

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

FESTO

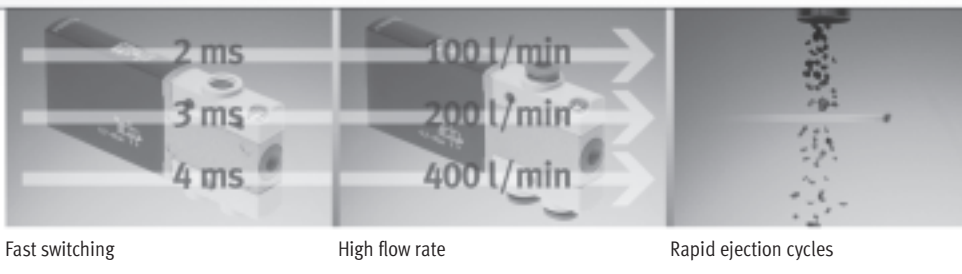


- Directly actuated valves
- Rapid response times down to 2 ms
- Standard nominal flow rate 100 ... 400 l/min
- Compact design
- Flexible construction of valve manifolds
- Free of copper and PTFE

Fast-switching valves from Festo: More than just fast switching

The fast-switching professionals with response times down to 2 milliseconds

Speed, dynamic response and precision are in demand more than ever in modern automation. The solution lies in pneumatic components that offer shorter cycle times in return for comparatively low investment costs for the components. Maximum process reliability, robustness and service life are guaranteed.



High speed in production

Fast-switching valves are a true technological gem when it comes to high-speed applications. With response times ≤ 2 ms and a repetition accuracy ≤ 0.2 ms, they represent the pinnacle of what is technologically achievable – even in 24-hour continuous operation with over 500 million cycles.

Fast-switching valves are easily retrofitted into existing systems or can be used as a pacesetter for newly designed systems. They have a compact design that provides high component density. Indispensable for sorting parts by means of air ejector, in flap control systems, for gluing, dosing, packaging and, of course, suitable for vacuum applications as well.

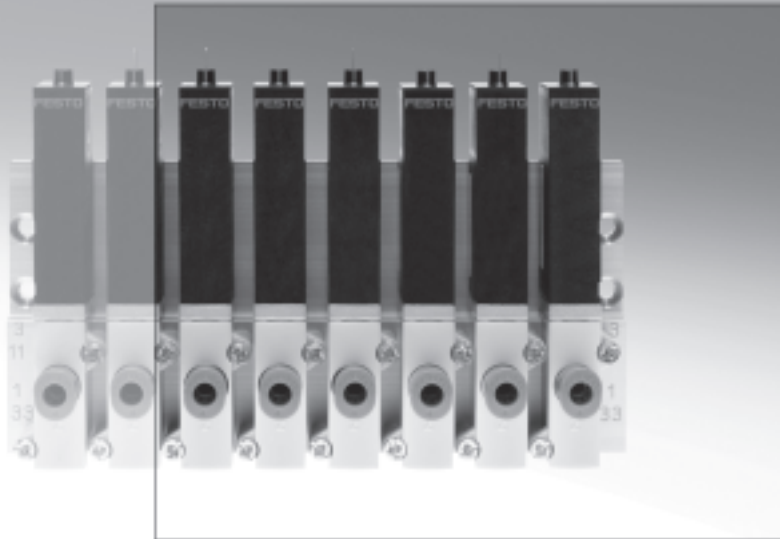
Faster switching

The extremely short response times facilitate short cycle times. Extremely precise switching makes it possible to control process sequences accurately.

High output and very good machine utilisation are also guaranteed. Good repetition accuracy of response times ensures consistent processes, improves process and part quality and reduces rejects and rework.

Faster installation

Thanks to the various connection options such as threads or integrated QS push-in connectors and the different mounting options for individual valves or the valve manifold, the installation can be optimised to suit local conditions and space requirements can be reduced 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.



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

Advantages for design

- Very high cycle rates
- Extremely short cycle times
- Maximum repetition accuracy
- Vacuum-compatible thanks to directly actuated poppet valve
- Flexible design principle
- Direct actuation via standard PLC possible
- Direct mounting in the application with IP65 protection

Advantages for purchasing

- 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 QS connections
- Reduced assembly costs with pre-assembled cables
- No additional protection required thanks to IP65



Fast and precise – sturdy and economical

High performance, process stability and extremely simple handling

MH fast-switching valves increase cycle rates and improve process and part quality with their excellent repetition accuracy.



Precise switching with high power ...

... for fast and precision-pulsed operation

Built-in 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 simple, and no additional electronics or pneumatics know-how is necessary.

Optimised equipment and processes

- On-site assembly thanks to IP65 – insensitive to dust and humidity.
- Direct actuation with 24 V DC/1 A – use of PLC standard outputs.
- With an extremely long service life of 500 million cycles, three-layer continuous operation and being maintenance-free, you get optimum efficiency.

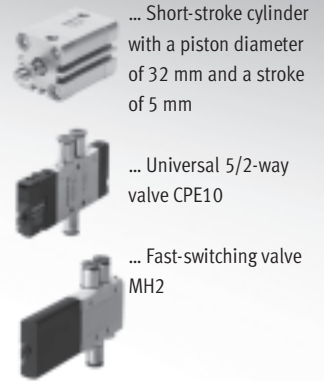
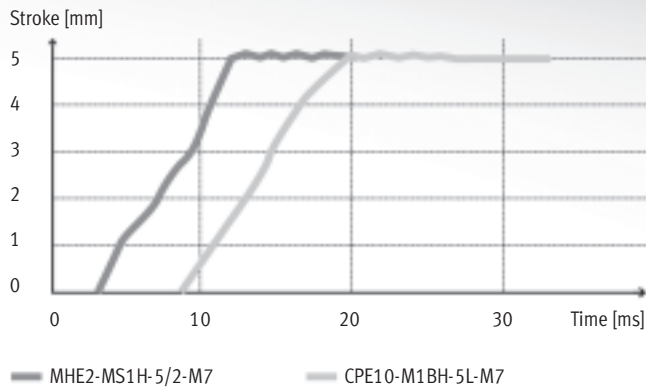
Key features

- Repetition accuracy ≤ 0.2 ms for exact dispensing/bonding, for example.
- Switching time ≤ 2 ms makes for short cycle times and very quick response characteristics.
- 10 mm width enables compact assembly.
- Variably connectable as an individual valve, a semi in-line or manifold mounted variant, facilitating customised installation.
- IP65 protection enables direct mounting during use without requiring additional protective measures.
- Easy installation via direct actuation from the standard PLC with 24 V DC/1 A.

Fast valves and an optimised control loop system – two guarantees for success

To generate speed in pneumatics, the combination of valve and cylinder must be perfectly harmonised. With the right combination, efficiency can be improved by 30%. Cylinders with small diameters and short strokes need fast valves.

Short-stroke cylinder ADN-32-5 – 30% faster with a fast-switching valve



... Short-stroke cylinder with a piston diameter of 32 mm and a stroke of 5 mm

... Universal 5/2-way valve CPE10

... Fast-switching valve MH2

Valve type		CPE10	MH2-5/2
Flow rate	[l/min]	350	100
Valve response time	[ms]	16	1.7
Cycle time	[ms]	20	14
	[%]	100	70
Result			30% faster

Small and fast – a good combination

With a small cylinder volume, particularly in the case of short-stroke cylinders, the response time is crucial. In the example shown here, the combination with a fast-switching valve is 30% faster. In concrete terms, this means that the cylinder actuated using the fast-switching valve is already in the end position before movement of the cylinder in combination with the universal valve even begins.

The result is a significant increase in system efficiency and economy – with a comparable space requirement and weight for both valves, low air consumption and a ten-fold increase in the service life of the fast-switching valve.

Length means losses – Focus on tubing

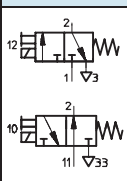
Short tubing is a key factor when it comes to pneumatic efficiency. Reducing the tubing length from 1 m to 0.5 m, for example, improves the max. possible flow rate by 20%. A tube length greater than 2 m results in losses of up to 50%. Use of the next largest tube is recommended in this case.

Small and local – The clever alternative

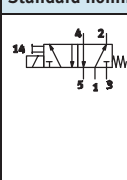
Short tubes with a small diameter are ideal for installation of valves close to the cylinder. The small and light fast-switching valves are suitable for direct mounting in the application – thanks also to their IP65 protection. The use of smaller and lighter fittings also reduces the weight – and improves the efficiency of moving systems in particular.

Solenoid valves MH2, fast-switching valves

Product range overview

Function	Circuit symbol	Design	Response time [ms]		Operating voltage [V DC]	Free of copper and PTFE	→ Page
			2	7			
3/2-way valve ²⁾	Standard nominal flow rate 100 l/min						
		Individual valve	■ ¹⁾	■	5, 12, 24	■	2 / 3.2-11
		Semi in-line valve	■ ¹⁾	■	5, 12, 24	■	2 / 3.2-21
		Sub-base valve	■ ¹⁾	■	5, 12, 24	■	2 / 3.2-37

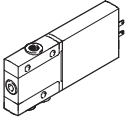
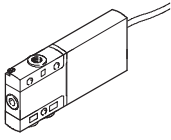
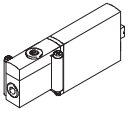
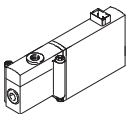
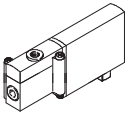
- 1) Response time of 2 ms only with voltage of 24 V DC and plug vanes or moulded-in cable
2) Can be used as a 2/2 way valve by sealing connection 3 or 33

Function	Circuit symbol	Design	Response time [ms]		Operating voltage [V DC]	Free of copper and PTFE	→ Page
			Off	On			
5/2-way valve	Standard nominal flow rate 100 l/min						
		Individual valve	1.7	1.9	24	■	2 / 3.2-16
		Semi in-line valve	1.7	1.9	24	■	2 / 3.2-31
		Sub-base valve	1.7	1.9	24	■	2 / 3.2-46

Solenoid valves MH2, fast-switching valves

Product range overview

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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 mounting	-	-	■	■	■	■
Moulded-in cable							
	Direct mounting	■	■	-	-	-	-
	Individual sub-base	-	-	■	■	■	■
	Manifold mounting	-	-	■	■	■	■
Plug connection at rear (HC)							
	Individual sub-base	-	-	■	-	■	-
	Manifold mounting	-	-	■	-	■	-
Plug connection on top (TC)							
	Individual sub-base	-	-	■	-	■	-
	Manifold mounting	-	-	■	-	■	-
Plug connection underneath (PI)							
	Individual sub-base with plug base	-	-	■	-	■	-
	Manifold mounting via plug bases	-	-	■	-	■	-
	Manifold mounting via plug bases and electrical multi-pin connection	-	-	■	-	■	-

Solenoid valves MH3, fast-switching valves



Product range overview

Function	Circuit symbol	Design	Response time [ms]		Operating voltage [V DC]	Free of copper and PTFE	→ Page
			3	8			
3/2-way valve ¹⁾	Standard nominal flow rate 200 l/min						
		Individual valve	■	■	24	■	2 / 3.2-60
		Semi in-line valve	■	■	24	■	2 / 3.2-65
		Sub-base valve	■	■	24	■	2 / 3.2-72

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

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

Solenoid valves MH4, fast-switching valves

Product range overview



Function	Circuit symbol	Design	Response time [ms]		Operating voltage [V DC]	Free of copper and PTFE	→ Page
			3.5	9			
3/2-way valve ¹⁾	Standard nominal flow rate 400 l/min						
		Individual valve	■	■	24	■	2 / 3.2-81
		Semi in-line valve	■	■	24	■	2 / 3.2-85
		Sub-base valve	■	■	24	■	2 / 3.2-92

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

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

Solenoid valves MH2, fast-switching valves


Type codes



Application-optimised directional control valves
Fast-switching valves

3.2

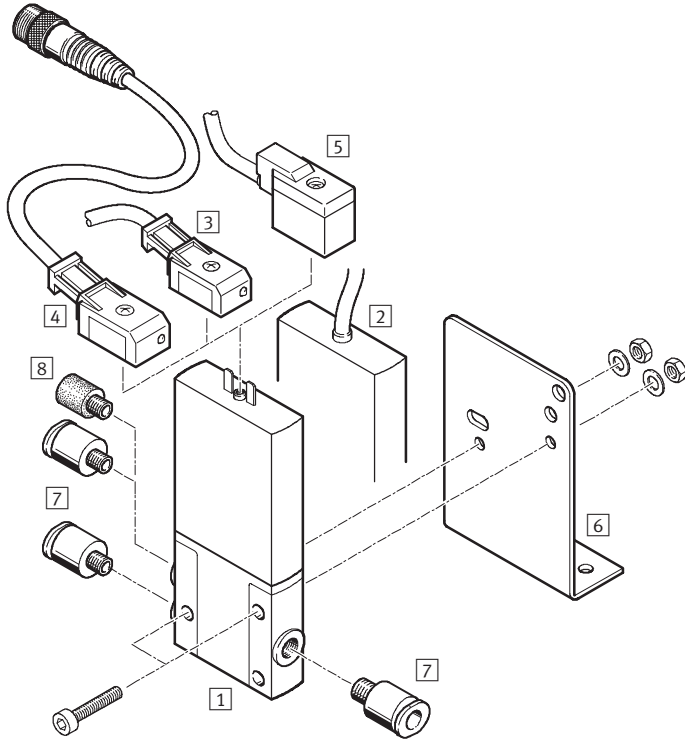
		MH	P	2	-	M	S	5	H	-	3/2	-	O	-	M5	-	TC	
Valve family																		
MH	Fast-switching valves																	
Design																		
E	Individual valve																	
P	Semi in-line valve																	
A	Sub-base valve																	
Size																		
2	Flow rate 100 l/min																	
Drive function																		
M	Solenoid, switching																	
Response time																		
-	7 ms																	
S	2 ms																	
Operating voltage																		
4	5 V DC																	
5	12 V DC																	
1	24 V DC																	
Manual override																		
H	Non-detenting																	
Valve function																		
3/2	3/2-way valve																	
5/2	5/2-way valve																	
Normal position																		
G	Closed																	
O	Open																	
Pneumatic connection																		
2	Nominal size 2 mm																	
M5	Thread M5																	
M7	Thread M7																	
QS4	Push-in connector for 4 mm O.D. tubing																	
Electrical connection																		
-	Plug vanes for plug socket KMYZ-...																	
K	Moulded-in cable, 2.5 m long																	
HC	Plug connection at rear for plug socket KMH																	
TC	Plug connection on top for plug socket KMH																	
PI	Plug connection underneath for plug-in connection																	

 Note
Additional variants and accessories can be configured and ordered through the MH2 modular product system → 2 / 3.2-52.

Solenoid valves MHE2, fast-switching valves

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

Connection with plug vanes – Connection with moulded-in cable

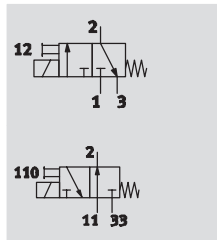





Valves and accessories		
	Brief description	→ Page
1	Individual valve MHE2-...	With plug vanes 2 / 3.2-12
2	Individual valve MHE2-...-K	With moulded-in cable 2 / 3.2-12
3	Plug socket with cable KMYZ-3 (IP65)	With LED and PUR cable 2 / 3.2-58
4	Plug socket with cable KMYZ-3 (IP65)	With LED, PUR cable and M8 plug 2 / 3.2-58
5	Plug socket with cable KMYZ-4 (IP40)	With PVC cable 2 / 3.2-58
6	Mounting bracket MHE2-BG-L	– 2 / 3.2-14
7	Push-in fittings QS	For connecting compressed air tubing with standard O.D. to CETOP RP 54 P Volume 3
8	Silencer UC	For fitting in exhaust ports Volume 3

Solenoid valves MHE2, fast-switching valves

Technical data – Individual valve, 3/2-way valve

Function



-  - Voltage
24 V DC
-  - Pressure
-0.9 ... +8 bar
-  - Temperature range
-5 ... +60 °C



General technical data		
Valve function		3/2 way, single solenoid ¹⁾
Design		Pressure-relieved poppet valve
Sealing principle		Soft
Control type		Electric
Actuation type		Direct
Direction of flow		Reversible with restrictions (operating pressure)
Exhaust function		With flow control
Manual override		Non-detenting
Assembly position		Any
Grid dimension	[mm]	14 (minimum clearance 4 mm)
Nominal diameter	[mm]	2
Standard nominal flow rate	[l/min]	100
Type of mounting		Via through-holes
Pneumatic connection		Connecting thread M7
		Push-in fitting for tubing O.D. 4 mm
Product weight	[g]	60

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

Operating and environmental conditions		
Operating medium		Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm
		Vacuum, grade of filtration 40 µm
Operating pressure	[bar]	-0.9 ... +8 ²⁾
Operating pressure, reversible	[bar]	-0.9 ... 0
Ambient temperature	[°C]	-5 ... +60 (100% duty cycle)
Temperature of medium	[°C]	-5 ... +60 (100% duty cycle)
Corrosion resistance class CRC		2 ¹⁾
Certification		c UL us - Recognized (OL)

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

2) There may be slight leakage in the pressure range -0.5 to +0.5 bar

Solenoid valves MHE2, fast-switching valves

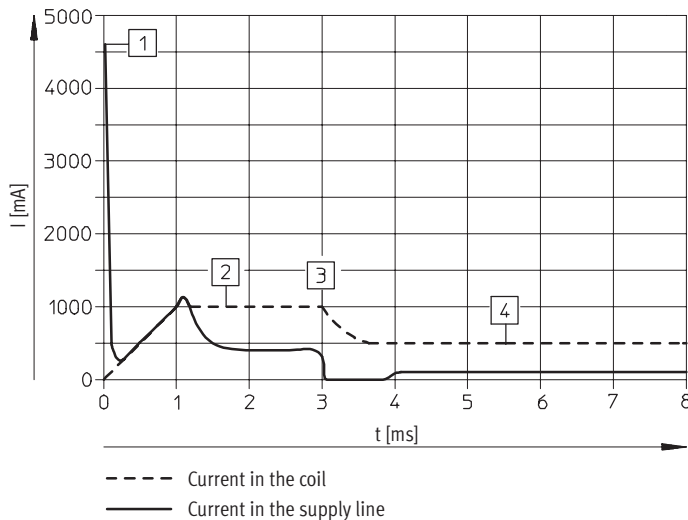
Technical data – Individual valve, 3/2-way valve

Electrical data		
Operating voltage	[V DC]	24 ±10%
Type of connection		Plug vanes or moulded-in cable
Power consumption		
With fast-switching electronics	[W]	5 for 3 ms approx. (pull 1 A), then 1.25 W
Without fast-switching electronics	[W]	2.88
Protection class to EN 60529		
With moulded-in cable		IP65
With plug socket with cable KMYZ-3		IP65
With plug socket with cable KMYZ-3 and plug M8		IP65
With plug socket with cable KMYZ-4		IP40

Response times and switching frequencies		
With fast-switching electronics		
Switching time on/off	[ms]	1.7/2 +10% ... -30%
Maximum switching frequency	[Hz]	330 ¹⁾
CE symbol		In accordance with EU EMC Directive
Without fast-switching electronics		
Switching time on/off	[ms]	7/3.5
Maximum switching frequency	[Hz]	130

1) The ambient temperature must be limited as from 125 Hz.

Current path for valves with fast-switching electronics



- 1 Capacitor charging
- 2 Controlled coil current 1 A
- 3 Drop to holding current
- 4 Controlled holding current 0.5 A

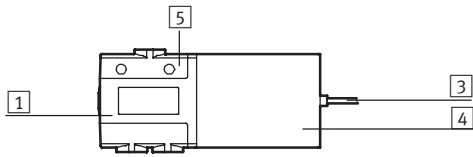
Solenoid valves MHE2, fast-switching valves

Technical data – Individual valve, 3/2-way valve



Application-optimised directional control valves
Fast-switching valves

Materials



1	Body	Die-cast zinc, coated
3	Cable sheath	Polyurethane
4	Coil housing	Polyamide
5	Connection piece	Polyamide
-	Seals	Nitrile rubber/ hydrogenated nitrile rubber
Note on materials		Free of copper and PTFE

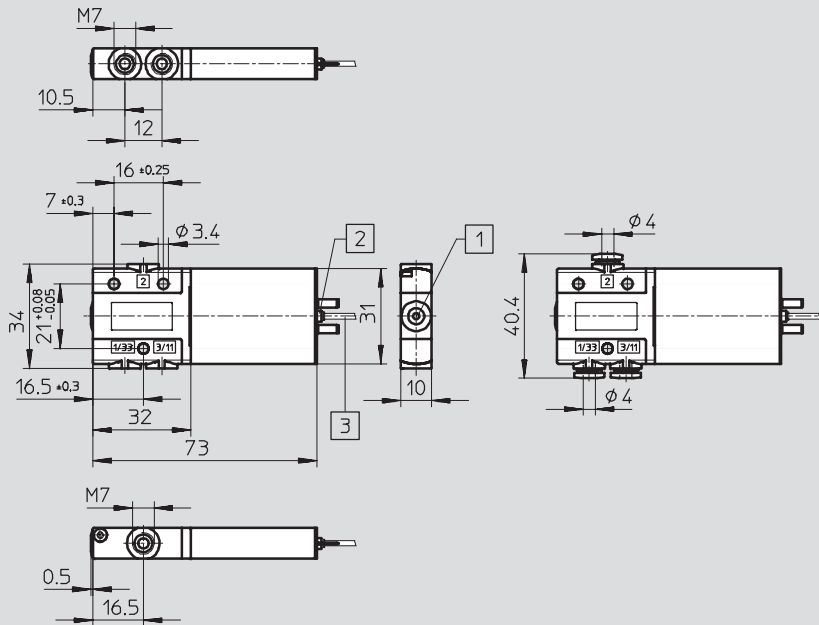
Dimensions

Download CAD data → www.festo.com/en/engineering

Valve with plug vanes or moulded-in cable

MHE2-...-M7

MHE2-...-QS4

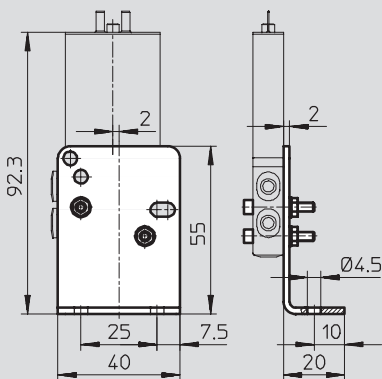


1 Manual override, non-detenting

2 Plug vanes for plug socket with cable KMYZ-3, KMYZ-4

3 Cable 2.5 m

Mounting bracket MHE2-BG-L



Solenoid valves MHE2, fast-switching valves



Technical data – Individual valve, 3/2-way valve

Ordering data – Valves					
Electrical connection	Operating voltage	Normally closed		Normally open	
		Part No.	Type	Part No.	Type
Response time 2 ms					
Connecting thread M7					
Plug vanes	24 V DC	196 131	MHE2-MS1H-3/2G-M7	196 151	MHE2-MS1H-3/2O-M7
Cable		196 133	MHE2-MS1H-3/2G-M7-K	196 153	MHE2-MS1H-3/2O-M7-K
Push-in connector QS 4					
Plug vanes	24 V DC	196 135	MHE2-MS1H-3/2G-QS4	196 155	MHE2-MS1H-3/2O-QS4
Cable		196 137	MHE2-MS1H-3/2G-QS4-K	196 157	MHE2-MS1H-3/2O-QS4-K
Response time 7 ms					
Connecting thread M7					
Plug vanes	24 V DC	196 130	MHE2-M1H-3/2G-M7	196 150	MHE2-M1H-3/2O-M7
Cable		196 132	MHE2-M1H-3/2G-M7-K	196 152	MHE2-M1H-3/2O-M7-K
Push-in connector QS 4					
Plug vanes	24 V DC	196 134	MHE2-M1H-3/2G-QS4	196 154	MHE2-M1H-3/2O-QS4
Cable		196 136	MHE2-M1H-3/2G-QS4-K	196 156	MHE2-M1H-3/2O-QS4-K

Ordering data – Product-specific accessories		
Designation	Part No.	Type
Mounting bracket	196 165	MHE2-BG-L

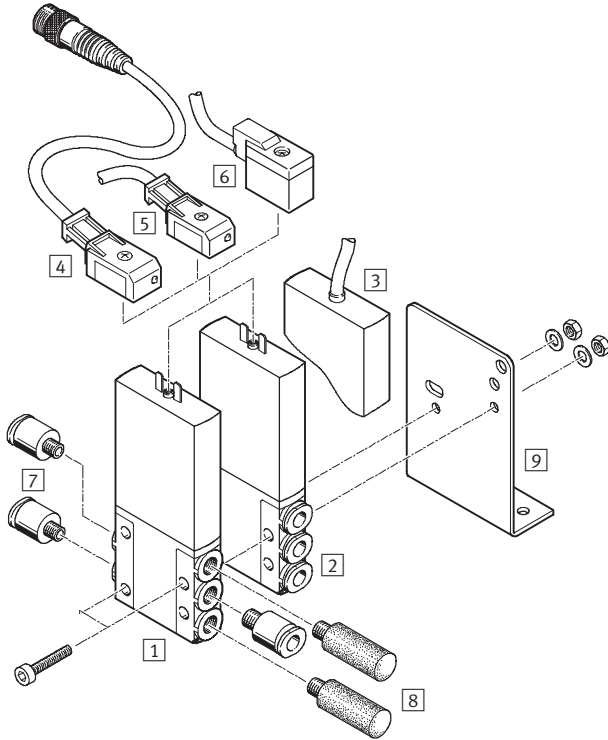
Application-optimised directional control valves
Fast-switching valves

3.2

Solenoid valves MHE2, fast-switching valves

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

Connection with plug vanes – Connection with moulded-in cable



Application-optimised directional control valves
Fast-switching valves

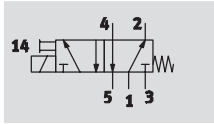
3.2

Valves and accessories		
	Brief description	→ Page
1	Individual valve MHE2-...QS-4	2 / 3.2-17
2	Individual valve MHE2-...-M7	2 / 3.2-17
3	Individual valve MHE2-...-K	2 / 3.2-17
4	Plug socket with cable KMYZ-3 (IP65)	2 / 3.2-58
5	Plug socket with cable KMYZ-3 (IP65)	2 / 3.2-58
6	Plug socket with cable KMYZ-4 (IP40)	2 / 3.2-58
7	Push-in fittings QS	Volume 3
8	Silencer UC	Volume 3
9	Mounting bracket MHE2-BG-L	2 / 3.2-19


Solenoid valves MHE2, fast-switching valves

Technical data – Individual valve, 5/2-way valve

Function



 Voltage
24 V DC

 Pressure
-0.9 ... +8 bar

 Temperature range
-5 ... +60 °C



General technical data		
Valve function		5/2, single solenoid
Design		Pressure-relieved poppet valve
Sealing principle		Soft
Control type		Electric
Actuation type		Direct
Direction of flow		Reversible
Exhaust function		With flow control
Manual override		Non-detenting
Assembly position		Any
Grid dimension	[mm]	14 (minimum clearance 4 mm)
Nominal diameter	[mm]	2
Standard nominal flow rate	[l/min]	100
Type of mounting		Via through-holes
Pneumatic connection		Connecting thread M7
		Push-in fitting for tubing O.D. 4 mm
Product weight	[g]	65

Operating and environmental conditions		
Operating medium		Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm
		Vacuum, grade of filtration 40 µm
Operating pressure	[bar]	-0.9 ... +8
Ambient temperature	[°C]	-5 ... +60 (100% duty cycle)
Temperature of medium	[°C]	-5 ... +60 (100% duty cycle)
Corrosion resistance class CRC		2 ¹⁾
Certification		c UL us - Recognised (OL)

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

Solenoid valves MHE2, fast-switching valves

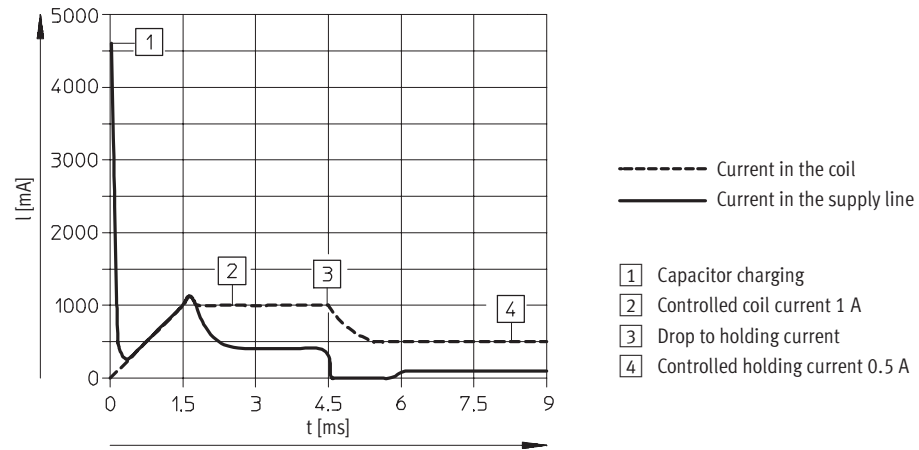
Technical data – Individual valve, 5/2-way valve

Electrical data		
Operating voltage	[V DC]	24 ±10%
Type of connection		Plug vanes or moulded-in cable
Power consumption		
Low-current phase	[W]	1.625
High-current phase	[W]	6.5
Protection class to EN 60529		
With moulded-in cable		IP65
With plug socket with cable KMYZ-3		IP65
With plug socket with cable KMYZ-3 and plug M8		IP65
With plug socket with cable KMYZ-4		IP40

Response times and switching frequencies		
Response time on	[ms]	1.9 +10% ... -30%
Response time off	[ms]	1.7 +10% ... -30%
Maximum switching frequency	[Hz]	300 ¹⁾
CE symbol		In accordance with EU EMC Directive

1) The ambient temperature must be limited as from 100 Hz.

Current path

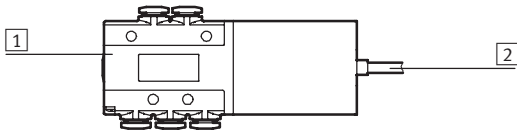


Solenoid valves MHE2, fast-switching valves

Technical data – Individual valve, 5/2-way valve



Materials



1	Body	Die-cast zinc, coated
2	Cable sheath	Polyurethane
-	Seals	Nitrile rubber/ hydrogenated nitrile rubber
-	Screws	Galvanised steel
Note on materials		Free of copper and PTFE

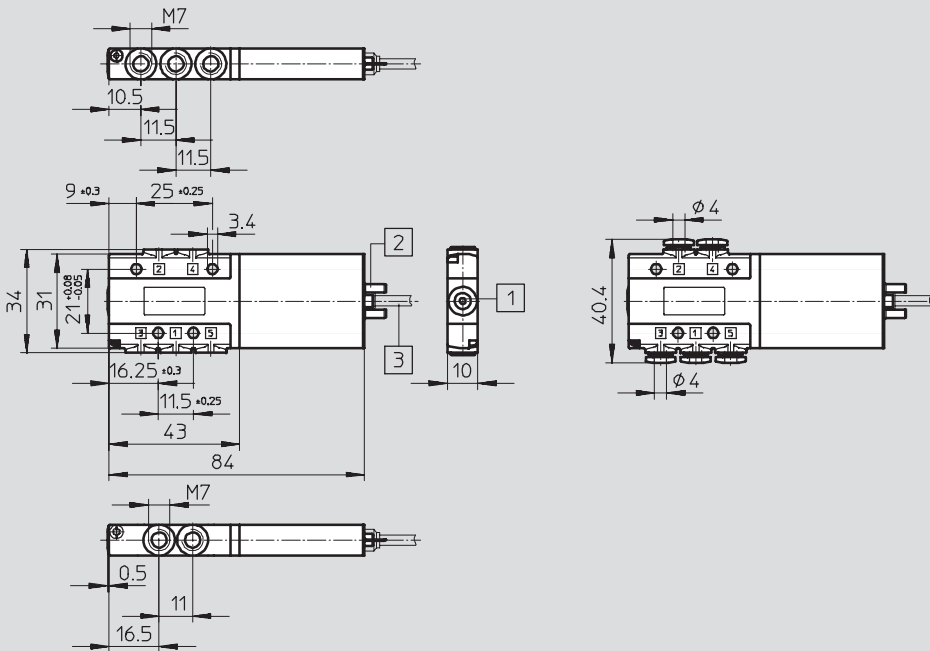
Dimensions

Download CAD data → www.festo.com/en/engineering

Valve with plug vanes or moulded-in cable

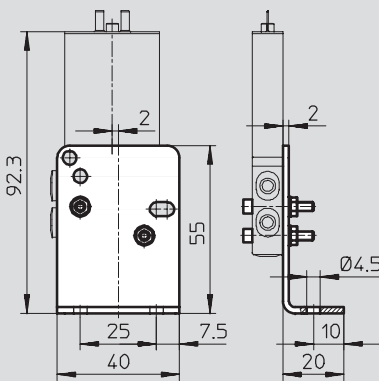
MHE2-...-M7

MHE2-...-QS4



- 1 Manual override, non-detenting
- 2 Plug vanes for plug socket with cable KMYZ-3, KMYZ-4
- 3 Cable 2.5 m

Mounting bracket MHE2-BG-L



Solenoid valves MHE2, fast-switching valves

Technical data – Individual valve, 5/2-way valve

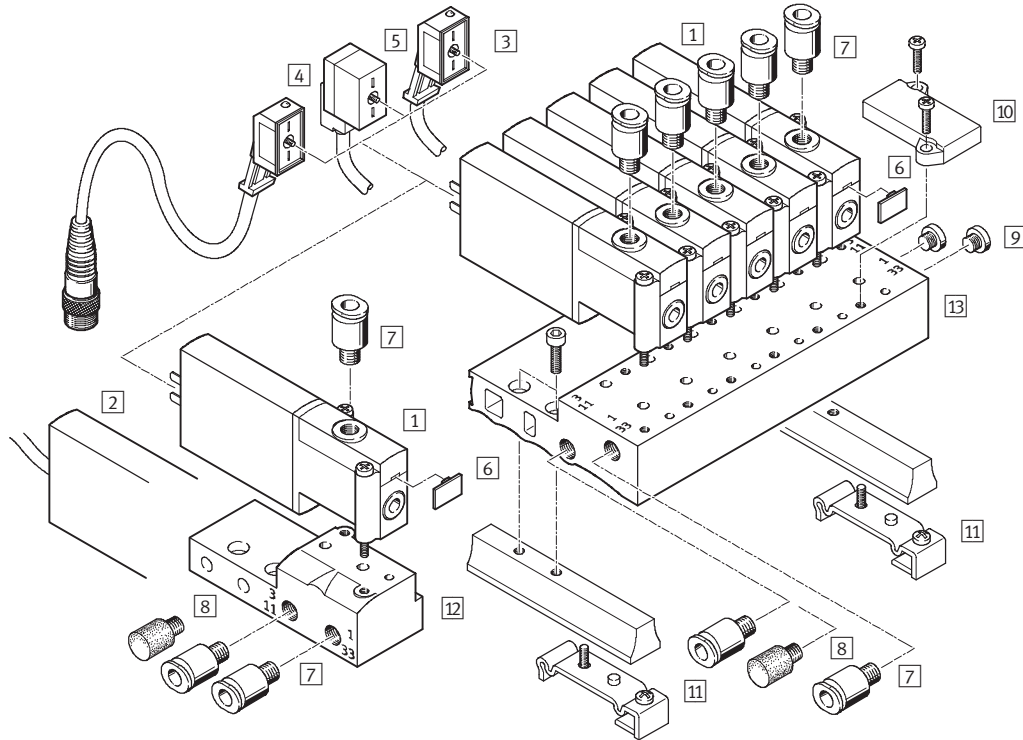
Ordering data – Valves			
Electrical connection	Operating voltage	Part No.	Type
Connecting thread M7			
Plug vanes	24 V DC	525113	MHE2-MS1H-5/2-M7
Cable		525115	MHE2-MS1H-5/2-M7-K
Push-in connector QS 4			
Plug vanes	24 V DC	525117	MHE2-MS1H-5/2-QS-4
Cable		525119	MHE2-MS1H-5/2-QS-4-K

Ordering data – Product-specific accessories			
Designation		Part No.	Type
Mounting bracket		196 165	MHE2-BG-L

Solenoid valves MHP2, fast-switching valves

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

Connection with plug vanes – Connection with moulded-in cable ...-K



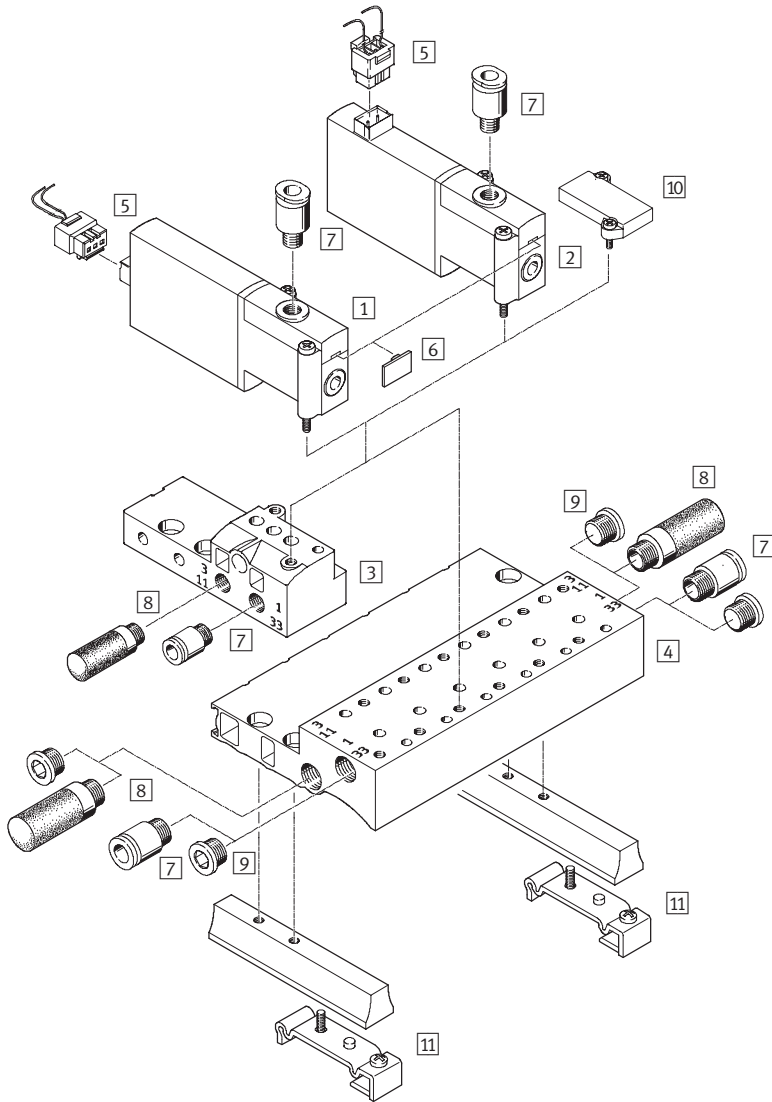
Valves and accessories		Brief description	→ Page
1	Semi in-line valve MHP2-...	With plug vanes	2 / 3.2-24
2	Semi in-line valve MHP2-...-K	With moulded-in cable	2 / 3.2-24
3	Plug socket with cable KMYZ-3 (IP65)	With LED and PUR cable	2 / 3.2-58
4	Plug socket with cable KMYZ-3 (IP65)	With LED, PUR cable and M8 plug	2 / 3.2-58
5	Plug socket with cable KMYZ-4 (IP40)	With PVC cable	2 / 3.2-58
6	Inscription label MH-BZ-80X	For identifying the valves	2 / 3.2-58
7	Push-in fittings QS	For connecting compressed air tubing with standard O.D. to CETOP RP 54 P	Volume 3
8	Silencer UC	For fitting in exhaust ports	Volume 3
9	Blanking plug B	For sealing unused ports	2 / 3.2-58
10	Blanking plate MHAP2-BP-3	For sealing vacant positions	2 / 3.2-58
11	Hat-rail mounting MHAP2-BG-NRH-35	–	2 / 3.2-58
12	Individual sub-base MHP2-AS-3-M5	For semi in-line valve	2 / 3.2-27
13	Manifold block MHP2-PR...-3	For semi in-line valve	2 / 3.2-27

Solenoid valves MHP2, fast-switching valves

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



Plug connection at rear ...-HC – Plug connection on top ...-TC



Application-optimised directional control valves
Fast-switching valves

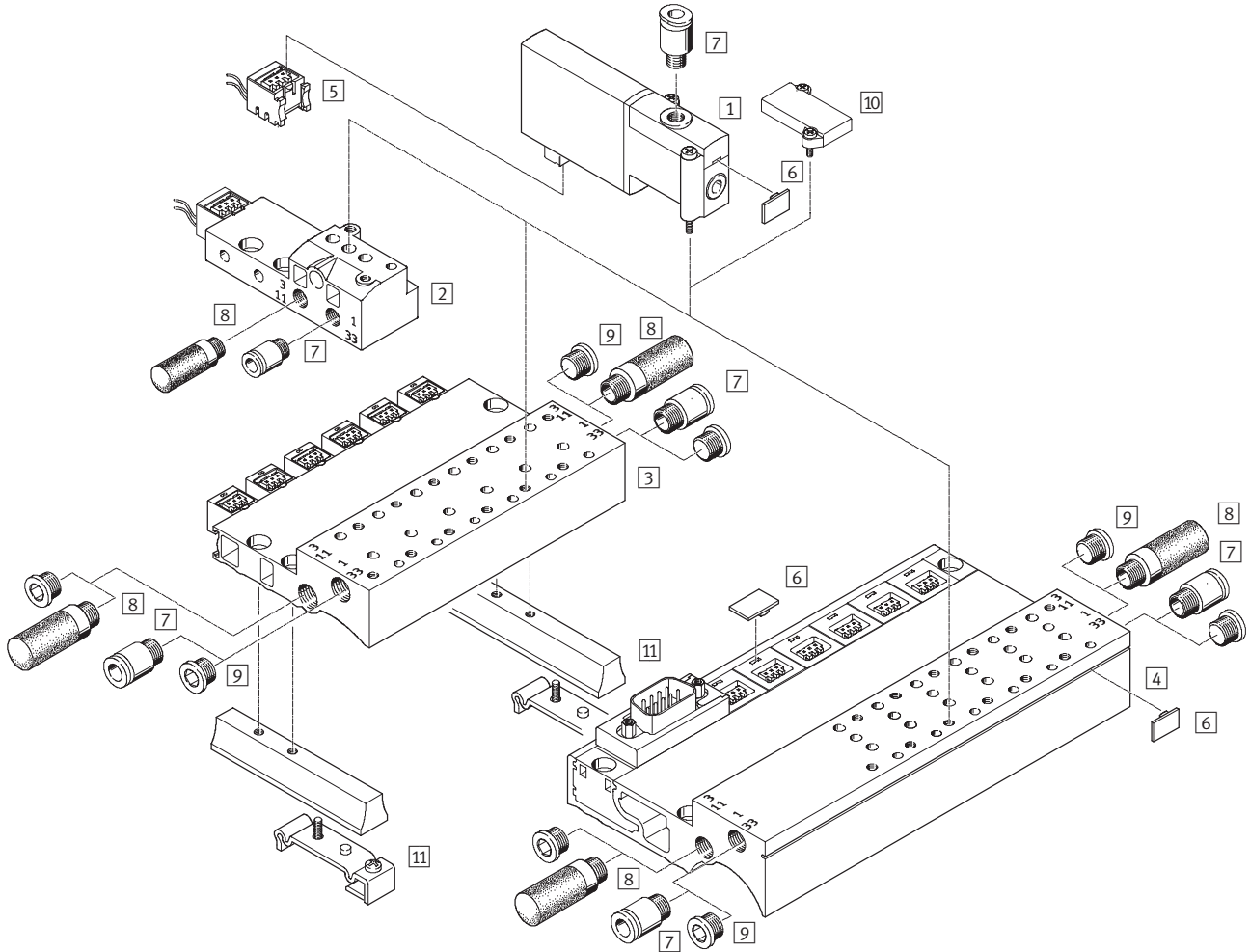
3.2

Valves and accessories			
	Brief description	→ Page	
1	Semi in-line valve MHP2-...-HC	Plug connection at rear	2 / 3.2-24
2	Semi in-line valve MHP2-...-TC	Plug connection on top	2 / 3.2-24
3	Individual sub-base MHP2-AS-3-M5	For semi in-line valve	2 / 3.2-27
4	Manifold block MHP2-PR...-3	For semi in-line valve	2 / 3.2-27
5	Plug socket KMH (IP 40)	With cable	2 / 3.2-58
6	Inscription label MH-BZ-80X	For identifying the valves	2 / 3.2-58
7	Push-in fittings QS	For connecting compressed air tubing with standard O.D. to CETOP RP 54 P	Volume 3
8	Silencer UC	For fitting in exhaust ports	Volume 3
9	Blanking plug B	For sealing unused ports	2 / 3.2-58
10	Blanking plate MHAP2-BP-3	For sealing vacant positions	2 / 3.2-58
11	H-rail mounting MHAP2-BG-NRH-35	-	2 / 3.2-58

Solenoid valves MHP2, fast-switching valves

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

Plug connection underneath ...-PI

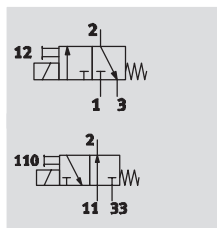


Valves and accessories		
	Brief description	→ Page
1	Semi in-line valve MHP2-...-PI	Plug connection underneath 2 / 3.2-24
2	Individual sub-base MHP2-AS-3-M5-PI	For semi in-line valve 2 / 3.2-27
3	Manifold block MHP2-PR...-3-PI	With plug bases 2 / 3.2-27
4	Manifold block MHP2-PR...-3-PI-D...	With plug bases and electrical multi-pin connection 2 / 3.2-28
5	Plug base MHAP-PI (IP 40)	– 2 / 3.2-58
6	Inscription label MH-BZ-80X	For identifying the valves 2 / 3.2-58
7	Push-in fittings QS	For connecting compressed air tubing with standard O.D. to CETOP RP 54 P Volume 3
8	Silencer UC	For fitting in exhaust ports Volume 3
9	Blanking plug B	For sealing unused ports 2 / 3.2-58
10	Blanking plate MHAP2-BP-3-PI	For sealing vacant positions 2 / 3.2-58
11	H-rail mounting MHAP2-BG-NRH-35	– 2 / 3.2-58

Solenoid valves MHP2, fast-switching valves

Technical data – Semi in-line valve, 3/2-way valve

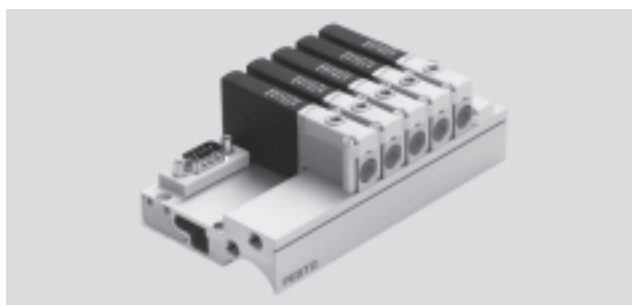
Function



- - Voltage
5, 12, 24 V DC

- - Pressure
-0.9 ... +8 bar

- - Temperature range
-5 ... +40 °C



General technical data		
Valve function		3/2 way, single solenoid ¹⁾
Design		Pressure-relieved poppet valve
Sealing principle		Soft
Control type		Electric
Actuation type		Direct
Direction of flow		Reversible
Exhaust function		With flow control
Manual override		Non-detenting
Assembly position		Any
Grid dimension	[mm]	14
Nominal diameter	[mm]	2
Standard nominal flow rate	[l/min]	100
Type of mounting		On sub-base/manifold
Pneumatic connection		Connecting thread M5
		Push-in fitting for tubing O.D. 4 mm
Product weight	[g]	50

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

Operating and environmental conditions		
Operating medium		Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm
		Vacuum, grade of filtration 40 µm
Operating pressure	[bar]	-0.9 ... +8 ²⁾
Operating pressure, reversible	[bar]	-0.9 ... 0
Ambient temperature	[°C]	-5 ... +40 (100% duty cycle)
Temperature of medium	[°C]	-5 ... +40 (100% duty cycle)
Corrosion resistance class CRC		2 ¹⁾
Certification		c UL us - Recognised (OL)

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

2) There may be slight leakage in the pressure range -0.5 to +0.5 bar

Solenoid valves MHP2, fast-switching valves

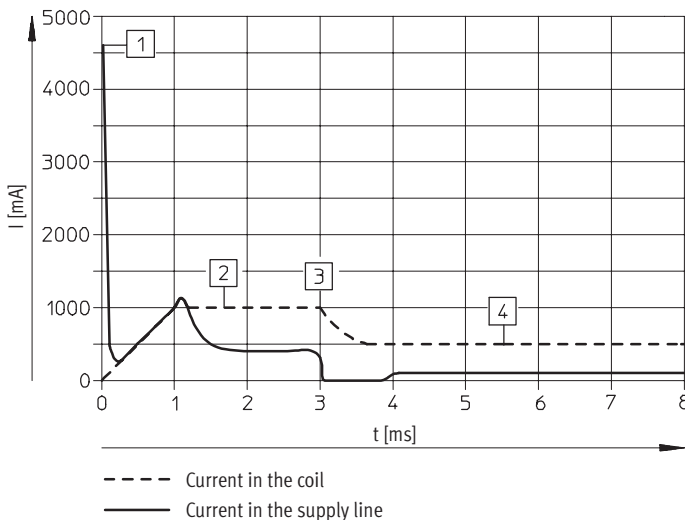
Technical data – Semi in-line valve, 3/2-way valve

Electrical data		
Operating voltage	[V DC]	5 ±10%, 12 ±10% or 24 ±10%
Type of connection		Plug vanes, moulded-in cable or plug connection
Power consumption		
With fast-switching electronics	[W]	5 for 3 ms approx. (pull 1 A), then 1.25 W
Without fast-switching electronics	[W]	2.88
Protection class to EN 60529		
With moulded-in cable		IP65
With plug socket with cable KMH		IP40
With plug socket with cable KMYZ-3		IP65
With plug socket with cable KMYZ-3 and plug M8		IP65
With plug socket with cable KMYZ-4		IP40
With plug base MHAP-PI		IP40
With Sub-D connector plug		IP40

Response times and switching frequencies		
With fast-switching electronics		
Switching time on/off	[ms]	1.7/2 +10% ... -30%
Maximum switching frequency	[Hz]	330 ¹⁾
CE symbol		In accordance with EU EMC Directive
Without fast-switching electronics		
Switching time on/off	[ms]	7/3.5
Maximum switching frequency	[Hz]	130

1) The ambient temperature must be limited from 100 Hz.

Current path for valves with fast-switching electronics



- 1 Capacitor charging
- 2 Controlled coil current 1 A
- 3 Drop to holding current
- 4 Controlled holding current 0.5 A

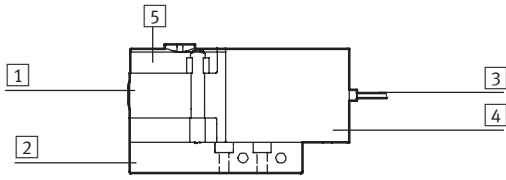
Solenoid valves MHP2, fast-switching valves

Technical data – Semi in-line valve, 3/2-way valve



Application-optimised directional control valves
Fast-switching valves

Materials



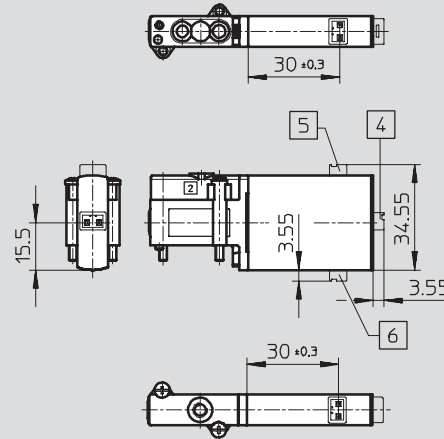
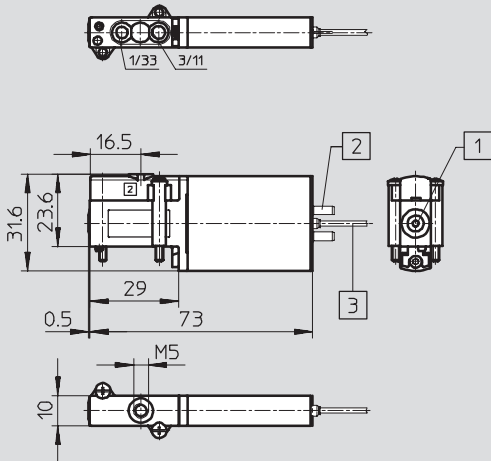
1	Body	Die-cast zinc
2	Sub-base	Manifold block: Aluminium Individual sub-base: Die-cast zinc
3	Cable sheath	Polyurethane
4	Coil housing	Polyamide
5	Connection piece	Polyamide
-	Seals	Nitrile rubber/ hydrogenated nitrile rubber
Note on materials		Free of copper and PTFE

Dimensions

Download CAD data → www.festo.com/en/engineering

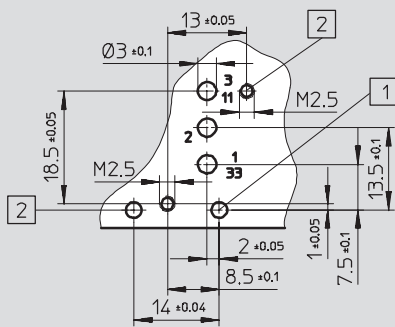
Valve with plug vanes or moulded-in cable ...-K

Valve with plug connection ...-TC/HC/PI



- 1 Manual override, non-detenting
- 2 Plug vanes for plug socket with cable KMYZ-3, KMYZ-4
- 3 Cable 2.5 m
- 4 Plug connection HC
- 5 Plug connection TC
- 6 Plug connection PI

Port pattern on sub-bases



- - - Note
- Semi in-line valves do not require port 2.
- 1 Hole for coding pin, 1.7^{+0.2} mm deep
 - 2 Mounting thread, 4.6⁺¹ mm deep
- If used as a 2/2-way valve, port 3/11 is not required.
- If used as a 2/2-way valve, port 1/33 is not required.

Solenoid valves MHP2, fast-switching valves

Technical data – Semi in-line valve, 3/2-way valve



Dimensions Download CAD data → www.festo.com/en/engineering

Individual sub-base

- 1 Plug base MHAP-PI
- 2 Plug vanes for plug socket with cable KMYZ-3, KMYZ-4
- 3 Cable 2.5 m
- 4 Plug connection HC
- 5 Plug connection TC
- 6 Plug connection PI

Manifold mounting

- 1 Plug base MHAP-PI
- 2 Plug vanes for plug socket with cable KMYZ-3, KMYZ-4
- 3 Cable 2.5 m
- 4 Plug connection HC
- 5 Plug connection TC
- 6 Plug connection PI
- 7 Plug socket with cable KMH
- 8 Blanking plate MHAP2-BP-3
- 9 Silencer UC

Valve positions n	L1	L2	L3
2	38	31	14
3	52	45	18
4	66	59	42

Valve positions n	L1	L2	L3
5	80	73	56
6	94	87	70
7	108	101	84

Valve positions n	L1	L2	L3
8	122	115	98
9	136	129	112
10	150	143	126

Application-optimised directional control valves
Fast-switching valves
3.2

Solenoid valves MHP2, fast-switching valves

Technical data – Semi in-line valve, 3/2-way valve

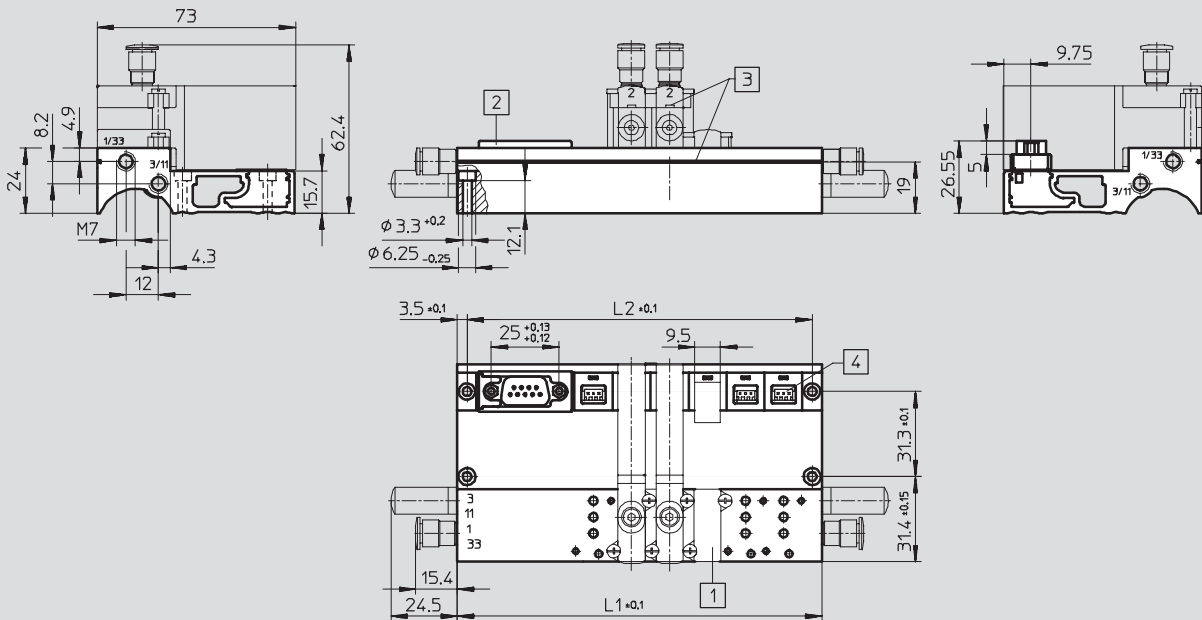


Application-optimised directional control valves
Fast-switching valves

3.2

Dimensions – Manifold mounting with electrical multi-pin connection

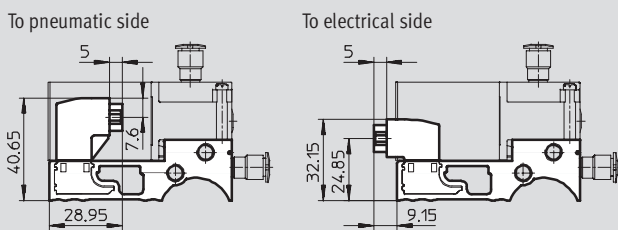
Download CAD data → www.festo.com/en/engineering



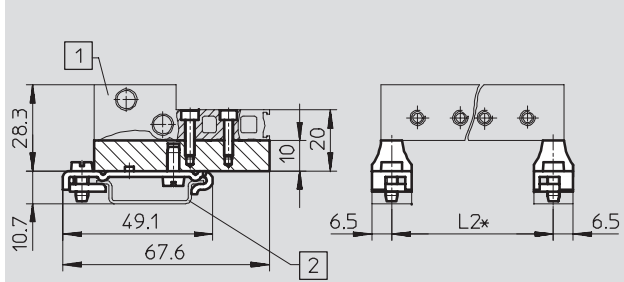
- 1 Blanking plate MHAP2-BP-3
- 2 Sub-D plug, plug outlet to top (standard)
- 3 Slot for inscription labels
- 4 Plug base MHAP-PI

Valve positions n	L1	L2
2	78	71
4	106	99
6	134	127
8	162	155
10	212	205

Electrical multi-pin connection – Plug directions



H-rail mounting MHAP-BG-NRH-35




- 1 Manifold block
 - 2 Mounting rail NRH-35-2000
- * See dimensions table for manifold block used

Solenoid valves MHP2, fast-switching valves

Technical data – Semi in-line valve, 3/2-way valve

Ordering data – Valves					
Electrical connection	Operating voltage	Normally closed		Normally open	
		Part No.	Type	Part No.	Type
Response time 2 ms					
Connecting thread M5					
Plug vanes	24 V DC	196 123	MHP2-MS1H-3/2G-M5	196 143	MHP2-MS1H-3/2O-M5
Cable	24 V DC	196 125	MHP2-MS1H-3/2G-M5-K	196 145	MHP2-MS1H-3/2O-M5-K
Push-in connector QS 4					
Plug vanes	24 V DC	196 127	MHP2-MS1H-3/2G-QS4	196 147	MHP2-MS1H-3/2O-QS4
Cable	24 V DC	196 129	MHP2-MS1H-3/2G-QS4-K	196 149	MHP2-MS1H-3/2O-QS4-K
Response time 7 ms					
Connecting thread M5					
Plug vanes	24 V DC	196 122	MHP2-M1H-3/2G-M5	196 142	MHP2-M1H-3/2O-M5
Cable	24 V DC	196 124	MHP2-M1H-3/2G-M5-K	196 144	MHP2-M1H-3/2O-M5-K
Plug connection at rear	5 V DC	197 429	MHP2-M4H-3/2G-M5-HC	197 411	MHP2-M4H-3/2O-M5-HC
	12 V DC	197 430	MHP2-M5H-3/2G-M5-HC	197 412	MHP2-M5H-3/2O-M5-HC
	24 V DC	197 431	MHP2-M1H-3/2G-M5-HC	197 413	MHP2-M1H-3/2O-M5-HC
Plug connection on top	5 V DC	197 432	MHP2-M4H-3/2G-M5-TC	197 414	MHP2-M4H-3/2O-M5-TC
	12 V DC	197 433	MHP2-M5H-3/2G-M5-TC	197 415	MHP2-M5H-3/2O-M5-TC
	24 V DC	197 434	MHP2-M1H-3/2G-M5-TC	197 416	MHP2-M1H-3/2O-M5-TC
Plug connection underneath	5 V DC	197 435	MHP2-M4H-3/2G-M5-PI	197 417	MHP2-M4H-3/2O-M5-PI
	12 V DC	197 436	MHP2-M5H-3/2G-M5-PI	197 418	MHP2-M5H-3/2O-M5-PI
	24 V DC	197 437	MHP2-M1H-3/2G-M5-PI	197 419	MHP2-M1H-3/2O-M5-PI
Push-in connector QS 4					
Plug vanes	24 V DC	196 126	MHP2-M1H-3/2G-QS4	196 146	MHP2-M1H-3/2O-QS4
Cable	24 V DC	196 128	MHP2-M1H-3/2G-QS4-K	196 148	MHP2-M1H-3/2O-QS4-K

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

Solenoid valves MHP2, fast-switching valves


Technical data – Semi in-line valve, 3/2-way valve



Application-optimised directional control valves
Fast-switching valves

3.2

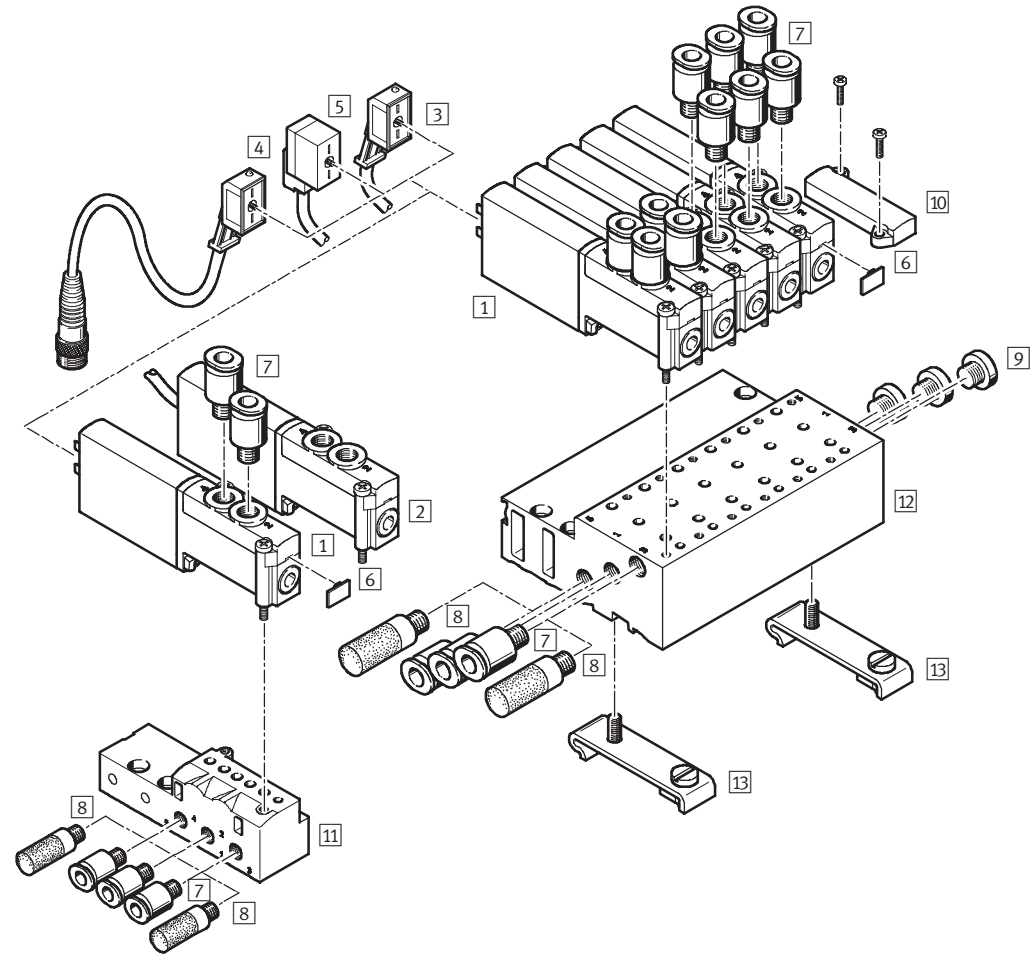
Ordering data – Product-specific accessories		
Designation	Part No.	Type
Valves with plug vanes, cable, plug connection at rear or on top		
Individual sub-base	197 439	MHP2-AS-3-M5
Manifold block for ...	2 valves	197 442 MHP2-PR2-3
	4 valves	197 443 MHP2-PR4-3
	6 valves	197 444 MHP2-PR6-3
	8 valves	197 445 MHP2-PR8-3
	10 valves	197 446 MHP2-PR10-3
Valves with plug connection underneath		
Individual sub-base	197 441	MHP2-AS-3-M5-PI
Manifold block with plug bases for ...	2 valves	197 452 MHP2-PR2-3-PI
	4 valves	197 453 MHP2-PR4-3-PI
	6 valves	197 454 MHP2-PR6-3-PI
	8 valves	197 455 MHP2-PR8-3-PI
	10 valves	197 456 MHP2-PR10-3-PI
Manifold block with plug bases and electrical multi-pin connection for ...	6 valves	197 463 MHP2-PR6-3-PI-D9
	8 valves	197 464 MHP2-PR8-3-PI-D9
	10 valves	197 465 MHP2-PR10-3-PI-D25

 Note
Additional variants and accessories can be configured and ordered through the MH2 modular product system → from 2 / 3.2-52.

Solenoid valves MHP2, fast-switching valves

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

Connection with plug vanes – Connection with moulded-in cable ...-K



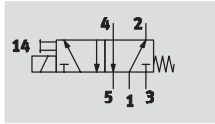
Application-optimised directional control valves
Fast-switching valves
3.2

Valves and accessories		
	Brief description	→ Page
1	Semi in-line valve MHP2-...	With plug vanes 2 / 3.2-32
2	Semi in-line valve MHP2-...-K	With moulded-in cable 2 / 3.2-32
3	Plug socket with cable KMYZ-3 (IP65)	With LED and PUR cable 2 / 3.2-58
4	Plug socket with cable KMYZ-3 (IP65)	With LED, PUR cable and M8 plug 2 / 3.2-58
5	Plug socket with cable KMYZ-4 (IP40)	With PVC cable 2 / 3.2-58
6	Inscription label MH-BZ-80X	For identifying the valves 2 / 3.2-58
7	Push-in fittings QS	For connecting compressed air tubing with standard external diameters Volume 3
8	Silencer UC	For fitting in exhaust ports Volume 3
9	Blanking plug B	For sealing unused ports 2 / 3.2-58
10	Blanking plate MHP2-BP-5	For sealing vacant positions 2 / 3.2-58
11	Individual sub-base MHP2-AS-5-M5	For semi in-line valve 2 / 3.2-36
12	Manifold block MHP2-PR...-5	For semi in-line valve 2 / 3.2-36
13	H-rail mounting CPV10/14-VI-BG-NRH-35	- 2 / 3.2-58


Solenoid valves MHP2, fast-switching valves

Technical data – Semi in-line valve, 5/2-way valve

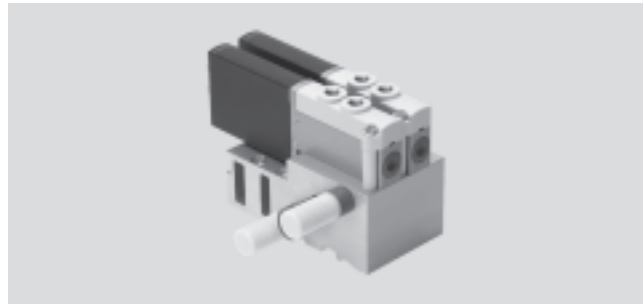
Function



 - Voltage
24 V DC

 - Pressure
-0.9 ... +8 bar

 - Temperature range
-5 ... +40 °C



General technical data		
Valve function		5/2, single solenoid
Design		Pressure-relieved poppet valve
Sealing principle		Soft
Control type		Electric
Actuation type		Direct
Direction of flow		Reversible
Exhaust function		With flow control
Manual override		Non-detenting
Assembly position		Any
Grid dimension	[mm]	14
Nominal diameter	[mm]	2
Standard nominal flow rate	[l/min]	100
Type of mounting		On sub-base/manifold
Pneumatic connection		Connecting thread M5
		Push-in fitting for tubing O.D. 4 mm
Product weight	[g]	65

Operating and environmental conditions		
Operating medium		Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm
		Vacuum, grade of filtration 40 µm
Operating pressure	[bar]	-0.9 ... +8
Ambient temperature	[°C]	-5 ... +40 (100% duty cycle)
Temperature of medium	[°C]	-5 ... +40 (100% duty cycle)
Corrosion resistance class CRC		2 ¹⁾
Certification		c UL us - Recognised (OL)

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

Solenoid valves MHP2, fast-switching valves

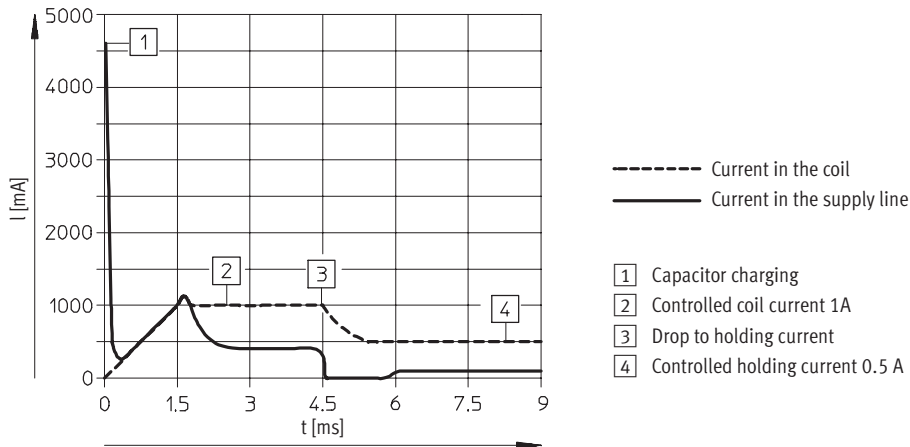
Technical data – Semi in-line valve, 5/2-way valve

Electrical data		
Operating voltage	[V DC]	24 ±10%
Type of connection		Plug vanes or moulded-in cable
Power consumption		
Low-current phase	[W]	1.625
High-current phase	[W]	6.5
Protection class to EN 60529		
With moulded-in cable		IP65
With plug socket with cable KMYZ-3		IP65
With plug socket with cable KMYZ-3 and plug M8		IP65
With plug socket with cable KMYZ-4		IP40

Response times and switching frequencies		
Response time on	[ms]	1.9 +10% ... -30%
Response time off	[ms]	1.7 +10% ... -30%
Maximum switching frequency	[Hz]	300 ¹⁾
CE symbol		In accordance with EU EMC Directive

1) The ambient temperature must be limited as from 75 Hz.

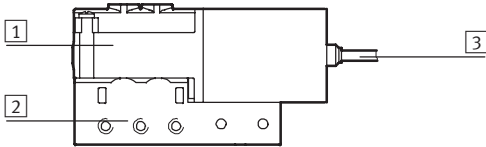
Current path



Solenoid valves MHP2, fast-switching valves

Technical data – Semi in-line valve, 5/2-way valve

Materials



1	Body	Die-cast zinc, coated
2	Sub-base	Die-cast zinc
3	Cable sheath	Polyurethane
-	Seals	Nitrile rubber/ hydrogenated nitrile rubber
-	Screws	Galvanised steel
	Note on materials	Free of copper and PTFE

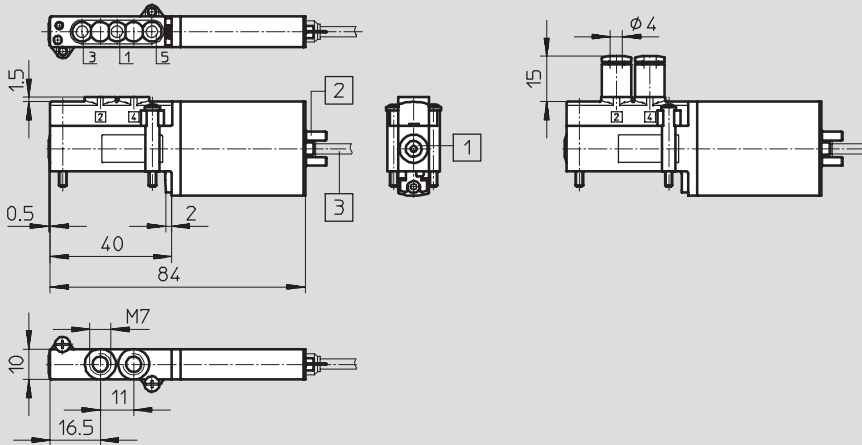
Dimensions

Download CAD data → www.festo.com/en/engineering

Valve with plug vanes or moulded-in cable ...-K

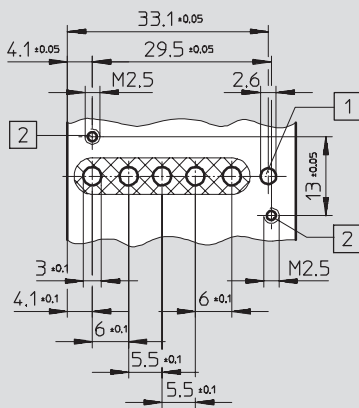
MHP2...-M5

MHP2...-QS4




- 1 Manual override, non-detenting
- 2 Plug vanes for plug socket with cable KMYZ-3, KMYZ-4
- 3 Cable 2.5 m

Port pattern on sub-bases



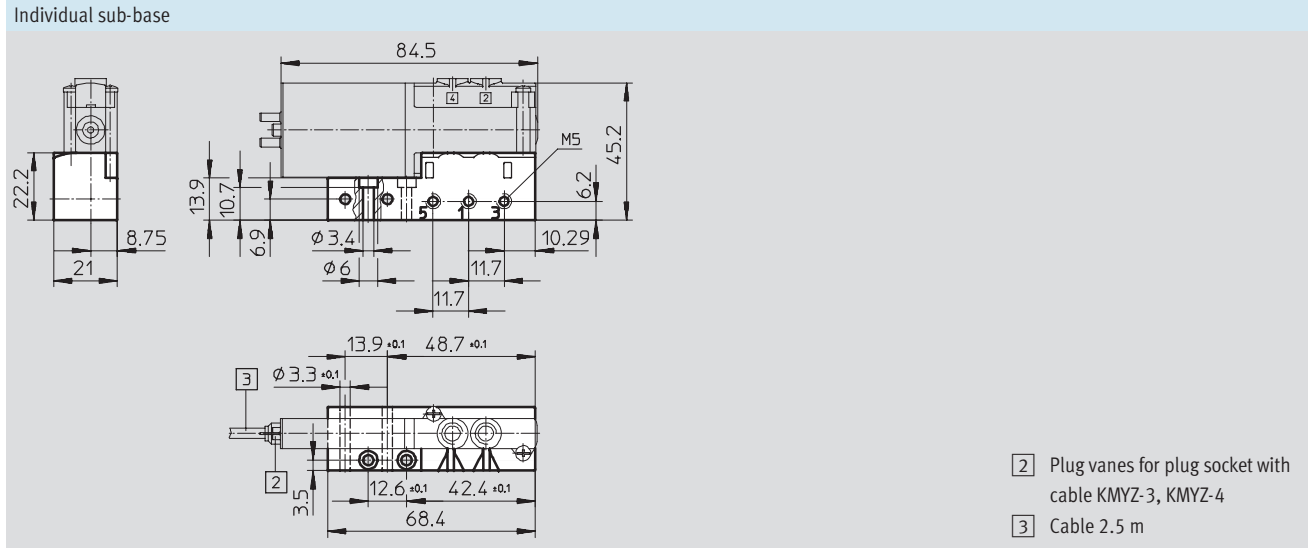
- 1 Hole for coding pin, 1.7 mm deep
- 2 Mounting thread, 4.6 mm deep

 Note
Semi in-line valves do not require ports 2 and 4.

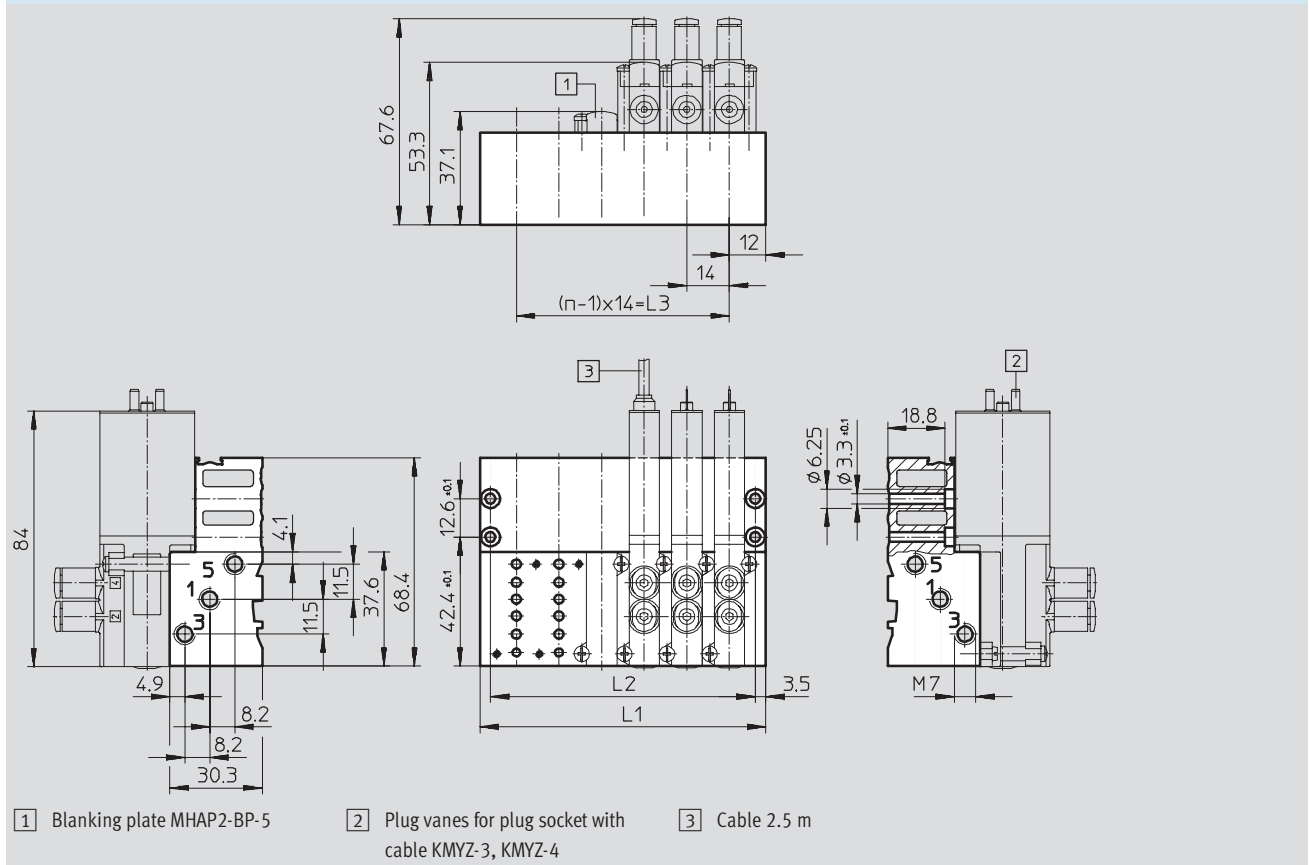
Solenoid valves MHP2, fast-switching valves

Technical data – Semi in-line valve, 5/2-way valve

Dimensions Download CAD data → www.festo.com/en/engineering



Manifold mounting



Valve positions n	L1	L2	L3
2	38	31	14
3	52	45	18
4	66	59	42

Valve positions n	L1	L2	L3
5	80	73	56
6	94	87	70
7	108	101	84

Valve positions n	L1	L2	L3
8	122	115	98
9	136	129	112
10	150	143	126

Solenoid valves MHP2, fast-switching valves

Technical data – Semi in-line valve, 5/2-way valve

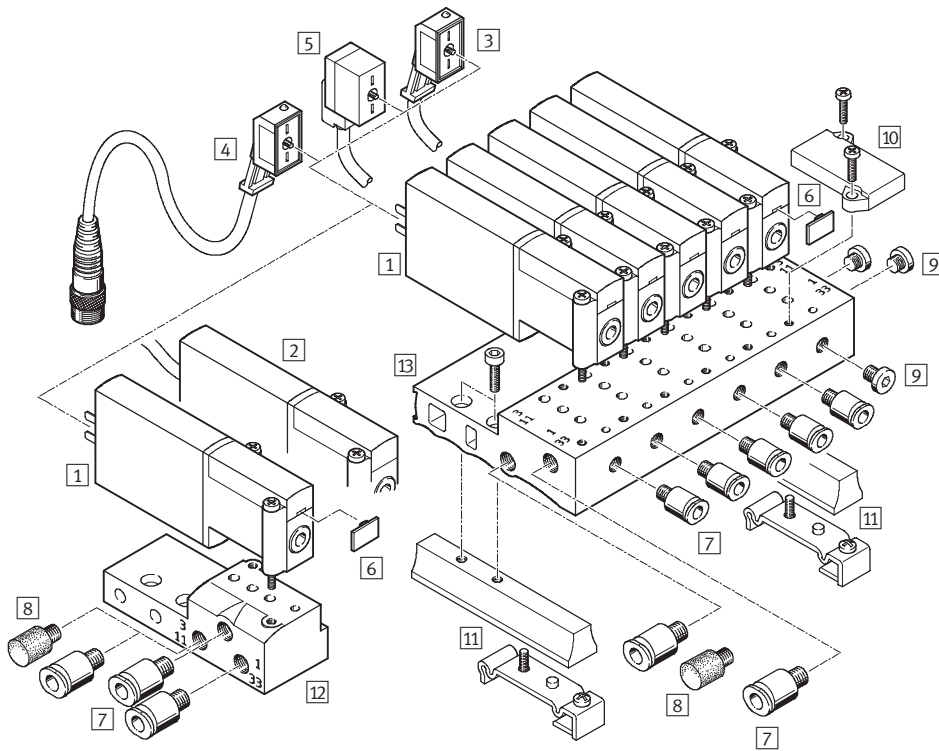
Ordering data – Valves			
Electrical connection	Operating voltage	Part No.	Type
Connecting thread M5			
Plug vanes	24 V DC	525105	MHP2-MS1H-5/2-M5
Cable	24 V DC	525107	MHP2-MS1H-5/2-M5-K
Push-in connector QS 4			
Plug vanes	24 V DC	525109	MHP2-MS1H-5/2-QS4
Cable	24 V DC	525111	MHP2-MS1H-5/2-QS4-K

Ordering data – Product-specific accessories			
Designation		Part No.	Type
Valve with plug vanes or cable			
Individual sub-base		525 121	MHP2-AS-5-M5
Manifold block for ...	2 valves	525 122	MHP2-PR2-5
	4 valves	525 123	MHP2-PR4-5
	6 valves	525 124	MHP2-PR6-5
	8 valves	525 125	MHP2-PR8-5
	10 valves	525 126	MHP2-PR10-5

Solenoid valves MHA2, fast-switching valves

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

Connection with plug vanes – Connection with moulded-in cable ...-K



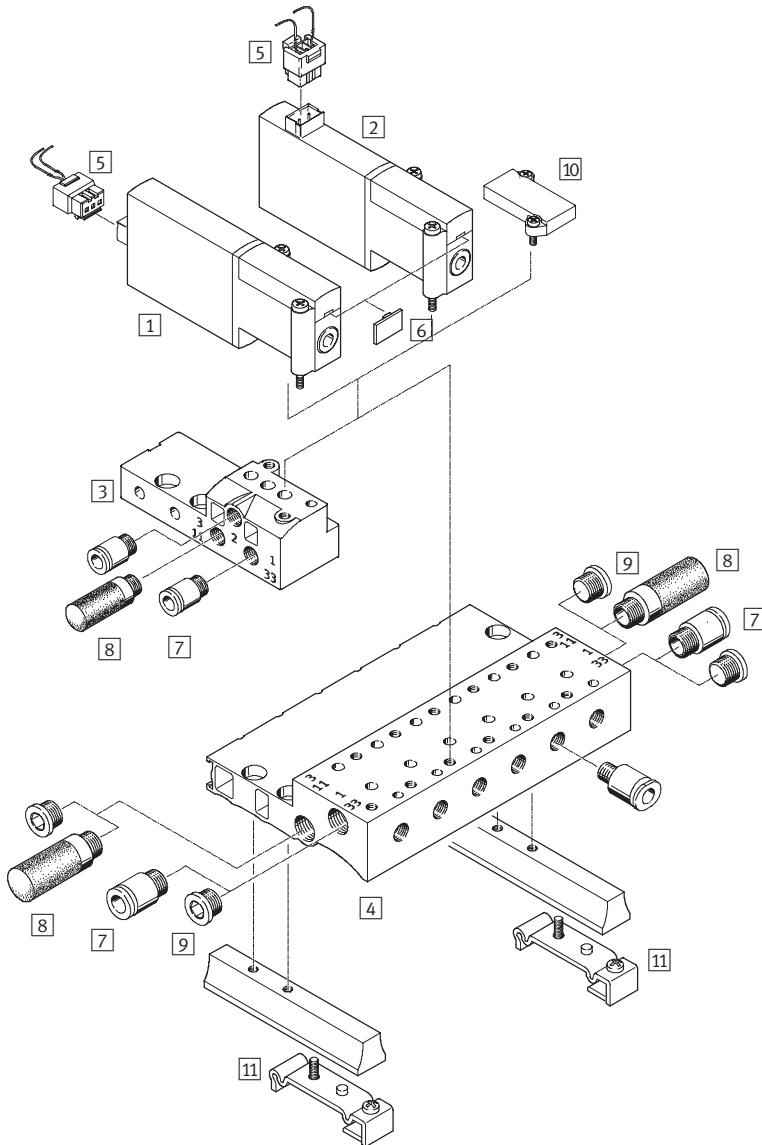
Valves and accessories		Brief description	→ Page
1	Sub-base valve MHA2-...	With plug vanes	2 / 3.2-40
2	Sub-base valve MHA2-...-K	With moulded-in cable	2 / 3.2-40
3	Plug socket KMYZ-3 (IP 65)	With LED and PUR cable	2 / 3.2-58
4	Plug socket KMYZ-3 (IP 65)	With LED, PUR cable and M8 plug	2 / 3.2-58
5	Plug socket KMYZ-4 (IP 40)	With PVC cable	2 / 3.2-58
6	Inscription label MH-BZ-80X	For identifying the valves	2 / 3.2-58
7	Push-in fittings QS	For connecting compressed air tubing with standard O.D. to CETOP RP 54 P	Volume 3
8	Silencer UC	For fitting in exhaust ports	Volume 3
9	Blanking plug B	For sealing unused ports	2 / 3.2-58
10	Blanking plate MHAP2-BP-3	For sealing vacant positions	2 / 3.2-58
11	H-rail mounting MHAP2-BG-NRH-35	–	2 / 3.2-58
12	Individual sub-base MHA2-AS-3-M5	For sub-base valve	2 / 3.2-43
13	Manifold block MHA2-PR...-3-M5	For sub-base valve	2 / 3.2-43

Solenoid valves MHA2, fast-switching valves

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



Plug connection at rear ...-HC – Plug connection on top ...-TC



Application-optimised directional control valves
Fast-switching valves

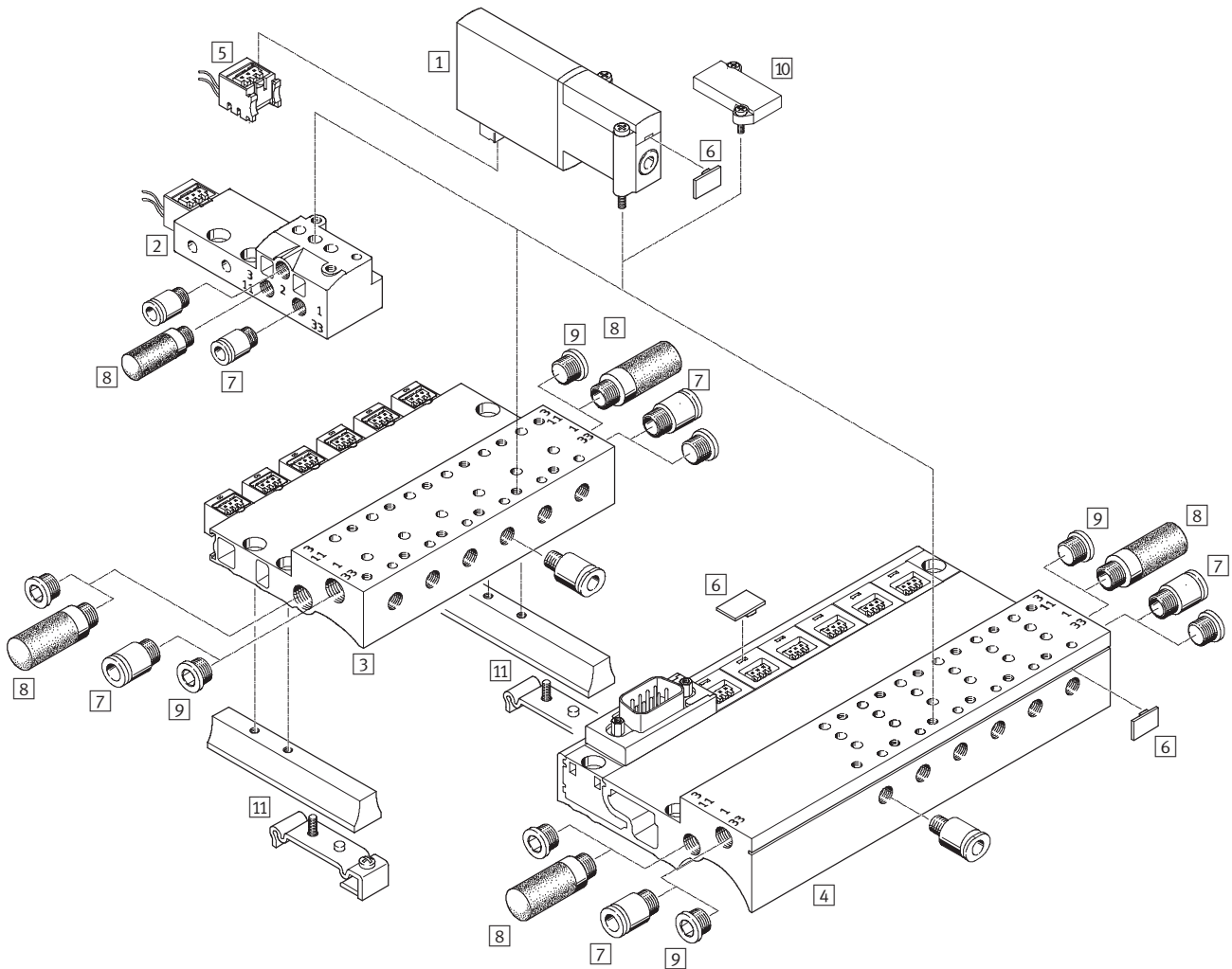
3.2

Valves and accessories		
	Brief description	→ Page
1	Sub-base valve MHA2-...-HC	2 / 3.2-40
2	Sub-base valve MHA2-...-TC	2 / 3.2-40
3	Individual sub-base MHA2-AS-3-M5	2 / 3.2-43
4	Manifold block MHA2-PR...-3	2 / 3.2-43
5	Plug socket KMH (IP 40)	2 / 3.2-58
6	Inscription label MH-BZ-80X	2 / 3.2-58
7	Push-in fittings QS	Volume 3
8	Silencer UC	Volume 3
9	Blanking plug B	2 / 3.2-58
10	Blanking plate MHAP2-BP-3	2 / 3.2-58
11	H-rail mounting MHAP2-BG-NRH-35	2 / 3.2-58

Solenoid valves MHA2, fast-switching valves

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

Plug connection underneath ...-PI

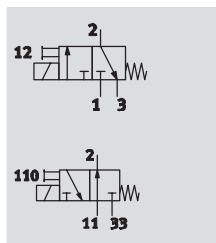


Valves and accessories		
	Brief description	→ Page
1	Sub-base valve MHA2-...-PI	Plug connection underneath 2 / 3.2-40
2	Individual sub-base MHA2-AS-3-M3-PI	With plug base 2 / 3.2-43
3	Manifold block MHA2-PR...-3-M3-PI	With plug bases 2 / 3.2-43
4	Manifold block MHA2-PR...-3-M5-PI-D...	With plug bases and electrical multi-pin connection 2 / 3.2-43
5	Plug base MHAP-PI (IP 40)	– 2 / 3.2-58
6	Inscription label MH-BZ-80X	For identifying the valves 2 / 3.2-58
7	Push-in fittings QS	For connecting compressed air tubing with standard O.D. to CETOP RP 54 P Volume 3
8	Silencer UC	For fitting in exhaust ports Volume 3
9	Blanking plug B	For sealing unused ports 2 / 3.2-58
10	Blanking plate MHAP2-BP-3-PI	For sealing vacant positions 2 / 3.2-58
11	H-rail mounting MHAP2-BG-NRH-35	– 2 / 3.2-58

Solenoid valves MHA2, fast-switching valves

Technical data – Sub-base valve, 3/2-way valve

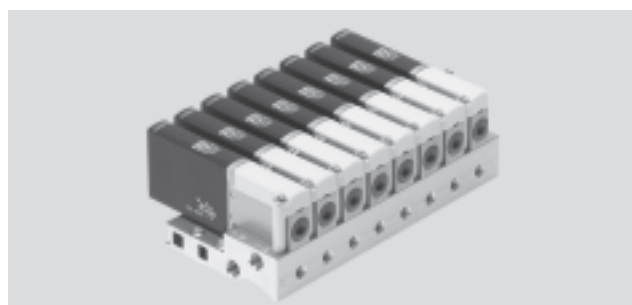
Function



- - Voltage
5, 12, 24 V DC

- - Pressure
-0.9 ... +8 bar

- - Temperature range
-5 ... +40 °C



General technical data		
Valve function		3/2 way, single solenoid ¹⁾
Design		Pressure-relieved poppet valve
Sealing principle		Soft
Control type		Electric
Actuation type		Direct
Direction of flow		Reversible with restrictions (operating pressure)
Exhaust function		With flow control
Manual override		Non-detenting
Assembly position		Any
Grid dimension	[mm]	14
Nominal diameter	[mm]	2
Standard nominal flow rate	[l/min]	100
Type of mounting		On sub-base/manifold
Pneumatic connection		Connecting thread M5 or M7
Product weight	[g]	50

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

Operating and environmental conditions		
Operating medium		Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm Vacuum, grade of filtration 40 µm
Operating pressure	[bar]	-0.9 ... +8 ²⁾
Operating pressure, reversible	[bar]	-0.9 ... 0
Ambient temperature	[°C]	-5 ... +40 (100% duty cycle)
Temperature of medium	[°C]	-5 ... +40 (100% duty cycle)
Corrosion resistance class CRC		2 ¹⁾
Certification		c UL us - Recognised (OL)

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

2) There may be slight leakage in the pressure range -0.5 to +0.5 bar

Solenoid valves MHA2, fast-switching valves

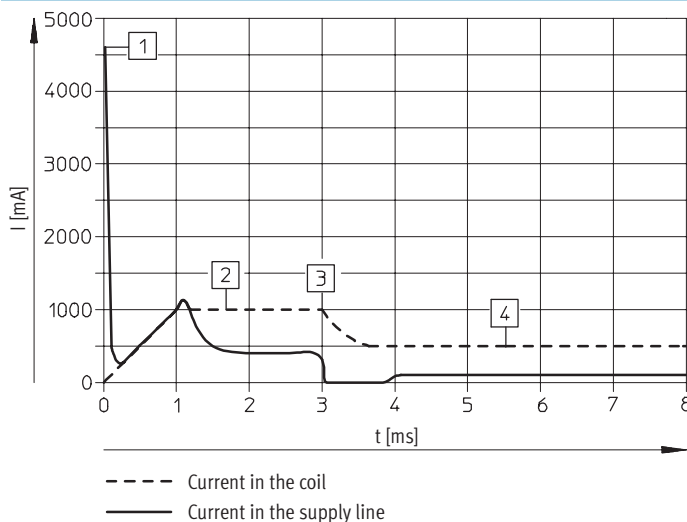
Technical data – Sub-base valve, 3/2-way valve

Electrical data		
Operating voltage	[V DC]	5 ±10%, 12 ±10% or 24 ±10%
Type of connection		Plug vanes, moulded-in cable or plug connection
Power consumption		
With fast-switching electronics	[W]	5 for 3 ms approx. (pull 1 A), then 1.25 W
Without fast-switching electronics	[W]	2.88
Protection class to EN 60529		
With moulded-in cable		IP65
With plug socket with cable KMH		IP40
With plug socket with cable KMYZ-3		IP65
With plug socket with cable KMYZ-3 and plug M8		IP65
With plug socket with cable KMYZ-4		IP40
With plug base MHAP-PI		IP40
With Sub-D connector plug		IP40

Response times and switching frequencies		
With fast-switching electronics		
Switching time on/off	[ms]	1.7/2 +10% ... -30%
Maximum switching frequency	[Hz]	330 ¹⁾
CE symbol		In accordance with EU EMC Directive
Without fast-switching electronics		
Switching time on/off	[ms]	7/3.5
Maximum switching frequency	[Hz]	130

1) The ambient temperature must be limited as from 100 Hz.

Current path for valves with fast-switching electronics



- 1 Capacitor charging
- 2 Controlled coil current 1 A
- 3 Drop to holding current
- 4 Controlled holding current 0.5 A

Solenoid valves MHA2, fast-switching valves

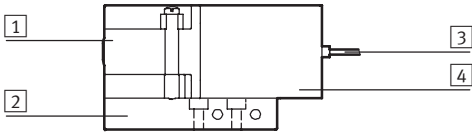
Technical data – Sub-base valve, 3/2-way valve



Application-optimised directional control valves
Fast-switching valves

3.2

Materials



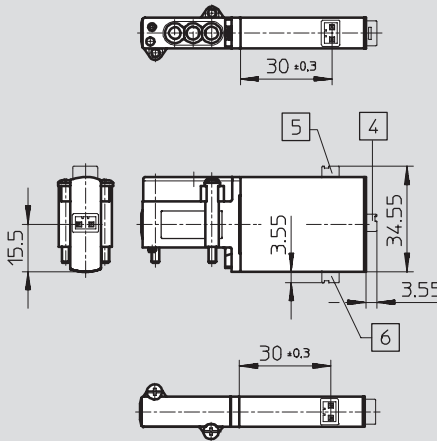
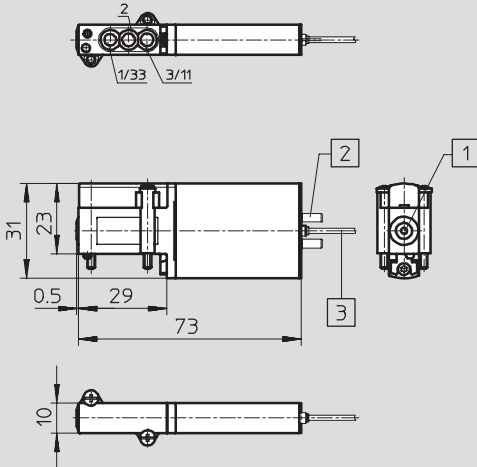
1	Body	Die-cast zinc, coated
2	Sub-base	Manifold block: Aluminium Individual sub-base: Die-cast zinc
3	Cable sheath	Polyurethane
4	Coil housing	Polyamide
-	Seals	Nitrile rubber/ hydrogenated nitrile rubber
Note on materials		Free of copper and PTFE

Dimensions

Download CAD data → www.festo.com/en/engineering

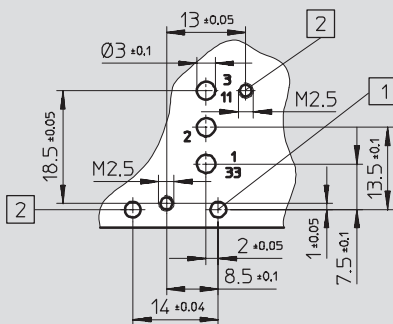
Valve with plug vanes or moulded-in cable ...-K

Valve with plug connection ...-TC/HC/PI



- 1 Manual override, non-detenting
- 2 Plug vanes for plug socket with cable KMYZ-3, KMYZ-4
- 3 Cable 2.5 m
- 4 Plug connection HC
- 5 Plug connection TC
- 6 Plug connection PI

Port pattern on sub-bases



- 1 Hole for coding pin, 1.7^{+0.2} mm deep
- 2 Mounting thread, 4.6⁺¹ mm deep

Solenoid valves MHA2, fast-switching valves

Technical data – Sub-base valve, 3/2-way valve



Dimensions Download CAD data → www.festo.com/en/engineering

Individual sub-base

- 1 Plug base MHAP-PI
- 2 Plug vanes for plug socket with cable KMYZ-3, KMYZ-4
- 3 Cable 2.5 m
- 4 Plug connection HC
- 5 Plug connection TC
- 6 Plug connection PI

Manifold mounting

- 1 Plug base MHAP-PI
- 2 Plug vanes for plug socket with cable KMYZ-3, KMYZ-4
- 3 Cable 2.5 m
- 4 Plug connection HC
- 5 Plug connection TC
- 6 Plug connection PI
- 7 Plug socket with cable KMH
- 8 Blanking plate MHAP2-BP-3
- 9 Silencer UC

Valve positions n	L1	L2	L3
2	38	31	14
3	52	45	18
4	66	59	42

Valve positions n	L1	L2	L3
5	80	73	56
6	94	87	70
7	108	101	84

Valve positions n	L1	L2	L3
8	122	115	98
9	136	129	112
10	150	143	126

Application-optimised directional control valves
Fast-switching valves
3.2

Solenoid valves MHA2, fast-switching valves

Technical data – Sub-base valve, 3/2-way valve

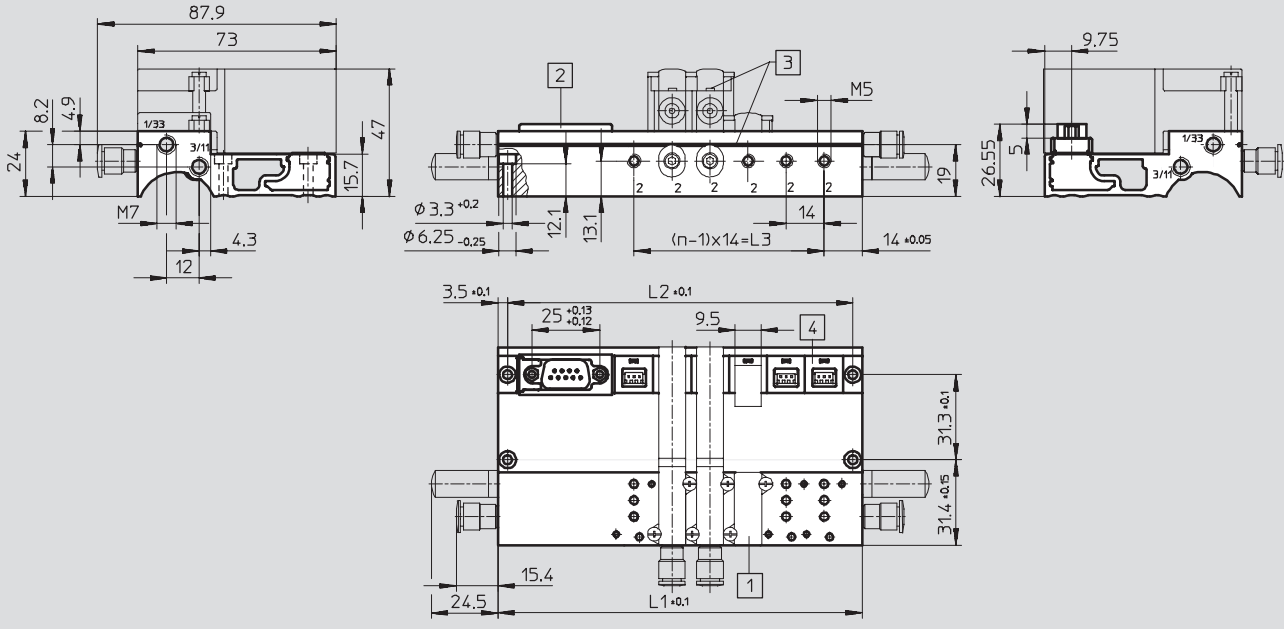


Application-optimised directional control valves
Fast-switching valves

3.2

Dimensions – Manifold mounting with electrical multi-pin connection

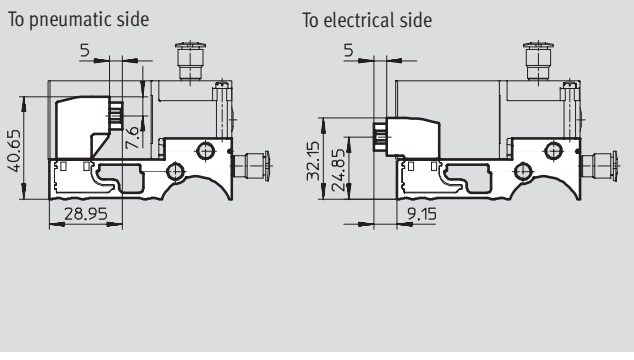
Download CAD data → www.festo.com/en/engineering



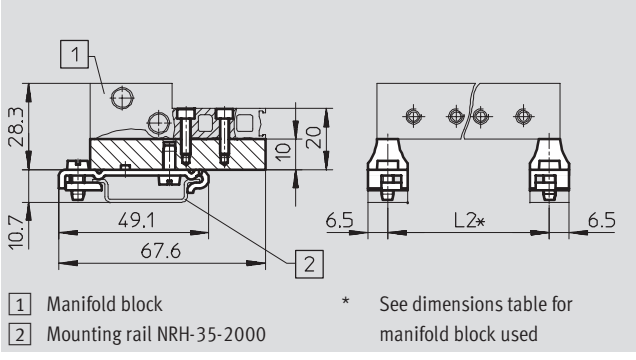
- 1 Blanking plate MHAP2-BP-3
- 2 Sub-D plug, plug outlet to top (standard)
- 3 Slot for inscription labels
- 4 Plug base MHAP-PI

Valve positions n	L1	L2	L3
2	78	71	14
4	106	99	42
6	134	127	70
8	162	155	98
10	212	205	126

Electrical multi-pin connection – Plug directions




H-rail mounting MHAP-BG-NRH-35




Solenoid valves MHA2, fast-switching valves

Technical data – Sub-base valve, 3/2-way valve

Ordering data – Valves					
Electrical connection	Operating voltage	Normally closed		Normally open	
		Part No.	Type	Part No.	Type
Response time 2 ms					
Plug vanes	24 V DC	196 119	MHA2-MS1H-3/2G-2	196 139	MHA2-MS1H-3/2O-2
Cable	24 V DC	196 121	MHA2-MS1H-3/2G-2-K	196 141	MHA2-MS1H-3/2O-2-K
Response time 7 ms					
Plug vanes	24 V DC	196 118	MHA2-M1H-3/2G-2	196 138	MHA2-M1H-3/2O-2
Cable	24 V DC	196 120	MHA2-M1H-3/2G-2-K	196 140	MHA2-M1H-3/2O-2-K
Plug connection at rear	5 V DC	197 420	MHA2-M4H-3/2G-2-HC	197 402	MHA2-M4H-3/2O-2-HC
	12 V DC	197 421	MHA2-M5H-3/2G-2-HC	197 403	MHA2-M5H-3/2O-2-HC
	24 V DC	197 422	MHA2-M1H-3/2G-2-HC	197 404	MHA2-M1H-3/2O-2-HC
Plug connection on top	5 V DC	197 423	MHA2-M4H-3/2G-2-TC	197 405	MHA2-M4H-3/2O-2-TC
	12 V DC	197 424	MHA2-M5H-3/2G-2-TC	197 406	MHA2-M5H-3/2O-2-TC
	24 V DC	197 425	MHA2-M1H-3/2G-2-TC	197 407	MHA2-M1H-3/2O-2-TC
Plug connection underneath	5 V DC	197 426	MHA2-M4H-3/2G-2-PI	197 408	MHA2-M4H-3/2O-2-PI
	12 V DC	197 427	MHA2-M5H-3/2G-2-PI	197 409	MHA2-M5H-3/2O-2-PI
	24 V DC	197 428	MHA2-M1H-3/2G-2-PI	197 410	MHA2-M1H-3/2O-2-PI

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

Ordering data – Product-specific accessories			
Designation		Part No.	Type
Valves with plug vanes, cable, plug connection at rear or on top			
Individual sub-base		197 438	MHA2-AS-3-M5
Manifold for ...	2 valves	197 447	MHA2-PR2-3-M5
	4 valves	197 448	MHA2-PR4-3-M5
	6 valves	197 449	MHA2-PR6-3-M5
	8 valves	197 450	MHA2-PR8-3-M5
	10 valves	197 451	MHA2-PR10-3-M5
Valves with plug connection underneath			
Individual sub-base		197 440	MHA2-AS-3-M5-PI
Manifold block with plug bases for ...	2 valves	197 457	MHA2-PR2-3-PI-M5
	4 valves	197 458	MHA2-PR4-3-PI-M5
	6 valves	197 459	MHA2-PR6-3-PI-M5
	8 valves	197 460	MHA2-PR8-3-PI-M5
	10 valves	197 461	MHA2-PR10-3-PI-M5
Manifold block with plug bases and electrical multi-pin connection for ...	6 valves	197 467	MHA2-PR6-3-PI-D9
	8 valves	197 468	MHA2-PR8-3-PI-D9
	10 valves	197 469	MHA2-PR10-3-PI-D25

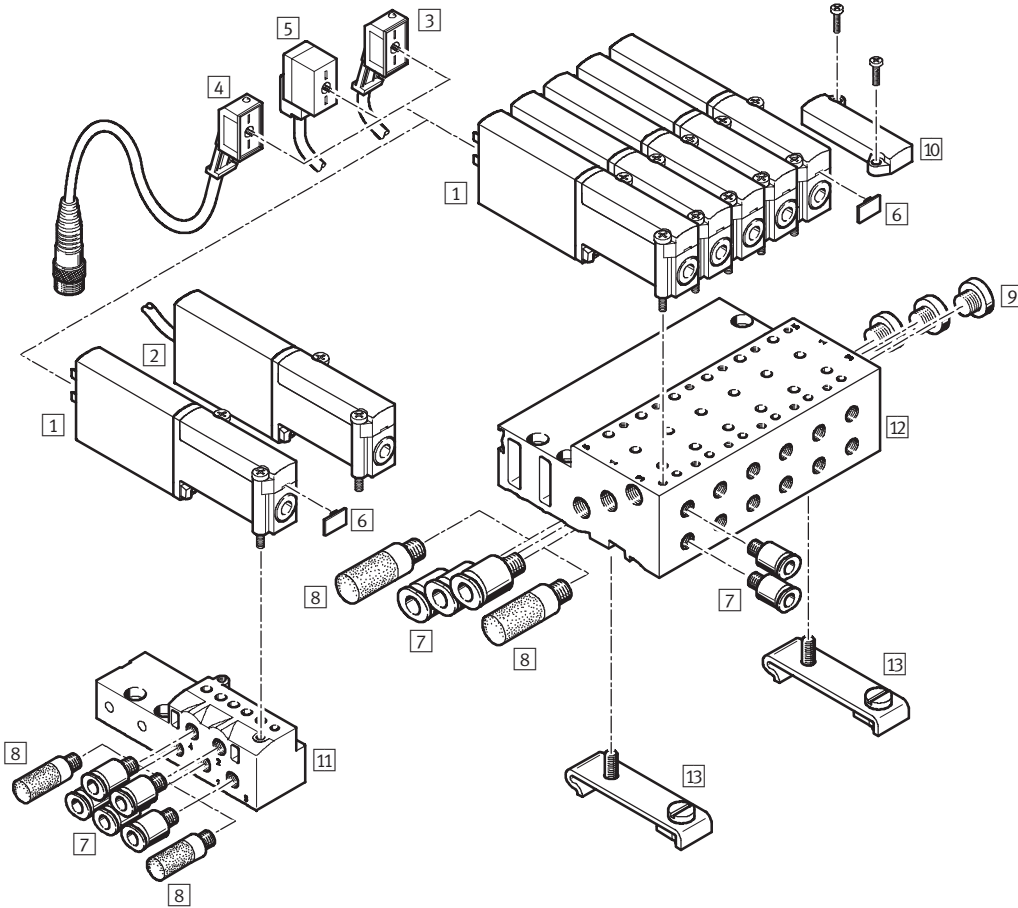
 Note
Additional variants and accessories can be configured and ordered through the MH2 modular product system → from 2 / 3.2-52.

Application-optimised directional control valves
Fast-switching valves
3.2

Solenoid valves MHA2, fast-switching valves

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

Connection with plug vanes – Connection with moulded-in cable ...-K



Application-optimised directional control valves
Fast-switching valves

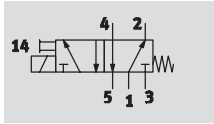
3.2

Valves and accessories		
	Brief description	→ Page
1	Sub-base valve MHA2-...	With plug vanes 2 / 3.2-47
2	Sub-base valve MHA2-...-K	With moulded-in cable 2 / 3.2-47
3	Plug socket KMYZ-3 (IP 65)	With LED and PUR cable 2 / 3.2-58
4	Plug socket KMYZ-3 (IP 65)	With LED, PUR cable and M8 plug 2 / 3.2-58
5	Plug socket KMYZ-4 (IP 40)	With PVC cable 2 / 3.2-58
6	Inscription label MH-BZ-80X	For identifying the valves 2 / 3.2-58
7	Push-in fittings QS	For connecting compressed air tubing with standard external diameters Volume 3
8	Silencer UC	For fitting in exhaust ports Volume 3
9	Blanking plug B	For sealing unused ports 2 / 3.2-58
10	Blanking plate MHAP2-BP-5	For sealing vacant positions 2 / 3.2-58
11	Individual sub-base MHA2-AS-5-M5	For sub-base valve 2 / 3.2-51
12	Manifold block MHA2-PR...-5-M5	For sub-base valve 2 / 3.2-51
13	H-rail mounting CPV10/14-VI-BG-NRH-35	- 2 / 3.2-58

Solenoid valves MHA2, fast-switching valves

Technical data – Sub-base valve, 5/2-way valve

Function



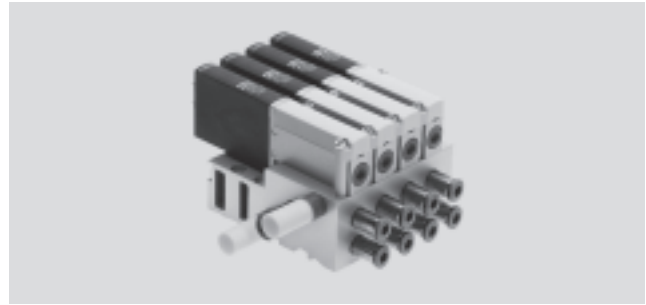
Voltage
24 V DC



Pressure
-0.9 ... +8 bar



Temperature range
-5 ... +40 °C



General technical data	
Valve function	5/2, single solenoid
Design	Pressure-relieved poppet valve
Sealing principle	Soft
Control type	Electric
Actuation type	Direct
Direction of flow	Reversible
Exhaust function	With flow control
Manual override	Non-detenting
Assembly position	Any
Grid dimension	[mm] 14
Nominal diameter	[mm] 2
Standard nominal flow rate	[l/min] 100
Type of mounting	On sub-base/manifold
Max. tightening torque, valve mounting	[Nm] 0.4
Pneumatic connection	Sub-base
Product weight	[g] 65

Operating and environmental conditions	
Operating medium	Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm Vacuum, grade of filtration 40 µm
Operating pressure	[bar] -0.9 ... +8
Ambient temperature	[°C] -5 ... +40 (100% duty cycle)
Temperature of medium	[°C] -5 ... +40 (100% duty cycle)
Corrosion resistance class CRC	2 ¹⁾
Certification	c UL us - Recognised (OL)

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

Solenoid valves MHA2, fast-switching valves

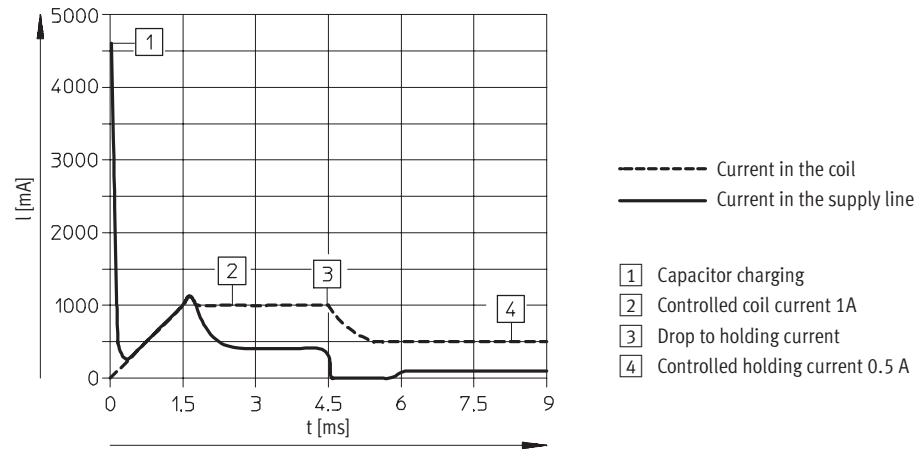
Technical data – Sub-base valve, 5/2-way valve

Electrical data		
Operating voltage	[V DC]	24 ±10%
Type of connection		Plug vanes or moulded-in cable
Power consumption		
Low-current phase	[W]	1.625
High-current phase	[W]	6.5
Protection class to EN 60529		
With moulded-in cable		IP65
With plug socket with cable KMYZ-3		IP65
With plug socket with cable KMYZ-3 and plug M8		IP65
With plug socket with cable KMYZ-4		IP40

Response times and switching frequencies		
Response time on	[ms]	1.9 +10% ... -30%
Response time off	[ms]	1.7 +10% ... -30%
Maximum switching frequency	[Hz]	300 ¹⁾
CE symbol		In accordance with EU EMC Directive

1) The ambient temperature must be limited as from 125 Hz.

Current path

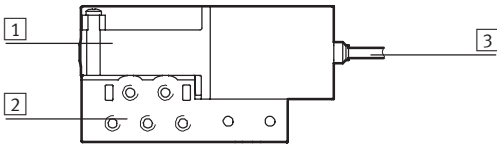


Solenoid valves MHA2, fast-switching valves

Technical data – Sub-base valve, 5/2-way valve



Materials

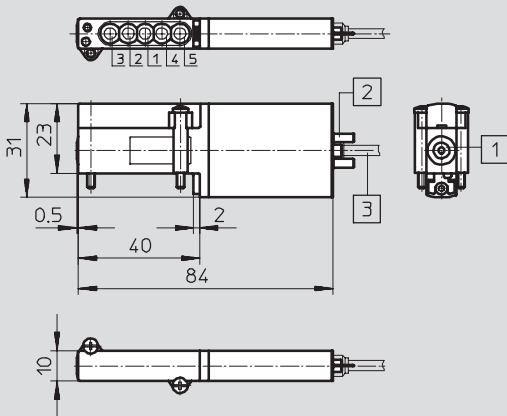


1	Body	Die-cast zinc
2	Sub-base	Die-cast zinc
3	Cable sheath	Polyurethane
-	Seals	Nitrile rubber/ hydrogenated nitrile rubber
Note on materials		Free of copper and PTFE

Dimensions

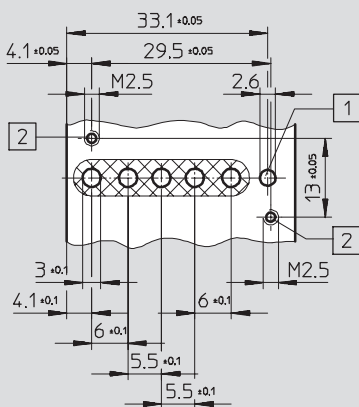
Download CAD data → www.festo.com/en/engineering

Valve with plug vanes or moulded-in cable ...-K




- 1 Manual override, non-detenting
- 2 Plug vanes for plug socket with cable KMYZ-3, KMYZ-4
- 3 Cable 2.5 m

Port pattern on sub-bases



- 1 Hole for coding pin, 1.7 mm deep
- 2 Mounting thread, 4.6 mm deep

 Note
Semi in-line valves do not require ports 2 and 4.

Application-optimised directional control valves
Fast-switching valves

3.2

Solenoid valves MHA2, fast-switching valves

Technical data – Sub-base valve, 5/2-way valve

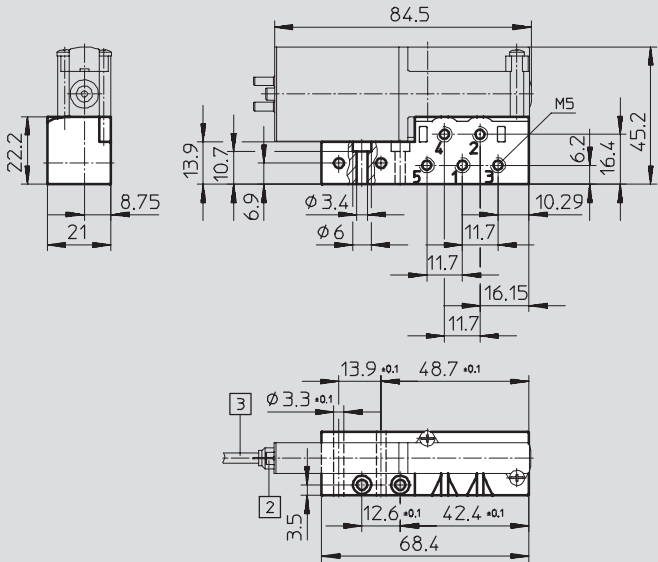
Application-optimised directional control valves
Fast-switching valves

3.2

Dimensions

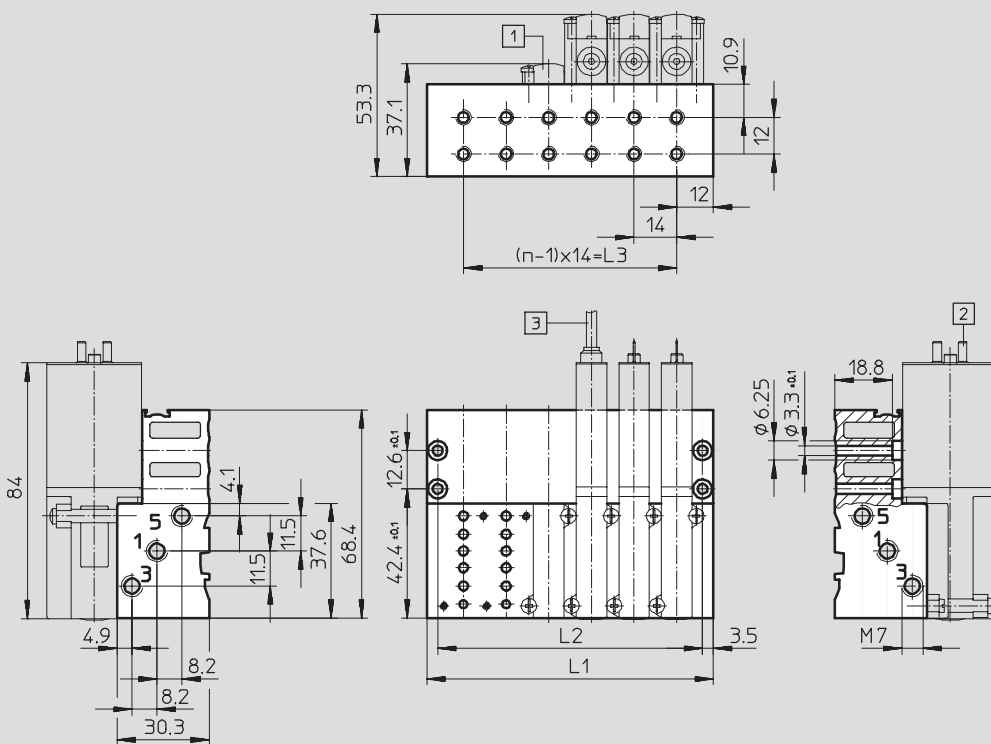
Download CAD data → www.festo.com/en/engineering

Individual sub-base



- 1 Plug vanes for plug socket with cable KMYZ-3, KMYZ-4
- 2 Cable 2.5 m

Manifold mounting



- 1 Blanking plate MHAP2-BP-5
- 2 Plug vanes for plug socket with cable KMYZ-3, KMYZ-4
- 3 Cable 2.5 m

Valve positions n	L1	L2	L3
2	38	31	14
3	52	45	18
4	66	59	42

Valve positions n	L1	L2	L3
5	80	73	56
6	94	87	70
7	108	101	84

Valve positions n	L1	L2	L3
8	122	115	98
9	136	129	112
10	150	143	126

Solenoid valves MHA2, fast-switching valves

Technical data – Sub-base valve, 5/2-way valve

Ordering data – Valves			
Electrical connection	Operating voltage	Normally closed	
		Part No.	Type
Plug vanes	24 V DC	525101	MHA2-MS1H-5/2-2
Cable	24 V DC	525103	MHA2-MS1H-5/2-2-K

Ordering data – Product-specific accessories			
Designation		Part No. Type	
		Individual sub-base	
Manifold for ...	2 valves	525 127	MHA2-PR2-5-M5
	4 valves	525 128	MHA2-PR4-5-M5
	6 valves	525 129	MHA2-PR6-5-M5
	8 valves	525 130	MHA2-PR8-5-M5
	10 valves	525 131	MHA2-PR10-5-M5

Solenoid valves MH2, fast-switching valves, individual sub-base

Ordering data – Modular products



Application-optimised directional control valves
Fast-switching valves

3.2

Mandatory data

Module No.	Valve family	Design	Operating voltage	Valve function	Plug-in direction on valve	No. of valve positions	Linkage type
197 335	MH2	P A	5VDC 12VDC 24VDC	C N	TC HC PI K IP	1V	PS
Order example							
197 335	MH2	- P	- 24VDC	- C	- IP	- 1V	- PS

Ordering table

Size	2	Condi- tions	Code	Enter code
M Module No.	197 335			
Valve family	Miniature and fast-switching valve of size 2		MH2	MH2
Design	Semi in-line valve		-P	-P
	Sub-base valve		-A	
Operating voltage [V DC]	5, 12, 24		-...VDC	
Valve function	3/2-way valve, normally closed		-C	
	3/2-way valve, normally open		-N	
Plug-in direction on valve	Plug connection on top for connecting cable with socket IP40 (KMH)		-TC	
	Plug connection at rear for connecting cable with socket IP40 (KMH)		-HC	
	Plug connection underneath for electrical linkage		-PI	
	Connection with cable end	1	-K	
	Plug connection at rear for connecting cable with socket IP65 (KMYZ)	1	-IP	
Number of valve positions	1		-1V	1V
Linkage type	Individual sub-base		-PS	-PS

1 K, IP Only with operating voltage 24 V DC

Transfer order code

197 335	MH2	-	P	-		-		-	1V	-	PS
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Solenoid valves MH2, fast-switching valves, individual sub-base



Ordering data – Modular products

0 Options				
Number of valve positions with fast-switching function	Connecting cable with socket	Fitting for working port	Fitting in supply duct on left	Fitting in exhaust duct on left
1S	K05 K01 K25 K50 K10 KI05 KI25	QB QC QD	AB AC	BB BC BU
-	- K25 -	- QC -	-	-

Ordering table				
Size		Condi- tions	Code	Enter code
0	Number of valve positions with fast-switching function	2	-1S	
	Connecting cable with socket (supplied separately)	3	-K05	
		3	-K01	
		4	-K25	
		4	-K50	
		4	-K10	
		4	-KI05	
		4	-KI25	
	Fitting for working port		-QB	
			-QC	
			-QD	
	Fitting in supply duct on left	5	-AB	
		6	-AC	
	Fitting in exhaust duct on left	7	-BB	
			-BC	
			-BU	

- 2 1S Only with plug-in direction on valve K, IP
- 3 K05, K01 Not with plug-in direction on HC, TC valve
- 4 K25, K50, K10, KI05, KI25 Only with plug-in direction on valve IP

- 5 AB Not with fitting QC, QD
- 6 AC Not with fitting QD
- 7 BB Not with fitting AC

Transfer order code

- - - - -

Application-optimised directional control valves
Fast-switching valves

3.2

Solenoid valves MH2, fast-switching valves, individual electrical connection



Ordering data – Modular products

Application-optimised directional control valves
Fast-switching valves

3.2

M Mandatory data								O Options →	
Module No.	Valve family	Design	Operating voltage	Valve function	Plug-in direction on valve	No. of valve positions	Linkage type	Number of valve positions with fast-switching function	Number of vacant positions
197 335	MH2	A P	5VDC 12VDC 24VDC	C N	TC HC K IP	2V ... 10V	PR	2S ... 10S	2L ... 10L
Order example									
197 335	MH2	- A	- 24VDC	- C	- IP	- 8V	- PR	- 4S	-

Ordering table							
Size	2	Condi-tions		Code		Enter code	
M Module No.	197 335						
Valve family	Miniature and fast-switching valve of size 2			MH2		MH2	
Design	Sub-base valve			-A			
	Semi in-line valve			-P			
Operating voltage [V DC]	5, 12, 24			...VDC			
Valve function	3/2-way valve, normally closed			-C			
	3/2-way valve, normally open			-N			
Plug-in direction on valve	Plug connection on top for connecting cable with socket IP40 (KMH)			-TC			
	Plug connection at rear for connecting cable with socket IP40 (KMH)			-HC			
	Connection with cable end		1	-K			
	Plug connection at rear for connecting cable with socket IP65 (KMYZ)		1	-IP			
Number of valve positions	2 ... 10			...V			
Linkage type	Block without electrical manifold module			-PR		-PR	
O Number of valves with fast-switching function	2 ... 10		2	...S			
↓ Number of vacant positions	2 ... 10			...L			

1 K, IP Only with operating voltage 24 V DC

2 ...S Only with plug-in direction on valve K, IP

Transfer order code

197 335 MH2 - - - - - PR - - - - -

Solenoid valves MH2, fast-switching valves, individual electrical connection



Ordering data – Modular products

Options						
Connecting cable with socket	Wall mounting	Fitting for working port	Fitting in supply duct on left	Fitting in exhaust duct on left	Fitting in supply duct on right	Fitting in exhaust duct on right
K05	H	QB	AX	BX	CX	DX
K01		QC	AC	BC	CC	DC
K25		QD	AD	BD	CD	DD
K50				BU		DU
K10						
KI05						
KI25						
K25	H	QC	AX	BD	CD	DX

Ordering table					
Size		Condi- tions	Code	Enter code	
↓ Connecting cable with socket 0 (supplied separately)	0.5 m, with socket IP40 (KMH-0,5)	3	-K05		
	1 m, with socket IP40 (KMH-1)	3	-K01		
	2.5 m, with socket IP65 (KMYZ-3-24DC-2,5-LED-PUR-B)	4	-K25		
	5 m, with socket IP65 (KMYZ-3-24DC-5-LED-PUR-B)	4	-K50		
	10 m, with socket IP65 (KMYZ-3-24DC-10-LED-PUR-B)	4	-K10		
	0.5 m, with socket IP40 (KMYZ-4-24DC-0,5-B)	4	-KI05		
	2.5 m, with socket IP40 (KMYZ-4-24DC-2,5-B)	4	-KI25		
	Wall mounting	H-rail mounting		-H	
Fitting for working port	QS fitting for working port, tubing O.D. 3 mm		-QB		
	QS fitting for working port, tubing O.D. 4 mm		-QC		
	QS fitting for working port, tubing O.D. 6 mm		-QD		
Fitting in supply duct on left	Blanking plug for supply on left	5	-AX		
	QS fitting for supply on left, tubing O.D. 4 mm	6	-AC		
	QS fitting for supply on left, tubing O.D. 6 mm		-AD		
Fitting in exhaust duct on left	Blanking plug for exhaust on left	7	-BX		
	QS fitting for exhaust on left, tubing O.D. 4 mm	8	-BC		
	QS fitting for exhaust on left, tubing O.D. 6 mm	9	-BD		
	Silencer for exhaust on left		-BU		
Fitting in supply duct on right	Blanking plug for supply on right		-CX		
	QS fitting for supply on right, tubing O.D. 4 mm	10	-CC		
	QS fitting for supply on right, tubing O.D. 6 mm		-CD		
Fitting in exhaust duct on right	Blanking plug for exhaust on right		-DX		
	QS fitting for exhaust on right, tubing O.D. 4 mm	8	-DC		
	QS fitting for exhaust on right, tubing O.D. 6 mm		-DD		
	Silencer for exhaust on right		-DU		

- 3 K05, K01 Not with plug-in direction HC, TC
- 4 K25, K50, K10, KI05, KI25 Only with plug-in direction IP
- 5 AX Not with fitting CX
- 6 AC Not with fitting QD

- 7 BX Not with fitting DX
- 8 BC, DC Not with fitting AD, CD
- 9 BD Not with fitting DC
- 10 CC Not with fitting QD

Transfer order code

- - - - - - -

Application-optimised directional control valves
 Fast-switching valves
3.2

Solenoid valves MH2, fast-switching valves, electrical multi-pin connection



Ordering data – Modular products

Application-optimised directional control valves
Fast-switching valves

3.2

M Mandatory data **O** Options →

Module No.	Valve family	Design	Operating voltage	Valve function	Plug-in direction on valve	No. of valve positions	Linkage type	Number of vacant positions
197 335	MH2	A P	5VDC 12VDC 24VDC	C N	PI	2V ... 10V	PRA	2L ... 10L
Order example								
197 335	MH2	- A	- 24VDC	- C	- IP	- 8V	- PR	

Ordering table

Size	2	Condi- tions	Code	Enter code
M Module No.	197 335			
Valve family	Miniature and fast-switching valve of size 2		MH2	MH2
Design	Sub-base valve		-A	
	Semi in-line valve		-P	
Operating voltage [V DC]	5, 12, 24		-...VDC	
Valve function	3/2-way valve, normally closed		-C	
	3/2-way valve, normally open		-N	
Plug-in direction on valve	Plug connection underneath for electrical linkage		-PI	-PI
Number of valve positions	2, 4, 6, 8, 10		-...V	
Linkage type	Block with Sub-D plug		-PRA	-PRA
O Number of vacant positions	2, 4, 6, 8, 10		-...L	

Transfer order code

197 335	MH2	-		-		-	PI	-		-	PRA	-	
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Solenoid valves MH2, fast-switching valves, electrical multi-pin connection



Ordering data – Modular products

0 Options							
Plug-in direction, Sub-D plug	Connecting cable with socket	Wall mounting	Fitting for working port	Fitting in supply duct on left	Fitting in exhaust duct on left	Fitting in supply duct on right	Fitting in exhaust duct on right
SP	S25	H	QB	AX	BX	CX	DX
ST	S50		QC	AC	BC	CC	DC
SE	S10		QD	AD	BD	CD	DD
	M25				BU		DU
	M50						
	M10						
	- S25	- H	- QC	- AX	- BD	- CD	- DX

Ordering table				
Size		Condi-tions	Code	Enter code
0 Plug-in direction, Sub-D plug	To pneumatic side		-SP	
	To top		-ST	
	To electrical side		-SE	
Connecting cable with socket (supplied separately)	2.5 m, Sub-D 9-pin, 8-wire	1	-S25	
	5 m, Sub-D 9-pin, 8-wire	1 2	-S50	
	10 m, Sub-D 9-pin, 8-wire	1 2	-S10	
	2.5 m, Sub-D 25-pin, 12-wire	3	-M25	
	5 m, Sub-D 25-pin, 12-wire	2 3	-M50	
	10 m, Sub-D 25-pin, 12-wire	2 3	-M10	
Wall mounting	H-rail mounting		-H	
Fitting for working port	QS fitting for working port, tubing O.D. 3 mm		-QB	
	QS fitting for working port, tubing O.D. 4 mm		-QC	
	QS fitting for working port, tubing O.D. 6 mm		-QD	
Fitting in supply duct on left	Blanking plug for supply on left	4	-AX	
	QS fitting for supply on left, tubing O.D. 4 mm	5	-AC	
	QS fitting for supply on left, tubing O.D. 6 mm		-AD	
Fitting in exhaust duct on left	Blanking plug for exhaust on left	6	-BX	
	QS fitting for exhaust on left, tubing O.D. 4 mm	7	-BC	
	QS fitting for exhaust on left, tubing O.D. 6 mm	8	-BD	
	Silencer for exhaust on left		-BU	
Fitting in supply duct on right	Blanking plug for supply on right		-CX	
	QS fitting for supply on right, tubing O.D. 4 mm	9	-CC	
	QS fitting for supply on right, tubing O.D. 6 mm		-CD	
Fitting in exhaust duct on right	Blanking plug for exhaust on right		-DX	
	QS fitting for exhaust on right, tubing O.D. 4 mm	7	-DC	
	QS fitting for exhaust on right, tubing O.D. 6 mm		-DD	
	Silencer for exhaust on right		-DU	

- 1 S25, S50, S10
Max. 8 valve positions
- 2 S50, S10, M50, M10
Not with solenoid voltage 5 V DC
- 3 M25, M50, M10
Only with 10 valve positions

- 4 AX Not with fitting CX
- 5 AC Not with fitting QD
- 6 BX Not with fitting DX
- 7 BC, DC Not with fitting AD, CD
- 8 BD Not with fitting DC
- 9 CC Not with fitting QD

Transfer order code

- - - - - - -

Application-optimised directional control valves
Fast-switching valves

3.2


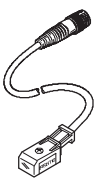








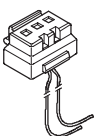


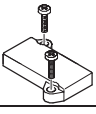
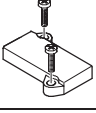


Solenoid valves MH2, fast-switching valves

Accessories

FESTO

Application-optimised directional control valves
Fast-switching valves

3.2

Ordering data		Part No.	Type
Plug socket with cable (IP65) with LED and PUR cable			
	2.5 m	193 693	KMYZ-3-24DC-2,5-LED-PUR-B
	5 m	193 695	KMYZ-3-24DC-5-LED-PUR-B
	10 m	196 066	KMYZ-3-24DC-10-LED-PUR-B
Plug socket with cable (IP65) with LED, PUR cable and M8 plug			
	0.5 m	525 654	KMYZ-3-24-M8-0,5-LED-PUR
	2.5 m	525 655	KMYZ-3-24-M8-2.5-LED-PUR
Plug base (IP40)			
		197 260	MHAP-PI
H-rail mounting (3/2-way valves)			
		525 053	MHAP2-BG-NRH-35
H-rail mounting (5/2-way valves)			
		162556	CPV10/14-VI-BG-NRH-35
Blanking plug B			
	M5	3843	B-M5 ²⁾
	M7	174 309	B-M7 ²⁾
Silencer UC			
		→	Volume 3
Connecting cable KMP6 (up to 8 valves)			
	2.5 m	531 184	KMP6-09P-8-2,5
	5 m	531 185	KMP6-09P-8-5
	10 m	531 186	KMP6-09P-8-10
Connecting cable KMP6 (up to 22 valves)			
	2.5 m	530 046	KMP6-25P-22-2,5
	5 m	530 047	KMP6-25P-22-5
	10 m	530 048	KMP6-25P-22-10
Plug socket with cable (IP40) with PVC cable			
	0.5 m	193 690	KMYZ-4-24DC-0,5-B
	2.5 m	193 691	KMYZ-4-24DC-2.5-B
Plug socket with cable (IP40)			
	0.5 m	197 263	KMH-0,5
	1 m	197 264	KMH-1
Inscription label			
		197 289	MH-BZ-80X ¹⁾
H-rail			
	2 m	35 430	NRH-35-2000
Blanking plate (3/2-way valves)			
	Plug connection	197 470	MHAP-BP-3
	Plug base	197 471	MHAP-BP-3-PI
Blanking plate (5/2-way valves)			
		525 132	MHAP-BP-5
Push-in fittings QS			
		→	Volume 3
Connecting cable KMP6 (up to 12 valves)			
	2.5 m	530 049	KMP6-25P-12-2,5
	5 m	530 050	KMP6-25P-12-5
	10 m	530 051	KMP6-25P-12-10

1) Scope of delivery 80 pieces

2) Scope of delivery 10 pieces

Solenoid valves MH3, fast-switching valves

Type codes

FESTO

		MH	P	3	-	M	S	1	H	-	3/2	-	0	-	QS6	-	K	
Valve family																		
MH	Fast-switching valves																	
Design																		
E	Individual valve																	
P	Semi in-line valve																	
A	Sub-base valve																	
Size																		
3	Flow rate 200 l/min																	
Drive function																		
M	Solenoid, switching																	
Response time																		
-	8 ms																	
S	3 ms																	
Operating voltage																		
1	24 V DC																	
Manual override																		
H	Non-detenting																	
Valve function																		
3/2	3/2-way valve																	
Normal position																		
G	Closed																	
O	Open																	
Pneumatic connection																		
3	Nominal size 3 mm																	
1/8	G1/8 thread																	
QS6	Push-in connector for 6 mm O.D. tubing																	
Electrical connection																		
-	Plug vanes for plug socket KMYZ-...																	
K	Moulded-in cable, 2.5 m long																	

Application-optimised directional control valves
Fast-switching valves

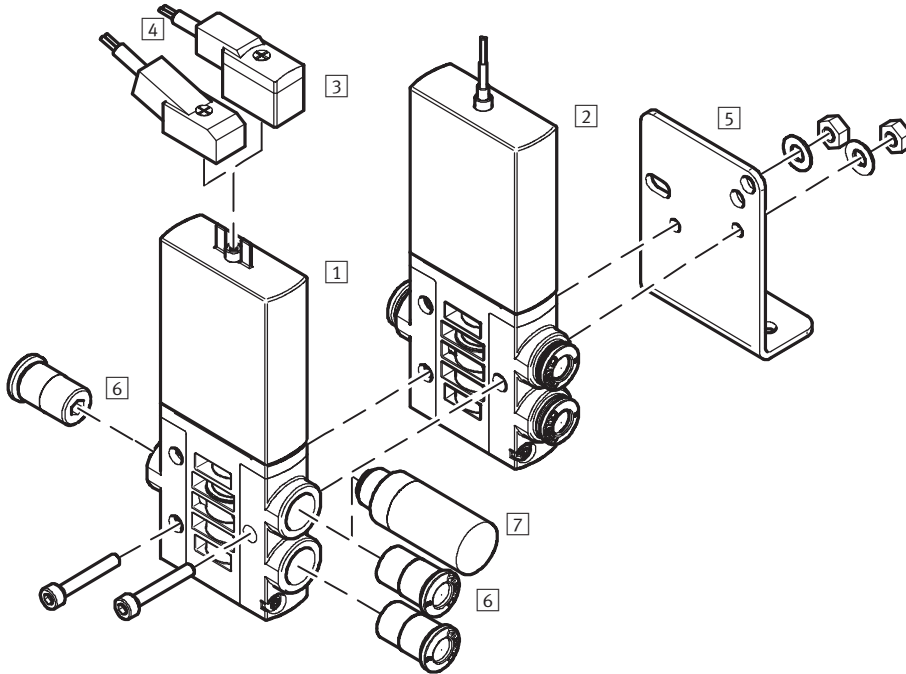
3.2

Solenoid valves MHE3, fast-switching valves

Peripherals overview – Individual valve



Connection with plug vanes – Connection with moulded-in cable



Application-optimised directional control valves
Fast-switching valves

3.2

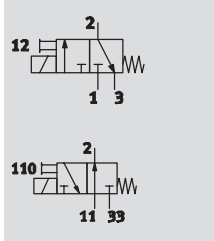
Valves and accessories		
	Brief description	→ Page
1	Individual valve MHE3-...	With plug vanes 2 / 3.2-61
2	Individual valve MHE3-...-K	With cable 2 / 3.2-61
3	Plug socket with cable KMYZ-4 (IP 40)	With PVC cable 2 / 3.2-78
4	Plug socket with cable KMYZ-3 (IP 65)	With LED, PUR cable, with M8 plug or open end 2 / 3.2-78
5	Mounting bracket MHE2-BG-L	– 2 / 3.2-64
6	Push-in fittings QS	For connecting compressed air tubing with standard O.D. to CETOP RP 54 P Volume 3
7	Silencer UC	For fitting in exhaust ports Volume 3

Solenoid valves MHE3, fast-switching valves

Technical data – Individual valve

FESTO

Function



Voltage
24 V DC



Pressure
-0.9 ... +8 bar



Temperature range
-5 ... +60 °C



General technical data		
Valve function		3/2 way, single solenoid ¹⁾
Design		Pressure-relieved poppet valve
Sealing principle		Soft
Control type		Electric
Actuation type		Direct
Direction of flow		Reversible with restrictions (operating pressure)
Exhaust function		With flow control
Manual override		Non-detenting
Assembly position		Any
Grid dimension	[mm]	19 (minimum distance 5 mm)
Nominal diameter	[mm]	3
Standard nominal flow rate	[l/min]	200
Type of mounting		Via through-holes
Pneumatic connection		Connecting thread G1/8
		Push-in fitting for tubing O.D. 6 mm
Product weight	[g]	120

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

Operating and environmental conditions		
Operating medium		Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm
		Vacuum, grade of filtration 40 µm
Operating pressure	[bar]	-0.9 ... +8 ²⁾
Operating pressure, reversible	[bar]	-0.9 ... 0
Ambient temperature	[°C]	-5 ... +60
Temperature of medium	[°C]	-5 ... +60
Corrosion resistance class CRC		2 ¹⁾
Certification		c UL us - Recognised (OL)

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

2) There may be slight leakage in the pressure range -0.5 to +0.5 bar

Solenoid valves MHE3, fast-switching valves

Technical data – Individual valve



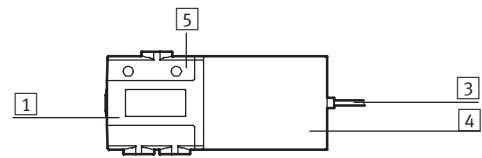
Application-optimised directional control valves
Fast-switching valves
3.2

Electrical data		
Operating voltage	[V DC]	24 ±10%
Type of connection		Plug vanes or moulded-in cable
Power consumption		
With fast-switching electronics	[W]	Pull: 6.5 Hold: 1.6
Without fast-switching electronics	[W]	3.7
Protection class to EN 60529		
With moulded-in cable		IP65
With plug socket with cable KMYZ-3		IP65
With plug socket with cable KMYZ-3 and plug M8		IP65
With plug socket with cable KMYZ-4		IP40

Response times and switching frequencies		
With fast-switching electronics		
Switching time on/off	[ms]	3/2.3 +10% ... -30%
Maximum switching frequency	[Hz]	280 ¹⁾
CE symbol		In accordance with EU EMC Directive
Without fast-switching electronics		
Switching time on/off	[ms]	8/4.5
Maximum switching frequency	[Hz]	130

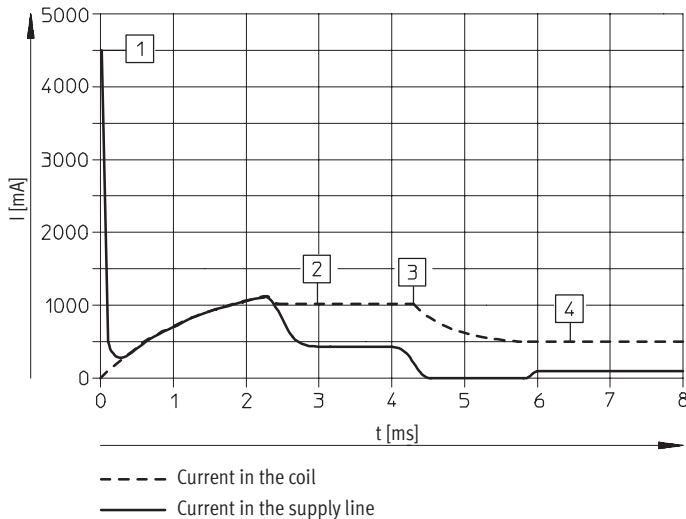
1) The ambient temperature must be limited as from 90 Hz.

Materials



1	Body	Die-cast zinc, coated
3	Cable sheath	Polyurethane
4	Coil housing	Polyamide
5	Connection piece	Polyamide
-	Seals	Nitrile rubber
	Note on materials	Free of copper and PTFE

Current path for valves with fast-switching electronics



- 1 Capacitor charging
- 2 Controlled coil current 1 A
- 3 Drop to holding current
- 4 Controlled holding current 0.5 A

Solenoid valves MHE3, fast-switching valves

Technical data – Individual valve

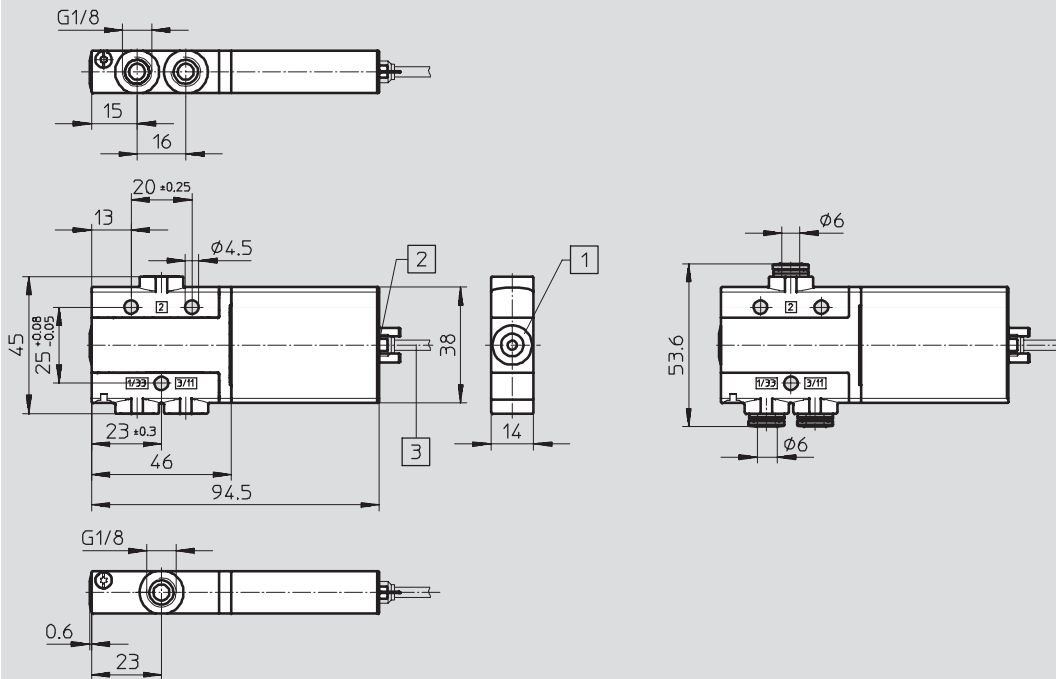


Dimensions

Download CAD data → www.festo.com/en/engineering

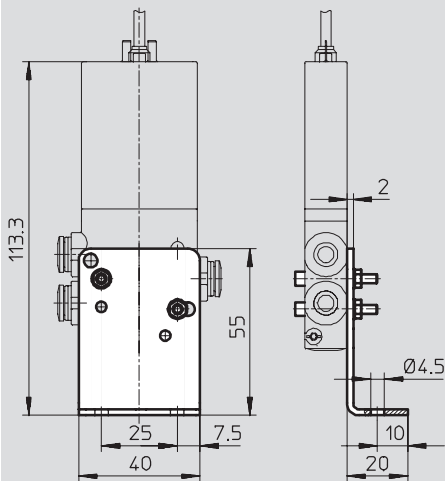
Valve with connecting thread G1/8

Valve with push-in fitting QS 6



- 1 Manual override, non-detenting
- 2 Plug vanes for plug socket with cable KMYZ-3, KMYZ-4
- 3 Cable 2.5 m

Mounting bracket MHE2-BG-L



Application-optimised directional control valves
Fast-switching valves

3.2

Solenoid valves MHE3, fast-switching valves

Technical data – Individual valve



Application-optimised directional control valves
Fast-switching valves

3.2

Ordering data – Valves					
Electrical connection	Operating voltage	Normally closed		Normally open	
		Part No.	Type	Part No.	Type
Response time 3/2.3 ms					
Connecting thread G $\frac{1}{8}$					
Plug vanes	24 V DC	525 147	MHE3-MS1H-3/2G- $\frac{1}{8}$	525 167	MHE3-MS1H-3/2O- $\frac{1}{8}$
Cable	24 V DC	525 149	MHE3-MS1H-3/2G- $\frac{1}{8}$ -K	525 169	MHE3-MS1H-3/2O- $\frac{1}{8}$ -K
Push-in connector QS 6					
Plug vanes	24 V DC	525 151	MHE3-MS1H-3/2G-QS6	525 171	MHE3-MS1H-3/2O-QS6
Cable	24 V DC	525 153	MHE3-MS1H-3/2G-QS6-K	525 173	MHE3-MS1H-3/2O-QS6-K
Response time 8/4.5 ms					
Connecting thread G $\frac{1}{8}$					
Plug vanes	24 V DC	525 146	MHE3-M1H-3/2G- $\frac{1}{8}$	525 166	MHE3-M1H-3/2O- $\frac{1}{8}$
Cable	24 V DC	525 148	MHE3-M1H-3/2G- $\frac{1}{8}$ -K	525 168	MHE3-M1H-3/2O- $\frac{1}{8}$ -K
Push-in connector QS 6					
Plug vanes	24 V DC	525 150	MHE3-M1H-3/2G-QS6	525 170	MHE3-M1H-3/2O-QS6
Cable	24 V DC	525 152	MHE3-M1H-3/2G-QS6-K	525 172	MHE3-M1H-3/2O-QS6-K

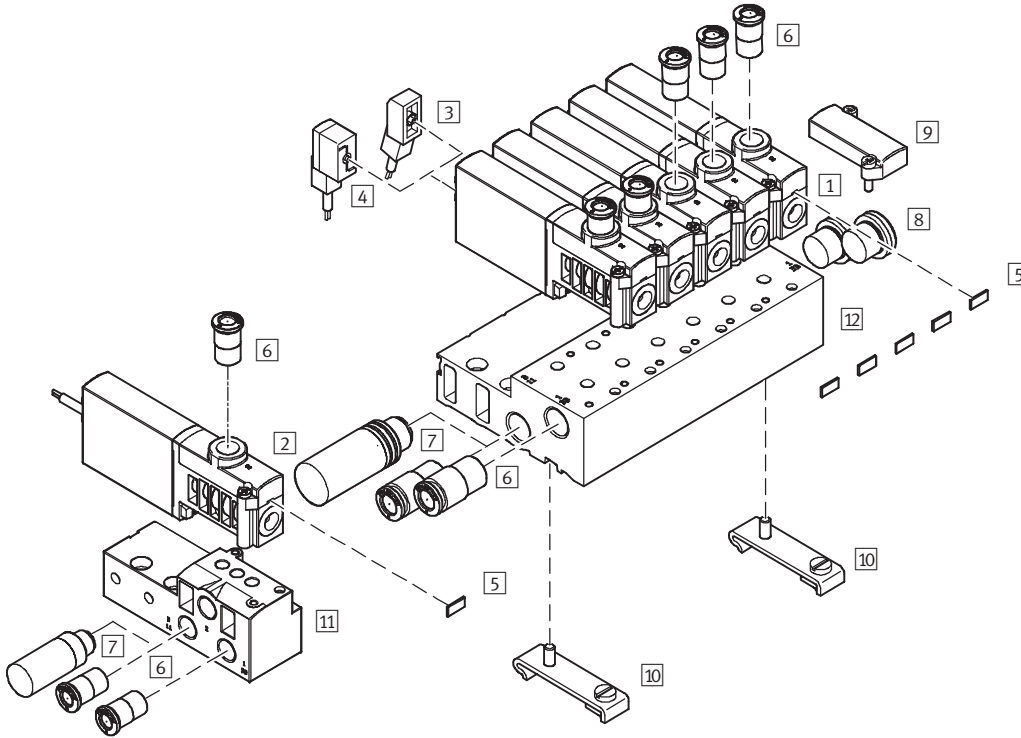
Ordering data – Product-specific accessories				
Designation	Weight [g]	CRC	Part No.	Type
Mounting bracket	55	2 ¹⁾	196 165	MHE2-BG-L

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

Solenoid valves MHP3, fast-switching valves

Peripherals overview – Semi in-line valve

Connection with plug vanes – Connection with moulded-in cable



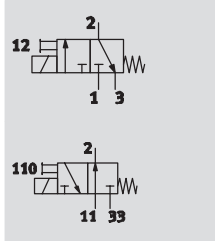
Valves and accessories		Brief description	→ Page
1	Semi in-line valve MHP3-...	With plug vanes	2 / 3.2-66
2	Semi in-line valve MHP3-...-K	With cable	2 / 3.2-66
3	Plug socket with cable KMYZ-4 (IP 40)	With PVC cable	2 / 3.2-78
4	Plug socket with cable KMYZ-3 (IP 65)	With LED, PUR cable, with M8 plug or open end	2 / 3.2-78
5	Inscription label MH-BZ-80X	For identifying the valves	2 / 3.2-78
6	Push-in fittings QS	For connecting compressed air tubing with standard O.D. to CETOP RP 54 P	Volume 3
7	Silencer UC	For fitting in exhaust ports	Volume 3
8	Blanking plug B	For sealing unused ports	2 / 3.2-78
9	Blanking plate MHAP3-BP-3	For sealing vacant positions	2 / 3.2-78
10	H-rail mounting CPV10/14-VI-BG-NRH-35	–	2 / 3.2-78
11	Individual sub-base MHP3-AS-3-1/8	For semi in-line valve	2 / 3.2-69
12	Manifold block MHP3-PR...-3	For semi in-line valve	2 / 3.2-69

Solenoid valves MHP3, fast-switching valves

Technical data – Semi in-line valve



Function



- - Voltage
24 V DC

- - Pressure
-0.9 ... +8 bar

- - Temperature range
-5 ... +40 °C



General technical data		
Valve function		3/2 way, single solenoid ¹⁾
Design		Pressure-relieved poppet valve
Sealing principle		Soft
Control type		Electric
Actuation type		Direct
Direction of flow		Reversible with restrictions (operating pressure)
Exhaust function		With flow control
Manual override		Non-detenting
Assembly position		Any
Grid dimension	[mm]	19
Nominal diameter	[mm]	3
Standard nominal flow rate	[l/min]	200
Type of mounting		On sub-base or manifold, via through-hole
Pneumatic connection		Connecting thread G1/8
		Push-in fitting for tubing O.D. 6 mm
Product weight	[g]	120

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

Operating and environmental conditions		
Operating medium		Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm
		Vacuum, grade of filtration 40 µm
Operating pressure	[bar]	-0.9 ... +8 ²⁾
Operating pressure, reversible	[bar]	-0.9 ... 0
Ambient temperature	[°C]	-5 ... +40
Temperature of medium	[°C]	-5 ... +40
Corrosion resistance class CRC		2 ¹⁾
Certification		c UL us - Recognised (OL)

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

2) There may be slight leakage in the pressure range -0.5 to +0.5 bar

Solenoid valves MHP3, fast-switching valves

Technical data – Semi in-line valve



Application-optimised directional control valves
Fast-switching valves

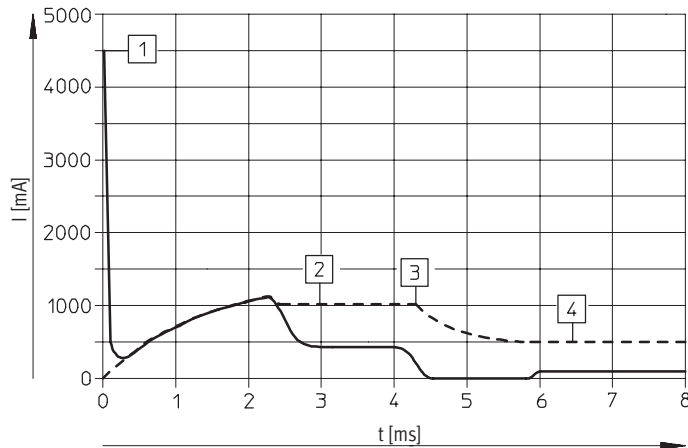
3.2

Electrical data		
Operating voltage	[V DC]	24 ±10%
Type of connection		Plug vanes or moulded-in cable
Power consumption		
With fast-switching electronics	[W]	Pull: 6.5 Hold: 1.6
Without fast-switching electronics	[W]	3.7
Protection class to EN 60529		
With moulded-in cable		IP65
With plug socket with cable KMYZ-3		IP65
With plug socket with cable KMYZ-3 and plug M8		IP65
With plug socket with cable KMYZ-4		IP40

Response times and switching frequencies		
With fast-switching electronics		
Switching time on/off	[ms]	3/2.3 +10% ... -30%
Maximum switching frequency	[Hz]	280 ¹⁾
CE symbol		In accordance with EU EMC Directive
Without fast-switching electronics		
Switching time on/off	[ms]	8/4.5
Maximum switching frequency	[Hz]	130

1) The ambient temperature must be limited as from 100 Hz.

Current path for valves with fast-switching electronics



- 1 Capacitor charging
- 2 Controlled coil current 1 A
- 3 Drop to holding current
- 4 Controlled holding current 0.5 A

Solenoid valves MHP3, fast-switching valves

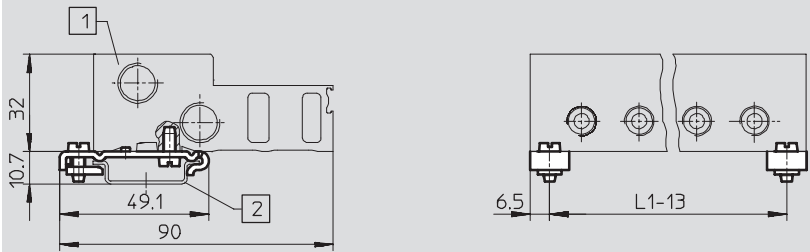
Technical data – Semi in-line valve



Application-optimised directional control valves
Fast-switching valves

Dimensions Download CAD data → www.festo.com/en/engineering

H-rail mounting CPV10/14-VI-BG-NRH-35



- 1 Manifold block
- 2 Mounting rail NRH-35

Type	Valve positions n	L1
MHAP3-PR2-3	2	53
MHAP3-PR4-3	4	91
MHAP3-PR6-3	6	129

Type	Valve positions n	L1
MHAP3-PR8-3	8	167
MHAP3-PR10-3	10	205

Ordering data – Valves

Electrical connection	Operating voltage	Normally closed		Normally open	
		Part No.	Type	Part No.	Type
Response time 3/2.3 ms					
Connecting thread G $\frac{1}{8}$					
Plug vanes	24 V DC	525 139	MHP3-MS1H-3/2G- $\frac{1}{8}$	525 159	MHP3-MS1H-3/2O- $\frac{1}{8}$
Cable	24 V DC	525 141	MHP3-MS1H-3/2G- $\frac{1}{8}$ -K	525 161	MHP3-MS1H-3/2O- $\frac{1}{8}$ -K
Push-in connector QS 6					
Plug vanes	24 V DC	525 143	MHP3-MS1H-3/2G-QS6	525 163	MHP3-MS1H-3/2O-QS6
Cable	24 V DC	525 145	MHP3-MS1H-3/2G-QS6-K	525 165	MHP3-MS1H-3/2O-QS6-K
Response time 8/4.5 ms					
Connecting thread G $\frac{1}{8}$					
Plug vanes	24 V DC	525 138	MHP3-M1H-3/2G- $\frac{1}{8}$	525 158	MHP3-M1H-3/2O- $\frac{1}{8}$
Cable	24 V DC	525 140	MHP3-M1H-3/2G- $\frac{1}{8}$ -K	525 160	MHP3-M1H-3/2O- $\frac{1}{8}$ -K
Push-in connector QS 6					
Plug vanes	24 V DC	525 142	MHP3-M1H-3/2G-QS6	525 162	MHP3-M1H-3/2O-QS6
Cable	24 V DC	525 144	MHP3-M1H-3/2G-QS6-K	525 164	MHP3-M1H-3/2O-QS6-K

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

Solenoid valves MHP3, fast-switching valves



Technical data – Semi in-line valve

Ordering data – Product-specific accessories			
Designation		Part No.	Type
Individual sub-base			
For semi in-line valve		525 215	MHP3-AS-3-1/8
Manifold block			
For semi in-line valve	2 valves	525 216	MHP3-PR2-1/8
	4 valves	525 217	MHP3-PR4-1/8
	6 valves	525 218	MHP3-PR6-1/8
	8 valves	525 219	MHP3-PR8-1/8
	10 valves	525 220	MHP3-PR10-1/8

Application-optimised directional control valves
Fast-switching valves

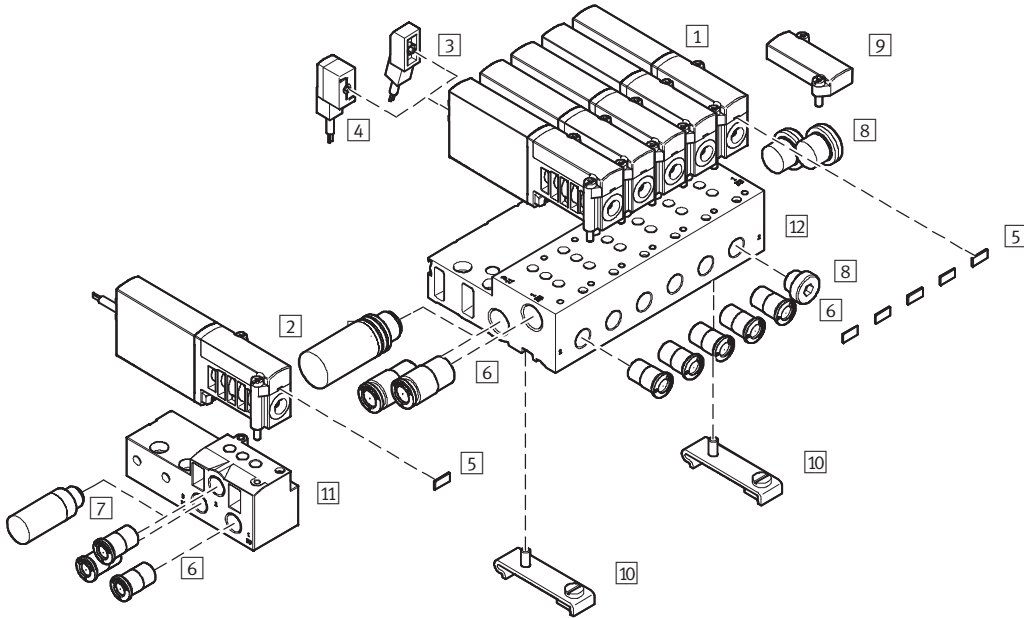
3.2

Solenoid valves MHA3, fast-switching valves

Peripherals overview – Sub-base valve



Connection with plug vanes – Connection with moulded-in cable



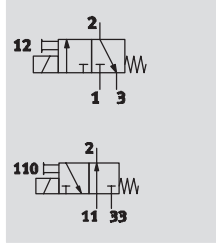
Valves and accessories		
	Brief description	→ Page
1	Sub-base valve MHA3-...	With plug vanes 2 / 3.2-73
2	Sub-base valve MHA3-...-K	With cable 2 / 3.2-73
3	Plug socket with cable KMYZ-4 (IP 40)	With PVC cable 2 / 3.2-78
4	Plug socket with cable KMYZ-3 (IP 65)	With LED, PUR cable, with M8 plug or open end 2 / 3.2-78
5	Inscription label MH-BZ-80X	For identifying the valves 2 / 3.2-78
6	Push-in fittings QS	For connecting compressed air tubing with standard O.D. to CETOP RP 54 P Volume 3
7	Silencer UC	For fitting in exhaust ports Volume 3
8	Blanking plug B	For sealing unused ports 2 / 3.2-78
9	Blanking plate MHAP3-BP-3	For sealing vacant positions 2 / 3.2-78
10	H-rail mounting CPV10/14-VI-BG-NRH-35	– 2 / 3.2-78
11	Individual sub-base MHA3-AS-3-1/8	For sub-base valve 2 / 3.2-76
12	Manifold block MHA3-PR...-3-1/8	For sub-base valve 2 / 3.2-76

Solenoid valves MHA3, fast-switching valves



Technical data – Sub-base valve

Function



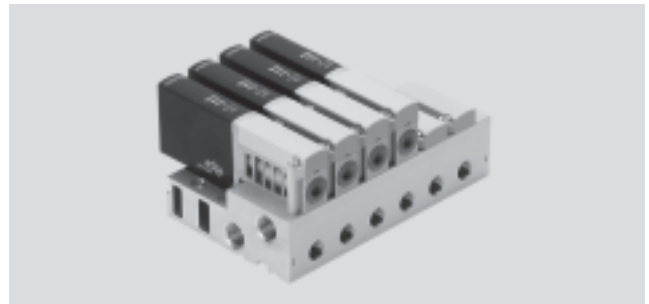
Voltage
24 V DC



Pressure
-0.9 ... +8 bar



Temperature range
-5 ... +40 °C



General technical data	
Valve function	3/2 way, single solenoid ¹⁾
Design	Pressure-relieved poppet valve
Sealing principle	Soft
Control type	Electric
Actuation type	Direct
Direction of flow	Reversible with restrictions (operating pressure)
Exhaust function	With flow control
Manual override	Non-detenting
Assembly position	Any
Grid dimension	[mm] 19
Nominal diameter	[mm] 3
Standard nominal flow rate	[l/min] 200
Type of mounting	On sub-base or manifold, via through-hole
Pneumatic connection	Connecting thread G1/8
Product weight	[g] 120

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

Operating and environmental conditions	
Operating medium	Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm Vacuum, grade of filtration 40 µm
Operating pressure	[bar] -0.9 ... +8 ²⁾
Operating pressure, reversible	[bar] -0.9 ... 0
Ambient temperature	[°C] -5 ... +40
Temperature of medium	[°C] -5 ... +40
Corrosion resistance class CRC	2 ¹⁾
Certification	c UL us - Recognised (OL)

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

2) There may be slight leakage in the pressure range -0.5 to +0.5 bar

Solenoid valves MHA3, fast-switching valves

Technical data – Sub-base valve



Application-optimised directional control valves
Fast-switching valves

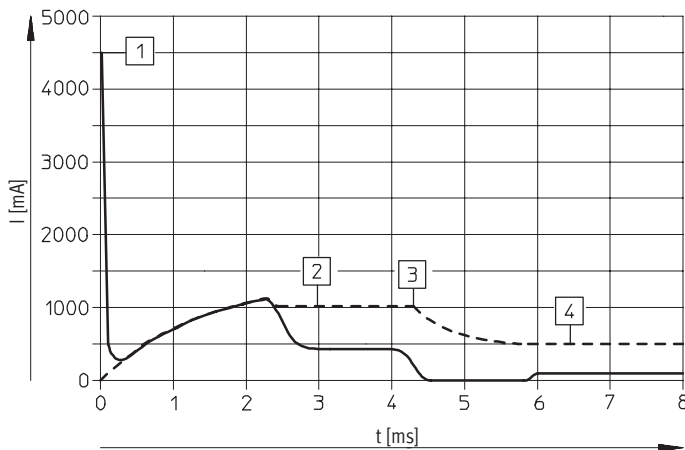
3.2

Electrical data		
Operating voltage	[V DC]	24 ±10%
Type of connection		Plug vanes or moulded-in cable
Power consumption		
With fast-switching electronics	[W]	Pull: 6.5 Hold: 1.6
Without fast-switching electronics	[W]	3.7
Protection class to EN 60529		
With moulded-in cable		IP65
With plug socket with cable KMYZ-3		IP65
With plug socket with cable KMYZ-3 and plug M8		IP65
With plug socket with cable KMYZ-4		IP40

Response times and switching frequencies		
With fast-switching electronics		
Switching time on/off	[ms]	3/2.3 +10% ... -30%
Maximum switching frequency	[Hz]	280 ¹⁾
CE symbol		In accordance with EU EMC Directive
Without fast-switching electronics		
Switching time on/off	[ms]	8/4.5
Maximum switching frequency	[Hz]	130

1) The ambient temperature must be limited as from 100 Hz.

Current path for valves with fast-switching electronics



--- Current in the coil
— Current in the supply line

- 1) Capacitor charging
- 2) Controlled coil current 1 A
- 3) Drop to holding current
- 4) Controlled holding current 0.5 A

Solenoid valves MHA3, fast-switching valves

Technical data – Sub-base valve

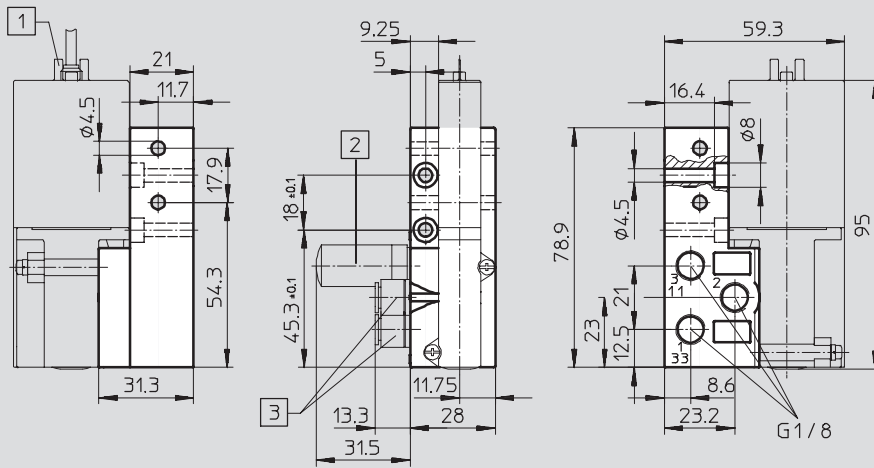


Application-optimised directional control valves
Fast-switching valves

Dimensions

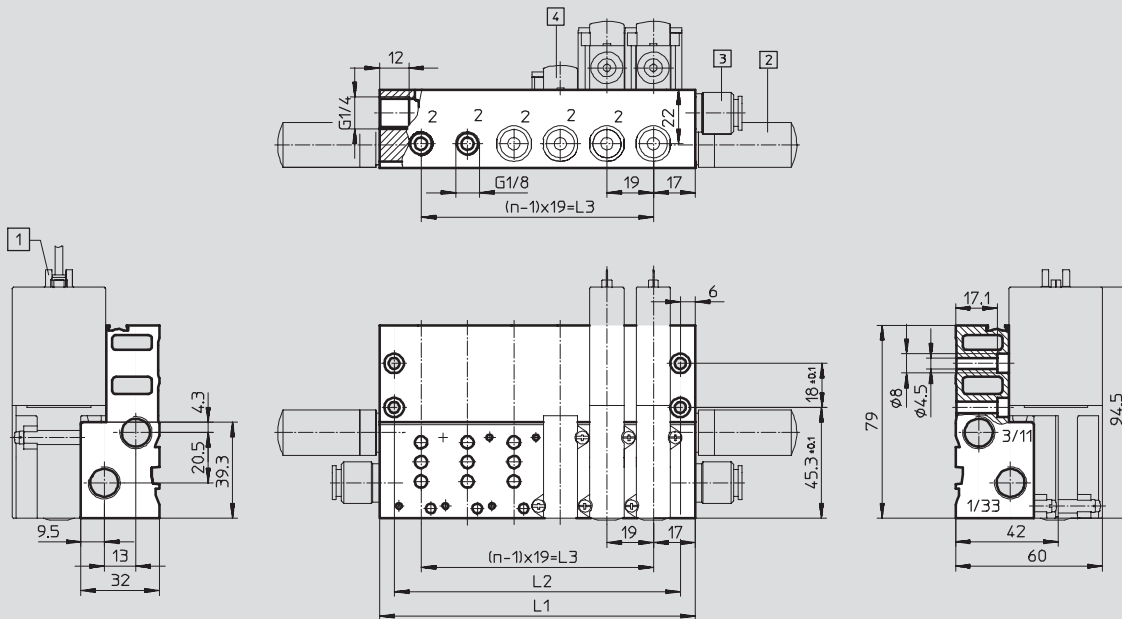
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Individual sub-base



- 1 Plug vanes for plug socket with cable KMYZ-3, KMYZ-4
- 2 Silencer UC-1/8
- 3 Push-in fitting

Manifold mounting



- 1 Plug vanes for plug socket with cable KMYZ-3, KMYZ-4 or moulded-in cable
- 2 Silencer UC-1/4
- 3 Push-in fitting
- 4 Blanking plate MHAP-BP-3

Valve positions n	L1	L2	L3
2	53	41	19
4	91	79	57
6	129	117	95

Valve positions n	L1	L2	L3
8	167	155	133
10	205	193	171

Solenoid valves MHA3, fast-switching valves

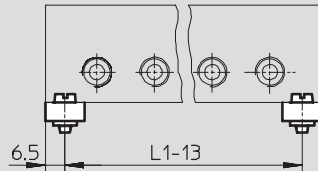
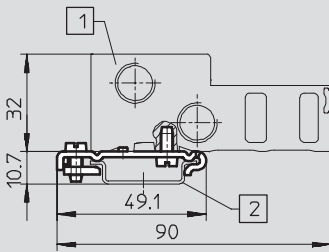
Technical data – Sub-base valve



Dimensions

Download CAD data → www.festo.com/en/engineering

H-rail mounting CPV10/14-VI-BG-NRH-35



- 1 Manifold block
- 2 Mounting rail NRH-35

Type	Valve positions n	L1
MHAP3-PR2-3	2	53
MHAP3-PR4-3	4	91
MHAP3-PR6-3	6	129

Type	Valve positions n	L1
MHAP3-PR8-3	8	167
MHAP3-PR10-3	10	205

Ordering data – Valves

Electrical connection	Operating voltage	Normally closed		Normally open	
		Part No.	Type	Part No.	Type
Response time 3/2.3 ms					
Plug vanes	24 V DC	525 135	MHA3-MS1H-3/2G-3	525 155	MHA3-MS1H-3/2O-3
Cable	24 V DC	525 137	MHA3-MS1H-3/2G-3-K	525 157	MHA3-MS1H-3/2O-3-K
Response time 8/4.5 ms					
Plug vanes	24 V DC	525 134	MHA3-M1H-3/2G-3	525 154	MHA3-M1H-3/2O-3
Cable	24 V DC	525 136	MHA3-M1H-3/2G-3-K	525 156	MHA3-M1H-3/2O-3-K

- Note

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

Ordering data – Product-specific accessories

Designation	Part No.	Type
Individual sub-base		
For sub-base valve	525 214	MHA3-AS-3-1/8
Manifold block		
For sub-base valve	2 valves	525 221 MHA3-PR2-1/8
	4 valves	525 222 MHA3-PR4-1/8
	6 valves	525 223 MHA3-PR6-1/8
	8 valves	525 224 MHA3-PR8-1/8
	10 valves	525 225 MHA3-PR10-1/8

Solenoid valves MH3, fast-switching valves

Accessories



Application-optimised directional control valves
Fast-switching valves

3.2

Ordering data			Part No.	Type				Part No.	Type
Plug socket with cable (IP65) with LED and PUR cable									
	2.5 m	193 693	KMYZ-3-24-2,5-LED-PUR-B						
	5 m	193 695	KMYZ-3-24-5-LED-PUR-B						
	10 m	196 066	KMYZ-3-24-10-LED-PUR-B						
Plug socket with cable (IP65) with LED, PUR cable and M8 plug									
	0.5 m	525 654	KMYZ-3-24-M8-0,5-LED-PUR						
	2.5 m	525 655	KMYZ-3-24-M8-2,5-LED-PUR						
H-rail mounting									
		162 556	CPV10/14-VI-BG-NRH-35						
Blanking plug B									
	G1/8	3 569	B-1/8²⁾						
	G1/4	3 568	B-1/4²⁾						
Silencer UC									
		→ Volume 3							
Plug socket with cable (IP40) with PVC cable									
	0.5 m	193 690	KMYZ-4-24-0,5-B						
	2.5 m	193 691	KMYZ-4-24-2,5-B						
Inscription label									
		197 259	MH-BZ-80X¹⁾						
H-rail									
	2 m	35 430	NRH-35-2000						
Blanking plate									
		525 226	MHAP3-BP-3						
Push-in fittings QS									
		→ Volume 3							

1) Scope of delivery 80 pieces
2) Scope of delivery 10 pieces

Solenoid valves MH4, fast-switching valves

Type codes

FESTO

		MH	P	4	-	M	S	1	H	-	3/2	-	0	-	QS8	
Valve family																
MH	Miniature and fast-switching valves															
Design																
E	Individual valve															
P	Semi in-line valve															
A	Sub-base valve															
Size																
4	Flow rate 400 l/min															
Drive function																
M	Solenoid, switching															
Response time																
-	9 ms															
S	3.5 ms															
Operating voltage																
1	24 V DC															
Manual override																
H	Non-detenting															
Valve function																
3/2	3/2-way valve															
Normal position																
G	Closed															
O	Open															
Pneumatic connection																
4	Nominal size 4 mm															
1/4	G1/4 thread															
QS8	Push-in connector for 8 mm O.D. tubing															
Electrical connection																
-	Plug vanes for plug socket KMEB-...															
K	Moulded-in cable, 2.5 m long															

Application-optimised directional control valves
Fast-switching valves

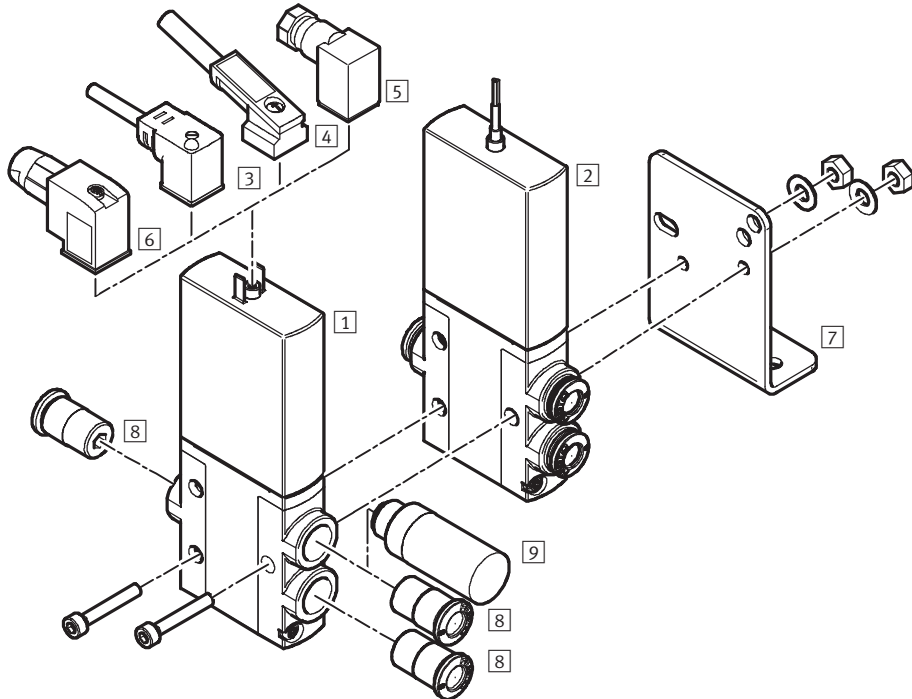
3.2

Solenoid valves MHE4, fast-switching valves

Peripherals overview – Individual valve



Connection with plug vanes – Connection with moulded-in cable



Application-optimised directional control valves
Fast-switching valves

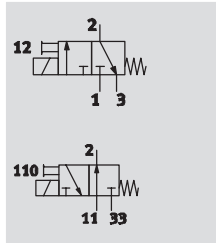
3.2

Valves and accessories			
	Brief description	→ Page	
1	Individual valve MHE4-...	With plug vanes	2 / 3.2-81
2	Individual valve MHE4-...-K	With cable	2 / 3.2-81
3	Plug socket with cable KMEB-1 (IP65)	PVC cable, with or without LED	2 / 3.2-98
4	Plug socket with cable KMEB-2 (IP65)	With LED, without LED; PUR cable, with or without LED	2 / 3.2-98
5	Plug socket MSSD-EB (IP65)	With clamping screw	2 / 3.2-98
6	Plug socket MSSD-EB-S-M14 (IP65)	With insulation displacement connector	2 / 3.2-98
7	Mounting bracket MHE2-BG-L	–	2 / 3.2-84
8	Push-in fittings QS	For connecting compressed air tubing with standard O.D. to CETOP RP 54 P	Volume 3
9	Silencer UC	For fitting in exhaust ports	Volume 3

Solenoid valves MHE4, fast-switching valves

Technical data – Individual valve

Function



Voltage
24 V DC



Pressure
-0.9 ... +8 bar



Temperature range
-5 ... +60 °C



General technical data	
Valve function	3/2 way, single solenoid ¹⁾
Design	Pressure-relieved poppet valve
Sealing principle	Soft
Control type	Electric
Actuation type	Direct
Direction of flow	Reversible with restrictions (operating pressure)
Exhaust function	With flow control
Manual override	Non-detenting
Assembly position	Any
Grid dimension	[mm] 24
Nominal diameter	[mm] 4
Standard nominal flow rate	[l/min] 400
Type of mounting	Via through-holes
Pneumatic connection	Connecting thread G1/8
	Push-in fitting for tubing O.D. 8 mm
Product weight	[g] 270

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

Operating and environmental conditions	
Operating medium	Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm
	Vacuum, grade of filtration 40 µm
Operating pressure	[bar] -0.9 ... +8 ²⁾
Operating pressure, reversible	[bar] -0.9 ... 0
Ambient temperature	[°C] -5 ... +60
Temperature of medium	[°C] -5 ... +60
Corrosion resistance class CRC	2 ¹⁾
Certification	c UL us - Recognised (OL)

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

2) There may be slight leakage in the pressure range -0.5 to +0.5 bar

Solenoid valves MHE4, fast-switching valves

Technical data – Individual valve



Application-optimised directional control valves
Fast-switching valves

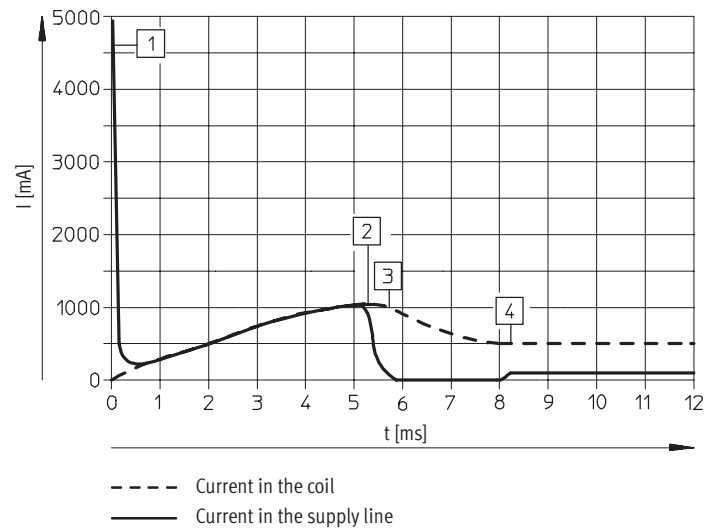
3.2

Electrical data		
Operating voltage	[V DC]	24 ±10%
Type of connection		Plug vanes or moulded-in cable
Power consumption		
With fast-switching electronics	[W]	Pull: 8.5 Hold: 2.125
Without fast-switching electronics	[W]	5,6
Protection class to EN 60529		
With moulded-in cable		IP65
With plug socket with cable KMEB		IP65

Response times and switching frequencies		
With fast-switching electronics		
Switching time on/off	[ms]	3.5/3.5 +10% ... -30%
Maximum switching frequency	[Hz]	210 ¹⁾
CE symbol		In accordance with EU EMC Directive
Without fast-switching electronics		
Switching time on/off	[ms]	9/5
Maximum switching frequency	[Hz]	120

1) The ambient temperature must be limited as from 90 Hz.

Current path for valves with fast-switching electronics



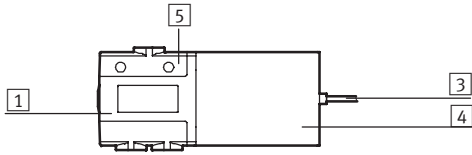
- 1 Capacitor charging
- 2 Controlled coil current 1 A
- 3 Drop to holding current
- 4 Controlled holding current 0.5 A

Solenoid valves MHE4, fast-switching valves

Technical data – Individual valve



Materials



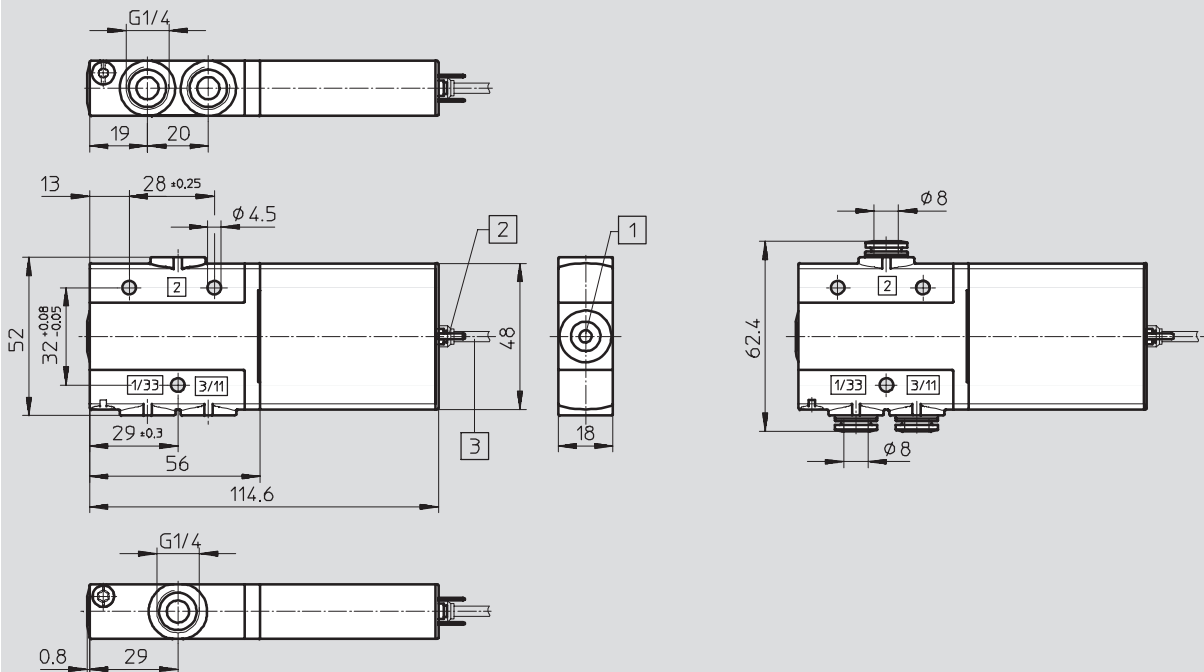
1	Body	Die-cast zinc, coated
3	Cable sheath	Polyurethane
4	Coil housing	Polyamide
5	Connection piece	Polyamide
-	Seals	Nitrile rubber
Note on materials		Free of copper and PTFE

Dimensions

Download CAD data → www.festo.com/en/engineering

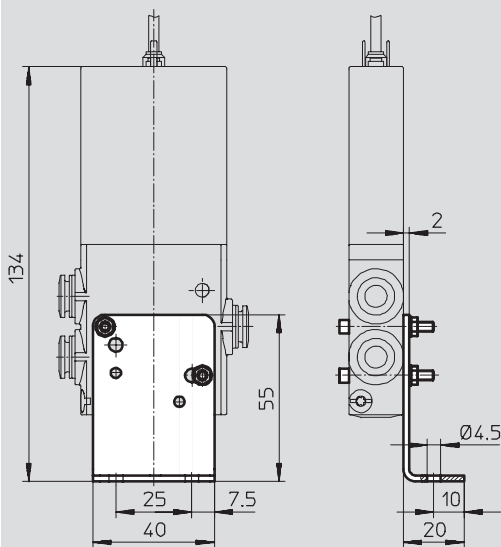
Valve with connecting thread G1/4

Valve with push-in fitting QS 8



- 1 Manual override, non-detenting
- 2 Plug vanes for plug socket with cable KMEB
- 3 Cable 2.5 m

Mounting bracket MHE2-BG-L



Solenoid valves MHE4, fast-switching valves

Technical data – Individual valve



Application-optimised directional control valves
Fast-switching valves

3.2

Ordering data – Valves					
Electrical connection	Operating voltage	Normally closed		Normally open	
		Part No.	Type	Part No.	Type
Response time 3.5/3.5 ms					
Connecting thread G $\frac{1}{4}$					
Plug vanes	24 V DC	525 187	MHE4-MS1H-3/2G- $\frac{1}{4}$	525 207	MHE4-MS1H-3/2O- $\frac{1}{4}$
Cable	24 V DC	525 189	MHE4-MS1H-3/2G- $\frac{1}{4}$ -K	525 209	MHE4-MS1H-3/2O- $\frac{1}{4}$ -K
Push-in connector QS 8					
Plug vanes	24 V DC	525 191	MHE4-MS1H-3/2G-QS8	525 211	MHE4-MS1H-3/2O-QS8
Cable	24 V DC	525 193	MHE4-MS1H-3/2G-QS8-K	525 213	MHE4-MS1H-3/2O-QS8-K
Response time 9/5 ms					
Connecting thread G $\frac{1}{4}$					
Plug vanes	24 V DC	525 186	MHE4-M1H-3/2G- $\frac{1}{4}$	525 206	MHE4-M1H-3/2O- $\frac{1}{4}$
Cable	24 V DC	525 188	MHE4-M1H-3/2G- $\frac{1}{4}$ -K	525 208	MHE4-M1H-3/2O- $\frac{1}{4}$ -K
Push-in connector QS 8					
Plug vanes	24 V DC	525 190	MHE4-M1H-3/2G-QS8	525 210	MHE4-M1H-3/2O-QS8
Cable	24 V DC	525 192	MHE4-M1H-3/2G-QS8-K	525 212	MHE4-M1H-3/2O-QS8-K

Ordering data – Product-specific accessories				
Designation	Weight [g]	CRC	Part No.	Type
Mounting bracket	55	2 ¹⁾	196 165	MHE2-BG-L

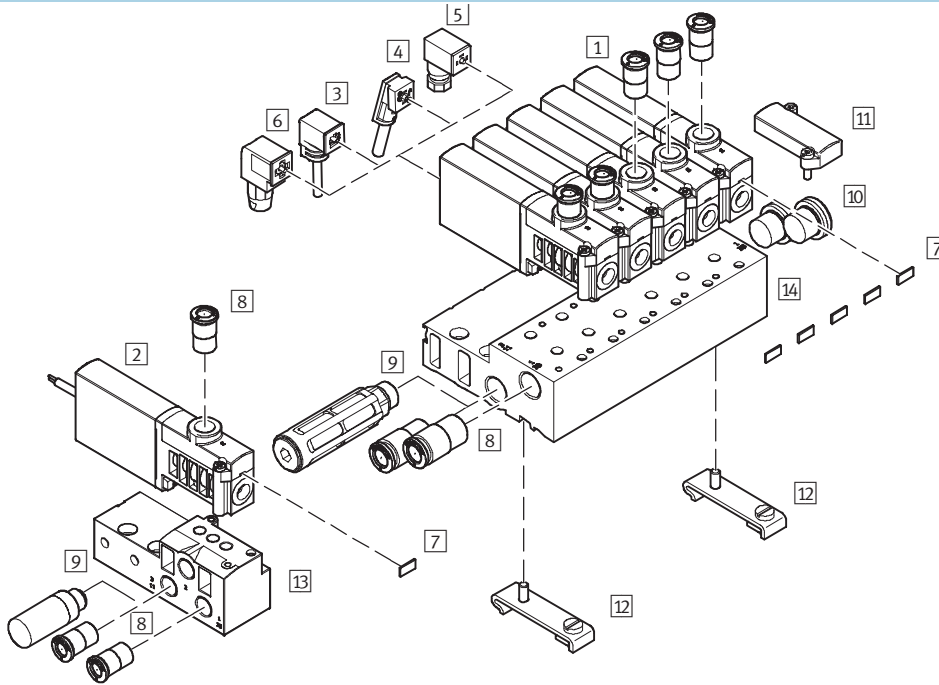
1) Corrosion resistance class 2 according to Festo standard 940 070

Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

Solenoid valves MHP4, fast-switching valves

Peripherals overview – Semi in-line valve

Connection with plug vanes – Connection with moulded-in cable



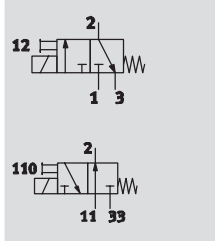
Valves and accessories		
	Brief description	→ Page
1	Semi in-line valve MHP4-...	With plug vanes 2 / 3.2-86
2	Semi in-line valve MHP4-...-K	With cable 2 / 3.2-86
3	Plug socket MSSD-EB (IP65)	With clamping screw 2 / 3.2-98
4	Plug socket MSSD-EB-S-M14 (IP65)	With insulation displacement connector 2 / 3.2-98
5	Plug socket with cable KMEB-1 (IP65)	PVC cable, with or without LED 2 / 3.2-98
6	Plug socket with cable KMEB-2 (IP65)	PUR cable, with or without LED 2 / 3.2-98
7	Inscription label MH-BZ-80X	For identifying the valves 2 / 3.2-98
8	Push-in fittings QS	For connecting compressed air tubing with standard O.D. to CETOP RP 54 P Volume 3
9	Silencer UC	For fitting in exhaust ports Volume 3
10	Blanking plug B	For sealing unused ports 2 / 3.2-98
11	Blanking plate MHAP4-BP-3	For sealing vacant positions 2 / 3.2-98
12	H-rail mounting CPV10/14-VI-BG-NRH-35	– 2 / 3.2-98
13	Individual sub-base MHP4-AS-3-1/4	For semi in-line valve 2 / 3.2-89
14	Manifold block MHP4-PR...-3	For semi in-line valve 2 / 3.2-89

Solenoid valves MHP4, fast-switching valves

Technical data – Semi in-line valve



Function



- - Voltage
24 V DC

- - Pressure
-0.9 ... +8 bar

- - Temperature range
-5 ... +40 °C



General technical data		
Valve function		3/2 way, single solenoid ¹⁾
Design		Pressure-relieved poppet valve
Sealing principle		Soft
Control type		Electric
Actuation type		Direct
Direction of flow		Reversible with restrictions (operating pressure)
Exhaust function		With flow control
Manual override		Non-detenting
Assembly position		Any
Grid dimension	[mm]	24
Nominal diameter	[mm]	4
Standard nominal flow rate	[l/min]	400
Type of mounting		On sub-base or manifold, via through-hole
Pneumatic connection		Connecting thread G1/4
		Push-in fitting for tubing O.D. 8 mm
Product weight	[g]	270

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

Operating and environmental conditions		
Operating medium		Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm
		Vacuum, grade of filtration 40 µm
Operating pressure	[bar]	-0.9 ... +8 ²⁾
Operating pressure, reversible	[bar]	-0.9 ... 0
Ambient temperature	[°C]	-5 ... +40
Temperature of medium	[°C]	-5 ... +40
Corrosion resistance class CRC		2 ¹⁾
Certification		c UL us - Recognised (OL)

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

2) There may be slight leakage in the pressure range -0.5 to +0.5 bar

Solenoid valves MHP4, fast-switching valves

Technical data – Semi in-line valve

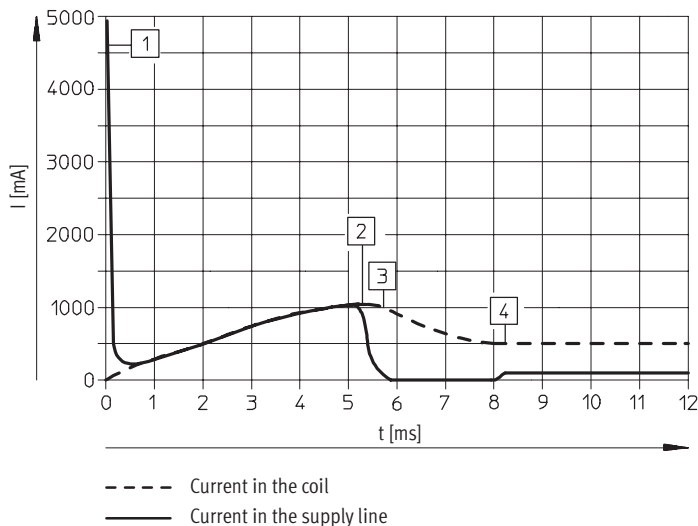


Electrical data		
Operating voltage	[V DC]	24 ±10%
Type of connection		Plug vanes or moulded-in cable
Power consumption		
With fast-switching electronics	[W]	Pull: 8.5 Hold: 2.125
Without fast-switching electronics	[W]	5.6
Protection class to EN 60529		
With moulded-in cable		IP65
With plug socket with cable KMEB		IP65

Response times and switching frequencies		
With fast-switching electronics		
Switching time on/off	[ms]	3.5/3.5 +10% ... -30%
Maximum switching frequency	[Hz]	210 ¹⁾
CE symbol		In accordance with EU EMC Directive
Without fast-switching electronics		
Switching time on/off	[ms]	9/5
Maximum switching frequency	[Hz]	120

1) The ambient temperature must be limited as from 100 Hz.

Current path for valves with fast-switching electronics



- 1 Capacitor charging
- 2 Controlled coil current 1 A
- 3 Drop to holding current
- 4 Controlled holding current 0.5 A

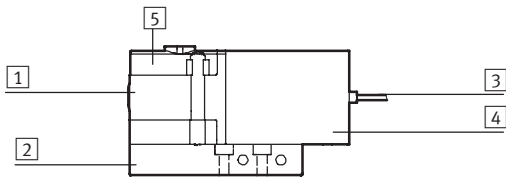
Solenoid valves MHP4, fast-switching valves

Technical data – Semi in-line valve



Application-optimised directional control valves
Fast-switching valves

Materials



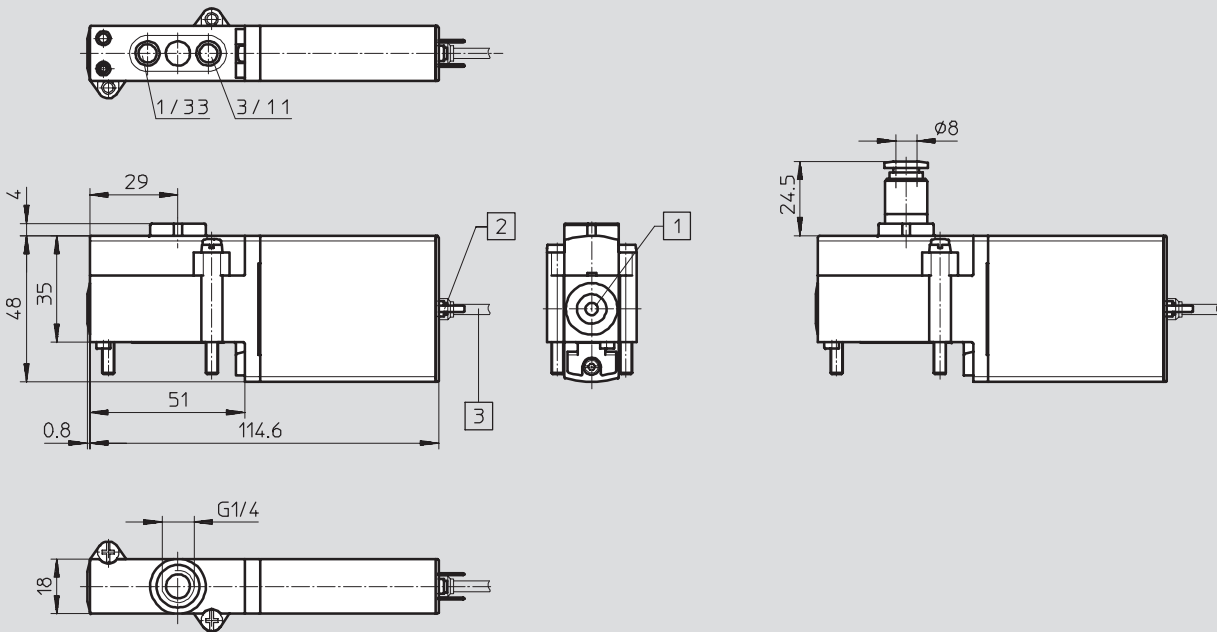
1	Body	Die-cast zinc, coated
2	Sub-base	Manifold block: Aluminium Individual sub-base: Die-cast zinc
3	Cable sheath	Polyurethane
4	Coil housing	Polyamide
5	Connection piece	Polyamide
-	Seals	Nitrile rubber
Note on materials		Free of copper and PTFE

Dimensions

Download CAD data → www.festo.com/en/engineering

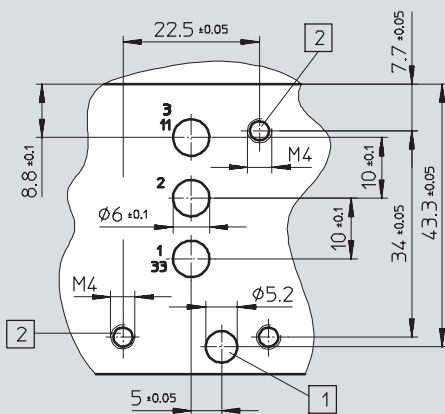
Valve with connecting thread G $\frac{1}{4}$

Valve with push-in fitting QS 8



- 1 Manual override, non-detenting
- 2 Plug vanes for plug socket with cable KMEB
- 3 Cable 2.5 m

Port pattern on sub-bases



Note

Semi in-line valves do not require port 2.
If used as a 2/2-way valve, normally closed, port 3/11 is not required.
If used as a 2/2-way valve, normally open, port 1/33 is not required.

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

Solenoid valves MHP4, fast-switching valves

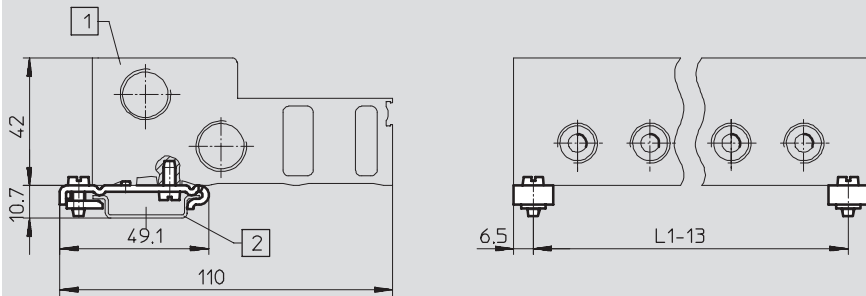
Technical data – Semi in-line valve



Application-optimised directional control valves
Fast-switching valves

Dimensions Download CAD data → www.festo.com/en/engineering

H-rail mounting CPV10/14-VI-BG-NRH-35



- 1 Manifold block
- 2 Mounting rail NRH-35

Type	Valve positions n	L1
MHA4/MHP4-PR2-3	2	66
MHA4/MHP4-PR4-3	4	114
MHA4/MHP4-PR6-3	6	162

Type	Valve positions n	L1
MHA4/MHP4-PR8-3	8	210
MHA4/MHP4-PR10-3	10	258

Ordering data – Valves

Electrical connection	Operating voltage	Normally closed		Normally open	
		Part No.	Type	Part No.	Type
Response time 3.5/3.5 ms					
Connecting thread G1/4					
Plug vanes	24 V DC	525 179	MHP4-MS1H-3/2G-1/4	525 199	MHP4-MS1H-3/20-1/4
Cable	24 V DC	525 181	MHP4-MS1H-3/2G-1/4-K	525 201	MHP4-MS1H-3/20-1/4-K
Push-in connector QS 8					
Plug vanes	24 V DC	525 183	MHP4-MS1H-3/2G-QS8	525 203	MHP4-MS1H-3/20-QS8
Cable	24 V DC	525 185	MHP4-MS1H-3/2G-QS8-K	525 205	MHP4-MS1H-3/20-QS8-K
Response time 9/5 ms					
Connecting thread G1/4					
Plug vanes	24 V DC	525 178	MHP4-M1H-3/2G-1/4	525 198	MHP4-M1H-3/20-1/4
Cable	24 V DC	525 180	MHP4-M1H-3/2G-1/4-K	525 200	MHP4-M1H-3/20-1/4-K
Push-in connector QS 8					
Plug vanes	24 V DC	525 182	MHP4-M1H-3/2G-QS8	525 202	MHP4-M1H-3/20-QS8
Cable	24 V DC	525 184	MHP4-M1H-3/2G-QS8-K	525 204	MHP4-M1H-3/20-QS8-K

- - Note

Type 3/2G and type 3/20 valves must not be mixed on a manifold block.

Solenoid valves MHP4, fast-switching valves



Technical data – Semi in-line valve

Ordering data – Product-specific accessories			
Designation		Part No.	Type
Individual sub-base			
For semi in-line valve		525 228	MHP4-AS-3-1/4
Manifold block			
For semi in-line valve	2 valves	525 229	MHP4-PR2-3
	4 valves	525 230	MHP4-PR4-3
	6 valves	525 231	MHP4-PR6-3
	8 valves	525 232	MHP4-PR8-3
	10 valves	525 233	MHP4-PR10-3

Application-optimised directional control valves
Fast-switching valves

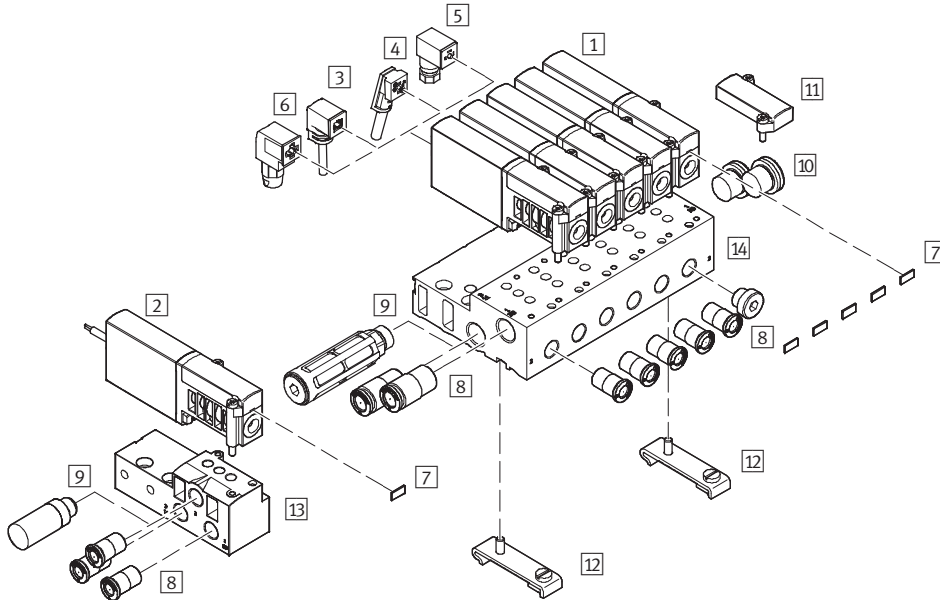
3.2

Solenoid valves MHA4, fast-switching valves

Peripherals overview – Sub-base valve



Connection with plug vanes – Connection with moulded-in cable



Application-optimised directional control valves
Fast-switching valves

3.2

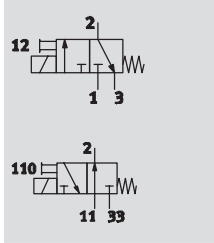
Valves and accessories		
	Brief description	→ Page
1	Sub-base valve MHA4-...	With plug vanes 2 / 3.2-98
2	Sub-base valve MHA4-...-K	With cable 2 / 3.2-98
3	Plug socket with cable KMEB-1 (IP65)	PVC cable, with or without LED 2 / 3.2-98
4	Plug socket with cable KMEB-2 (IP65)	PUR cable, with or without LED 2 / 3.2-98
5	Plug socket MSSD-EB (IP65)	With clamping screw 2 / 3.2-98
6	Plug socket MSSD-EB-S-M14 (IP65)	With insulation displacement connector 2 / 3.2-98
7	Inscription label MH-BZ-80X	For identifying the valves 2 / 3.2-98
8	Push-in fittings QS	For connecting compressed air tubing with standard O.D. to CETOP RP 54 P Volume 3
9	Silencer UC	For fitting in exhaust ports Volume 3
10	Blanking plug B	For sealing unused ports 2 / 3.2-98
11	Blanking plate MHAP4-BP-3	For sealing vacant positions 2 / 3.2-98
12	H-rail mounting CPV10/14-VI-BG-NRH-35	– 2 / 3.2-98
13	Individual sub-base MHA4-AS-3-1/4	For sub-base valves 2 / 3.2-96
14	Manifold block MHA4-PR...-3	For sub-base valves 2 / 3.2-96

Solenoid valves MHA4, fast-switching valves

FESTO

Technical data – Sub-base valve

Function



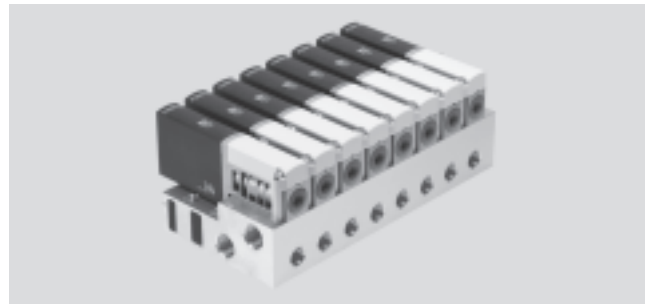
Voltage
24 V DC



Pressure
-0.9 ... +8 bar



Temperature range
-5 ... +40 °C



General technical data	
Valve function	3/2 way, single solenoid ¹⁾
Design	Pressure-relieved poppet valve
Sealing principle	Soft
Control type	Electric
Actuation type	Direct
Direction of flow	Reversible with restrictions (operating pressure)
Exhaust function	With flow control
Manual override	Non-detenting
Assembly position	Any
Grid dimension	[mm] 24
Nominal diameter	[mm] 4
Standard nominal flow rate	[l/min] 400
Type of mounting	On sub-base or manifold, via through-hole
Pneumatic connection	Connecting thread G $\frac{1}{4}$
Product weight	[g] 270

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

Operating and environmental conditions	
Operating medium	Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm Vacuum, grade of filtration 40 µm
Operating pressure	[bar] -0.9 ... +8 ²⁾
Operating pressure, reversible	[bar] -0.9 ... 0
Ambient temperature	[°C] -5 ... +40
Temperature of medium	[°C] -5 ... +40
Corrosion resistance class CRC	2 ¹⁾
Certification	c UL us - Recognised (OL)

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

2) There may be slight leakage in the pressure range -0.5 to +0.5 bar

Application-optimised directional control valves
Fast-switching valves

3.2

Solenoid valves MHA4, fast-switching valves

Technical data – Sub-base valve



Application-optimised directional control valves
Fast-switching valves

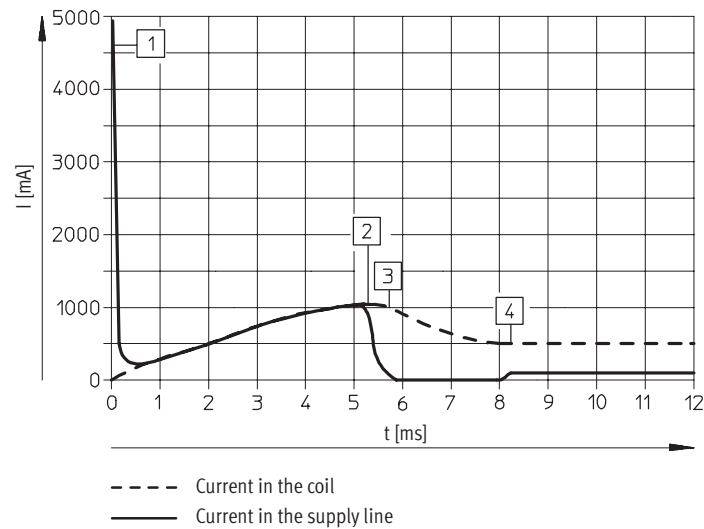
3.2

Electrical data		
Operating voltage	[V DC]	24 ±10%
Type of connection		Plug vanes or moulded-in cable
Power consumption		
With fast-switching electronics	[W]	Pull: 8.5 Hold: 2.125
Without fast-switching electronics	[W]	5.6
Protection class to EN 60529		
With moulded-in cable		IP65
With plug socket with cable KMEB		IP65

Response times and switching frequencies		
With fast-switching electronics		
Switching time on/off	[ms]	3.5/3.5 +10% ... -30%
Maximum switching frequency	[Hz]	210 ¹⁾
CE symbol		In accordance with EU EMC Directive
Without fast-switching electronics		
Switching time on/off	[ms]	9/5
Maximum switching frequency	[Hz]	120

1) The ambient temperature must be limited as from 100 Hz.

Current path for valves with fast-switching electronics



- 1 Capacitor charging
- 2 Controlled coil current 1 A
- 3 Drop to holding current
- 4 Controlled holding current 0.5 A

Solenoid valves MHA4, fast-switching valves

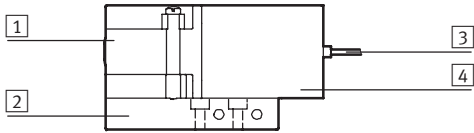
Technical data – Sub-base valve



Application-optimised directional control valves
Fast-switching valves

3.2

Materials

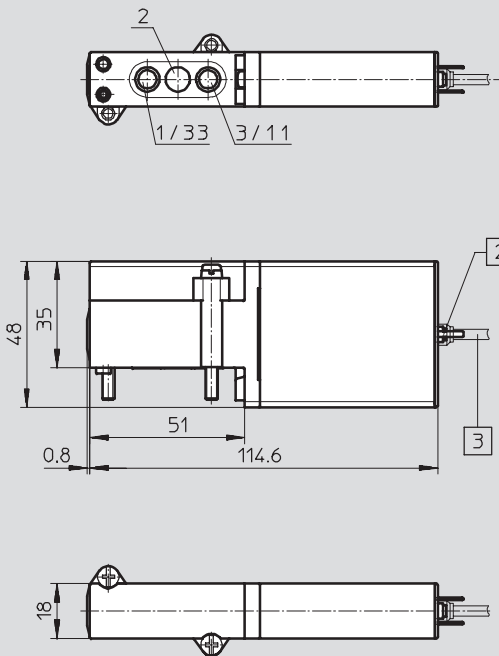


1	Body	Die-cast zinc, coated
2	Sub-base	Manifold block: Aluminium Individual sub-base: Die-cast zinc
3	Cable sheath	Polyurethane
4	Coil housing	Polyamide
-	Seals	Nitrile rubber/ hydrogenated nitrile rubber
Note on materials		Free of copper and PTFE

Dimensions

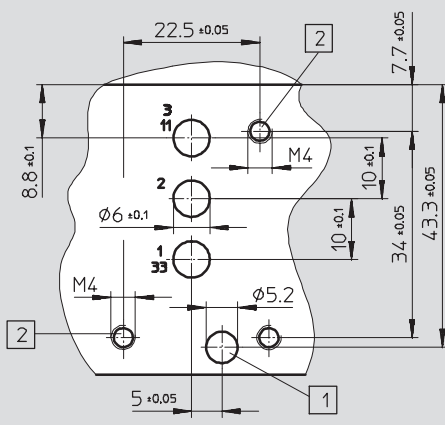
Download CAD data → www.festo.com/en/engineering

Valve



- 1 Manual override, non-detenting
- 2 Plug vanes for plug socket with cable KMEB
- 3 Cable 2.5 m

Port pattern on sub-bases



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

Solenoid valves MHA4, fast-switching valves

Technical data – Sub-base valve

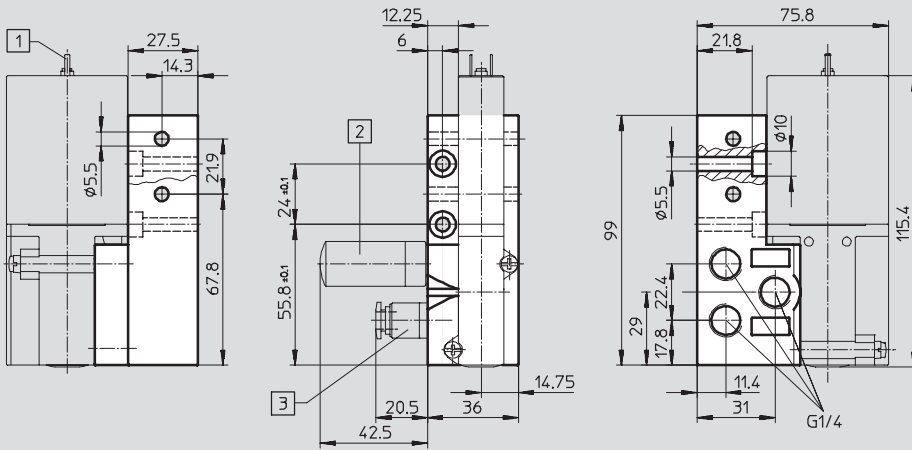


Application-optimised directional control valves
Fast-switching valves

Dimensions

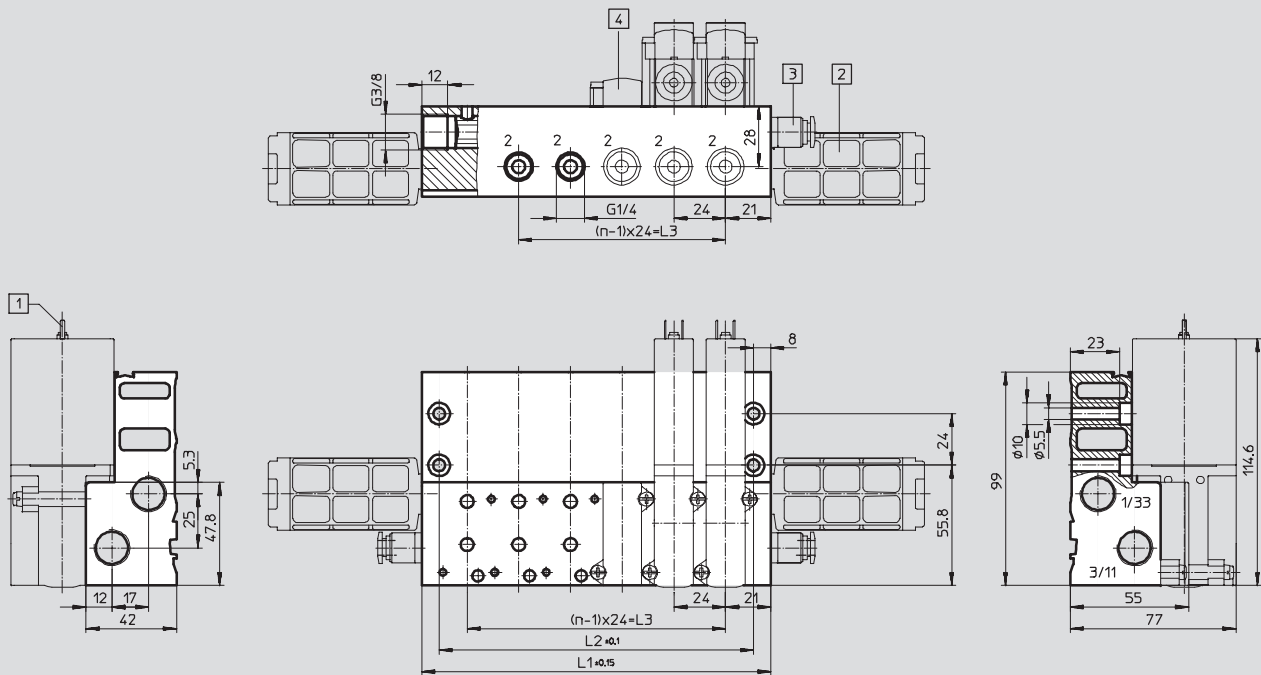
Download CAD data → www.festo.com/en/engineering

Individual sub-base



- 1 Plug vanes for plug socket with cable KMEB
- 2 Silencer UC-¼
- 3 Push-in fitting

Manifold mounting



- 1 Plug vanes for plug socket with cable KMEB or moulded-in cable
- 2 Silencer UC-3/8
- 3 Push-in fitting
- 4 Blanking plate MHAP4-BP-3

Valve positions n	L1	L2	L3
2	66	50	24
4	114	98	72
6	162	146	120

Valve positions n	L1	L2	L3
8	210	194	168
10	258	242	216

Solenoid valves MHA4, fast-switching valves

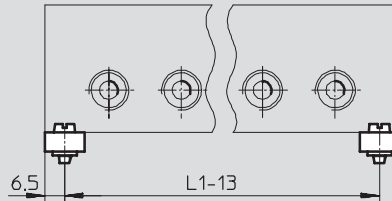
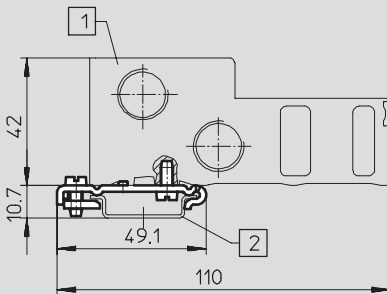
Technical data – Sub-base valve



Dimensions

Download CAD data → www.festo.com/en/engineering

H-rail mounting CPV10/14-VI-BG-NRH-35



- 1 Manifold block
- 2 Mounting rail NRH-35

Type	Valve positions n	L1
MHA4/MHP4-PR2-3	2	66
MHA4/MHP4-PR4-3	4	114
MHA4/MHP4-PR6-3	6	162

Type	Valve positions n	L1
MHA4/MHP3-PR8-3	8	210
MHA4/MHP4-PR10-3	10	258

Ordering data – Valves

Electrical connection	Operating voltage	Normally closed		Normally open	
		Part No.	Type	Part No.	Type
Response time 3.5/3.5 ms					
Plug vanes	24 V DC	525 175	MHA4-MS1H-3/2G-4	525 195	MHA4-MS1H-3/2O-4
Cable	24 V DC	525 177	MHA4-MS1H-3/2G-4-K	525 197	MHA4-MS1H-3/2O-4-K
Response time 9/5 ms					
Plug vanes	24 V DC	525 174	MHA4-M1H-3/2G-4	525 194	MHA4-M1H-3/2O-4
Cable	24 V DC	525 176	MHA4-M1H-3/2G-4-K	525 196	MHA4-M1H-3/2O-4-K

- Note

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

Ordering data – Product-specific accessories

Designation	Part No.	Type
Individual sub-base		
For sub-base valve	525 227	MHA4-AS-3-¼
Manifold block		
For sub-base valve	2 valves	525 234 MHA4-PR2-¼
	4 valves	525 235 MHA4-PR4-¼
	6 valves	525 236 MHA4-PR6-¼
	8 valves	525 237 MHA4-PR8-¼
	10 valves	525 238 MHA4-PR10-¼

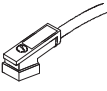
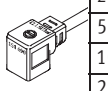


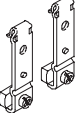
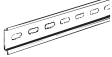





Solenoid valves MH4, fast-switching valves

Accessories



Application-optimised directional control valves
Fast-switching valves

3.2

Ordering data			Part No.	Type	Ordering data			Part No.	Type
Plug socket with cable (IP65) with PUR cable					Plug socket with cable (IP65) with PVC cable				
	2.5 m	174 844	KMEB-2-24-2,5-LED		2.5 m	151 688	KMEB-1-24-2,5-LED		
	5 m	174 845	KMEB-2-24-5-LED		5 m	151 689	KMEB-1-24-5-LED		
	2.5 m	174 846	KMEB-2-230-2,5		10 m	193 457	KMEB-1-24-10-LED		
	5 m	174 847	KMEB-2-230-5		2.5 m	151 690	KMEB-1-230AC-2,5		
				5 m	151 691	KMEB-1-230AC-5			
Plug socket with screw terminal					Plug sockets with insulation displacement connector				
		151 687	MSSD-EB			192 745	MSSD-EB-S-M14		
H-rail mounting					H-rail				
		162 556	CPV10/14-VI-BG-NRH-35		2 m	35 430	NRH-35-2000		
Blanking plug B					Blanking plate				
	G ¹ / ₄	3 568	B-1/4²⁾			525 239	MHAP4-BP-3		
	G ³ / ₈	3 570	B-3/8²⁾						
Silencer UC					Push-in fittings QS				
		→ Volume 3					→ Volume 3		
Inscription label									
		197 259	MH-BZ-80X¹⁾						

1) Scope of delivery 80 pieces

2) Scope of delivery 10 pieces