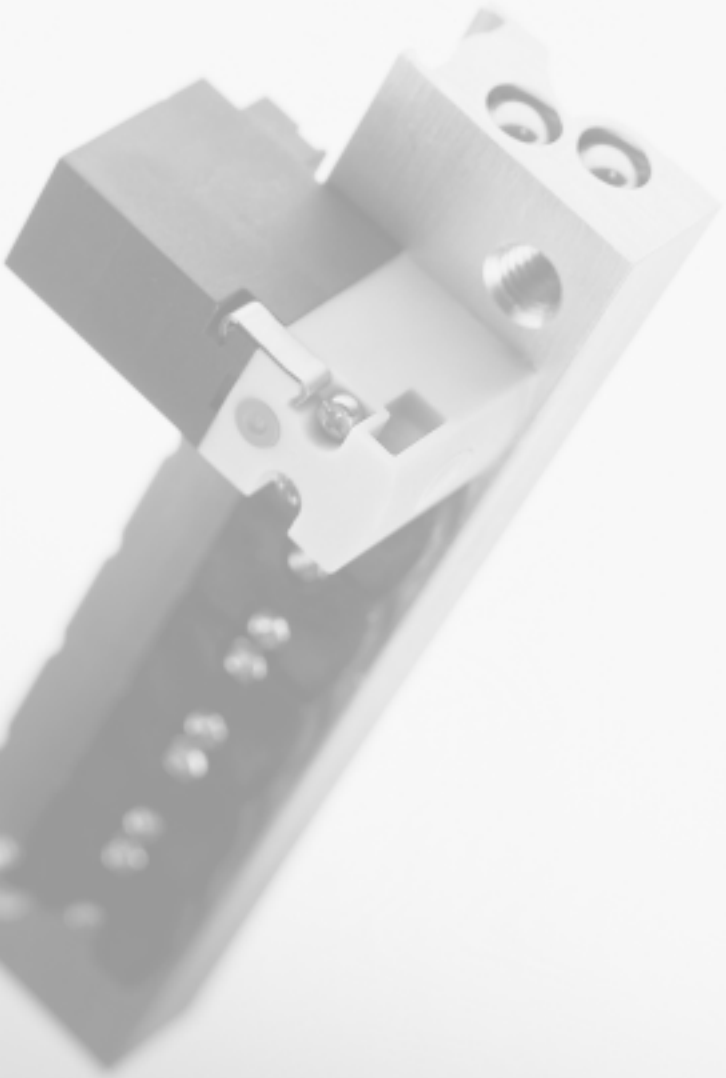
Solenoid valves MH1, miniature

FESTO

Complete product range for a variety of applications



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 and14 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.

Operation with different pressures

Vacuum 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.

This is achieved by connecting the vacuum to port 3 or 2 (33 or 11).

Reverse operation

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

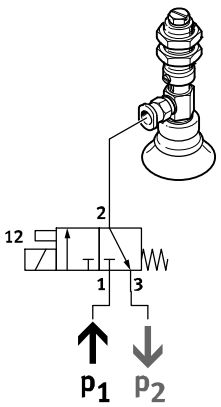
3/2-way valve, MH...-3/2O-...

- 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

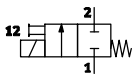
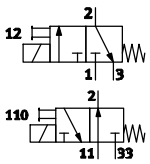
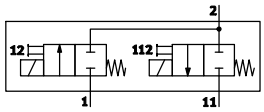
Example



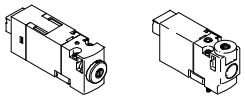
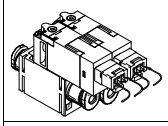
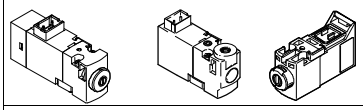
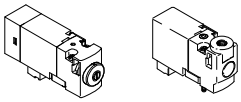
With the 3/2-way valve, normally closed, vacuum operation is established by connecting the vacuum (P2) to port 3 and connecting e.g. a silencer for venting (P1) to port 1.
This changes the normal position from "closed" to "open".

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

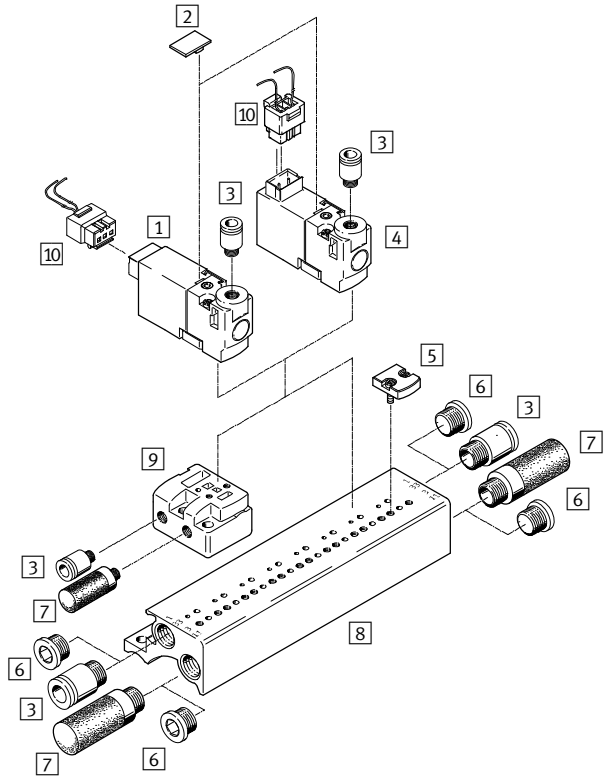
1) Can be used as a 2/2-way valve by sealing port 1 or 3

Mounting options					
Design		Semi in-line valve	Sub-base valve		
Electrical connection		Without LED	Without LED	With E-box	With LED
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

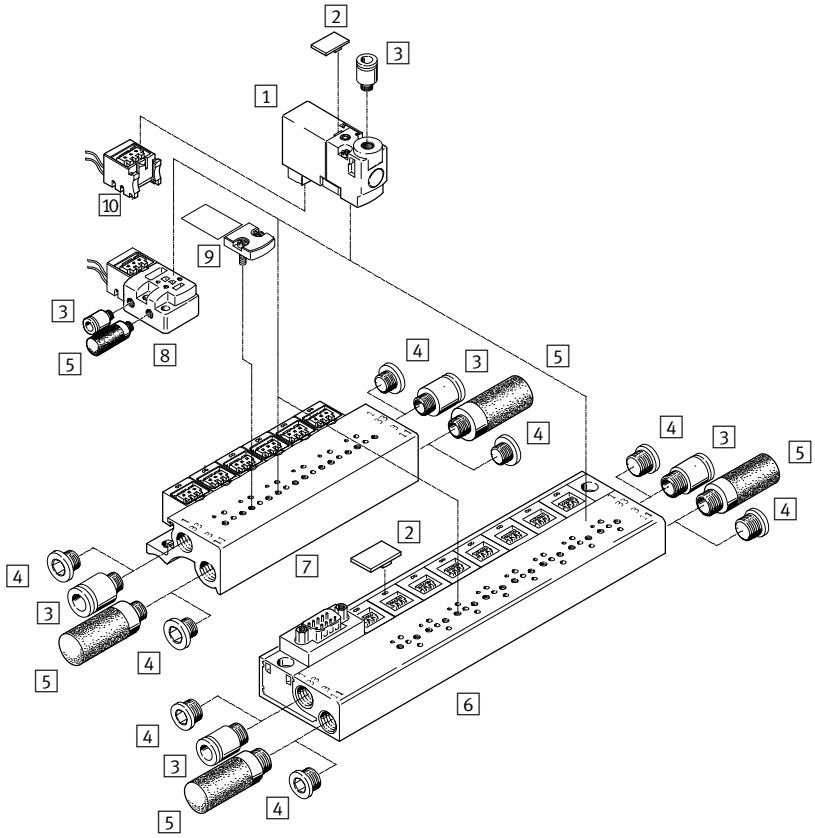


Designation		Brief description	➔ Page/Internet
1	Solenoid valve	Valve with plug connection at rear	16
2	Inscription label	For identifying the valve positions	18
3	Push-in fitting	For connecting compressed air tubing with standard O.D.	18
4	Solenoid valve	Valve with plug connection on top	16
5	Blanking 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

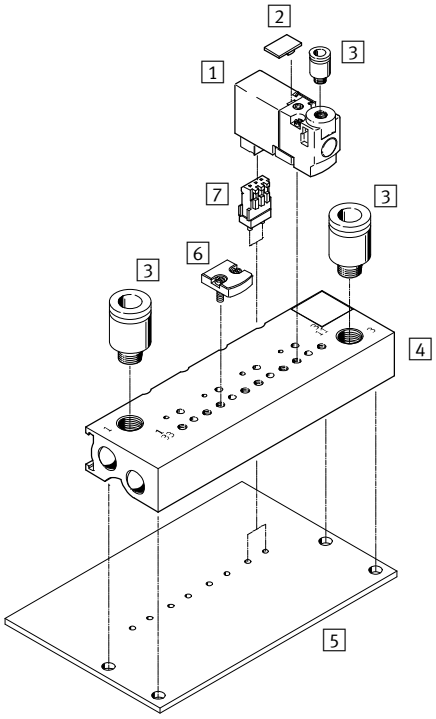


Designation	Brief description	➔ Page/Internet
1 Solenoid valve	Valve with plug connection underneath	16
2 Inscription label	For identifying the valve positions	18
3 Push-in fitting	For connecting compressed air tubing with standard O.D.	18
4 Blanking plug	For sealing ports that are not required	18
5 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	O	–	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
O	Open

Pneumatic connection	
M3	M3 thread

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

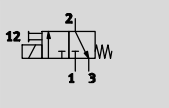
Note

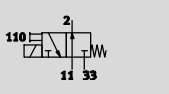
Further variants and accessories can be configured and ordered online using the modular product system.

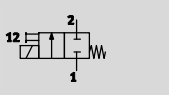
Solenoid valves MH1, semi in-line valve

Technical data

Function



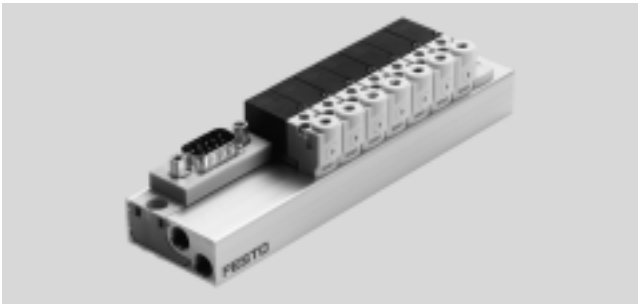




Voltage
5 V DC
12 V DC
24 V DC

Pressure
–0.9 ... +8 bar

Temperature range
–5 ... +50 °C



General technical data				
Type		MHP1-...-2/2G-...	MHP1-...-3/2G-...	MHP1-...-3/2O-...
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]	0.9	0.65	0.7
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-...-3/2O-...
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]	–0.9 ... +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

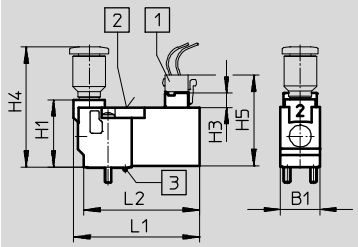
Electrical data		
Operating voltage	[V DC]	5
	[V DC]	12
	[V DC]	24
Permissible voltage fluctuations	[%]	±10
Connection type		Plug connection
Power consumption	[W]	1
Duty cycle	[%]	100
Degree of protection to EN 60529		IP40

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

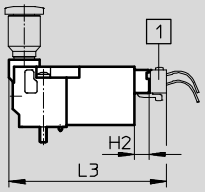


1 Plug socket KMH/NEBV-H1G2

2 Manual override

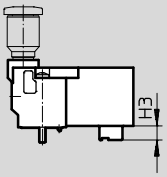
3 Coding pin

Plug connection at rear

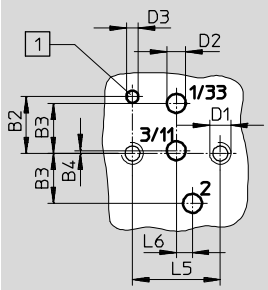


1 Plug socket KMH/NEBV-H1G2

Plug connection underneath



Hole pattern on sub-bases



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.

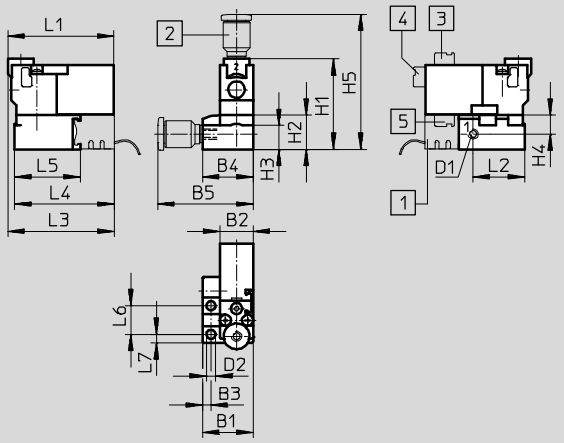
Type	B1	B2	B3	B4	D1	D2	D3	H1	H2	H3	H4	H5	L1	L2	L3	L5	L6
MHP1	9.8	4.2	3.7	0.2	M1.6	1.4	0.9	16.5	3.6	3.6	29.6	22.6	31	28.5	38.9	6.5	1.2

Solenoid valves MH1, semi in-line valve

Technical data

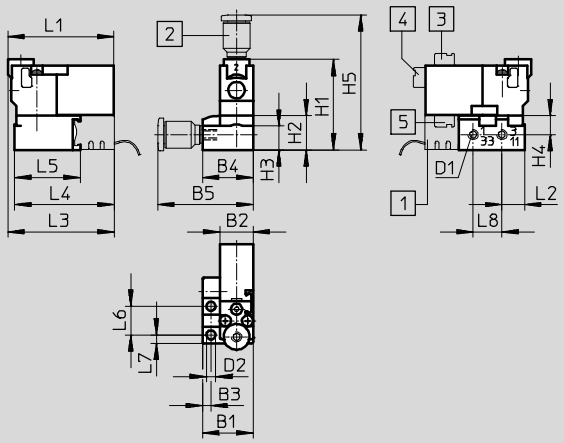
Dimensions – Assembly on individual sub-base Download CAD data ➔ **www.festo.com**

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

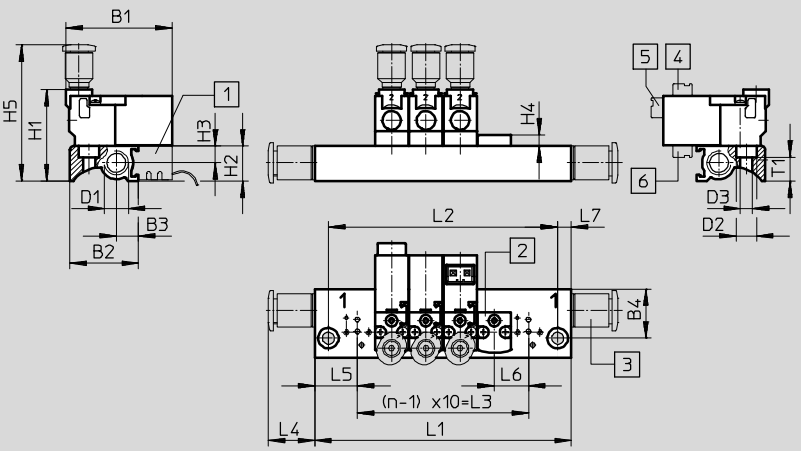


1 Plug base MHAP-PI
2 Fitting
3 Plug connection on top
4 Plug connection at rear
5 Plug connection underneath

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

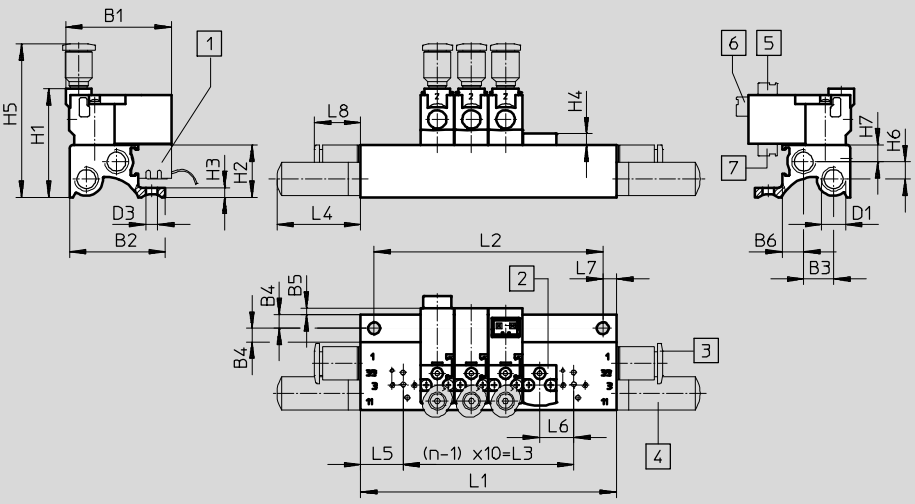
Dimensions – Manifold assembly Download CAD data ➔ **www.festo.com**

2/2-way valve



1 Plug base MHAP-PI
2 Blanking plate MHAP1
3 Fitting
4 Plug connection on top
5 Plug connection at rear
6 Plug connection underneath

3/2-way valve



1 Plug base MHAP-PI
2 Blanking plate MHAP1
3 Fitting
4 Silencer
5 Plug connection on top
6 Plug connection at rear
7 Plug connection underneath

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 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

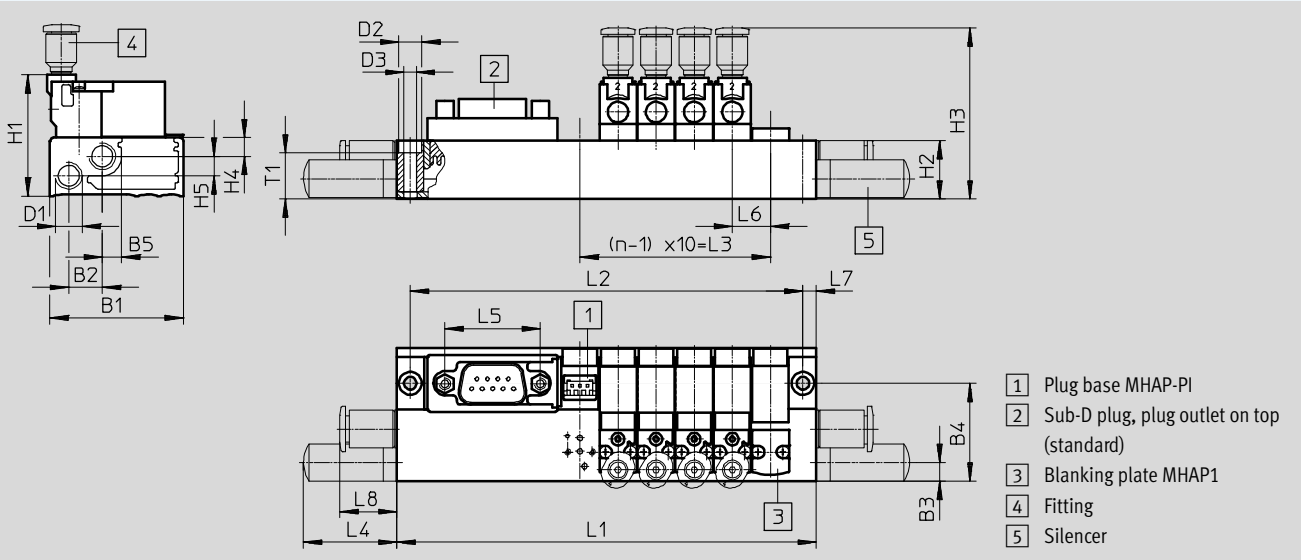
Valve positions n	L1 ±0.15	L2 ±0.1	L3
16	175	167	150
17	185	177	160
18	195	187	170
19	205	197	180
20	215	207	190
21	225	217	200
22	235	227	210

Solenoid valves MH1, semi in-line valve

Technical data

Dimensions – Manifold assembly with electrical multi-pin plug Download CAD data ➔ **www.festo.com**

3/2-way valve



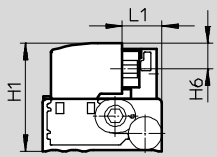
Type	B1	B2	B3	B4	B5	D1	D2	D3	H1	H2	H3	H4	H5	L4	L5	L6	L7	L8	T1
MHP1	35	8.8	5.3	25.7	5.2	M7	6	3.3	31.8	15.3	44.9	4.9	5.1	54.5	25	10	3.5	15	12.1

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

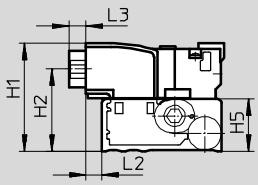
Valve positions n	L1 ±0.15	L2 ±0.1	L3
10	172	165	90
12	192	185	110
14	212	205	130
16	232	225	150

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

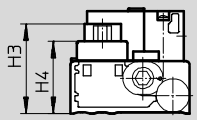
Plug outlet to pneumatic side



Plug outlet to electrical side



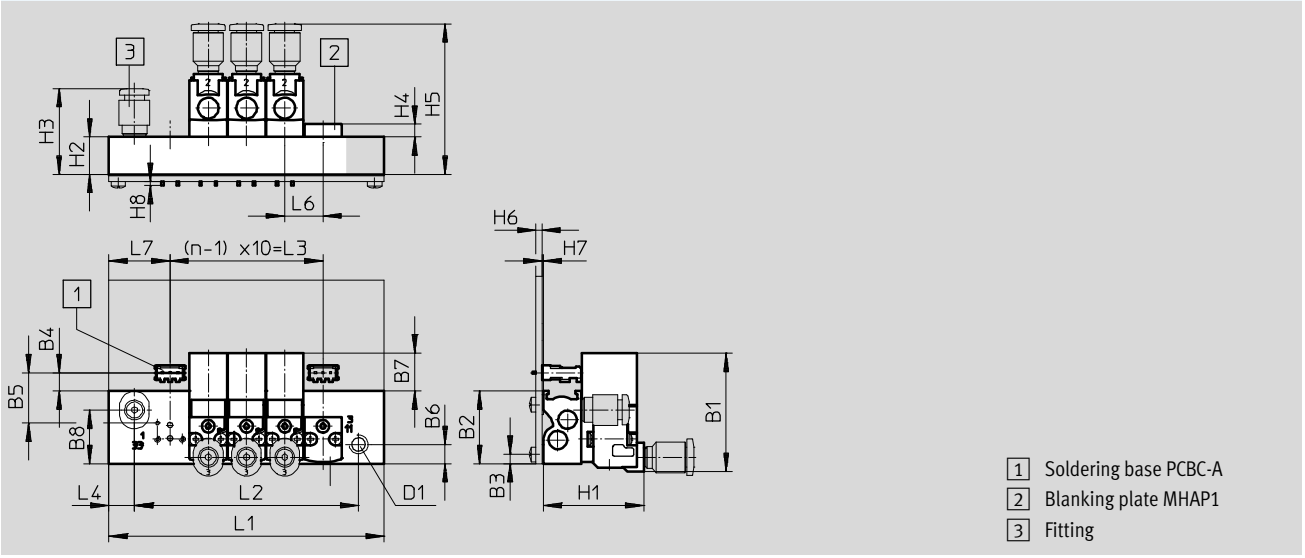
Plug outlet on top (standard)



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

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

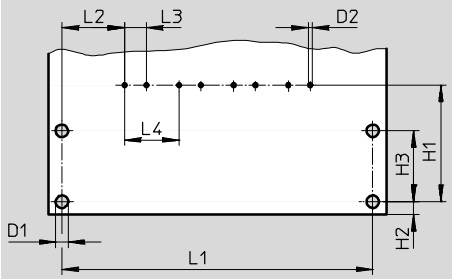
3/2-way valve



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 n	L1 ±0.15	L2 ±0.1	L3
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



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

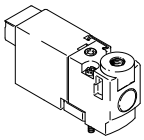
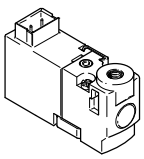
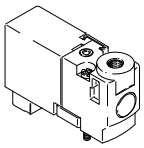
Valve positions n	L1 ±0.1
2	37
4	57
6	77
8	97
10	117

Solenoid valves MH1, semi in-line valve

Technical data

FESTO

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**

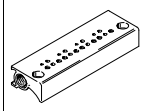
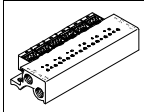
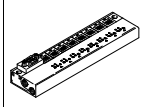
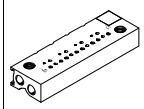
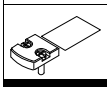
Note

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

FESTO

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

Technical data

FESTO

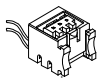
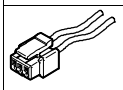
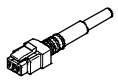
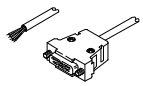
Ordering data						
				Part No.	Type	PU[1]
Blanking plug						
	For M3 thread			**30979**	**B-M3-S9**	**10**
	For M7 thread			**174309**	**B-M7**	**10**
Silencer						
	M3 connecting thread			**1231120**	**AMTE-M-LH-M3**	**20**
	M7 connecting thread			**161418**	**UC-M7**	**1**
Push-in fitting						
	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

FESTO

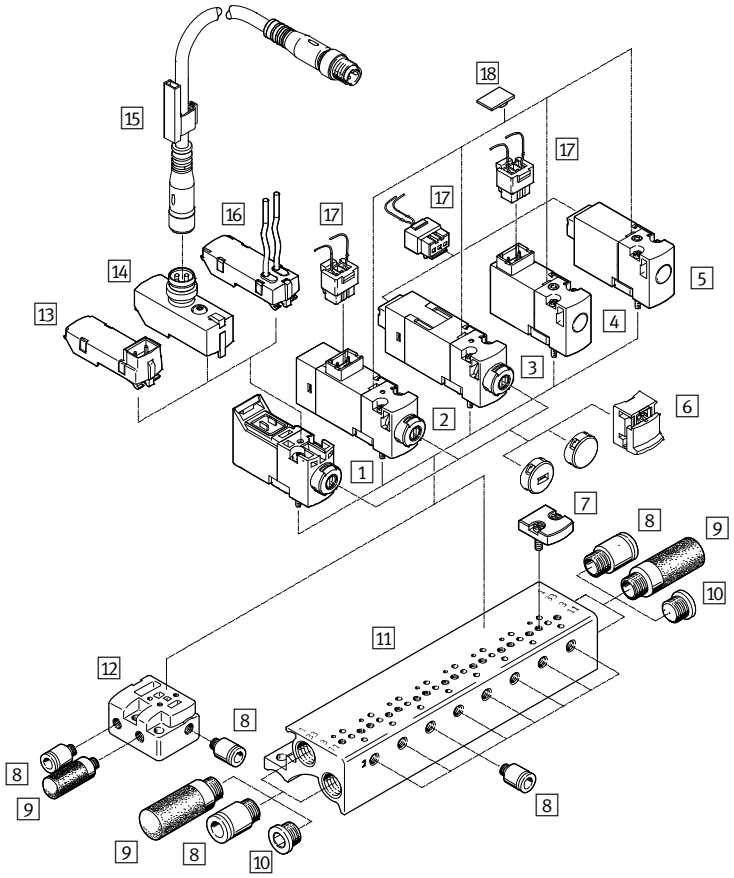
Ordering data						
				Part No.	Type	PU[1]
Soldering base						
	For manifold rail for valves with plug connection underneath for PCB mounting, 3-pin			**197261**	**PCBC-A-10**	**10**
				197262	**PCBC-A-100**	**100**
Electrical plug-in base						
	For manifold rail, for valves with plug connection underneath	2x flying leads 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	**197263**	**KMH-0,5**	**1**
			1 m	**197264**	**KMH-1**	**1**
			2.5 m	**527400**	**KMH-2,5**	**1**
			5 m	**527401**	**KMH-5**	**1**
	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**
	Straight socket Connection pattern H 3-pin	Cable Open end 2-wire	0.5 m	**566658**	**NEBV-H1G2-P-0.5-N-LE2**	**1**
			1 m	**566659**	**NEBV-H1G2-P-1-N-LE2**	**1**
			2.5 m	**566660**	**NEBV-H1G2-P-2.5-N-LE2**	**1**
			5 m	**566661**	**NEBV-H1G2-P-5-N-LE2**	**1**
Connecting cable for manifold rail with electrical multi-pin plug						
	Straight socket, Sub-D, 9-pin	Cable Open end 9-wire	2.5 m	**531184**	**KMP6-09P-8-2,5**	**1**
			5 m	**531185**	**KMP6-09P-8-5**	**1**
			10 m	**531186**	**KMP6-09P-8-10**	**1**
	Straight socket, Sub-D, 25-pin	Cable Open end 15-wire	2.5 m	**530049**	**KMP6-25P-12-2,5**	**1**
			5 m	**530050**	**KMP6-25P-12-5**	**1**
			10 m	**530051**	**KMP6-25P-12-10**	**1**
	Straight socket, Sub-D, 25-pin	Cable Open end 25-wire	2.5 m	**530046**	**KMP6-25P-20-2,5**	**1**
			5 m	**530047**	**KMP6-25P-20-5**	**1**
			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

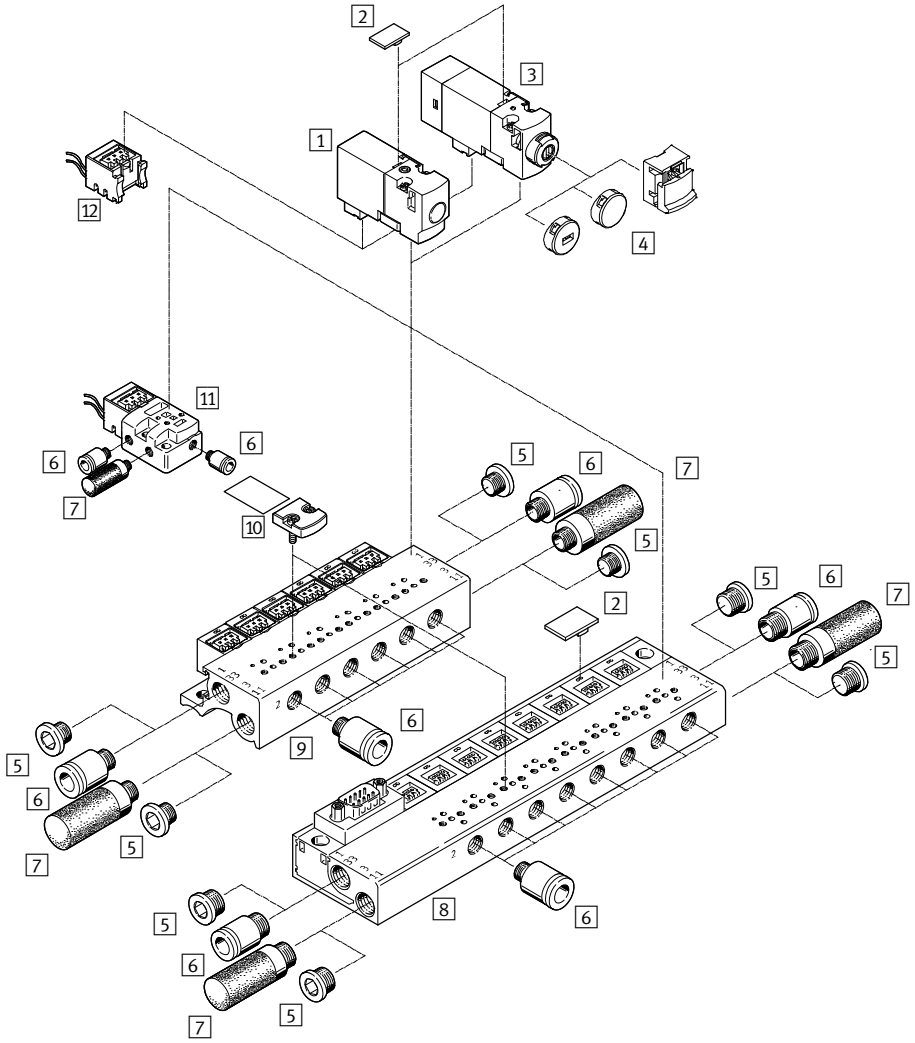


Designation		Brief description	➔ Page/Internet
1	Solenoid valve	Valve without plug connection, with manual override	41
2	Solenoid valve	Valve with plug connection on top, with LED, with manual override	54
3	Solenoid valve	Valve with plug connection at rear, with LED, with manual override	54
4	Solenoid 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

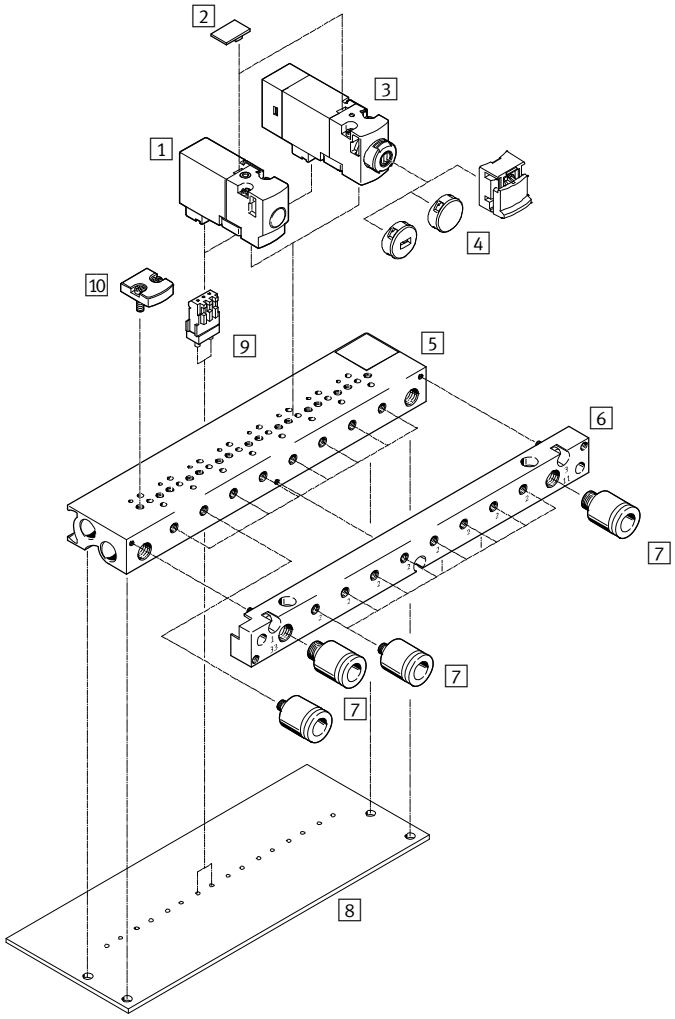
Peripherals overview

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

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	O	–	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
O	Open

Nominal width	
0,6	0.65 mm
0,9	0.9 mm

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

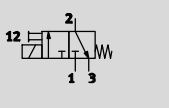
Note

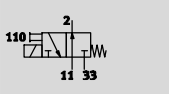
Further variants and accessories can be configured and ordered online using the modular product system.

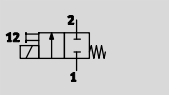
Solenoid valves MH1, sub-base valve without LED

Technical data

Function



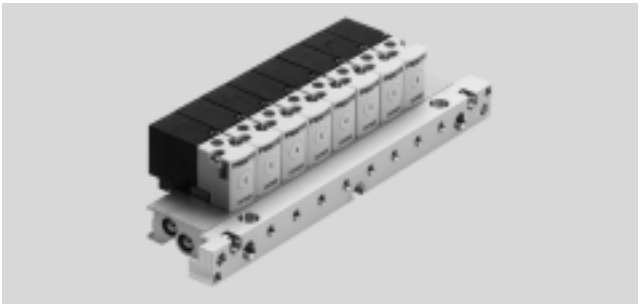




Voltage
5 V DC
12 V DC
24 V DC

Pressure
–0.9 … +8 bar

Temperature range
–5 … +40 °C



General technical data				
Type		MHA1-...-2/2G-...	MHA1-...-3/2G-...	MHA1-...-3/2O-...
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]	0.9	0.65	0.7
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-...-3/2O-...
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]	–0.9 … +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, sub-base valve without LED

Technical data

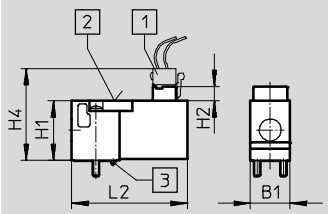
Electrical data		
Operating voltage	[V DC]	5
	[V DC]	12
	[V DC]	24
Permissible voltage fluctuations	[%]	±10
Connection type		Plug connection
Power consumption	[W]	1
Duty cycle	[%]	100
Degree of protection to EN 60529		IP40

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

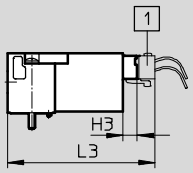


1 Plug socket KMH/NEBV-H1G2

2 Manual override

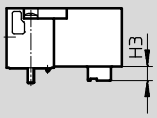
3 Coding pin

Plug connection at rear

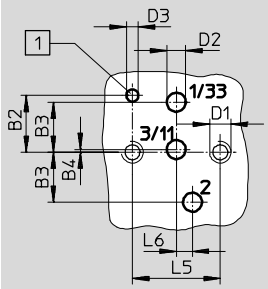


1 Plug socket KMH/NEBV-H1G2

Plug connection underneath



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.

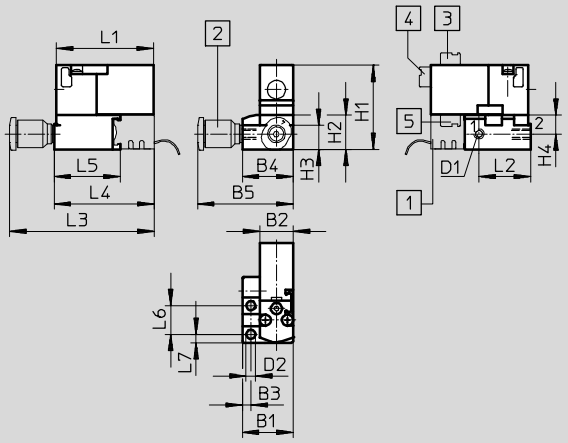
Type	B1	B2	B3	B4	D1	D2	D3	H1	H2	H3	H4	L2	L3	L5	L6
MHA1	9.8	4.2	3.7	0.2	M1.6	1.4	0.9	14.7	3.6	3.6	22.6	28.5	36.4	6.5	1.2

Solenoid valves MH1, sub-base valve without LED

Technical data

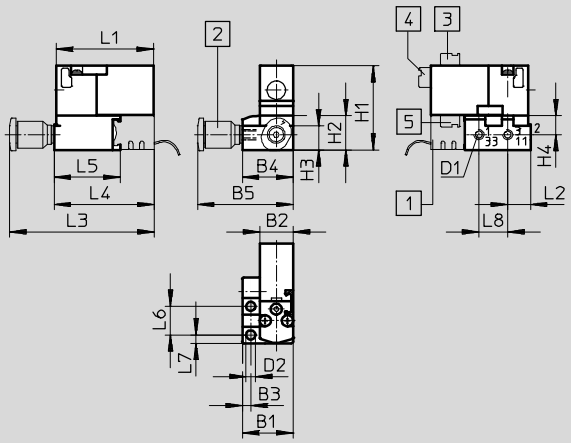
Dimensions – Assembly on individual sub-base Download CAD data ➔ **www.festo.com**

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

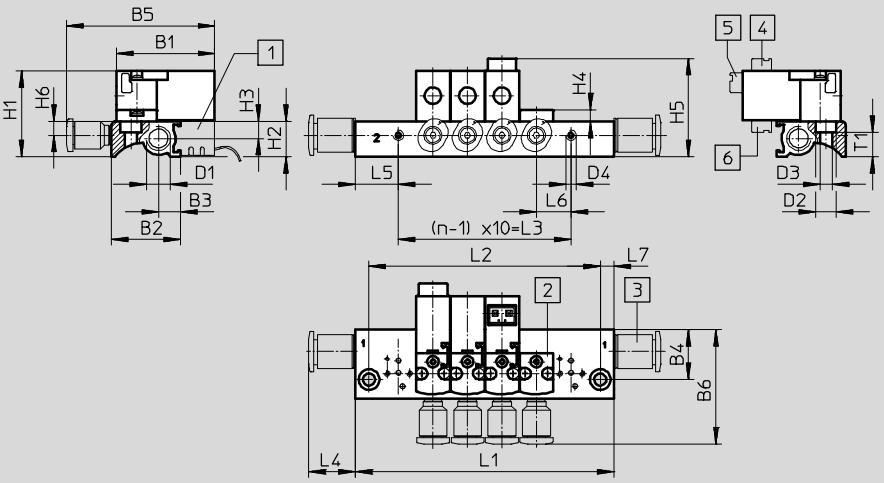


1 Plug base MHAP-PI
2 Fitting
3 Plug connection on top
4 Plug connection at rear
5 Plug connection underneath

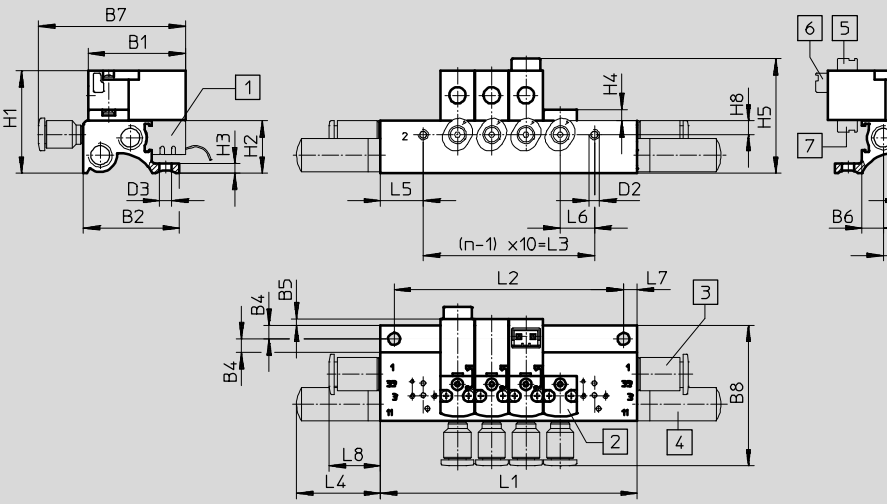
Type	B1	B2	B3	B4	B5	D1	D2	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7	L8
2/2-way valve	14.9	9.8	2.5	14.9	28	M3	2.7	24.7	10	7	5.5	28.5	15.1	42.4	29.3	19.3	8.4	2.5	–
3/2-way valve	14.9	9.8	2.5	14.9	28	M3	2.7	24.7	10	7	5.5	28.5	6.7	42.4	29.3	19.3	8.4	2.5	8.4

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

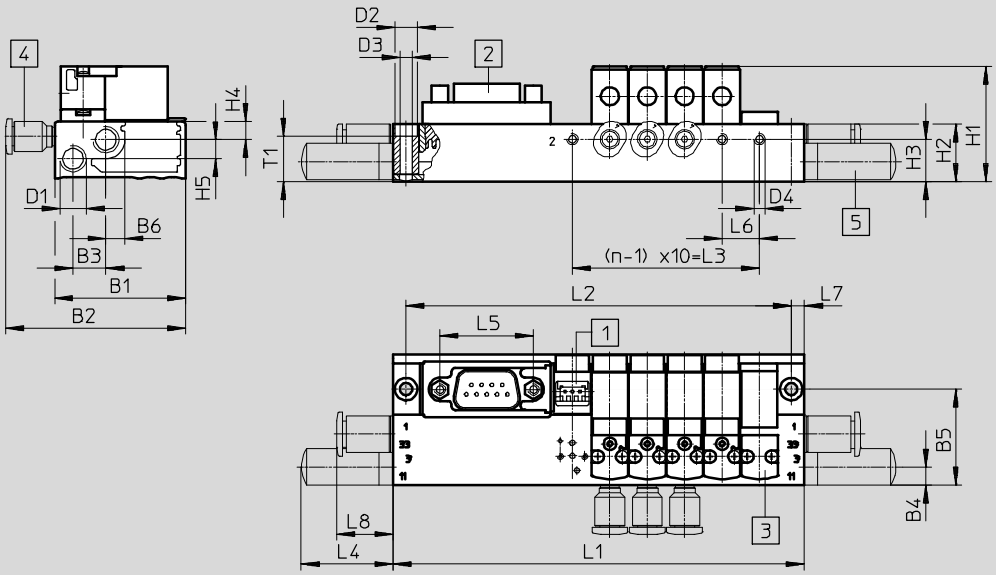
Valve positions n	L1 ±0.15	L2 ±0.1	L3
16	175	167	150
17	185	177	160
18	195	187	170
19	205	197	180
20	215	207	190
21	225	217	200
22	235	227	210

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



1 Plug base MHAP-PI
2 Sub-D plug, plug outlet on top (standard)
3 Blanking plate MHAP1
4 Fitting
5 Silencer

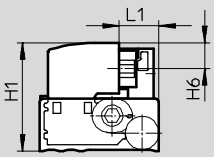
Type	B1	B2	B3	B4	B5	B6	D1	D2	D3	D4	H1	H2	H3	H4	H5	L4	L5	L6	L7	L8	T1
MHA1	35	48.1	8.8	5.3	25.7	5.2	M7	6	3.3	M3	30.8	15.3	11.3	4.9	5.1	24.5	25	10	3.5	15	12.1

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

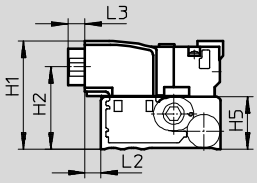
Valve positions n	L1 ±0.15	L2 ±0.1	L3
10	172	165	90
12	192	185	110
14	212	205	130
16	232	225	150

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

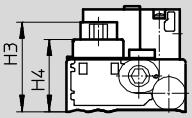
Plug outlet to pneumatic side



Plug outlet to electrical side



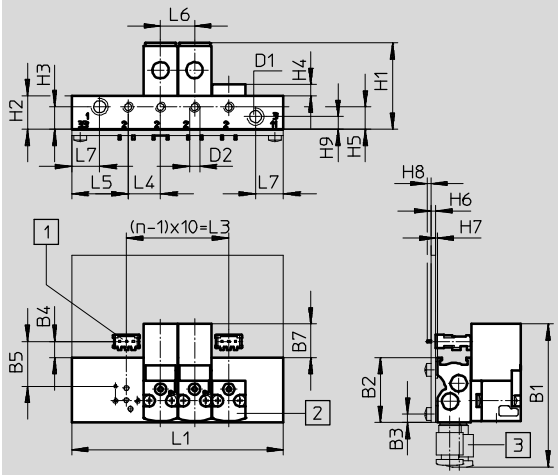
Plug outlet on top (standard)



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

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

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



1 Soldering base PCBC-A
2 Blanking plate MHAP1
3 Fitting

Note

The PCB is not included in the scope of delivery.

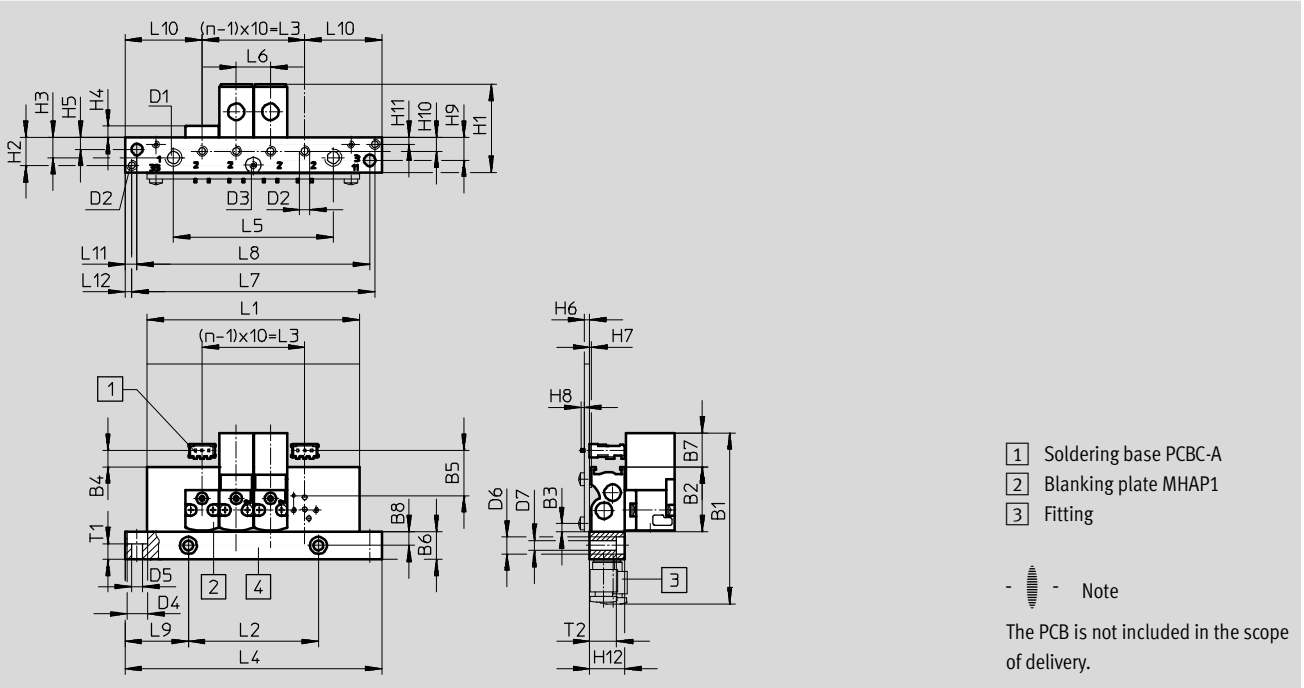
Type	B1	B2	B3	B4	B5	B7	D1	D2
Without pneumatic multiple connector plate	42	19	2.4	4.8	13.2	9.9	M5	M3

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

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

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



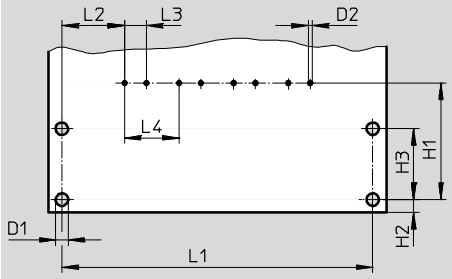
Type	B1	B2	B3	B4	B5	B6	B7	B8	D1	D2	D3	D4	D5	D6	D7
With pneumatic multiple connector plate	49.5	19	2.4	4.8	13.2	8	9.9	4	M5	M3	M2	6.1	3.3	5	2.9

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

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.

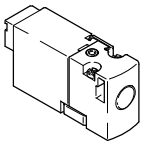
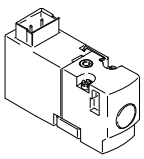
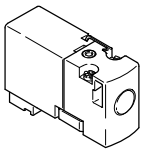
Type	D1	D2	H1	H2	H3	L2	L3	L4
PCB	2.3	0.7	21.4	2.4	13	11.5	4	10

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

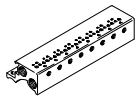
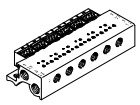
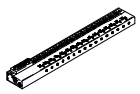
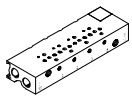
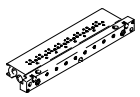
		Valve function	Normal position		Part No.	Type
Solenoid valve						
	Plug connection at rear	2/2-way solenoid valve	Closed	5 V DC	**197036**	**MHA1-M4H-2/2G-0,9-HC**
				12 V DC	**197037**	**MHA1-M5H-2/2G-0,9-HC**
				24 V DC	**197038**	**MHA1-M1H-2/2G-0,9-HC**
		3/2-way solenoid valve	Closed	5 V DC	**197000**	**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

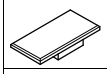
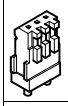
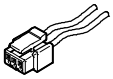
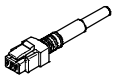
				Part No.	Type	PU[1]
Blanking plate for manifold rail						
	For manifold rail for valves with plug connection at rear or on top			**197257**	**MHAP1-BP-3**	**1**
	For manifold rail with plug bases with valves with plug connection underneath			**197258**	**MHAP1-BP-3-PI**	**1**
Blanking plug						
	For 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	**197263**	**KMH-0,5**	**1**
			1 m	**197264**	**KMH-1**	**1**
			2.5 m	**527400**	**KMH-2,5**	**1**
			5 m	**527401**	**KMH-5**	**1**
	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**
	Straight socket Connection pattern H 3-pin	Cable Open end 2-wire	0.5 m	**566658**	**NEBV-H1G2-P-0.5-N-LE2**	**1**
			1 m	**566659**	**NEBV-H1G2-P-1-N-LE2**	**1**
			2.5 m	**566660**	**NEBV-H1G2-P-2.5-N-LE2**	**1**
			5 m	**566661**	**NEBV-H1G2-P-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

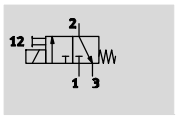
Further variants and accessories can be configured and ordered online using the modular product system.

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

Technical data

FESTO

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
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

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	–

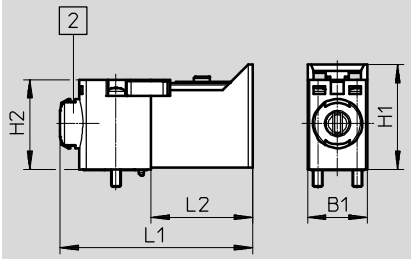
Switching times and frequencies						
Type			MHA1-M4R-...	MHA1-M5R-...	MHA1-M1R-...	MHA1-M1AR-...
Switching time	On	[ms]	5	5	5	5
	Off	[ms]	5	5	5	10
Maximum switching frequency		[Hz]	10	10	10	10

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

Dimensions

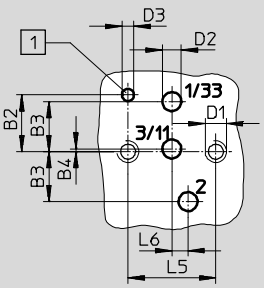
Download CAD data ➔ **www.festo.com**

Valve



2 Manual override

Hole pattern on sub-bases



1 Hole for coding pin

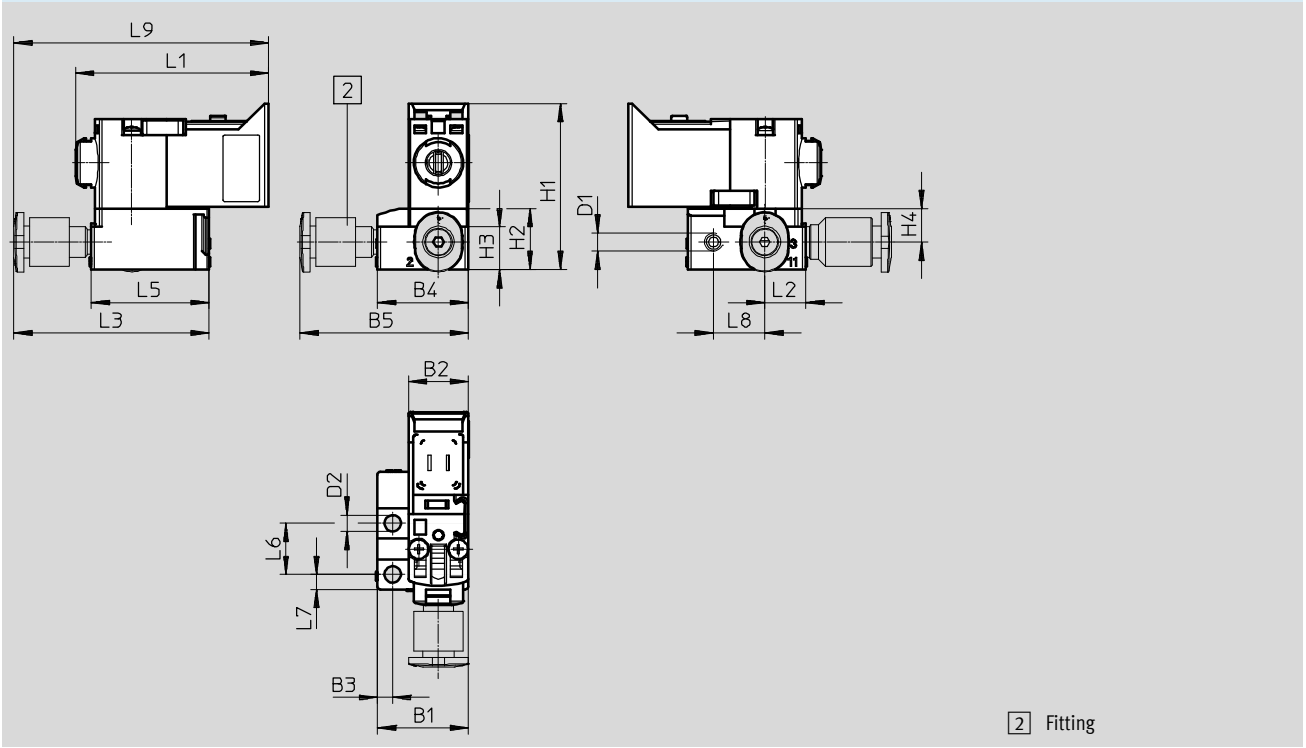
- If used as a 2/2-way valve, normally closed, port 3/11 are not used.
- If used as a 2/2-way valve, normally open, port 1/33 are not used.

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**

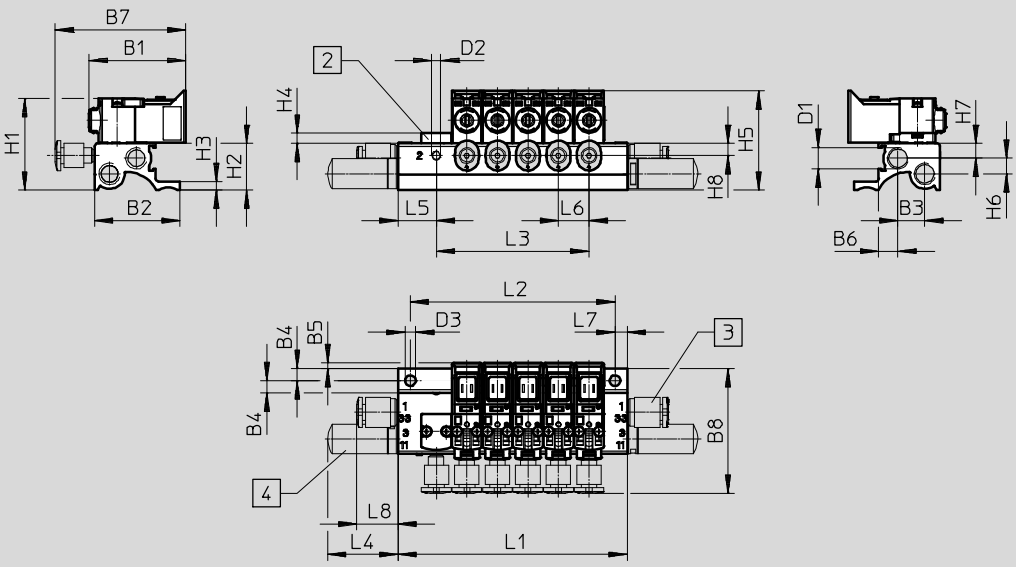


Type	B1	B2	B3	B4	B5	D1	D2	H1	H2	H3	H4	L1	L2	L3	L5	L6	L7	L8	L9
3/2-way valve	14.9	9.8	2.5	14.9	27.6	M3	2.7	27.2	10	7	5.5	31.7	6.7	32	19.3	8.4	2.5	8.4	42

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

Technical data

Dimensions – Manifold assembly Download CAD data ➔ **www.festo.com**



2 Blanking plate MHAP1 3 Fitting 4 Silencer

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

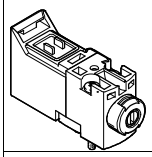
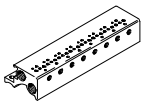
Valve positions n	L1 ±0.15	L2 ±0.1	L3
2	35	27	10
3	45	37	20
4	55	47	30
5	65	57	40
6	75	67	50
7	85	77	60
8	95	87	70

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

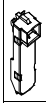
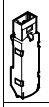
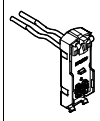
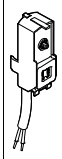
Ordering data						
				Part No.	Type	PU[1]
Blanking plate for manifold rail						
	Vacant valve positions must be sealed with a blanking plate			**197257**	**MHAP1-BP-3**	**1**
Cover cap for manual override						
	Function covered The cover cap protects the manual override against accidental actuation			**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

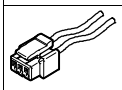
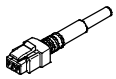
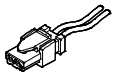
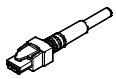
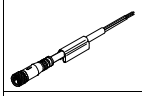
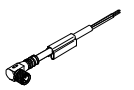
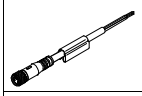
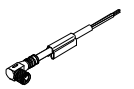
FESTO

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

FESTO

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	**197263**	**KMH-0,5**
			1 m	**197264**	**KMH-1**
			2.5 m	**527400**	**KMH-2,5**
			5 m	**527401**	**KMH-5**
	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-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	–	O	–	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 KMH/NEBV-H1G2
TC	Plug connection on top for plug socket KMH/NEBV-H1G2
PI	Plug connection underneath for plug-in connection

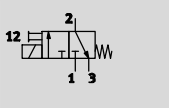
Note

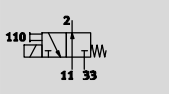
Further variants and accessories can be configured and ordered online using the modular product system.

Solenoid valves MH1, sub-base valve with LED

Technical data

Function

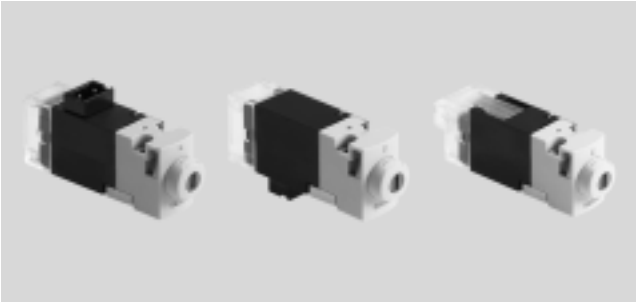




Voltage
24 V DC

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	3/2-way solenoid valve
		Normally closed	Normally open
		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	
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
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

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

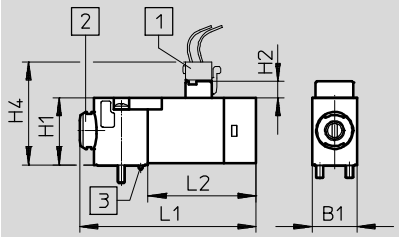
Switching times and frequencies			
Switching time	On	[ms]	4
	Off	[ms]	4
Maximum switching frequency		[Hz]	20

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

Dimensions

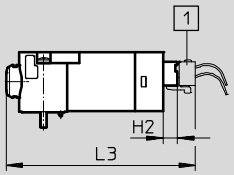
Download CAD data ➔ **www.festo.com**

Plug connection on top



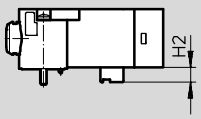
1 Plug socket KMH/NEBV-H1G2
2 Manual override
3 Coding pin

Plug connection at rear

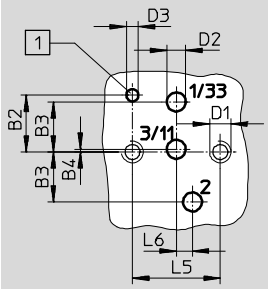


1 Plug socket KMH/NEBV-H1G2

Plug connection underneath



Hole pattern on sub-bases



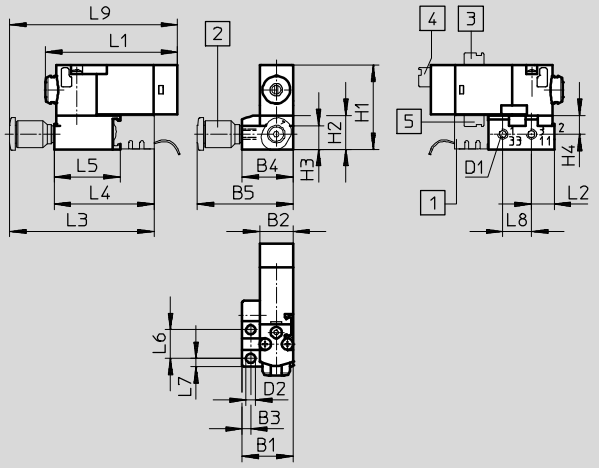
1 Hole for coding pin

- 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.

Type	B1	B2	B3	B4	D1	D2	D3	H1	H2	H4	L1	L2	L3	L5	L6
MHA1	9.8	4.2	3.7	0.2	M1.6	1.4	0.9	14.7	3.6	22.6	38.7	23.7	46.6	6.5	1.2

Dimensions – Assembly on individual sub-base Download CAD data ➔ **www.festo.com**

3/2-way valve

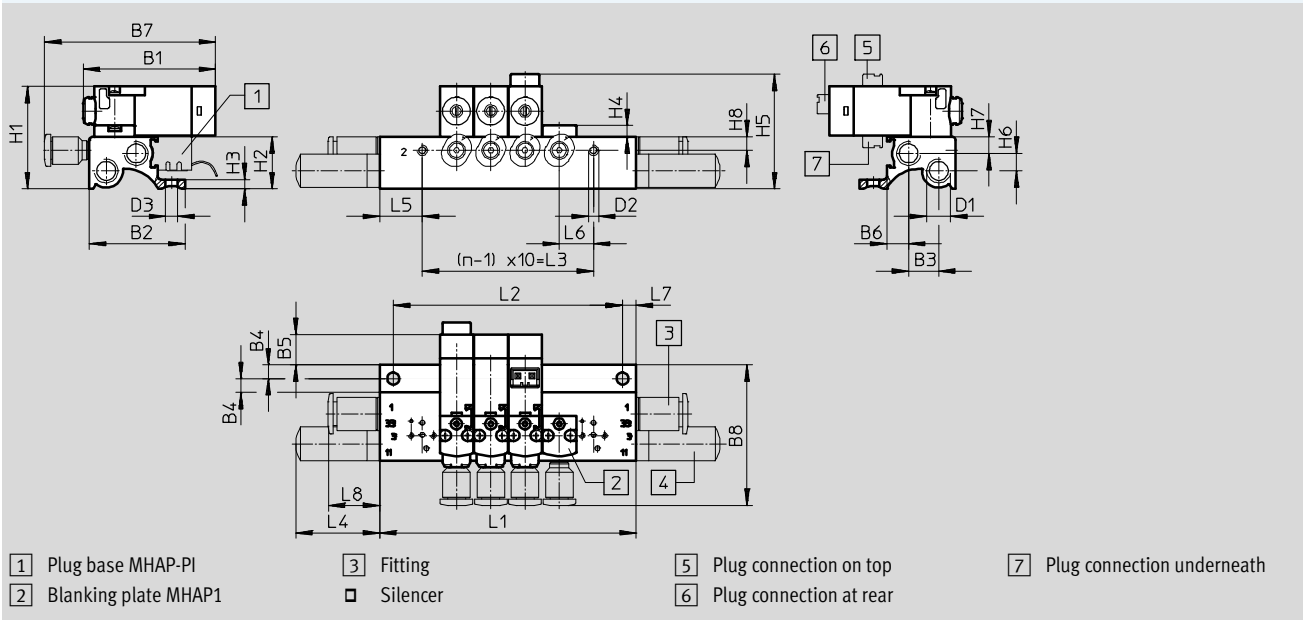


1 Plug base MHAP-PI
2 Fitting
3 Plug connection on top
4 Plug connection at rear
5 Plug connection underneath

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

Dimensions – Manifold assembly Download CAD data ➔ **www.festo.com**

3/2-way valve



1 Plug base MHAP-PI
2 Blanking plate MHAP1
3 Fitting
Silencer
5 Plug connection on top
6 Plug connection at rear
7 Plug connection underneath

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

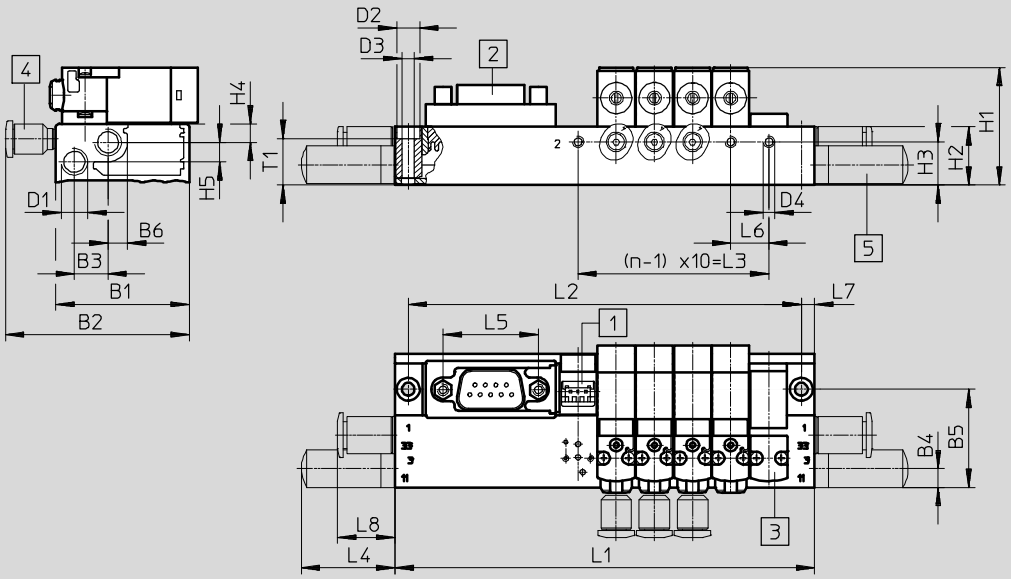
Valve positions n	L1 ±0.15	L2 ±0.1	L3
2	35	27	10
3	45	37	20
4	55	47	30
5	65	57	40
6	75	67	50
7	85	77	60
8	95	87	70

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

Dimensions – Manifold assembly with electrical multi-pin plug Download CAD data ➔ **www.festo.com**

3/2-way valve



1 Plug base MHAP-PI
2 Sub-D plug, plug outlet on top (standard)
3 Blanking plate MHAP1
4 Fitting
5 Silencer

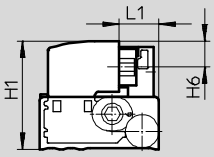
Type	B1	B2	B3	B4	B5	B6	D1	D2	D3	D4	H1	H2	H3	H4	H5	L4	L5	L6	L7	L8	T1
MHA1	35	48.1	8.8	5.3	25.7	5.2	M7	6	3.3	M3	30.8	15.3	11.3	4.9	5.1	24.5	25	10	3.5	15	12.1

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

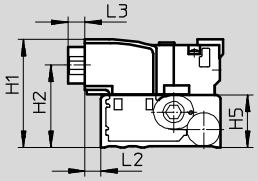
Valve positions n	L1 ±0.15	L2 ±0.1	L3
10	172	165	90
12	192	185	110
14	212	205	130
16	232	225	150

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

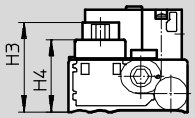
Plug outlet to pneumatic side



Plug outlet to electrical side



Plug outlet on top (standard)



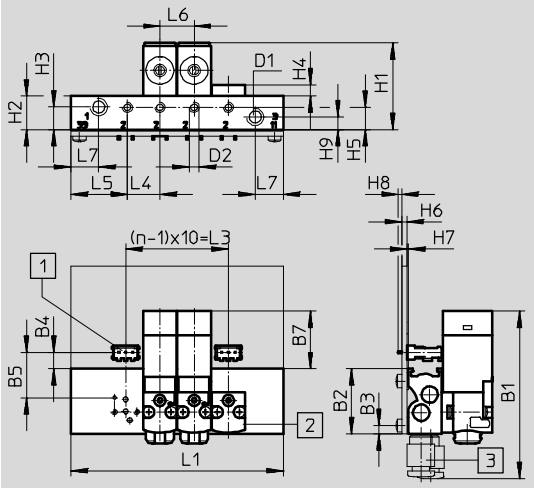
Type	H1	H2	H3	H4	H5	H6	L1	L2	L3
MHA1	31.8	24.2	26.2	21.2	15.3	7.6	11.7	4.8	5

Solenoid valves MH1, sub-base valve with LED

Technical data

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

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



1 Soldering base PCBC-A
2 Blanking plate MHAP1
3 Fitting

- - Note

The PCB is not included in the scope of delivery.

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

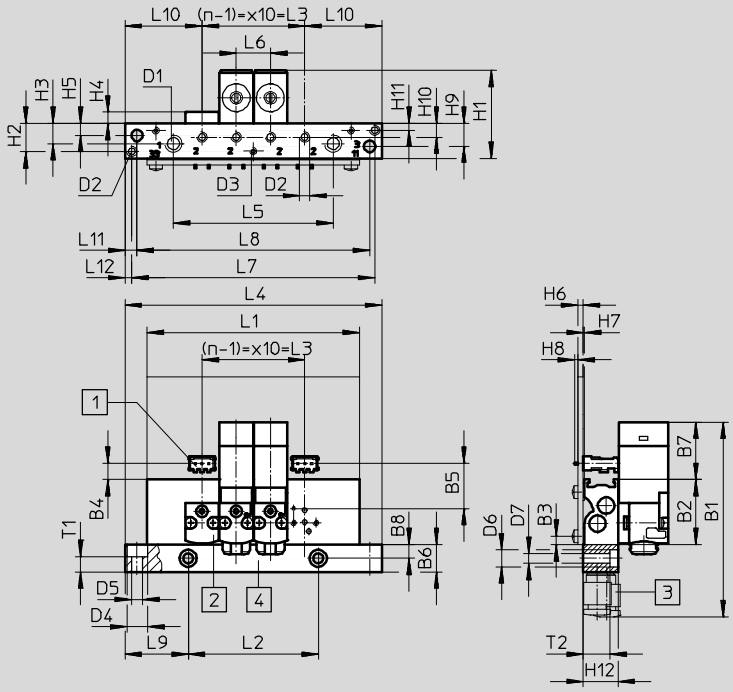
Valve positions n	L1 ±0.15	L3
2	42	10
4	62	30
6	82	50
8	102	70
10	122	90

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



1 Soldering base PCBC-A
2 Blanking plate MHAP1
3 Fitting

- - Note

The PCB is not included in the scope of delivery.

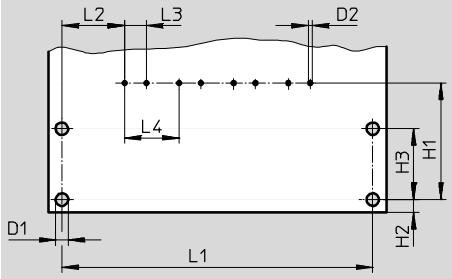
Type	B1	B2	B3	B4	B5	B6	B7	B8	D1	D2	D3	D4	D5	D6	D7
With pneumatic multiple connector plate	56.5	19	2.4	4.8	13.2	8	16.9	4	M5	M3	M2	6.1	3.3	5	2.9

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

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.

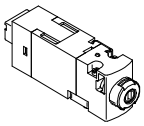
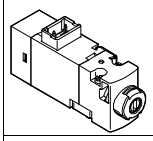
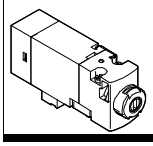
Type	D1	D2	H1	H2	H3	L2	L3	L4
PCB	2.3	0.7	21.4	2.4	13	11.5	4	10

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

FESTO

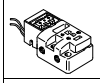
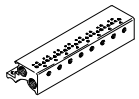
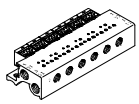
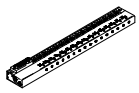
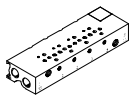
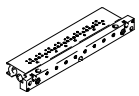
Ordering data						
		Valve function	Normal position		Part No.	Type
Solenoid valve						
	Plug connection at rear	3/2-way solenoid valve	Closed	24 V DC	**540443**	**MHA1-M1LH-3/2G-0,6-HC**
			Open	24 V DC	**540440**	**MHA1-M1LH-3/2O-0,6-HC**
	Plug connection on top	3/2-way solenoid valve	Closed	24 V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

Technical data

Ordering data

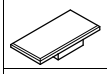
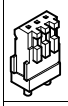
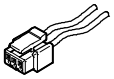
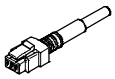
				Part No.	Type	PU[1]
Blanking plate for manifold rail						
	For manifold rail for valves with plug connection at rear or on top			197257	MHAP1-BP-3	1
	For manifold rail with plug bases with valves with plug connection underneath			197258	MHAP1-BP-3-PI	1
Cover cap for manual override						
	Function covered 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
		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 with LED

Technical data

Ordering data

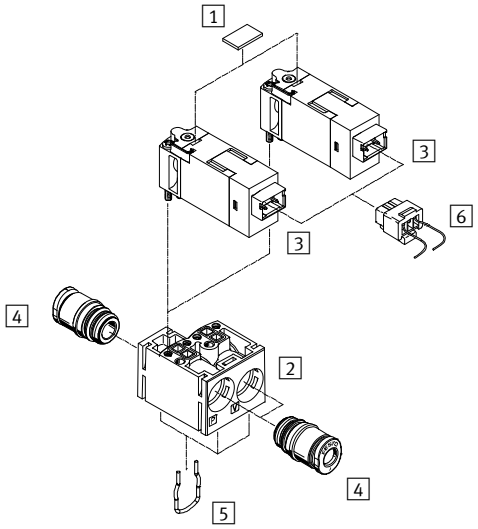
				Part No.	Type	PU[1]
Inscription label						
	For identifying the valve positions			**197259**	**MH-BZ-80X**	**80**
Soldering base						
	For plug-in connection, 3-pin			**197261**	**PCBC-A-10**	**10**
				197262	**PCBC-A-100**	**100**
Electrical plug-in base						
	For manifold rail, for valves with 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	**197263**	**KMH-0,5**	**1**
			1 m	**197264**	**KMH-1**	**1**
			2.5 m	**527400**	**KMH-2,5**	**1**
			5 m	**527401**	**KMH-5**	**1**
	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**
	Straight socket Connection pattern H 3-pin	Cable Open end 2-wire	0.5 m	**566658**	**NEBV-H1G2-P-0.5-N-LE2**	**1**
			1 m	**566659**	**NEBV-H1G2-P-1-N-LE2**	**1**
			2.5 m	**566660**	**NEBV-H1G2-P-2.5-N-LE2**	**1**
			5 m	**566661**	**NEBV-H1G2-P-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

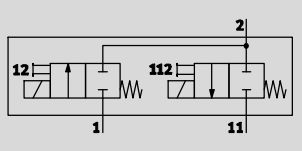
Note

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

Technical data

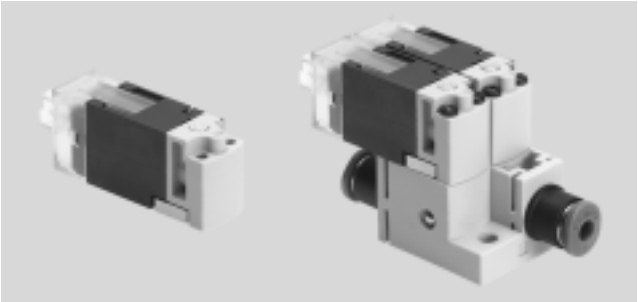
Function



Voltage
24 V DC

Pressure
–0.95 ... +1.5 bar

Temperature range
–5 ... +50 °C



General technical data				
Valve function			2/2-way, single solenoid	2x2/2-way, 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	
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

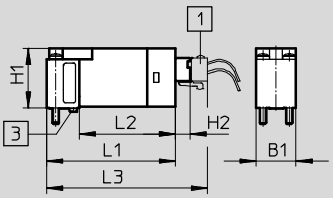
Electrical data		
Operating voltage	[V DC]	24 ±10%
Connection type		Plug connection
Power consumption	[W]	3, following current reduction 0.7
Duty cycle	[%]	100
Max. connecting cable length	[m]	30
Degree of protection to EN 60529		
With plug socket KMH/NEBV-H1G2		IP40

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

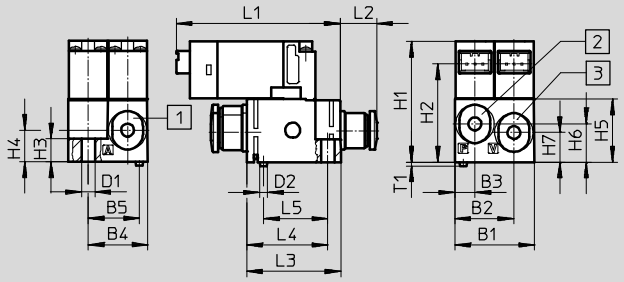
Dimensions Download CAD data ➔ **www.festo.com**

2/2-way valve



1 Plug socket KMH/NEBV-H1G2 3 Coding pin

2x2/2-way valve

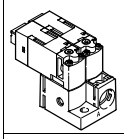
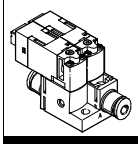


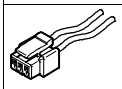
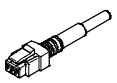
1 Push-in connector 2 3 Push-in connector 11
2 Push-in connector 1

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	–	–	–	–	–	–	14.4	3.6	–	–	–	–	–	31.7	23.7	39.7	–	–	–
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					
		Weight [g]	Pneumatic connection	Part No.	Type
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	**197263**	**KMH-0,5**	**1**
			1 m	**197264**	**KMH-1**	**1**
			2.5 m	**527400**	**KMH-2,5**	**1**
			5 m	**527401**	**KMH-5**	**1**
	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**
	Straight socket Connection pattern H 3-pin	Cable Open end 2-wire	0.5 m	**566658**	**NEBV-H1G2-P-0.5-N-LE2**	**1**
			1 m	**566659**	**NEBV-H1G2-P-1-N-LE2**	**1**
			2.5 m	**566660**	**NEBV-H1G2-P-2.5-N-LE2**	**1**
			5 m	**566661**	**NEBV-H1G2-P-5-N-LE2**	**1**

1) Packaging unit.