid valve	1 valve position	197190	MHP1-AS-2-M3-PI		
		For 3/2-way solenoid valve	1 valve position	197186	MHP1-AS-3-M3-PI		
Manifold rail, for valves with plug connection at rear or on top							
	Without plug bases	For 2/2-way solenoid valve	2 valves	197196	MHP1-P2-2		
			4 valves	197197	MHP1-P4-2		
			6 valves	197198	MHP1-P6-2		
			8 valves	197200	MHP1-P8-2		
			10 valves	197201	MHP1-P10-2		
	For 3/2-way solenoid valve	2 valves	197191	MHP1-PR2-3			
		4 valves	197192	MHP1-PR4-3			
		6 valves	197193	MHP1-PR6-3			
		8 valves	197194	MHP1-PR8-3			
		10 valves	197195	MHP1-PR10-3			
Manifold rail, for valves with plug connection underneath							
	With plug bases	For 2/2-way solenoid valve	2 valves	197217	MHP1-P2-2-PI		
			4 valves	197218	MHP1-P4-2-PI		
			6 valves	197219	MHP1-P6-2-PI		
			8 valves	197220	MHP1-P8-2-PI		
			10 valves	197221	MHP1-P10-2-PI		
	For 3/2-way solenoid valve	2 valves	197212	MHP1-PR2-3-PI			
		4 valves	197213	MHP1-PR4-3-PI			
		6 valves	197214	MHP1-PR6-3-PI			
		8 valves	197215	MHP1-PR8-3-PI			
		10 valves	197216	MHP1-PR10-3-PI			
	With plug bases and electrical multi-pin plug, Sub-D, 9-pin	For 3/2-way solenoid valve	4 valves	197233	MHP1-PR4-3-PI-D9		
			6 valves	197234	MHP1-PR6-3-PI-D9		
			8 valves	197235	MHP1-PR8-3-PI-D9		
	With plug bases and electrical multi-pin plug, Sub-D, 25-pin	For 3/2-way solenoid valve	10 valves	197236	MHP1-PR10-3-PI-D25		
			Without plug bases for PCB mounting	For 3/2-way solenoid valve	2 valves	197242	MHP1-PR2-3-PI-PCB
					4 valves	197243	MHP1-PR4-3-PI-PCB
					6 valves	197244	MHP1-PR6-3-PI-PCB
8 valves	197245	MHP1-PR8-3-PI-PCB					
			10 valves	197246	MHP1-PR10-3-PI-PCB		
Blanking plate							
	For manifold rail without plug bases			197257	MHAP1-BP-3		
	For manifold rail with plug bases			197258	MHAP1-BP-3-PI		

 Note

Manifold rails with an uneven number of valves and for 11 ... 24 valves as well as further variants can be

configured and ordered online using the MH1 modular product system.





 Note

Valves of the type 3/2G and 3/2O must not be mixed on a manifold rail.

Solenoid valves MH1, semi in-line valve

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

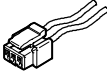
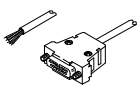
Technical data

Ordering data				Part No.	Type	PU ¹⁾
Blanking plug						
	For M3 thread			30979	B-M3-S9	10
	For M7 thread			174309	B-M7	10
Silencer						
	M3 connecting thread			1231120	AMTE-M-LH-M3	20
	M7 connecting thread			161418	UC-M7	1
Push-in fitting						
	M3 connecting thread	With internal hex	For tubing O.D. 3 mm	153312	QSM-M3-3-I	10
			For tubing O.D. 4 mm	153314	QSM-M3-4-I	10
		With external hex	For tubing O.D. 3 mm	153301	QSM-M3-3	10
			For tubing O.D. 4 mm	153303	QSM-M3-4	10
	M5 connecting thread	With internal hex	For tubing O.D. 3 mm	153313	QSM-M5-3-I	10
			For tubing O.D. 4 mm	153315	QSM-M5-4-I	10
			For tubing O.D. 6 mm	153317	QSM-M5-6-I	10
		With external hex	For tubing O.D. 3 mm	153302	QSM-M5-3	10
			For tubing O.D. 4 mm	153304	QSM-M5-4	10
			For tubing O.D. 6 mm	153306	QSM-M5-6	10
	M7 connecting thread	With internal hex	For tubing O.D. 4 mm	153319	QSM-M7-4-I	10
			For tubing O.D. 6 mm	153321	QSM-M7-6-I	10
Inscription label						
	For identifying the valve positions			197259	MH-BZ-80X	80

1) Packaging unit.

Solenoid valves MH1, semi in-line valve

Technical data

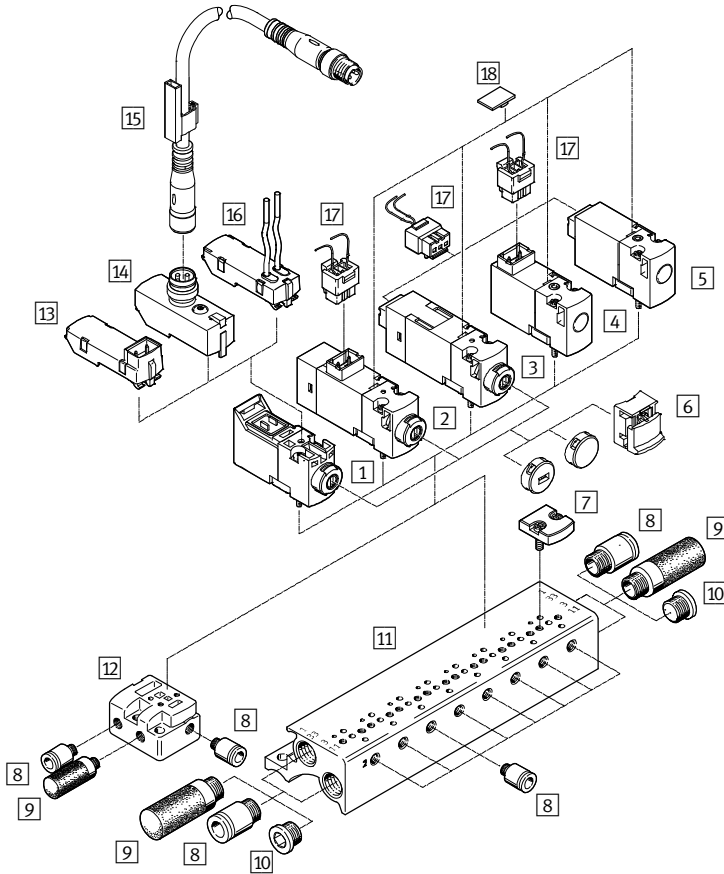
Ordering data				Part No.	Type	PU ¹⁾
Soldering base						
	For manifold rail for valves with plug connection underneath for PCB mounting, 3-pin			197261	PCBC-A-10	10
				197262	PCBC-A-100	100
Electrical plug-in base						
	For manifold rail, for valves with plug connection underneath	2x flying leads	0.5 m	197260	MHAP-PI	1
		Open end 1-wire	1 m	532182	MHAP-PI-1	1
Plug socket with cable						
	Straight socket Connection pattern H 3-pin	2x flying leads	0.5 m	566654	NEBV-H1G2-KN-0.5-N-LE2	1
		Open end	1 m	566655	NEBV-H1G2-KN-1-N-LE2	1
		1-wire	2.5 m	566656	NEBV-H1G2-KN-2.5-N-LE2	1
			5 m	566657	NEBV-H1G2-KN-5-N-LE2	1
Connecting cable for manifold rail with electrical multi-pin plug						
	Straight socket, Sub-D, 9-pin	Cable	2.5 m	531184	KMP6-09P-8-2,5	1
		Open end	5 m	531185	KMP6-09P-8-5	1
		9-wire	10 m	531186	KMP6-09P-8-10	1
	Straight socket, Sub-D, 25-pin	Cable	2.5 m	530049	KMP6-25P-12-2,5	1
		Open end	5 m	530050	KMP6-25P-12-5	1
		15-wire	10 m	530051	KMP6-25P-12-10	1
	Straight socket, Sub-D, 25-pin	Cable	2.5 m	530046	KMP6-25P-20-2,5	1
		Open end	5 m	530047	KMP6-25P-20-5	1
		25-wire	10 m	530048	KMP6-25P-20-10	1

1) Packaging unit.

Solenoid valves MH1, sub-base valve

Peripherals overview

Valves with plug connection at rear, plug connection on top

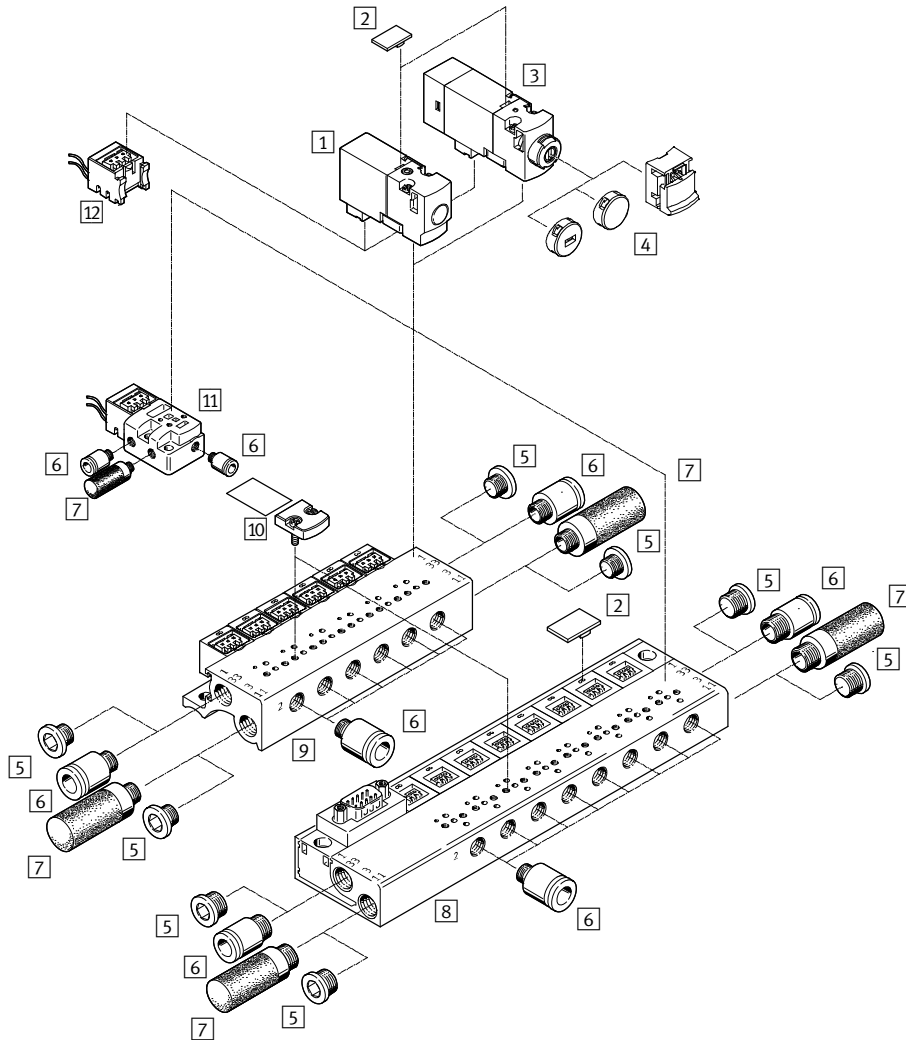


Designation	Brief description	→ Page/Internet	
1	Solenoid valve	Valve without plug connection, with manual override	41
2	Solenoid valve	Valve with plug connection on top, with LED, with manual override	54
3	Solenoid valve	Valve with plug connection at rear, with LED, with manual override	54
4	Solenoid valve	Valve with plug connection on top, without LED, without manual override	32
5	Solenoid valve	Valve with plug connection at rear, without LED, without manual override	32
6	Cover cap	For manual override	42, 56
7	Blanking plate	For manifold rail without plug bases	34, 42, 56
8	Push-in fitting	For connecting compressed air tubing with standard O.D.	34, 42, 56
9	Silencer	For exhaust ports	34, 42, 56
10	Blanking plug	For sealing ports that are not required	34, 42, 56
11	Manifold rail	Without plug bases	33, 41, 55
12	Individual sub-base	For valves with plug connection at rear, plug connection on top	33, 41, 55
13	E-box	Plug connection pattern H/connection pattern S	43
14	E-box	Plug M8x1	43
15	Connecting cable	Socket M8x1, 4-pin	44
16	E-box	Open end	43
17	Plug socket with cable	Straight socket, connection pattern H, 3-pin	35, 44, 57
18	Inscription label	For identifying the valve positions	35, 57

Solenoid valves MH1, sub-base valve

Peripherals overview

Valves with plug connection underneath

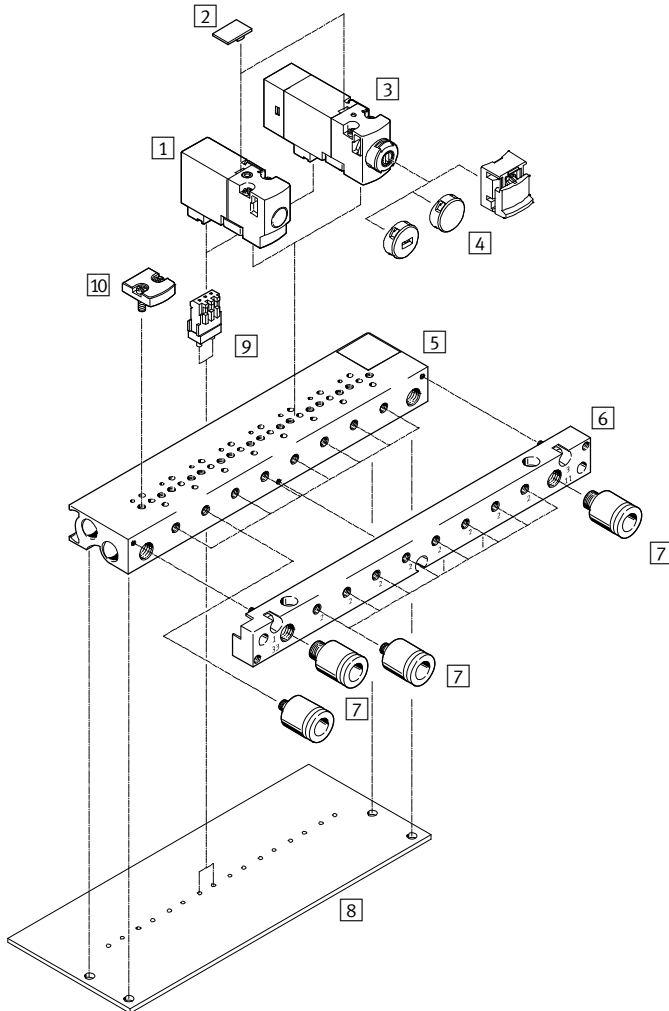


Designation	Brief description	→ Page/Internet	
1	Solenoid valve	Valve with plug connection underneath, without LED	32
2	Inscription label	For identifying the valve positions	35, 57
3	Solenoid valve	Valve with plug connection underneath, with LED	54
4	Cover cap	For manual override	42, 56
5	Blanking plug	For sealing ports that are not required	34, 56
6	Push-in fitting	For connecting compressed air tubing with standard O.D.	34, 56
7	Silencer	For exhaust ports	34, 56
8	Manifold rail	With plug bases	33, 55
9	Manifold rail	With plug bases and electrical multi-pin plug	33, 55
10	Blanking plate	For manifold rail with plug bases	34, 56
11	Individual sub-base	For valves with plug connection underneath	33, 55
12	Plug socket with cable	Straight socket, connection pattern H, 3-pin	35, 57

Solenoid valves MH1, sub-base valve

Peripherals overview

Valves with plug connection underneath, PCB mounting



	Brief description	→ Page/Internet	
1	Solenoid valve	Plug connection underneath, without LED	32
2	Inscription label	For identifying the valve positions	35, 57
3	Sub-base valve	Plug connection underneath, with LED	54
4	Cover cap	For manual override	42, 56
5	Manifold rail	Without plug bases for PCB mounting	33, 55
6	Pneumatic multiple connector plate	Enables the tubing connection to be left in place on the PCB when changing the valve terminal (included in the scope of delivery)	-
7	Push-in fittings	For connecting compressed air tubing with standard O.D.	34, 56
8	PCB	Provided by the customer (not included in the scope of delivery)	-
9	Soldering base	For plug-in connection, 3-pin	35, 57
10	Blanking plate	For manifold rail without plug bases	34, 56

Solenoid valves MH1, sub-base valve without LED

Type codes

MH A 1 - M 4 H - 3/2 0 - 0,6 - HC

Valve series

MH	Miniature and fast-switching valves
----	-------------------------------------

Design

A	Sub-base valve
---	----------------

Size

1	Flow rate 10 ... 14 l/min
---	---------------------------

Drive system

M	Solenoid, switching
---	---------------------

Operating voltage

4	5 V DC
5	12 V DC
1	24 V DC

Manual override

H	Non-detenting
---	---------------

Valve function

2/2	2/2-way valve
3/2	3/2-way valve

Normal position


G	Closed
0	Open

Nominal width

0,6	0.65 mm
0,9	0.9 mm

Electrical connection

HC	Plug connection at rear for plug socket NEBV-H1G2
TC	Plug connection on top for plug socket NEBV-H1G2
PI	Plug connection underneath for plug-in connection

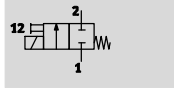
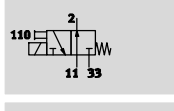
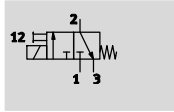
 - Note
Further variants and accessories can be configured and ordered online using the modular product system.


Solenoid valves MH1, sub-base valve without LED


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Technical data

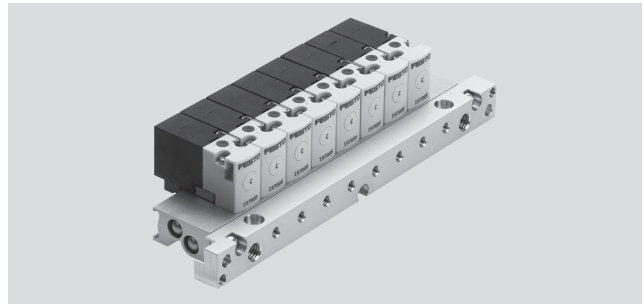
Function



-  - Voltage
5 V DC
12 V DC
24 V DC

-  - Pressure
-0.9 ... +8 bar

-  - Temperature range
-5 ... +40 °C



General technical data				
Type		MHA1-...-2/2G-...	MHA1-...-3/2G-...	MHA1-...-3/20-...
Valve function		2/2-way solenoid valve	3/2-way solenoid valve	3/2-way solenoid valve
		Normally closed	Normally closed	Normally open
		Single solenoid	Single solenoid	Single solenoid
Design		Poppet valve with spring return		
Sealing principle		Soft		
Actuation type		Electric		
Reset method		Mechanical spring		
Type of control		Direct		
Direction of flow		Non-reversible		
Suitability for vacuum		Yes	-	-
Exhaust function		No flow control	With flow control	With flow control
Manual override		Non-detenting		
Type of mounting		On sub-base via through-hole		
Mounting position		Any		
Nominal size	[mm]	Q.9	Q.65	Q.7
Standard nominal flow rate	[l/min]	14	10	10
Grid dimension	[mm]	10	10	10
Pneumatic connection	1	Sub-base	Sub-base	-
	2	Sub-base	Sub-base	Sub-base
	3	-	Sub-base	-
	11	-	-	Sub-base
	33	-	-	Sub-base
Product weight	[g]	10	10	10

Operating and environmental conditions				
Type		MHA1-...-2/2G-...	MHA1-...-3/2G-...	MHA1-...-3/20-...
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	[bar]	-0.9 ... +2	0 ... 8 ¹⁾	0 ... 6 ¹⁾
Ambient temperature	[°C]	-5 ... +40		
Temperature of medium	[°C]	-5 ... +40		
Storage temperature	[°C]	-20 ... +60		
Corrosion resistance class CRC ²⁾		2		
Certification		c UL us Recognized (OL)		
		c CSA us Recognized (OL)		

1) Vacuum operation possible with special connection method → 4

2) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Solenoid valves MH1, sub-base valve without LED

Technical data

Safety data				
Operating voltage		5 V DC	12 V DC	24 V DC
Note on forced checking procedure	Switching frequency min. 1/week			
Max. positive test pulse with 0 signal	[μs]	-	-	500
Max. negative test pulse with 1 signal	[μs]	-	-	400
Resistance to shocks	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27			
Vibration resistance	Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6			

Electrical data		
Operating voltage	[V DC]	5
	[V DC]	12
	[V DC]	24
Permissible voltage fluctuations	[%]	±10
Connection type	Plug connection	
Power consumption	[W]	1
Duty cycle	[%]	100
Degree of protection to EN 60529	IP40	

Switching times and frequencies					
Type			MHA1-...-2/2G-...	MHA1-...-3/2G-...	MHA1-...-3/2O-...
Switching time	On	[ms]	4	4	4
	Off	[ms]	5	4	4
Maximum switching frequency		[Hz]	20	20	20

Materials	
Housing	Reinforced PA, reinforced PPS
Sub-base	Aluminium
Seals	FPM, HNBR, NBR
Note on materials	RoHS-compliant Free of copper and PTFE

Dimensions

Download CAD data → www.festo.com

Plug connection on top

Plug connection at rear

Plug connection underneath

1 Plug socket NEBV-H1G2
 2 Manual override
3 Coding pin

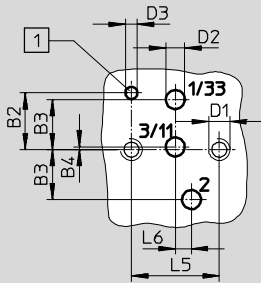
Type	B1	H1	H2	H4	L2	L3
MHA1	9.8	14.7	3.6	27.7	28.5	41.5

Solenoid valves MH1, sub-base valve without LED

Technical data

Dimensions – Hole pattern on sub-bases

Download CAD data → www.festo.com



1 Hole for coding pin

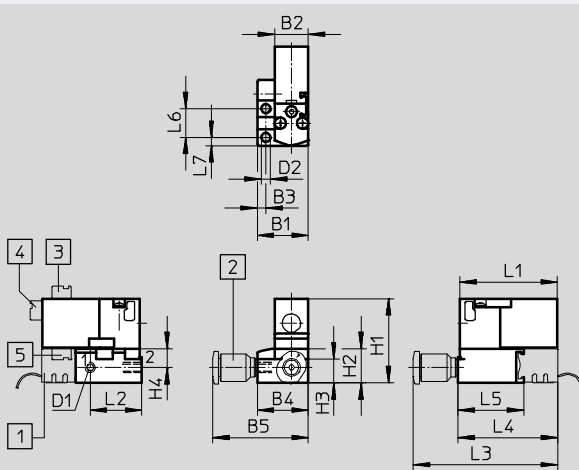
- If used as a 2/2-way valve, normally closed, port 3/11 are not used.
- If used as a 2/2-way valve, normally open, port 1/33 are not used.

Type	B2	B3	B4	D1	D2	D3	L5	L6
MHA1	4.2	3.7	0.2	M1.6	1.4	0.9	6.5	1.2

Dimensions – Assembly on individual sub-base

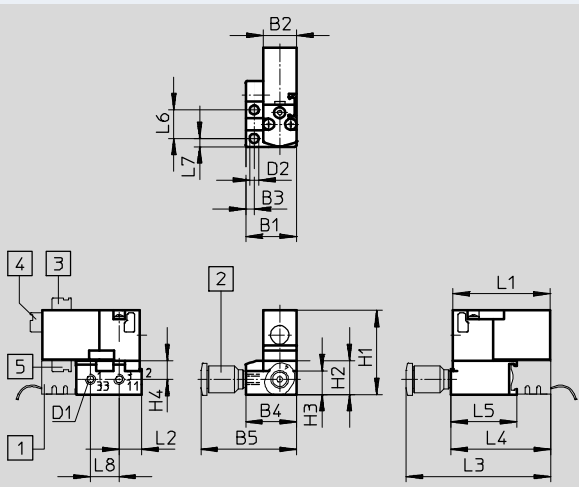
Download CAD data → www.festo.com

2/2-way valve



- 1 Plug base MHAP-PI
- 2 Fitting
- 3 Plug connection on top
- 4 Plug connection at rear
- 5 Plug connection underneath

3/2-way valve



- 1 Plug base MHAP-PI
- 2 Fitting
- 3 Plug connection on top
- 4 Plug connection at rear
- 5 Plug connection underneath

Type	B1	B2	B3	B4	B5	D1	D2	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7	L8
2/2-way valve	14.9	9.8	2.5	14.9	28	M3	2.7	24.7	10	7	5.5	28.5	15.1	42.4	29.3	19.3	8.4	2.5	–
3/2-way valve	14.9	9.8	2.5	14.9	28	M3	2.7	24.7	10	7	5.5	28.5	6.7	42.4	29.3	19.3	8.4	2.5	8.4

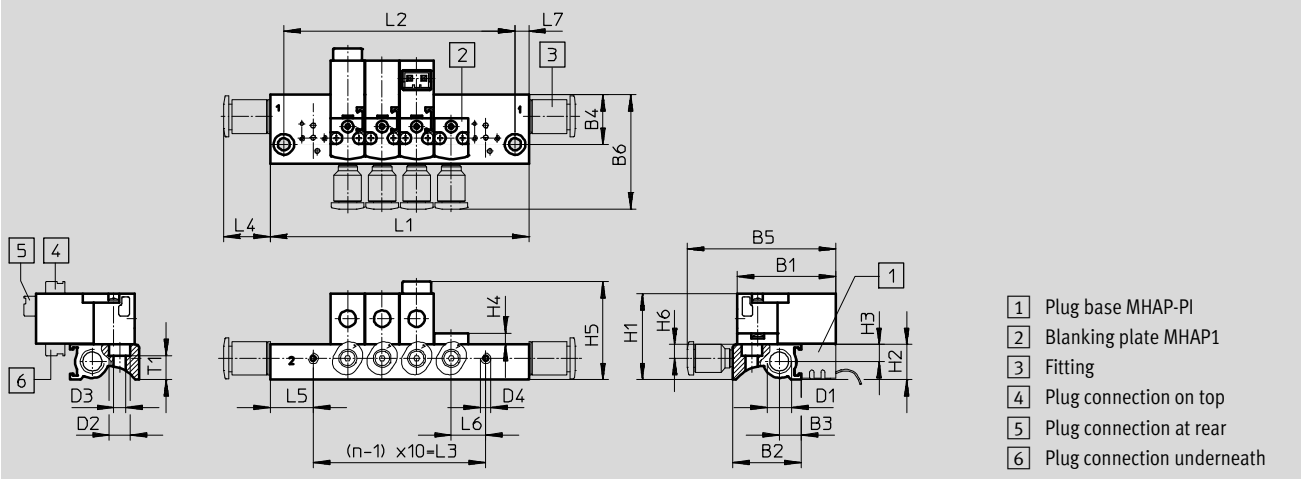
Solenoid valves MH1, sub-base valve without LED

Technical data

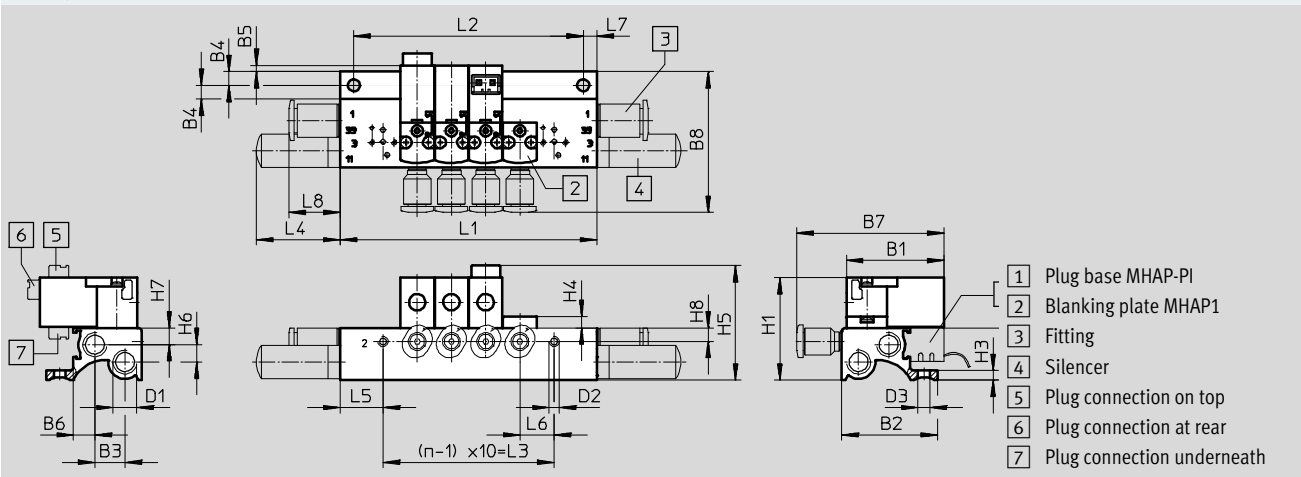
Dimensions – Manifold assembly

Download CAD data → www.festo.com

2/2-way valve



3/2-way valve



Type	B1	B2	B3	B4	B5	B6	B7	B8	D1	D2	D3	D4
2/2-way valve	28.5	20	6.3	14.4	42.9	33.1	-	-	M7	6	3.5	M3
3/2-way valve	28.5	28	8.8	4	1.9	6.3	42.9	41.1	M7	M3	3.5	-

Type	H1	H2	H3	H4	H5	H6	H7	H8	L4	L5	L6	L7	L8	T1
2/2-way valve	24.9	10.2	4.9	3.3	28.5	4	-	-	13.5	12.5	10	4	-	7
3/2-way valve	30	15.3	2.8	3.3	33.6	5.1	4.9	4	24.5	12.5	10	4	13.5	-

Valve positions n	L1 ±0.15	L2 ±0.1	L3
2	35	27	10
3	45	37	20
4	55	47	30
5	65	57	40
6	75	67	50
7	85	77	60
8	95	87	70

Valve positions n	L1 ±0.15	L2 ±0.1	L3
9	105	97	80
10	115	107	90
11	125	117	100
12	135	127	110
13	145	137	120
14	155	147	130
15	165	157	140

Valve positions n	L1 ±0.15	L2 ±0.1	L3
16	175	167	150
17	185	177	160
18	195	187	170
19	205	197	180
20	215	207	190
21	225	217	200
22	235	227	210

Solenoid valves MH1, sub-base valve without LED

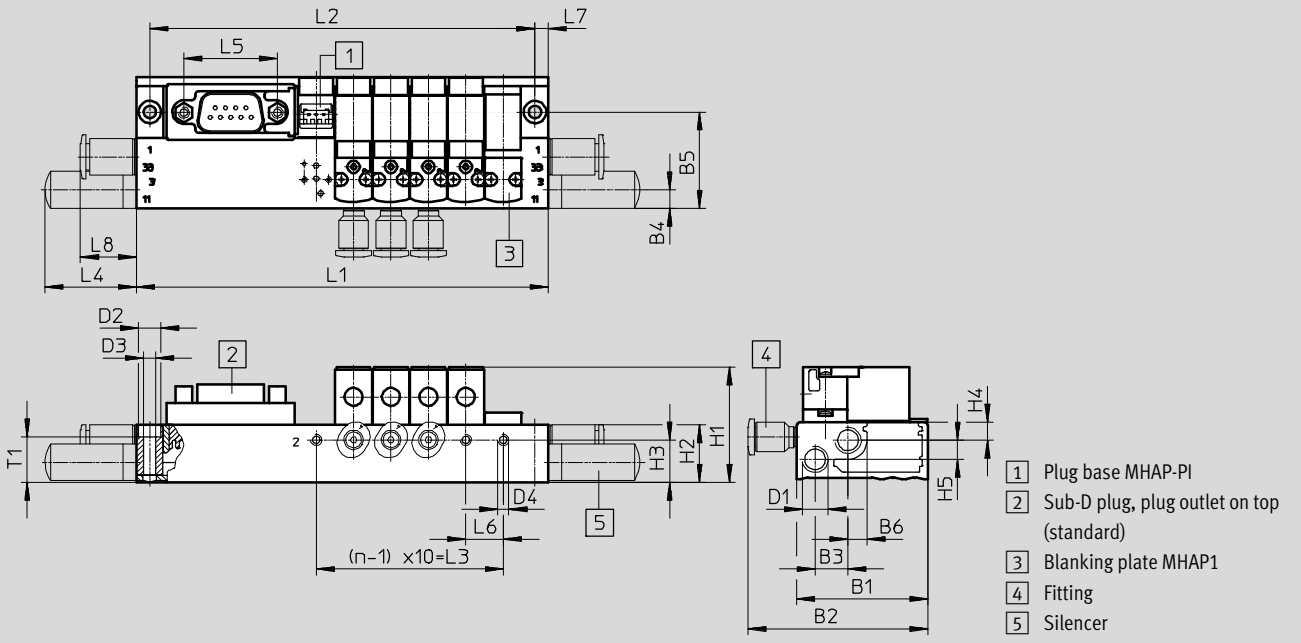
Technical data



Dimensions – Manifold assembly with electrical multi-pin plug

Download CAD data → www.festo.com

3/2-way valve



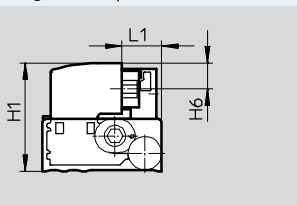
Type	B1	B2	B3	B4	B5	B6	D1	D2	D3	D4	H1	H2	H3	H4	H5	L4	L5	L6	L7	L8	T1
MHA1	35	48.1	8.8	5.3	25.7	5.2	M7	6	3.3	M3	30.8	15.3	11.3	4.9	5.1	24.5	25	10	3.5	15	12.1

Valve positions n	L1 ±0.15	L2 ±0.1	L3
2	70	63	10
4	90	83	30
6	110	103	50
8	130	123	70

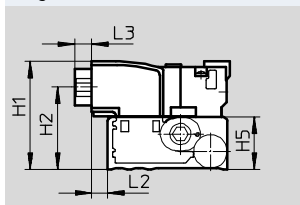
Valve positions n	L1 ±0.15	L2 ±0.1	L3
10	172	165	90
12	192	185	110
14	212	205	130
16	232	225	150

Valve positions n	L1 ±0.15	L2 ±0.1	L3
18	252	245	170
20	272	265	190
22	292	285	210

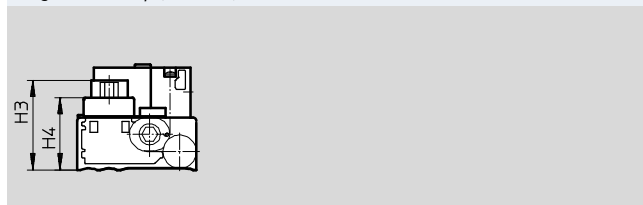
Plug outlet to pneumatic side



Plug outlet to electrical side



Plug outlet on top (standard)



Type	H1	H2	H3	H4	H5	H6	L1	L2	L3
MHA1	31.8	24.2	26.2	21.2	15.3	7.6	11.7	4.8	5

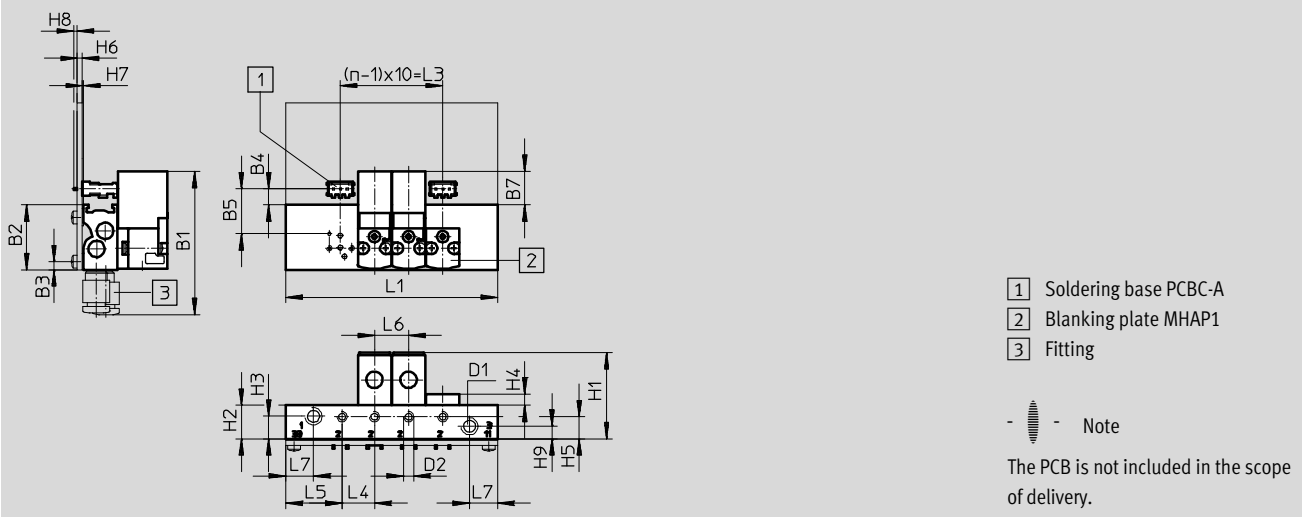
Solenoid valves MH1, sub-base valve without LED

Technical data

Dimensions – Manifold assembly on PCB

Download CAD data → www.festo.com

3/2-way valve, without pneumatic multiple connector plate



Type	B1	B2	B3	B4	B5	B7	D1	D2
Without pneumatic multiple connector plate	42	19	2.4	4.8	13.2	9.9	M5	M3

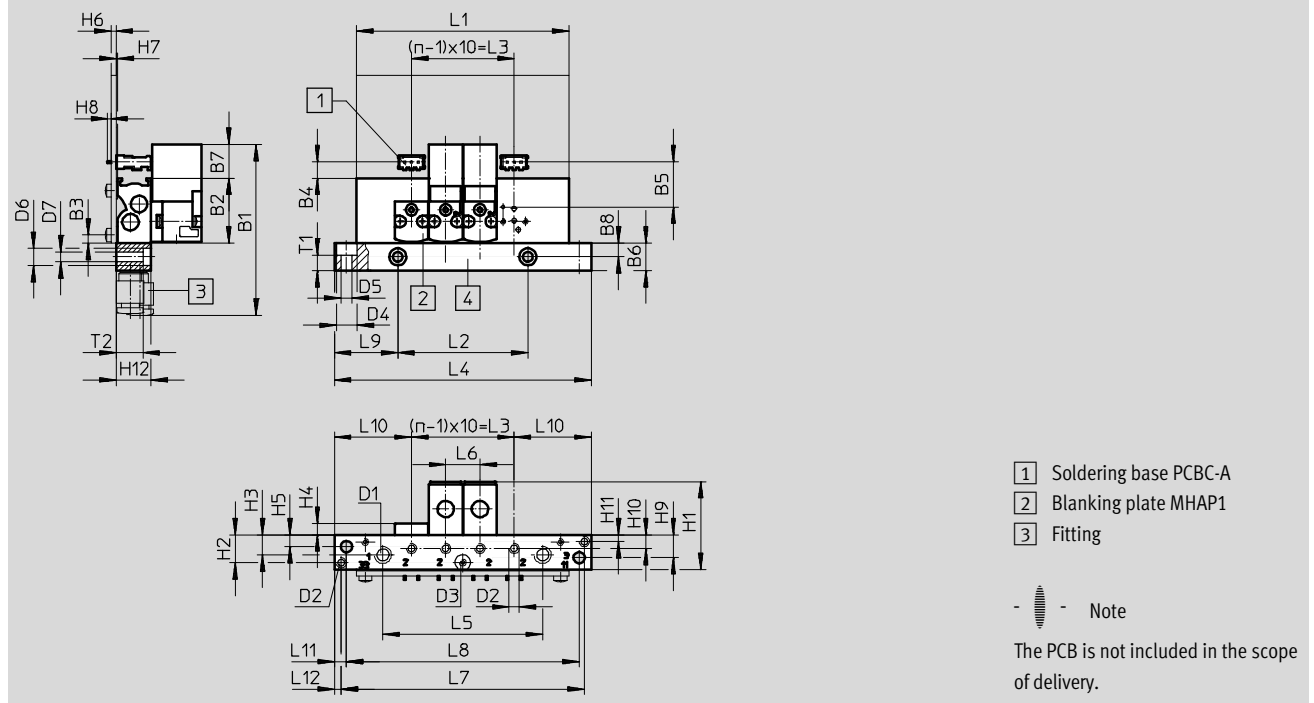
Type	H1	H2	H3	H4	H5	H6	H7	H8	H9	L4	L5	L6	L7
Without pneumatic multiple connector plate	25.3	9.8	6.6	3.3	6.5	1.5	0.4	1	3.7	9.5	16.5	10	8.2

Valve positions n	L1 ±0.15	L3
2	42	10
4	62	30
6	82	50
8	102	70
10	122	90

Solenoid valves MH1, sub-base valve without LED

Technical data

Dimensions – Manifold assembly on PCB Download CAD data → www.festo.com
 3/2-way valve, with pneumatic multiple connector plate



Type	B1	B2	B3	B4	B5	B6	B7	B8	D1	D2	D3	D4	D5	D6	D7
With pneumatic multiple connector plate	49.5	19	2.4	4.8	13.2	8	9.9	4	M5	M3	M2	6.1	3.3	5	2.9

Type	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	L6	L9	L10	L11	L12	T1	T2
With pneumatic multiple connector plate	25.7	8.2	5.9	3.3	3.5	1.5	0.4	1	6.7	4	2	10.2	10	18.5	22.5	3.5	2	4.5	7.8

Valve positions n	L1 ±0.15	L2 ±0.1	L3	L4 ±0.2	L5 ±0.15	L7 ±0.1	L8
4	62	38	30	75	46.7	71	68
6	82	58	50	95	66.7	91	88
8	102	78	70	115	86.7	111	108
10	122	98	90	135	106.7	131	128

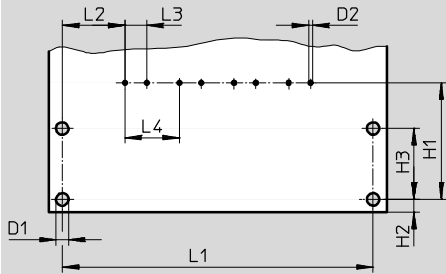
Solenoid valves MH1, sub-base valve without LED

Technical data

Dimensions – Manifold assembly on PCB

Download CAD data → www.festo.com

Hole pattern on PCB



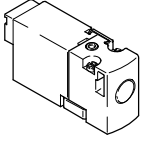
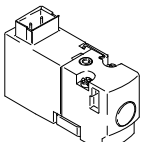
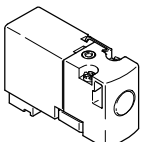
Note
The PCB is not included in the scope of delivery.

Type	D1	D2	H1	H2	H3	L2	L3	L4
PCB	2.3	0.7	21.4	2.4	13	11.5	4	10

Valve positions n	L1
	±0.1
2	37
4	57
6	77
8	97
10	117

Solenoid valves MH1, sub-base valve without LED

Technical data



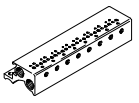
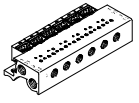
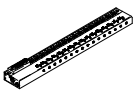
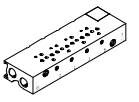
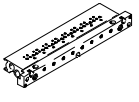
Ordering data									
		Valve function	Normal position		Part No.	Type			
Solenoid valve									
	Plug connection at rear	2/2-way solenoid valve	Closed	5 V DC	197036	MHA1-M4H-2/2G-0,9-HC			
				12 V DC	197037	MHA1-M5H-2/2G-0,9-HC			
				24 V DC	197038	MHA1-M1H-2/2G-0,9-HC			
				3/2-way solenoid valve	Closed	5 V DC	197000	MHA1-M4H-3/2G-0,6-HC	
						12 V DC	197001	MHA1-M5H-3/2G-0,6-HC	
						24 V DC	197002	MHA1-M1H-3/2G-0,6-HC	
						Open	5 V DC	197018	MHA1-M4H-3/2O-0,6-HC
							12 V DC	197019	MHA1-M5H-3/2O-0,6-HC
							24 V DC	197020	MHA1-M1H-3/2O-0,6-HC
	Plug connection on top	2/2-way solenoid valve	Closed	5 V DC	197039	MHA1-M4H-2/2G-0,9-TC			
				12 V DC	197040	MHA1-M5H-2/2G-0,9-TC			
				24 V DC	197041	MHA1-M1H-2/2G-0,9-TC			
				3/2-way solenoid valve	Closed	5 V DC	197003	MHA1-M4H-3/2G-0,6-TC	
						12 V DC	197004	MHA1-M5H-3/2G-0,6-TC	
						24 V DC	197005	MHA1-M1H-3/2G-0,6-TC	
						Open	5 V DC	197021	MHA1-M4H-3/2O-0,6-TC
							12 V DC	197022	MHA1-M5H-3/2O-0,6-TC
							24 V DC	197023	MHA1-M1H-3/2O-0,6-TC
	Plug connection underneath	2/2-way solenoid valve	Closed	5 V DC	197042	MHA1-M4H-2/2G-0,9-PI			
				12 V DC	197043	MHA1-M5H-2/2G-0,9-PI			
				24 V DC	197044	MHA1-M1H-2/2G-0,9-PI			
				3/2-way solenoid valve	Closed	5 V DC	197006	MHA1-M4H-3/2G-0,6-PI	
						12 V DC	197007	MHA1-M5H-3/2G-0,6-PI	
						24 V DC	197008	MHA1-M1H-3/2G-0,6-PI	
						Open	5 V DC	197024	MHA1-M4H-3/2O-0,6-PI
							12 V DC	197025	MHA1-M5H-3/2O-0,6-PI
							24 V DC	197026	MHA1-M1H-3/2O-0,6-PI


 Note


Valves of the type 3/2G and 3/2O must not be mixed on a manifold rail.

Solenoid valves MH1, sub-base valve without LED

Technical data






Ordering data				Part No.	Type
Individual sub-base					
	For valves with plug connection at rear or on top	For 2/2-way solenoid valve	1 valve position	197187	MHA1-AS-2-M3
		For 3/2-way solenoid valve	1 valve position	197183	MHA1-AS-3-M3
	For valves with plug connection underneath	For 2/2-way solenoid valve	1 valve position	197189	MHA1-AS-2-M3-PI
		For 3/2-way solenoid valve	1 valve position	197185	MHA1-AS-3-M3-PI
Manifold rail, for valves with plug connection at rear or on top					
	Without plug bases	For 2/2-way solenoid valve	2 valves	197207	MHA1-P2-2-M3
			4 valves	197208	MHA1-P4-2-M3
			6 valves	197209	MHA1-P6-2-M3
			8 valves	197210	MHA1-P8-2-M3
			10 valves	197211	MHA1-P10-2-M3
	For 3/2-way solenoid valve	2 valves	197202	MHA1-PR2-3-M3	
		4 valves	197203	MHA1-PR4-3-M3	
		6 valves	197204	MHA1-PR6-3-M3	
		8 valves	197205	MHA1-PR8-3-M3	
		10 valves	197206	MHA1-PR10-3-M3	
Manifold rail, for valves with plug connection underneath					
	With plug bases	For 2/2-way solenoid valve	2 valves	197227	MHA1-P2-2-M3-PI
			4 valves	197228	MHA1-P4-2-M3-PI
			6 valves	197229	MHA1-P6-2-M3-PI
			8 valves	197230	MHA1-P8-2-M3-PI
			10 valves	197231	MHA1-P10-2-M3-PI
	For 3/2-way solenoid valve	2 valves	197222	MHA1-PR2-3-M3-PI	
		4 valves	197223	MHA1-PR4-3-M3-PI	
		6 valves	197224	MHA1-PR6-3-M3-PI	
		8 valves	197225	MHA1-PR8-3-M3-PI	
		10 valves	197226	MHA1-PR10-3-M3-PI	
	With plug bases and electrical multi-pin plug	For 3/2-way solenoid valve	4 valves	197238	MHA1-PR4-3-M3-PI-D9
			6 valves	197239	MHA1-PR6-3-M3-PI-D9
			8 valves	197240	MHA1-PR8-3-M3-PI-D9
			10 valves	197241	MHA1-PR10-3-M3-PI-D25
	Without plug bases for PCB mounting	For 3/2-way solenoid valve	2 valves	197247	MHA1-PR2-3-M3-PI-PCB
			4 valves	197248	MHA1-PR4-3-M3-PI-PCB
			6 valves	197249	MHA1-PR6-3-M3-PI-PCB
			8 valves	197250	MHA1-PR8-3-M3-PI-PCB
			10 valves	197251	MHA1-PR10-3-M3-PI-PCB
	Without plug bases for PCB mounting, with pneumatic multiple connector plate	For 3/2-way solenoid valve	4 valves	197253	MHA1-PR4-3-PI-PCBM
			6 valves	197254	MHA1-PR6-3-PI-PCBM
			8 valves	197255	MHA1-PR8-3-PI-PCBM
			10 valves	197256	MHA1-PR10-3-PI-PCBM

 Note
 Manifold rails with an uneven number of valves and for 11 ... 24 valves as well as further variants can be configured and ordered online using the MH1 modular product system.

 Note
 Valves of the type 3/2G and 3/2O must not be mixed on a manifold rail.

Solenoid valves MH1, sub-base valve without LED




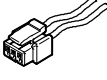
Technical data

Ordering data				Part No.	Type	PU ¹⁾
Blanking plate for manifold rail						
	For manifold rail for valves with plug connection at rear or on top			197257	MHAP1-BP-3	1
	For manifold rail with plug bases with valves with plug connection underneath			197258	MHAP1-BP-3-PI	1
Blanking plug						
	For M3 thread			30979	B-M3-S9	10
	For M5 thread			3843	B-M5	10
	For M7 thread			174309	B-M7	10
Silencer						
	M3 connecting thread			1231120	AMTE-M-LH-M3	20
	M5 connecting thread	Plastic design		165003	UC-M5	1
		Metal design		1205858	AMTE-M-LH-M5	20
	M7 connecting thread			161418	UC-M7	1
Push-in fittings						
	M3 connecting thread	With internal hex	For tubing O.D. 3 mm	153312	QSM-M3-3-I	10
			For tubing O.D. 4 mm	153314	QSM-M3-4-I	10
		With external hex	For tubing O.D. 3 mm	153301	QSM-M3-3	10
			For tubing O.D. 4 mm	153303	QSM-M3-4	10
	M5 connecting thread	With internal hex	For tubing O.D. 3 mm	153313	QSM-M5-3-I	10
			For tubing O.D. 4 mm	153315	QSM-M5-4-I	10
			For tubing O.D. 6 mm	153317	QSM-M5-6-I	10
		With external hex	For tubing O.D. 3 mm	153302	QSM-M5-3	10
			For tubing O.D. 4 mm	153304	QSM-M5-4	10
			For tubing O.D. 6 mm	153306	QSM-M5-6	10
	M7 connecting thread	With internal hex	For tubing O.D. 4 mm	153319	QSM-M7-4-I	10
			For tubing O.D. 6 mm	153321	QSM-M7-6-I	10

1) Packaging unit.

Solenoid valves MH1, sub-base valve without LED

Technical data

Ordering data				Part No.	Type	PU ¹⁾
Inscription label						
	For solenoid valve			197259	MH-BZ-80X	80
Soldering base						
	For plug-in connection, 3-pin			197261	PCBC-A-10	10
				197262	PCBC-A-100	100
Electrical plug-in base						
	Electrical plug-in base for plug-in connection, for 1 valve	2x flying leads Open end 1-wire	0.5 m	197260	MHAP-PI	1
			1 m	532182	MHAP-PI-1	1
Plug socket with cable						
	Straight socket Connection pattern H 3-pin	2x flying leads Open end 1-wire	0.5 m	566654	NEBV-H1G2-KN-0.5-N-LE2	1
			1 m	566655	NEBV-H1G2-KN-1-N-LE2	1
			2.5 m	566656	NEBV-H1G2-KN-2.5-N-LE2	1
			5 m	566657	NEBV-H1G2-KN-5-N-LE2	1


1) Packaging unit.

Solenoid valves MH1, sub-base valve with E-box

Type codes

MH A 1 - M 4 R - 3/2 G - 0,6 - P3

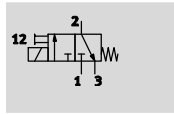
Valve series	
MH	Miniature and fast-switching valves
Design	
A	Sub-base valve
Size	
1	Flow rate 10 ... 14 l/min
Drive system	
M	Solenoid, switching
Operating voltage	
4	5 V DC
5	12 V DC
1	24 V DC
1A	24 V AC
Manual override	
R	Non-detenting/detenting
Valve function	
3/2	3/2-way valve
Normal position	
G	Closed
Nominal width	
0,6	0.65 mm
Electrical connection	
P3	Without plug connection

 - Note
 Further variants and accessories can be configured and ordered online using the modular product system.

Solenoid valves MH1, sub-base valve with E-box

Technical data

Function



Voltage
5 V DC
12 V DC
24 V DC
24 V AC



Pressure
+1.5 ... +8 bar



General technical data	
Valve function	3/2-way solenoid valve Normally closed Single solenoid
Design	Poppet valve with spring return
Sealing principle	Soft
Actuation type	Electric
Reset method	Mechanical spring
Type of control	Direct
Direction of flow	Non-reversible
Exhaust function	With flow control
Manual override	Non-detenting/detenting
Signal status display	–
Type of mounting	On sub-base via through-hole
Mounting position	Any
Nominal size	[mm] 0.65
Standard nominal flow rate	[l/min] 10
Grid dimension	[mm] 10
Pneumatic connection	1 Sub-base 2 Sub-base 3 Sub-base
Product weight	[g] 10

Operating and environmental conditions				
Type	MHA1-M4R-...	MHA1-M5R-...	MHA1-M1R-...	MHA1-M1AR-...
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	[bar] 1.5 ... 8 ¹⁾			
Ambient temperature	[°C] -5 ... +40	-5 ... +40	-5 ... +50	-5 ... +50
Temperature of medium	[°C] -5 ... +50	-5 ... +50	-5 ... +50	-5 ... +50
Restricted ambient and media temperature	[°C] –	–	-5 ... +40	–
			Without holding current reduction	–
Storage temperature	[°C] -20 ... +60	-20 ... +60	-20 ... +60	-20 ... +60
Corrosion resistance class CRC ¹⁾	2	2	2	2

1) Vacuum operation possible with special connection method → 4

2) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Solenoid valves MH1, sub-base valve with E-box

Technical data

Safety data					
Operating voltage		5 V DC	12 V DC	24 V DC	24 V AC
Note on forced checking procedure		Switching frequency min. 1/week			
Max. positive test pulse with 0 signal	[μ s]	–	–	500	–
Max. negative test pulse with 1 signal	[μ s]	–	–	400	–
Resistance to shocks		Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27			
Vibration resistance		Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6			

Electrical data					
Type		MHA1-M4R-...	MHA1-M5R-...	MHA1-M1R-...	MHA1-M1AR-...
Operating voltage	[V DC]	5	12	24	–
	[V AC]	–	–	–	24, 50/60 Hz
Permissible voltage fluctuations	[%]	± 10	± 10	± 10	± 10
Connection type		Plug connection	Plug connection	Plug connection	Plug connection
Power consumption	[W]	1	1	1	–
	[VA]	–	–	–	1
Duty cycle	[%]	100	100	100	100
Degree of protection to EN 60529		IP40	IP40	IP40	IP40
		IP65	IP65	IP65	–

Switching times and frequencies						
Type			MHA1-M4R-...	MHA1-M5R-...	MHA1-M1R-...	MHA1-M1AR-...
Switching time	On	[ms]	5	5	5	5
	Off	[ms]	5	5	5	10
Maximum switching frequency		[Hz]	10	10	10	10

Materials	
Housing	Reinforced PA, reinforced PPS
Sub-base	Aluminium
Seals	FPM, HNBR, NBR
Note on materials	RoHS-compliant
	Free of copper and PTFE

Dimensions

Valve

2 Manual override

Hole pattern on sub-bases

1 Hole for coding pin

- If used as a 2/2-way valve, normally closed, port 3/11 are not used.
- If used as a 2/2-way valve, normally open, port 1/33 are not used.

Download CAD data → www.festo.com

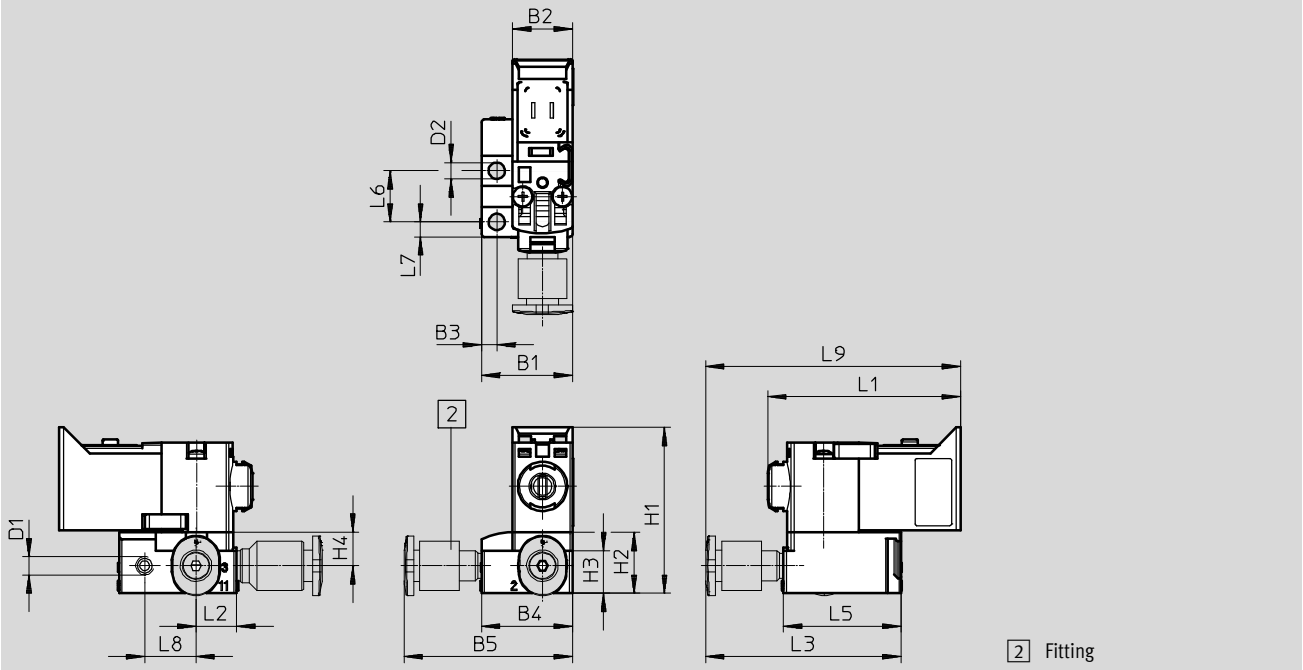
Type	B1	B2	B3	B4	D1	D2	D3	H1	H2	L1	L2	L5	L6
MHA1	9.8	4.2	3.7	0.2	M1.6	1.4	0.9	17.2	14.7	31.7	16.7	6.5	1.2

Solenoid valves MH1, sub-base valve with E-box

Technical data

Dimensions – Assembly on individual sub-base

Download CAD data → www.festo.com



Type	B1	B2	B3	B4	B5	D1	D2	H1	H2	H3	H4	L1	L2	L3	L5	L6	L7	L8	L9
3/2-way valve	14.9	9.8	2.5	14.9	27.6	M3	2.7	27.2	10	7	5.5	31.7	6.7	32	19.3	8.4	2.5	8.4	42

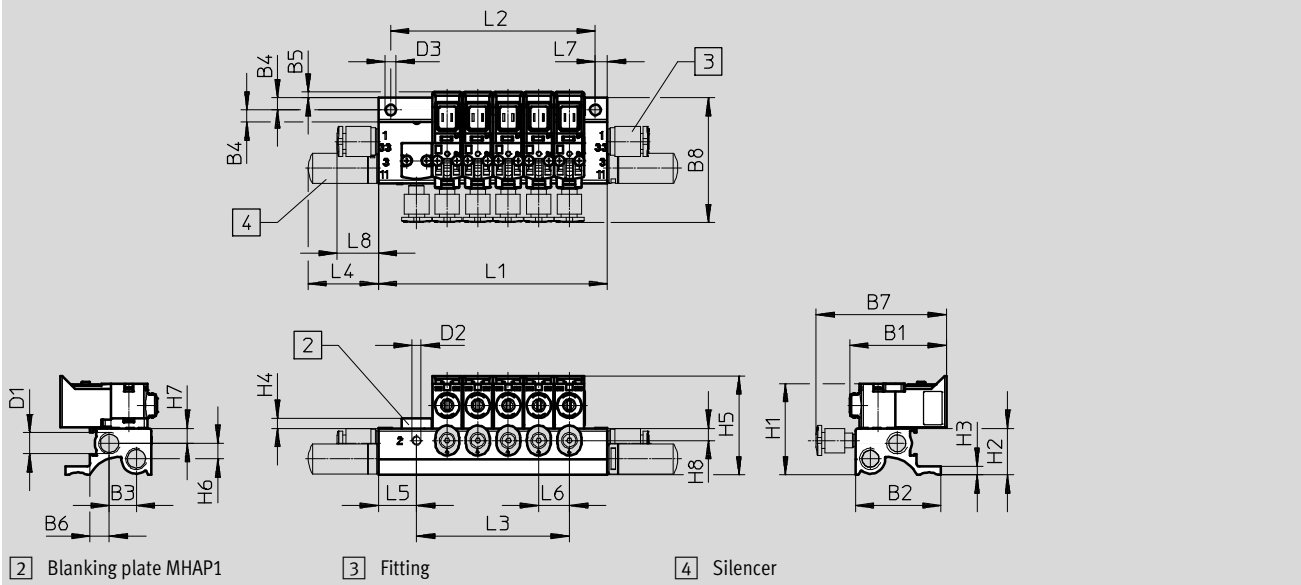
Solenoid valves MH1, sub-base valve with E-box

Technical data

FESTO

Dimensions – Manifold assembly

Download CAD data → www.festo.com



Type	B1	B2	B3	B4	B5	B6	B7	B8	D1	D2	D3
3/2-way valve	31.7	28	8.8	4	1.9	6.3	42.7	42	M7	M3	3.5

Type	H1	H2	H3	H4	H5	H6	H7	H8	L4	L5	L6	L7	L8
3/2-way valve	30	15.3	2.8	3.3	32.5	5.1	4.9	4	23.1	12.5	10	4	13.5

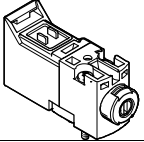

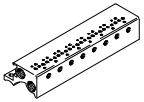
Valve positions n	L1 ±0.15	L2 ±0.1	L3
2	35	27	10
3	45	37	20
4	55	47	30
5	65	57	40
6	75	67	50
7	85	77	60
8	95	87	70

Valve positions n	L1 ±0.15	L2 ±0.1	L3
9	105	97	80
10	115	107	90
11	125	117	100
12	135	127	110
13	145	137	120
14	155	147	130
15	165	157	140

Valve positions n	L1 ±0.15	L2 ±0.1	L3
16	175	167	150
17	185	177	160
18	195	187	170
19	205	197	180
20	215	207	190
21	225	217	200
22	235	227	210

Solenoid valves MH1, sub-base valve with E-box

Technical data

Ordering data					
	Valve function	Normal position		Part No.	Type
Solenoid valve					
	Without plug connection	3/2-way solenoid valve	Closed	5 V DC	8025224 MHA1-M4R-3/2G-0,6-P3
				12 V DC	8025225 MHA1-M5R-3/2G-0,6-P3
				24 V DC	8025223 MHA1-M1R-3/2G-0,6-P3
				24 V AC	8025226 MHA1-M1AR-3/2G-0,6-P3
Individual sub-base					
	Individual sub-base Pneumatic connection: M3 thread		1 valve position	197183	MHA1-AS-3-M3
Manifold rail					
	Manifold rail Pneumatic connection: M3, M7 thread		2 valve positions	197202	MHA1-PR2-3-M3
			4 valve positions	197203	MHA1-PR4-3-M3
			6 valve positions	197204	MHA1-PR6-3-M3
			8 valve positions	197205	MHA1-PR8-3-M3
			10 valve positions	197206	MHA1-PR10-3-M3










Note

Manifold rails with an uneven number of valves and for 11 ... 24 valves as well as further variants can be configured and ordered online using the MH1 modular product system.

Solenoid valves MH1, sub-base valve with E-box






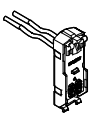
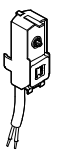
Technical data

Ordering data				Part No.	Type	PU ¹⁾
Blanking plate for manifold rail						
	Vacant valve positions must be sealed with a blanking plate			197257	MHAP1-BP-3	1
Cover cap for manual override						
	Function covered The cover cap protects the manual override against accidental actuation			540898	VMPA-HBV-B	10
	Function non-detenting The cover cap prevents latching of the manual override			540897	VMPA-HBT-B	10
	Function detenting The cover cap enables the manual override to be actuated and latched without tools			8002234	VAMC-L1-CD	10
Blanking plug						
	For M3 thread			30979	B-M3-S9	10
	For M7 thread			174309	B-M7	10
Silencer						
	M3 connecting thread			1231120	AMTE-M-LH-M3	20
	M7 connecting thread			161418	UC-M7	1
Push-in fittings						
	M3 connecting thread	With internal hex	For tubing O.D. 3 mm	153312	QSM-M3-3-I	10
			For tubing O.D. 4 mm	153314	QSM-M3-4-I	10
		With external hex	For tubing O.D. 3 mm	153301	QSM-M3-3	10
			For tubing O.D. 4 mm	153303	QSM-M3-4	10
	M7 connecting thread	With internal hex	For tubing O.D. 4 mm	153319	QSM-M7-4-I	10
			For tubing O.D. 6 mm	153321	QSM-M7-6-I	10

1) Packaging unit.

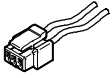
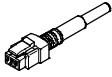
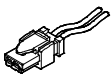
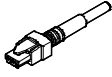



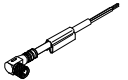
Solenoid valves MH1, sub-base valve with E-box

Technical data

Ordering data										
Design	Electrical connection	Contacts	Cable length [m]	Nominal operating voltage [V DC]	Holding current reduction	Part No.	Type			
E-box with protective circuit										
	Plug connection pattern H, angled	2-pin	-	12/24	-	566714	VAVE-L1-1VH2-LP			
				24	■	566716	VAVE-L1-1H2-LR			
	Plug connection pattern H, straight	2-pin	-	12/24	-	566715	VAVE-L1-1VH3-LP			
				24	■	566717	VAVE-L1-1H3-LR			
	Plug connection pattern S, angled	2-pin	-	12/24	-	566718	VAVE-L1-1VS2-LP			
				24	■	566720	VAVE-L1-1S2-LR			
	Plug connection pattern S, straight	2-pin	-	12/24	-	566719	VAVE-L1-1VS3-LP			
				24	■	566721	VAVE-L1-1S3-LR			
	Plug M8x1, angled	4-pin	-	12/24	-	573921	VAVE-L1-1VR1-LP			
				24	■	573920	VAVE-L1-1R8-LR			
		3-pin	-	12/24	-	573919	VAVE-L1-1VR8-LP			
				24	■	573922	VAVE-L1-1R1-LR			
	2x flying leads, open end	1-wire	0.5	12/24	-	566722	VAVE-L1-1VL1-LP			
				24	■	566726	VAVE-L1-1L1-LR			
			1	12/24	-	566723	VAVE-L1-1VL2-LP			
				24	■	566727	VAVE-L1-1L2-LR			
			2.5	12/24	-	566724	VAVE-L1-1VL3-LP			
				24	■	566728	VAVE-L1-1L3-LR			
			5	12/24	-	566725	VAVE-L1-1VL4-LP			
				24	■	566729	VAVE-L1-1L4-LR			
				Cable, open end	2-wire	0.5	12/24	-	573941	VAVE-L1-1VK6-LP
							24	■	573945	VAVE-L1-1K6-LR
1	12/24	-				573942	VAVE-L1-1VK7-LP			
	24	■				573946	VAVE-L1-1K7-LR			
2.5	12/24	-				573943	VAVE-L1-1VK8-LP			
	24	■				573947	VAVE-L1-1K8-LR			
5	12/24	-				573944	VAVE-L1-1VK9-LP			
	24	■				573948	VAVE-L1-1K9-LR			

Solenoid valves MH1, sub-base valve with E-box

Technical data

Ordering data					
	Electrical connection 1	Electrical connection 2	Length	Part No.	Type
Plug socket with cable for plug connection pattern H					Technical data → Internet: nebv
	Straight socket Connection pattern H 3-pin	2x flying leads Open end 1-wire	0.5 m	566654	NEBV-H1G2-KN-0.5-N-LE2
			1 m	566655	NEBV-H1G2-KN-1-N-LE2
			2.5 m	566656	NEBV-H1G2-KN-2.5-N-LE2
			5 m	566657	NEBV-H1G2-KN-5-N-LE2
	Straight socket Connection pattern H 3-pin	Cable Open end 2-wire	0.5 m	566658	NEBV-H1G2-P-0.5-N-LE2
			1 m	566659	NEBV-H1G2-P-1-N-LE2
			2.5 m	566660	NEBV-H1G2-P-2.5-N-LE2
			5 m	566661	NEBV-H1G2-P-5-N-LE2
Plug socket with cable for plug connection pattern S					Technical data → Internet: nebv
	Straight socket Connection pattern S 2-pin	2x flying leads Open end 1-wire	0.5 m	566662	NEBV-HSG2-KN-0.5-N-LE2
			1 m	566663	NEBV-HSG2-KN-1-N-LE2
			2.5 m	566664	NEBV-HSG2-KN-2.5-N-LE2
			5 m	566665	NEBV-HSG2-KN-5-N-LE2
	Straight socket Connection pattern S 2-pin	Cable Open end 2-wire	0.5 m	566666	NEBV-HSG2-P-0.5-N-LE2
			1 m	566667	NEBV-HSG2-P-1-N-LE2
			2.5 m	566668	NEBV-HSG2-P-2.5-N-LE2
			5 m	566669	NEBV-HSG2-P-5-N-LE2
Connecting cable for plug M8x1					
4-pin					Technical data → Internet: nebu
	Straight socket Plug coding type A, to EN 61076-2-104	Cable Open end 4-wire	2.5 m	541342	NEBU-M8G4-K-2.5-LE4
			5 m	541343	NEBU-M8G4-K-5-LE4
	Angled socket Plug coding type A, to EN 61076-2-104	Cable Open end 4-wire	2.5 m	541344	NEBU-M8W4-K-2.5-LE4
			5 m	541345	NEBU-M8W4-K-5-LE4
3-pin					Technical data → Internet: nebu
	Straight socket Plug coding type A, to EN 61076-2-104	Cable Open end 3-wire	2.5 m	541333	NEBU-M8G3-K-2.5-LE3
			5 m	541334	NEBU-M8G3-K-5-LE3
	Angled socket Plug coding type A, to EN 61076-2-104	Cable Open end 3-wire	2.5 m	541338	NEBU-M8W3-K-2.5-LE3
			5 m	541341	NEBU-M8W3-K-5-LE3

Solenoid valves MH1, sub-base valve with LED

Type codes

MH A 1 - M 1 L H - 3/2 - 0 - 0,6 - HC

Valve series

MH Miniature and fast-switching valves

Design

A Sub-base valve

Size

1 Flow rate 10 ... 14 l/min

Drive system

M Solenoid, switching

Operating voltage

1 24 V DC

Signal status display

L LED

Manual override

H Non-detenting/detenting

Valve function

3/2 3/2-way valve

Normal position

G Closed

O Open

Nominal width


0,6 0.65 mm

Electrical connection

HC Plug connection at rear
for plug socket NEBV-H1G2

TC Plug connection on top
for plug socket NEBV-H1G2

PI Plug connection underneath
for plug-in connection

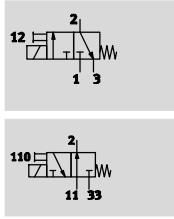
 Note
Further variants and accessories can be configured and ordered online using the modular product system.

Solenoid valves MH1, sub-base valve with LED


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Technical data

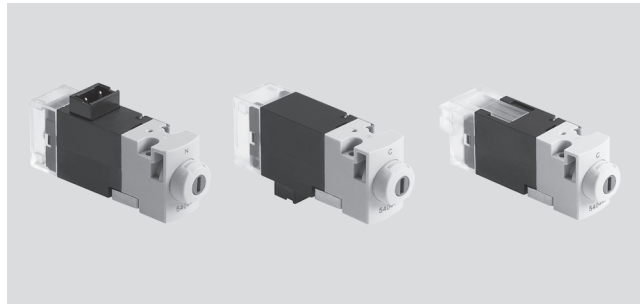
Function



-  - Voltage
24 V DC

-  - Pressure
0 ... +8 bar

-  - Temperature range
-5 ... +50 °C



General technical data		
Type	MHA1-M1LH...-3/2G-...	MHA1-M1LH...-3/2O-...
Valve function	3/2-way solenoid valve Normally closed Single solenoid	3/2-way solenoid valve Normally open Single solenoid
Design	Poppet valve with spring return	
Sealing principle	Soft	
Actuation type	Electric	
Reset method	Mechanical spring	
Type of control	Direct	
Direction of flow	Non-reversible	
Exhaust function	With flow control	
Manual override	Non-detenting/detenting	
Signal status display	LED	
Type of mounting	On sub-base via through-hole	
Mounting position	Any	
Nominal size	[mm] 0.65	0.7
Standard nominal flow rate	[l/min] 10	10
Grid dimension	[mm] 10	10
Pneumatic connection	1 Sub-base	-
	2 Sub-base	Sub-base
	3 Sub-base	-
	11 -	Sub-base
	33 -	Sub-base
Product weight	[g] 11	11

Operating and environmental conditions		
Type	MHA1-M1LH...-3/2G-...	MHA1-M1LH...-3/2O-...
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	[bar] 0 ... 8 ¹⁾	0 ... 6 ¹⁾
Ambient temperature	[°C] -5 ... +40	
Temperature of medium	[°C] -5 ... +40	
Storage temperature	[°C] -20 ... +60	
Corrosion resistance class CRC ²⁾	2	
Certification	c UL us Recognized (OL) c CSA us Recognized (OL)	

1) Vacuum operation possible with special connection method → 4

2) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Solenoid valves MH1, sub-base valve with LED

Technical data

Safety data	
Note on forced checking procedure	Switching frequency min. 1/week
Resistance to shocks	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27
Vibration resistance	Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6

Electrical data		
Operating voltage	[V DC]	24
Permissible voltage fluctuations	[%]	±10
Connection type		Plug connection
Power consumption	[W]	1.1
Duty cycle	[%]	100
Degree of protection to EN 60529		IP40

Switching times and frequencies			
Switching time	On	[ms]	4
	Off	[ms]	4
Maximum switching frequency		[Hz]	20

Materials	
Housing	Reinforced PA, reinforced PPS
Sub-base	Aluminium
Seals	FPM, HNBR, NBR
Note on materials	RoHS-compliant Free of copper and PTFE

Dimensions Download CAD data → www.festo.com

Plug connection on top

1 Plug socket NEBV-H1G2 2 Manual override
3 Coding pin

Plug connection at rear

1 Plug socket NEBV-H1G2

Plug connection underneath

Type	B1	H1	H2	H4	L1	L2	L3
MHA1	9.8	14.7	3.6	27.7	38.7	23.7	51.7

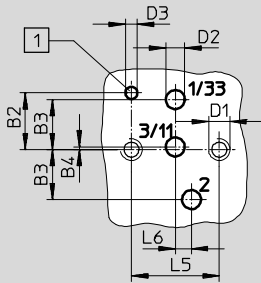
Solenoid valves MH1, sub-base valve with LED

Technical data

FESTO

Dimensions – Hole pattern on sub-bases

Download CAD data → www.festo.com



1 Hole for coding pin

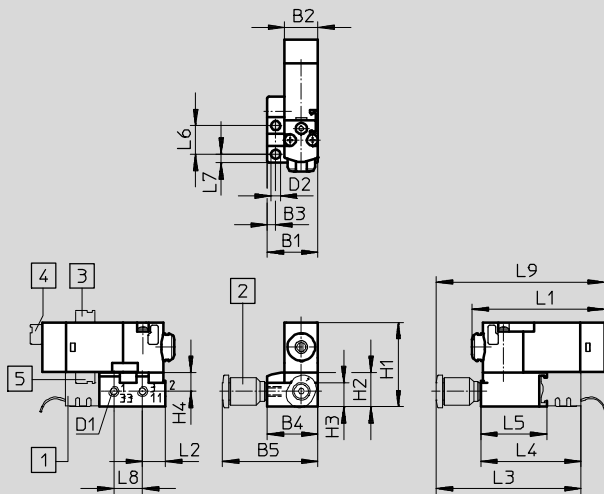
- If used as a 2/2-way valve, normally closed, port 3/11 are not used.
- If used as a 2/2-way valve, normally open, port 1/33 are not used.

Type	B2	B3	B4	D1	D2	D3	L5	L6
MHA1	4.2	3.7	0.2	M1.6	1.4	0.9	6.5	1.2

Dimensions – Assembly on individual sub-base

Download CAD data → www.festo.com

3/2-way valve



- 1 Plug base MHAP-PI
- 2 Fitting
- 3 Plug connection on top
- 4 Plug connection at rear
- 5 Plug connection underneath

Type	B1	B2	B3	B4	B5	D1	D2	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7	L8	L9
3/2-way valve	14.9	9.8	2.5	14.9	28	M3	2.7	24.7	10	7	5.5	38.7	6.7	43.1	29.1	19.3	8.4	2.5	8.4	50.1

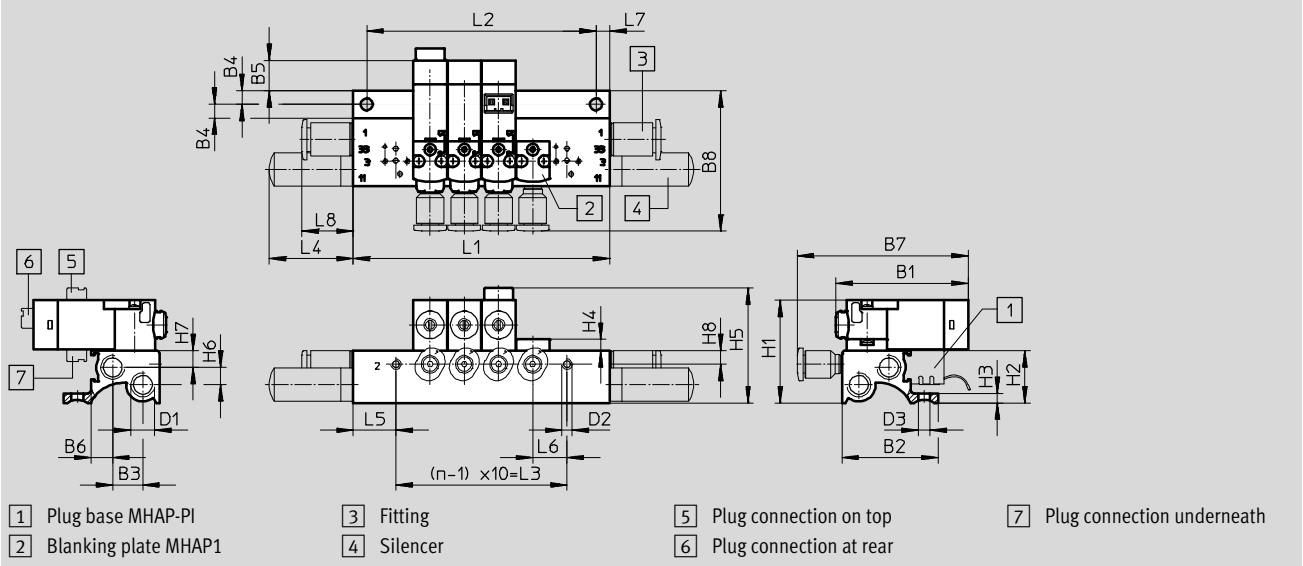
Solenoid valves MH1, sub-base valve with LED

Technical data

Dimensions – Manifold assembly

Download CAD data → www.festo.com

3/2-way valve



Type	B1	B2	B3	B4	B5	B6	B7	B8	D1	D2
3/2-way valve	38.7	28	8.8	4	8.9	6.3	50	42	M7	M3

Type	H1	H2	H3	H4	H5	H6	H7	H8	L4	L5	L6	L7	L8
3/2-way valve	30	15.3	2.8	3.3	33.6	5.1	4.9	4	23.1	12.5	10	4	13.5

Valve positions n	L1 ±0.15	L2 ±0.1	L3
2	35	27	10
3	45	37	20
4	55	47	30
5	65	57	40
6	75	67	50
7	85	77	60
8	95	87	70

Valve positions n	L1 ±0.15	L2 ±0.1	L3
9	105	97	80
10	115	107	90
11	125	117	100
12	135	127	110
13	145	137	120
14	155	147	130
15	165	157	140

Valve positions n	L1 ±0.15	L2 ±0.1	L3
16	175	167	150
17	185	177	160
18	195	187	170
19	205	197	180
20	215	207	190
21	225	217	200
22	235	227	210

Solenoid valves MH1, sub-base valve with LED

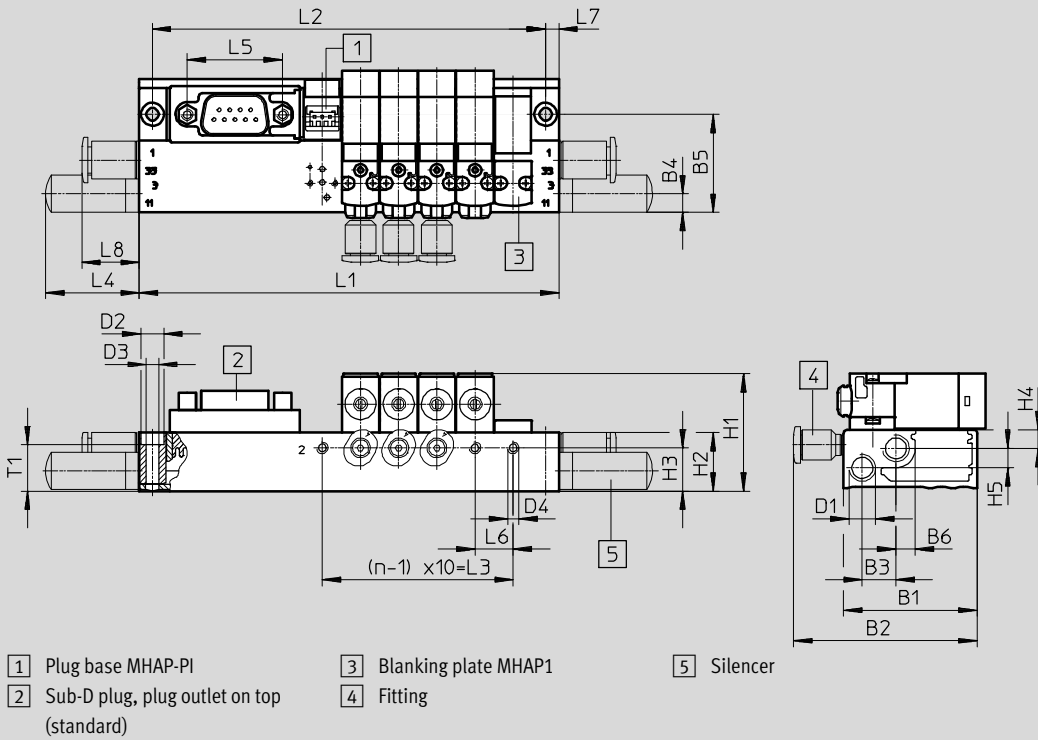
Technical data

FESTO

Dimensions – Manifold assembly with electrical multi-pin plug

Download CAD data → www.festo.com

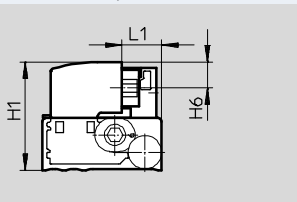
3/2-way valve



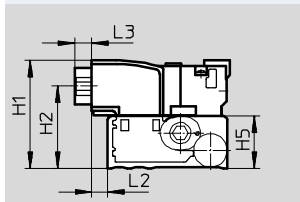
Type	B1	B2	B3	B4	B5	B6	D1	D2	D3	D4	H1	H2	H3	H4	H5	L4	L5	L6	L7	L8	T1
MHA1	35	48.1	8.8	5.3	25.7	5.2	M7	6	3.3	M3	30.8	15.3	11.3	4.9	5.1	24.5	25	10	3.5	15	12.1

Valve positions	L1	L2	L3	Valve positions	L1	L2	L3	Valve positions	L1	L2	L3
n	±0.15	±0.1		n	±0.15	±0.1		n	±0.15	±0.1	
2	70	63	10	10	172	165	90	18	252	245	170
4	90	83	30	12	192	185	110	20	272	265	190
6	110	103	50	14	212	205	130	22	292	285	210
8	130	123	70	16	232	225	150				

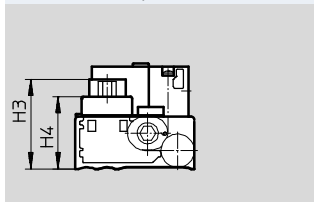
Plug outlet to pneumatic side



Plug outlet to electrical side



Plug outlet on top (standard)



Type	H1	H2	H3	H4	H5	H6	L1	L2	L3
MHA1	31.8	24.2	26.2	21.2	15.3	7.6	11.7	4.8	5

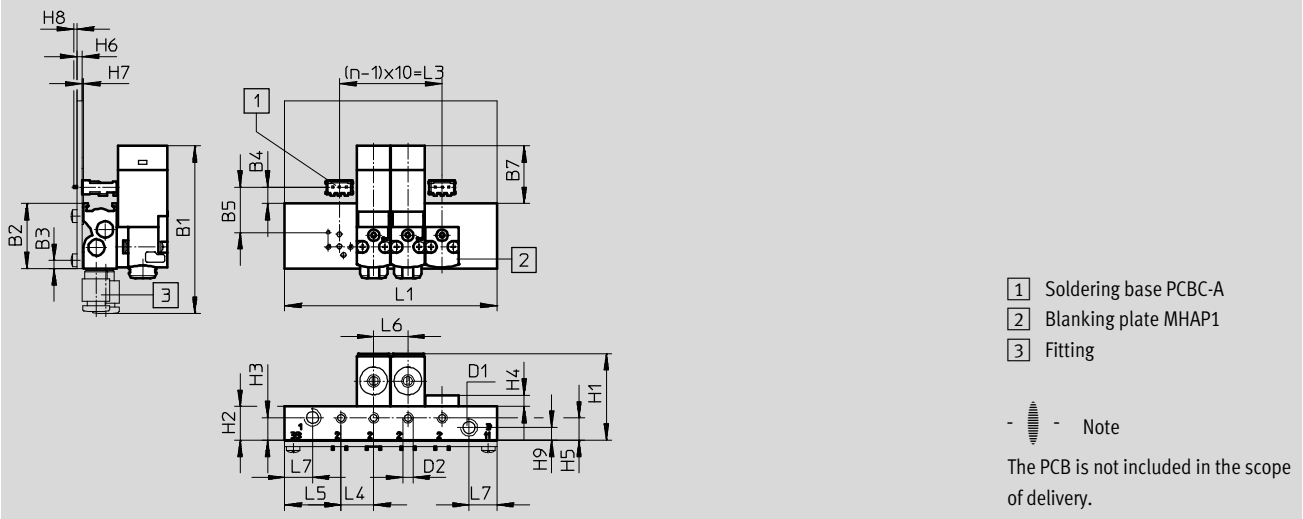
Solenoid valves MH1, sub-base valve with LED

Technical data

Dimensions – Manifold assembly on PCB

Download CAD data → www.festo.com

3/2-way valve, without pneumatic multiple connector plate



Type	B1	B2	B3	B4	B5	B7	D1	D2
Without pneumatic multiple connector plate	49	19	2.4	4.8	13.2	16.9	M5	M3

Type	H1	H2	H3	H4	H5	H6	H7	H8	H9	L4	L5	L6	L7
Without pneumatic multiple connector plate	25.3	9.8	6.6	3.3	6.5	1.5	0.4	1	3.7	9.5	16.5	10	8.2

Valve positions n	L1 ±0.15	L3
2	42	10
4	62	30
6	82	50
8	102	70
10	122	90

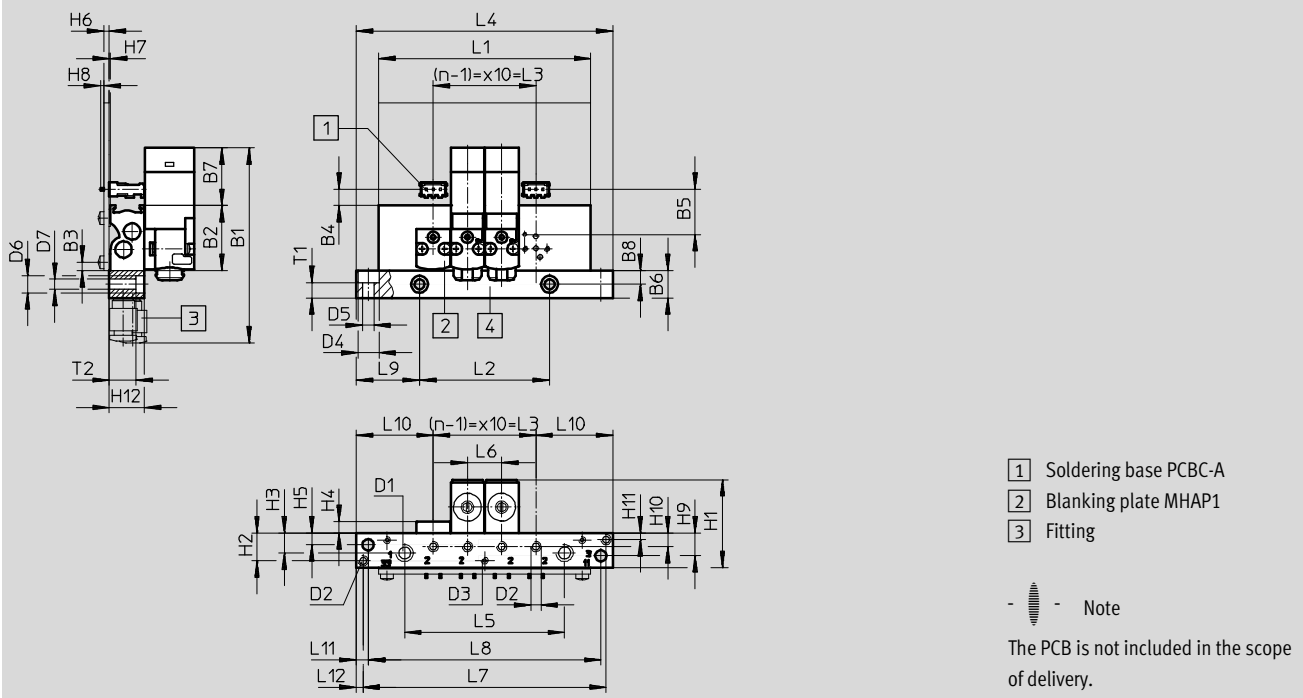
Solenoid valves MH1, sub-base valve with LED

Technical data

Dimensions – Manifold assembly on PCB

Download CAD data → www.festo.com

3/2-way valve, with pneumatic multiple connector plate



Type	B1	B2	B3	B4	B5	B6	B7	B8	D1	D2	D3	D4	D5	D6	D7
With pneumatic multiple connector plate	56.5	19	2.4	4.8	13.2	8	16.9	4	M5	M3	M2	6.1	3.3	5	2.9

Type	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	L6	L9	L10	L11	L12	T1	T2
With pneumatic multiple connector plate	25.7	8.2	5.9	3.3	3.5	1.5	0.4	1	6.7	4	2	10.2	10	18.5	22.5	3.5	2	4.5	7.8

Valve positions n	L1 ±0.15	L2 ±0.1	L3	L4 ±0.2	L5 ±0.15	L7 ±0.1	L8
4	62	38	30	75	46.7	71	68
6	82	58	50	95	66.7	91	88
8	102	78	70	115	86.7	111	108
10	122	98	90	135	106.7	131	128

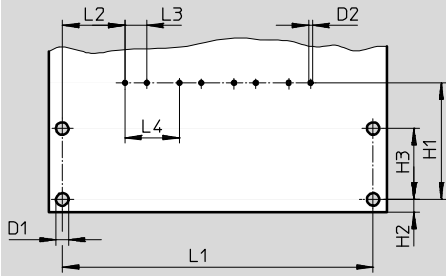
Solenoid valves MH1, sub-base valve with LED

Technical data

Dimensions – Manifold assembly on PCB

Download CAD data → www.festo.com

Hole pattern on PCB



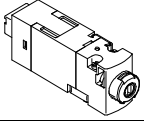
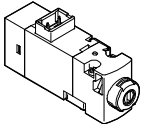
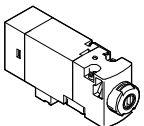
Note
The PCB is not included in the scope of delivery.


Type	D1	D2	H1	H2	H3	L2	L3	L4
PCB	2.3	0.7	21.4	2.4	13	11.5	4	10

Valve positions n	L1
	±0.1
2	37
4	57
6	77
8	97
10	117

Solenoid valves MH1, sub-base valve with LED



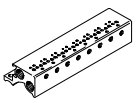
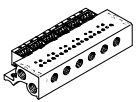
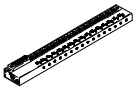
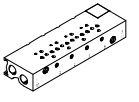
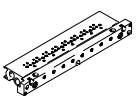
Technical data

Ordering data						
		Valve function	Normal position		Part No.	Type
Solenoid valve						
	Plug connection at rear	3/2-way solenoid valve	Closed	24 V DC	540443	MHA1-M1LH-3/2G-0,6-HC
			Open	24 V DC	540440	MHA1-M1LH-3/2O-0,6-HC
	Plug connection on top	3/2-way solenoid valve	Closed	24 V DC	540444	MHA1-M1LH-3/2G-0,6-TC
			Open	24 V DC	540441	MHA1-M1LH-3/2O-0,6-TC
	Plug connection underneath	3/2-way solenoid valve	Closed	24 V DC	540445	MHA1-M1LH-3/2G-0,6-PI
			Open	24 V DC	540442	MHA1-M1LH-3/2O-0,6-PI

 Note
 Valves of the type 3/2G and 3/2O must not be mixed on a manifold rail.

Solenoid valves MH1, sub-base valve with LED

Technical data

Ordering data				Part No.	Type
Individual sub-base					
	For valves with plug connection at rear or on top	For 3/2-way solenoid valve	1 valve position	197183	MHA1-AS-3-M3
	For valves with plug connection underneath	For 3/2-way solenoid valve	1 valve position	197185	MHA1-AS-3-M3-PI
Manifold rail, for valves with plug connection at rear or on top					
	Without plug bases	For 3/2-way solenoid valve	2 valves	197202	MHA1-PR2-3-M3
			4 valves	197203	MHA1-PR4-3-M3
			6 valves	197204	MHA1-PR6-3-M3
			8 valves	197205	MHA1-PR8-3-M3
			10 valves	197206	MHA1-PR10-3-M3
Manifold rail, for valves with plug connection underneath					
	With plug bases	For 3/2-way solenoid valve	2 valves	197222	MHA1-PR2-3-M3-PI
			4 valves	197223	MHA1-PR4-3-M3-PI
			6 valves	197224	MHA1-PR6-3-M3-PI
			8 valves	197225	MHA1-PR8-3-M3-PI
			10 valves	197226	MHA1-PR10-3-M3-PI
	With plug bases and electrical multi-pin plug	For 3/2-way solenoid valve	4 valves	197238	MHA1-PR4-3-M3-PI-D9
			6 valves	197239	MHA1-PR6-3-M3-PI-D9
			8 valves	197240	MHA1-PR8-3-M3-PI-D9
			10 valves	197241	MHA1-PR10-3-M3-PI-D25
	Without plug bases for PCB mounting	For 3/2-way solenoid valve	2 valves	197247	MHA1-PR2-3-M3-PI-PCB
			4 valves	197248	MHA1-PR4-3-M3-PI-PCB
			6 valves	197249	MHA1-PR6-3-M3-PI-PCB
			8 valves	197250	MHA1-PR8-3-M3-PI-PCB
			10 valves	197251	MHA1-PR10-3-M3-PI-PCB
	Without plug bases for PCB mounting, with pneumatic multiple connector plate	For 3/2-way solenoid valve	4 valves	197253	MHA1-PR4-3-PI-PCBM
			6 valves	197254	MHA1-PR6-3-PI-PCBM
			8 valves	197255	MHA1-PR8-3-PI-PCBM
			10 valves	197256	MHA1-PR10-3-PI-PCBM

 Note

Manifold rails with an uneven number of valves and for 11 ... 24 valves as well as further variants can be

configured and ordered online using the MH1 modular product system.









 Note

Valves of the type 3/2G and 3/2O must not be mixed on a manifold rail.

Solenoid valves MH1, sub-base valve with LED

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


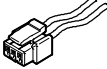
Technical data

Ordering data				Part No.	Type	PU ¹⁾		
Blanking plate for manifold rail								
	For manifold rail for valves with plug connection at rear or on top			197257	MHAP1-BP-3	1		
	For manifold rail with plug bases with valves with plug connection underneath			197258	MHAP1-BP-3-PI	1		
Cover cap for manual override								
	Function covered The cover cap protects the manual override against accidental actuation			540898	VMPA-HBV-B	10		
	Function non-detenting The cover cap prevents latching of the manual override			540897	VMPA-HBT-B	10		
	Function detenting The cover cap enables the manual override to be actuated and latched without tools			8002234	VAMC-L1-CD	10		
Blanking plug								
	For M3 thread			30979	B-M3-S9	10		
	For M5 thread			3843	B-M5	10		
	For M7 thread			174309	B-M7	10		
Silencer								
	M3 connecting thread			1231120	AMTE-M-LH-M3	20		
	M5 connecting thread	Plastic design		165003	UC-M5	1		
		Metal design		1205858	AMTE-M-LH-M5	20		
	M7 connecting thread			161418	UC-M7	1		
Push-in fittings								
	M3 connecting thread	With internal hex	For tubing O.D. 3 mm	153312	QSM-M3-3-I	10		
			For tubing O.D. 4 mm	153314	QSM-M3-4-I	10		
			For tubing O.D. 3 mm	153301	QSM-M3-3	10		
		With external hex	For tubing O.D. 4 mm	153303	QSM-M3-4	10		
			M5 connecting thread	With internal hex	For tubing O.D. 3 mm	153313	QSM-M5-3-I	10
					For tubing O.D. 4 mm	153315	QSM-M5-4-I	10
	For tubing O.D. 6 mm	153317			QSM-M5-6-I	10		
	With external hex	For tubing O.D. 3 mm	153302	QSM-M5-3	10			
		For tubing O.D. 4 mm	153304	QSM-M5-4	10			
		For tubing O.D. 6 mm	153306	QSM-M5-6	10			
	M7 connecting thread	With internal hex	For tubing O.D. 4 mm	153319	QSM-M7-4-I	10		
			For tubing O.D. 6 mm	153321	QSM-M7-6-I	10		

1) Packaging unit.

Solenoid valves MH1, sub-base valve with LED

Technical data

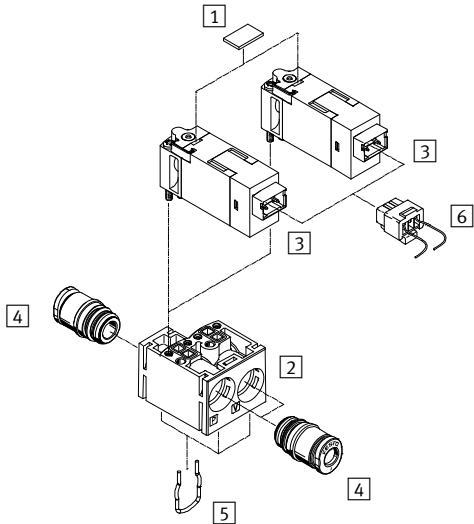
Ordering data				Part No.	Type	PU ¹⁾
Inscription label						
	For identifying the valve positions			197259	MH-BZ-80X	80
Soldering base						
	For plug-in connection, 3-pin			197261	PCBC-A-10	10
				197262	PCBC-A-100	100
Electrical plug-in base						
	For manifold rail, for valves with plug connection underneath	2x flying leads Open end 1-wire	0.5 m	197260	MHAP-PI	1
			1 m	532182	MHAP-PI-1	1
Plug socket with cable						
	Straight socket Connection pattern H 3-pin	2x flying leads Open end 1-wire	0.5 m	566654	NEBV-H1G2-KN-0.5-N-LE2	1
			1 m	566655	NEBV-H1G2-KN-1-N-LE2	1
			2.5 m	566656	NEBV-H1G2-KN-2.5-N-LE2	1
			5 m	566657	NEBV-H1G2-KN-5-N-LE2	1

1) Packaging unit.

Solenoid valves MH1, 2x2/2-way sub-base valve with LED

Peripherals overview

2x2/2-way sub-base valve with LED




Designation	Brief description	→ Page/Internet
1 Inscription label	For identifying the valve positions	62
2 Sub-base	Included in the scope of delivery	-
3 Solenoid valve	2/2-way valve, normally closed	62
4 Push-in cartridge	Included in the scope of delivery	62
5 Clip	Included in the scope of delivery	-
6 Plug socket with cable	Straight socket, connection pattern H, 3-pin	62

Solenoid valves MH1, 2x2/2-way sub-base valve with LED

Type codes

MH	A	1	-	2X2/2	-	G	-	1,5	-	333
Valve series										
MH	Miniature and fast-switching valves									
Design										
A	Sub-base valve									
Size										
1	Flow rate 10 ... 14 l/min									
Valve function										
2X2/2	2x2/2-way valve on sub-base									
Normal position										
G	Closed									
Nominal width										
1,5	1.5 mm									
Electrical connection										
-	With connection for 10 mm cartridge									
333	With push-in connector for tubing O.D. 3 mm									
444	With push-in connector for tubing O.D. 4 mm									
443	With push-in connector for tubing O.D. 4 mm, port 2 with push-in connector for tubing O.D. 3 mm									

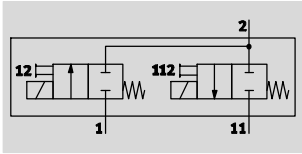
 Note
 Further variants and accessories can be configured and ordered online using the modular product system.




Solenoid valves MH1, 2x2/2-way sub-base valve with LED

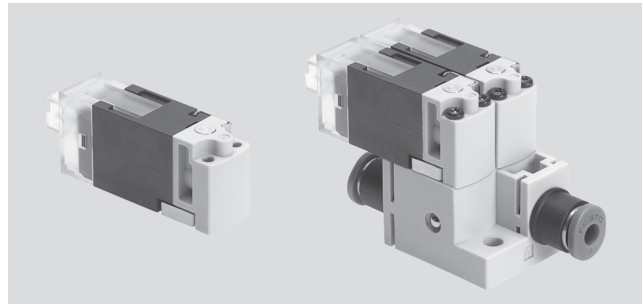
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Technical data

Function



-  - Voltage
24 V DC
-  - Pressure
-0.95 ... +1.5 bar
-  - Temperature range
-5 ... +50 °C



General technical data			2/2-way, single solenoid	2x2/2-way, single solenoid
Valve function				
Design		Poppet valve with spring return		
Sealing principle		Soft		
Actuation type		Electric		
Reset method		Mechanical spring		
Type of control		Direct		
Direction of flow		Non-reversible		
Suitability for vacuum		Yes		
Exhaust function		No flow control		
Manual override		Non-detenting		
Signal status display		LED		
Type of mounting		On sub-base via through-hole	Via through-hole	
Mounting position		Any		
Nominal size	[mm]	1.5		
Standard nominal flow rate	[l/min]	30		
Width	[mm]	10	20	
Grid dimension	[mm]	10	20	
Pneumatic connection	1	-	QS3, QS4	
	11	-	QS3, QS4	
	2	-	QS3, QS4	

Operating and environmental conditions			
Operating medium			Compressed air to ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium			Lubricated operation possible (in which case lubricated operation will always be required)
Operating pressure	Port 1	[bar]	0 ... 1.5
	Port 11	[bar]	- 0.95 ... 0
Ambient temperature		[°C]	-5 ... +50
Temperature of medium		[°C]	-5 ... +50
Storage temperature		[°C]	-20 ... +60
Corrosion resistance class CRC ¹⁾			2
CE marking (see declaration of conformity)			In accordance with EU EMC Directive ²⁾

- 1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
- 2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp → User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Solenoid valves MH1, 2x2/2-way sub-base valve with LED

Technical data

Safety data	
Resistance to shocks	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27
Vibration resistance	Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6

Electrical data	
Operating voltage	[V DC] 24 ±10%
Connection type	Plug connection
Power consumption	[W] 3, following current reduction 0.7
Duty cycle	[%] 100
Max. cable length	[m] 30
Degree of protection to EN 60529	
With plug socket NEBV-H1G2	IP40

Switching times and frequencies			
Switching time	On	[ms]	6
	Off	[ms]	6
Maximum switching frequency		[Hz]	10

Materials	
Housing	Reinforced PA, reinforced PPS
Screws	Steel
Seals	FPM, HNBR, NBR
Note on materials	RoHS-compliant Free of copper and PTFE

Dimensions

2/2-way valve

1 Plug socket NEBV-H1G2 3 Coding pin

Download CAD data → www.festo.com


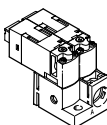
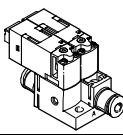
2x2/2-way valve



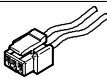
1 Push-in connector 2
2 Push-in connector 1
3 Push-in connector 11

Type	B1	B2	B3	B4	B5	D1	D2	H1	H2	H3	H4	H5	H6	H7	L1	L2	L3	L4	L5	T1
2/2-way valve	9.8	-	-	-	-	-	-	14.7	3.6	-	-	-	-	-	31.8	23.7	44.8	-	-	-
2x2/2-way valve	20	14.9	5	15	13	3.4	2	30.7	26	5.9	8	16	9.7	7.5	41.8	9.2	23.8	20.6	16.3	1

Solenoid valves MH1, 2x2/2-way sub-base valve with LED

Technical data

Ordering data				Part No.	Type
	Weight [g]	Pneumatic connection			
2/2-way solenoid valve					
	Plug connection at rear	10	Via sub-base	557864	MHA1-M1LCH-2/2G-1.5-HC
2x2/2-way solenoid valve on sub-base					
	Plug connection at rear	26.3	Connection for 10 mm cartridge	563365	MHA1-2X2/2G-1,5
	Plug connection at rear	30.6	Push-in connector for tubing O.D. 3 mm	562051	MHA1-2X2/2G-1,5-3-3-3
		30.6	Push-in connector for tubing O.D. 4 mm	566175	MHA1-2X2/2G-1,5-4-4-4
		30.6	Push-in connector for tubing O.D. 4 mm, port 2 with push-in connector for tubing O.D. 3 mm	560372	MHA1-2X2/2G-1,5-4-4-3

Ordering data				Part No.	Type	PU ¹⁾
Push-in fittings						
	10 mm cartridge	Plastic	For tubing O.D. 3 mm	132621	QSPKG10-3	10
			For tubing O.D. 4 mm	132622	QSPKG10-4	10
			For tubing O.D. 6 mm	132623	QSPKG10-6	10
Inscription label						
	For identifying the valve positions			197259	MH-BZ-80X	80
Plug socket with cable						
	Straight socket Connection pattern H 3-pin	2x flying leads Open end 1-wire	0.5 m	566654	NEBV-H1G2-KN-0.5-N-LE2	1
			1 m	566655	NEBV-H1G2-KN-1-N-LE2	1
			2.5 m	566656	NEBV-H1G2-KN-2.5-N-LE2	1
			5 m	566657	NEBV-H1G2-KN-5-N-LE2	1

1) Packaging unit.

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