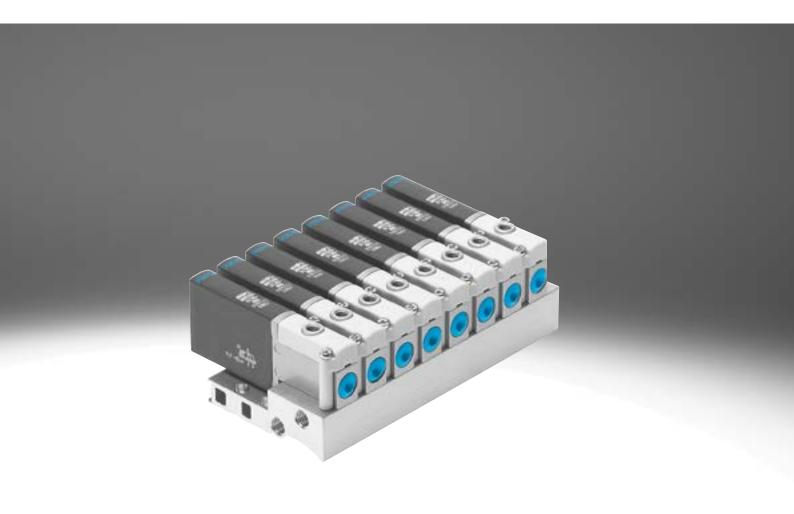
Solenoid valves MH2, MH3, MH4, fast-switching valves





Key features

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

Pros that switch as fast as 2 milliseconds

Speed, dynamic response and precision are more sought after than ever before in modern automation. The solution lies in pneumatic components. The result: shorter cycle times in return for comparatively low investment costs for the components. Maximum process reliability, sturdiness and service life are guaranteed.

High speed in production

The fast-switching valves are a technological treat for all things high-speed. With switching times ≤ 2 ms and a repetition accuracy ≤ 0.2 ms, they represent the pinnacle of what is technologically achievable worldwide – even in 24-hour continuous operation with over 500 million cycles.

Simple to retrofit in existing systems, or setting the pace for newly designed systems. Naturally compact, including maximum component density. Indispensable for sorting parts using an air ejector, in flap control systems, for gluing, dispensing, packaging and, of course, also suitable for pick & place vacuum applications, for example (continuous holding not possible).

Faster switching

Extremely short switching times enable short cycle times. Extremely precise switching makes it possible to control the timing of process sequences accurately.

High output and very good machine utilisation are included. Excellent repetition accuracy of switching times ensures consistent processes, improves process and part quality and reduces rejects and rework.

Faster installation

With a variety of connection options such as thread or integrated push-in tubing connectors and a range of mounting options for individual valves or valve manifold assembly, the installation can be perfectly adapted to onsite circumstances while the footprint is kept to a minimum.

Fast-switching valves can be used directly in the application without additional protective measures. As a result, very short pneumatic lines guarantee short signal paths and fast response times.

Key features

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



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

Advantages for designers



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

Advantages for installation



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

Advantages for purchasers



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

Key features

Fast and precise – sturdy and economical

High performance, process stability and extremely easy handling

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

Integrated: the fast-switching electronics

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

Optimised: systems and processes

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

Key features

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

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

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

Length means losses – focus on tubing

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

Small and nearby – the clever alternative

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

Small and fast – a good combination

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

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

Product range overview

Function Circuit symbol		Design	Switching time [ms]				Operating voltage	Free of copper and	→ Page/
			Off ²⁾	On ²⁾	Off	On	[V DC]	PTFE	Internet
3/2-way valve ¹⁾	Standard nominal flo	ow rate 100 l/min							
	2	Individual valve	2	1.7	3.5	7	24	•	9
	12 1 3	Semi in-line valve	2	1.7	3.5	7	24	•	22
		Sub-base valve	2	1.7	3.5	7	24	•	39
	21								
	110 7 111 33								

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

Function	Circuit symbol	Design	Switching time [ms]		Operating voltage	Free of copper and	→ Page/	
			Off	On	[V DC]	PTFE	Internet	
5/2-way valve	ve Standard nominal flow rate 100 l/min							
	14 2	Individual valve	1.7	1.9	24		16	
	14 J J J J J J J J J J J J J J J J J J J	Semi in-line valve	1.7	1.9	24	•	31	
		Sub-base valve	1.7	1.9	24	•	48	

Design		Individual valve		Semi in-line valv	e	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		·					
$\overline{}$	Direct mounting	•	•	_	-	_	_
	Individual sub-base	-	-	•	•	•	•
30	Manifold assembly	-	-	•	•	•	
Moulded-in cable	Direct mounting						
	Individual sub-base	<u> </u>	_				_
9 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Manifold assembly	-	_	_	-	-	-

Solenoid valves MH3, fast-switching valves

Product range overview

Function	Circuit symbol	Design	Switching time [ms]				Operating voltage	Free of copper and	→ Page/
			Off ²⁾	On ²⁾	Off	On	[V DC]	PTFE	Internet
3/2-way valve ¹⁾	Standard nominal flo	ow rate 200 l/min							
	2	Individual valve	2.8	2.3	4.5	8.3	24	•	56
	12 T T W	Semi in-line valve	2.8	2.3	4.5	8.3	24		63
		Sub-base valve	2.8	2.3	4.5	8.3	24	•	72
	110 Z T T W 11 33								

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

Mounting options Design		Individual valve	Semi in-line valve	Sub-base valve
Plug vanes		marriadat vatve	Semi in tine valve	Sub suse valve
The state of the s	Direct mounting	•	-	-
	Individual sub-base	-		•
	Manifold assembly	-	•	•
Moulded-in cable	Direct manufact	_		
//	Direct mounting Individual sub-base	•		
	Manifold assembly		•	
	maillold assembly		•	•

Product range overview

Function Circuit symbol		Design	Switching time [ms]				Operating voltage	Free of copper and	→ Page/
			Off ²⁾	On ²⁾	Off	On	[V DC]	PTFE	Internet
3/2-way valve ¹⁾ Standard nominal flow rate 400 l/min									
	2	Individual valve	3.5	3.5	5	10.5	24		81
	12 1 3	Semi in-line valve	3.5	3.5	5	10.5	24		86
		Sub-base valve	3.5	3.5	5	10.5	24	•	95
	21								
	110 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7								

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

Mounting options				
Design		Individual valve	Semi in-line valve	Sub-base valve
Plug vanes				
(No.	Direct mounting		_	_
	Individual sub-base	-	•	•
	Manifold assembly	-	•	•
Moulded-in cable				
	Direct mounting		_	-
	Individual sub-base	-		
	Manifold assembly	-	•	•

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

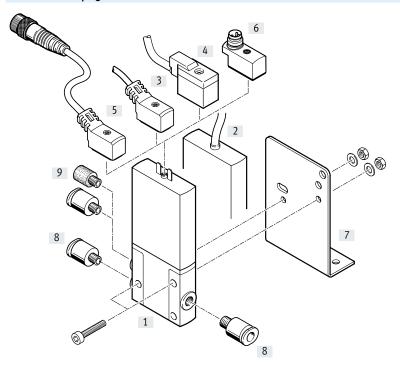
Type codes

001	Series				
MHA2	Solenoid valve MHA2				
MHE2	Solenoid valve MHE2				
MHP2	Solenoid valve MHP2				
MHA3	Solenoid valve MHA3				
MHE3	Solenoid valve MHE3				
MHP3	Solenoid valve MHP3				
MHA4	Solenoid valve MHA4				
MHE4	Solenoid valve MHE4				
MHP4	Solenoid valve MHP4				
002	Drive system				
М	Solenoid, switching				
003	Nominal operating voltage				
1	24 V DC				
004	Manual override				
Н	Non-detenting Non-detenting				
005	Valve function				
3/2	3/2-way valve				
5/2	5/2-way valve				

006	Normal position	
	5/2-way valve	
G	Closed	
0	Open	
007	Pneumatic connection	
2	Sub-base, nominal width 2 mm	
3	Sub-base, nominal width 3 mm	
4	Sub-base, nominal width 4 mm	
1/8	Thread G1/8	
1/4	Thread G1/4	
M5	Thread M5	
M7	Thread M7	
QS-4	Push-in connector, 4 mm	
QS-6	Push-in connector 6 mm	
QS-8	Push-in connector 8 mm	
008	Electrical connection	
	Plug tabs	
K	Moulded cable, 2.5 m long	

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

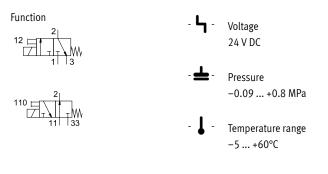
Connection with plug vanes – Connection with moulded-in cable



Desig	nation	Description	→ Page/Internet
[1]	Individual valve With plug vanes MHE2		14
[2]	Individual valve MHE2K	With moulded-in cable, IP55	14
[3]	Connecting cable NEBV	PUR cable, signal status indication with LED, IP65	15
[4]	Plug socket with cable KMYZ-4	PVC cable, without signal status indication, IP50	15
[5]	Connecting cable NEBV	PUR cable, signal status indication with LED, plug M8x1 3-pin, IP65	15
[6]	Adapter VAVE-C8	For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65	15
[7]	Mounting bracket MHE2-BG-L	For wall mounting	15
[8]	Push-in fittings QS	For connecting compressed air tubing with standard O.D.	15
[9]	Silencer UC	For fitting in exhaust ports	15

Solenoid valves MHE2, fast-switching valves

Datasheet – Individual valve, 3/2-way valve





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

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

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

Datasheet – Individual valve, 3/2-way valve

Operating and environmental conditions				
			With fast-switching electronics	Without fast-switching electronics
Operating medium			Compressed air to ISO 8573-1:2010 [7:4:4]	
Note on the operating/pilot medium			Lubricated operation possible (in which case	e lubricated operation will always be required)
Operating pressure		[MPa]	-0.09 +0.8	
		[bar]	-0.9 +8	
	Reversible	[MPa]	-0.09 +0.1	
		[bar]	-0.9 +1	
		[psi]	-13.05 +14.5	
Ambient temperature		[°C]	-5 +60	
Temperature of medium		[°C]	-5 +60	
Restricted ambient temperature and temperature of n	nedium		As a function of switching frequency (see	-
			graph)	
Corrosion resistance class CRC ¹⁾			2	2
CE marking (see declaration of conformity)			To EU EMC Directive ²⁾	_
KC mark			KC EMC	_
Certification			c UL us - Recognized (OL)	c UL us - Recognized (OL)
			RCM	-
Shock resistance			Shock test with severity level 2 to FN 94201	7-5 and EN 60068-2-27
Vibration resistance			Transport application test with severity level	l 2 to FN 942017-4 and EN 60068-2-6

¹⁾ Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

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

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

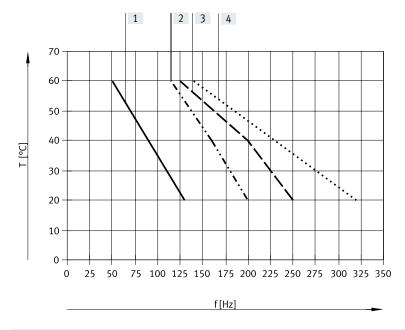
Switching times and frequencies				
			With fast-switching electronics	Without fast-switching electronics
Switching time	On	[ms]	1.7	7
	Off	[ms]	2	3.5
Tolerance for switching time	On	[%]	+1030	-
	Off	[%]	+1030	-
Switching time variation from 1 Hz upwards		[ms]	0.2	-
Maximum switching frequency		[Hz]	330	130

Materials	
Housing	Coated die-cast zinc
Cable sheath	PUR
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	Free of copper and PTFE
	RoHS-compliant
PWIS conformity	VDMA24364-B1/B2-L

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

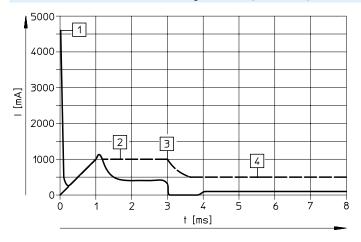
Datasheet - Individual valve, 3/2-way valve

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



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

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



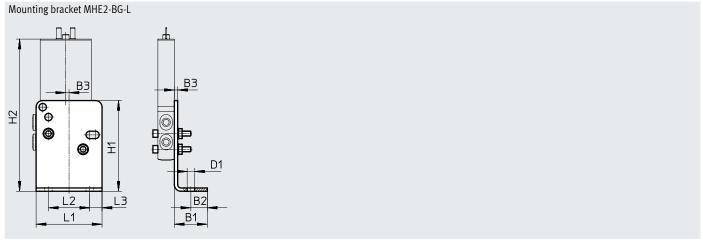
----- Internal current in the coil

External current in the supply line

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

Datasheet – Individual valve, 3/2-way valve

Dimensions Valve with plug vanes or moulded-in cable MHE2-...-3/0...-QS-4 MHE2-...-3/0...-QS-4 D1 L2 L3 B1 B1 Manual override, non-detenting 12 Plug vanes 13 Cable, 2.5 m Cable, 2.5 m Cable, 2.5 m



Туре	B1	B2	В3	D1	D2 Ø	D3 Ø	H1	H2	Н3	H4	L1	L2	L3	L4	L5	L6	L7	L8	L9
MHE23/0M7	10	-	-	M7	-	3.4	34	-	31	21	73	32	16.5	16	7	12	10.5	16.5	0.5
MHE23/0QS-4	10	-	-	-	4	3.4	34	40.4	31	21	73	32	16.5	16	7	12	10.5	16.5	0.5
MHE2-BG-L	20	10	2	4.5	-	-	55	92.3	-	-	40	25	7.5	-	-	-	-	ı	-

Solenoid valves MHE2, fast-switching valves

Datasheet – Individual valve, 3/2-way valve

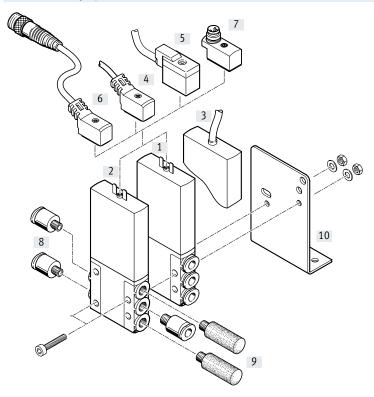
Ordering data						
					Part no.	Туре
Valves						
<u> </u>	Electrical connection:	With fast-switching	Pneumatic connection: thread	Normally open	196151	MHE2-MS1H-3/20-M7
	2-pin plug	electronics, switching	M7	Normally closed	196131	MHE2-MS1H-3/2G-M7
		time 2 ms	Pneumatic connection: push-in	Normally open	196155	MHE2-MS1H-3/20-QS-4
2			connector for tubing O.D. 4 mm	Normally closed	196135	MHE2-MS1H-3/2G-QS-4
		Without fast-switching	Pneumatic connection: thread	Normally open	196150	MHE2-M1H-3/20-M7
		electronics, switching	M7	Normally closed	196130	MHE2-M1H-3/2G-M7
		time 7 ms	Pneumatic connection: push-in	Normally open	196154	MHE2-M1H-3/20-QS-4
			connector for tubing O.D. 4 mm	Normally closed	196134	MHE2-M1H-3/2G-QS-4
	Electrical connection:	With fast-switching	Pneumatic connection: thread	Normally open	196153	MHE2-MS1H-3/20-M7-K
	cable	electronics, switching	M7	Normally closed	196133	MHE2-MS1H-3/2G-M7-K
200		time 2 ms	Pneumatic connection: push-in	Normally open	196157	MHE2-MS1H-3/20-QS-4-K
2021			connector for tubing O.D. 4 mm	Normally closed	196137	MHE2-MS1H-3/2G-QS-4-K
		Without fast-switching	Pneumatic connection: thread	Normally open	196152	MHE2-M1H-3/20-M7-K
		electronics, switching	M7	Normally closed	196132	MHE2-M1H-3/2G-M7-K
		time 7 ms	Pneumatic connection: push-in	Normally open	196156	MHE2-M1H-3/20-QS-4-K
			connector for tubing O.D. 4 mm	Normally closed	196136	MHE2-M1H-3/2G-QS-4-K

Datasheet – Individual valve, 3/2-way valve

Ordering data						
					Part no.	Туре
Connecting cable (for	r valves with 2-pin plug)					Datasheets → Internet: nebv
	2-pin socket,	PUR cable,	Signal status	Length 2.5 m	8047671	NEBV-Z4WA2L-P-E-2.5-N-LE2-S1
	open cable end 2-wire	degree of protection	indication with LED	Length 5 m	8047672	NEBV-Z4WA2L-P-E-5-N-LE2-S1
		IP65		Length 10 m	8047670	NEBV-Z4WA2L-P-E-10-N-LE2-S1
		PVC cable,	Without signal status	Length 0.5 m	193690	KMYZ-4-24-0.5-B
		degree of protection IP40	indication	Length 2.5 m	193691	KMYZ-4-24-2.5-B
	2-pin socket, plug	PUR cable,	Signal status	Length 0.5 m	8047673	NEBV-Z4WA2L-P-E-0.5-N-M8G3-S1
	M8x1 3-pin	degree of protection IP65	indication with LED	Length 2.5 m	8047674	NEBV-Z4WA2L-P-E-2.5-N-M8G3-S1
Adapter (for valves w	ith 2-pin plug)					
	2-pin socket	Signal status	Plug M8, 3-pin		571686	VAVE-C8-1R8
		indication with LED	Plug M8, 4-pin		573194	VAVE-C8-1R1
Wall mounting						
	Mounting bracket				196165	MHE2-BG-L
Silencer						Datasheets → Internet: uc
	Push-in sleeve with O.D.	. 4 mm		1 piece	165006	UC-QS-4H
	With M7 threaded conn	ection		1 piece	161418	UC-M7
				50 pieces	534218	UC-M7-50
	,				'	
Push-in fitting						Datasheets → Internet: qs
	Male thread M7 with int	ernal hex for tubing O.D.	4 mm	10 pieces	153319	QSM-M7-4-I
		· ·		100 pieces	133006	QSM-M7-4-I-100
-			6 mm	10 pieces	153321	QSM-M7-6-I
	Male thread M7 with ex	ternal hex nush-in	4 mm	10 pieces	186352	QSML-M7-4
	L-fitting rotatable throug		7	100 pieces	130773	QSML-M7-4-100
	L many rotatable tillous	550 , 101 tubility 0.D.	6 mm	100 pieces	186353	OSML-M7-6
				100 pieces		QSML-M7-6-100
				100 pieces	130774	Q3MIT-MI/-0-100

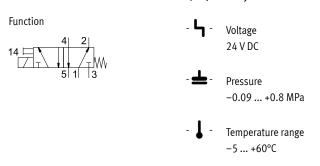
Peripherals overview – Individual valve, 5/2-way valve

Connection with plug vanes - Connection with moulded-in cable



Desig	nation	Description	→ Page/Internet
[1]	Individual valve MHE2QS-4	With plug vanes and push-in connector for standard O.D. tubing	21
[2]	Individual valve MHE2M7	With plug vanes and connection M7	21
[3]	Individual valve MHE2K	With moulded-in cable, IP55	21
[4]	Connecting cable NEBV	PUR cable, signal status indication with LED, IP65	21
[5]	Plug socket with cable KMYZ-4	PVC cable, without signal status indication, IP50	21
[6]	Connecting cable NEBV	PUR cable, signal status indication with LED, plug M8x1 3-pin, IP65	21
[7]	Adapter VAVE-C8	For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65	21
[8]	Push-in fittings QS	For connecting compressed air tubing with standard O.D.	21
[9]	Silencer UC	For fitting in exhaust ports	21
[10]	Mounting bracket MHE2-BG-L	For wall mounting	21

Datasheet – Individual valve, 5/2-way valve





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

Datasheet – Individual valve, 5/2-way valve

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

¹⁾ Corrosion resistance class CRC 2 to Festo standard FN 940070

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

Electrical data				
Electrical connection			2-pin plug	Cable
Operating voltage		[V DC]	24	
Permissible voltage fluctuat	ions	[%]	±10	
Power consumption	Low-current phase	[W]	1.625	
	High-current phase	[W]	6.5	
Reverse polarity protection			Bipolar	
Duty cycle		[%]	100	
Additional functions			Spark arresting	
			Holding current reduction	
			Protective circuit	
Degree of protection to EN 6	0529		IP65	IP55

Switching times and frequencies			
Switching time	On	[ms]	1.9
	Off	[ms]	1.7
Tolerance for switching time	On	[%]	+1030
	Off	[%]	+1030
Switching time variation from 1 Hz		[ms]	0.2
upwards			
Maximum switching frequency		[Hz]	300

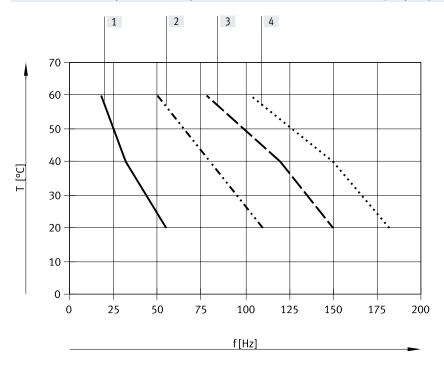
Materials	
Housing	Coated die-cast zinc
Cable sheath	PUR
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	Free of copper and PTFE
	RoHS-compliant
PWIS conformity	VDMA24364-B1/B2-L

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

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

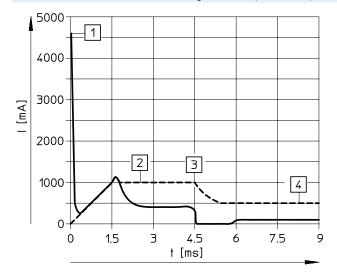
Datasheet - Individual valve, 5/2-way valve

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



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

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



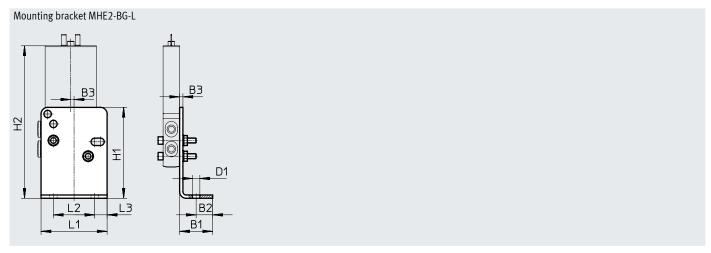
----- Internal current in the coil
------ External current in the supply line

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

<u>L10</u>

L8

Datasheet – Individual valve, 5/2-way valve



Туре	B1	B2	В3	D1	D2 Ø	D3 Ø	H1	H2	Н3	H4	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
MHE25/2-M7	10	-	-	M7	-	3.4	34	-	31	21	84	43	16.3	25	9	11.5	10.5	16.5	0.5	11
MHE25/2-QS-4	10	-	-	-	4	3.4	34	40.4	31	21	84	43	16.3	25	9	11.5	10.5	16.5	0.5	11
MHE2-BG-L	20	10	2	4.5	-	-	55	92.3	-	-	40	25	7.5	-	-	-	-	-	-	-

[1] Manual override, non-detenting

[2] Plug vanes

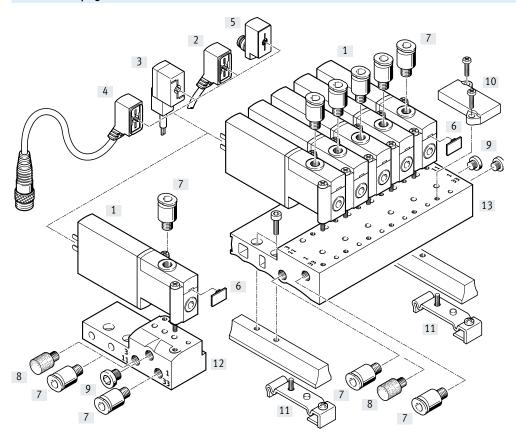
[3] Cable, 2.5 m

Datasheet – Individual valve, 5/2-way valve

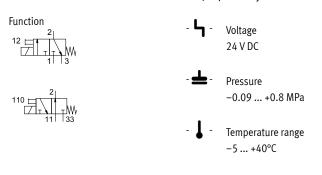
Ordering data					Part no.	Туре		
Valves								
	Electrical connection:	With fast-switching	Pneumatic connection:		525113	MHE2-MS1H-5/2-M7		
0 2	2-pin plug	electronics, switching time 2 ms	Pneumatic connections tubing O.D. 4 mm	push-in connector for	525117	MHE2-MS1H-5/2-QS-4		
	Electrical connection:	With fast-switching	Pneumatic connection:	thread M7	525115	MHE2-MS1H-5/2-M7-K		
9 20 0 20 20 0 20 20	cable	electronics, switching time 2 ms	Pneumatic connections tubing O.D. 4 mm	push-in connector for	525119	MHE2-MS1H-5/2-QS-4-K		
C								
connecting cable (for t	valves with 2-pin plug)	DUD cable dagge of	Cignal status	Longth 2.5	0047674	Datasheets → Internet: nebv		
	2-pin socket, open cable end 2-wire	PUR cable, degree of protection IP65	Signal status indication with LED	Length 5 m	8047671 8047672	NEBV-Z4WA2L-P-E-2.5-N-LE2-S1 NEBV-Z4WA2L-P-E-5-N-LE2-S1		
//	open cable end 2-wife	piotection iros	mulcation with LED	Length 5 m Length 10 m	8047672	NEBV-Z4WAZL-P-E-5-N-LEZ-S1 NEBV-Z4WAZL-P-E-10-N-LEZ-S1		
		PVC cable, degree of	Without signal status		193690	KMYZ-4-24-0.5-B		
		protection IP40	indication	Length 0.5 m Length 2.5 m	193691	KMYZ-4-24-0.5-B		
	2-pin socket, plug	PUR cable, degree of	Signal status	Length 0.5 m	8047673	NEBV-Z4WA2L-P-E-0.5-N-M8G3-S1		
	M8x1 3-pin	protection IP65	indication with LED	Length 2.5 m	8047674	NEBV-Z4WA2L-P-E-2.5-N-M8G3-S1		
Adapter (for valves wit		le: 1.11	DI MO 2 :		F74404	VANT CO 4DO		
	2-pin socket	Signal status indica- tion with LED	Plug M8, 3-pin Plug M8, 4-pin		571686 573194	VAVE-C8-1R8 VAVE-C8-1R1		
Wall mounting								
	Mounting bracket				196165	MHE2-BG-L		
Silencer						Datasheets → Internet: uc		
	Push-in sleeve with O.D.	4 mm		1 piece	165006	UC-QS-4H		
	With M7 threaded conne			1 piece	161418	UC-M7		
				50 pieces	534218	UC-M7-50		
Push-in fitting						Datasheets → Internet: qs		
	Male thread M7 with int	ernal hex for tubing O.D.	4 mm	10 pieces	153319	QSM-M7-4-I		
				100 pieces	133006	QSM-M7-4-I-100		
			6 mm	10 pieces	153321	QSM-M7-6-I		
	Male thread M7 with ext		4 mm	10 pieces	186352	QSML-M7-4		
	L-fitting rotatable throug	th 360º, for tubing O.D.		100 pieces	130773	QSML-M7-4-100		
			6 mm	10 pieces	186353	QSML-M7-6		
				100 pieces	130774	QSML-M7-6-100		

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

Connection via plug vanes



Desig	nation	Description	→ Page/Internet
[1]	Semi in-line valve MHP2	With plug vanes	29
[2]	Connecting cable NEBV	PUR cable, signal status indication with LED, IP65	29
[3]	Plug socket with cable KMYZ-4	PVC cable, without signal status indication, IP50	29
[4]	Connecting cable NEBV	PUR cable, signal status indication with LED, plug M8x1 3-pin, IP65	29
[5]	Adapter VAVE-C8	For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65	29
[6]	Inscription label MH-BZ-80X	For identifying the valves	30
[7]	Push-in fittings QS	For connecting compressed air tubing with standard O.D.	30
[8]	Silencer UC	For fitting in exhaust ports	30
[9]	Blanking plug B	For sealing unused ports	30
[10]	Cover plate MHAP2-BP-3	For sealing vacant positions	29
[11]	H-rail mounting MHAP2-BG-NRH-35	For mounting the manifold block on H-rails to EN 60715	29
[12]	Individual sub-base MHA2-AS-3-M5	For semi in-line valve, the individual sub-base is also used for the sub-base valve; here the outlet port must be sealed with a blanking plug	29
[13]	Manifold block MHP2-PR3	For semi in-line valves	29





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

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

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

Operating and environmental conditions				
			With fast-switching electronics	Without fast-switching electronics
Operating medium	•		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on the operating/pilot medium			Lubricated operation possible (in which	ch case lubricated operation will always be required)
Operating pressure		[MPa]	-0.09 +0.8	
		[bar]	-0.9 +8	
	Reversible	[MPa]	-0.09 +0.1	
		[bar]	-0.9 +1	
		[psi]	-13.05 +14.5	
Ambient temperature		[°C]	-5 +40	
Temperature of medium		[°C]	-5 +40	
Restricted ambient temperature and temperature of	medium		As a function of switching frequency (s	see graph)
Corrosion resistance class CRC ¹⁾			2	
CE marking (see declaration of conformity)			To EU EMC Directive ²⁾	-
KC mark			KC EMC	-
Certification			c UL us - Recognized (OL)	c UL us - Recognized (OL)
			RCM	-
Shock resistance			Shock test with severity level 2 to FN 9	942017-5 and EN 60068-2-27
Vibration resistance			Transport application test with severit EN 60068-2-6	y level 2 to FN 942017-4 and

¹⁾ Corrosion resistance class CRC 2 to Festo standard FN 940070

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

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

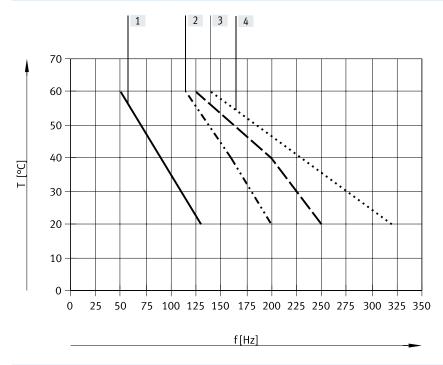
Switching times and frequencies				
			With fast-switching electronics	Without fast-switching electronics
Switching time	On	[ms]	1.7	7
	Off	[ms]	2	3.5
Tolerance for switching time	On	[%]	+1030	-
	Off	[%]	+1030	-
Switching time variation from 1 Hz		[ms]	0.2	-
upwards				
Maximum switching frequency		[Hz]	330	130

Materials	
Housing	Coated die-cast zinc
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	Free of copper and PTFE
	RoHS-compliant
PWIS conformity	VDMA24364-B1/B2-L

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

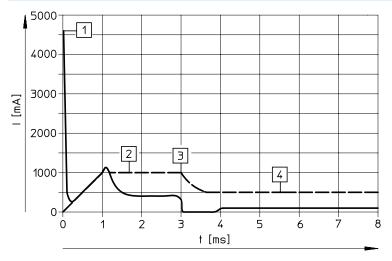
²⁾ For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/mh2 -> Support/Downloads.

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



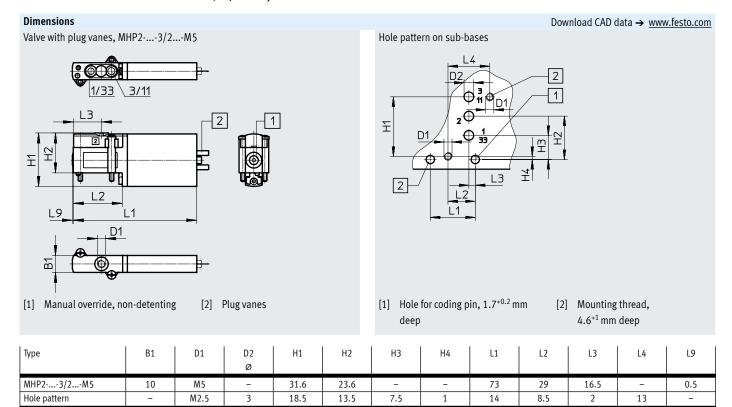
- [1] Manifold, 6 valves, unpressurised
- [2] Manifold, 6 valves, through-flow, 0.6 MPa
- 3] Individual valve, unpressurised
- [4] Individual valve, through-flow,0.6 MPa

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



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

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

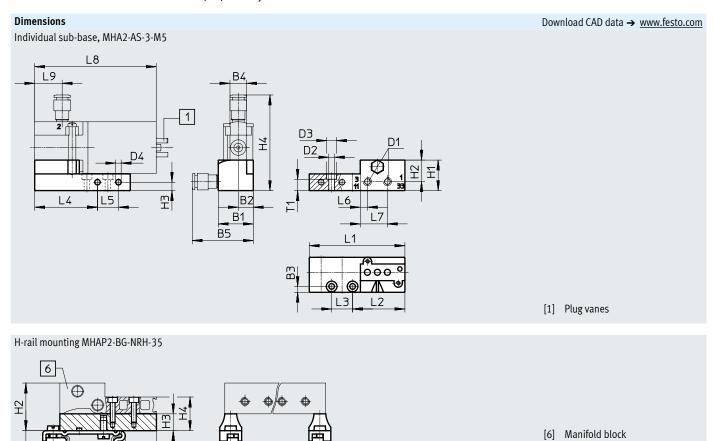


[7] DIN mounting rail

See dimensions table for

manifold block used

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



Туре	B1	B2	В3	B4	B5	D1	D2 Ø	D3 Ø	D4 Ø	H1	H2	Н3	H4	L1	L2	L3	L4	L5	L6	L7	L8	L9	T1
MHA2-AS-3-M5	21	9	3.5	10	36.6	M5	3.4	6	3.3	18.3	12.9	5	57.4	57.4	31.4	12.6	37.7	12.6	4.3	16.3	73	16.5	6.8
MHAP2-BG-NRH-35	49.1	67.6	_	_	_	_	_	_	-	10.7	28.3	10	20	-	*	_	6.5	-	_	-	_	-	-

^{*} See dimensions table for manifold block used

В2

Dimensions Download CAD data → www.festo.com Manifold assembly, MHP2-PR...-3 В6 2 D2 L8 В1 L1 В4 B3 L3 L2 [1] Plug vanes [3] Silencer [2] Cover plate В1 D1 D2 D3 Н4 L8 Туре B2 В3 B5 Н1 H2 Н3 Н5 Н6 L4 L5 L6 T1 Ø Ø MHP2-PR...-3 57.4 31.4 12.6 12 4.3 73 M7 3.3 6.3 18.3 10 8.2 4.9 56.7 25.1 12 14 3.5 24.5 15.4 6.8

Туре		Number of valve positions				
		2	4	6	8	10
MHP2-PR3	L1	38	66	94	122	150
	L2	31	59	87	115	143
	L3	14	42	70	98	126

· 🖣 - Note

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

Ordering data					1	1
			:		Part no.	Туре
Valves	Mish foot suitable and attending	Ciabi	Nav		10(1/2	MUD2 MC4U 2/20 MF
	With fast-switching electronics	Switching time on	Normally open		196143	MHP2-MS1H-3/20-M5
	Maril and Control of the Control	1.7 ms	Normally closed		196123	MHP2-MS1H-3/2G-M5
	Without fast-switching electronics	Switching time on	Normally open		196142	MHP2-M1H-3/2O-M5
		7 ms	Normally closed		196122	MHP2-M1H-3/2G-M5
Manifold rail						
	Individual sub-base ¹⁾			1 valve position	197438	MHA2-AS-3-M5
	Pneumatic connection: thread M5					
\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	Manifold block			2 valve positions	197442	MHP2-PR2-3
	Pneumatic connection: thread M7			4 valve positions	197443	MHP2-PR4-3
				6 valve positions	197444	MHP2-PR6-3
				8 valve positions	197445	MHP2-PR8-3
				10 valve positions	197446	MHP2-PR10-3
Cover plate						
e e	Vacant valve positions must be sea	led with a cover plate	 e		197470	MHAP2-BP-3
		nea min a coron piac	-		257476	
Connecting cable		I nun III I	Tar	I		Datasheets → Internet: nebv
	2-pin socket,	PUR cable, degree	Signal status	Length 2.5 m	8047671	NEBV-Z4WA2L-P-E-2.5-N-LE2-S1
	open cable end 2-wire	of protection IP65	indication with LED	Length 5 m	8047672	NEBV-Z4WA2L-P-E-5-N-LE2-S1
				Length 10 m	8047670	NEBV-Z4WA2L-P-E-10-N-LE2-S1
i de la companya della companya dell		PVC cable, degree	Without signal	Length 0.5 m	193690	KMYZ-4-24-0.5-B
		of protection IP40	status indication	Length 2.5 m	193691	KMYZ-4-24-2.5-B
	2-pin socket, plug M8x1 3-pin	PUR cable, degree	Signal status	Length 0.5 m	8047673	NEBV-Z4WA2L-P-E-0.5-N-M8G3-S1
		of protection IP65	indication with LED	Length 2.5 m	8047674	NEBV-Z4WA2L-P-E-2.5-N-M8G3-S1
Adapter	2-pin socket	Signal status indi-	Plug M8, 3-pin		571686	VAVE-C8-1R8
	2 pm socket	cation with LED	Plug M8, 4-pin		573194	VAVE-C8-1R1
<u> </u>		<u> </u>				
H-rail mounting						
	For 3/2-way solenoid valves				525053	MHAP2-BG-NRH-35
H-rail			,			
II-IAIL	To EN 60715			2 m	25/20	NDH 35 3000
	To EN 60715			2 m	35430	NRH-35-2000

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

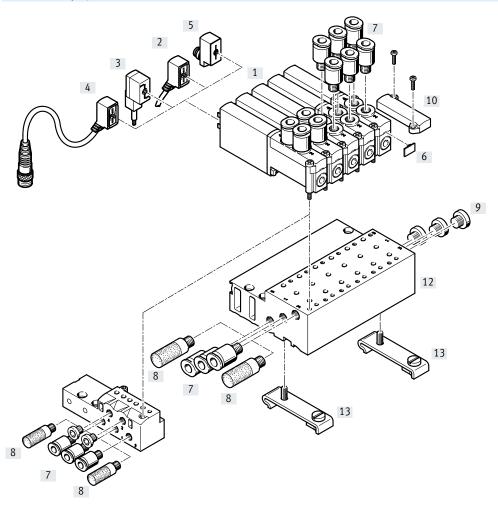
Solenoid valves MHP2, fast-switching valves

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

				Part no.	Туре
Silencer					Datasheets → Internet:
	With threaded connection	M5	1 piece	165003	UC-M5
			50 pieces	534217	UC-M5-50
		M7	1 piece	161418	UC-M7
			50 pieces	534218	UC-M7-50
ush-in fitting					Datasharda a latawad
usii-iii iittiiig	Male thread M5 with internal hex for tubing O.D.	4 mm	10 pieces	153315	Datasheets → Internet: QSM-M5-4-I
	Mate thread M5 with internal nex for tubing 0.D.	6 mm	10 pieces	153315	QSM-M5-4-I
	Male thread M7 with internal hex for tubing O.D.	4 mm	10 pieces	153317	QSM-M7-4-I
	Male tillead M7 with internal flex for tubing O.D.	4 111111	10 pieces		QSM-M7-4-I QSM-M7-4-I-100
		6 mm		133006	• • •
	Male thread M5 with external hex, push-in L-fitting		10 pieces	153321	QSM-M7-6-I OSML-M5-4
	rotatable through 360°, for tubing O.D.	4 mm	10 pieces	153333	
	Totalable tillough 500-, for tubing 0.b.	6	100 pieces	130771	QSML-M5-4-100
_		6 mm	10 pieces	153335	QSML-M5-6
	M 1 d 1 1 1 1 7 20 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1,	100 pieces	130772	QSML-M5-6-100
	Male thread M7 with external hex, push-in L-fitting	4 mm	10 pieces	186352	QSML-M7-4
	rotatable through 360°, for tubing O.D.		100 pieces	130773	QSML-M7-4-100
		6 mm	10 pieces	186353	QSML-M7-6
			100 pieces	130774	QSML-M7-6-100
lanking plug					
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	For thread M5		10 pieces	3843	B-M5
	For thread M7		10 pieces	174309	B-M7
indian labal					
nscription label	Frank et l		100 : .:	407050	MU DZ GOV
	For solenoid valve		80 pieces in a frame	197259	MH-BZ-80X

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

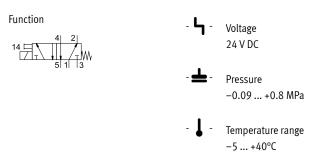
#### Connection via plug vanes



Desig	nation	Description	→ Page/Internet					
[1]	Semi in-line valve MHP2	37						
[2]	Connecting cable NEBV	g cable PUR cable, signal status indication with LED, IP65						
[3]	Plug socket with cable KMYZ-4	PVC cable, without signal status indication, IP50						
[4]	Connecting cable NEBV	37						
[5]	Adapter VAVE-C8	For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65	37					
[6]	Inscription label MH-BZ-80X	For identifying the valves	38					
[7]	Push-in fittings QS	For connecting compressed air tubing with standard O.D.	38					
[8]	Silencer UC	For fitting in exhaust ports	38					
[9]	Blanking plug B	For sealing unused ports	38					
[10]	Cover plate MHAP2-BP-5	For sealing vacant positions	37					
[11]	Individual sub-base MHA2-AS-5-M5	For semi in-line valve, the individual sub-base is also used for sub-base valves and must be sealed with a blanking plug here	37					
[12]	Manifold block MHP2-PR5	For semi in-line valves	37					
[13]	H-rail mounting CPV10/14-VI-BG-NRH-35	For mounting the manifold block on H-rails to EN 60715	37					

## Solenoid valves MHP2, fast-switching valves

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





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

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

¹⁾ Corrosion resistance class CRC 2 to Festo standard FN 940070

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

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

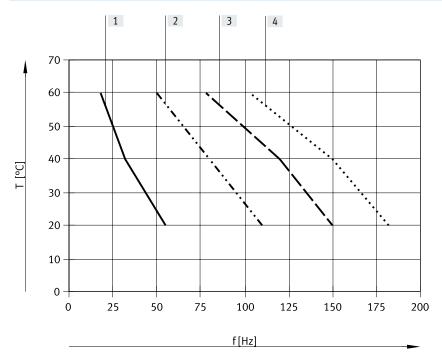
Electrical data			
Electrical connection			Plug, 2-pin
Operating voltage [V DC]		[V DC]	24
Permissible voltage fluctuati	ions	[%]	±10
Power consumption	Low-current phase	[W]	1.625
	High-current phase	[W]	6.5
Reverse polarity protection	Reverse polarity protection		Bipolar
Duty cycle [%]		[%]	100
Additional functions			Spark arresting
			Holding current reduction
			Protective circuit
Degree of protection to EN 6	0529		IP65

Switching times and frequencies			
Switching time	On	[ms]	1.9
	Off	[ms]	1.7
Tolerance for switching time	On	[%]	+1030
	Off	[%]	+1030
Maximum switching frequency		[Hz]	300
Switching time variation from 1 Hz		[ms]	0.2
upwards			

Materials								
Housing	Coated die-cast zinc							
Seals	HNBR, NBR							
Screws	Galvanised steel							
Note on materials	Free of copper and PTFE							
	RoHS-compliant							
PWIS conformity	VDMA24364-B1/B2-L							

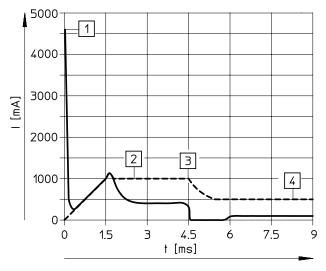
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

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



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

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



----- Internal current in the coil

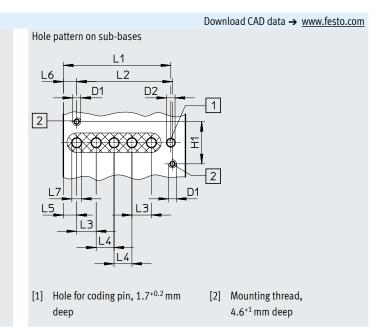
External current in the supply line

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

# Dimensions Valve with plug vanes, MHP2-...-5/2...-M5 L9 L2 D1 **B**1 L8

[2] Plug vanes

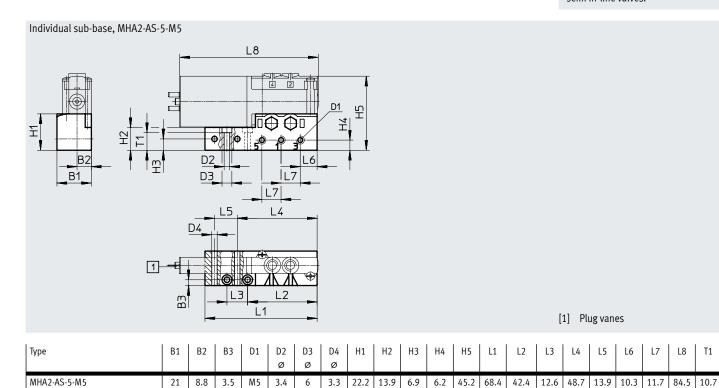
[1] Manual override, non-detenting



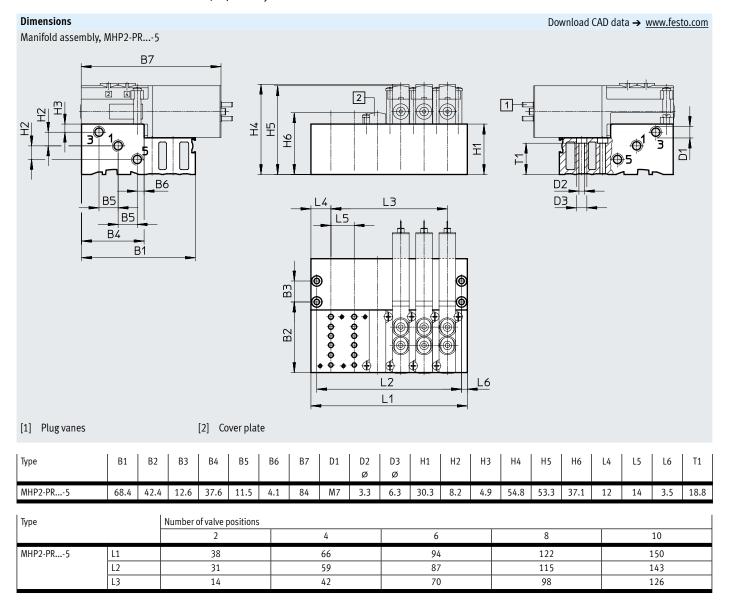
Туре	B1	D1	D2 Ø	H1	H2	Н3	H4	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
MHP25/2M5	10	M5	-	31	23	1.5	-	84	40	-	-	-	-	-	16.5	0.5	11
Hole pattern	_	M2.5	2.6	13	-	-	-	33.1	29.5	6	5.5	4.1	4.1	3	_	_	-



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



T1



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

Ordering data					Part no.	Туре
Valves						
	With fast-switching electronics	Switching time on 1.9	ms		525105	MHP2-MS1H-5/2-M5
Manifold rail						
	Individual sub-base ¹⁾ Pneumatic connection: thread M	5		1 valve position	525120	MHA2-AS-5-M5
\\ \dag{\chi_{\chi_{\chi_{\chi}}}}	Manifold block			2 valve positions	525122	MHP2-PR2-5
	Pneumatic connection 1, 3, 5: th	read M7		4 valve positions	525123	MHP2-PR4-5
				6 valve positions	525124	MHP2-PR6-5
				8 valve positions	525125	MHP2-PR8-5
				10 valve positions	525126	MHP2-PR10-5
Cover plate		1 1 51				Laurana nn a
	Vacant valve positions must be s	ealed with a cover plate	2.		525132	MHAP2-BP-5
Connecting cable						Datasharta a latawat a la
Connecting capite	2-pin socket,	PUR cable, degree of	Signal status	Length 2.5 m	8047671	Datasheets → Internet: neb
	open cable end 2-wire	protection IP65	indication with LED	Length 5 m	8047671	NEBV-Z4WA2L-P-E-5-N-LE2-S1
//	open cable end 2-wire	protection ii 03	Indication with LLD	Length 10 m	8047672	NEBV-Z4WA2L-P-E-10-N-LE2-S1
		PVC cable, degree of	Without signal	Length 0.5 m	193690	KMYZ-4-24-0.5-B
		protection IP40	status indication	Length 2.5 m	193691	KMYZ-4-24-2.5-B
	2-pin socket, plug M8x1 3-pin	PUR cable, degree of	Signal status	Length 0.5 m	8047673	NEBV-Z4WA2L-P-E-0.5-N-M8G3-S1
		protection IP65	indication with LED	Length 2.5 m	8047674	NEBV-Z4WA2L-P-E-2.5-N-M8G3-S1
Adapter						
	2-pin socket	Signal status	Plug M8, 3-pin		571686	VAVE-C8-1R8
	,	indication with LED	Plug M8, 4-pin		573194	VAVE-C8-1R1
H-rail mounting						
	For 5/2-way solenoid valves				162556	CPV10/14-VI-BG-NRH-35
H-rail						
The state of the s	To EN 60715			2 m	35430	NRH-35-2000

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

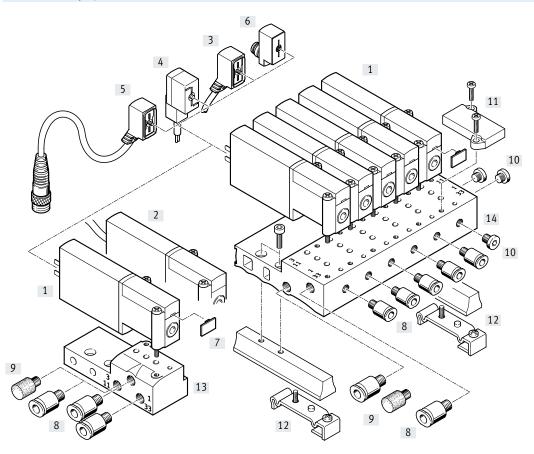
# Solenoid valves MHP2, fast-switching valves

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

				Part no.	Туре
Silencer					Datasheets → Internet: u
	With threaded connection	M5	1 piece	165003	UC-M5
			50 pieces	534217	UC-M5-50
		M7	1 piece	161418	UC-M7
			50 pieces	534218	UC-M7-50
Push-in fitting					Datasheets → Internet: o
was in members	Male thread M5 with internal hex for tubing O.D.	4 mm	10 pieces	153315	QSM-M5-4-I
	mate amount of the material mexicon tubing orb.	6 mm	10 pieces	153317	QSM-M5-6-I
	Male thread M7 with internal hex for tubing O.D.	4 mm	10 pieces	153319	OSM-M7-4-I
		'	100 pieces	133006	QSM-M7-4-I-100
		6 mm	10 pieces	153321	QSM-M7-6-I
	Male thread M5 with external hex, push-in L-fitting	4 mm	10 pieces	153333	QSML-M5-4
	rotatable through 360°, for tubing O.D.		100 pieces	130771	QSML-M5-4-100
		6 mm	10 pieces	153335	QSML-M5-6
			100 pieces	130772	QSML-M5-6-100
	Male thread M7 with external hex, push-in L-fitting	4 mm	10 pieces	186352	QSML-M7-4
	rotatable through 360°, for tubing O.D.		100 pieces	130773	QSML-M7-4-100
		6 mm	10 pieces	186353	QSML-M7-6
			100 pieces	130774	QSML-M7-6-100
Blanking plug					
Dianking plug	For thread M5		10 pieces	3843	B-M5
	For thread M7		10 pieces	174309	B-M7
Inscription label	T		1		[
	For solenoid valve		80 pieces in a frame	197259	MH-BZ-80X

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

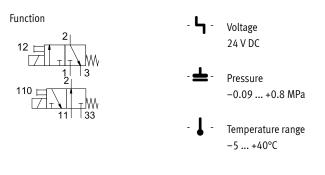
#### Connection with plug vanes – Connection with moulded-in cable



Desig	nation	Description	→ Page/Internet
[1]	Sub-base valve MHA2	With plug vanes	46
[2]	Sub-base valve MHA2K	With moulded-in cable, IP55	46
[3]	Connecting cable NEBV	PUR cable, signal status indication with LED, IP65	46
[4]	Plug socket with cable KMYZ-4	PVC cable, without signal status indication, IP50	46
[5]	Connecting cable NEBV	PUR cable, signal status indication with LED, plug M8x1 3-pin, IP65	46
[6]	Adapter VAVE-C8	For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65	47
[7]	Inscription label MH-BZ-80X	For identifying the valves	47
[8]	Push-in fittings QS	For connecting compressed air tubing with standard O.D.	47
[9]	Silencer UC	For fitting in exhaust ports	47
[10]	Blanking plug B	For sealing unused ports	47
[11]	Cover plate MHAP2-BP-3	For sealing vacant positions	46
[12]	H-rail mounting MHAP2-BG-NRH-35	For mounting the manifold block on H-rails to EN 60715	47
[13]	Individual sub-base MHA2-AS-3-M5	For sub-base valve	46
[14]	Manifold block MHA2-PR3-M5	For sub-base valve	46

## Solenoid valves MHA2, fast-switching valves

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





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

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

Operating and environmental conditions							
			With fast-switching electronics	Without fast-switching electronics			
Operating medium	*		Compressed air to ISO 8573-1:2010 [	7:4:4]			
Note on the operating/pilot medium			Lubricated operation possible (in which	ch case lubricated operation will always be required)			
Operating pressure		[MPa]	-0.09 +0.8				
		[bar]	-0.9 +8				
	Reversible	[MPa]	-0.09 +0.1				
		[bar]	-0.9 +1				
		[psi]	-13.05 +14.5				
Ambient temperature		[°C]	-5 +40				
Temperature of medium		[°C]	-5 +40				
Restricted ambient temperature and temperature of m	edium		As a function of switching frequency (see graph)				
Corrosion resistance class CRC ¹⁾			2				
CE marking (see declaration of conformity)			To EU EMC Directive ²⁾	-			
KC mark			KC EMC	-			
Certification			c UL us - Recognized (OL)	c UL us - Recognized (OL)			
			RCM	-			
Shock resistance			Shock test with severity level 2 to FN 9	42017-5 and EN 60068-2-27			
Vibration resistance			Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6				

¹⁾ Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

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

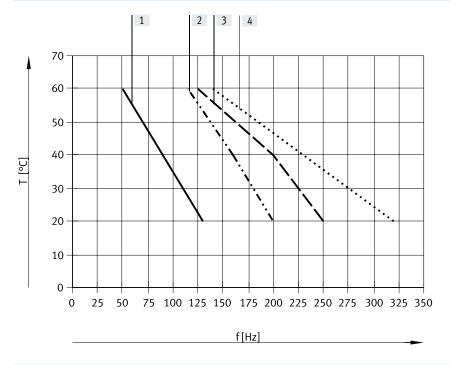
Electrical data				
			With fast-switching electronics	Without fast-switching electronics
Electrical connection			2-pin plug or cable	
Operating voltage		[V DC]	24	
Permissible voltage fluctuations		[%]	±10	
Power consumption		[W]	5 for approx. 3 ms (high-current phase, inrush current 1 A)	2.88
		[W]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

Switching times and frequencies				
			With fast-switching electronics	Without fast-switching electronics
Switching time	On	[ms]	1.7	7
	Off	[ms]	2	3.5
Tolerance for switching time	On	[%]	+1030	-
	Off	[%]	+1030	-
Switching time variation from 1 Hz		[ms]	0.2	-
upwards				
Maximum switching frequency		[Hz]	330	130

Materials	
Housing	Coated die-cast zinc
Cable sheath	PUR
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	Free of copper and PTFE
	RoHS-compliant
PWIS conformity	VDMA24364-B1/B2-L

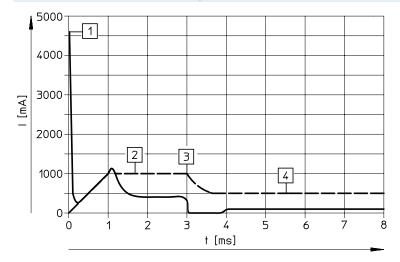
²⁾ For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/mh2 → Support/Downloads.

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



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

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

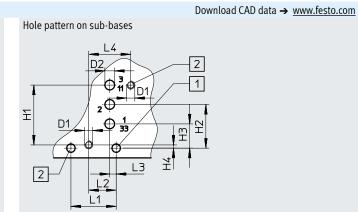


------ Internal current in the coil
------- External current in the supply line

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

# Dimensions

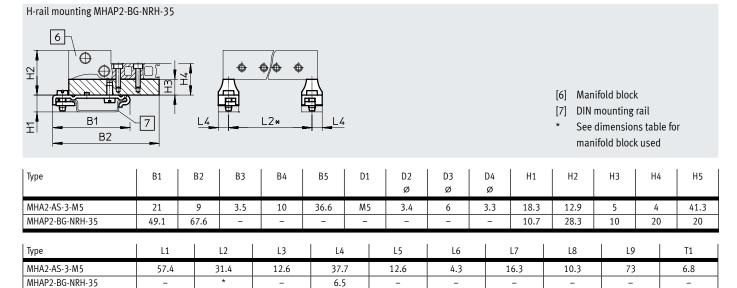
- [1] Manual override, non-detenting
- [2] Plug vanes
- [3] Cable, 2.5 m



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

Туре	B1	D1	D2 Ø	H1	H2	Н3	H4	L1	L2	L3	L4	L9
MHA23/2	10	-	-	31	23	-	-	73	29	-	-	0.5
Hole pattern	-	M2.5	3	18.5	13.5	7.5	1	14	8.5	2	13	_

# Download CAD data > www.festo.com Individual sub-base, MHA2-AS-3-M5 Individual sub-b



^{*} See dimensions table for manifold block used

#### Dimensions Download CAD data → www.festo.com Manifold assembly, MHA2-PR...-3-M5 В7 2 D2 B3 [1] Plug vanes [2] Cover plate [3] Silencer [4] Cable, 2.5 m Туре В1 В2 В4 В5 В6 В7 D1 D2 D3 D4 Н1 Н2 Н3 Н4 Н5 Н6 Н7 Ø Ø MHP2-PR...-3-M5 57.4 31.4 12.6 12 4.3 87.9 73 M7 3.3 6.3 M5 18.3 10 8.2 4.9 10.9 41.3 25.1 Туре T1 MHP2-PR...-3-M5 6.8 12 14 3.5 24.5 15.4 Number of valve positions Туре 8 10 4 6 MHP2-PR...-3-M5 38 66 94 122 150 L1 L2 31 59 87 115 143 L3 14 42 70 98 126



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

# Solenoid valves MHA2, fast-switching valves

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

Ordering data						
					Part no.	Туре
/alves						
$\sim$	Electrical connection:	With fast-switching el	ectronics,	Normally open	196139	MHA2-MS1H-3/20-2
	2-pin plug	switching time 2 ms		Normally closed	196119	MHA2-MS1H-3/2G-2
		Without fast-switching	g electronics,	Normally open	196138	MHA2-M1H-3/20-2
3		switching time 7 ms		Normally closed	196118	MHA2-M1H-3/2G-2
	Electrical connection:	With fast-switching el	ectronics,	Normally open	196141	MHA2-MS1H-3/20-2-K
	cable	switching time 2 ms		Normally closed	196121	MHA2-MS1H-3/2G-2-K
		Without fast-switching	g electronics,	Normally open	196140	MHA2-M1H-3/20-2-K
		switching time 7 ms		Normally closed	196120	MHA2-M1H-3/2G-2-K
Nanifold rail						
	Individual sub-base			1 valve position	197438	MHA2-AS-3-M5
	Pneumatic connection:	thread M5				
	Manifold block			2 valve positions	197447	MHA2-PR2-3-M5
	Pneumatic connection 2	1. 11. 3. 33: thread M7		4 valve positions	197448	MHA2-PR4-3-M5
	Pneumatic connection 2			6 valve positions	197449	MHA2-PR6-3-M5
				8 valve positions	197450	MHA2-PR8-3-M5
~				10 valve positions	197451	MHA2-PR10-3-M5
				10 valve positions	197431	MIIMZ-FRIO-J-MIJ
Cover plate						
.over plate	Vacant valve nocitions	nust be sealed with a co	wer nlate		197470	MHAP2-BP-3
	vacant valve positions i	must be seared with a co	ver plate.		197470	min 2 bi 3
annocting cable (for u	alves with 2-pin plug)					Datash asta a listamat is
Onlinecting capite (101 v	2-pin socket,	PUR cable, degree of	Cignal status	Length 2.5 m	8047671	Datasheets → Internet: ne  NEBV-Z4WA2L-P-E-2.5-N-LE2-S1
	open cable end	protection IP65	indication with	Length 5 m	8047672	NEBV-Z4WA2L-P-E-5-N-LE2-S1
//	2-wire	protection ir 03	LED	Length 10 m	8047670	NEBV-Z4WA2L-P-E-3-N-LE2-S1
	Z-WIIC	PVC cable, degree of	Without signal	Length 0.5 m	193690	KMYZ-4-24-0.5-B
		protection IP40	status			
		protection 1F40	indication	Length 2.5 m	193691	KMYZ-4-24-2.5-B
	2-pin socket,	PUR cable, degree of	•	Length 0.5 m	8047673	NEBV-Z4WA2L-P-E-0.5-N-M8G3-S1
	plug M8x1 3-pin	protection IP65	indication with	Length 2.5 m	8047674	NEBV-Z4WA2L-P-E-2.5-N-M8G3-S1
			LED			
The state of the s						
<b>√</b>						

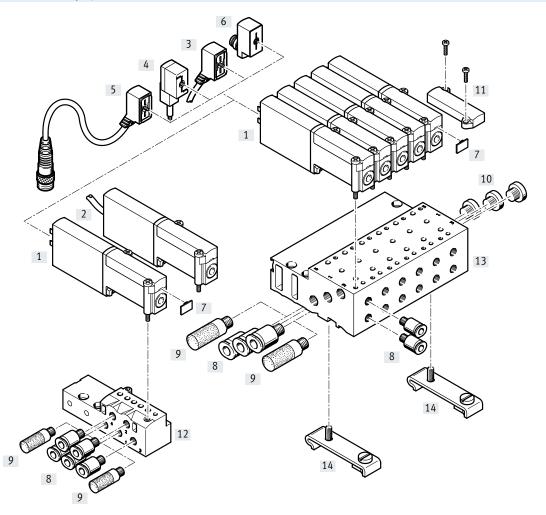


Valve types 3/2G and 3/20 must not be mixed on one manifold block.

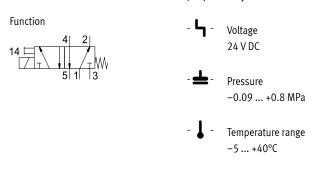
·			Part no.	Type
				71
Signal status	Plug M8, 3-p	in	571686	VAVE-C8-1R8
indication with LEI			573194	VAVE-C8-1R1
noid valves			525053	MHAP2-BG-NRH-35
		2 m	35430	NRH-35-2000
	I M.F.	14:-	4/5002	Datasheets → Internet: u
onnection	M5	1 piece	165003 534217	UC-M5 UC-M5-50
		50 pieces 1 piece	161418	UC-M7
	M7	50 pieces	534218	UC-M7-50
	'			•
				Datasheets → Internet: q
with internal hex for tubing O.D.	4 mm	10 pieces	153315	QSM-M5-4-I
	6 mm	10 pieces	153317	QSM-M5-6-I
Male thread M7 with internal hex for tubing O.D.		10 pieces	153319	QSM-M7-4-I
		100 pieces	133006	QSM-M7-4-I-100
	6 mm	10 pieces	153321	QSM-M7-6-I
with external hex, push-in L-fitting	n-in L-fitting 4 mm	10 pieces	153333	QSML-M5-4
h 360º, for tubing O.D.		100 pieces	130771	QSML-M5-4-100
	6 mm	10 pieces	153335	QSML-M5-6
		100 pieces	130772	QSML-M5-6-100
with external hex, push-in L-fitting	4 mm	10 pieces	186352	QSML-M7-4
h 360º, for tubing O.D.		100 pieces	130773	QSML-M7-4-100
	6 mm	10 pieces	186353	QSML-M7-6
		100 pieces	130774	QSML-M7-6-100
		1.0 .	06:5	12.00
		10 pieces	3843	B-M5
		10 pieces	174309	B-M7
ve		80 pieces in a	197259	MH-BZ-80X
	e	e		e 80 pieces in a <b>197259</b>

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

## Connection with plug vanes - Connection with moulded-in cable



Desig	nation	Description	→ Page/Internet
[1]	Sub-base valve MHA2	With plug vanes	54
[2]	Sub-base valve MHA2K	With moulded-in cable, IP55	54
[3]	Connecting cable NEBV	PUR cable, signal status indication with LED, IP65	54
[4]	Plug socket with cable KMYZ-4	PVC cable, without signal status indication, IP50	54
[5]	Connecting cable NEBV	PUR cable, signal status indication with LED, plug M8x1 3-pin, IP65	54
[6]	Adapter VAVE-C8	For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65	55
[7]	Inscription label MH-BZ-80X	For identifying the valves	55
[8]	Push-in fittings QS	For connecting compressed air tubing with standard O.D.	55
[9]	Silencer UC	For fitting in exhaust ports	55
[10]	Blanking plug B	For sealing unused ports	55
[11]	Cover plate MHAP2-BP-5	For sealing vacant positions	54
[12]	Individual sub-base MHA2-AS-5-M5	For sub-base valve	54
[13]	Manifold block MHA2-PR5-M5	For sub-base valve	54
[14]	H-rail mounting CPV1 0/14-VI-BG-NRH-35	For mounting the manifold block on H-rails to EN 60715	55





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

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

¹⁾ Corrosion resistance class CRC 2 to Festo standard FN 940070

Additional functions

Degree of protection to EN 60529

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

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

Electrical data Electrical connection			2-pin plug	Cable	
Operating voltage		[V DC]	24		
Permissible voltage fluctuat	ions	[%]	±10		
Power consumption	Low-current phase	[W]	1.625		
	High-current phase	[W]	6.5		
Reverse polarity protection			Bipolar		
Duty cycle		[%]	100		

Spark arresting Holding current reduction Protective circuit

IP55

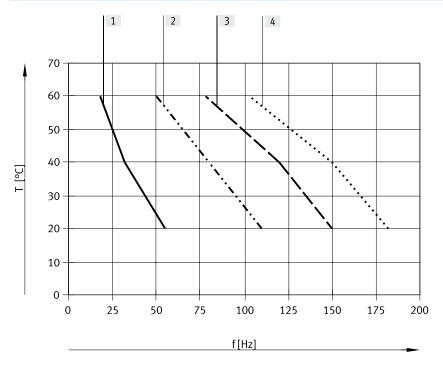
IP65

Switching times and frequencies			
Switching time	On	[ms]	1.9
	Off	[ms]	1.7
Tolerance for switching time	On	[%]	+1030
	Off	[%]	+1030
Maximum switching frequency		[Hz]	300
Switching time variation from 1 Hz		[ms]	0.2
upwards			

Materials	
Housing	Coated die-cast zinc
Cable sheath	PUR
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	Free of copper and PTFE
	RoHS-compliant
PWIS conformity	VDMA24364-B1/B2-L

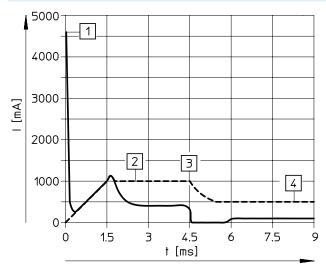
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

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



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

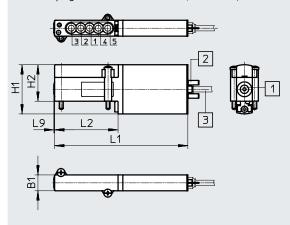
#### Current curve for valves with fast-switching electronics (MHA2-MS1H)



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

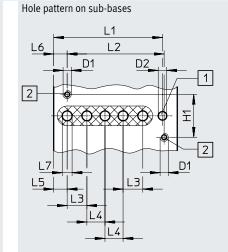
#### **Dimensions**

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



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

## Download CAD data → www.festo.com



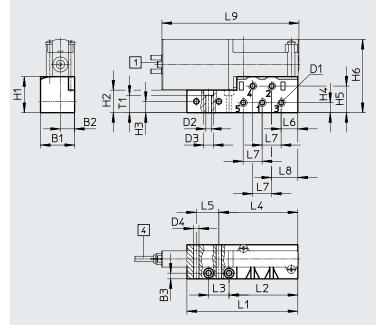
- [1] Hole for coding pin,  $1.7^{+0.2}$  mm
- [2] Mounting thread, 4.6+1 mm deep

L5	L6	L7	L9	

Туре	B1	D1	D2 Ø	H1	H2	L1	L2	L3	L4	L5	L6	L7	L9
MHA25/2	10	-	-	31	23	84	40	-	-	-	-	-	0.5
Hole pattern	-	M2.5	2.6	13	-	33.1	29.5	6	5.5	4.1	4.1	3	-

#### **Dimensions**

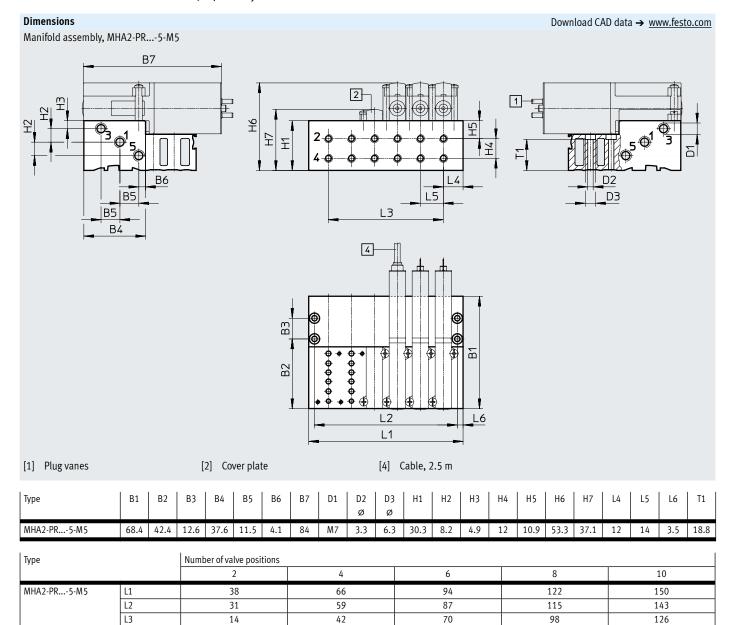
Individual sub-base, MHA2-AS-5-M5



Download CAD data → www.festo.com

- [1] Plug vanes
- Cable, 2.5 m [4]

Туре	B1	B2	В3	D1	D2 Ø	D3 Ø	D4 Ø	H1	H2	Н3	H4	H5	H6
MHA2-AS-5-M5	21	8.8	3.5	M5	3.4	6	3.3	22.2	13.9	6.9	6.2	16.4	45.2
Туре	L1	L2	2	L3	L4	L5		L6	L7	L8		L9	T1
MHA2-AS-5-M5	68.4	42.	.4	12.6	48.7	13.9	)	10.3	11.7	16.2	8	4.5	10.7

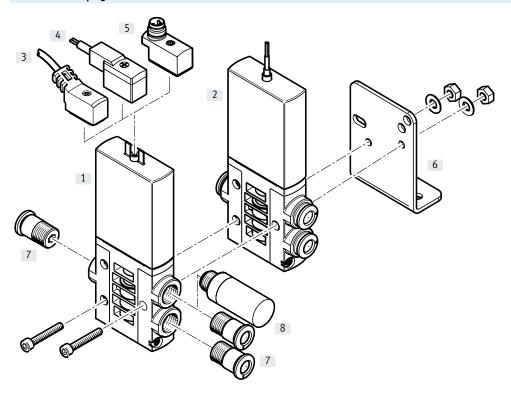


Ordering data						
					Part no.	Туре
Valves						
	Electrical connection: plug vanes	With fast-switching el	ectronics, switching tin	ne 2 ms	525101	MHA2-MS1H-5/2-2
	Electrical connection: cable	With fast-switching el	ectronics, switching tin	ne 2 ms	525103	MHA2-MS1H-5/2-2-K
Manifold rail						
	Individual sub-base Pneumatic connection: thread M	5		1 valve position	525120	MHA2-AS-5-M5
\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	Manifold block			2 valve positions	525127	MHA2-PR2-5-M5
	Pneumatic connection 1, 3, 5: th	read M7		4 valve positions	525128	MHA2-PR4-5-M5
	Pneumatic connection 2, 4: threa	ad M5		6 valve positions	525129	MHA2-PR6-5-M5
				8 valve positions	525130	MHA2-PR8-5-M5
				10 valve positions	525131	MHA2-PR10-5-M5
Cover plate						
	Vacant valve positions must be s	ealed with a cover plate	e.		525132	MHAP2-BP-5
Connecting cable (for va	alvoc with 2 nin nlug)					Datasharata a latawast aska
Connecting capte (101 va	2-pin socket,	PUR cable, degree of	Signal status	Length 2.5 m	8047671	Datasheets → Internet: neb
	open cable end 2-wire	protection IP65	indication with LED	Length 5 m	8047671	NEBV-Z4WAZL-P-E-5-N-LE2-S1
//	Spon subte end 2 mile	p.steetion ii o		Length 10 m	8047672	NEBV-Z4WA2L-P-E-10-N-LE2-S1
_//		PVC cable, degree of	Without signal	Length 0.5 m	193690	KMYZ-4-24-0.5-B
		protection IP40	status indication	Length 2.5 m	193691	KMYZ-4-24-2.5-B
	2-pin socket, plug M8x1 3-pin	PUR cable, degree of	Signal status	Length 0.5 m	8047673	NEBV-Z4WA2L-P-E-0.5-N-M8G3-S1
		protection IP65	indication with LED	Length 2.5 m	8047674	NEBV-Z4WA2L-P-E-2.5-N-M8G3-S1

Ordering data					Part no.	Туре
Adapter (for valves wi	ith 2-nin nlug)					
@ <u></u>		gnal status	Plug M8, 3-pi	1	571686	VAVE-C8-1R8
	1 1	dication with LED	Plug M8, 4-pi		573194	VAVE-C8-1R1
H-rail mounting						
	For 5/2-way solenoid valves				162556	CPV10/14-VI-BG-NRH-35
H-rail						
	To EN 60715			2 m	35430	NRH-35-2000
Silencer				'		Datashaata > Internativ
J. C. I.C. I.	With threaded connection		M5	1 piece	165003	Datasheets → Internet: u UC-M5
	with threaded connection		IWO	50 pieces	534217	UC-M5-50
			M7	1 piece	161418	UC-M7
				50 pieces	534218	UC-M7-50
Push-in fitting						Datasheets → Internet: q
	Male thread M5 with internal hex for to	ubing O.D.	4 mm	10 pieces	153315	QSM-M5-4-I
		Ü	6 mm	10 pieces	153317	QSM-M5-6-I
	Male thread M7 with internal hex for to	ubing O.D.	4 mm	10 pieces	153319	QSM-M7-4-I
				100 pieces	133006	QSM-M7-4-I-100
			6 mm	10 pieces	153321	QSM-M7-6-I
	Male thread M5 with external hex, pus	h-in L-fitting	4 mm	10 pieces	153333	QSML-M5-4
	rotatable through 360°, for tubing O.D.	D.		100 pieces	130771	QSML-M5-4-100
			6 mm	10 pieces	153335	QSML-M5-6
				100 pieces	130772	QSML-M5-6-100
	Male thread M7 with external hex, pus		4 mm	10 pieces	186352	QSML-M7-4
	rotatable through 360°, for tubing O.D.	•		100 pieces	130773	QSML-M7-4-100
			6 mm	10 pieces	186353	QSML-M7-6
				100 pieces	130774	QSML-M7-6-100
Blanking plug						
	For thread M5			10 pieces	3843	B-M5
	For thread M7			10 pieces	174309	B-M7
Inscription label						
	For solenoid valve			80 pieces in a frame	197259	MH-BZ-80X

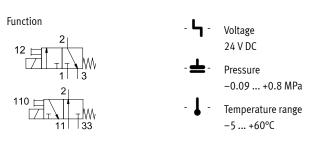
# Peripherals overview – Individual valve

# ${\bf Connection\ with\ plug\ vanes-Connection\ with\ moulded-in\ cable}$



Desig	nation	Description	→ Page/Internet
[1]	Individual valve MHE3	With plug vanes	61
[2]	Individual valve MHE3K	With moulded-in cable, IP65	61
[3]	Connecting cable NEBV	PUR cable, signal status indication with LED, IP65	62
[4]	Plug socket with cable KMYZ-4	PVC cable, without signal status indication, IP50	62
[5]	Adapter VAVE-C8	For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65	62
[6]	Mounting bracket MHE2-BG-L	For wall mounting	62
[7]	Push-in fittings QS	For connecting compressed air tubing with standard O.D.	62
[8]	Silencer UC	For fitting in exhaust ports	62

## Datasheet - Individual valve





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

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

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

¹⁾ Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

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

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

# Solenoid valves MHE3, fast-switching valves

# Datasheet – Individual valve

Operating and environmental conditions				
			With fast-switching electronics	Without fast-switching electronics
Operating pressure		[MPa]	-0.09 +0.8	
		[bar]	-0.9 +8	
	Reversible	[MPa]	-0.09 +0.1	
		[bar]	-0.9 +1	
		[psi]	-13.05 +14.5	
Operating pressure for		[MPa]	-0.09 +0.8	
• MHE3-M1H-3/20-1/8-K		[bar]	-0.9 +8	
• MHE3-M1H-3/20-QS-6	Reversible	[MPa]	-0.09 +0.1	
• MHE3-MS1H-3/20-1/8-K		[bar]	-0.9 +1	
• MHE3-MS1H-3/20-QS-6		[psi]	-13.05 +14.5	

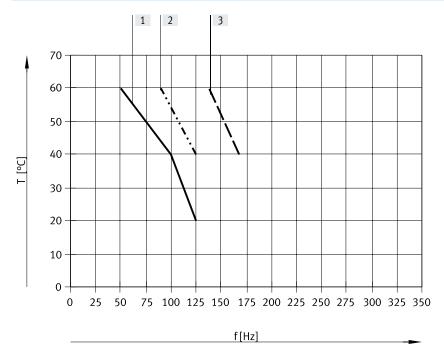
Electrical data			
		With fast-switching electronics	Without fast-switching electronics
Electrical connection		2-pin plug or cable	
Operating voltage	[V DC]	24	
Permissible voltage fluctuations	[%]	±10	
Power consumption	[W]	6.5 for approx. 4.5 ms (high-current phase, inrush current 1 A)	3.7
	[W]	1.6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

Switching times and frequencies				
			With fast-switching electronics	Without fast-switching electronics
Switching time	On	[ms]	2.3	8.3
	Off	[ms]	2.8	4.5
Tolerance for switching time	On	[%]	+1030	-
	Off	[%]	+1050	-
Switching time variation from 1 Hz		[ms]	0.2	-
upwards				
Maximum switching frequency		[Hz]	280	130

Materials	
Housing	Coated die-cast zinc
Cable sheath	PUR
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	Free of copper and PTFE
	RoHS-compliant
PWIS conformity	VDMA24364-B1/B2-L

#### Datasheet - Individual valve

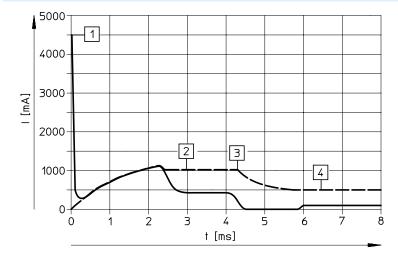
#### Restricted ambient temperature and temperature of medium as a function of switching frequency



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

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

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



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

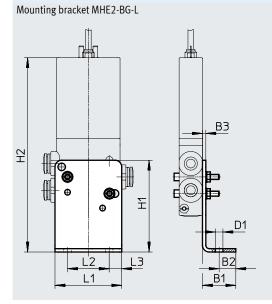
- [1] Capacitor charging
- [2] Controlled coil current 1 A
- [3] Holding current reduction
- [4] Controlled holding current 0.5 A

#### Datasheet - Individual valve

#### **Dimensions** Download CAD data → www.festo.com Valve with plug vanes or moulded-in cable MHE3-...-1/8-... MHE3-...-QS-6-... <u>D</u>1 D2 <u>D3</u> 2 **D** 2 **D** 7 H Ŧ <del>1/33</del> **()** 3/11 1/33 **(** 3/11) D2 3 Ľ1 L9 L8 [1] Manual override, non-detenting [2] Plug vanes [3] Cable, 2.5 m Туре В1 D2 D3 H2 Н3 L2 L3 L4 L5 L6 L7 L9 Ø Ø MHE3-...-1/8-.. 14 G1/8 4.5 45 38 25 94.5 46 23 20 13 16 23 0.6 15 MHE3-...-QS-6-... 14 4.5 53.6 25 94.5 23 20 13 16 23 0.6

#### **Dimensions**

Download CAD data → www.festo.com



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

# Datasheet – Individual valve

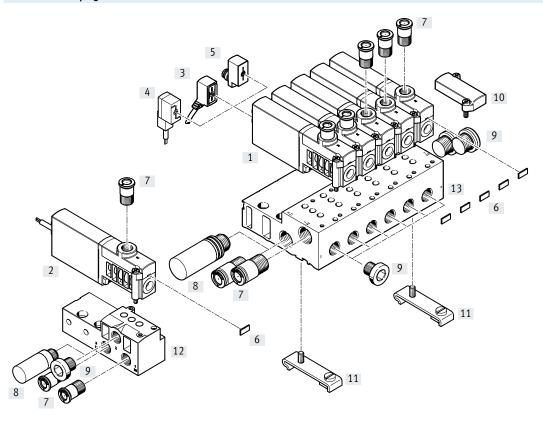
Ordering data						
					Part no.	Туре
Valves						
,	Electrical connec-	With fast-switching	Pneumatic connection: thread	Normally open	525167	MHE3-MS1H-3/20-1/8
	tion: 2-pin plug	electronics, switching	G1/8	Normally closed	525147	MHE3-MS1H-3/2G-1/8
		time 2.3 ms	Pneumatic connection:	Normally open	525171	MHE3-MS1H-3/20-QS-6
			push-in connector for tubing	Normally closed	525151	MHE3-MS1H-3/2G-QS-6
			O.D. 6 mm			
		Without fast-switching	Pneumatic connection: thread	Normally open	525166	MHE3-M1H-3/20-1/8
		electronics, switching	G1/8	Normally closed	525146	MHE3-M1H-3/2G-1/8
		time 8.3 ms	Pneumatic connection:	Normally open	525170	MHE3-M1H-3/20-QS-6
			push-in connector for tubing	Normally closed	525150	MHE3-M1H-3/2G-QS-6
			O.D. 6 mm			
	Electrical connec-	With fast-switching	Pneumatic connection: thread	Normally open	525169	MHE3-MS1H-3/20-1/8-K
	tion: cable	electronics, switching	G1/8	Normally closed	525149	MHE3-MS1H-3/2G-1/8-K
0 20		time 2.3 ms	Pneumatic connection:	Normally closed	525153	MHE3-MS1H-3/2G-QS-6-K
To the second se			push-in connector for tubing			
			O.D. 6 mm			
		Without fast-switching	Pneumatic connection: thread	Normally open	525168	MHE3-M1H-3/20-1/8-K
		electronics, switching	G1/8	Normally closed	525148	MHE3-M1H-3/2G-1/8-K
		time 8.3 ms	Pneumatic connection:	Normally closed	525152	MHE3-M1H-3/2G-QS-6-K
			push-in connector for tubing			
			O.D. 6 mm			

# Datasheet – Individual valve

Ordering data						
					Part no.	Туре
Connecting cable (for	valves with 2-pin plug)					Datasheets → Internet: nebv
	2-pin socket,	PUR cable, degree of	Signal status	Length 2.5 m	8047671	NEBV-Z4WA2L-P-E-2.5-N-LE2-S1
	open cable end 2-wire	protection IP65	indication with LED Length 5 m		8047672	NEBV-Z4WA2L-P-E-5-N-LE2-S1
				Length 10 m	8047670	NEBV-Z4WA2L-P-E-10-N-LE2-S1
_//		PVC cable, degree of	Without signal	Length 0.5 m	193690	KMYZ-4-24-0.5-B
		protection IP40	status indication	Length 2.5 m	193691	KMYZ-4-24-2.5-B
	2-pin socket, plug M8x1	PUR cable, degree of	Signal status	Length 0.5 m	8047673	NEBV-Z4WA2L-P-E-0.5-N-M8G3-S1
	3-pin	protection IP65	indication with LED	Length 2.5 m	8047674	NEBV-Z4WA2L-P-E-2.5-N-M8G3-S1
Adapter (for valves wi	ith 2 nin nlug)					
Adapter (for valves wi	2-pin socket	Signal status indication	Plug M8, 3-pin		571686	VAVE-C8-1R8
	2-piii socket	with LED	Plug M8, 4-pin		_	
		WILLI LED	Plug Mo, 4-pill		573194	VAVE-C8-1R1
Wall mounting						
0000	Mounting bracket					MHE2-BG-L
611						
Silencer	Ta. 1. 1. 11. 11. 11. 11.			I		Datasheets → Internet: uc
	Push-in sleeve with O.D. 6			1 piece	165007	UC-QS-6H
	With threaded connection (	G1/8		1 piece	161419	UC-1/8
				50 pieces	534219	UC-1/8-50
Push-in fitting						Datasharta a litir tira
rusii-iii iiitiing	Mala thread C1/0 : 11		1 (	10 -:	40(001	Datasheets → Internet: qs
	Male thread G1/8 with exte	ernai nex for tubing O.D.	6 mm	10 pieces	186096	QS-G1/8-6
				100 pieces	132037	QS-G1/8-6-100
			8 mm	10 pieces	186098	QS-G1/8-8
				50 pieces	132038	QS-G1/8-8-50
	Male thread G1/8 with exte		6 mm	10 pieces	186117	QSL-G1/8-6
	rotatable through 360°, for	tubing O.D.		100 pieces	132049	QSL-G1/8-6-100
			8 mm	10 pieces	186119	QSL-G1/8-8
				50 pieces	132050	QSL-G1/8-8-50

# Peripherals overview – Semi in-line valve

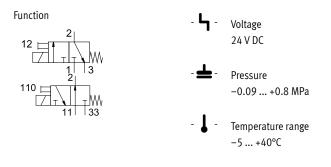
#### Connection with plug vanes – Connection with moulded-in cable



Desig	nation	Description	→ Page/Internet	
[1]	Semi in-line valve MHP3	With plug vanes	70	
[2]	Semi in-line valve MHP3K	With moulded-in cable, IP65	70	
[3]	Connecting cable NEBV	PUR cable, signal status indication with LED, IP65	70	
[4]	Plug socket with cable KMYZ-4	PVC cable, without signal status indication, IP50	70	
[5]	Adapter VAVE-C8	For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65	70	
[6]	Inscription label MH-BZ-80X	For identifying the valves	71	
[7]	Push-in fittings QS	For connecting compressed air tubing with standard O.D.	71	
[8]	Silencer UC	For fitting in exhaust ports	71	
[9]	Blanking plug B	For sealing unused ports	71	
[10]	Cover plate MHAP3-BP-3	For sealing vacant positions	70	
[11]	H-rail mounting CPV10/14-VI-BG-NRH-35	For mounting the manifold block on H-rails to EN 60715	71	
[12]	Individual sub-base MHA3-AS-3-1/8	For semi in-line valves; the individual sub-base is also used for sub-base valves and must be sealed with a blanking plug here	70	
[13]	Manifold block MHA3-PR	For semi in-line valves	70	

## Solenoid valves MHP3, fast-switching valves

## Datasheet - Semi in-line valve





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

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

Slight leakage can occur in the pressure range –0.8 bar to +0.5 bar.

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

¹⁾ Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

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

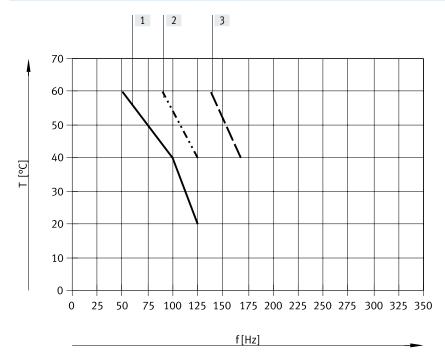
Electrical data			
		With fast-switching electronics	Without fast-switching electronics
Electrical connection		2-pin plug or cable	
Operating voltage	[V DC]	24	
Permissible voltage fluctuations	[%]	±10	
Power consumption	[W]	6.5 (high-current phase)	3.7
	[W]	1.6 (low-current phase)	-
Reverse polarity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

Switching times and frequencies				
			With fast-switching electronics	Without fast-switching electronics
Switching time	On	[ms]	2.3	8.3
	Off	[ms]	2.8	4.5
Tolerance for switching time	On	[%]	+1030	-
	Off	[%]	+1050	-
Switching time variation from 1 Hz		[ms]	0.2	-
upwards				
Maximum switching frequency		[Hz]	280	130

Materials	
Housing	Coated die-cast zinc
Cable sheath	PUR
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	Free of copper and PTFE
	RoHS-compliant
PWIS conformity	VDMA24364-B1/B2-L

²⁾ For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/mh21 → Support/Downloads.

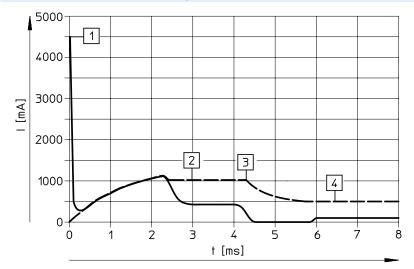
#### Restricted ambient temperature and temperature of medium as a function of switching frequency



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

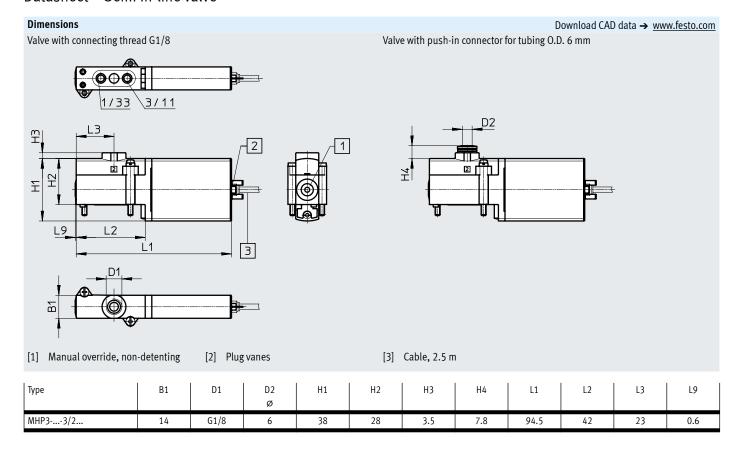
No restrictions for individual valve, through-flow, 0.6 MPa.

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



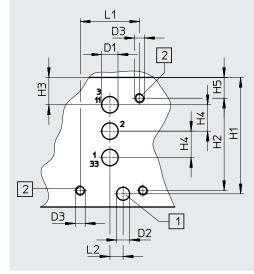
----- Internal current in the coil
------ External current in the supply line

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



#### **Dimensions**

Hole pattern on sub-bases



Download CAD data → www.festo.com

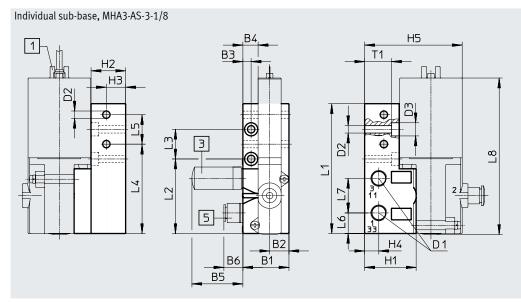
#### - 🖣 - Note

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

If used as a 2/2-way valve, normally closed, ports 3/11 are not used.
If used as a 2/2-way valve, normally open, ports 1/33 are not used.

[1] Hole for coding pin, 2mm deep

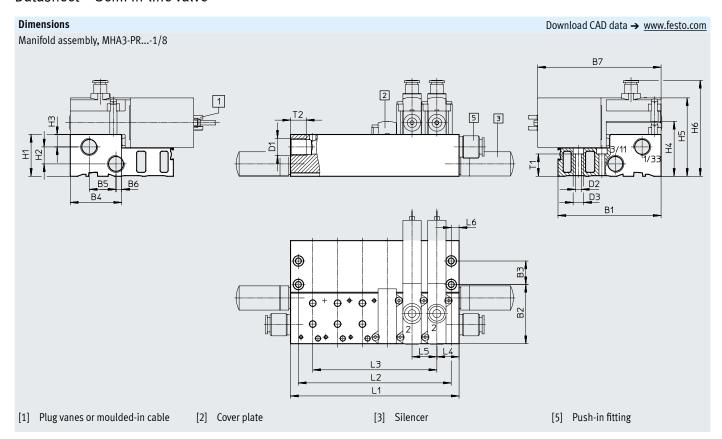
[2] Mounting thread, 8 mm deep

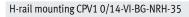


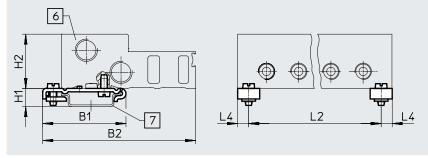
- [1] Plug vanes
- [3] Silencer
- [5] Push-in fitting

	Туре	B1	B2	B3	B4	B5	B6	D1	D2 Ø	D3 Ø	H1	H2	Н3	H4	H5
MHA3-AS-3-1/8 28 11.8 5 9.3 31.5 13.3 G1/8 4.5 8 31.3 21 11.7 8.6 59.3	Hole pattern	-	-	-	-			5	4	M3	35.3	28	8.3	8	6.3
	MHA3-AS-3-1/8	28	11.8	5			13.3	G1/8	4.5	8	31.3	1 71	1 11 /	8.6	59.3

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







- [6] Manifold block
- [7] DIN mounting rail

Туре	B1	B2	В3	B4	B5	В6	B7	D1	D2 Ø	D3 Ø	H1	H2	Н3	H4	H5	Н6	L4	L5	L6	T1	T2
MHA3-PR1/8	79	45.3	18	39.3	20.5	4.3	94.5	G1/4	4.5	8	32	13	9.5	42	60	73.5	17	19	6	17.1	12
CPV1 0/14-VI-BG	49.1	90	-	-	-	_	-	-	-	-	10.7	32	-	-	-	-	6.5	-	-	-	-

Туре		Number of valve positions				
		2	4	6	8	10
MHA3-PR1/8	L1	53	91	129	167	205
	L2	41	79	117	155	193
	L3	19	57	95	133	171
CPV1 0/14-VI-BG	L2	40	78	116	154	192



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

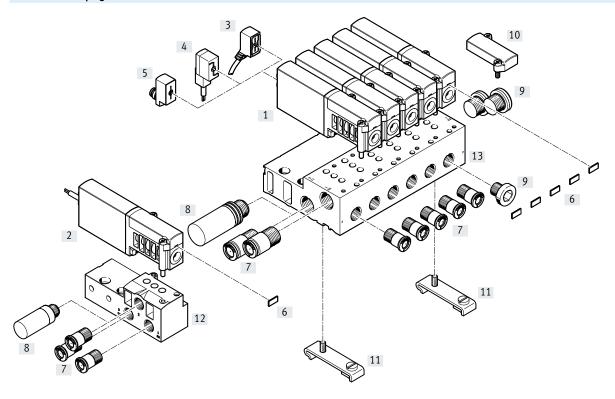
Ordering data						
	·	:			Part no.	Туре
Valves						
	Electrical connection:	With fast-switching electronics, switch-	Pneumatic connection: thread	Normally open	525159	MHP3-MS1H-3/20-1/8
	2-pin plug	G1/8	Normally closed	525139	MHP3-MS1H-3/2G-1/8	
0 0		ing time 2.3 ms	Pneumatic connection:	Normally closed	525143	MHP3-MS1H-3/2G-QS-6
<b>V</b>			push-in connector for tubing			
		Med - 15 - 1 - 21 l	O.D. 6 mm	Maria III.		MUDO MAIL GIOCA IO
		Without fast-switch-	Pneumatic connection: thread	Normally open	525158	MHP3-M1H-3/20-1/8
		ing electronics, switching time	G1/8 Pneumatic connection:	Normally closed	525138	MHP3-M1H-3/2G-1/8 MHP3-M1H-3/2G-QS-6
		8.3 ms		Normally closed	525142	MHP3-M1H-3/2G-QS-6
		0.5 1113	push-in connector for tubing O.D. 6 mm			
	Electrical connection:	With fast-switching	Pneumatic connection:	Normally closed	525145	MHP3-MS1H-3/2G-QS-6-K
	cable	electronics, switch-	push-in connector for tubing	Normally closed	323143	MITE 3-M3111-3/20-Q3-0-K
( a d a d )	cable	ing time 2.3 ms	O.D. 6 mm			
2021		ing time 2.5 ms	0.0. 0 111111			
Manifold rail	Individual sub-base ¹⁾			1 valve n==:+:==	F3F344	MUA2 AC 2 1/0
( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )		throad C1/9		1 valve position	525214	MHA3-AS-3-1/8
	Pneumatic connection	: thread G1/8				
	Manifold block ¹⁾			2 valve positions	525221	MHA3-PR2-3-1/8
	Pneumatic connection	1, 11, 3, 33: thread G	1/4	4 valve positions	525222	MHA3-PR4-3-1/8
	Pneumatic connection		,	6 valve positions	525223	MHA3-PR6-3-1/8
2000		,		8 valve positions	525224	MHA3-PR8-3-1/8
•				10 valve positions	525225	MHA3-PR10-3-1/8
						-
Cover plate						
	Vacant valve positions	must be sealed with a	cover plate.		525226	MHAP3-BP-3
		,				
Connecting cable (for	r valves with 2-pin plug)					Datasheets → Internet: neb
M	2-pin socket,	PUR cable, degree of	Signal status indication with	Length 2.5 m	8047671	NEBV-Z4WA2L-P-E-2.5-N-LE2-S1
	open cable end,	protection IP65	LED	Length 5 m	8047672	NEBV-Z4WA2L-P-E-5-N-LE2-S1
//	2-wire	F 1000.00 05	===	Length 10 m	8047670	NEBV-Z4WA2L-P-E-10-N-LE2-S1
//		PVC cable, degree of	Without signal status	Length 0.5 m	193690	KMYZ-4-24-0.5-B
		protection IP40	indication	Length 2.5 m	193691	KMYZ-4-24-2.5-B
		p. 500000001111 40		Length 2.7 III	173071	MIII 2-7-27-2.J-U
	2-pin socket, plug	PUR cable, degree of	Signal status indication with	Length 0.5 m	8047673	NEBV-Z4WA2L-P-E-0.5-N-M8G3-S1
<b>₽</b>	M8x1 3-pin	protection IP65	LED	Length 2.5 m	8047674	NEBV-Z4WA2L-P-E-2.5-N-M8G3-S1
		protestion in 03		Length 2.7 m	001/0/4	MEST E-TIMEET E EIS N MOSS ST
		1				
			ļ.			·
Adapter (for valves w	rith 2-pin plug)			-		
Adapter (for valves w	rith 2-pin plug)  2-pin socket	Signal status	Plug M8, 3-pin		571686	VAVE-C8-1R8
Adapter (for valves w		Signal status indication with LED	Plug M8, 3-pin Plug M8, 4-pin		571686 573194	VAVE-C8-1R8 VAVE-C8-1R1

 $^{1) \}hspace{0.5cm} \text{Seal port 2 with a blanking plug. These ports have no function when using semi in-line valves.} \\$ 

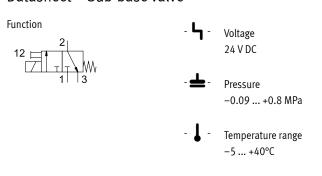
Ordering data				Part no.	Туре
I-rail mounting					
	For manifold block			162556	CPV10/14-VI-BG-NRH-35
I-rail					
	To EN 60715		2 m	35430	NRH-35-2000
Silencer					Datasheets → Internet: u
	Push-in sleeve with O.D. 6 mm	,	1 piece	165007	UC-QS-6H
	With threaded connection	G1/8	1 piece	161419	UC-1/8
			50 pieces	534219	UC-1/8-50
		G1/4	1 piece	165004	UC-1/4
			20 pieces	534220	UC-1/4-20
ush-in fitting					Datasheets → Internet:
	Male thread G1/8 with external hex for tubing O.D.	6 mm	10 pieces	186096	QS-G1/8-6
	mate tilleda d1/0 with external nex for tubing o.b.	0 111111	100 pieces	132037	QS-G1/8-6-100
		8 mm	10 pieces	186098	QS-G1/8-8
		0	50 pieces	132038	QS-G1/8-8-50
	Male thread G1/4 with external hex for tubing O.D.	8 mm	10 pieces	186099	QS-G1/4-8
	mate timesa e 27 y man externat mexico tazing enzi		50 pieces	132040	QS-G1/4-8-50
		10 mm	10 pieces	186101	QS-G1/4-10
			50 pieces	132041	QS-G1/4-10-50
	Male thread G1/8 with external hex, push-in L-fitting	6 mm	10 pieces	186117	QSL-G1/8-6
	rotatable through 360°, for tubing O.D.		100 pieces	132049	QSL-G1/8-6-100
		8 mm	10 pieces	186119	QSL-G1/8-8
			50 pieces	132050	QSL-G1/8-8-50
	Male thread G1/4 with external hex, push-in L-fitting	8 mm	10 pieces	186120	QSL-G1/4-8
	rotatable through 360°, for tubing O.D.		50 pieces	132052	QSL-G1/4-8-50
		10 mm	10 pieces	186122	QSL-G1/4-10
			50 pieces	132053	QSL-G1/4-10-50
lanking plug					
- And Andrews	For thread G1/8		10 pieces	3568	B-1/8
	For thread G1/4		10 pieces	3569	B-1/4
nscription label				107075	LAUL DZ GOV
	For solenoid valve		80 pieces in a frame	197259	MH-BZ-80X

# Peripherals overview – Sub-base valve

#### Connection with plug vanes – Connection with moulded-in cable



Desig	nation	Description	→ Page/Internet
[1]	Sub-base valve MHA3	With plug vanes	78
[2]	Sub-base valve MHA3K	With moulded-in cable, IP65	78
[3]	Connecting cable NEBV	PUR cable, signal status indication with LED, IP65	78
[4]	Plug socket with cable KMYZ-4	PVC cable, without signal status indication, IP50	78
[5]	Adapter VAVE-C8	For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65	78
[6]	Inscription label MH-BZ-80X	For identifying the valves	79
[7]	Push-in fittings QS	For connecting compressed air tubing with standard O.D.	79
[8]	Silencer UC	For fitting in exhaust ports	79
[9]	Blanking plug B	For sealing unused ports	79
[10]	Cover plate MHAP3-BP-3	For sealing vacant positions	78
[11]	H-rail mounting CPV10/14-VI-BG-NRH-35	For mounting the manifold block on H-rails to EN 60715	79
[12]	Individual sub-base MHA3-AS-3-1/8	For sub-base valve	78
[13]	Manifold block MHA3-PR3-1/8	For sub-base valve	78





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

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

Operating and environmental conditions				
			With fast-switching electronics	Without fast-switching electronics
Operating medium	•		Compressed air to ISO 8573-1:2010 [7:4	4:4]
Note on the operating/pilot medium			Lubricated operation possible (in which o	case lubricated operation will always be required)
Operating pressure		[MPa]	-0.09 +0.8	
		[bar]	-0.9 +1	
	Reversible	[MPa]	-0.09 +0.1	
		[bar]	-0.9 +1	
		[psi]	-13.05 +14.5	
Ambient temperature		[°C]	-5 +40	
Temperature of medium		[°C]	-5 +40	
Restricted ambient temperature and temperature of m	edium		As a function of switching frequency	-
Corrosion resistance class CRC ¹⁾			2	2
CE marking (see declaration of conformity)			To EU EMC Directive ²⁾	-
KC mark			KC EMC	-
Certification			c UL us - Recognized (OL)	c UL us - Recognized (OL)
			RCM	-
Shock resistance			Shock test with severity level 2 to FN 942	2017-5 and EN 60068-2-27
Vibration resistance			Transport application test with severity le	evel 2 to FN 942017-4 and
			EN 60068-2-6	

¹⁾ Corrosion resistance class CRC 2 to Festo standard FN 940070

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

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

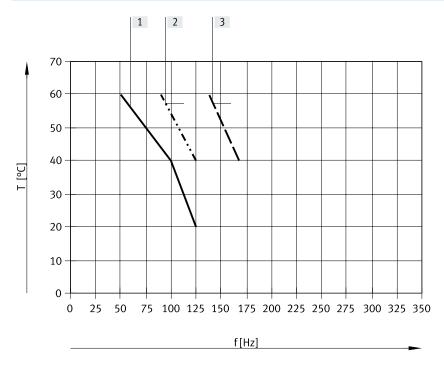
Switching times and frequencies				
			With fast-switching electronics	Without fast-switching electronics
Switching time	On	[ms]	2.3	8.3
	Off	[ms]	2.8	4.5
Tolerance for switching time	On	[%]	+1030	-
	Off	[%]	+1050	-
Switching time variation from 1 Hz		[ms]	0.2	-
upwards				
Maximum switching frequency		[Hz]	280	130

Materials	
Housing	Coated die-cast zinc
Cable sheath	PUR
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	Free of copper and PTFE
	RoHS-compliant
PWIS conformity	VDMA24364-B1/B2-L

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

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

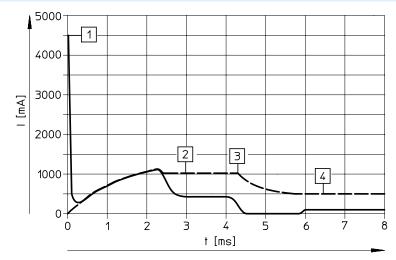
#### Restricted ambient temperature and temperature of medium as a function of switching frequency



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

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

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

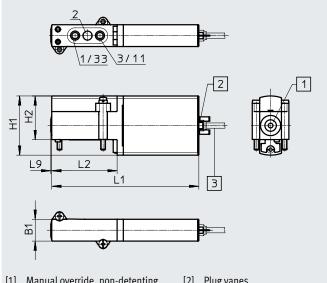


----- Internal current in the coil
------ External current in the supply line

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

#### **Dimensions**

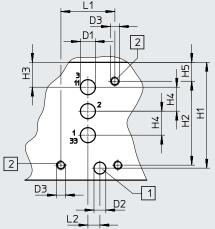
Valve with plug vanes or moulded-in cable, MHA3-...-3/2G...



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

#### Download CAD data → www.festo.com

Hole pattern on sub-bases D3

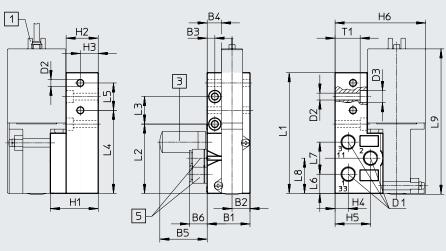


- [1] Hole for coding pin, 2mm deep
- [2] Mounting thread, 8 mm deep

Туре	B1	D1	D2 Ø	D3 Ø	H1	H2	Н3	H4	H5	L1	L2	L9
MHA33/2G	14	-	-	-	38	28	-	-	-	94.5	42	0.6
Hole pattern	-	5	4	M3	35.3	28	8.3	8	6.3	18	4	-

#### **Dimensions**

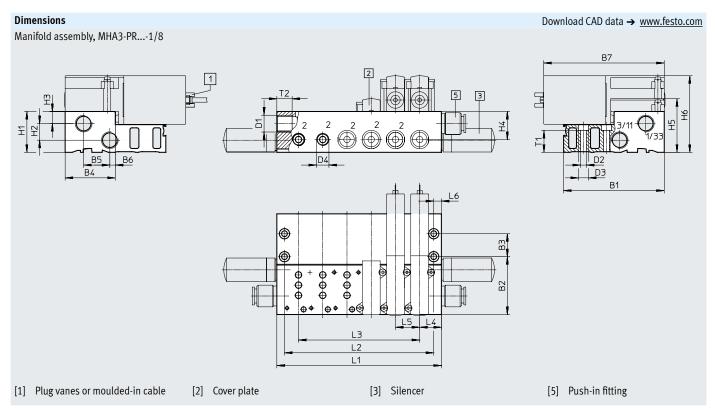
Individual sub-base, MHA3-AS-3-1/8

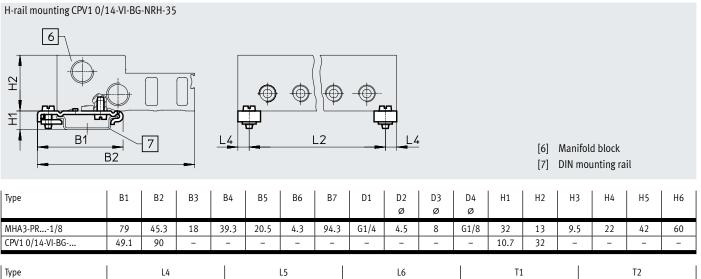


#### Download CAD data → www.festo.com

- Plug vanes [1]
- [3] Silencer
- [5] Push-in fitting

Туре	B1	B2	В3	B4	B5	В6	D1	D2 Ø	D3 Ø	H1	H2	Н3	H4	Н5	H6
MHA3-AS-3-1/8	28	11.8	5	9.3	31.5	13.3	G1/8	4.5	8	31.3	21	11.7	8.6	23.2	59.3
Туре	L1		L2	L3		L4	L5		L6	L7		L8	L9		T1
MHA3-AS-3-1/8	78.9		45.3	18		54.3	17.9		12.5	21		23	95		16.4





Туре		Number of valve positions								
		2	4	6	8	10				
MHA3-PR1/8	L1	53	91	129	167	205				
	L2	41	79	117	155	193				
	L3	19	57	95	133	171				
CPV1 0/14-VI-BG	L2	41	79	117	155	193				

19

17

6.5

MHA3-PR...-1/8

CPV1 0/14-VI-BG-...

6

17.1

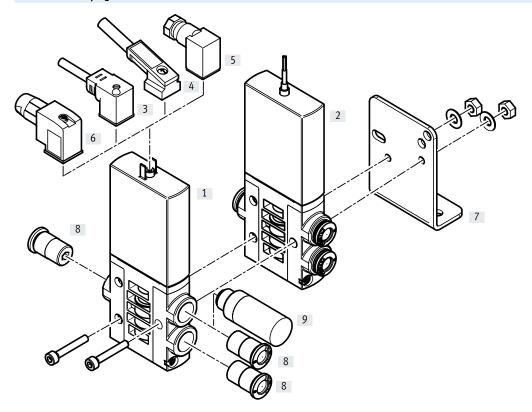
12

2-pin socket, PUR cable, Signal status Length 2.5 m <b>8047671 NEBV-Z4WA2L-P-E-2.5</b>	
Electrical connection: 2-pin plug time 2.3 ms  Without fast-switching electronics, switching switching time 8.3 ms  Without fast-switching electronics, switching time 8.3 ms  Without fast-switching electronics, switching time 2.3 ms  Without fast-switching electronics, switching time 8.3 ms  Normally closed  525137  MHA3-MS1H-3/2G-3-K  MHA3-MS1H-3/2G-3-K  WHA3-MS1H-3/2G-3-K  WHA3-MS1H-3/2G-3	
time 2.3 ms  Without fast-switching electronics, switching itime 8.3 ms  Without fast-switching electronics, switching itime 2.3 ms  Without fast-switching electronics, switching itime 2.3 ms  Without fast-switching electronics, switching itime 8.3 ms  Without fast-switching electronics, switching itime 8.3 ms  Manifold rail  Individual sub-base Pneumatic connection: thread G1/8  Manifold block Pneumatic connection 1, 11, 3, 33: thread G1/4 Pneumatic connection 2: thread G1/8  Manifold block Pneumatic connection 2: thread G1/8  Vacant valve positions must be sealed with a cover plate.  Vacant valve positions must be sealed with a cover plate.  Connecting cable (for valves with 2-pin plug)  Datasher  Connecting cable (for valves with 2-pin plug)  Datasher  Connecting cable (for valves with 2-pin plug)  Datasher	
switching time 8.3 ms  Electrical connection: cable  With fast-switching electronics, switching time 2.3 ms  Without fast-switching electronics, switching electronics, switching time 8.3 ms  Manifold rail  Individual sub-base Pneumatic connection: thread G1/8  Manifold block Pneumatic connection 1, 11, 3, 33: thread G1/4 Pneumatic connection 2: thread G1/8  Pneumatic connection 2: thread G1/8  Cover plate  Vacant valve positions must be sealed with a cover plate.  Signal status  Signal status  Signal status  Length 2.5 m  MAA3-MS1H-3/2G-3-K  MHA3-MS1H-3/2G-3-K  Signal status  Length 2.5 m  8047671 NEBV-Z4WA2L-P-E-2.5	
time 2.3 ms Without fast-switching electronics, switching time 8.3 ms  Manifold rail  Individual sub-base Pneumatic connection: thread G1/8  Manifold block Pneumatic connection 1, 11, 3, 33: thread G1/4 Pneumatic connection 2: thread G1/8  Cover plate  Vacant valve positions must be sealed with a cover plate.    Valve positions   525224   MHA3-PR2-3-1/8	
Manifold rail  Individual sub-base Pneumatic connection: thread G1/8  Manifold block Pneumatic connection 1, 11, 3, 33: thread G1/4 4 valve positions 525221 52522 MHA3-PR2-3-1/8 6 valve positions 525222 MHA3-PR4-3-1/8 8 valve positions 525223 MHA3-PR6-3-1/8 8 valve positions 525224 MHA3-PR8-3-1/8 10 valve positions 525225 MHA3-PR10-3-1/8  Cover plate  Vacant valve positions must be sealed with a cover plate.  Connecting cable (for valves with 2-pin plug)  Datashee  2-pin socket, PUR cable, Signal status Length 2.5 m 8047671 NEBV-Z4WA2L-P-E-2.5	
Individual sub-base Pneumatic connection: thread G1/8  Manifold block Pneumatic connection 1, 11, 3, 33: thread G1/4 Pneumatic connection 2: thread G1/8  Cover plate  Vacant valve positions must be sealed with a cover plate.  1 valve position 525221 MHA3-PR2-3-1/8 4 valve positions 525222 MHA3-PR2-3-1/8 6 valve positions 525223 MHA3-PR6-3-1/8 8 valve positions 525224 MHA3-PR8-3-1/8 10 valve positions 525225 MHA3-PR10-3-1/8  Cover plate  Connecting cable (for valves with 2-pin plug)  Datashee  2-pin socket, PUR cable, Signal status Length 2.5 m 8047671 NEBV-Z4WA2L-P-E-2.5	
Individual sub-base Pneumatic connection: thread G1/8  Manifold block Pneumatic connection 1, 11, 3, 33: thread G1/4 Pneumatic connection 2: thread G1/8  Cover plate  Vacant valve positions must be sealed with a cover plate.  1 valve position 525214 MHA3-RS-3-1/8 4 valve positions 525221 MHA3-PR2-3-1/8 6 valve positions 525222 MHA3-PR3-3-1/8 8 valve positions 525224 MHA3-PR3-3-1/8 10 valve positions 525225 MHA3-PR10-3-1/8  Cover plate  Connecting cable (for valves with 2-pin plug)  Datashee  2-pin socket, PUR cable, Signal status Length 2.5 m 8047671 NEBV-Z4WA2L-P-E-2.5	
Pneumatic connection 1, 11, 3, 33: thread G1/4 Pneumatic connection 2: thread G1/8  Pneumatic connection 2: thread G1/8  Pneumatic connection 2: thread G1/8  A valve positions 525222 MHA3-PR4-3-1/8  8 valve positions 525224 MHA3-PR8-3-1/8  10 valve positions 525225 MHA3-PR10-3-1/8  Cover plate  Vacant valve positions must be sealed with a cover plate.  Sequence of the positions 525225 MHA3-PR10-3-1/8  Connecting cable (for valves with 2-pin plug)  Datasher of the plate	
Pneumatic connection 1, 11, 3, 33: thread G1/4 Pneumatic connection 2: thread G1/8  Pneumatic connection 2: thread G1/8  Pneumatic connection 2: thread G1/8  Evalve positions 525222 MHA3-PR6-3-1/8  8 valve positions 525224 MHA3-PR8-3-1/8  10 valve positions 525225 MHA3-PR10-3-1/8  Evalve positions 525224 MHA3-PR10-3-1/8  Evalve positions 525225 MHA3-PR10-3-1/8  Function 2: thread G1/4  Pneumatic connection 2: thread G1/4  Positions 525222 MHA3-PR4-3-1/8  8 valve positions 525224 MHA3-PR10-3-1/8  Evalve positions 525225 MHA3-PR10-3-1/8  Evalve positions 525226 MHA3-PR10-3-1/8  Evalve positions 525226 MHA3-PR4-3-1/8  Evalve positions 525226 MHA3-PR4-3-1/8  Evalve positions 525226 MHA3-PR4-3-1/8  Evalve positions 525226 MHA3-PR4-3-1/8  Evalve positions 525224 MHA3-PR4-3-1/8  Evalve positions 525225 MHA3-PR4-3-1/8  Evalve positions 525224 MHA3-PR4-3-1/8  Evalve positions 525225 MHA3-PR4-3-1/8  Evalve positions 525225 MHA3-PR4-3-1/8  Evalve positions 525226 MHA3-PR4-3-1/8  Evalve positions 525222 MHA3-PR4-3-1/8  Evalve positions 525222 MHA3-PR4-3-1/8  Evalve positions 525222 MHA3-PR4-3-1/8  Evalve positions 525222 MHA3-PR4-3-1/8  Evalve positions 525223 MHA3-PR4-3-1/8  Evalve positions 525224 MHA3-PR4-3-1/8  Evalve positions 525225 MHA3-PR4-3-1/8  Evalve positions 525224	
Pneumatic connection 2: thread G1/8  6 valve positions 525223 MHA3-PR6-3-1/8 8 valve positions 525224 MHA3-PR8-3-1/8 10 valve positions 525225 MHA3-PR10-3-1/8  Cover plate  Vacant valve positions must be sealed with a cover plate.  525226 MHA9-PR10-3-1/8  Connecting cable (for valves with 2-pin plug)  Datashed 2-pin socket, PUR cable, Signal status Length 2.5 m 8047671 NEBV-Z4WA2L-P-E-2.5	
8 valve positions 525224 MHA3-PR8-3-1/8 10 valve positions 525225 MHA3-PR10-3-1/8  Cover plate  Vacant valve positions must be sealed with a cover plate.  Signal status Length 2.5 m 8047671 NEBV-Z4WA2L-P-E-2.5	
Cover plate  Vacant valve positions must be sealed with a cover plate.  Signal status  To valve positions 525225 MHA3-PR10-3-1/8  MHAP3-BP-3  Datasher  Purcable, Signal status Length 2.5 m 8047671 NEBV-Z4WA2L-P-E-2.5	
Cover plate  Vacant valve positions must be sealed with a cover plate.  525226 MHAP3-BP-3  Connecting cable (for valves with 2-pin plug)  Datashed  2-pin socket, PUR cable, Signal status Length 2.5 m 8047671 NEBV-Z4WAZL-P-E-2.5	
2-pin socket, PUR cable, Signal status Length 2.5 m <b>8047671 NEBV-Z4WA2L-P-E-2.5</b>	
2-pin socket, PUR cable, Signal status Length 2.5 m <b>8047671 NEBV-Z4WA2L-P-E-2.5</b>	ets → Internet: nebv
open cable end 2-wire degree of indication with LED Length 5 m 8047672 NEBV-Z4WA2L-P-E-5-N	LE2-S1
protection IP65 Length 10 m <b>8047670 NEBV-Z4WA2L-P-E-10-</b>	N-LE2-S1
PVC cable, degree   Without signal   Length 0.5 m   193690   KMYZ-4-24-0.5-B	
of protection IP40 status indication Length 2.5 m 193691 KMYZ-4-24-2.5-B	
2-pin socket, plug M8x1 3-pin PUR cable, Signal status Length 0.5 m 8047673 NEBV-Z4WA2L-P-E-0.5	N-M8G3-S1
degree of protection IP65 lindication with LED Length 2.5 m 8047674 NEBV-Z4WA2L-P-E-2.5	N-M8G3-S1
Adapter (for valves with 2-pin plug)	
2-pin socket Signal status Plug M8, 3-pin 571686 VAVE-C8-1R8	
indication with LED Plug M8, 4-pin 573194 VAVE-C8-1R1	

Ordering data				Part no.	Туре
I-rail mounting			·	•	
	For manifold block		162556	CPV10/14-VI-BG-NRH-35	
I-rail					
	To EN 60715		2 m	35430	NRH-35-2000
Silencer					Datasheets → Internet: u
	With threaded connection	G1/8	1 piece	161419	UC-1/8
			50 pieces	534219	UC-1/8-50
		G1/4	1 piece	165004	UC-1/4
			20 pieces	534220	UC-1/4-20
ush-in fitting					Datasheets → Internet:
	Male thread G1/8 with external hex for tubing O.D.	6 mm	10 pieces	186096	QS-G1/8-6
			100 pieces	132037	QS-G1/8-6-100
		8 mm	10 pieces	186098	QS-G1/8-8
			50 pieces	132038	QS-G1/8-8-50
	Male thread G1/4 with external hex for tubing O.D.	8 mm	10 pieces	186099	QS-G1/4-8
			50 pieces	132040	QS-G1/4-8-50
		10 mm	10 pieces	186101	QS-G1/4-10
			50 pieces	132041	QS-G1/4-10-50
	Male thread G1/8 with external hex, push-in L-fitting	6 mm	10 pieces	186117	QSL-G1/8-6
	rotatable through 360° for tubing O.D.		100 pieces	132049	QSL-G1/8-6-100
		8 mm	10 pieces	186119	QSL-G1/8-8
			50 pieces	132050	QSL-G1/8-8-50
	Male thread G1/4 with external hex, push-in L-fitting	8 mm	10 pieces	186120	QSL-G1/4-8
	rotatable through 360°, for tubing O.D.		50 pieces	132052	QSL-G1/4-8-50
		10 mm	10 pieces	186122	QSL-G1/4-10
			50 pieces	132053	QSL-G1/4-10-50
lanking plug					
<u> </u>	For thread G1/8		10 pieces	3568	B-1/8
	For thread G1/4		10 pieces	3569	B-1/4
accription label					
nscription label	For solenoid valve		90 pieses in s	107350	MH-BZ-80X
	roi soieiiola vaive		80 pieces in a frame	197259	IVIN-D2-8UX

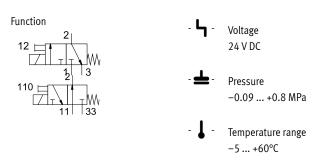
# Peripherals overview – Individual valve

# ${\bf Connection\ with\ plug\ vanes-Connection\ with\ moulded-in\ cable}$



Desig	nation	Description	→ Page/Internet
[1]	Individual valve MHE4	With plug vanes	84
[2]	Individual valve MHE4K	With moulded-in cable, IP65	84
[3]	Plug socket with cable KMEB-1 (IP65)	PVC cable, with or without LED	85
[4]	Plug socket with cable KMEB-2 (IP65)	With LED, without LED; PUR cable, with or without LED	85
[5]	Plug socket MSSD-EB (IP65)	With clamping screw	85
[6]	Plug socket MSSD-EB-S-M14 (IP65)	With insulation displacement connector	85
[7]	Mounting bracket MHE2-BG-L	For wall mounting	85
[8]	Push-in fittings QS	For connecting compressed air tubing with standard O.D.	85
[9]	Silencer UC	For fitting in exhaust ports	85

## Datasheet - Individual valve





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

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

Operating and environmental conditions					
			With fast-switching electronics	Without fast-switching electronics	
Operating medium			Compressed air to ISO 8573-1:2010 [7	7:4:4]	
Note on the operating/pilot medium			Lubricated operation possible (in which	h case lubricated operation will always be required)	
Operating pressure		[MPa]	-0.09 +0.8		
		[bar]	-0.9 +8		
	Reversible	[MPa]	-0.09 +0.1		
		[bar]	-0.9 +1		
		[psi]	-13.05 +14.5		
Ambient temperature		[°C]	-5 +60		
Temperature of medium		[°C]	-5 +60		
Corrosion resistance class CRC ¹⁾			2		
CE marking (see declaration of conformity)			To EU EMC Directive ²⁾	-	
KC mark			KC EMC	-	
Certification			c UL us - Recognized (OL)	c UL us - Recognized (OL)	
			RCM	-	
Shock resistance			Shock test with severity level 2 to FN 94	42017-5 and EN 60068-2-27	
Vibration resistance			Transport application test with severity level 2 to FN 942017-4 and		
			EN 60068-2-6		

¹⁾ Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

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

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

## Solenoid valves MHE4, fast-switching valves

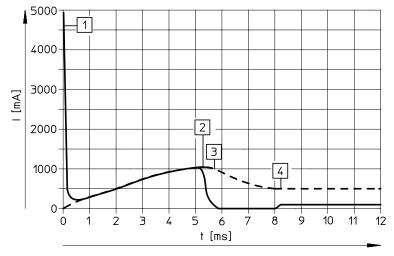
## Datasheet - Individual valve

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

Switching times and frequencies				
			With fast-switching electronics	Without fast-switching electronics
Switching time	On	[ms]	3.5	10.5
	Off	[ms]	3.5	5
Tolerance for switching time	On	[%]	+1030	-
	Off	[%]	+1040	-
Switching time variation from 1 Hz	,	[ms]	0.3	-
upwards				
Maximum switching frequency		[Hz]	210	120

Materials	
Housing	Coated die-cast zinc
Cable sheath	PUR
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	Free of copper and PTFE
	RoHS-compliant
PWIS conformity	VDMA24364-B1/B2-L

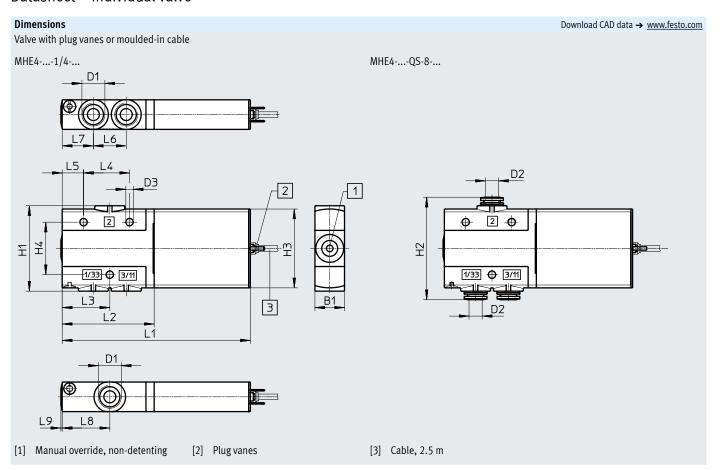
#### Current curve for valves with fast-switching electronics (MHE4-MS1H)

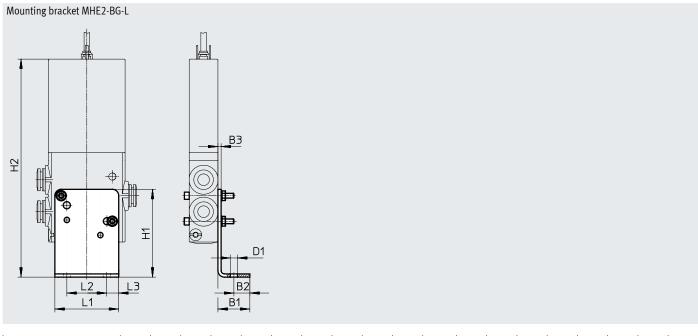


Internal current in the coil
External current in the supply line

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

## Datasheet - Individual valve





Туре	B1	B2	В3	D1	D2	D3	H1	H2	Н3	H4	L1	L2	L3	L4	L5	L6	L7	L8	L9
					Ø	Ø													
MHE41/4	18	-	-	G1/4	-	4.5	56	-	48	32	114.6	56	29	28	13	20	19	29	0.8
MHE4QS-8	18	1	-	-	8	4.5	52	62.4	48	32	114.6	56	29	28	13	20	19	29	0.8
MHE2-BG-L	20	10	2	4.5	-	-	55	134	-	_	40	25	7.5	-	-	-	-	-	-

# Solenoid valves MHE4, fast-switching valves

# Datasheet – Individual valve

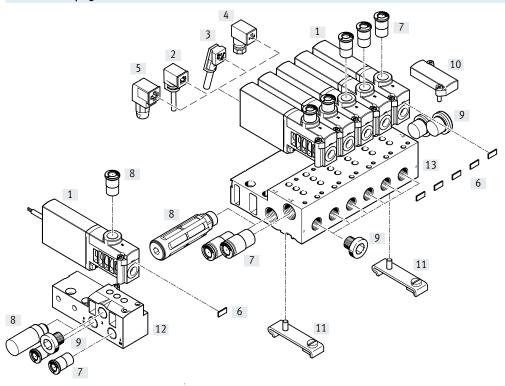
Ordering data						
					Part no.	Туре
Valves						
	Electrical connec-	With fast-switching	Pneumatic connection: thread	Normally open	525207	MHE4-MS1H-3/20-1/4
<b>1</b>	tion: 2-pin plug	electronics, switching	G1/4	Normally closed	525187	MHE4-MS1H-3/2G-1/4
0 2		time 3.5 ms	Pneumatic connection:	Normally open	525211	MHE4-MS1H-3/20-QS-8
			push-in connector for tubing	Normally closed	525191	MHE4-MS1H-3/2G-QS-8
			O.D. 8 mm			
		Without fast-switching	Pneumatic connection: thread	Normally open	525206	MHE4-M1H-3/20-1/4
		electronics, switching	G1/4	Normally closed	525186	MHE4-M1H-3/2G-1/4
		time 10.5 ms	Pneumatic connection:	Normally open	525210	MHE4-M1H-3/20-QS-8
			push-in connector for tubing	Normally closed	525190	MHE4-M1H-3/2G-QS-8
			O.D. 8 mm			
	Electrical connec-	With fast-switching	Pneumatic connection: thread	Normally closed	525189	MHE4-MS1H-3/2G-1/4-K
	tion: cable	electronics, switching	G1/4			
0 20		time 3.5 ms	Pneumatic connection:	Normally open	525213	MHE4-MS1H-3/20-QS-8-K
\\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\			push-in connector for tubing	Normally closed	525193	MHE4-MS1H-3/2G-QS-8-K
			O.D. 8 mm			
		Without fast-switching	Pneumatic connection: thread	Normally open	525208	MHE4-M1H-3/20-1/4-K
		electronics, switching	G1/4	Normally closed	525188	MHE4-M1H-3/2G-1/4-K
		time 10.5 ms				

# Datasheet – Individual valve

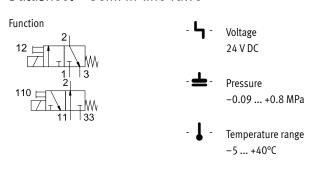
Ordering data					I	1_
					Part no.	Туре
Plug socket with cable	e (for valves with 2-pin plug)	Inva III I		T		
	3-pin socket, open cable end 3-wire	PVC cable, degree of	protection	Length 2.5 m	151688	KMEB-1-24-2.5-LED
	Signal status indication with LED	11765		Length 5 m	151689	KMEB-1-24-5-LED
*	4-pin socket,	PUR cable, degree o	furatastian	Length 10 m Length 2.5 m	193457 174844	KMEB-1-24-10-LED KMEB-2-24-2.5-LED
	open cable end 3-wire	IP65	rprotection	Length 5 m	174844	KMEB-2-24-2.5-LED KMEB-2-24-5-LED
	Signal status indication with LED	11.00		Length 5 III	174045	RMED-2-24-3-LED
	5-pin socket, plug M12 5-pin	Cable sheath TPE-U	(PU), degree	Length 0.5 m	177677	KMEB-2-24-M12-0.5-LED
	Signal status indication with LED	of protection IP65				
Plug socket (for valves	with 2-nin nlug)					
1 tug socket (for varves	Angled socket	Screw terminal		3-pin	151687	MSSD-EB
	Without signal status indication	Degree of protection	IP65	) piii	151007	MISSE EB
		Insulation displacer		4-pin	192745	MSSD-EB-S-M14
		technology		'		
		Degree of protection	IP67			
Illumination and						
Illuminating seal	For mounting between also coalest (without	t signal status indicati	مم) ممط برمايره		454747	MED 10 13 2400
	For mounting between plug socket (withou	t Signat Status Indicati	on) and valve		151717	MEB-LD-12-24DC
Wall mounting					,	
	Mounting bracket				196165	MHE2-BG-L
000						
Silencer						Datasheets → Internet: uc
	Push-in sleeve	Screwed trunnion	8 mm	1 piece	175611	UC-QS-8H
		PE		'		
	Threaded connection, polymer design	Screwed trunnion G1/4		1 piece	165004	UC-1/4
		PE		20 pieces	534220	UC-1/4-20
Push-in fitting						Datasheets → Internet: qs
	Male thread with external hex	G1/4	8 mm	10 pieces	186099	QS-G1/4-8
				50 pieces	132040	QS-G1/4-8-50
			10 mm	10 pieces	186101	QS-G1/4-10
				50 pieces	132041	QS-G1/4-10-50
	Push-in L-fitting, rotatable through 360°,	G1/4	8 mm	10 pieces	186120	QSL-G1/4-8
	male thread with external hex			50 pieces	132052	QSL-G1/4-8-50
•			10 mm	10 pieces	186122	QSL-G1/4-10
				50 pieces	132053	QSL-G1/4-10-50
Blanking plug						
~	For thread G1/4			10 pieces	3569	B-1/4
	101 (111044 01)			10 p.0000	3303	, .
	·		,	•		
Inscription label						
	For solenoid valve			80 pieces	197259	MH-BZ-80X
*						

# Peripherals overview – Semi in-line valve

#### Connection via plug vanes



Desig	nation	Description	→ Page/Internet
[1]	Semi in-line valve MHP4	With plug vanes	92
[2]	Plug socket MSSD-EB (IP65)	With clamping screw	93
[3]	Plug socket MSSD-EB-S-M14 (IP65)	With insulation displacement connector	93
[4]	Plug socket with cable KMEB-1 (IP65)	PVC cable, with or without LED	93
[5]	Plug socket with cable KMEB-2 (IP65)	PUR cable, with or without LED	93
[6]	Inscription label MH-BZ-80X	For identifying the valves	94
[7]	Push-in fittings QS	For connecting compressed air tubing with standard O.D.	94
[8]	Silencers UC	For fitting in exhaust ports	94
[9]	Blanking plug B	For sealing unused ports	94
[10]	Cover plate MHAP4-BP-3	For sealing vacant positions	92
[11]	H-rail mounting CPV10/14-VI-BG-NRH-35	For mounting the manifold block on H-rails to EN 60715	93
[12]	Individual sub-base MHA4-AS-3-1/4	For semi in-line valves; the individual sub-base is also used for sub-base valves; the extra connection must be sealed with a plug here	92
[13]	Manifold block MHA4-PR1/4	For semi in-line valves	92





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

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

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

Operating and environmental conditions					
			With fast-switching electronics	Without fast-switching electronics	
Operating medium			Compressed air to ISO 8573-1:2010 [	7:4:4]	
Note on the operating/pilot medium			Lubricated operation possible (in which	h case lubricated operation will always be required)	
Operating pressure		[MPa]	-0.09 +0.8		
		[bar]	-0.9 +8		
	Reversible	[MPa]	-0.09 +0.1		
		[bar]	-0.9 +1		
		[psi]	-13.05 +14.5		
Ambient temperature		[°C]	-5 +40		
Temperature of medium		[°C]	-5 +40		
Corrosion resistance class CRC ¹⁾			2		
CE marking (see declaration of conformity)			To EU EMC Directive ²⁾	-	
KC mark			KC EMC	-	
Certification			c UL us - Recognized (OL)	c UL us - Recognized (OL)	
			RCM	-	
Shock resistance			Shock test with severity level 2 to FN 9	42017-5 and EN 60068-2-27	
Vibration resistance			Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6		

¹⁾ Corrosion resistance class CRC 2 to Festo standard FN 940070

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

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

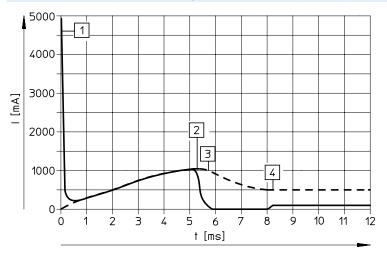
Switching times and frequencies				
			With fast-switching electronics	Without fast-switching electronics
Switching time	On	[ms]	3.5	10.5
	Off	[ms]	3.5	5
Tolerance for switching time	On	[%]	+1030	-
	Off	[%]	+1040	-
Switching time variation from 1 Hz		[ms]	0.3	-
upwards				
Maximum switching frequency		[Hz]	210	120

Materials	
Housing	Coated die-cast zinc
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	Free of copper and PTFE
	RoHS-compliant
PWIS conformity	VDMA24364-B1/B2-L

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

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

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



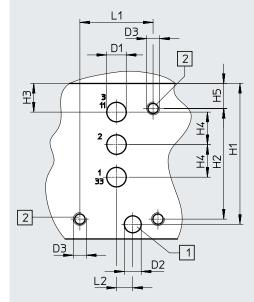
- [1] Capacitor charging
- Controlled coil current 1 A
- Holding current reduction
- Controlled holding current 0.5 A

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

**Dimensions** Download CAD data → www.festo.com Valve with connecting thread G1/4 Valve with push-in connector for tubing O.D. 8 mm \3/11 L3 HZ 王 L9 L2 3 D1 [1] Manual override, non-detenting [2] Plug vanes Туре В1 D1 D2 Н1 H2 Н3 Н4 L1 L2 L3 L9 Ø

#### **Dimensions**

Hole pattern on sub-bases



Download CAD data → www.festo.com

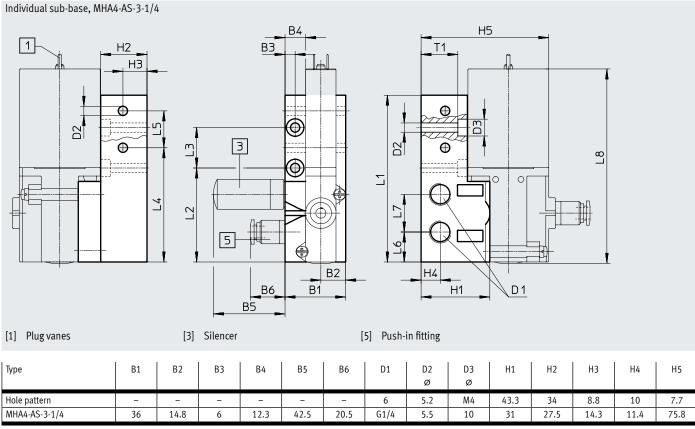
Note

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

If used as a 2/2-way valve, normally closed, ports 3/11 are not used. If used as a 2/2-way valve, normally open, ports 1/33 are not used.

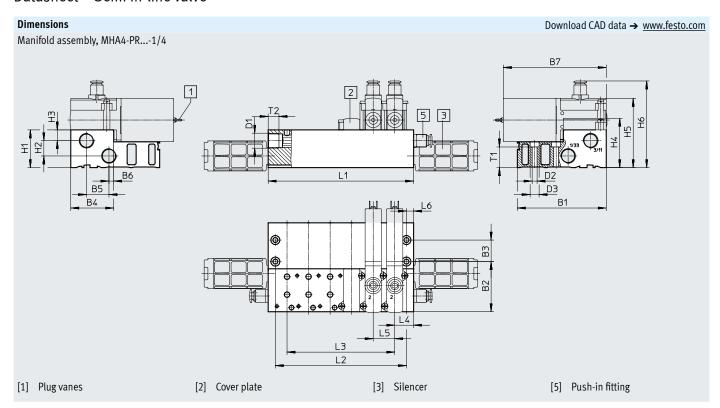
[1] Hole for coding pin, 2.5mm deep

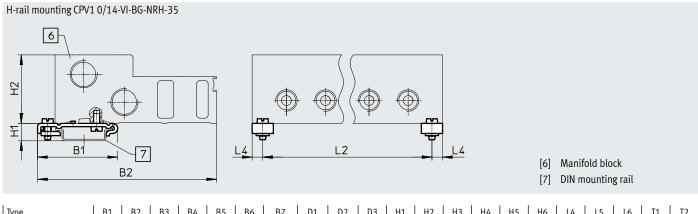
[2] Mounting thread, 13 mm deep



Туре	B1	B2	В3	B4	B5	B6	D1	D2 Ø	D3 Ø	H1	H2	Н3	H4	Н5
Hole pattern	-	-	-	-	-	-	6	5.2	M4	43.3	34	8.8	10	7.7
MHA4-AS-3-1/4	36	14.8	6	12.3	42.5	20.5	G1/4	5.5	10	31	27.5	14.3	11.4	75.8

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





Туре	B1	B2	В3	B4	B5	В6	В7	D1	D2	D3	H1	H2	Н3	H4	H5	Н6	L4	L5	L6	T1	T2
									Ø	Ø											
MHA4-PR1/4	99	55.8	24	47.8	25	5.3	114.6	G3/8	5.5	10	42	17	12	55	77	96.5	21	24	8	23	12
CPV1 0/14-VI-BG	49.1	110	-	-	-	-	_	-	-	-	10.7	42	-	-	-	-	6.5	-	-	-	-

Туре		Number of valve positions	lumber of valve positions								
		2	4	6	8	10					
MHA4-PR1/4	L1	66	114	162	210	258					
	L2	50	98	146	194	242					
	L3	24	72	120	168	216					
CPV1 0/14-VI-BG	L2	53	101	149	197	245					



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

## Solenoid valves MHP4, fast-switching valves

## Datasheet – Semi in-line valve

					Part no.	Туре
/alves	:				•	
	Electrical connec-	With fast-switching	Pneumatic connection: thread	Normally open	525199	MHP4-MS1H-3/20-1/4
	tion: 2-pin plug	electronics, switching	G1/4	Normally closed	525179	MHP4-MS1H-3/2G-1/4
3		time 3.5 ms	Pneumatic connection: push-in connector for tubing O.D. 8 mm	Normally closed	525183	MHP4-MS1H-3/2G-QS-8
		Without fast-switching	Pneumatic connection: thread	Normally open	525198	MHP4-M1H-3/20-1/4
		electronics, switching time 10.5 ms	G1/4	Normally closed	525178	MHP4-M1H-3/2G-1/4
	Pneumatic connec	tion: thread G1/4		·		
^_	Manifold block ¹⁾			2 1	505007	ANIA ( DD2 2 4 //
		tion 1, 11, 3, 33: thread G	:2/0	2 valve positions 4 valve positions	525234	MHA4-PR2-3-1/4
	, ,	tion 2: thread G1/4	0)0	6 valve positions	525235 525236	MHA4-PR4-3-1/4 MHA4-PR6-3-1/4
100	i ilcullatic colliec			8 valve positions	525236	MHA4-PR8-3-1/4
<b>Y</b>				10 valve positions	525238	MHA4-PR10-3-1/4
				10 valve positions	323230	111111111111111111111111111111111111111
Cover plate						
<u> </u>	Vacant valve posit	ions must be sealed with a	a cover plate.		525239	MHAP4-BP-3

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



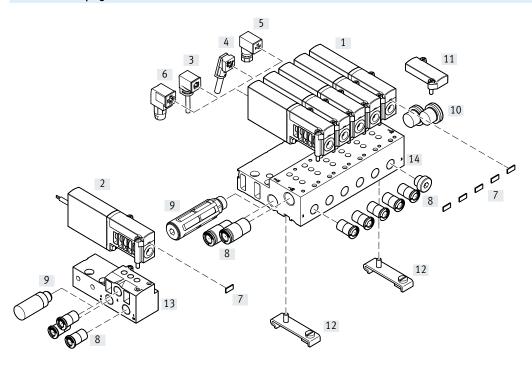
Valve types 3/2G and 3/20 must not be mixed on one manifold block.

Ordering data				Part no.	Туре
lug socket with ca	ible			·	
A.	3-pin socket,	PVC cable, degree of protection	Length 2.5 m	151688	KMEB-1-24-2.5-LED
	open cable end 3-wire	IP65	Length 5 m	151689	KMEB-1-24-5-LED
$\downarrow$	Signal status indication with LED		Length 10 m	193457	KMEB-1-24-10-LED
M	4-pin socket,	PUR cable, degree of protection	Length 2.5 m	174844	KMEB-2-24-2.5-LED
<b>1</b>	open cable end 3-wire	IP65	Length 5 m	174845	KMEB-2-24-5-LED
	Signal status indication with LED				
	5-pin socket, plug M12 5-pin	Cable sheath TPE-U (PU), degree	Length 0.5 m	177677	KMEB-2-24-M12-0.5-LED
	Signal status indication with LED	of protection IP65			
lug socket	1		T		T
	Angled socket	Screw terminal	3-pin	151687	MSSD-EB
ŢŢ	Without signal status indication	Degree of protection IP65			
$\checkmark$		Insulation displacement	4-pin	192745	MSSD-EB-S-M14
		technology			
		Degree of protection IP67			
lluminating seal					
	For mounting between plug socket (wi	thout signal status indication) and valve	!	151717	MEB-LD-12-24DC
I-rail mounting					
	For manifold block			162556	CPV10/14-VI-BG-NRH-35
				102330	S. 123, 2 . 11. 20
	1			1	
I-rail	Te en contra		T _a		[
[[2]	To EN 60715		2 m	35430	NRH-35-2000

Ordering data					Part no.	Туре
Silencer			-		•	Datasheets → Internet: u
	Push-in sleeve	Screwed trunnion PE	8 mm	1 piece	175611	UC-QS-8H
	Threaded connection, polymer design	Screwed trunnion	G1/4	1 piece	165004	UC-1/4
		PE		20 pieces	534220	UC-1/4-20
		Housing	G3/8	1 piece	2309	U-3/8
		Polyacetal		20 pieces	534224	U-3/8-20
ush-in fitting						Datasheets → Internet: c
	Male thread with external hex	G1/4	8 mm	10 pieces	186099	QS-G1/4-8
				50 pieces	132040	QS-G1/4-8-50
			10 mm	10 pieces	186101	QS-G1/4-10
				50 pieces	132041	QS-G1/4-10-50
		G3/8	10 mm	10 pieces	186102	QS-G3/8-10
				50 pieces	132044	QS-G3/8-10-50
			12 mm	10 pieces	186103	QS-G3/8-12
				20 pieces	132045	QS-G3/8-12-20
	Push-in L-fitting, rotatable through	G1/4	8 mm	10 pieces	186120	QSL-G1/4-8
	360°, male thread with external hex			50 pieces	132052	QSL-G1/4-8-50
			10 mm	10 pieces	186122	QSL-G1/4-10
				50 pieces	132053	QSL-G1/4-10-50
		G3/8	10 mm	10 pieces	186123	QSL-G3/8-10
				20 pieces	132056	QSL-G3/8-10-20
			12 mm	10 pieces	186124	QSL-G3/8-12
				20 pieces	132057	QSL-G3/8-12-20
lanking plug						
<b>√</b>	For thread G1/4			10 pieces	3569	B-1/4
	For thread G3/8			10 pieces	3570	B-3/8
nscription label						
	For solenoid valve			80 pieces	197259	MH-BZ-80X

# Peripherals overview – Sub-base valve

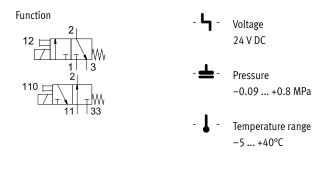
#### Connection with plug vanes – Connection with moulded-in cable



Desig	nation	Description	→ Page/Internet
[1]	Sub-base valves MHA4	With plug vanes	101
[2]	Sub-base valves MHA4K	With moulded-in cable, IP65	101
[3]	Plug socket with cable KMEB-1 (IP65)	PVC cable, with or without LED	102
[4]	Plug socket with cable KMEB-2 (IP65)	PUR cable, with or without LED	102
[5]	Plug socket MSSD-EB (IP65)	With clamping screw	102
[6]	Plug socket MSSD-EB-S-M14 (IP65)	With insulation displacement connector	102
[7]	Inscription label MH-BZ-80X	For identifying the valves	103
[8]	Push-in fittings QS	For connecting compressed air tubing with standard O.D.	103
[9]	Silencer UC	For fitting in exhaust ports	103
[10]	Blanking plug B	For sealing unused ports	103
[11]	Cover plate MHAP4-BP-3	For sealing vacant positions	101
[12]	H-rail mounting CPV10/14-VI-BG-NRH-35	For mounting the manifold block on H-rails to EN 60715	102
[13]	Individual sub-base MHA4-AS-3-1/4	For sub-base valves	101
[14]	Manifold block MHA4-PR1/4	For sub-base valves	101

## Solenoid valves MHA4, fast-switching valves

#### Datasheet - Sub-base valve





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

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

Operating and environmental conditions			With fact quitabing electronics	Without fact quitabing electronics
			With fast-switching electronics	Without fast-switching electronics
Operating medium			Compressed air to ISO 8573-1:2010 [2	7:4:4]
Note on the operating/pilot medium			Lubricated operation possible (in whice	ch case lubricated operation will always be required)
Operating pressure		[MPa]	-0.09 +0.8	
		[bar]	-0.9 +8	
	Reversible	[MPa]	-0.09 +1	
		[bar]	-0.9 +1	
		[psi]	-13.05 +14.5	
Ambient temperature		[°C]	-5 +40	
Temperature of medium		[°C]	-5 +40	
Corrosion resistance class CRC ¹⁾			2	
CE marking (see declaration of conformity)			To EU EMC Directive ²⁾	-
KC mark			KC EMC	-
Certification			c UL us - Recognized (OL)	c UL us - Recognized (OL)
			RCM	-
Shock resistance			Shock test with severity level 2 to FN 9	942017-5 and EN 60068-2-27
Vibration resistance			Transport application test with severity	y level 2 to FN 942017-4 and EN 60068-2-6

¹⁾ Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

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

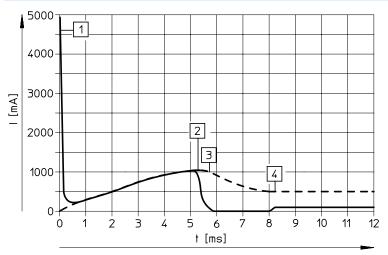
Electrical data			
		With fast-switching electronics	Without fast-switching electronics
Electrical connection		2-pin plug or cable	
Operating voltage	[V DC]	24	
Permissible voltage fluctuations	[%]	±10	
Power consumption	[W]	8.5 (high-current phase)	5.6
	[W]	2.125 (low-current phase)	-
Reverse polarity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

Switching times and frequencies				
			With fast-switching electronics	Without fast-switching electronics
Switching time	On	[ms]	3.5	10.5
	Off	[ms]	3.5	5
Tolerance for switching time	On	[%]	+1030	-
	Off	[%]	+1040	-
Switching time variation from 1 Hz		[ms]	0.3	-
upwards				
Maximum switching frequency		[Hz]	210	120

Materials	
Housing	Coated die-cast zinc
Cable sheath	PUR
Seals	HNBR, NBR
Screws	Galvanised steel
Note on materials	Free of copper and PTFE
	RoHS-compliant
PWIS conformity	VDMA24364-B1/B2-L

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

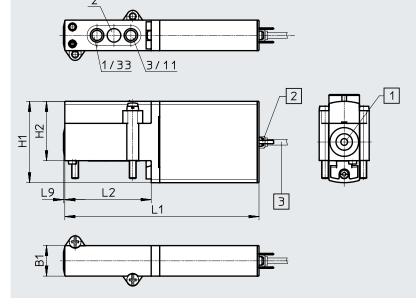
#### Current curve for valves with fast-switching electronics (MHA4-MS1H)



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

#### **Dimensions**

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



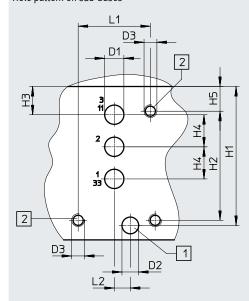
Download CAD data → www.festo.com

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

Туре	B1	H1	H2	L1	L2	L9
MHA43/2	18	48	35	114.6	51	0.8

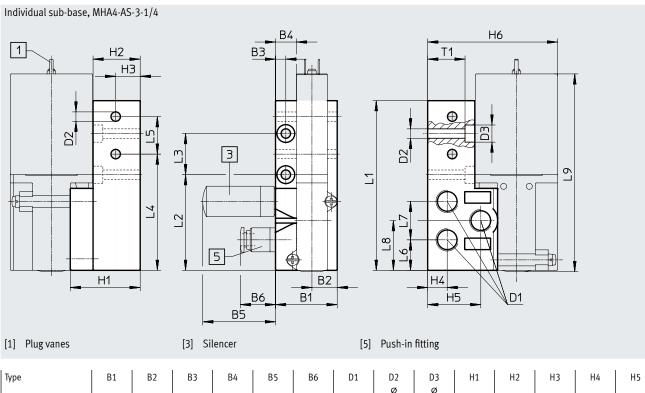
Hole pattern on sub-bases

Dimensions



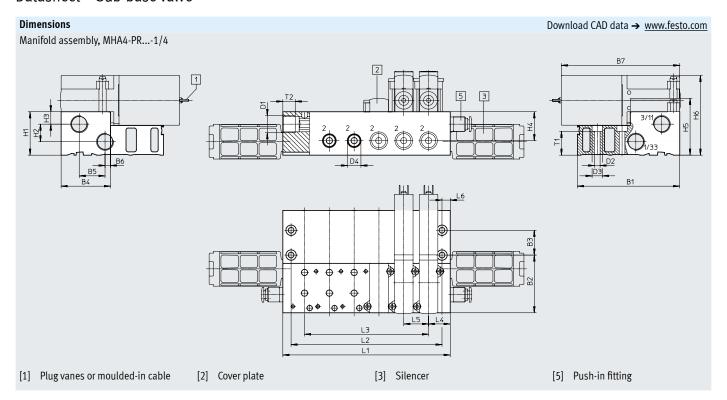
Download CAD data → www.festo.com

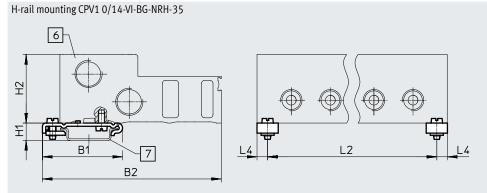
- [1] Hole for coding pin, 2.5mm deep
- [2] Mounting thread, 13 mm deep



Туре	B1	B2	В3	B4	B5	В6	D1	D2 Ø	D3 Ø	H1	H2	H3	H4	Н5	H6
Hole pattern	-	-	-	-	-	-	6	5.2	M4	43.3	34	8.8	10	7.7	-
MHA4-AS-3-1/4	36	14.8	6	12.3	42.5	20.5	G1/4	5.5	10	40.8	27.5	14.3	11.4	31	75.8

Туре	L1	L2	L3	L4	L5	L6	L7	L8	L9	T1
Hole pattern	22.5	5	-	-	-	-	-	-	-	-
MHA4-AS-3-1/4	99	55.8	24	67.8	21.9	17.8	22.4	29	115.4	21.8





- [6] Manifold block
- [7] DIN mounting rail

MHA4-PR1/4 99 55.8 24 47.8 25 5.3 114.6 G3/8 5.5 10 G1/4 42 17 12 28 55 77 CPV1 0/14-VI-BG 49.1 110 10.7 42	Туре	B1	B2	B3	B4	B5	B6	B7	D1	D2	D3	D4	H1	H2	H3	H4	H5	H6
MITA+T N1/4 77 33.0 24 47.0 23 3.5 114.0 03/0 3.3 10 01/4 42 17 12 20 33 77										Ø	Ø	Ø						
CPV1 0/14-VI-BG         49.1         110         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         - <td>MHA4-PR1/4</td> <td>99</td> <td>55.8</td> <td></td> <td>47.8</td> <td></td> <td></td> <td>114.6</td> <td>G3/8</td> <td>5.5</td> <td>10</td> <td>G1/4</td> <td></td> <td>1 1/</td> <td>1 1)</td> <td>28</td> <td>1 55</td> <td>77</td>	MHA4-PR1/4	99	55.8		47.8			114.6	G3/8	5.5	10	G1/4		1 1/	1 1)	28	1 55	77
	CPV1 0/14-VI-BG	49.1	110	-	-	-	-	-	-	-	-	-	10.7	42	-	-	-	

Туре	L4	L5	L6	T1	T2
MHA4-PR1/4	21	24	8	23	12
CPV1 0/14-VI-BG	6.5	-	-	-	-

Туре		Number of valve positions	lumber of valve positions								
		2	4	6	8	10					
MHA4-PR1/4	L1	66	114	162	210	258					
	L2	50	98	146	194	242					
	L3	24	72	120	168	216					
CPV1 0/14-VI-BG	L2	53	101	149	197	245					

Ordering data				Part no.	Туре
/alves					
	Electrical connection: 2-pin plug	With fast-switching electronics, switching time 3.5 ms	Normally closed	525175	MHA4-MS1H-3/2G-4
		Without fast-switching electronics, switching time 10.5 ms	Normally closed	525174	MHA4-M1H-3/2G-4
Electrical connection: cable		With fast-switching electronics, switching time 3.5 ms	Normally closed	525177	MHA4-MS1H-3/2G-4-K
		Without fast-switching electronics,	Normally open	525196	MHA4-M1H-3/20-4-K
		switching time 10.5 ms	Normally closed	525176	MHA4-M1H-3/2G-4-K
	Individual sub-base Pneumatic connection: thread	G1/4	1 valve position	525227	MHA4-AS-3-1/4
		,			
	Manifold block		2 valve positions	525234	MHA4-PR2-3-1/4
	Pneumatic connection 1, 11, 3		4 valve positions	525235	MHA4-PR4-3-1/4
	Pneumatic connection 2: threa	d G1/4	6 valve positions	525236	MHA4-PR6-3-1/4
•			8 valve positions	525237	MHA4-PR8-3-1/4
			10 valve positions	525238	MHA4-PR10-3-1/4
over plate	ly the second of			525220	MUADZ DD 3
	Vacant valve positions must be	sealed with a cover plate.		525239	MHAP4-BP-3



#### Note

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

# Solenoid valves MHA4, fast-switching valves

# Datasheet – Sub-base valve

				Part no.	Туре
Plug socket with c	able (for valves with plug vanes)				
, AP	3-pin socket,	PVC cable, degree of protection	Length 2.5 m	151688	KMEB-1-24-2.5-LED
	open cable end 3-wire	IP65	Length 5 m	151689	KMEB-1-24-5-LED
$\cup$	Signal status indication with LED		Length 10 m	193457	KMEB-1-24-10-LED
M	4-pin socket,	PUR cable, degree of protection	Length 2.5 m	174844	KMEB-2-24-2.5-LED
<b>~</b> 55 ^{C7}	open cable end 3-wire	IP65	Length 5 m	174845	KMEB-2-24-5-LED
	Signal status indication with LED				
	5-pin socket, plug M12 5-pin	Cable sheath TPE-U (PU), degree	Length 0.5 m	177677	KMEB-2-24-M12-0.5-LED
	Signal status indication with LED	of protection IP65			
Plug socket (for va	lves with plug vanes)				
- Control va	Angled socket	Screw terminal	3-pin	151687	MSSD-EB
	Without signal status indication	Degree of protection IP65	J P	1,100,	
$\downarrow$		Insulation displacement	4-pin	192745	MSSD-EB-S-M14
		technology	, F	-7-7.72	
		Degree of protection IP67			
lluminating seal					
	For mounting between plug socket (wi	thout signal status indication) and valve		151717	MEB-LD-12-24DC
H-rail mounting					
A)	For manifold block			162556	CPV10/14-VI-BG-NRH-35
	To mamora block			102330	CFV10/14-VI-DG-HKII-55
1 9				•	
I-rail	T. FN (0745		12	25/26	NDU 25 2000
1/2	To EN 60715		2 m	35430	NRH-35-2000

					Part no.	Туре
Silencer				•		Datasheets → Internet:
	Push-in sleeve	Screwed trunnion PE	8 mm	1 piece	175611	UC-QS-8H
	Threaded connection, polymer design	Screwed trunnion	G1/4	1 piece	165004	UC-1/4
		PE		20 pieces	534220	UC-1/4-20
		Housing	G3/8	1 piece	2309	U-3/8
		POM		20 pieces	534224	U-3/8-20
ush-in fitting						Datasheets → Internet:
	Male thread with external hex	G1/4	8 mm	10 pieces	186099	QS-G1/4-8
				50 pieces	132040	QS-G1/4-8-50
			10 mm	10 pieces	186101	QS-G1/4-10
				50 pieces	132041	QS-G1/4-10-50
		G3/8	10 mm	10 pieces	186102	QS-G3/8-10
				50 pieces	132044	QS-G3/8-10-50
			12 mm	10 pieces	186103	QS-G3/8-12
				20 pieces	132045	QS-G3/8-12-20
	Push-in L-fitting, rotatable through 360°,	G1/4	8 mm	10 pieces	186120	QSL-G1/4-8
	male thread with external hex			50 pieces	132052	QSL-G1/4-8-50
			10 mm	10 pieces	186122	QSL-G1/4-10
				50 pieces	132053	QSL-G1/4-10-50
		G3/8	10 mm	10 pieces	186123	QSL-G3/8-10
				20 pieces	132056	QSL-G3/8-10-20
			12 mm	10 pieces	186124	QSL-G3/8-12
				20 pieces	132057	QSL-G3/8-12-20
lanking plug						
	For thread G1/4			10 pieces	3569	B-1/4
	For thread G3/8			10 pieces	3570	B-3/8
nscription label				•	1	
iscription tabet	For solenoid valve			80 pieces	107250	MH-BZ-80X
	rui Suienuia vaive			ou pieces	197259	MU-P7-80Y