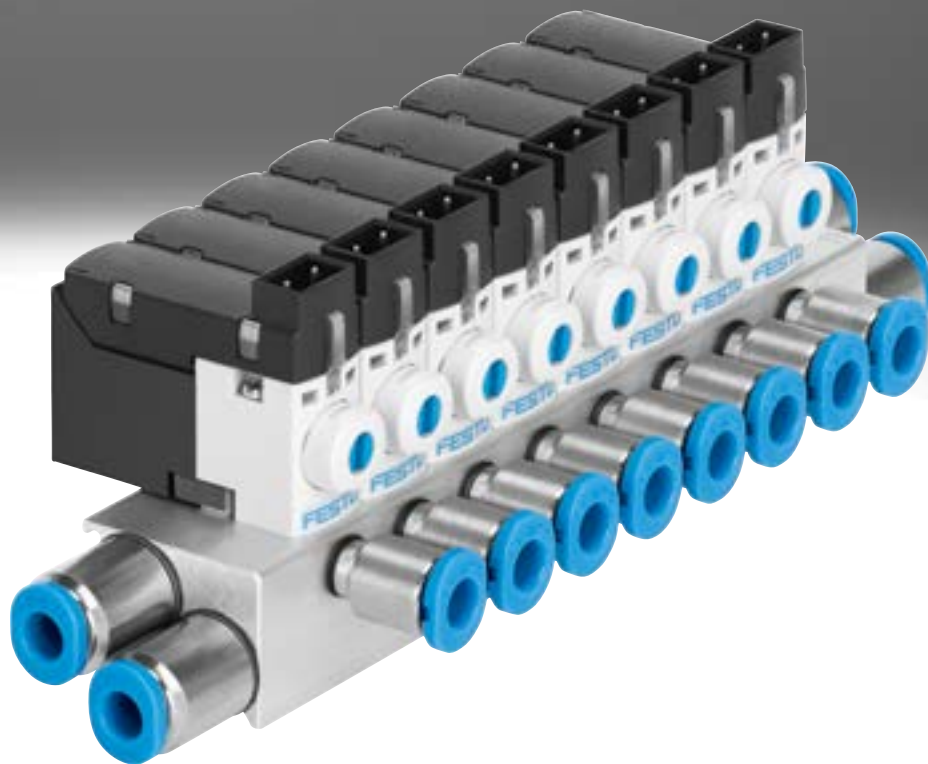


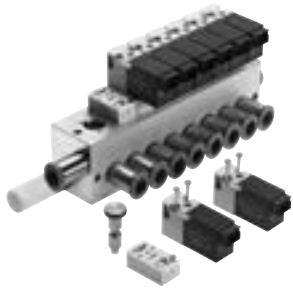
Solenoid valves MH1, miniature

FESTO



Key features

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. Another interesting variant: mounting on a circuit board including connection. All components are tested and assembled for Festo plug and work. And if a system needs to run as fast as possible, that's no problem! The response time of the miniature valves is 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



They can also be used in 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. The 100% duty cycle and the three-shift operation guarantee maximum cost-effectiveness.

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

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

Key features – Pneumatic components

Operation with different pressures

Vacuum operation

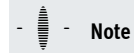
The flow direction of the MH1 valves is clearly defined and cannot be reversed.

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

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

3/2-way valve

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

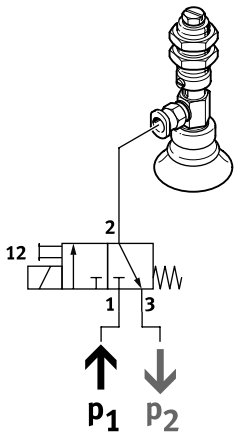
3/2-way valve

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

2x2/2-way valve

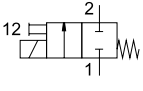
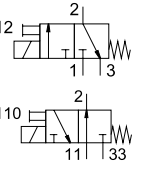
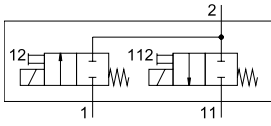
- Vacuum operation is realised by connecting vacuum at port 11
- The ejector pulse is connected at port 1

Example

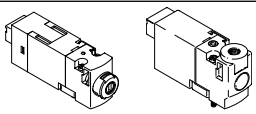
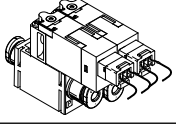
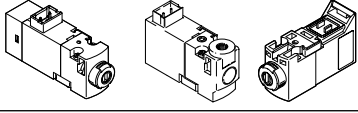
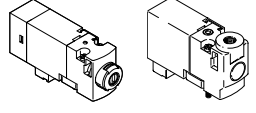


With the 3/2-way valve, normally closed, vacuum operation is realised by connecting the vacuum (P2) to port 3 and connecting e.g. a silencer for venting (P1) to port 1. This changes the normal position from "closed" to "open".

Product range overview

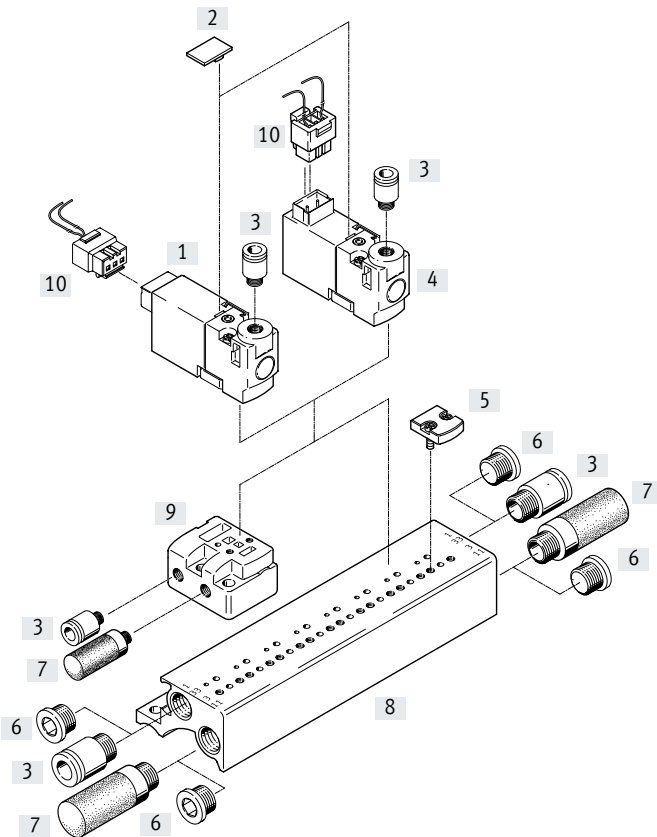
Function	Circuit symbol	Design	Operating voltage				→ Page/ Internet
			5 V DC	12 V DC	24 V DC	24 V AC	
2/2-way valve		Standard nominal flow rate 14 l/min					
		Semi in-line valve	■	■	■	–	9
		Sub-base valve without LED	■	■	■	–	22
		Standard nominal flow rate 30 l/min, controls vacuum or ejector pulse					
		Sub-base valve with LED	–	–	■	–	55
3/2-way valve ¹⁾		Standard nominal flow rate 10 l/min					
		Semi in-line valve	■	■	■	–	9
		Sub-base valve without LED	■	■	■	–	22
		Sub-base valve with E-box	■	■	■	■	34
		Sub-base valve with LED	–	–	■	–	42
2x2/2-way valve		Standard nominal flow rate 30 l/min, controls vacuum and ejector pulse					
		Sub-base valve with LED	–	–	■	–	55

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

Mounting options					
Design type		Semi in-line valve		Sub-base valve	
Electrical connection		Without LED	Without LED	With E-box	With LED
Plug connection at the 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	–	■	–	■

Peripherals overview

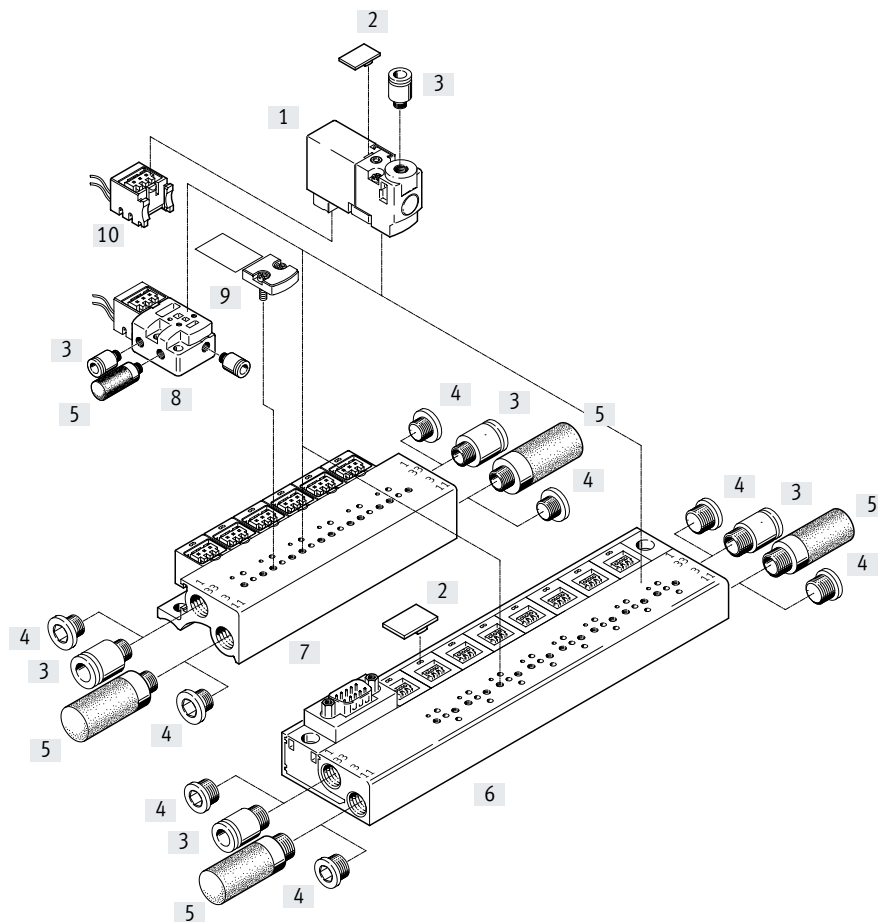
Valves with plug connection at the rear, plug connection on top



Designation	Description	→ Page/Internet
[1] Solenoid valve	Valve with plug connection at the rear	15
[2] Inscription label	For identifying the valve positions	17
[3] Push-in fitting	For connecting compressed air tubing with standard O.D.	17
[4] Solenoid valve	Valve with plug connection on top	15
[5] Cover plate	For manifold rail without plug bases	16
[6] Blanking plug	For sealing unused connections	17
[7] Silencer	For exhaust ports	17
[8] Manifold rail	Without plug bases	16
[9] Individual sub-base	For valves with plug connection at the rear, plug connection on top	16
[10] Plug socket with cable	Straight socket, plug pattern H, 3-pin	18

Peripherals overview

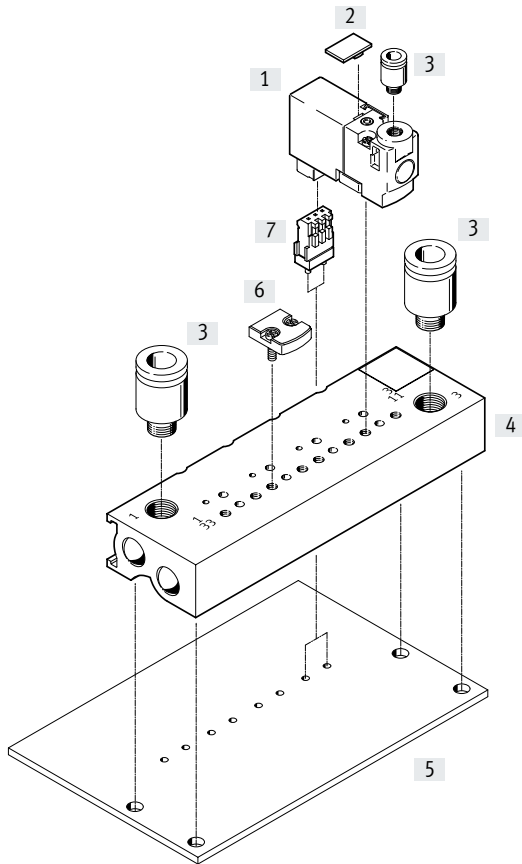
Valves with plug connection underneath



Designation	Description	→ Page/Internet
[1] Solenoid valve	Valve with plug connection underneath	15
[2] Inscription label	For identifying the valve positions	17
[3] Push-in fitting	For connecting compressed air tubing with standard O.D.	17
[4] Blanking plug	For sealing unused connections	17
[5] Silencer	For exhaust ports	17
[6] Manifold rail	With plug bases and electrical multi-pin plug, Sub-D	16
[7] Manifold rail	With plug bases	16
[8] Individual sub-base	For valves with plug connection underneath	16
[9] Cover plate	For manifold rail with plug bases	16
[10] Electrical plug-in base	Straight socket, plug pattern H, 3-pin	18

Peripherals overview

Valves with plug connection underneath, PCB mounting



Designation	Brief description	→ Page/Internet
[1] Solenoid valve	Valve with plug connection underneath	15
[2] Inscription label	For identifying the valve positions	17
[3] Push-in fitting	For connecting compressed air tubing with standard O.D.	17
[4] Manifold rail	Without plug bases, for PCB mounting	16
[5] PCB	Not included in the scope of delivery	-
[6] Cover plate	For manifold rail without plug bases	16
[7] Soldering base	For PCB mounting, 3-pin	18

Type codes

001	Series
MHP1	Solenoid valve MHP1
MHA1	Solenoid valve MHA1

002	Drive system
M	Solenoid, switching

003	Nominal operating voltage
1	24 V DC
1A	24 V AC/50-60 Hz
4	5 V DC
5	12 V DC

004	Display
	None
L	LED

005	Manual override
H	Non-detenting
R	Non-detenting, detenting


006	Valve function
2/2	2/2-way valve
3/2	3/2-way valve
2X2/2	Double 2/2-way valve on sub-base

007	Normal position
G	Closed
O	Open

008	Nominal size
0,6	0.65 mm
0,9	0.9 mm
1,5	1.5 mm

009	Pneumatic connection
M3	Thread M3

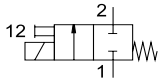
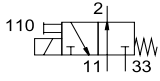
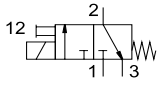
010	Electrical connection
	With connection for 10 mm cartridge
HC	Rear plug connection for plug socket NEBV-H1G2
TC	Plug connection on top for plug socket NEBV-H1G2
PI	Plug connection underneath for plug-in connection
P3	Without plug connection
333	With push-in connector for tubing O.D. 3 mm
444	With push-in connector for tubing O.D. 4 mm
443	With push-in connector for tubing O.D. 4 mm, connection 2 with push-in connector for tubing O.D. 3 mm


 - **Note**


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


Datasheet

Function



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

-  - Pressure
-0.9 ... +8 bar

-  - Temperature range
-5 ... +40°C



General technical data				
Type		MHP1-...-2/2G-...	MHP1-...-3/2G-...	MHP1-...-3/2O-...
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		Electrical		
Reset method		Mechanical spring		
Type of control		Direct		
Direction of flow		Not reversible		
Suitability for vacuum		Yes	-	-
Exhaust function		Cannot be throttled	Can be throttled	Can be throttled
Manual override		Non-detenting		
Type of mounting		On sub-base via through-hole		
Mounting position		Any		
Nominal width	[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 the 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 → page 4

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

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Datasheet

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

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

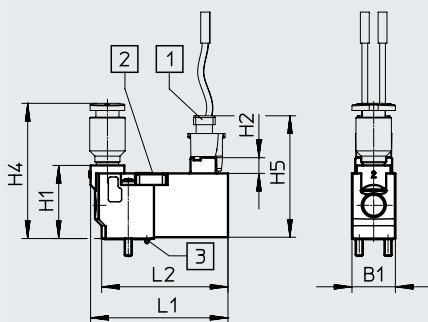
Switching times and frequencies					
Type			MHP1-...-2/2G-...	MHP1-...-3/2G-...	MHP1-...-3/20-...
Switching time	On	[ms]	4	4	4
	Off	[ms]	5	4	4
Maximum switching frequency		[Hz]	20	20	20

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

Dimensions

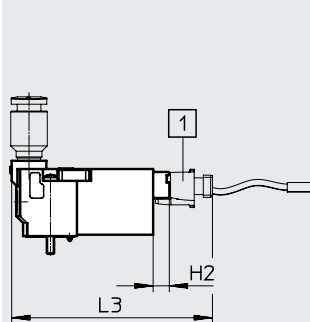
Download CAD data → www.festo.com

Plug connection on top



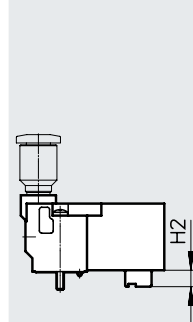
- [1] Plug socket NEBV-H1G2
[2] Manual override
[3] Coding pin

Plug connection at the rear



- [1] Plug socket NEBV-H1G2

Plug connection underneath

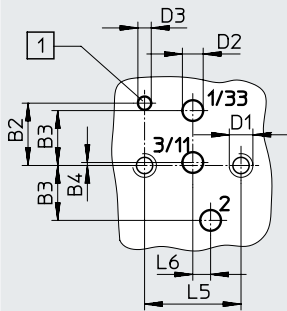


Type	B1	H1	H2	H4	H5	L1	L2	L3
MHP1	9.8	16.5	3.6	30.5	27.4	31	28.5	44

Datasheet

Dimensions – Hole pattern on sub-bases

Download CAD data → www.festo.com



[1] Hole for coding pin

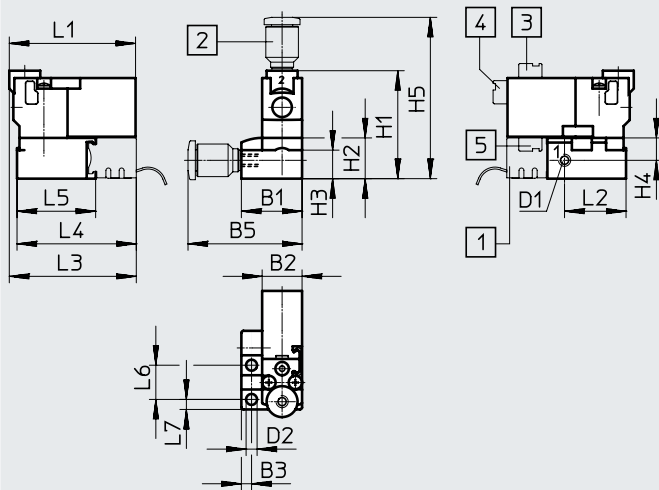
- With semi in-line valves, port 2 is not used.
- If used as a 2/2-way valve, normally closed, ports 3/11 are not used.
- If used as a 2/2-way valve, normally open, ports 1/33 are not used.

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

Dimensions – Assembly on individual sub-base

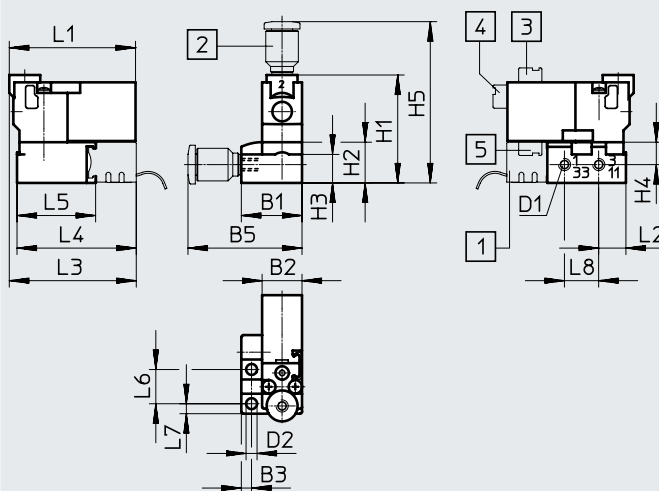
Download CAD data → www.festo.com

2/2-way valve



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

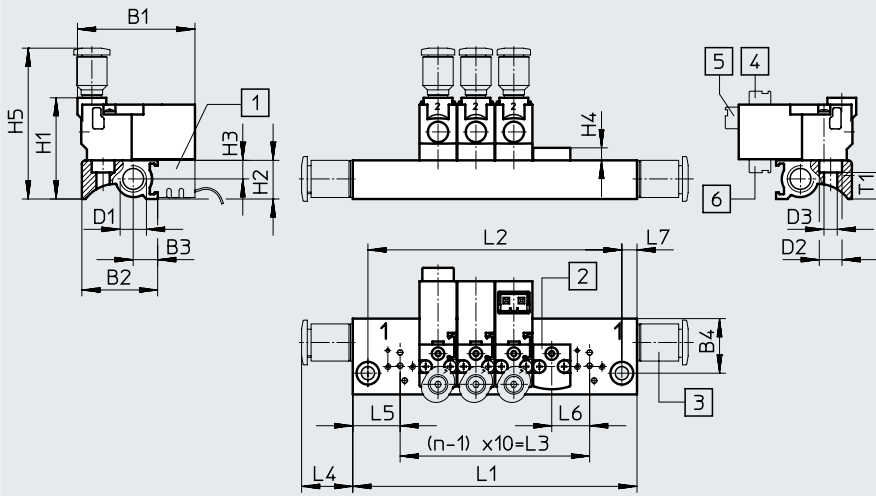
Type	B1	B2	B3	B5	D1	D2	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5	L6	L7	L7
2/2-way valve	14.9	9.8	2.5	28	M3	2.7	26.5	10	7	5.5	39.6	31	15.1	31.2	29.3	19.3	8.4	2.5	2.5
3/2-way valve	14.9	9.8	2.5	28	M3	2.7	26.5	10	7	5.5	39.6	31	6.7	31.2	29.3	19.3	8.4	2.5	8.4

Datasheet

Dimensions – Manifold assembly

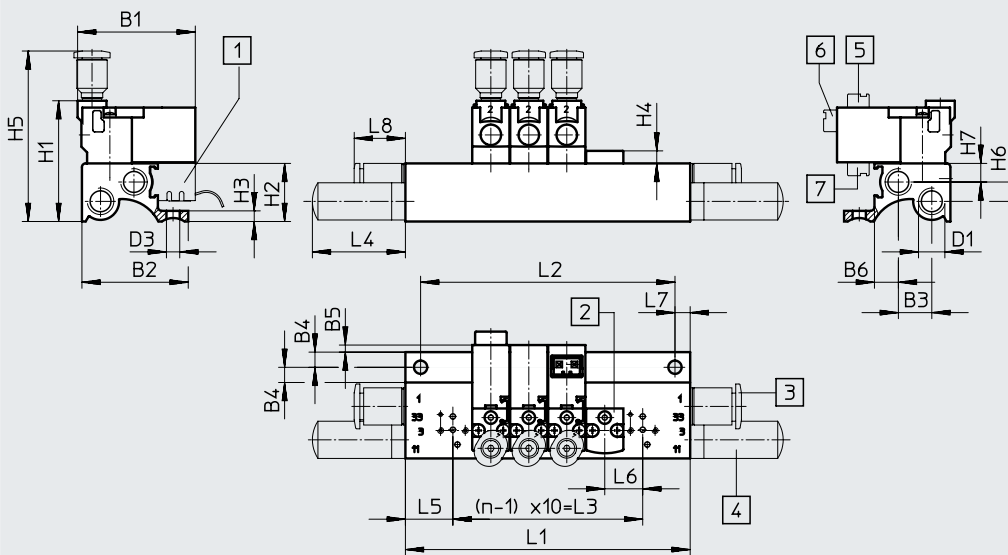
Download CAD data → www.festo.com

2/2-way valve



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

3/2-way valve



- [1] Plug base MHAP-PI
- [2] Cover plate MHAP1
- [3] Fitting
- [4] Silencer
- [5] Plug connection on top
- [6] Plug connection at the 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

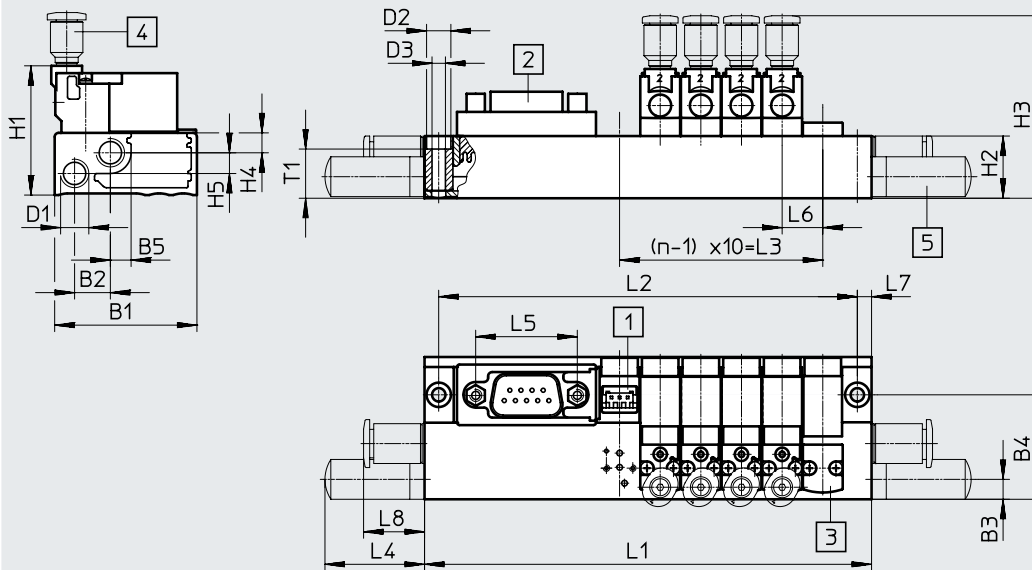
Valve positions n	L1 ±0.15	L2 ±0.1	L3
16	175	167	150
17	185	177	160
18	195	187	170
19	205	197	180
20	215	207	190
21	225	217	200
22	235	227	210

Datasheet

Dimensions – Manifold assembly with electrical multi-pin plug

Download CAD data → www.festo.com

3/2-way valve

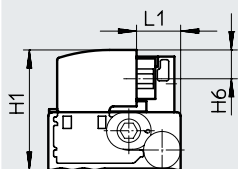


- [1] Plug base MHAP-PI
- [2] Sub-D plug, plug outlet on top (standard)
- [3] Cover plate MHAP1
- [4] Fitting
- [5] Silencer

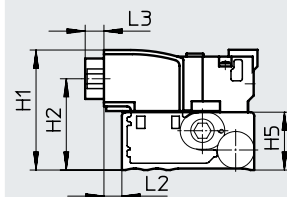
Type	B1	B2	B3	B4	B5	D1	D2	D3	H1	H2	H3	H4	H5	L4	L5	L6	L7	L8	T1
MHP1	35	8.8	5.3	25.7	5.2	M7	6	3.3	31.8	15.3	44.9	4.9	5.1	54.5	25	10	3.5	15	12.1

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

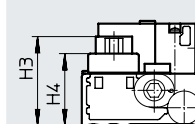
Plug outlet to the pneumatic side



Plug outlet to electrical side



Plug outlet on top (standard)



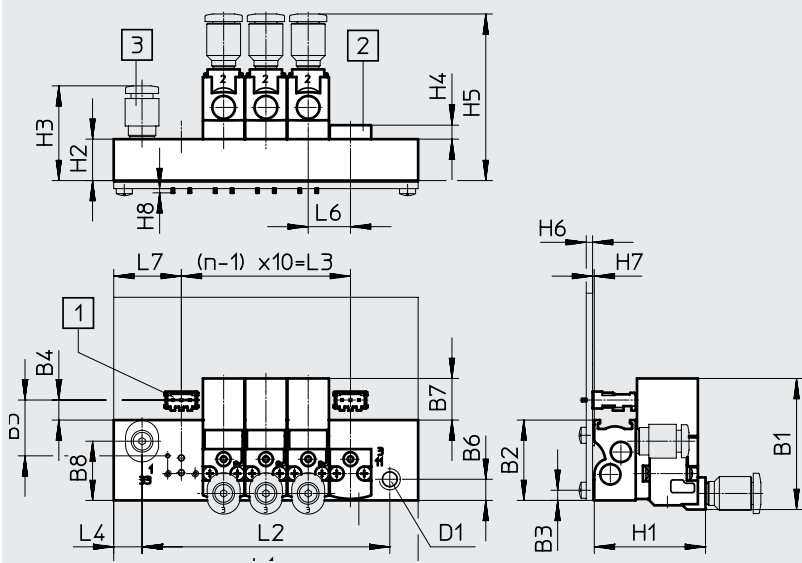
Type	H1	H2	H3	H4	H5	H6	L1	L2	L3
MHP1	31.8	24.2	26.2	21.2	15.3	7.6	11.7	4.8	5

Datasheet

Dimensions – Manifold assembly on PCB

Download CAD data → www.festo.com

3/2-way valve

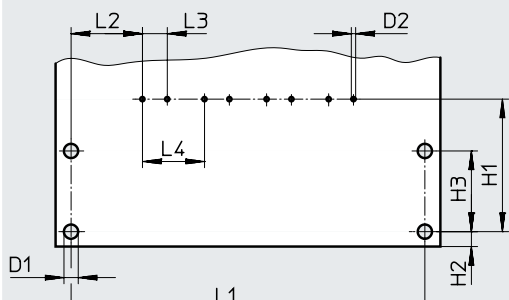



- [1] Soldering base PCBC-A
- [2] Cover plate MHAP1
- [3] Fitting

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

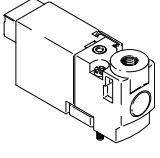
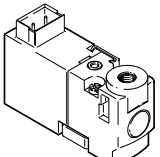
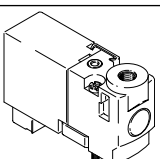



 **Note**
The PCB is not included in the scope of delivery.

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



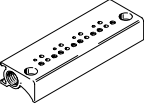
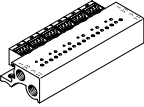
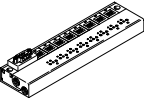
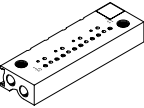


Datasheet


Ordering data		Valve function	Normal position		Part no.	Type
Solenoid valve						
	Plug connection at the 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 types 3/2G and 3/2O must not be mixed on a manifold rail.




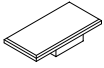
Datasheet

Ordering data			Part no.	Type	
Individual sub-base					
	For valves with plug connection at the 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 the 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
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			
Cover 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 via the modular product system for MH1.


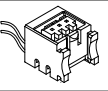
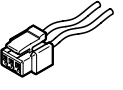
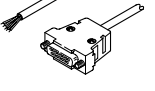
 **Note**
 Valves types 3/2G and 3/2O must not be mixed on a manifold rail.

Datasheet

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.

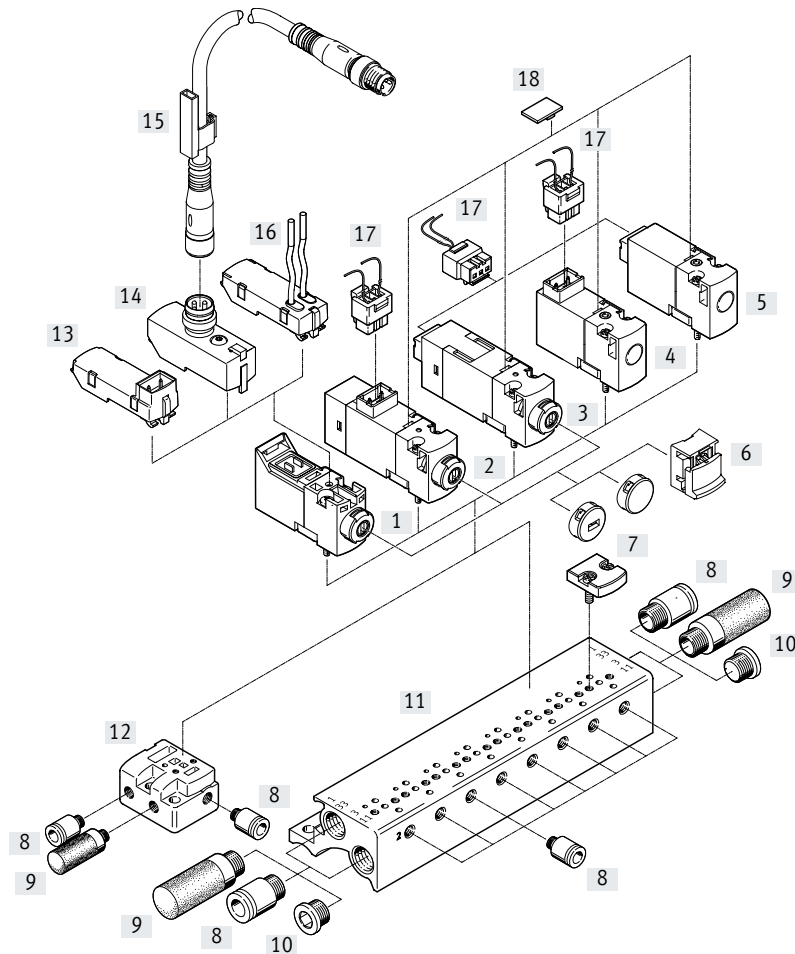
Datasheet

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

1) Packaging unit.

Peripherals overview

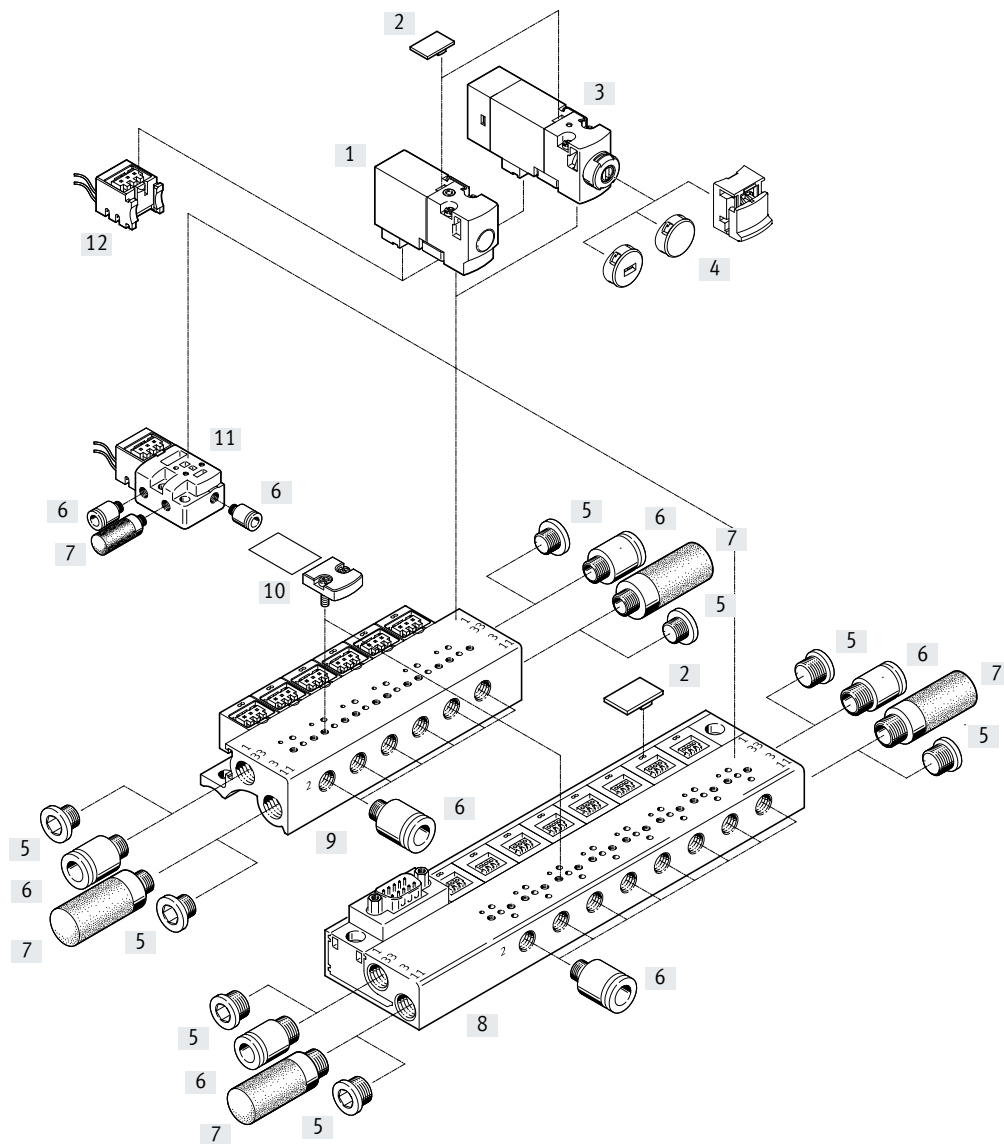
Valves with plug connection at the rear, plug connection on top



Designation	Description	→ Page/Internet
[1] Solenoid valve	Valve without plug connection, with manual override	39
[2] Solenoid valve	Valve with plug connection on top, with LED, with manual override	50
[3] Solenoid valve	Valve with plug connection at the rear, with LED, with manual override	50
[4] Solenoid valve	Valve with plug connection on top, without LED, without manual override	30
[5] Solenoid valve	Valve with plug connection at the rear, without LED, without manual override	30
[6] Cover cap	For manual override	39, 52
[7] Cover plate	For manifold rail without plug bases	32, 39, 52
[8] Push-in fitting	For connecting compressed air tubing with standard O.D.	32, 39, 52
[9] Silencer	For exhaust ports	32, 39, 52
[10] Blanking plug	For sealing unused connections	32, 39, 52
[11] Manifold rail	Without plug bases	31, 38, 51
[12] Individual sub-base	For valves with plug connection at the rear, plug connection on top	31, 38, 51
[13] E-box	Plug connection pattern H/connection pattern S	40
[14] E-box	Plug M8x1	40
[15] Connecting cable	Socket M8x1, 4-pin	41
[16] E-box	Open end	40
[17] Plug socket with cable	Straight socket, plug pattern H, 3-pin	33, 41, 53
[18] Inscription label	For identifying the valve positions	33, 53

Peripherals overview

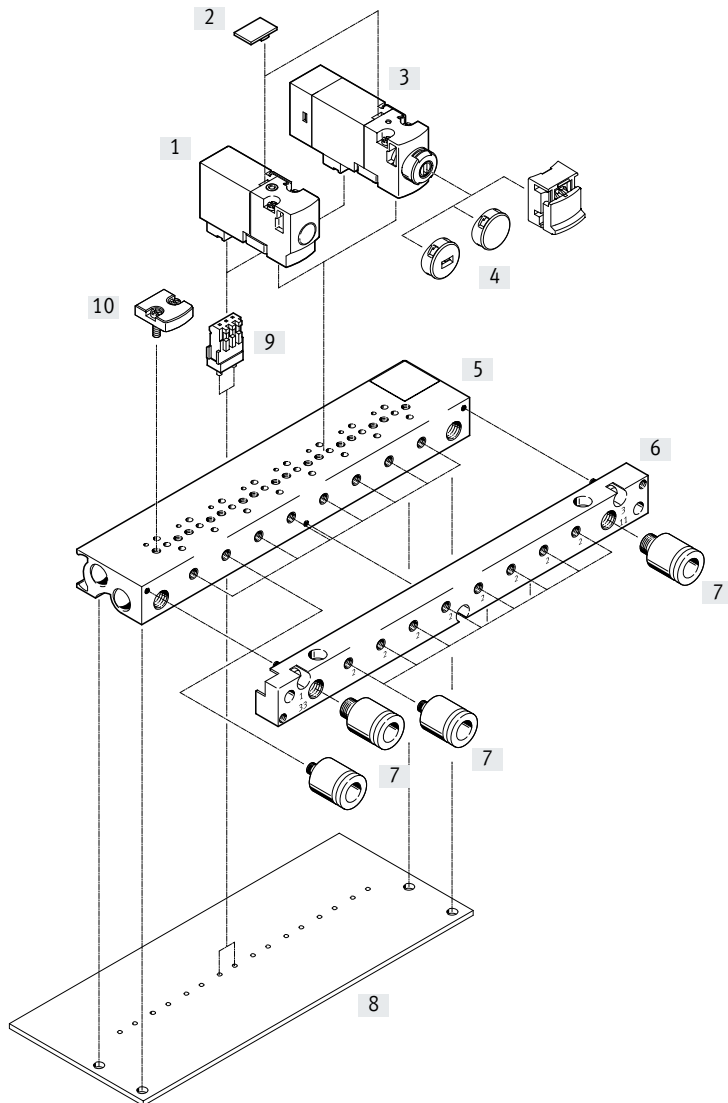
Valves with plug connection underneath



Designation	Description	→ Page/Internet
[1] Solenoid valve	Valve with plug connection underneath, without LED	30
[2] Inscription label	For identifying the valve positions	33, 53
[3] Solenoid valve	Valve with plug connection underneath, with LED	50
[4] Cover cap	For manual override	39, 52
[5] Blanking plug	For sealing unused connections	32, 52
[6] Push-in fitting	For connecting compressed air tubing with standard O.D.	32, 52
[7] Silencer	For exhaust ports	32, 52
[8] Manifold rail	With plug bases	31, 51
[9] Manifold rail	With plug bases and electrical multi-pin plug	31, 51
[10] Cover plate	For manifold rail with plug bases	32, 52
[11] Individual sub-base	For valves with plug connection underneath	31, 51
[12] Plug socket with cable	Straight socket, plug pattern H, 3-pin	33, 53

Peripherals overview

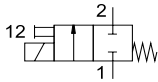
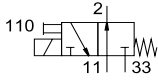
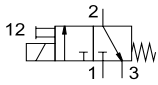
Valves with plug connection underneath, PCB mounting



	Description	→ Page/Internet	
[1]	Solenoid valve	Plug connection underneath, without LED	30
[2]	Inscription label	For identifying the valve positions	33, 53
[3]	Sub-base valve	Plug connection underneath, with LED	50
[4]	Cover cap	For manual override	39, 52
[5]	Manifold rail	Without plug bases for PCB mounting	31, 51
[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.	32, 52
[8]	PCB	Provided by the customer (not included in the scope of delivery)	–
[9]	Soldering base	For plug-in connection, 3-pin	33, 53
[10]	Cover plate	For manifold rail without plug bases	32, 52

Datasheet

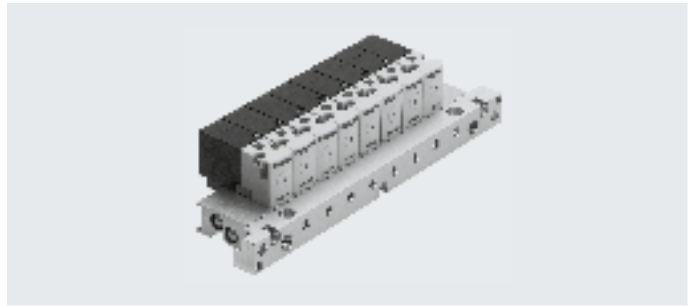
Function



- - 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 Normally closed Single solenoid	3/2-way solenoid valve Normally closed Single solenoid	3/2-way solenoid valve Normally open Single solenoid
Design	Poppet valve with spring return		
Sealing principle	Soft		
Actuation type	Electrical		
Reset method	Mechanical spring		
Type of control	Direct		
Direction of flow	Not reversible		
Suitability for vacuum	Yes	-	-
Exhaust function	Cannot be throttled	Can be throttled	Can be throttled
Manual override	Non-detenting		
Type of mounting	On sub-base via through-hole		
Mounting position	Any		
Nominal width	[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 2 Sub-base 3 - 11 - 33 -	Sub-base Sub-base Sub-base - -	- Sub-base 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 the 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 → page 4

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

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Datasheet

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

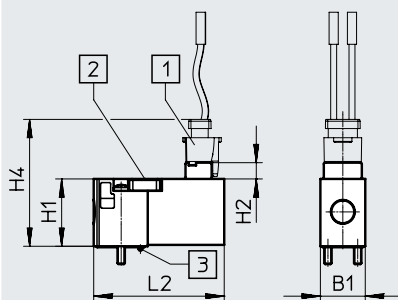
Electrical data		
Operating voltage	[V DC]	5
	[V DC]	12
	[V DC]	24
Permissible voltage fluctuations	[%]	± 10
Connection type		Plug connection
Power consumption	[W]	1
Duty cycle	[%]	100
Degree of protection to EN 60529		IP40

Switching times and frequencies					
Type			MHA1-...-2/2G-...	MHA1-...-3/2G-...	MHA1-...-3/20-...
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

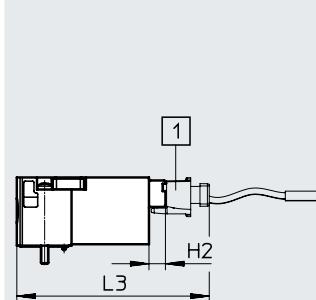
Dimensions

Plug connection on top



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

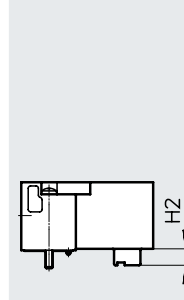
Plug connection at the rear



- [1] Plug socket NEBV-H1G2

Download CAD data → www.festo.com

Plug connection underneath

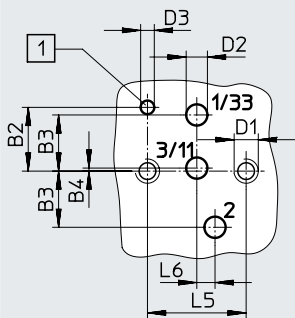


Type	B1	H1	H2	H4	L2	L3
MHA1	9.8	14.7	3.6	27.7	28.5	41.5

Datasheet

Dimensions – Hole pattern on sub-bases

Download CAD data → www.festo.com



[1] Hole for coding pin

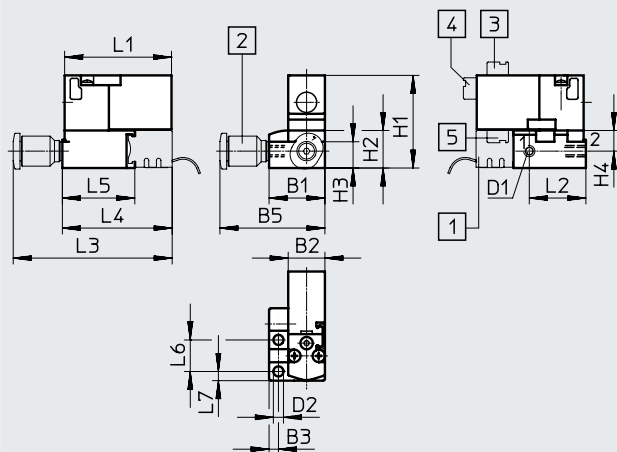
- If used as a 2/2-way valve, normally closed, ports 3/11 are not used.
- If used as a 2/2-way valve, normally open, ports 1/33 are not used.

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

Dimensions – Assembly on individual sub-base

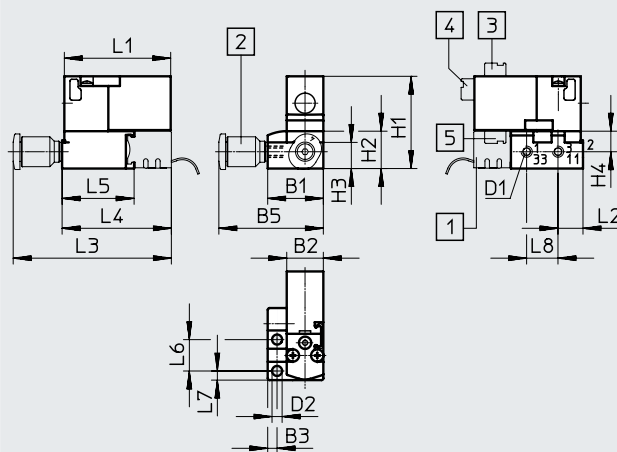
Download CAD data → www.festo.com

2/2-way valve



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

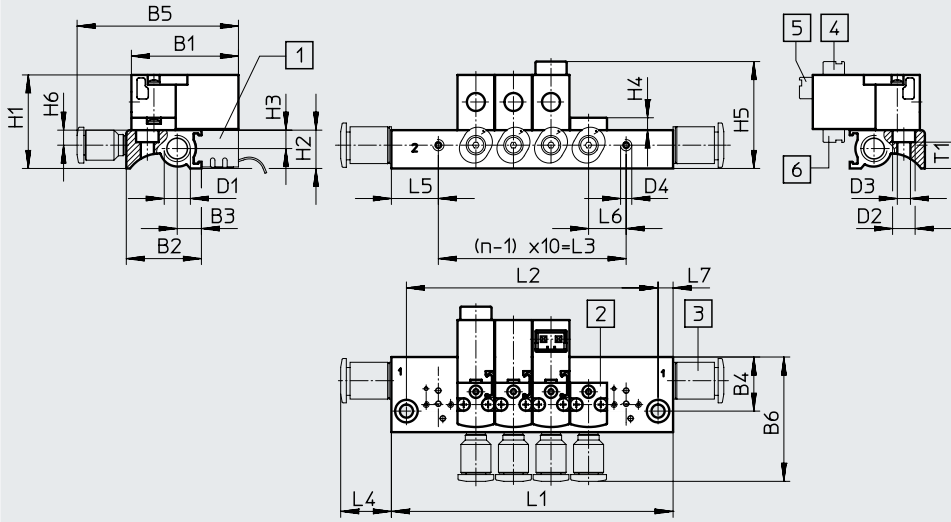
Type	B1	B2	B3	B4	B5	D1	D2	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7	L8
2/2-way valve	14.9	9.8	2.5	14.9	28	M3	2.7	24.7	10	7	5.5	28.5	15.1	42.4	29.3	19.3	8.4	2.5	–
3/2-way valve	14.9	9.8	2.5	14.9	28	M3	2.7	24.7	10	7	5.5	28.5	6.7	42.4	29.3	19.3	8.4	2.5	8.4

Datasheet

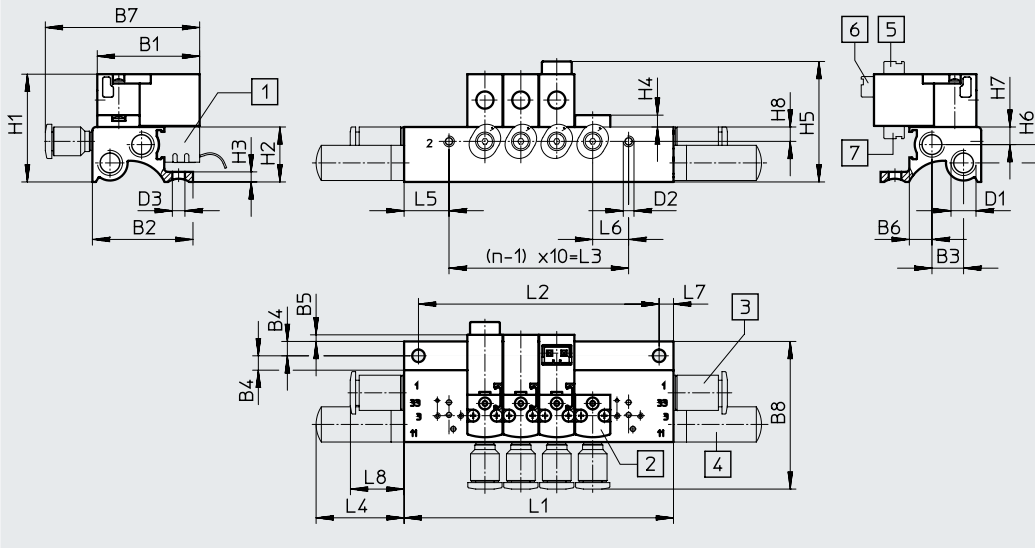
Dimensions – Manifold assembly

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

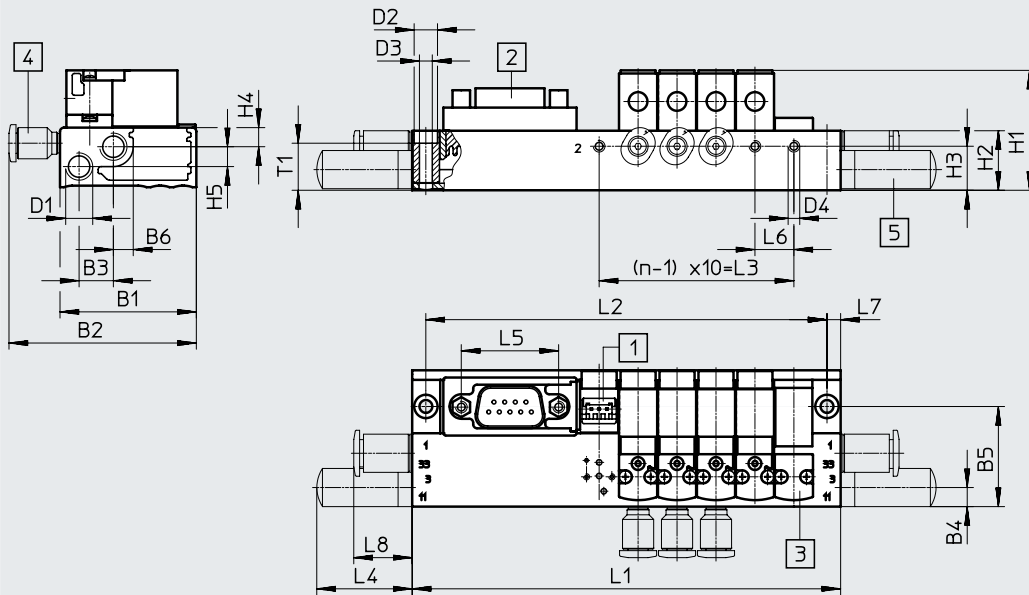
Valve positions n	L1 ±0.15	L2 ±0.1	L3
16	175	167	150
17	185	177	160
18	195	187	170
19	205	197	180
20	215	207	190
21	225	217	200
22	235	227	210

Datasheet

Dimensions – Manifold assembly with electrical multi-pin plug

Download CAD data → www.festo.com

3/2-way valve



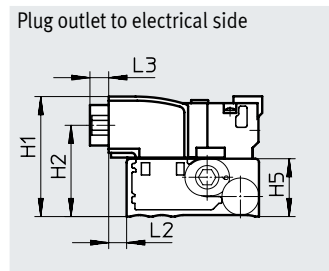
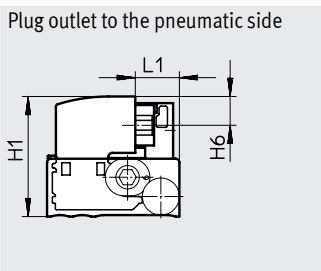
- [1] Plug base MHAP-PI
- [2] Sub-D plug, plug outlet on top (standard)
- [3] Cover plate MHAP1
- [4] Fitting
- [5] Silencer

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



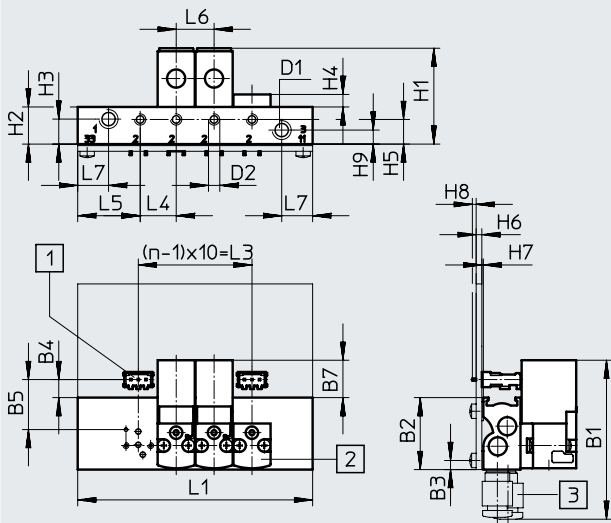
Type	H1	H2	H3	H4	H5	H6	L1	L2	L3
MHA1	31.8	24.2	26.2	21.2	15.3	7.6	11.7	4.8	5

Datasheet

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] Cover 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

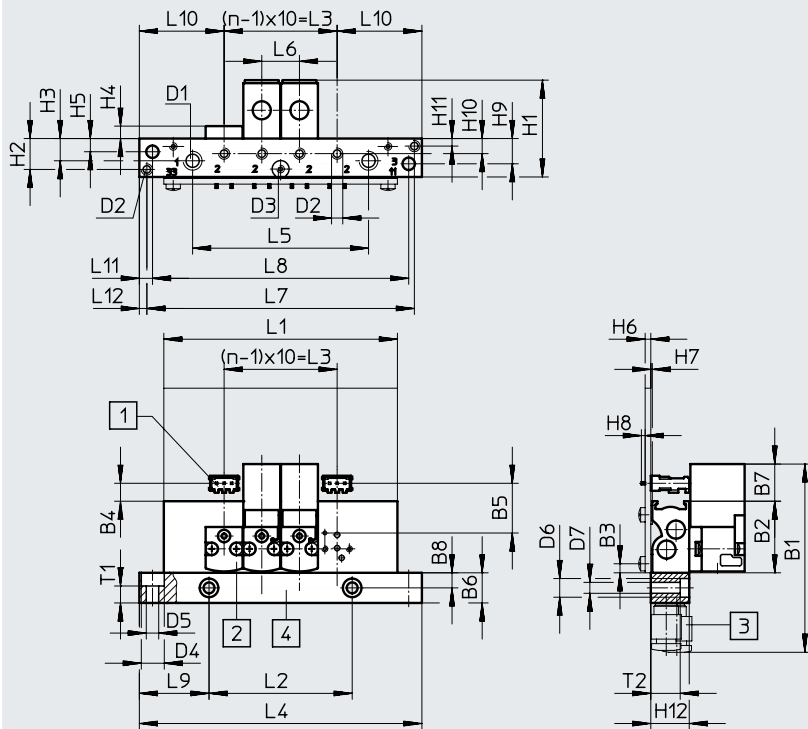
Valve positions n	L1	L3
	±0.15	
2	42	10
4	62	30
6	82	50
8	102	70
10	122	90

Datasheet

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] Cover 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	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

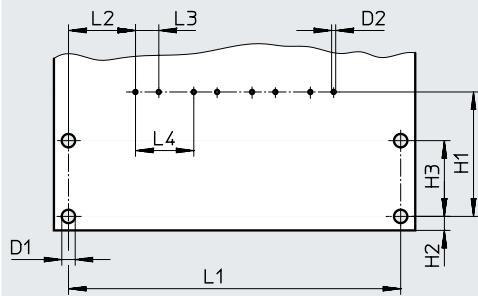
Valve positions n	L1 ±0.15	L2 ±0.1	L3	L4 ±0.2	L5 ±0.15	L7 ±0.1	L8
4	62	38	30	75	46.7	71	68
6	82	58	50	95	66.7	91	88
8	102	78	70	115	86.7	111	108
10	122	98	90	135	106.7	131	128

Datasheet

Dimensions – Manifold assembly on PCB

Download CAD data → www.festo.com

Hole pattern on PCB



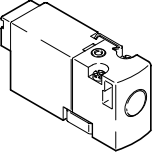
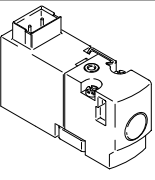
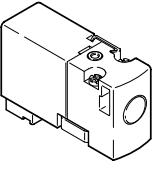
Note


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



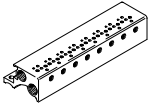
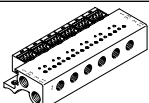
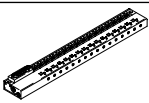
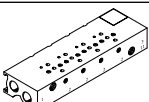
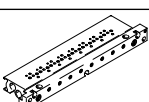
Valve positions n	L1 ±0.1
2	37
4	57
6	77
8	97
10	117


Datasheet

Ordering data		Valve function	Normal position		Part no.	Type
Solenoid valve						
	Plug connection at the 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 types 3/2G and 3/2O must not be mixed on a manifold rail.

Datasheet

Ordering data				Part no.	Type
Individual sub-base					
	For valves with plug connection at the 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 the 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 via the modular product system for MH1.

 - **Note**

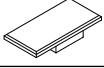
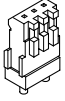
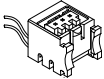
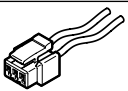
Valves types 3/2G and 3/2O must not be mixed on a manifold rail.

Datasheet

Ordering data				Part no.	Type	PJ ¹⁾
Cover plate for manifold rail						
	For manifold rail for valves with plug connection at the rear or on top			197257	MHAP1-BP-3	1
	For manifold rail with plug bases for 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	Polymer 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.

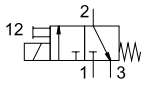
Datasheet

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 Plug pattern H 3-pin	2x flying leads Open end 1-wire	0.5 m	566654	NEBV-H1G2-KN-0.5-N-LE2	1
			1 m	566655	NEBV-H1G2-KN-1-N-LE2	1
			2.5 m	566656	NEBV-H1G2-KN-2.5-N-LE2	1
			5 m	566657	NEBV-H1G2-KN-5-N-LE2	1

1) Packaging unit.

Datasheet

Function



Voltage

5 V DC

12 V DC

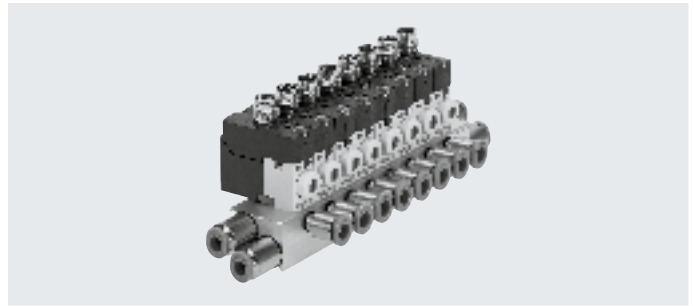
24 V DC

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	Electrical	
Reset method	Mechanical spring	
Type of control	Direct	
Direction of flow	Not reversible	
Exhaust function	Can be throttled	
Manual override	Non-detenting/detenting	
Signal status indication	-	
Type of mounting	On sub-base via through-hole	
Mounting position	Any	
Nominal width	[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 the 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
Temperature of medium	[°C]	-5 ... +50	-5 ... +50	-5 ... +50
Restricted ambient temperature and temperature of medium	[°C]	-	-	-5 ... +40
			Without holding current reduction	-
Storage temperature	[°C]	-20 ... +60	-20 ... +60	-20 ... +60
Corrosion resistance class CRC ²⁾		2	2	2

1) Vacuum operation possible with special connection method → page 4

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

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Datasheet

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

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

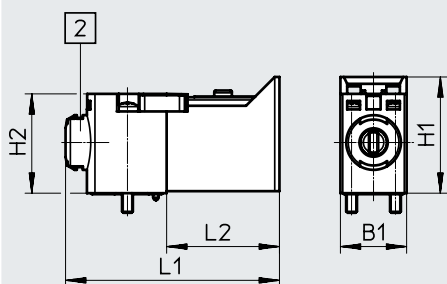
Switching times and frequencies					
Type		MHA1-M4R...	MHA1-M5R...	MHA1-M1R...	MHA1-M1AR...
Switching time	On	[ms]	5	5	5
	Off	[ms]	5	5	10
Maximum switching frequency		[Hz]	10	10	10

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

Dimensions

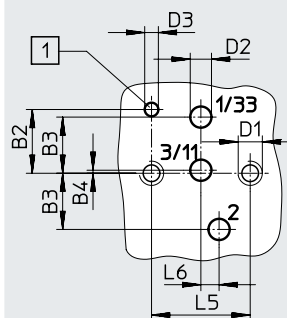
Download CAD data → www.festo.com

Valve



[2] Manual override

Hole pattern on sub-bases



[1] Hole for coding pin

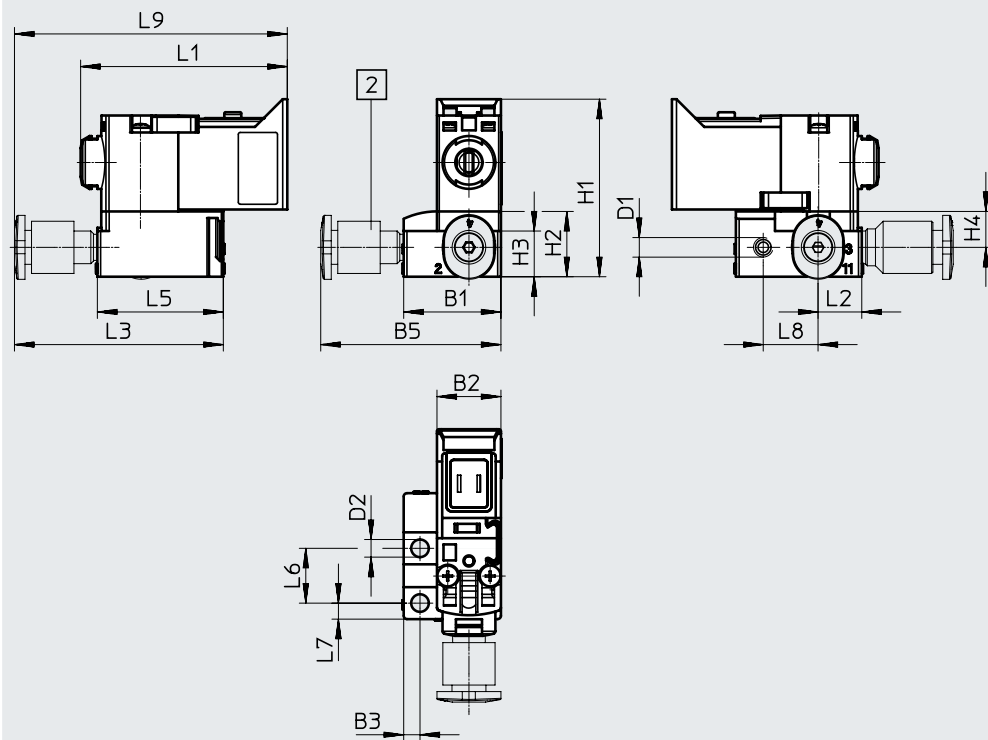
- If used as a 2/2-way valve, normally closed, ports 3/11 are not used.
- If used as a 2/2-way valve, normally open, ports 1/33 are not used.

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

Datasheet

Dimensions – Assembly on individual sub-base

Download CAD data → www.festo.com

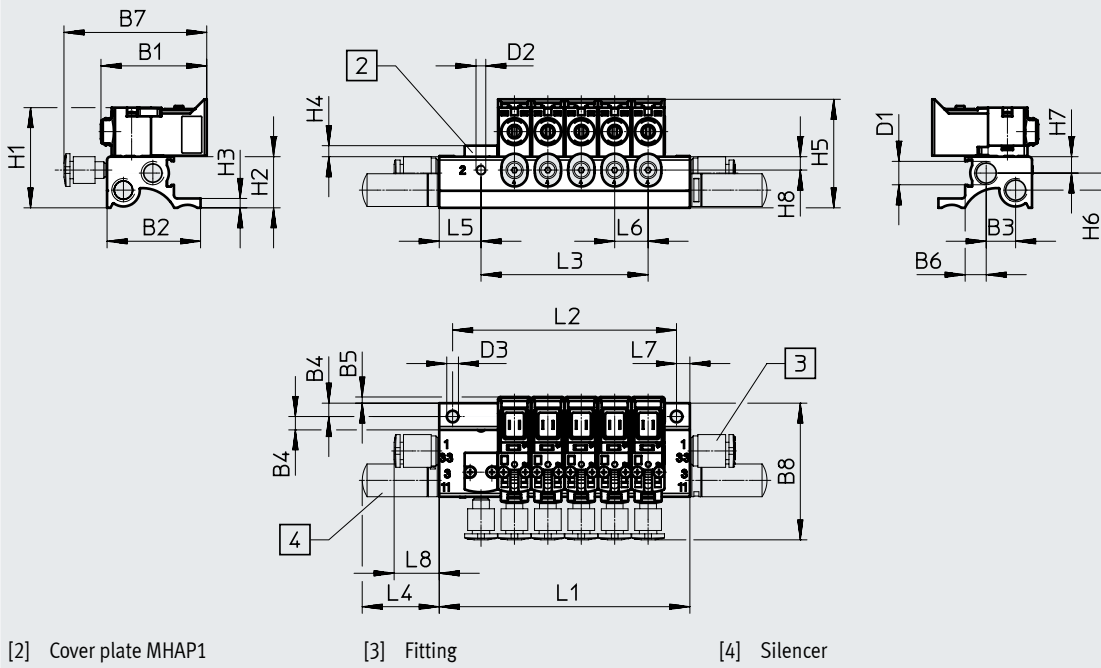


Type	B1	B2	B3	B5	D1	D2	H1	H2	H3	H4	L1	L2	L3	L5	L6	L7	L8	L9
3/2-way valve	14.9	9.8	2.5	27.6	M3	2.7	27.2	10	7	5.5	31.7	6.7	32	19.3	8.4	2.5	8.4	42

Datasheet

Dimensions – Manifold assembly

Download CAD data → www.festo.com



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

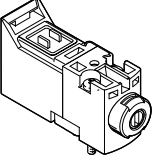

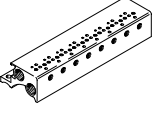
Type	H1	H2	H3	H4	H5	H6	H7	H8	L4	L5	L6	L7	L8
3/2-way valve	30	15.3	2.8	3.3	32.5	5.1	4.9	4	23.1	12.5	10	4	13.5


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

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

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








Datasheet

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**






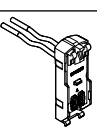

Manifold rails with an uneven number of valves and for 11 ... 24 valves as well as further variants can be configured and ordered online via the modular product system for MH1.

Datasheet

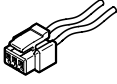
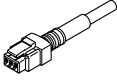
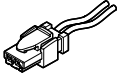
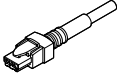
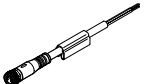

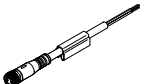
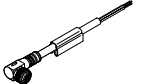
Ordering data				Part no.	Type	PU ¹⁾
Cover plate for manifold rail						
	Vacant valve positions must be sealed with a cover plate			197257	MHAP1-BP-3	1
Cover cap for manual override						
	Function covered The cover cap protects the manual override against accidental actuation.			540898	VMPA-HBV-B	10
	Function non-detenting The cover cap prevents the manual override from latching.			540897	VMPA-HBF-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.

Datasheet

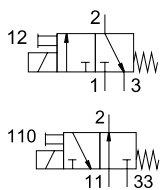
Ordering data											
Design type	Electrical connection	Contacts	Cable length [m]	Nominal operating voltage [V DC]	Holding current reduction	Part no.	Type				
E-box with protective circuit											
	Plug connection pattern H, angled	2-pin	-	1 2/24	-	566714	VAVE-L1-1VH2-LP				
				24	■	566716	VAVE-L1-1H2-LR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

Datasheet

Ordering data					
	Electrical connection 1	Electrical connection 2	Length	Part no.	Type
Plug socket with cable for plug connection pattern H					Datasheets → Internet: nebv
	Straight socket Plug 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 Plug 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					Datasheets → Internet: nebv
	Straight socket Connection pattern S 2-pin	2x flying leads Open end 1-wire	0.5 m	566662	NEBV-HSG2-KN-0.5-N-LE2
			1 m	566663	NEBV-HSG2-KN-1-N-LE2
			2.5 m	566664	NEBV-HSG2-KN-2.5-N-LE2
			5 m	566665	NEBV-HSG2-KN-5-N-LE2
	Straight socket Connection pattern S 2-pin	Cable Open end 2-wire	0.5 m	566666	NEBV-HSG2-P-0.5-N-LE2
			1 m	566667	NEBV-HSG2-P-1-N-LE2
			2.5 m	566668	NEBV-HSG2-P-2.5-N-LE2
			5 m	566669	NEBV-HSG2-P-5-N-LE2
Connecting cable for plug M8x1					Datasheets → Internet: nebu
4-pin					Datasheets → 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					Datasheets → 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

Datasheet

Function



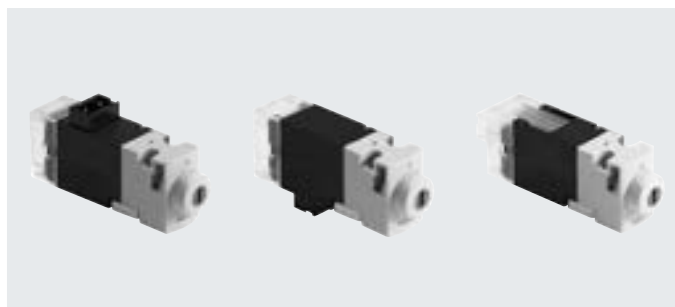
Voltage
24 V DC



Pressure
0 ... +8 bar



Temperature range
-5 ... +50°C



General technical data

Type	MHA1-M1LH-...-3/2G-...	MHA1-M1LH-...-3/2O-...
Valve function	3/2-way solenoid valve Normally closed Single solenoid	3/2-way solenoid valve Normally open Single solenoid
Design	Poppet valve with spring return	
Sealing principle	Soft	
Actuation type	Electrical	
Reset method	Mechanical spring	
Type of control	Direct	
Direction of flow	Not reversible	
Exhaust function	Can be throttled	
Manual override	Non-detenting/detenting	
Signal status indication	LED	
Type of mounting	On sub-base via through-hole	
Mounting position	Any	
Nominal width [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 3 Sub-base 11 - 33 -	- Sub-base - Sub-base 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 the 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 → page 4

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

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Datasheet

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

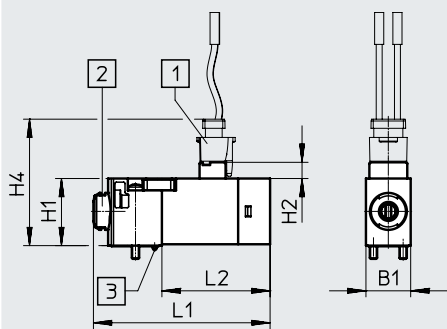
Electrical data		
Operating voltage	[V DC]	24
Permissible voltage fluctuations	[%]	±10
Connection type		Plug connection
Power consumption	[W]	1.1
Duty cycle	[%]	100
Degree of protection to EN 60529		IP40

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

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

Dimensions

Plug connection on top

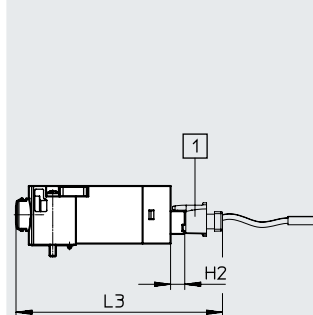


[1] Plug socket NEBV-H1G2

[2] Manual override

[3] Coding pin

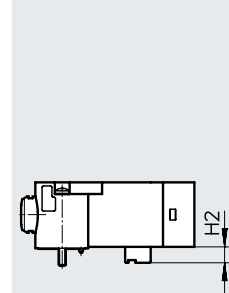
Plug connection at the rear



[1] Plug socket NEBV-H1G2

Download CAD data → www.festo.com

Plug connection underneath

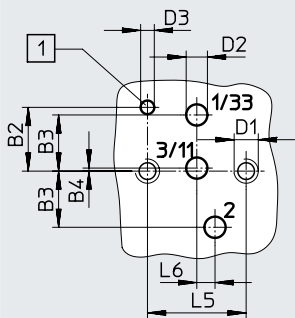


Type	B1	H1	H2	H4	L1	L2	L3
MHA1	9.8	14.7	3.6	27.7	38.7	23.7	51.7

Datasheet

Dimensions – Hole pattern on sub-bases

Download CAD data → www.festo.com



[1] Hole for coding pin

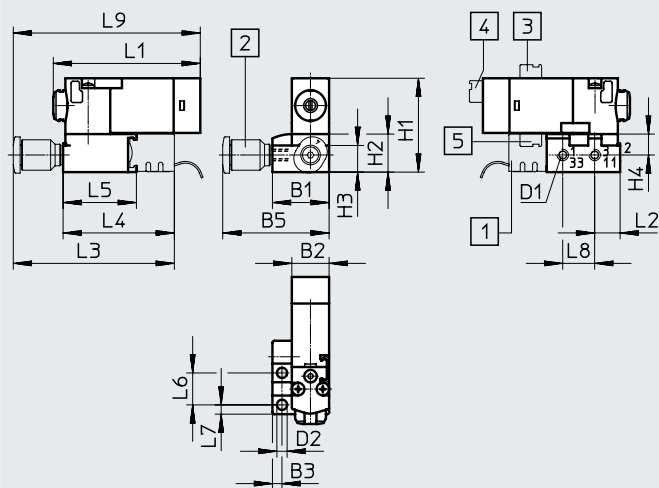
- If used as a 2/2-way valve, normally closed, ports 3/11 are not used.
- If used as a 2/2-way valve, normally open, ports 1/33 are not used.

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

Dimensions – Assembly on individual sub-base

Download CAD data → www.festo.com

3/2-way valve



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

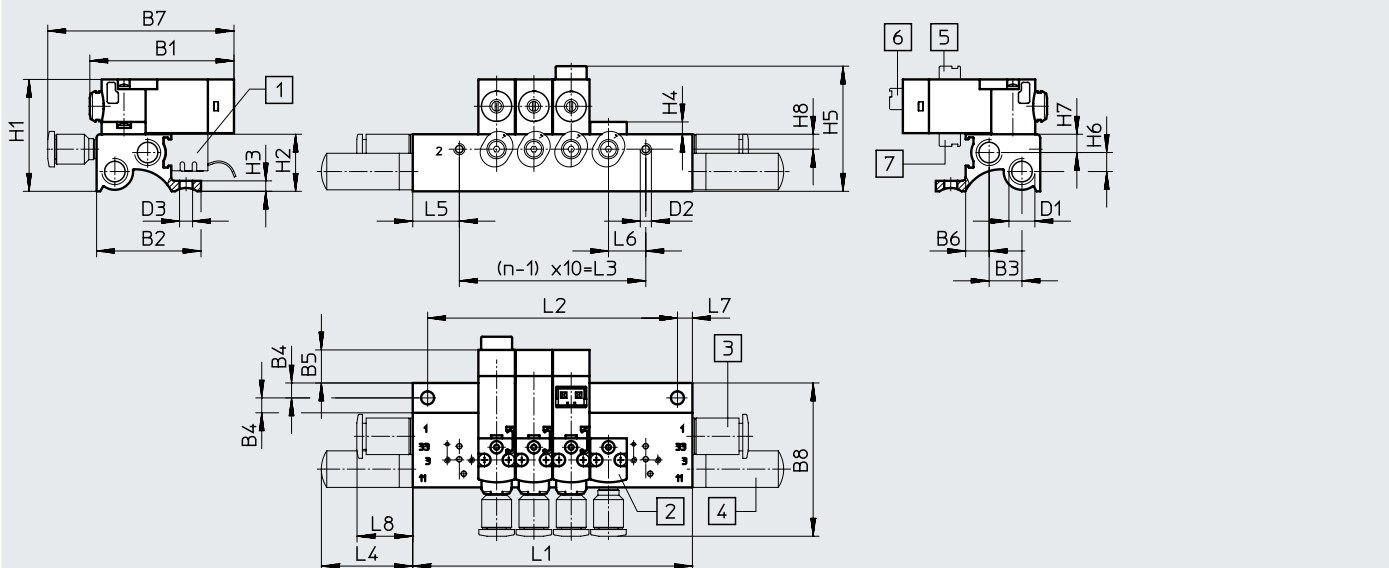
Type	B1	B2	B3	B5	D1	D2	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7	L8	L9
3/2-way valve	14.9	9.8	2.5	28	M3	2.7	24.7	10	7	5.5	38.7	6.7	43.1	29.1	19.3	8.4	2.5	8.4	50.1

Datasheet

Dimensions – Manifold assembly

Download CAD data → www.festo.com

3/2-way valve



- [1] Plug base MHAP-PI
- [2] Cover plate MHAP1
- [3] Fitting
- [4] Silencer
- [5] Plug connection on top
- [6] Plug connection at the 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	L2	L3
	±0.15	±0.1	
2	35	27	10
3	45	37	20
4	55	47	30
5	65	57	40
6	75	67	50
7	85	77	60
8	95	87	70

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

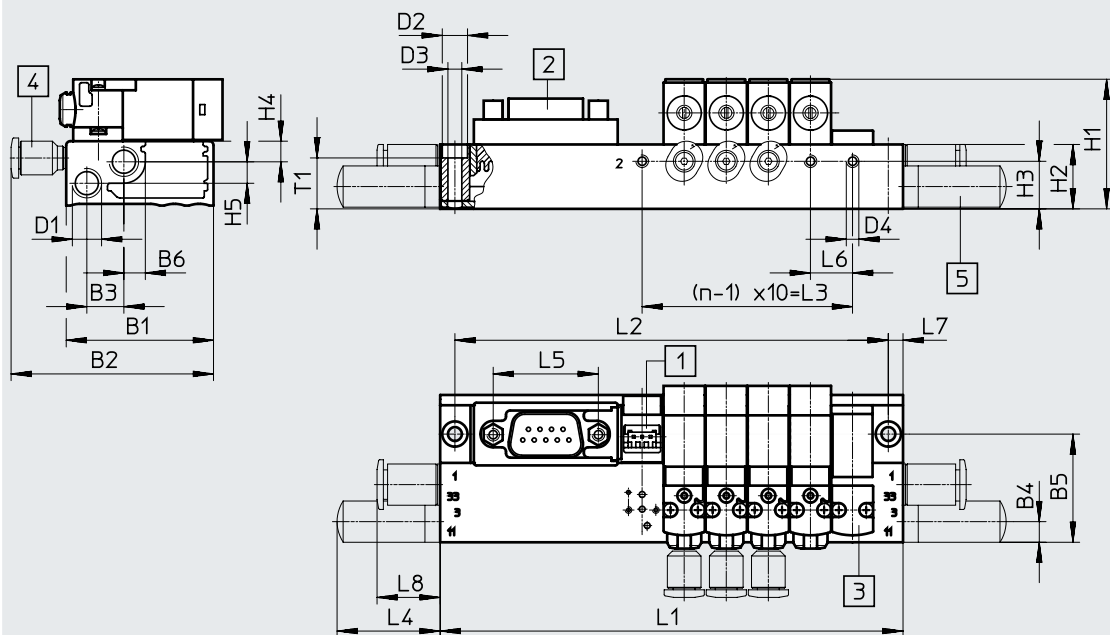
Valve positions n	L1	L2	L3
	±0.15	±0.1	
16	175	167	150
17	185	177	160
18	195	187	170
19	205	197	180
20	215	207	190
21	225	217	200
22	235	227	210

Datasheet

Dimensions – Manifold assembly with electrical multi-pin plug

Download CAD data → www.festo.com

3/2-way valve



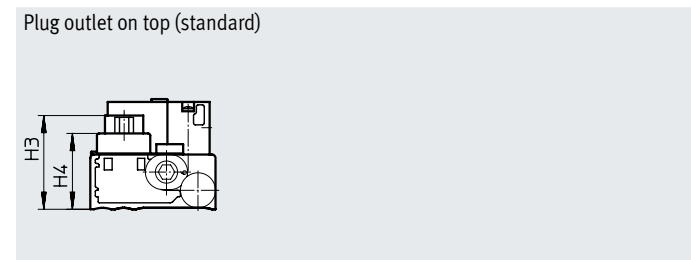
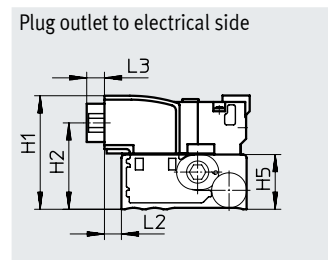
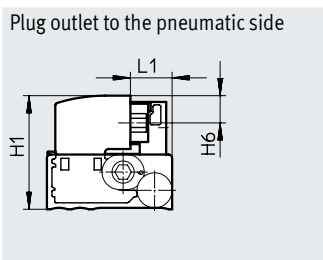
- [1] Plug base MHAP-PI
- [2] Sub-D plug, plug outlet on top (standard)
- [3] Cover plate MHAP1
- [4] Fitting
- [5] Silencer

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



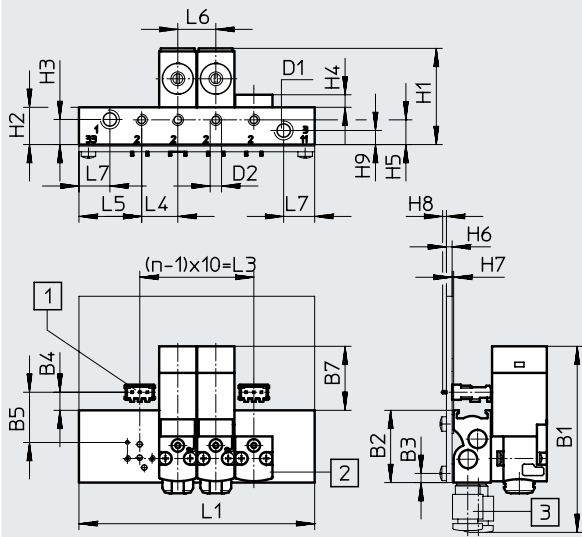
Type	H1	H2	H3	H4	H5	H6	L1	L2	L3
MHA1	31.8	24.2	26.2	21.2	15.3	7.6	11.7	4.8	5

Datasheet

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] Cover 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

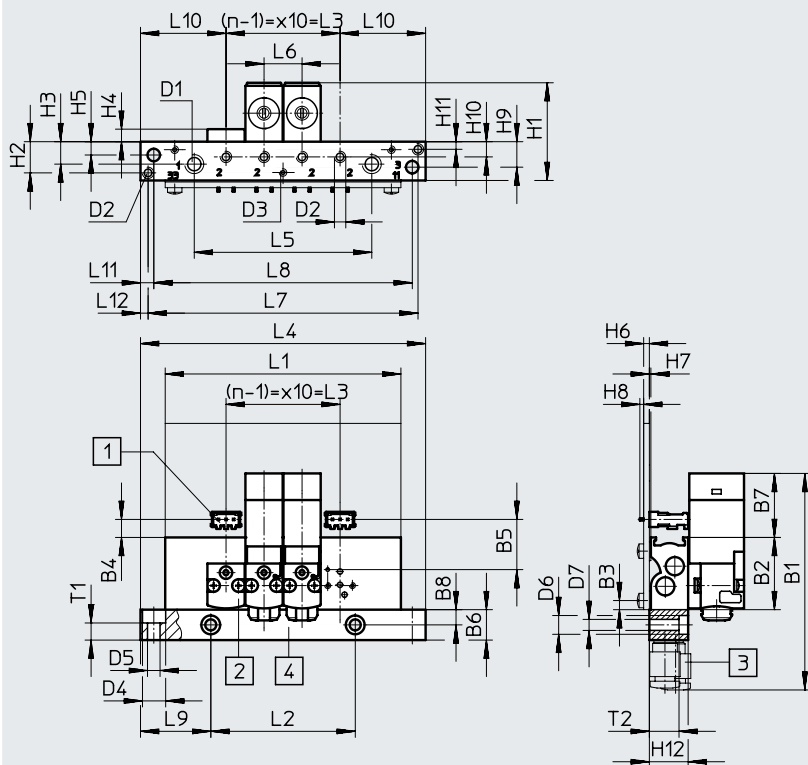
Valve positions n	L1 ±0.15	L3
2	42	10
4	62	30
6	82	50
8	102	70
10	122	90

Datasheet

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] Cover 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

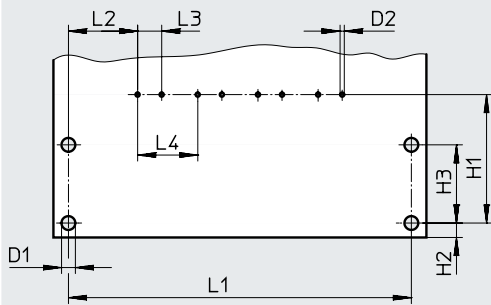
Valve positions n	L1 ±0.15	L2 ±0.1	L3	L4 ±0.2	L5 ±0.15	L7 ±0.1	L8
4	62	38	30	75	46.7	71	68
6	82	58	50	95	66.7	91	88
8	102	78	70	115	86.7	111	108
10	122	98	90	135	106.7	131	128

Datasheet

Dimensions – Manifold assembly on PCB

Download CAD data → www.festo.com

Hole pattern on PCB

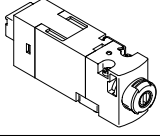
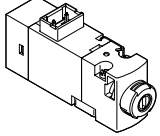
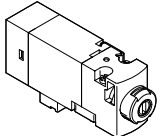



Note
The PCB is not included in the scope of delivery.

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



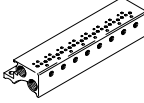
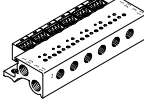
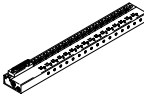
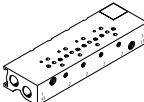
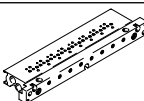
Valve positions n	L1 ±0.1
2	37
4	57
6	77
8	97
10	117


Datasheet

Ordering data		Valve function	Normal position		Part no.	Type
Solenoid valve						
	Plug connection at the 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-3/20-0.6-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-3/20-0.6-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-3/20-0.6-PI

 **Note**
Valves types 3/2G and 3/20 must not be mixed on a manifold rail.

Datasheet

Ordering data				Part no.	Type
Individual sub-base					
	For valves with plug connection at the 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 the 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
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 via the modular product system for MH1.

 - **Note**

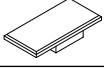

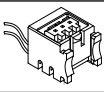
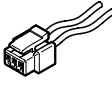
Valves types 3/2G and 3/2O must not be mixed on a manifold rail.

Datasheet

Ordering data			Part no.	Type	PJ ¹⁾	
Cover plate for manifold rail						
	For manifold rail for valves with plug connection at the rear or on top		197257	MHAP1-BP-3	1	
	For manifold rail with plug bases for 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 the manual override from latching.		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	Polymer 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.

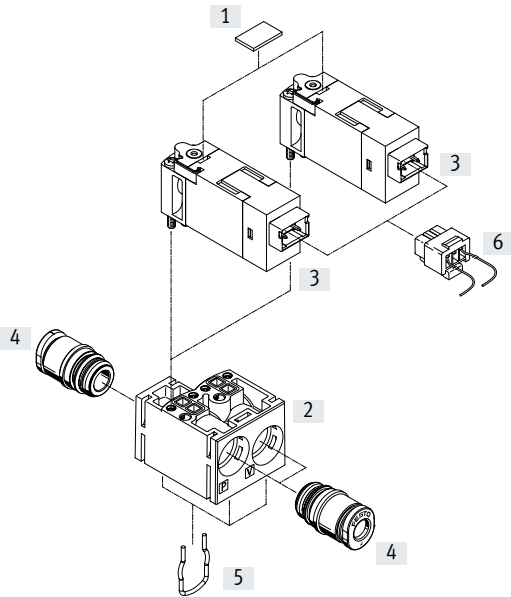
Datasheet

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 Plug pattern H 3-pin	2x flying leads Open end 1-wire	0.5 m	566654	NEBV-H1G2-KN-0.5-N-LE2	1
			1 m	566655	NEBV-H1G2-KN-1-N-LE2	1
			2.5 m	566656	NEBV-H1G2-KN-2.5-N-LE2	1
			5 m	566657	NEBV-H1G2-KN-5-N-LE2	1

1) Packaging unit.

Peripherals overview

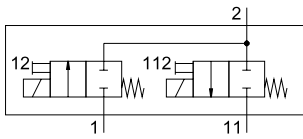
2x2/2-way sub-base valve with LED






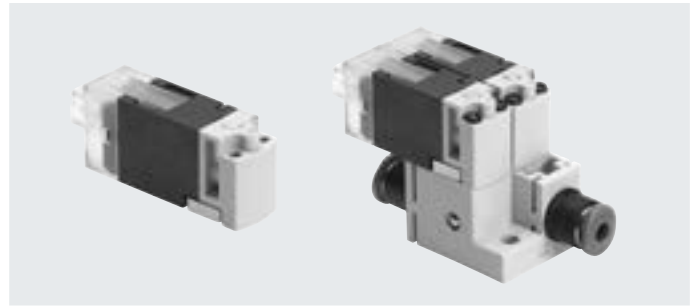
Designation	Description	→ Page/Internet
[1] Inscription label	For identifying the valve positions	57
[2] Sub-base	Included in the scope of delivery	-
[3] Solenoid valve	2/2-way valve, normally closed	57
[4] Push-in cartridge	Included in the scope of delivery	57
[5] Clip	Included in the scope of delivery	-
[6] Plug socket with cable	Straight socket, plug pattern H, 3-pin	57

Datasheet

Function



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



General technical data		2/2-way	2x2/2-way, single solenoid
Valve function			
Design		Poppet valve with spring return	
Sealing principle		Soft	
Actuation type		Electrical	
Reset method		Mechanical spring	
Type of control		Direct	
Direction of flow		Not reversible	
Suitability for vacuum		Yes	
Exhaust function		Cannot be throttled	
Manual override		Non-detenting	
Signal status indication		LED	
Type of mounting		On sub-base via through-hole	Via through-hole
Mounting position		Any	
Nominal width	[mm]	1.5	
Standard nominal flow rate	[l/min]	30	
Width	[mm]	10	20
Grid dimension	[mm]	10	
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 the 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)		To EU EMC Directive ²⁾	

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

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/mh1 → Support/Downloads.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Datasheet

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

Electrical data	
Operating voltage	[V DC] 24 ±10%
Connection type	Plug connection
Power consumption	[W] 3, following current reduction 0.7
Duty cycle	[%] 100
Max. cable length	[m] 30

Degree of protection to EN 60529	
With plug socket NEBV-H1G2	IP40

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

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

Dimensions Download CAD data → www.festo.com

2/2-way valve

[1] Plug socket NEBV-H1G2 [3] Coding pin


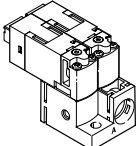
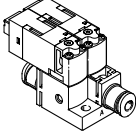


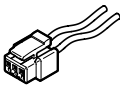
2x2/2-way valve

[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	-	-	-	-	-	-	14.7	3.6	-	-	-	-	-	31.8	23.7	44.8	-	-	-
2x2/2-way valve	20	14.9	5	15	13	3.4	2	30.7	26	5.9	8	16	9.7	7.5	41.8	9.2	23.8	20.6	16.3	1

1) Packaging unit.

Datasheet

Ordering data		Weight [g]	Pneumatic connection	Part no.	Type	
2/2-way solenoid valve						
	Plug connection at the rear	10	Via sub-base	557864	MHA1-M1LCH-2/2G-1.5-HC	
2x2/2-way solenoid valve on sub-base						
	Plug connection at the rear	26.3	Connection for 10 mm cartridge	563365	MHA1-2X2/2G-1.5	
	Plug connection at the 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	PJ ¹⁾
Push-in fittings						
	10 mm cartridge	Polymer	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 Plug pattern H 3-pin	2x flying leads Open end 1-wire	0.5 m	566654	NEBV-H1G2-KN-0.5-N-LE2	1
			1 m	566655	NEBV-H1G2-KN-1-N-LE2	1
			2.5 m	566656	NEBV-H1G2-KN-2.5-N-LE2	1
			5 m	566657	NEBV-H1G2-KN-5-N-LE2	1

1) Packaging unit.