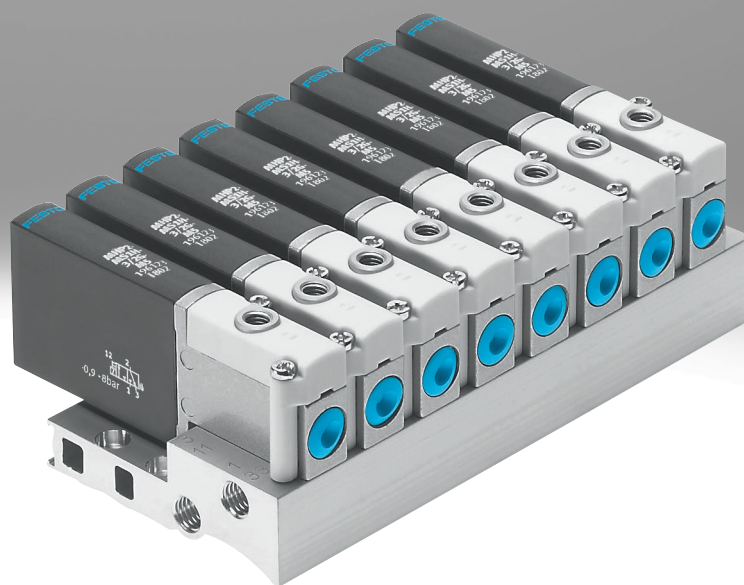


Solenoid valves MH2, MH3, MH4, fast-switching valves

FESTO

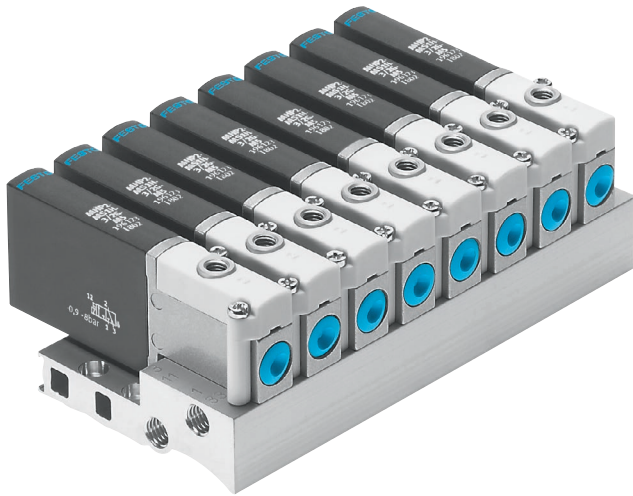


Key features

Fast-switching valves from Festo: it's not just the switching that's fast			
Pros that switch as fast as 2 milliseconds	High speed in production	Faster switching	
Speed, dynamic response and precision are more sought after than ever before in modern automation. The solution lies in pneumatic components. The result: shorter cycle times in return for comparatively low investment costs for the components. Maximum process reliability, sturdiness and service life are guaranteed.	The fast-switching valves are a technological treat for all things high-speed. With switching times ≤ 2 ms and a repetition accuracy ≤ 0.2 ms, they represent the pinnacle of what is technologically achievable worldwide – even in 24-hour continuous operation with over 500 million cycles.	Simple to retrofit in existing systems, or setting the pace for newly designed systems. Naturally compact, including maximum component density. Indispensable for sorting parts using an air ejector, in flap control systems, for gluing, dispensing, packaging and, of course, also suitable for pick & place vacuum applications, for example (continuous holding not possible).	Extremely short switching times enable short cycle times. Extremely precise switching makes it possible to control the timing of process sequences accurately. High output and very good machine utilisation are included. Excellent repetition accuracy of switching times ensures consistent processes, improves process and part quality and reduces rejects and rework.
Faster installation			
With a variety of connection options such as thread or integrated push-in tubing connectors and a range of mounting options for individual valves or valve manifold assembly, the installation can be perfectly adapted to on-site circumstances while the footprint is kept to a minimum.	Fast-switching valves can be used directly in the application without additional protective measures. As a result, very short pneumatic lines guarantee short signal paths and fast response times.		

Key features

Fast-switching valves from Festo: it's not just the switching that's fast



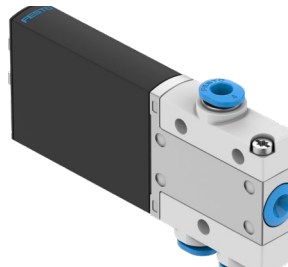
- Variants with and without fast-switching electronics as 3/2-way and 5/2-way valves
- Extremely short switching times with maximum repetition accuracy and outstanding service life
- Directly actuated poppet valve with degree of protection IP65

Advantages for designers



- Very high cycle rates
- Extremely short cycle times
- Maximum repetition accuracy
- Suitable for vacuum thanks to directly actuated poppet valve (time limited)
- Flexible design principle
- Direct activation via standard PLC possible
- Direct mounting in the application with IP65 protection

Advantages for purchasers



- Everything from a single source
- Low ordering costs
- No additional mounting components
- No costs for additional power outputs
- Use of standard PLCs
- Increased system productivity

Advantages for installation



- Easy installation
- Direct pneumatic connection via integrated tubing connections
- Reduced assembly costs with pre-assembled cables
- No additional protection required thanks to IP65

Key features

Fast and precise – sturdy and economical

High performance, process stability and extremely easy handling

Fast-switching valves MH increase switching frequencies and improve process and part quality with their excellent repetition accuracy.

Integrated: the fast-switching electronics

- All 3/2- and 5/2-way valves are available with built-in fast-switching electronics
- This enables constant dynamic response independent of temperature or supply voltage fluctuations
- With Festo plug & work, installation is easy, and no additional electronics or pneumatics know-how is necessary

Optimised: systems and processes

- On-site assembly thanks to IP65 – not sensitive to dust and humidity
- Direct activation with 24 V DC/1 A – use of PLC standard outputs
- With an extremely long service life of 500 million cycles, and continuous three-shift operation with no need for maintenance, optimum efficiency comes as standard!

Key features

- Repetition accuracy ≤ 0.2 ms for accurate dispensing/bonding, for example
- Switching time ≤ 3 ms for short cycle times and very quick response characteristics
- 10 mm width for compact assembly
- Choice of connections as an individual valve, semi in-line or sub-base variant, enabling need-optimised installation
- Degree of protection IP65 enables direct mounting in the application without additional safeguarding
- Easy installation via direct activation from the standard PLC with 24 V DC/1 A

Fast valves and an optimised control chain – two guarantees for success

To generate speed in pneumatics, the valve and cylinder must be perfectly matched. The correct combination can result in a 30% increase in efficiency. Cylinders with small diameters and short strokes need fast valves!

Length means losses – focus on tubing

In terms of pneumatic efficiency, short tubing is a key factor. Reducing the tubing length from 1 m to 0.5 m, for example, improves the max. possible flow rate by 20%. A tube length greater than 2 m results in losses of up to 50%. In this case it is recommended to use tubing of the next size up.

Small and nearby – the clever alternative

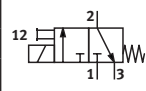
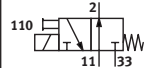
Short tubing with a small diameter is ideal for mounting valves close to the cylinder. The small and light fast-switching valves are suitable for direct mounting in the application, thanks also to their degree of protection IP65. By using them together with smaller and lighter fittings, the weight is reduced, too. This results in particular in an improvement in the efficiency of moving systems.

Small and fast – a good combination

The switching time plays a crucial role with small cylinder volumes, especially with short-stroke cylinders. In the adjacent example, the combination with a fast-switching valve is 30% faster. In concrete terms, this means that the cylinder controlled using the fast-switching valve is already in the end position before the cylinder with the universal valve even begins to move.

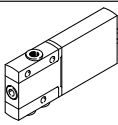
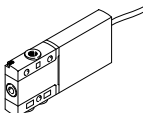
This equates to a significant increase in both the efficiency and the economy of the system, especially when taking into account that the two valves have comparable space requirements and weight, and the fast-switching valve uses less air and lasts 10 times as long!

Product range overview

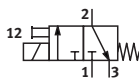
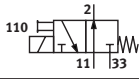
Function	Circuit symbol	Design	Switching time [ms]				Operating voltage [V DC]	→ Page/Internet
			Off2)	On2)	Off	On		
3/2-way valve1)	Standard nominal flow rate 100 l/min							
		Individual valve	2	1.7	3.5	7	24	9
		Semi-in-line valve	2	1.7	3.5	7	24	22
		Sub-base valve	2	1.7	3.5	7	24	40
								

- 1) Can be used as a 2/2-way valve by sealing port 3 or 33
 2) With integrated fast-switching electronics

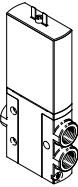
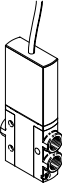
Function	Circuit symbol	Design	Switching time [ms]		Operating voltage [V DC]	→ Page/Internet
			Off	On		
5/2-way valve	Standard nominal flow rate 100 l/min					
		Individual valve	1.7	1.9	24	16
		Semi-in-line valve	1.7	1.9	24	31
		Sub-base valve	1.7	1.9	24	49

Mounting options							
Design		Individual valve		Semi-in-line valve		Sub-base valve	
Valve function		3/2-way	5/2-way	3/2-way	5/2-way	3/2-way	5/2-way
Plug vanes							
	Direct mounting	■	■	–	–	–	–
	Individual sub-base	–	–	■	■	■	■
	Manifold assembly	–	–	■	■	■	■
Moulded-in cable							
	Direct mounting	■	■	–	–	–	–
	Individual sub-base	–	–	–	–	■	■
	Manifold assembly	–	–	–	–	■	■

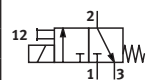
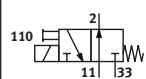
Product range overview

Function	Circuit symbol	Design	Switching time [ms]				Operating voltage [V DC]	→ Page/Inter- net
			Off2)	On2)	Off	On		
3/2-way valve1)	Standard nominal flow rate 200 l/min							
		Individual valve	2.8	2.3	4.5	8.3	24	58
		Semi-in-line valve	2.8	2.3	4.5	8.3	24	66
		Sub-base valve	2.8	2.3	4.5	8.3	24	75
								

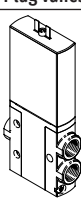
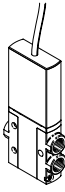
- 1) Can be used as a 2/2-way valve by sealing port 3 or 33
- 2) With integrated fast-switching electronics

Mounting options				
Design		Individual valve	Semi-in-line valve	Sub-base valve
Plug vanes				
	Direct mounting	■	–	–
	Individual sub-base	–	■	■
	Manifold assembly	–	■	■
Moulded-in cable				
	Direct mounting	■	–	–
	Individual sub-base	–	■	■
	Manifold assembly	–	■	■

Product range overview

Function	Circuit symbol	Design	Switching time [ms]				Operating voltage [V DC]	→ Page/Inter- net
			Off2)	On2)	Off	On		
3/2-way valve1)	Standard nominal flow rate 400 l/min							
		Individual valve	3.5	3.5	5	10.5	24	85
		Semi-in-line valve	3.5	3.5	5	10.5	24	92
		Sub-base valve	3.5	3.5	5	10.5	24	101
								

- 1) Can be used as a 2/2-way valve by sealing port 3 or 33
 2) With integrated fast-switching electronics

Mounting options				
Design		Individual valve	Semi-in-line valve	Sub-base valve
Plug vane				
	Direct mounting	■	–	–
	Individual sub-base	–	■	■
	Manifold assembly	–	■	■
Moulded-in cable				
	Direct mounting	■	–	–
	Individual sub-base	–	■	■
	Manifold assembly	–	■	■

Type codes

001	Series	
MHA2	Solenoid valve MHA2	
MHE2	Solenoid valve MHE2	
MHP2	Solenoid valve MHP2	
MHA3	Solenoid valve MHA3	
MHE3	Solenoid valve MHE3	
MHP3	Solenoid valve MHP3	
MHA4	Solenoid valve MHA4	
MHE4	Solenoid valve MHE4	
MHP4	Solenoid valve MHP4	

002	Drive system	
M	Solenoid, switching	

003	Nominal operating voltage	
1	24 V DC	

004	Manual override	
H	Non-detenting	

005	Valve function	
3/2	3/2-way valve	
5/2	5/2-way valve	

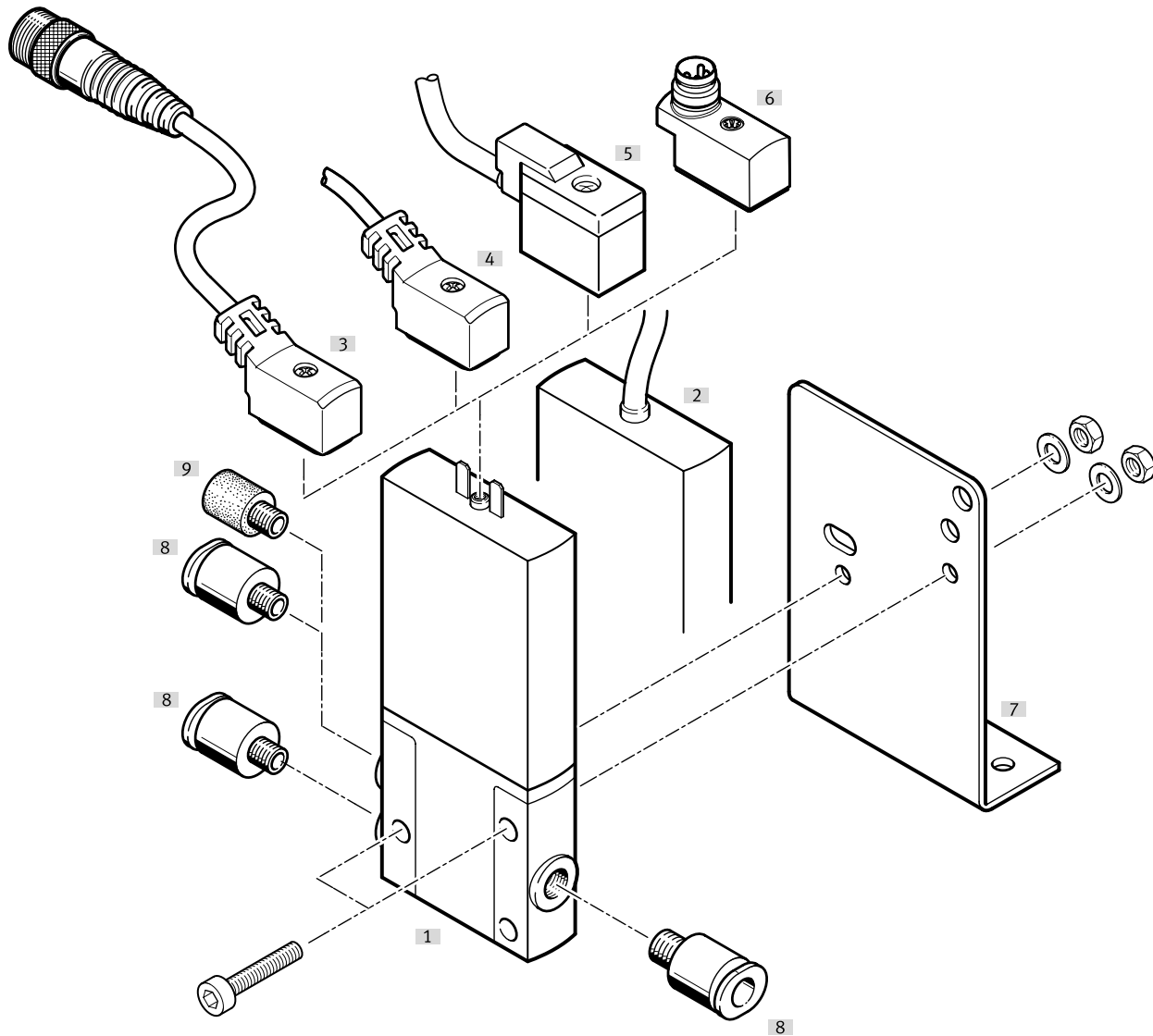
006	Normal position	
	5/2-way valve	
G	Closed	
O	Open	

007	Pneumatic connection	
2	Sub-base, nominal width 2 mm	
3	Sub-base, nominal width 3 mm	
4	Sub-base, nominal width 4 mm	
1/8	Thread G1/8	
1/4	Thread G1/4	
M5	Thread M5	
M7	Thread M7	
QS-4	Push-in connector, 4 mm	
QS-6	Push-in connector 6 mm	
QS-8	Push-in connector 8 mm	

008	Electrical connection	
	Plug tabs	
K	Moulded cable, 2.5 m long	

Peripherals overview – Individual valve, 3/2-way valve

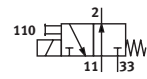
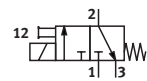
Connection with plug vanes – Connection with moulded-in cable



Designation	Type	Description	→ Page/Internet
[1] Individual valve	MHE2	With plug vanes	14
[2] Individual valve	MHE2-...-K	With moulded-in cable, IP55	14
[3] Connecting cable	NEBV	PUR cable, signal status indication with LED, plug M8x1 3-pin, IP65	15
[4] Connecting cable	NEBV	PUR cable, signal status indication with LED, IP65	15
[5] Plug socket with cable	KMYZ-4	PVC cable, without signal status indication, IP50	15
[6] Adapter	VAVE-C8	For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65	15
[7] Mounting bracket	MHE2-BG-L	For wall mounting	15
[8] Push-in fittings	QS	For connecting tubing with standard O.D.	15
[9] Silencer	UC	For fitting in exhaust ports	15

Datasheet – Individual valve, 3/2-way valve

Function



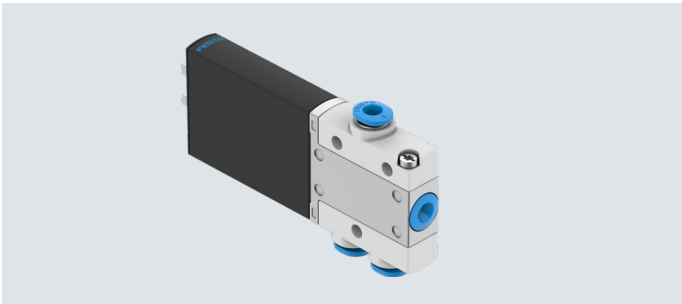
Voltage
24 V DC



Pressure
–0.09 ... +0.8 MPa



Temperature range
–5 ... +60 °C



General technical data		
Valve function		3/2, single solenoid ¹⁾
Design		Pressure relief poppet valve
Overlap		Negative overlap
Sealing principle		Soft
Reset method		Mechanical spring
Actuation type		Electrical
Type of control		Direct
Flow direction		Reversible with restrictions ²⁾
Exhaust air function		Can be throttled
Manual override		Non-detenting
Mounting position		Any
Width	[mm]	10
Grid dimension	[mm]	14
Note on grid dimension		Minimum distance between the valves is 4 mm
Nominal width	[mm]	2
Standard nominal flow rate	[l/min]	100
Type of mounting		With through-hole
Pneumatic connection		Connecting thread M7
		Push-in connector for tubing O.D. 4 mm
Product weight	[g]	60

1) Can be used as a 2/2-way valve by sealing port 3 or 33
2) Slight leakage can occur in the pressure range –0.8 bar to +0.5 bar.

Datasheet – Individual valve, 3/2-way valve

Operating and environmental conditions			With fast-switching electronics	Without fast-switching electronics
Operating medium			Compressed air to ISO 8573-1:2010 [7:4:4]	
Note on the operating/pilot medium			Lubricated operation possible (in which case lubricated operation will always be required)	
Operating pressure	[MPa]	Reversible	−0.09 ... +0.8	
	[bar]		−0.9 ... +8	
	[psi]		−13.05 ... +116	
	[MPa]		−0.09 ... +0.1	
	[bar]		−0.9 ... +1	
	[psi]		−13.05 ... +14.5	
Ambient temperature	[°C]	−5 ... +60		
Temperature of medium	[°C]	−5 ... +60		
Restricted ambient temperature and temperature of medium			As a function of the switching frequency (see graph)	–
Corrosion resistance class CRC ¹⁾			2	2
CE marking (see declaration of conformity) ³⁾			To EU EMC Directive ²⁾	–
			To EU RoHS Directive	–
UKCA marking (see declaration of conformity) ³⁾			To UK EMC regulations	–
			To UK RoHS regulations	–
Certification	c UL us - Recognized (OL)			c UL us - Recognized (OL)
	RCM			–
Cleanroom class			Class 6 to ISO 14644-1	
Shock resistance			Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27	
Vibration resistant			Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6	

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

2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/mh2 → Support/Downloads.

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

3) More information www.festo.com/catalogue/... → Support/Downloads.

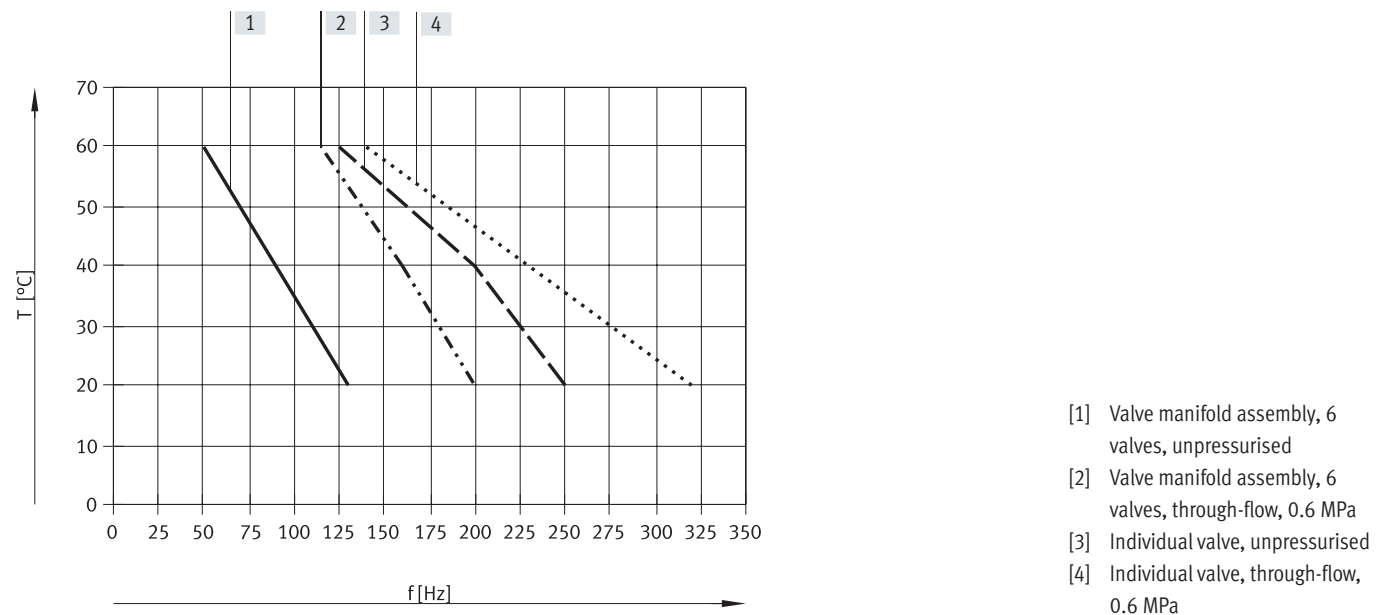
Electrical data			
		With fast-switching electronics	Without fast-switching electronics
Electrical connection		Plug, 2-pin or cable	
Operating voltage	[V DC]	24	
Permissible voltage fluctuations		±10%	
Power consumption	[W]	5 for approx. 3 ms (high-current phase, in-rush current 1 A)	2.88
	[W]	1.25 (low-current phase)	–
Reverse polarity protection		Bipolar	–
Duty cycle	[%]	100	100
Additional functions		Spark arresting	–
		Holding current reduction	–
		Protective circuit	–
Degree of protection to EN 60529	Electrical connection: plug, 2-pin	IP65	IP65
	Electrical connection: cable	IP55	IP55

Switching times and frequencies					With fast-switching electronics	Without fast-switching electronics
Switching time	On	[ms]			1.7	7
	Off	[ms]			2	3.5
Tolerance for switching time	On	[%]			+10 ... -30	–
	Off	[%]			+10 ... -30	–
Switching time variation from 1 Hz up-wards			[ms]		0.2	–
Maximum switching frequency			[Hz]		330	130

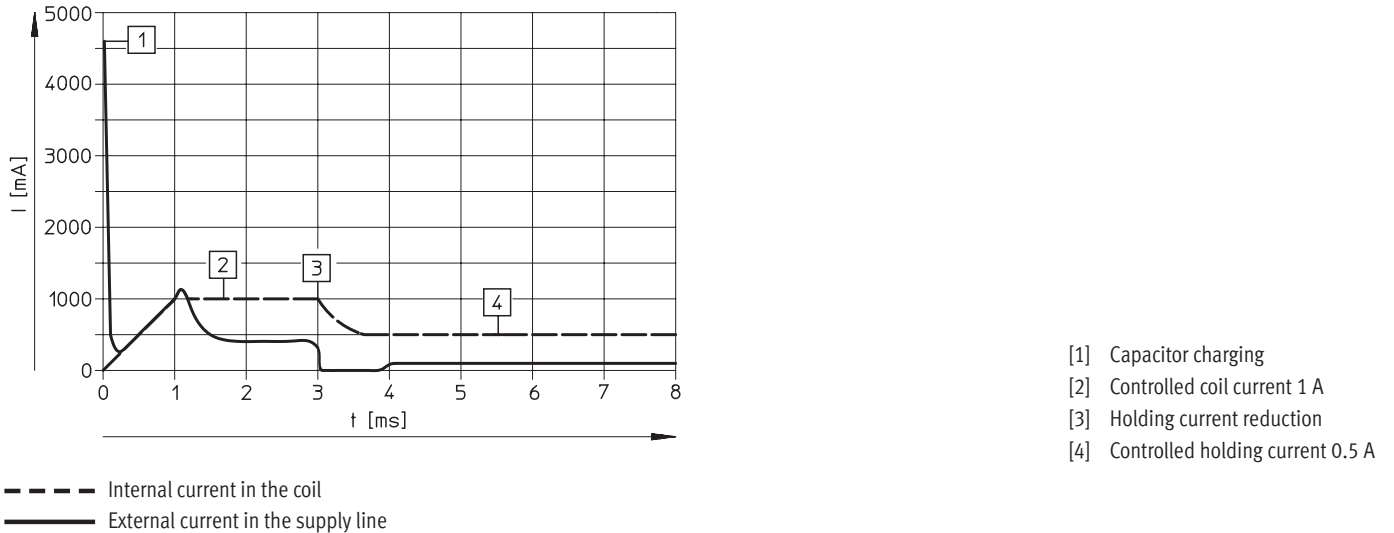
Datasheet – Individual valve, 3/2-way valve

Materials	
Housing	Die-cast zinc, coated
Cable sheath	PUR
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	RoHs-compliant
LABS (PWIS) conformity	VDMA24364-B1/B2-L

Restricted ambient temperature and temperature of medium as a function of switching frequency



Current curve for valves with fast-switching electronics (MHE2-MS1H)



Datasheet – Individual valve, 3/2-way valve

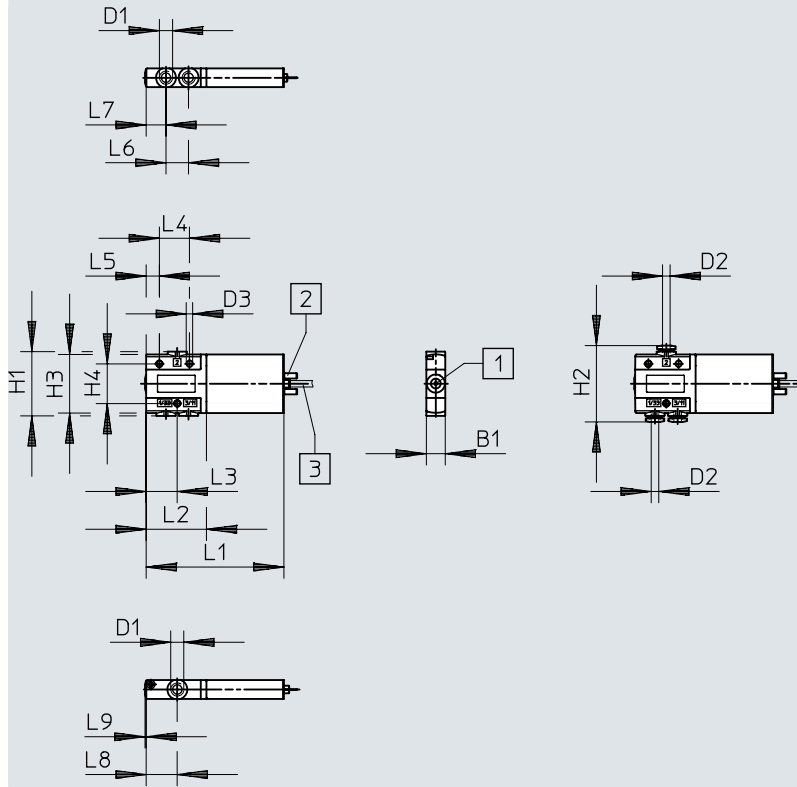
Dimensions

Download CAD data → www.festo.com

Valve with plug vanes or moulded-in cable

MHE2-...-3/0...-M7

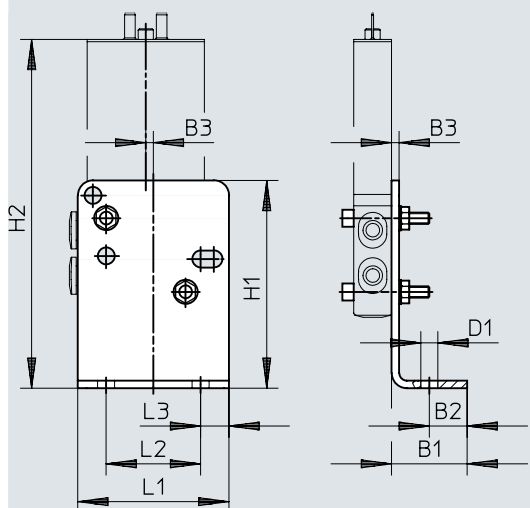
MHE2-...-3/0...-QS-4

[1] Manual override,
non-detenting

[2] Plug vanes

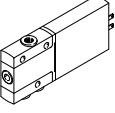
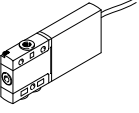
[3] Cable, 2.5 m

Mounting bracket MHE2-BG-L

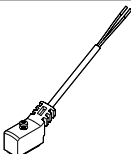
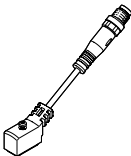
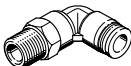


Type	B1	B2	B3	D1	D2 Ø	D3 Ø	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7	L8	L9
MHE2-...-3/0...-M7	10	–	–	M7	–	3.4	34	–	31	21	73	32	16.5	16	7	12	10.5	16.5	0.5
MHE2-...-3/0...-QS-4	10	–	–	–	4	3.4	34	39.3	31	21	73	32	16.5	16	7	12	10.5	16.5	0.5
MHE2-BG-L	20	10	2	4.5	–	–	55	92.3	–	–	40	25	7.5	–	–	–	–	–	–

Datasheet – Individual valve, 3/2-way valve

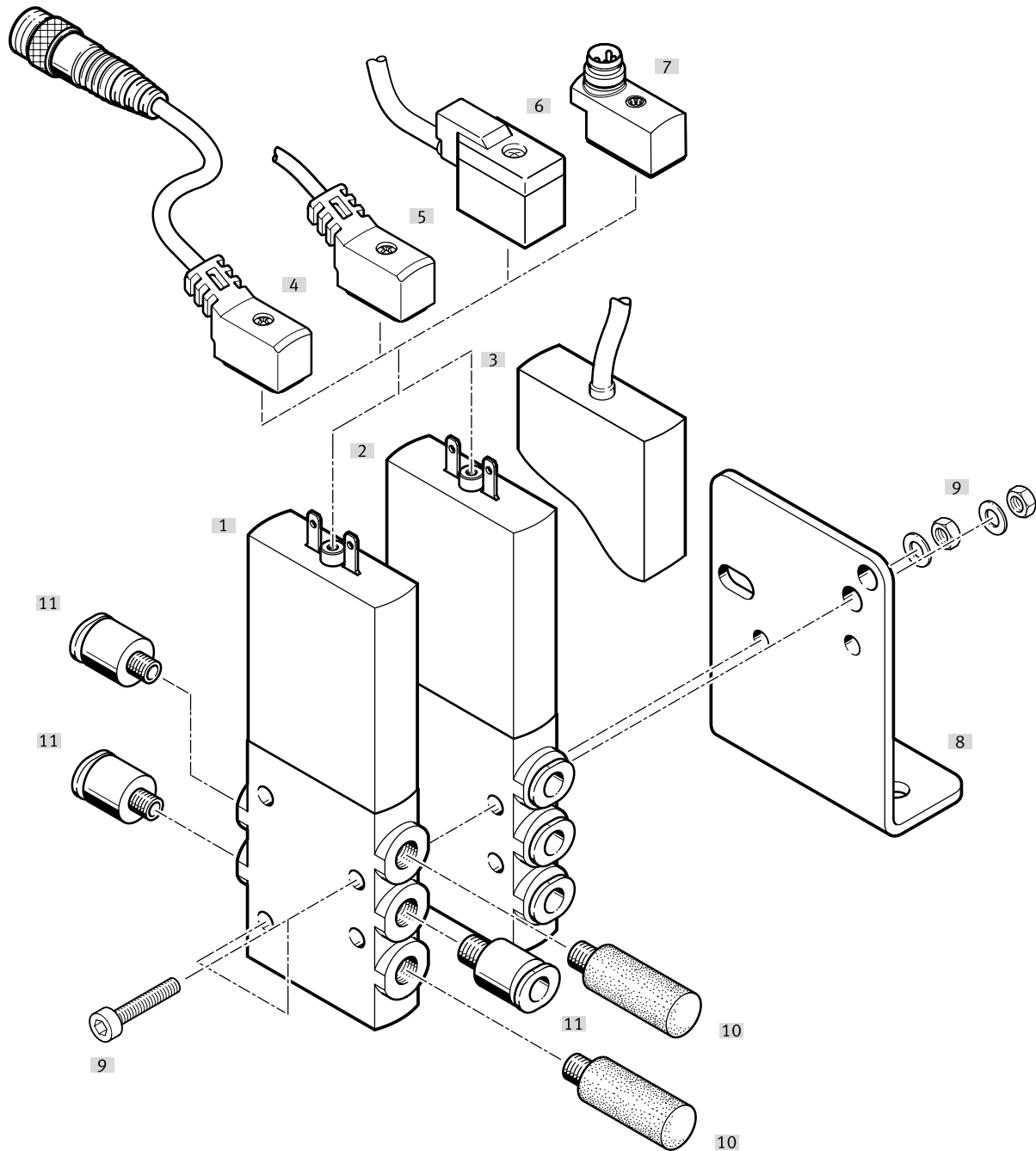
Ordering data					Part no.	Type
Valves						
	Electrical connection: plug, 2-pin	With fast-switching electronics, switching time 2 ms	Pneumatic connection: thread M7	Normally open	196151	MHE2-MS1H-3/2O-M7
				Normally closed	196131	MHE2-MS1H-3/2G-M7
			Pneumatic connection: push-in connector for tubing O.D. 4 mm	Normally open	196155	MHE2-MS1H-3/2O-QS-4
				Normally closed	196135	MHE2-MS1H-3/2G-QS-4
		Without fast-switching electronics, switching time 7 ms	Pneumatic connection: thread M7	Normally open	196150	MHE2-M1H-3/2O-M7
				Normally closed	196130	MHE2-M1H-3/2G-M7
			Pneumatic connection: push-in connector for tubing O.D. 4 mm	Normally open	196154	MHE2-M1H-3/2O-QS-4
				Normally closed	196134	MHE2-M1H-3/2G-QS-4
	Electrical connection: cable	With fast-switching electronics, switching time 2 ms	Pneumatic connection: thread M7	Normally open	196153	MHE2-MS1H-3/2O-M7-K
				Normally closed	196133	MHE2-MS1H-3/2G-M7-K
			Pneumatic connection: push-in connector for tubing O.D. 4 mm	Normally open	196157	MHE2-MS1H-3/2O-QS-4-K
				Normally closed	196137	MHE2-MS1H-3/2G-QS-4-K
		Without fast-switching electronics, switching time 7 ms	Pneumatic connection: thread M7	Normally open	196152	MHE2-M1H-3/2O-M7-K
				Normally closed	196132	MHE2-M1H-3/2G-M7-K
			Pneumatic connection: push-in connector for tubing O.D. 4 mm	Normally open	196156	MHE2-M1H-3/2O-QS-4-K
				Normally closed	196136	MHE2-M1H-3/2G-QS-4-K

Datasheet – Individual valve, 3/2-way valve

Ordering data					Part no.	Type
Connecting cable (for valves with 2-pin plug)					Datasheets → Internet: nebv	
	2-pin socket, open cable end 2-core	PUR cable, degree of protection IP65	Signal status indication with LED	Length 2.5 m	8047671	NEBV-Z4WA2L-P-E-2.5-N-LE2-S1
				Length 5 m	8047672	NEBV-Z4WA2L-P-E-5-N-LE2-S1
		PVC cable, degree of protection IP40	Without signal status indication	Length 10 m	8047670	NEBV-Z4WA2L-P-E-10-N-LE2-S1
				Length 0.5 m	193690	KMYZ-4-24-0.5-B
	2-pin socket, plug M8x1 3-pin	PUR cable, degree of protection IP65	Signal status indication with LED	Length 2.5 m	193691	KMYZ-4-24-2.5-B
				Length 0.5 m	8047673	NEBV-Z4WA2L-P-E-0.5-N-M8G3-S1
				Length 2.5 m	8047674	NEBV-Z4WA2L-P-E-2.5-N-M8G3-S1
Adapter (for valves with 2-pin plug)						
	2-pin socket	Signal status indication with LED	Plug M8, 3-pin	571686	VAVE-C8-1R8	
			Plug M8, 4-pin	573194	VAVE-C8-1R1	
Wall mounting						
	Mounting bracket			196165	MHE2-BG-L	
Silencer						
	Push-in sleeve with O.D. 4 mm		Pack of 1	165006	UC-QS-4H	
	With M7 threaded connection		Pack of 1	161418	UC-M7	
			Pack of 50	534218	UC-M7-50	
Push-in fitting						
	Male thread M7 with internal hex for tubing O.D.	4 mm	Pack of 10	153319	QSM-M7-4-I	
			Pack of 100	133006	QSM-M7-4-I-100	
		6 mm	Pack of 10	153321	QSM-M7-6-I	
	Male thread M7 with external hex, push-in L-fitting, rotatable 360°, for tubing O.D.	4 mm	Pack of 10	186352	QSML-M7-4	
			Pack of 100	130773	QSML-M7-4-100	
		6 mm	Pack of 10	186353	QSML-M7-6	
			Pack of 100	130774	QSML-M7-6-100	

Peripherals overview – Individual valve, 5/2-way valve

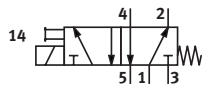
Connection with plug vanes – Connection with moulded-in cable



Designation	Type	Description	→ Page/Internet
[1] Individual valve	MHE2-...-M7	With plug vanes and connection M7	21
[2] Individual valve	MHE2-...QS-4	With plug vanes and push-in connector for standard O.D. tubing	21
[3] Individual valve	MHE2-...-K	With moulded-in cable, IP55	21
[4] Connecting cable	NEBV	PUR cable, signal status indication with LED, plug M8x1 3-pin, IP65	21
[5] Connecting cable	NEBV	PUR cable, signal status indication with LED, IP65	21
[6] Plug socket with cable	KMYZ-4	PVC cable, without signal status indication, IP50	21
[7] Adapter	VAVE-C8	For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65	21
[8] Mounting bracket	MHE2-BG-L	For wall mounting	21
[9] Retaining screws	–	Hole diameter: see dimensional drawing	–
[10] Silencer	UC	For fitting in exhaust ports	21
[11] Push-in fittings	QS	For connecting tubing with standard O.D.	21

Datasheet – Individual valve, 5/2-way valve

Function



-  - Voltage
24 V DC
-  - Pressure
-0.09 ... +0.8 MPa
-  - Temperature range
-5 ... +60 °C



General technical data

Valve function		5/2-way, single solenoid
Design		Pressure relief poppet valve
Overlap		Negative overlap
Sealing principle		Soft
Reset method		Mechanical spring
Actuation type		Electrical
Type of control		Direct
Flow direction		Not reversible
Exhaust air function		Can be throttled
Manual override		Non-detenting
Mounting position		Any
Width	[mm]	10
Grid dimension	[mm]	14
Note on grid dimension		Minimum distance between the valves is 4 mm
Nominal width	[mm]	2
Standard nominal flow rate	[l/min]	90
Type of mounting		With through-hole
Pneumatic connection		Connecting thread M7
		Push-in connector for tubing O.D. 4 mm
Max. tightening torque of fitting	[Nm]	2
Product weight	[g]	70

Datasheet – Individual valve, 5/2-way valve

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on the operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Operating pressure	[MPa]	−0.09 ... +0.8
	[bar]	−0.9 ... +8
	[psi]	−13.05 ... +116
Ambient temperature	[°C]	−5 ... +60
Temperature of medium	[°C]	−5 ... +60
Restricted ambient temperature and temperature of medium		As a function of the switching frequency (see graph)
Corrosion resistance class CRC ¹⁾		2
CE marking (see declaration of conformity) ³⁾		To EU EMC Directive ²⁾
		To EU RoHS Directive
UKCA marking (see declaration of conformity) ³⁾		To UK EMC regulations
		To UK RoHS regulations
Certification		c UL us - Recognized (OL)
		RCM
Cleanroom class		Class 6 to ISO 14644-1
Shock resistance		Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27
Vibration resistant		Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6

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

2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/mh2 → Support/Downloads.

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

3) More information www.festo.com/catalogue/... → Support/Downloads.

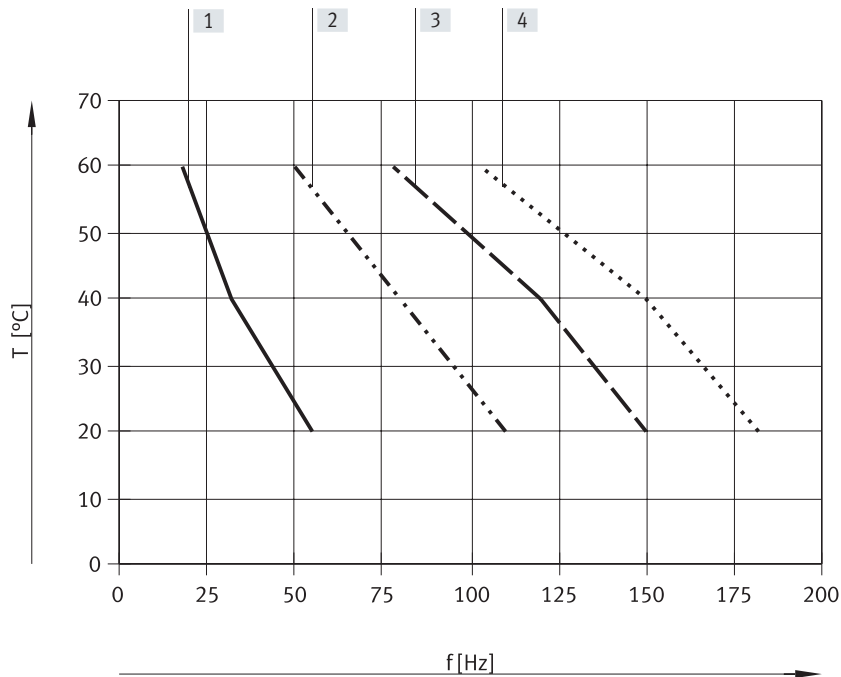
Electrical data			
Electrical connection		Plug, 2-pin	Cable
Operating voltage	[V DC]	24	
Permissible voltage fluctuations	[%]	±10	
Power consumption	Low-current phase	[W]	1.625
	High-current phase	[W]	6.5
Reverse polarity protection		Bipolar	
Duty cycle	[%]	100	
Additional functions		Spark arresting	
		Holding current reduction	
		Protective circuit	
Degree of protection to EN 60529		IP65	IP55

Switching times and frequencies			
Switching time	On	[ms]	1.9
	Off	[ms]	1.7
Tolerance for switching time	On	[%]	+10 ... −30
	Off	[%]	+10 ... −30
Switching time variation from 1 Hz upwards		[ms]	0.2
Maximum switching frequency		[Hz]	300

Materials	
Housing	Die-cast zinc, coated
Cable sheath	PUR
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	RoHS-compliant
LABS (PWIS) conformity	VDMA24364-B1/B2-L

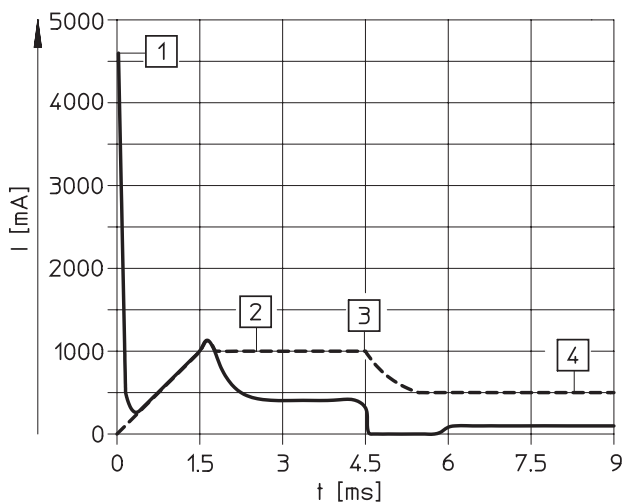
Datasheet – Individual valve, 5/2-way valve

Restricted ambient temperature and temperature of medium as a function of switching frequency



- [1] Valve manifold assembly, 6 valves, unpressurised
- [2] Valve manifold assembly, 6 valves, through-flow, 0.6 MPa
- [3] Individual valve, unpressurised
- [4] Individual valve, through-flow, 0.6 MPa

Current curve for valves with fast-switching electronics (MHE2-MS1H)



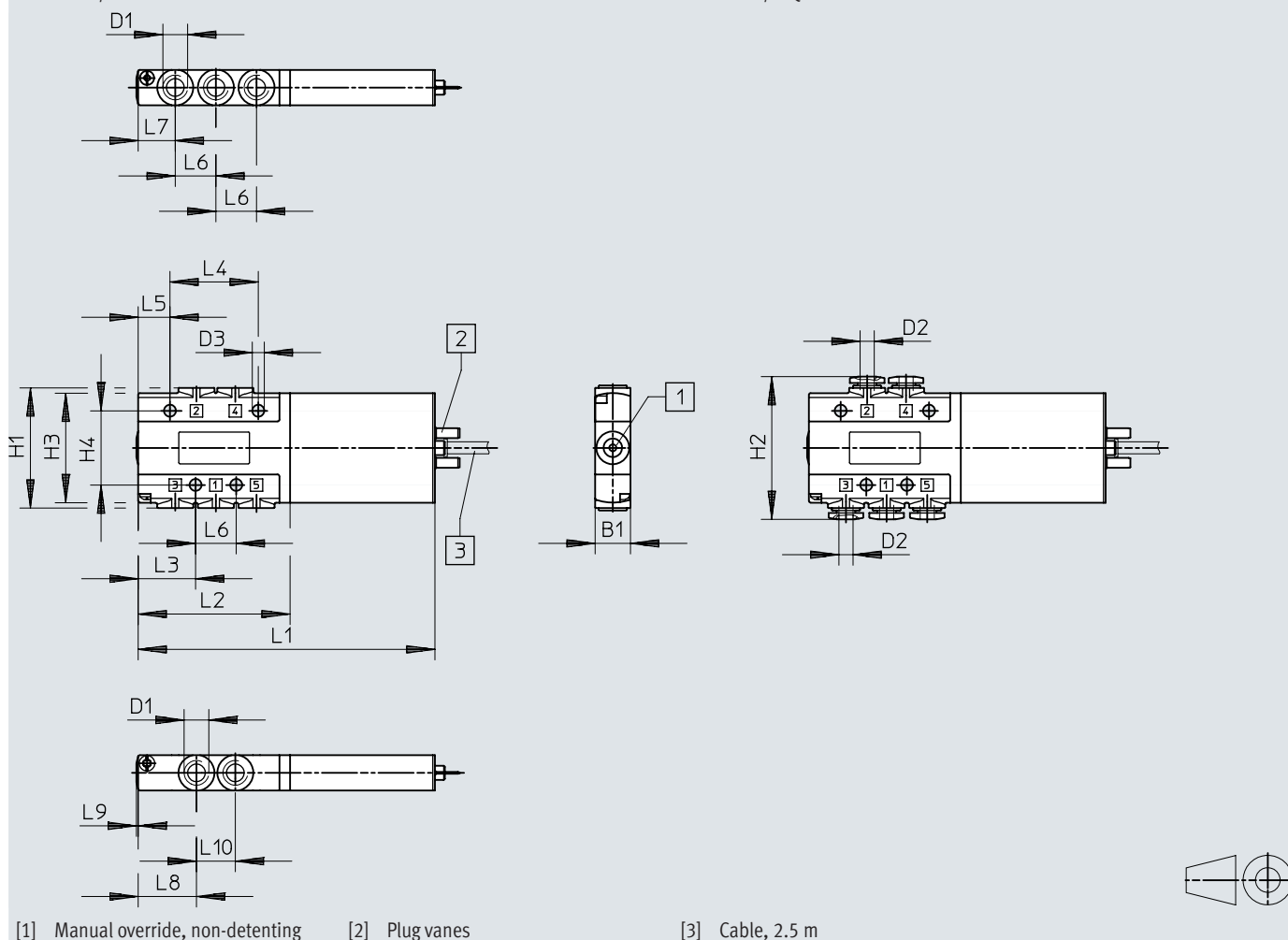
- [1] Capacitor charging
- [2] Controlled coil current 1 A
- [3] Holding current reduction
- [4] Controlled holding current 0.5 A

--- Internal current in the coil
 — External current in the supply line

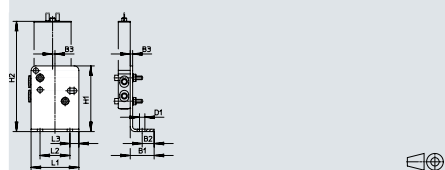
Download CAD data → www.festo.com

MHE2-...-5/2-M7

MHE2-...-5/2-QS-4

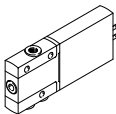
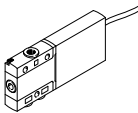
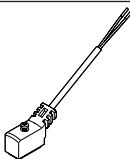
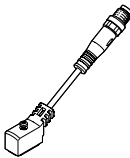
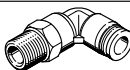


Mounting bracket MHE2-BG-L



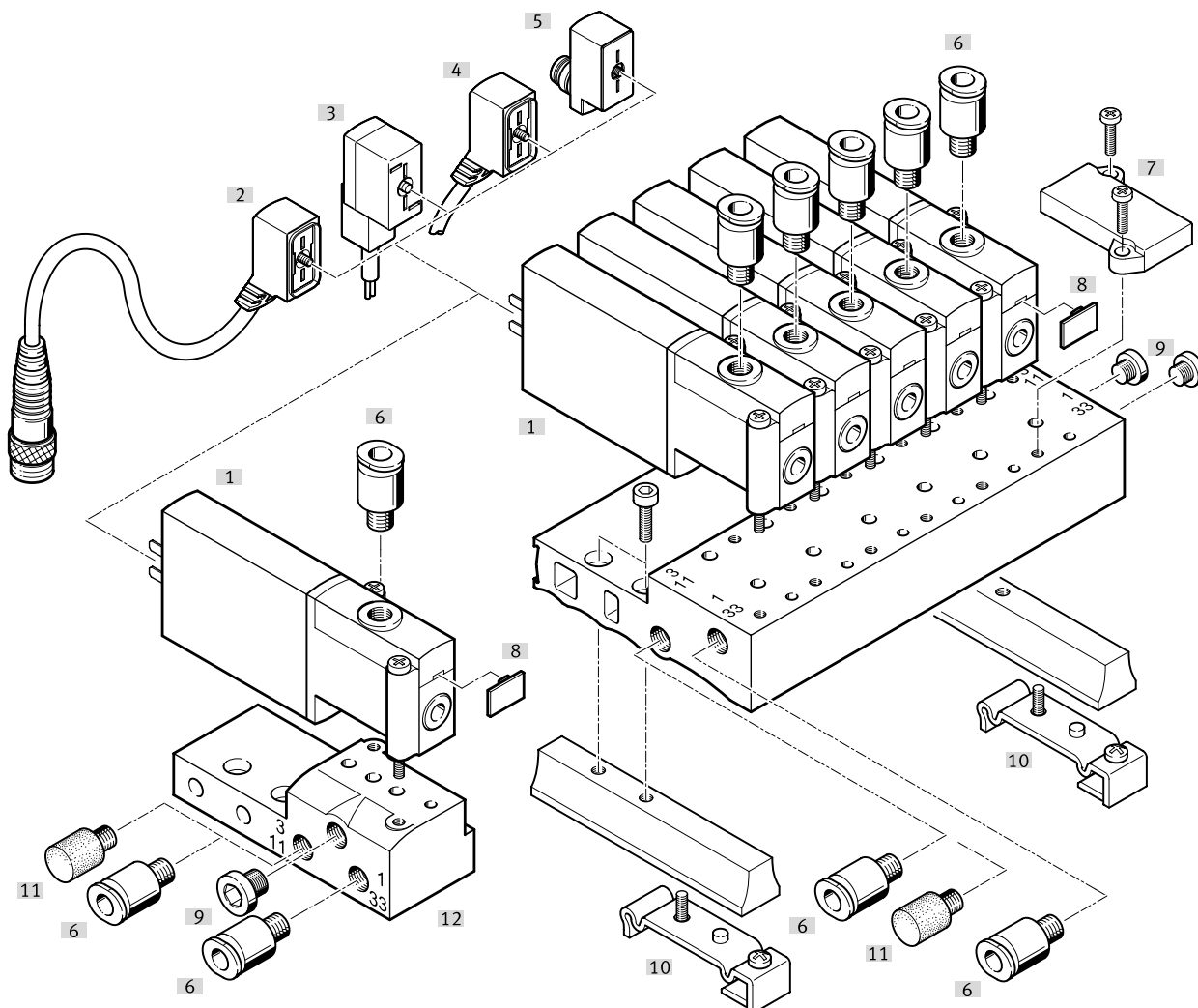
Type	B1	B2	B3	D1	D2 ∅	D3 ∅	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
MHE2-...5/2-M7	10	–	–	M7	–	3.4	34	–	31	21	84	43	16.3	25	9	11.5	10.5	16.5	0.5	11
MHE2-...5/2-QS-4	10	–	–	–	4	3.4	34	40.4	31	21	84	43	16.3	25	9	11.5	10.5	16.5	0.5	11
MHE2-BG-L	20	10	2	4.5	–	–	55	92.3	–	–	40	25	7.5	–	–	–	–	–	–	–

Datasheet – Individual valve, 5/2-way valve

Ordering data					Part no.	Type
Valves						
	Electrical connection: plug, 2-pin	With fast-switching electronics, switching time 2 ms	Pneumatic connection: thread M7	525113	MHE2-MS1H-5/2-M7	
			Pneumatic connection: push-in connector for tubing O.D. 4 mm	525117	MHE2-MS1H-5/2-QS-4	
	Electrical connection: cable	With fast-switching electronics, switching time 2 ms	Pneumatic connection: thread M7	525115	MHE2-MS1H-5/2-M7-K	
			Pneumatic connection: push-in connector for tubing O.D. 4 mm	525119	MHE2-MS1H-5/2-QS-4-K	
Connecting cable (for valves with 2-pin plug)						
	2-pin socket, open cable end 2-core	PUR cable, degree of protection IP65	Signal status indica- tion with LED	Length 2.5 m	8047671	NEBV-Z4WA2L-P-E-2.5-N-LE2-S1
				Length 5 m	8047672	NEBV-Z4WA2L-P-E-5-N-LE2-S1
				Length 10 m	8047670	NEBV-Z4WA2L-P-E-10-N-LE2-S1
		PVC cable, degree of protection IP40	Without signal status indication	Length 0.5 m	193690	KMYZ-4-24-0.5-B
				Length 2.5 m	193691	KMYZ-4-24-2.5-B
	2-pin socket, plug M8x1 3-pin	PUR cable, degree of protection IP65	Signal status indica- tion with LED	Length 0.5 m	8047673	NEBV-Z4WA2L-P-E-0.5-N-M8G3-S1
				Length 2.5 m	8047674	NEBV-Z4WA2L-P-E-2.5-N-M8G3-S1
Adapter (for valves with 2-pin plug)						
	2-pin socket	Signal status indica- tion with LED	Plug M8, 3-pin	571686	VAVE-C8-1R8	
			Plug M8, 4-pin	573194	VAVE-C8-1R1	
Wall mounting						
	Mounting bracket			196165	MHE2-BG-L	
Silencer						
	Push-in sleeve with O.D. 4 mm		Pack of 1	165006	UC-QS-4H	
	With M7 threaded connection		Pack of 1	161418	UC-M7	
			Pack of 50	534218	UC-M7-50	
Push-in fitting						
	Male thread M7 with internal hex for tubing O.D.	4 mm	Pack of 10	153319	QSM-M7-4-I	
			Pack of 100	133006	QSM-M7-4-I-100	
			6 mm	Pack of 10	153321	QSM-M7-6-I
	Male thread M7 with external hex, push-in L-fit- ting, rotatable 360°, for tubing O.D.	4 mm	Pack of 10	186352	QSML-M7-4	
			Pack of 100	130773	QSML-M7-4-100	
		6 mm	Pack of 10	186353	QSML-M7-6	
			Pack of 100	130774	QSML-M7-6-100	

Peripherals overview – Semi in-line valve, 3/2-way valve

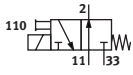
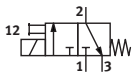
Connection via plug vanes



Designation	Type	Description	→ Page/Internet
[1] Semi-in-line valve	MHP2	With plug vanes	29
[2] Connecting cable	NEBV	PUR cable, signal status indication with LED, plug M8x1 3-pin, IP65	29
[3] Plug socket with cable	KMYZ-4	PVC cable, without signal status indication, IP50	29
[4] Connecting cable	NEBV	PUR cable, signal status indication with LED, IP65	29
[5] Adapter	VAVE-C8	For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65	29
[6] Push-in fittings	QS	For connecting tubing with standard O.D.	30
[7] Cover plate	MHAP2-BP-3	For sealing vacant positions	29
[8] Inscription labels	MH-BZ-80X	For identifying the valves	30
[9] Blanking plug	B	For sealing unused ports	30
[10] DIN rail mounting	MHAP2-BG-NRH-35	For mounting the manifold block on DIN rails to EN 60715	29
[11] Silencer	UC	For fitting in exhaust ports	30
[12] Individual sub-base	MHA2-AS-3-M5	For semi in-line valve, the individual sub-base is also used for the sub-base valve; here the outlet port must be sealed with a blanking plug	29
Manifold block	MHP2-PR...-3	For semi in-line valves	29

Datasheet – Semi in-line valve, 3/2-way valve

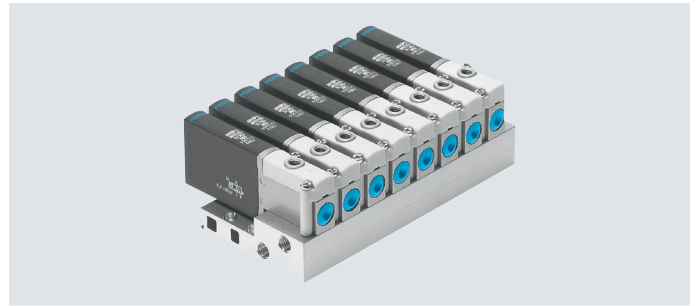
Function



-  - Voltage
24 V DC

-  - Pressure
-0.09 ... +0.8 MPa

-  - Temperature range
-5 ... +40 °C



General technical data

Valve function	3/2, single solenoid ¹⁾
Design	Pressure relief poppet valve
Overlap	Negative overlap
Sealing principle	Soft
Reset method	Mechanical spring
Actuation type	Electrical
Type of control	Direct
Flow direction	Reversible with restrictions ²⁾
Exhaust air function	Can be throttled
Manual override	Non-detenting
Mounting position	Any
Width	[mm] 10
Grid dimension	[mm] 14
Note on grid dimension	Minimum distance between the valves is 4 mm
Nominal width	[mm] 2
Standard nominal flow rate	[l/min] 100
Type of mounting	On PR rail
Pneumatic connection	2 1, 3, 11, 33
	Connecting thread M5
	Sub-base
Product weight	[g] 60

1) Can be used as a 2/2-way valve by sealing port 3 or 33.

2) Slight leakage can occur in the pressure range -0.8 bar to +0.5 bar.

Datasheet – Semi in-line valve, 3/2-way valve

Operating and environmental conditions			With fast-switching electronics	Without fast-switching electronics
Operating medium			Compressed air to ISO 8573-1:2010 [7:4:4]	
Note on the operating/pilot medium			Lubricated operation possible (in which case lubricated operation will always be required)	
Operating pressure	Reversible	[MPa]	−0.09 ... +0.8	
		[bar]	−0.9 ... +8	
		[psi]	−13.05 ... +116	
		[MPa]	−0.09 ... +0.1	
		[bar]	−0.9 ... +1	
		[psi]	−13.05 ... +14.5	
Ambient temperature	[°C]	−5 ... +40		
Temperature of medium	[°C]	−5 ... +40		
Restricted ambient temperature and temperature of medium			As a function of the switching frequency (see graph)	
Corrosion resistance class CRC ¹⁾			2	
CE marking (see declaration of conformity) ³⁾			To EU EMC Directive ²⁾	–
			To EU RoHS Directive	–
UKCA marking (see declaration of conformity) ³⁾			To UK EMC regulations	–
			To UK RoHS regulations	–
Certification	c UL us - Recognized (OL)		c UL us - Recognized (OL)	
	RCM		–	
Cleanroom class			Class 6 to ISO 14644-1	
Shock resistance			Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27	
Vibration resistant			Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6	

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

2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/mh2 → Support/Downloads.

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3) More information www.festo.com/catalogue/... → Support/Downloads.

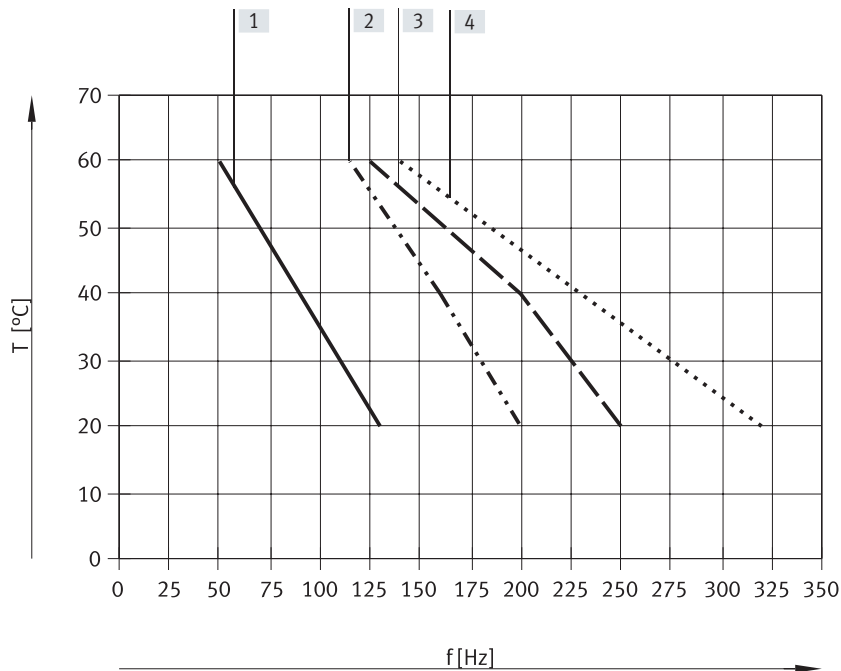
Electrical data			
		With fast-switching electronics	Without fast-switching electronics
Electrical connection		Plug, 2-pin	
Operating voltage	[V DC]	24	
Permissible voltage fluctuations	[%]	±10	
Power consumption	[W]	5 for approx. 3 ms (high-current phase, in-rush current 1 A)	2.88
	[W]	1.25 (low-current phase)	–
Reverse polarity protection		Bipolar	–
Duty cycle	[%]	100	100
Additional functions		Spark arresting	–
		Holding current reduction	–
		Protective circuit	–
Degree of protection to EN 60529		IP65	IP65

Switching times and frequencies			With fast-switching electronics	Without fast-switching electronics
Switching time	On	[ms]	1.7	7
	Off	[ms]	2	3.5
Tolerance for switching time	On	[%]	+10 ... -30	–
	Off	[%]	+10 ... -30	–
Switching time variation from 1 Hz upwards			0.2	–
Maximum switching frequency			330	130

Materials	
Housing	Die-cast zinc, coated
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	RoHS-compliant
LABS (PWIS) conformity	VDMA24364-B1/B2-L

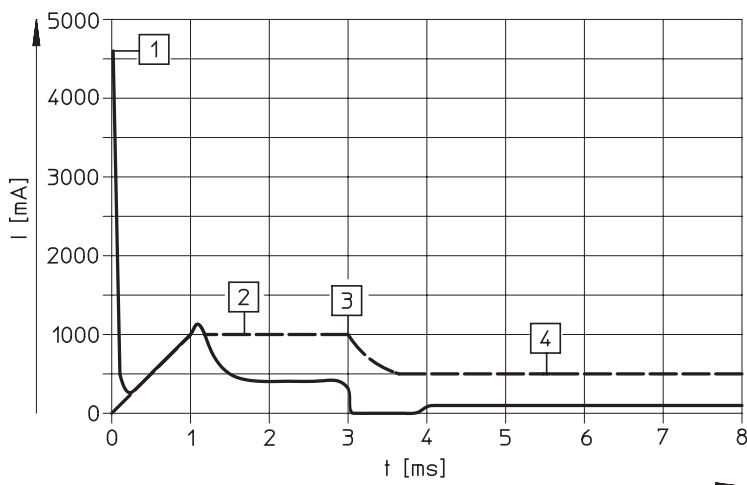
Datasheet – Semi in-line valve, 3/2-way valve

Restricted ambient temperature and temperature of medium as a function of switching frequency



- [1] Valve manifold assembly, 6 valves, unpressurised
- [2] Valve manifold assembly, 6 valves, through-flow, 0.6 MPa
- [3] Individual valve, unpressurised
- [4] Individual valve, through-flow, 0.6 MPa

Current curve for valves with fast-switching electronics (MHP2-MS1H)



- [1] Capacitor charging
- [2] Controlled coil current 1 A
- [3] Holding current reduction
- [4] Controlled holding current 0.5 A

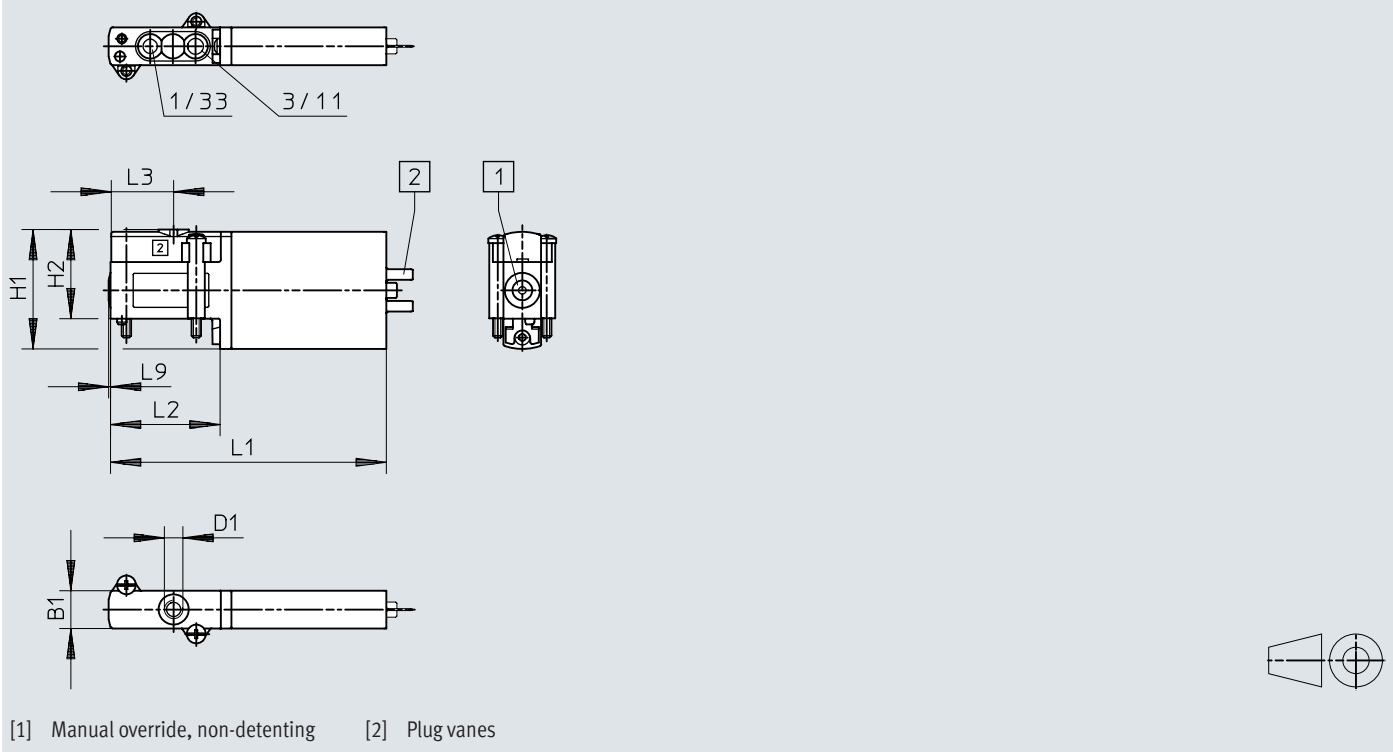
--- Internal current in the coil
 — External current in the supply line

Datasheet – Semi in-line valve, 3/2-way valve

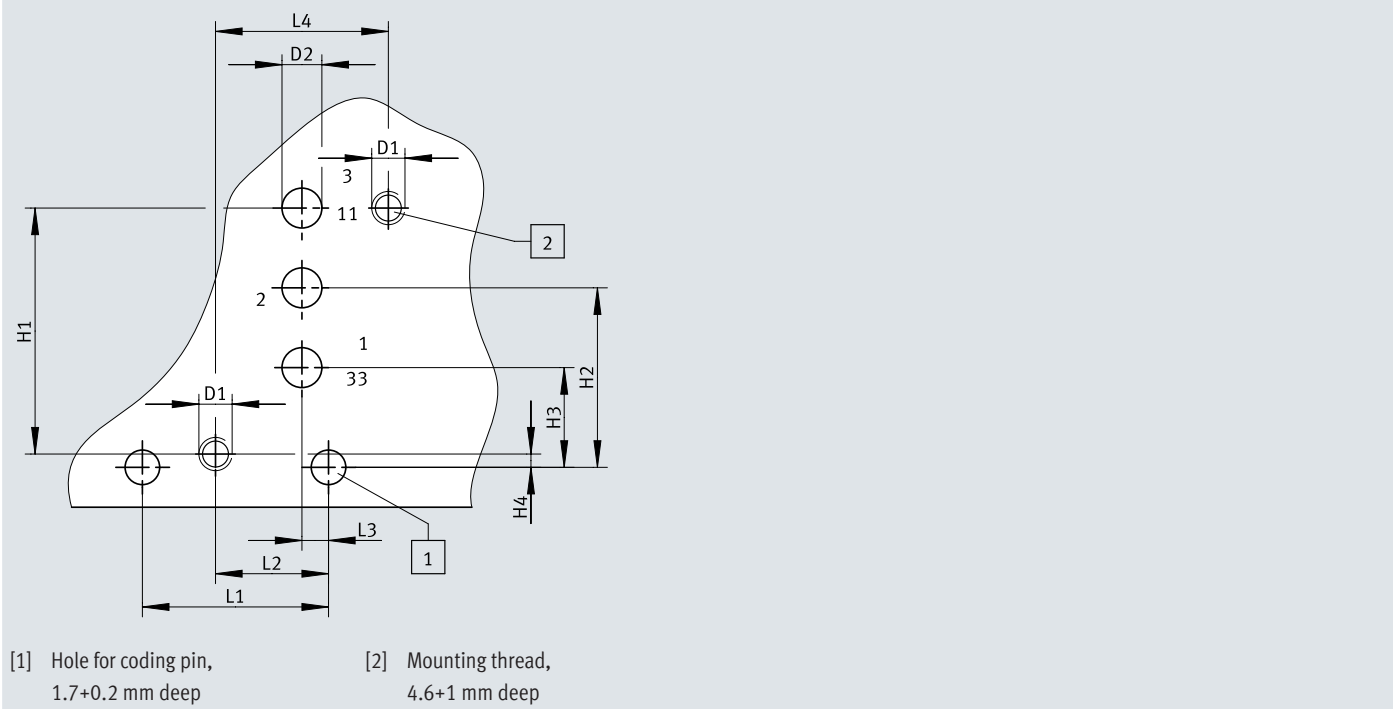
Dimensions

Download CAD data → www.festo.com

Valve with plug vanes, MHP2-...-3/2...-M5



Hole pattern on sub-bases



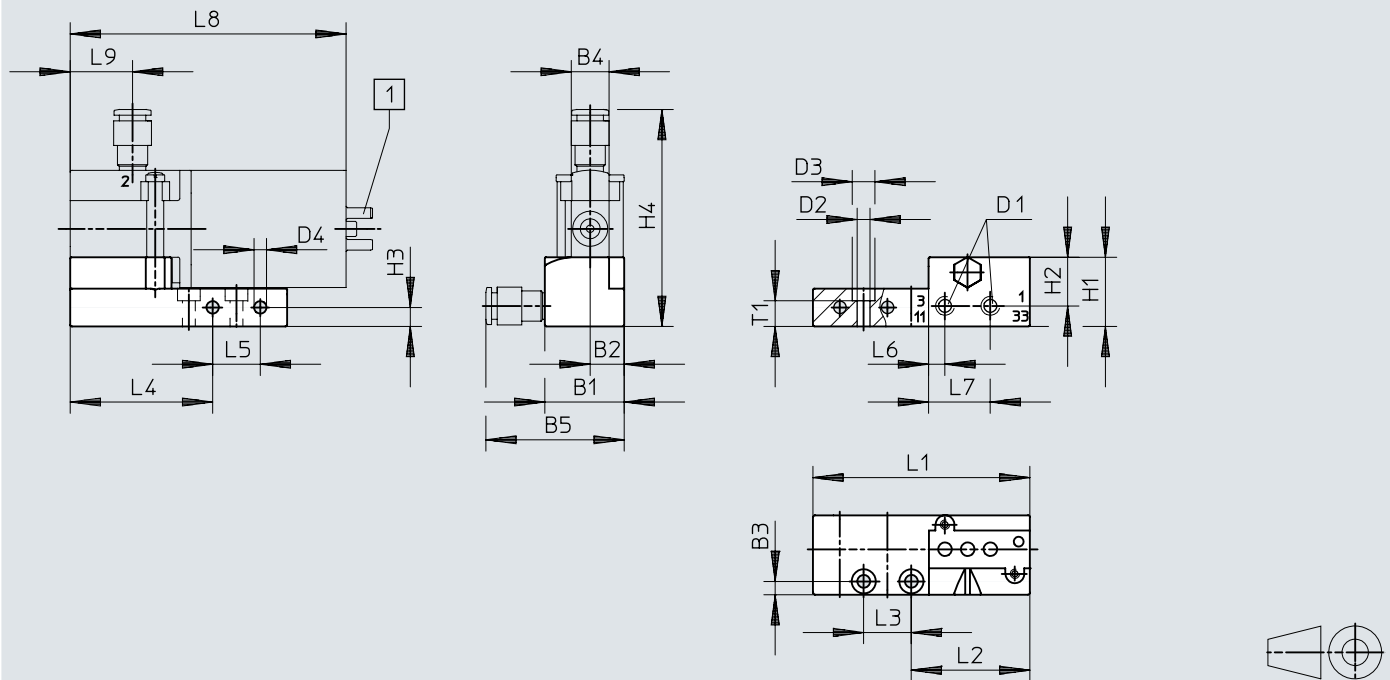
Type	B1	D1	D2 Ø	H1	H2	H3	H4	L1	L2	L3	L4	L9
MHP2-...-3/2...-M5	10	M5	–	31.6	23.6	–	–	73	29	16.5	–	0.5
Hole pattern	–	M2.5	3	18.5	13.5	7.5	1	14	8.5	2	13	–

Datasheet – Semi in-line valve, 3/2-way valve

Dimensions

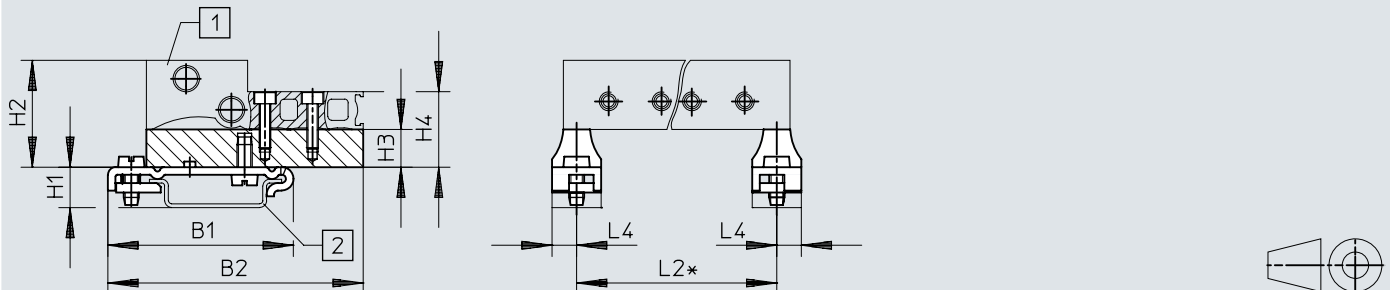
Download CAD data → www.festo.com

Individual sub-base, MHA2-AS-3-M5



[1] Plug pins

DIN rail attachment MHAP2-BG-NRH-35



[1] Connection block

[2] DIN mounting rail

* See dimensional table for the manifold block used

Type	B1	B2	B3	B4	B5	D1	D2 Ø	D3 Ø	D4 Ø	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7	L8	L9	T1
MHA2-AS-3-M5	21	9	3.5	10	36.6	M5	3.4	6	3.3	18.3	12.9	5	57.4	57.4	31.4	12.6	37.7	12.6	4.3	16.3	73	16.5	6.8
MHAP2-BG-NRH-35	49.1	67.6	—	—	—	—	—	—	—	10.7	28.3	10	20	—	*	—	6.5	—	—	—	—	—	—

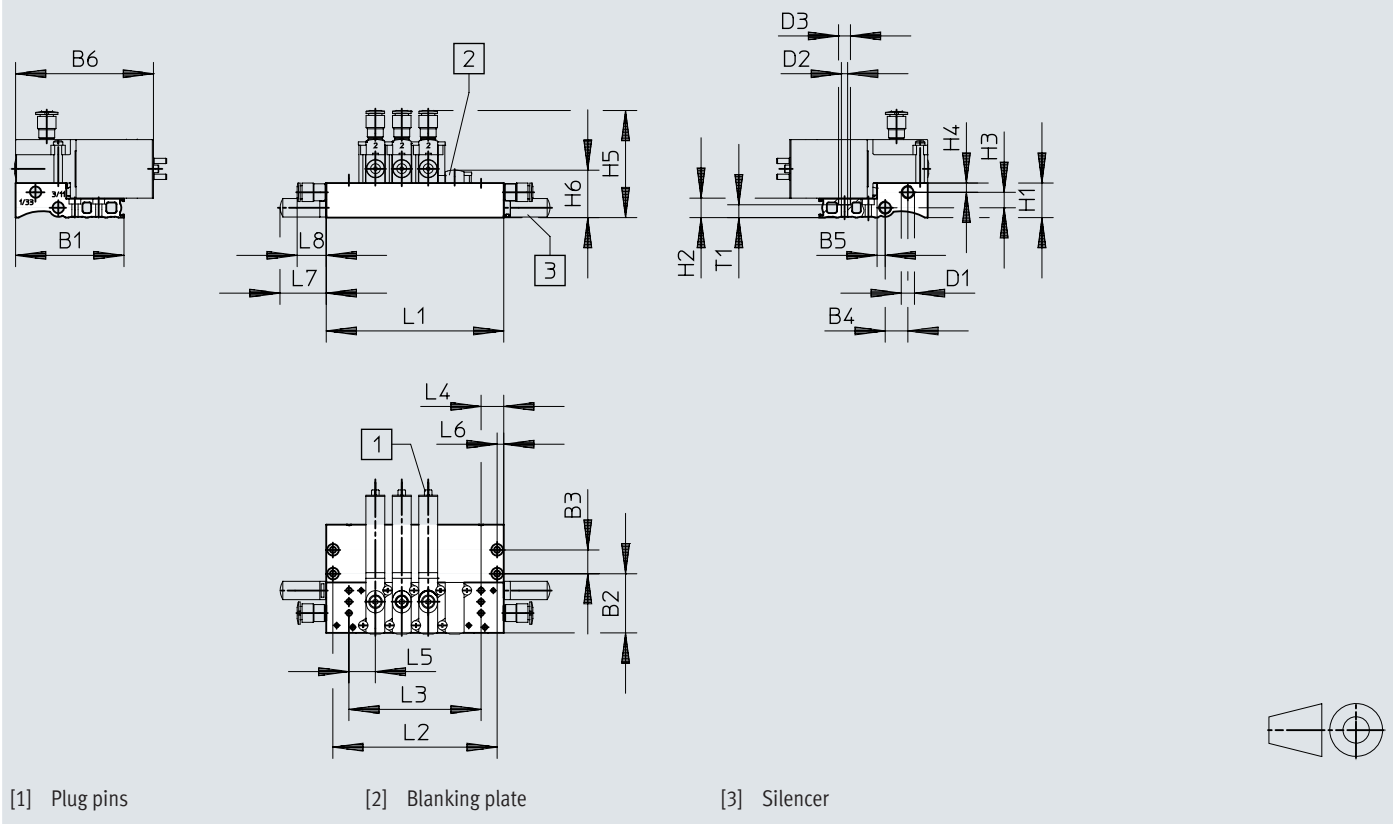
* See dimensional table for the manifold block used

Datasheet – Semi in-line valve, 3/2-way valve

Dimensions

Download CAD data → www.festo.com

Manifold assembly, MHP2-PR...-3

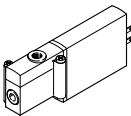
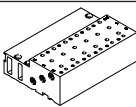
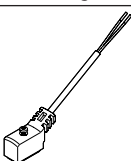
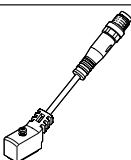


Type	B1	B2	B3	B4	B5	B6	D1	D2 Ø	D3 Ø	H1	H2	H3	H4	H5	H6	L4	L5	L6	L7	L8	T1
MHP2-PR...-3	57.4	31.4	12.6	12	4.3	73	M7	3.3	6.3	18.3	10	8.2	4.9	56.7	25.1	12	14	3.5	24.5	15.4	6.8

Type	Number of valve positions					
	2		4		6	
MHP2-PR...-3	L1	38	66		94	
	L2	31	59		87	
	L3	14	42		70	

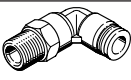
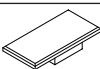
 **Note**
Valve types 3/2G and 3/2O must not be mixed on one manifold block.

Datasheet – Semi in-line valve, 3/2-way valve

Ordering data					Part no.	Type
Valves						
	With fast-switching electronics	Switching time on 1.7 ms	Normally open	196143	MHP2-MS1H-3/2O-M5	
			Normally closed	196123	MHP2-MS1H-3/2G-M5	
	Without fast-switching electronics	Switching time on 7 ms	Normally open	196142	MHP2-M1H-3/2O-M5	
			Normally closed	196122	MHP2-M1H-3/2G-M5	
Manifold rail						
	Individual sub-base1) Pneumatic connection: M5 thread		1 valve position	197438	MHA2-AS-3-M5	
	Manifold block Pneumatic connection: thread M7		2 valve positions	197442	MHP2-PR2-3	
			4 valve positions	197443	MHP2-PR4-3	
			6 valve positions	197444	MHP2-PR6-3	
			8 valve positions	197445	MHP2-PR8-3	
			10 valve positions	197446	MHP2-PR10-3	
Cover plate						
	Vacant valve positions must be sealed with a cover plate			197470	MHAP2-BP-3	
Connecting cable						
	2-pin socket, open cable end 2-core	PUR cable, degree of protection IP65	Signal status indica- tion with LED	Length 2.5 m	8047671	NEBV-Z4WA2L-P-E-2.5-N-LE2-S1
				Length 5 m	8047672	NEBV-Z4WA2L-P-E-5-N-LE2-S1
				Length 10 m	8047670	NEBV-Z4WA2L-P-E-10-N-LE2-S1
		PVC cable, degree of protection IP40	Without signal status indication	Length 0.5 m	193690	KMYZ-4-24-0.5-B
				Length 2.5 m	193691	KMYZ-4-24-2.5-B
	2-pin socket, plug M8x1 3-pin	PUR cable, degree of protection IP65	Signal status indica- tion with LED	Length 0.5 m	8047673	NEBV-Z4WA2L-P-E-0.5-N-M8G3-S1
				Length 2.5 m	8047674	NEBV-Z4WA2L-P-E-2.5-N-M8G3-S1
Adapter						
	2-pin socket	Signal status indi- cation with LED	Plug M8, 3-pin	571686	VAVE-C8-1R8	
			Plug M8, 4-pin	573194	VAVE-C8-1R1	
DIN rail mounting						
	For 3/2-way solenoid valves			525053	MHAP2-BG-NRH-35	
DIN rail						
	To EN 60715		2 m	35430	NRH-35-2000	

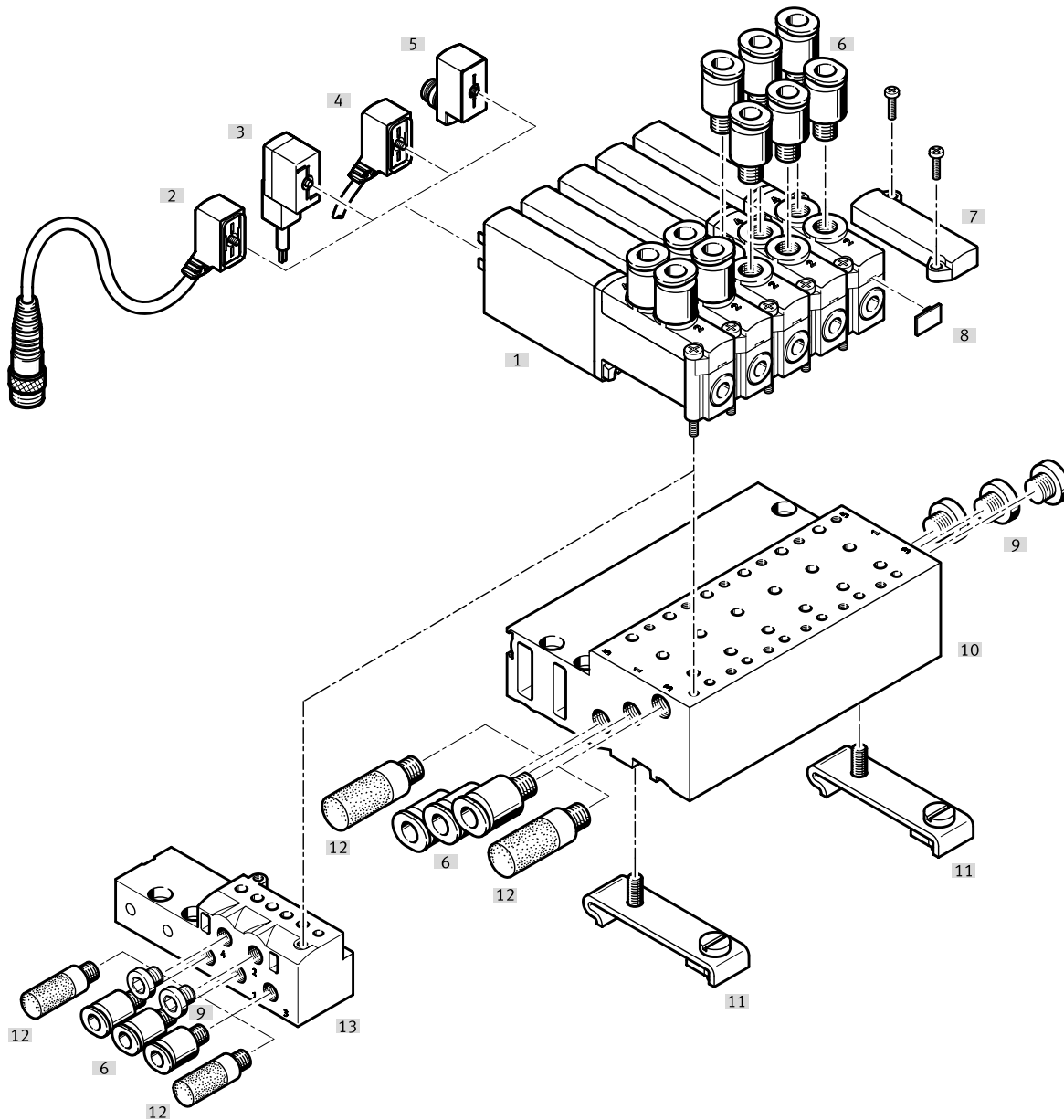
1) Seal ports 2 and 4 on the individual sub-base with blanking plugs. These ports on the individual sub-base have no function when using semi in-line valves.

Datasheet – Semi in-line valve, 3/2-way valve

Ordering data				Part no.	Type
Silencer				Datasheets → Internet: uc	
	With threaded connection	M5	Pack of 1	165003	UC-M5
			Pack of 50	534217	UC-M5-50
		M7	Pack of 1	161418	UC-M7
			Pack of 50	534218	UC-M7-50
Push-in fitting				Datasheets → Internet: qs	
	Male thread M5 with internal hex for tubing O.D.	4 mm	Pack of 10	153315	QSM-M5-4-I
		6 mm	Pack of 10	153317	QSM-M5-6-I
	Male thread M7 with internal hex for tubing O.D.	4 mm	Pack of 10	153319	QSM-M7-4-I
			Pack of 100	133006	QSM-M7-4-I-100
	Male thread M5 with external hex, push-in L-fitting, rotatable 360°, for tubing O.D.	4 mm	Pack of 10	153333	QSML-M5-4
			Pack of 100	130771	QSML-M5-4-100
		6 mm	Pack of 10	153335	QSML-M5-6
			Pack of 100	130772	QSML-M5-6-100
	Male thread M7 with external hex, push-in L-fitting, rotatable 360°, for tubing O.D.	4 mm	Pack of 10	186352	QSML-M7-4
			Pack of 100	130773	QSML-M7-4-100
		6 mm	Pack of 10	186353	QSML-M7-6
			Pack of 100	130774	QSML-M7-6-100
Blanking plug					
	For M5 thread		Pack of 10	3843	B-M5
	For M7 thread		Pack of 10	174309	B-M7
Inscription label					
	For solenoid valve		80 pieces in a frame	197259	MH-BZ-80X

Peripherals overview – Semi in-line valve, 5/2-way valve

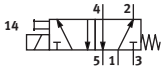
Connection via plug vanes



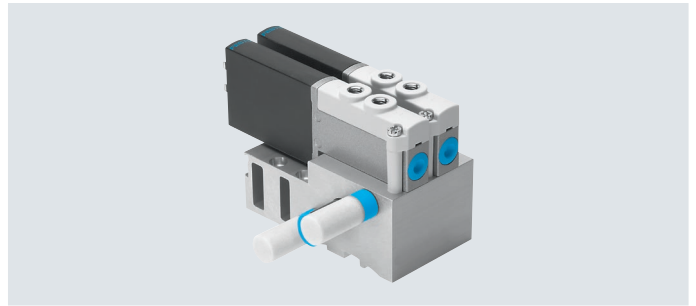
Designation	Type	Description	→ Page/Internet
[1] Semi-in-line valve	MHP2	With plug vanes	38
[2] Connecting cable	NEBV	PUR cable, signal status indication with LED, plug M8x1 3-pin, IP65	38
[3] Plug socket with cable	KMYZ-4	PVC cable, without signal status indication, IP50	38
[4] Connecting cable	NEBV	PUR cable, signal status indication with LED, IP65	38
[5] Adapter	VAVE-C8	For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65	38
[6] Push-in fittings	QS	For connecting tubing with standard O.D.	39
[7] Cover plate	MHAP2-BP-5	For sealing vacant positions	38
[8] Inscription labels	MH-BZ-80X	For identifying the valves	39
[9] Blanking plug	B	For sealing unused ports	39
[10] Manifold block	MHP2-PR...-5	For semi in-line valves	38
[11] DIN rail mounting	CPV10/14-VI-BG-NRH-35	For mounting the manifold block on DIN rails to EN 60715	38
[12] Silencer	UC	For fitting in exhaust ports	39
[13] Individual sub-base	MHA2-AS-5-M5	For semi in-line valve, the individual sub-base is also used for sub-base valves and must be sealed with a blanking plug here	38

Datasheet – Semi in-line valve, 5/2-way valves

Function



-  - Voltage
24 V DC
-  - Pressure
-0.09 ... +0.8 MPa
-  - Temperature range
-5 ... +40 °C



General technical data

Valve function	5/2-way, single solenoid	
Design	Pressure relief poppet valve	
Overlap	Negative overlap	
Sealing principle	Soft	
Reset method	Mechanical spring	
Actuation type	Electrical	
Type of control	Direct	
Flow direction	Not reversible	
Exhaust air function	Can be throttled	
Manual override	Non-detenting	
Mounting position	Any	
Width	[mm]	10
Grid dimension	[mm]	14
Note on grid dimension	Minimum distance between the valves is 4 mm	
Nominal width	[mm]	2
Standard nominal flow rate	[l/min]	90
Type of mounting	On PR rail	
Max. tightening torque for valve mounting	[Nm]	0.4
Pneumatic connection	1, 3, 5	Sub-base
	2, 4	Connecting thread M5
Max. tightening torque of fitting	[Nm]	1.5
Product weight	[g]	70

Datasheet – Semi in-line valve, 5/2-way valves

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on the operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Operating pressure	[MPa]	−0.09 ... +0.8
	[bar]	−0.9 ... +8
	[psi]	−13.05 ... +116
Ambient temperature	[°C]	−5 ... +40
Temperature of medium	[°C]	−5 ... +40
Restricted ambient temperature and temperature of medium		As a function of switching frequency
Corrosion resistance class CRC ¹⁾		2
CE marking (see declaration of conformity) ³⁾		To EU EMC Directive ²⁾
		To EU RoHS Directive
UKCA marking (see declaration of conformity) ³⁾		To UK EMC regulations
		To UK RoHS regulations
Certification		c UL us - Recognized (OL)
		RCM
Cleanroom class		Class 6 to ISO 14644-1
Shock resistance		Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27
Vibration resistant		Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6

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

2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/mh2 → Support/Downloads.

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

3) More information www.festo.com/catalogue/... → Support/Downloads.

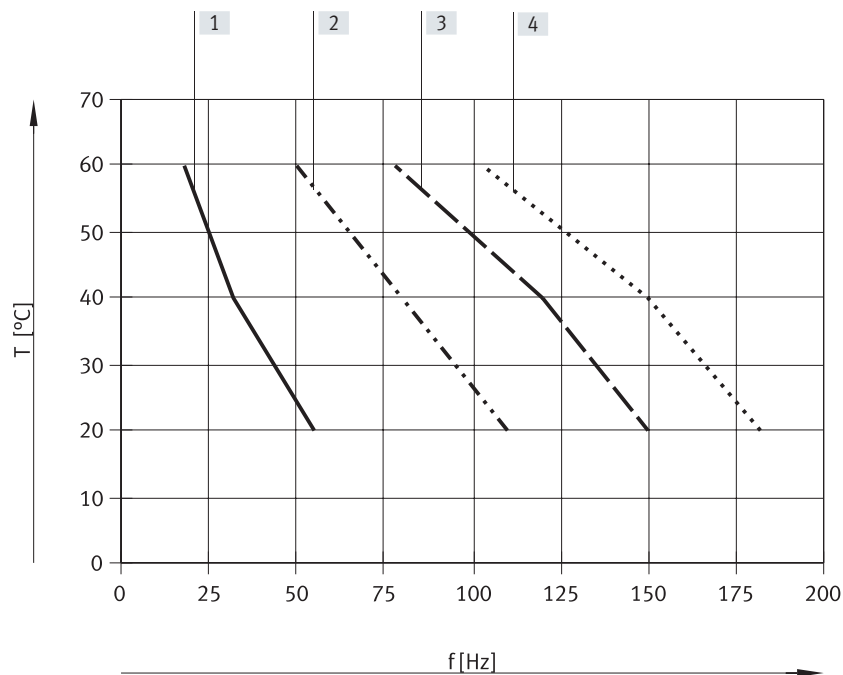
Electrical data		
Electrical connection		Plug, 2-pin
Operating voltage	[V DC]	24
Permissible voltage fluctuations	[%]	±10
Power consumption	Low-current phase	[W] 1.625
	High-current phase	[W] 6.5
Reverse polarity protection		Bipolar
Duty cycle	[%]	100
Additional functions		Spark arresting
		Holding current reduction
		Protective circuit
Degree of protection to EN 60529		IP65

Switching times and frequencies		
Switching time	On	[ms] 1.9
	Off	[ms] 1.7
Tolerance for switching time	On	[%] +10 ... −30
	Off	[%] +10 ... −30
Maximum switching frequency	[Hz]	300
Switching time variation from 1 Hz upwards	[ms]	0.2

Materials	
Housing	Die-cast zinc, coated
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	RoHS-compliant
LABS (PWIS) conformity	VDMA24364-B1/B2-L

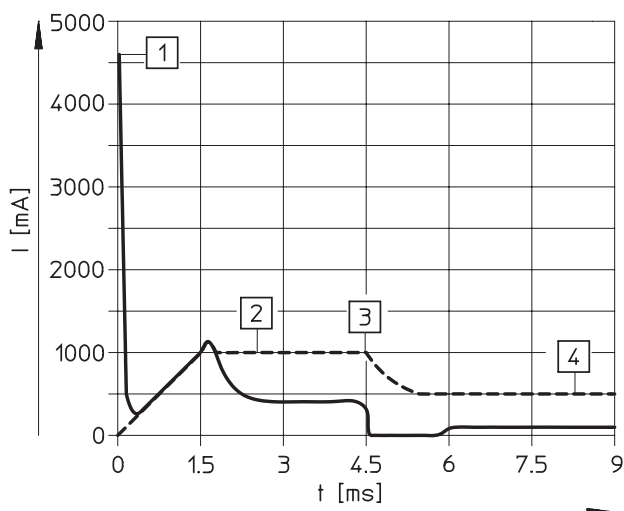
Datasheet – Semi in-line valve, 5/2-way valves

Restricted ambient temperature and temperature of medium as a function of switching frequency



- [1] Valve manifold assembly, 6 valves, unpressurised
- [2] Valve manifold assembly, 6 valves, through-flow, 0.6 MPa
- [3] Individual valve, unpressurised
- [4] Individual valve, through-flow, 0.6 MPa

Current curve for valves with fast-switching electronics (MHP2-MS1H)



- [1] Capacitor charging
- [2] Controlled coil current 1 A
- [3] Holding current reduction
- [4] Controlled holding current 0.5 A

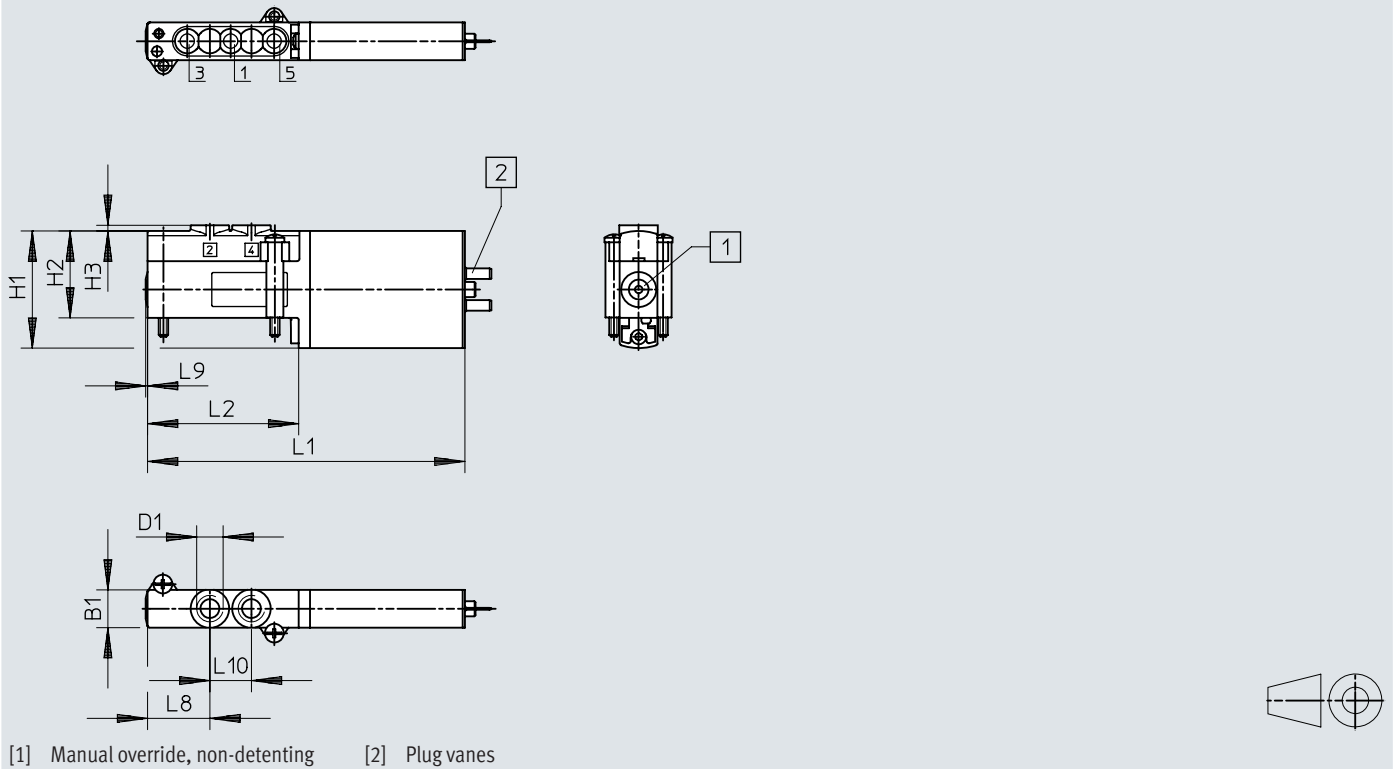
--- Internal current in the coil
 — External current in the supply line

Datasheet – Semi in-line valve, 5/2-way valves

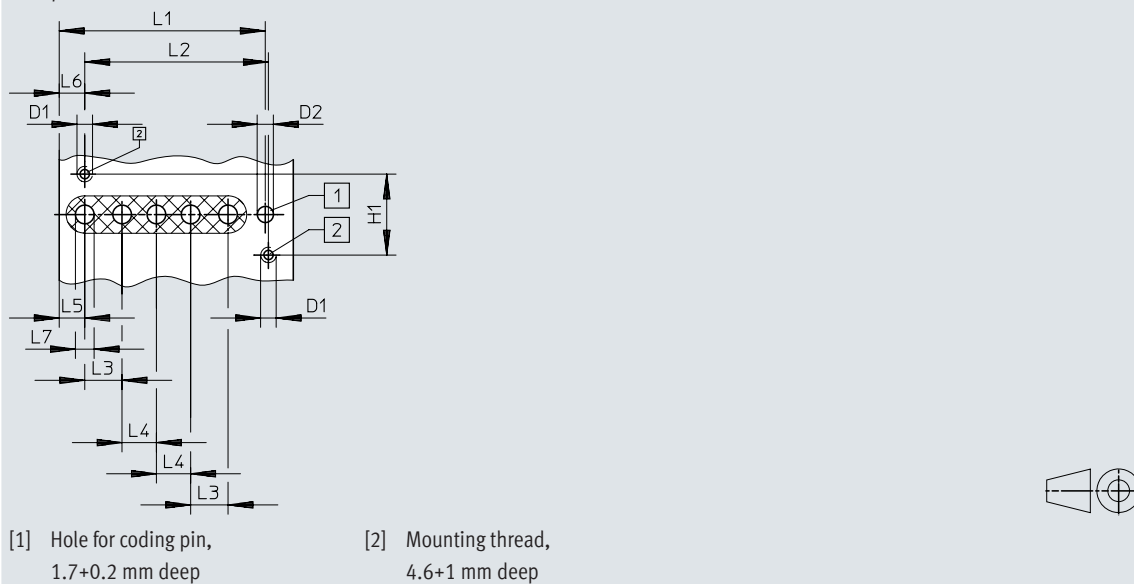
Dimensions

Download CAD data → www.festo.com

Valve with plug vanes, MHP2-...-5/2...-M5



Hole pattern on sub-bases



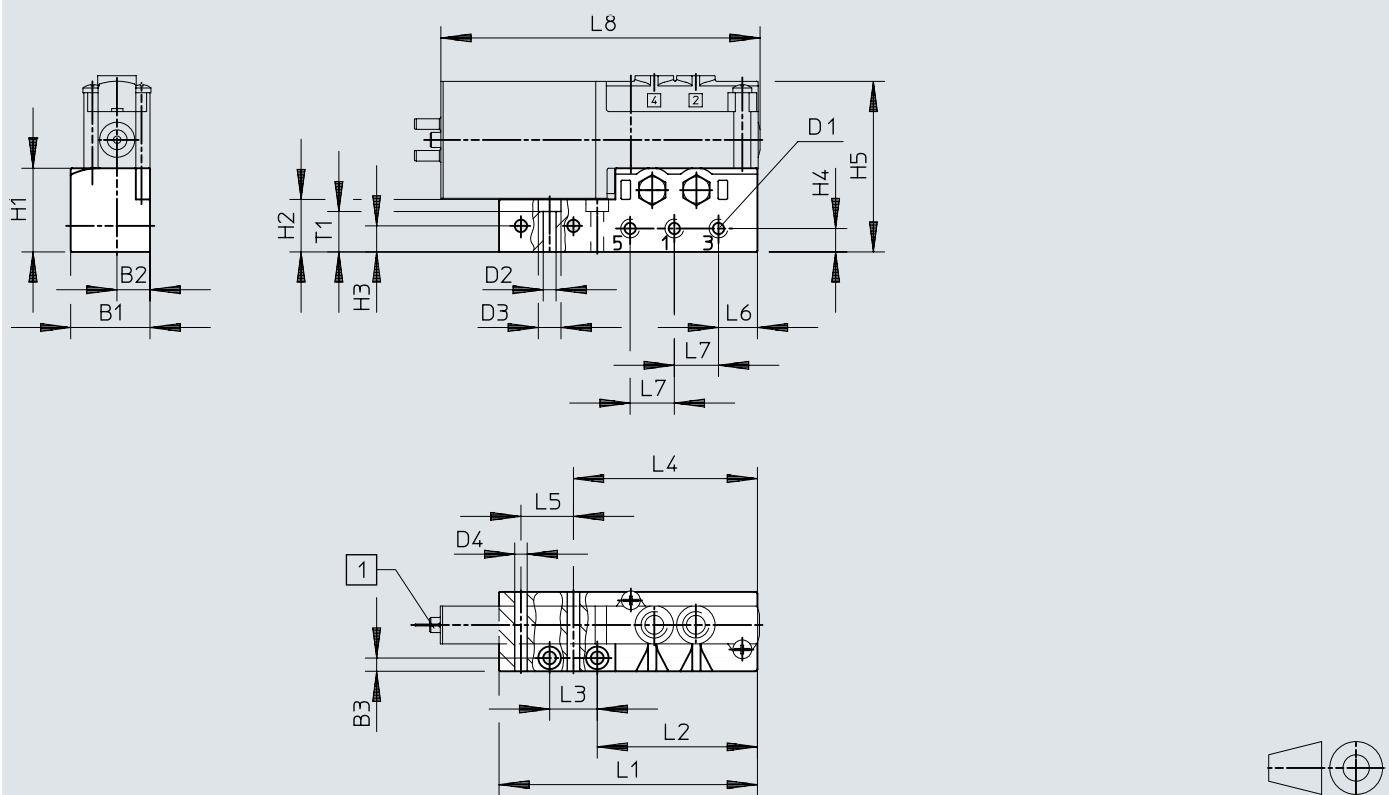
Type	B1	D1	D2 Ø	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
MHP2-...-5/2...-M5	10	M5	–	31	23	1.5	–	84	40	–	–	–	–	–	16.5	0.5	11
Hole pattern	–	M2.5	2.6	13	–	–	–	33.1	29.5	6	5.5	4.1	4.1	3	–	–	–

Note

Ports 2 and 4 are not applicable
with semi in-line valves.

Download CAD data → www.festo.com

Individual sub-base, MHA2-AS-5-M5



[1] Plug pins

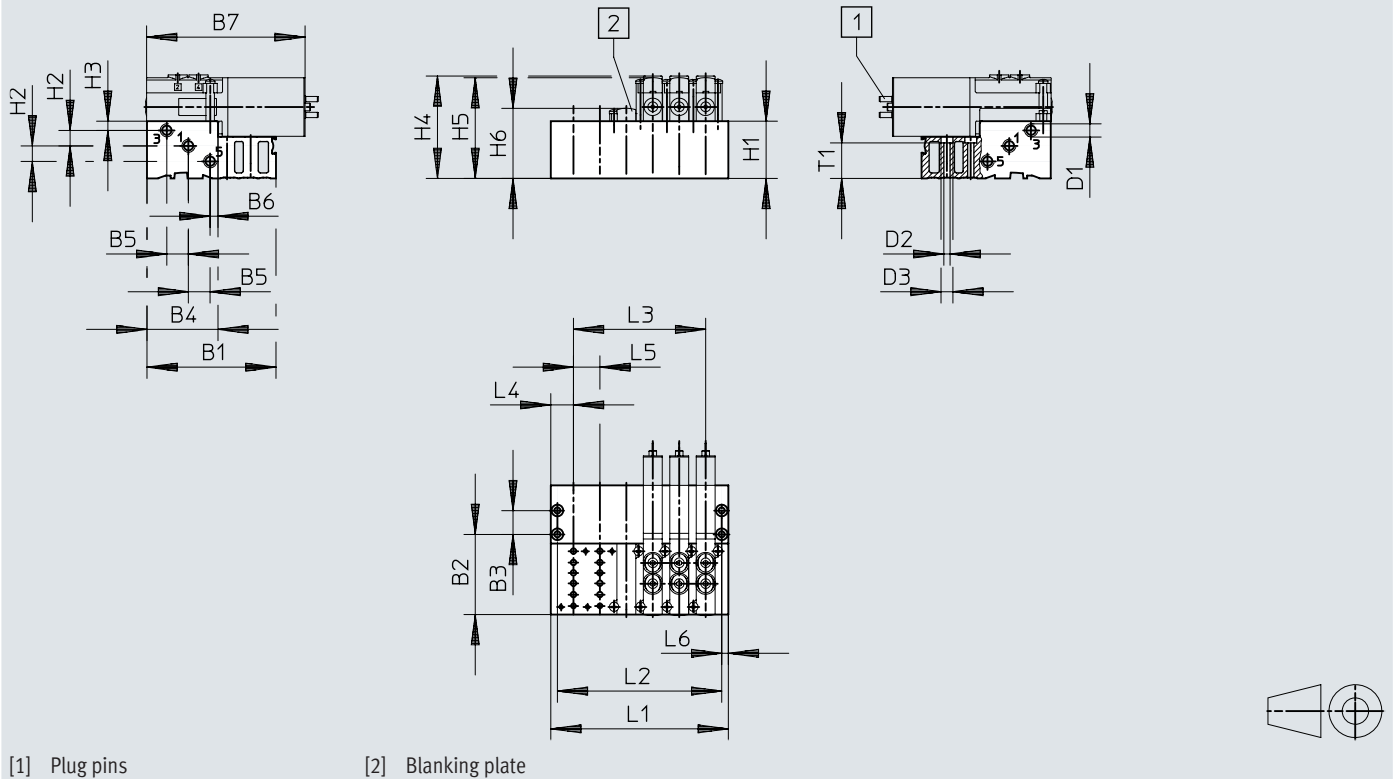
Type	B1	B2	B3	D1	D2 Ø	D3 Ø	D4 Ø	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5	L6	L7	L8	T1
MHA2-AS-5-M5	21	8.8	3.5	M5	3.4	6	3.3	22.2	13.9	6.9	6.2	45.2	68.4	42.4	12.6	48.7	13.9	10.3	11.7	84.5	10.7

Datasheet – Semi in-line valve, 5/2-way valves

Dimensions

Download CAD data → www.festo.com

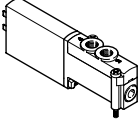
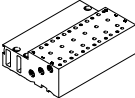
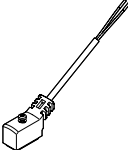
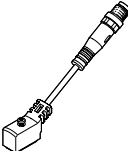
Manifold assembly, MHP2-PR...-5



Type	B1	B2	B3	B4	B5	B6	B7	D1	D2 Ø	D3 Ø	H1	H2	H3	H4	H5	H6	L4	L5	L6	T1
MHP2-PR...-5	68.4	42.4	12.6	37.6	11.5	4.1	84	M7	3.3	6.3	30.3	8.2	4.9	54.8	53.3	37.1	12	14	3.5	18.8

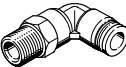
Type		Number of valve positions				
		2	4	6	8	10
MHP2-PR...-5	L1	38	66	94	122	150
	L2	31	59	87	115	143
	L3	14	42	70	98	126

Datasheet – Semi in-line valve, 5/2-way valve

Ordering data						Part no.	Type	
Valves								
	With fast-switching electronics	Switching time on 1.9 ms			525105	MHP2-MS1H-5/2-M5		
Manifold rail								
	Individual sub-base1) Pneumatic connection: M5 thread	1 valve position	525120	MHA2-AS-5-M5				
	Manifold block Pneumatic connection 1, 3, 5: thread M7	2 valve positions	525122	MHP2-PR2-5				
		4 valve positions	525123	MHP2-PR4-5				
		6 valve positions	525124	MHP2-PR6-5				
		8 valve positions	525125	MHP2-PR8-5				
		10 valve positions	525126	MHP2-PR10-5				
Cover plate								
	Vacant valve positions must be sealed with a cover plate.			525132	MHAP2-BP-5			
Connecting cable								
	2-pin socket, open cable end 2-core	PUR cable, degree of protection IP65	Signal status indica- tion with LED	Length 2.5 m	8047671	NEBV-Z4WA2L-P-E-2.5-N-LE2-S1		
				Length 5 m	8047672	NEBV-Z4WA2L-P-E-5-N-LE2-S1		
				Length 10 m	8047670	NEBV-Z4WA2L-P-E-10-N-LE2-S1		
		PVC cable, degree of protection IP40	Without signal status indication	Length 0.5 m	193690	KMYZ-4-24-0.5-B		
				Length 2.5 m	193691	KMYZ-4-24-2.5-B		
	2-pin socket, plug M8x1 3-pin	PUR cable, degree of protection IP65	Signal status indica- tion with LED	Length 0.5 m	8047673	NEBV-Z4WA2L-P-E-0.5-N-M8G3-S1		
				Length 2.5 m	8047674	NEBV-Z4WA2L-P-E-2.5-N-M8G3-S1		
Adapter								
	2-pin socket	Signal status indica- tion with LED	Plug M8, 3-pin	571686	VAVE-C8-1R8			
			Plug M8, 4-pin	573194	VAVE-C8-1R1			
DIN rail mounting								
	For 5/2-way solenoid valves			162556	CPV10/14-VI-BG-NRH-35			
DIN rail								
	To EN 60715	2 m	35430	NRH-35-2000				

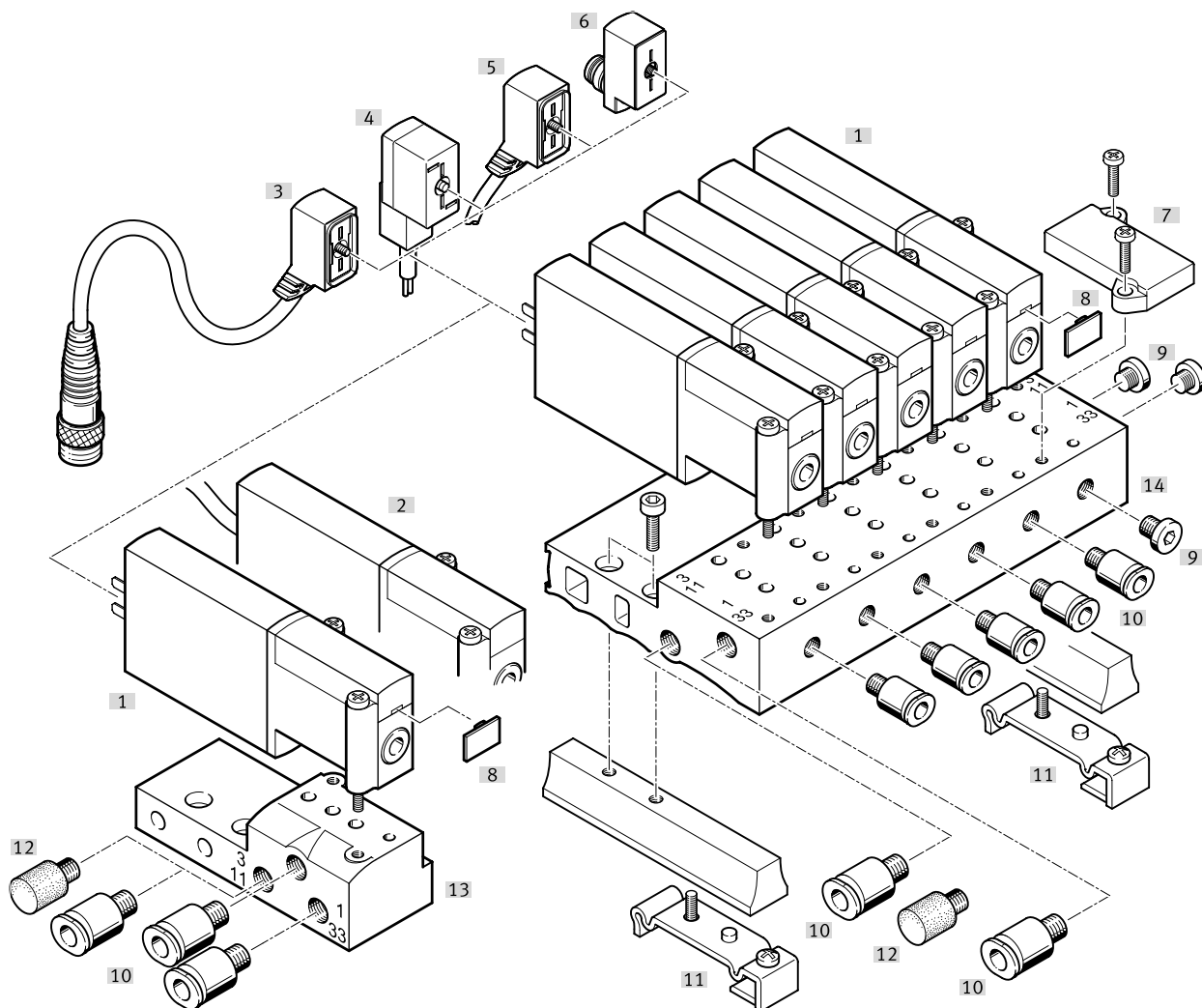
1) Seal ports 2 and 4 on the individual sub-base with blanking plugs. These ports on the individual sub-base have no function when using semi in-line valves.

Datasheet – Semi in-line valve, 5/2-way valve

Ordering data					Part no.	Type
Silencer					Datasheets → Internet: uc	
	With threaded connection	M5	Pack of 1	165003	UC-M5	
			Pack of 50	534217	UC-M5-50	
		M7	Pack of 1	161418	UC-M7	
			Pack of 50	534218	UC-M7-50	
Push-in fitting					Datasheets → Internet: qs	
	Male thread M5 with internal hex for tubing O.D.	4 mm	Pack of 10	153315	QSM-M5-4-I	
		6 mm	Pack of 10	153317	QSM-M5-6-I	
	Male thread M7 with internal hex for tubing O.D.	4 mm	Pack of 10	153319	QSM-M7-4-I	
			Pack of 100	133006	QSM-M7-4-I-100	
		6 mm	Pack of 10	153321	QSM-M7-6-I	
	Male thread M5 with external hex, push-in L-fitting, rotatable 360°, for tubing O.D.	4 mm	Pack of 10	153333	QSML-M5-4	
			Pack of 100	130771	QSML-M5-4-100	
		6 mm	Pack of 10	153335	QSML-M5-6	
			Pack of 100	130772	QSML-M5-6-100	
	Male thread M7 with external hex, push-in L-fitting, rotatable 360°, for tubing O.D.	4 mm	Pack of 10	186352	QSML-M7-4	
			Pack of 100	130773	QSML-M7-4-100	
		6 mm	Pack of 10	186353	QSML-M7-6	
			Pack of 100	130774	QSML-M7-6-100	
Blanking plug						
	For M5 thread		Pack of 10	3843	B-M5	
	For M7 thread		Pack of 10	174309	B-M7	
Inscription label						
	For solenoid valve		80 pieces in a frame	197259	MH-BZ-80X	

Peripherals overview – Sub-base valve, 3/2-way valve

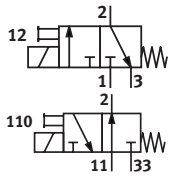
Connection with 2-pin plug – Connection with moulded-in cable



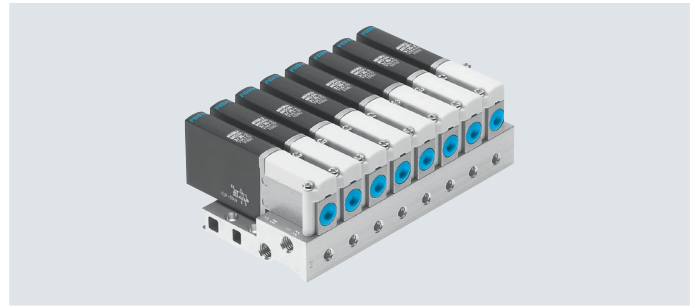
Designation	Type	Description	→ Page/Internet
[1] Sub-base valve	MHA2	With plug vanes	47
[2] Sub-base valve	MHA2-...-K	With moulded-in cable, IP55	47
[3] Connecting cable	NEBV	PUR cable, signal status indication with LED, plug M8x1 3-pin, IP65	47
[4] Plug socket with cable	KMYZ-4	PVC cable, without signal status indication, IP50	47
[5] Connecting cable	NEBV	PUR cable, signal status indication with LED, IP65	47
[6] Adapter	VAVE-C8	For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65	48
[7] Cover plate	MHAP2-BP-3	For sealing vacant positions	47
[8] Inscription labels	MH-BZ-80X	For identifying the valves	48
[9] Blanking plug	B	For sealing unused ports	48
[10] Push-in fittings	QS	For connecting tubing with standard O.D.	48
[11] DIN rail mounting	MHAP2-BG-NRH-35	For mounting the manifold block on DIN rails to EN 60715	48
[12] Silencer	UC	For fitting in exhaust ports	48
[13] Individual sub-base	MHA2-AS-3-M5	For sub-base valve	47
[14] Manifold block	MHA2-PR-...-3-M5	For sub-base valve	47

Datasheet – Sub-base valve, 3/2-way valve

Function



-  - Voltage
24 V DC
-  - Pressure
-0.09 ... +0.8 MPa
-  - Temperature range
-5 ... +40 °C



General technical data

Valve function	3/2, single solenoid ¹⁾
Design	Pressure relief poppet valve
Overlap	Negative overlap
Sealing principle	Soft
Reset method	Mechanical spring
Actuation type	Electrical
Type of control	Direct
Flow direction	Reversible with restrictions
Exhaust air function	Can be throttled
Manual override	Non-detenting
Mounting position	Any
Width	[mm] 10
Grid dimension	[mm] 14
Note on grid dimension	Minimum distance between the valves is 4 mm
Nominal width	[mm] 2
Standard nominal flow rate	[l/min] 100
Type of mounting	On sub-base
Pneumatic connection	Sub-base
Product weight	[g] 60

1) Can be used as a 2/2-way valve by sealing port 3 or 33

Datasheet – Sub-base valve, 3/2-way valve

Operating and environmental conditions		With fast-switching electronics	Without fast-switching electronics	
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Note on the operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)		
Operating pressure	[MPa]	−0.09 ... +0.8		
	[bar]	−0.9 ... +8		
	[psi]	−13.05 ... +116		
	Reversible	[MPa]	−0.09 ... +0.1	
		[bar]	−0.9 ... +1	
		[psi]	−13.05 ... +14.5	
Ambient temperature	[°C]	−5 ... +40		
Temperature of medium	[°C]	−5 ... +40		
Restricted ambient temperature and temperature of medium		As a function of the switching frequency (see graph)		
Corrosion resistance class CRC ¹⁾		2		
CE marking (see declaration of conformity) ³⁾		To EU EMC Directive ²⁾	–	
		To EU RoHS Directive	–	
UKCA marking (see declaration of conformity) ³⁾		To UK EMC regulations	–	
		To UK RoHS regulations	–	
Certification	c UL us - Recognized (OL)		c UL us - Recognized (OL)	
	RCM		–	
Cleanroom class		Class 6 to ISO 14644-1		
Shock resistance		Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27		
Vibration resistant		Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6		

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

2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/mh2 → Support/Downloads.

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3) More information www.festo.com/catalogue/... → Support/Downloads.

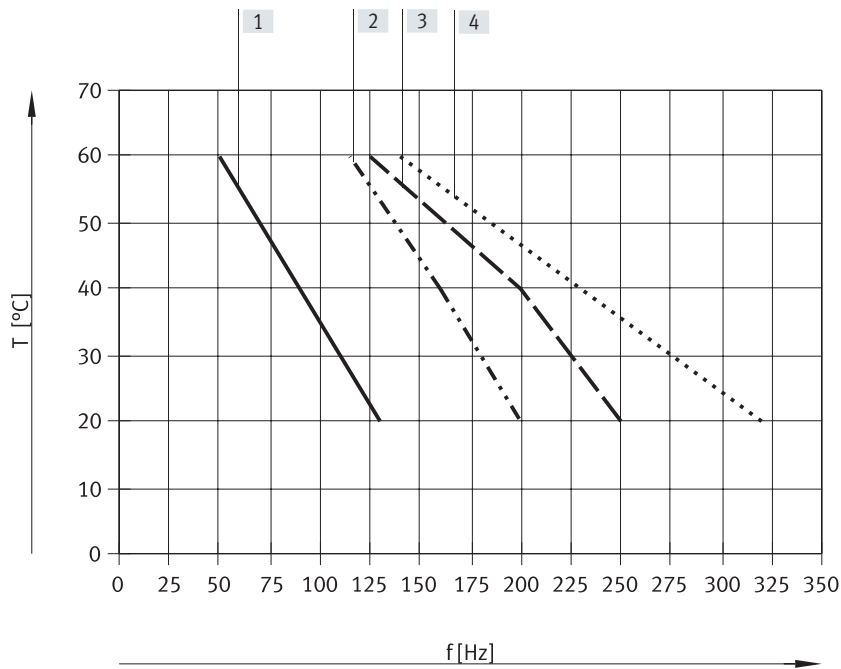
Electrical data		With fast-switching electronics	Without fast-switching electronics
Electrical connection		Plug, 2-pin or cable	
Operating voltage	[V DC]	24	
Permissible voltage fluctuations	[%]	±10	
Power consumption	[W]	5 for approx. 3 ms (high-current phase, in-rush current 1 A)	2.88
	[W]	1.25 (low-current phase)	–
Reverse polarity protection		Bipolar	–
Duty cycle	[%]	100	100
Additional functions		Spark arresting	–
		Holding current reduction	–
		Protective circuit	–
Degree of protection to EN 60529	Electrical connection: plug, 2-pin	IP65	IP65
	Electrical connection: cable	IP55	IP55

Switching times and frequencies		With fast-switching electronics	Without fast-switching electronics
Switching time	On [ms]	1.7	7
	Off [ms]	2	3.5
Tolerance for switching time	On [%]	+10 ... –30	–
	Off [%]	+10 ... –30	–
Switching time variation from 1 Hz upwards	[ms]	0.2	–
Maximum switching frequency	[Hz]	330	130

Datasheet – Sub-base valve, 3/2-way valve

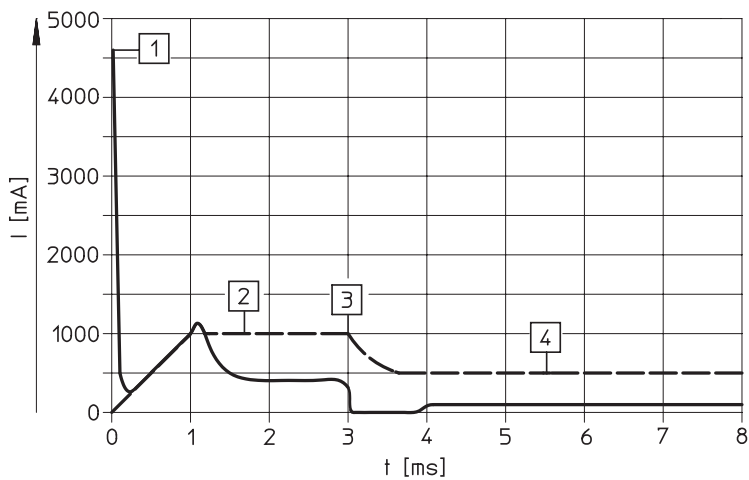
Materials	
Housing	Die-cast zinc, coated
Cable sheath	PUR
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	RoHS-compliant
LABS (PWIS) conformity	VDMA24364-B1/B2-L

Restricted ambient temperature and temperature of medium as a function of switching frequency



- [1] Valve manifold assembly, 6 valves, unpressurised
- [2] Valve manifold assembly, 6 valves, through-flow, 0.6 MPa
- [3] Individual valve, unpressurised
- [4] Individual valve, through-flow, 0.6 MPa

Current curve for valves with fast-switching electronics (MHA2-MS1H)



- [1] Capacitor charging
- [2] Controlled coil current 1 A
- [3] Holding current reduction
- [4] Controlled holding current 0.5 A

--- Internal current in the coil
 — External current in the supply line

Datasheet – Sub-base valve, 3/2-way valve

Dimensions

Download CAD data → www.festo.com

Valve with plug vanes or moulded-in cable, MHA2-...-3/2...

[1] Manual override, non-detenting [2] Plug vanes [3] Cable, 2.5 m

Hole pattern on sub-bases

[1] Hole for coding pin, 1.7+0.2 mm deep [2] Mounting thread, 4.6+1 mm deep

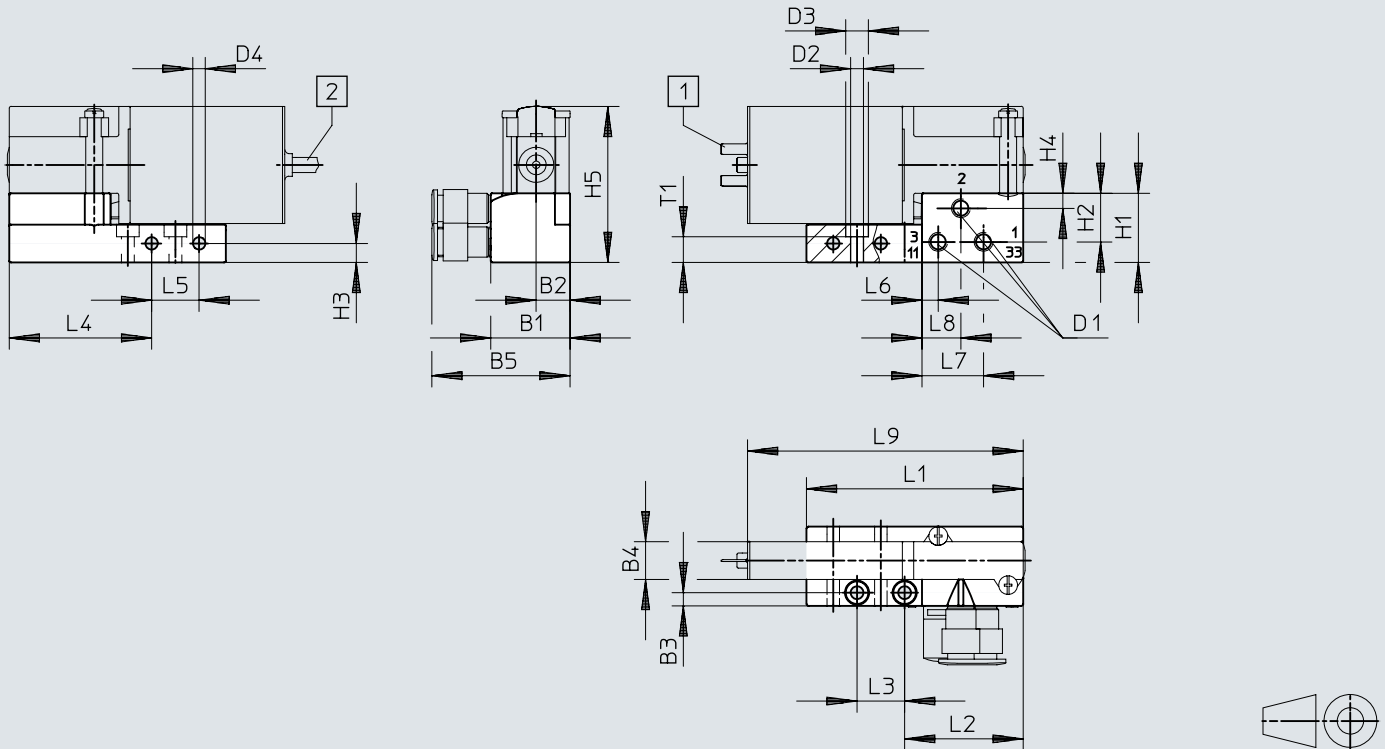
Type	B1	D1	D2 Ø	H1	H2	H3	H4	L1	L2	L3	L4	L9
MHA2-...-3/2...	10	–	–	31	23	–	–	73	29	–	–	0.5
Hole pattern	–	M2.5	3	18.5	13.5	7.5	1	14	8.5	2	13	–

Datasheet – Sub-base valve, 3/2-way valve

Dimensions

Download CAD data → www.festo.com

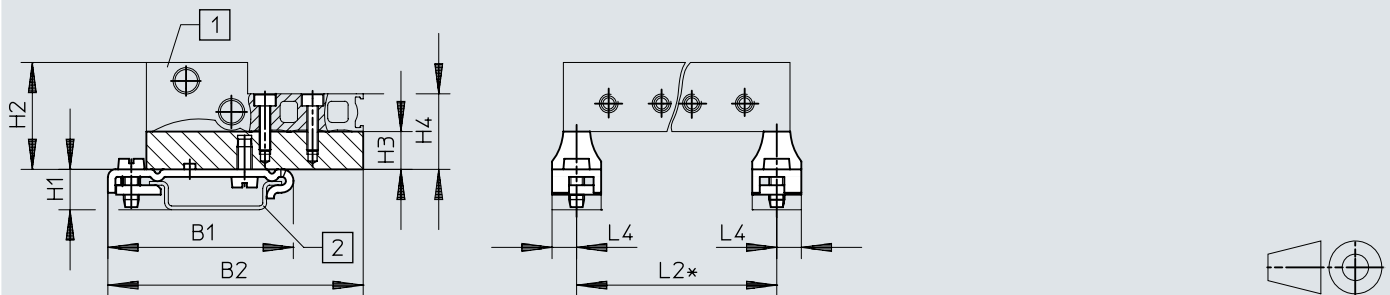
Individual sub-base, MHA2-AS-3-M5



[1] Plug pins

[2] Cable, 2.5 m

DIN rail attachment MHAP2-BG-NRH-35



[1] Connection block

[2] DIN mounting rail

* See dimensional table for the manifold block used

Type	B1	B2	B3	B4	B5	D1	D2 Ø	D3 Ø	D4 Ø	H1	H2	H3	H4	H5
MHA2-AS-3-M5	21	9	3.5	10	36.6	M5	3.4	6	3.3	18.3	12.9	5	4	41.3
MHAP2-BG-NRH-35	49.1	67.6	–	–	–	–	–	–	–	10.7	28.3	10	20	20

Type	L1	L2	L3	L4	L5	L6	L7	L8	L9	T1
MHA2-AS-3-M5	57.4	31.4	12.6	37.7	12.6	4.3	16.3	10.3	73	6.8
MHAP2-BG-NRH-35	–	*	–	6.5	–	–	–	–	–	–

* See dimensional table for the manifold block used

Datasheet – Sub-base valve, 3/2-way valve

Dimensions

Download CAD data → www.festo.com

Manifold assembly, MHA2-PR...-3-M5

[1] Plug pins [2] Blanking plate [3] Silencer [4] Cable, 2.5 m

Type	B1	B2	B3	B4	B5	B6	B7	D1	D2 ∅	D3 ∅	D4 ∅	H1	H2	H3	H4	H5	H6	H7
MHP2-PR...-3-M5	57.4	31.4	12.6	12	4.3	87.9	73	M7	3.3	6.3	M5	18.3	10	8.2	4.9	10.9	41.3	25.1

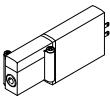
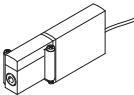
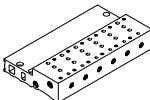
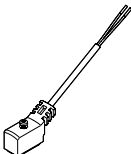
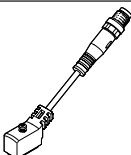
Type	L4		L5		L6		L7		L8		T1	
MHP2-PR...-3-M5	12		14		3.5		24.5		15.4		6.8	

Type		Number of valve positions				
		2	4	6	8	10
MHP2-PR...-3-M5	L1	38	66	94	122	150
	L2	31	59	87	115	143
	L3	14	42	70	98	126

Note

Valve types 3/2G and 3/2O must not be mixed on one manifold block.

Datasheet – Sub-base valve, 3/2-way valve

Ordering data					Part no.	Type
Valves						
	Electrical connection: plug, 2-pin	With fast-switching electronics, switch- ing time 2 ms	Normally open	196139	MHA2-MS1H-3/20-2	
			Normally closed	196119	MHA2-MS1H-3/2G-2	
		Without fast-switching electronics, switching time 7 ms	Normally open	196138	MHA2-M1H-3/20-2	
			Normally closed	196118	MHA2-M1H-3/2G-2	
	Electrical connection: cable	With fast-switching electronics, switch- ing time 2 ms	Normally open	196141	MHA2-MS1H-3/20-2-K	
			Normally closed	196121	MHA2-MS1H-3/2G-2-K	
		Without fast-switching electronics, switching time 7 ms	Normally open	196140	MHA2-M1H-3/20-2-K	
			Normally closed	196120	MHA2-M1H-3/2G-2-K	
Manifold rail						
	Individual sub-base Pneumatic connection: M5 thread		1 valve position	197438	MHA2-AS-3-M5	
	Manifold block Pneumatic connection 1, 11, 3, 33: thread M7 Pneumatic connection 2: thread M5		2 valve positions	197447	MHA2-PR2-3-M5	
			4 valve positions	197448	MHA2-PR4-3-M5	
			6 valve positions	197449	MHA2-PR6-3-M5	
			8 valve positions	197450	MHA2-PR8-3-M5	
			10 valve positions	197451	MHA2-PR10-3-M5	
Cover plate						
	Vacant valve positions must be sealed with a cover plate.			197470	MHAP2-BP-3	
Connecting cable (for valves with 2-pin plug)					Datasheets → Internet: nebv	
	2-pin socket, open cable end 2-core	PUR cable, degree of protection IP65	Signal status indication with LED	Length 2.5 m	8047671	NEBV-Z4WA2L-P-E-2.5-N-LE2-S1
				Length 5 m	8047672	NEBV-Z4WA2L-P-E-5-N-LE2-S1
				Length 10 m	8047670	NEBV-Z4WA2L-P-E-10-N-LE2-S1
		PVC cable, degree of protection IP40	Without signal status indica- tion	Length 0.5 m	193690	KMYZ-4-24-0.5-B
				Length 2.5 m	193691	KMYZ-4-24-2.5-B
	2-pin socket, plug M8x1 3-pin	PUR cable, degree of protection IP65	Signal status indication with LED	Length 0.5 m	8047673	NEBV-Z4WA2L-P-E-0.5-N-M8G3-S1
				Length 2.5 m	8047674	NEBV-Z4WA2L-P-E-2.5-N-M8G3-S1

 Note

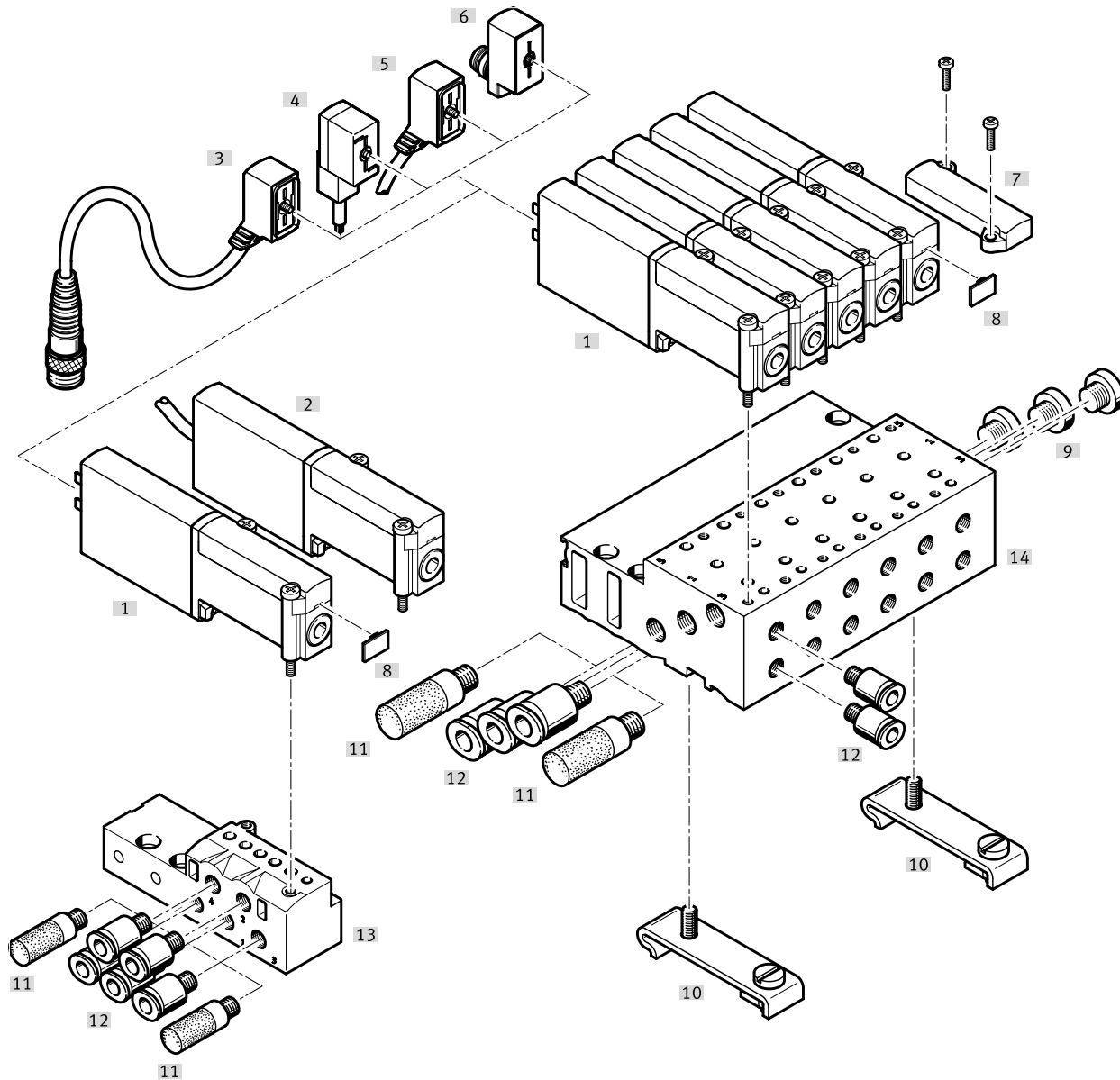
Valve types 3/2G and 3/2O must not be mixed on one manifold block.

Datasheet – Sub-base valve, 3/2-way valve

Ordering data				Part no.	Type
Adapter (for valves with 2-pin plug)					
	2-pin socket	Signal status indication with LED	Plug M8, 3-pin	571686	VAVE-C8-1R8
			Plug M8, 4-pin	573194	VAVE-C8-1R1
DIN rail mounting					
	For 3/2-way solenoid valves			525053	MHAP2-BG-NRH-35
DIN rail					
	To EN 60715	2 m	35430	NRH-35-2000	
Silencer					
	With threaded connection	M5	Pack of 1	165003	UC-M5
			Pack of 50	534217	UC-M5-50
		M7	Pack of 1	161418	UC-M7
			Pack of 50	534218	UC-M7-50
Push-in fitting					
	Male thread M5 with internal hex for tubing O.D.	4 mm	Pack of 10	153315	QSM-M5-4-I
		6 mm	Pack of 10	153317	QSM-M5-6-I
	Male thread M7 with internal hex for tubing O.D.	4 mm	Pack of 10	153319	QSM-M7-4-I
			Pack of 100	133006	QSM-M7-4-I-100
	Male thread M5 with external hex, push-in L-fitting, rotatable 360°, for tubing O.D.	4 mm	Pack of 10	153333	QSML-M5-4
			Pack of 100	130771	QSML-M5-4-100
		6 mm	Pack of 10	153335	QSML-M5-6
			Pack of 100	130772	QSML-M5-6-100
	Male thread M7 with external hex, push-in L-fitting, rotatable 360°, for tubing O.D.	4 mm	Pack of 10	186352	QSML-M7-4
			Pack of 100	130773	QSML-M7-4-100
		6 mm	Pack of 10	186353	QSML-M7-6
			Pack of 100	130774	QSML-M7-6-100
Blanking plug					
	For M5 thread	Pack of 10	3843	B-M5	
	For M7 thread	Pack of 10	174309	B-M7	
Inscription label					
	For solenoid valve	80 pieces in a frame	197259	MH-BZ-80X	

Peripherals overview – Sub-base valve, 5/2-way valve

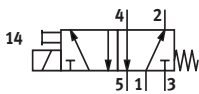
Connection with plug vanes – Connection with moulded-in cable



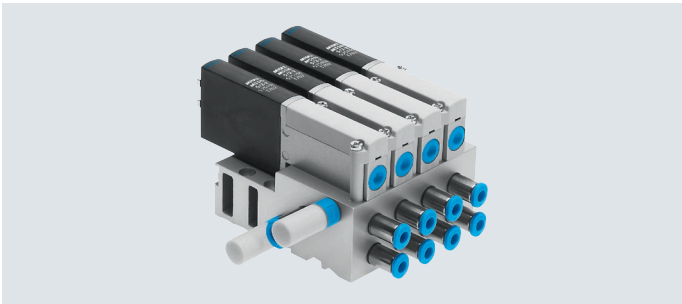
Designation	Type	Description	→ Page/Internet
[1] Sub-base valve	MHA2	With plug vanes	56
[2] Sub-base valve	MHA2-...-K	With moulded-in cable, IP55	56
[3] Connecting cable	NEBV	PUR cable, signal status indication with LED, plug M8x1 3-pin, IP65	56
[4] Plug socket with cable	KMYZ-4	PVC cable, without signal status indication, IP50	56
[5] Connecting cable	NEBV	PUR cable, signal status indication with LED, IP65	56
[6] Adapter	VAVE-C8	For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65	57
[7] Cover plate	MHAP2-BP-5	For sealing vacant positions	56
[8] Inscription labels	MH-BZ-80X	For identifying the valves	57
[9] Blanking plug	B	For sealing unused ports	57
[10] DIN rail mounting	CPV10/14-VI-BG-NRH-35	For mounting the manifold block on DIN rails to EN 60715	57
[11] Silencer	UC	For fitting in exhaust ports	57
[12] Push-in fittings	QS	For connecting tubing with standard O.D.	57
[13] Individual sub-base	MHA2-AS-5-M5	For sub-base valve	56
[14] Manifold block	MHA2-PR...-5-M5	For sub-base valve	56

Datasheet – Sub-base valve, 5/2-way valve

Function



-  - Voltage
24 V DC
-  - Pressure
–0.09 ... +0.8 MPa
-  - Temperature range
–5 ... +40 °C



General technical data		
Valve function		5/2-way, single solenoid
Design		Pressure relief poppet valve
Overlap		Negative overlap
Sealing principle		Soft
Reset method		Mechanical spring
Actuation type		Electrical
Type of control		Direct
Flow direction		Not reversible
Exhaust air function		Can be throttled
Manual override		Non-detenting
Mounting position		Any
Width	[mm]	10
Grid dimension	[mm]	14
Note on grid dimension		Minimum distance between the valves is 4 mm
Nominal width	[mm]	2
Standard nominal flow rate	[l/min]	90
Type of mounting		On PR rail
Max. tightening torque for valve mounting	[Nm]	0.4
Pneumatic connection		Sub-base
Product weight	[g]	70

Datasheet – Sub-base valve, 5/2-way valve

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on the operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Operating pressure	[MPa]	–0.09 ... +0.8
	[bar]	–0.9 ... +8
	[psi]	–13.05 ... +116
Ambient temperature	[°C]	–5 ... +40
Temperature of medium	[°C]	–5 ... +40
Restricted ambient temperature and temperature of medium		As a function of the switching frequency (see graph)
Corrosion resistance class CRC ¹⁾		2
CE marking (see declaration of conformity) ³⁾		To EU EMC Directive ²⁾
		To EU RoHS Directive
UKCA marking (see declaration of conformity) ³⁾		To UK EMC regulations
		To UK RoHS regulations
Certification		c UL us - Recognized (OL)
		RCM
Cleanroom class		Class 6 to ISO 14644-1
Shock resistance		Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27
Vibration resistant		Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6

1) More information www.festo.com/x/topic/crc2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/mh2 → Support/Downloads.

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

3) More information www.festo.com/catalogue/... → Support/Downloads.

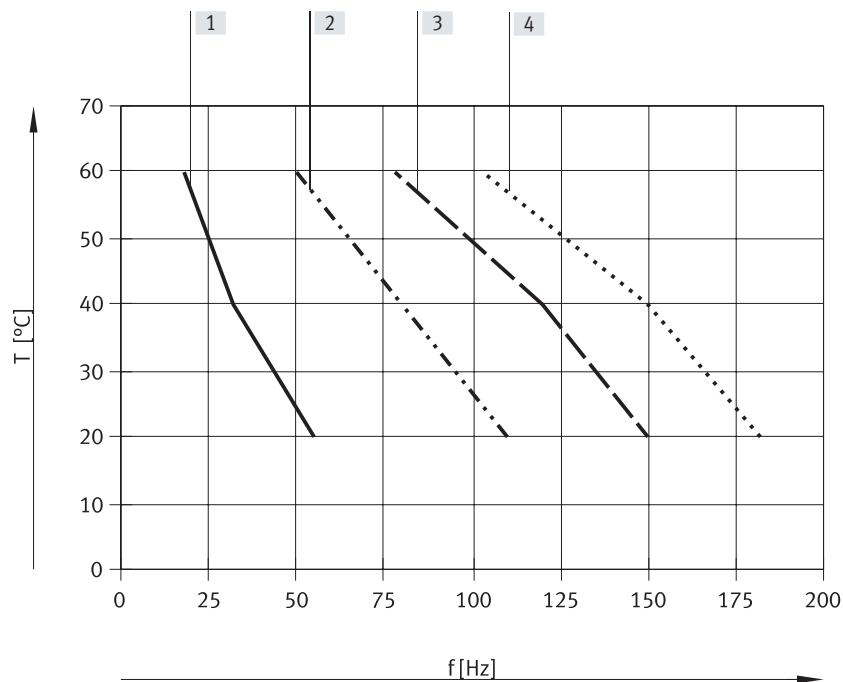
Electrical data		
Electrical connection	Plug, 2-pin	Cable
Operating voltage	[V DC]	24
Permissible voltage fluctuations	[%]	±10
Power consumption	Low-current phase	[W]
	High-current phase	[W]
Reverse polarity protection		Bipolar
Duty cycle	[%]	100
Additional functions		Spark arresting
		Holding current reduction
		Protective circuit
Degree of protection to EN 60529	IP65	IP55

Switching times and frequencies			
Switching time	On	[ms]	1.9
	Off	[ms]	1.7
Tolerance for switching time	On	[%]	+10 ... –30
	Off	[%]	+10 ... –30
Maximum switching frequency		[Hz]	300
Switching time variation from 1 Hz upwards		[ms]	0.2

Materials	
Housing	Die-cast zinc, coated
Cable sheath	PUR
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	RoHS-compliant
LABS (PWIS) conformity	VDMA24364-B1/B2-L

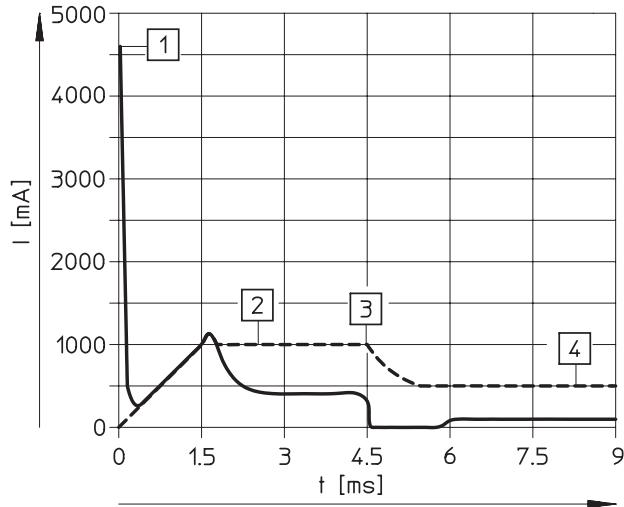
Datasheet – Sub-base valve, 5/2-way valve

Restricted ambient temperature and temperature of medium as a function of switching frequency



- [1] Valve manifold assembly, 6 valves, unpressurised
- [2] Valve manifold assembly, 6 valves, through-flow, 0.6 MPa
- [3] Individual valve, unpressurised
- [4] Individual valve, through-flow, 0.6 MPa

Current curve for valves with fast-switching electronics (MHA2-MS1H)



--- Internal current in the coil
— External current in the supply line

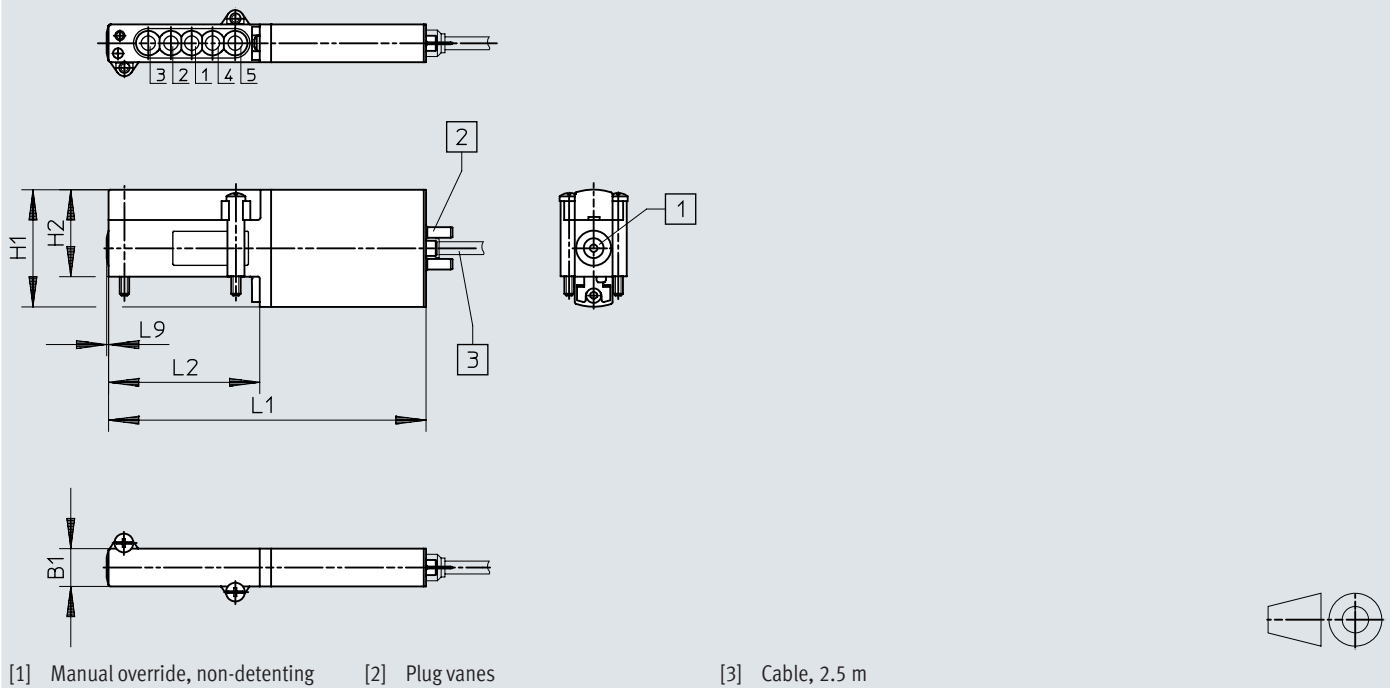
- [1] Capacitor charging
- [2] Controlled coil current 1 A
- [3] Holding current reduction
- [4] Controlled holding current 0.5 A

Datasheet – Sub-base valve, 5/2-way valve

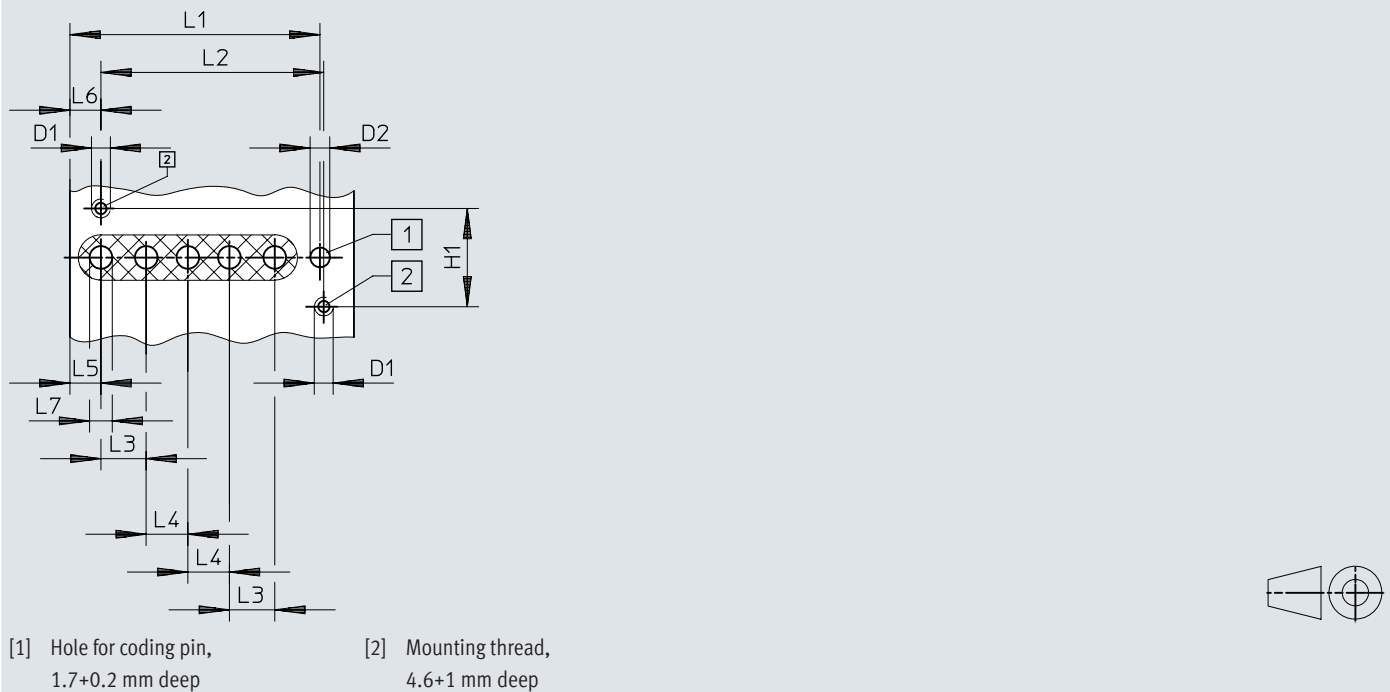
Dimensions

Download CAD data → www.festo.com

Valve with plug vanes or moulded-in cable, MHA2-...-5/2...



Hole pattern on sub-bases



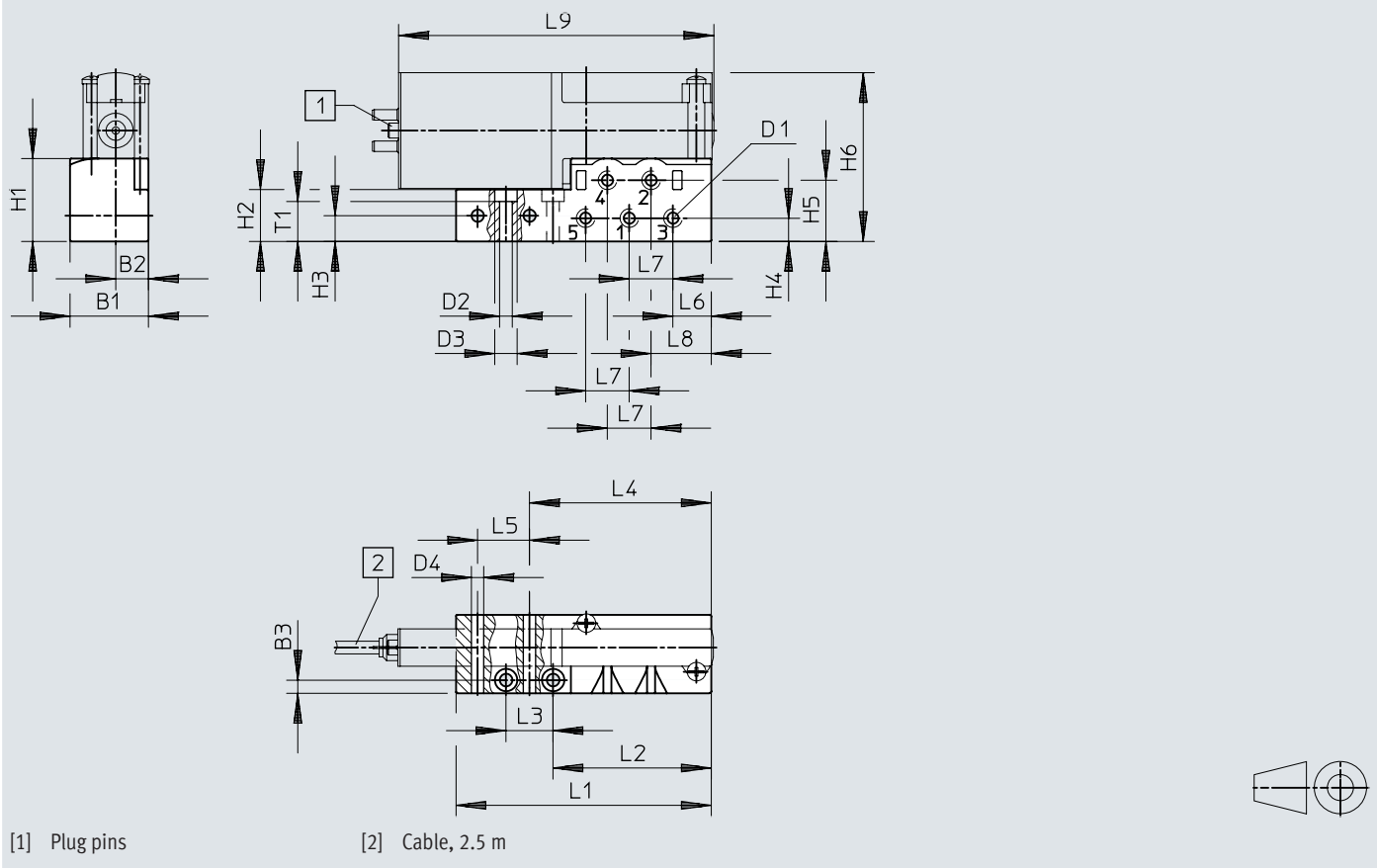
Type	B1	D1	D2 ø	H1	H2	L1	L2	L3	L4	L5	L6	L7	L9
MHA2-...-5/2...	10	–	–	31	23	84	40	–	–	–	–	–	0.5
Hole pattern	–	M2.5	2.6	13	–	33.1	29.5	6	5.5	4.1	4.1	3	–

Datasheet – Sub-base valve, 5/2-way valve

Dimensions

Download CAD data → www.festo.com

Individual sub-base, MHA2-AS-5-M5



Type	B1	B2	B3	D1	D2 ø	D3 ø	D4 ø	H1	H2	H3	H4	H5	H6
MHA2-AS-5-M5	21	8.8	3.5	M5	3.4	6	3.3	22.2	13.9	6.9	6.2	16.4	45.2

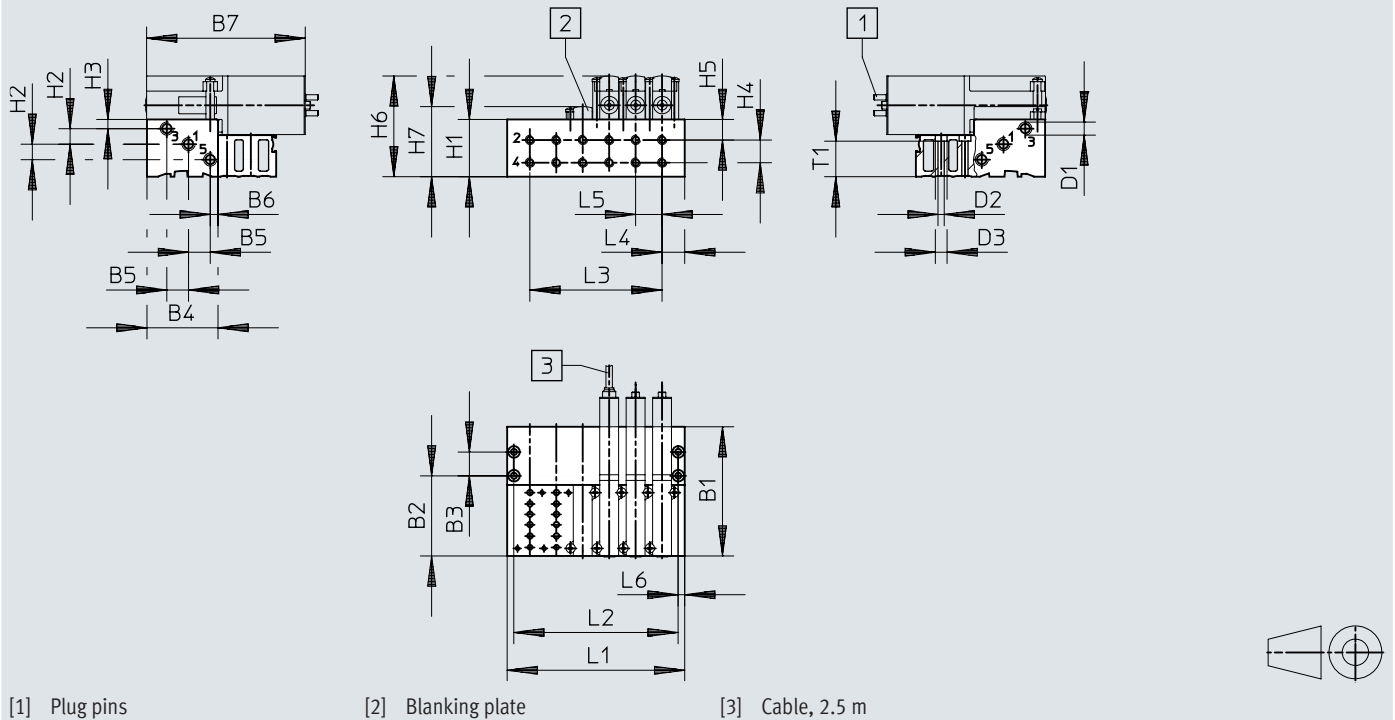
Type	L1	L2	L3	L4	L5	L6	L7	L8	L9	T1
MHA2-AS-5-M5	68.4	42.4	12.6	48.7	13.9	10.3	11.7	16.2	84.5	10.7

Datasheet – Sub-base valve, 5/2-way valves

Dimensions

Download CAD data → www.festo.com

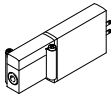
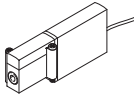
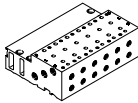
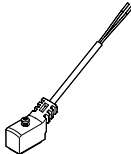
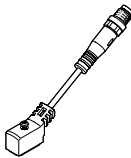
Manifold assembly, MHA2-PR...-5-M5



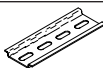
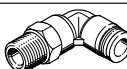
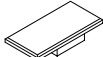
Type	B1	B2	B3	B4	B5	B6	B7	D1	D2 Ø	D3 Ø	H1	H2	H3	H4	H5	H6	H7	L4	L5	L6	T1
MHA2-PR...-5-M5	68.4	42.4	12.6	37.6	11.5	4.1	84	M7	3.3	6.3	30.3	8.2	4.9	12	10.9	53.3	37.1	12	14	3.5	18.8

Type	Number of valve positions					
	2		4		6	
MHA2-PR...-5-M5	L1	38	66	94	122	150
	L2	31	59	87	115	143
	L3	14	42	70	98	126

Datasheet – Sub-base valve, 5/2-way valve

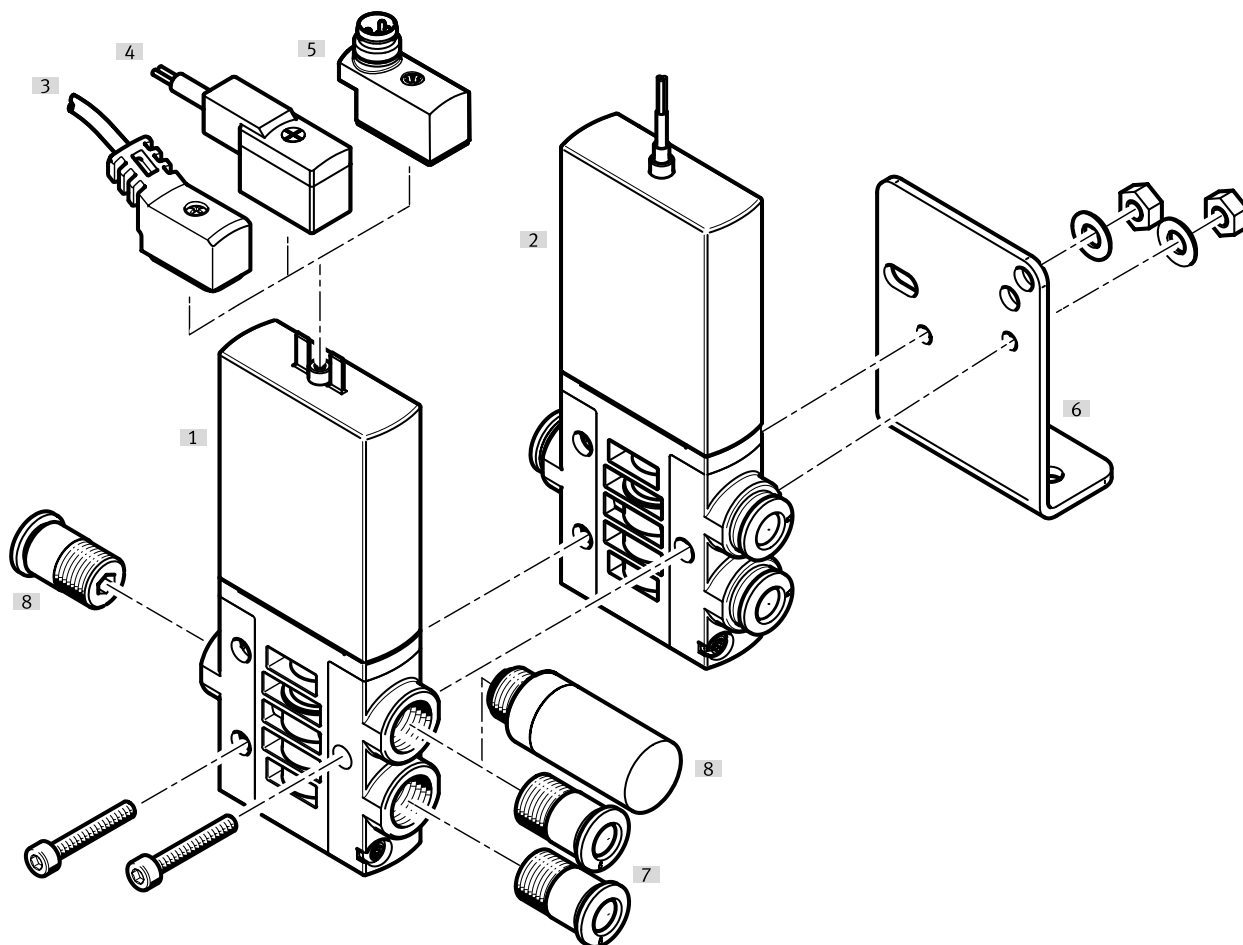
Ordering data					Part no.	Type
Valves						
	Electrical connection: plug, 2-pin	With fast-switching electronics, switching time 2 ms			525101	MHA2-MS1H-5/2-2
	Electrical connection: cable	With fast-switching electronics, switching time 2 ms			525103	MHA2-MS1H-5/2-2-K
Manifold rail						
	Individual sub-base Pneumatic connection: M5 thread	1 valve position	525120	MHA2-AS-5-M5		
	Manifold block Pneumatic connection 1, 3, 5: thread M7 Pneumatic connection 2, 4: thread M5	2 valve positions	525127	MHA2-PR2-5-M5		
		4 valve positions	525128	MHA2-PR4-5-M5		
		6 valve positions	525129	MHA2-PR6-5-M5		
		8 valve positions	525130	MHA2-PR8-5-M5		
		10 valve positions	525131	MHA2-PR10-5-M5		
Cover plate						
	Vacant valve positions must be sealed with a cover plate.				525132	MHAP2-BP-5
Connecting cable (for valves with 2-pin plug)						
	2-pin socket, open cable end 2-core	PUR cable, degree of protection IP65	Signal status indication with LED	Length 2.5 m	8047671	NEBV-Z4WA2L-P-E-2.5-N-LE2-S1
				Length 5 m	8047672	NEBV-Z4WA2L-P-E-5-N-LE2-S1
				Length 10 m	8047670	NEBV-Z4WA2L-P-E-10-N-LE2-S1
		PVC cable, degree of protection IP40	Without signal status indication	Length 0.5 m	193690	KMYZ-4-24-0.5-B
Length 2.5 m	193691			KMYZ-4-24-2.5-B		
	2-pin socket, plug M8x1 3-pin	PUR cable, degree of protection IP65	Signal status indication with LED	Length 0.5 m	8047673	NEBV-Z4WA2L-P-E-0.5-N-M8G3-S1
				Length 2.5 m	8047674	NEBV-Z4WA2L-P-E-2.5-N-M8G3-S1

Datasheet – Sub-base valve, 5/2-way valve

Ordering data					Part no.	Type
Adapter (for valves with 2-pin plug)						
	2-pin socket	Signal status indication with LED	Plug M8, 3-pin	571686	VAVE-C8-1R8	
			Plug M8, 4-pin	573194	VAVE-C8-1R1	
DIN rail mounting						
	For 5/2-way solenoid valves			162556	CPV10/14-VI-BG-NRH-35	
DIN rail						
	To EN 60715		2 m	35430	NRH-35-2000	
Silencer						
	With threaded connection	M5	Pack of 1	165003	UC-M5	
			Pack of 50	534217	UC-M5-50	
		M7	Pack of 1	161418	UC-M7	
			Pack of 50	534218	UC-M7-50	
Push-in fitting						
	Male thread M5 with internal hex for tubing O.D.	4 mm	Pack of 10	153315	QSM-M5-4-I	
		6 mm	Pack of 10	153317	QSM-M5-6-I	
	Male thread M7 with internal hex for tubing O.D.	4 mm	Pack of 10	153319	QSM-M7-4-I	
			Pack of 100	133006	QSM-M7-4-I-100	
	Male thread M5 with external hex, push-in L-fitting, rotatable 360°, for tubing O.D.	6 mm	Pack of 10	153321	QSM-M7-6-I	
		4 mm	Pack of 10	153333	QSML-M5-4	
			Pack of 100	130771	QSML-M5-4-100	
		6 mm	Pack of 10	153335	QSML-M5-6	
	Pack of 100		130772	QSML-M5-6-100		
	Male thread M7 with external hex, push-in L-fitting, rotatable 360°, for tubing O.D.	4 mm	Pack of 10	186352	QSML-M7-4	
			Pack of 100	130773	QSML-M7-4-100	
		6 mm	Pack of 10	186353	QSML-M7-6	
Pack of 100			130774	QSML-M7-6-100		
Blanking plug						
	For M5 thread		Pack of 10	3843	B-M5	
	For M7 thread		Pack of 10	174309	B-M7	
Inscription label						
	For solenoid valve		80 pieces in a frame	197259	MH-BZ-80X	

Peripherals overview – Individual valve

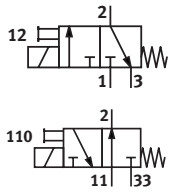
Connection with plug vanes – Connection with moulded-in cable



Designation	Type	Description	→ Page/Internet
[1] Individual valve	MHE3	With plug vanes	64
[2] Individual valve	MHE3-...-K	With moulded-in cable, IP65	64
[3] Connecting cable	NEBV	PUR cable, signal status indication with LED, IP65	65
[4] Plug socket with cable	KMYZ-4	PVC cable, without signal status indication, IP50	65
[5] Adapter	VAVE-C8	For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65	65
[6] Mounting bracket	MHE2-BG-L	For wall mounting	65
[7] Push-in fittings	QS	For connecting tubing with standard O.D.	65
[8] Silencer	UC	For fitting in exhaust ports	65

Datasheet – Individual valve

Function



-  - Voltage
24 V DC
-  - Pressure
-0.09 ... +0.8 MPa
-  - Temperature range
-5 ... +60 °C



General technical data

Valve function	3/2, single solenoid ¹⁾
Design	Pressure relief poppet valve
Overlap	Negative overlap
Sealing principle	Soft
Reset method	Mechanical spring
Actuation type	Electrical
Type of control	Direct
Flow direction	Reversible with restrictions ²⁾
Exhaust air function	Can be throttled
Manual override	Non-detenting
Mounting position	Any
Width	[mm] 14
Grid dimension	[mm] 19
Note on grid dimension	Minimum distance between the valves is 5 mm
Nominal width	[mm] 3
Standard nominal flow rate	[l/min] 200
Type of mounting	With through-hole
Pneumatic connection	Connecting thread G1/8 Push-in connector for tubing O.D. 6 mm
Product weight	[g] 120

1) Can be used as a 2/2-way valve by sealing port 3 or 33

2) Slight leakage can occur in the pressure range -0.8 bar to +0.5 bar.

Operating and environmental conditions

	With fast-switching electronics	Without fast-switching electronics
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4]	
Note on the operating/pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)	
Ambient temperature	[°C] -5 ... +60	
Temperature of medium	[°C] -5 ... +60	
Restricted ambient temperature and temperature of medium	As a function of switching frequency	–
Corrosion resistance class CRC ¹⁾	2	2
CE marking (see declaration of conformity) ³⁾	To EU EMC Directive ²⁾	–
	To EU RoHS Directive	–
UKCA marking (see declaration of conformity) ³⁾	To UK EMC regulations	–
	To UK RoHS regulations	–
Certification	c UL us - Recognized (OL)	c UL us - Recognized (OL)
	RCM	–
Cleanroom class	Class 6 to ISO 14644-1	
Shock resistance	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27	
Vibration resistant	Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6	

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

2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/mh2 → Support/Downloads.

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

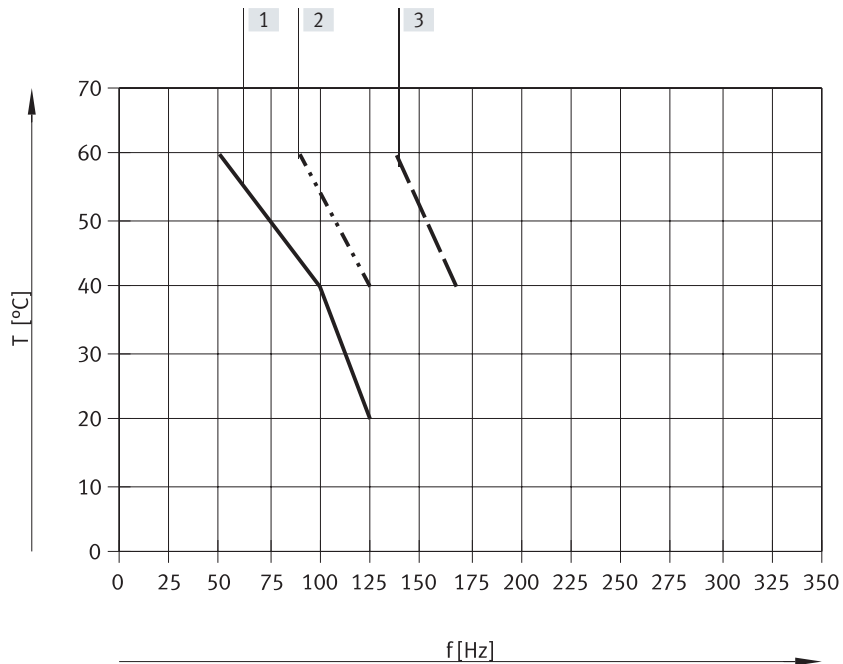
3) More information www.festo.com/catalogue/... → Support/Downloads.

Datasheet – Individual valve

Operating and environmental conditions					With fast-switching electronics	Without fast-switching electronics
Operating pressure		[MPa]	−0.09 ... +0.8			
		[bar]	−0.9 ... +8			
		[psi]	−13.05 ... +116			
	Reversible	[MPa]	−0.09 ... +0.1			
		[bar]	−0.9 ... +1			
		[psi]	−13.05 ... +14.5			
Electrical data					With fast-switching electronics	Without fast-switching electronics
Electrical connection					Plug, 2-pin or cable	
Operating voltage	[V DC]	24				
Permissible voltage fluctuations	[%]	±10				
Power consumption	[W]	6.5 for approx. 4.5 ms (high-current phase, inrush current 1 A)			3.7	
	[W]	1.6 (low-current phase)			–	
Reverse polarity protection		Bipolar			–	
Duty cycle	[%]	100			100	
Additional functions		Spark arresting			–	
		Holding current reduction			–	
		Protective circuit			–	
Degree of protection to EN 60529		IP65			IP65	
Switching times and frequencies					With fast-switching electronics	Without fast-switching electronics
Switching time	On	[ms]	2.3		8.3	
	Off	[ms]	2.8		4.5	
Tolerance for switching time	On	[%]	+10 ... −30		–	
	Off	[%]	+10 ... −50		–	
Switching time variation from 1 Hz upwards	[ms]	0.2			–	
Maximum switching frequency	[Hz]	280			130	
Materials						
Housing					Die-cast zinc, coated	
Cable sheath					PUR	
Seals					HNBR, NBR	
Screws					Galvanised steel	
Note on materials					RoHs-compliant	
LABS (PWIS) conformity					VDMA24364-B1/B2-L	

Datasheet – Individual valve

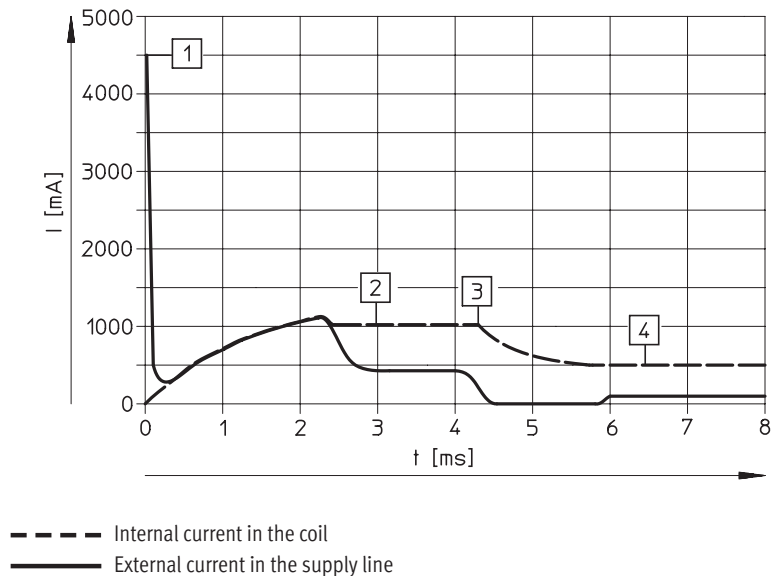
Restricted ambient temperature and temperature of medium as a function of switching frequency



- [1] Valve manifold assembly, 6 valves, unpressurised
- [2] Valve manifold assembly, 6 valves, through-flow, 0.6 MPa
- [3] Individual valve, unpressurised

No restrictions for individual valve, through-flow, 0.6 MPa.

Current curve for valves with fast-switching electronics (MHE3-MS1H)



- [1] Capacitor charging
- [2] Controlled coil current 1 A
- [3] Holding current reduction
- [4] Controlled holding current 0.5 A

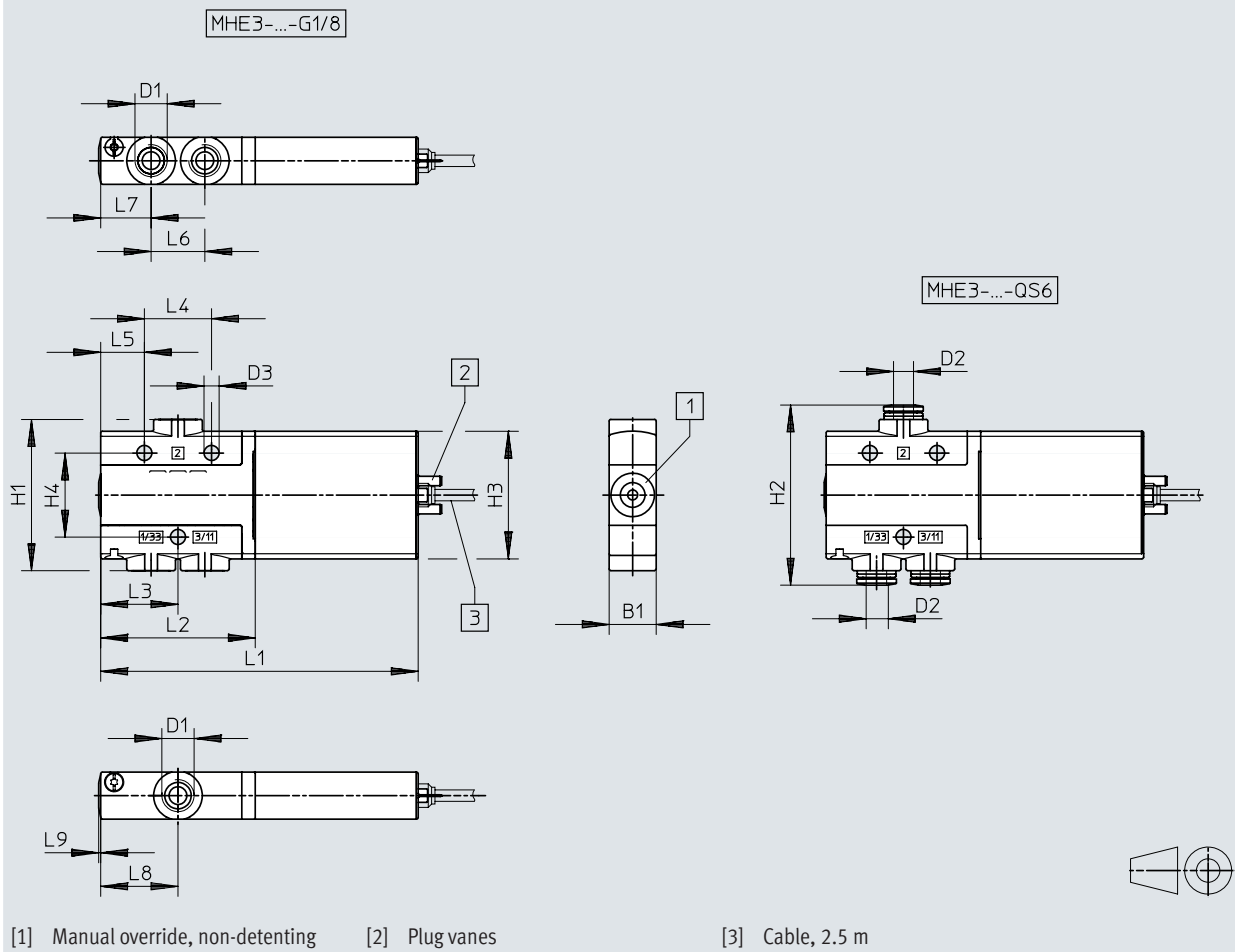
--- Internal current in the coil
 — External current in the supply line

Datasheet – Individual valve

Dimensions

Download CAD data → www.festo.com

Valve with plug vanes or moulded-in cable



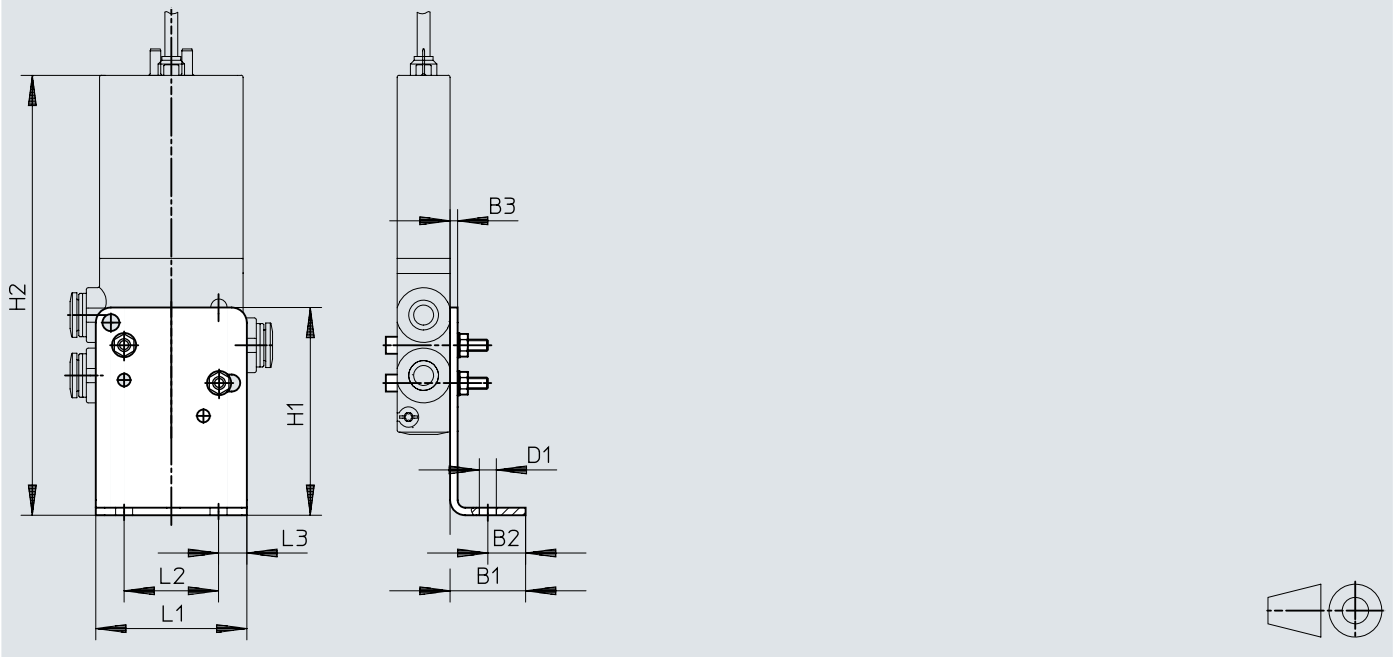
Type	B1	D1	D2 Ø	D3 Ø	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7	L8	L9
MHE3-...-1/8-...	14	G1/8	–	4.5	45	–	38	25	94.5	46	23	20	13	16	15	23	0.6
MHE3-...-QS-6-...	14	–	6	4.5	45	51	38	25	94.5	46	23	20	13	16	15	23	0.6

Datasheet – Individual valve

Dimensions

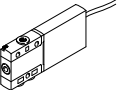
Download CAD data → www.festo.com

Mounting bracket MHE2-BG-L

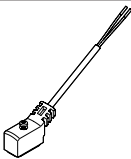
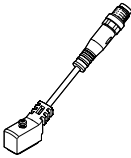
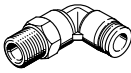


Type	B1	B2	B3	D1	H1	H2	L1	L2	L3
MHE2-BG-L	20	10	2	4.5	55	113.3	40	25	7.5

Datasheet – Individual valve

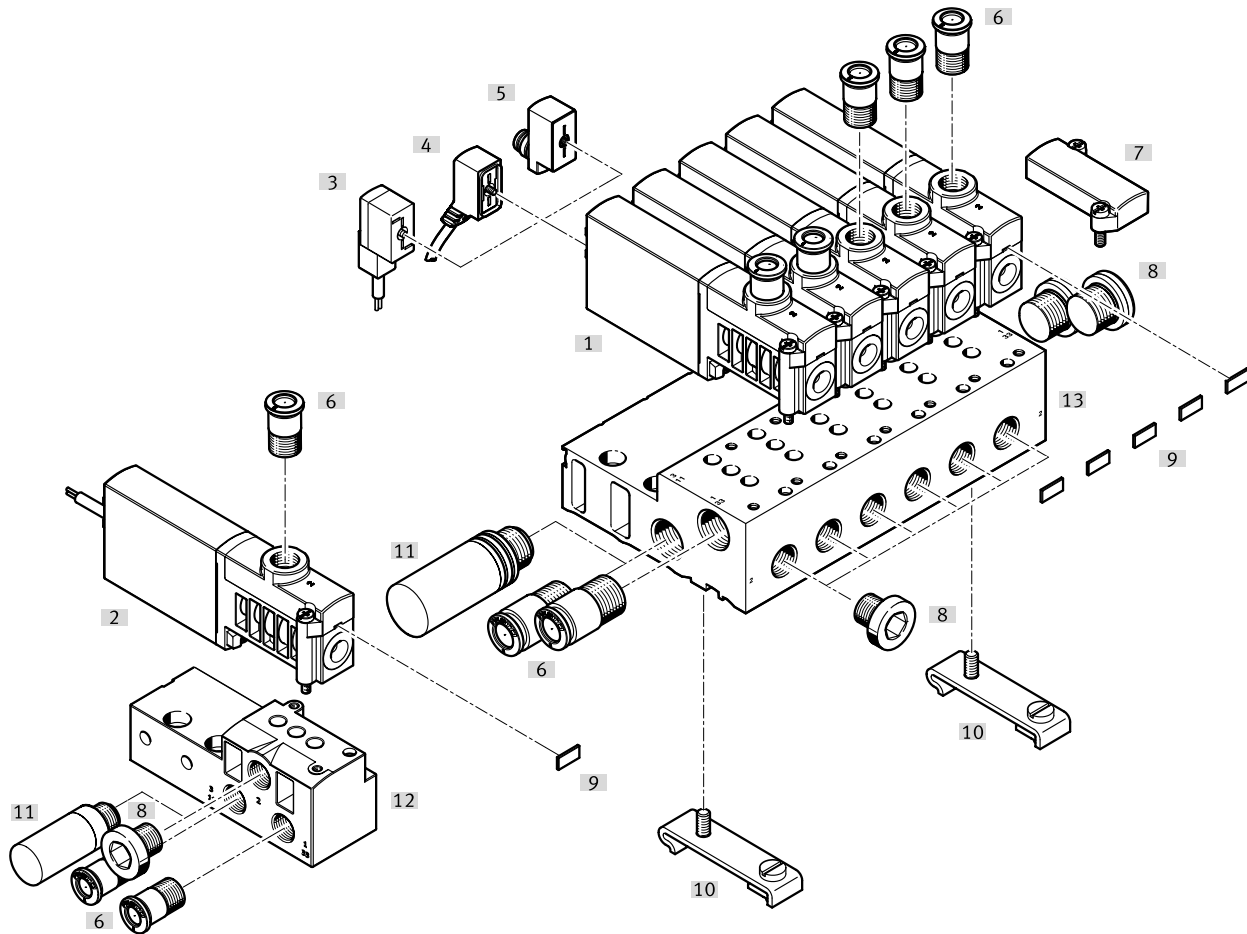
Ordering data					Part no.	Type
Valves						
	Electrical connection: plug, 2-pin	With fast-switching electronics, switching time 2.3 ms	Pneumatic connection: thread G1/8	Normally open	525167	MHE3-MS1H-3/20-1/8
				Normally closed	525147	MHE3-MS1H-3/2G-1/8
			Pneumatic connection: push-in connector for tubing O.D. 6 mm	Normally open	525171	MHE3-MS1H-3/20-QS-6
				Normally closed	525151	MHE3-MS1H-3/2G-QS-6
		Without fast-switching electronics, switching time 8.3 ms	Pneumatic connection: thread G1/8	Normally open	525166	MHE3-M1H-3/20-1/8
				Normally closed	525146	MHE3-M1H-3/2G-1/8
			Pneumatic connection: push-in connector for tubing O.D. 6 mm	Normally open	525170	MHE3-M1H-3/20-QS-6
				Normally closed	525150	MHE3-M1H-3/2G-QS-6
	Electrical connection: cable	With fast-switching electronics, switching time 2.3 ms	Pneumatic connection: thread G1/8	Normally open	525169	MHE3-MS1H-3/20-1/8-K
				Normally closed	525149	MHE3-MS1H-3/2G-1/8-K
			Pneumatic connection: push-in connector for tubing O.D. 6 mm	Normally closed	525153	MHE3-MS1H-3/2G-QS-6-K
		Without fast-switching electronics, switching time 8.3 ms	Pneumatic connection: thread G1/8	Normally open	525168	MHE3-M1H-3/20-1/8-K
				Normally closed	525148	MHE3-M1H-3/2G-1/8-K
			Pneumatic connection: push-in connector for tubing O.D. 6 mm	Normally closed	525152	MHE3-M1H-3/2G-QS-6-K

Datasheet – Individual valve

Ordering data					Part no.	Type
Connecting cable (for valves with 2-pin plug)					Datasheets → Internet: nebv	
	2-pin socket, open cable end 2-core	PUR cable, degree of protection IP65	Signal status indication with LED	Length 2.5 m	8047671	NEBV-Z4WA2L-P-E-2.5-N-LE2-S1
				Length 5 m	8047672	NEBV-Z4WA2L-P-E-5-N-LE2-S1
				Length 10 m	8047670	NEBV-Z4WA2L-P-E-10-N-LE2-S1
	2-pin socket, plug M8x1 3-pin	PVC cable, degree of protection IP40	Without signal status indication	Length 0.5 m	193690	KMYZ-4-24-0.5-B
				Length 2.5 m	193691	KMYZ-4-24-2.5-B
				Length 0.5 m	8047673	NEBV-Z4WA2L-P-E-0.5-N-M8G3-S1
				Length 2.5 m	8047674	NEBV-Z4WA2L-P-E-2.5-N-M8G3-S1
Adapter (for valves with 2-pin plug)						
	2-pin socket	Signal status indication with LED	Plug M8, 3-pin	571686	VAVE-C8-1R8	
			Plug M8, 4-pin	573194	VAVE-C8-1R1	
Wall mounting						
	Mounting bracket			196165	MHE2-BG-L	
Silencer						
	Push-in sleeve with O.D. 6 mm			Pack of 1	165007	UC-QS-6H
	With threaded connection G1/8			Pack of 1	161419	UC-1/8
				Pack of 50	534219	UC-1/8-50
Push-in fitting						
	Male thread G1/8 with external hex for tubing O.D.	6 mm	Pack of 10	186096	QS-G1/8-6	
			Pack of 100	132037	QS-G1/8-6-100	
		8 mm	Pack of 10	186098	QS-G1/8-8	
			Pack of 50	132038	QS-G1/8-8-50	
	Male thread G1/8 with external hex, push-in L-fitting, rotatable 360°, for tubing O.D.	6 mm	Pack of 10	186117	QSL-G1/8-6	
			Pack of 100	132049	QSL-G1/8-6-100	
		8 mm	Pack of 10	186119	QSL-G1/8-8	
			Pack of 50	132050	QSL-G1/8-8-50	

Peripherals overview – Semi in-line valve

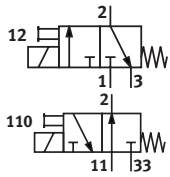
Connection with plug vanes – Connection with moulded-in cable



Designation	Type	Description	→ Page/Internet
[1] Semi-in-line valve	MHP3	With plug vanes	73
[2] Semi-in-line valve	MHP3-...-K	With moulded-in cable, IP65	73
[3] Plug socket with cable	KMYZ-4	PVC cable, without signal status indication, IP50	73
[4] Connecting cable	NEBV	PUR cable, signal status indication with LED, IP65	73
[5] Adapter	VAVE-C8	For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65	73
[6] Push-in fittings	QS	For connecting tubing with standard O.D.	74
[7] Cover plate	MHAP3-BP-3	For sealing vacant positions	73
[8] Blanking plug	B	For sealing unused ports	74
[9] Inscription labels	MH-BZ-80X	For identifying the valves	74
[10] DIN rail mounting	CPV10/14-VI-BG-NRH-35	For mounting the manifold block on DIN rails to EN 60715	74
[11] Silencer	UC	For fitting in exhaust ports	74
[12] Individual sub-base	MHA3-AS-3-1/8	For semi in-line valves; the individual sub-base is also used for sub-base valves and must be sealed with a blanking plug here	73
[13] Manifold block	MHA3-PR	For semi in-line valves	73

Datasheet – Semi in-line valve

Function



-  - Voltage
24 V DC
-  - Pressure
-0.09 ... +0.8 MPa
-  - Temperature range
-5 ... +40 °C



General technical data

Valve function	3/2, single solenoid ¹⁾
Design	Pressure relief poppet valve
Overlap	Negative overlap
Sealing principle	Soft
Reset method	Mechanical spring
Actuation type	Electrical
Type of control	Direct
Flow direction	Reversible with restrictions ²⁾
Exhaust air function	Can be throttled
Manual override	Non-detenting
Mounting position	Any
Width	[mm] 14
Grid dimension	[mm] 19
Note on grid dimension	Minimum distance between the valves is 5 mm
Nominal width	[mm] 3
Standard nominal flow rate	[l/min] 200
Type of mounting	On PR rail
Pneumatic connection	2 1, 11, 3, 33
	Connecting thread G1/8, push-in connector for tubing O.D. 6 mm
	Sub-base
Product weight	[g] 120

1) Can be used as a 2/2-way valve by sealing port 3 or 33

2) Slight leakage can occur in the pressure range -0.8 bar to +0.5 bar.

Datasheet – Semi in-line valve

Operating and environmental conditions			With fast-switching electronics	Without fast-switching electronics
Operating medium			Compressed air to ISO 8573-1:2010 [7:4:4]	
Note on the operating/pilot medium			Lubricated operation possible (in which case lubricated operation will always be required)	
Operating pressure	Reversible	[MPa]	−0.09 ... +0.8	
		[bar]	−0.9 ... +8	
		[psi]	−13.05 ... +116	
		[MPa]	−0.09 ... +0.1	
		[bar]	−0.9 ... +1	
		[psi]	−13.05 ... +14.5	
Ambient temperature		[°C]	−5 ... +40	
Temperature of medium		[°C]	−5 ... +40	
Restricted ambient temperature and temperature of medium			As a function of switching frequency	–
Corrosion resistance class CRC ¹⁾			2	2
CE marking (see declaration of conformity) ³⁾			To EU EMC Directive ²⁾	–
			To EU RoHS Directive	–
UKCA marking (see declaration of conformity) ³⁾			To UK EMC regulations	–
			To UK RoHS regulations	–
Certification			c UL us - Recognized (OL)	c UL us - Recognized (OL)
			RCM	–
Cleanroom class			Class 6 to ISO 14644-1	
Shock resistance			Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27	
Vibration resistant			Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6	

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

2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/mh2 → Support/Downloads.

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

3) More information www.festo.com/catalogue/... → Support/Downloads.

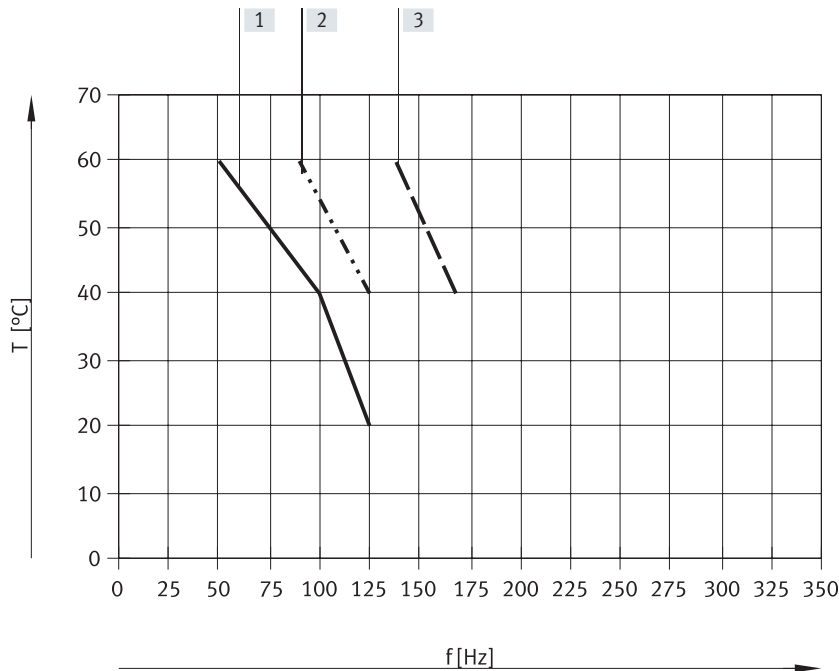
Electrical data		With fast-switching electronics	Without fast-switching electronics
Electrical connection		Plug, 2-pin or cable	
Operating voltage	[V DC]	24	
Permissible voltage fluctuations	[%]	±10	
Power consumption	[W]	6.5 (high-current phase)	3.7
	[W]	1.6 (low-current phase)	–
Reverse polarity protection		Bipolar	–
Duty cycle	[%]	100	100
Additional functions		Spark arresting	–
		Holding current reduction	–
		Protective circuit	–
Degree of protection to EN 60529		IP65	IP65

Switching times and frequencies			With fast-switching electronics	Without fast-switching electronics
Switching time	On	[ms]	2.3	8.3
	Off	[ms]	2.8	4.5
Tolerance for switching time	On	[%]	+10 ... -30	–
	Off	[%]	+10 ... -50	–
Switching time variation from 1 Hz upwards		[ms]	0.2	–
Maximum switching frequency		[Hz]	280	130

Materials	
Housing	Die-cast zinc, coated
Cable sheath	PUR
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	RoHS-compliant
LABS (PWIS) conformity	VDMA24364-B1/B2-L

Datasheet – Semi in-line valve

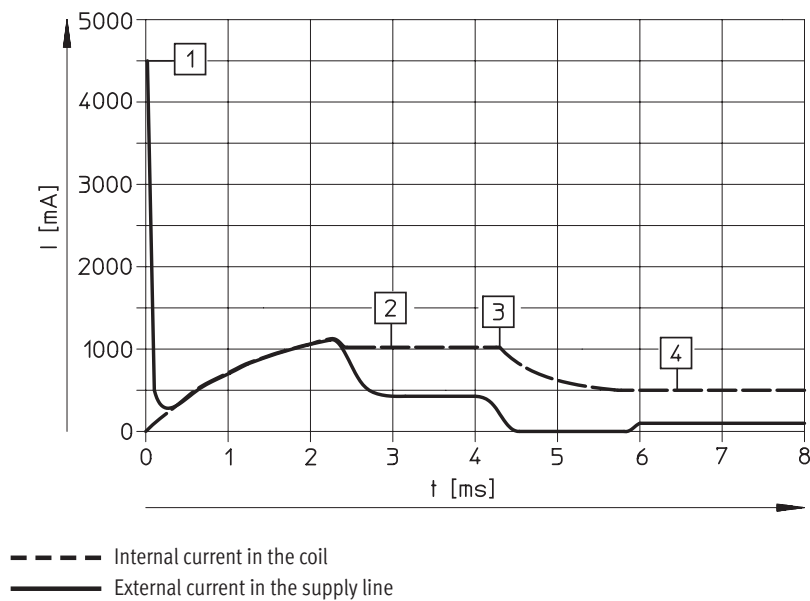
Restricted ambient temperature and temperature of medium as a function of switching frequency



- [1] Valve manifold assembly, 6 valves, unpressurised
- [2] Valve manifold assembly, 6 valves, through-flow, 0.6 MPa
- [3] Individual valve, unpressurised

No restrictions for individual valve, through-flow, 0.6 MPa.

Current curve for valves with fast-switching electronics (MHP3-MS1H)



- [1] Capacitor charging
- [2] Controlled coil current 1 A
- [3] Holding current reduction
- [4] Controlled holding current 0.5 A

--- Internal current in the coil
 — External current in the supply line

Datasheet – Semi in-line valve

Dimensions

Download CAD data → www.festo.com

Valve with connecting thread G1/8

Valve with push-in connector for tubing O.D. 6 mm

MHP3-...-G1/8

MHP3-...-QS6

[1] Manual override, non-detenting [2] Plug vanes [3] Cable, 2.5 m

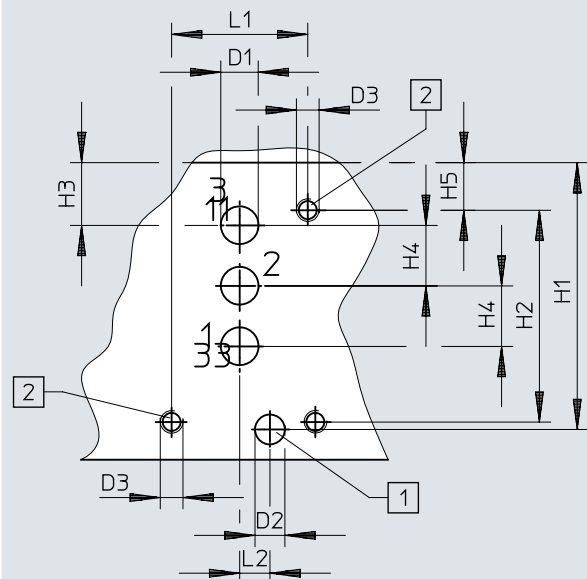
Type	B1	D1	D2 Ø	H1	H2	H3	H4	L1	L2	L3	L9
MHP3-...-3/2...	14	G1/8	6	38	28	3.5	7.8	94.5	42	23	0.6

Datasheet – Semi in-line valve

Dimensions

Download CAD data → www.festo.com

Hole pattern on sub-bases



[1] Hole for coding pin, 2mm deep

[2] Mounting thread, 8 mm deep

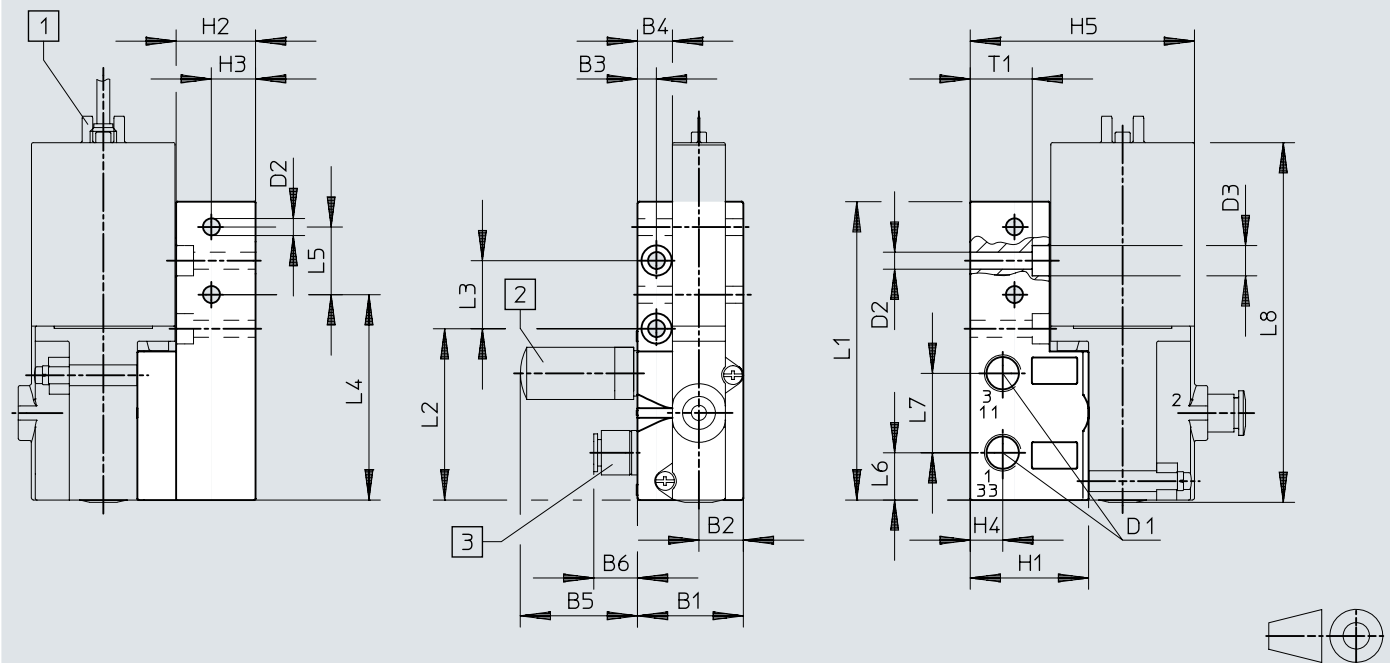
**Note**

With semi in-line valves, port 2 is not used.

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

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

Individual sub-base, MHA3-AS-3-1/8



[1] Plug pins

[2] Silencer

[3] Push-in fitting

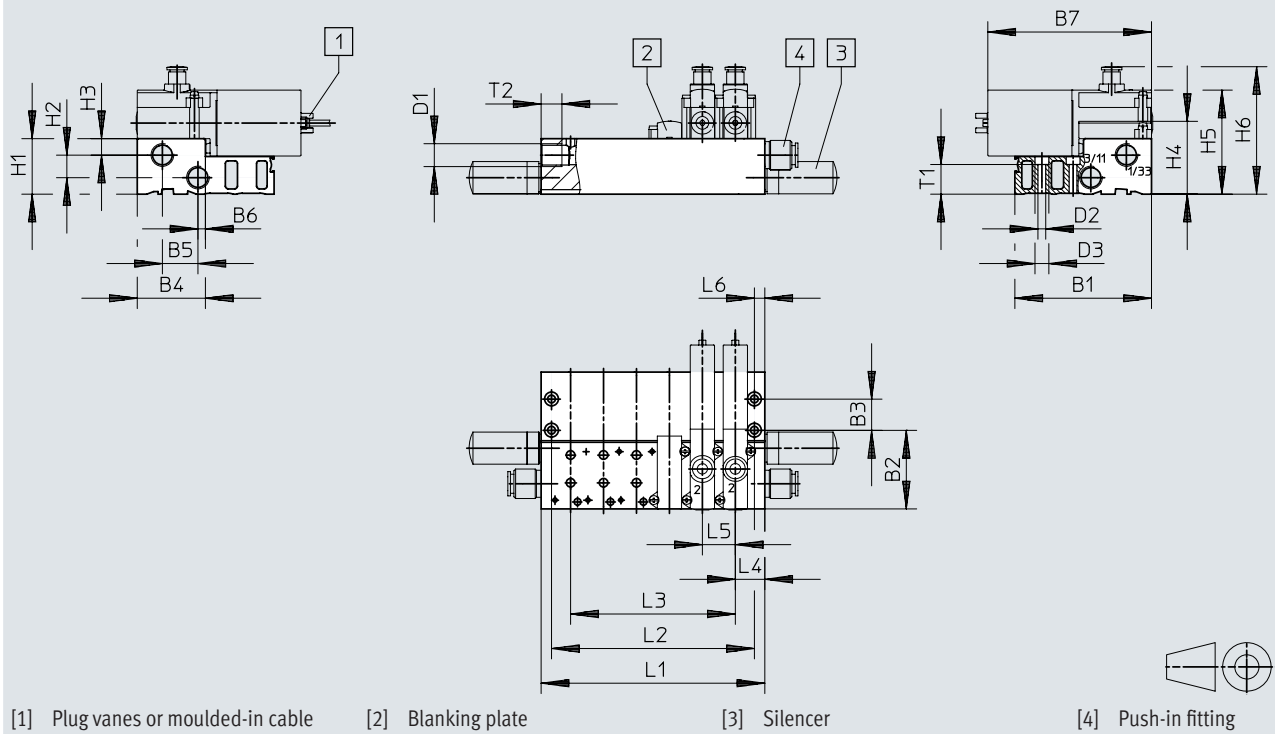
Type	B1	B2	B3	B4	B5	B6	D1	D2 Ø	D3 Ø	H1	H2	H3	H4	H5
Hole pattern	–	–	–	–	–	–	5	4	M3	35.3	28	8.3	8	6.3
MHA3-AS-3-1/8	28	11.8	5	9.3	31.5	13.3	G1/8	4.5	8	31.3	21	11.7	8.6	59.3

Type	L1	L2	L3	L4	L5	L6	L7	L8	T1
Hole pattern	18	4	–	–	–	–	–	–	–
MHA3-AS-3-1/8	78.9	45.3	18	54.3	17.9	12.5	21	95	16.4

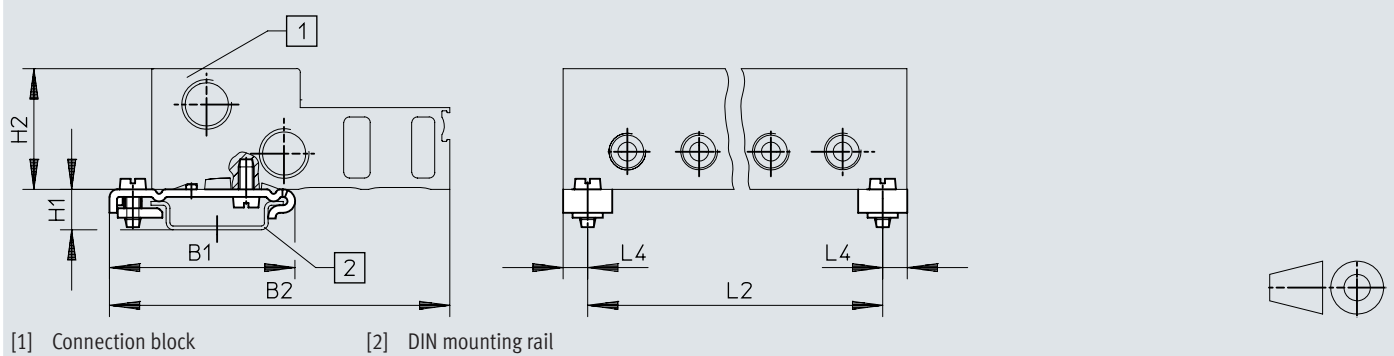
Datasheet – Semi in-line valve

Dimensions Download CAD data → www.festo.com

Manifold assembly, MHA3-PR...-1/8



DIN rail attachment CPV10/14-VI-BG-NRH-35

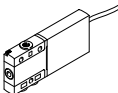
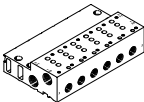
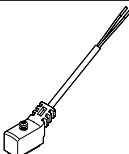
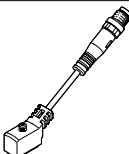


Type	B1	B2	B3	B4	B5	B6	B7	D1	D2 ø	D3 ø	H1	H2	H3	H4	H5	H6	L4	L5	L6	T1	T2
MHA3-PR...-1/8	79	45.3	18	39.3	20.5	4.3	94.5	G1/4	4.5	8	32	13	9.5	42	60	73.5	17	19	6	17.1	12
CPV10/14-VI-BG...	49.1	90	–	–	–	–	–	–	–	–	10.7	32	–	–	–	–	6.5	–	–	–	–

Type	Number of valve positions				
	2	4	6	8	10
MHA3-PR...-1/8	L1	53	91	129	205
	L2	41	79	117	193
	L3	19	57	95	171
CPV10/14-VI-BG...	L2	40	78	116	192

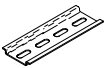
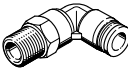
 **Note**
Valve types 3/2G and 3/2O must not be mixed on one manifold block.

Datasheet – Semi in-line valve

Ordering data					Part no.	Type
Valves						
	Electrical connection: plug, 2-pin	With fast-switching electronics, switch- ing time 2.3 ms	Pneumatic connection: thread G1/8	Normally open	525159	MHP3-MS1H-3/20-1/8
				Normally closed	525139	MHP3-MS1H-3/2G-1/8
			Pneumatic connection: push- in connector for tubing O.D. 6 mm	Normally closed	525143	MHP3-MS1H-3/2G-QS-6
		Without fast-switch- ing electronics, switching time 8.3 ms	Pneumatic connection: thread G1/8	Normally open	525158	MHP3-M1H-3/20-1/8
				Normally closed	525138	MHP3-M1H-3/2G-1/8
			Pneumatic connection: push- in connector for tubing O.D. 6 mm	Normally closed	525142	MHP3-M1H-3/2G-QS-6
	Electrical connection: cable	With fast-switching electronics, switch- ing time 2.3 ms	Pneumatic connection: push- in connector for tubing O.D. 6 mm	Normally closed	525145	MHP3-MS1H-3/2G-QS-6-K
Manifold rail						
	Individual sub-base1) Pneumatic connection: thread G1/8			1 valve position	525214	MHA3-AS-3-1/8
	Manifold block1) Pneumatic connection 1, 11, 3, 33: thread G1/4 Pneumatic connection 2: thread G1/8			2 valve positions	525221	MHA3-PR2-3-1/8
				4 valve positions	525222	MHA3-PR4-3-1/8
				6 valve positions	525223	MHA3-PR6-3-1/8
				8 valve positions	525224	MHA3-PR8-3-1/8
				10 valve positions	525225	MHA3-PR10-3-1/8
Cover plate						
	Vacant valve positions must be sealed with a cover plate.				525226	MHAP3-BP-3
Connecting cable (for valves with 2-pin plug) Datasheets → Internet: nebv						
	2-pin socket, open cable end, 2-core	PUR cable, degree of protection IP65	Signal status indication with LED	Length 2.5 m	8047671	NEBV-Z4WA2L-P-E-2.5-N-LE2-S1
				Length 5 m	8047672	NEBV-Z4WA2L-P-E-5-N-LE2-S1
				Length 10 m	8047670	NEBV-Z4WA2L-P-E-10-N-LE2-S1
		PVC cable, degree of protection IP40	Without signal status indica- tion	Length 0.5 m	193690	KMYZ-4-24-0.5-B
				Length 2.5 m	193691	KMYZ-4-24-2.5-B
	2-pin socket, plug M8x1 3-pin	PUR cable, degree of protection IP65	Signal status indication with LED	Length 0.5 m	8047673	NEBV-Z4WA2L-P-E-0.5-N-M8G3-S1
				Length 2.5 m	8047674	NEBV-Z4WA2L-P-E-2.5-N-M8G3-S1
Adapter (for valves with 2-pin plug)						
	2-pin socket	Signal status indica- tion with LED	Plug M8, 3-pin	571686	VAVE-C8-1R8	
			Plug M8, 4-pin	573194	VAVE-C8-1R1	

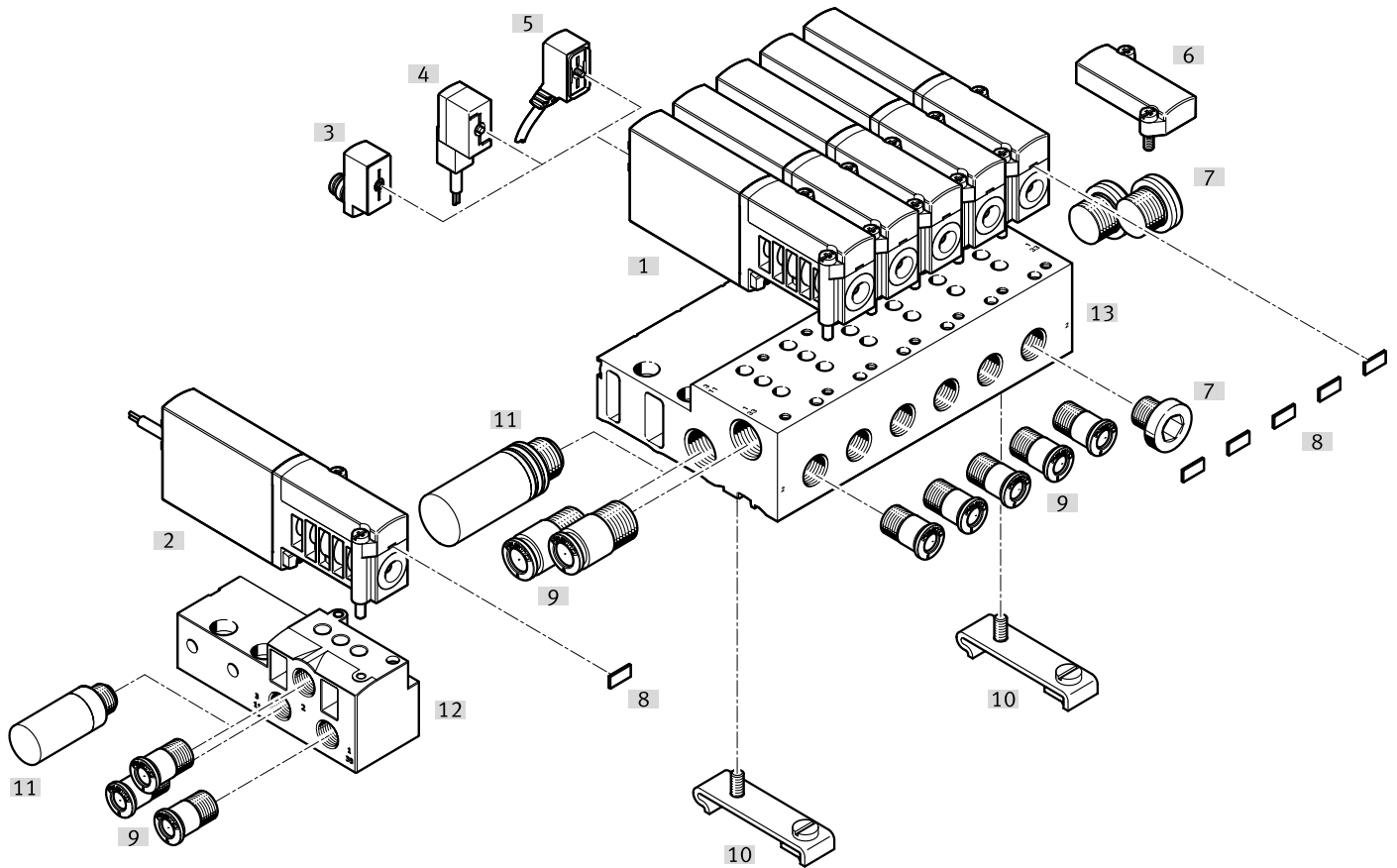
1) Seal port 2 with a blanking plug. These ports have no function when using semi in-line valves.

Datasheet – Semi in-line valve

Ordering data				Part no.	Type			
DIN rail mounting								
	For manifold block			162556	CPV10/14-VI-BG-NRH-35			
DIN rail								
	To EN 60715	2 m	35430	NRH-35-2000				
Silencer								
	Push-in sleeve with O.D. 6 mm		Pack of 1	165007	UC-QS-6H			
	With threaded connection	G1/8	Pack of 1	161419	UC-1/8			
			Pack of 50	534219	UC-1/8-50			
		G1/4	Pack of 1	165004	UC-1/4			
			Pack of 20	534220	UC-1/4-20			
Push-in fitting								
	Male thread G1/8 with external hex for tubing O.D.	6 mm	Pack of 10	186096	QS-G1/8-6			
			Pack of 100	132037	QS-G1/8-6-100			
		8 mm	Pack of 10	186098	QS-G1/8-8			
			Pack of 50	132038	QS-G1/8-8-50			
	Male thread G1/4 with external hex for tubing O.D.	8 mm	Pack of 10	186099	QS-G1/4-8			
			Pack of 50	132040	QS-G1/4-8-50			
		10 mm	Pack of 10	186101	QS-G1/4-10			
			Pack of 50	132041	QS-G1/4-10-50			
				Male thread G1/8 with external hex, push-in L-fitting, rotatable 360°, for tubing O.D.	6 mm	Pack of 10	186117	QSL-G1/8-6
						Pack of 100	132049	QSL-G1/8-6-100
8 mm	Pack of 10	186119			QSL-G1/8-8			
	Pack of 50	132050			QSL-G1/8-8-50			
Male thread G1/4 with external hex, push-in L-fitting, rotatable 360°, for tubing O.D.	8 mm	Pack of 10		186120	QSL-G1/4-8			
		Pack of 50		132052	QSL-G1/4-8-50			
	10 mm	Pack of 10		186122	QSL-G1/4-10			
		Pack of 50		132053	QSL-G1/4-10-50			
Blanking plug								
	For G1/8 thread		Pack of 10	3568	B-1/8			
	For G1/4 thread		Pack of 10	3569	B-1/4			
Inscription label								
	For solenoid valve		80 pieces in a frame	197259	MH-BZ-80X			

Peripherals overview – Sub-base valve

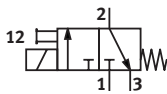
Connection with plug vanes – Connection with moulded-in cable



Designation	Type	Description	→ Page/Internet
[1] Sub-base valve	MHA3	With plug vanes	82
[2] Sub-base valve	MHA3-...-K	With moulded-in cable, IP65	82
[3] Adapter	VAVE-C8	For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65	82
[4] Plug socket with cable	KMYZ-4	PVC cable, without signal status indication, IP50	82
[5] Connecting cable	NEBV	PUR cable, signal status indication with LED, IP65	82
[6] Cover plate	MHAP3-BP-3	For sealing vacant positions	82
[7] Blanking plug	B	For sealing unused ports	83
[8] Inscription labels	MH-BZ-80X	For identifying the valves	83
[9] Push-in fittings	QS	For connecting tubing with standard O.D.	83
[10] DIN rail mounting	CPV10/14-VI-BG-NRH-35	For mounting the manifold block on DIN rails to EN 60715	83
[11] Silencer	UC	For fitting in exhaust ports	83
[12] Individual sub-base	MHA3-AS-3-1/8	For sub-base valve	82
[13] Manifold block	MHA3-PR...-3-1/8	For sub-base valve	82

Datasheet – Sub-base valve

Function



-  Voltage
24 V DC
-  Pressure
–0.09 ... +0.8 MPa
-  Temperature range
–5 ... +40 °C



General technical data		
Valve function		3/2, single solenoid ¹⁾
Design		Pressure relief poppet valve
Overlap		Negative overlap
Sealing principle		Soft
Reset method		Mechanical spring
Actuation type		Electrical
Type of control		Direct
Flow direction		Reversible with restrictions ²⁾
Exhaust air function		Can be throttled
Manual override		Non-detenting
Mounting position		Any
Width	[mm]	14
Grid dimension	[mm]	19
Note on grid dimension		Minimum distance between the valves is 5 mm
Nominal width	[mm]	3
Standard nominal flow rate	[l/min]	200
Type of mounting		On PR rail, via through-hole
Pneumatic connection		Sub-base
Product weight	[g]	120

1) Can be used as a 2/2-way valve by sealing port 3 or 33
2) Slight leakage can occur in the pressure range –0.8 bar to +0.5 bar.

Datasheet – Sub-base valve

Operating and environmental conditions		With fast-switching electronics	Without fast-switching electronics	
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Note on the operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)		
Operating pressure	[MPa]	-0.09 ... +0.8		
	[bar]	-0.9 ... +8		
	[psi]	-13.05 ... +116		
	Reversible	[MPa]	-0.09 ... +0.1	
		[bar]	-0.9 ... +1	
		[psi]	-13.05 ... +14.5	
Ambient temperature	[°C]	-5 ... +40		
Temperature of medium	[°C]	-5 ... +40		
Restricted ambient temperature and temperature of medium		As a function of switching frequency	–	
Corrosion resistance class CRC ¹⁾		2	2	
CE marking (see declaration of conformity) ³⁾		To EU EMC Directive ²⁾	–	
		To EU RoHS Directive	–	
UKCA marking (see declaration of conformity) ³⁾		To UK EMC regulations	–	
		To UK RoHS regulations	–	
Certification	c UL us - Recognized (OL)		c UL us - Recognized (OL)	
	RCM		–	
Cleanroom class		Class 6 to ISO 14644-1		
Shock resistance		Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27		
Vibration resistant		Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6		

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

2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/mh2 → Support/Downloads.

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

3) More information www.festo.com/catalogue/... → Support/Downloads.

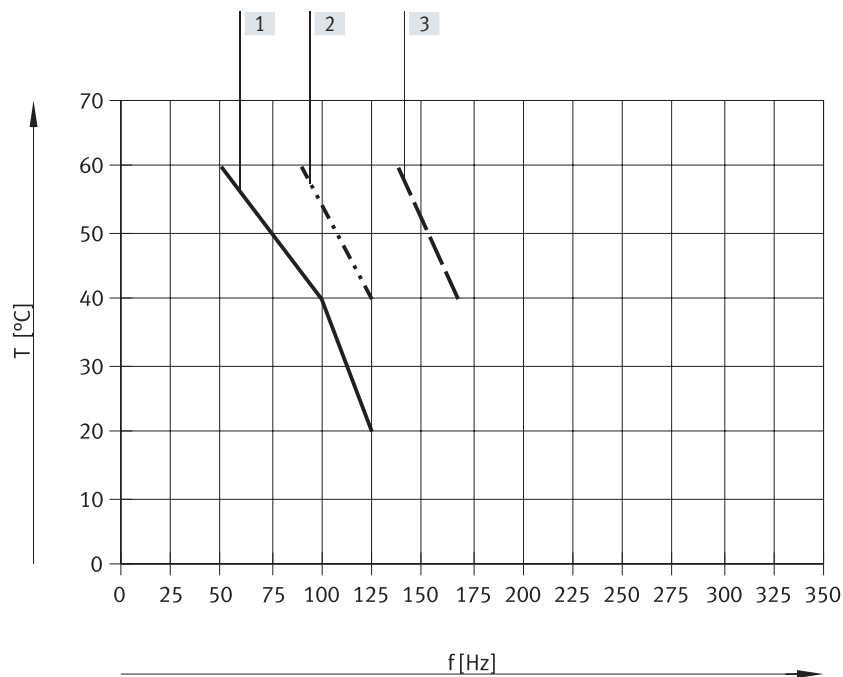
Electrical data		With fast-switching electronics	Without fast-switching electronics
Electrical connection		Plug, 2-pin or cable	
Operating voltage		[V DC]	24
Permissible voltage fluctuations		[%]	±10
Power consumption	[W]	6.5 for approx. 4.5 ms (high-current phase, inrush current 1 A)	3.7
	[W]	1.6 (low-current phase)	–
Reverse polarity protection		Bipolar	
Duty cycle		[%]	100
Additional functions		Spark arresting	
		Holding current reduction	
		Protective circuit	
Degree of protection to EN 60529		IP65	

Switching times and frequencies		With fast-switching electronics	Without fast-switching electronics
Switching time	On [ms]	2.3	8.3
	Off [ms]	2.8	4.5
Tolerance for switching time	On [%]	+10 ... -30	–
	Off [%]	+10 ... -50	–
Switching time variation from 1 Hz upwards		[ms]	0.2
Maximum switching frequency		[Hz]	280

Materials	
Housing	Die-cast zinc, coated
Cable sheath	PUR
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	RoHS-compliant
LABS (PWIS) conformity	VDMA24364-B1/B2-L

Datasheet – Sub-base valve

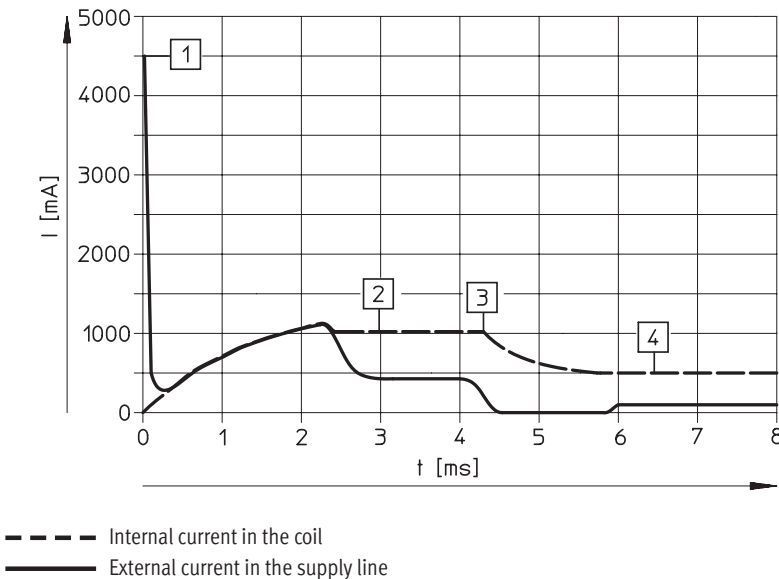
Restricted ambient temperature and temperature of medium as a function of switching frequency



- [1] Valve manifold assembly, 6 valves, unpressurised
- [2] Valve manifold assembly, 6 valves, through-flow, 0.6 MPa
- [3] Individual valve, unpressurised

No restrictions for individual valve, through-flow, 0.6 MPa.

Current curve for valves with fast-switching electronics (MHA3-MS1H)



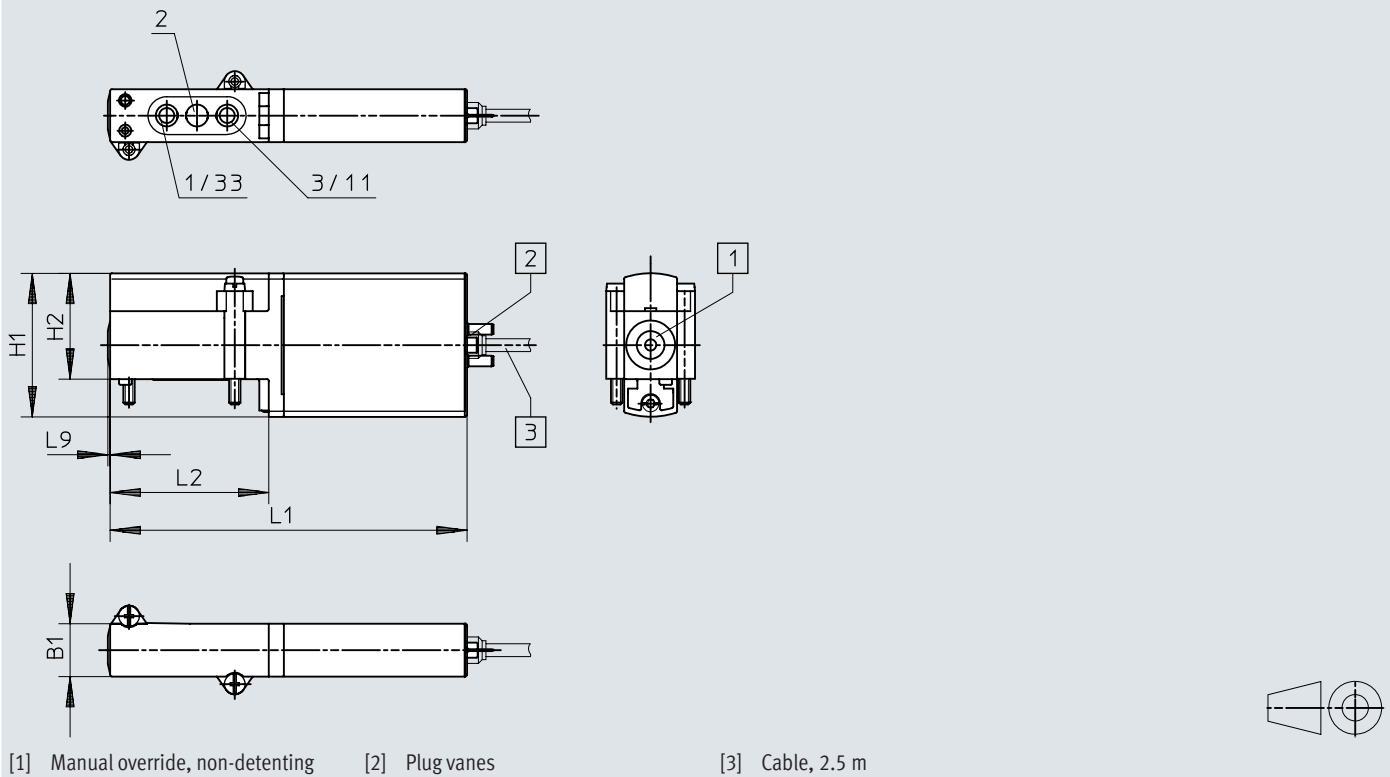
- [1] Capacitor charging
- [2] Controlled coil current 1 A
- [3] Holding current reduction
- [4] Controlled holding current 0.5 A

Datasheet – Sub-base valve

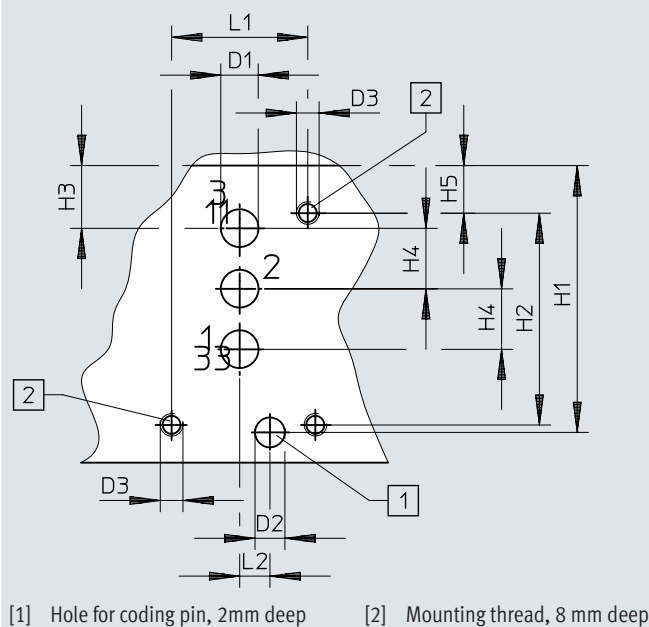
Dimensions

Download CAD data → www.festo.com

Valve with plug vanes or moulded-in cable, MHA3-...-3/2G...

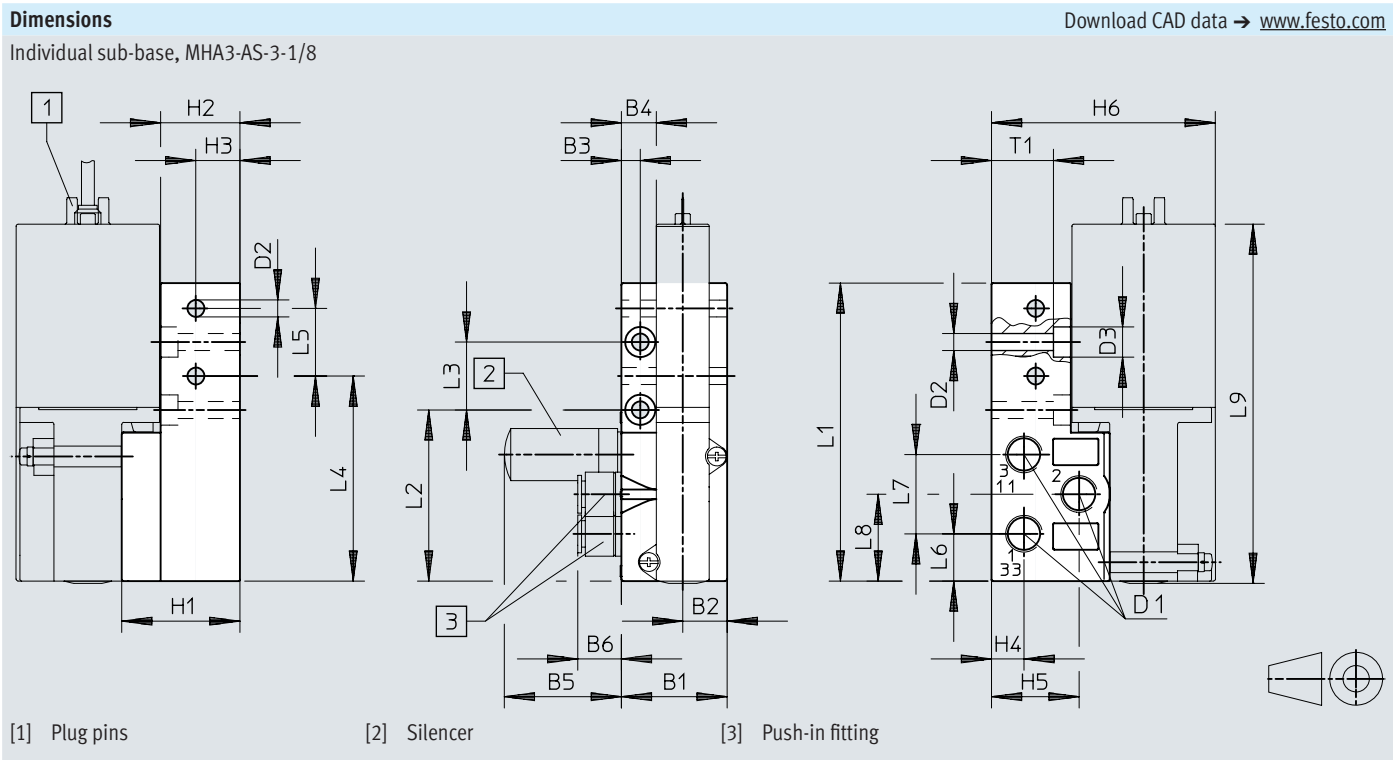


Hole pattern on sub-bases



Type	B1	D1	D2 Ø	D3 Ø	H1	H2	H3	H4	H5	L1	L2	L9
MHA3-...-3/2G...	14	–	–	–	38	28	–	–	–	94.5	42	0.6
Hole pattern	–	5	4	M3	35.3	28	8.3	8	6.3	18	4	–

Datasheet – Sub-base valve



Type	B1	B2	B3	B4	B5	B6	D1	D2 Ø	D3 Ø	H1	H2	H3	H4	H5	H6
MHA3-AS-3-1/8	28	11.8	5	9.3	31.5	13.3	G1/8	4.5	8	31.3	21	11.7	8.6	23.2	59.3

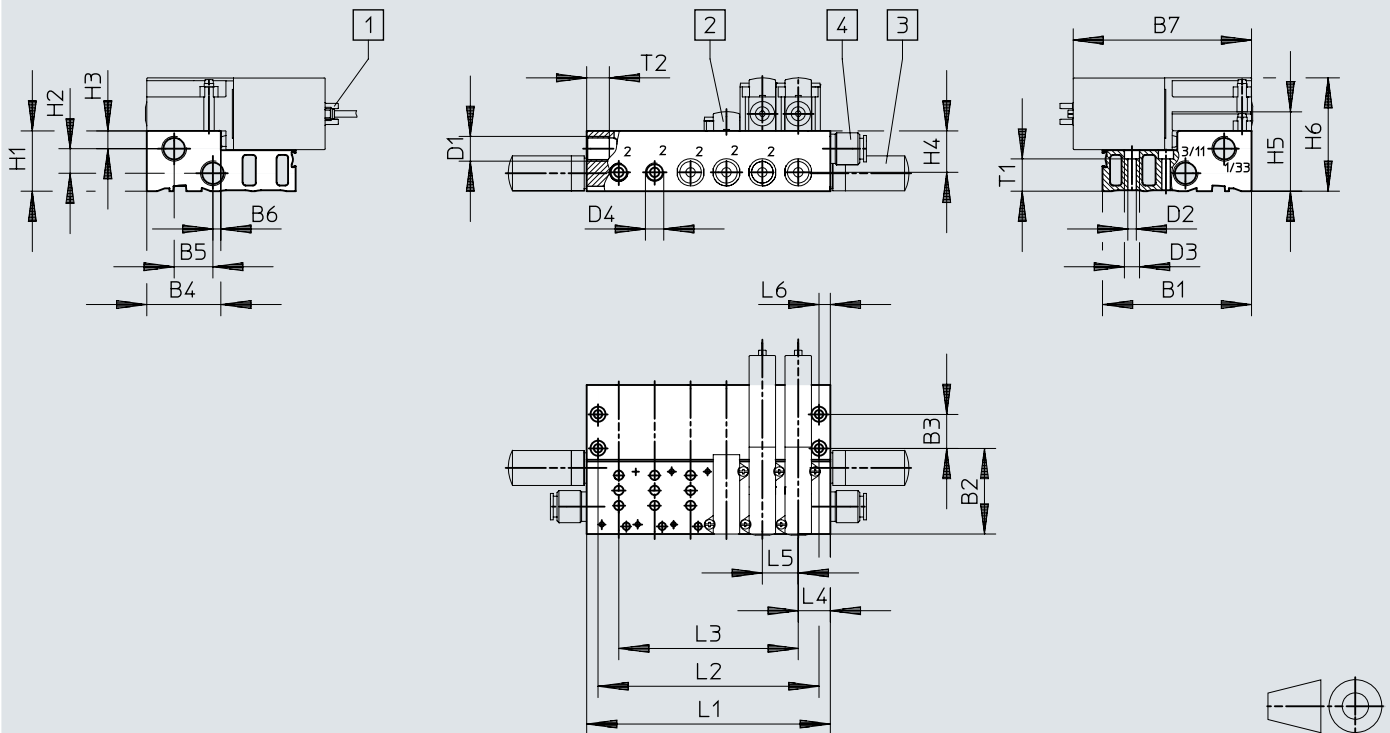
Type	L1	L2	L3	L4	L5	L6	L7	L8	L9	T1
MHA3-AS-3-1/8	78.9	45.3	18	54.3	17.9	12.5	21	23	95	16.4

Datasheet – Sub-base valve

Dimensions

Download CAD data → www.festo.com

Manifold assembly, MHA3-PR...-1/8



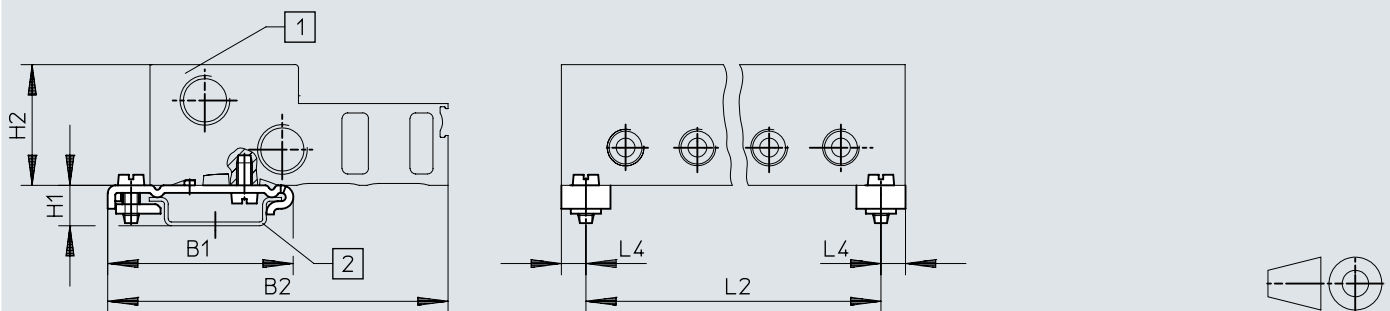
[1] Plug vanes or moulded-in cable

[2] Blanking plate

[3] Silencer

[4] Push-in fitting

DIN rail attachment CPV10/14-VI-BG-NRH-35



[1] Connection block

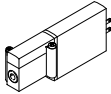
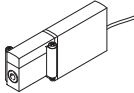
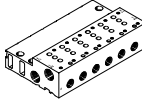
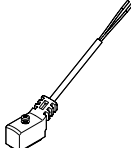
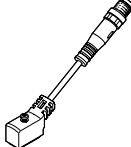
[2] DIN mounting rail

Type	B1	B2	B3	B4	B5	B6	B7	D1	D2 Ø	D3 Ø	D4 Ø	H1	H2	H3	H4	H5	H6
MHA3-PR...-1/8	79	45.3	18	39.3	20.5	4.3	94.3	G1/4	4.5	8	G1/8	32	13	9.5	22	42	60
CPV10/14-VI-BG-...	49.1	90	–	–	–	–	–	–	–	–	–	10.7	32	–	–	–	–

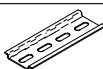
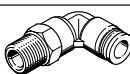
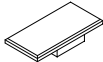
Type	L4		L5		L6		T1		T2	
MHA3-PR...-1/8	17		19		6		17.1		12	
CPV10/14-VI-BG-...	6.5		–		–		–		–	

Type		Number of valve positions				
		2	4	6	8	10
MHA3-PR...-1/8	L1	53	91	129	167	205
	L2	41	79	117	155	193
	L3	19	57	95	133	171
CPV10/14-VI-BG-...	L2	41	79	117	155	193

Datasheet – Sub-base valve

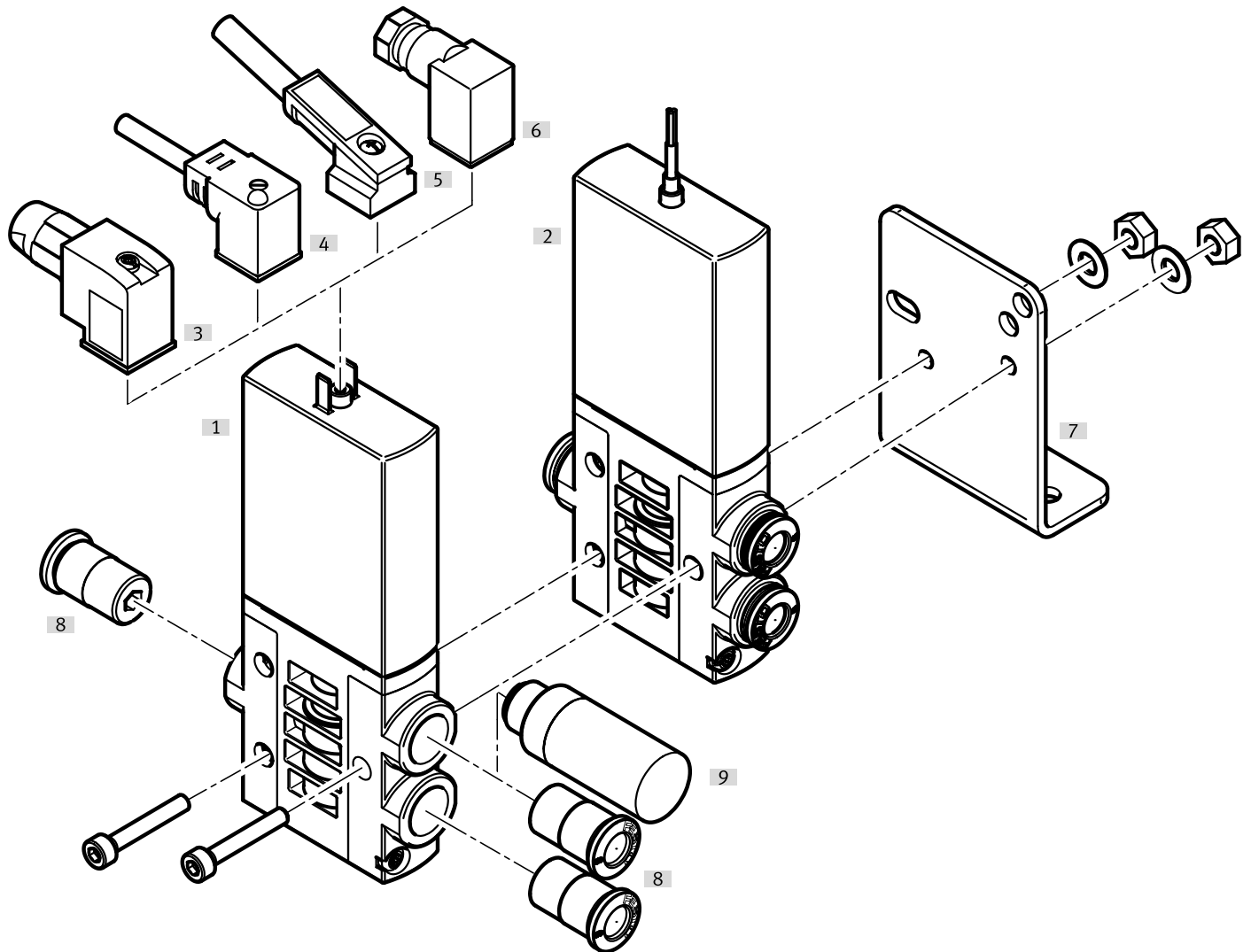
Ordering data				Part no.	Type	
Valves						
	Electrical connection: plug, 2-pin	With fast-switching electronics, switching time 2.3 ms	Normally closed	525135	MHA3-MS1H-3/2G-3	
		Without fast-switching electronics, switching time 8.3 ms	Normally closed	525134	MHA3-M1H-3/2G-3	
	Electrical connection: cable	With fast-switching electronics, switching time 2.3 ms	Normally closed	525137	MHA3-MS1H-3/2G-3-K	
		Without fast-switching electronics, switching time 8.3 ms	Normally closed	525136	MHA3-M1H-3/2G-3-K	
Manifold rail						
	Individual sub-base Pneumatic connection: thread G1/8		1 valve position	525214	MHA3-AS-3-1/8	
	Manifold block Pneumatic connection 1, 11, 3, 33: thread G1/4 Pneumatic connection 2: thread G1/8		2 valve positions	525221	MHA3-PR2-3-1/8	
			4 valve positions	525222	MHA3-PR4-3-1/8	
			6 valve positions	525223	MHA3-PR6-3-1/8	
			8 valve positions	525224	MHA3-PR8-3-1/8	
			10 valve positions	525225	MHA3-PR10-3-1/8	
Cover plate						
	Vacant valve positions must be sealed with a cover plate.			525226	MHAP3-BP-3	
Connecting cable (for valves with 2-pin plug)				Datasheets → Internet: nebv		
	2-pin socket, open cable end 2-core	PUR cable, degree of protection IP65	Signal status indication with LED	Length 2.5 m	8047671	NEBV-Z4WA2L-P-E-2.5-N-LE2-S1
				Length 5 m	8047672	NEBV-Z4WA2L-P-E-5-N-LE2-S1
				Length 10 m	8047670	NEBV-Z4WA2L-P-E-10-N-LE2-S1
		PVC cable, degree of protection IP40	Without signal status indication	Length 0.5 m	193690	KMYZ-4-24-0.5-B
				Length 2.5 m	193691	KMYZ-4-24-2.5-B
	2-pin socket, plug M8x1 3-pin	PUR cable, degree of protection IP65	Signal status indication with LED	Length 0.5 m	8047673	NEBV-Z4WA2L-P-E-0.5-N-M8G3-S1
				Length 2.5 m	8047674	NEBV-Z4WA2L-P-E-2.5-N-M8G3-S1
Adapter (for valves with 2-pin plug)						
	2-pin socket	Signal status indication with LED	Plug M8, 3-pin	571686	VAVE-C8-1R8	
			Plug M8, 4-pin	573194	VAVE-C8-1R1	

Datasheet – Sub-base valve

Ordering data					Part no.	Type
DIN rail mounting						
	For manifold block			162556	CPV10/14-VI-BG-NRH-35	
DIN rail						
	To EN 60715		2 m	35430	NRH-35-2000	
Silencer						
	With threaded connection	G1/8	Pack of 1	161419	UC-1/8	
			Pack of 50	534219	UC-1/8-50	
		G1/4	Pack of 1	165004	UC-1/4	
			Pack of 20	534220	UC-1/4-20	
Push-in fitting						
	Male thread G1/8 with external hex for tubing O.D.	6 mm	Pack of 10	186096	QS-G1/8-6	
			Pack of 100	132037	QS-G1/8-6-100	
		8 mm	Pack of 10	186098	QS-G1/8-8	
			Pack of 50	132038	QS-G1/8-8-50	
	Male thread G1/4 with external hex for tubing O.D.	8 mm	Pack of 10	186099	QS-G1/4-8	
			Pack of 50	132040	QS-G1/4-8-50	
		10 mm	Pack of 10	186101	QS-G1/4-10	
			Pack of 50	132041	QS-G1/4-10-50	
	Male thread G1/8 with external hex, push-in L-fitting, rotatable 360°, for tubing O.D.	6 mm	Pack of 10	186117	QSL-G1/8-6	
			Pack of 100	132049	QSL-G1/8-6-100	
		8 mm	Pack of 10	186119	QSL-G1/8-8	
			Pack of 50	132050	QSL-G1/8-8-50	
	Male thread G1/4 with external hex, push-in L-fitting, rotatable 360°, for tubing O.D.	8 mm	Pack of 10	186120	QSL-G1/4-8	
			Pack of 50	132052	QSL-G1/4-8-50	
		10 mm	Pack of 10	186122	QSL-G1/4-10	
			Pack of 50	132053	QSL-G1/4-10-50	
Blanking plug						
	For G1/8 thread		Pack of 10	3568	B-1/8	
	For G1/4 thread		Pack of 10	3569	B-1/4	
Inscription label						
	For solenoid valve		80 pieces in a frame	197259	MH-BZ-80X	

Peripherals overview – Individual valve

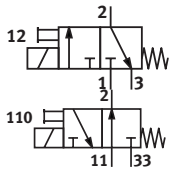
Connection with plug vanes – Connection with moulded-in cable



Designation	Type	Description	→ Page/Internet
[1] Individual valve	MHE4	With plug vanes	90
[2] Individual valve	MHE4-...-K	With moulded-in cable, IP65	90
[3] Plug socket	MSSD-EB-S-M14	With insulation displacement connector	91
[4] Plug socket with cable	KMEB-1	PVC cable, with or without LED	91
[5] Plug socket with cable	KMEB-2	With LED, without LED; PUR cable, with or without LED	91
[6] Plug socket	MSSD-EB	With clamping screw	91
[7] Mounting bracket	MHE2-BG-L	For wall mounting	91
[8] Push-in fittings	QS	For connecting tubing with standard O.D.	91
[9] Silencer	UC	For fitting in exhaust ports	91

Datasheet – Individual valve

Function



Voltage
24 V DC



Pressure
−0.09 ... +0.8 MPa



Temperature range
−5 ... +60 °C



General technical data

Valve function	3/2, single solenoid ¹⁾
Design	Pressure relief poppet valve
Overlap	Negative overlap
Sealing principle	Soft
Reset method	Mechanical spring
Actuation type	Electrical
Type of control	Direct
Flow direction	Reversible with restrictions ²⁾
Exhaust air function	Can be throttled
Manual override	Non-detenting
Mounting position	Any
Width	[mm] 18
Grid dimension	[mm] 24
Note on grid dimension	Minimum distance between the valves is 6 mm
Nominal width	[mm] 4
Standard nominal flow rate	[l/min] 400
Type of mounting	With through-hole
Pneumatic connection	Connecting thread G1/4
	Push-in connector for tubing O.D. 8 mm
Product weight	[g] 270

1) Can be used as a 2/2-way valve by sealing port 3 or 33

2) Slight leakage can occur in the pressure range −0.8 bar to +0.5 bar.

Datasheet – Individual valve

Operating and environmental conditions			With fast-switching electronics	Without fast-switching electronics
Operating medium			Compressed air to ISO 8573-1:2010 [7:4:4]	
Note on the operating/pilot medium			Lubricated operation possible (in which case lubricated operation will always be required)	
Operating pressure	Reversible	[MPa]	−0.09 ... +0.8	
		[bar]	−0.9 ... +8	
		[psi]	−13.05 ... +116	
		[MPa]	−0.09 ... +0.1	
		[bar]	−0.9 ... +1	
		[psi]	−13.05 ... +14.5	
Ambient temperature		[°C]	−5 ... +60	
Temperature of medium		[°C]	−5 ... +60	
Corrosion resistance class CRC ¹⁾			2	
CE marking (see declaration of conformity) ³⁾			To EU EMC Directive ²⁾	–
			To EU RoHS Directive	–
UKCA marking (see declaration of conformity) ³⁾			To UK EMC regulations	–
			To UK RoHS regulations	–
Certification			c UL us - Recognized (OL)	c UL us - Recognized (OL)
			RCM	–
Cleanroom class			Class 6 to ISO 14644-1	
Shock resistance			Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27	
Vibration resistant			Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6	

1) More information www.festo.com/x/topic/crc2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/mh2 → Support/Downloads.

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3) More information www.festo.com/catalogue/... → Support/Downloads.

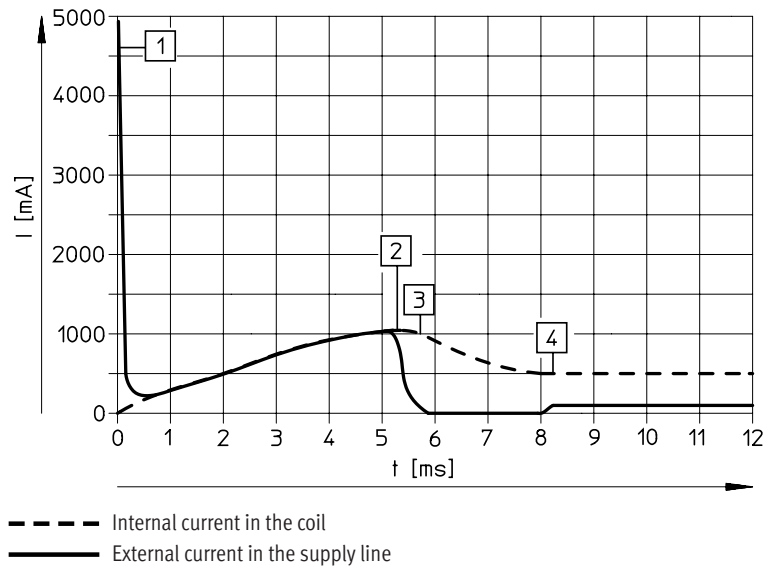
Electrical data		With fast-switching electronics	Without fast-switching electronics
Electrical connection		Plug, 2-pin or cable	
Operating voltage		[V DC]	24
Permissible voltage fluctuations		[%]	±10
Power consumption	[W]	8.5 (high-current phase)	5.6
	[W]	2.125 (low-current phase)	–
Reverse polarity protection		Bipolar	
Duty cycle		[%]	100
Additional functions		Spark arresting	–
		Holding current reduction	–
		Protective circuit	–
Degree of protection to EN 60529		IP65	IP65

Switching times and frequencies		With fast-switching electronics	Without fast-switching electronics
Switching time	On [ms]	3.5	10.5
	Off [ms]	3.5	5
Tolerance for switching time	On [%]	+10 ... −30	–
	Off [%]	+10 ... −40	–
Switching time variation from 1 Hz upwards		[ms]	0.3
Maximum switching frequency		[Hz]	210
			120

Materials	
Housing	Die-cast zinc, coated
Cable sheath	PUR
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	RoHS-compliant
LABS (PWIS) conformity	VDMA24364-B1/B2-L

Datasheet – Individual valve

Current curve for valves with fast-switching electronics (MHE4-MS1H)

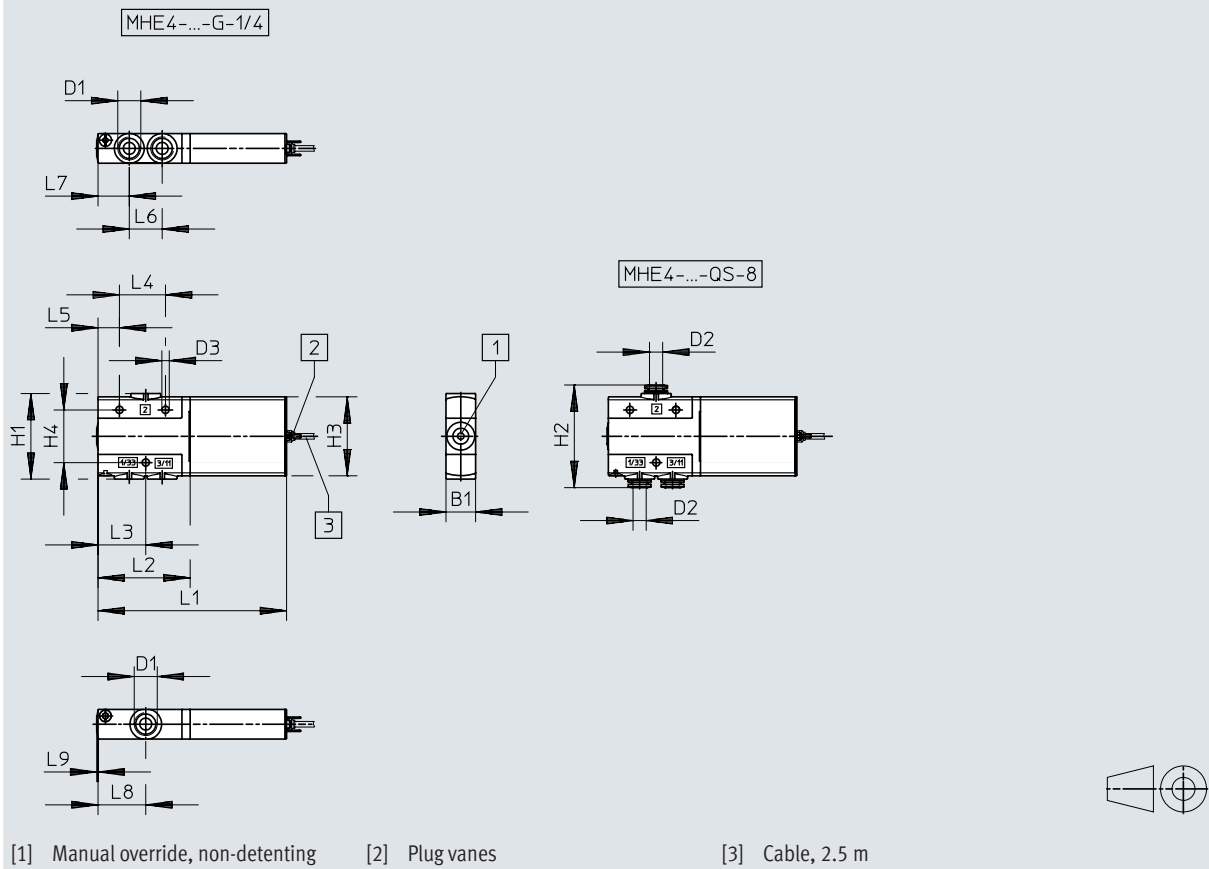


- [1] Capacitor charging
- [2] Controlled coil current 1 A
- [3] Holding current reduction
- [4] Controlled holding current 0.5 A

Datasheet – Individual valve

Dimensions Download CAD data → www.festo.com

Valve with plug vanes or moulded-in cable



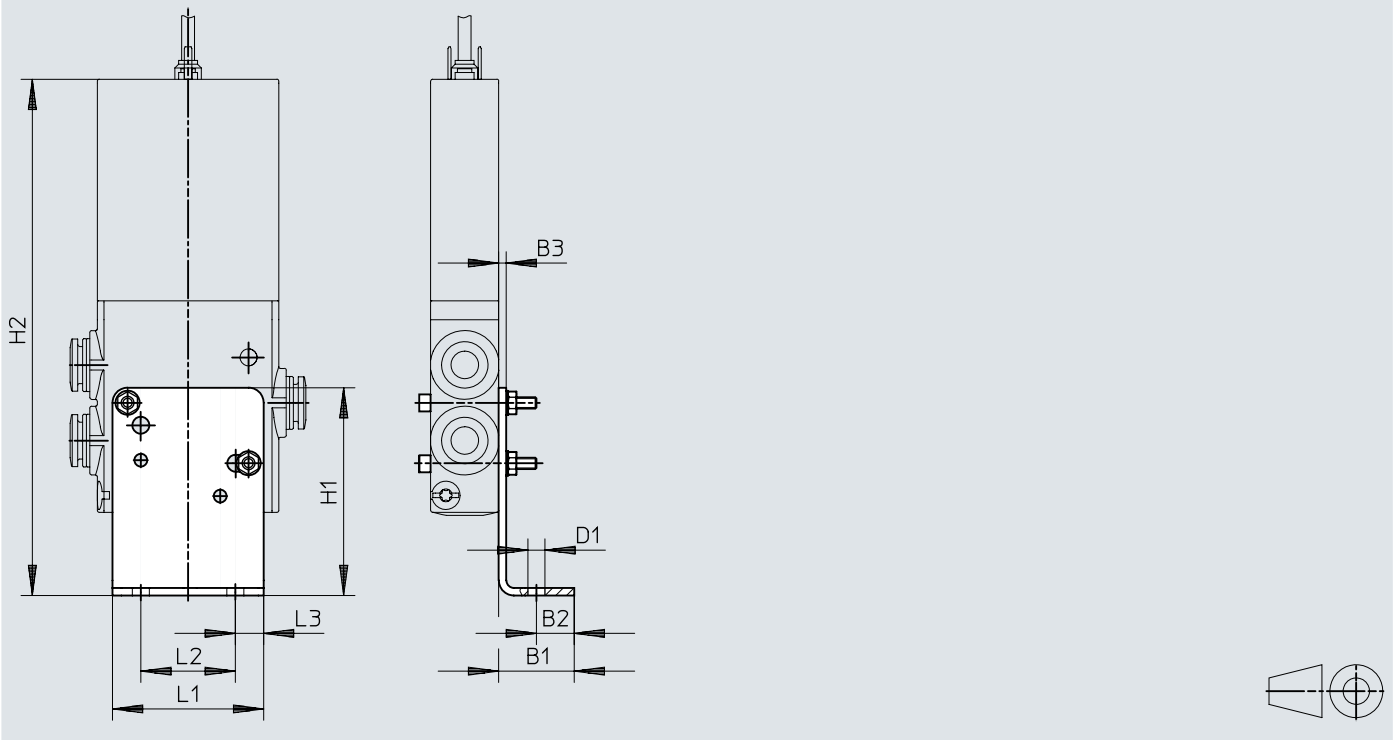
Type	B1	D1	D2 Ø	D3 Ø	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7	L8	L9
MHE4-...-1/4-...	18	G1/4	–	4.5	56	–	48	32	114.6	56	29	28	13	20	19	29	0.8
MHE4-...-QS-8-...	18	–	8	4.5	52	57.2	48	32	114.6	56	29	28	13	20	19	29	0.8

Datasheet – Individual valve

Dimensions

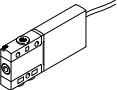
Download CAD data → www.festo.com

Mounting bracket MHE2-BG-L

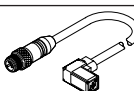
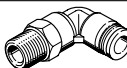


Type	B1	B2	B3	D1	H1	H2	L1	L2	L3
MHE2-BG-L	20	10	2	4.5	55	134	40	25	7.5

Datasheet – Individual valve

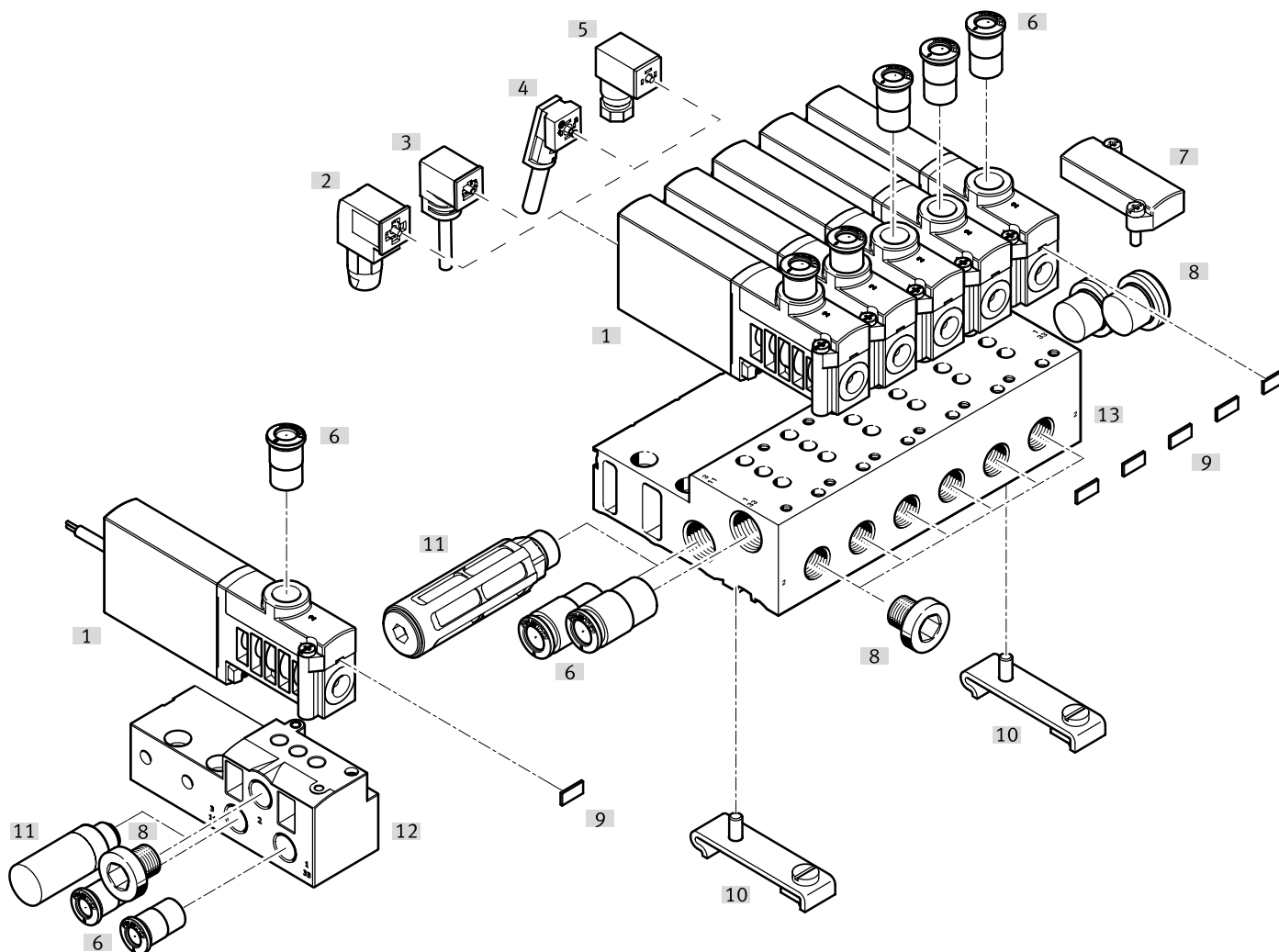
Ordering data					Part no.	Type
Valves						
	Electrical connection: plug, 2-pin	With fast-switching electronics, switching time 3.5 ms	Pneumatic connection: thread G1/4	Normally open	525207	MHE4-MS1H-3/20-1/4
				Normally closed	525187	MHE4-MS1H-3/2G-1/4
			Pneumatic connection: push-in connector for tubing O.D. 8 mm	Normally open	525211	MHE4-MS1H-3/20-QS-8
				Normally closed	525191	MHE4-MS1H-3/2G-QS-8
		Without fast-switching electronics, switching time 10.5 ms	Pneumatic connection: thread G1/4	Normally open	525206	MHE4-M1H-3/20-1/4
				Normally closed	525186	MHE4-M1H-3/2G-1/4
			Pneumatic connection: push-in connector for tubing O.D. 8 mm	Normally open	525210	MHE4-M1H-3/20-QS-8
				Normally closed	525190	MHE4-M1H-3/2G-QS-8
	Electrical connection: cable	With fast-switching electronics, switching time 3.5 ms	Pneumatic connection: thread G1/4	Normally closed	525189	MHE4-MS1H-3/2G-1/4-K
			Pneumatic connection: push-in connector for tubing O.D. 8 mm	Normally open	525213	MHE4-MS1H-3/20-QS-8-K
				Normally closed	525193	MHE4-MS1H-3/2G-QS-8-K
		Without fast-switching electronics, switching time 10.5 ms	Pneumatic connection: thread G1/4	Normally open	525208	MHE4-M1H-3/20-1/4-K
				Normally closed	525188	MHE4-M1H-3/2G-1/4-K

Datasheet – Individual valve

Ordering data					Part no.	Type
Plug socket with cable (for valves with 2-pin plug)						
	3-pin socket, open cable end 3-core Signal status indication with LED	PVC cable, degree of protection IP65	Length 2.5 m	151688	KMEB-1-24-2.5-LED	
			Length 5 m	151689	KMEB-1-24-5-LED	
			Length 10 m	193457	KMEB-1-24-10-LED	
	4-pin socket, open cable end 3-core Signal status indication with LED	PUR cable, degree of protection IP65	Length 2.5 m	174844	KMEB-2-24-2.5-LED	
			Length 5 m	174845	KMEB-2-24-5-LED	
	5-pin socket, plug M12 5-pin Signal status indication with LED	Cable sheath TPE-U (PU), degree of protection IP65	Length 0.5 m	177677	KMEB-2-24-M12-0.5-LED	
Plug socket (for valves with 2-pin plug)						
	Angled socket, without signal status indication	Screw terminal Degree of protection IP65	3-pin	151687	MSSD-EB	
		Insulation displacement technol- ogy Degree of protection IP67	4-pin	192745	MSSD-EB-S-M14	
Illuminating seal						
	For mounting between plug socket (without signal status indication) and valve			151717	MEB-LD-12-24DC	
Wall mounting						
	Mounting bracket			196165	MHE2-BG-L	
Silencer						
	Push-in sleeve	Screwed plug PE	8 mm	Pack of 1	175611	UC-QS-8H
	Threaded connection, polymer design	Screwed plug PE	G1/4	Pack of 1	165004	UC-1/4
				Pack of 20	534220	UC-1/4-20
Push-in fitting						
	Male thread with external hex	G1/4	8 mm	Pack of 10	186099	QS-G1/4-8
				Pack of 50	132040	QS-G1/4-8-50
			10 mm	Pack of 10	186101	QS-G1/4-10
				Pack of 50	132041	QS-G1/4-10-50
	Push-in L-fitting, rotatable 360°, male thread with external hex	G1/4	8 mm	Pack of 10	186120	QSL-G1/4-8
				Pack of 50	132052	QSL-G1/4-8-50
			10 mm	Pack of 10	186122	QSL-G1/4-10
				Pack of 50	132053	QSL-G1/4-10-50
Blanking plug						
	For G1/4 thread		Pack of 10		3569	B-1/4
Inscription label						
	For solenoid valve		Pack of 80		197259	MH-BZ-80X

Peripherals overview – Semi in-line valve

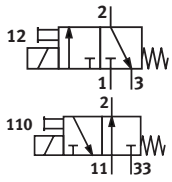
Connection via plug vanes



Designation	Type	Description	→ Page/Internet
[1] Semi-in-line valve	MHP4	With plug vanes	98
[2] Plug socket with cable	KMEB-2	PUR cable, with or without LED	99
[3] Plug socket	MSSD-EB	With clamping screw	99
[4] Plug socket	MSSD-EB-S-M14	With insulation displacement connectors	99
[5] Plug socket with cable	KMEB-1	PVC cable, with or without LED	99
[6] Push-in fittings	QS	For connecting tubing with standard O.D.	100
[7] Cover plate	MHAP4-BP-3	For sealing vacant positions	98
[8] Blanking plug	B	For sealing unused ports	100
[9] Inscription labels	MH-BZ-80X	For identifying the valves	100
[10] DIN rail mounting	CPV10/14-VI-BG-NRH-35	For mounting the manifold block on DIN rails to EN 60715	99
[11] Silencer	UC	For fitting in exhaust ports	100
[12] Individual sub-base	MHA4-AS-3-1/4	For semi in-line valves; the individual sub-base is also used for sub-base valves; the extra connection must be sealed with a plug here	98
[13] Manifold block	MHA4-PR...-1/4	For semi in-line valves	98

Datasheet – Semi in-line valve

Function



Voltage
24 V DC



Pressure
−0.09 ... +0.8 MPa



Temperature range
−5 ... +40 °C



General technical data

Valve function	3/2, single solenoid ¹⁾
Design	Pressure relief poppet valve
Overlap	Negative overlap
Sealing principle	Soft
Reset method	Mechanical spring
Actuation type	Electrical
Type of control	Direct
Flow direction	Reversible with restrictions ²⁾
Exhaust air function	Can be throttled
Manual override	Non-detenting
Mounting position	Any
Width	[mm] 18
Grid dimension	[mm] 24
Note on grid dimension	Minimum distance between the valves is 6 mm
Nominal width	[mm] 4
Standard nominal flow rate	[l/min] 400
Type of mounting	On PR rail
Pneumatic connection	2 1, 11, 3, 33
	Connecting thread G1/4, push-in connector for tubing O.D. 8 mm
	Sub-base
Product weight	[g] 270

1) Can be used as a 2/2-way valve by sealing port 3 or 33

2) Slight leakage can occur in the pressure range −0.8 bar to +0.5 bar.

Datasheet – Semi in-line valve

Operating and environmental conditions		With fast-switching electronics	Without fast-switching electronics	
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Note on the operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)		
Operating pressure	[MPa]	−0.09 ... +0.8		
	[bar]	−0.9 ... +8		
	[psi]	−13.05 ... +116		
	Reversible	[MPa]	−0.09 ... +0.1	
		[bar]	−0.9 ... +1	
		[psi]	−13.05 ... +14.5	
Ambient temperature	[°C]	−5 ... +40		
Temperature of medium	[°C]	−5 ... +40		
Corrosion resistance class CRC ¹⁾		2		
CE marking (see declaration of conformity) ³⁾		To EU EMC Directive ²⁾	–	
		To EU RoHS Directive	–	
UKCA marking (see declaration of conformity) ³⁾		To UK EMC regulations	–	
		To UK RoHS regulations	–	
Certification	c UL us - Recognized (OL)		c UL us - Recognized (OL)	
	RCM		–	
Cleanroom class		Class 6 to ISO 14644-1		
Shock resistance		Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27		
Vibration resistant		Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6		

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

2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/mh2 → Support/Downloads.

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3) More information www.festo.com/catalogue/... → Support/Downloads.

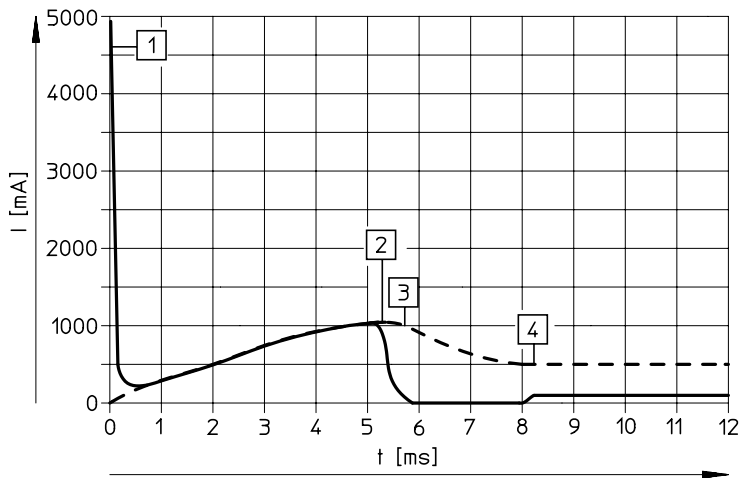
Electrical data		With fast-switching electronics	Without fast-switching electronics
Electrical connection		Plug, 2-pin	
Operating voltage		[V DC]	24
Permissible voltage fluctuations		[%]	±10
Power consumption	[W]	8.5 (high-current phase)	5.6
	[W]	2.125 (low-current phase)	–
Reverse polarity protection		Bipolar	
Duty cycle		[%]	100
Additional functions		Spark arresting	–
		Holding current reduction	–
		Protective circuit	–
Degree of protection to EN 60529		IP65	IP65

Switching times and frequencies		With fast-switching electronics	Without fast-switching electronics
Switching time	On [ms]	3.5	10.5
	Off [ms]	3.5	5
Tolerance for switching time	On [%]	+10 ... -30	–
	Off [%]	+10 ... -40	–
Switching time variation from 1 Hz upwards		[ms]	0.3
Maximum switching frequency		[Hz]	210
			120

Materials		
Housing		Die-cast zinc, coated
Seals		HNBR, NBR
Screws		Galvanised steel
Note on materials		RoHS-compliant
LABS (PWIS) conformity		VDMA24364-B1/B2-L

Datasheet – Semi in-line valve

Current curve for valves with fast-switching electronics (MHP4-MS1H)



- [1] Capacitor charging
- [2] Controlled coil current 1 A
- [3] Holding current reduction
- [4] Controlled holding current 0.5 A

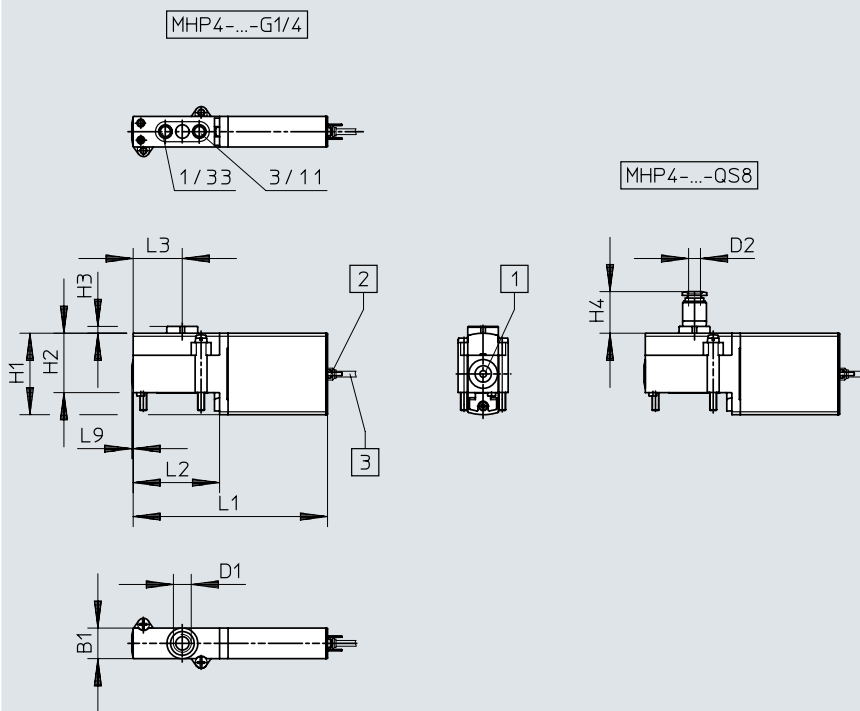
--- Internal current in the coil
 — External current in the supply line

Dimensions

Download CAD data → www.festo.com

Valve with connecting thread G1/4

Valve with push-in connector for tubing O.D. 8 mm



[1] Manual override, non-detenting [2] Plug vanes

Type	B1	D1	D2 Ø	H1	H2	H3	H4	L1	L2	L3	L9
MHP4-...-3/2...	18	G1/4	8	48	35	4	24.5	114.6	51	29	0.8

Datasheet – Semi in-line valve

Dimensions

Download CAD data → www.festo.com

Hole pattern on sub-bases

[1] Hole for coding pin, 2.5mm deep
[2] Mounting thread, 13 mm deep

Note

With semi in-line valves, port 2 is not used.

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

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

Individual sub-base, MHA4-AS-3-1/4

[1] Plug pins
[2] Silencer
[3] Push-in fitting

Type	B1	B2	B3	B4	B5	B6	D1	D2 Ø	D3 Ø	H1	H2	H3	H4	H5
Hole pattern	–	–	–	–	–	–	6	5.2	M4	43.3	34	8.8	10	7.7
MHA4-AS-3-1/4	36	14.8	6	12.3	42.5	20.5	G1/4	5.5	10	31	27.5	14.3	11.4	75.8

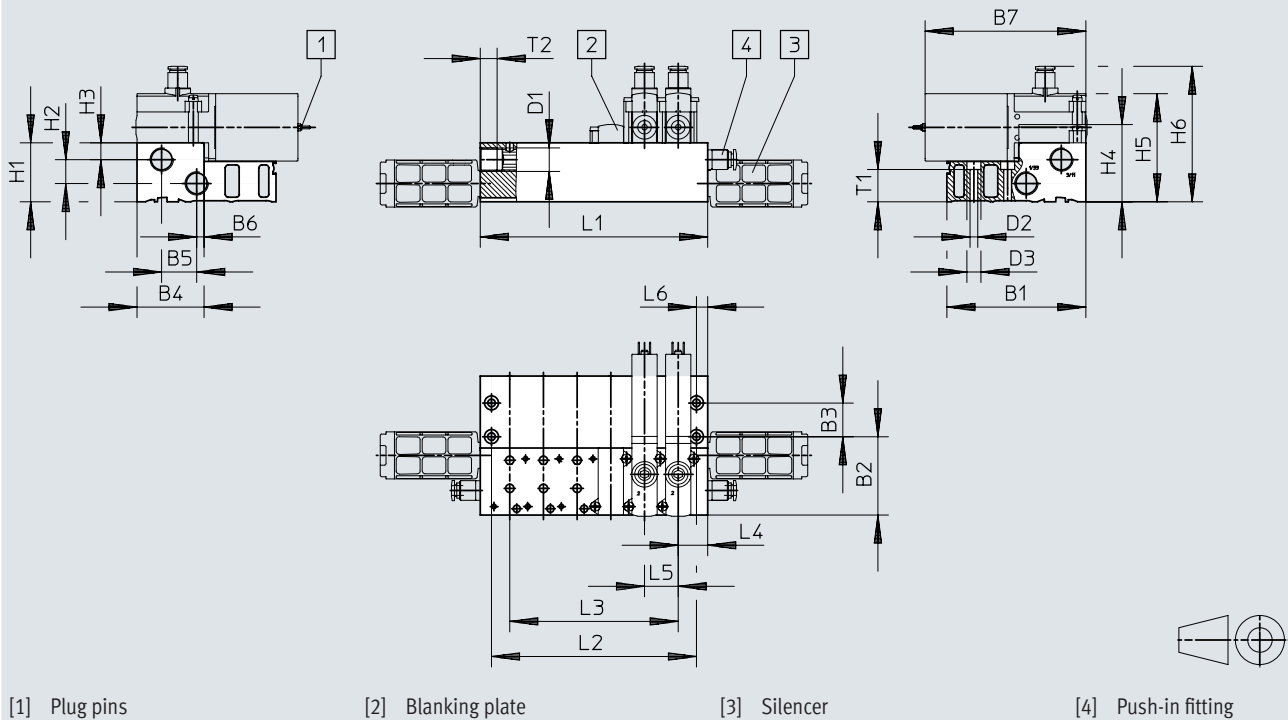
Type	L1	L2	L3	L4	L5	L6	L7	L8	T1
Hole pattern	22.5	5	–	–	–	–	–	–	–
MHA4-AS-3-1/4	99	55.8	24	67.8	21.9	17.8	22.4	115.4	21.8

Datasheet – Semi in-line valve

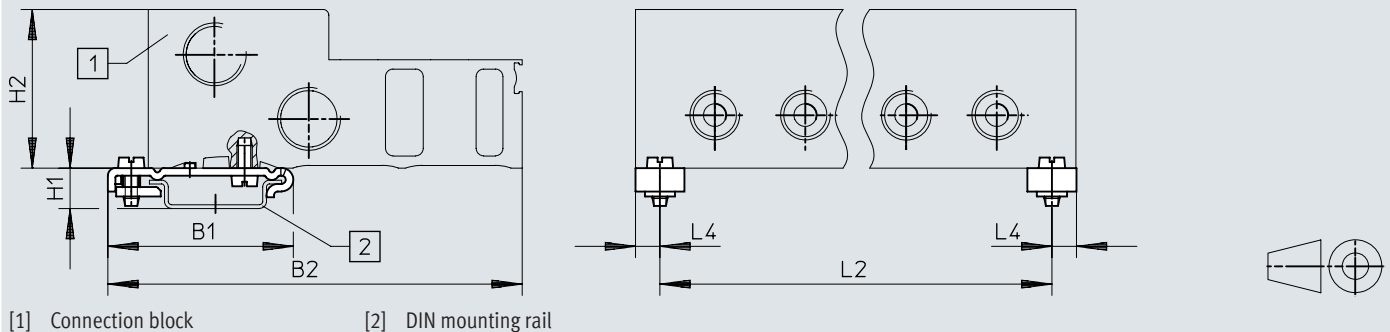
Dimensions

Download CAD data → www.festo.com

Manifold assembly, MHA4-PR...-1/4

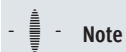


DIN rail attachment CPV10/14-VI-BG-NRH-35



Type	B1	B2	B3	B4	B5	B6	B7	D1	D2 Ø	D3 Ø	H1	H2	H3	H4	H5	H6	L4	L5	L6	T1	T2
MHA4-PR...-1/4	99	55.8	24	47.8	25	5.3	114.6	G3/8	5.5	10	42	17	12	55	77	96.5	21	24	8	23	12
CPV10/14-VI-BG...	49.1	110	—	—	—	—	—	—	—	—	10.7	42	—	—	—	—	6.5	—	—	—	—

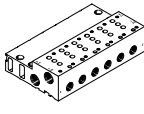
Type		Number of valve positions				
		2	4	6	8	10
MHA4-PR...-1/4	L1	66	114	162	210	258
	L2	50	98	146	194	242
	L3	24	72	120	168	216
CPV10/14-VI-BG...	L2	53	101	149	197	245



Note

Valve types 3/2G and 3/2O must not be mixed on one manifold block.

Datasheet – Semi in-line valve

Ordering data					Part no.	Type
Valves						
	Electrical connection: plug, 2-pin	With fast-switching electronics, switching time 3.5 ms	Pneumatic connection: thread G1/4	Normally open	525199	MHP4-MS1H-3/20-1/4
				Normally closed	525179	MHP4-MS1H-3/2G-1/4
		Without fast-switching electronics, switching time 10.5 ms	Pneumatic connection: push-in connector for tubing O.D. 8 mm	Normally closed	525183	MHP4-MS1H-3/2G-QS-8
			Pneumatic connection: thread G1/4	Normally open	525198	MHP4-M1H-3/20-1/4
				Normally closed	525178	MHP4-M1H-3/2G-1/4
Manifold rail						
	Individual sub-base1) Pneumatic connection: thread G1/4			1 valve position	525227	MHA4-AS-3-1/4
	Manifold block1) Pneumatic connection 1, 11, 3, 33: thread G3/8 Pneumatic connection 2: thread G1/4			2 valve positions	525234	MHA4-PR2-3-1/4
				4 valve positions	525235	MHA4-PR4-3-1/4
				6 valve positions	525236	MHA4-PR6-3-1/4
				8 valve positions	525237	MHA4-PR8-3-1/4
				10 valve positions	525238	MHA4-PR10-3-1/4
Cover plate						
	Vacant valve positions must be sealed with a cover plate.				525239	MHP4-BP-3

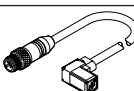
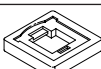
1) Seal port 2 with a blanking plug. These ports have no function when using semi in-line valves.



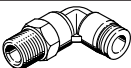
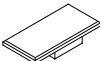
Note

Valve types 3/2G and 3/20 must not be mixed on one manifold block.

Datasheet – Semi in-line valve

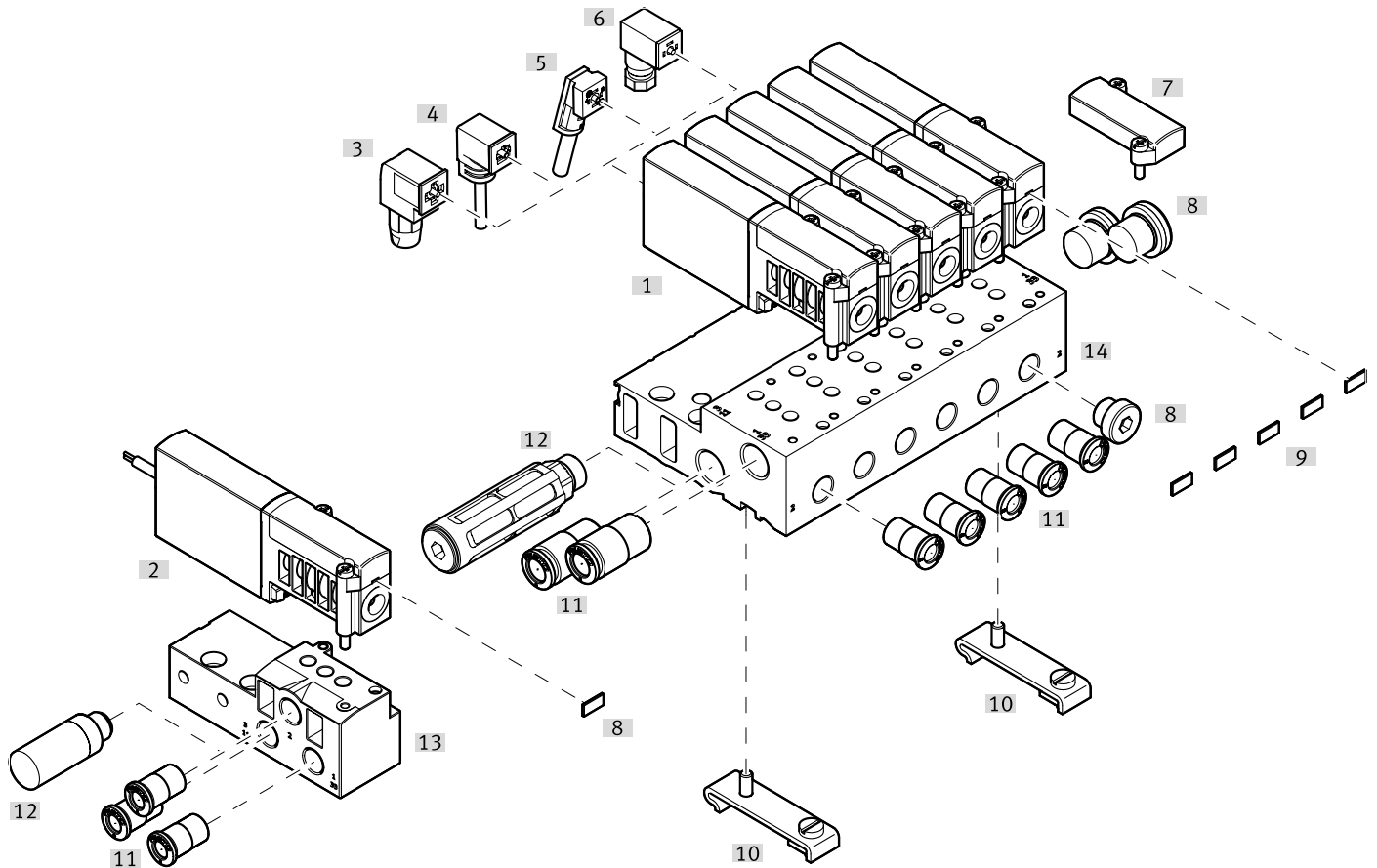
Ordering data				Part no.	Type
Plug socket with cable					
	3-pin socket, open cable end 3-core Signal status indication with LED	PVC cable, degree of protection IP65	Length: 2.5 m	151688	KMEB-1-24-2.5-LED
			Length: 5 m	151689	KMEB-1-24-5-LED
			Length: 10 m	193457	KMEB-1-24-10-LED
	4-pin socket, open cable end 3-core Signal status indication with LED	PUR cable, degree of protection IP65	Length: 2.5 m	174844	KMEB-2-24-2.5-LED
			Length: 5 m	174845	KMEB-2-24-5-LED
	5-pin socket, plug M12 5-pin Signal status indication with LED	Cable sheath TPE-U (PU), degree of protection IP65	Length 0.5 m	177677	KMEB-2-24-M12-0.5-LED
Plug socket					
	Angled socket, without signal status indication	Screw terminal Degree of protection IP65	3-pin	151687	MSSD-EB
		Insulation displacement technol- ogy Degree of protection IP67	4-pin	192745	MSSD-EB-S-M14
Illuminating seal					
	For mounting between plug socket (without signal status indication) and valve			151717	MEB-LD-12-24DC
DIN rail mounting					
	For manifold block			162556	CPV10/14-VI-BG-NRH-35
DIN rail					
	To EN 60715		2 m	35430	NRH-35-2000

Datasheet – Semi in-line valve

Ordering data					Part no.	Type
Silencer					Datasheets → Internet: uc	
	Push-in sleeve	Screwed plug PE	8 mm	Pack of 1	175611	UC-QS-8H
	Threaded connection, polymer design	Screwed plug PE	G1/4	Pack of 1	165004	UC-1/4
				Pack of 20	534220	UC-1/4-20
		Housing Polyacetal	G3/8	Pack of 1	2309	U-3/8
				Pack of 20	534224	U-3/8-20
Push-in fitting					Datasheets → Internet: qs	
	Male thread with external hex	G1/4	8 mm	Pack of 10	186099	QS-G1/4-8
				Pack of 50	132040	QS-G1/4-8-50
			10 mm	Pack of 10	186101	QS-G1/4-10
				Pack of 50	132041	QS-G1/4-10-50
		G3/8	10 mm	Pack of 10	186102	QS-G3/8-10
				Pack of 50	132044	QS-G3/8-10-50
			12 mm	Pack of 10	186103	QS-G3/8-12
				Pack of 20	132045	QS-G3/8-12-20
	Push-in L-fitting, rotatable 360°, male thread with external hex	G1/4	8 mm	Pack of 10	186120	QSL-G1/4-8
				Pack of 50	132052	QSL-G1/4-8-50
			10 mm	Pack of 10	186122	QSL-G1/4-10
				Pack of 50	132053	QSL-G1/4-10-50
		G3/8	10 mm	Pack of 10	186123	QSL-G3/8-10
				Pack of 20	132056	QSL-G3/8-10-20
			12 mm	Pack of 10	186124	QSL-G3/8-12
				Pack of 20	132057	QSL-G3/8-12-20
Blanking plug						
	For G1/4 thread			Pack of 10	3569	B-1/4
	For G3/8 thread			Pack of 10	3570	B-3/8
Inscription label						
	For solenoid valve			Pack of 80	197259	MH-BZ-80X

Peripherals overview – Sub-base valve

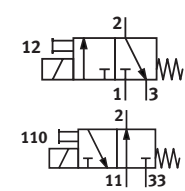
Connection with plug vanes – Connection with moulded-in cable



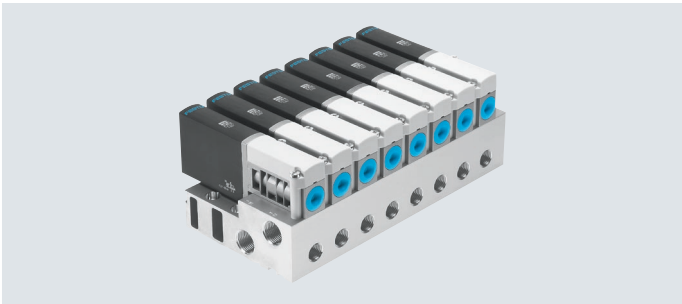
Designation	Type	Description	→ Page/Internet
[1] Sub-base valves	MHA4	With plug vanes	108
[2] Sub-base valves	MHA4-...-K	With moulded-in cable, IP65	108
[3] Plug socket	MSSD-EB-S-M14	With insulation displacement connectors	109
[4] Plug socket with cable	KMEB-1	PVC cable, with or without LED	109
[5] Plug socket with cable	KMEB-2	PUR cable, with or without LED	109
[6] Plug socket	MSSD-EB	With clamping screw	109
[7] Cover plate	MHAP4-BP-3	For sealing vacant positions	108
[8] Blanking plug	B	For sealing unused ports	110
[9] Inscription labels	MH-BZ-80X	For identifying the valves	110
[10] DIN rail mounting	CPV10/14-VI-BG-NRH-35	For mounting the manifold block on DIN rails to EN 60715	109
[11] Push-in fittings	QS	For connecting tubing with standard O.D.	110
[12] Silencer	UC	For fitting in exhaust ports	110
[13] Individual sub-base	MHA4-AS-3-1/4	For sub-base valves	108
[14] Manifold block	MHA4-PR...-1/4	For sub-base valves	108

Datasheet – Sub-base valve

Function



-  - Voltage
24 V DC
-  - Pressure
–0.09 ... +0.8 MPa
-  - Temperature range
–5 ... +40 °C



General technical data		
Valve function		3/2, single solenoid ¹⁾
Design		Pressure relief poppet valve
Overlap		Negative overlap
Sealing principle		Soft
Reset method		Mechanical spring
Actuation type		Electrical
Type of control		Direct
Flow direction		Reversible with restrictions ²⁾
Exhaust air function		Can be throttled
Manual override		Non-detenting
Mounting position		Any
Width	[mm]	18
Grid dimension	[mm]	24
Note on grid dimension		Minimum distance between the valves is 6 mm
Nominal width	[mm]	4
Standard nominal flow rate	[l/min]	400
Type of mounting		On PR rail
Pneumatic connection	1, 11, 2, 3, 33	Sub-base
Product weight	[g]	270

1) Can be used as a 2/2-way valve by sealing port 3 or 33
2) Slight leakage can occur in the pressure range –0.8 bar to +0.5 bar.

Datasheet – Sub-base valve

Operating and environmental conditions			With fast-switching electronics	Without fast-switching electronics
Operating medium			Compressed air to ISO 8573-1:2010 [7:4:4]	
Note on the operating/pilot medium			Lubricated operation possible (in which case lubricated operation will always be required)	
Operating pressure	Reversible	[MPa]	−0.09 ... +0.8	
		[bar]	−0.9 ... +8	
		[psi]	−13.05 ... +116	
		[MPa]	−0.09 ... +1	
		[bar]	−0.9 ... +1	
		[psi]	−13.05 ... +14.5	
Ambient temperature		[°C]	−5 ... +40	
Temperature of medium		[°C]	−5 ... +40	
Corrosion resistance class CRC ¹⁾			2	
CE marking (see declaration of conformity) ³⁾			To EU EMC Directive ²⁾	–
			To EU RoHS Directive	–
UKCA marking (see declaration of conformity) ³⁾			To UK EMC regulations	–
			To UK RoHS regulations	–
Certification			c UL us - Recognized (OL)	c UL us - Recognized (OL)
			RCM	–
Cleanroom class			Class 6 to ISO 14644-1	
Shock resistance			Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27	
Vibration resistant			Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6	

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

2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/mh2 → Support/Downloads.

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

3) More information www.festo.com/catalogue/... → Support/Downloads.

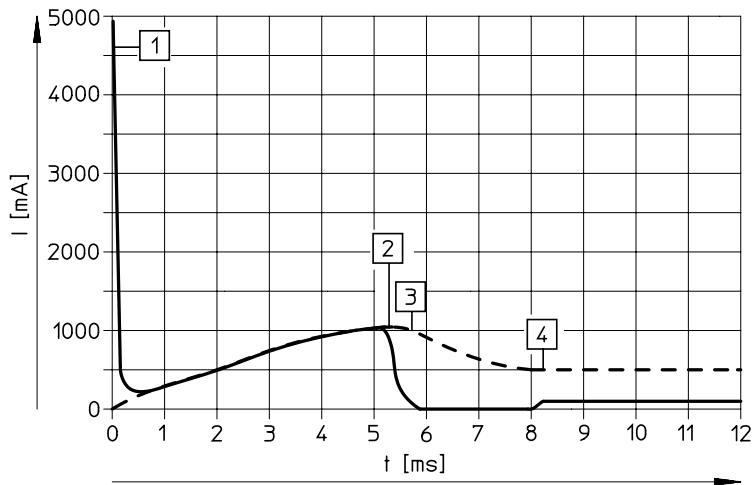
Electrical data			
		With fast-switching electronics	Without fast-switching electronics
Electrical connection		Plug, 2-pin or cable	
Operating voltage	[V DC]	24	
Permissible voltage fluctuations	[%]	±10	
Power consumption	[W]	8.5 (high-current phase)	5.6
	[W]	2.125 (low-current phase)	–
Reverse polarity protection		Bipolar	–
Duty cycle	[%]	100	100
Additional functions		Spark arresting	–
		Holding current reduction	–
		Protective circuit	–
Degree of protection to EN 60529		IP65	IP65

Switching times and frequencies			With fast-switching electronics	Without fast-switching electronics
Switching time	On	[ms]	3.5	10.5
	Off	[ms]	3.5	5
Tolerance for switching time	On	[%]	+10 ... -30	–
	Off	[%]	+10 ... -40	–
Switching time variation from 1 Hz upwards			[ms] 0.3	–
Maximum switching frequency			[Hz] 210	120

Materials		
Housing		Die-cast zinc, coated
Cable sheath		PUR
Seals		HNBR, NBR
Screws		Galvanised steel
Note on materials		RoHS-compliant
LABS (PWIS) conformity		VDMA24364-B1/B2-L

Datasheet – Sub-base valve

Current curve for valves with fast-switching electronics (MHA4-MS1H)

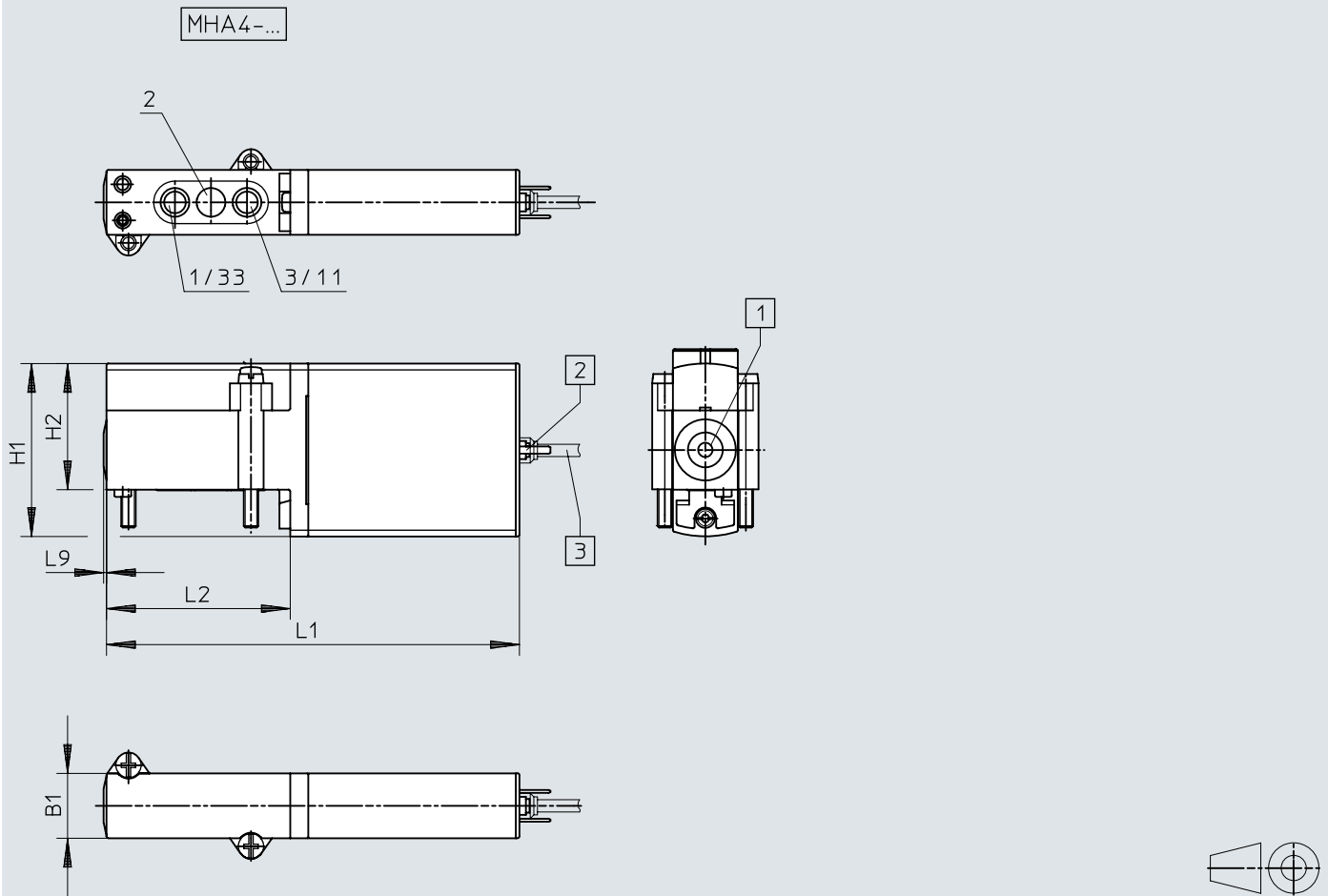


- [1] Capacitor charging
- [2] Controlled coil current 1 A
- [3] Holding current reduction
- [4] Controlled holding current 0.5 A

--- Internal current in the coil
— External current in the supply line

Dimensions Download CAD data → www.festo.com

Valve with plug vanes or moulded-in cable, MHA4-...-3/2...



- [1] Manual override, non-detenting [2] Plug vanes [3] Cable, 2.5 m

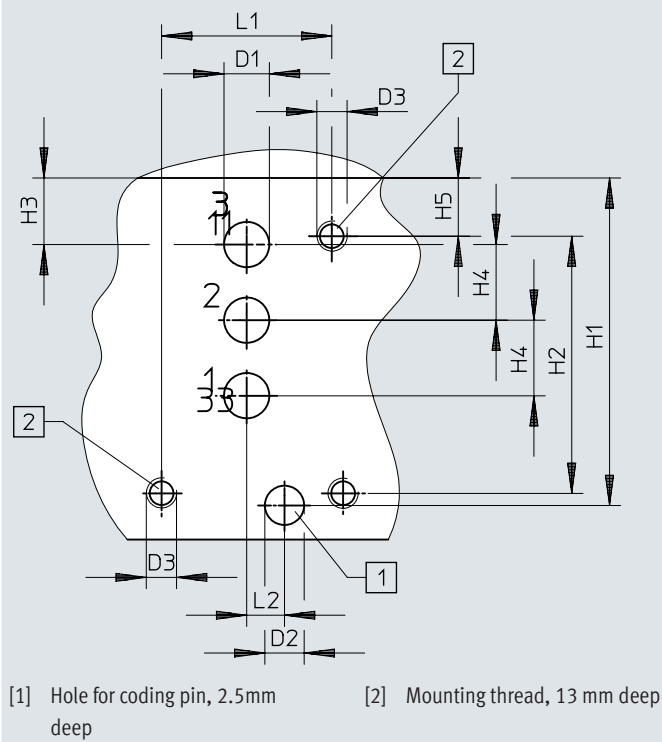
Type	B1	H1	H2	L1	L2	L9
MHA4-...-3/2...	18	48	35	114.6	51	0.8

Datasheet – Sub-base valve

Dimensions

Download CAD data → www.festo.com

Hole pattern on sub-bases

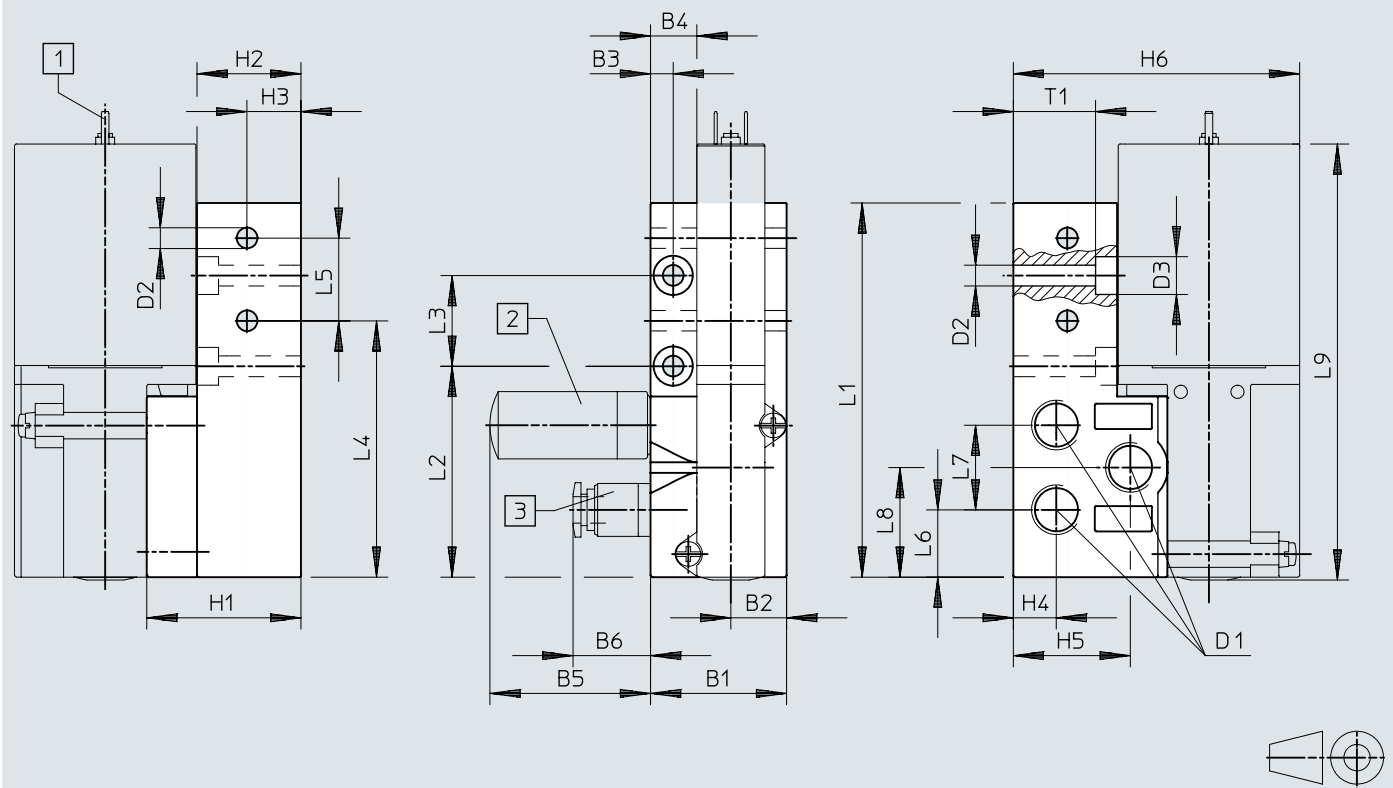


Type	D1	D2 Ø	D3 Ø	H1	H2	H3	H4	H5	L1	L2
Hole pattern	6	5.2	M4	43.3	34	8.8	10	7.7	22.5	5

Datasheet – Sub-base valve

Dimensions Download CAD data → www.festo.com

Individual sub-base, MHA4-AS-3-1/4



[1] Plug pins [2] Silencer [3] Push-in fitting

Type	B1	B2	B3	B4	B5	B6	D1	D2 ø	D3 ø	H1	H2	H3	H4	H5	H6
MHA4-AS-3-1/4	36	14.8	6	12.3	42.5	20.5	G1/4	5.5	10	40.8	27.5	14.3	11.4	31	75.8

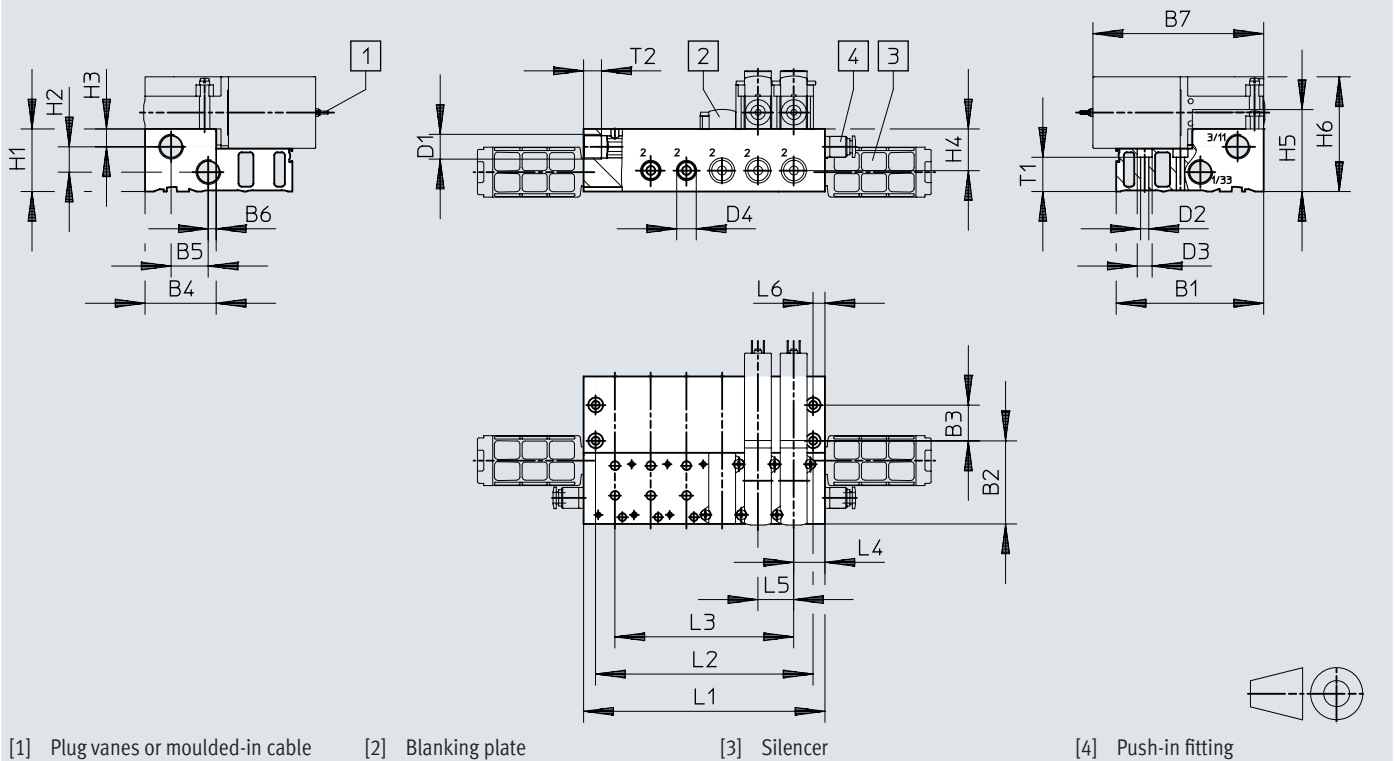
Type	L1	L2	L3	L4	L5	L6	L7	L8	L9	T1
MHA4-AS-3-1/4	99	55.8	24	67.8	21.9	17.8	22.4	29	115.4	21.8

Datasheet – Sub-base valve

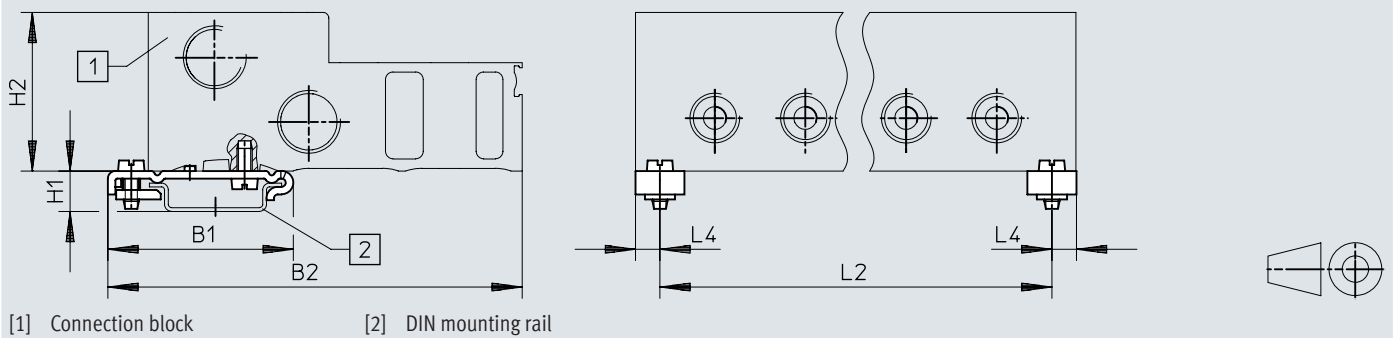
Dimensions

Download CAD data → www.festo.com

Manifold assembly, MHA4-PR...-1/4



DIN rail attachment CPV10/14-VI-BG-NRH-35

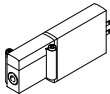
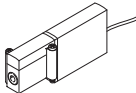
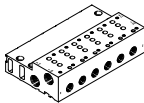


Type	B1	B2	B3	B4	B5	B6	B7	D1	D2 Ø	D3 Ø	D4 Ø	H1	H2	H3	H4	H5	H6
MHA4-PR...-1/4	99	55.8	24	47.8	25	5.3	114.6	G3/8	5.5	10	G1/4	42	17	12	28	55	77
CPV10/14-VI-BG...	49.1	110	–	–	–	–	–	–	–	–	–	10.7	42	–	–	–	–

Type	L4	L5	L6	T1	T2
MHA4-PR...-1/4	21	24	8	23	12
CPV10/14-VI-BG...	6.5	–	–	–	–

Type	Number of valve positions				
	2	4	6	8	10
MHA4-PR...-1/4	L1	66	114	162	210
	L2	50	98	146	194
	L3	24	72	120	168
CPV10/14-VI-BG...	L2	53	101	149	197

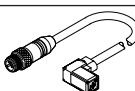
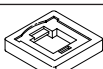
Datasheet – Sub-base valve

Ordering data				Part no.	Type
Valves					
	Electrical connection: plug, 2-pin	With fast-switching electronics, switching time 3.5 ms	Normally closed	525175	MHA4-MS1H-3/2G-4
		Without fast-switching electronics, switching time 10.5 ms	Normally closed	525174	MHA4-M1H-3/2G-4
	Electrical connection: cable	With fast-switching electronics, switching time 3.5 ms	Normally closed	525177	MHA4-MS1H-3/2G-4-K
		Without fast-switching electronics, switching time 10.5 ms	Normally open	525196	MHA4-M1H-3/20-4-K
			Normally closed	525176	MHA4-M1H-3/2G-4-K
Manifold rail					
	Individual sub-base Pneumatic connection: thread G1/4	1 valve position	525227	MHA4-AS-3-1/4	
	Manifold block Pneumatic connection 1, 11, 3, 33: thread G3/8 Pneumatic connection 2: thread G1/4	2 valve positions	525234	MHA4-PR2-3-1/4	
		4 valve positions	525235	MHA4-PR4-3-1/4	
		6 valve positions	525236	MHA4-PR6-3-1/4	
		8 valve positions	525237	MHA4-PR8-3-1/4	
		10 valve positions	525238	MHA4-PR10-3-1/4	
Cover plate					
	Vacant valve positions must be sealed with a cover plate.		525239	MHAP4-BP-3	

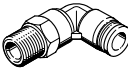
 Note

Valve types 3/2G and 3/20 must not be mixed on one manifold block.

Datasheet – Sub-base valve

Ordering data				Part no.	Type
Plug socket with cable (for valves with 2-pin plug)					
	3-pin socket, open cable end 3-core Signal status indication with LED	PVC cable, degree of protection IP65	Length 2.5 m	151688	KMEB-1-24-2.5-LED
			Length 5 m	151689	KMEB-1-24-5-LED
			Length 10 m	193457	KMEB-1-24-10-LED
	4-pin socket, open cable end 3-core Signal status indication with LED	PUR cable, degree of protection IP65	Length 2.5 m	174844	KMEB-2-24-2.5-LED
			Length 5 m	174845	KMEB-2-24-5-LED
	5-pin socket, plug M12 5-pin Signal status indication with LED	Cable sheath TPE-U (PU), degree of protection IP65	Length 0.5 m	177677	KMEB-2-24-M12-0.5-LED
Plug socket (for valves with 2-pin plug)					
	Angled socket, without signal status indication	Screw terminal Degree of protection IP65	3-pin	151687	MSSD-EB
		Insulation displacement technol- ogy Degree of protection IP67	4-pin	192745	MSSD-EB-S-M14
Illuminating seal					
	For mounting between plug socket (without signal status indication) and valve			151717	MEB-LD-12-24DC
DIN rail mounting					
	For manifold block			162556	CPV10/14-VI-BG-NRH-35
DIN rail					
	To EN 60715		2 m	35430	NRH-35-2000

Datasheet – Sub-base valve

Ordering data					Part no.	Type
Silencer					Datasheets → Internet: uc	
	Push-in sleeve	Screwed plug PE	8 mm	Pack of 1	175611	UC-QS-8H
	Threaded connection, polymer design	Screwed plug PE	G1/4	Pack of 1	165004	UC-1/4
				Pack of 20	534220	UC-1/4-20
		Housing POM	G3/8	Pack of 1	2309	U-3/8
				Pack of 20	534224	U-3/8-20
Push-in fitting					Datasheets → Internet: qs	
	Male thread with external hex	G1/4	8 mm	Pack of 10	186099	QS-G1/4-8
				Pack of 50	132040	QS-G1/4-8-50
			10 mm	Pack of 10	186101	QS-G1/4-10
				Pack of 50	132041	QS-G1/4-10-50
		G3/8	10 mm	Pack of 10	186102	QS-G3/8-10
				Pack of 50	132044	QS-G3/8-10-50
12 mm	Pack of 10		186103	QS-G3/8-12		
	Pack of 20		132045	QS-G3/8-12-20		
	Push-in L-fitting, rotatable through 360°, male thread with external hex	G1/4	8 mm	Pack of 10	186120	QSL-G1/4-8
				Pack of 50	132052	QSL-G1/4-8-50
			10 mm	Pack of 10	186122	QSL-G1/4-10
				Pack of 50	132053	QSL-G1/4-10-50
		G3/8	10 mm	Pack of 10	186123	QSL-G3/8-10
				Pack of 20	132056	QSL-G3/8-10-20
			12 mm	Pack of 10	186124	QSL-G3/8-12
				Pack of 20	132057	QSL-G3/8-12-20
Blanking plug						
	For G1/4 thread			Pack of 10	3569	B-1/4
	For G3/8 thread			Pack of 10	3570	B-3/8
Inscription label						
	For solenoid valve			Pack of 80	197259	MH-BZ-80X