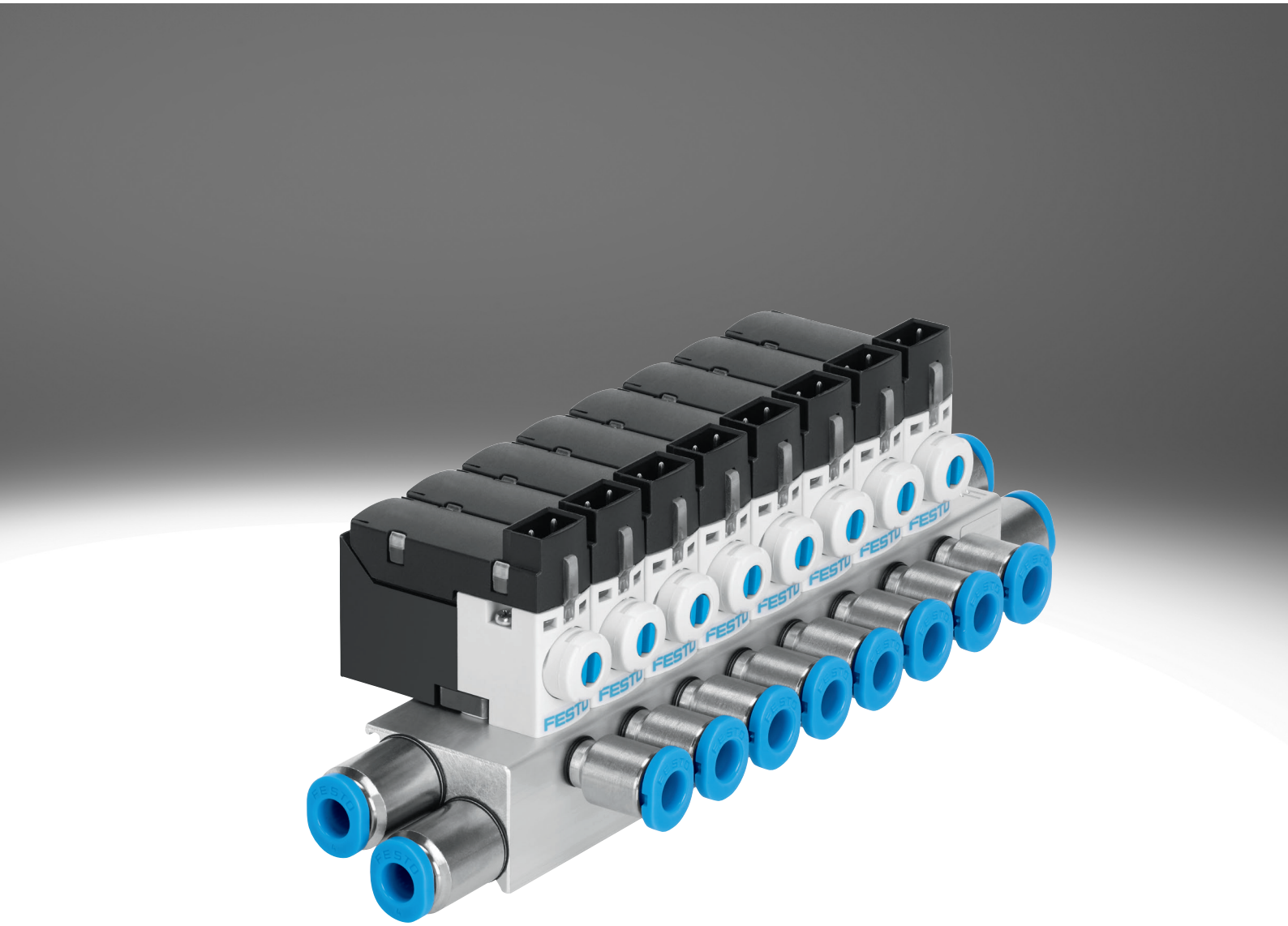
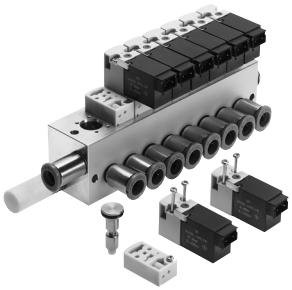
Solenoid valves MH1, miniature



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, it is compact to mount using a PR manifold rail. For increased requirements and speed, the bigger MH2 with a flow rate of up to 100 l/min is the ideal solution.

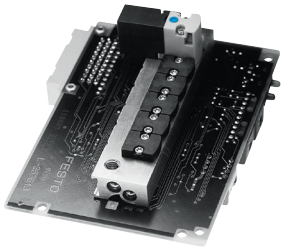
Extremely versatile and fast

The miniature valves can be linked via a pneumatic multiple connector plate and an electrical multi-pin plug. There is also a choice between having electrical connections horizontally, 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 manufacturing and processing 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

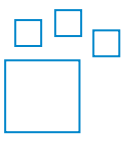


They can also be used in the light assembly, medical technology and semiconductor industries and wherever extremely compact and fast-switching valves or pilot valves are required for valves coming into contact with media (e.g. process industry).

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 the 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.

Ordering data – Product options



Configurable product
This product and all its product options can be ordered using the configurator.

The configurator can be found at
➔ **www.festo.com/catalogue/...**
Enter the part number or the type.

Part no.	Type
197334	MH1

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 must 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) is via port 1
- Normally open with vacuum operation

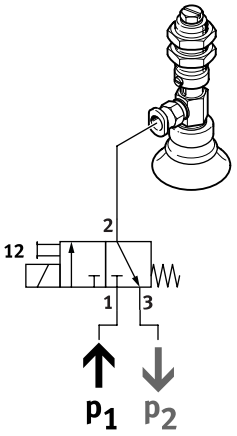
3/2-way valve

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

2x2/2-way valve

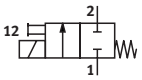
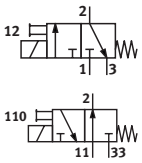
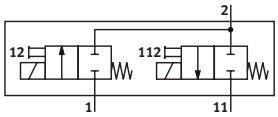
- Vacuum operation is realised by connecting vacuum at port 11
- The ejector pulse is connected at port 1

Example

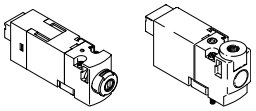
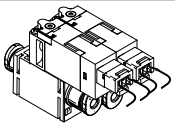
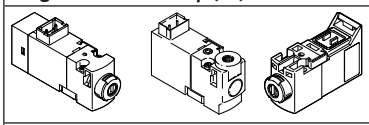
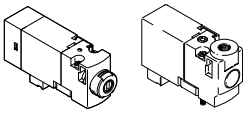


With the 3/2-way valve, normally closed, vacuum operation is realised by connecting the vacuum (P2) to port 3 and connecting e.g. a silencer for exhausting (P1) to port 1.
This changes the normal position from "closed" to "open".

Product range overview

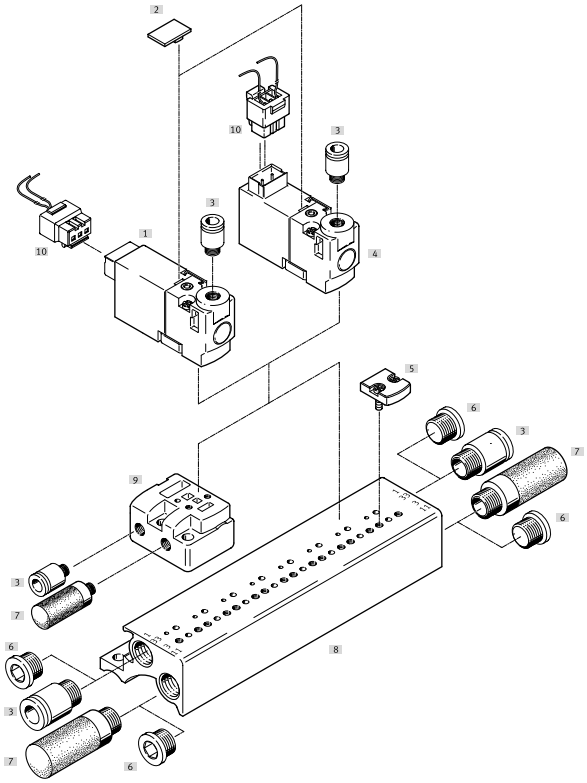
Function	Circuit symbol	Version	Operating voltage			→ Page/Internet
			5 V DC	12 V DC	24 V DC	
2/2-way valve		**Standard nominal flow rate 14 l/min**				
		Semi-in-line valve	■	■	■	13
		Sub-base valve without LED	■	■	■	23
		Standard nominal flow rate 30 l/min, controls vacuum or ejector pulse				
		Sub-base valve with LED	–	–	■	56
3/2-way valve[1]		**Standard nominal flow rate 10 l/min**				
		Semi-in-line valve	■	■	■	13
		Sub-base valve without LED	■	■	■	23
		Sub-base valve with E-box	■	■	■	35
		Sub-base valve with LED	–	–	■	43
2x2/2-way valve		**Standard nominal flow rate 30 l/min, controls vacuum and ejector pulse**				
		Sub-base valve with LED	–	–	■	56

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

Mounting options					
Design		Semi-in-line valve	Sub-base valve		
Electrical connection		Without LED	Without LED	With E-box	With LED
Plug connection at 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 circuit board with soldering bases	■	■	–	■
	Manifold assembly on circuit board with soldering bases and pneumatic multiple connector plate	–	■	–	■

Peripherals overview

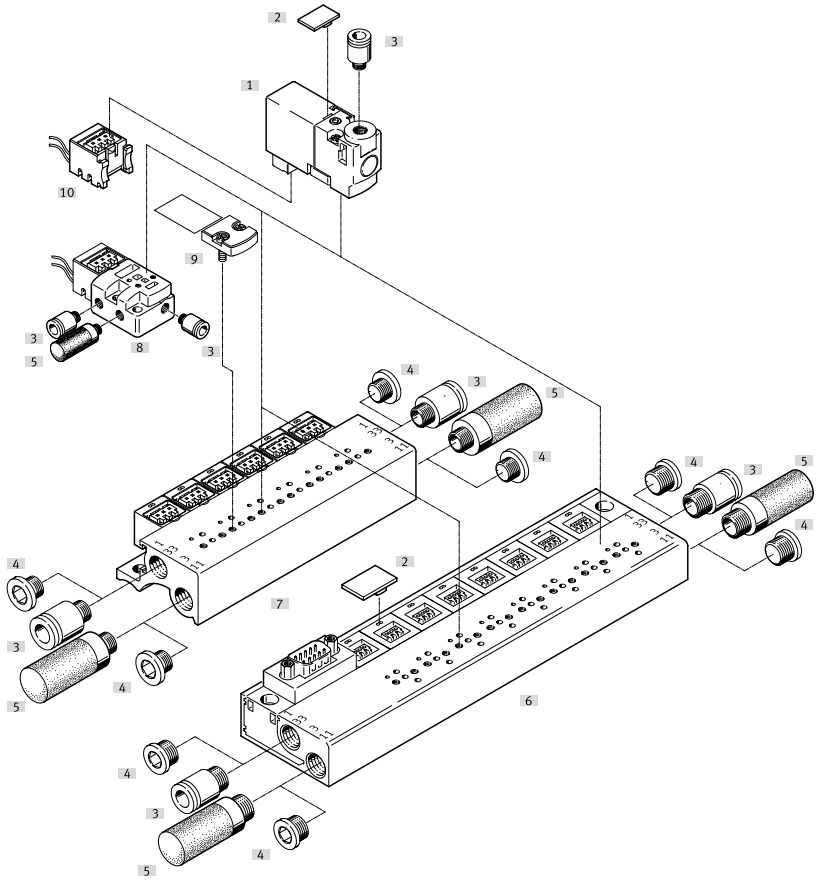
Semi in-line valve with plug connection at the rear, plug connection on top



Designation		Description	→ Page/Internet
[1]	Solenoid valve	Valve with plug connection at the rear	19
[2]	Inscription labels	For identifying the valve positions	21
[3]	Push-in fitting	For connecting compressed air tubing with standard O.D.	21
[4]	Solenoid valve	Valve with plug connection on top	19
[5]	Cover plate	For manifold rail without plug bases	20
[6]	Blanking plug	For sealing ports that are not required	21
[7]	Silencer	For exhaust ports	21
[8]	Manifold rail	Without plug bases	20
[9]	Individual sub-base	For valves with plug connection at the rear, plug connection on top	20
[10]	Plug socket with cable	Straight socket, plug pattern H, 3-pin	22

Peripherals overview

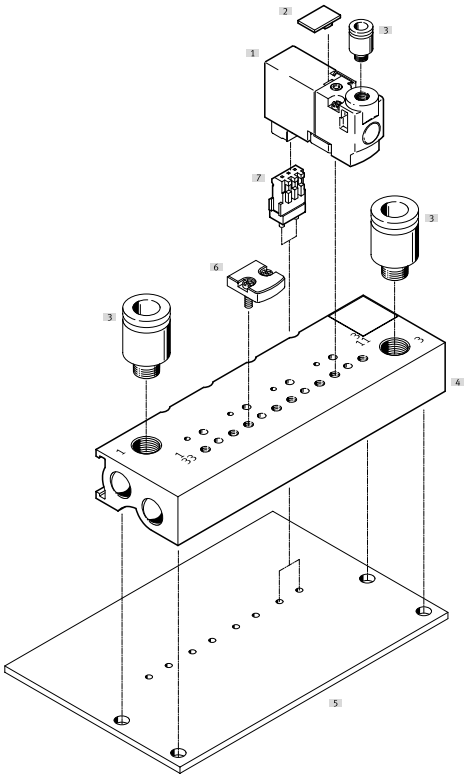
Semi in-line valve with plug connection underneath



Designation		Description	→ Page/Internet
[1]	Solenoid valve	Valve with plug connection underneath	19
[2]	Inscription labels	For identifying the valve positions	21
[3]	Push-in fitting	For connecting compressed air tubing with standard O.D.	21
[4]	Blanking plug	For sealing ports that are not required	21
[5]	Silencer	For exhaust ports	21
[6]	Manifold rail	With plug bases and electrical multi-pin plug, Sub-D	20
[7]	Manifold rail	With plug bases	20
[8]	Individual sub-base	For valves with plug connection underneath	20
[9]	Cover plate	For manifold rail with plug bases	20
[10]	Electrical plug base	Straight socket, plug pattern H, 3-pin	22

Peripherals overview

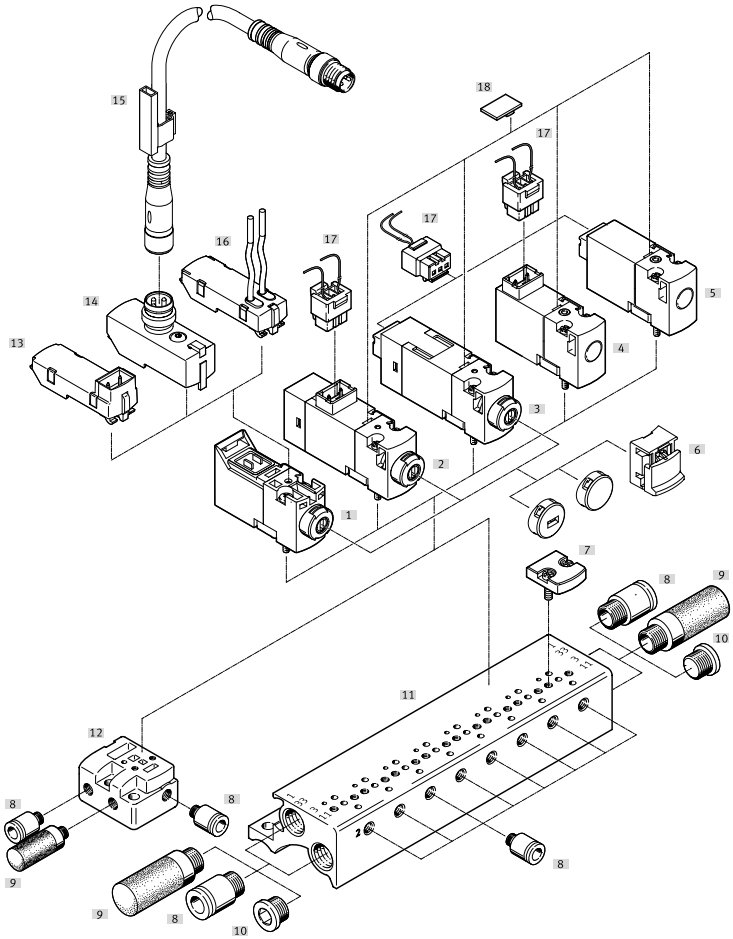
Semi in-line valve with plug connection underneath, mounting on a circuit board



Designation		Brief description	→ Page/Internet
[1]	Solenoid valve	Valve with plug connection underneath	19
[2]	Inscription labels	For identifying the valve positions	21
[3]	Push-in fitting	For connecting compressed air tubing with standard O.D.	21
[4]	Manifold rail	Without plug bases, for mounting on a circuit board	20
[5]	Circuit board	Not included in the scope of delivery	–
[6]	Cover plate	For manifold rail without plug bases	20
[7]	Soldering base	For mounting on a circuit board, 3-pin	22

Peripherals overview

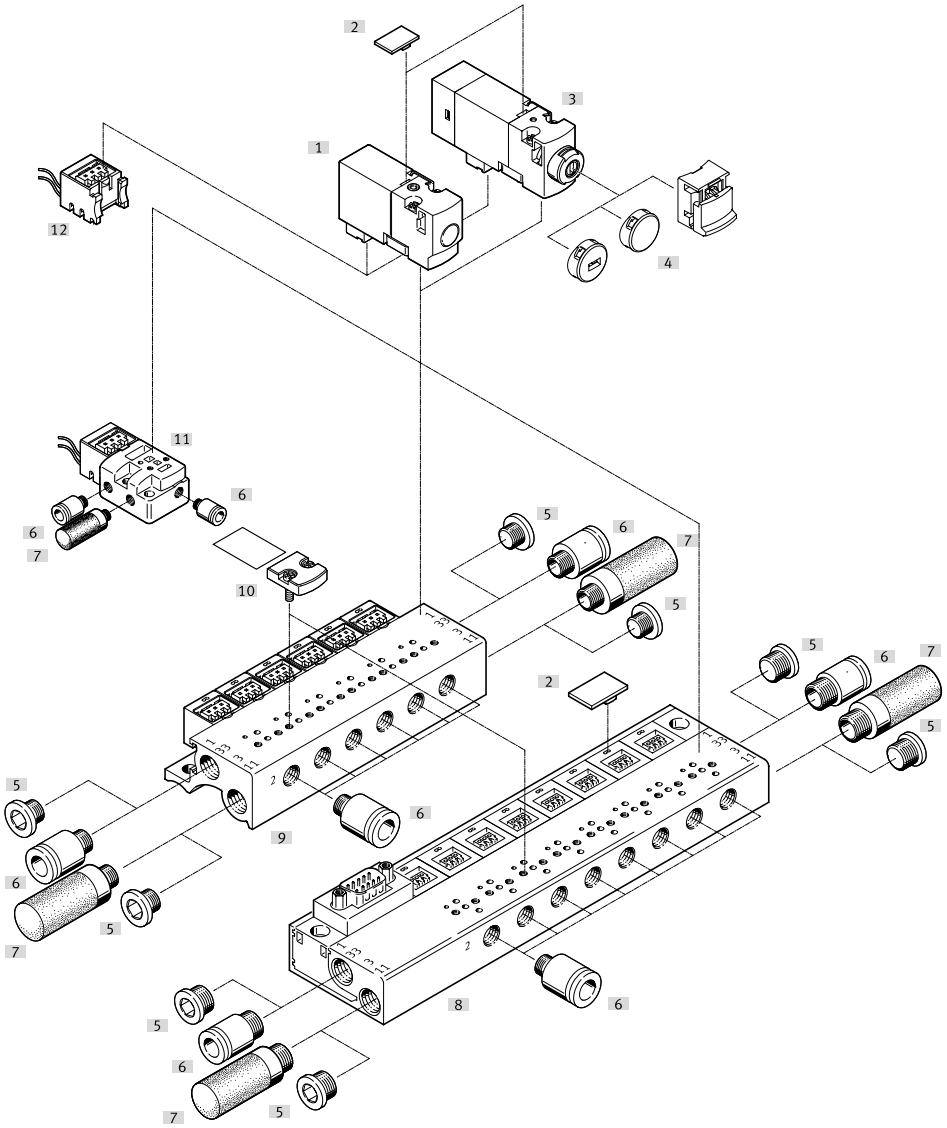
Sub-base valve with plug connection at the rear, plug connection on top



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	51
[3]	Solenoid valve	Valve with plug connection at the rear, with LED, with manual override	51
[4]	Solenoid valve	Valve with plug connection on top, without LED, without manual override	31
[5]	Solenoid valve	Valve with plug connection at the rear, without LED, without manual override	31
[6]	Cover cap	For manual override	40, 53
[7]	Cover plate	For manifold rail without plug bases	33, 40, 53
[8]	Push-in fitting	For connecting compressed air tubing with standard O.D.	33, 40, 53
[9]	Silencer	For exhaust ports	33, 40, 53
[10]	Blanking plug	For sealing ports that are not required	33, 40, 53
[11]	Manifold rail	Without plug bases	32, 39, 52
[12]	Individual sub-base	For valves with plug connection at the rear, plug connection on top	32, 39, 52
[13]	E-box	Plug pattern H/plug pattern S	41
[14]	E-box	Plug M8x1	41
[15]	Connecting cable	Socket M8x1, 4-pin	42
[16]	E-box	Open end	41
[17]	Plug socket with cable	Straight socket, plug pattern H, 3-pin	34, 42, 54
[18]	Inscription labels	For identifying the valve positions	34, 54

Peripherals overview

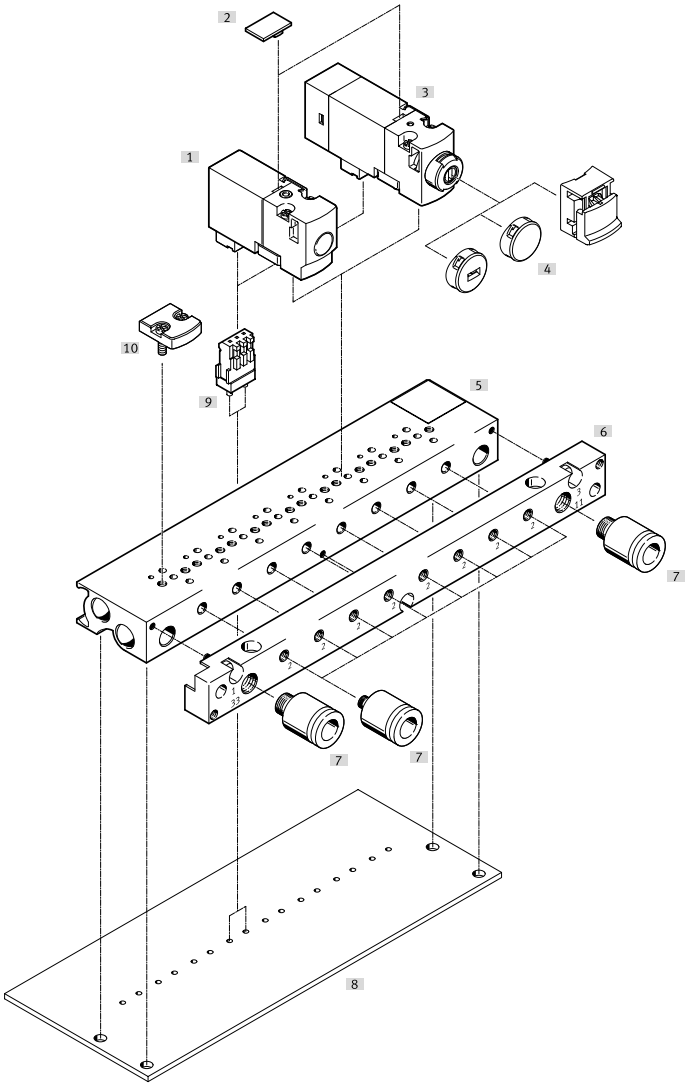
Sub-base valve with plug connection underneath



Designation		Description	→ Page/Internet
[1]	Solenoid valve	Valve with plug connection underneath, without LED	31
[2]	Inscription labels	For identifying the valve positions	34, 54
[3]	Solenoid valve	Valve with plug connection underneath, with LED	51
[4]	Cover cap	For manual override	40, 53
[5]	Blanking plug	For sealing ports that are not required	33, 53
[6]	Push-in fitting	For connecting compressed air tubing with standard O.D.	33, 53
[7]	Silencer	For exhaust ports	33, 53
[8]	Manifold rail	With plug bases	32, 52
[9]	Manifold rail	With plug bases and electrical multi-pin plug	32, 52
[10]	Cover plate	For manifold rail with plug bases	33, 53
[11]	Individual sub-base	For valves with plug connection underneath	32, 52
[12]	Plug socket with cable	Straight socket, plug pattern H, 3-pin	34, 54

Peripherals overview

Sub-base valve with plug connection underneath, mounting on a circuit board



		Description	→ Page/Internet
[1]	Solenoid valve	Plug connection underneath, without LED	31
[2]	Inscription labels	For identifying the valve positions	34, 54
[3]	Sub-base valve	Plug connection underneath, with LED	51
[4]	Cover cap	For manual override	40, 53
[5]	Manifold rail	Without plug bases for mounting on a circuit board	32, 52
[6]	Pneumatic multiple connector plate	Enables the tubing connection to be left in place on the circuit board when changing the valve terminal (included in the scope of delivery)	–
[7]	Push-in fittings	For connecting compressed air tubing with standard O.D.	33, 53
[8]	Circuit board	Provided by the customer (not included in the scope of delivery)	–
[9]	Soldering base	For plug-in connection, 3-pin	34, 54
[10]	Cover plate	For manifold rail without plug bases	33, 53

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	
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

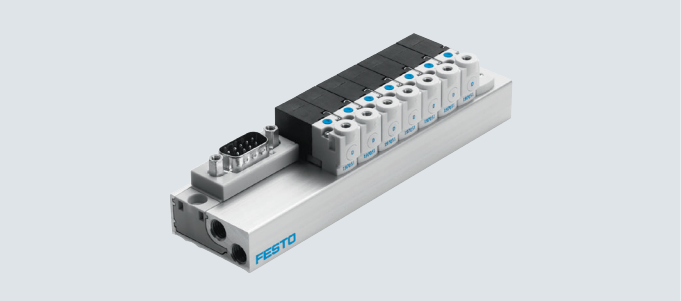
Further variants and accessories can be configured and ordered online using the modular product system.

Datasheet

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

- Pressure
  –0.9 ... +8 bar

- Temperature range
  –5 ... +40 °C



General technical data		
Valve terminal design		Fixed grid
Electrical control		Individual connection
		Multi-pin plug
Maximum number of valve positions		24
Valve function		3/2-way, single solenoid, open
		3/2-way, single solenoid, closed
		2/2-way, single solenoid, closed
Design		Poppet valve with spring return
Sealing principle		Soft
Actuation type		Electrical
Reset method		Mechanical spring
Type of control		Direct
Suitable for vacuum		Yes
Exhaust air function		Can be throttled
Signal status indication		LED
Nominal width	[mm]	0.9
Maximum standard nominal flow rate	[l/min]	10 at 10 mm
Valve size	[mm]	10

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	[bar]	–0.9 ... 8
Ambient temperature	[°C]	–5 ... +40
Temperature of medium	[°C]	–5 ... +40
Corrosion resistance class CRC[1)]		1 - Low corrosion stress
Certification		c UL us - Recognized (OL)
Certificate-issuing authority		UL MH19482
CE marking (see declaration of conformity)		To EU RoHS Directive[2)]
LABS (PWIS) conformity		VDMA24364-B2-L

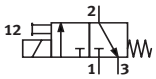
1) More information www.festo.com/x/topic/crc
2) More information: www.festo.com/catalogue/... → Support/Downloads.

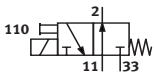
Electrical data		
Nominal operating voltage	[V DC]	5
	[V DC]	12
	[V DC]	24
	[V AC]	24
Degree of protection		IP40
		IP65

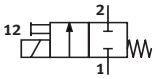
Materials	
Note on materials	RoHS-compliant
	Free of copper and PTFE

Datasheet

Function



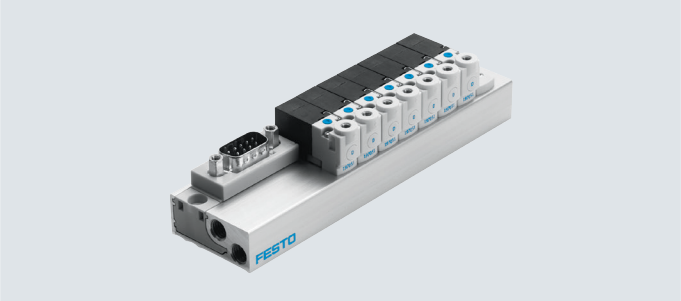




Voltage
5 V DC
12 V DC
24 V DC

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		
Overlap		Negative overlap		
Sealing principle		Soft		
Actuation type		Electrical		
Reset method		Mechanical spring		
Type of control		Direct		
Flow direction		Not reversible		
Suitable for vacuum		Yes	–	–
Exhaust air 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		
Valve position identification		Label		
Nominal width	[mm]	0.9	0.65	0.7
Standard nominal flow rate	[l/min]	14	10	10
Width	[mm]	10	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	[MPa]	–0.09 ... +0.2	0 ... 0.8[1)]	0 ... 0.6[1)]
	[bar]	–0.9 ... +2	0 ... 8[1)]	0 ... 6[1)]
	[psi]	–13.05 ... +29	0 ... 116[1)]	0 ... 87[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)		
Certificate-issuing authority		UL MH19482		

1) Vacuum operation possible with special connection method → page 3
2) More information: www.festo.com/x/topic/crc

Datasheet

Safety characteristics				
Operating voltage		5 V DC	12 V DC	24 V DC
Note on forced checking procedure		Switching frequency at least once a week		
Max. positive test pulse with logic 0	[µs]	–	–	500
Max. negative test pulse with logic 1	[µs]	–	–	400
Shock resistance		Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27		
Vibration resistant		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
Electrical connection		Plug
Electrical power consumption	[W]	1
Duty cycle	[%]	100
Degree of protection		IP40

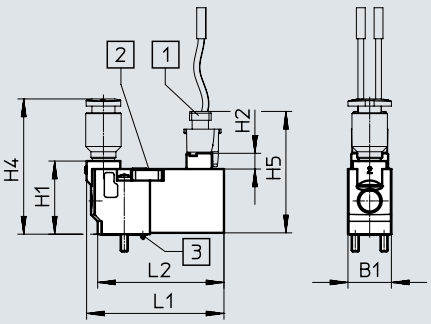
Switching times and frequencies					
Type			MHP1-...-2/2G-...	MHP1-...-3/2G-...	MHP1-...-3/2O-...
Switching time	On	[ms]	4	4	4
	Off	[ms]	5	4	4
Maximum switching frequency		[Hz]	20	20	20

Materials	
Housing	Reinforced PA, reinforced PPS
Seals	FPM, HNBR, NBR
Note on materials	RoHS-compliant
LABS (PWIS) conformity	VDMA24364-B2-L

Dimensions

Download CAD data ➔ www.festo.com

Plug connection on top

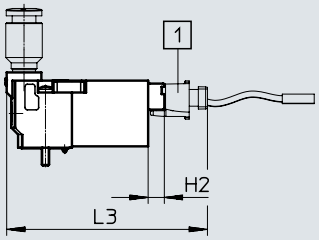


[1] Plug socket NEBV-H1G2

[2] Manual override

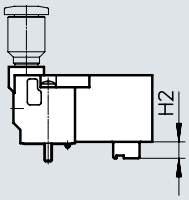
[3] Coding pin

Plug connection at the rear



[1] Plug socket NEBV-H1G2

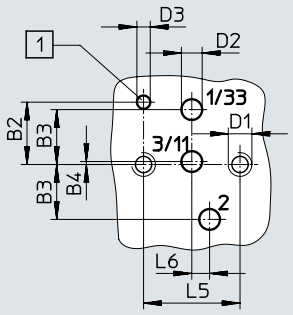
Plug connection underneath



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



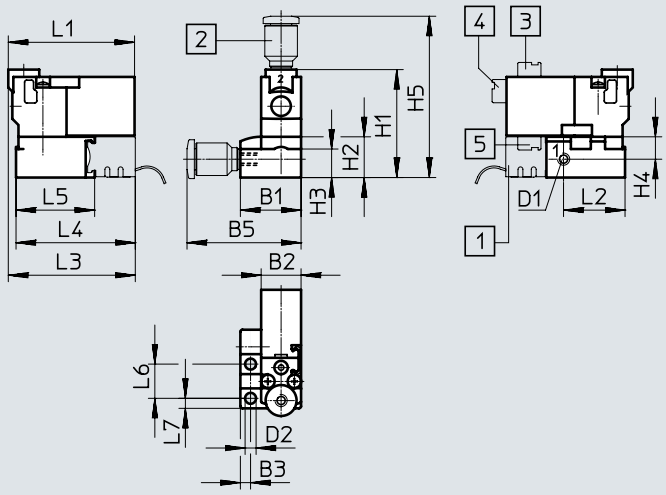
[1] Hole for coding pin

- 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

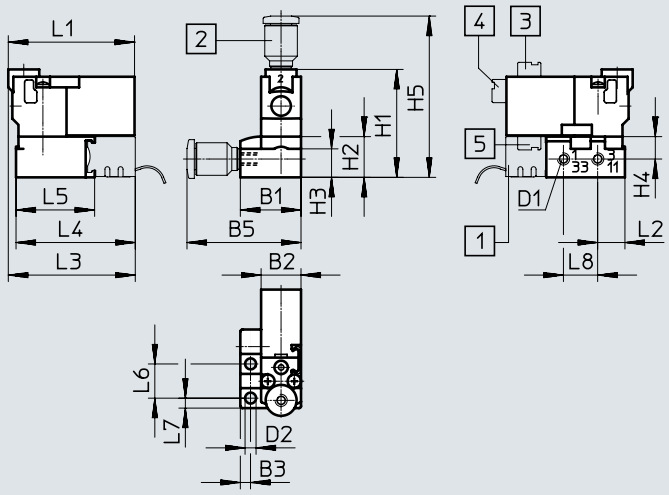
Dimensions – Mounting on individual sub-base Download CAD data ➔ www.festo.com

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



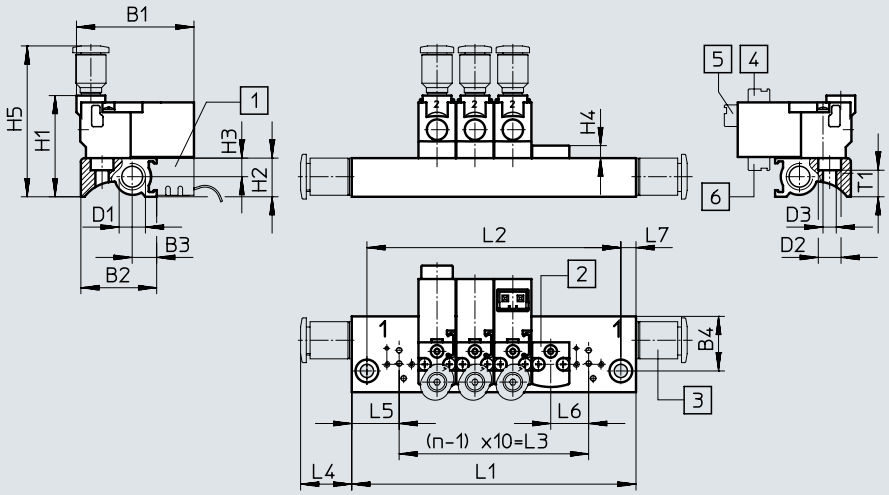
[1] Plug base MHAP-PI
[2] Fitting
[3] Plug connection on top
[4] Plug connection at the rear
[5] Plug connection underneath

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

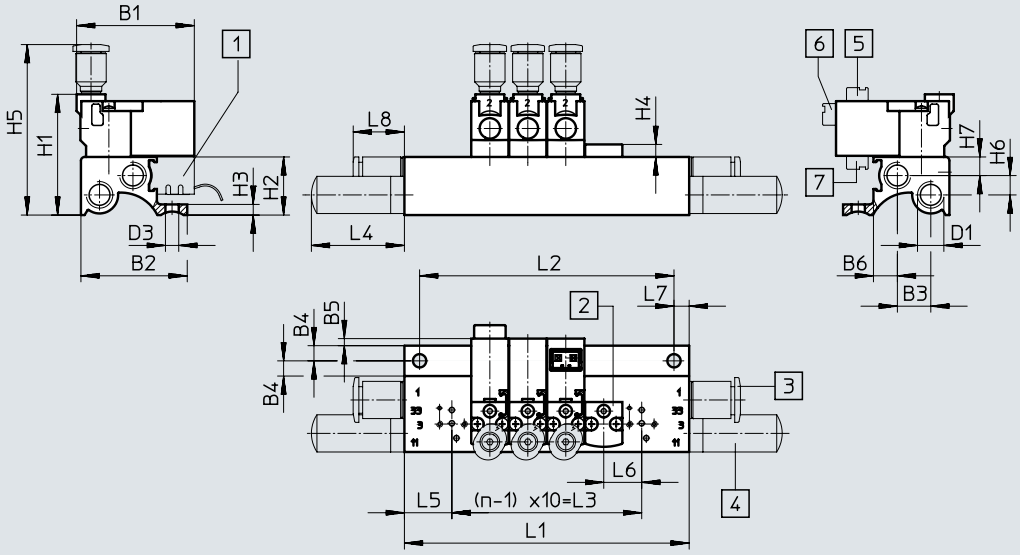
Dimensions – Manifold assembly Download CAD data ➔ www.festo.com

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

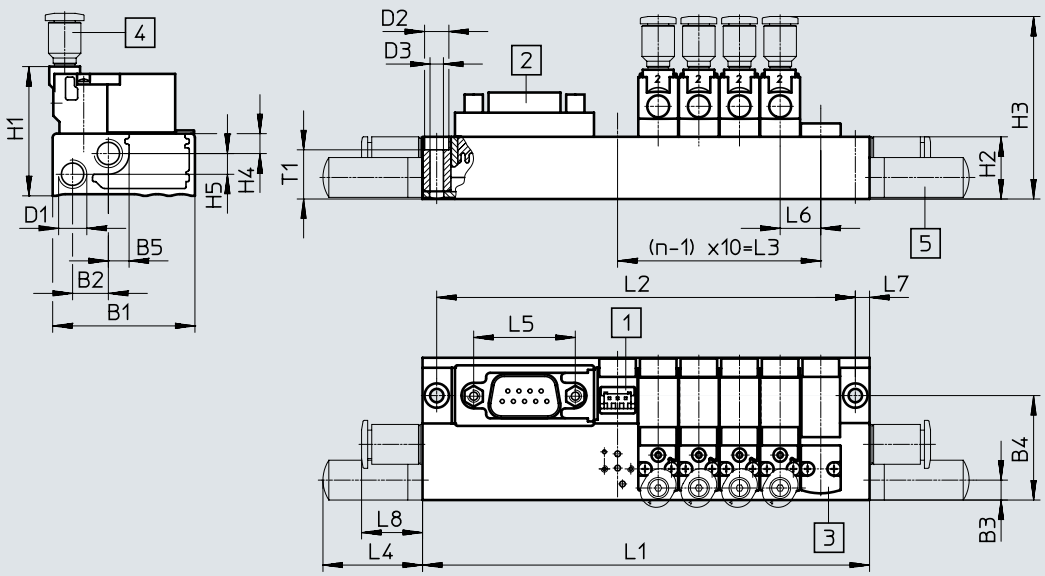
Valve positions n	L1 ±0.15	L2 ±0.1	L3
9	105	97	80
10	115	107	90
11	125	117	100
12	135	127	110
13	145	137	120
14	155	147	130
15	165	157	140

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

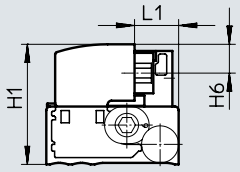
Type	B1	B2	B3	B4	B5	D1	D2	D3	H1	H2	H3	H4	H5	L4	L5	L6	L7	L8	T1
MHP1	35	8.8	5.3	25.7	5.2	M7	6	3.3	31.8	15.3	44.9	4.9	5.1	54.5	25	10	3.5	15	12.1

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

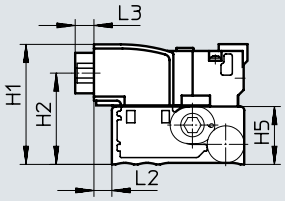
Valve positions n	L1 ±0.15	L2 ±0.1	L3
10	172	165	90
12	192	185	110
14	212	205	130
16	232	225	150

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

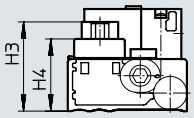
Plug outlet to the pneumatic side



Plug outlet to the electrical side



Plug outlet on top (standard)

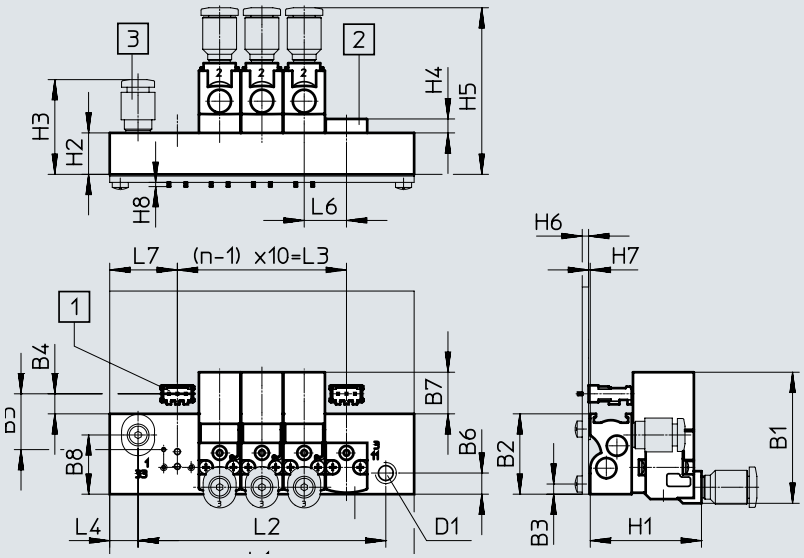


Type	H1	H2	H3	H4	H5	H6	L1	L2	L3
MHP1	31.8	24.2	26.2	21.2	15.3	7.6	11.7	4.8	5

Datasheet

Dimensions – Manifold assembly on a circuit board Download CAD data → www.festo.com

3/2-way valve

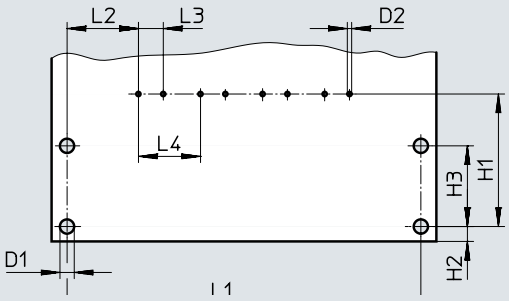


[1] Soldering base PCBC-A
[2] Cover plate MHAP1
[3] Fitting

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 circuit board



Note

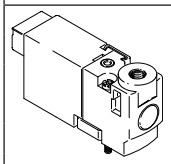
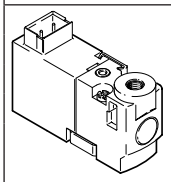
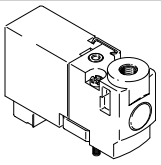
The circuit board is not included in the scope of delivery.

Type	D1	D2	H1	H2	H3	L2	L3	L4
Circuit board	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

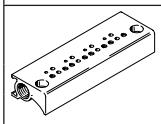
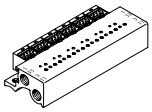
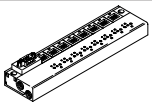
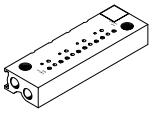
Ordering data

		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 one 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 mounting on a circuit board	For 3/2-way solenoid valve	2 valves	**197242**	**MHP1-PR2-3-PI-PCB**
			4 valves	**197243**	**MHP1-PR4-3-PI-PCB**
			6 valves	**197244**	**MHP1-PR6-3-PI-PCB**
			8 valves	**197245**	**MHP1-PR8-3-PI-PCB**
			10 valves	**197246**	**MHP1-PR10-3-PI-PCB**
Blanking plate					
	For manifold rail without plug bases			**197257**	**MHAP1-BP-3**
	For manifold rail with plug bases			**197258**	**MHAP1-BP-3-PI**

Note

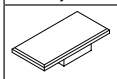
Manifold rails with an odd number of valves and for 11 ... 24 valves and further variants can be configured and ordered online via the modular product system MH1.

Note

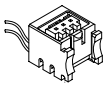
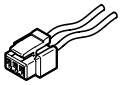
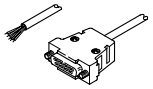
Valves types 3/2G and 3/2O must not be mixed on one manifold rail.

Datasheet

Ordering data

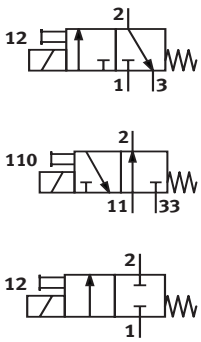
				Pack size	Part no.	Type
Blanking plug						
	For M3 thread			10	**30979**	**B-M3-S9**
	For M7 thread			10	**174309**	**B-M7**
Silencer						
	Connecting thread M3			20	**1231120**	**AMTE-M-LH-M3**
	Connecting thread M7			1	**161418**	**UC-M7**
Push-in fitting						
	Connecting thread M3	With internal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

Datasheet

Ordering data				Pack size	Part no.	Type
Soldering base						
	For manifold rail for valves with plug connection underneath for mounting on a circuit board, 3-pin			10	**197261**	**PCBC-A-10**
				100	**197262**	**PCBC-A-100**
Electrical plug base						
	For manifold rail, for valves with plug connection underneath	2x flying leads Open end 1-core	0.5 m	–	**197260**	**MHAP-PI**
			1 m	–	**532182**	**MHAP-PI-1**
Plug socket with cable						
	Straight socket Plug pattern H 3-pin	2x flying leads Open end 1-core	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**
Connecting cable for manifold rail with electrical multi-pin plug						
	Straight socket, Sub-D, 9-pin	Cable Open end 9-core	2.5 m	–	**531184**	**KMP6-09P-8-2.5**
			5 m	–	**531185**	**KMP6-09P-8-5**
			10 m	–	**531186**	**KMP6-09P-8-10**
	Straight socket, Sub-D, 25-pin	Cable Open end 15-core	2.5 m	–	**530049**	**KMP6-25P-12-2.5**
			5 m	–	**530050**	**KMP6-25P-12-5**
			10 m	–	**530051**	**KMP6-25P-12-10**
	Straight socket, Sub-D, 25-pin	Cable Open end 25-core	2.5 m	–	**530046**	**KMP6-25P-20-2.5**
			5 m	–	**530047**	**KMP6-25P-20-5**
			10 m	–	**530048**	**KMP6-25P-20-10**

Datasheet

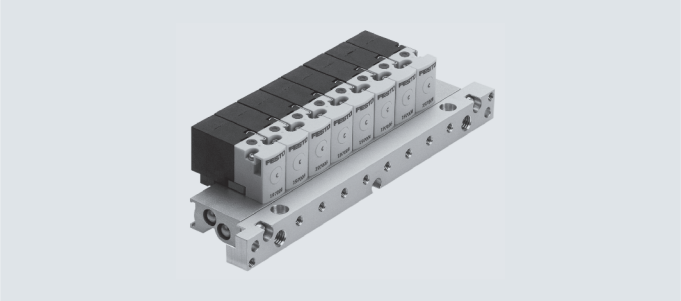
Function



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	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		
Overlap		Negative overlap		
Sealing principle		Soft		
Actuation type		Electrical		
Reset method		Mechanical spring		
Type of control		Direct		
Flow direction		Not reversible		
Suitable for vacuum		Yes	–	–
Exhaust air 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		
Valve position identification		Label		
Nominal width	[mm]	0.9	0.65	0.7
Standard nominal flow rate	[l/min]	14	10	10
Width	[mm]	10	10	10
Grid dimension	[mm]	10	10	10
Pneumatic connection	1	Sub-base	Sub-base	–
	2	Sub-base	Sub-base	Sub-base
	3	–	Sub-base	–
	11	–	–	Sub-base
	33	–	–	Sub-base
Product weight	[g]	10	10	10

Operating and environmental conditions				
Type		MHA1-...-2/2G-...	MHA1-...-3/2G-...	MHA1-...-3/2O-...
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Note on the operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)		
Operating pressure	[MPa]	–0.09 ... +0.2	0 ... 0.8[1]	0 ... 0.6[1]
	[bar]	–0.9 ... +2	0 ... 8[1]	0 ... 6[1]
	[psi]	–13.05 ... +29	0 ... 116[1]	0 ... 87[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)		
Certificate-issuing authority		UL MH19482		

1) Vacuum operation possible with special connection method → page 3
2) More information: www.festo.com/x/topic/crc

Datasheet

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

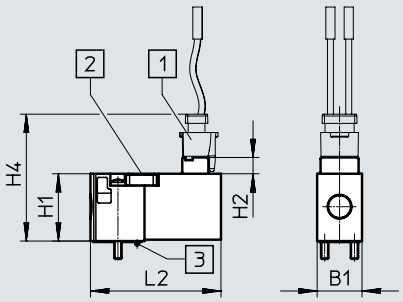
Electrical data		
Operating voltage	[V DC]	5
	[V DC]	12
	[V DC]	24
Permissible voltage fluctuations	[%]	±10
Electrical connection		Plug
Electrical power consumption	[W]	1
Duty cycle	[%]	100
Degree of protection		IP40

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

Materials	
Housing	Reinforced PA, reinforced PPS
Sub-base	Aluminium
Seals	FPM, HNBR, NBR
Note on materials	RoHS-compliant
LABS (PWIS) conformity	VDMA24364-B2-L

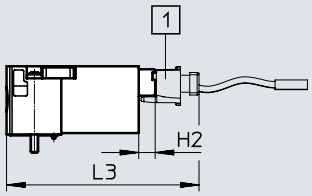
Dimensions Download CAD data ➔ www.festo.com

Plug connection on top



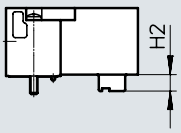
[1] Plug socket NEBV-H1G2
[2] Manual override
[3] Coding pin

Plug connection at the rear



[1] Plug socket NEBV-H1G2

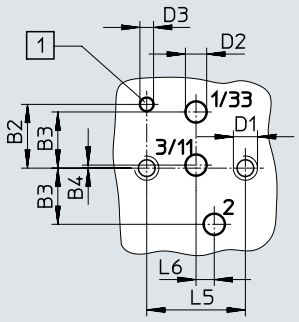
Plug connection underneath



Type	B1	H1	H2	H4	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



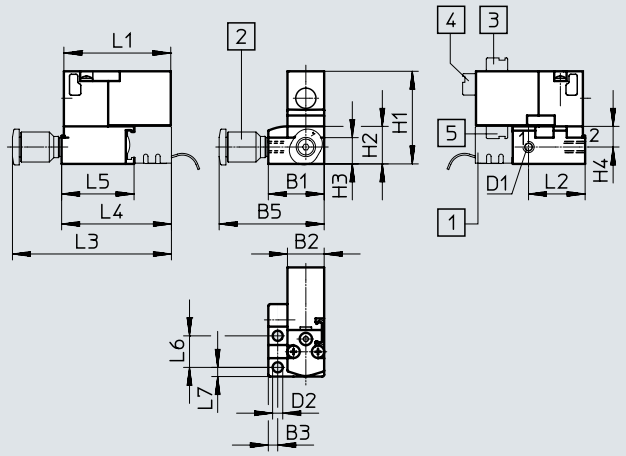
[1] Hole for coding pin

- 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

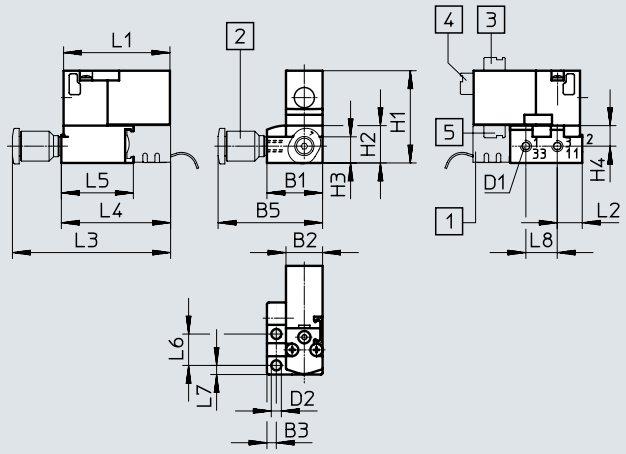
Dimensions – Mounting on individual sub-base Download CAD data ➔ www.festo.com

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



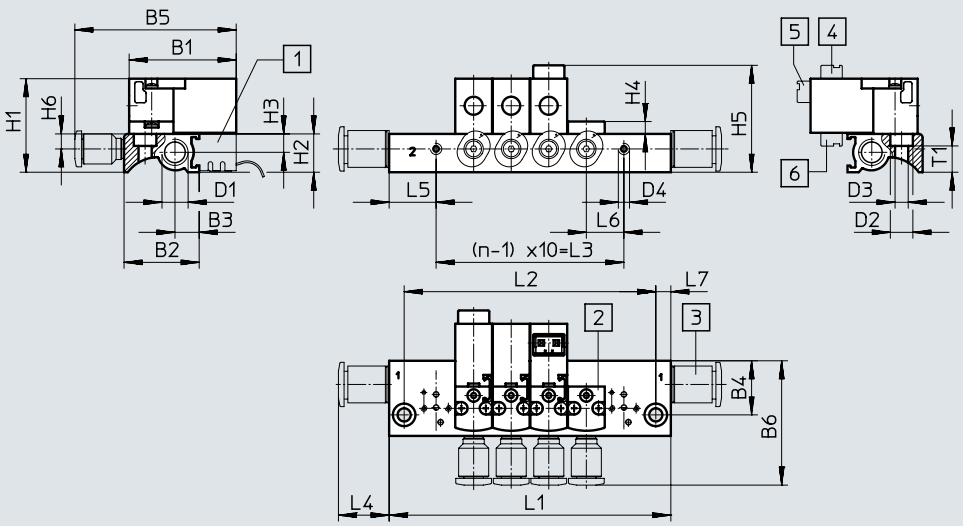
[1] Plug base MHAP-PI
[2] Fitting
[3] Plug connection on top
[4] Plug connection at the rear
[5] Plug connection underneath

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

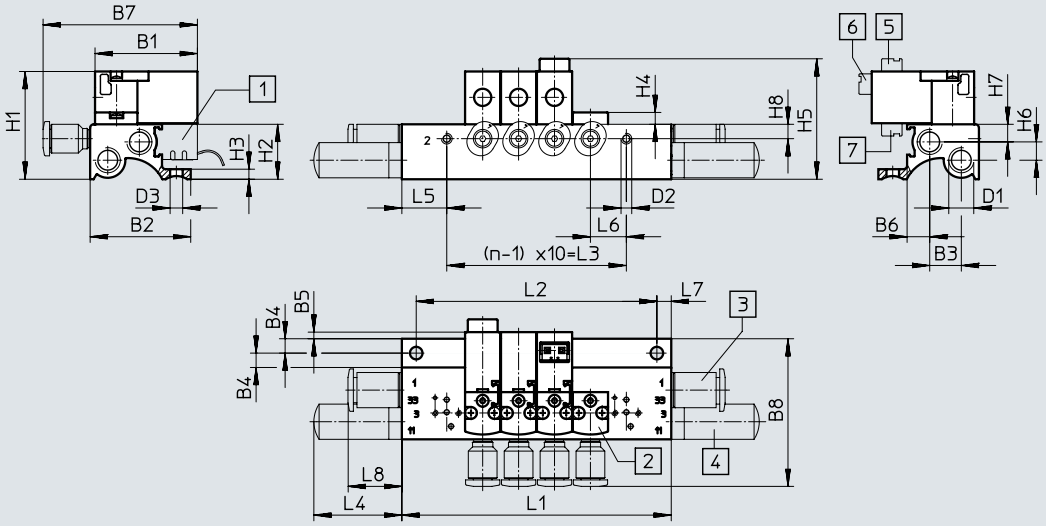
Dimensions – Manifold assembly Download CAD data ➔ www.festo.com

2/2-way valve



[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	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

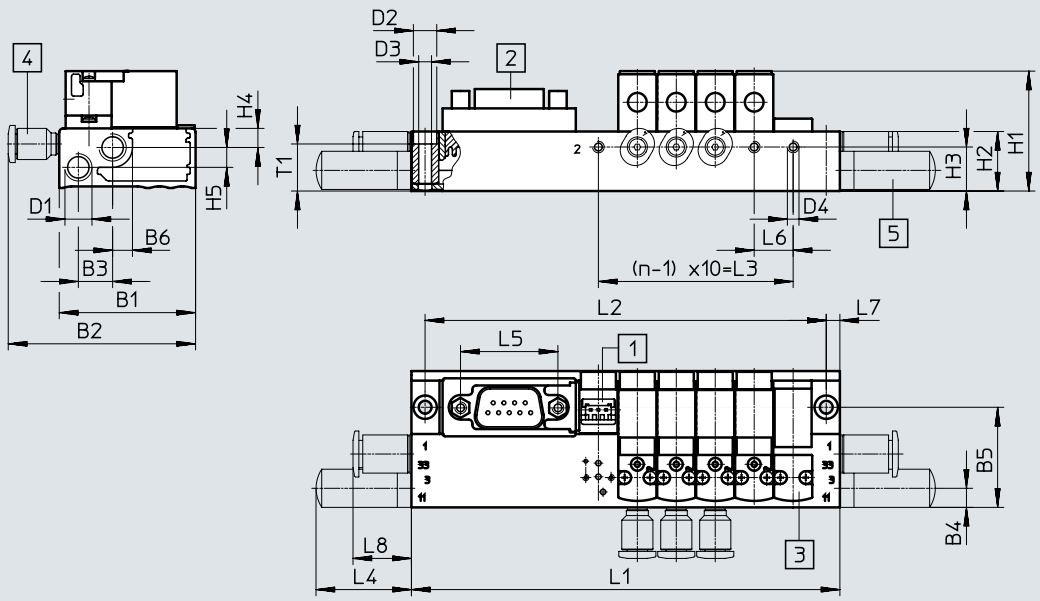
Valve positions n	L1 ±0.15	L2 ±0.1	L3
9	105	97	80
10	115	107	90
11	125	117	100
12	135	127	110
13	145	137	120
14	155	147	130
15	165	157	140

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

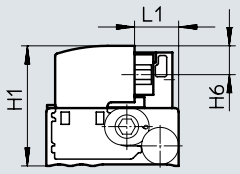
Type	B1	B2	B3	B4	B5	B6	D1	D2	D3	D4	H1	H2	H3	H4	H5	L4	L5	L6	L7	L8	T1
MHA1	35	48.1	8.8	5.3	25.7	5.2	M7	6	3.3	M3	30.8	15.3	11.3	4.9	5.1	24.5	25	10	3.5	15	12.1

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

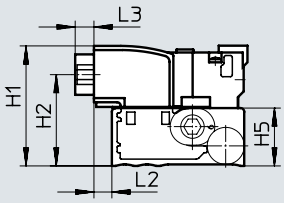
Valve positions n	L1 ±0.15	L2 ±0.1	L3
10	172	165	90
12	192	185	110
14	212	205	130
16	232	225	150

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

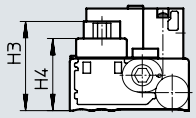
Plug outlet to the pneumatic side



Plug outlet to the electrical side



Plug outlet on top (standard)

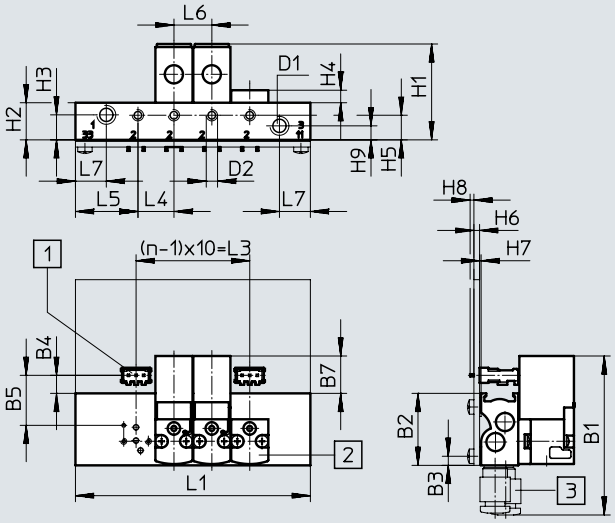


Type	H1	H2	H3	H4	H5	H6	L1	L2	L3
MHA1	31.8	24.2	26.2	21.2	15.3	7.6	11.7	4.8	5

Datasheet

Dimensions – Manifold assembly on a circuit board 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 circuit board is not included in the scope of delivery.

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

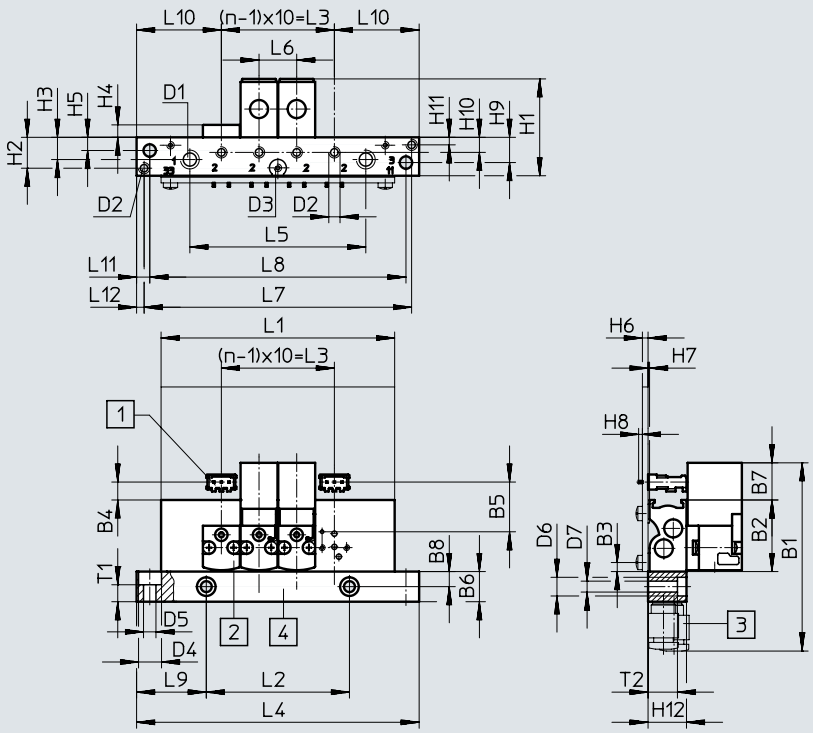
Type	H1	H2	H3	H4	H5	H6	H7	H8	H9	L4	L5	L6	L7
Without pneumatic multiple connector plate	25.3	9.8	6.6	3.3	6.5	1.5	0.4	1	3.7	9.5	16.5	10	8.2

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

Datasheet

Dimensions – Manifold assembly on a circuit board 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
[4] Pneumatic multiple connector plate, removable

Note

The circuit board 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

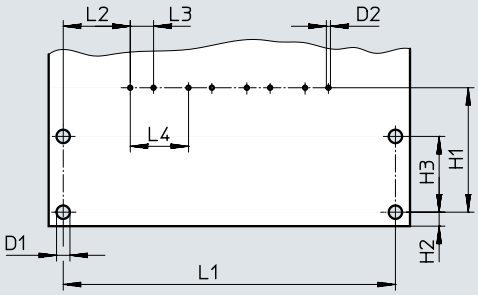
Type	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	L6	L9	L10	L11	L12	T1	T2
With pneumatic multiple connector plate	25.7	8.2	5.9	3.3	3.5	1.5	0.4	1	6.7	4	2	10.2	10	18.5	22.5	3.5	2	4.5	7.8

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 a circuit board Download CAD data ➔ www.festo.com

Hole pattern on circuit board



Note

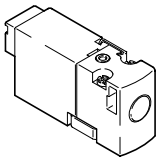
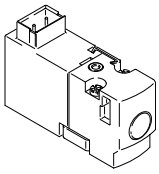
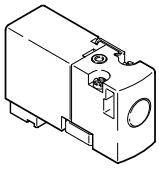
The circuit board is not included in the scope of delivery.

Type	D1	D2	H1	H2	H3	L2	L3	L4
Circuit board	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

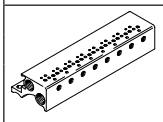
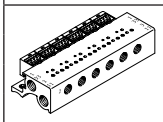
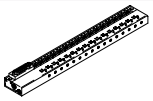
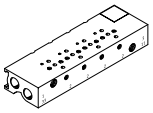
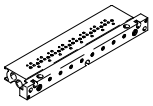
		Valve function	Normal position		Part no.	Type
Solenoid valve						
	Plug connection at the rear	2/2-way solenoid valve	Closed	5 V DC	**197036**	**MHA1-M4H-2/2G-0.9-HC**
				12 V DC	**197037**	**MHA1-M5H-2/2G-0.9-HC**
				24 V DC	**197038**	**MHA1-M1H-2/2G-0.9-HC**
		3/2-way solenoid valve	Closed	5 V 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 mounting on a circuit board	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 mounting on a circuit board, 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 odd number of valves and for 11 ... 24 valves and further variants can be configured and ordered online via the modular product system MH1.

Note

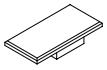
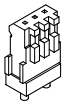
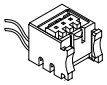
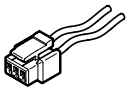
Valves types 3/2G and 3/2O must not be mixed on one manifold rail.

Datasheet

Ordering data

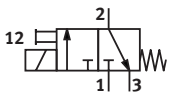
				Pack size	Part no.	Type
Cover plate for manifold rail						
	For manifold rail for valves with plug connection at the rear or on top			–	**197257**	**MHAP1-BP-3**
	For manifold rail with plug bases for valves with plug connection underneath			–	**197258**	**MHAP1-BP-3-PI**
Blanking plug						
	For M3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

Datasheet

Ordering data				Pack size	Part no.	Type
Inscription label						
	For identifying the valve positions			–	**197259**	**MH-BZ-80X**
Soldering base						
	For manifold rail for valves with plug connection underneath for mounting on a circuit board, 3-pin			10	**197261**	**PCBC-A-10**
				100	**197262**	**PCBC-A-100**
Electrical plug base						
	For manifold rail, for valves with Plug connection underneath	2x flying leads Open end 1-core	0.5 m	–	**197260**	**MHAP-PI**
			1 m	–	**532182**	**MHAP-PI-1**
Plug socket with cable						
	Straight socket Plug pattern H 3-pin	2x flying leads Open end 1-core	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**

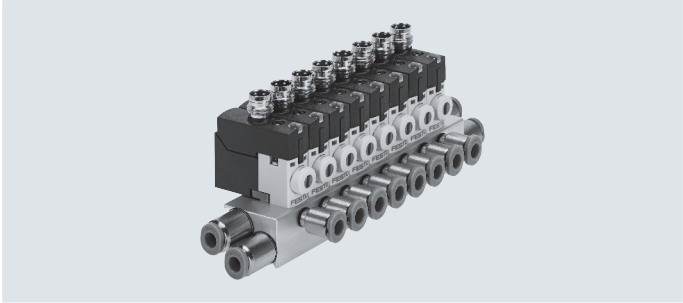
Datasheet

Function



Voltage
5 V DC
12 V DC
24 V DC

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
Overlap		Negative overlap
Sealing principle		Soft
Actuation type		Electrical
Reset method		Mechanical spring
Type of control		Direct
Flow direction		Not reversible
Exhaust air function		Can be throttled
Manual override		Non-detenting/detenting
Type of mounting		On sub-base via through-hole
Mounting position		Any
Nominal width	[mm]	0.65
Standard nominal flow rate	[l/min]	10
Width	[mm]	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-...
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	[MPa]	0.15 ... 0.8[1]		
	[bar]	1.5 ... 8[1]		
	[psi]	21.75 ... 116[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
Certification		c UL us - Recognized (OL)		
Certificate-issuing authority		UL MH19482		

1) Vacuum operation possible with special connection method → page 3
2) More information: www.festo.com/x/topic/crc

Datasheet

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

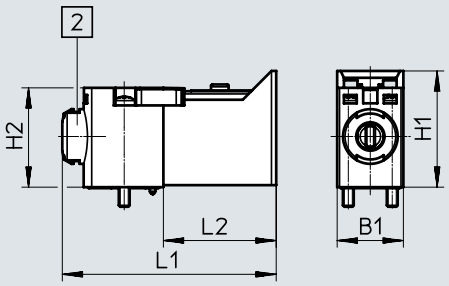
Electrical data				
Type		MHA1-M4R-...	MHA1-M5R-...	MHA1-M1R-...
Operating voltage	[V DC]	5	12	24
Permissible voltage fluctuations	[%]	±10	±10	±10
Electrical connection		Via E-box	Via E-box	Via E-box
Electrical power consumption	[W]	1	1	1
Duty cycle	[%]	100	100	100
Degree of protection		IP40	IP40	IP40
		IP65	IP65	IP65

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

Materials	
Housing	Reinforced PA, reinforced PPS
Seals	FPM, HNBR, NBR
Note on materials	RoHS-compliant
LABS (PWIS) conformity	VDMA24364-B2-L

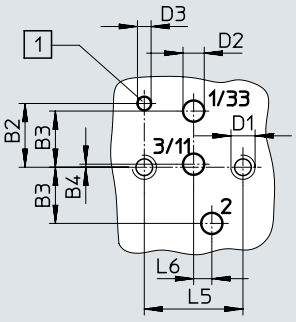
Dimensions Download CAD data ➔ www.festo.com

Valve



[2] Manual override

Hole pattern on sub-bases



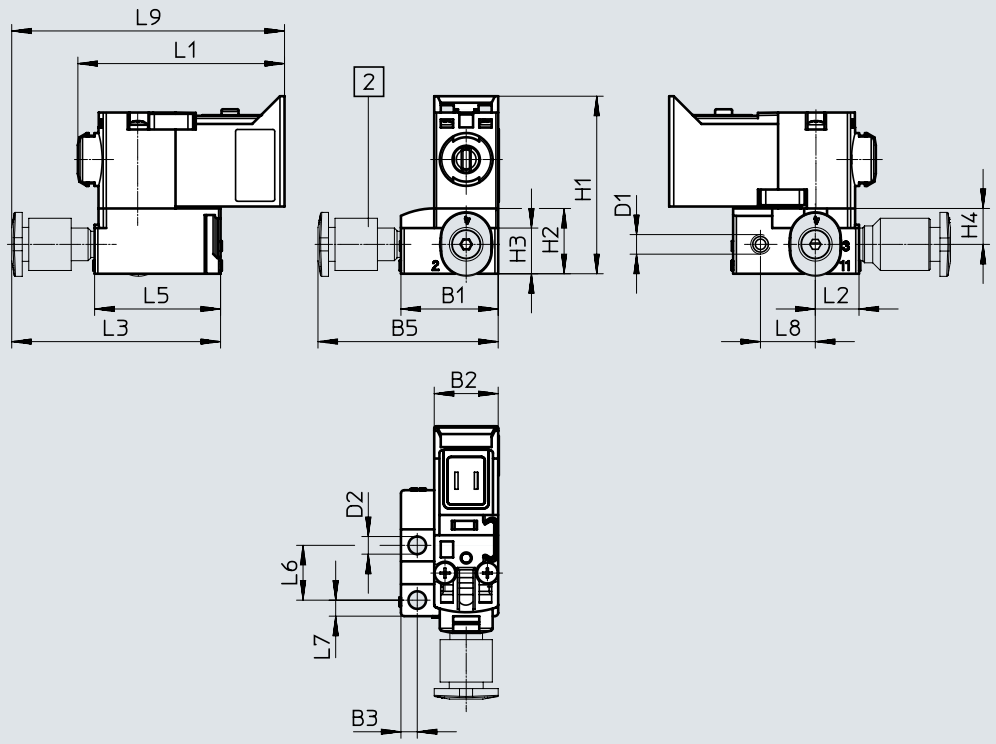
[1] Hole for coding pin

- 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 – Mounting on individual sub-base Download CAD data ➔ www.festo.com

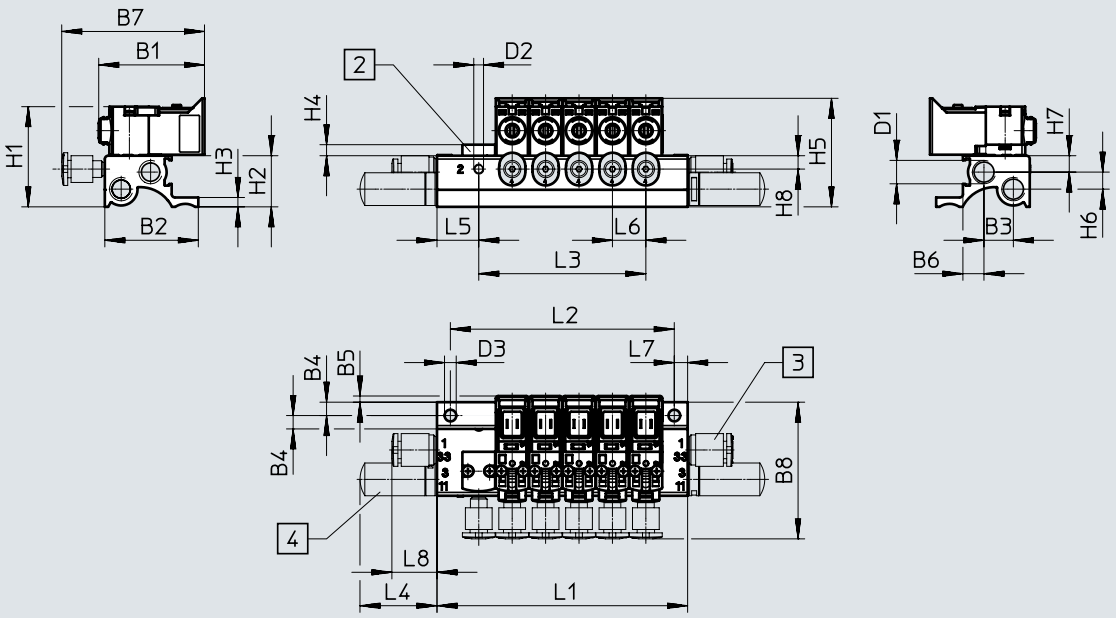


[2] Fitting

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



[2] Cover plate MHAP1 [3] Fitting [4] Silencer

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

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

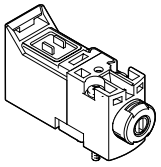
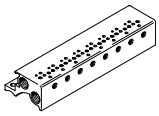
Valve positions n	L1 ±0.15	L2 ±0.1	L3
2	35	27	10
3	45	37	20
4	55	47	30
5	65	57	40
6	75	67	50
7	85	77	60
8	95	87	70

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

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

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**
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

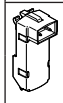
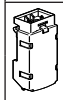
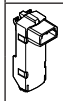
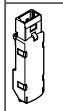
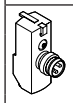
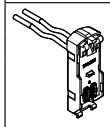
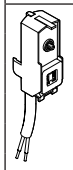
Manifold rails with an odd number of valves and for 11 ... 24 valves and further variants can be configured and ordered online via the modular product system MH1.

Datasheet

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

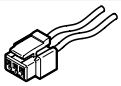
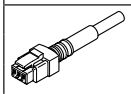
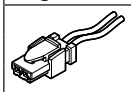
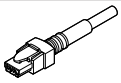
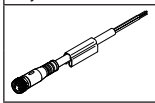
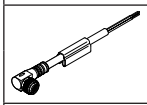
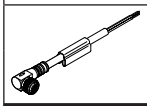
Datasheet

Ordering data

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

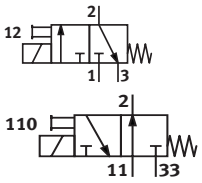
Datasheet

Ordering data

	Electrical connection 1	Electrical connection 2	Length	Part no.	Type
Plug socket with cable for plug pattern H					Datasheets → Internet: nebv
	Straight socket Plug pattern H 3-pin	2x flying leads Open end 1-core	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-core	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 pattern S					Datasheets → Internet: nebv
	Straight socket Plug pattern S 2-pin	2x flying leads Open end 1-core	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 Plug pattern S 2-pin	Cable Open end 2-core	0.5 m	**566666**	**NEBV-HSG2-P-0.5-N-LE2**
			1 m	**566667**	**NEBV-HSG2-P-1-N-LE2**
			2.5 m	**566668**	**NEBV-HSG2-P-2.5-N-LE2**
			5 m	**566669**	**NEBV-HSG2-P-5-LE2**
Connecting cable for plug M8x1					
4-pin					Datasheets → Internet: neba
	Straight socket Plug coding type A, to EN 61076-2-104	Cable Open end 4-core	2.5 m	**8078227**	**NEBA-M8G4-U-2.5-N-LE4**
			5 m	**8078228**	**NEBA-M8G4-U-5-N-LE4**
	Angled socket Plug coding type A, to EN 61076-2-104	Cable Open end 4-core	2.5 m	**8078233**	**NEBA-M8W4-U-2.5-N-LE4**
			5 m	**8078234**	**NEBA-M8W4-U-5-N-LE4**
3-pin					Datasheets → Internet: neba
	Straight socket Plug coding type A, to EN 61076-2-104	Cable Open end 3-core	2.5 m	**8078223**	**NEBA-M8G3-U-2.5-N-LE3**
			5 m	**8078224**	**NEBA-M8G3-U-5-N-LE3**
	Angled socket Plug coding type A, to EN 61076-2-104	Cable Open end 3-core	2.5 m	**8078230**	**NEBA-M8W3-U-2.5-N-LE3**
			5 m	**8078231**	**NEBA-M8W3-U-5-N-LE3**

Datasheet

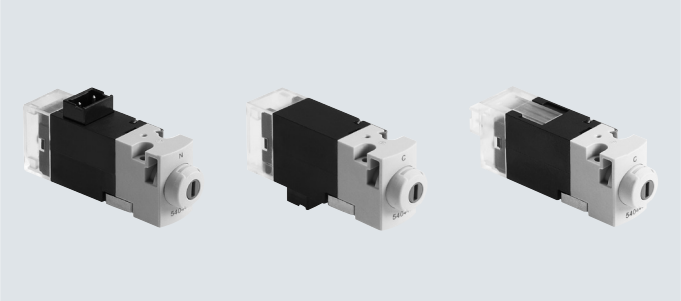
Function



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	3/2-way solenoid valve
		Normally closed	Normally open
		Single solenoid	Single solenoid
Design		Poppet valve with spring return	
Overlap		Negative overlap	
Sealing principle		Soft	
Actuation type		Electrical	
Reset method		Mechanical spring	
Type of control		Direct	
Flow direction		Not reversible	
Exhaust air 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	
Valve position identification		Label	
Nominal width	[mm]	0.65	0.7
Standard nominal flow rate	[l/min]	10	10
Width	[mm]	10	10
Grid dimension	[mm]	10	10
Pneumatic connection	1	Sub-base	–
	2	Sub-base	Sub-base
	3	Sub-base	–
	11	–	Sub-base
	33	–	Sub-base
Product weight	[g]	11	11

Operating and environmental conditions			
Type		MHA1-M1LH-...-3/2G-...	MHA1-M1LH-...-3/2O-...
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]	
Note on the operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)	
Operating pressure	[MPa]	0 ... 0.8[1)]	0 ... 0.6[1)]
	[bar]	0 ... 8[1)]	0 ... 6[1)]
	[psi]	0 ... 116[1)]	0 ... 87[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)	
Certificate-issuing authority		UL MH19482	

1) Vacuum operation possible with special connection method → page 3
2) More information: www.festo.com/x/topic/crc

Datasheet

Safety characteristics	
Note on forced checking procedure	Switching frequency at least once a week
Shock resistance	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27
Vibration resistant	Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6

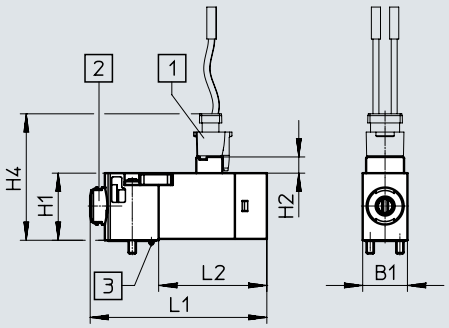
Electrical data		
Operating voltage	[V DC]	24
Permissible voltage fluctuations	[%]	±10
Electrical connection		Plug
Electrical power consumption	[W]	1.1
Duty cycle	[%]	100
Protection rating to EN 60529		IP40

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
LABS (PWIS) conformity	VDMA24364-B2-L

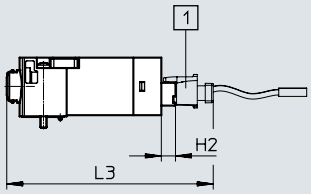
Dimensions Download CAD data ➔ www.festo.com

Plug connection on top



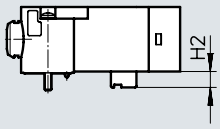
[1] Plug socket NEBV-H1G2
[2] Manual override
[3] Coding pin

Plug connection at the rear



[1] Plug socket NEBV-H1G2

Plug connection underneath

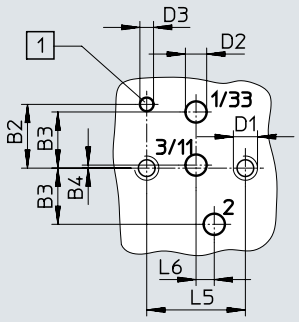


Type	B1	H1	H2	H4	L1	L2	L3
MHA1	9.8	14.7	3.6	27.7	38.7	23.7	51.7

Datasheet

Dimensions – Hole pattern on sub-bases

Download CAD data ➔ www.festo.com



[1] Hole for coding pin

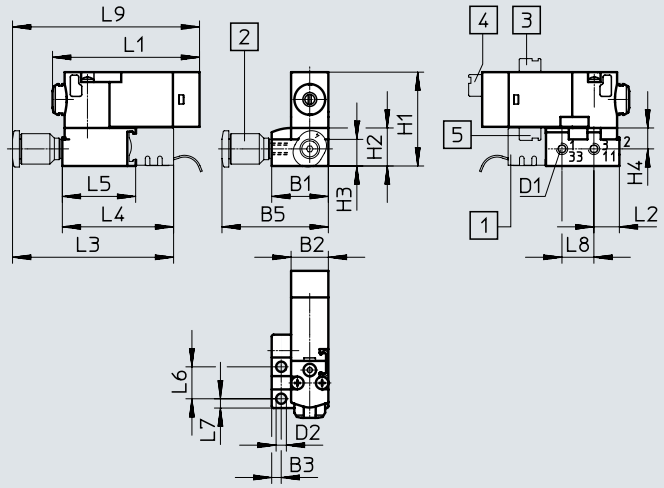
- If used as a 2/2-way valve, normally closed, ports 3/11 are not used.
- If used as a 2/2-way valve, normally open, ports 1/33 are not used.

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 – Mounting on individual sub-base

Download CAD data ➔ www.festo.com

3/2-way valve



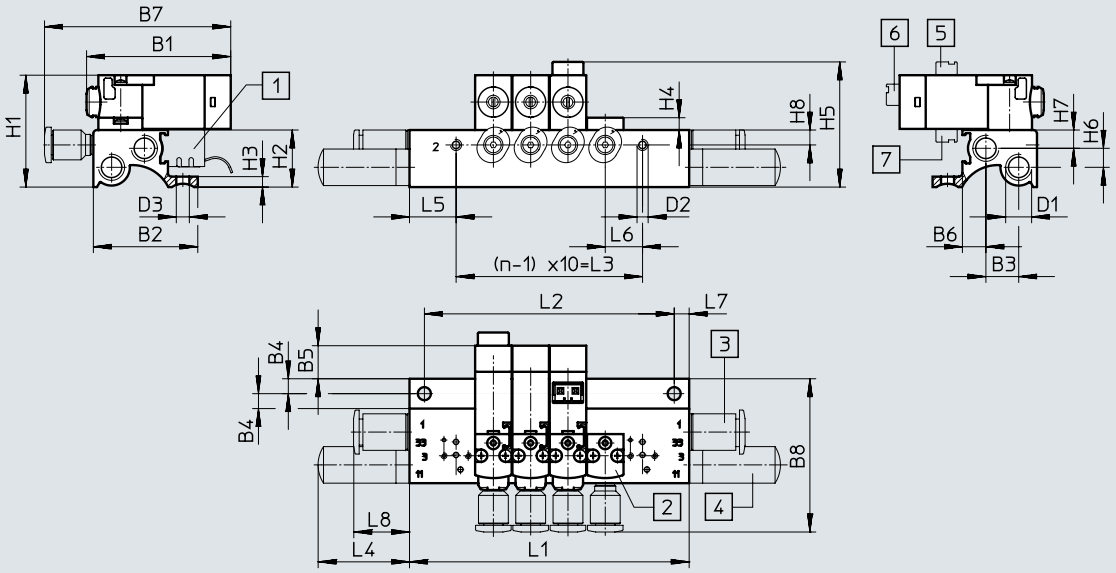
[1] Plug base MHAP-PI
[2] Fitting
[3] Plug connection on top
[4] Plug connection at the rear
[5] Plug connection underneath

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 ±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

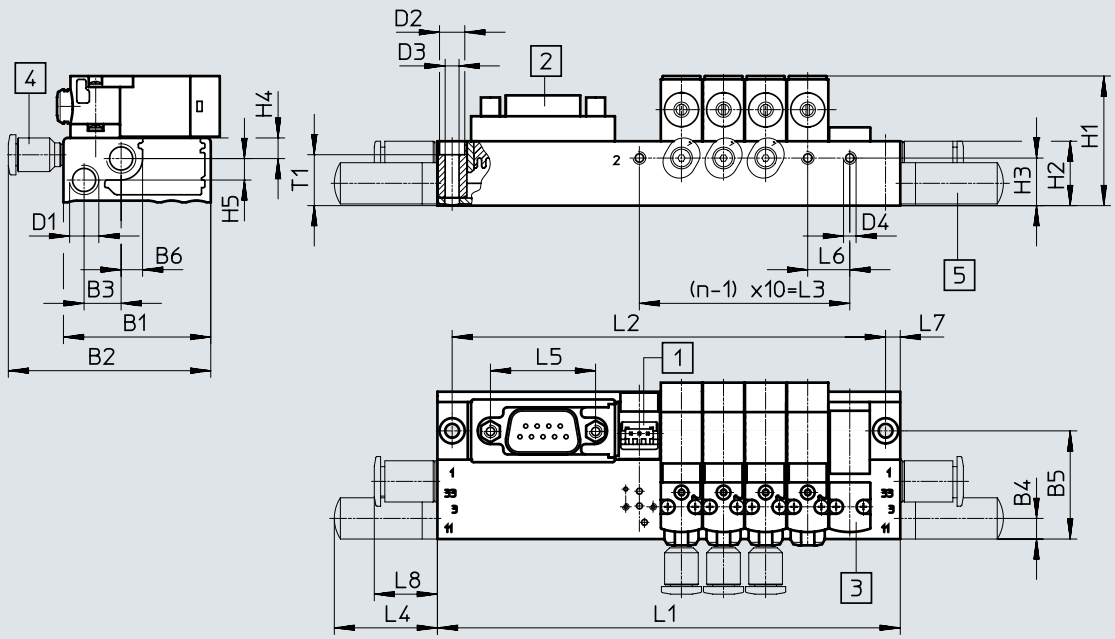
Valve positions n	L1 ±0.15	L2 ±0.1	L3
9	105	97	80
10	115	107	90
11	125	117	100
12	135	127	110
13	145	137	120
14	155	147	130
15	165	157	140

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

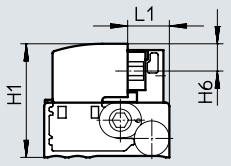
Type	B1	B2	B3	B4	B5	B6	D1	D2	D3	D4	H1	H2	H3	H4	H5	L4	L5	L6	L7	L8	T1
MHA1	35	48.1	8.8	5.3	25.7	5.2	M7	6	3.3	M3	30.8	15.3	11.3	4.9	5.1	24.5	25	10	3.5	15	12.1

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

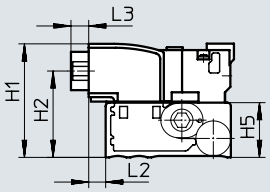
Valve positions n	L1 ±0.15	L2 ±0.1	L3
10	172	165	90
12	192	185	110
14	212	205	130
16	232	225	150

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

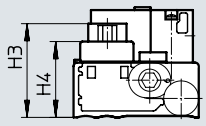
Plug outlet to the pneumatic side



Plug outlet to the electrical side



Plug outlet on top (standard)

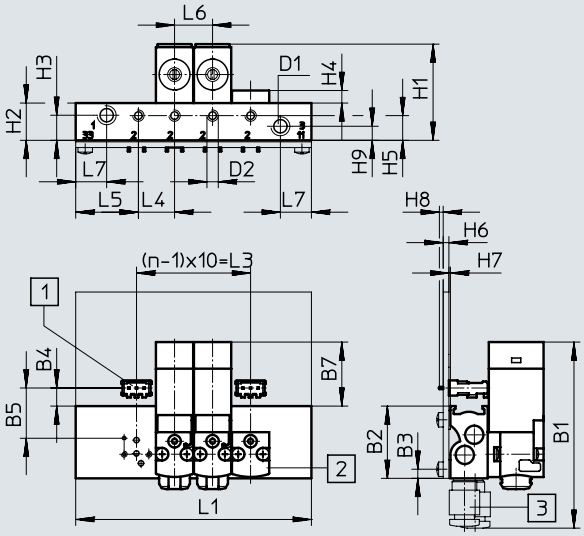


Type	H1	H2	H3	H4	H5	H6	L1	L2	L3
MHA1	31.8	24.2	26.2	21.2	15.3	7.6	11.7	4.8	5

Datasheet

Dimensions – Manifold assembly on a circuit board 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 circuit board 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

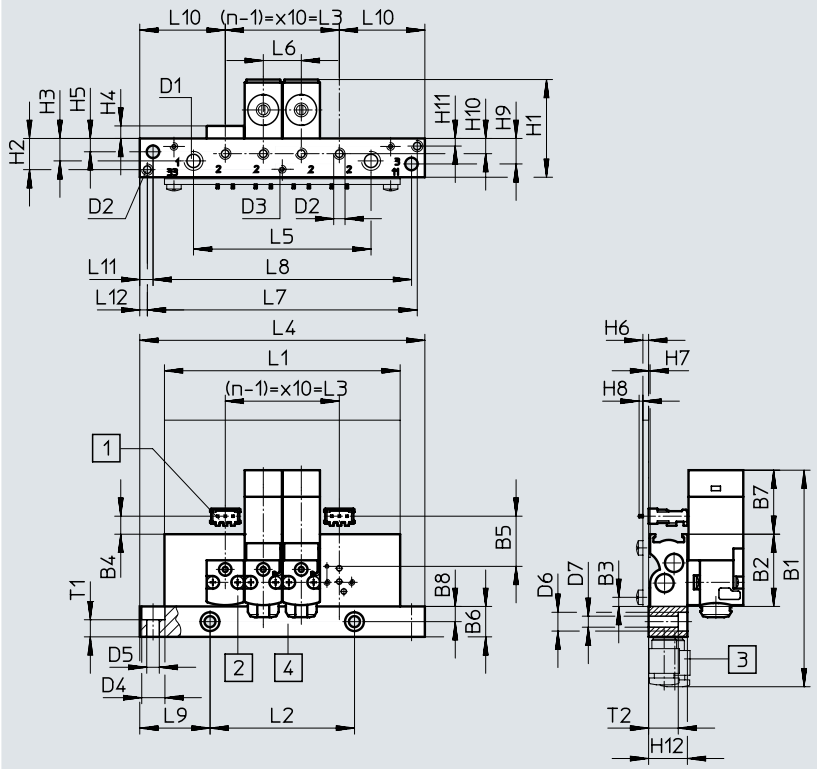
Type	H1	H2	H3	H4	H5	H6	H7	H8	H9	L4	L5	L6	L7
Without pneumatic multiple connector plate	25.3	9.8	6.6	3.3	6.5	1.5	0.4	1	3.7	9.5	16.5	10	8.2

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 a circuit board 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
[4] Pneumatic multiple connector plate, removable

Note

The circuit board 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

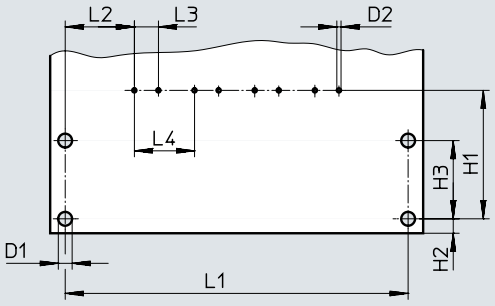
Type	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	L6	L9	L10	L11	L12	T1	T2
With pneumatic multiple connector plate	25.7	8.2	5.9	3.3	3.5	1.5	0.4	1	6.7	4	2	10.2	10	18.5	22.5	3.5	2	4.5	7.8

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 a circuit board Download CAD data → www.festo.com

Hole pattern on circuit board



Note

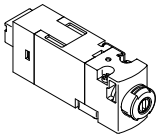
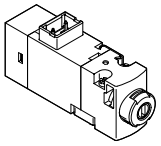
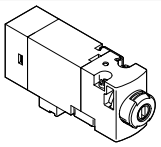
The circuit board is not included in the scope of delivery.

Type	D1	D2	H1	H2	H3	L2	L3	L4
Circuit board	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

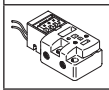
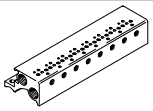
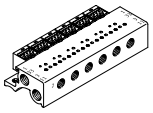
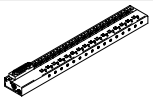
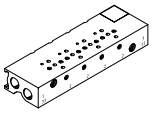
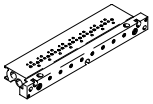
Ordering data

		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-3/2O-0.6-HC**
	Plug connection on top	3/2-way solenoid valve	Closed	24 V DC	**540444**	**MHA1-M1LH-3/2G-0.6-TC**
			Open	24 V DC	**540441**	**MHA1-M1LH-3/2O-0.6-TC**
	Plug connection underneath	3/2-way solenoid valve	Closed	24 V DC	**540445**	**MHA1-M1LH-3/2G-0.6-PI**
			Open	24 V DC	**540442**	**MHA1-M1LH-3/2O-0.6-PI**

Note

Valves types 3/2G and 3/2O must not be mixed on one 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 mounting on a circuit board	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 mounting on a circuit board, 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**

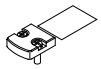
Note

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

Note

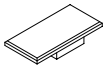
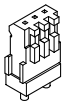
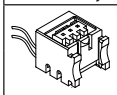
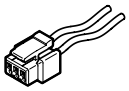
Valves types 3/2G and 3/2O must not be mixed on one manifold rail.

Datasheet

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

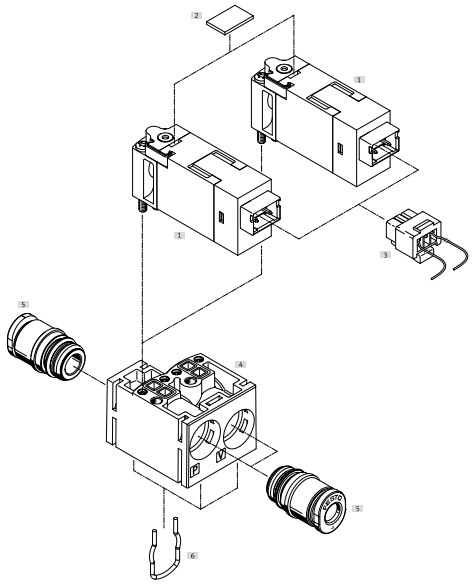
Datasheet

Ordering data

				Pack size	Part no.	Type
Inscription label						
	For identifying the valve positions			–	**197259**	**MH-BZ-80X**
Soldering base						
	For manifold rail for valves with plug connection underneath for mounting on a circuit board, 3-pin			10	**197261**	**PCBC-A-10**
				100	**197262**	**PCBC-A-100**
Electrical plug base						
	For manifold rail, for valves with Plug connection underneath	2x flying leads Open end 1-core	0.5 m	–	**197260**	**MHAP-PI**
			1 m	–	**532182**	**MHAP-PI-1**
Plug socket with cable						
	Straight socket Plug pattern H 3-pin	2x flying leads Open end 1-core	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**

Peripherals overview

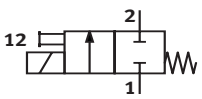
2x2/2-way sub-base valve with LED

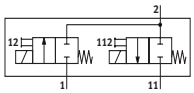


Designation		Description	→ Page/Internet
[1]	Solenoid valve	2/2-way valve, normally closed	58
[2]	Inscription labels	For identifying the valve positions	58
[3]	Plug socket with cable	Straight socket, plug pattern H, 3-pin	58
[4]	Sub-base	Included in the scope of delivery	–
[5]	Push-in cartridge	Included in the scope of delivery	58
[6]	Clip	Included in the scope of delivery	–

Datasheet

Function

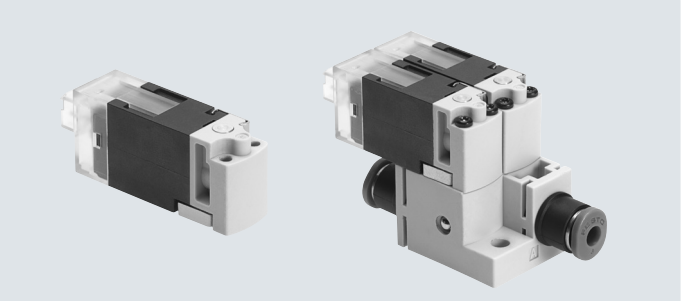




Voltage
24 V DC

Pressure
– 0.95 ... +1.5 bar

Temperature range
–5 ... +50 °C



General technical data			
Valve function		2/2-way, single solenoid, closed	2x2/2-way, single solenoid, closed
Design		Poppet valve with spring return	–
Sealing principle		Soft	
Actuation type		Electrical	
Reset method		Mechanical spring	
Type of control		Direct	
Flow direction		Not reversible	
Suitable for vacuum		Yes	
Exhaust air function		Cannot be throttled	
Manual override		Non-detenting	
Signal status indication		LED	
Type of mounting		On sub-base	With through-hole
Mounting position		Any	
Nominal width	[mm]	1.5	
Standard nominal flow rate	[l/min]	30	
Standard flow rate	[l/min]	30	
Width	[mm]	10	20
Grid dimension	[mm]	10	20
Pneumatic connection	1	Sub-base	QS3, QS4, prepared for QSP10
	11	Sub-base	QS3, QS4, prepared for QSP10
	2	Sub-base	QS3, QS4, prepared for QSP10

Operating and environmental conditions			
Valve function		2/2-way, single solenoid, closed	2x2/2-way, single solenoid, closed
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 ... 1.5	
Operating pressure, reversible	[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	
Certification		RCM Mark	–
CE marking (see declaration of conformity)		To EU EMC Directive[2)]	
		To EU RoHS Directive[2)]	
UKCA marking (see declaration of conformity)		To UK EMC regulations[2)]	
		To UK RoHS regulations[2)]	

1) More information www.festo.com/x/topic/crc

2) For information about the area of use, see the declaration of conformity at: www.festo.com/catalogue/... ➔ 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 resistant	Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6

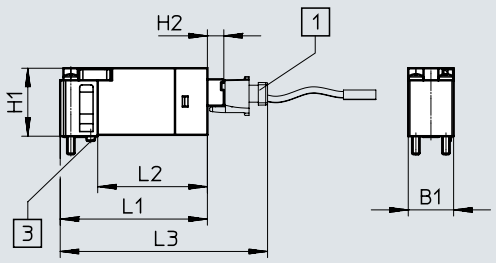
Electrical data		
Operating voltage	[V DC]	24
Permissible voltage fluctuations	[%]	±10
Electrical connection		Plug KMH
Power consumption	[W]	3, following current reduction 0.7
Duty cycle	[%]	100
Max. cable length	[m]	30
Degree of protection		IP40

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
LABS (PWIS) conformity	VDMA24364-B2-L

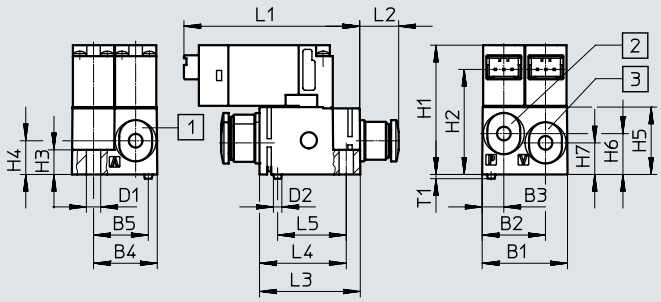
Dimensions Download CAD data ➔ www.festo.com

2/2-way valve



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

2x2/2-way valve



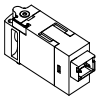
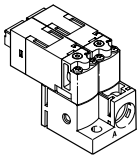
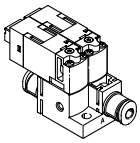
[1] Push-in connector 2 [3] Push-in connector 11
[2] Push-in connector 1

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

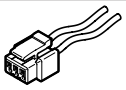
1) Packaging unit.

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

				Pack size	Part no.	Type
Push-in fittings						
	10 mm cartridge	Polymer	For tubing O.D. 3 mm	10	**132621**	**QSPKG10-3**
			For tubing O.D. 4 mm	10	**132622**	**QSPKG10-4**
			For tubing O.D. 6 mm	10	**132623**	**QSPKG10-6**
Inscription label						
	For identifying the valve positions			–	**197259**	**MH-BZ-80X**
Plug socket with cable						
	Straight socket Plug pattern H 3-pin	2x flying leads Open end 1-core	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**