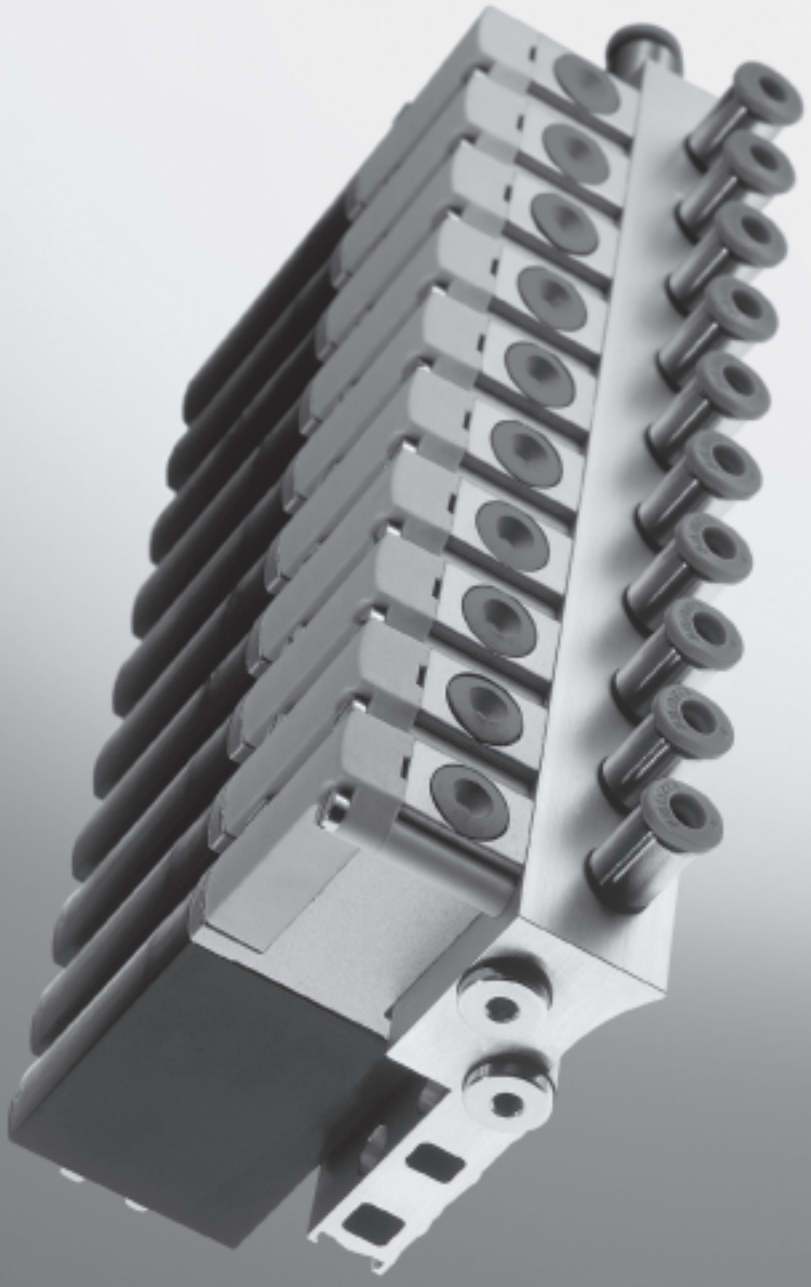
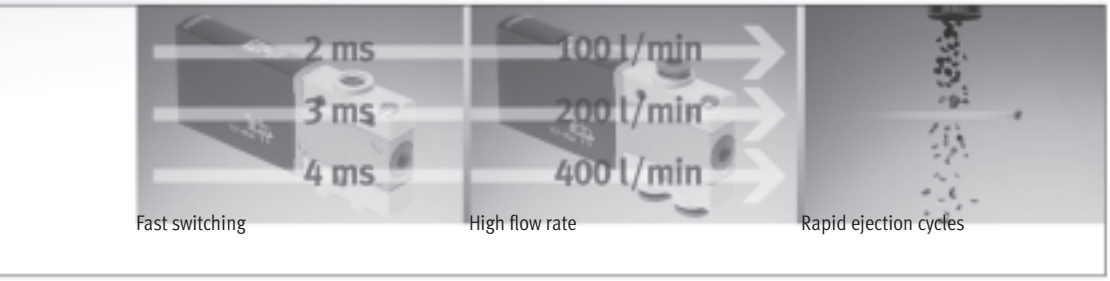
Solenoid valves MH2/MH3/MH4, fast-switching valves



- 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.



Fast switching | High flow rate | Rapid ejection cycles

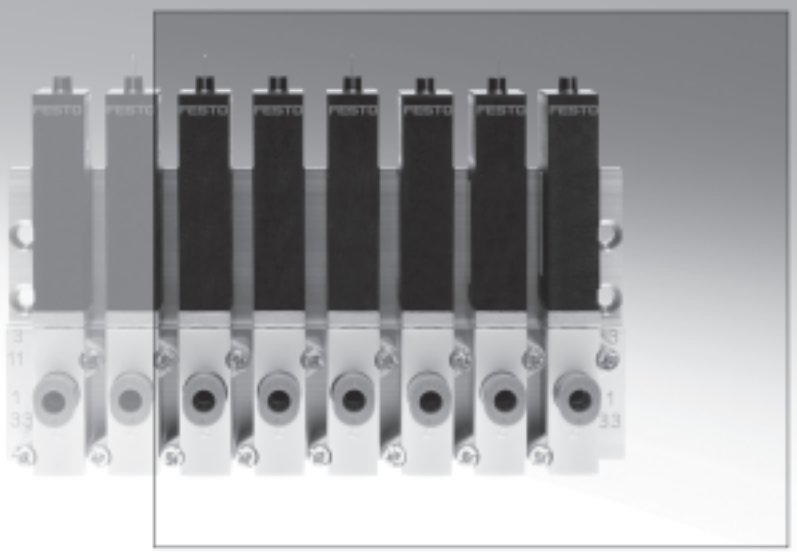
High speed in production
Fast-switching valves are a true technological gem when it comes to high-speed applications. With response times ≤ 2 ms and a repetition accuracy ≤ 0.2 ms, they represent the pinnacle of what is technologically achievable – even in 24-hour continuous operation with over 500 million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

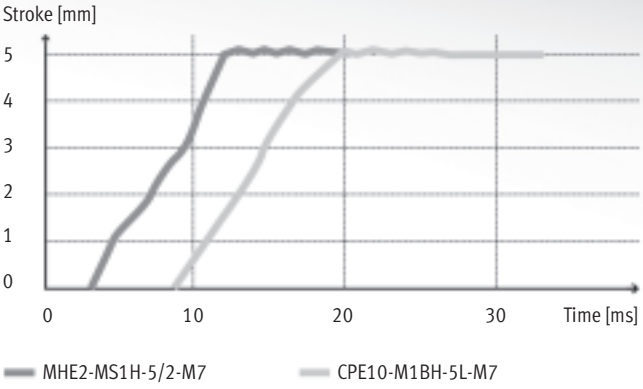
Optimised equipment and processes
- On-site assembly thanks to IP65 – insensitive to dust and humidity.
- Direct actuation with 24 V DC/1 A – use of PLC standard outputs.
- With an extremely long service life of 500 million cycles, three-layer continuous operation and being maintenance-free, you get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

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.

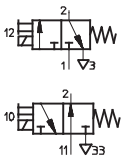
Small and fast – a good combination

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.

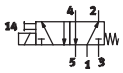
The result is a significant increase in system efficiency and economy – with a comparable space requirement and weight for both valves, low air consumption and a ten-fold increase in the service life of the fast-switching valve.

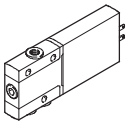
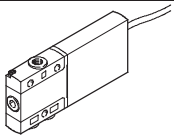
Solenoid valves MH2, fast-switching valves

Product range overview

Function	Circuit symbol	Design	Response time [ms]				Operating voltage [V DC]	Free of copper and PTFE	→ Page/Internet
			Off[2]	On[2]	Off	On			
3/2-way valve[1]	**Standard nominal flow rate 100 l/min**								
		Individual valve	2	1.7	3.5	7	24	■	10
		Semi in-line valve	2	1.7	3.5	7	24	■	20
		Sub-base valve	2	1.7	3.5	7	24	■	32

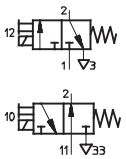
1) Can be used as a 2/2 way valve by sealing connection 3 or 33
2) With built-in fast-switching electronics

Function	Circuit symbol	Design	Response time [ms]		Operating voltage [V DC]	Free of copper and PTFE	→ Page/Internet
			Off	On			
5/2-way valve	**Standard nominal flow rate 100 l/min**						
		Individual valve	1.7	1.9	24	■	15
		Semi in-line valve	1.7	1.9	24	■	26
		Sub-base valve	1.7	1.9	24	■	38

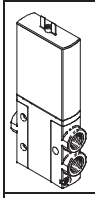
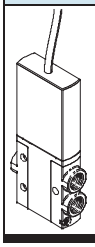
Mounting options							
Design		Individual valve		Semi in-line valve		Sub-base valve	
Valve function		3/2-way	5/2-way	3/2-way	5/2-way	3/2-way	5/2-way
Plug vanes							
	Direct mounting	■	■	–	–	–	–
	Individual sub-base	–	–	■	■	■	■
	Manifold mounting	–	–	■	■	■	■
Moulded-in cable							
	Direct mounting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

Solenoid valves MH3, fast-switching valves

Product range overview

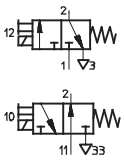
Function	Circuit symbol	Design	Response time [ms]				Operating voltage [V DC]	Free of copper and PTFE	➔ Page/Internet
			Off[2]	On[2]	Off	On			
3/2-way valve[1]	**Standard nominal flow rate 200 l/min**								
		Individual valve	2.8	2.3	4.5	8.3	24	■	46
		Semi in-line valve	2.8	2.3	4.5	8.3	24	■	51
		Sub-base valve	2.8	2.3	4.5	8.3	24	■	57

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

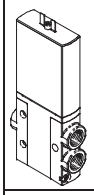
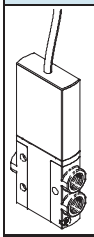
Mounting options				
Design		Individual valve	Semi in-line valve	Sub-base valve
Plug vanes				
	Direct mounting	■	–	–
	Individual sub-base	–	■	■
	Manifold mounting	–	■	■
Moulded-in cable				
	Direct mounting	■	–	–
	Individual sub-base	–	■	■
	Manifold mounting	–	■	■

Solenoid valves MH4, fast-switching valves

Product range overview

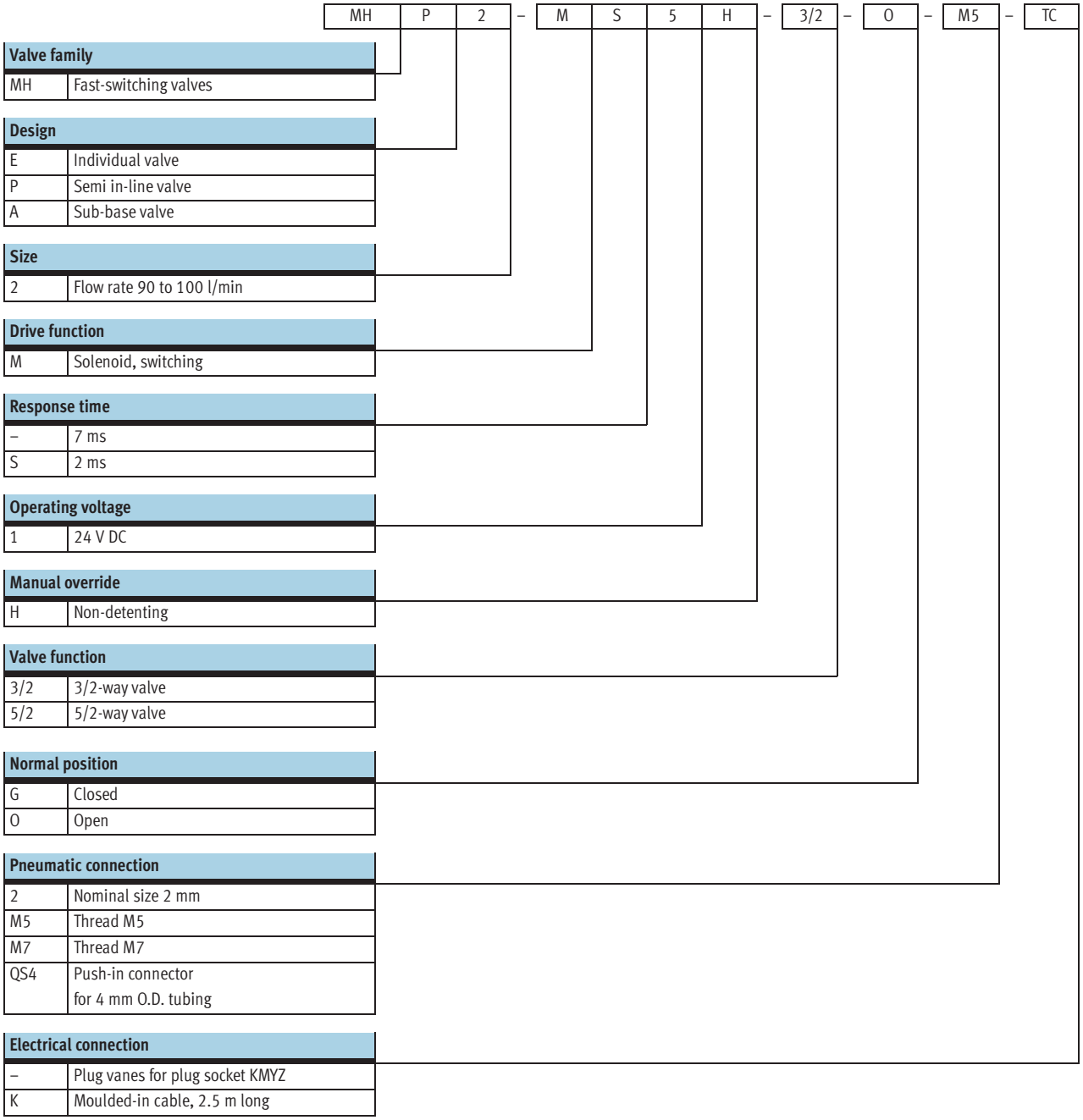
Function	Circuit symbol	Design	Response time [ms]				Operating voltage [V DC]	Free of copper and PTFE	➔ Page/Internet
			Off[2]	On[2]	Off	On			
3/2-way valve[1]	**Standard nominal flow rate 400 l/min**								
		Individual valve	3.5	3.5	5	10.5	24	■	66
		Semi in-line valve	3.5	3.5	5	10.5	24	■	70
		Sub-base valve	3.5	3.5	5	10.5	24	■	76

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

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



Valve family	
MH	Fast-switching valves

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

Size	
2	Flow rate 90 to 100 l/min

Drive function	
M	Solenoid, switching

Response time	
–	7 ms
S	2 ms

Operating voltage	
1	24 V DC

Manual override	
H	Non-detenting

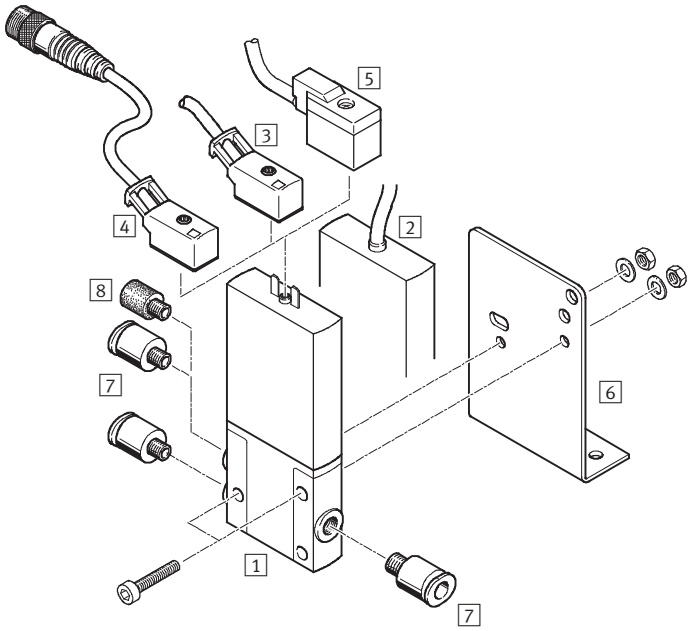
Valve function	
3/2	3/2-way valve
5/2	5/2-way valve

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

Connection with plug vanes – Connection with moulded-in cable

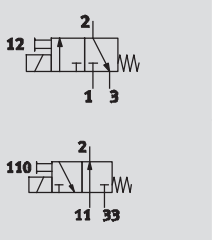


Valves and accessories		
	Brief description	**➔ Page/Internet**
1 Individual valve MHE2	With plug vanes	11
2 Individual valve MHE2-...-K	With moulded-in cable	11
3 Plug socket with cable KMYZ-3 (IP65)	With LED and PUR cable	44
4 Plug socket with cable KMYZ-3 (IP65)	With LED, PUR cable and M8 plug	44
5 Plug socket with cable KMYZ-4 (IP40)	With PVC cable	44
6 Mounting bracket MHE2-BG-L	–	13
7 Push-in fittings QS	For connecting compressed air tubing with standard O.D.	quick star
8 Silencer UC	For fitting in exhaust ports	uc

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[2]
Exhaust function		With flow control
Manual override		Non-detenting
Assembly position		Any
Grid dimension	[mm]	14 (minimum clerance 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
2) There may be slight leakage in the pressure range –0.5 to +0.5 bar

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
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.

Solenoid valves MHE2, fast-switching valves

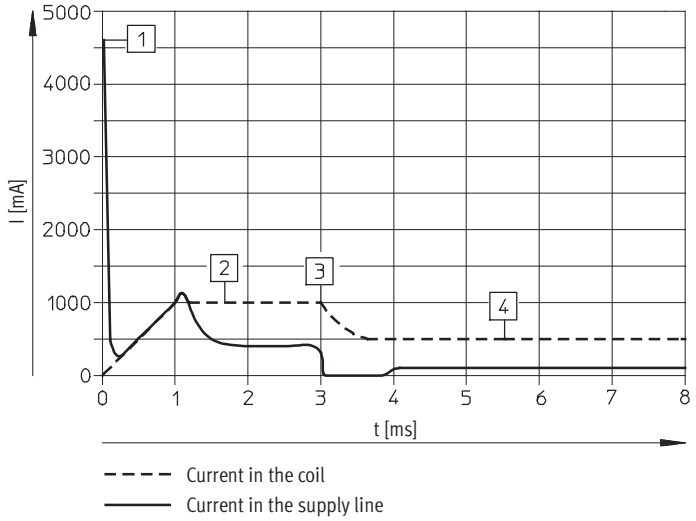
Technical data – Individual valve, 3/2-way valve

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

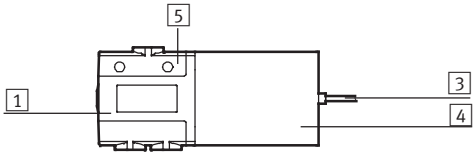
1) The ambient temperature must be limited as from 125 Hz.

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

Materials



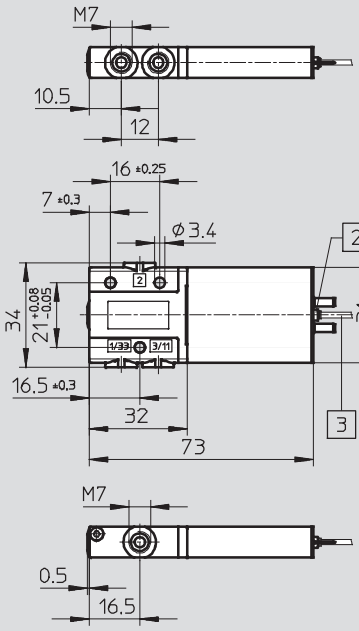
1	Body	Die-cast zinc, coated
3	Cable sheath	Polyurethane
4	Coil housing	Polyamide
5	Connection piece	Polyamide
–	Seals	Nitrile rubber/ hydrogenated nitrile rubber
	Note on materials	Free of copper and PTFE

Dimensions

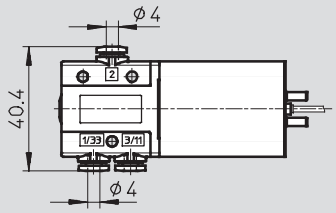
Download CAD data ➔ **www.festo.com**

Valve with plug vanes or moulded-in cable

MHE2-...-M7



MHE2-...-QS4

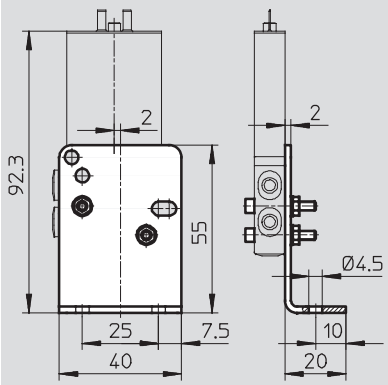


1 Manual override, non-detenting

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

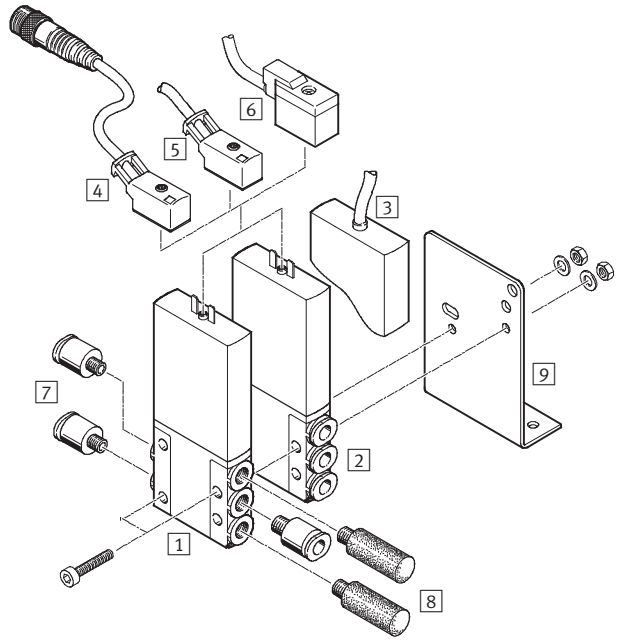
Technical data – Individual valve, 3/2-way valve

FESTO

Ordering data – Valves					
	Pneumatic connection	Normal position	Electrical connection	Part No.	Type
Response time 2 ms					
Operating voltage 24 V DC	Connecting thread M7	Normally open	Plug vanes	**196151**	**MHE2-MS1H-3/2O-M7**
			Cable	**196153**	**MHE2-MS1H-3/2O-M7-K**
		Normally closed	Plug vanes	**196131**	**MHE2-MS1H-3/2G-M7**
			Cable	**196133**	**MHE2-MS1H-3/2G-M7-K**
	Push-in connector QS 4	Normally open	Plug vanes	**196155**	**MHE2-MS1H-3/2O-QS4**
			Cable	**196157**	**MHE2-MS1H-3/2O-QS4-K**
		Normally closed	Plug vanes	**196135**	**MHE2-MS1H-3/2G-QS4**
			Cable	**196137**	**MHE2-MS1H-3/2G-QS4-K**
Response time 7 ms					
Operating voltage 24 V DC	Connecting thread M7	Normally open	Plug vanes	**196150**	**MHE2-M1H-3/2O-M7**
			Cable	**196152**	**MHE2-M1H-3/2O-M7-K**
		Normally closed	Plug vanes	**196130**	**MHE2-M1H-3/2G-M7**
			Cable	**196132**	**MHE2-M1H-3/2G-M7-K**
	Push-in connector QS 4	Normally open	Plug vanes	**196154**	**MHE2-M1H-3/2O-QS4**
			Cable	**196156**	**MHE2-M1H-3/2O-QS4-K**
		Normally closed	Plug vanes	**196134**	**MHE2-M1H-3/2G-QS4**
			Cable	**196136**	**MHE2-M1H-3/2G-QS4-K**

Ordering data – Product-specific accessories		
Designation	Part No.	Type
Mounting bracket	**196165**	**MHE2-BG-L**

Connection with plug vanes – Connection with moulded-in cable

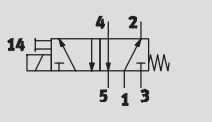


Valves and accessories		
	Brief description	**➔ Page/Internet**
1 Individual valve MHE2-...QS-4	With plug vanes and connection QS-4	16
2 Individual valve MHE2-...-M7	With plug vanes and connection M7	16
3 Individual valve MHE2-...-K	With moulded-in cable	16
4 Plug socket with cable KMYZ-3 (IP65)	With LED, PUR cable and M8 plug	44
5 Plug socket with cable KMYZ-3 (IP65)	With LED and PUR cable	44
6 Plug socket with cable KMYZ-4 (IP40)	With PVC cable	44
7 Push-in fittings QS	For connecting compressed air tubing with standard external diameters	quick star
8 Silencer UC	For fitting in exhaust ports	uc
9 Mounting bracket MHE2-BG-L	–	18

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 with restrictions[2)]
Exhaust function		With flow control
Manual override		Non-detenting
Assembly position		Any
Grid dimension	[mm]	14 (minimum clerance 4 mm)
Nominal diameter	[mm]	2
Standard nominal flow rate	[l/min]	90
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.

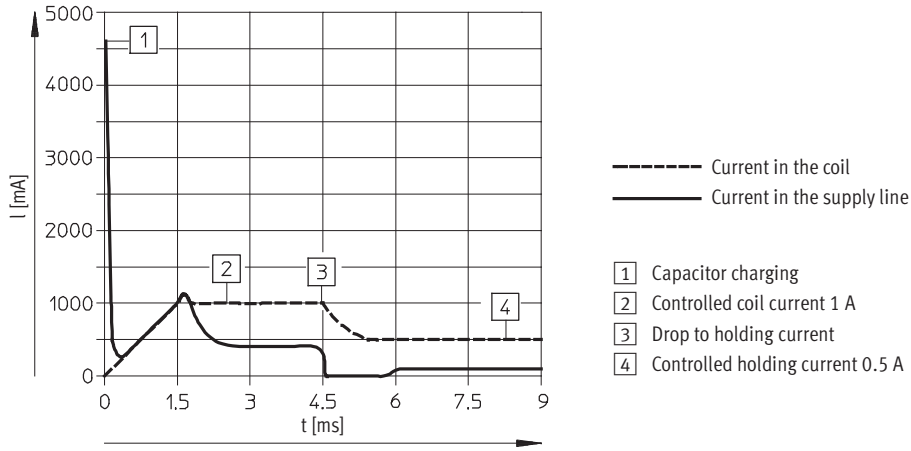
2) With reversible operation leakage may occur.

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.

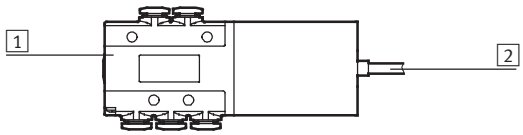
Current path



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

Materials



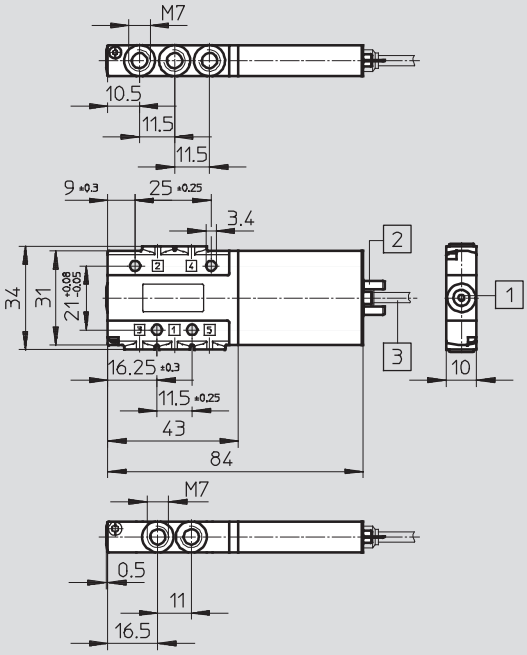
1	Body	Die-cast zinc, coated
2	Cable sheath	Polyurethane
–	Seals	Nitrile rubber/ hydrogenated nitrile rubber
–	Screws	Galvanised steel
	Note on materials	Free of copper and PTFE

Dimensions

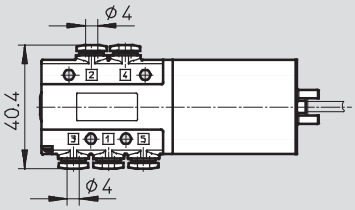
Download CAD data ➔ **www.festo.com**

Valve with plug vanes or moulded-in cable

MHE2-...-M7



MHE2-...-QS4

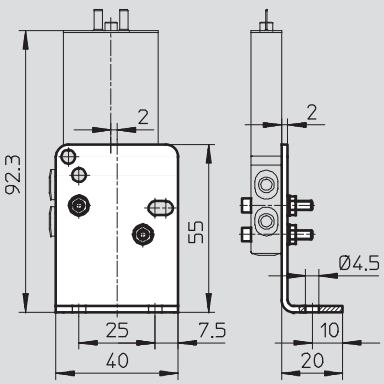


1 Manual override, non-detenting

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

3 Cable 2.5 m

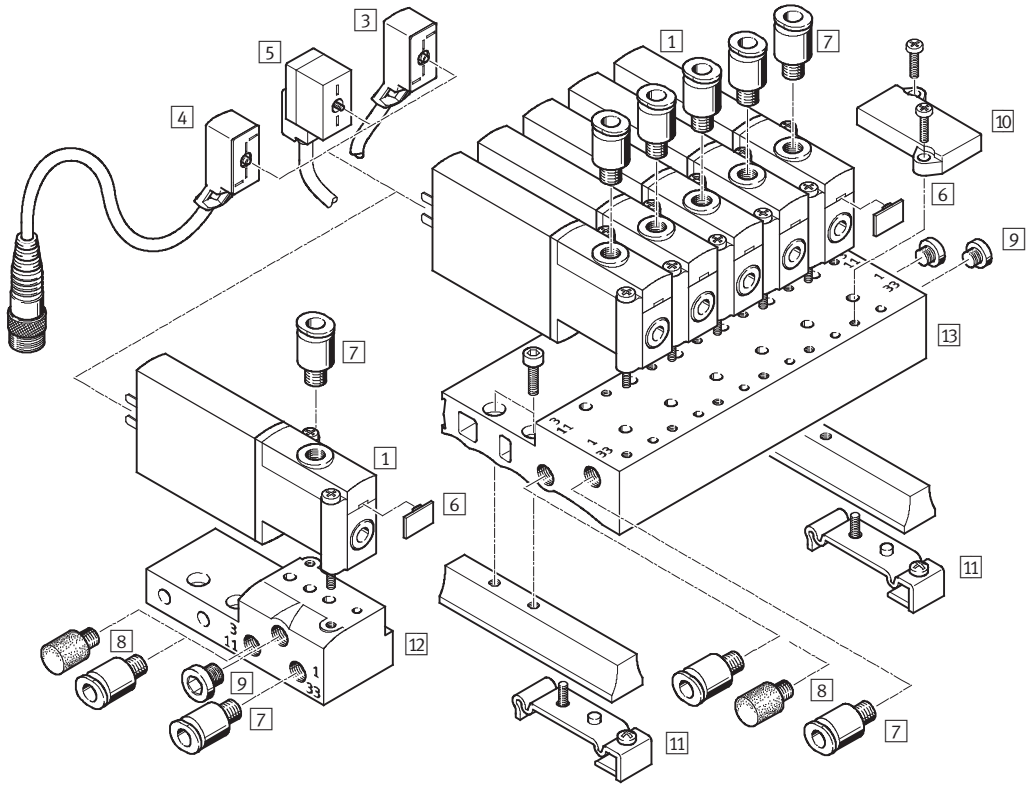
Mounting bracket MHE2-BG-L



Ordering data – Valves				
	Pneumatic connection	Electrical connection	Part No.	Type
Operating voltage 24 V DC	Connecting thread M7	Plug vanes	**525113**	**MHE2-MS1H-5/2-M7**
		Cable	**525115**	**MHE2-MS1H-5/2-M7-K**
	Push-in connector QS 4	Plug vanes	**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	**196165**	**MHE2-BG-L**

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

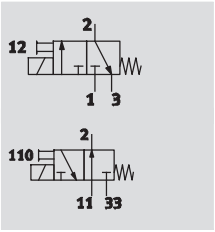


Valves and accessories			
		Brief description	**➔ Page/Internet**
1	Semi in-line valve MHP2	With plug vanes	21
2	Semi in-line valve MHP2-...-K	With moulded-in cable	21
3	Plug socket with cable KMYZ-3 (IP65)	With LED and PUR cable	44
4	Plug socket with cable KMYZ-3 (IP65)	With LED, PUR cable and M8 plug	44
5	Plug socket with cable KMYZ-4 (IP40)	With PVC cable	44
6	Inscription label MH-BZ-80X	For identifying the valves	44
7	Push-in fittings QS	For connecting compressed air tubing with standard O.D.	quick star
8	Silencer UC	For fitting in exhaust ports	uc
9	Blanking plug B	For sealing unused ports	44
10	Blanking plate MHAP2-BP-3	For sealing vacant positions	44
11	Hat-rail mounting MHAP2-BG-NRH-35	–	44
12	Individual sub-base MHA2-AS-3-M5	For semi in-line valve; the individual sub-base is also used for the sub-base valve, the output port must in this case be sealed with a blanking plug	24
13	Manifold block MHP2-PR...-3	For semi in-line valve	24

Solenoid valves MHP2, fast-switching valves

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

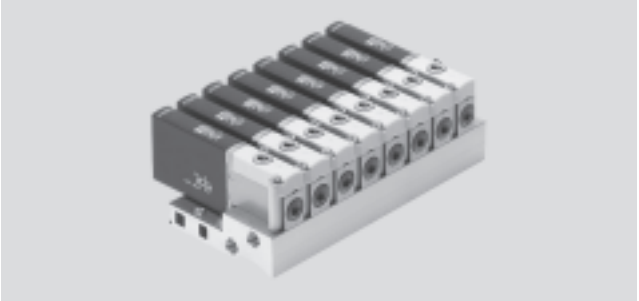
Function



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[2]
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
2) There may be slight leakage in the pressure range –0.5 to +0.5 bar

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
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.

Solenoid valves MHP2, fast-switching valves

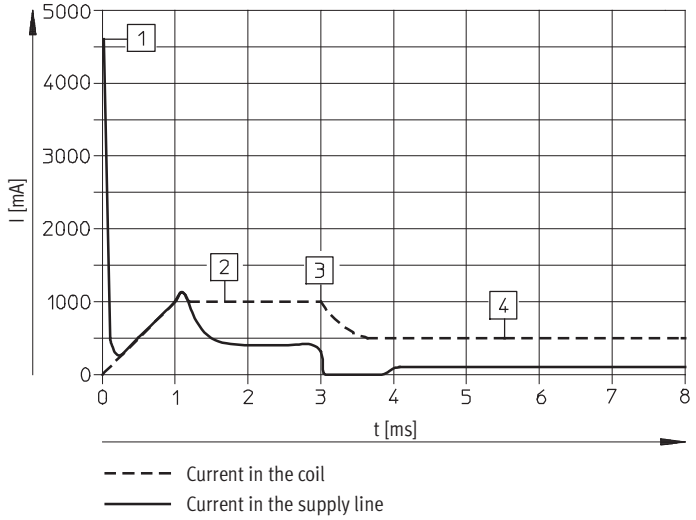
Technical data – Semi in-line valve, 3/2-way valve

Electrical data		
Operating voltage	[V DC]	24 ±10%
Type of connection		Plug vanes
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

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

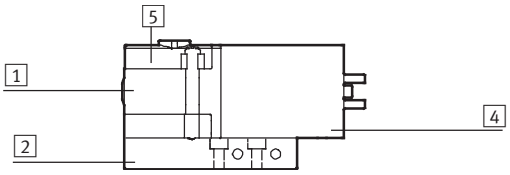
1) The ambient temperature must be limited from 100 Hz.

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

Materials

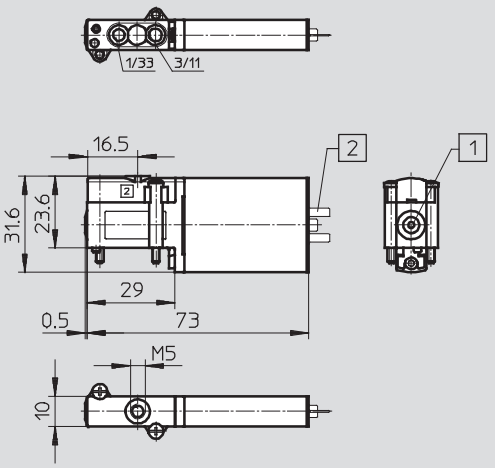


1	Body	Die-cast zinc
2	Sub-base	Manifold block: Aluminium Individual sub-base: Die-cast zinc
3	Cable sheath	Polyurethane
4	Coil housing	Polyamide
5	Connection piece	Polyamide
–	Seals	Nitrile rubber/ hydrogenated nitrile rubber
	Note on materials	Free of copper and PTFE

Dimensions

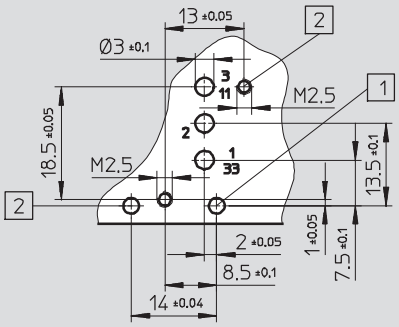
Download CAD data ➔ **www.festo.com**

Valve with plug vanes



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

Port pattern on sub-bases

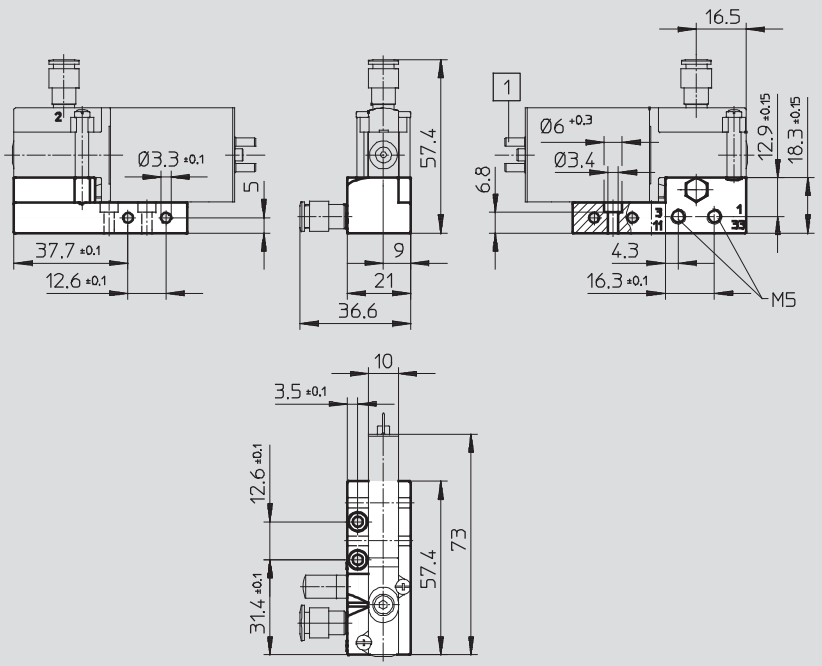


1 Hole for coding pin, $1.7^{+0.2}$ mm deep
2 Mounting thread, 4.6^{+1} mm deep

Dimensions

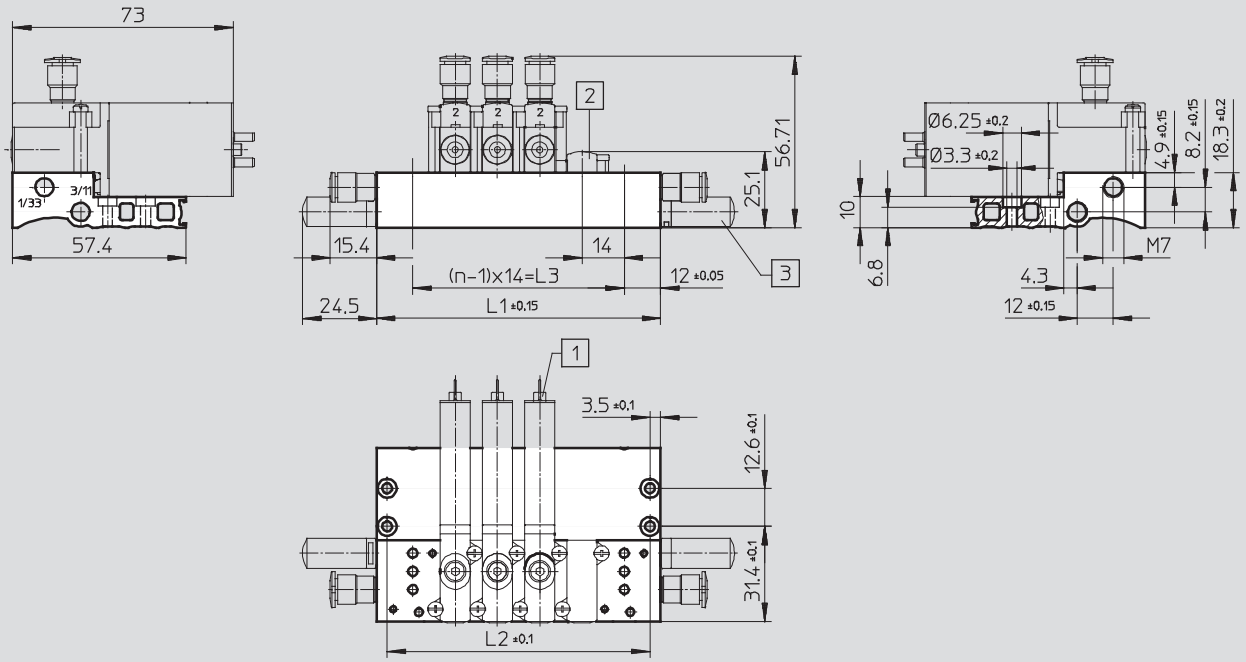
Download CAD data ➔ **www.festo.com**

Individual sub-base



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

Manifold mounting



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

2 Blanking plate MHAP2-BP-3

3 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

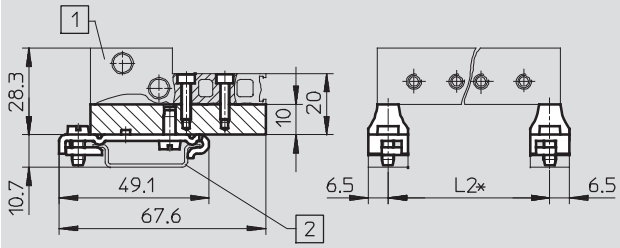
Valve positions n	L1	L2	L3
8	122	115	98
9	136	129	112
10	150	143	126

Solenoid valves MHP2, fast-switching valves

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

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

H-rail mounting MHAP-BG-NRH-35



1 Manifold block
2 Mounting rail NRH-35-2000

* See dimensions table for manifold block used

Valve positions n	2	3	4	5	6	7	8	9	10
L1	38	52	66	80	94	108	122	136	150
L2	31	45	59	73	87	101	115	129	143
L3	14	28	42	56	70	84	98	112	126

Ordering data – Valves

	Pneumatic connection	Normal position	Electrical connection	Part No.	Type
Response time 2 ms					
Operating voltage 24 V DC	Connecting thread M5	Normally open	Plug vanes	**196143**	**MHP2-MS1H-3/2O-M5**
		Normally closed	Plug vanes	**196123**	**MHP2-MS1H-3/2G-M5**
Response time 7 ms					
Operating voltage 24 V DC	Connecting thread M5	Normally open	Plug vanes	**196142**	**MHP2-M1H-3/2O-M5**
		Normally closed	Plug vanes	**196122**	**MHP2-M1H-3/2G-M5**

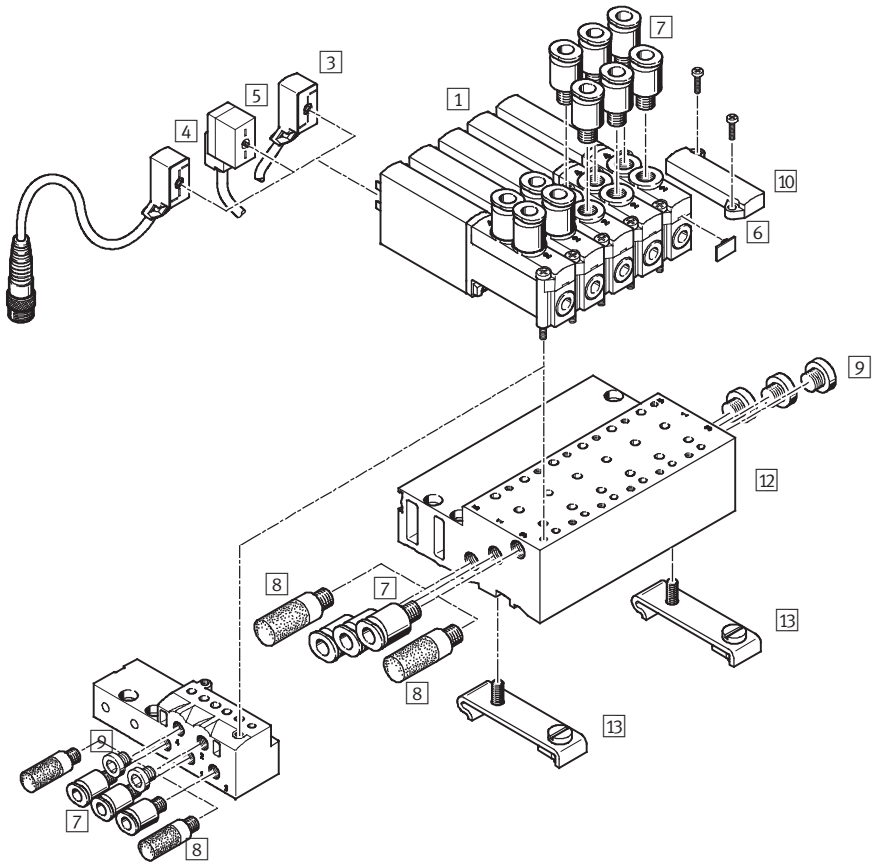
Note

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	1 valve	**197438**	**MHA2-AS-3-M5**
Manifold block for	2 valves	**197442**	**MHP2-PR2-3**
	4 valves	**197443**	**MHP2-PR4-3**
	6 valves	**197444**	**MHP2-PR6-3**
	8 valves	**197445**	**MHP2-PR8-3**
	10 valves	**197446**	**MHP2-PR10-3**

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

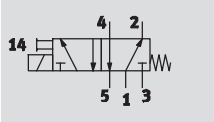


Valves and accessories			
		Brief description	**➔ Page/Internet**
1	Semi in-line valve MHP2	With plug vanes	27
3	Plug socket with cable KMYZ-3 (IP65)	With LED and PUR cable	44
4	Plug socket with cable KMYZ-3 (IP65)	With LED, PUR cable and M8 plug	44
5	Plug socket with cable KMYZ-4 (IP40)	With PVC cable	44
6	Inscription label MH-BZ-80X	For identifying the valves	44
7	Push-in fittings QS	For connecting compressed air tubing with standard external diameters	quick star
8	Silencer UC	For fitting in exhaust ports	uc
9	Blanking plug B	For sealing unused ports	44
10	Blanking plate MHAP2-BP-5	For sealing vacant positions	44
11	Individual sub-base MHA2-AS-3-M5	For semi in-line valve; the individual sub-base is also used for the sub-base valve, the output port must in this case be sealed with a blanking plug	31
12	Manifold block MHP2-PR...-5	For semi in-line valve	31
13	H-rail mounting CPV10/14-VI-BG-NRH-35	–	44

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 with restrictions[2)]
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]	90
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.

2) With reversible operation leakage may occur.

Solenoid valves MHP2, fast-switching valves

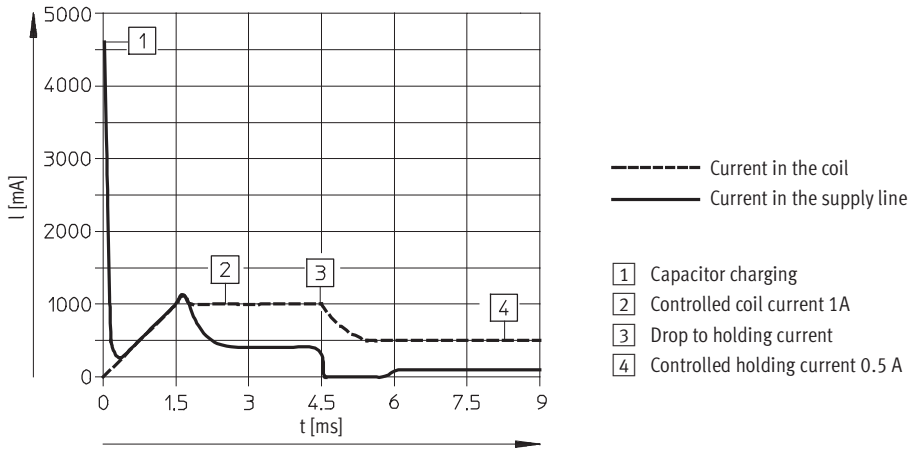
Technical data – Semi in-line valve, 5/2-way valve

Electrical data		
Operating voltage	[V DC]	24 ±10%
Type of connection		Plug vanes
Power consumption		
Low-current phase	[W]	1.625
High-current phase	[W]	6.5
Protection class to EN 60529		
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

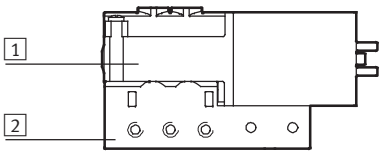
Response times and switching frequencies		
Response time on	[ms]	1.9 +10% ... –30%
Response time off	[ms]	1.7 +10% ... –30%
Maximum switching frequency	[Hz]	300[1)]
CE symbol		In accordance with EU EMC Directive

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

Current path



Materials

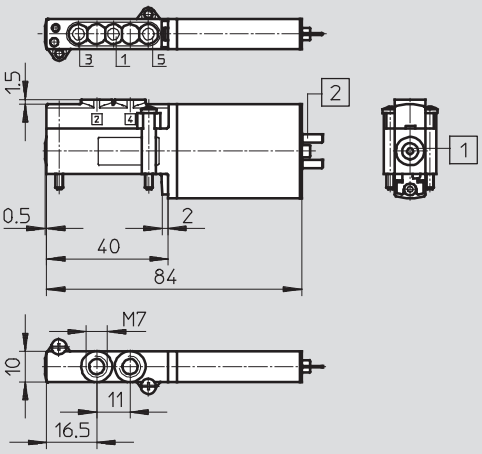


1	Body	Die-cast zinc, coated
2	Sub-base	Die-cast zinc
–	Seals	Nitrile rubber/ hydrogenated nitrile rubber
–	Screws	Galvanised steel
	Note on materials	Free of copper and PTFE

Dimensions

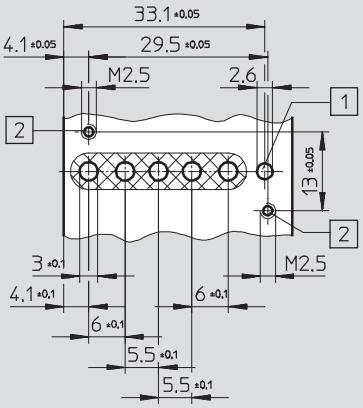
Download CAD data ➔ **www.festo.com**

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

Port pattern on sub-bases



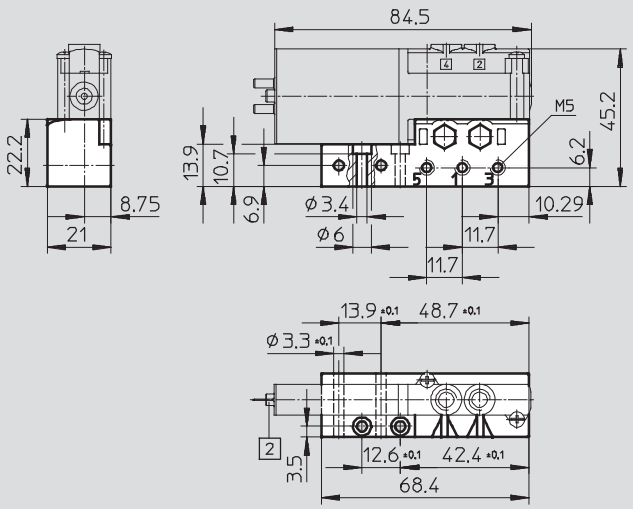
1 Hole for coding pin, 1.7 mm deep
2 Mounting thread, 4.6 mm deep

- - Note

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

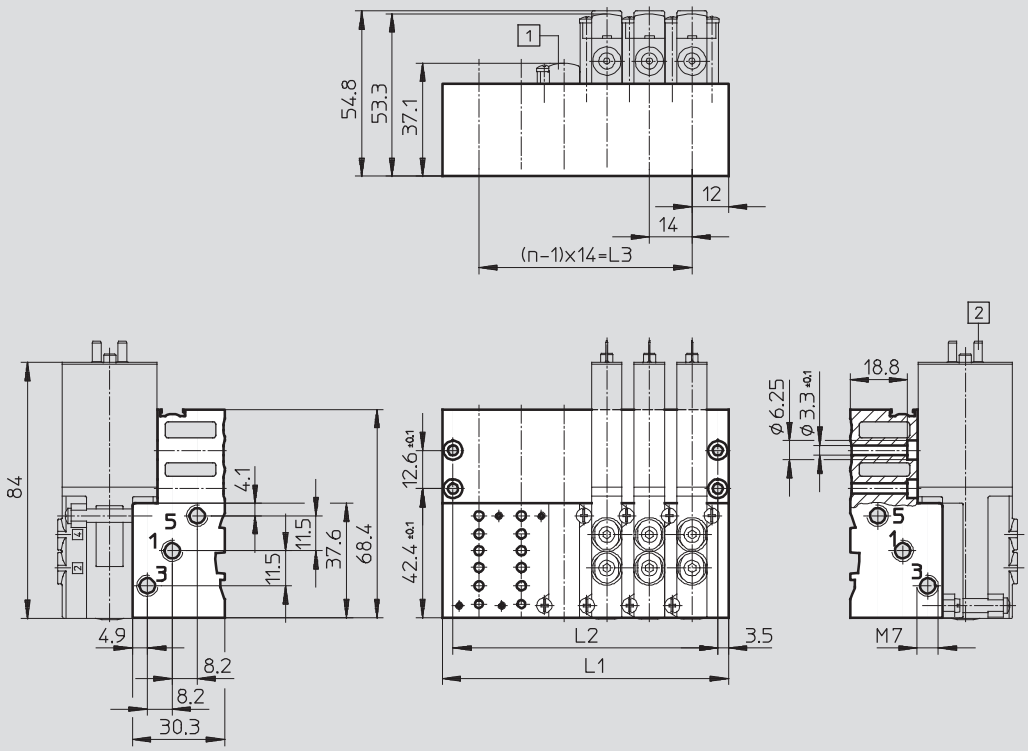
Dimensions Download CAD data ➔ **www.festo.com**

Individual sub-base



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

Manifold mounting



1 Blanking plate MHAP2-BP-5

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

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

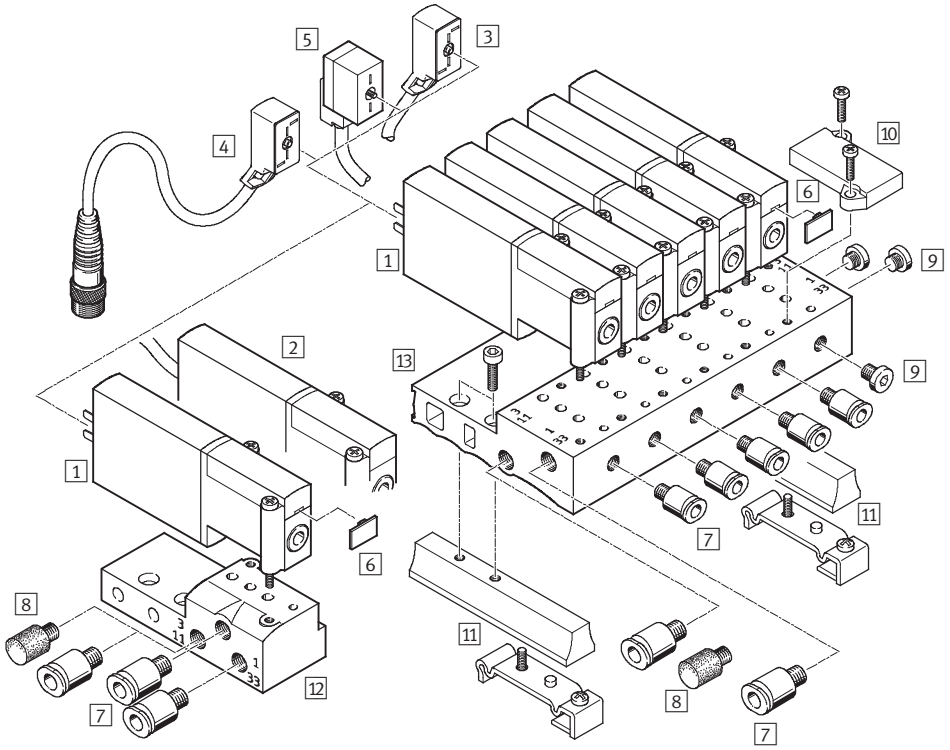
Technical data – Semi in-line valve, 5/2-way valve

FESTO

Ordering data – Valves				
	Pneumatic connection	Electrical connection	Part No.	Type
Operating voltage 24 V DC	Connecting thread M5	Plug vanes	**525105**	**MHP2-MS1H-5/2-M5**

Ordering data – Product-specific accessories			
Designation		Part No.	Type
Individual sub-base	1 valve	**525120**	**MHA2-AS-5-M5**
Manifold block for	2 valves	**525122**	**MHP2-PR2-5**
	4 valves	**525123**	**MHP2-PR4-5**
	6 valves	**525124**	**MHP2-PR6-5**
	8 valves	**525125**	**MHP2-PR8-5**
	10 valves	**525126**	**MHP2-PR10-5**

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

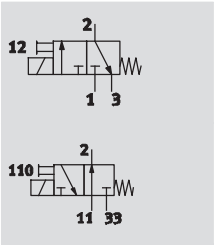


Valves and accessories			
		Brief description	➔ Page/Internet
1	Sub-base valve MHA2	With plug vanes	33
2	Sub-base valve MHA2-...-K	With moulded-in cable	33
3	Plug socket KMYZ-3 (IP 65)	With LED and PUR cable	44
4	Plug socket KMYZ-3 (IP 65)	With LED, PUR cable and M8 plug	44
5	Plug socket KMYZ-4 (IP 40)	With PVC cable	44
6	Inscription label MH-BZ-80X	For identifying the valves	44
7	Push-in fittings QS	For connecting compressed air tubing with standard O.D.P	quick star
8	Silencer UC	For fitting in exhaust ports	uc
9	Blanking plug B	For sealing unused ports	44
10	Blanking plate MHAP2-BP-3	For sealing vacant positions	44
11	H-rail mounting MHAP2-BG-NRH-35	–	44
12	Individual sub-base MHA2-AS-3-M5	For sub-base valve	36
13	Manifold block MHA2-PR...-3-M5	For sub-base valve	36

Solenoid valves MHA2, fast-switching valves

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

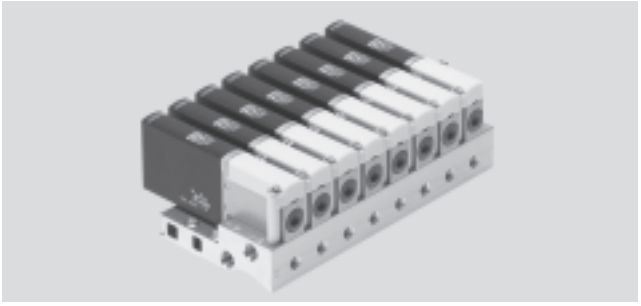
Function



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[2]
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
2) There may be slight leakage in the pressure range –0.5 to +0.5 bar

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
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)

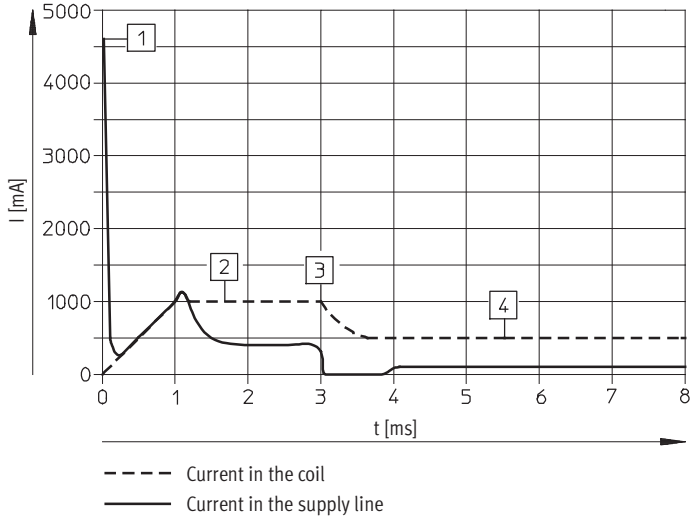
1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

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 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

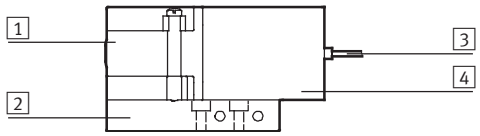
1) The ambient temperature must be limited as from 100 Hz.

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

Materials

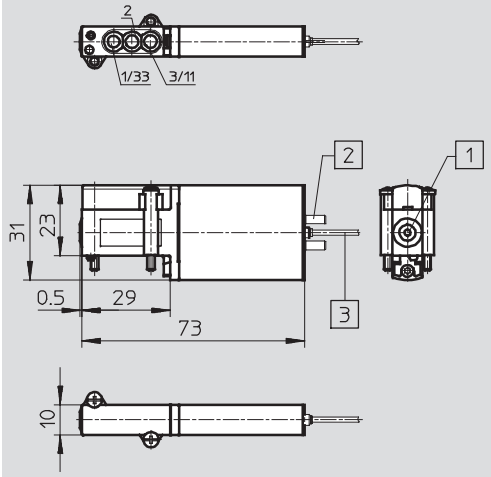


1	Body	Die-cast zinc, coated
2	Sub-base	Manifold block: Aluminium Individual sub-base: Die-cast zinc
3	Cable sheath	Polyurethane
4	Coil housing	Polyamide
–	Seals	Nitrile rubber/ hydrogenated nitrile rubber
	Note on materials	Free of copper and PTFE

Dimensions

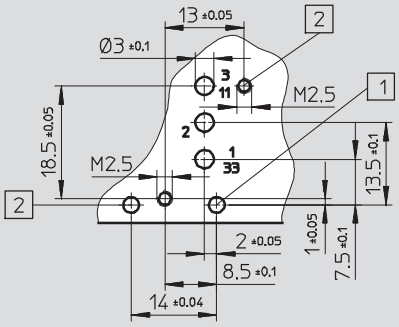
Download CAD data ➔ **www.festo.com**

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

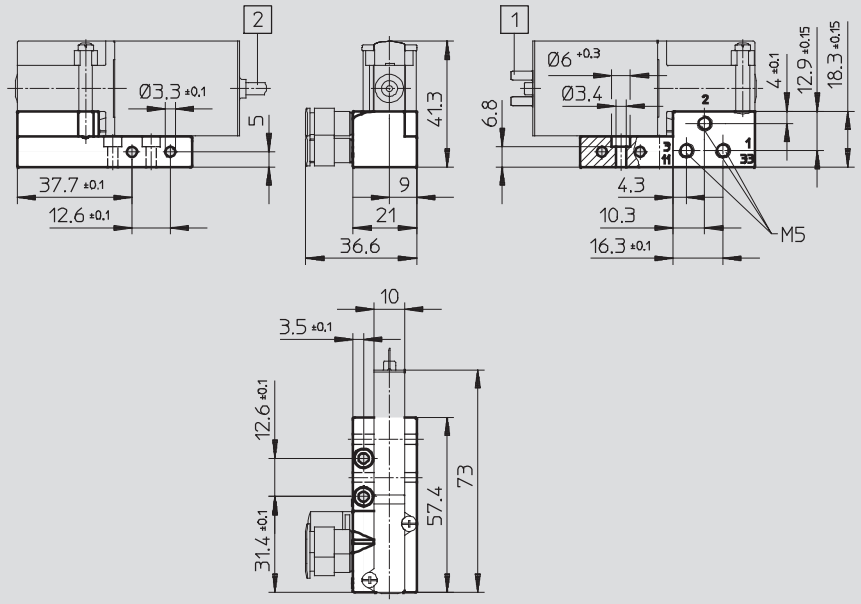


1 Hole for coding pin, $1.7^{+0.2}$ mm deep
2 Mounting thread, 4.6^{+1} mm deep

Dimensions

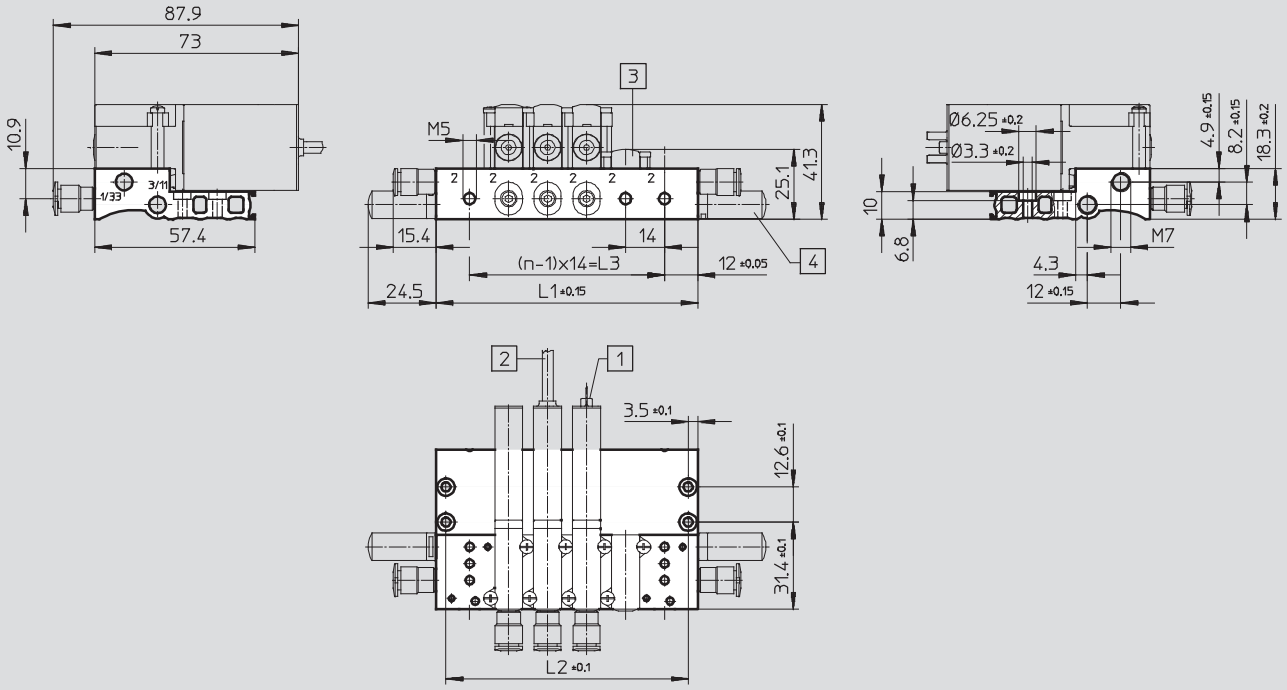
Download CAD data ➔ **www.festo.com**

Individual sub-base



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

Manifold mounting



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

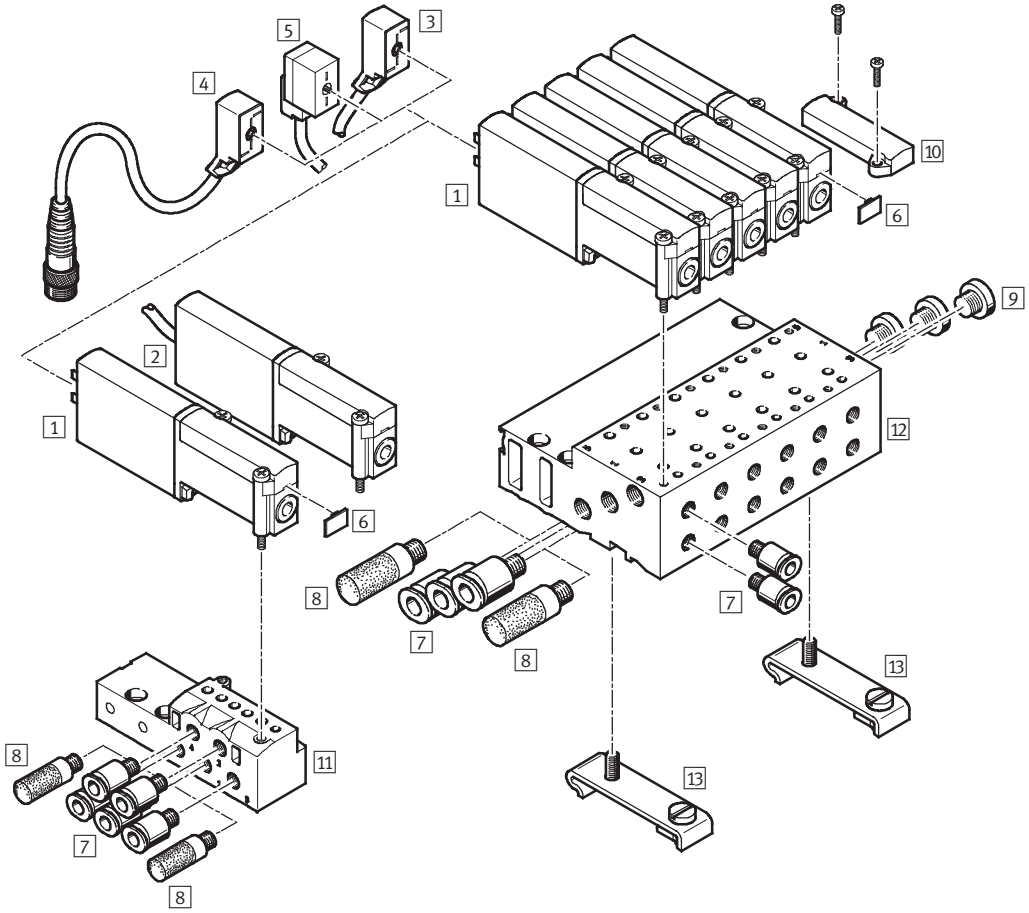
Ordering data – Valves				
	Normal position	Electrical connection	Part No.	Type
Response time 2 ms				
Operating voltage 24 V DC	Normally open	Plug vanes	**196139**	**MHA2-MS1H-3/2O-2**
		Cable	**196141**	**MHA2-MS1H-3/2O-2-K**
	Normally closed	Plug vanes	**196119**	**MHA2-MS1H-3/2G-2**
		Cable	**196121**	**MHA2-MS1H-3/2G-2-K**
Response time 7 ms				
Operating voltage 24 V DC	Normally open	Plug vanes	**196138**	**MHA2-M1H-3/2O-2**
		Cable	**196140**	**MHA2-M1H-3/2O-2-K**
	Normally closed	Plug vanes	**196118**	**MHA2-M1H-3/2G-2**
		Cable	**196120**	**MHA2-M1H-3/2G-2-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	1 valve	**197438**	**MHA2-AS-3-M5**
Manifold for	2 valves	**197447**	**MHA2-PR2-3-M5**
	4 valves	**197448**	**MHA2-PR4-3-M5**
	6 valves	**197449**	**MHA2-PR6-3-M5**
	8 valves	**197450**	**MHA2-PR8-3-M5**
	10 valves	**197451**	**MHA2-PR10-3-M5**

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

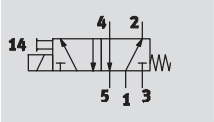


Valves and accessories			
		Brief description	**➔ Page/Internet**
1	Sub-base valve MHA2	With plug vanes	39
2	Sub-base valve MHA2-...-K	With moulded-in cable	39
3	Plug socket KMYZ-3 (IP 65)	With LED and PUR cable	44
4	Plug socket KMYZ-3 (IP 65)	With LED, PUR cable and M8 plug	44
5	Plug socket KMYZ-4 (IP 40)	With PVC cable	44
6	Inscription label MH-BZ-80X	For identifying the valves	44
7	Push-in fittings QS	For connecting compressed air tubing with standard external diameters	quick star
8	Silencer UC	For fitting in exhaust ports	uc
9	Blanking plug B	For sealing unused ports	44
10	Blanking plate MHAP2-BP-5	For sealing vacant positions	44
11	Individual sub-base MHA2-AS-5-M5	For sub-base valve	43
12	Manifold block MHA2-PR...-5-M5	For sub-base valve	43
13	H-rail mounting CPV10/14-VI-BG-NRH-35	–	44

Solenoid valves MHA2, fast-switching valves

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

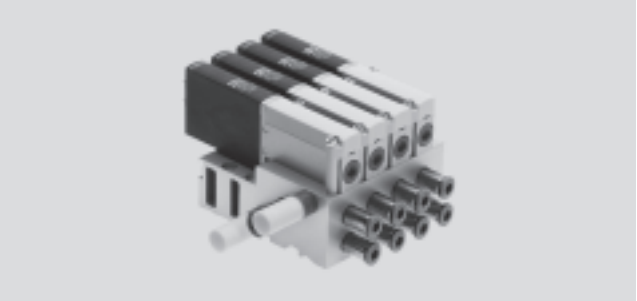
Function



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 with restrictions[2]
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]	90
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)

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.

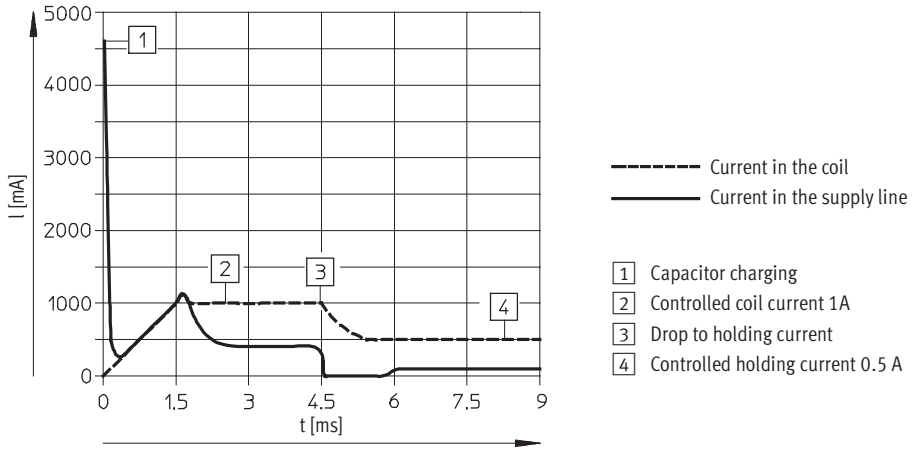
2) There may be slight leakage in the pressure range –0.5 to +0.5 bar.

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

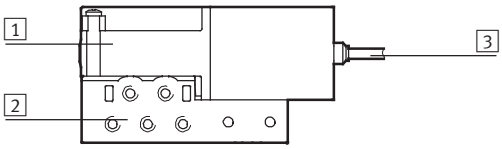
Response times and switching frequencies		
Response time on	[ms]	1.9 +10% ... −30%
Response time off	[ms]	1.7 +10% ... −30%
Maximum switching frequency	[Hz]	300[1)]
CE symbol		In accordance with EU EMC Directive

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

Current path



Materials

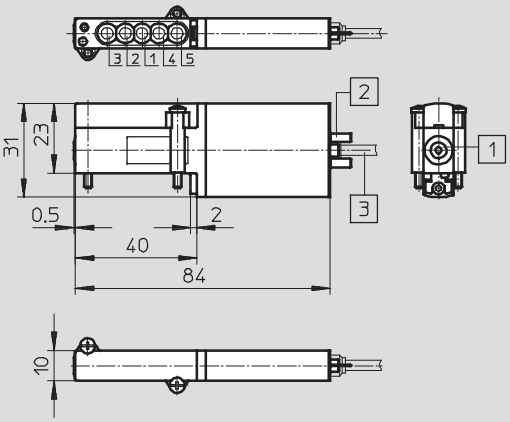


1	Body	Die-cast zinc
2	Sub-base	Die-cast zinc
3	Cable sheath	Polyurethane
–	Seals	Nitrile rubber/ hydrogenated nitrile rubber
	Note on materials	Free of copper and PTFE

Dimensions

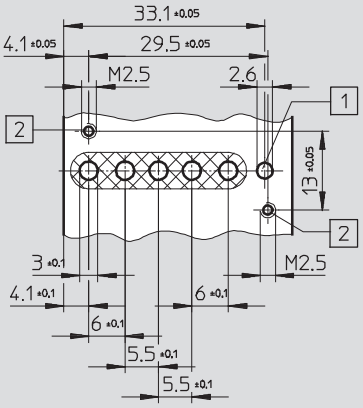
Download CAD data ➔ **www.festo.com**

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



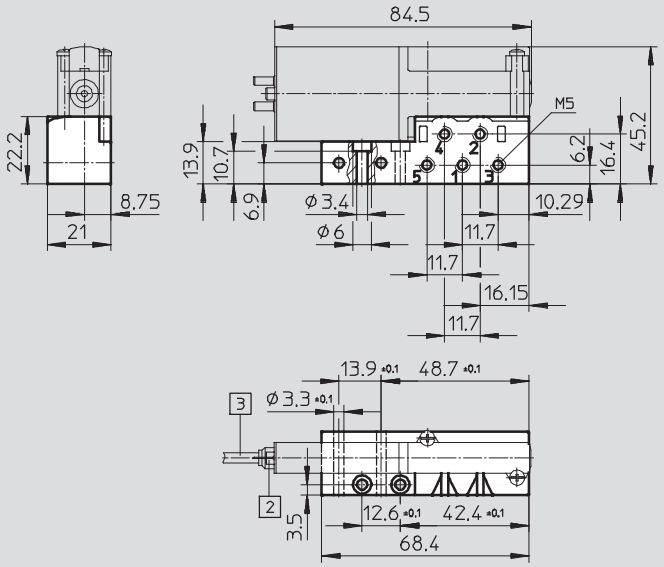
1 Hole for coding pin, 1.7 mm deep
2 Mounting thread, 4.6 mm deep

Note

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

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

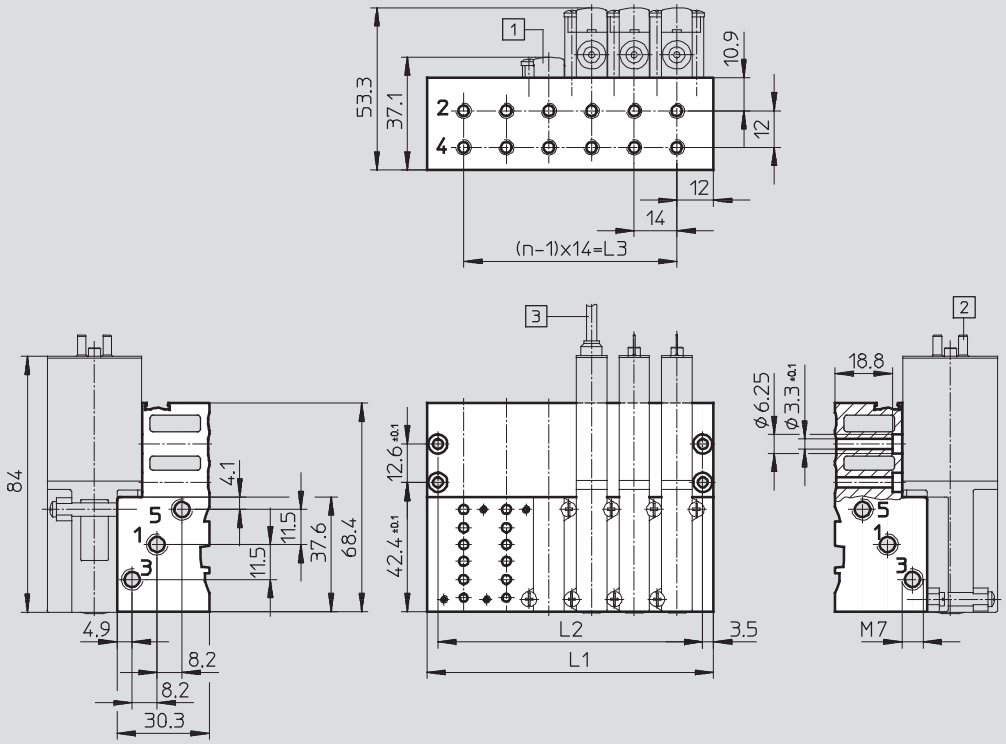
Individual sub-base



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

3 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

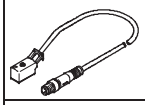
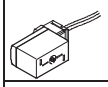
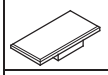
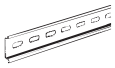
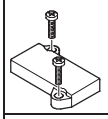
Valve positions n	L1	L2	L3
8	122	115	98
9	136	129	112
10	150	143	126

Solenoid valves MHA2, fast-switching valves

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

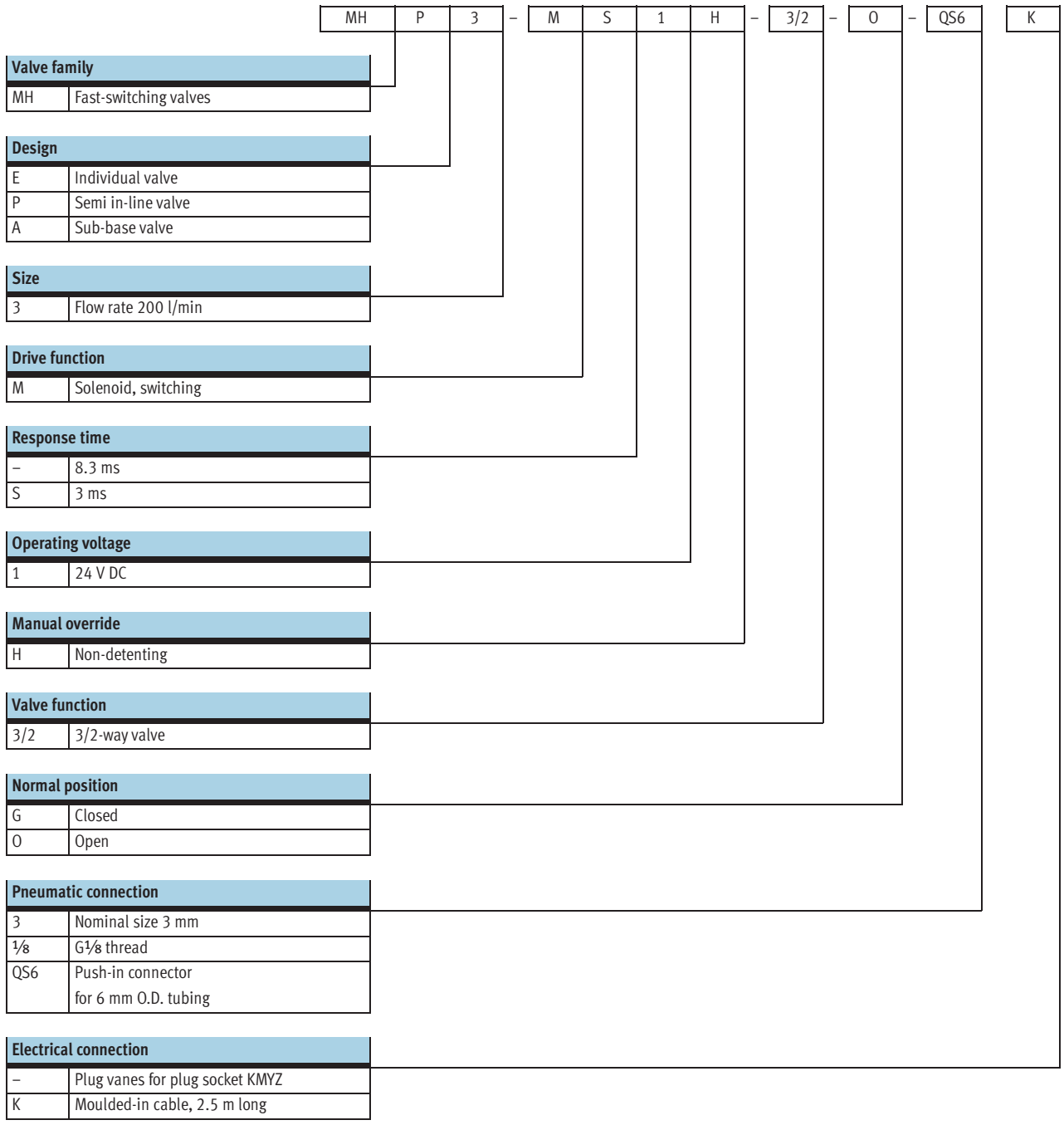
Ordering data – Valves				
	Normal position	Electrical connection	Part No.	Type
Operating voltage 24 V DC	Normally closed	Plug vanes	**525101**	**MHA2-MS1H-5/2-2**
		Cable	**525103**	**MHA2-MS1H-5/2-2-K**

Ordering data – Product-specific accessories			
Designation		Part No.	Type
Individual sub-base	1 valve	**525120**	**MHA2-AS-5-M5**
Manifold for	2 valves	**525127**	**MHA2-PR2-5-M5**
	4 valves	**525128**	**MHA2-PR4-5-M5**
	6 valves	**525129**	**MHA2-PR6-5-M5**
	8 valves	**525130**	**MHA2-PR8-5-M5**
	10 valves	**525131**	**MHA2-PR10-5-M5**

Ordering data				
			Part No.	Type
Plug socket with cable				
	Protection class IP65 with LED, PUR cable, open cable end	Length 2.5 m	**193693**	**KMYZ-3-24-2,5-LED-PUR-B**
		Length 5 m	**193695**	**KMYZ-3-24-5-LED-PUR-B**
		Length 10 m	**196066**	**KMYZ-3-24-10-LED-PUR-B**
	Protection class IP65 with LED, PUR cable, M8 plug, 3-pin	Length 0.5 m	**525654**	**KMYZ-3-24-M8-0,5-LED-PUR**
		Length 2.5 m	**525655**	**KMYZ-3-24-M8-2,5-LED-PUR**
	Protection class IP40, PVC cable, open cable end	Length 0.5 m	**193690**	**KMYZ-4-24-0,5-B**
		Length 2.5 m	**193691**	**KMYZ-4-24-2,5-B**
H-rail mounting				
	For 3/2-way valves		**525053**	**MHAP2-BG-NRH-35**
	For 5/2-way valves		**162556**	**CPV10/14-VI-BG-NRH-35**
Blanking plug				
	For M5 thread	10 pieces	**3843**	**B-M5**
	For M7 thread	10 pieces	**174309**	**B-M7**
Inscription label				
	For solenoid valve	80 labels in frame	**197259**	**MH-BZ-80X**
H-rail				
		2 m	**35430**	**NRH-35-2000**
Blanking plate				
	For 3/2-way valves	Plug connection	**197470**	**MHAP2-BP-3**
		Plug base	**197471**	**MHAP2-BP-3-PI**
	For 5/2-way valves		**525132**	**MHAP2-BP-5**
Silencer				
			→ Internet: uc	
Push-in fittings				
			→ Internet: quick star	

Solenoid valves MH3, fast-switching valves

Type codes



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	
–	8.3 ms
S	3 ms

Operating voltage	
1	24 V DC

Manual override	
H	Non-detenting

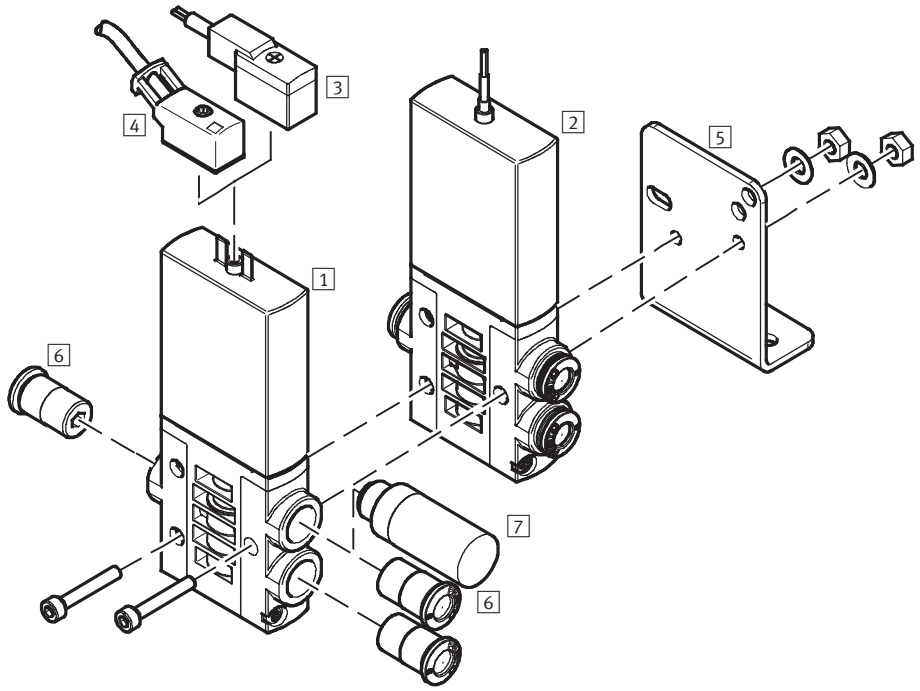
Valve function	
3/2	3/2-way valve

Normal position	
G	Closed
O	Open

Pneumatic connection	
3	Nominal size 3 mm
⅛	G⅛ 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

Connection with plug vanes – Connection with moulded-in cable



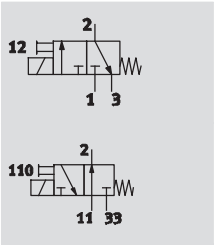
Valves and accessories			
		Brief description	→ Page/Internet
1	Individual valve MHE3	With plug vanes	47
2	Individual valve MHE3-...-K	With cable	47
3	Plug socket with cable KMYZ-4 (IP 40)	With PVC cable	63
4	Plug socket with cable KMYZ-3 (IP 65)	With LED, PUR cable, with M8 plug or open end	63
5	Mounting bracket MHE2-BG-L	–	50
6	Push-in fittings QS	For connecting compressed air tubing with standard O.D.	quick star
7	Silencer UC	For fitting in exhaust ports	uc

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[2]
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
2) There may be slight leakage in the pressure range –0.5 to +0.5 bar

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
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)

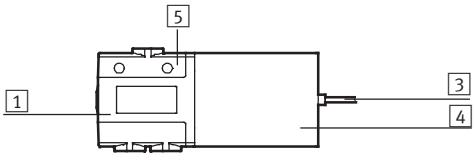
1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

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]	8.3/4.5
Maximum switching frequency	[Hz]	130

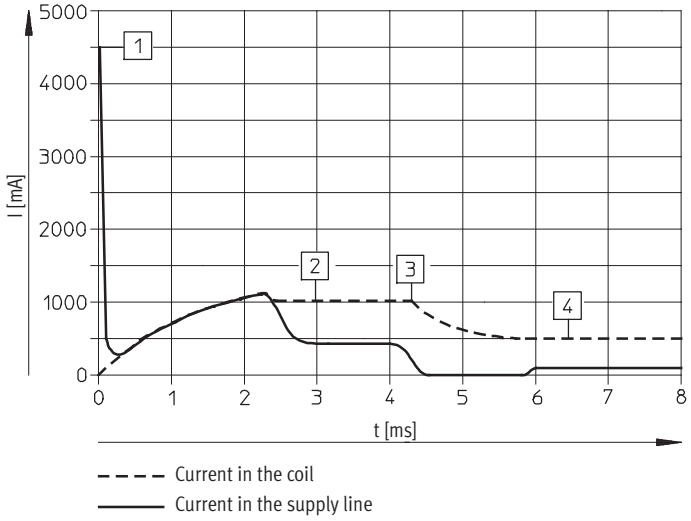
1) The ambient temperature must be limited as from 90 Hz.

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

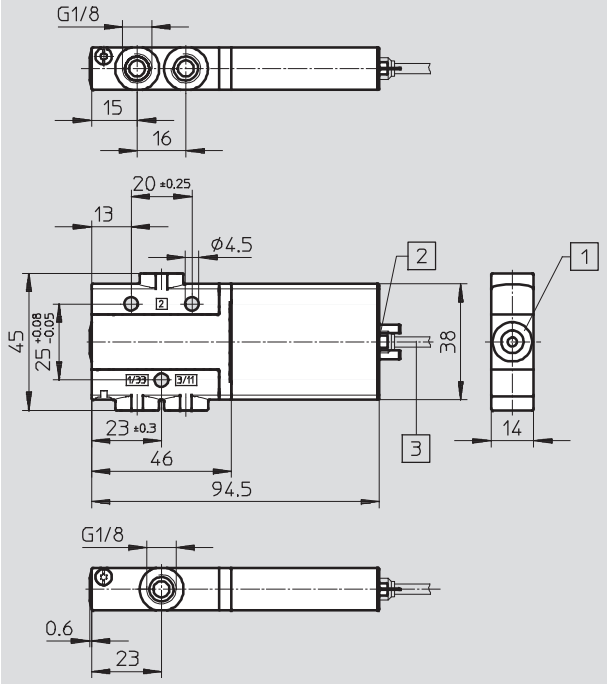
Current path for valves with fast-switching electronics



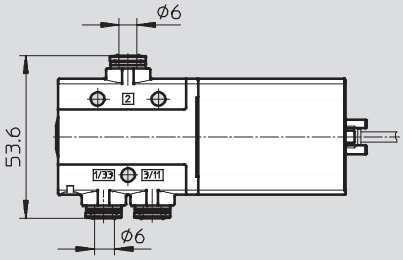
1 Capacitor charging
2 Controlled coil current 1 A
3 Drop to holding current
4 Controlled holding current 0.5 A

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

Valve with connecting thread G1/8



Valve with push-in fitting QS 6

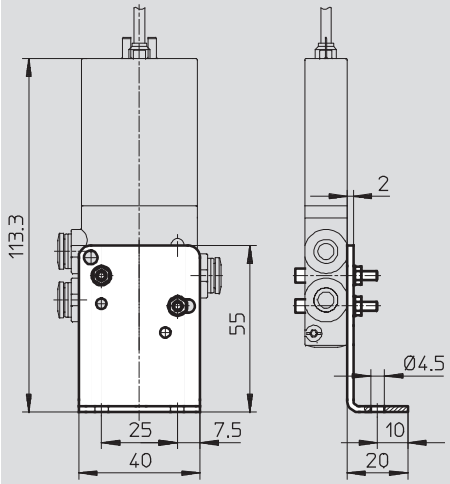


[1] Manual override, non-detenting

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

[3] Cable 2.5 m

Mounting bracket MHE2-BG-L



Solenoid valves MHE3, fast-switching valves

Technical data – Individual valve

FESTO

Ordering data – Valves					
	Pneumatic connection	Normal position	Electrical connection	Part No.	Type
Response time 3/2.3 ms					
Operating voltage 24 V DC	Connecting thread G1⁄8	Normally open	Plug vanes	**525167**	**MHE3-MS1H-3/2O-1⁄8**
			Cable	**525169**	**MHE3-MS1H-3/2O-1⁄8-K**
		Normally closed	Plug vanes	**525147**	**MHE3-MS1H-3/2G-1⁄8**
			Cable	**525149**	**MHE3-MS1H-3/2G-1⁄8-K**
	Push-in connector QS 6	Normally open	Plug vanes	**525171**	**MHE3-MS1H-3/2O-QS6**
		Normally closed	Plug vanes	**525151**	**MHE3-MS1H-3/2G-QS6**
			Cable	**525153**	**MHE3-MS1H-3/2G-QS6-K**
Response time 8.3/4.5 ms					
Operating voltage 24 V DC	Connecting thread G1⁄8	Normally open	Plug vanes	**525166**	**MHE3-M1H-3/2O-1⁄8**
			Cable	**525168**	**MHE3-M1H-3/2O-1⁄8-K**
		Normally closed	Plug vanes	**525146**	**MHE3-M1H-3/2G-1⁄8**
			Cable	**525148**	**MHE3-M1H-3/2G-1⁄8-K**
	Push-in connector QS 6	Normally open	Plug vanes	**525170**	**MHE3-M1H-3/2O-QS6**
		Normally closed	Plug vanes	**525150**	**MHE3-M1H-3/2G-QS6**
			Cable	**525152**	**MHE3-M1H-3/2G-QS6-K**

Ordering data – Product-specific accessories				
Designation	Weight [g]	CRC	Part No.	Type
Mounting bracket	55	2[1)]	**196165**	**MHE2-BG-L**

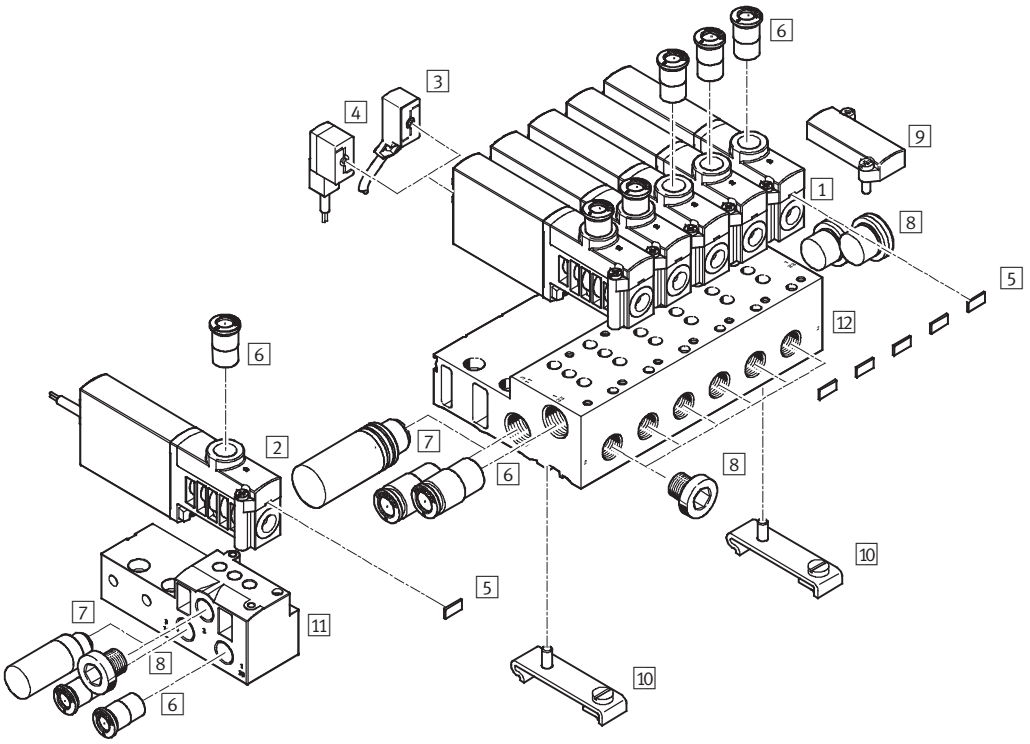
1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

Solenoid valves MHP3, fast-switching valves

Peripherals overview – Semi in-line valve

FESTO

Connection with plug vanes – Connection with moulded-in cable

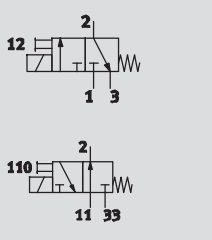


Valves and accessories		
Brief description		**➔ Page/Internet**
1 Semi in-line valve MHP3	With plug vanes	52
2 Semi in-line valve MHP3-...-K	With cable	52
3 Plug socket with cable KMYZ-4 (IP 40)	With PVC cable	63
4 Plug socket with cable KMYZ-3 (IP 65)	With LED, PUR cable, with M8 plug or open end	63
5 Inscription label MH-BZ-80X	For identifying the valves	63
6 Push-in fittings QS	For connecting compressed air tubing with standard O.D.	quick star
7 Silencer UC	For fitting in exhaust ports	uc
8 Blanking plug B	For sealing unused ports	63
9 Blanking plate MHAP3-BP-3	For sealing vacant positions	63
10 H-rail mounting CPV10/14-VI-BG-NRH-35	–	63
11 Individual sub-base MHA3-AS-3-⅛	For semi in-line valve; the individual sub-base is also used for the sub-base valve, the output port must in this case be sealed with a blanking plug	55
12 Manifold block MHA3-PR	For semi in-line valve	55

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[2]
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
2) There may be slight leakage in the pressure range –0.5 to +0.5 bar

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
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)

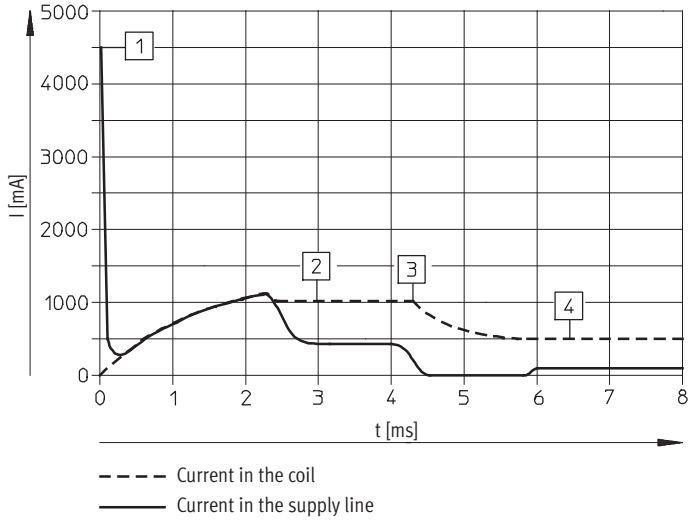
1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

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]	8.3/4.5
Maximum switching frequency	[Hz]	130

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

Current path for valves with fast-switching electronics

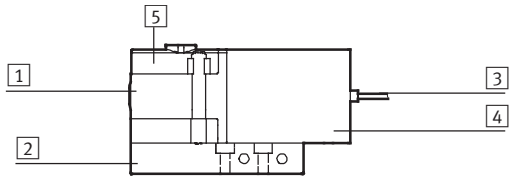


1 Capacitor charging
2 Controlled coil current 1 A
3 Drop to holding current
4 Controlled holding current 0.5 A

Solenoid valves MHP3, fast-switching valves

Technical data – Semi in-line valve

Materials

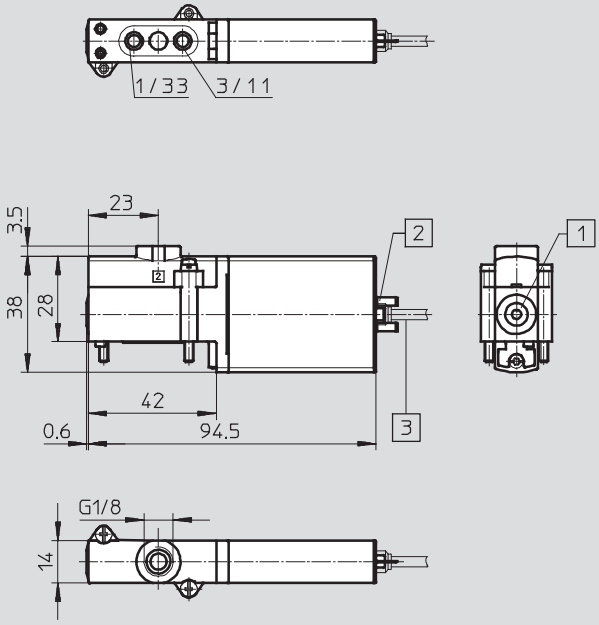


1	Body	Die-cast zinc, coated
2	Sub-base	Manifold block: Aluminium Individual sub-base: Die-cast zinc
3	Cable sheath	Polyurethane
4	Coil housing	Polyamide
5	Connection piece	Polyamide
–	Seals	Nitrile rubber
	Note on materials	Free of copper and PTFE

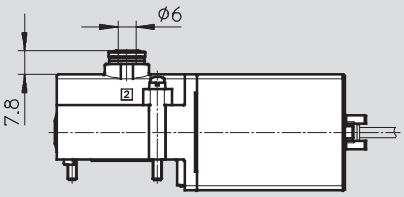
Dimensions

Download CAD data ➔ **www.festo.com**

Valve with connecting thread G1⁄8



Valve with push-in fitting QS 6

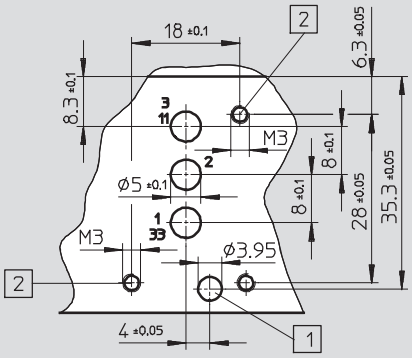


1 Manual override, non-detenting

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

3 Cable 2.5 m

Port pattern on sub-bases



1 Hole for coding pin, 2 mm deep

2 Mounting thread, 8 mm deep

- - Note

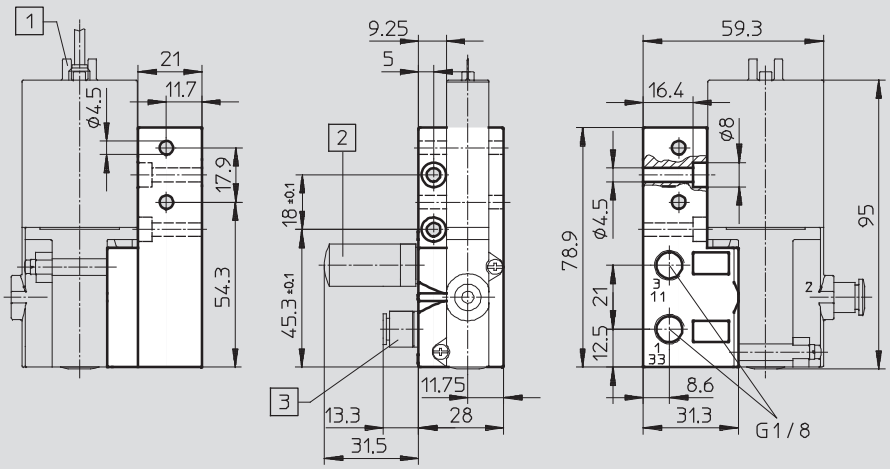
Semi in-line valves do not require port 2.

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.

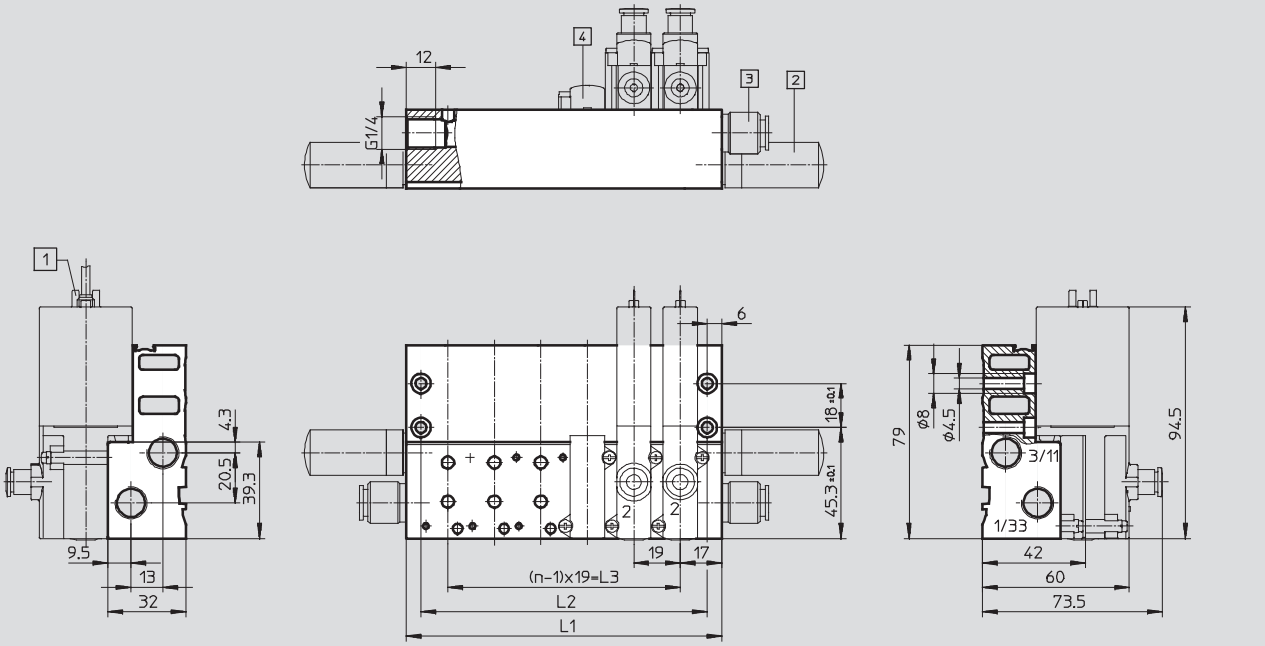
Dimensions Download CAD data ➔ **www.festo.com**

Individual sub-base



1 Plug vanes for plug socket with cable KMYZ-3, KMYZ-4
2 Silencer UC-⅛
3 Push-in fitting

Manifold mounting



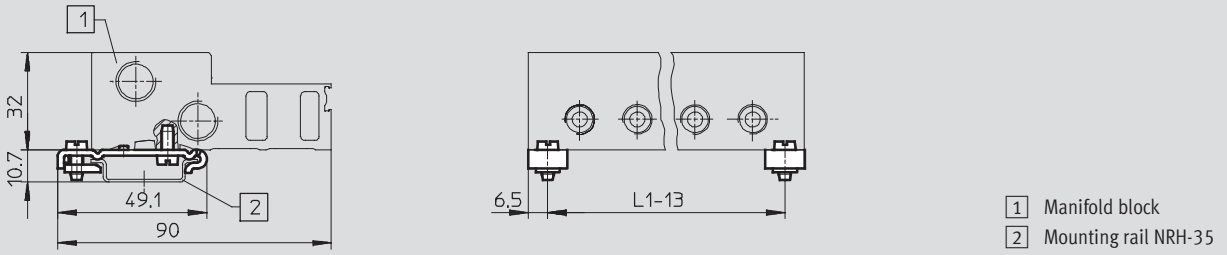
1 Plug vanes for plug socket with cable KMYZ-3, KMYZ-4 or moulded-in cable
2 Silencer UC-¼
3 Push-in fitting
4 Blanking plate MHAP3-BP-3

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

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

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



Type	Valve positions n	L1
MHA3-PR2-⅛	2	53
MHA3-PR4-⅛	4	91
MHA3-PR6-⅛	6	129

Type	Valve positions n	L1
MHA3-PR8-⅛	8	167
MHA3-PR10-⅛	10	205

Ordering data – Valves

	Pneumatic connection	Normal position	Electrical connection	Part No.	Type
Response time 3/2.3 ms					
Operating voltage 24 V DC	Connecting thread G⅛	Normally open	Plug vanes	**525159**	**MHP3-MS1H-3/2O-⅛**
		Normally closed	Plug vanes	**525139**	**MHP3-MS1H-3/2G-⅛**
	Push-in connector QS 6	Normally closed	Plug vanes	**525143**	**MHP3-MS1H-3/2G-QS6**
			Cable	**525145**	**MHP3-MS1H-3/2G-QS6-K**
Response time 8.3/4.5 ms					
Operating voltage 24 V DC	Connecting thread G⅛	Normally open	Plug vanes	**525158**	**MHP3-M1H-3/2O-⅛**
		Normally closed	Plug vanes	**525138**	**MHP3-M1H-3/2G-⅛**
	Push-in connector QS 6	Normally closed	Plug vanes	**525142**	**MHP3-M1H-3/2G-QS6**

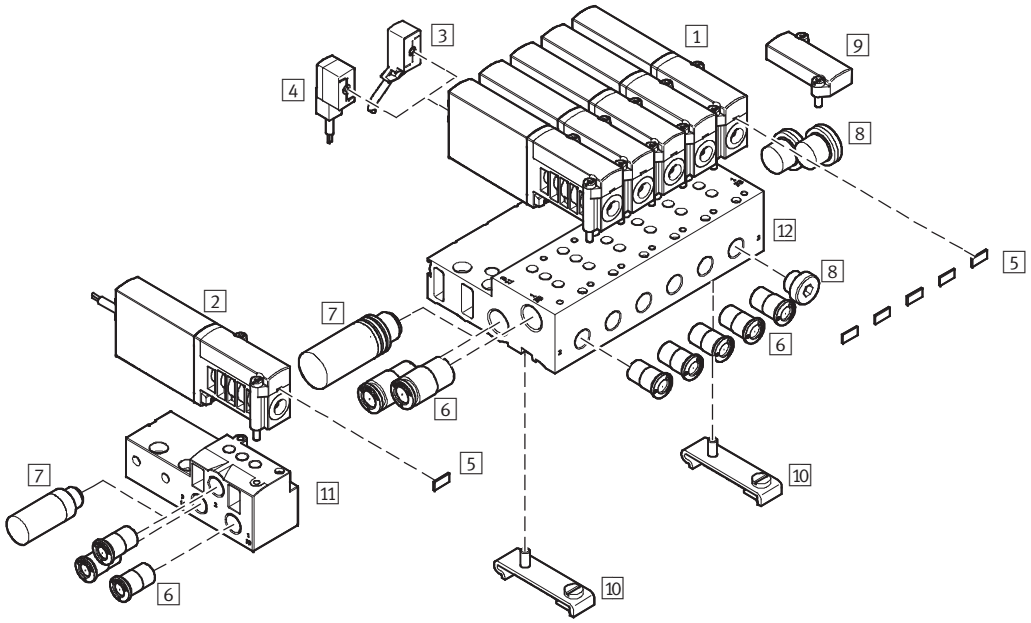
Note

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	1 valve	**525214**	**MHA3-AS-3-⅛**
Manifold block for	2 valves	**525221**	**MHA3-PR2-⅛**
	4 valves	**525222**	**MHA3-PR4-⅛**
	6 valves	**525223**	**MHA3-PR6-⅛**
	8 valves	**525224**	**MHA3-PR8-⅛**
	10 valves	**525225**	**MHA3-PR10-⅛**

Connection with plug vanes – Connection with moulded-in cable

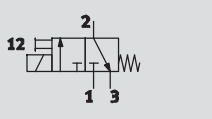


Valves and accessories		
	Brief description	➔ Page/Internet
1 Sub-base valve MHA3	With plug vanes	58
2 Sub-base valve MHA3-...-K	With cable	58
3 Plug socket with cable KMYZ-4 (IP 40)	With PVC cable	63
4 Plug socket with cable KMYZ-3 (IP 65)	With LED, PUR cable, with M8 plug or open end	63
5 Inscription label MH-BZ-80X	For identifying the valves	63
6 Push-in fittings QS	For connecting compressed air tubing with standard O.D.	quick star
7 Silencer UC	For fitting in exhaust ports	uc
8 Blanking plug B	For sealing unused ports	63
9 Blanking plate MHAP3-BP-3	For sealing vacant positions	63
10 H-rail mounting CPV10/14-VI-BG-NRH-35	–	63
11 Individual sub-base MHA3-AS-3-1/8	For sub-base valve	61
12 Manifold block MHA3-PR...-3-1/8	For sub-base valve	61

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[2)]
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
2) There may be slight leakage in the pressure range –0.5 to +0.5 bar

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
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)

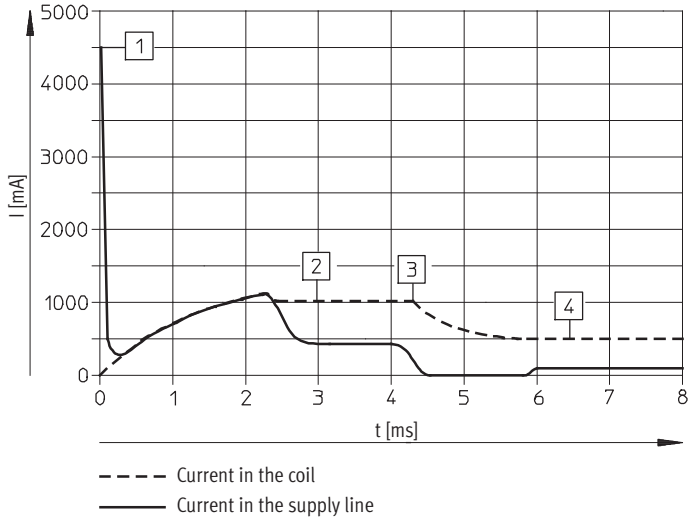
1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

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]	8.3/4.5
Maximum switching frequency	[Hz]	130

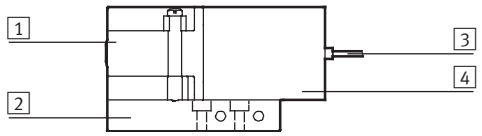
1) The ambient temperature must be limited as from 100 Hz.

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

Materials

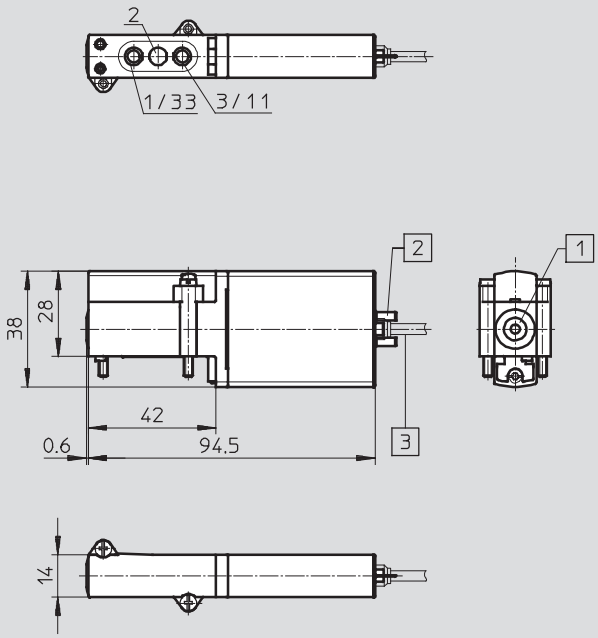


1	Body	Die-cast zinc, coated
2	Sub-base	Manifold block: Aluminium Individual sub-base: Die-cast zinc
3	Cable sheath	Polyurethane
4	Coil housing	Polyamide
–	Seals	Nitrile rubber/ hydrogenated nitrile rubber
	Note on materials	Free of copper and PTFE

Dimensions

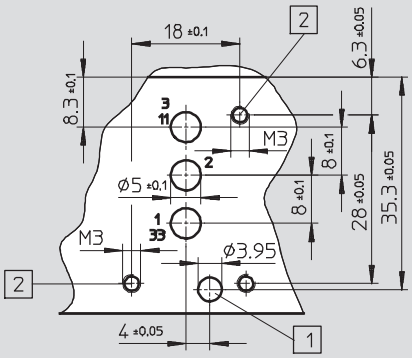
Download CAD data ➔ **www.festo.com**

Valve



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



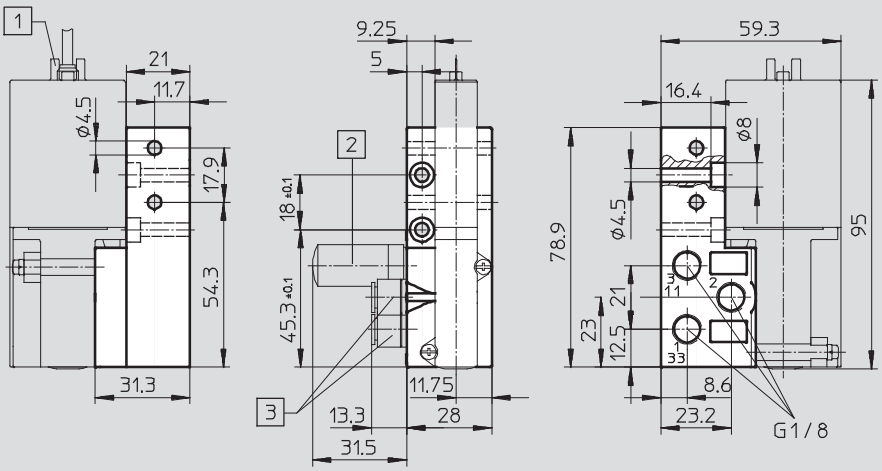
1 Hole for coding pin, 2 mm deep
2 Mounting thread, 8 mm deep

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.

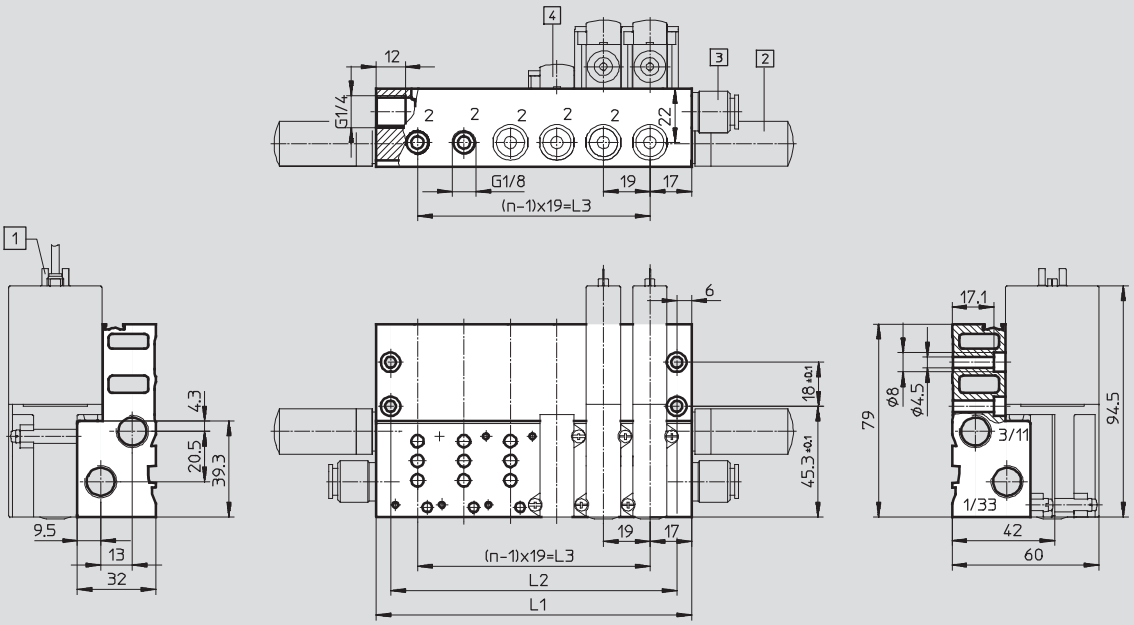
Dimensions Download CAD data ➔ **www.festo.com**

Individual sub-base



1 Plug vanes for plug socket with cable KMYZ-3, KMYZ-4
2 Silencer UC-⅛
3 Push-in fitting

Manifold mounting



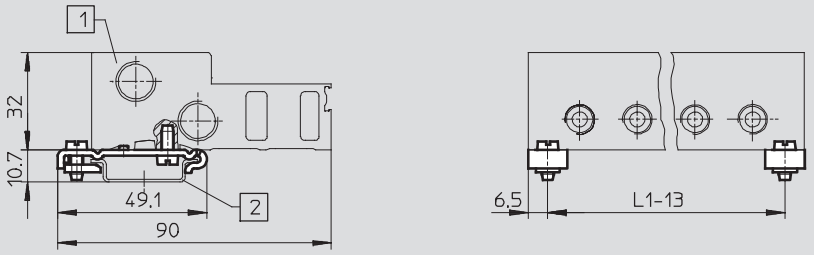
1 Plug vanes for plug socket with cable KMYZ-3, KMYZ-4 or moulded-in cable
2 Silencer UC-¼
3 Push-in fitting
4 Blanking plate MHAP3-BP-3

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

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

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



1 Manifold block
2 Mounting rail NRH-35

Type	Valve positions n	L1
MHA3-PR2-⅛	2	53
MHA3-PR4-⅛	4	91
MHA3-PR6-⅛	6	129

Type	Valve positions n	L1
MHA3-PR8-⅛	8	167
MHA3-PR10-⅛	10	205

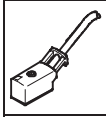
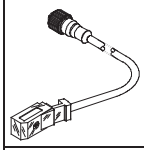
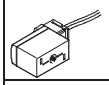
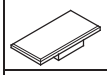
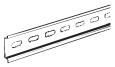
Ordering data – Valves

	Normal position	Electrical connection	Part No.	Type
Response time 3/2.3 ms				
Operating voltage 24 V DC	Normally closed	Plug vanes	**525135**	**MHA3-MS1H-3/2G-3**
		Cable	**525137**	**MHA3-MS1H-3/2G-3-K**
Response time 8.3/4.5 ms				
Operating voltage 24 V DC	Normally closed	Plug vanes	**525134**	**MHA3-M1H-3/2G-3**
		Cable	**525136**	**MHA3-M1H-3/2G-3-K**

Ordering data – Product-specific accessories

Designation		Part No.	Type
Individual sub-base	1 valve	**525214**	**MHA3-AS-3-⅛**
Manifold block for	2 valves	**525221**	**MHA3-PR2-⅛**
	4 valves	**525222**	**MHA3-PR4-⅛**
	6 valves	**525223**	**MHA3-PR6-⅛**
	8 valves	**525224**	**MHA3-PR8-⅛**
	10 valves	**525225**	**MHA3-PR10-⅛**

Ordering data

			Part No.	Type
Plug socket with cable				
	Protection class IP65 with LED, PUR cable, open cable end	Length 2.5 m	**193693**	**KMYZ-3-24-2,5-LED-PUR-B**
		Length 5 m	**193695**	**KMYZ-3-24-5-LED-PUR-B**
		Length 10 m	**196066**	**KMYZ-3-24-10-LED-PUR-B**
	Protection class IP65 with LED, PUR cable, M8 plug, 3-pin	Length 0.5 m	**525654**	**KMYZ-3-24-M8-0,5-LED-PUR**
		Length 2.5 m	**525655**	**KMYZ-3-24-M8-2,5-LED-PUR**
	Protection class IP40, PVC cable, open cable end	Length 0.5 m	**193690**	**KMYZ-4-24-0,5-B**
		Length 2.5 m	**193691**	**KMYZ-4-24-2,5-B**
H-rail mounting				
	For 5/2-way valves		**162556**	**CPV10/14-VI-BG-NRH-35**
Blanking plug				
	For G⅛ thread	10 pieces	**3569**	**B-⅛**
	For G¼ thread	10 pieces	**3568**	**B-¼**
Inscription label				
	For solenoid valve	80 labels in frame	**197259**	**MH-BZ-80X**
H-rail				
		2 m	**35430**	**NRH-35-2000**
Blanking plate				
	For manifold block		**525226**	**MHAP3-BP-3**
Silencer				
			→ Internet: uc	
Push-in fittings				
			→ Internet: quick star	

Solenoid valves MH4, fast-switching valves

Type codes

MH	P	4	–	M	S	1	H	–	3/2	–	O	–	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	
–	10.5 ms
S	3.5 ms

Operating voltage	
1	24 V DC

Manual override	
H	Non-detenting

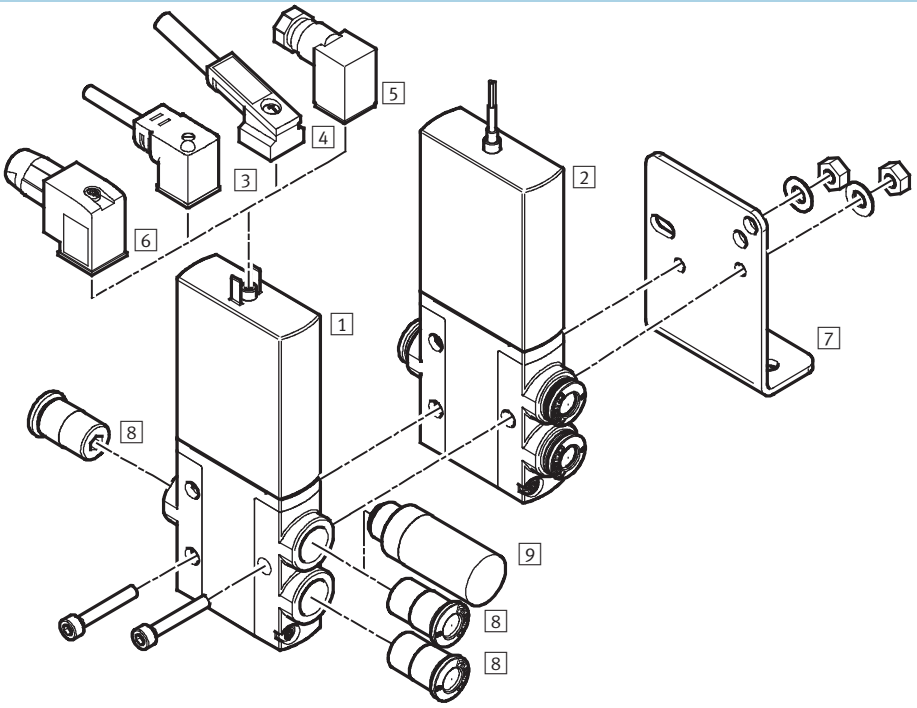
Valve function	
3/2	3/2-way valve

Normal position	
G	Closed
O	Open

Pneumatic connection	
4	Nominal size 4 mm
¼	G¼ 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

Connection with plug vanes – Connection with moulded-in cable

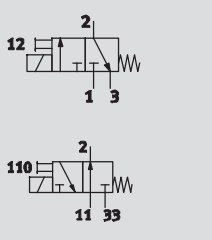


Valves and accessories			
		Brief description	➔ Page/Internet
1	Individual valve MHE4	With plug vanes	66
2	Individual valve MHE4-...-K	With cable	66
3	Plug socket with cable KMEB-1 (IP65)	PVC cable, with or without LED	82
4	Plug socket with cable KMEB-2 (IP65)	With LED, without LED; PUR cable, with or without LED	82
5	Plug socket MSSD-EB (IP65)	With clamping screw	82
6	Plug socket MSSD-EB-S-M14 (IP65)	With insulation displacement connector	82
7	Mounting bracket MHE2-BG-L	–	69
8	Push-in fittings QS	For connecting compressed air tubing with standard O.D.	quick star
9	Silencer UC	For fitting in exhaust ports	uc

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[2)]
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
2) There may be slight leakage in the pressure range –0.5 to +0.5 bar

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
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.

Solenoid valves MHE4, fast-switching valves

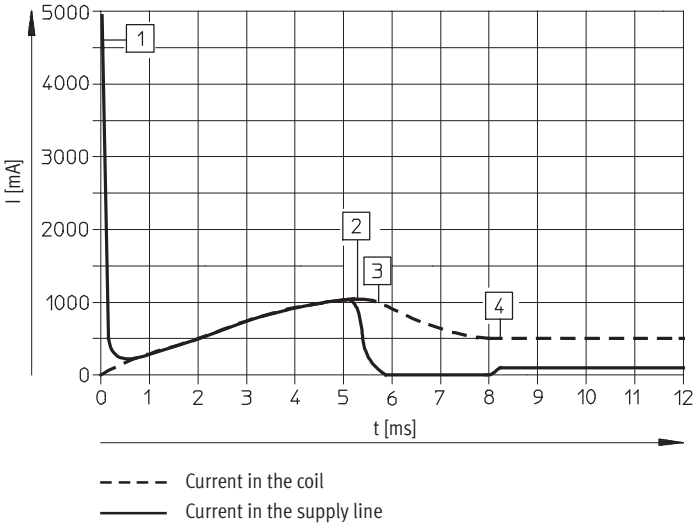
Technical data – Individual valve

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]	10.5/5
Maximum switching frequency	[Hz]	120

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

Current path for valves with fast-switching electronics

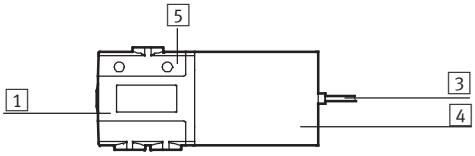


1 Capacitor charging
2 Controlled coil current 1 A
3 Drop to holding current
4 Controlled holding current 0.5 A

Solenoid valves MHE4, fast-switching valves

Technical data – Individual valve

Materials

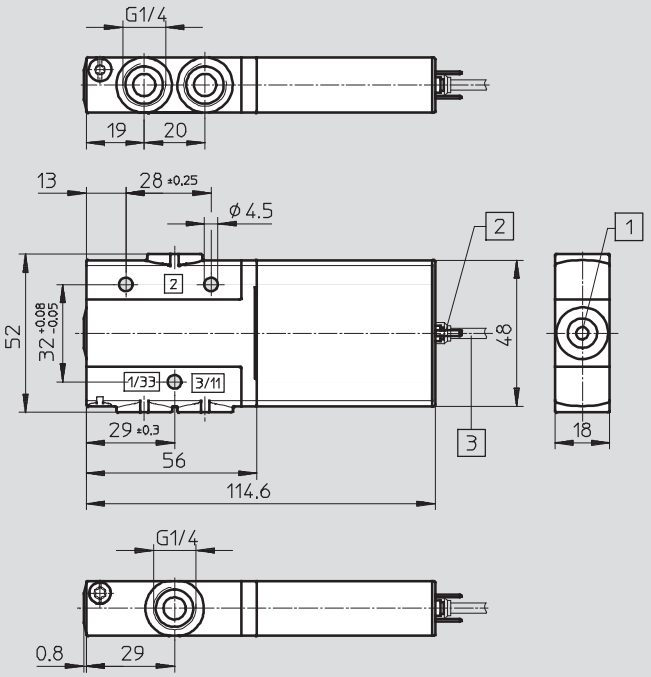


1	Body	Die-cast zinc, coated
3	Cable sheath	Polyurethane
4	Coil housing	Polyamide
5	Connection piece	Polyamide
–	Seals	Nitrile rubber
	Note on materials	Free of copper and PTFE

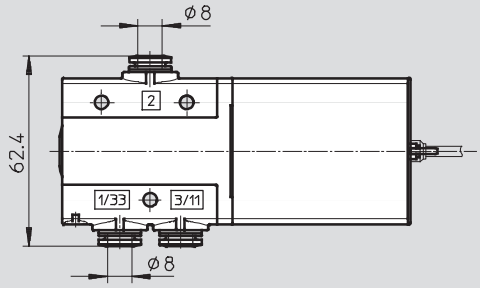
Dimensions

Download CAD data ➔ **www.festo.com**

Valve with connecting thread G¼



Valve with push-in fitting QS 8

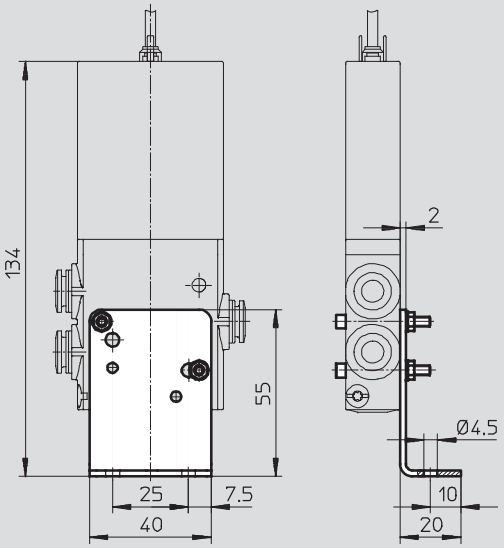


1 Manual override, non-detenting

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

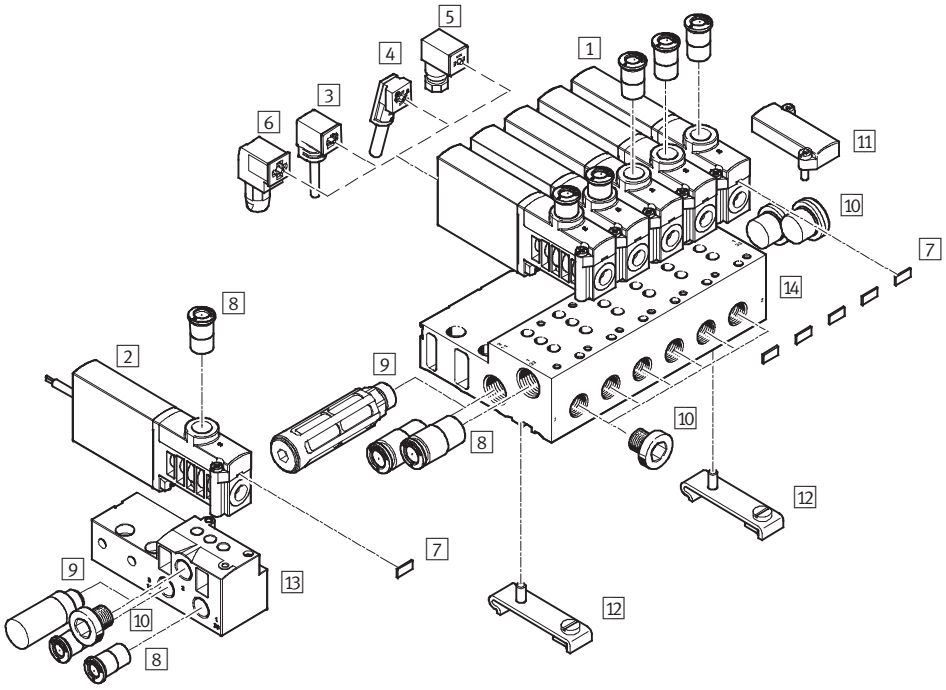
FESTO

Ordering data – Valves					
	Pneumatic connection	Normal position	Electrical connection	Part No.	Type
Response time 3.5/3.5 ms					
Operating voltage 24 V DC	Connecting thread G¼	Normally open	Plug vanes	**525207**	**MHE4-MS1H-3/2O-¼**
		Normally closed	Plug vanes	**525187**	**MHE4-MS1H-3/2G-¼**
			Cable	**525189**	**MHE4-MS1H-3/2G-¼-K**
	Push-in connector QS 8	Normally open	Plug vanes	**525211**	**MHE4-MS1H-3/2O-QS8**
			Cable	**525213**	**MHE4-MS1H-3/2O-QS8-K**
		Normally closed	Plug vanes	**525191**	**MHE4-MS1H-3/2G-QS8**
			Cable	**525193**	**MHE4-MS1H-3/2G-QS8-K**
Response time 10.5/5 ms					
Operating voltage 24 V DC	Connecting thread G¼	Normally open	Plug vanes	**525206**	**MHE4-M1H-3/2O-¼**
			Cable	**525208**	**MHE4-M1H-3/2O-¼-K**
		Normally closed	Plug vanes	**525186**	**MHE4-M1H-3/2G-¼**
			Cable	**525188**	**MHE4-M1H-3/2G-¼-K**
	Push-in connector QS 8	Normally open	Plug vanes	**525210**	**MHE4-M1H-3/2O-QS8**
		Normally closed	Plug vanes	**525190**	**MHE4-M1H-3/2G-QS8**

Ordering data – Product-specific accessories				
Designation	Weight [g]	CRC	Part No.	Type
Mounting bracket	55	2[1)]	**196165**	**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.

Connection with plug vanes – Connection with moulded-in cable

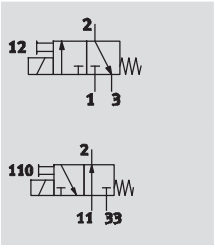


Valves and accessories		
	Brief description	**→ Page/Internet**
1 Semi in-line valve MHP4	With plug vanes	71
2 Semi in-line valve MHP4-...-K	With cable	71
3 Plug socket MSSD-EB (IP65)	With clamping screw	82
4 Plug socket MSSD-EB-S-M14 (IP65)	With insulation displacement connector	82
5 Plug socket with cable KMEB-1 (IP65)	PVC cable, with or without LED	82
6 Plug socket with cable KMEB-2 (IP65)	PUR cable, with or without LED	82
7 Inscription label MH-BZ-80X	For identifying the valves	82
8 Push-in fittings QS	For connecting compressed air tubing with standard O.D.	quick star
9 Silencer UC	For fitting in exhaust ports	uc
10 Blanking plug B	For sealing unused ports	82
11 Blanking plate MHAP4-BP-3	For sealing vacant positions	82
12 H-rail mounting CPV10/14-VI-BG-NRH-35	–	82
13 Individual sub-base MHA4-AS-3-¼	For semi in-line valve; the individual sub-base is also used for the sub-base valve, the output port must in this case be sealed with a blanking plug	74
14 Manifold block MHA4-PR	For semi in-line valve	74

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[2]
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 G¼
		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
2) There may be slight leakage in the pressure range –0.5 to +0.5 bar

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
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.

Solenoid valves MHP4, fast-switching valves

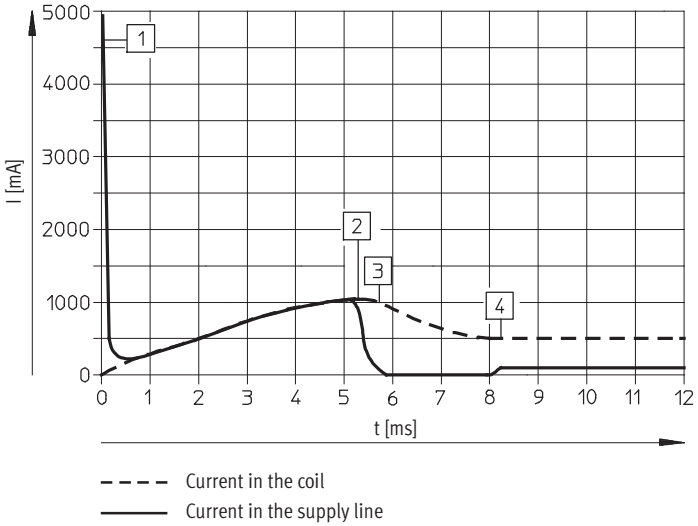
Technical data – Semi in-line valve

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]	10.5/5
Maximum switching frequency	[Hz]	120

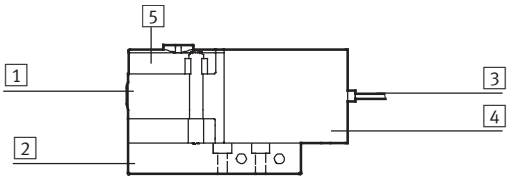
1) The ambient temperature must be limited as from 100 Hz.

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

Materials

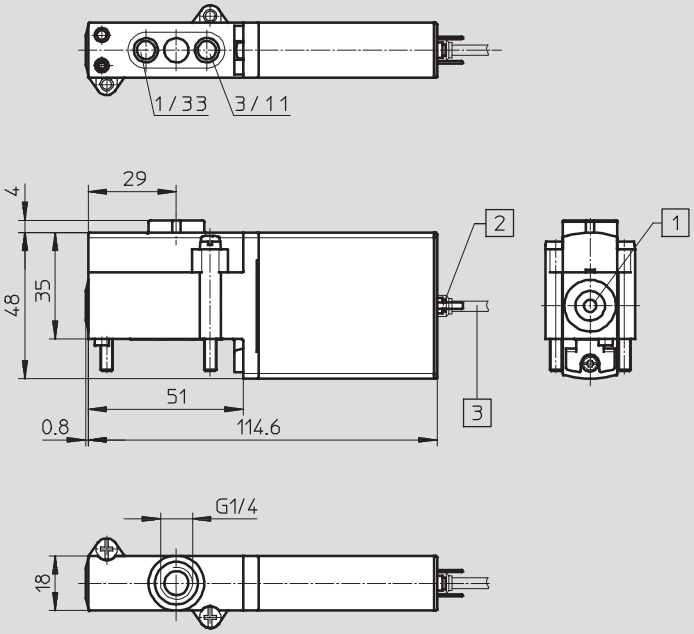


1	Body	Die-cast zinc, coated
2	Sub-base	Manifold block: Aluminium Individual sub-base: Die-cast zinc
3	Cable sheath	Polyurethane
4	Coil housing	Polyamide
5	Connection piece	Polyamide
–	Seals	Nitrile rubber
	Note on materials	Free of copper and PTFE

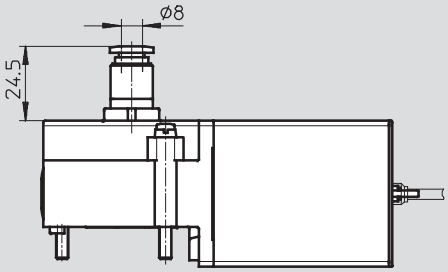
Dimensions

Download CAD data ➔ **www.festo.com**

Valve with connecting thread G¼



Valve with push-in fitting QS 8

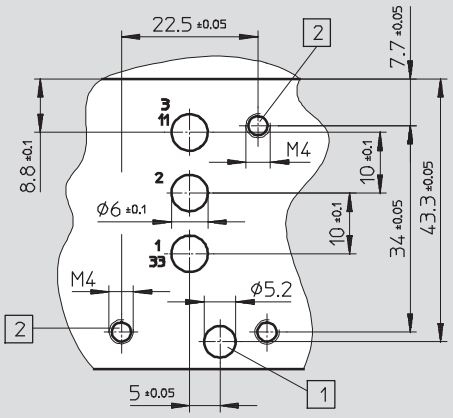


1 Manual override, non-detenting

2 Plug vanes for plug socket with cable KMEB

3 Cable 2.5 m

Port pattern on sub-bases



1 Hole for coding pin, 2.5 mm deep

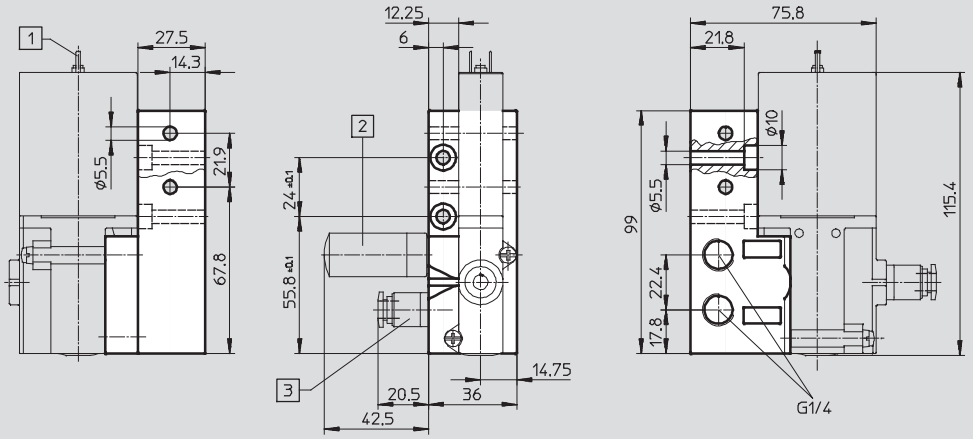
2 Mounting thread, 13 mm deep

- 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.

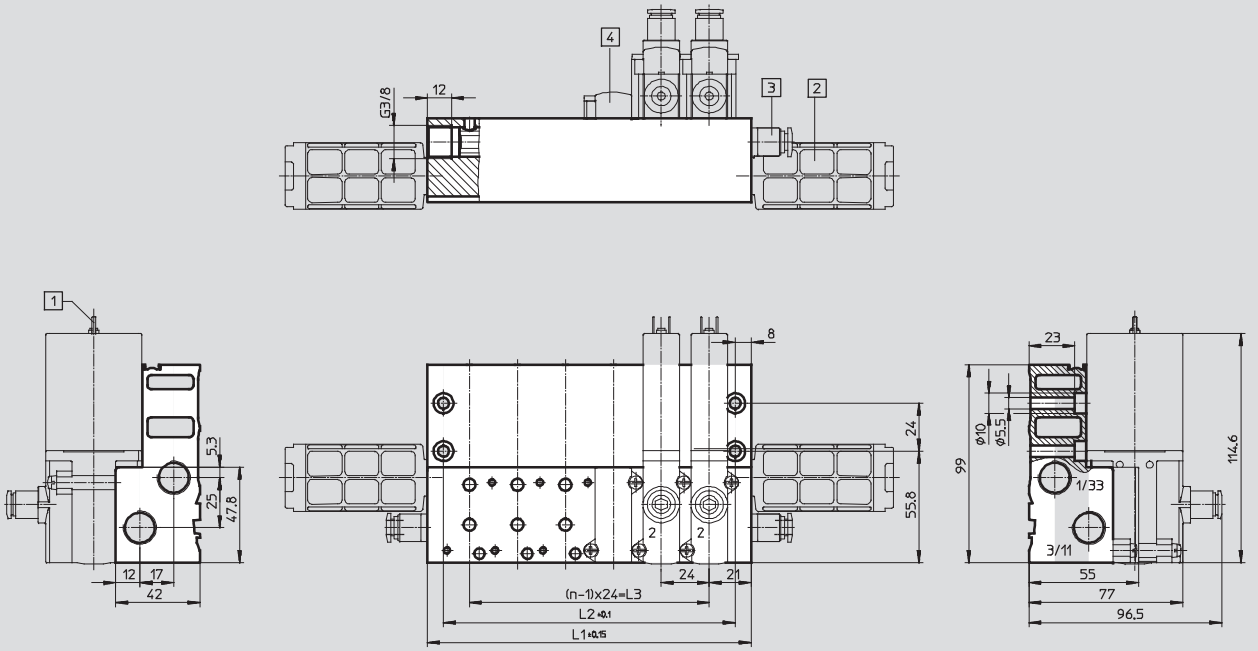
Dimensions Download CAD data ➔ **www.festo.com**

Individual sub-base



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

Manifold mounting



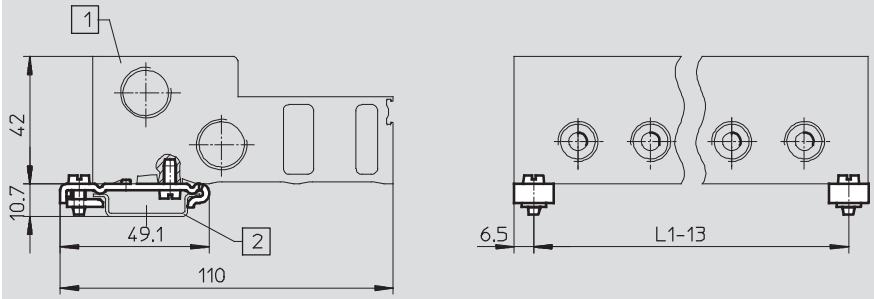
1 Plug vanes for plug socket with cable KMEB or moulded-in cable
2 Silencer UC-⅜
3 Push-in fitting
4 Blanking plate MHAP4-BP-3

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

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

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



1 Manifold block
2 Mounting rail NRH-35

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

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

Ordering data – Valves

	Pneumatic connection	Normal position	Electrical connection	Part No.	Type
Response time 3.5/3.5 ms					
Operating voltage 24 V DC	Connecting thread G¼	Normally open	Plug vanes	**525199**	**MHP4-MS1H-3/2O-¼**
		Normally closed	Plug vanes	**525179**	**MHP4-MS1H-3/2G-¼**
	Push-in connector QS 8	Normally closed	Plug vanes	**525183**	**MHP4-MS1H-3/2G-QS8**
Response time 10.5/5 ms					
Operating voltage 24 V DC	Connecting thread G¼	Normally open	Plug vanes	**525198**	**MHP4-M1H-3/2O-¼**
		Normally closed	Plug vanes	**525178**	**MHP4-M1H-3/2G-¼**

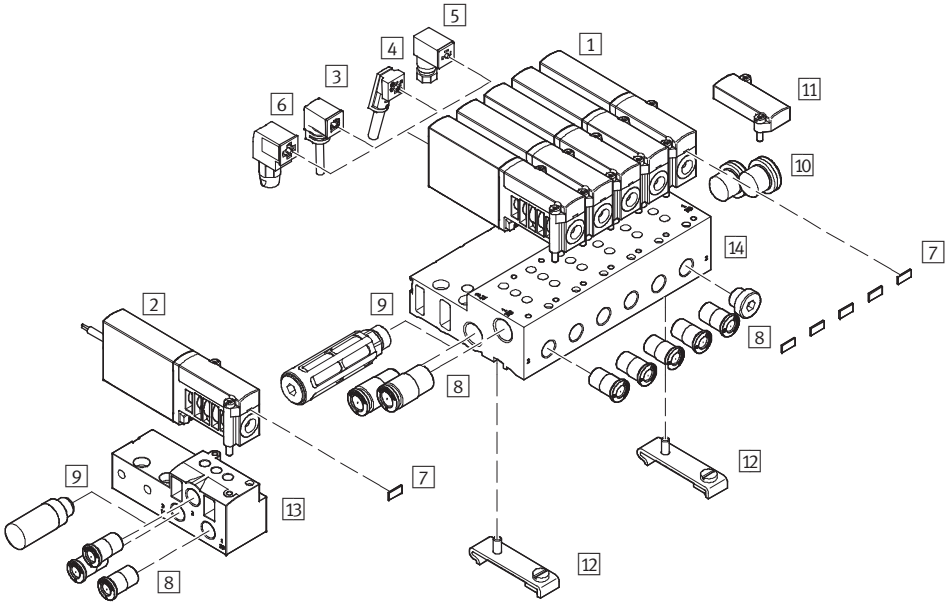
Note

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	1 valve	**525227**	**MHA4-AS-3-¼**
Manifold block for	2 valves	**525234**	**MHA4-PR2-¼**
	4 valves	**525235**	**MHA4-PR4-¼**
	6 valves	**525236**	**MHA4-PR6-¼**
	8 valves	**525237**	**MHA4-PR8-¼**
	10 valves	**525238**	**MHA4-PR10-¼**

Connection with plug vanes – Connection with moulded-in cable



Valves and accessories		
	Brief description	**→ Page/Internet**
1 Sub-base valve MHA4	With plug vanes	82
2 Sub-base valve MHA4-...-K	With cable	82
3 Plug socket with cable KMEB-1 (IP65)	PVC cable, with or without LED	82
4 Plug socket with cable KMEB-2 (IP65)	PUR cable, with or without LED	82
5 Plug socket MSSD-EB (IP65)	With clamping screw	82
6 Plug socket MSSD-EB-S-M14 (IP65)	With insulation displacement connector	82
7 Inscription label MH-BZ-80X	For identifying the valves	82
8 Push-in fittings QS	For connecting compressed air tubing with standard O.D.	quick star
9 Silencer UC	For fitting in exhaust ports	uc
10 Blanking plug B	For sealing unused ports	82
11 Blanking plate MHAP4-BP-3	For sealing vacant positions	82
12 H-rail mounting CPV10/14-VI-BG-NRH-35	–	82
13 Individual sub-base MHA4-AS-3-¼	For sub-base valves	80
14 Manifold block MHA4-PR...-3	For sub-base valves	80

Solenoid valves MHA4, fast-switching valves

Technical data – Sub-base valve

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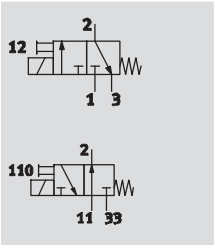
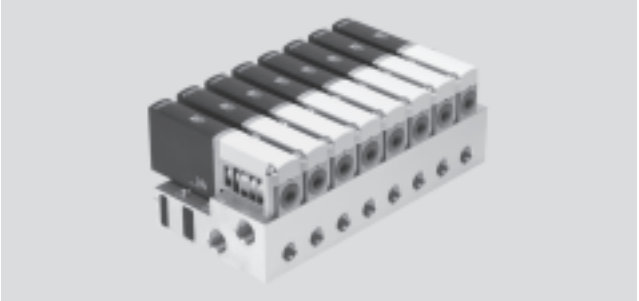
Function



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[2)]
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 G1¼
Product weight	[g]	270

1) Can be used as a 2/2 way valve by sealing connection 3 or 33
2) There may be slight leakage in the pressure range –0.5 to +0.5 bar

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
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)

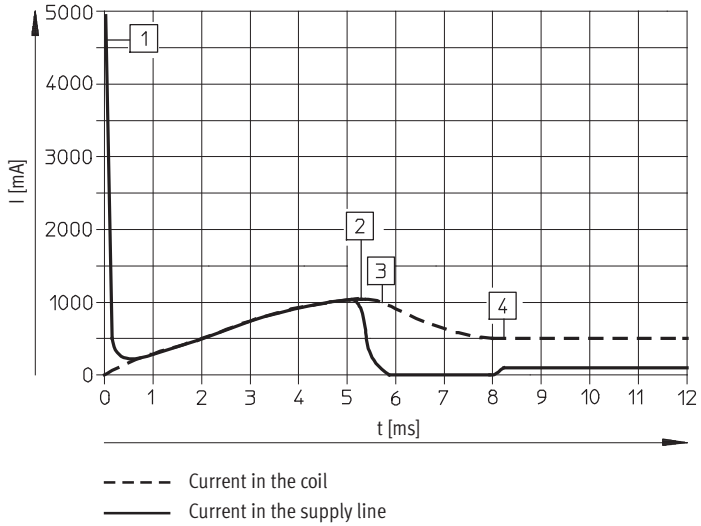
1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

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]	10.5/5
Maximum switching frequency	[Hz]	120

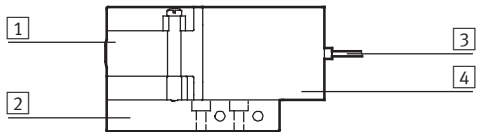
1) The ambient temperature must be limited as from 100 Hz.

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

Materials

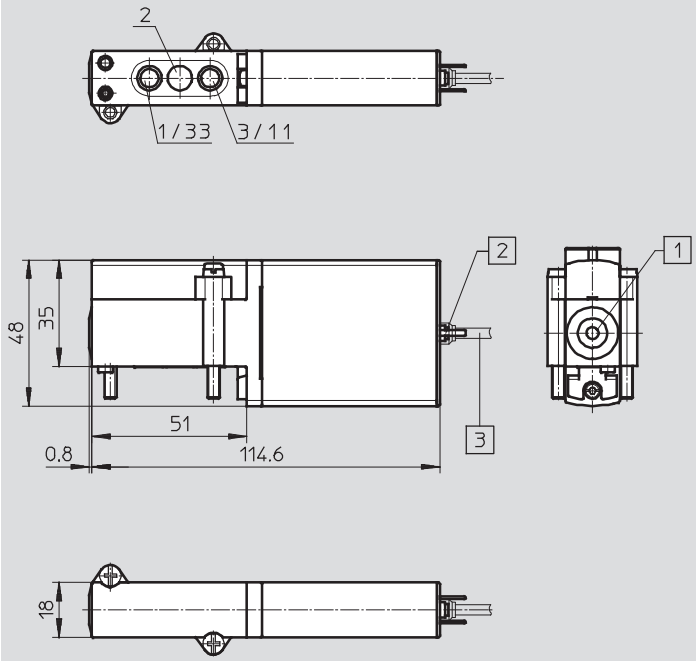


1	Body	Die-cast zinc, coated
2	Sub-base	Manifold block: Aluminium Individual sub-base: Die-cast zinc
3	Cable sheath	Polyurethane
4	Coil housing	Polyamide
–	Seals	Nitrile rubber/ hydrogenated nitrile rubber
	Note on materials	Free of copper and PTFE

Dimensions

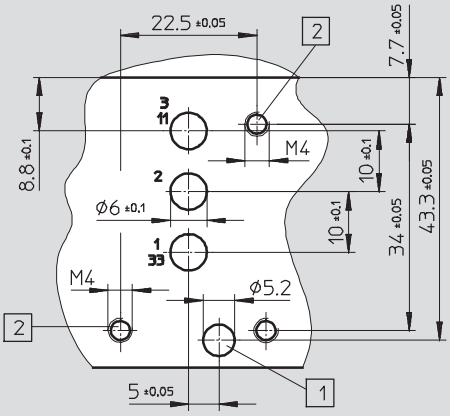
Download CAD data ➔ **www.festo.com**

Valve



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

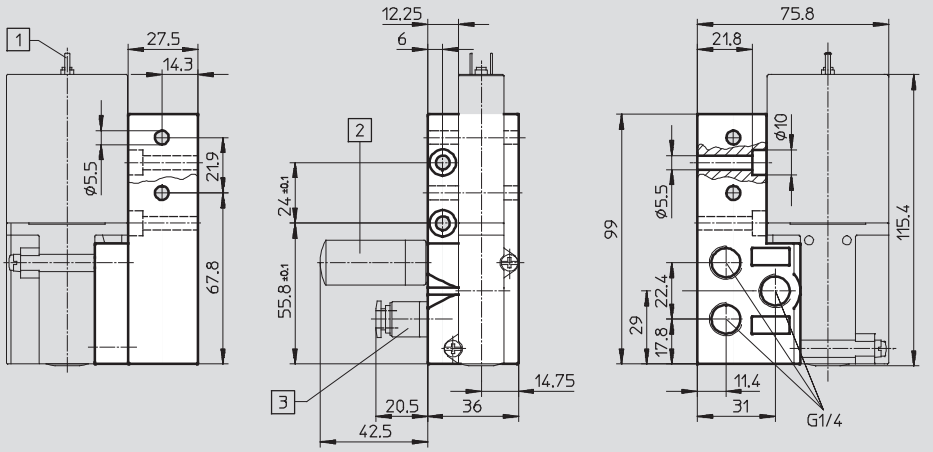
Port pattern on sub-bases



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

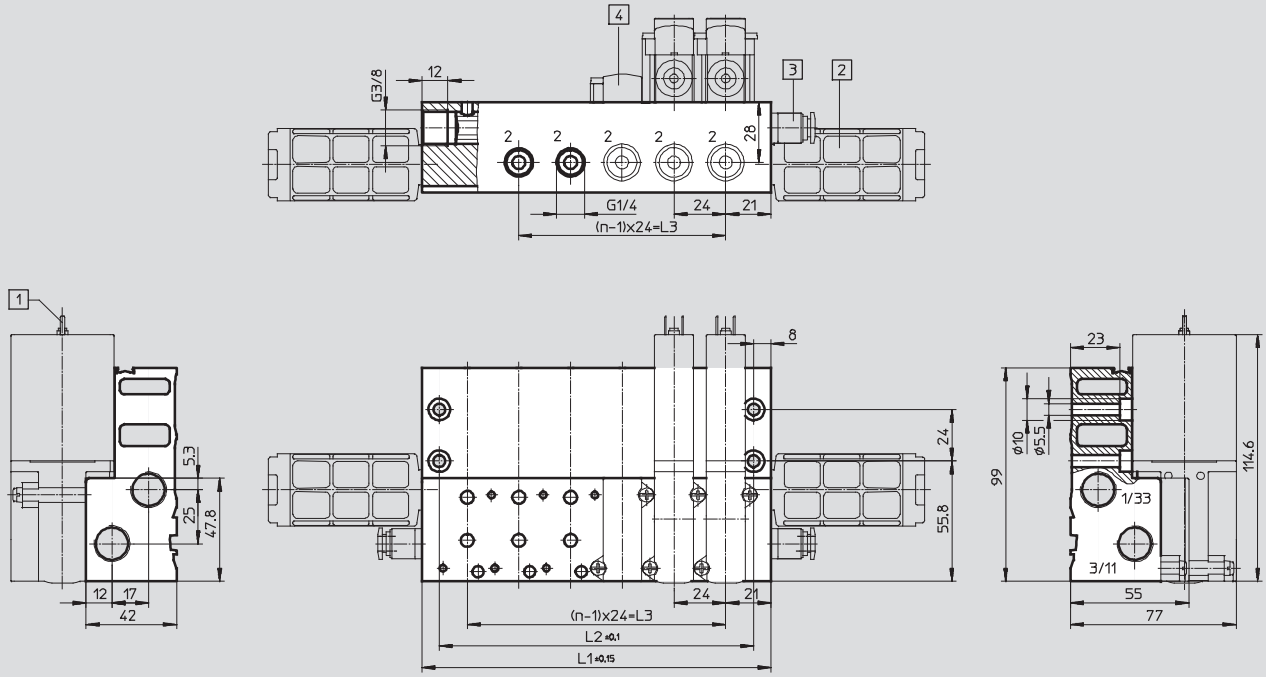
Dimensions Download CAD data ➔ **www.festo.com**

Individual sub-base



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

Manifold mounting



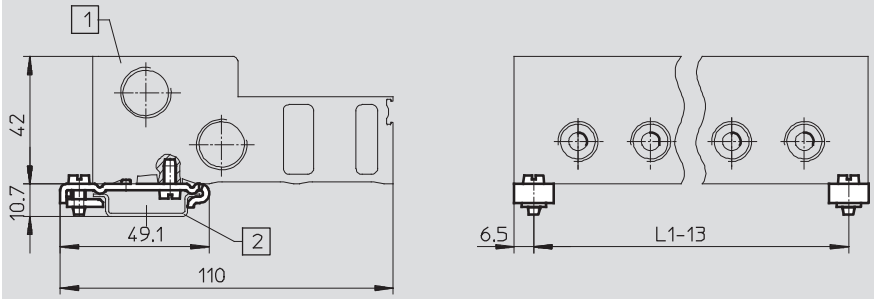
1 Plug vanes for plug socket with cable KMEB or moulded-in cable
2 Silencer UC-⅜
3 Push-in fitting
4 Blanking plate MHAP4-BP-3

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

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

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



1 Manifold block
2 Mounting rail NRH-35

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

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

Ordering data – Valves

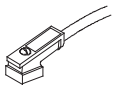
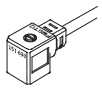
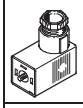
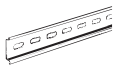
	Normal position	Electrical connection	Part No.	Type
Response time 3.5/3.5 ms				
Operating voltage 24 V DC	Normally closed	Plug vanes	**525175**	**MHA4-MS1H-3/2G-4**
		Cable	**525177**	**MHA4-MS1H-3/2G-4-K**
Response time 10.5/5 ms				
Operating voltage 24 V DC	Normally open	Cable	**525196**	**MHA4-M1H-3/2O-4-K**
	Normally closed	Plug vanes	**525174**	**MHA4-M1H-3/2G-4**
		Cable	**525176**	**MHA4-M1H-3/2G-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	1 valve	**525227**	**MHA4-AS-3-¼**
Manifold block for	2 valves	**525234**	**MHA4-PR2-¼**
	4 valves	**525235**	**MHA4-PR4-¼**
	6 valves	**525236**	**MHA4-PR6-¼**
	8 valves	**525237**	**MHA4-PR8-¼**
	10 valves	**525238**	**MHA4-PR10-¼**

Ordering data				
			Part No.	Type
Plug socket with cable				
	Protection class IP65 with LED, PUR cable, open cable end	Length 2.5 m	**174844**	**KMEB-2-24-2,5-LED**
		Length 5 m	**174845**	**KMEB-2-24-5-LED**
	Protection class IP65 without LED, PUR cable, open cable end	Length 2.5 m	**174846**	**KMEB-2-230-2,5**
		Length 5 m	**174847**	**KMEB-2-230-5**
	Protection class IP65 with LED, PVC cable, open cable end	Length 2.5 m	**151688**	**KMEB-1-24-2,5-LED**
		Length 5 m	**151689**	**KMEB-1-24-5-LED**
		Length 10 m	**193457**	**KMEB-1-24-10-LED**
	Protection class IP65 without LED, PVC cable, open cable end	Length 2.5 m	**151690**	**KMEB-1-230AC-2,5**
		Length 5 m	**151691**	**KMEB-1-230AC-5**
Plug socket				
	Plug socket, angled, 3-pin, screw terminal		**151687**	**MSSD-EB**
	Plug socket, angled, 3-pin, insulation displacement connection		**192745**	**MSSD-EB-S-M14**
H-rail mounting				
	For manifold block		**162556**	**CPV10/14-VI-BG-NRH-35**
Blanking plug				
	For G¼ thread	10 pieces	**3568**	**B-¼**
	For G⅜ thread	10 pieces	**3570**	**B-⅜**
Inscription label				
	For solenoid valve	80 labels in frame	**197259**	**MH-BZ-80X**
H-rail				
		2 m	**35430**	**NRH-35-2000**
Blanking plate				
	For manifold block		**525239**	**MHAP4-BP-3**
Silencer				
			➔ Internet: uc	
Push-in fittings				
			➔ Internet: quick star	