Solenoid valves MH1, miniature

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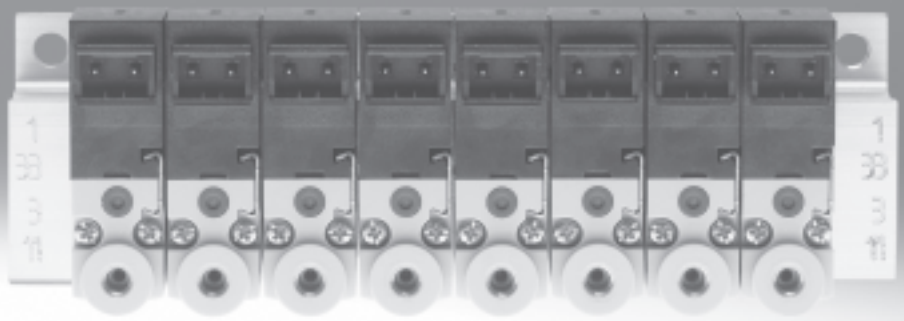

Complete product range for a wide range of applications

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. Either as an individual sub-base or pre-assembled on a PR manifold rail. In addition, mounting on a PR manifold rail enables very compact assembly. For increased requirements and speed, the bigger MH2 with a flow rate of up to 100 l/min is the ideal solution.

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

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

Miniature valves not just for the electronics industry ...

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

With flow rates of 10 and 14 l/min for the miniature valves, there is always sufficient volume for pilot control of process valves. The flow rate is also adequate for Festo's wide range of compact cylinders, rotary drives and slides.
For increased requirements of up to 100 l/min: MH2.

Solenoid valves MH1, miniature

Key features – Pneumatic components

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Operation with different pressures

Vacuum operation

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

It must therefore be ensured that this direction of flow is observed even when operating the valve with vacuum.

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

Reverse operation

Reverse operation is not possible; the direction of flow cannot be reversed.

Note

Vacuum must not be connected to port 1.

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

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

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

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

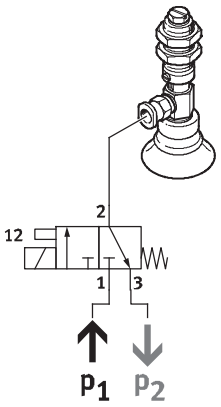
3/2-way valve, MH...-3/2O-...

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

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

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

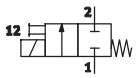
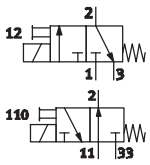
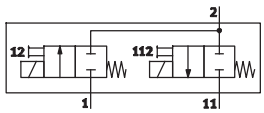
Example



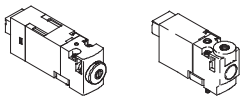
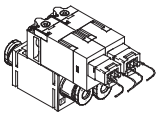
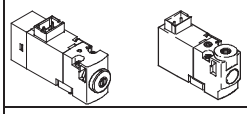
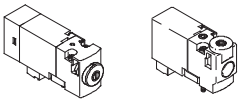
With the 3/2-way valve, normally closed, vacuum operation is established by connecting the vacuum (P2) to port 3 and connecting e.g. a silencer for venting (P1) to port 1.
This changes the normal position from "closed" to "open".

Solenoid valves MH1, miniature

Product range overview

Function	Circuit symbol	Version	Voltage [V DC]			➔ Page/ Internet
			5	12	24	
2/2-way valve		**Standard nominal flow rate 14 l/min**				
		Semi in-line valve	■	■	■	7
		Sub-base valve	■	■	■	17
		Standard nominal flow rate 30 l/min, controls vacuum or ejector pulse				
		Sub-base valve	–	–	■	34
3/2-way valve[1)]		**Standard nominal flow rate 10 l/min**				
		Semi in-line valve	■	■	■	7
		Sub-base valve	■	■	■	17
		Sub-base valve with LED	–	–	■	17
2x2/2-way valve		**Standard nominal flow rate 30 l/min, controls vacuum and ejector pulse**				
		Sub-base valve with LED	–	–	■	34

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 LED
Plug connection at rear (HC)				
	Individual sub-base	■	■	■
	Manifold assembly	■	■	■
	Sub-base with 2x2/2-way valve fully assembled	–	–	■
Plug connection on top (TC)				
	Individual sub-base	■	■	■
	Manifold assembly	■	■	■
Plug connection underneath (PI)				
	Individual sub-base with plug base	■	■	■
	Manifold assembly with plug bases	■	■	■
	Manifold assembly with plug bases and electrical multi-pin plug	■	■	■
	Manifold assembly on PCB with soldering bases	■	■	■
	Manifold assembly on PCB with soldering bases and pneumatic multiple connector plate	–	■	■

Solenoid valves MH1, miniature

Type codes

MH	A	1	–	M	4	L	H	–	3/2	–	O	–	M3	–	HC

Valve family	
MH	Miniature and fast-switching valves

Design	
P	Semi in-line valve
A	Sub-base valve

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

Drive type	
M	Solenoid, switching

Operating voltage	
4	5 V DC
5	12 V DC
1	24 V DC

Signal status display	
–	No
L	LED

Manual override	
H	Non-detenting/detenting

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

Normal position	
G	Closed
O	Open

Pneumatic connection	
0.6	Nominal size 0.65 mm
0.9	Nominal size 0.9 mm
M3	M3 thread

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

Note

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

Solenoid valves MHP1, miniature

Peripherals overview – Semi in-line valve, valve manifold

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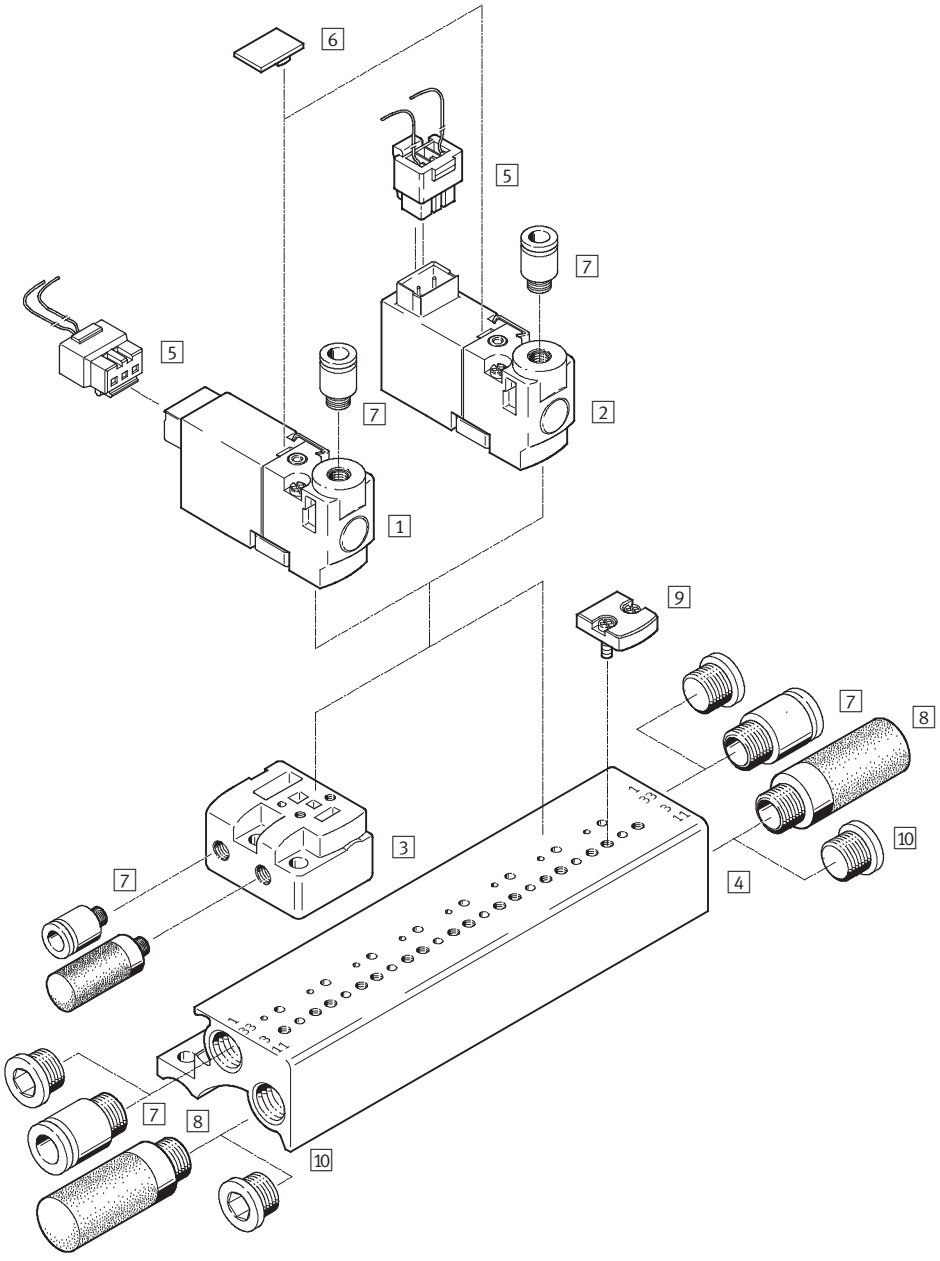
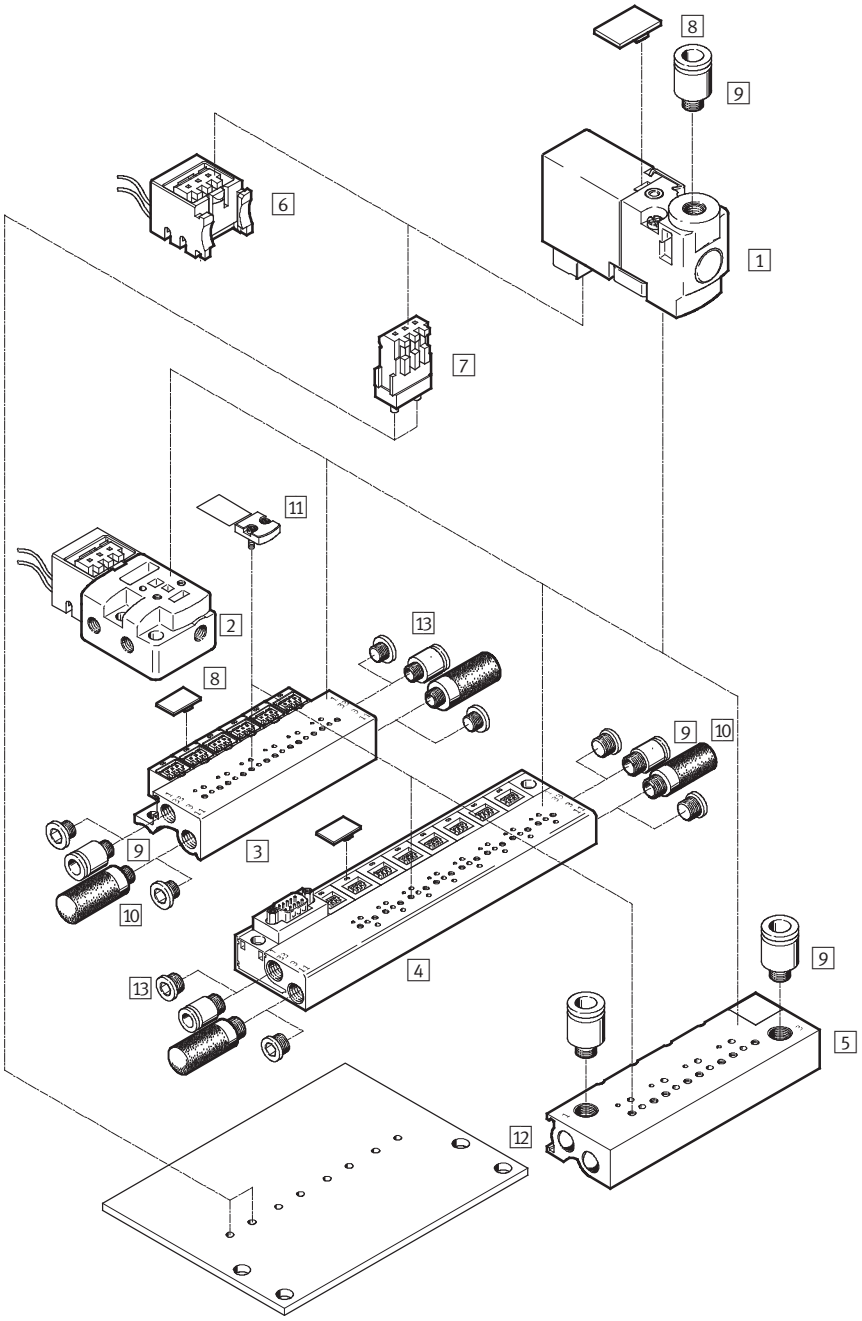
Plug connection at rear ...-HC, plug connection on top ...-TC



Accessories

		➔ Page/ Internet			➔ Page/ Internet
1	Semi in-line valve MHP1-...-HC	9	6	Inscription label MH-BZ-80X	36
2	Semi in-line valve MHP1-...-TC	9	7	Push-in fittings QS/QSM	qs
3	Individual sub-base MHP1-AS-3-M3	11	8	Silencer UC	uc
4	Manifold block MHP1-PR...-3	11	9	Blanking plate MHAP1-BP-3 for sealing vacant positions	36
5	Plug socket with cable KMH/NEBV-H1G2	36	10	Blanking plug B	36

Plug connection underneath ...-PI



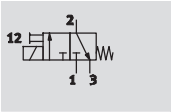
Accessories

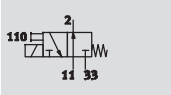
		➔ Page/ Internet			➔ Page/ Internet
1	Semi in-line valve MHP1-...-PI	9	7	Soldering base PCBC-A	36
2	Individual sub-base MHP1-AS-3-M3-PI	11	8	Inscription label MH-BZ-80x	36
3	Manifold block MHP1-PR...-3-PI with plug bases	11	9	Push-in fittings QS/QSM	qs
4	Manifold block MHP1-PR...-3-PI-D with plug bases and electrical multi-pin plug	13	10	Silencer UC	uc
5	Manifold block MHP1-PR...-3-PI-PCB for mounting on PCB	14	11	Blanking plate MHAP1-BP-3-PI for sealing vacant positions	36
			12	PCB (user-specific)	14
6	Plug base MHAP-PI	36	13	Blanking plug B	36

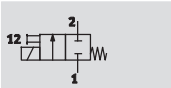
Solenoid valves MHP1, miniature

Technical data – Semi in-line valve

Function



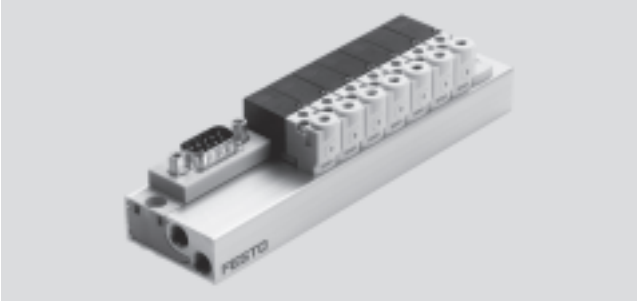




Voltage
5, 12, 24 V DC

Pressure
–0.9 … +8 bar

Temperature range
–5 … +50 °C



General technical data				
Valve function			2/2-way, single solenoid	3/2-way, single solenoid
Constructional design			Poppet valve with spring return	
Sealing principle			Soft	
Actuation type			Electric	
Reset method			Mechanical spring	
Type of pilot control			Direct	
Direction of flow			Non-reversible	
Exhaust function			–	With flow control
Manual override			Non-detenting	
Type of mounting			On sub-base via through-holes	
Mounting position			Any	
Nominal size		[mm]	0.9	0.65
Standard nominal flow rate		[l/min]	14 (2 bar → 0 bar)	10
Grid dimension		[mm]	10	10
Pneumatic connection	Individual sub-base	1, 33	M3	M3
		2	M3	M3
		3, 11	–	M3
	Manifold assembly	1, 33	M7	M7
		2	M3	M3
		3, 11	–	M7
Product weight		[g]	10	10

Operating and environmental conditions				
Valve function			2/2-way, single solenoid	3/2-way, single solenoid
Operating medium			Compressed air in accordance with ISO 8573-1:2010 [7:4:4]	
Note on operating/pilot medium			Operation with lubricated medium possible (in which case lubricated operation will always be required)	
Operating pressure range	Normally closed	[bar]	–0.9 … +2	0 … 8[1]
	Normally open	[bar]	–	0 … 6[1]
Ambient temperature	Individual mounting	[°C]	–5 … +50	
	Manifold assembly	[°C]	–5 … +40	
Temperature of medium	Individual mounting	[°C]	–5 … +50	
	Manifold assembly	[°C]	–5 … +40	
Storage temperature		[°C]	–20 … +60	
Corrosion resistance class CRC			2[2]	

1) Vacuum operation possible with special connection method

2) Corrosion resistance class 2 as per Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

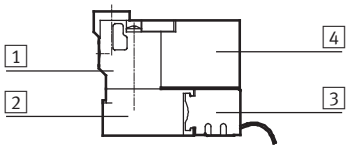
Solenoid valves MHP1, miniature

Technical data – Semi in-line valve

Electrical data			
Valve function		2/2-way, single solenoid	3/2-way, single solenoid
Operating voltage	[V DC]	5 ±10%, 12 ±10% or 24 ±10%	
Type of connection		Plug connection	
Power consumption	[W]	1	
Duty cycle		100%	
Protection class to EN 60529			
With plug socket KMH/NEBV-H1G2		IP40	
With plug base MHAP-PI			
With soldering base PCBC-A			
With Sub-D connector plug			

Response times and switching frequencies			
Valve function		2/2-way, single solenoid	3/2-way, single solenoid
Response time on/off	[ms]	4/5	4/4
Maximum switching frequency	[Hz]	20	

Materials

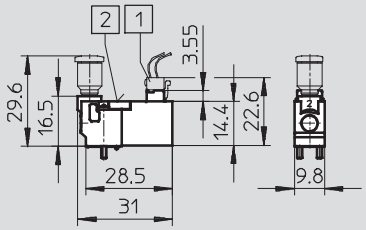


1	Housing	Polyphenylene sulphide
2	Sub-base	Aluminium
3	Plug base	Polyamide
4	Coil housing	Polyamide
–	Seals	Fluoro elastomer, nitrile rubber, hydrogenated nitrile rubber
	Note on materials	Free of copper and PTFE

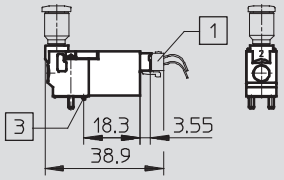
Dimensions

Download CAD data ➔ **www.festo.com**

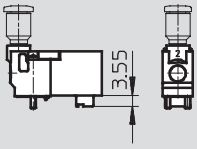
Plug connection on top



Plug connection at rear

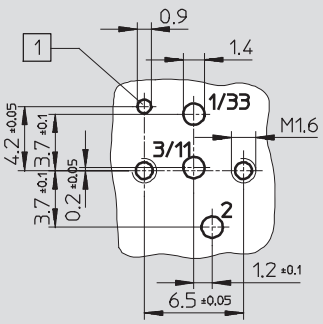


Plug connection underneath



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

Hole pattern on sub-bases



1 Hole for coding pin

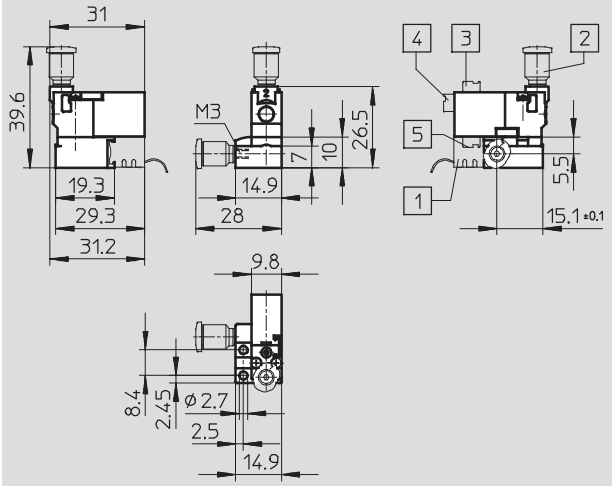
Note

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

If used as a 2/2-way valve, normally open, port 1/33 is not used.

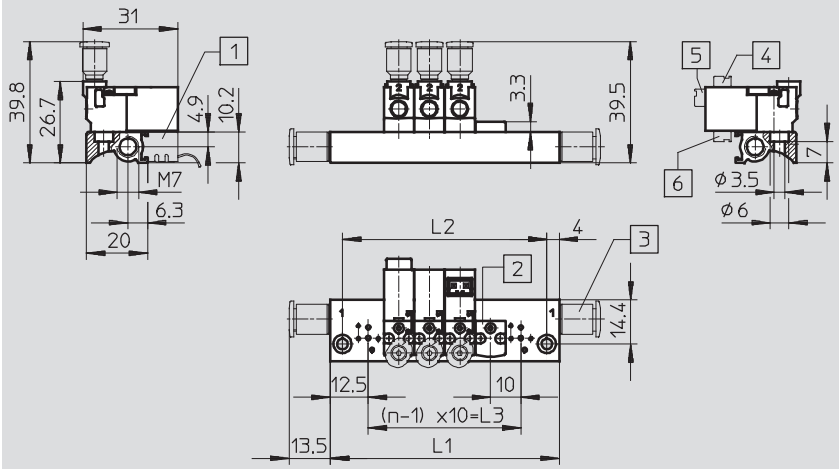
Dimensions – 2/2-way valve Download CAD data ➔ **www.festo.com**

Individual sub-base



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

Manifold assembly



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

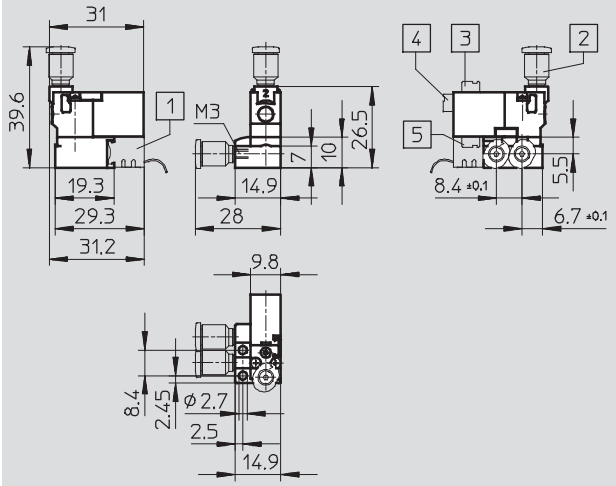
Valve positions n	L1 ±0.15	L2 ±0.1	L3
2	35	27	10
3	45	37	20
4	55	47	30
5	65	57	40
6	75	67	50
7	85	77	60
8	95	87	70

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

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

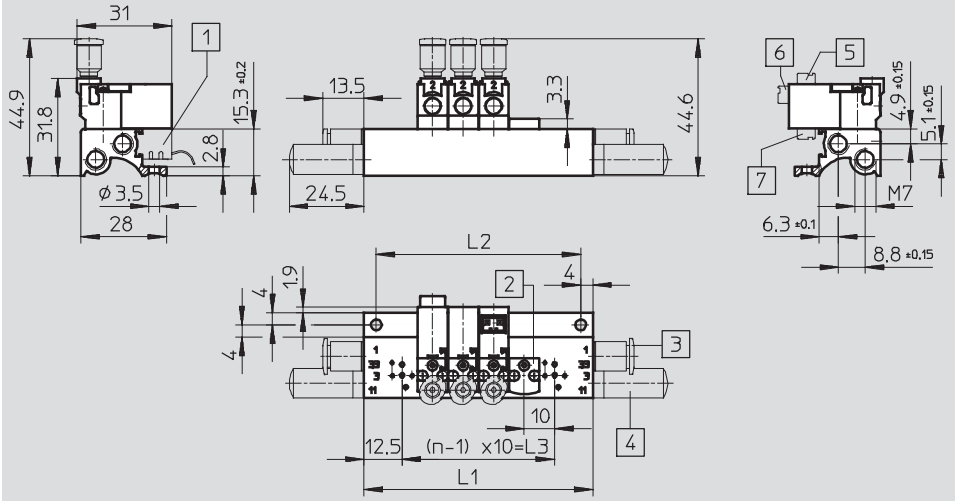
Dimensions – 3/2-way valve Download CAD data ➔ **www.festo.com**

Individual sub-base



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

Manifold assembly



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

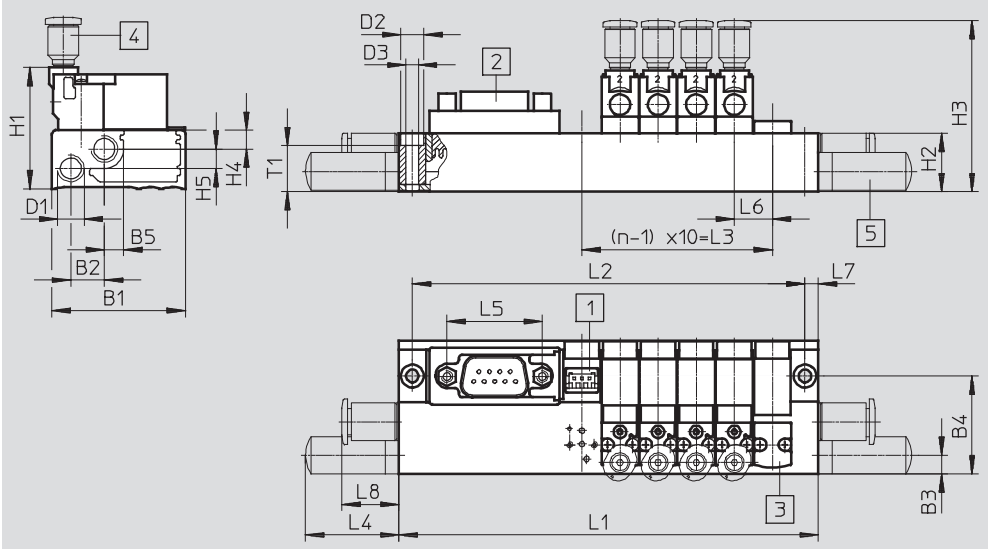
Valve positions n	L1 ±0.15	L2 ±0.1	L3
2	35	27	10
3	45	37	20
4	55	47	30
5	65	57	40
6	75	67	50
7	85	77	60
8	95	87	70

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

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

Dimensions – 3/2-way valve Download CAD data ➔ **www.festo.com**

Manifold assembly with electrical multi-pin plug



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

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

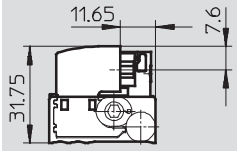
Valve positions n	L1 ±0.15	L2 ±0.1	L3
10	172	165	90
12	192	185	110
14	212	205	130
16	232	225	150

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

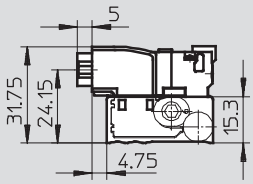
Type	L4	L5	L6	L7	L8	B1	B2	B3	B4	B5	D1	D2	D3	H1	H2	H3	H4	H5	T1
MHP1	25	25	10	4	15	35	9	5	26	5	M7	6	3	32	15	45	5	5	12

Electrical multi-pin plug – Plug directions

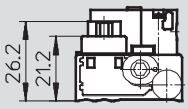
To pneumatic side



To electrical side

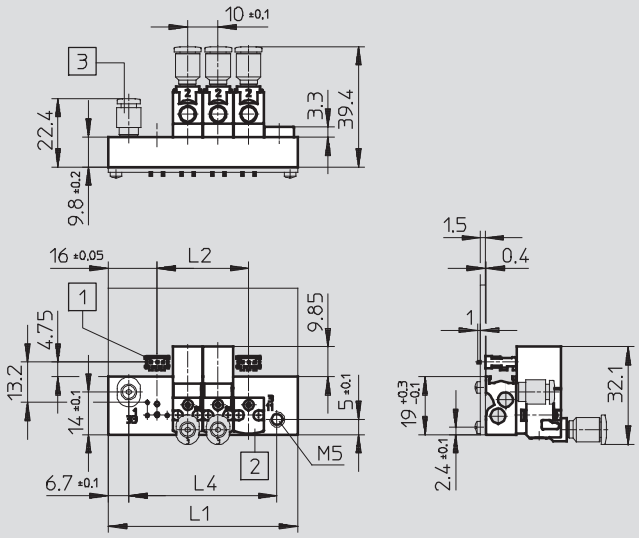


To top (standard)



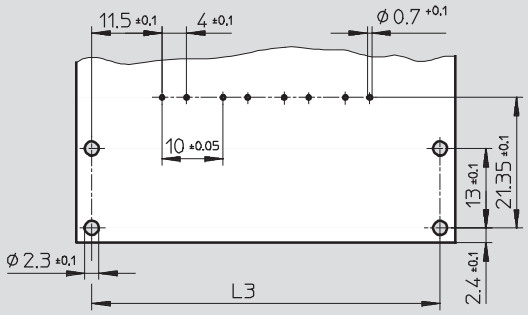
Dimensions – 3/2-way valve Download CAD data ➔ **www.festo.com**

Manifold assembly on PCB



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

Hole pattern on PCB



Note

The PCB is not included in the scope of delivery.

Valve positions n	L1 ±0.15	L2	L3 ±0.1	L4 ±0.1
2	42	10	37	28.6
4	62	30	57	48.6
6	82	50	77	68.6
8	102	70	97	88.6
10	122	90	117	108.6

Solenoid valves MHP1, miniature

Technical data – Semi in-line valve

Ordering data – 2/2-way valves			
Electrical connection	Operating voltage	Normally closed Part No.	Type
M3 connecting thread			
Plug connection at rear	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**
Plug connection on top	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**
Plug connection underneath	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**

- Note

Type 2/2G and type 3/2O valves must not be mixed on a manifold block.

Ordering data – Product-specific accessories			
Designation		Part No.	Type
Valves with plug connection at rear or on top			
Individual sub-base		**197188**	**MHP1-AS-2-M3**
Manifold block for	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**
Valves with plug connection underneath			
Individual sub-base		**197190**	**MHP1-AS-2-M3-PI**
Manifold block with plug bases for	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**

- Note

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

Solenoid valves MHP1, miniature

Technical data – Semi in-line valve

Ordering data – 3/2-way valves					
Electrical connection	Operating voltage	Normally closed Part No.	Type	Normally open Part No.	Type
M3 connecting thread					
Plug connection at rear	5 V DC	**197009**	**MHP1-M4H-3/2G-M3-HC**	**197027**	**MHP1-M4H-3/2O-M3-HC**
	12 V DC	**197010**	**MHP1-M5H-3/2G-M3-HC**	**197028**	**MHP1-M5H-3/2O-M3-HC**
	24 V DC	**197011**	**MHP1-M1H-3/2G-M3-HC**	**197029**	**MHP1-M1H-3/2O-M3-HC**
Plug connection on top	5 V DC	**197012**	**MHP1-M4H-3/2G-M3-TC**	**197030**	**MHP1-M4H-3/2O-M3-TC**
	12 V DC	**197013**	**MHP1-M5H-3/2G-M3-TC**	**197031**	**MHP1-M5H-3/2O-M3-TC**
	24 V DC	**197014**	**MHP1-M1H-3/2G-M3-TC**	**197032**	**MHP1-M1H-3/2O-M3-TC**
Plug connection underneath	5 V DC	**197015**	**MHP1-M4H-3/2G-M3-PI**	**197033**	**MHP1-M4H-3/2O-M3-PI**
	12 V DC	**197016**	**MHP1-M5H-3/2G-M3-PI**	**197034**	**MHP1-M5H-3/2O-M3-PI**
	24 V DC	**197017**	**MHP1-M1H-3/2G-M3-PI**	**197035**	**MHP1-M1H-3/2O-M3-PI**

- Note

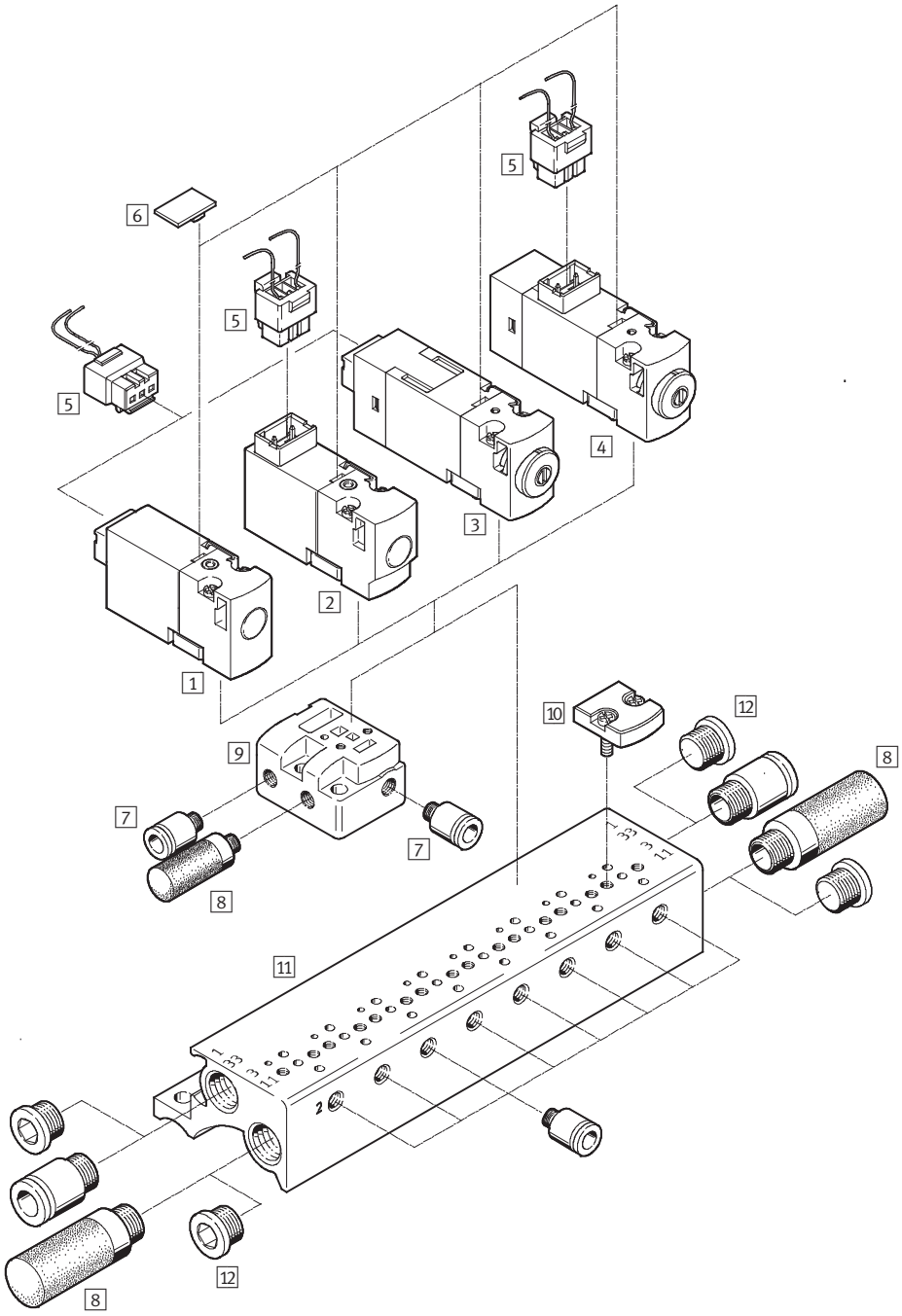
Type 3/2G and type 3/2O valves must not be mixed on a manifold block.

Ordering data – Product-specific accessories			
Designation		Part No.	Type
Valves with plug connection at rear or on top			
Individual sub-base		**197184**	**MHP1-AS-3-M3**
Manifold block for	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**
Valves with plug connection underneath			
Individual sub-base		**197186**	**MHP1-AS-3-M3-PI**
Manifold block with plug bases for	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**
Manifold block with plug bases and electrical multi-pin plug for	4 valves	**197233**	**MHP1-PR4-3-PI-D9**
	6 valves	**197234**	**MHP1-PR6-3-PI-D9**
	8 valves	**197235**	**MHP1-PR8-3-PI-D9**
	10 valves	**197236**	**MHP1-PR10-3-PI-D25**
Manifold block for mounting on PCB for	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**

- Note

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

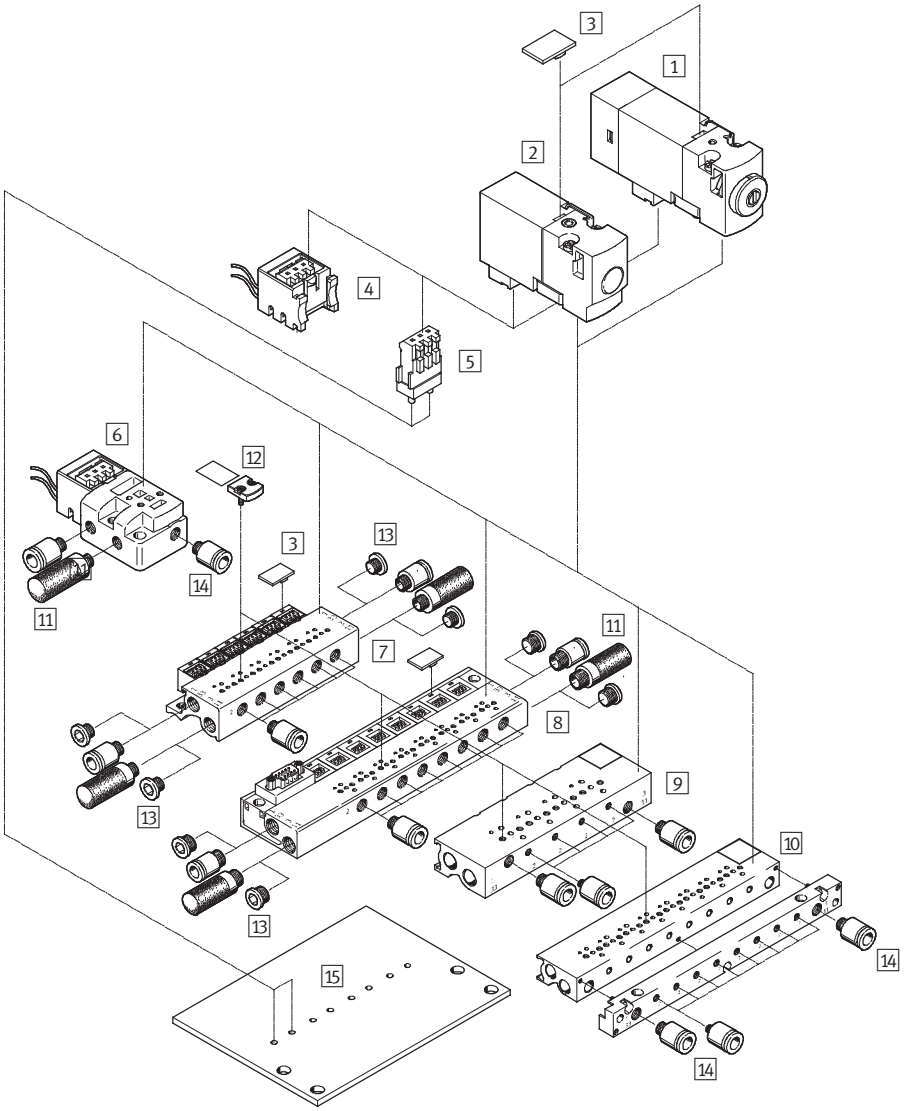
Plug connection at rear ...-HC, plug connection on top ...-TC



Accessories

		➔ Page/ Internet				➔ Page/ Internet
1	Sub-base valve MHA1-...-HC	20		7	Push-in fittings QS/QSM	qs
2	Sub-base valve MHA1-...-TC	20		8	Silencer UC	uc
3	Sub-base valve MHA1-...-HC with LED	28		9	Individual sub-base MHA1-AS-3-M3	22
4	Sub-base valve MHA1-...-TC with LED	28		10	Blanking plate MHAP1-BP-3 for sealing vacant positions	36
5	Plug socket with cable KMH/NEBV-H1G2	36		11	Manifold block MHA1-PR...-3	22
6	Inscription label MH-BZ-80X	36		12	Blanking plug B	36

Plug connection underneath ...-PI



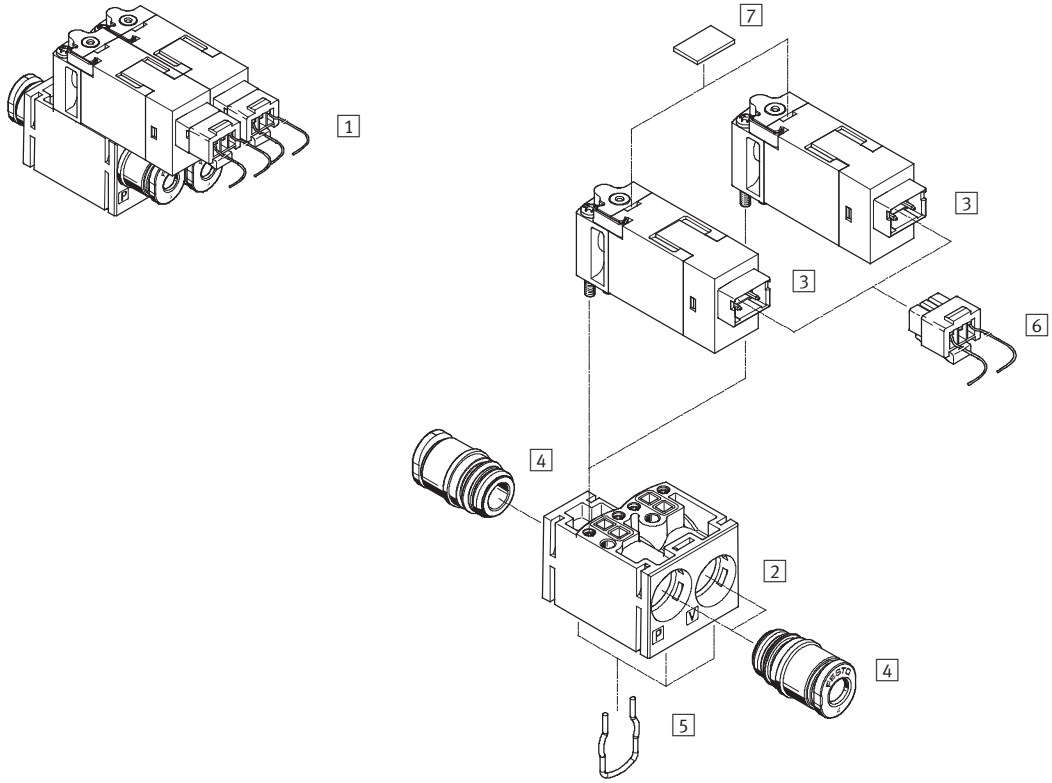
Accessories

		➔ Page/ Internet			➔ Page/ Internet
1	Sub-base valve MHA1-...-PI with LED	28	9	Manifold block MHA1-PR...-3-M3-PI-PCB for mounting on PCB	25
2	Sub-base valve MHA1-...-PI	20	10	Manifold block MHA1-PR...-3-M3-PI-PCBM for mounting on PCB with pneumatic multiple connector plate	25
3	Inscription label MH-BZ-80X	36	11	Silencer UC	uc
4	Plug base MHAP-PI	36	12	Blanking plate MHAP1 for sealing vacant positions	36
5	Soldering base PCBC-A	36	13	Blanking plug B	36
6	Individual sub-base MHA1-AS-3-M3-PI with plug base	22	14	Push-in fittings QS	qs
7	Manifold block MHA1-PR...-3-M3-PI with plug bases	22	15	PCB (user-specific)	25
8	Manifold block MHA1-PR...-3-M3-PI-D with plug bases and electrical multi-pin plug	24			

Solenoid valves MHP1, miniature

Peripherals overview – 2x2/2 sub-base valve with LED

2x2/2 sub-base valve with LED



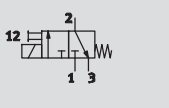
Accessories

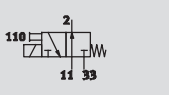
		➔ Page/ Internet			➔ Page/ Internet
1	Solenoid valve MHA1-2x2/2G-1,5	34	5	Clip	–
2	Sub-base	–	6	Plug socket with cable KMH/NEBV-H1G2	36
3	Solenoid valve MHA1-M1LCH-2/2G-1.5-HC	34	7	Inscription label MH-BZ-80x	36
4	Push-in cartridge	–			

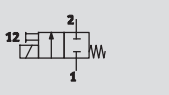
Solenoid valves MHA1, miniature

Technical data – Sub-base valve

Function



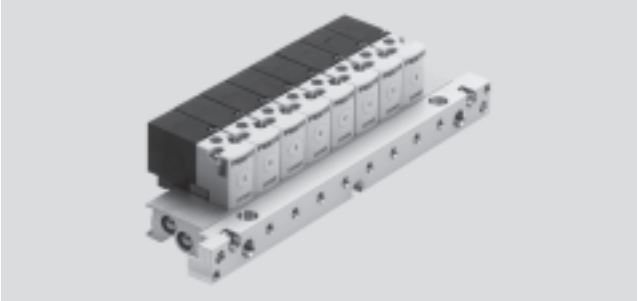




Voltage
5, 12, 24 V DC

Pressure
–0.9 … +8 bar

Temperature range
–5 … +50 °C



General technical data				
Valve function			2/2-way, single solenoid	3/2-way, single solenoid
Constructional design			Poppet valve with spring return	
Sealing principle			Soft	
Actuation type			Electric	
Reset method			Mechanical spring	
Type of pilot control			Direct	
Direction of flow			Non-reversible	
Exhaust function			–	With flow control
Manual override			Non-detenting	
Type of mounting			On sub-base via through-holes	
Mounting position			Any	
Nominal size		[mm]	0.9	0.65
Standard nominal flow rate		[l/min]	14 (2 bar → 0 bar)	10
Grid dimension		[mm]	10	10
Pneumatic connection	Individual sub-base	1, 33	M3	M3
		2	–	M3
		3, 11	M3	M3
	Manifold assembly	1, 33	M7	M7 (PCB: M5)
		2	–	M3
		3, 11	M7	M7 (PCB: M5)
Product weight		[g]	10	10

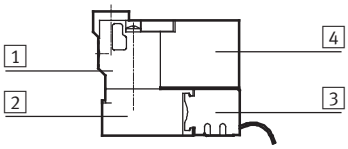
Operating and environmental conditions				
Valve function			2/2-way, single solenoid	3/2-way, single solenoid
Operating medium			Compressed air in accordance with ISO 8573-1:2010 [7:4:4]	
Note on operating/pilot medium			Operation with lubricated medium possible (in which case lubricated operation will always be required)	
Operating pressure range	Normally closed	[bar]	–0.9 … +2	0 … 8[1]
	Normally open	[bar]	–	0 … 6[1]
Ambient temperature	Individual mounting	[°C]	–5 … +50	
	Manifold assembly	[°C]	–5 … +40	
Temperature of medium	Individual mounting	[°C]	–5 … +50	
Temperature of medium	Manifold assembly	[°C]	–5 … +40	
Storage temperature		[°C]	–20 … +60	
Corrosion resistance class CRC			2[2]	

1) Vacuum operation possible with special connection method (vacuum at connection 3)
2) Corrosion resistance class 2 as per Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

Electrical data			
Valve function		2/2-way, single solenoid	3/2-way, single solenoid
Operating voltage	[V DC]	5 ±10%, 12 ±10% or 24 ±10%	
Type of connection		Plug connection	
Power consumption	[W]	1	
Duty cycle	[%]	100	
Protection class to EN 60529			
With plug socket KMH/NEBV-H1G2		IP40	
With plug base MHAP-PI			
With soldering base PCBC-A			
With Sub-D connector plug			

Response times and switching frequencies			
Valve function		2/2-way, single solenoid	3/2-way, single solenoid
Response time on/off	[ms]	4/5	4/4
Maximum switching frequency	[Hz]	20	

Materials



1	Housing	Polyphenylene sulphide
2	Sub-base	Aluminium
3	Plug base	Polyamide
4	Coil housing	Polyamide
–	Seals	Fluoro elastomer, nitrile rubber, hydrogenated nitrile rubber
	Note on materials	Free of copper and PTFE

Dimensions

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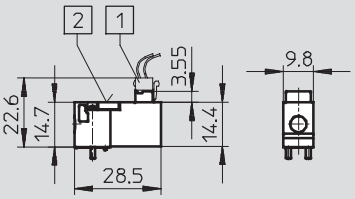
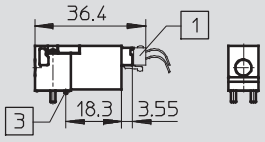
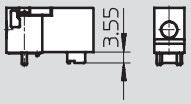
Plug connection on top



Plug connection at rear

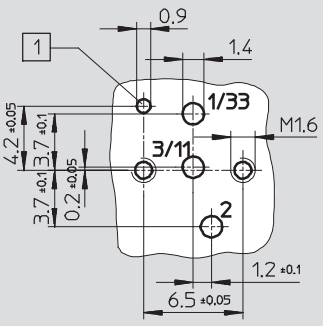


Plug connection underneath



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

Hole pattern on sub-bases



1 Hole for coding pin

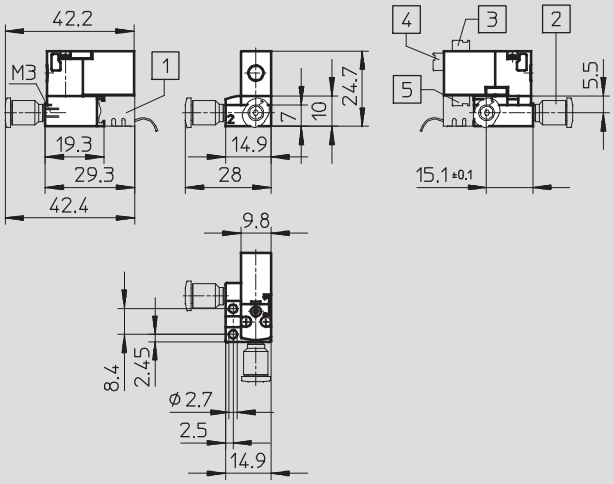
- Note

If used as a 2/2-way valve, normally closed, port 3/11 is not used.

If used as a 2/2-way valve, normally open, port 1/33 is not used.

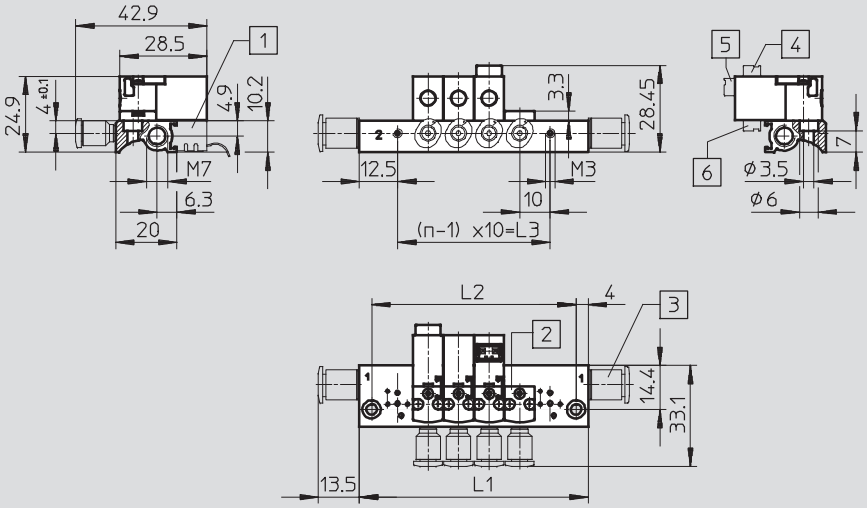
Dimensions – 2/2-way valve Download CAD data ➔ **www.festo.com**

Individual sub-base



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

Manifold assembly



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

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

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

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

Dimensions – 3/2-way valve

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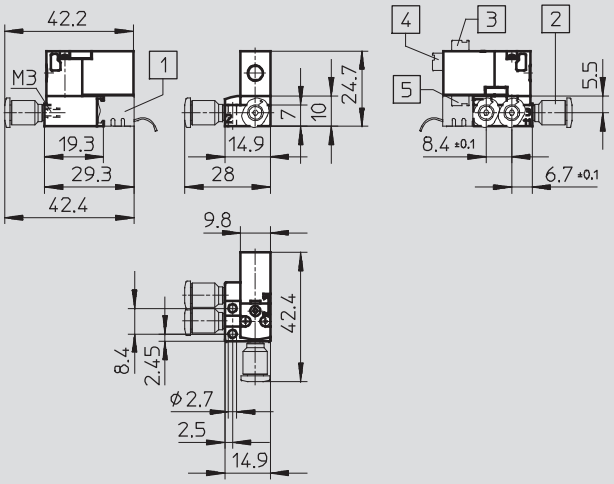
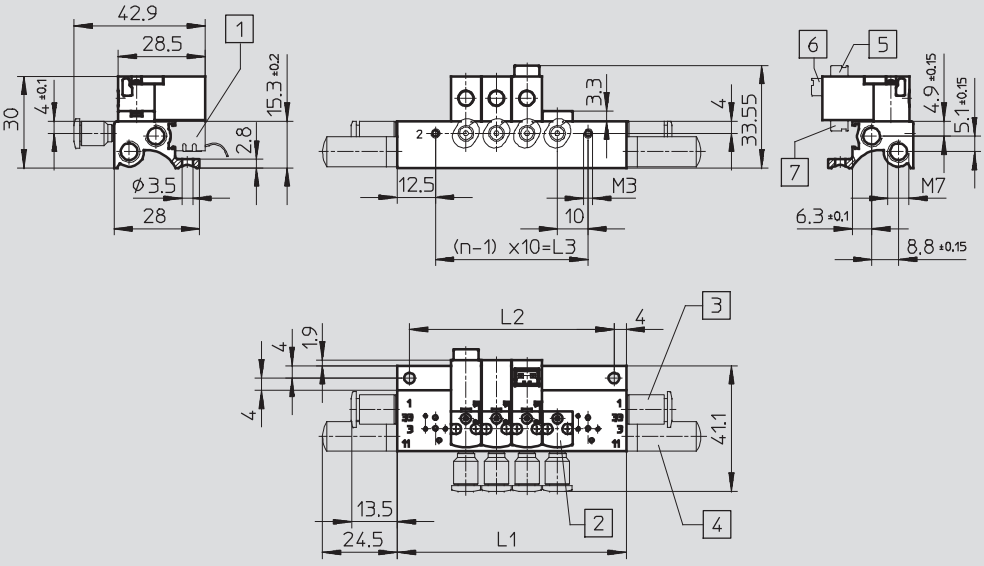
Individual sub-base



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

Manifold assembly



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

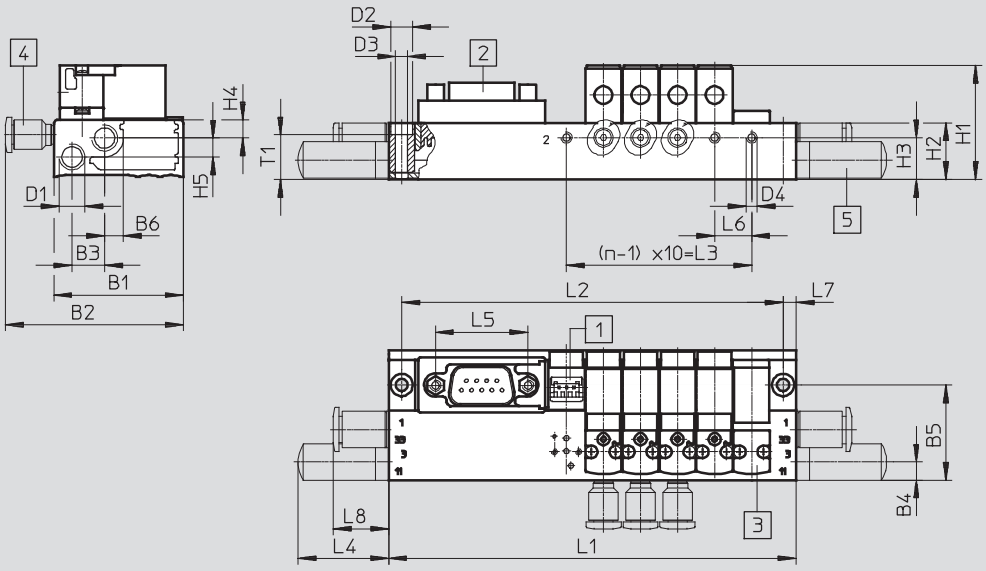
Valve positions n	L1 ±0.15	L2 ±0.1	L3
2	35	27	10
3	45	37	20
4	55	47	30
5	65	57	40
6	75	67	50
7	85	77	60
8	95	87	70

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

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

Dimensions – 3/2-way valve Download CAD data ➔ **www.festo.com**

Manifold assembly with electrical multi-pin plug



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

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

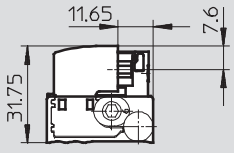
Valve positions n	L1 ±0.15	L2 ±0.1	L3
10	172	165	90
12	192	185	110
14	212	205	130
16	232	225	150

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

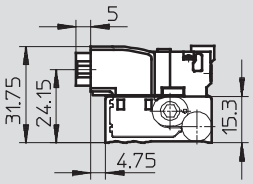
Type	L4	L5	L6	L7	L8	B1	B2	B3	B4	B5	B6	D1	D2	D3	D4	H1	H2	H3	H4	H5	T1
MHA1	25	25	10	4	15	35	48	9	5	26	5	M7	6	3	M3	31	15	11	5	5	12

Electrical multi-pin plug – Plug directions

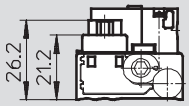
To pneumatic side



To electrical side

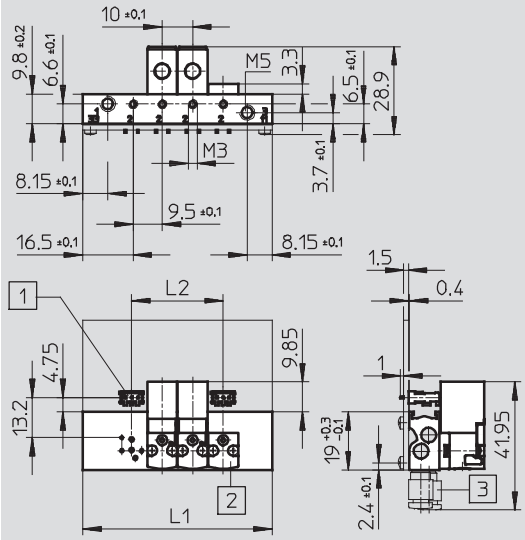


To top (standard)



Dimensions – 3/2-way valve Download CAD data ➔ **www.festo.com**

Manifold assembly on PCB

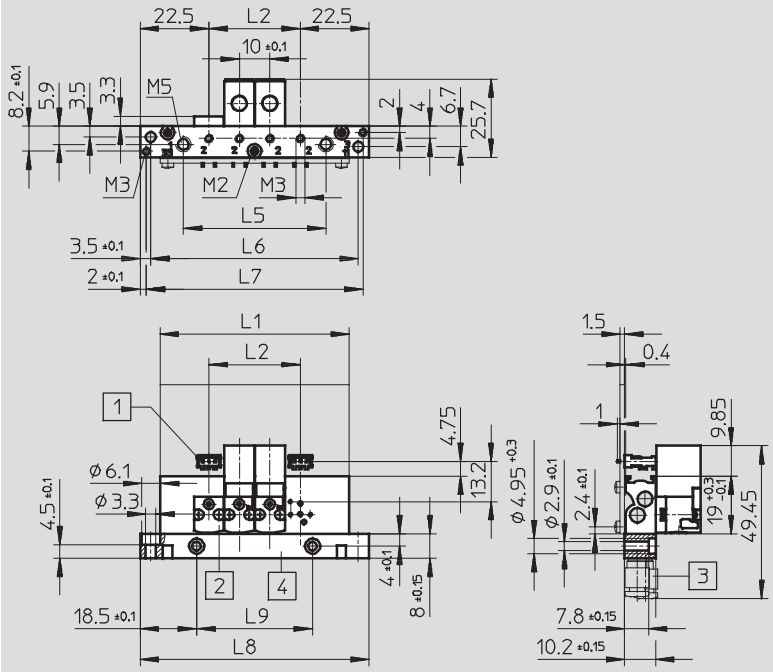


1 Soldering base PCBC-A
2 Blanking plate MHAP1
3 Fitting QSM

- - Note

The PCB is not included in the scope of delivery.
Hole pattern on PCB ➔ 26

Manifold assembly with pneumatic multiple connector plate on PCB



1 Soldering base PCBC-A
2 Blanking plate MHAP1
3 Fitting QSM
4 Removable pneumatic multiple connector plate

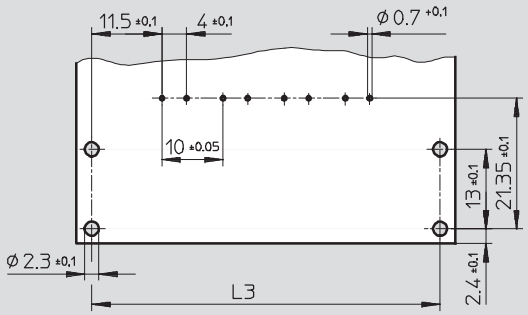
- - Note

The PCB is not included in the scope of delivery.
Hole pattern on PCB ➔ 26

Valve positions n	L1 ±0.15	L2	L3 ±0.1	L5 ±0.15	L6	L7 ±0.1	L8 ±0.2	L9 ±0.1
2	42	10	37	–	–	–	–	–
4	62	30	57	46.7	68	71	75	38
6	82	50	77	66.7	88	91	95	58
8	102	70	97	86.7	108	111	115	78
10	122	90	117	106.7	128	131	135	98

Dimensions

Hole pattern on PCB



- Note

The PCB is not included in the scope of delivery.

Ordering data – 2/2-way valves

Electrical connection	Operating voltage	Normally closed Part No.	Type
M3 connecting thread			
Plug connection at rear	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**
Plug connection on top	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**
Plug connection underneath	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**

- Note

Type 3/2G and type 3/2O valves must not be mixed on a manifold block.

Ordering data – Product-specific accessories

Designation		Part No.	Type
Valves with plug connection at rear or on top			
Individual sub-base		**197187**	**MHA1-AS-2-M3**
Manifold block for	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**
Valves with plug connection underneath			
Individual sub-base		**197189**	**MHA1-AS-2-M3-PI**
Manifold block with plug bases for	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**

- Note

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

Solenoid valves MHA1, miniature

Technical data – Sub-base valve

Ordering data – 3/2-way valves					
Electrical connection	Operating voltage	Normally closed Part No.	Type	Normally open Part No.	Type
M3 connecting thread					
Plug connection at rear	5 V DC	**197000**	**MHA1-M4H-3/2G-0,6-HC**	**197018**	**MHA1-M4H-3/2O-0,6-HC**
	12 V DC	**197001**	**MHA1-M5H-3/2G-0,6-HC**	**197019**	**MHA1-M5H-3/2O-0,6-HC**
	24 V DC	**197002**	**MHA1-M1H-3/2G-0,6-HC**	**197020**	**MHA1-M1H-3/2O-0,6-HC**
Plug connection on top	5 V DC	**197003**	**MHA1-M4H-3/2G-0,6-TC**	**197021**	**MHA1-M4H-3/2O-0,6-TC**
	12 V DC	**197004**	**MHA1-M5H-3/2G-0,6-TC**	**197022**	**MHA1-M5H-3/2O-0,6-TC**
	24 V DC	**197005**	**MHA1-M1H-3/2G-0,6-TC**	**197023**	**MHA1-M1H-3/2O-0,6-TC**
Plug connection underneath	5 V DC	**197006**	**MHA1-M4H-3/2G-0,6-PI**	**197024**	**MHA1-M4H-3/2O-0,6-PI**
	12 V DC	**197007**	**MHA1-M5H-3/2G-0,6-PI**	**197025**	**MHA1-M5H-3/2O-0,6-PI**
	24 V DC	**197008**	**MHA1-M1H-3/2G-0,6-PI**	**197026**	**MHA1-M1H-3/2O-0,6-PI**

- Note

Type 3/2G and type 3/2O valves must not be mixed on a manifold block.

Ordering data – Product-specific accessories			
Designation		Part No.	Type
Valves with plug connection at rear or on top			
Individual sub-base		**197183**	**MHA1-AS-3-M3**
Manifold block for	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**
Valves with plug connection underneath			
Individual sub-base		**197185**	**MHA1-AS-3-M3-PI**
Manifold block with plug bases for	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**
Manifold block with plug bases and electrical multi-pin plug for	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**
Manifold block for mounting on PCB for	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**
Manifold block for mounting on PCB with pneumatic multiple connector plate for	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**

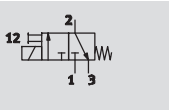
- Note

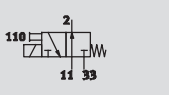
Manifold blocks with an uneven number of valves and for 11 ... 24 valves as well as further variants can be configured and ordered using the MH1 modular product system.

Solenoid valves MHA1, miniature

Technical data – Sub-base valve with LED

Function

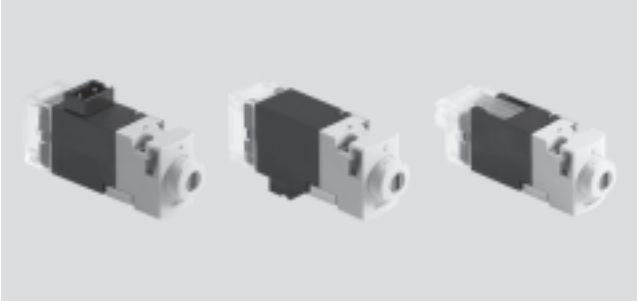




Voltage
24 V DC

Pressure
0 … +8 bar

Temperature range
–5 … +50 °C



General technical data			
Valve function			3/2-way, single solenoid
Constructional design			Poppet valve with spring return
Sealing principle			Soft
Actuation type			Electric
Reset method			Mechanical spring
Type of pilot control			Direct
Direction of flow			Non-reversible
Exhaust function			With flow control
Manual override			Non-detenting/detenting
Signal status display			LED
Type of mounting			On sub-base via through-holes
Mounting position			Any
Nominal size		[mm]	0.65
Standard nominal flow rate		[l/min]	10
Grid dimension		[mm]	10
Pneumatic connection	Individual sub-base	1, 33	M3
		2	M3
		3, 11	M3
	Manifold assembly	1, 33	M7
		2	M3
		3, 11	M7
Product weight		[g]	11

Operating and environmental conditions			
Valve function			3/2-way, single solenoid
Operating medium			Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium			Operation with lubricated medium possible (in which case lubricated operation will always be required)
Operating pressure range	Normally closed	[bar]	0 … 8[1)]
	Normally open	[bar]	0 … 6[1)]
Ambient temperature	Individual mounting	[°C]	–5 … +50
	Manifold assembly	[°C]	–5 … +40
Temperature of medium	Individual mounting	[°C]	–5 … +50
	Manifold assembly	[°C]	–5 … +40
Storage temperature		[°C]	–20 … +60
Corrosion resistance class CRC			2[2)]

1) Vacuum operation possible with special connection method
2) Corrosion resistance class 2 as per Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

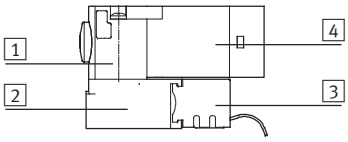
Solenoid valves MHA1, miniature

Technical data – Sub-base valve with LED

Electrical data		
Valve function		3/2-way, single solenoid
Operating voltage	[V DC]	24 ±10%
Type of connection		Plug connection
Power consumption	[W]	1.1
Protection class to EN 60529		
With plug socket KMH/NEBV-H1G2		IP40
With plug base MHAP-PI		
With soldering base PCBC-A		
With Sub-D connector plug		

Response times and switching frequencies		
Valve function		3/2-way, single solenoid
Response time on/off	[ms]	4/4
Maximum switching frequency	[Hz]	20

Materials

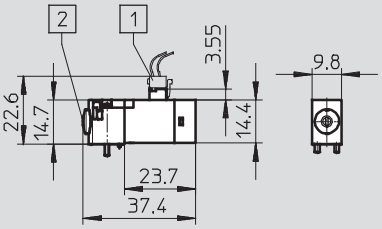


1	Housing	Polyphenylene sulphide
2	Sub-base	Aluminium
3	Plug base	Polyamide
4	Coil housing	Polyamide
–	Seals	Fluoro elastomer, nitrile rubber, hydrogenated nitrile rubber
	Note on materials	Free of copper and PTFE

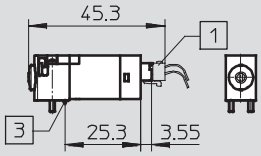
Dimensions

Download CAD data ➔ **www.festo.com**

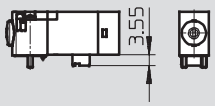
Plug connection on top



Plug connection at rear

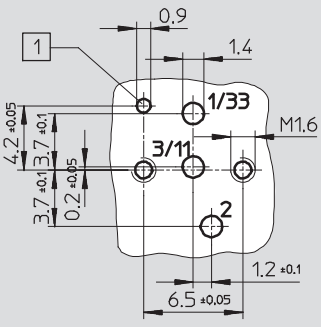


Plug connection underneath



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

Hole pattern on sub-bases



1 Hole for coding pin

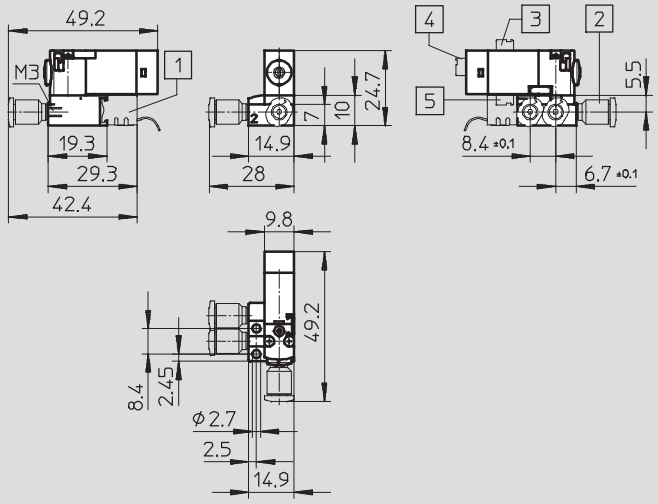
- - Note

If used as a 2/2-way valve, normally closed, port 3/11 is not used.

If used as a 2/2-way valve, normally open, port 1/33 is not used.

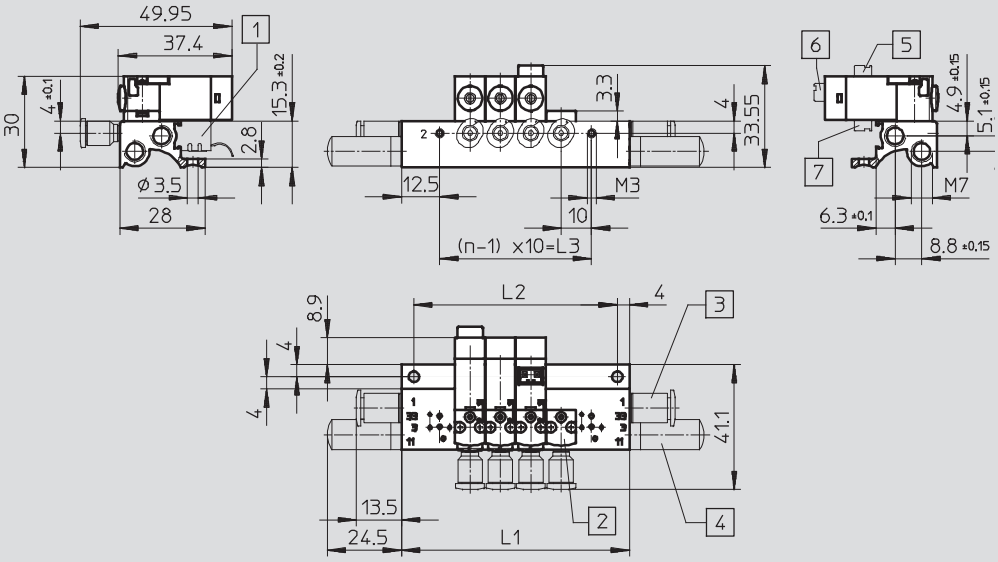
Dimensions – 3/2-way valve Download CAD data ➔ **www.festo.com**

Individual sub-base



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

Manifold assembly



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

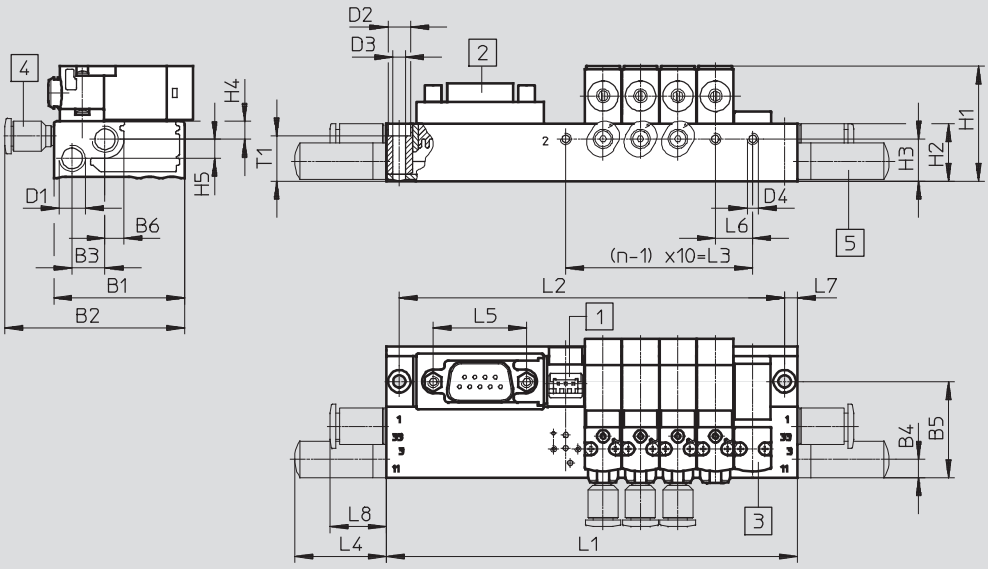
Valve positions n	L1 ±0.15	L2 ±0.1	L3
2	35	27	10
3	45	37	20
4	55	47	30
5	65	57	40
6	75	67	50
7	85	77	60
8	95	87	70

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

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

Dimensions – 3/2-way valve Download CAD data ➔ **www.festo.com**

Manifold assembly with electrical multi-pin plug



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

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

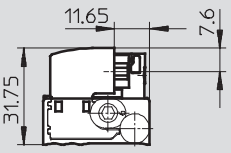
Valve positions n	L1 ±0.15	L2 ±0.1	L3
10	172	165	90
12	192	185	110
14	212	205	130
16	232	225	150

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

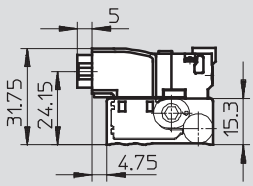
Type	L4	L5	L6	L7	L8	B1	B2	B3	B4	B5	B6	D1	D2	D3	D4	H1	H2	H3	H4	H5	T1
MHA1-M1LH	25	25	10	4	15	35	48	9	5	26	5	M7	6	3	M3	31	15	11	5	5	12

Electrical multi-pin plug – Plug directions

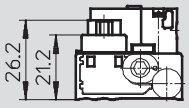
To pneumatic side



To electrical side

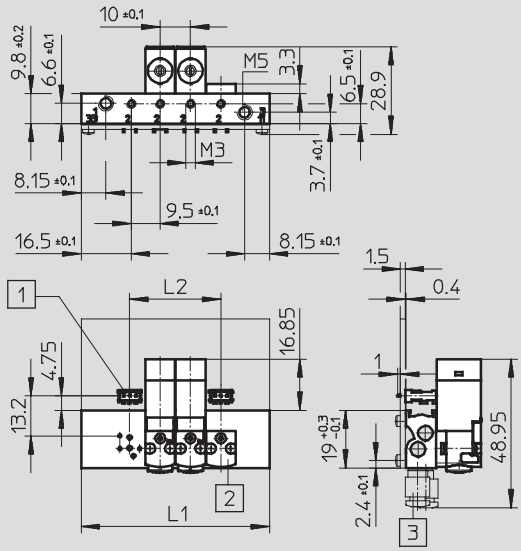


To top (standard)



Dimensions – 3/2-way valve Download CAD data ➔ **www.festo.com**

Manifold assembly on PCB

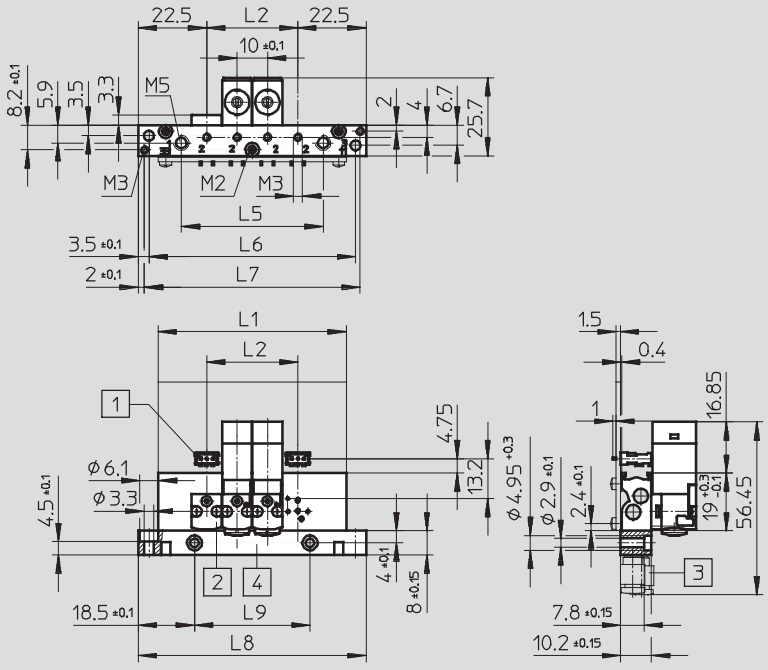


1 Soldering base PCBC-A
2 Blanking plate MHAP1
3 Fitting QSM

Note

The PCB is not included in the scope of delivery.
Hole pattern on PCB ➔ 33

Manifold assembly with pneumatic multiple connector plate on PCB



1 Soldering base PCBC-A
2 Blanking plate MHAP1
3 Fitting QSM
4 Removable pneumatic multiple connector plate

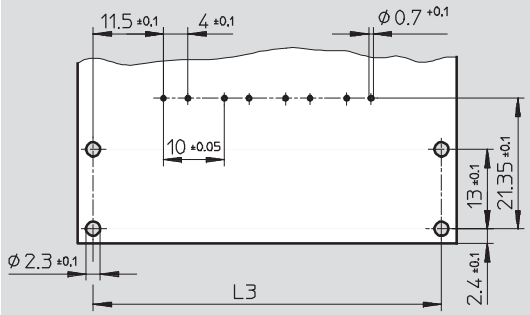
Note

The PCB is not included in the scope of delivery.
Hole pattern on PCB ➔ 33

Valve positions n	L1 ±0.15	L2	L3 ±0.1	L5 ±0.15	L6	L7 ±0.1	L8 ±0.2	L9 ±0.1
2	42	10	37	–	–	–	–	–
4	62	30	57	46.7	68	71	75	38
6	82	50	77	66.7	88	91	95	58
8	102	70	97	86.7	108	111	115	78
10	122	90	117	106.7	128	131	135	98

Dimensions

Hole pattern on PCB



- Note

The PCB is not included in the scope of delivery.

Ordering data – 3/2-way valves

Electrical connection	Operating voltage	Normally closed Part No.	Type	Normally open Part No.	Type
M3 connecting thread					
Plug connection at rear	24 V DC	**540443**	**MHA1-M1LH-3/2G-0,6-HC**	**540440**	**MHA1-M1LH-3/2O-0,6-HC**
Plug connection on top	24 V DC	**540444**	**MHA1-M1LH-3/2G-0,6-TC**	**540441**	**MHA1-M1LH-3/2O-0,6-TC**
Plug connection underneath	24 V DC	**540445**	**MHA1-M1LH-3/2G-0,6-PI**	**540442**	**MHA1-M1LH-3/2O-0,6-PI**

- Note

Type 3/2G and type 3/2O valves must not be mixed on a manifold block.

Ordering data – Product-specific accessories

Designation		Part No.	Type
Valves with plug connection at rear or on top			
Individual sub-base		**197183**	**MHA1-AS-3-M3**
Manifold block for	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**
Valves with plug connection underneath			
Individual sub-base		**197185**	**MHA1-AS-3-M3-PI**
Manifold block with plug bases for	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**
Manifold block with plug bases and electrical multi-pin plug for	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**
Manifold block for mounting on PCB for	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**
Manifold block for mounting on PCB with pneumatic multiple connector plate for	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**

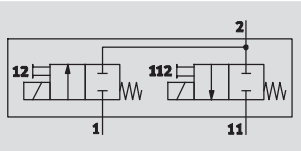
- Note

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

Solenoid valves MHA1, miniature

Technical data – 2x2/2-way sub-base valve with LED

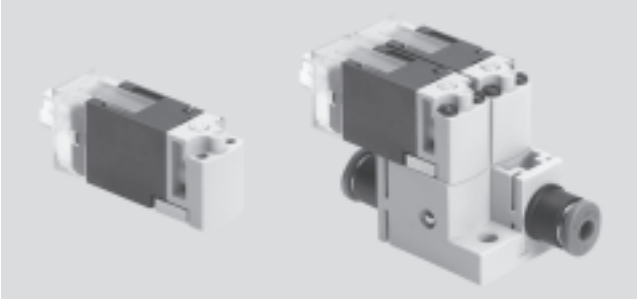
Function



Voltage
24 V DC

Pressure
– 0.95 ... +1.5 bar

Temperature range
–5 ... +50 °C



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

Operating and environmental conditions				
Valve function			2/2-way, single solenoid	2x2/2-way, single solenoid
Operating medium			Compressed air in accordance with ISO 8573-1:2010 [7:4:4]	
Note on operating/pilot medium			Operation with lubricated medium possible (in which case lubricated operation will always be required)	
Operating pressure	Port 1	[bar]	0 ... 1.5	
	Port 11	[bar]	– 0.95 ... 0	
Ambient temperature		[°C]	–5 ... +50	
Temperature of medium		[°C]	–5 ... +50	
Storage temperature		[°C]	–20 ... +60	
Corrosion resistance class CRC			2[1)]	

1) Corrosion resistance class 2 as per Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

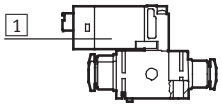
Electrical data			
Valve function		2/2-way, single solenoid	2x2/2-way, single solenoid
Operating voltage	[V DC]	24 ±10%	
Type of connection		Plug connection	
Power consumption	[W]	3, following current reduction 0.7	
Max. length of connecting cable	[m]	30	
Protection class to EN 60529			
With plug socket KMH/NEBV-H1G2		IP40	

Solenoid valves MHA1, miniature

Technical data – 2x2/2-way sub-base valve with LED

Response times and switching frequencies			
Valve function		2/2-way, single solenoid	2x2/2-way, single solenoid
Response time on/off	[ms]	6/5	
Maximum switching frequency	[Hz]	10	

Materials

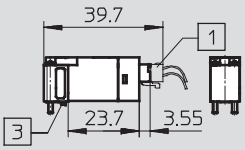


1	Housing	Reinforced PA, reinforced PPS
–	Screws	Steel
–	Seals	HNBR, NBR
	Note on materials	Free of copper and PTFE RoHS-compliant

Dimensions

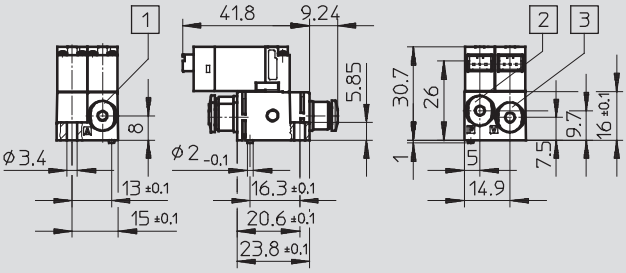
Download CAD data ➔ **www.festo.com**

2/2-way valve



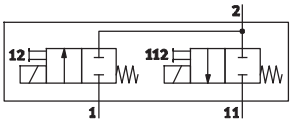
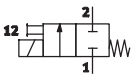
1 Plug socket KMH/NEBV-H1G2
3 Coding pin

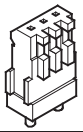
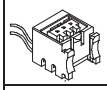
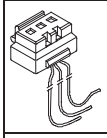
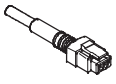
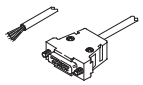
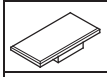
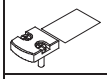
2x2/2-way valve



1 Push-in fitting 2
2 Push-in fitting 1
3 Push-in fitting 11

Ordering data

Circuit symbol	Normal position	Push-in fitting for 1/11/2 [mm]	Weight [g]	Part No.	Type
2x2/2-way valve					
	2x closed	4/4/3	30.6	**560372**	**MHA1-2X2/2G-1,5-4-4-3**
		4/4/4	30.6	**566175**	**MHA1-2X2/2G-1,5-4-4-4**
		3/3/3	30.6	**562051**	**MHA1-2X2/2G-1,5-3-3-3**
		Prepared for QSP10	26.3	**563365**	**MHA1-2X2/2G-1,5**
2/2-way valve					
	Closed	–	10	**557864**	**MHA1-M1LCH-2/2G-1.5-HC**

Ordering data			Part No.	Type
Soldering base				
	For plug-in connection, 3-pin	10 pieces	**197261**	**PCBC-A-10**
		100 pieces	**197262**	**PCBC-A-100**
Plug socket with cable				
	Electrical plug base for plug-in connection, for 1 valve, with cable	0.5 m	**197260**	**MHAP-PI**
	Plug socket with cable for horizontal connection, for 1 valve, 2-wire	0.5 m	**197263**	**KMH-0,5**
		1 m	**197264**	**KMH-1**
	Plug socket with cable, sheathed for horizontal connection, for 1 valve, 2-wire	0.5 m	**566658**	**NEBV-H1G2-P-0.5-N-LE2**
		1 m	**566659**	**NEBV-H1G2-P-1-N-LE2**
		2.5 m	**566660**	**NEBV-H1G2-P-2.5-N-LE2**
		5 m	**566661**	**NEBV-H1G2-P-5-N-LE2**
	Socket, 9-pin, Sub-D, open cable end, for up to 8 valves, IP40, cable sheath PVC	2.5 m	**531184**	**KMP6-09P-8-2,5**
		5 m	**531185**	**KMP6-09P-8-5**
		10 m	**531186**	**KMP6-09P-8-10**
	Socket, 25-pin, Sub-D, open cable end, for up to 12 valves, IP40, cable sheath PVC	2.5 m	**530049**	**KMP6-25P-12-2,5**
		5 m	**530050**	**KMP6-25P-12-5**
		10 m	**530051**	**KMP6-25P-12-10**
	Socket, 25-pin, Sub-D, open cable end, for up to 24 valves, IP40, cable sheath PVC	2.5 m	**530046**	**KMP6-25P-20-2,5**
		5 m	**530047**	**KMP6-25P-20-5**
		10 m	**530048**	**KMP6-25P-20-10**
Blanking plug				
	For M5 thread	10 pieces	**3843**	**B-M5**
	For M7 thread	10 pieces	**174309**	**B-M7**
Inscription label				
	For solenoid valve	80 labels in frame	**197259**	**MH-BZ-80X**
Blanking plate				
	For manifold block	Plug connection	**197257**	**MHAP1-BP-3**
		Plug base	**197258**	**MHAP1-BP-3-PI**
Silencer				
			→ Internet: uc	
Push-in fittings				
			→ Internet: quick star	