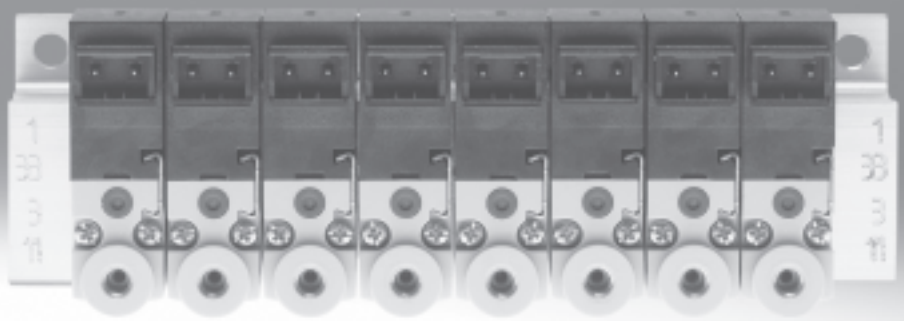
Solenoid valves MH1, miniature

FESTO



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.

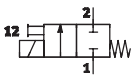
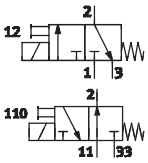
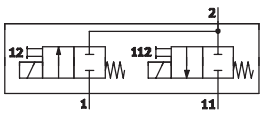
Miniature valves not just for the electronics industry ...

... 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.

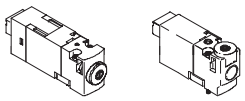
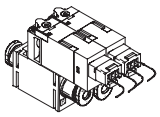
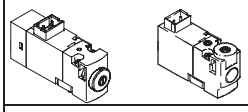
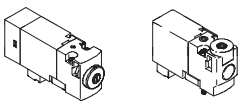
With flow rates of 10 and 14 l/min for the miniature valves, there is always sufficient volume for pilot control of process valves. The flow rate is also adequate for Festo's wide range of compact cylinders, rotary drives and slides.
For increased requirements of up to 100 l/min: MH2.

Solenoid valves MH1, miniature

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	■	■	■	6
		Sub-base valve	■	■	■	18
		Standard nominal flow rate 30 l/min, controls vacuum or ejector pulse				
		Sub-base valve	–	–	■	55
3/2-way valve[1)]		**Standard nominal flow rate 10 l/min**				
		Semi in-line valve	■	■	■	6
		Sub-base valve	■	■	■	18
		Sub-base valve with LED	–	–	■	18
2x2/2-way valve		**Standard nominal flow rate 30 l/min, controls vacuum and ejector pulse**				
		Sub-base valve with LED	–	–	■	55

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

Mounting options				
Design		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

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
TC	Plug connection on top for plug socket KMH
PI	Plug connection underneath for plug-in connection

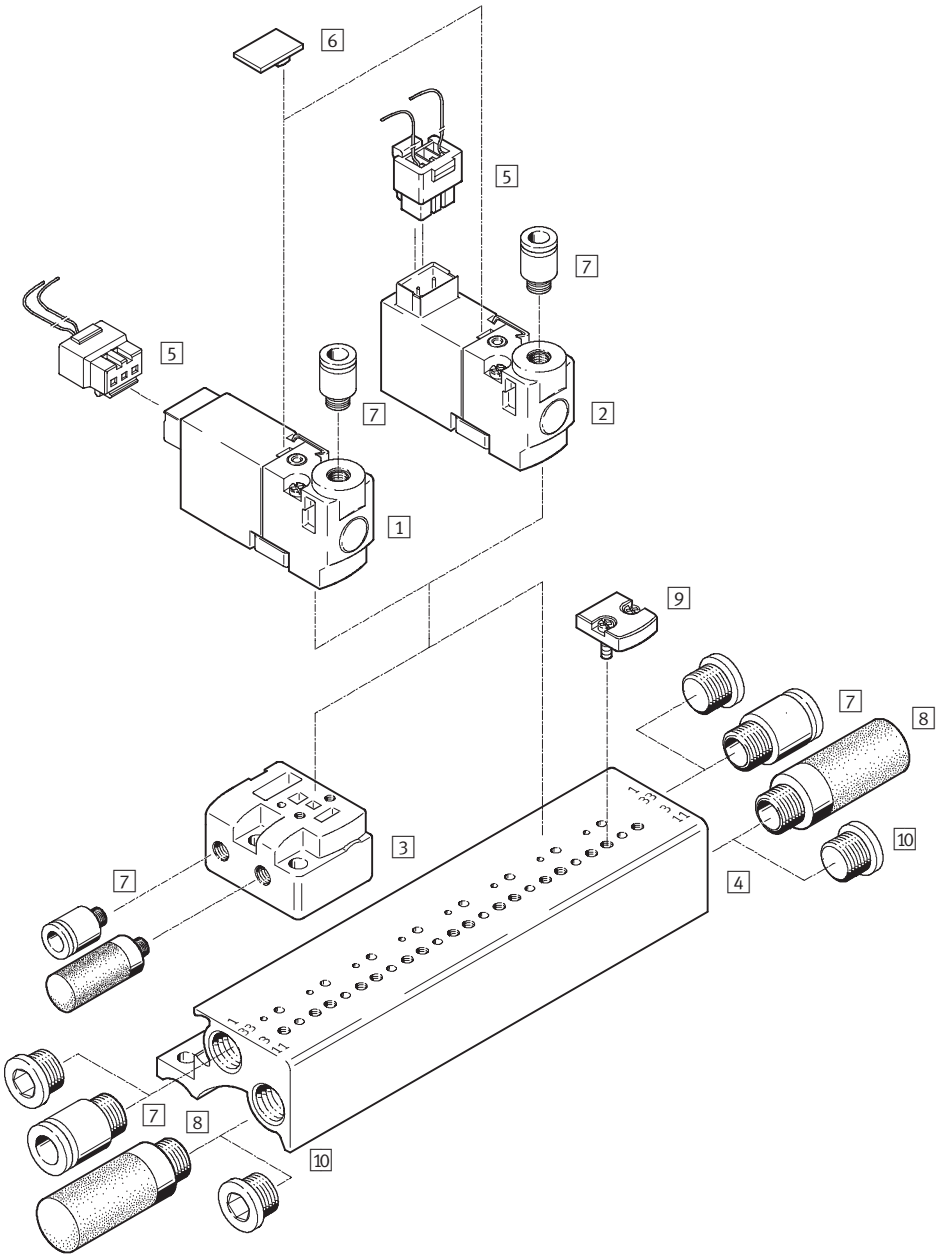
- Note

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

MH1 without LED → from 28

MH1 with LED → from 45

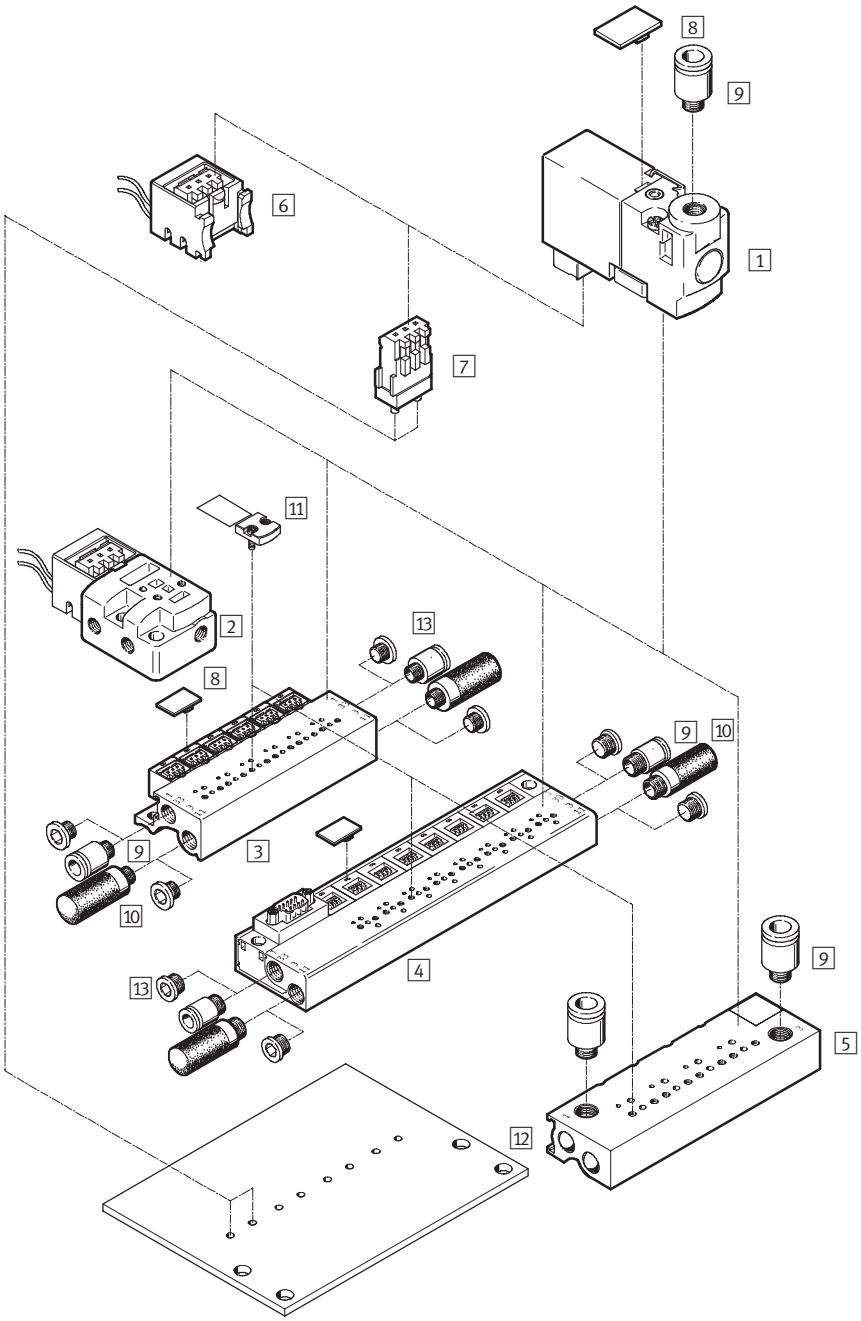
Plug connection at rear ...-HC, plug connection on top ...-TC



Accessories

		➔ Page/ Internet			➔ Page/ Internet
1	Semi in-line valve MHP1-...-HC	9	6	Inscription label MH-BZ-80X	57
2	Semi in-line valve MHP1-...-TC	9	7	Push-in fittings QS/QSM	qs
3	Individual sub-base MHP1-AS-3-M3	12	8	Silencer UC	uc
4	Manifold block MHP1-PR...-3	12	9	Blanking plate MHAP1-BP-3 for sealing vacant positions	57
5	Plug socket with cable KMH	57	10	Blanking plug B	57

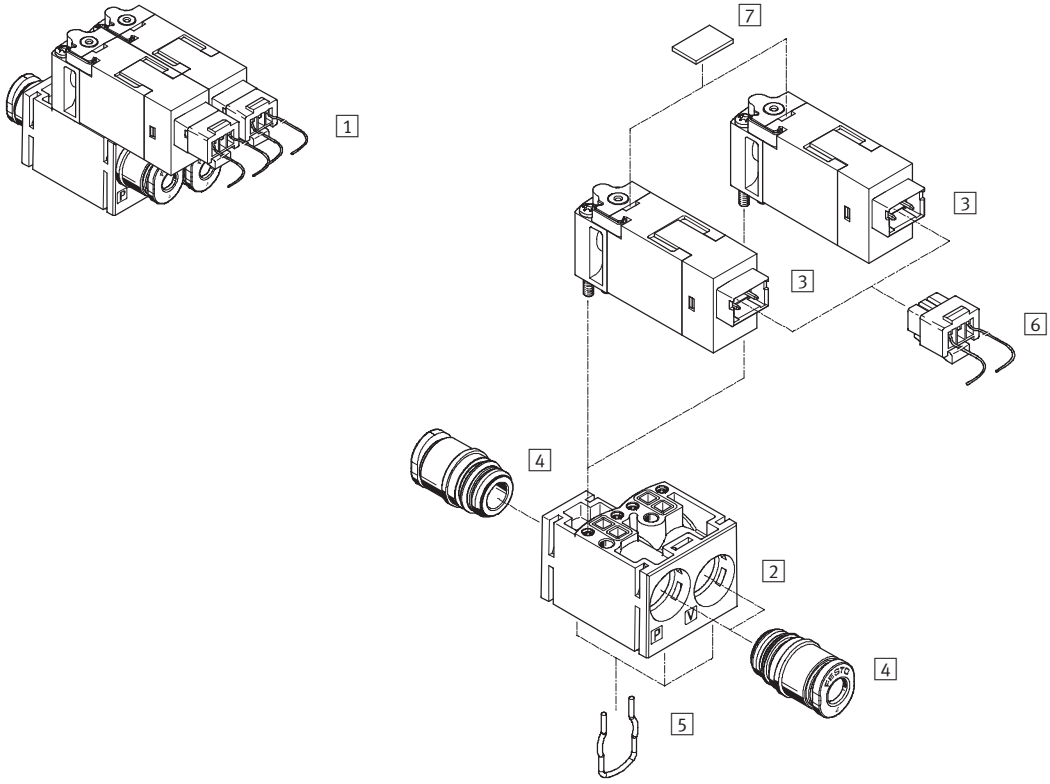
Plug connection underneath ...-PI



Accessories

		➔ Page/ Internet			➔ Page/ Internet
1	Semi in-line valve MHP1-...-PI	9	7	Soldering base PCBC-A	57
2	Individual sub-base MHP1-AS-3-M3-PI	12	8	Inscription label MH-BZ-80x	57
3	Manifold block MHP1-PR...-3-PI with plug bases	12	9	Push-in fittings QS/QSM	qs
4	Manifold block MHP1-PR...-3-PI-D... with plug bases and electrical multi-pin plug	14	10	Silencer UC	uc
5	Manifold block MHP1-PR...-3-PI-PCB for mounting on PCB	15	11	Blanking plate MHAP1-BP-3-PI for sealing vacant positions	57
			12	PCB (user-specific)	15
6	Plug base MHAP-PI	57	13	Blanking plug B	57

2x2/2-way valve



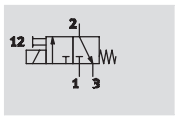
Accessories

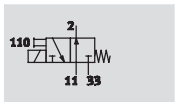
		➔ Page/ Internet			➔ Page/ Internet
1	Solenoid valve MHA1-2x2/2G-1,5-...	55	5	Clip	–
2	Sub-base	–	6	Plug socket with cable KMH	57
3	Solenoid valve MHA1-M1LCH-2/2G-1.5-HC	55	7	Inscription label MH-BZ-80x	57
4	Push-in cartridge	–			

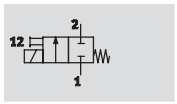
Solenoid valves MHP1, miniature

Technical data – Semi in-line valve

Function



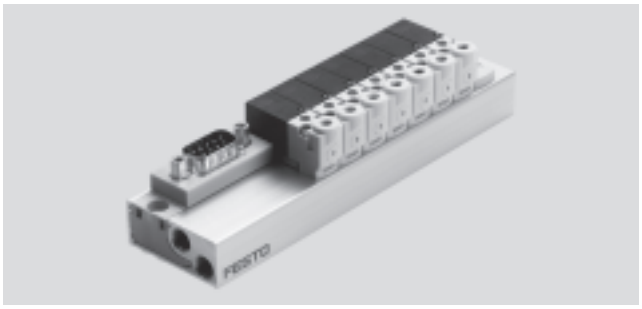




Voltage
5, 12, 24 V DC

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			Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm	Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm
			Vacuum, grade of filtration 40 µm	–
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.

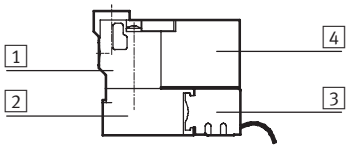
Solenoid valves MHP1, miniature

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		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

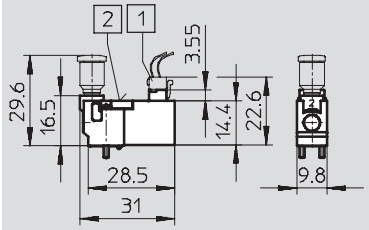


1	Housing	Polyphenylene sulphide
2	Sub-base	Aluminium
3	Plug base	Polyamide
4	Coil housing	Polyamide
–	Seals	Fluoro elastomer, nitrile rubber, hydrogenated nitrile rubber
	Note on materials	Free of copper and PTFE

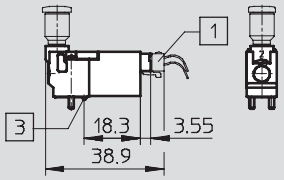
Dimensions

Download CAD data ➔ **www.festo.com**

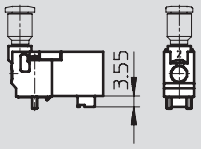
Plug connection on top



Plug connection at rear

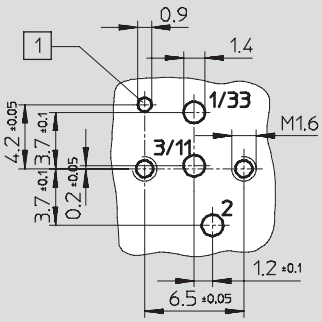


Plug connection underneath



1 Plug socket KMH-...
2 Manual override
3 Coding pin

Hole pattern on sub-bases



1 Hole for coding pin

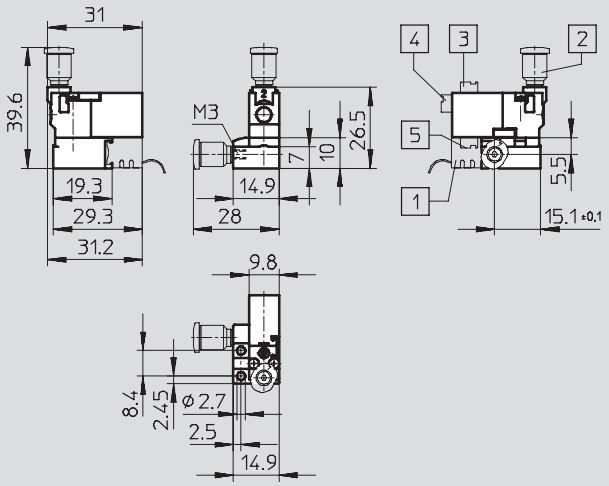
- - Note

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.

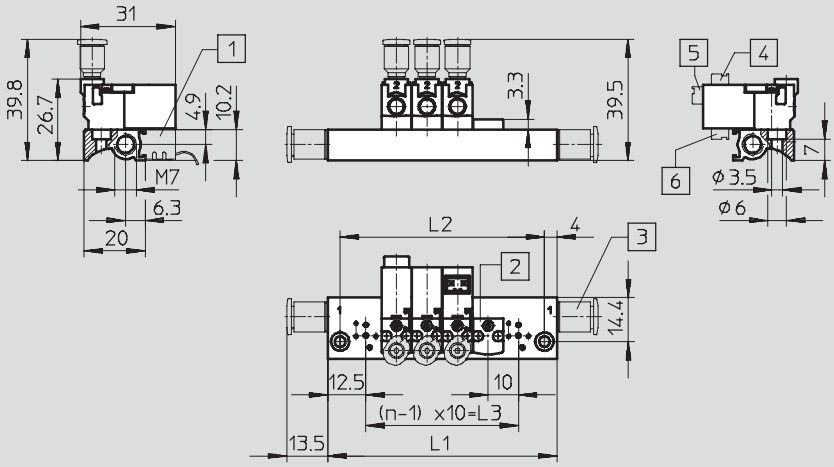
Dimensions – 2/2-way valve Download CAD data ➔ **www.festo.com**

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

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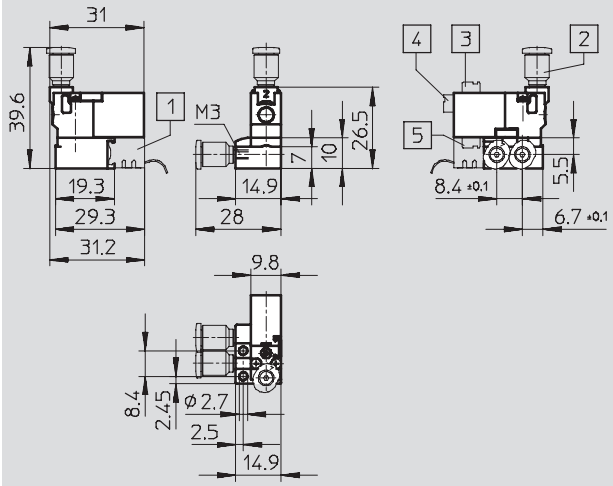
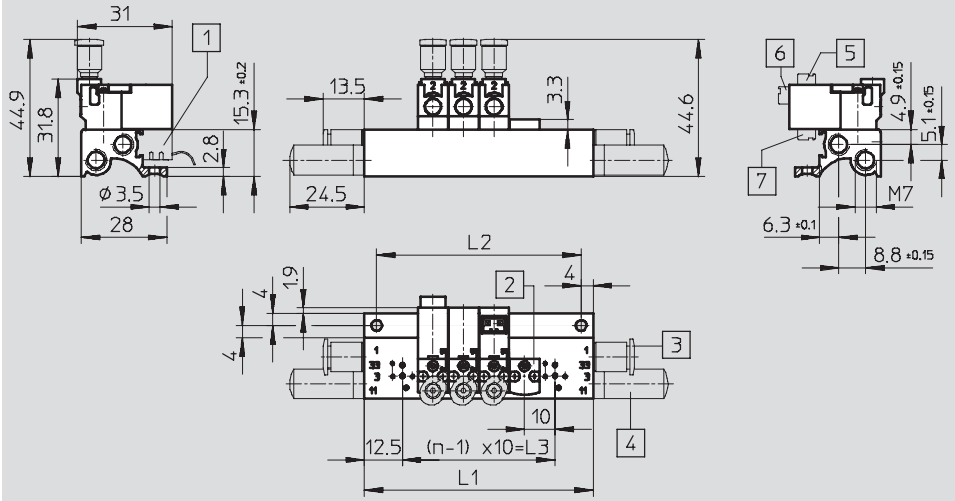
Individual sub-base



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

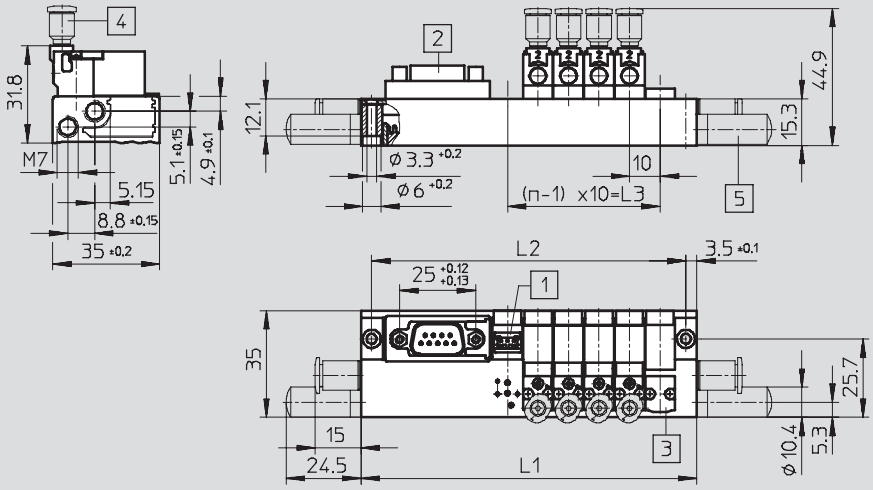
Valve positions n	L1 ±0.15	L2 ±0.1	L3
16	175	167	150
17	185	177	160
18	195	187	170
19	205	197	180
20	215	207	190
21	225	217	200
22	235	227	210

Solenoid valves MHP1, miniature

Technical data – Semi in-line valve

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

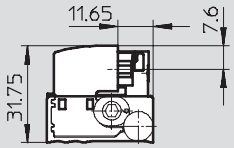
Valve positions n	L1 ±0.15	L2 ±0.1	L3
2	70	63	10
4	90	83	30
6	110	103	50
8	130	123	70

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

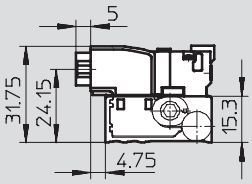
Valve positions n	L1 ±0.15	L2 ±0.1	L3
18	252	245	170
20	272	265	190
22	292	285	210

Electrical multi-pin plug – Plug directions

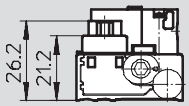
To pneumatic side



To electrical side

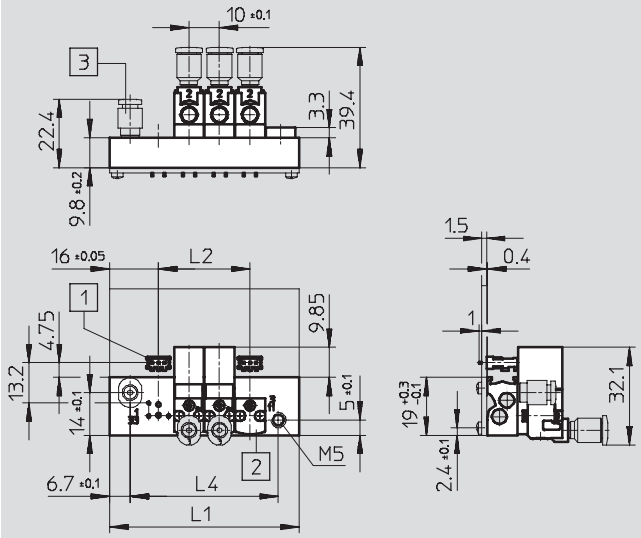


To top (standard)



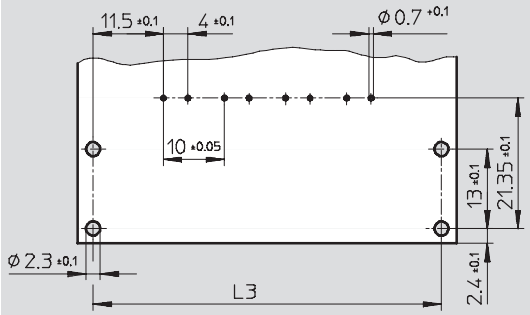
Dimensions – 3/2-way valve Download CAD data ➔ **www.festo.com**

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	**197 045**	**MHP1-M4H-2/2G-M3-HC**
	12 V DC	**197 046**	**MHP1-M5H-2/2G-M3-HC**
	24 V DC	**197 047**	**MHP1-M1H-2/2G-M3-HC**
Plug connection on top	5 V DC	**197 048**	**MHP1-M4H-2/2G-M3-TC**
	12 V DC	**197 049**	**MHP1-M5H-2/2G-M3-TC**
	24 V DC	**197 050**	**MHP1-M1H-2/2G-M3-TC**
Plug connection underneath	5 V DC	**197 051**	**MHP1-M4H-2/2G-M3-PI**
	12 V DC	**197 052**	**MHP1-M5H-2/2G-M3-PI**
	24 V DC	**197 053**	**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		**197 188**	**MHP1-AS-2-M3**
Manifold block for ...	2 valves	**197 196**	**MHP1-P2-2**
	4 valves	**197 197**	**MHP1-P4-2**
	6 valves	**197 198**	**MHP1-P6-2**
	8 valves	**197 200**	**MHP1-P8-2**
	10 valves	**197 201**	**MHP1-P10-2**
Valves with plug connection underneath			
Individual sub-base		**197 190**	**MHP1-AS-2-M3-PI**
Manifold block with plug bases for ...	2 valves	**197 217**	**MHP1-P2-2-PI**
	4 valves	**197 218**	**MHP1-P4-2-PI**
	6 valves	**197 219**	**MHP1-P6-2-PI**
	8 valves	**197 220**	**MHP1-P8-2-PI**
	10 valves	**197 221**	**MHP1-P10-2-PI**

- Note

Manifold blocks with an uneven number of valves and for 11 ... 22 valves as well as further variants can be configured and ordered using the MH1 modular product system ➔ from 28.

Solenoid valves MHP1, miniature

Technical data – Semi in-line valve

FESTO

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	**197 009**	**MHP1-M4H-3/2G-M3-HC**	**197 027**	**MHP1-M4H-3/2O-M3-HC**
	12 V DC	**197 010**	**MHP1-M5H-3/2G-M3-HC**	**197 028**	**MHP1-M5H-3/2O-M3-HC**
	24 V DC	**197 011**	**MHP1-M1H-3/2G-M3-HC**	**197 029**	**MHP1-M1H-3/2O-M3-HC**
Plug connection on top	5 V DC	**197 012**	**MHP1-M4H-3/2G-M3-TC**	**197 030**	**MHP1-M4H-3/2O-M3-TC**
	12 V DC	**197 013**	**MHP1-M5H-3/2G-M3-TC**	**197 031**	**MHP1-M5H-3/2O-M3-TC**
	24 V DC	**197 014**	**MHP1-M1H-3/2G-M3-TC**	**197 032**	**MHP1-M1H-3/2O-M3-TC**
Plug connection underneath	5 V DC	**197 015**	**MHP1-M4H-3/2G-M3-PI**	**197 033**	**MHP1-M4H-3/2O-M3-PI**
	12 V DC	**197 016**	**MHP1-M5H-3/2G-M3-PI**	**197 034**	**MHP1-M5H-3/2O-M3-PI**
	24 V DC	**197 017**	**MHP1-M1H-3/2G-M3-PI**	**197 035**	**MHP1-M1H-3/2O-M3-PI**

- Note

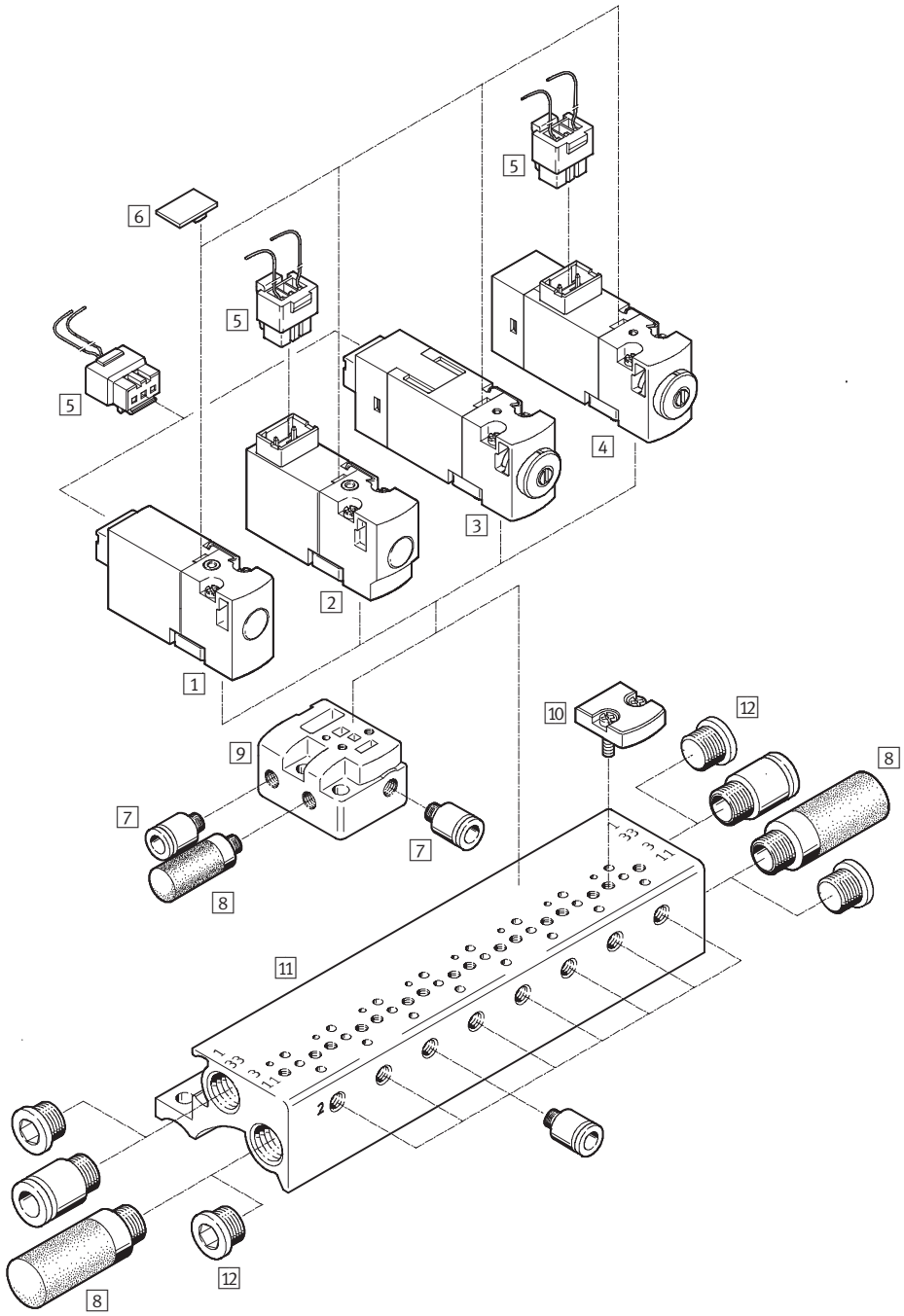
Type 3/2G and type 3/2O valves must not be mixed on a manifold block.

Ordering data – Product-specific accessories			
Designation		Part No.	Type
Valves with plug connection at rear or on top			
Individual sub-base		**197 184**	**MHP1-AS-3-M3**
Manifold block for ...	2 valves	**197 191**	**MHP1-PR2-3**
	4 valves	**197 192**	**MHP1-PR4-3**
	6 valves	**197 193**	**MHP1-PR6-3**
	8 valves	**197 194**	**MHP1-PR8-3**
	10 valves	**197 195**	**MHP1-PR10-3**
Valves with plug connection underneath			
Individual sub-base		**197 186**	**MHP1-AS-3-M3-PI**
Manifold block with plug bases for ...	2 valves	**197 212**	**MHP1-PR2-3-PI**
	4 valves	**197 213**	**MHP1-PR4-3-PI**
	6 valves	**197 214**	**MHP1-PR6-3-PI**
	8 valves	**197 215**	**MHP1-PR8-3-PI**
	10 valves	**197 216**	**MHP1-PR10-3-PI**
Manifold block with plug bases and electrical multi-pin plug for ...	4 valves	**197 233**	**MHP1-PR4-3-PI-D9**
	6 valves	**197 234**	**MHP1-PR6-3-PI-D9**
	8 valves	**197 235**	**MHP1-PR8-3-PI-D9**
	10 valves	**197 236**	**MHP1-PR10-3-PI-D25**
Manifold block for mounting on PCB for ...	2 valves	**197 242**	**MHP1-PR2-3-PI-PCB**
	4 valves	**197 243**	**MHP1-PR4-3-PI-PCB**
	6 valves	**197 244**	**MHP1-PR6-3-PI-PCB**
	8 valves	**197 245**	**MHP1-PR8-3-PI-PCB**
	10 valves	**197 246**	**MHP1-PR10-3-PI-PCB**

- Note

Manifold blocks with an uneven number of valves and for 11 ... 22 valves as well as further variants can be configured and ordered using the MH1 modular product system ➔ from 28.

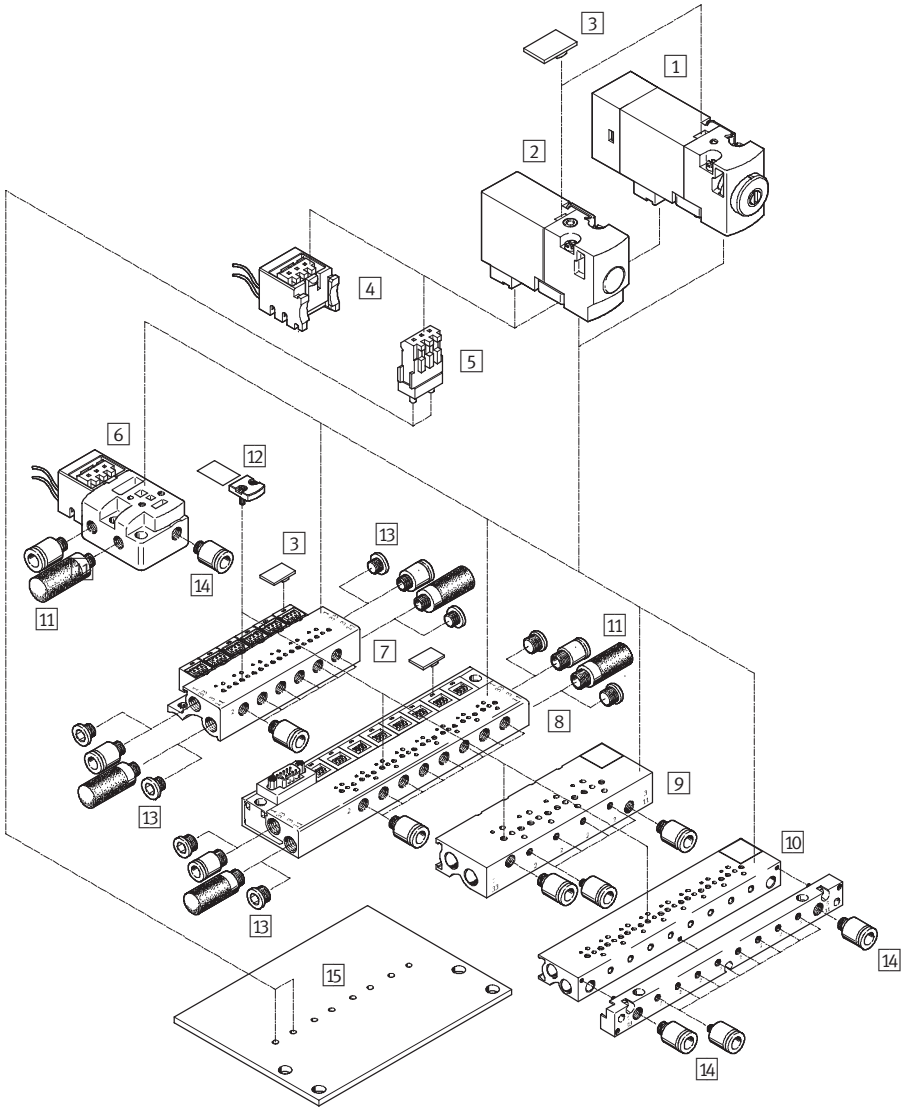
Plug connection at rear ...-HC, plug connection on top ...-TC



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	38	9	Individual sub-base MHA1-AS-3-M3	22
4	Sub-base valve MHA1-...-TC with LED	38	10	Blanking plate MHAP1-BP-3 for sealing vacant positions	57
5	Plug socket with cable KMH	57	11	Manifold block MHA1-PR...-3	22
6	Inscription label MH-BZ-80X	57	12	Blanking plug B	57

Plug connection underneath ...-PI



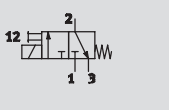
Accessories

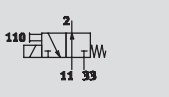
		➔ Page/Internet			➔ Page/Internet
1	Sub-base valve MHA1-...-PI with LED	38	9	Manifold block MHA1-PR...-3-M3-PI-PCB for mounting on PCB	25
2	Sub-base valve MHA1-...-PI	20	10	Manifold block MHA1-PR...-3-M3-PI-PCBM for mounting on PCB with pneumatic multiple connector plate	25
3	Inscription label MH-BZ-80X	57	11	Silencer UC	uc
4	Plug base MHAP-PI	57	12	Blanking plate MHAP1 for sealing vacant positions	57
5	Soldering base PCBC-A	57	13	Blanking plug B	57
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			

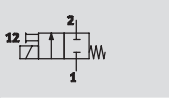
Solenoid valves MHA1, miniature

Technical data – Sub-base valve

Function



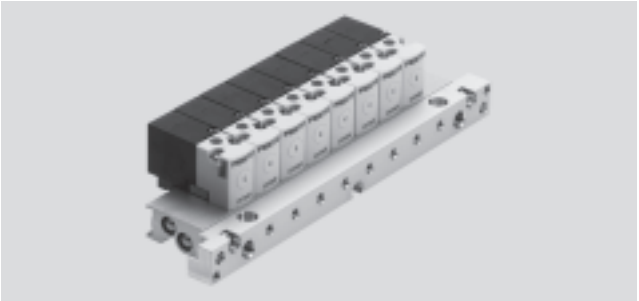




Voltage
5, 12, 24 V DC

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			Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm	Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm
			Vacuum, grade of filtration 40 µm	
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

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.

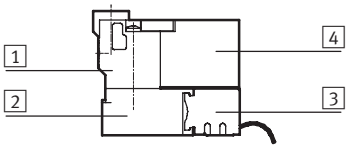
Solenoid valves MHA1, miniature

Technical data – Sub-base valve

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		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

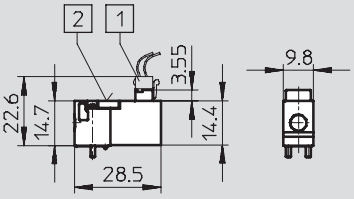


1	Housing	Polyphenylene sulphide
2	Sub-base	Aluminium
3	Plug base	Polyamide
4	Coil housing	Polyamide
–	Seals	Fluoro elastomer, nitrile rubber, hydrogenated nitrile rubber
	Note on materials	Free of copper and PTFE

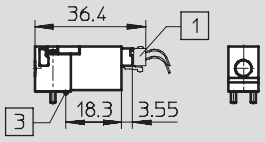
Dimensions

Download CAD data ➔ **www.festo.com**

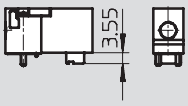
Plug connection on top



Plug connection at rear

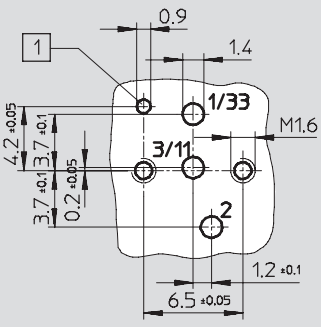


Plug connection underneath



1 Plug socket KMH-...
2 Manual override
3 Coding pin

Hole pattern on sub-bases



1 Hole for coding pin

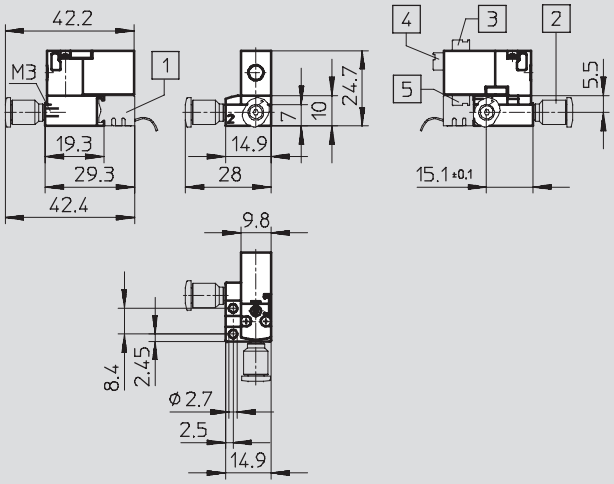
- - Note

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.

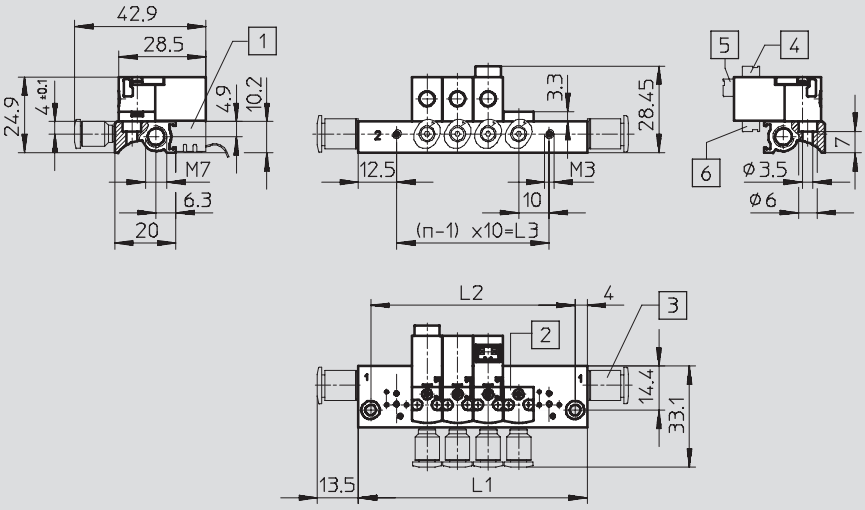
Dimensions – 2/2-way valve Download CAD data ➔ **www.festo.com**

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

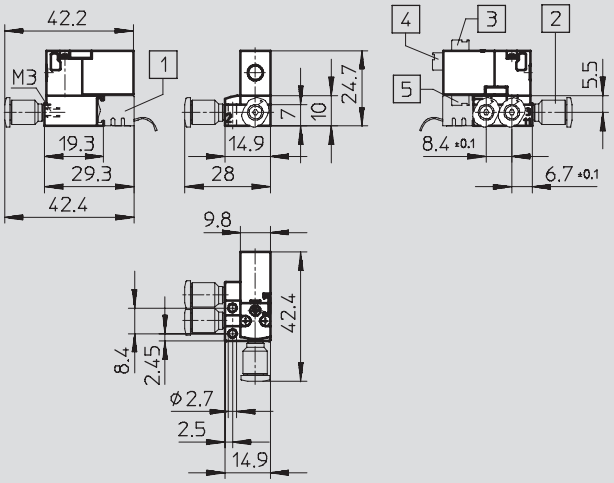
Valve positions n	L1 ±0.15	L2 ±0.1	L3
2	35	27	10
3	45	37	20
4	55	47	30
5	65	57	40
6	75	67	50
7	85	77	60
8	95	87	70

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

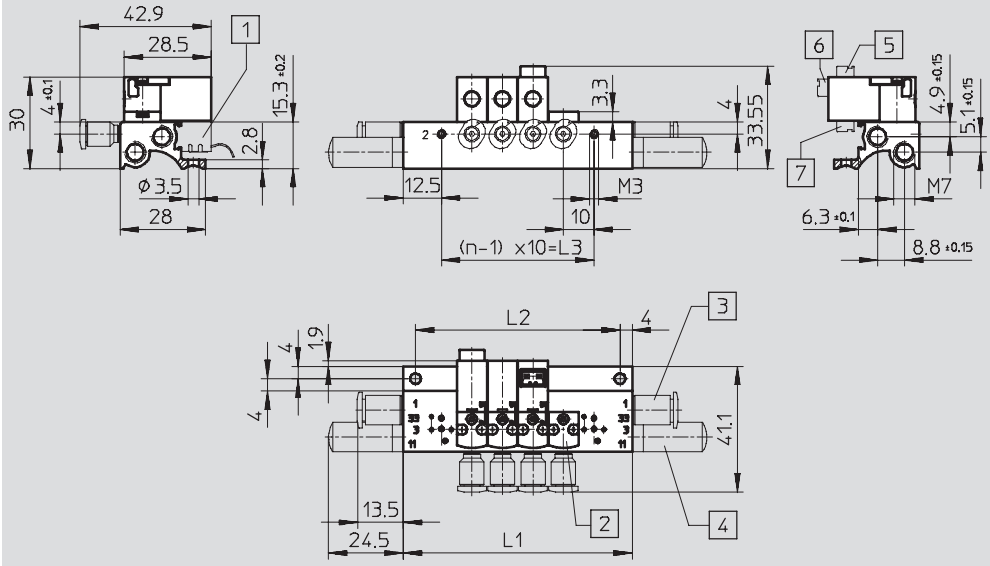
Dimensions – 3/2-way valve Download CAD data ➔ **www.festo.com**

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

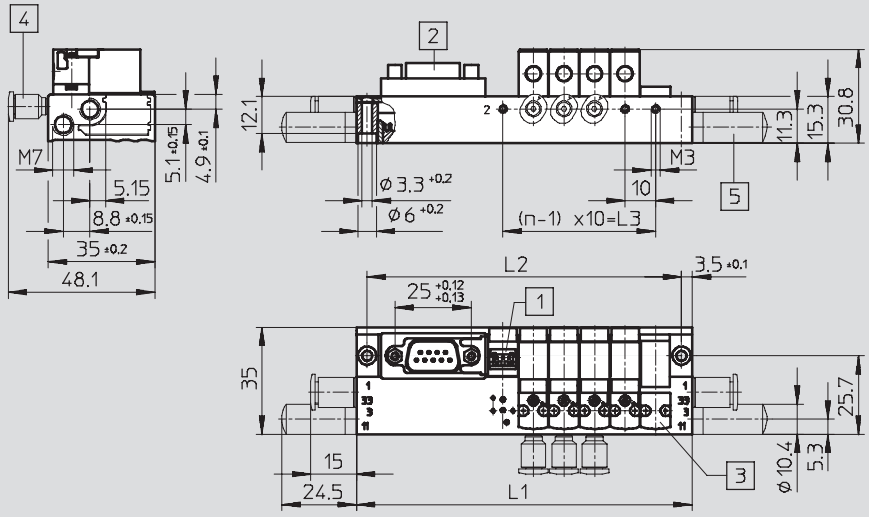
Valve positions n	L1 ±0.15	L2 ±0.1	L3
2	35	27	10
3	45	37	20
4	55	47	30
5	65	57	40
6	75	67	50
7	85	77	60
8	95	87	70

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

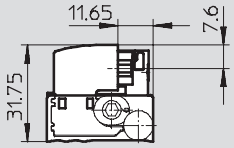
Valve positions n	L1 ±0.15	L2 ±0.1	L3
2	70	63	10
4	90	83	30
6	110	103	50
8	130	123	70

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

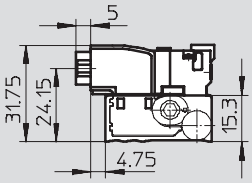
Valve positions n	L1 ±0.15	L2 ±0.1	L3
18	252	245	170
20	272	265	190
22	292	285	210

Electrical multi-pin plug – Plug directions

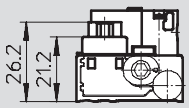
To pneumatic side



To electrical side

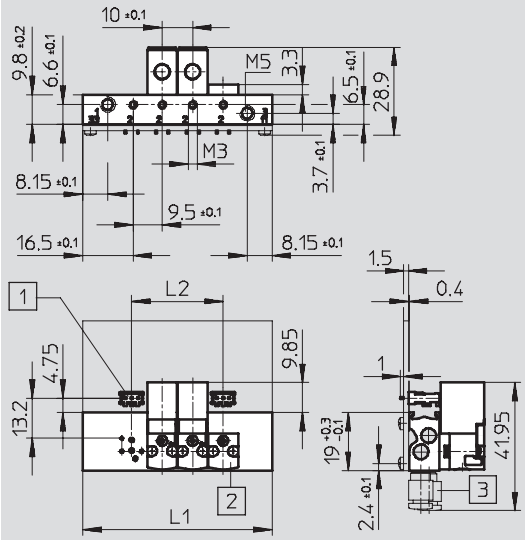


To top (standard)



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

Manifold assembly on PCB

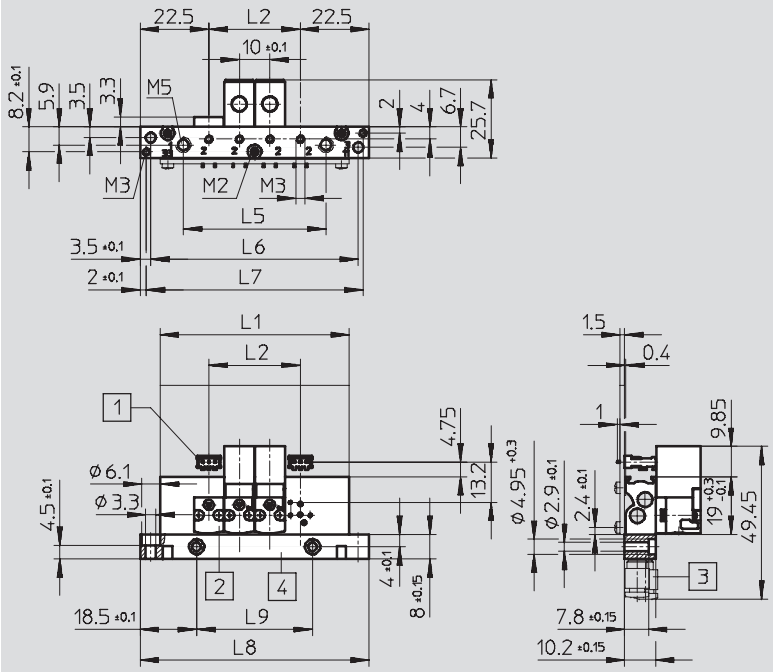


1 Soldering base PCBC-A-...
2 Blanking plate MHAP1
3 Fitting QSM-...

- - 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

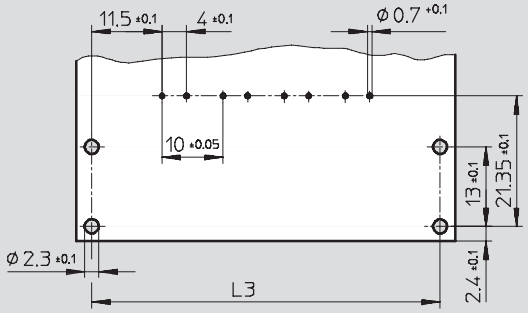
Solenoid valves MHA1, miniature

Technical data – Sub-base valve

FESTO

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	**197 036**	**MHA1-M4H-2/2G-0,9-HC**
	12 V DC	**197 037**	**MHA1-M5H-2/2G-0,9-HC**
	24 V DC	**197 038**	**MHA1-M1H-2/2G-0,9-HC**
Plug connection on top	5 V DC	**197 039**	**MHA1-M4H-2/2G-0,9-TC**
	12 V DC	**197 040**	**MHA1-M5H-2/2G-0,9-TC**
	24 V DC	**197 041**	**MHA1-M1H-2/2G-0,9-TC**
Plug connection underneath	5 V DC	**197 042**	**MHA1-M4H-2/2G-0,9-PI**
	12 V DC	**197 043**	**MHA1-M5H-2/2G-0,9-PI**
	24 V DC	**197 044**	**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		**197 187**	**MHA1-AS-2-M3**
Manifold block for ...	2 valves	**197 207**	**MHA1-P2-2-M3**
	4 valves	**197 208**	**MHA1-P4-2-M3**
	6 valves	**197 209**	**MHA1-P6-2-M3**
	8 valves	**197 210**	**MHA1-P8-2-M3**
	10 valves	**197 211**	**MHA1-P10-2-M3**
Valves with plug connection underneath			
Individual sub-base		**197 189**	**MHA1-AS-2-M3-PI**
Manifold block with plug bases for ...	2 valves	**197 227**	**MHA1-P2-2-M3-PI**
	4 valves	**197 228**	**MHA1-P4-2-M3-PI**
	6 valves	**197 229**	**MHA1-P6-2-M3-PI**
	8 valves	**197 230**	**MHA1-P8-2-M3-PI**
	10 valves	**197 231**	**MHA1-P10-2-M3-PI**

- Note

Manifold blocks with an uneven number of valves and for 11 ... 22 valves as well as further variants can be configured and ordered using the MH1 modular product system ➔ from 28.

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	**197 000**	**MHA1-M4H-3/2G-0,6-HC**	**197 018**	**MHA1-M4H-3/2O-0,6-HC**
	12 V DC	**197 001**	**MHA1-M5H-3/2G-0,6-HC**	**197 019**	**MHA1-M5H-3/2O-0,6-HC**
	24 V DC	**197 002**	**MHA1-M1H-3/2G-0,6-HC**	**197 020**	**MHA1-M1H-3/2O-0,6-HC**
Plug connection on top	5 V DC	**197 003**	**MHA1-M4H-3/2G-0,6-TC**	**197 021**	**MHA1-M4H-3/2O-0,6-TC**
	12 V DC	**197 004**	**MHA1-M5H-3/2G-0,6-TC**	**197 022**	**MHA1-M5H-3/2O-0,6-TC**
	24 V DC	**197 005**	**MHA1-M1H-3/2G-0,6-TC**	**197 023**	**MHA1-M1H-3/2O-0,6-TC**
Plug connection underneath	5 V DC	**197 006**	**MHA1-M4H-3/2G-0,6-PI**	**197 024**	**MHA1-M4H-3/2O-0,6-PI**
	12 V DC	**197 007**	**MHA1-M5H-3/2G-0,6-PI**	**197 025**	**MHA1-M5H-3/2O-0,6-PI**
	24 V DC	**197 008**	**MHA1-M1H-3/2G-0,6-PI**	**197 026**	**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		**197 183**	**MHA1-AS-3-M3**
Manifold block for ...	2 valves	**197 202**	**MHA1-PR2-3-M3**
	4 valves	**197 203**	**MHA1-PR4-3-M3**
	6 valves	**197 204**	**MHA1-PR6-3-M3**
	8 valves	**197 205**	**MHA1-PR8-3-M3**
	10 valves	**197 206**	**MHA1-PR10-3-M3**
Valves with plug connection underneath			
Individual sub-base		**197 185**	**MHA1-AS-3-M3-PI**
Manifold block with plug bases for ...	2 valves	**197 222**	**MHA1-PR2-3-M3-PI**
	4 valves	**197 223**	**MHA1-PR4-3-M3-PI**
	6 valves	**197 224**	**MHA1-PR6-3-M3-PI**
	8 valves	**197 225**	**MHA1-PR8-3-M3-PI**
	10 valves	**197 226**	**MHA1-PR10-3-M3-PI**
Manifold block with plug bases and electrical multi-pin plug for ...	4 valves	**197 238**	**MHA1-PR4-3-M3-PI-D9**
	6 valves	**197 239**	**MHA1-PR6-3-M3-PI-D9**
	8 valves	**197 240**	**MHA1-PR8-3-M3-PI-D9**
	10 valves	**197 241**	**MHA1-PR10-3-M3-PI-D25**
Manifold block for mounting on PCB for ...	2 valves	**197 247**	**MHA1-PR2-3-M3-PI-PCB**
	4 valves	**197 248**	**MHA1-PR4-3-M3-PI-PCB**
	6 valves	**197 249**	**MHA1-PR6-3-M3-PI-PCB**
	8 valves	**197 250**	**MHA1-PR8-3-M3-PI-PCB**
	10 valves	**197 251**	**MHA1-PR10-3-M3-PI-PCB**
Manifold block for mounting on PCB with pneumatic multiple connector plate for ...	4 valves	**197 253**	**MHA1-PR4-3-PI-PCBM**
	6 valves	**197 254**	**MHA1-PR6-3-PI-PCBM**
	8 valves	**197 255**	**MHA1-PR8-3-PI-PCBM**
	10 valves	**197 256**	**MHA1-PR10-3-PI-PCBM**

- Note

Manifold blocks with an uneven number of valves and for 11 ... 22 valves as well as further variants can be configured and ordered using the MH1 modular product system ➔ from 28.

Solenoid valves MH1, miniature, individual sub-base

Ordering data – Modular products

FESTO

M **Mandatory data** →

Module No.	Valve family		Design		Power supply		Valve function		Plug-in direction on valve		No. of valve positions		Type of linking
197 334	MH1		A P		5VDC 12VDC 24VDC		D C N		TC HC PI		1V		PS
Order example													
197 334	**MH1**	–	**P**	–	**12VDC**	–	**D**	–	**TC**	–	**1V**	–	**PS**

Ordering table

	Size	1	Condi-tions	Code		Enter code
M	Module No.	**197 334**				
	Valve family	Miniature valve size 1		**MH1**		MH1
	Design	Sub-base valve		**-A**		
		Semi in-line valve		**-P**		
	Power supply [V DC]	5, 12, 24		**-...VDC**		
	Valve function	2/2-way valve, normally closed		**-D**		
		3/2-way valve, normally closed		**-C**		
		3/2-way valve, normally open		**-N**		
	Plug-in direction on valve	Plug connection on top for connecting cable with socket IP40 (KMH-0,5)		**-TC**		
		Plug connection at rear for connecting cable with socket IP40 (KMH-1)		**-HC**		
		Plug connection underneath for electrical linking		**-PI**		
	No. of valve positions	1		**-1V**		-1V
↓	Type of linking	Individual sub-base		**-PS**		-PS

Transfer order code

197 334	**MH1**	–		–		–		–		–	**1V**	–	**PS**

➔ 0 **Options**

Connecting cable with socket	Fitting for working line	Fitting in supply duct on left	Fitting in exhaust duct on left
K05	QB	AB	BB
K01	QC	AC	BC
			BU
– **K05**	– **QB**	– **AB**	–

Ordering table

Size		1	Condi-tions	Code		Enter code
0	Connecting cable with socket (supplied loose)	Connecting cable 0.5 m, with socket IP40 (KMH-0,5)	1	**-K05**		
		Connecting cable 1 m, with socket IP40 (KMH-1)	1	**-K01**		
	Fitting for working line	Push-in fitting for working port, QS-3, tubing O.D. 3 mm		**-QB**		
		Push-in fitting for working port, QS-4, tubing O.D. 4 mm		**-QC**		
	Fitting in supply duct on left	Push-in fitting for supply on left, QS-3, tubing O.D. 3 mm	2	**-AB**		
		Push-in fitting for supply on left, QS-4, tubing O.D. 4 mm		**-AC**		
	Fitting in exhaust duct on left	Push-in fitting for exhaust on left, QS-3, tubing O.D. 3 mm	3	**-BB**		
		Push-in fitting for exhaust on left, QS-4, tubing O.D. 4 mm		**-BC**		
		Silencer for exhaust on left	4	**-BU**		

1 **K05, K01** Not with plug-in direction on valve PI.

2 **AB** Not with fitting for working line QC.

3 **BB** Not with fitting in supply duct on left AC.

4 **BU** Not with valve function D.

Transfer order code

– | | – | | – | | – |

Solenoid valves MH1, manifold assembly with individual electrical connection

Ordering data – Modular products

FESTO

M Mandatory data								O Options ➔
Module No.	**Valve family**	**Design**	**Power supply**	**Valve function**	**Plug-in direction on valve**	**No. of valve positions**	**Type of linking**	**Number of vacant positions**
197 334	MH1	A P	5VDC 12VDC 24VDC	D C N	TC HC PI	2V ... 22V	PR	1L ... 22L
Order example								
197 334	**MH1**	**A**	**12VDC**	**C**	**TC**	**14V**	**PR**	**2L**

Ordering table

Size		1	Condi-tions	Code		Enter code
M	Module No.	**197 334**				
	Valve family	Miniature valve size 1		**MH1**		MH1
	Design	Sub-base valve		**-A**		
		Semi in-line valve		**-P**		
	Power supply [V DC]	5, 12, 24		**-...VDC**		
	Valve function	2/2-way valve, normally closed		**-D**		
		3/2-way valve, normally closed		**-C**		
		3/2-way valve, normally open		**-N**		
	Plug-in direction on valve	Plug connection on top for connecting cable with socket IP40 (KMH-0,5)		**-TC**		
		Plug connection at rear for connecting cable with socket IP40 (KMH-1)		**-HC**		
		Plug connection underneath for electrical linking		**-PI**		
	No. of valve positions	2 ... 22		**-...V**		
	Type of linking	Block without electrical linking		**-PR**		-PR
O ➔	Number of vacant positions	1 ... 22		**-...L**		

Transfer order code

197 334	**MH1**	–		–		–		–		–		**PR**	–	

Solenoid valves MH1, manifold assembly with individual electrical connection

Ordering data – Modular products

FESTO

➔ 0 **Options**

	Connecting cable with socket		Fitting for working line		Fitting in supply duct on left		Fitting in exhaust duct on left		Fitting in supply duct on right		Fitting in exhaust duct on right
	K05 K01		QB QC		AX AC AD		BX BC BD BU		CX CC CD		DX DC DD DU
–	**K05**	–	**QC**	–	**AX**	–	**BD**	–	**CD**	–	**DX**

Ordering table

Size		1	Conditions	Code		Enter code
↓	Connecting cable with socket	Connecting cable 0.5 m, with socket IP40 (KMH-0,5)	1	**-K05**		
0	(supplied loose)	Connecting cable 1 m, with socket IP40 (KMH-1)	1	**-K01**		
	Fitting for working line	Push-in fitting for working port, QS-3, tubing O.D. 3 mm		**-QB**		
		Push-in fitting for working port, QS-4, tubing O.D. 4 mm		**-QC**		
	Fitting in supply duct on left	Blanking plug for supply on left	2	**-AX**		
		Push-in fitting for supply on left, QS-4, tubing O.D. 4 mm		**-AC**		
		Push-in fitting for supply on left, QS-6, tubing O.D. 6 mm		**-AD**		
	Fitting in exhaust duct on left	Blanking plug for exhaust on left	3	**-BX**		
		Push-in fitting for exhaust on left, QS-4, tubing O.D. 4 mm	4	**-BC**		
		Push-in fitting for exhaust on left, QS-6, tubing O.D. 6 mm		**-BD**		
		Silencer for exhaust on left	5	**-BU**		
	Fitting in supply duct on right	Blanking plug for supply on right		**-CX**		
		Push-in fitting for supply on right, QS-4, tubing O.D. 4 mm		**-CC**		
		Push-in fitting for supply on right, QS-6, tubing O.D. 6 mm		**-CD**		
	Fitting in exhaust duct on right	Blanking plug for exhaust on right		**-DX**		
		Push-in fitting for exhaust on right, QS-4, tubing O.D. 4 mm	4	**-DC**		
		Push-in fitting for exhaust on right, QS-6, tubing O.D. 6 mm		**-DD**		
		Silencer for exhaust on right	5	**-DU**		

1 **K05, K01** Not with plug-in direction on valve PI.
2 **AX** Not with fitting in supply duct on right CX.
3 **BX** Not with fitting in exhaust duct on right DX.
4 **BC, DC** Not with fitting in supply duct on left AD and fitting in supply duct on right CD.
5 **BU, DU** Not with valve function D.

Transfer order code

–		–		–		–		–		–	

Solenoid valves MH1, miniature, manifold assembly with electrical multi-pin plug

Ordering data – Modular products

M Mandatory data								O Options →	
Module No.	Valve family	Design	Power supply	Valve function	Plug-in direction on valve	No. of valve positions	Type of linking	Number of vacant positions	Plug-in direction, Sub-D plug
197 334	MH1	A P	5VDC 12VDC 24VDC	D C N	PI	2V ... 24V	PRA	1L ... 24L	SP ST SE
Order example									
197 334	MH1 –	A –	24VDC –	C –	PI –	18V –	PRA –	3L –	ST

Ordering table

Size		1	Condi-tions	Code		Enter code
M	Module No.	**197 334**				
	Valve family	Miniature valve size 1		**MH1**		MH1
	Design	Sub-base valve		**-A**		
		Semi in-line valve		**-P**		
	Power supply [V DC]	5, 12, 24		**-...VDC**		
	Valve function	2/2-way valve, normally closed		**-D**		
		3/2-way valve, normally closed		**-C**		
		3/2-way valve, normally open		**-N**		
	Plug-in direction on valve	Plug connection underneath for electrical linking		**-PI**		-PI
	No. of valve positions	2, 4, 6 ... 24 (even number only)	1	**-...V**		
	Type of linking	Block with Sub-D plug		**-PRA**		-PRA
O	Number of vacant positions	1 ... 24		**-...L**		
	Plug-in direction of Sub-D	Plug-in direction of Sub-D plug to pneumatic side		**-SP**		
		Plug-in direction of Sub-D plug to top		**-ST**		
↓		Plug-in direction of Sub-D plug to electrical side		**-SE**		

1 **24V** Number of valve positions 24: only with power supply 24 V DC.

Transfer order code

197 334	MH1 –	–	–	–	PI –	–	PRA –	–	–

Solenoid valves MH1, miniature, manifold assembly with electrical multi-pin plug

Ordering data – Modular products

➔ 0 **Options**

	Connecting cable with socket		Fitting for working line		Fitting in supply duct on left		Fitting in exhaust duct on left		Fitting in supply duct on right		Fitting in exhaust duct on right
	S25	M25 L25	QB		AX		BX		CX		DX
	S50	M50 L50	QC		AC		BC		CC		DC
	S10	M10 L10			AD		BD		CD		DD
							BU				DU
–	**L25**		**QC**	–	**AX**	–	**BD**	–	**CD**	–	**DX**

Ordering table

Size		1	Conditions	Code		Enter code
↓	Connecting cable with socket	Connecting cable 2.5 m, Sub-D, 9-pin, 8-wire	2	**-S25**		
0	(supplied loose)	Connecting cable 5 m, Sub-D, 9-pin, 8-wire	2	**-S50**		
		Connecting cable 10 m, Sub-D, 9-pin, 8-wire	2 3	**-S10**		
		Connecting cable 2.5 m, Sub-D, 25-pin, 12-wire	4	**-M25**		
		Connecting cable 5 m, Sub-D, 25-pin, 12-wire	4	**-M50**		
		Connecting cable 10 m, Sub-D, 25-pin, 12-wire	3 4	**-M10**		
		Connecting cable 2.5 m, Sub-D, 25-pin, 20-wire	5	**-L25**		
		Connecting cable 5 m, Sub-D, 25-pin, 20-wire	5	**-L50**		
		Connecting cable 10 m, Sub-D, 25-pin, 20-wire	3 5	**-L10**		
	Fitting for working line	Push-in fitting for working port, QS-3, tubing O.D. 3 mm		**-QB**		
		Push-in fitting for working port, QS-4, tubing O.D. 4 mm		**-QC**		
	Fitting in supply duct on left	Blanking plug for supply on left	6	**-AX**		
		Push-in fitting for supply on left, QS-4, tubing O.D. 4 mm		**-AC**		
		Push-in fitting for supply on left, QS-6, tubing O.D. 6 mm		**-AD**		
	Fitting in exhaust duct on left	Blanking plug for exhaust on left	7	**-BX**		
		Push-in fitting for exhaust on left, QS-4, tubing O.D. 4 mm	8	**-BC**		
		Push-in fitting for exhaust on left, QS-6, tubing O.D. 6 mm		**-BD**		
		Silencer for exhaust on left	9	**-BU**		
	Fitting in supply duct on right	Blanking plug for supply on right		**-CX**		
		Push-in fitting for supply on right, QS-4, tubing O.D. 4 mm		**-CC**		
		Push-in fitting for supply on right, QS-6, tubing O.D. 6 mm		**-CD**		
	Fitting in exhaust duct on right	Blanking plug for exhaust on right		**-DX**		
		Push-in fitting for exhaust on right, QS-4, tubing O.D. 4 mm	8	**-DC**		
		Push-in fitting for exhaust on right, QS-6, tubing O.D. 6 mm		**-DD**		
		Silencer for exhaust on right	9	**-DU**		

2 **S25, S50, S10**
Max. 8 valve positions.

3 **S10, M10, L10**
Not with power supply 5 V DC.

4 **M25, M50, M10**
Only with 10 or 12 valve positions.

5 **L25, L50, L10**
Min. 10 valve positions.

6 **AX** Not with fitting in supply duct on right CX.

7 **BX** Not with fitting in exhaust duct on right DX.

8 **BC, DC** Not with fitting in supply duct on left AD and fitting in supply duct on right CD.

9 **BU, DU** Not with valve function D.

Transfer order code

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Solenoid valves MH1, miniature, manifold assembly and PCB mounting

Ordering data – Modular products

FESTO

M Mandatory data →

Module No.	Valve family		Design		Power supply		Valve function		Plug-in direction on valve		No. of valve positions		Type of linking
197 334	MH1		A P		5VDC 12VDC 24VDC		D C N		PI		2V 4V 6V 8V 10V		PCD
Order example													
197 334	**MH1**	–	**P**	–	**5VDC**	–	**N**	–	**PI**	–	**10V**	–	**PCD**

Ordering table

Size		1	Condi-tions	Code		Enter code
M	Module No.	**197 334**				
	Valve family	Miniature valve size 1		**MH1**		MH1
	Design	Sub-base valve		**-A**		
		Semi in-line valve		**-P**		
	Power supply [V DC]	5, 12, 24		**-...VDC**		
	Valve function	2/2-way valve, normally closed		**-D**		
		3/2-way valve, normally closed		**-C**		
		3/2-way valve, normally open		**-N**		
	Plug-in direction on valve	Plug connection underneath for electrical linking		**-PI**		-PI
	No. of valve positions	2, 4, 6, 8, 10		**-...V**		
↓	Type of linking	PCB mounting, direct		**-PCD**		-PCD

Transfer order code

197 334	**MH1**	–		–		–		–	**PI**	–		–	**PCD**

➔ 0 **Options**

Number of vacant positions	Fitting for working line	Fitting in supply duct on left	Fitting in exhaust duct on left
1L ... 10L	QB QC	AB AC AD	BB BC BD BU
– **1L**	– **QC**	– **AC**	– **BC**

Ordering table

Size		1	Condi-tions	Code		Enter code
0	Number of vacant positions	1 ... 10		**-...L**		
	Fitting for working line	Push-in fitting for working port, QS-3, tubing O.D. 3 mm		**-QB**		
		Push-in fitting for working port, QS-4, tubing O.D. 4 mm	1	**-QC**		
	Fitting in supply duct on left	Push-in fitting for supply on left, QS-3, tubing O.D. 3 mm	2	**-AB**		
		Push-in fitting for supply on left, QS-4, tubing O.D. 4 mm		**-AC**		
		Push-in fitting for supply on left, QS-6, tubing O.D. 6 mm	2 3	**-AD**		
	Fitting in exhaust duct on left	Push-in fitting for exhaust on left, QS-3, tubing O.D. 3 mm	4	**-BB**		
		Push-in fitting for exhaust on left, QS-4, tubing O.D. 4 mm	5	**-BC**		
		Push-in fitting for exhaust on left, QS-6, tubing O.D. 6 mm	2 3	**-BD**		
		Silencer for exhaust on left	6	**-BU**		

1 **QC** Not with fitting in supply duct on left AD and fitting in exhaust duct on left BD.
2 **AB, AD, BD** Not with fitting for working line QC.
3 **AD, BD** Not with design P.
4 **BB** Not with fitting in supply duct on left AC, AD.
5 **BC** Not with fitting in supply duct on left AD.
6 **BU** Not with valve function D.

Transfer order code

– [ ] – [ ] – [ ] – [ ]

Solenoid valves MH1, PCB mounting with pneumatic multiple connector plate

Ordering data – Modular products

FESTO

M Mandatory data →

Module No.	Valve family		Design		Power supply		Valve function		Plug-in direction on valve		No. of valve positions		Type of linking
197 334	MH1		A		5VDC 12VDC 24VDC		D C N		PI		4V 6V 8V 10V		PCM
Order example													
197 334	**MH1**	–	**A**	–	**12VDC**	–	**D**	–	**PI**	–	**10V**	–	**PCM**

Ordering table

Size		1	Condi-tions	Code		Enter code
M	Module No.	**197 334**				
	Valve family	Miniature valve size 1		**MH1**		MH1
	Design	Sub-base valve		**-A**		-A
	Power supply [V DC]	5, 12, 24		**-...VDC**		
	Valve function	2/2-way valve, normally closed		**-D**		
		3/2-way valve, normally closed		**-C**		
		3/2-way valve, normally open		**-N**		
	Plug-in direction on valve	Plug connection underneath for electrical linking		**-PI**		-PI
	No. of valve positions	4, 6, 8, 10		**-...V**		
↓	Type of linking	PCB mounting, pneumatic multiple connector plate		**-PCM**		-PCM

Transfer order code

197 334	**MH1**	–	**A**	–		–		–	**PI**	–		–	**PCM**

Solenoid valves MH1, PCB mounting with pneumatic multiple connector plate

Ordering data – Modular products

➔ 0 **Options**

	Number of vacant positions		Fitting for working line		Fitting in supply duct on left		Fitting in exhaust duct on left
	L1 ... L10		QB QC		AB AC AD		BB BC BD BU
–		–	**QC**	–	**AC**	–	**BC**

Ordering table

Size		1	Conditions	Code		Enter code
0	Number of vacant positions	1 ... 10		**-...L**		
	Fitting for working line	Push-in fitting for working port, QS-3, tubing O.D. 3 mm		**-QB**		
		Push-in fitting for working port, QS-4, tubing O.D. 4 mm	1	**-QC**		
	Fitting in supply duct on left	Push-in fitting for supply on left, QS-3, tubing O.D. 3 mm	2	**-AB**		
		Push-in fitting for supply on left, QS-4, tubing O.D. 4 mm		**-AC**		
		Push-in fitting for supply on left, QS-6, tubing O.D. 6 mm	2	**-AD**		
	Fitting in exhaust duct on left	Push-in fitting for exhaust on left, QS-3, tubing O.D. 3 mm	3	**-BB**		
		Push-in fitting for exhaust on left, QS-4, tubing O.D. 4 mm	4	**-BC**		
		Push-in fitting for exhaust on left, QS-6, tubing O.D. 6 mm	2	**-BD**		
		Silencer for exhaust on left	5	**-BU**		

1 **QC** Not with fitting in supply duct on left AD and fitting in exhaust duct on left BD.

2 **AB, AD, BD** Not with fitting for working line QC.

3 **BB** Not with fitting in supply duct on left AC, AD.

4 **BC** Not with fitting in supply duct on left AD.

5 **BU** Not with valve function D.

Transfer order code

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New

Solenoid valves MHA1, miniature

Technical data – Sub-base valve with LED

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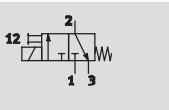
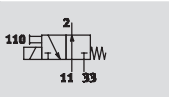
Function

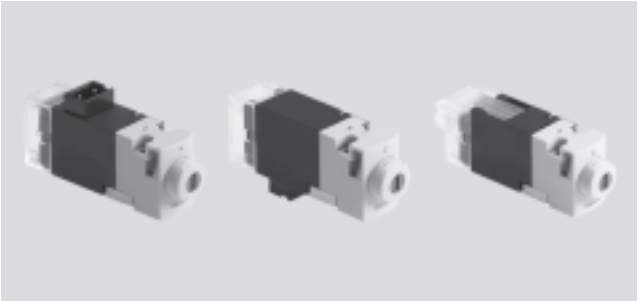




Voltage
24 V DC

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			Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm
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

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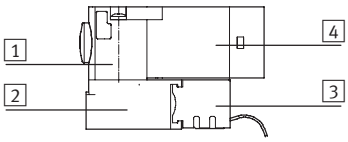
Electrical data		
Valve function		3/2-way, single solenoid
Operating voltage	[V DC]	24 ±10%
Type of connection		Plug connection
Power consumption	[W]	1.1
Protection class to EN 60529		
With plug socket KMH		IP40
With plug base MHAP-PI		
With soldering base PCBC-A		
With Sub-D connector plug		

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

Solenoid valves MHA1, miniature

Technical data – Sub-base valve with LED

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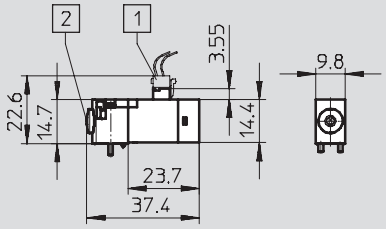
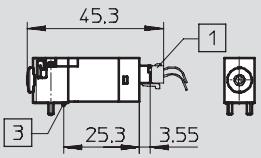
Dimensions

Download CAD data ➔ **www.festo.com**

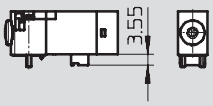
Plug connection on top



Plug connection at rear

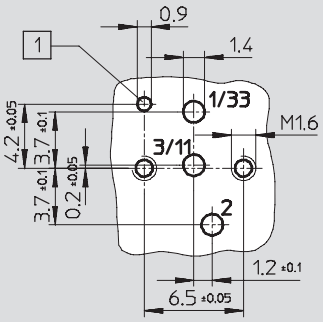


Plug connection underneath



1 Plug socket KMH-...
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.

Solenoid valves MHA1, miniature

Technical data – Sub-base valve with LED

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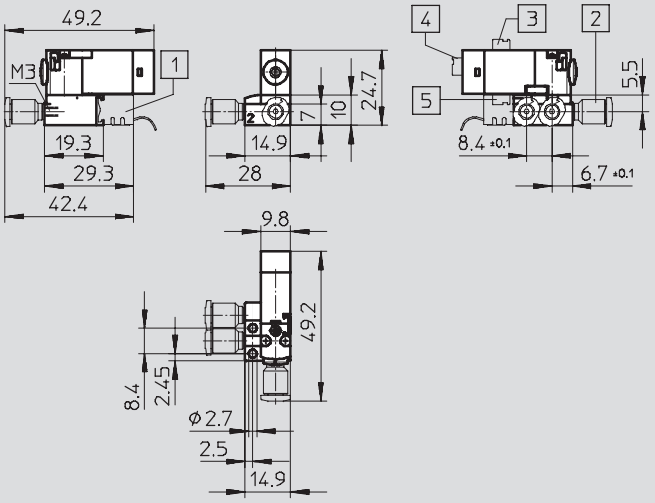
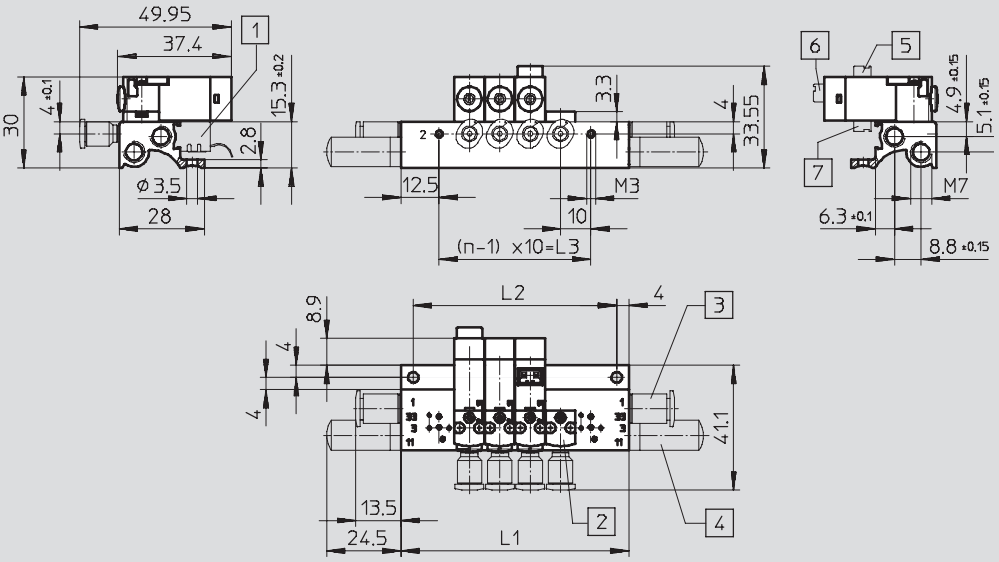
Dimensions – 3/2-way valve Download CAD data ➔ **www.festo.com**

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

Solenoid valves MHA1, miniature

Technical data – Sub-base valve with LED

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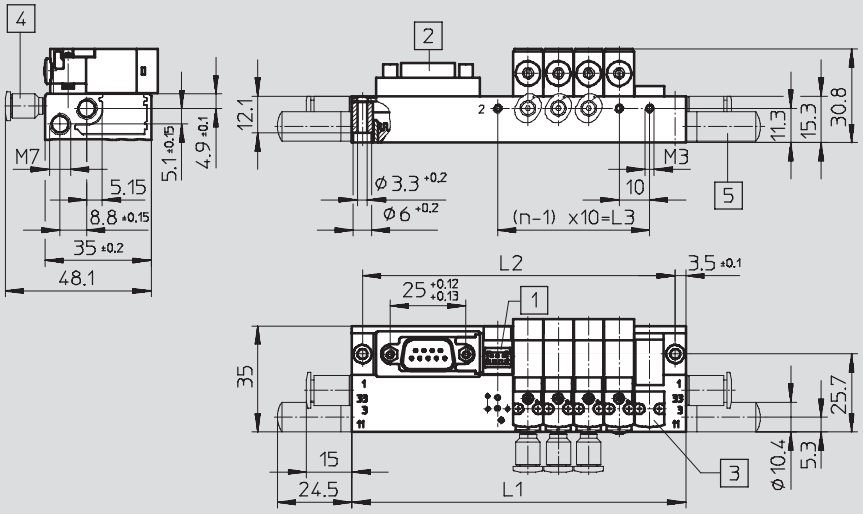
Dimensions – 3/2-way valve Download CAD data ➔ **www.festo.com**

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

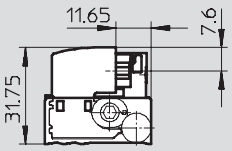
Valve positions n	L1 ±0.15	L2 ±0.1	L3
2	70	63	10
4	90	83	30
6	110	103	50
8	130	123	70

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

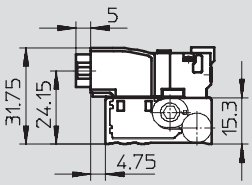
Valve positions n	L1 ±0.15	L2 ±0.1	L3
18	252	245	170
20	272	265	190
22	292	285	210

Electrical multi-pin plug – Plug directions

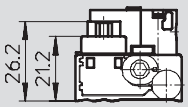
To pneumatic side



To electrical side



To top (standard)



Solenoid valves MHA1, miniature

Technical data – Sub-base valve with LED

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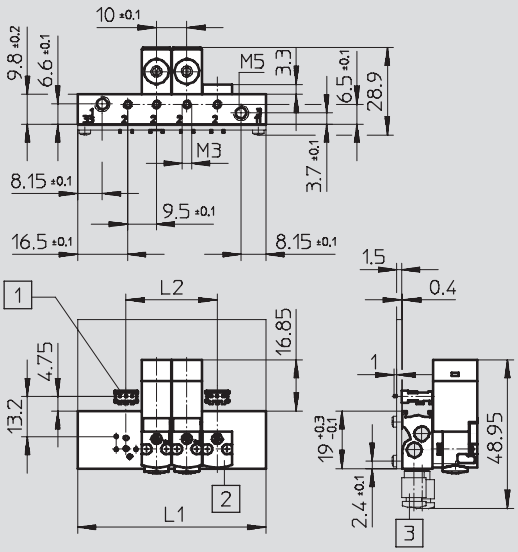
Dimensions – 3/2-way valve Download CAD data ➔ **www.festo.com**

Manifold assembly on PCB

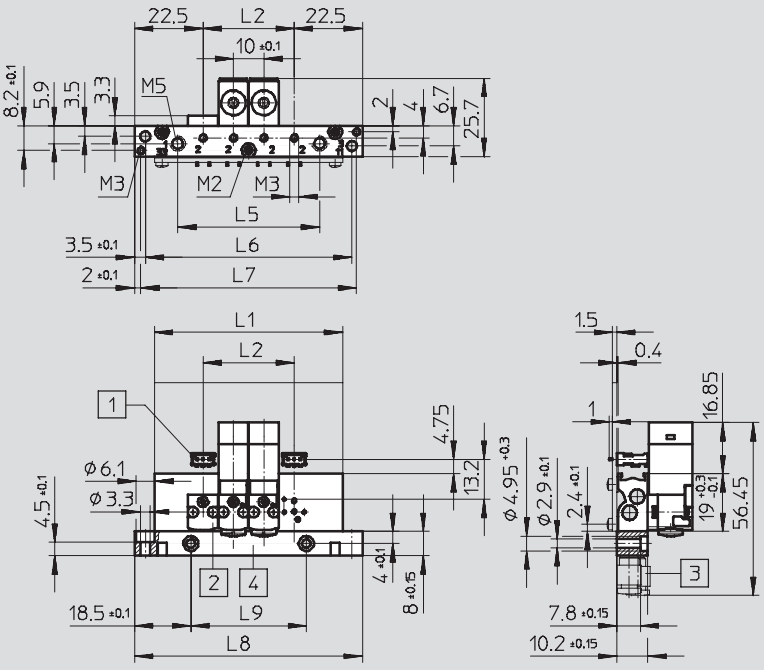


1 Soldering base PCBC-A-...
2 Blanking plate MHAP1
3 Fitting QSM-...

Note

The PCB is not included in the scope of delivery.
Hole pattern on PCB ➔ 44

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 ➔ 44

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

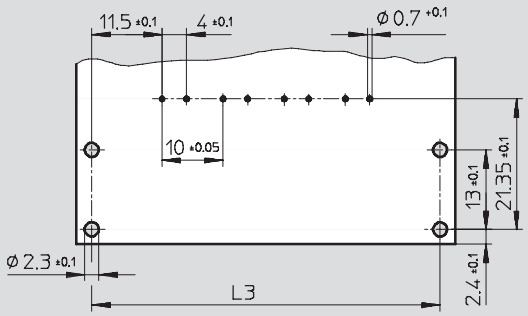
Solenoid valves MHA1, miniature

Technical data – Sub-base valve with LED

FESTO

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	**540 443**	**MHA1-M1LH-3/2G-0,6-HC**	**540 440**	**MHA1-M1LH-3/2O-0,6-HC**
Plug connection on top	24 V DC	**540 444**	**MHA1-M1LH-3/2G-0,6-TC**	**540 441**	**MHA1-M1LH-3/2O-0,6-TC**
Plug connection underneath	24 V DC	**540 445**	**MHA1-M1LH-3/2G-0,6-PI**	**540 442**	**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		**197 183**	**MHA1-AS-3-M3**
Manifold block for ...	2 valves	**197 202**	**MHA1-PR2-3-M3**
	4 valves	**197 203**	**MHA1-PR4-3-M3**
	6 valves	**197 204**	**MHA1-PR6-3-M3**
	8 valves	**197 205**	**MHA1-PR8-3-M3**
	10 valves	**197 206**	**MHA1-PR10-3-M3**
Valves with plug connection underneath			
Individual sub-base		**197 185**	**MHA1-AS-3-M3-PI**
Manifold block with plug bases for ...	2 valves	**197 222**	**MHA1-PR2-3-M3-PI**
	4 valves	**197 223**	**MHA1-PR4-3-M3-PI**
	6 valves	**197 224**	**MHA1-PR6-3-M3-PI**
	8 valves	**197 225**	**MHA1-PR8-3-M3-PI**
	10 valves	**197 226**	**MHA1-PR10-3-M3-PI**
Manifold block with plug bases and electrical multi-pin plug for ...	4 valves	**197 238**	**MHA1-PR4-3-M3-PI-D9**
	6 valves	**197 239**	**MHA1-PR6-3-M3-PI-D9**
	8 valves	**197 240**	**MHA1-PR8-3-M3-PI-D9**
	10 valves	**197 241**	**MHA1-PR10-3-M3-PI-D25**
Manifold block for mounting on PCB for ...	2 valves	**197 247**	**MHA1-PR2-3-M3-PI-PCB**
	4 valves	**197 248**	**MHA1-PR4-3-M3-PI-PCB**
	6 valves	**197 249**	**MHA1-PR6-3-M3-PI-PCB**
	8 valves	**197 250**	**MHA1-PR8-3-M3-PI-PCB**
	10 valves	**197 251**	**MHA1-PR10-3-M3-PI-PCB**
Manifold block for mounting on PCB with pneumatic multiple connector plate for ...	4 valves	**197 253**	**MHA1-PR4-3-PI-PCBM**
	6 valves	**197 254**	**MHA1-PR6-3-PI-PCBM**
	8 valves	**197 255**	**MHA1-PR8-3-PI-PCBM**
	10 valves	**197 256**	**MHA1-PR10-3-PI-PCBM**

Note

Manifold blocks with an uneven number of valves and for 11 ... 22 valves as well as further variants can be configured and ordered using the MH1 modular product system ➔ from 45.

Solenoid valves MH1, miniature, individual sub-base

Ordering data – Modular products, valve with LED

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M Mandatory data

Module No.	Valve family		Design		Power supply		Valve function		Plug-in direction on valve		No. of valve positions		Type of linking
197 334	MH1		A		24VDC		C N		TC HC PI		1V		PS
Order example													
197 334	**MH1**	–	**A**	–	**24VDC**	–	**C**	–	**TC**	–	**1V**	–	**PS**

Ordering table

Size		1	Conditions	Code		Enter code
M	Module No.	**197 334**				
	Valve family	Miniature valve size 1		**MH1**		MH1
	Design	Sub-base valve		**-A**		-A
	Power supply [V DC]	24		**-24VDC**		-24VDC
	Valve function	3/2-way valve, normally closed		**-C**		
		3/2-way valve, normally open		**-N**		
	Plug-in direction on valve	Plug connection on top for connecting cable with socket IP40 (KMH-0,5)		**-TC**		
		Plug connection at rear for connecting cable with socket IP40 (KMH-1)		**-HC**		
		Plug connection underneath for electrical linking		**-PI**		
	No. of valve positions	1		**-1V**		-1V
↓	Type of linking	Individual sub-base		**-PS**		-PS

Transfer order code

197 334	**MH1**	–	**A**	–	**24VDC**	–		–		–	**1V**	–	**PS**

Solenoid valves MH1, miniature, individual sub-base

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Ordering data – Modular products, valve with LED

➔ 0 **Options**

	Connecting cable with socket		Additional functions		Manual override		Fitting for working line		Fitting in supply duct on left		Fitting in exhaust duct on left
	K05 K01		LED		N		QB QC		AB AC		BB BC BU
–	**K05**	–	**LED**	–	**N**	–	**QB**	–	**AB**	–	**BC**

Ordering table

Size		1	Condi-tions	Code		Enter code
0	Connecting cable with socket (supplied loose)	Connecting cable 0.5 m, with socket IP40 (KMH-0,5)	1	**-K05**		
		Connecting cable 1 m, with socket IP40 (KMH-1)	1	**-K01**		
	Additional functions	Status display via LED		**-LED**		-LED
	Manual override	Non-detenting/detenting		**-N**		-N
	Fitting for working line	Push-in fitting for working port, QS-3, tubing O.D. 3 mm		**-QB**		
		Push-in fitting for working port, QS-4, tubing O.D. 4 mm		**-QC**		
	Fitting in supply duct on left	Push-in fitting for supply on left, QS-3, tubing O.D. 3 mm	2	**-AB**		
		Push-in fitting for supply on left, QS-4, tubing O.D. 4 mm		**-AC**		
	Fitting in exhaust duct on left	Push-in fitting for exhaust on left, QS-3, tubing O.D. 3 mm	3	**-BB**		
		Push-in fitting for exhaust on left, QS-4, tubing O.D. 4 mm		**-BC**		
		Silencer for exhaust on left		**-BU**		

1 **K05, K01** Not with plug-in direction on valve PI.
2 **AB** Not with fitting for working line QC.
3 **BB** Not with fitting in supply duct on left AC.

Transfer order code

–		–	LED	–	N	–		–		–	

Solenoid valves MH1, manifold assembly with individual electrical connection

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Ordering data – Modular products, valve with LED

M Mandatory data								O Options →
Module No.	Valve family	Design	Power supply	Valve function	Plug-in direction on valve	No. of valve positions	Type of linking	Number of vacant positions
197 334	MH1	A	24VDC	C N	TC HC PI	2V ... 22V	PR	2L ... 22L
Order example								
197 334	**MH1** –	**A** –	**24VDC** –	**N** –	**PI** –	**14V** –	**PR** –	**2L**

Ordering table

Size		1	Condi-tions	Code		Enter code
M	Module No.	**197 334**				
	Valve family	Miniature valve size 1		**MH1**		MH1
	Design	Sub-base valve		**-A**		-A
	Power supply [V DC]	24		**-24VDC**		-24VDC
	Valve function	3/2-way valve, normally closed		**-C**		
		3/2-way valve, normally open		**-N**		
	Plug-in direction on valve	Plug connection on top for connecting cable with socket IP40 (KMH-0,5)		**-TC**		
		Plug connection at rear for connecting cable with socket IP40 (KMH-1)		**-HC**		
		Plug connection underneath for electrical linking		**-PI**		
	No. of valve positions	2 ... 22		**-...V**		
	Type of linking	Block without electrical linking		**-PR**		-PR
O ↓	Number of vacant positions	1 ... 22		**-...L**		

Transfer order code

197 334	**MH1**	–	**A**	–	**24VDC**	–		–		–		–	**PR**	–	

Solenoid valves MH1, manifold assembly with individual electrical connection

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Ordering data – Modular products, valve with LED

➔ 0 **Options**

	Connecting cable with socket		Additional functions		Manual override		Fitting for working line		Fitting in supply duct on left		Fitting in exhaust duct on left		Fitting in supply duct on right		Fitting in exhaust duct on right
	K05 K01		LED		N		QB QC		AX AC AD		BX BC BD BU		CX CC CD		DX DC DD DU
–		–	**LED**	–	**N**	–	**QC**	–	**AX**	–	**BD**	–	**CD**	–	**DX**

Ordering table

Size		1	Conditions	Code		Enter code
↓	Connecting cable with socket (supplied loose)	Connecting cable 0.5 m, with socket IP40 (KMH-0,5)	1	**-K05**		
0		Connecting cable 1 m, with socket IP40 (KMH-1)	1	**-K01**		
	Additional functions	Status display via LED		**-LED**		-LED
	Manual override	Non-detenting/detenting		**-N**		-N
	Fitting for working line	Push-in fitting for working port, QS-3, tubing O.D. 3 mm		**-QB**		
		Push-in fitting for working port, QS-4, tubing O.D. 4 mm		**-QC**		
	Fitting in supply duct on left	Blanking plug for supply on left	2	**-AX**		
		Push-in fitting for supply on left, QS-4, tubing O.D. 4 mm		**-AC**		
		Push-in fitting for supply on left, QS-6, tubing O.D. 6 mm		**-AD**		
	Fitting in exhaust duct on left	Blanking plug for exhaust on left	3	**-BX**		
		Push-in fitting for exhaust on left, QS-4, tubing O.D. 4 mm	4	**-BC**		
		Push-in fitting for exhaust on left, QS-6, tubing O.D. 6 mm		**-BD**		
		Silencer for exhaust on left		**-BU**		
	Fitting in supply duct on right	Blanking plug for supply on right		**-CX**		
		Push-in fitting for supply on right, QS-4, tubing O.D. 4 mm		**-CC**		
		Push-in fitting for supply on right, QS-6, tubing O.D. 6 mm		**-CD**		
	Fitting in exhaust duct on right	Blanking plug for exhaust on right		**-DX**		
		Push-in fitting for exhaust on right, QS-4, tubing O.D. 4 mm	4	**-DC**		
		Push-in fitting for exhaust on right, QS-6, tubing O.D. 6 mm		**-DD**		
		Silencer for exhaust on right		**-DU**		

1 **K05, K01** Not with plug-in direction on valve PI.
2 **AX** Not with fitting in supply duct on right CX.
3 **BX** Not with fitting in exhaust duct on right DX.
4 **BC, DC** Not with fitting in supply duct on left AD and fitting in supply duct on right CD.

Transfer order code

–		–	LED	–	N	–		–		–		–		–	

Solenoid valves MH1, miniature, manifold assembly with electrical multi-pin plug

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Ordering data – Modular products, valve with LED

M Mandatory data								O Options →	
Module No.	**Valve family**	**Design**	**Power supply**	**Valve function**	**Plug-in direction on valve**	**No. of valve positions**	**Type of linking**	**Number of vacant positions**	**Plug-in direction of Sub-D plug**
197 334	MH1	A	24VDC	C N	PI	2V ... 24V	PRA	1L ... 24L	SP ST SE
Order example									
197 334	**MH1**	**A**	**24VDC**	**C**	**PI**	**14V**	**PRA**	**2L**	**SE**

Ordering table

Size		1	Condi-tions	Code		Enter code
M	Module No.	**197 334**				
	Valve family	Miniature valve size 1		**MH1**		MH1
	Design	Sub-base valve		**-A**		-A
	Power supply [V DC]	24		**-24VDC**		-24VDC
	Valve function	3/2-way valve, normally closed		**-C**		
		3/2-way valve, normally open		**-N**		
	Plug-in direction on valve	Plug connection underneath for electrical linking		**-PI**		-PI
	No. of valve positions	2, 4, 6 ... 24 (even number only)		**-...V**		
	Type of linking	Block with Sub-D plug		**-PRA**		-PRA
O	Number of vacant positions	1 ... 24		**-...L**		
	Plug-in direction of Sub-D plug	Plug-in direction of Sub-D plug to pneumatic side		**-SP**		
		Plug-in direction of Sub-D plug to top		**-ST**		
↓		Plug-in direction of Sub-D plug to electrical side		**-SE**		

Transfer order code

197 334	**MH1**	–	**A**	–	**24VDC**	–		–	**PI**	–		–	**PRA**	–		–	

New

Solenoid valves MH1, miniature, manifold assembly with electrical multi-pin plug

FESTO

Ordering data – Modular products, valve with LED

➔ [0] **Options**

	Connecting cable with socket	Addi-tional functions	Manual override	Fitting for working line	Fitting in supply duct on left	Fitting in exhaust duct on left	Fitting in supply duct on right	Fitting in exhaust duct on right
	S25 M25 L25 S50 M50 L50 S10 M10 L10	LED	N	QB QC	AX AC AD	BX BC BD BU	CX CC CD	DX DC DD DU
–	L25	– LED	– N	– QC	– AX	– BD	– CD	– DX

Ordering table

Size		1	Condi-tions	Code		Enter code
↓	Connecting cable with socket	Connecting cable 2.5 m, Sub-D, 9-pin, 8-wire	[1]	**-S25**		
[0]	(supplied loose)	Connecting cable 5 m, Sub-D, 9-pin, 8-wire	[1]	**-S50**		
		Connecting cable 10 m, Sub-D, 9-pin, 8-wire	[1]	**-S10**		
		Connecting cable 2.5 m, Sub-D, 25-pin, 12-wire	[2]	**-M25**		
		Connecting cable 5 m, Sub-D, 25-pin, 12-wire	[2]	**-M50**		
		Connecting cable 10 m, Sub-D, 25-pin, 12-wire	[2]	**-M10**		
		Connecting cable 2.5 m, Sub-D, 25-pin, 20-wire	[3]	**-L25**		
		Connecting cable 5 m, Sub-D, 25-pin, 20-wire	[3]	**-L50**		
		Connecting cable 10 m, Sub-D, 25-pin, 20-wire	[3]	**-L10**		
	Additional functions	Status display via LED		**-LED**		-LED
	Manual override	Non-detenting/detenting		**-N**		-N
	Fitting for working line	Push-in fitting for working port, QS-3, tubing O.D. 3 mm		**-QB**		
		Push-in fitting for working port, QS-4, tubing O.D. 4 mm		**-QC**		
	Fitting in supply duct on left	Blanking plug for supply on left	[4]	**-AX**		
		Push-in fitting for supply on left, QS-4, tubing O.D. 4 mm		**-AC**		
		Push-in fitting for supply on left, QS-6, tubing O.D. 6 mm		**-AD**		
	Fitting in exhaust duct on left	Blanking plug for exhaust on left	[5]	**-BX**		
		Push-in fitting for exhaust on left, QS-4, tubing O.D. 4 mm	[6]	**-BC**		
		Push-in fitting for exhaust on left, QS-6, tubing O.D. 6 mm		**-BD**		
		Silencer for exhaust on left		**-BU**		
	Fitting in supply duct on right	Blanking plug for supply on right		**-CX**		
		Push-in fitting for supply on right, QS-4, tubing O.D. 4 mm		**-CC**		
		Push-in fitting for supply on right, QS-6, tubing O.D. 6 mm		**-CD**		
	Fitting in exhaust duct on right	Blanking plug for exhaust on right		**-DX**		
		Push-in fitting for exhaust on right, QS-4, tubing O.D. 4 mm	[6]	**-DC**		
		Push-in fitting for exhaust on right, QS-6, tubing O.D. 6 mm		**-DD**		
		Silencer for exhaust on right		**-DU**		

[1] **S25, S50, S10**
Max. 8 valve positions.

[2] **M25, M50, M10**
Only with 10 or 12 valve positions.

[3] **L25, L50, L10**
Min. 10 valve positions.

[4] **AX** Not with fitting in supply duct on right CX.

[5] **BX** Not with fitting in exhaust duct on right DX.

[6] **BC, DC** Not with fitting in supply duct on left AD and fitting in supply duct on right CD.

Transfer order code

–		– LED	– N	–	–	–	–	–

Solenoid valves MH1, miniature, manifold assembly and PCB mounting

FESTO

Ordering data – Modular products, valve with LED

M **Mandatory data**

Module No.	Valve family		Design		Power supply		Valve function		Plug-in direction on valve		No. of valve positions		Type of linking
197 334	MH1	–	A	–	24VDC	–	C N	–	PI	–	2V 4V 6V 8V 10V	–	PCD
Order example													
197 334	**MH1**	–	**A**	–	**24VDC**	–		–	**PI**	–	**10V**	–	**PCD**

Ordering table

Size		1	Condi-tions	Code		Enter code
M	Module No.	**197 334**				
	Valve family	Miniature valve size 1		**MH1**		MH1
	Design	Sub-base valve		**-A**		-A
	Power supply [V DC]	5, 12, 24		**-24VDC**		-24VDC
	Valve function	3/2-way valve, normally closed		**-C**		
		3/2-way valve, normally open		**-N**		
	Plug-in direction on valve	Plug connection underneath for electrical linking		**-PI**		-PI
	No. of valve positions	2, 4, 6, 8, 10		**-...V**		
↓	Type of linking	PCB mounting, direct		**-PCD**		-PCD

Transfer order code

197 334	**MH1**	–	**A**	–	**24VDC**	–		–	**PI**	–		–	**PCD**

Solenoid valves MH1, miniature, manifold assembly and PCB mounting

FESTO

Ordering data – Modular products, valve with LED

➔ 0 Options

	Number of vacant positions		Additional functions		Manual override		Fitting for working line		Fitting in supply duct on left		Fitting in exhaust duct on left
	1L ... 10L		LED		N		QB QC		AB AC AD		BB BC BD BU
–	**2L**	–	**LED**	–	**N**	–	**QC**	–	**AC**	–	**BC**

Ordering table

Size		1	Conditions	Code		Enter code
0	Number of vacant positions	1 ... 10		**-...L**		
	Additional functions	Status display via LED		**-LED**		-LED
	Manual override	Non-detenting/detenting		**-N**		-N
	Fitting for working line	Push-in fitting for working port, QS-3, tubing O.D. 3 mm		**-QB**		
		Push-in fitting for working port, QS-4, tubing O.D. 4 mm	1	**-QC**		
	Fitting in supply duct on left	Push-in fitting for supply on left, QS-3, tubing O.D. 3 mm	2	**-AB**		
		Push-in fitting for supply on left, QS-4, tubing O.D. 4 mm		**-AC**		
		Push-in fitting for supply on left, QS-6, tubing O.D. 6 mm	2	**-AD**		
	Fitting in exhaust duct on left	Push-in fitting for exhaust on left, QS-3, tubing O.D. 3 mm	3	**-BB**		
		Push-in fitting for exhaust on left, QS-4, tubing O.D. 4 mm	4	**-BC**		
		Push-in fitting for exhaust on left, QS-6, tubing O.D. 6 mm	2	**-BD**		
		Silencer for exhaust on left		**-BU**		

1 **QC** Not with fitting in supply duct on left AD and fitting in exhaust duct on left BD.
2 **AB, AD, BD** Not with fitting for working line QC.
3 **BB** Not with fitting in supply duct on left AC, AD.
4 **BC** Not with fitting in supply duct on left AD.

Transfer order code

–		–	LED	–	N	–		–		–	

Solenoid valves MH1, PCB mounting with pneumatic multiple connector plate

FESTO

Ordering data – Modular products, valve with LED

M Mandatory data

Module No.	Valve family		Design		Power supply		Valve function		Plug-in direction on valve		No. of valve positions		Type of linking
197 334	MH1		A		24VDC		C N		PI		4V 6V 8V 10V		PCM
Order example													
197 334	**MH1**	–	**A**	–	**24VDC**	–	**C**	–	**PI**	–	**10V**	–	**PCM**

Ordering table

Size		1	Condi-tions	Code		Enter code
M	Module No.	**197 334**				
	Valve family	Miniature valve size 1		**MH1**		MH1
	Design	Sub-base valve		**-A**		-A
	Power supply [V DC]	24	1	**-24VDC**		-24VDC
	Valve function	3/2-way valve, normally closed		**-C**		
		3/2-way valve, normally open		**-N**		
	Plug-in direction on valve	Plug connection underneath for electrical linking		**-PI**		-PI
	No. of valve positions	4, 6, 8, 10		**-...V**		
↓	Type of linking	PCB mounting, pneumatic multiple connector plate		**-PCM**		-PCM

Transfer order code

197 334	**MH1**	–	**A**	–	**24VDC**	–		–	**PI**	–		–	**PCM**

Solenoid valves MH1, PCB mounting with pneumatic multiple connector plate

FESTO

Ordering data – Modular products, valve with LED

➔ 0 Options

	Number of vacant positions		Additional functions		Manual override		Fitting for working line		Fitting in supply duct on left		Fitting in exhaust duct on left
	1L ... 10L		LED		N		QB QC		AB AC AD		BB BC BD BU
–		–	**LED**	–	**N**	–	**QC**	–	**AC**	–	**BC**

Ordering table

Size		1	Conditions	Code		Enter code
0	Number of vacant positions	1 ... 10		**-...L**		
	Additional functions	Status display via LED		**-LED**		-LED
	Manual override	Non-detenting/detenting		**-N**		-N
	Fitting for working line	Push-in fitting for working port, QS-3, tubing O.D. 3 mm		**-QB**		
		Push-in fitting for working port, QS-4, tubing O.D. 4 mm	1	**-QC**		
	Fitting in supply duct on left	Push-in fitting for supply on left, QS-3, tubing O.D. 3 mm	2	**-AB**		
		Push-in fitting for supply on left, QS-4, tubing O.D. 4 mm		**-AC**		
		Push-in fitting for supply on left, QS-6, tubing O.D. 6 mm	2	**-AD**		
	Fitting in exhaust duct on left	Push-in fitting for exhaust on left, QS-3, tubing O.D. 3 mm	3	**-BB**		
		Push-in fitting for exhaust on left, QS-4, tubing O.D. 4 mm	4	**-BC**		
		Push-in fitting for exhaust on left, QS-6, tubing O.D. 6 mm	2	**-BD**		
		Silencer for exhaust on left		**-BU**		

1 **QC** Not with fitting in supply duct on left AD and fitting in exhaust duct on left BD.
2 **AB, AD, BD** Not with fitting for working line QC.
3 **BB** Not with fitting in supply duct on left AC, AD.
4 **BC** Not with fitting in supply duct on left AD.

Transfer order code

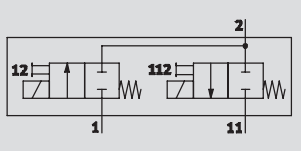
–		–	**LED**	–	**N**	–		–		–	

Solenoid valves MHA1, miniature

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

FESTO

Function

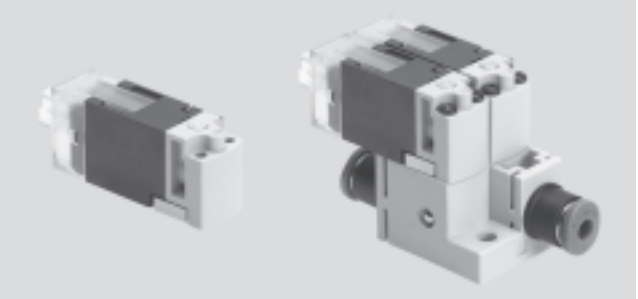


2x2/2-way valve

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			Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm	
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		IP40	

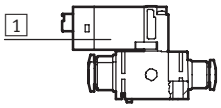
Solenoid valves MHA1, miniature

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

FESTO

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

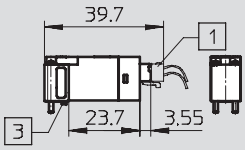
Materials



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

Dimensions – 2/2-way valve

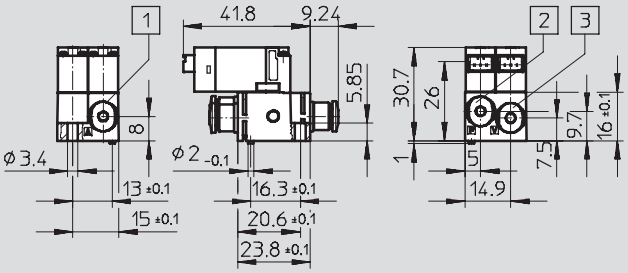
Download CAD data ➔ **www.festo.com**



1 Plug socket KMH-...
3 Coding pin

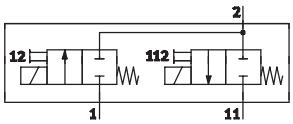
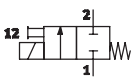
Dimensions – 2x2/2-way valve

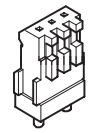
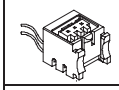
Download CAD data ➔ **www.festo.com**

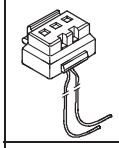


1 Push-in fitting 2
2 Push-in fitting 1
3 Push-in fitting 11

Ordering data – 2x2/2-way valve

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	**560 372**	**MHA1-2X2/2G-1,5-4-4-3**
		4/4/4	30.6	**566 175**	**MHA1-2X2/2G-1,5-4-4-4**
		3/3/3	30.6	**562 051**	**MHA1-2X2/2G-1,5-3-3-3**
2/2-way valve					
	Closed	–	10	**557 864**	**MHA1-M1LCH-2/2G-1.5-HC**

		Part No.	Type
Soldering base			
		**197 261**	**PCBC-A-10**[1]
		197 262	**PCBC-A-100**[2]
Plug base (IP40)			
		**197 260**	**MHAP-PI**
Blanking plug B			
	M5	**3843**	**B-M5**[4]
	M7	**174 309**	**B-M7**[4]
Silencer UC			
		➔ Internet: uc	
Connecting cable KMP6 (up to 8 valves)			
	2.5 m	**531 184**	**KMP6-09P-8-2,5**
	5 m	**531 185**	**KMP6-09P-8-5**
	10 m	**531 186**	**KMP6-09P-8-10**
Connecting cable KMP6 (up to 22 valves)			
	2.5 m	**530 046**	**KMP6-25P-22-2,5**
	5 m	**530 047**	**KMP6-25P-22-5**
	10 m	**530 048**	**KMP6-25P-22-10**

		Part No.	Type
Plug socket with cable (IP40)			
	0.5 m	**197 263**	**KMH-0,5**
	1 m	**197 264**	**KMH-1**
Inscription label			
		**197 259**	**MH-BZ-80X**[3]
Blanking plate			
	Plug connection	**197 257**	**MHAP1-BP-3**
	Plug base	**197 258**	**MHAP1-BP-3-PI**
Push-in fittings QS/QSM			
		➔ Internet: quick star	
Connecting cable KMP6 (up to 12 valves)			
	2.5 m	**530 049**	**KMP6-25P-12-2,5**
	5 m	**530 050**	**KMP6-25P-12-5**
	10 m	**530 051**	**KMP6-25P-12-10**

1) Scope of delivery 10 pieces
2) Scope of delivery 100 pieces
3) Scope of delivery 80 pieces
4) Scope of delivery 10 pieces

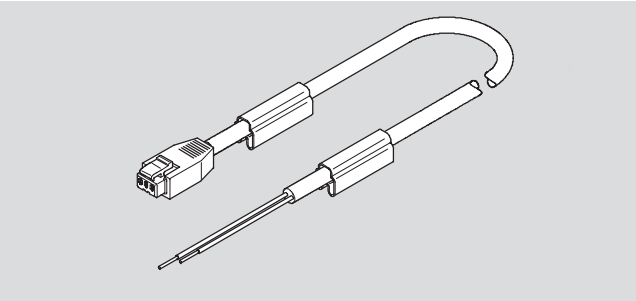
New

Plug sockets with cable NEBV

Technical data

FESTO

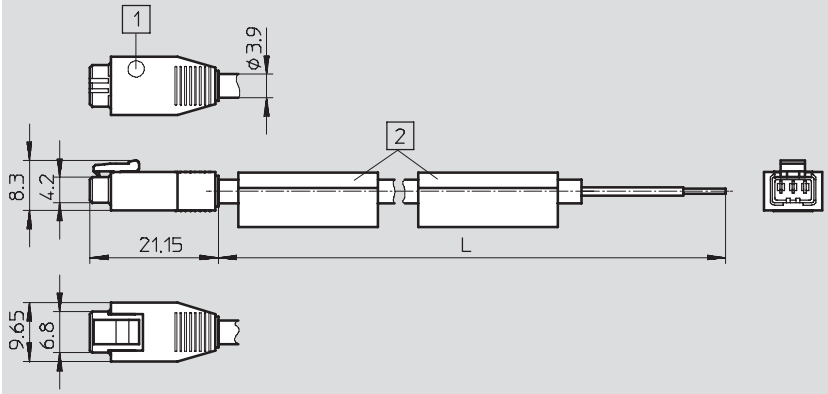
- Temperature range −20 … +70°C
- For miniature valves MHA1 and MHP1



General technical data				
			NEBV-H1G2-P-...	NEBV-H1G2L-P-...
Electrical connection			Socket, 2-pin	
Output current		[A]	2	
Protection class to EN 60 529			IP40 (assembled)	
Operating voltage		[V AC]	0 … 30	4.5 … 26.4
		[V DC]	0 … 30	4.5 … 26.4
Corrosion resistance class CRC			4[1)]	
Ambient temperature		[°C]	−20 … +70	
Material	Housing		Polyacetal	
	Cable sheath		Polyvinyl chloride	

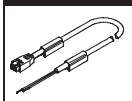
1) CRC4: Corrosion resistance class to Festo standard 940 070
Components with very heavy corrosion exposure. Components in contact with aggressive media, e.g. in food or chemical industries. These applications must, if necessary, be verified by special tests with the media concerned.

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



1 LED
2 Identification clips
L Cable length

Ordering data

	Description	LED	Cable length [m]	Product weight [g]	Part No.	Type
	Plug socket with cable for miniature valves MHA1 and MHP1	–	0.5	12	**552 001**	**NEBV-H1G2-P-0.5-LE2**
		–	1	24	**552 002**	**NEBV-H1G2-P-1-LE2**
		–	2.5	60	**552 003**	**NEBV-H1G2-P-2.5-LE2**
		–	5	120	**552 004**	**NEBV-H1G2-P-5-LE2**
		■	0.5	12	**554 029**	**NEBV-H1G2L-P-0.5-LE2**
		■	1	24	**554 030**	**NEBV-H1G2L-P-1-LE2**
		■	2.5	60	**554 031**	**NEBV-H1G2L-P-2.5-LE2**
		■	5	120	**554 032**	**NEBV-H1G2L-P-5-LE2**