

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

**FESTO**



## Key features

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

#### Pros that switch as fast as 2 milliseconds

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  $\leq 2$  ms and a repetition accuracy  $\leq 0.2$  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 on-site circumstances while the footprint is kept to a minimum.

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

## Key features

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



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

### Advantages for designers



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

### Advantages for purchasers



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

### Advantages for installation



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

## Key features

### Fast and precise – sturdy and economical

High performance, process stability and extremely easy handling

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

Integrated: the fast-switching electronics

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

Optimised: systems and processes

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

Key features

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

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

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

Length means losses – focus on tubing

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

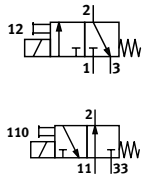
Small and nearby – the clever alternative

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

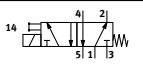
Small and fast – a good combination

The switching time plays a crucial role with small cylinder volumes, especially with short-stroke cylinders. In the adjacent example, the combination with a fast-switching valve is 30% faster. In concrete terms, this means that the cylinder controlled using the fast-switching valve is already in the end position before the cylinder with the universal valve even begins to move. This equates to a significant increase in both the efficiency and the economy of the system, especially when taking into account that the two valves have comparable space requirements and weight, and the fast-switching valve uses less air and lasts 10 times as long!

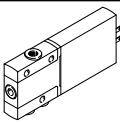
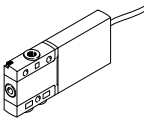
Product range overview

| Function                          | Circuit symbol                                                                    | Design                                      | Switching time [ms] |                  |     |    | Operating voltage [V DC] | → Page/Internet |
|-----------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------|---------------------|------------------|-----|----|--------------------------|-----------------|
|                                   |                                                                                   |                                             | Off <sup>2)</sup>   | On <sup>2)</sup> | Off | On |                          |                 |
| <b>3/2-way valve<sup>1)</sup></b> |  | <b>Standard nominal flow rate 100 l/min</b> |                     |                  |     |    |                          |                 |
|                                   |                                                                                   | Individual valve                            | 2                   | 1.7              | 3.5 | 7  | 24                       | 9               |
|                                   |                                                                                   | Semi in-line valve                          | 2                   | 1.7              | 3.5 | 7  | 24                       | 22              |
|                                   |                                                                                   | Sub-base valve                              | 2                   | 1.7              | 3.5 | 7  | 24                       | 40              |

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

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

**Mounting options**

| Design                                                                              | Individual valve    |         | Semi in-line valve |         | Sub-base valve |         |
|-------------------------------------------------------------------------------------|---------------------|---------|--------------------|---------|----------------|---------|
| Valve function                                                                      | 3/2-way             | 5/2-way | 3/2-way            | 5/2-way | 3/2-way        | 5/2-way |
| <b>Plug vanes</b>                                                                   |                     |         |                    |         |                |         |
|   | Direct mounting     | ■       | ■                  | -       | -              | -       |
|                                                                                     | Individual sub-base | -       | -                  | ■       | ■              | ■       |
|                                                                                     | Manifold assembly   | -       | -                  | ■       | ■              | ■       |
| <b>Moulded-in cable</b>                                                             |                     |         |                    |         |                |         |
|  | Direct mounting     | ■       | ■                  | -       | -              | -       |
|                                                                                     | Individual sub-base | -       | -                  | -       | -              | ■       |
|                                                                                     | Manifold assembly   | -       | -                  | -       | -              | ■       |

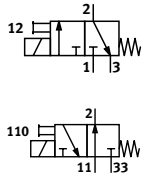
Product range overview

| Function                    | Circuit symbol | Design                                      | Switching time [ms] |                  |     |     | Operating voltage [V DC] | → Page/ Internet |
|-----------------------------|----------------|---------------------------------------------|---------------------|------------------|-----|-----|--------------------------|------------------|
|                             |                |                                             | Off <sup>2)</sup>   | On <sup>2)</sup> | Off | On  |                          |                  |
| 3/2-way valve <sup>1)</sup> |                | <b>Standard nominal flow rate 200 l/min</b> |                     |                  |     |     |                          |                  |
|                             |                | Individual valve                            | 2.8                 | 2.3              | 4.5 | 8.3 | 24                       | 58               |
|                             |                | Semi in-line valve                          | 2.8                 | 2.3              | 4.5 | 8.3 | 24                       | 66               |
|                             |                | Sub-base valve                              | 2.8                 | 2.3              | 4.5 | 8.3 | 24                       | 75               |

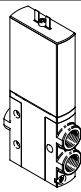
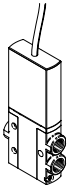
- 1) Can be used as a 2/2-way valve by sealing port 3 or 33  
 2) With integrated fast-switching electronics

| Mounting options        |                     | Individual valve | Semi in-line valve | Sub-base valve |
|-------------------------|---------------------|------------------|--------------------|----------------|
| <b>Plug vanes</b>       |                     |                  |                    |                |
|                         | Direct mounting     | ■                | -                  | -              |
|                         | Individual sub-base | -                | ■                  | ■              |
|                         | Manifold assembly   | -                | ■                  | ■              |
| <b>Moulded-in cable</b> |                     |                  |                    |                |
|                         | Direct mounting     | ■                | -                  | -              |
|                         | Individual sub-base | -                | ■                  | ■              |
|                         | Manifold assembly   | -                | ■                  | ■              |

Product range overview

| Function                    | Circuit symbol                                                                    | Design             | Switching time [ms] |                  |     |      | Operating voltage [V DC] | → Page/Internet |
|-----------------------------|-----------------------------------------------------------------------------------|--------------------|---------------------|------------------|-----|------|--------------------------|-----------------|
|                             |                                                                                   |                    | Off <sup>2)</sup>   | On <sup>2)</sup> | Off | On   |                          |                 |
| 3/2-way valve <sup>1)</sup> | <b>Standard nominal flow rate 400 l/min</b>                                       |                    |                     |                  |     |      |                          |                 |
|                             |  | Individual valve   | 3.5                 | 3.5              | 5   | 10.5 | 24                       | 85              |
|                             |                                                                                   | Semi in-line valve | 3.5                 | 3.5              | 5   | 10.5 | 24                       | 91              |
|                             |                                                                                   | Sub-base valve     | 3.5                 | 3.5              | 5   | 10.5 | 24                       | 100             |

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

| Mounting options                                                                    |                     | Individual valve | Semi in-line valve | Sub-base valve |
|-------------------------------------------------------------------------------------|---------------------|------------------|--------------------|----------------|
| <b>Plug vanes</b>                                                                   |                     |                  |                    |                |
|    | Direct mounting     | ■                | –                  | –              |
|                                                                                     | Individual sub-base | –                | ■                  | ■              |
|                                                                                     | Manifold assembly   | –                | ■                  | ■              |
| <b>Moulded-in cable</b>                                                             |                     |                  |                    |                |
|  | Direct mounting     | ■                | –                  | –              |
|                                                                                     | Individual sub-base | –                | ■                  | ■              |
|                                                                                     | Manifold assembly   | –                | ■                  | ■              |

## Type codes

| 001         | Series              |
|-------------|---------------------|
| <b>MHA2</b> | Solenoid valve MHA2 |
| <b>MHE2</b> | Solenoid valve MHE2 |
| <b>MHP2</b> | Solenoid valve MHP2 |
| <b>MHA3</b> | Solenoid valve MHA3 |
| <b>MHE3</b> | Solenoid valve MHE3 |
| <b>MHP3</b> | Solenoid valve MHP3 |
| <b>MHA4</b> | Solenoid valve MHA4 |
| <b>MHE4</b> | Solenoid valve MHE4 |
| <b>MHP4</b> | Solenoid valve MHP4 |

| 002      | Drive system        |
|----------|---------------------|
| <b>M</b> | Solenoid, switching |

| 003      | Nominal operating voltage |
|----------|---------------------------|
| <b>1</b> | 24 V DC                   |

| 004      | Manual override |
|----------|-----------------|
| <b>H</b> | Non-detenting   |

| 005        | Valve function |
|------------|----------------|
| <b>3/2</b> | 3/2-way valve  |
| <b>5/2</b> | 5/2-way valve  |

| 006      | Normal position |
|----------|-----------------|
|          | 5/2-way valve   |
| <b>G</b> | Closed          |
| <b>O</b> | Open            |

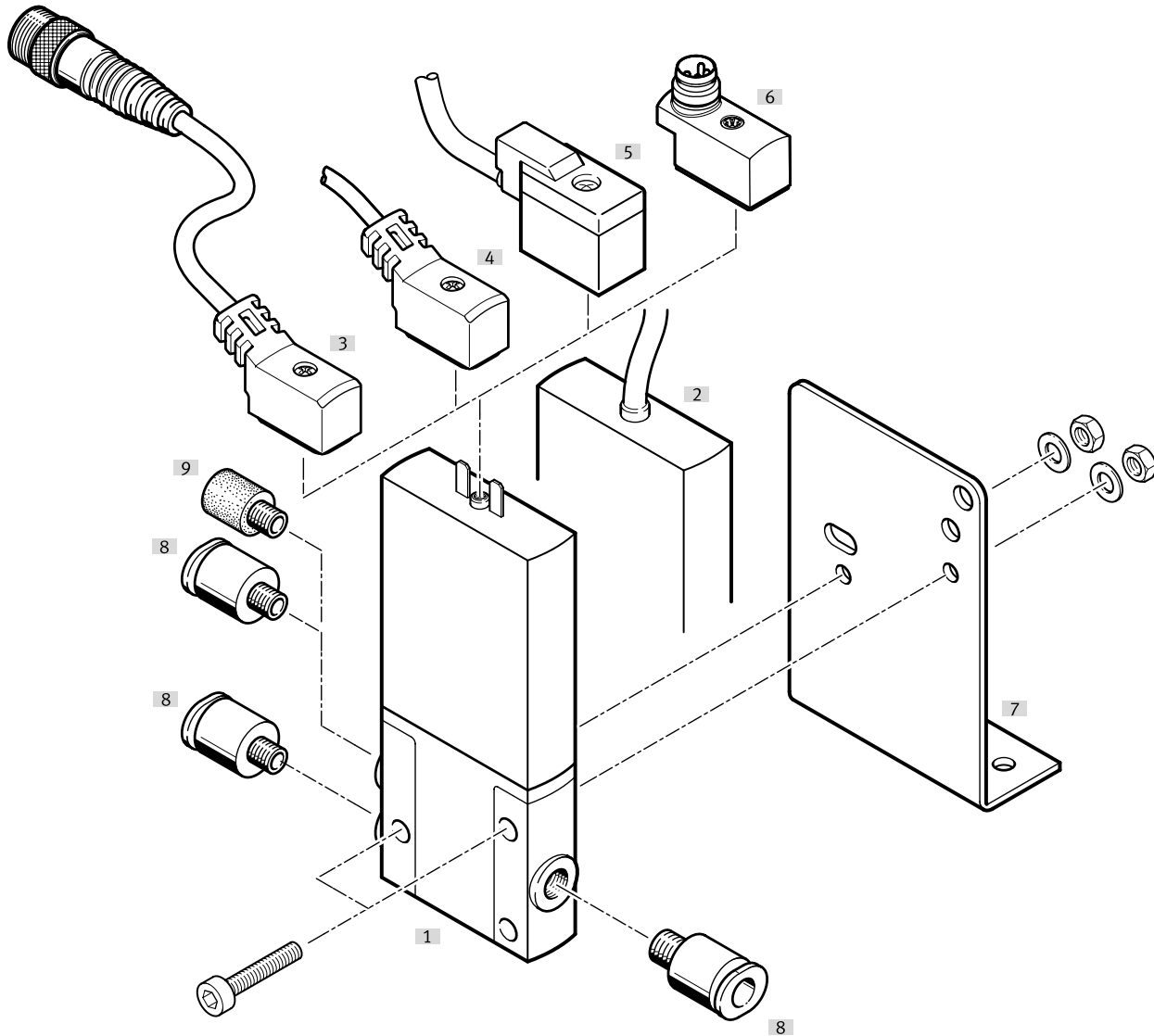
| 007         | Pneumatic connection         |
|-------------|------------------------------|
| <b>2</b>    | Sub-base, nominal width 2 mm |
| <b>3</b>    | Sub-base, nominal width 3 mm |
| <b>4</b>    | Sub-base, nominal width 4 mm |
| <b>1/8</b>  | Thread G1/8                  |
| <b>1/4</b>  | Thread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

| 008      | Electrical connection     |
|----------|---------------------------|
|          | Plug tabs                 |
| <b>K</b> | Moulded cable, 2.5 m long |



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

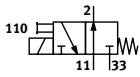
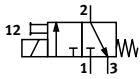
## Connection with plug vanes – Connection with moulded-in cable




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


Datasheet – Individual valve, 3/2-way valve

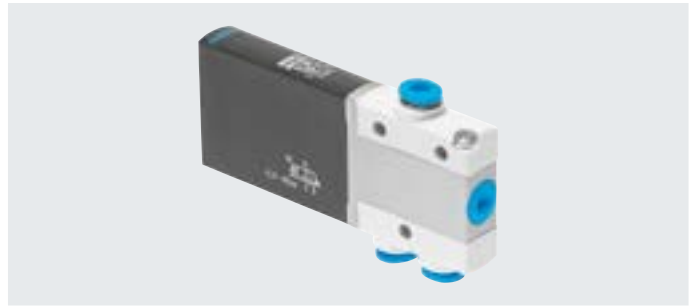
Function



-  - Voltage  
24 V DC

-  - Pressure  
-0.09 ... +0.8 MPa

-  - Temperature range  
-5 ... +60°C



General technical data

|                            |                                                                |
|----------------------------|----------------------------------------------------------------|
| Valve function             | 3/2 way, single solenoid <sup>1)</sup>                         |
| 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 <sup>2)</sup>                     |
| 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<br>Push-in connector for tubing O.D. 4 mm |
| Product weight             | [g] 60                                                         |

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

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

## Datasheet – Individual valve, 3/2-way valve

| Operating and environmental conditions                     |            | With fast-switching electronics                                                            | Without fast-switching electronics |  |
|------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------|------------------------------------|--|
| Operating medium                                           |            | Compressed air to ISO 8573-1:2010 [7:4:4]                                                  |                                    |  |
| Note on the operating/pilot medium                         |            | Lubricated operation possible (in which case lubricated operation will always be required) |                                    |  |
| Operating pressure                                         | [MPa]      | -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 medium   |            | As a function of switching frequency (see graph)                                           | -                                  |  |
| Corrosion resistance class CRC <sup>1)</sup>               |            | 2                                                                                          | 2                                  |  |
| CE marking (see declaration of conformity) <sup>3)</sup>   |            | To EU EMC Directive <sup>2)</sup>                                                          | -                                  |  |
|                                                            |            | To EU RoHS Directive                                                                       | -                                  |  |
| UKCA marking (see declaration of conformity) <sup>3)</sup> |            | To UK instructions for EMC                                                                 | -                                  |  |
|                                                            |            | To UK RoHS instructions                                                                    | -                                  |  |
| Certification                                              |            | c UL us - Recognized (OL)                                                                  | c UL us - Recognized (OL)          |  |
|                                                            |            | RCM                                                                                        | -                                  |  |
| Cleanroom class                                            |            | Class 6 to ISO 14644-1                                                                     |                                    |  |
| Shock resistance                                           |            | Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27                          |                                    |  |
| Vibration resistance                                       |            | Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6           |                                    |  |

1) More information: [www.festo.com/x/topic/kbk](http://www.festo.com/x/topic/kbk)

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

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

3) More information: [www.festo.com/catalogue/...](http://www.festo.com/catalogue/...) → Support/Downloads.

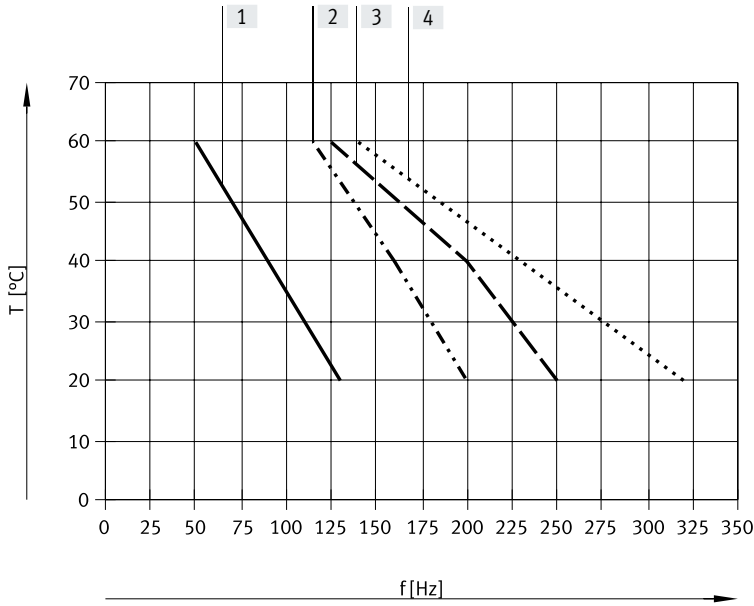
| Electrical data                  |                                   | With fast-switching electronics                             | Without fast-switching electronics |
|----------------------------------|-----------------------------------|-------------------------------------------------------------|------------------------------------|
| 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 [%]   | +10 ... -30                     | -                                  |
|                                            | Off [%]  | +10 ... -30                     | -                                  |
| 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 | RoHS-compliant       |
| PWIS conformity   | VDMA24364-B1/B2-L    |

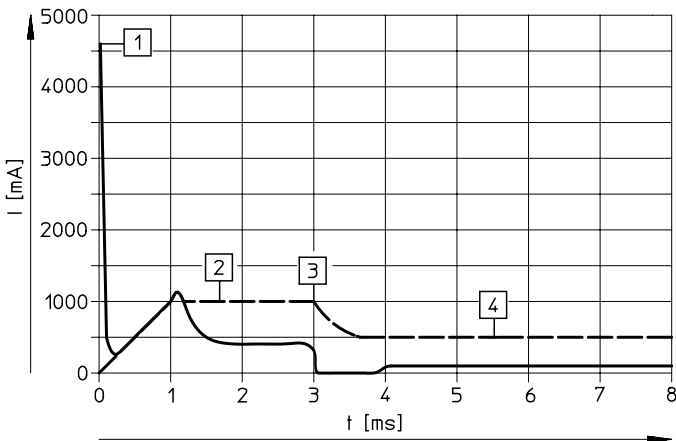
Datasheet – Individual valve, 3/2-way valve

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



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

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



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

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

## Datasheet – Individual valve, 3/2-way valve

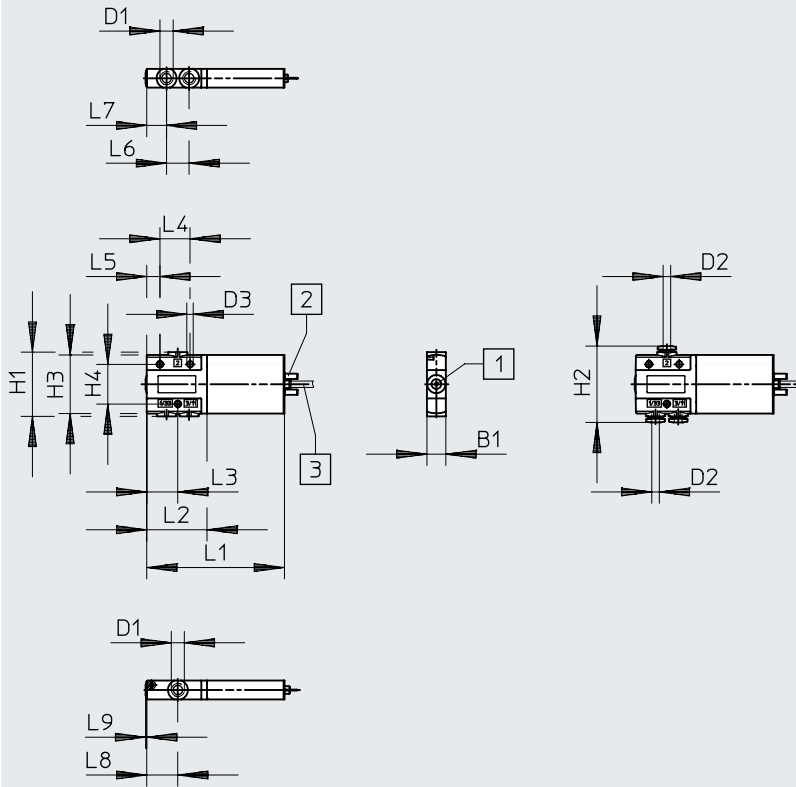
### Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

Valve with plug vanes or moulded-in cable

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

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

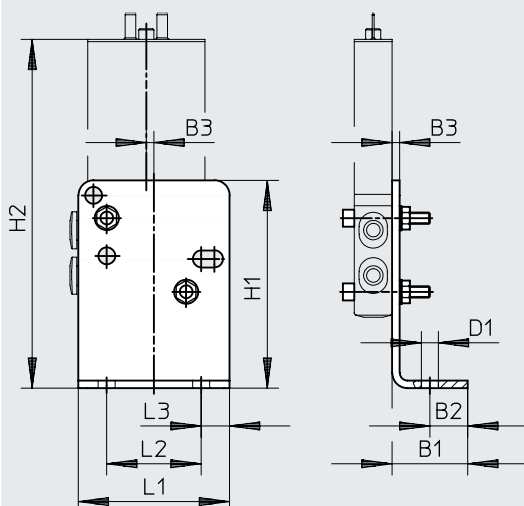


[1] Manual override, non-detenting

[2] Plug vanes

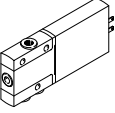
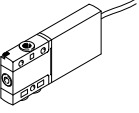
[3] Cable, 2.5 m

### Mounting bracket MHE2-BG-L

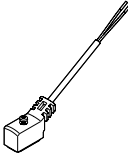
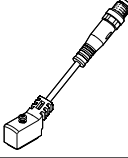




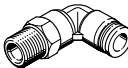


| Type                 | B1 | B2 | B3 | D1  | D2<br>∅ | D3<br>∅ | H1 | H2   | H3 | H4 | L1 | L2 | L3   | L4 | L5 | L6 | L7   | L8   | L9  |
|----------------------|----|----|----|-----|---------|---------|----|------|----|----|----|----|------|----|----|----|------|------|-----|
| MHE2-...-3/0...-M7   | 10 | -  | -  | M7  | -       | 3.4     | 34 | -    | 31 | 21 | 73 | 32 | 16.5 | 16 | 7  | 12 | 10.5 | 16.5 | 0.5 |
| MHE2-...-3/0...-QS-4 | 10 | -  | -  | -   | 4       | 3.4     | 34 | 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  | -  | -  | -  | -    | -    | -   |

Datasheet – Individual valve, 3/2-way valve

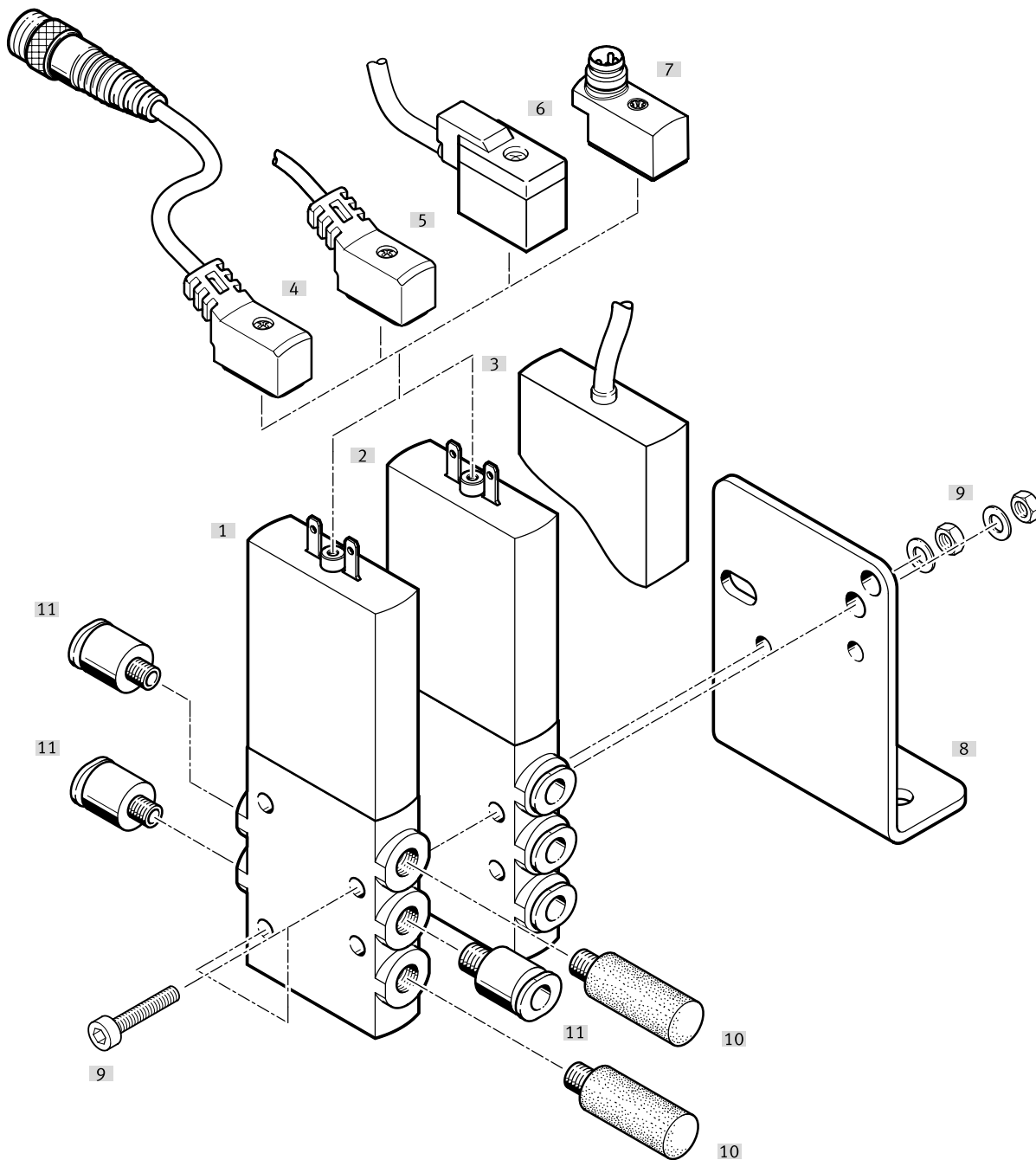
| Ordering data                                                                    |                                                              |                                                         |                                                              |                             | Part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

## Datasheet – Individual valve, 3/2-way valve

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

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

Connection with plug vanes – Connection with moulded-in cable

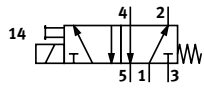





| Designation                | Type         | Description                                                            | → Page/Internet |
|----------------------------|--------------|------------------------------------------------------------------------|-----------------|
| [1] Individual valve    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



## Datasheet – Individual valve, 5/2-way valve

## Function



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



## General technical data

|                                   |         |                                                                |
|-----------------------------------|---------|----------------------------------------------------------------|
| Valve function                    |         | 5/2-way, single solenoid                                       |
| Design                            |         | Pressure relief poppet valve                                   |
| Overlap                           |         | Negative overlap                                               |
| Sealing principle                 |         | Soft                                                           |
| Reset method                      |         | Mechanical spring                                              |
| Actuation type                    |         | Electrical                                                     |
| Type of control                   |         | Direct                                                         |
| 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<br>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 <sup>1)</sup>               |       | 2                                                                                          |
| CE marking (see declaration of conformity) <sup>3)</sup>   |       | To EU EMC Directive <sup>2)</sup>                                                          |
|                                                            |       | To EU RoHS Directive                                                                       |
| UKCA marking (see declaration of conformity) <sup>3)</sup> |       | To UK instructions for EMC                                                                 |
|                                                            |       | To UK RoHS instructions                                                                    |
| Certification                                              |       | c UL us - Recognized (OL)                                                                  |
|                                                            |       | RCM                                                                                        |
| Cleanroom class                                            |       | Class 6 to ISO 14644-1                                                                     |
| Shock resistance                                           |       | Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27                          |
| Vibration resistance                                       |       | Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6           |

1) More information: [www.festo.com/x/topic/kbk](http://www.festo.com/x/topic/kbk)

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

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

3) More information: [www.festo.com/catalogue/...](http://www.festo.com/catalogue/...) → Support/Downloads.

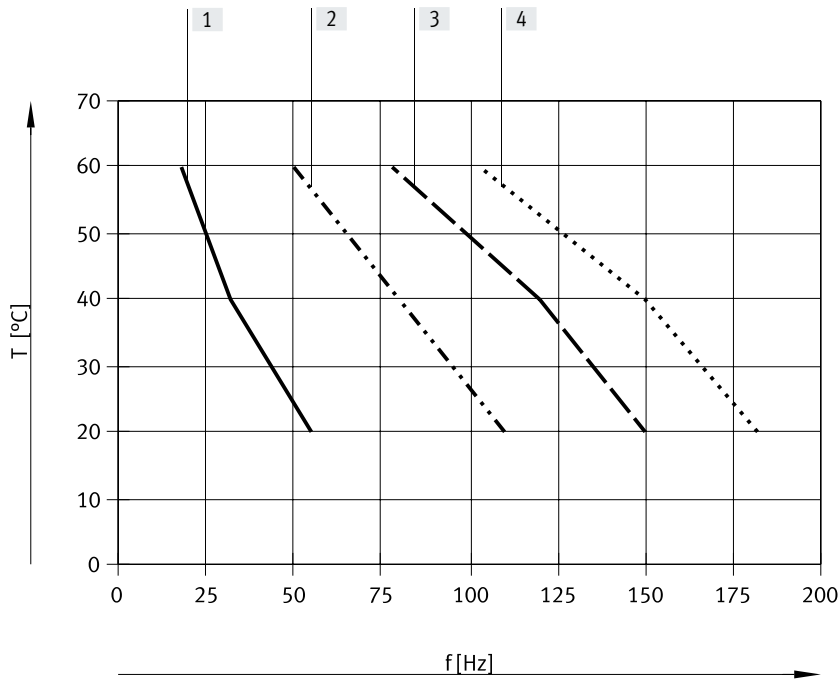
| Electrical data                  |                    |     | 2-pin plug                | Cable |
|----------------------------------|--------------------|-----|---------------------------|-------|
| Electrical connection            |                    |     |                           |       |
|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

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

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

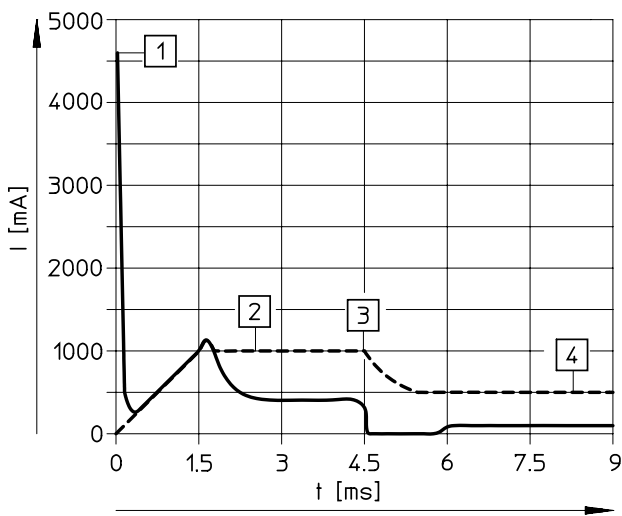
Datasheet – Individual valve, 5/2-way valve

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



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

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



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

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

Datasheet – Individual valve, 5/2-way valve

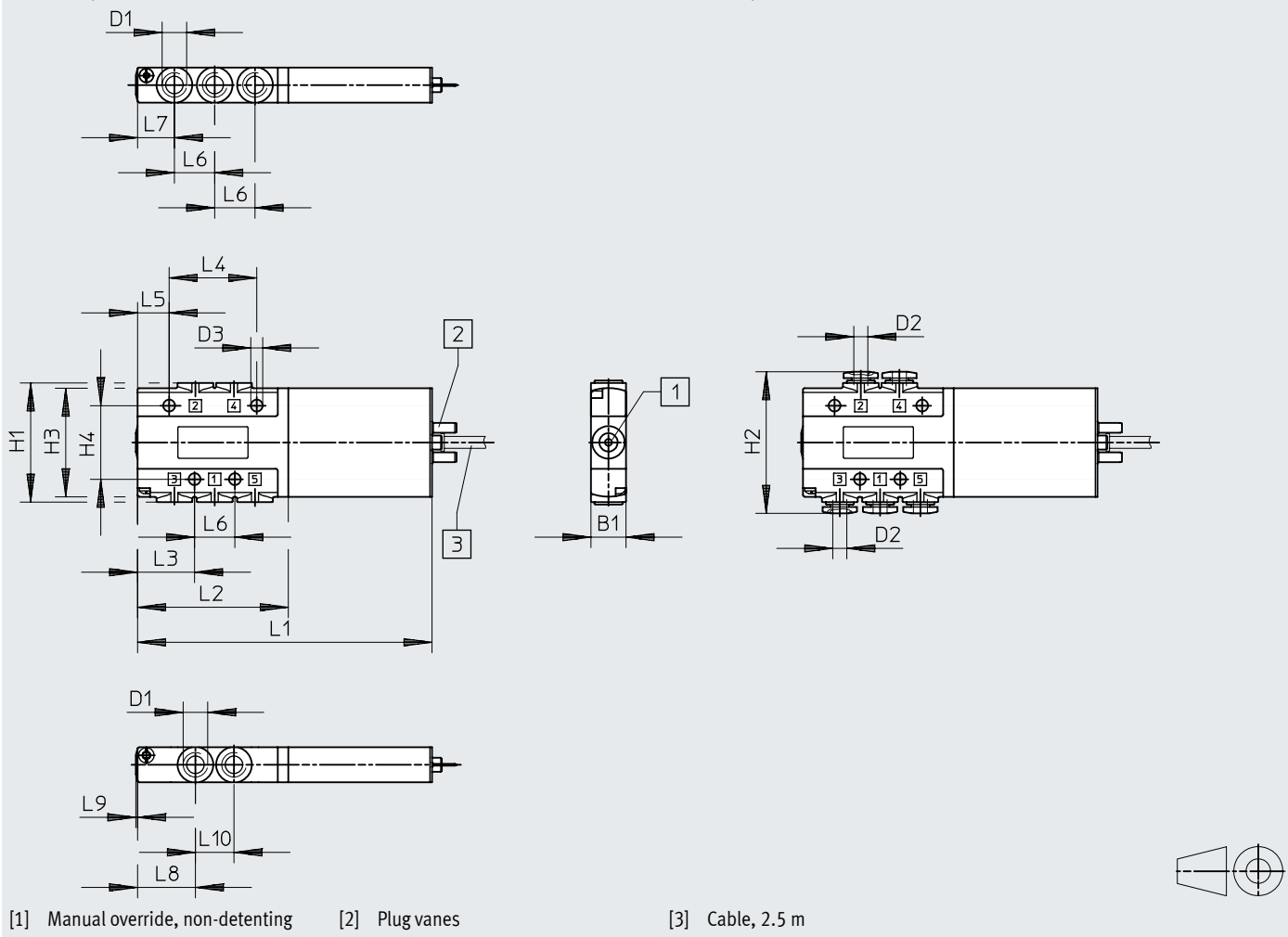
Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

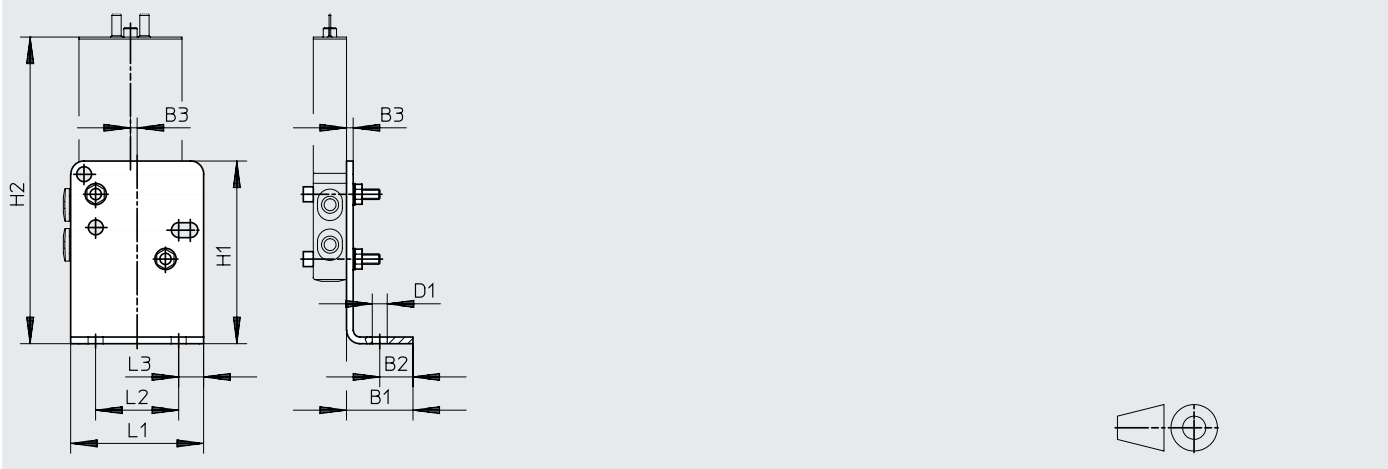
Valve with plug vanes or moulded-in cable

MHE2-...-5/2-M7

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

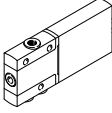
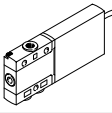
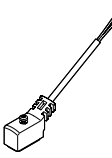
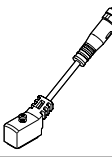
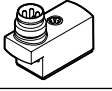






Mounting bracket MHE2-BG-L



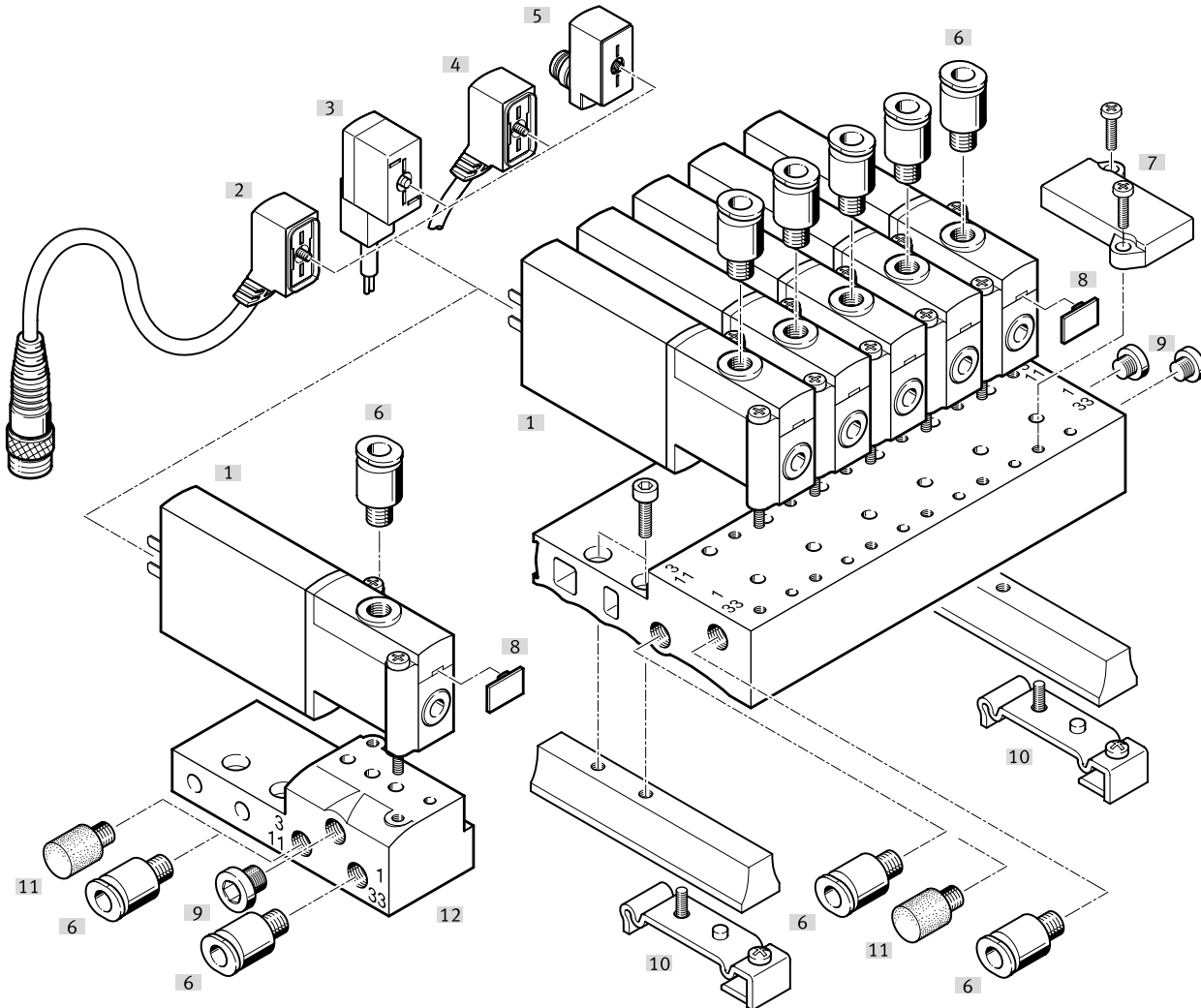
| Type              | B1 | B2 | B3 | D1  | D2<br>∅ | D3<br>∅ | H1 | H2   | H3 | H4 | L1 | L2 | L3   | L4 | L5 | L6   | L7   | L8   | L9  | L10 |
|-------------------|----|----|----|-----|---------|---------|----|------|----|----|----|----|------|----|----|------|------|------|-----|-----|
| MHE2-...-5/2-M7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

## Datasheet – Individual valve, 5/2-way valve

| Ordering data                                                                                                       |                                                                                             |                                                      |                                                              | Part no.     | Type                 |                               |
|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------|--------------|----------------------|-------------------------------|
| <b>Valves</b>                                                                                                       |                                                                                             |                                                      |                                                              |              |                      |                               |
|                                    | Electrical connection:<br>2-pin plug                                                        | With fast-switching electronics, switching time 2 ms | Pneumatic connection: thread M7                              | 525113       | MHE2-MS1H-5/2-M7     |                               |
|                                                                                                                     |                                                                                             |                                                      | Pneumatic connection: push-in connector for tubing O.D. 4 mm | 525117       | MHE2-MS1H-5/2-QS-4   |                               |
|                                    | Electrical connection:<br>cable                                                             | With fast-switching electronics, switching time 2 ms | Pneumatic connection: thread M7                              | 525115       | MHE2-MS1H-5/2-M7-K   |                               |
|                                                                                                                     |                                                                                             |                                                      | Pneumatic connection: push-in connector for tubing O.D. 4 mm | 525119       | MHE2-MS1H-5/2-QS-4-K |                               |
| <b>Connecting cable (for valves with 2-pin plug)</b> <span style="float: right;">Datasheets → Internet: nebv</span> |                                                                                             |                                                      |                                                              |              |                      |                               |
|                                    | 2-pin socket, open cable end 2-wire                                                         | PUR cable, degree of protection IP65                 | Signal status indication with LED                            | Length 2.5 m | 8047671              | NEBV-Z4WA2L-P-E-2.5-N-LE2-S1  |
|                                                                                                                     |                                                                                             |                                                      |                                                              | Length 5 m   | 8047672              | NEBV-Z4WA2L-P-E-5-N-LE2-S1    |
|                                                                                                                     |                                                                                             | PVC cable, degree of protection IP40                 | Without signal status indication                             | Length 10 m  | 8047670              | NEBV-Z4WA2L-P-E-10-N-LE2-S1   |
|                                                                                                                     |                                                                                             |                                                      |                                                              | Length 0.5 m | 193690               | KMYZ-4-24-0.5-B               |
|                                                                                                                     |                                                                                             |                                                      | Length 2.5 m                                                 | 193691       | KMYZ-4-24-2.5-B      |                               |
|                                    | 2-pin socket, plug M8x1 3-pin                                                               | PUR cable, degree of protection IP65                 | Signal status indication with LED                            | Length 0.5 m | 8047673              | NEBV-Z4WA2L-P-E-0.5-N-M8G3-S1 |
|                                                                                                                     |                                                                                             |                                                      |                                                              | Length 2.5 m | 8047674              | NEBV-Z4WA2L-P-E-2.5-N-M8G3-S1 |
| <b>Adapter (for valves with 2-pin plug)</b>                                                                         |                                                                                             |                                                      |                                                              |              |                      |                               |
|                                  | 2-pin socket                                                                                | Signal status indication with LED                    | Plug M8, 3-pin                                               | 571686       | VAVE-C8-1R8          |                               |
|                                                                                                                     |                                                                                             |                                                      | Plug M8, 4-pin                                               | 573194       | VAVE-C8-1R1          |                               |
| <b>Wall mounting</b>                                                                                                |                                                                                             |                                                      |                                                              |              |                      |                               |
|                                  | Mounting bracket                                                                            |                                                      |                                                              | 196165       | MHE2-BG-L            |                               |
| <b>Silencer</b> <span style="float: right;">Datasheets → Internet: uc</span>                                        |                                                                                             |                                                      |                                                              |              |                      |                               |
|                                  | Push-in sleeve with O.D. 4 mm                                                               |                                                      | 1 piece                                                      | 165006       | UC-QS-4H             |                               |
|                                                                                                                     | With M7 threaded connection                                                                 |                                                      | 1 piece                                                      | 161418       | UC-M7                |                               |
|                                                                                                                     |                                                                                             |                                                      | 50 pieces                                                    | 534218       | UC-M7-50             |                               |
| <b>Push-in fitting</b> <span style="float: right;">Datasheets → Internet: qs</span>                                 |                                                                                             |                                                      |                                                              |              |                      |                               |
|                                  | Male thread M7 with internal 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 external hex, push-in L-fitting rotatable through 360°, for tubing O.D. | 4 mm                                                 | 10 pieces                                                    | 186352       | QSML-M7-4            |                               |
|                                                                                                                     |                                                                                             |                                                      | 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

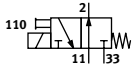
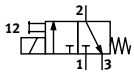
Connection via plug vanes




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


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

## Function



-  - Voltage  
24 V DC

-  - Pressure  
-0.09 ... +0.8 MPa

-  - Temperature range  
-5 ... +40°C



## General technical data

|                            |                                                       |
|----------------------------|-------------------------------------------------------|
| Valve function             | 3/2 way, single solenoid <sup>1)</sup>                |
| 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 <sup>2)</sup>            |
| 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<br>1, 3, 11, 33<br>M5 connecting thread<br>Sub-base |
| Product weight             | [g] 60                                                |

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

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

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

| Operating and environmental conditions                     |            | With fast-switching electronics                                                            | Without fast-switching electronics |  |
|------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------|------------------------------------|--|
| Operating medium                                           |            | Compressed air to ISO 8573-1:2010 [7:4:4]                                                  |                                    |  |
| Note on the operating/pilot medium                         |            | Lubricated operation possible (in which case lubricated operation will always be required) |                                    |  |
| Operating pressure                                         | [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 (see graph)                                           |                                    |  |
| Corrosion resistance class CRC <sup>1)</sup>               |            | 2                                                                                          |                                    |  |
| CE marking (see declaration of conformity) <sup>3)</sup>   |            | To EU EMC Directive <sup>2)</sup>                                                          | -                                  |  |
|                                                            |            | To EU RoHS Directive                                                                       | -                                  |  |
| UKCA marking (see declaration of conformity) <sup>3)</sup> |            | To UK instructions for EMC                                                                 | -                                  |  |
|                                                            |            | To UK RoHS instructions                                                                    | -                                  |  |
| Certification                                              |            | c UL us - Recognized (OL)                                                                  | c UL us - Recognized (OL)          |  |
|                                                            |            | RCM                                                                                        | -                                  |  |
| Cleanroom class                                            |            | Class 6 to ISO 14644-1                                                                     |                                    |  |
| Shock resistance                                           |            | Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27                          |                                    |  |
| Vibration resistance                                       |            | Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6           |                                    |  |

1) More information: [www.festo.com/x/topic/kbk](http://www.festo.com/x/topic/kbk)

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

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

3) More information: [www.festo.com/catalogue/...](http://www.festo.com/catalogue/...) → Support/Downloads.

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

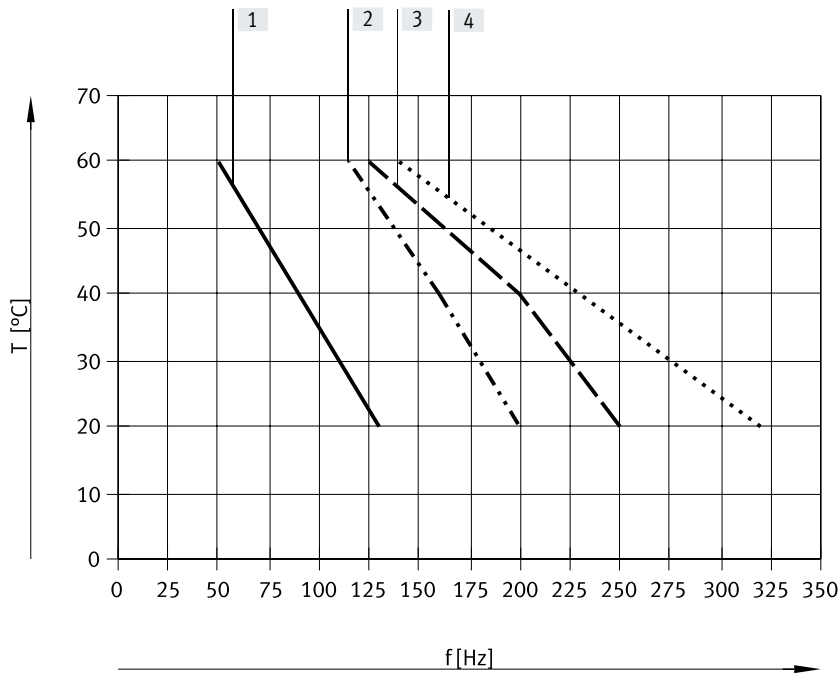
| Switching times and frequencies            |          | With fast-switching electronics | Without fast-switching electronics |
|--------------------------------------------|----------|---------------------------------|------------------------------------|
| Switching time                          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

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



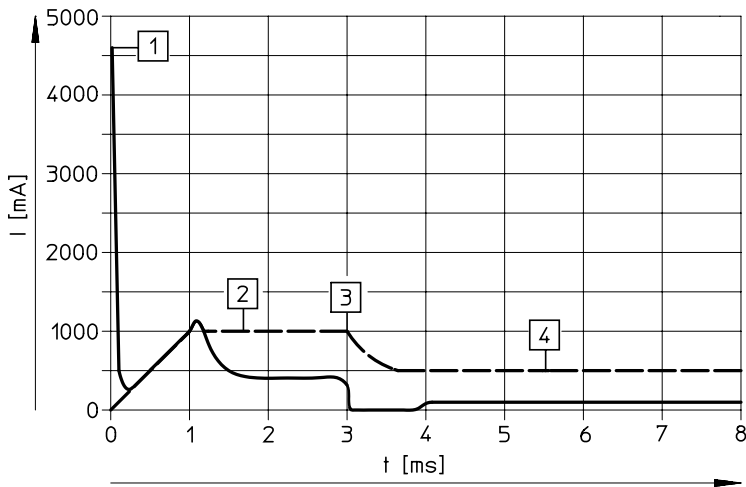
Datasheet – Semi in-line valve, 3/2-way valve

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



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

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



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

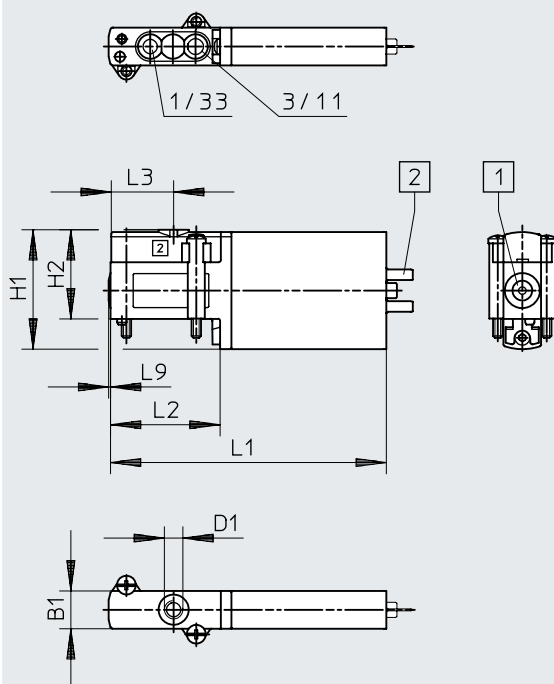
----- Internal current in the coil  
 — External current in the supply line

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

### Dimensions

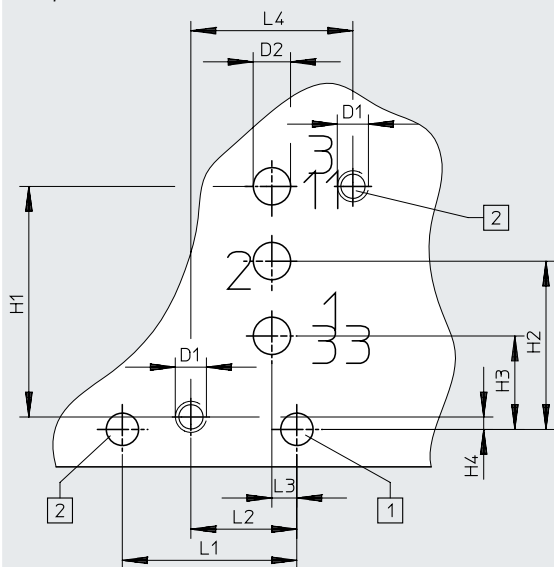
Download CAD data → [www.festo.com](http://www.festo.com)

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



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

### Hole pattern on sub-bases



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

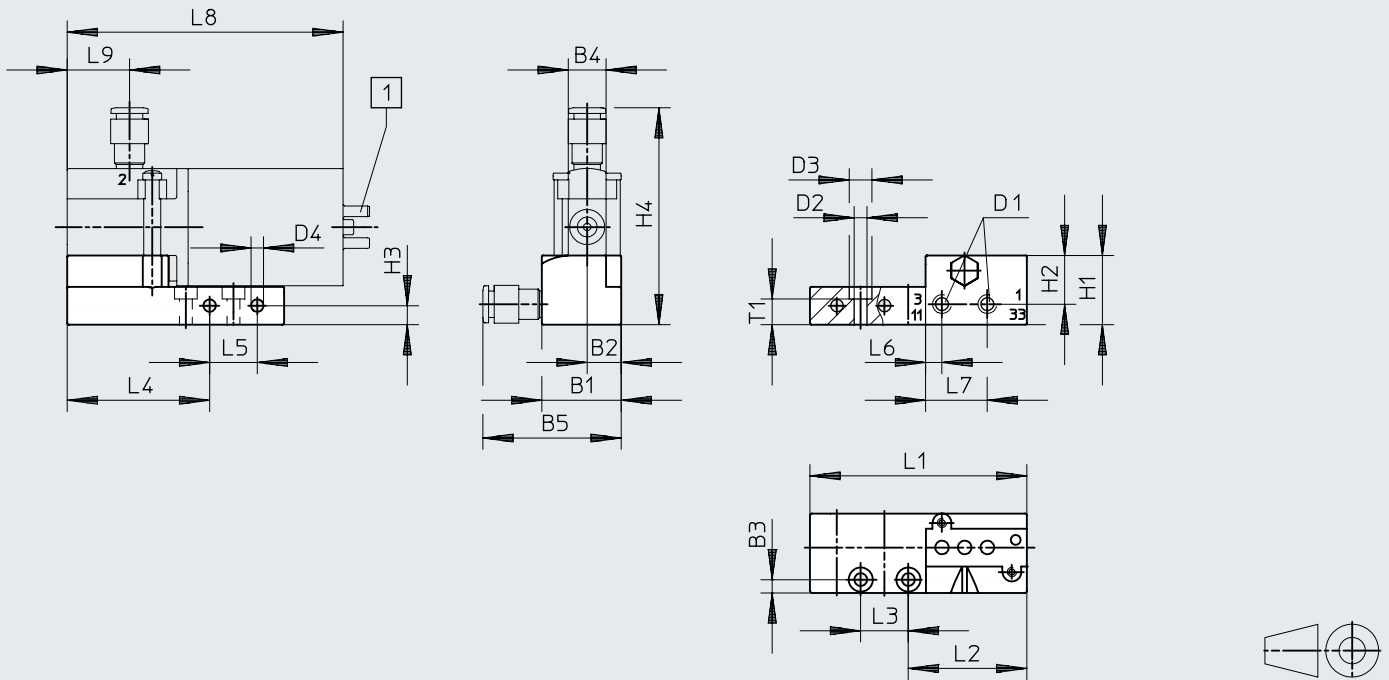
| Type               | B1 | D1   | D2<br>∅ | H1   | H2   | H3  | H4 | L1 | L2  | L3   | L4 | L9  |
|--------------------|----|------|---------|------|------|-----|----|----|-----|------|----|-----|
| MHP2-...-3/2...-M5 | 10 | M5   | -       | 31.6 | 23.6 | -   | -  | 73 | 29  | 16.5 | -  | 0.5 |
| Hole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

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

Dimensions

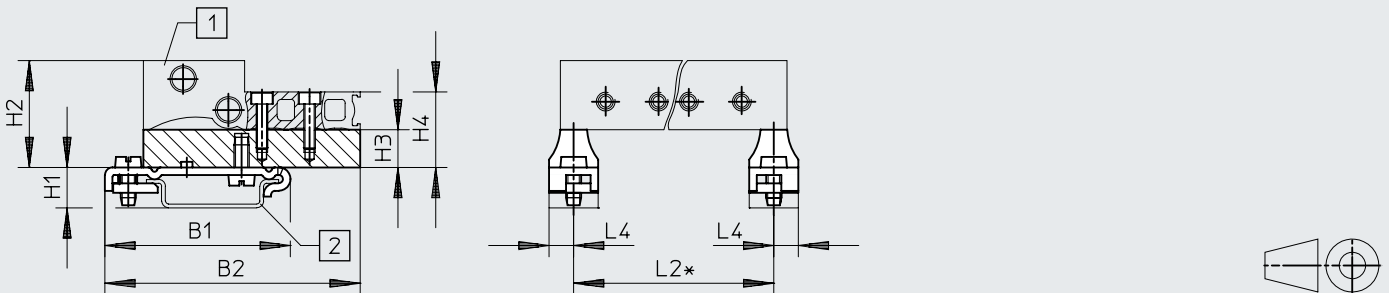
Download CAD data → [www.festo.com](http://www.festo.com)

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



[1] Plug vanes

H-rail mounting MHAP2-BG-NRH-35



[1] Manifold block

[2] DIN mounting rail

\* See dimensions table for manifold block used

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

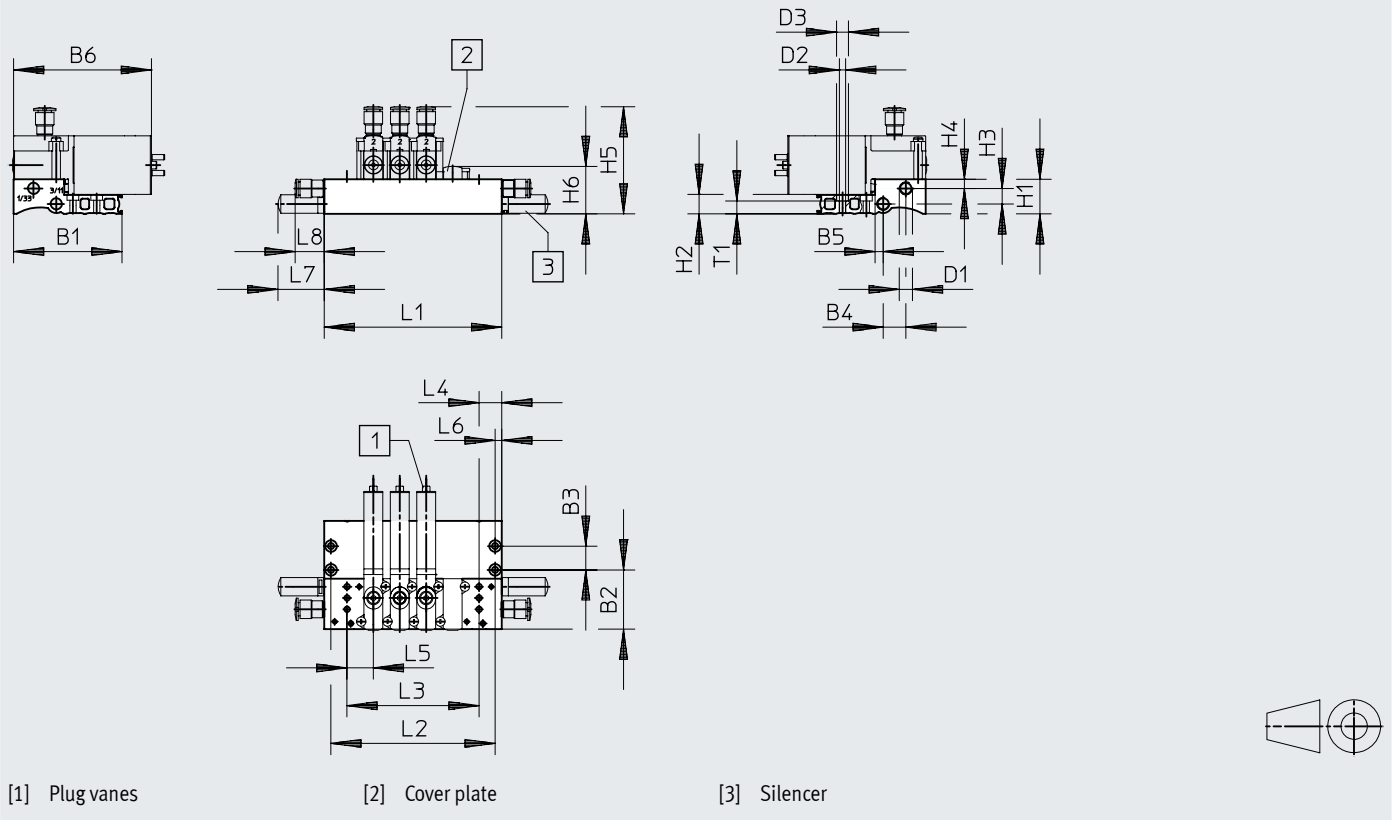
\* See dimensions table for manifold block used

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

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

Manifold assembly, MHP2-PR...-3

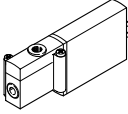

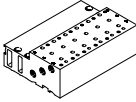

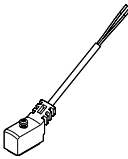
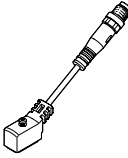

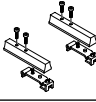
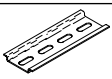


| Type         | B1   | B2   | B3   | B4 | B5  | B6 | D1 | D2  | D3  | H1   | H2 | H3  | H4  | H5   | H6   | L4 | L5 | L6  | L7   | L8   | T1  |
|--------------|------|------|------|----|-----|----|----|-----|-----|------|----|-----|-----|------|------|----|----|-----|------|------|-----|
| MHP2-PR...-3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

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



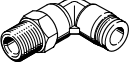

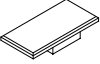
**Note**  
Valve types 3/2G and 3/2O must not be mixed on one manifold block.

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

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

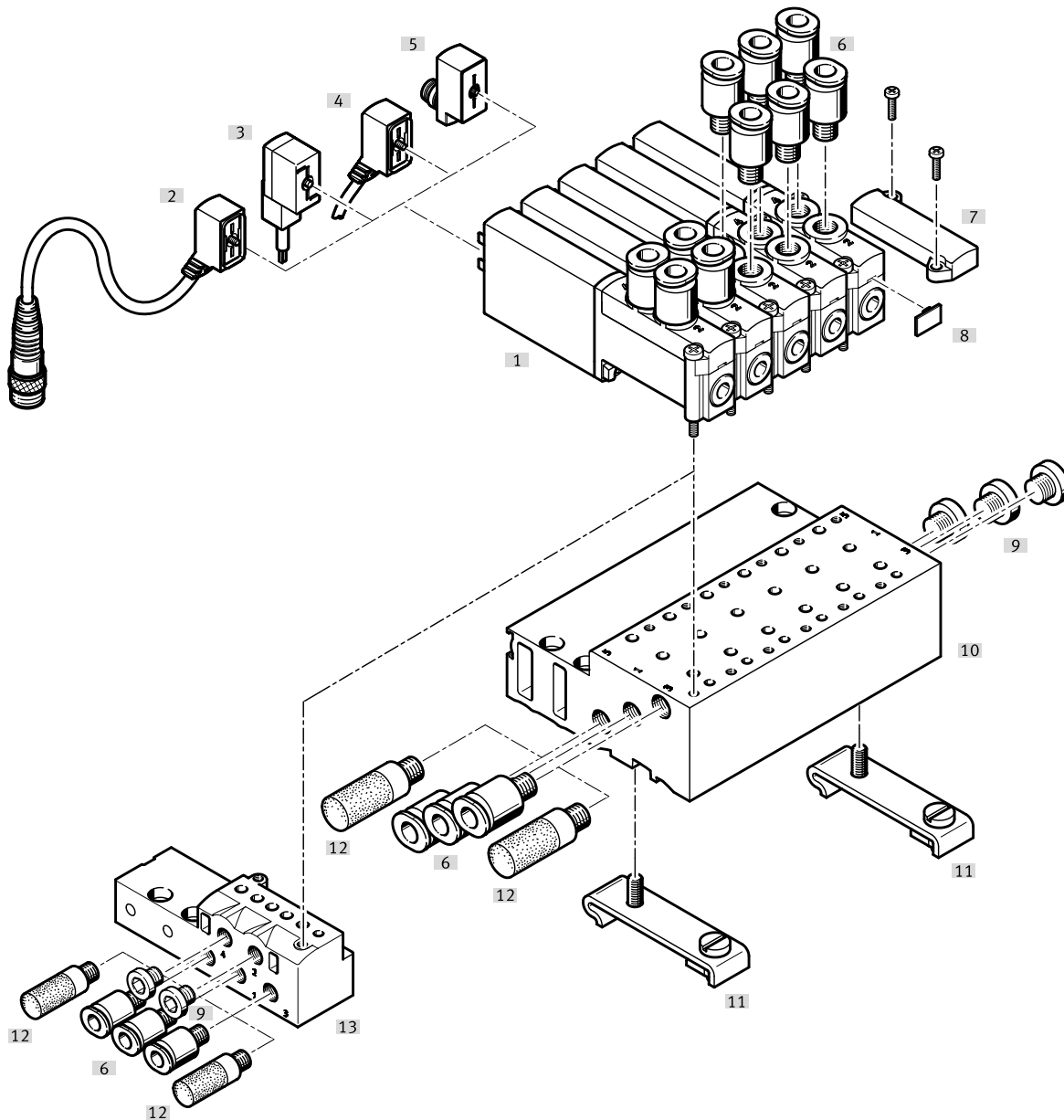
1) Seal ports 2 and 4 on the individual sub-base with blanking plugs. These ports on the individual sub-base have no function when using semi in-line valves.

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

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

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

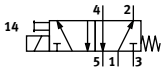
## Connection via plug vanes






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

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

Function



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



**General technical data**

|                                           |                                             |                      |
|-------------------------------------------|---------------------------------------------|----------------------|
| Valve function                            | 5/2-way, single solenoid                    |                      |
| Design                                    | Pressure relief poppet valve                |                      |
| Overlap                                   | Negative overlap                            |                      |
| Sealing principle                         | Soft                                        |                      |
| Reset method                              | Mechanical spring                           |                      |
| Actuation type                            | Electrical                                  |                      |
| Type of control                           | Direct                                      |                      |
| 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                   |



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

| Operating and environmental conditions                     |       |                                                                                            |
|------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------|
| Operating medium                                           |       | Compressed air to ISO 8573-1:2010 [7:4:4]                                                  |
| Note on the operating/pilot medium                         |       | Lubricated operation possible (in which case lubricated operation will always be required) |
| Operating pressure                                         | [MPa] | -0.09 ... +0.8                                                                             |
|                                                            | [bar] | -0.9 ... +8                                                                                |
| 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 <sup>1)</sup>               |       | 2                                                                                          |
| CE marking (see declaration of conformity) <sup>3)</sup>   |       | To EU EMC Directive <sup>2)</sup>                                                          |
|                                                            |       | To EU RoHS Directive                                                                       |
| UKCA marking (see declaration of conformity) <sup>3)</sup> |       | To UK instructions for EMC                                                                 |
|                                                            |       | To UK RoHS instructions                                                                    |
| Certification                                              |       | c UL us - Recognized (OL)                                                                  |
|                                                            |       | RCM                                                                                        |
| Cleanroom class                                            |       | Class 6 to ISO 14644-1                                                                     |
| Shock resistance                                           |       | Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27                          |
| Vibration resistance                                       |       | Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6           |

1) More information: [www.festo.com/x/topic/kbk](http://www.festo.com/x/topic/kbk)

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

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

3) More information: [www.festo.com/catalogue/...](http://www.festo.com/catalogue/...) → Support/Downloads.

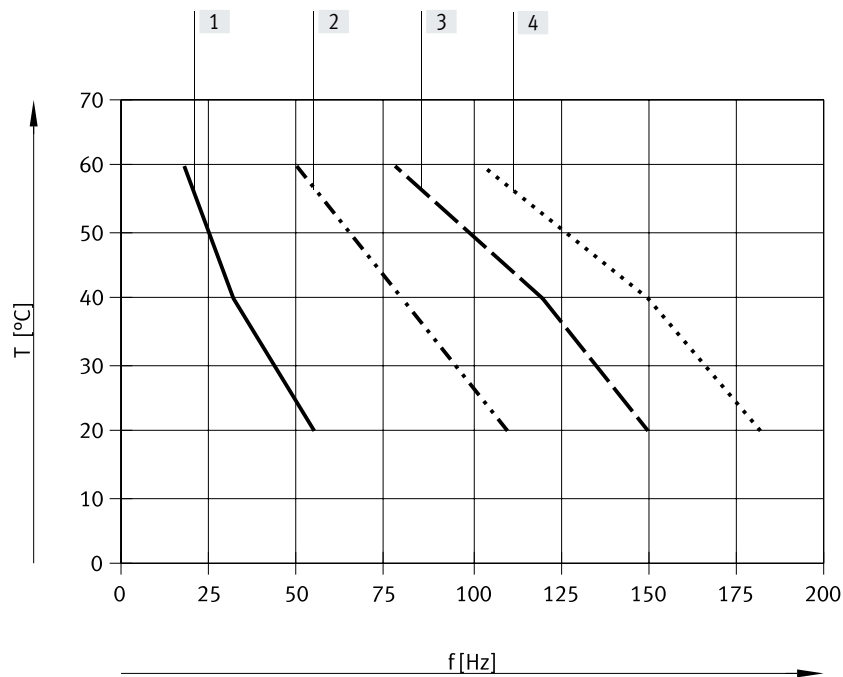
| Electrical data                  |                    |                           |
|----------------------------------|--------------------|---------------------------|
| Electrical connection            |                    | Plug, 2-pin               |
| Operating voltage                | [V DC]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

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

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

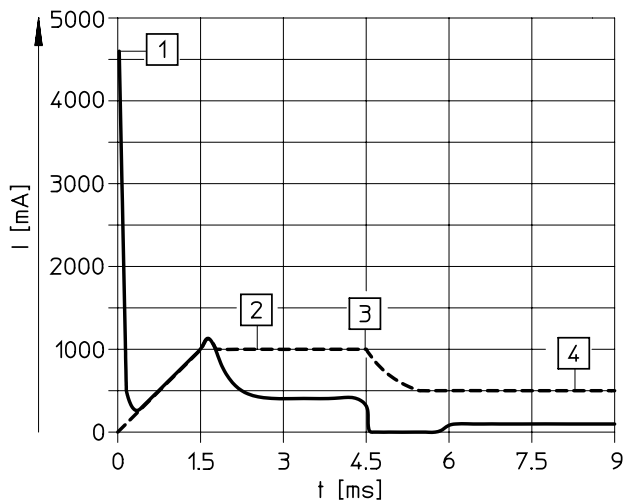
Datasheet – Semi in-line valve, 5/2-way valves

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



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

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



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

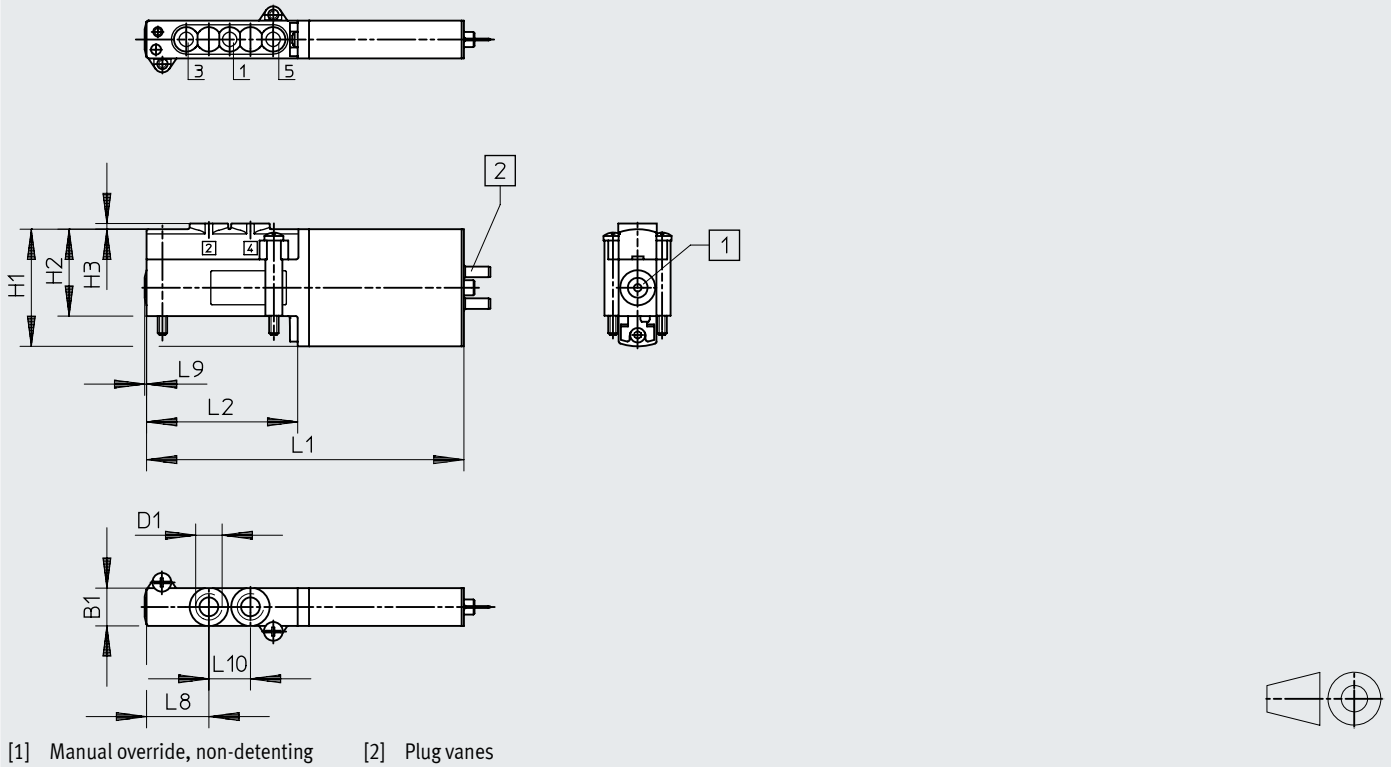
..... Internal current in the coil  
 — External current in the supply line

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

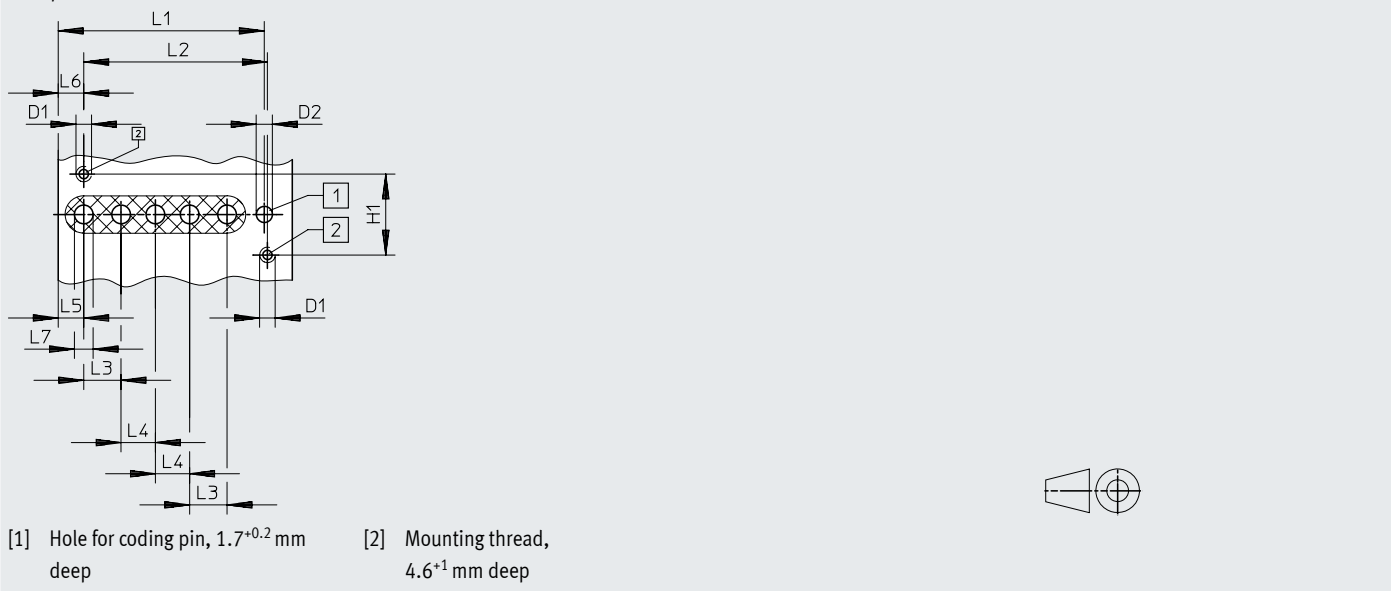
Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)


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



Hole pattern on sub-bases



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

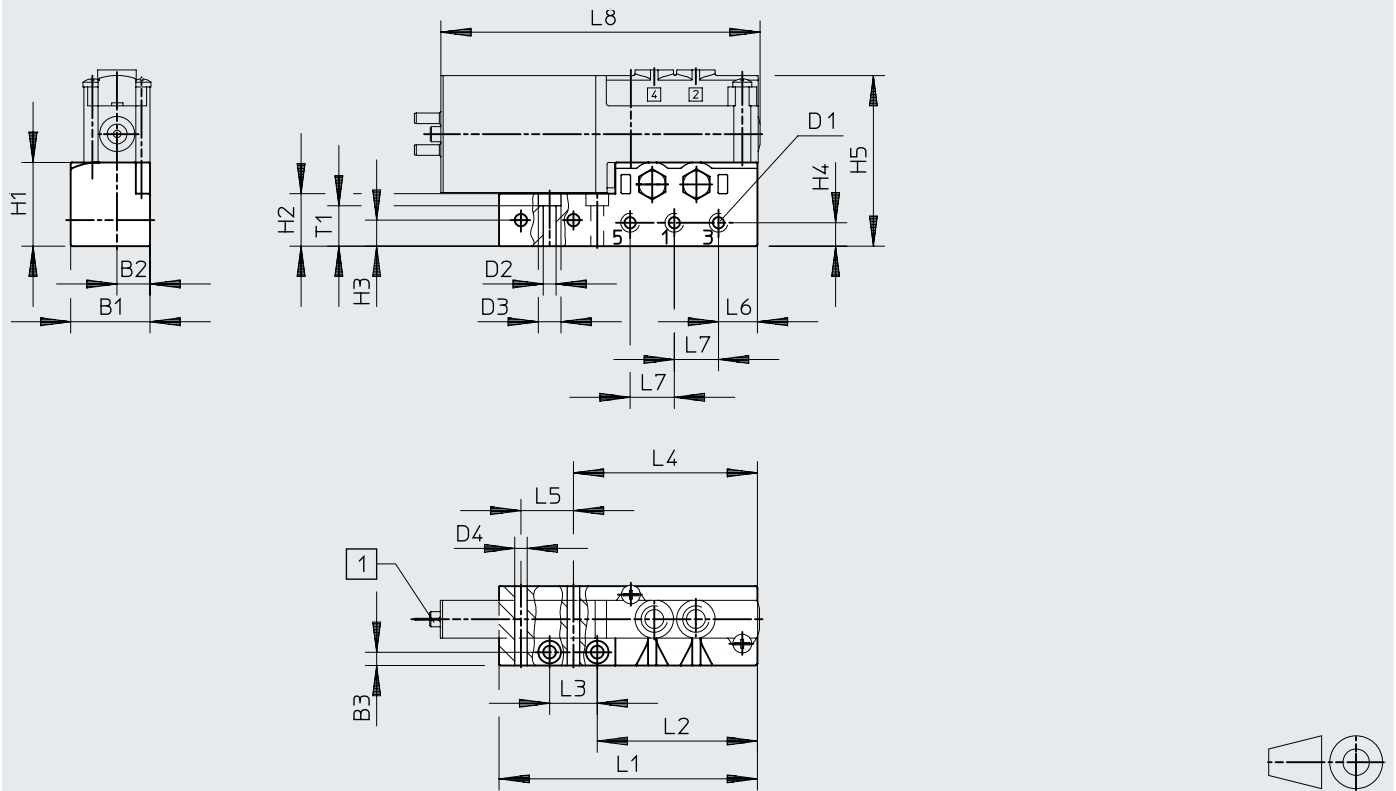
-  - **Note**  
Ports 2 and 4 are not required with semi in-line valves.

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

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

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



[1] Plug vanes

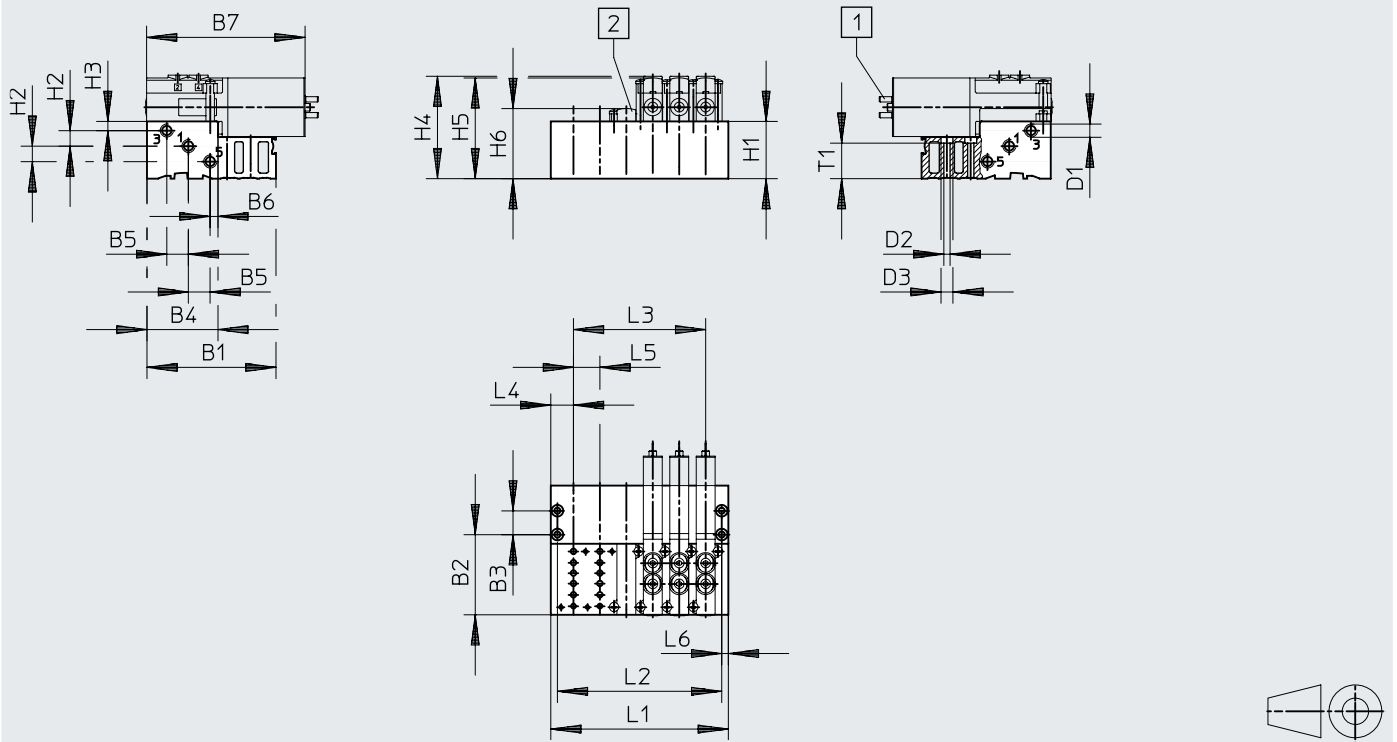
| Type         | B1 | B2  | B3  | D1 | D2<br>∅ | D3<br>∅ | D4<br>∅ | H1   | H2   | H3  | H4  | H5   | L1   | L2   | L3   | L4   | L5   | L6   | L7   | L8   | T1   |
|--------------|----|-----|-----|----|---------|---------|---------|------|------|-----|-----|------|------|------|------|------|------|------|------|------|------|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

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

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

Manifold assembly, MHP2-PR...-5



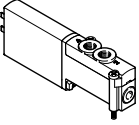

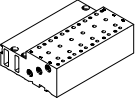

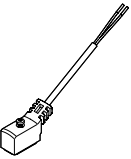
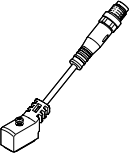


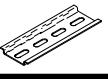
[1] Plug vanes

[2] Cover plate

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






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

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

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

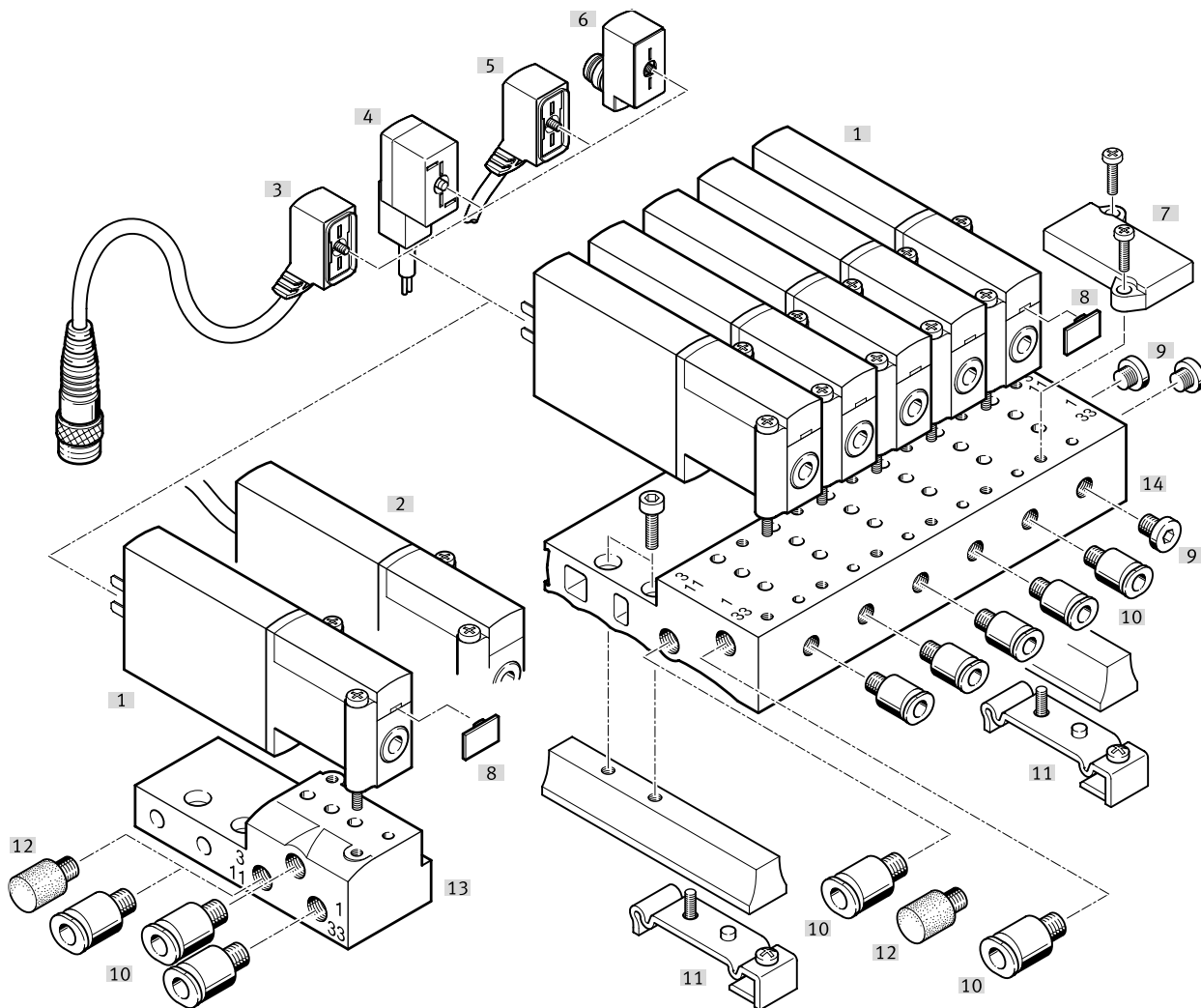
1) Seal ports 2 and 4 on the individual sub-base with blanking plugs. These ports on the individual sub-base have no function when using semi in-line valves.

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

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

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

Connection with plug vanes – Connection with moulded-in cable

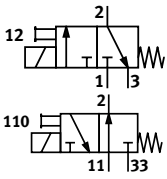





| Designation                | Type            | Description                                                            | → Page/Internet |
|----------------------------|-----------------|------------------------------------------------------------------------|-----------------|
| [1] Sub-base valve         | MHA2            | With plug vanes                                                        | 46              |
| [2] Sub-base valve         | MHA2-...-K      | With moulded-in cable, IP55                                            | 47              |
| [3] Connecting cable       | NEBV            | PUR cable, signal status indication with LED, plug M8x1 3-pin, IP65    | 47              |
| [4] Plug socket with cable | KMYZ-4          | PVC cable, without signal status indication, IP50                      | 47              |
| [5] Connecting cable       | NEBV            | PUR cable, signal status indication with LED, IP65                     | 47              |
| [6] Adapter                | VAVE-C8         | For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65 | 48              |
| [7] Cover plate            | MHAP2-BP-3      | For sealing vacant positions                                           | 47              |
| [8] Inscription label      | MH-BZ-80X       | For identifying the valves                                             | 48              |
| [9] Blanking plug          | B               | For sealing unused ports                                               | 48              |
| [10] Push-in fittings      | QS              | For connecting compressed air tubing with standard O.D.                | 48              |
| [11] H-rail mounting       | MHAP2-BG-NRH-35 | For mounting the manifold block on H-rails to EN 60715                 | 48              |
| [12] Silencer              | UC              | For fitting in exhaust ports                                           | 48              |
| [13] Individual sub-base   | MHA2-AS-3-M5    | For sub-base valve                                                     | 47              |
| [14] Manifold block        | MHA2-PR...-3-M5 | For sub-base valve                                                     | 47              |

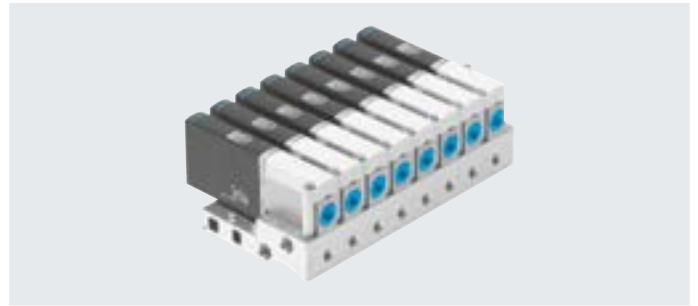


## Datasheet – Sub-base valve, 3/2-way valve

## Function



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



## General technical data

|                            |                                             |
|----------------------------|---------------------------------------------|
| Valve function             | 3/2 way, single solenoid <sup>1)</sup>      |
| 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                                    |
| Product weight             | [g] 60                                      |

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

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

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

1) More information: [www.festo.com/x/topic/kbk](http://www.festo.com/x/topic/kbk)

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

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

3) More information: [www.festo.com/catalogue/...](http://www.festo.com/catalogue/...) → Support/Downloads.

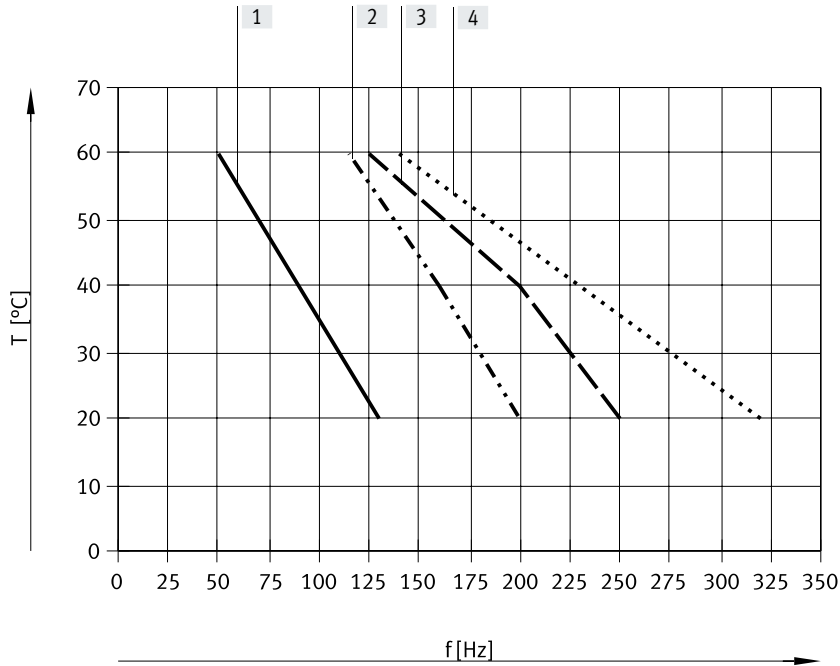
| Electrical data                  |                                   | With fast-switching electronics                             | Without fast-switching electronics |
|----------------------------------|-----------------------------------|-------------------------------------------------------------|------------------------------------|
| 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 [%]   | +10 ... -30                     | -                                  |
|                                            | Off [%]  | +10 ... -30                     | -                                  |
| 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 |
| PWIS conformity   | VDMA24364-B1/B2-L       |

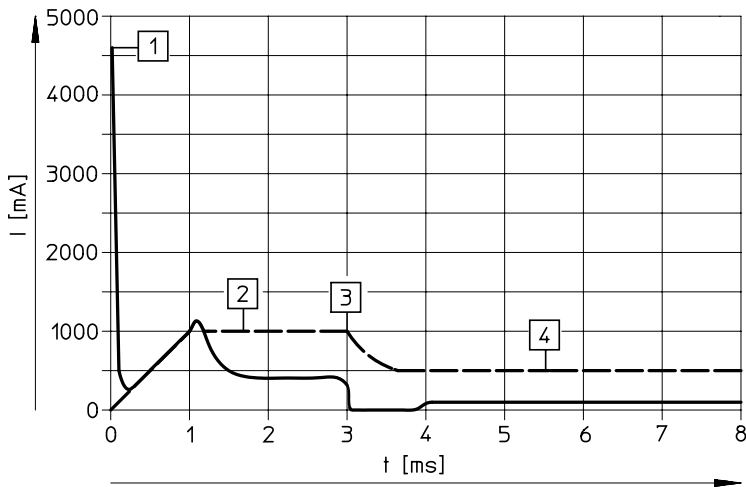
Datasheet – Sub-base valve, 3/2-way valve

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



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

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



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

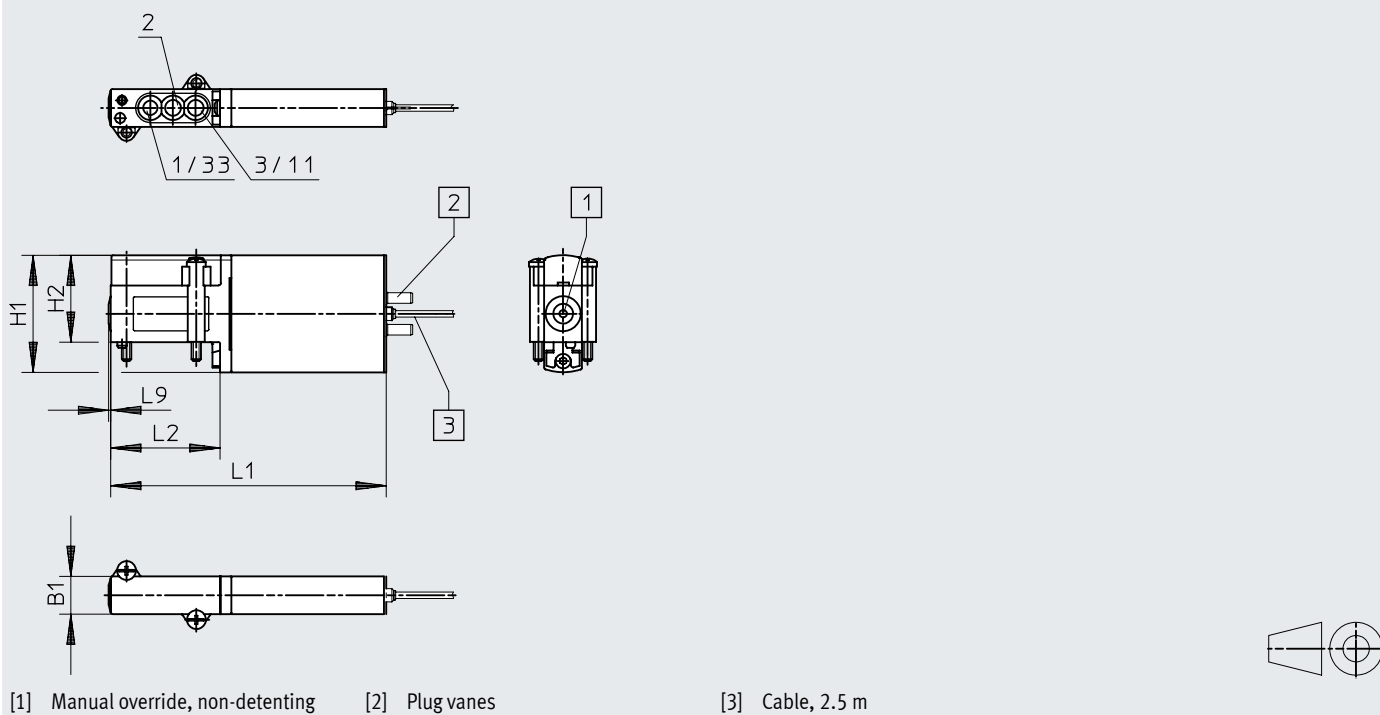
----- Internal current in the coil  
 — External current in the supply line

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

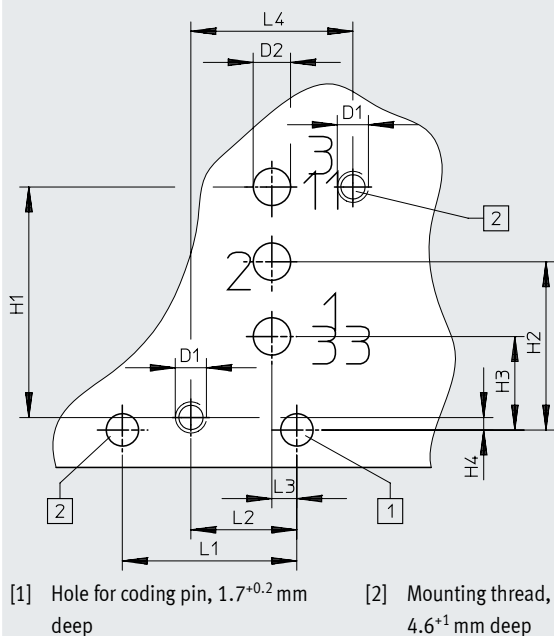
### Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

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



### Hole pattern on sub-bases



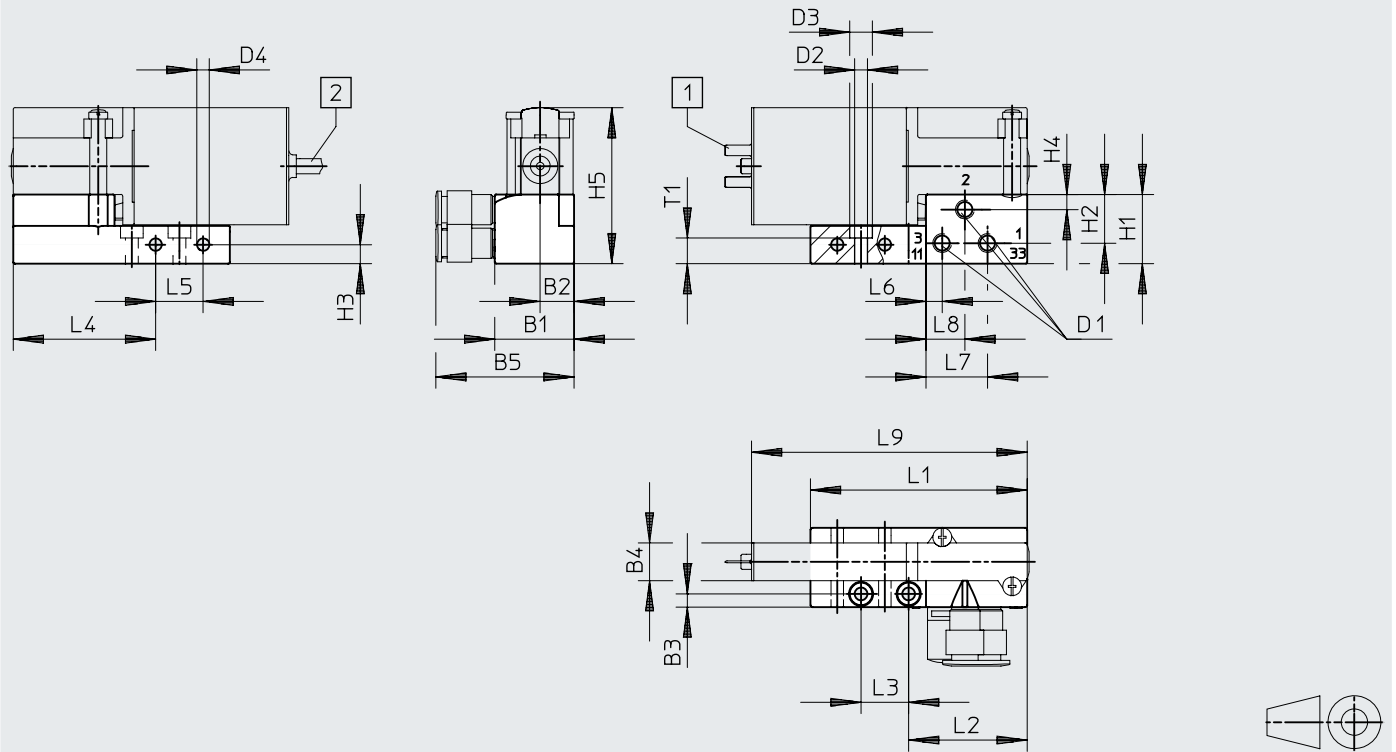
| Type            | B1 | D1   | D2<br>Ø | H1   | H2   | H3  | H4 | L1 | L2  | L3 | L4 | L9  |
|-----------------|----|------|---------|------|------|-----|----|----|-----|----|----|-----|
| MHA2-...-3/2... | 10 | -    | -       | 31   | 23   | -   | -  | 73 | 29  | -  | -  | 0.5 |
| Hole pattern    |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

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

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

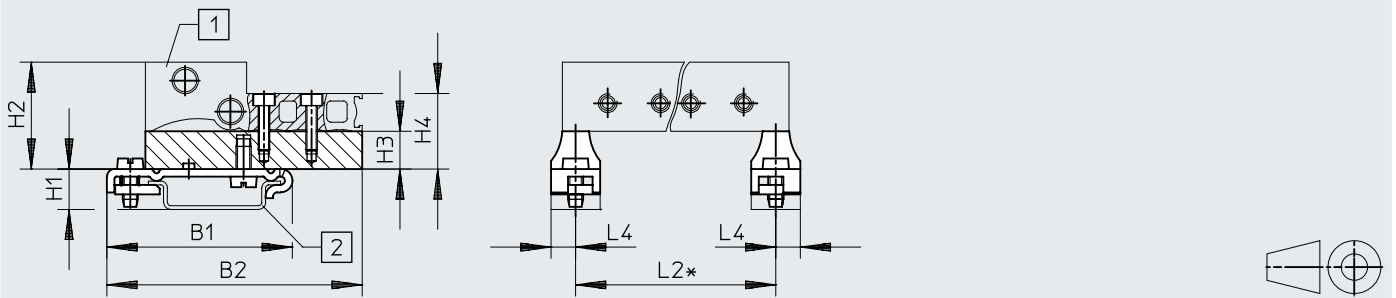
Individual sub-base, MHA2-AS-3-M5



[1] Plug vanes

[2] Cable, 2.5 m

H-rail mounting MHAP2-BG-NRH-35



[1] Manifold block

[2] DIN mounting rail

\* See dimensions table for manifold block used

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

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

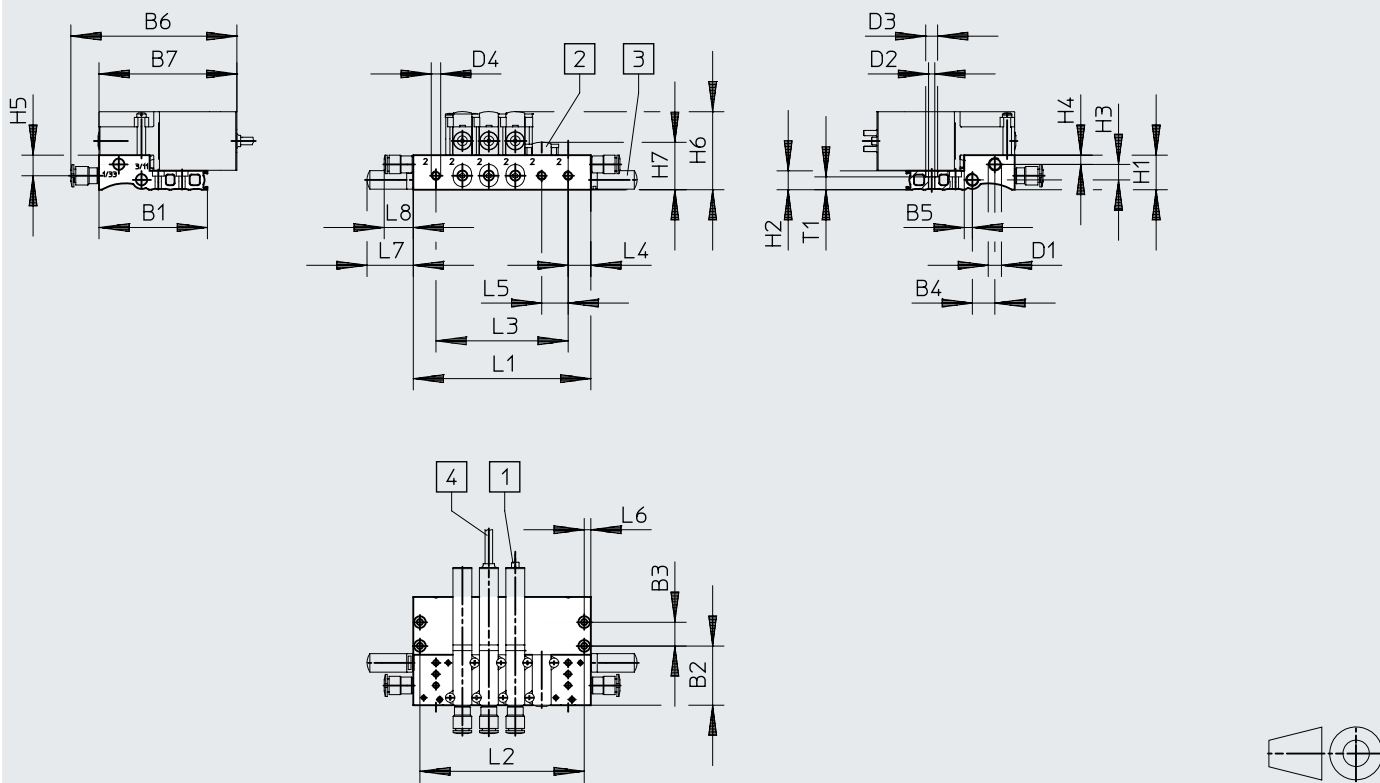
\* See dimensions table for manifold block used

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

### Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

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



[1] Plug vanes

[2] Cover plate


[3] Silencer

[4] Cable, 2.5 m

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

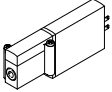
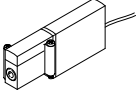

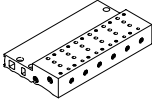

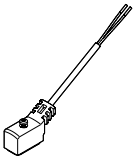
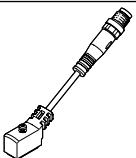
| Type            | L4 | L5 | L6  | L7   | L8   | T1  |
|-----------------|----|----|-----|------|------|-----|
| MHP2-PR...-3-M5 | 12 | 14 | 3.5 | 24.5 | 15.4 | 6.8 |


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

 **Note**

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









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

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

 **Note**

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

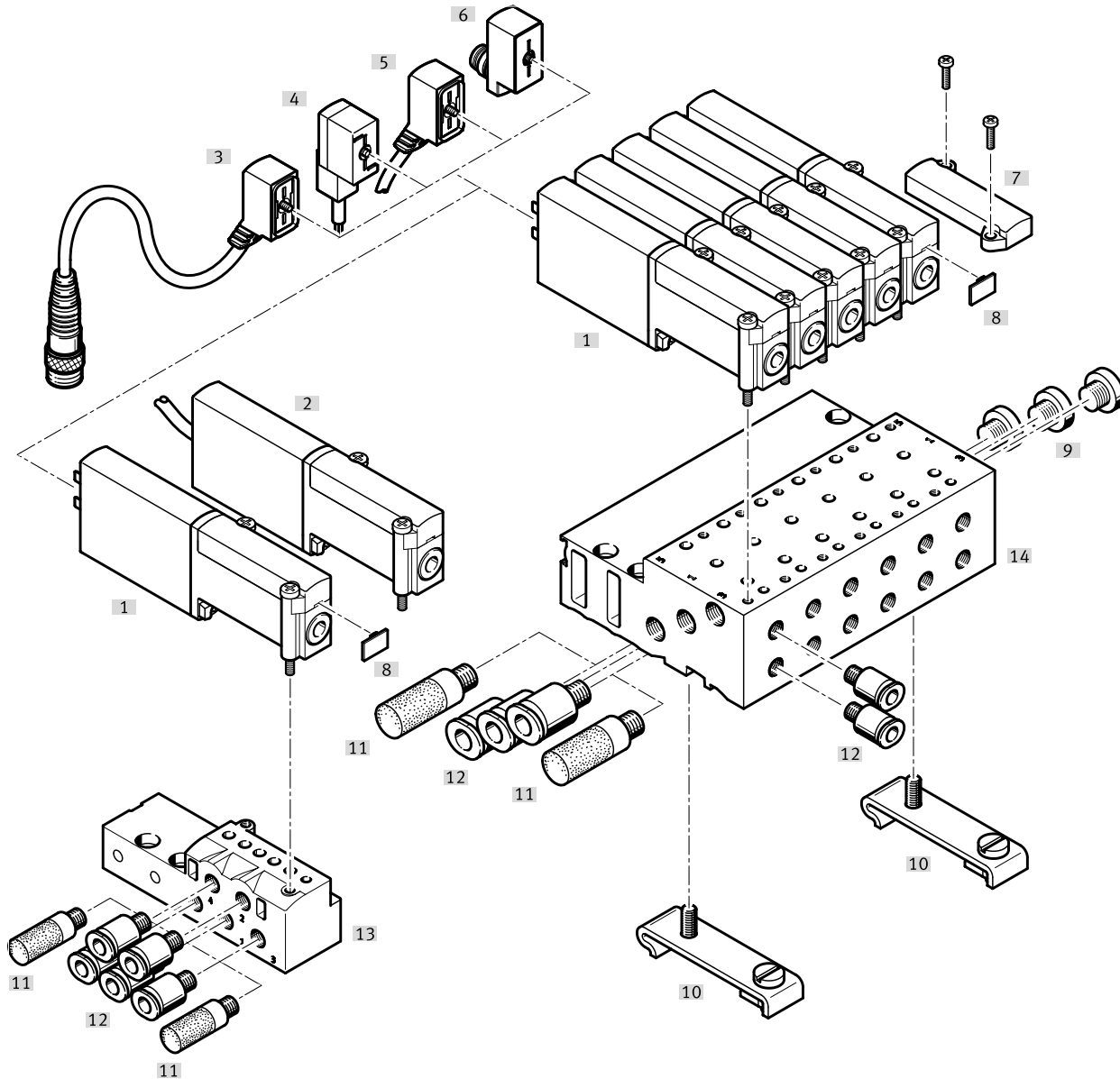
## Datasheet – Sub-base valve, 3/2-way valve

| Ordering data                                                                               |                                                                                             |                                   |                      | Part no.      | Type            |
|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-----------------------------------|----------------------|---------------|-----------------|
| <b>Adapter (for valves with 2-pin plug)</b>                                                 |                                                                                             |                                   |                      |               |                 |
|             | 2-pin socket                                                                                | Signal status indication with LED | Plug M8, 3-pin       | 571686        | VAVE-C8-1R8     |
|                                                                                             |                                                                                             |                                   | Plug M8, 4-pin       | 573194        | VAVE-C8-1R1     |
| <b>H-rail mounting</b>                                                                      |                                                                                             |                                   |                      |               |                 |
|             | For 3/2-way solenoid valves                                                                 |                                   |                      | 525053        | MHAP2-BG-NRH-35 |
| <b>H-rail</b>                                                                               |                                                                                             |                                   |                      |               |                 |
|             | To EN 60715                                                                                 |                                   | 2 m                  | 35430         | NRH-35-2000     |
| <b>Silencer</b> <span style="float: right;">Datasheets → Internet: uc</span>                |                                                                                             |                                   |                      |               |                 |
|             | 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        |
| <b>Push-in fitting</b> <span style="float: right;">Datasheets → Internet: qs</span>         |                                                                                             |                                   |                      |               |                 |
|            | Male thread M5 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.                                            | 4 mm                              | 10 pieces            | 153319        | QSM-M7-4-I      |
|                                                                                             |                                                                                             | 6 mm                              | 10 pieces            | 153321        | QSM-M7-6-I      |
|           | Male thread M5 with external hex, push-in L-fitting rotatable through 360°, for tubing O.D. | 4 mm                              | 10 pieces            | 153333        | QSML-M5-4       |
|                                                                                             |                                                                                             | 6 mm                              | 10 pieces            | 153335        | QSML-M5-6       |
|                                                                                             | Male thread M7 with external hex, push-in L-fitting rotatable through 360°, for tubing O.D. | 4 mm                              | 10 pieces            | 186352        | QSML-M7-4       |
|                                                                                             |                                                                                             | 6 mm                              | 10 pieces            | 186353        | QSML-M7-6       |
|                                                                                             | Male thread M5 with external hex, push-in L-fitting rotatable through 360°, for tubing O.D. | 4 mm                              | 100 pieces           | 133006        | QSM-M7-4-I-100  |
|                                                                                             |                                                                                             | 6 mm                              | 100 pieces           | 133006        | QSM-M7-6-I-100  |
| Male thread M7 with external hex, push-in L-fitting rotatable through 360°, for tubing O.D. | 4 mm                                                                                        | 100 pieces                        | 130771               | QSML-M5-4-100 |                 |
|                                                                                             | 6 mm                                                                                        | 100 pieces                        | 130772               | QSML-M5-6-100 |                 |
| Male thread M7 with external hex, push-in L-fitting rotatable through 360°, for tubing O.D. | 4 mm                                                                                        | 100 pieces                        | 130773               | QSML-M7-4-100 |                 |
|                                                                                             | 6 mm                                                                                        | 100 pieces                        | 130774               | QSML-M7-6-100 |                 |
| <b>Blanking plug</b>                                                                        |                                                                                             |                                   |                      |               |                 |
|           | For thread M5                                                                               |                                   | 10 pieces            | 3843          | B-M5            |
|                                                                                             | For thread M7                                                                               |                                   | 10 pieces            | 174309        | B-M7            |
| <b>Inscription label</b>                                                                    |                                                                                             |                                   |                      |               |                 |
|           | For solenoid valve                                                                          |                                   | 80 pieces in a frame | 197259        | MH-BZ-80X       |



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

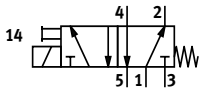
Connection with plug vanes – Connection with moulded-in cable






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

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

Function



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



| General technical data                    |         |                                             |
|-------------------------------------------|---------|---------------------------------------------|
| Valve function                            |         | 5/2-way, single solenoid                    |
| Design                                    |         | Pressure relief poppet valve                |
| Overlap                                   |         | Negative overlap                            |
| Sealing principle                         |         | Soft                                        |
| Reset method                              |         | Mechanical spring                           |
| Actuation type                            |         | Electrical                                  |
| Type of control                           |         | Direct                                      |
| 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                                          |

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

| Operating and environmental conditions                     |       |                                                                                            |
|------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------|
| Operating medium                                           |       | Compressed air to ISO 8573-1:2010 [7:4:4]                                                  |
| Note on the operating/pilot medium                         |       | Lubricated operation possible (in which case lubricated operation will always be required) |
| Operating pressure                                         | [MPa] | -0.09 ... +0.8                                                                             |
|                                                            | [bar] | -0.9 ... +8                                                                                |
| 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 <sup>1)</sup>               |       | 2                                                                                          |
| CE marking (see declaration of conformity) <sup>3)</sup>   |       | To EU EMC Directive <sup>2)</sup>                                                          |
|                                                            |       | To EU RoHS Directive                                                                       |
| UKCA marking (see declaration of conformity) <sup>3)</sup> |       | To UK instructions for EMC                                                                 |
|                                                            |       | To UK RoHS instructions                                                                    |
| Certification                                              |       | c UL us - Recognized (OL)                                                                  |
|                                                            |       | RCM                                                                                        |
| Cleanroom class                                            |       | Class 6 to ISO 14644-1                                                                     |
| Shock resistance                                           |       | Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27                          |
| Vibration resistance                                       |       | Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6           |

1) More information: [www.festo.com/x/topic/kbk](http://www.festo.com/x/topic/kbk)

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

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

3) More information: [www.festo.com/catalogue/...](http://www.festo.com/catalogue/...) → Support/Downloads.

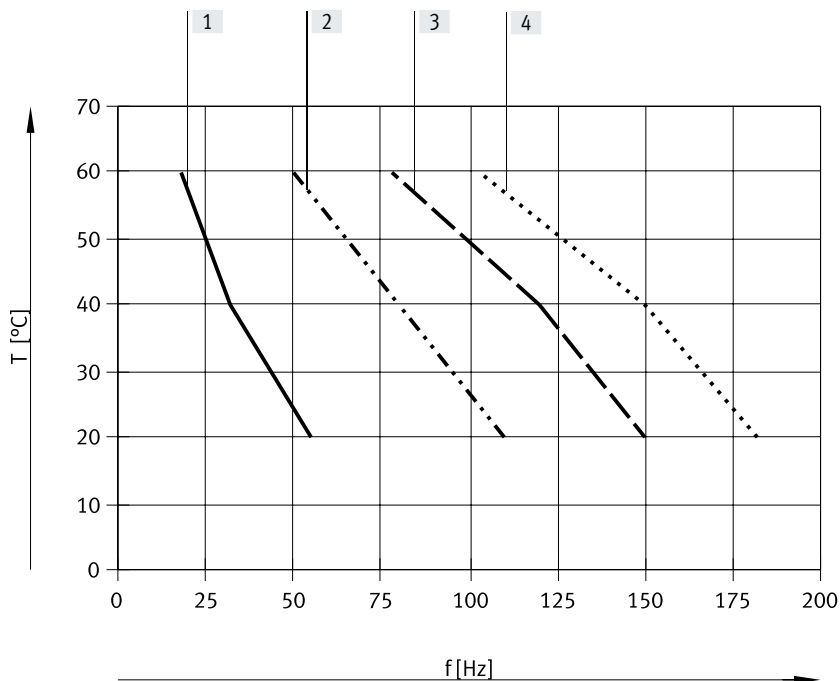
| Electrical data                  |                    |                           |
|----------------------------------|--------------------|---------------------------|
| Electrical connection            |                    | 2-pin plug   Cable        |
| Operating voltage                | [V DC]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

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

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

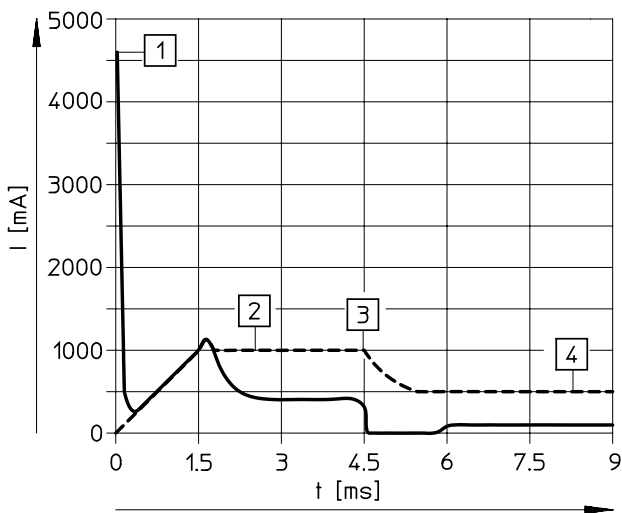
Datasheet – Sub-base valve, 5/2-way valve

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



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

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



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

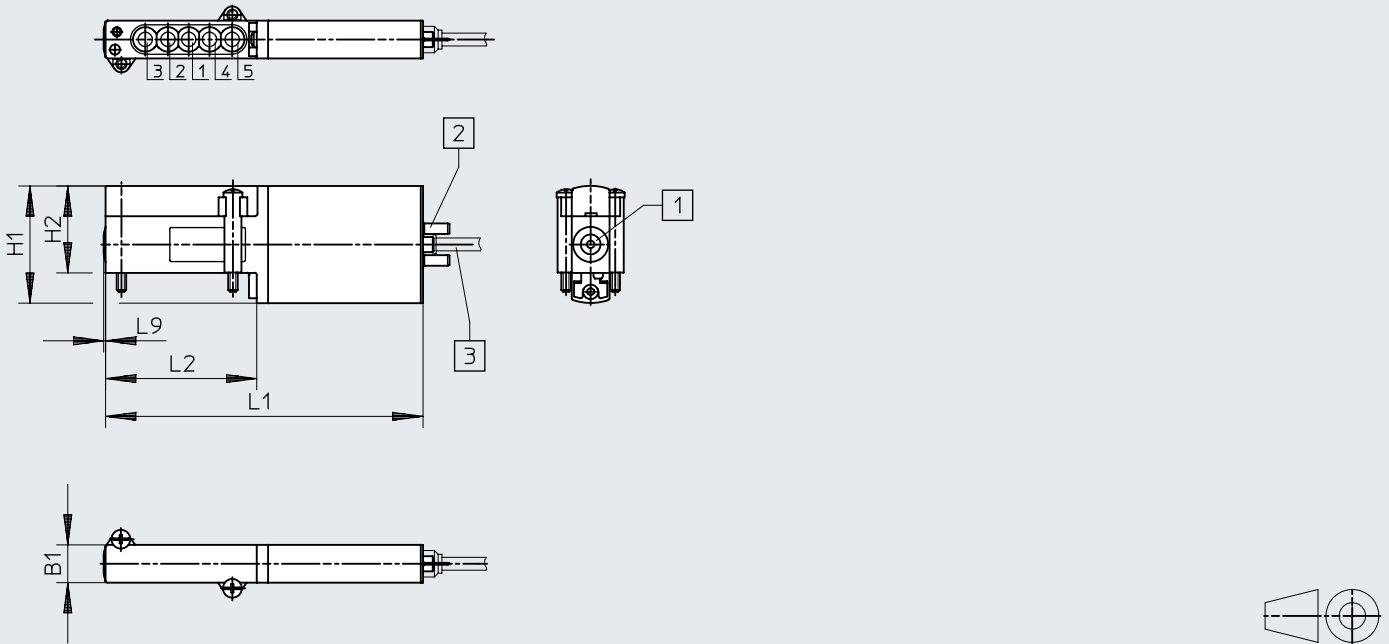
--- Internal current in the coil  
 — External current in the supply line

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

Dimensions

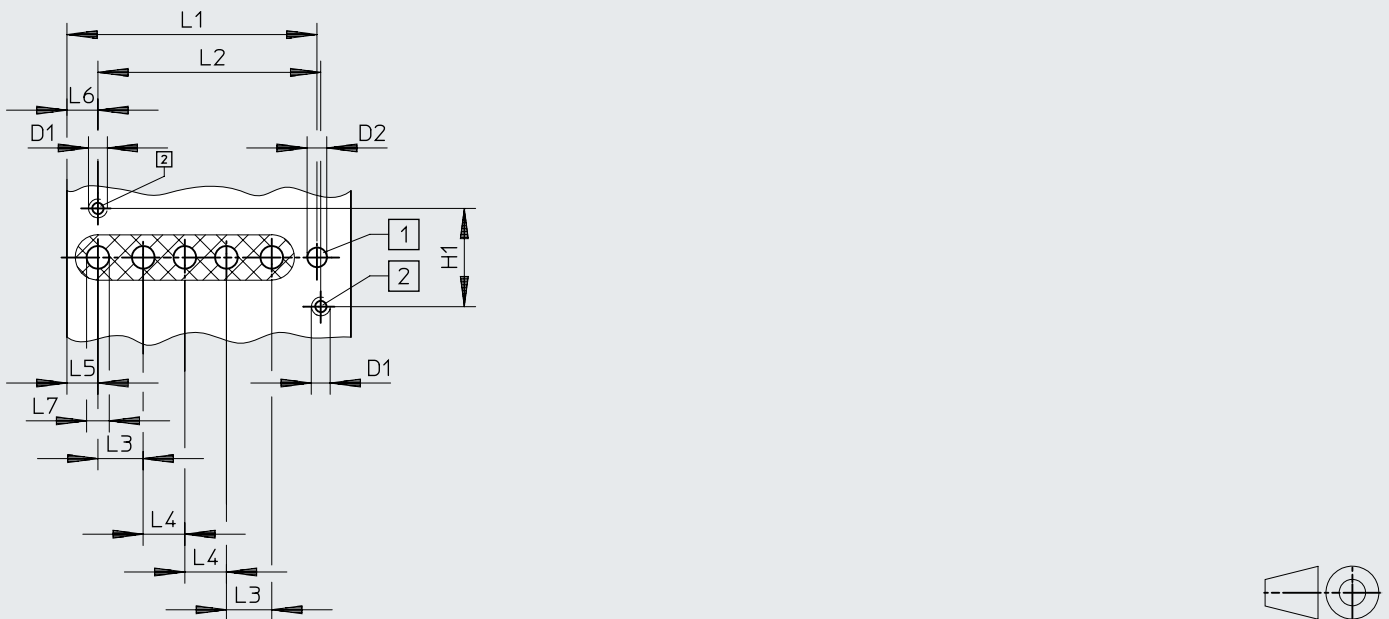
Download CAD data → [www.festo.com](http://www.festo.com)

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



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

Hole pattern on sub-bases



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

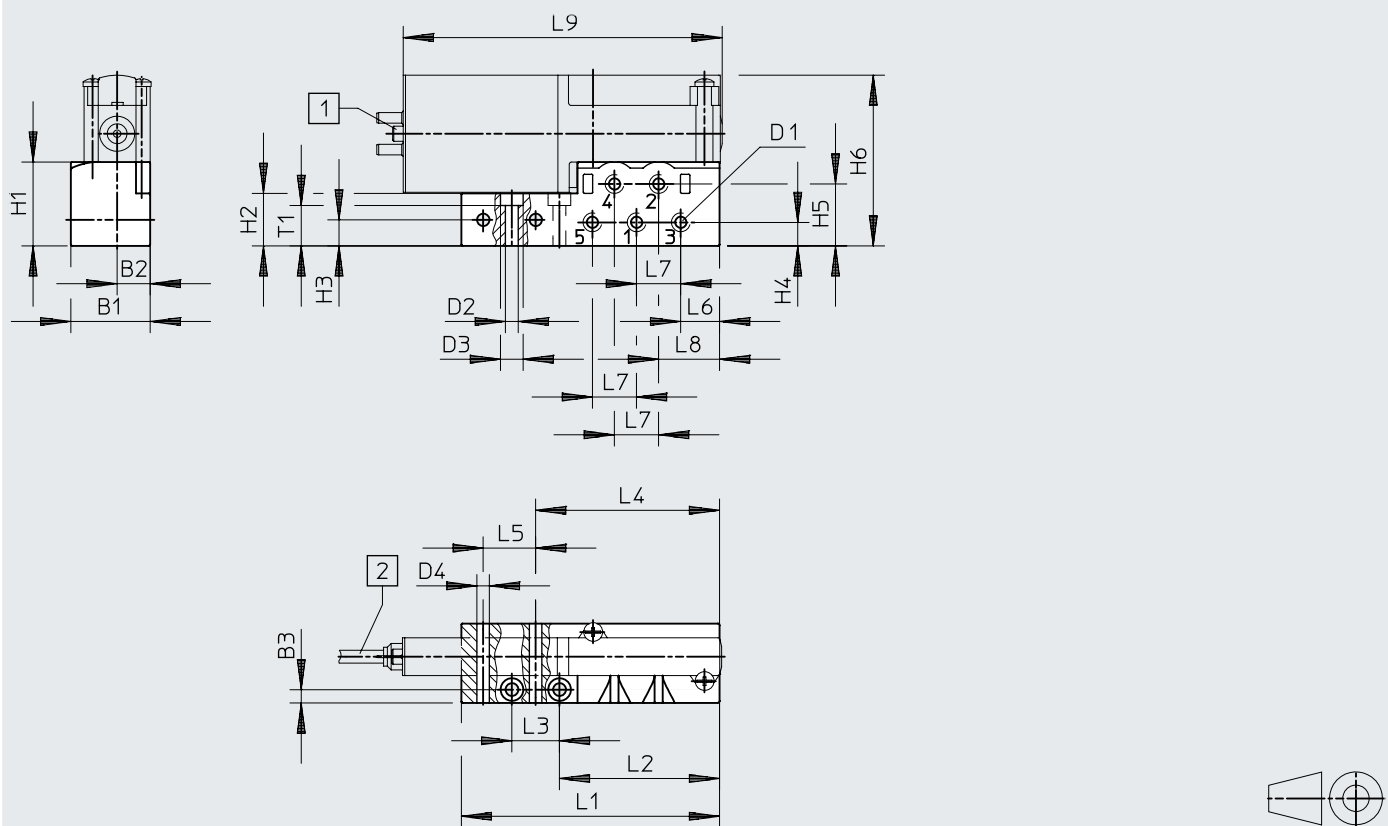
| Type            | B1 | D1   | D2<br>∅ | H1 | H2 | L1   | L2   | L3 | L4  | L5  | L6  | L7 | L9  |
|-----------------|----|------|---------|----|----|------|------|----|-----|-----|-----|----|-----|
| MHA2-...-5/2... | 10 | -    | -       | 31 | 23 | 84   | 40   | -  | -   | -   | -   | -  | 0.5 |
|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

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

**Dimensions**

Download CAD data → [www.festo.com](http://www.festo.com)

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



[1] Plug vanes

[2] Cable, 2.5 m

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

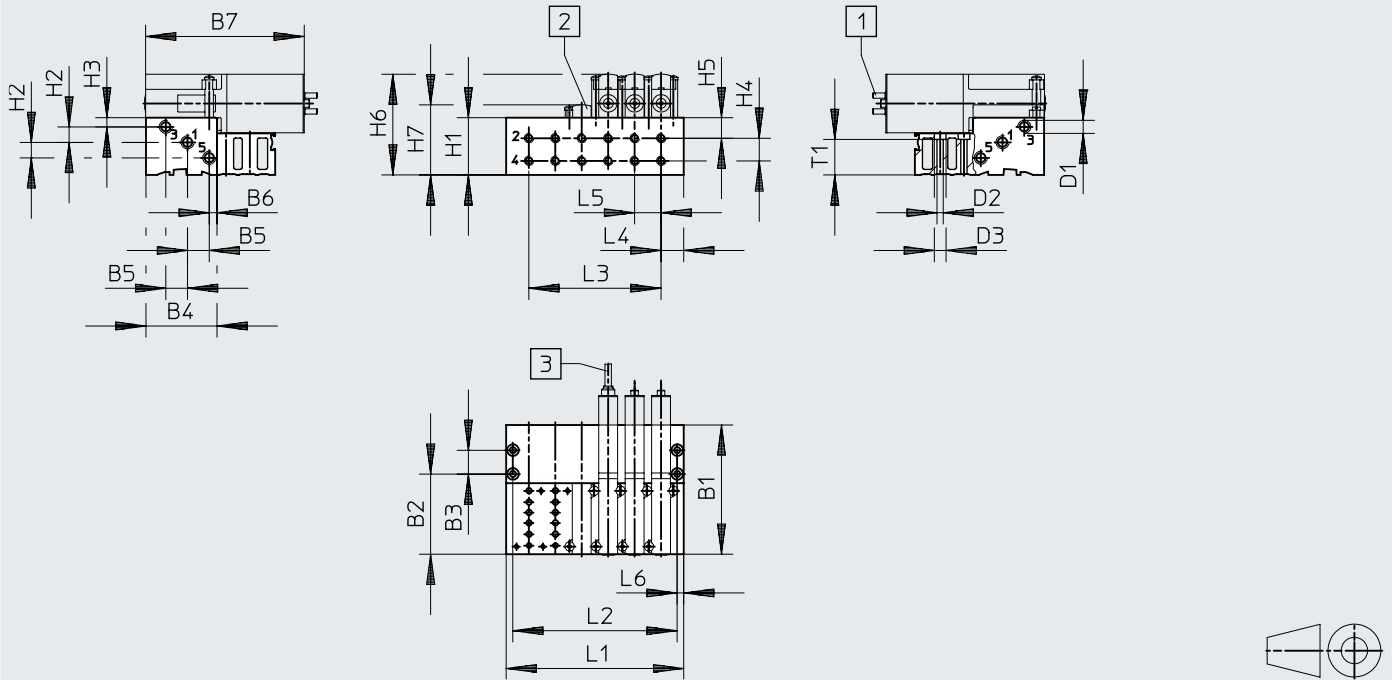
| Type         | L1   | L2   | L3   | L4   | L5   | L6   | L7   | L8   | L9   | T1   |
|--------------|------|------|------|------|------|------|------|------|------|------|
| MHA2-AS-5-M5 | 68.4 | 42.4 | 12.6 | 48.7 | 13.9 | 10.3 | 11.7 | 16.2 | 84.5 | 10.7 |

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

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

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



[1] Plug vanes

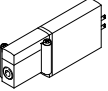
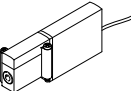

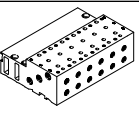

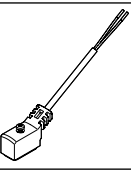
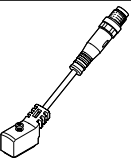
[2] Cover plate

[3] Cable, 2.5 m

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






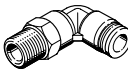

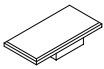
| Type            |    | Number of valve positions |    |    |     |     |
|-----------------|----|---------------------------|----|----|-----|-----|
|                 |    | 2                         | 4  | 6  | 8   | 10  |
| MHA2-PR...-5-M5 | L1 | 38                        | 66 | 94 | 122 | 150 |
|                 | L2 | 31                        | 59 | 87 | 115 | 143 |
|                 | L3 | 14                        | 42 | 70 | 98  | 126 |

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

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

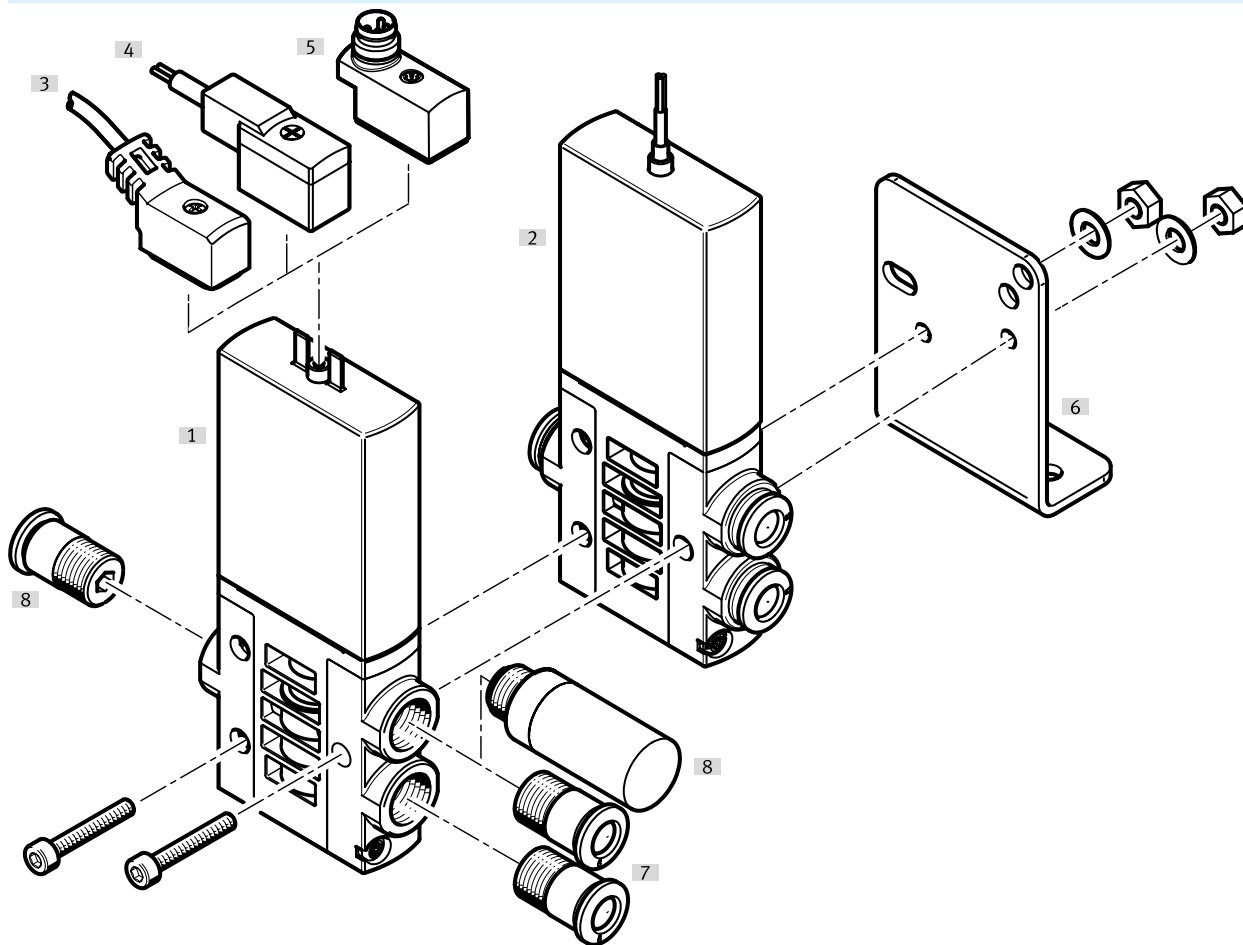


## Datasheet – Sub-base valve, 5/2-way valve

| Ordering data                                                                       |                                                                                             |                                   |                | Part no.      | Type                  |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-----------------------------------|----------------|---------------|-----------------------|
| <b>Adapter (for valves with 2-pin plug)</b>                                         |                                                                                             |                                   |                |               |                       |
|    | 2-pin socket                                                                                | Signal status indication with LED | Plug M8, 3-pin | 571686        | VAVE-C8-1R8           |
|                                                                                     |                                                                                             |                                   | Plug M8, 4-pin | 573194        | VAVE-C8-1R1           |
| <b>H-rail mounting</b>                                                              |                                                                                             |                                   |                |               |                       |
|    | For 5/2-way solenoid valves                                                                 |                                   |                | 162556        | CPV10/14-VI-BG-NRH-35 |
| <b>H-rail</b>                                                                       |                                                                                             |                                   |                |               |                       |
|    | To EN 60715                                                                                 | 2 m                               | 35430          | NRH-35-2000   |                       |
| <b>Silencer</b> <span style="float: right;">Datasheets → Internet: uc</span>        |                                                                                             |                                   |                |               |                       |
|    | 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              |
| <b>Push-in fitting</b> <span style="float: right;">Datasheets → Internet: qs</span> |                                                                                             |                                   |                |               |                       |
|   | Male thread M5 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.                                            | 4 mm                              | 10 pieces      | 153319        | QSM-M7-4-I            |
|                                                                                     |                                                                                             | 6 mm                              | 10 pieces      | 153321        | QSM-M7-6-I            |
|  | Male thread M5 with external hex, push-in L-fitting rotatable through 360°, for tubing O.D. | 4 mm                              | 10 pieces      | 153333        | QSML-M5-4             |
|                                                                                     |                                                                                             |                                   | 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 rotatable through 360°, for tubing O.D. | 4 mm                              | 10 pieces      | 186352        | QSML-M7-4             |
|                                                                                     |                                                                                             |                                   | 100 pieces     | 130773        | QSML-M7-4-100         |
| 6 mm                                                                                | 10 pieces                                                                                   | 186353                            | QSML-M7-6      |               |                       |
| 100 pieces                                                                          | 130774                                                                                      | QSML-M7-6-100                     |                |               |                       |
| <b>Blanking plug</b>                                                                |                                                                                             |                                   |                |               |                       |
|  | For thread M5                                                                               | 10 pieces                         | 3843           | B-M5          |                       |
|                                                                                     | For thread M7                                                                               | 10 pieces                         | 174309         | B-M7          |                       |
| <b>Inscription label</b>                                                            |                                                                                             |                                   |                |               |                       |
|  | For solenoid valve                                                                          | 80 pieces in a frame              | 197259         | MH-BZ-80X     |                       |

Peripherals overview – Individual valve

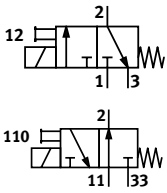
Connection with plug vanes – Connection with moulded-in cable






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

## Datasheet – Individual valve

## Function



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



## General technical data

|                            |                                                                  |
|----------------------------|------------------------------------------------------------------|
| Valve function             | 3/2 way, single solenoid <sup>1)</sup>                           |
| 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 <sup>2)</sup>                       |
| 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<br>Push-in connector for tubing O.D. 6 mm |
| Product weight             | [g] 120                                                          |

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

## Operating and environmental conditions

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

- 1) More information: [www.festo.com/x/topic/kbk](http://www.festo.com/x/topic/kbk)  
 2) For information about the area of use, see the EC declaration of conformity at: [www.festo.com/catalogue/mh2](http://www.festo.com/catalogue/mh2) → Support/Downloads.  
 If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.  
 3) More information: [www.festo.com/catalogue/...](http://www.festo.com/catalogue/...) → Support/Downloads.

## Datasheet – Individual valve

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

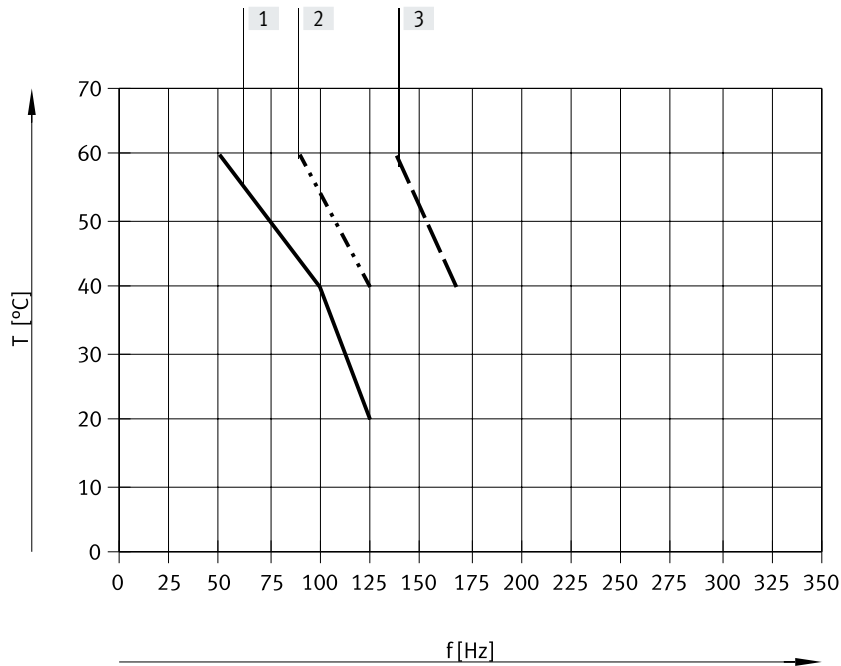
| Electrical data                  |  |        | With fast-switching electronics                                 | Without fast-switching electronics |
|----------------------------------|--|--------|-----------------------------------------------------------------|------------------------------------|
| Electrical connection            |  |        | 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  | [%]  | +10 ... -30                     | -                                  |
|                                            | Off | [%]  | +10 ... -50                     | -                                  |
| Switching time variation from 1 Hz upwards |     | [ms] | 0.2                             | -                                  |
| Maximum switching frequency                |     | [Hz] | 280                             | 130                                |

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

## Datasheet – Individual valve

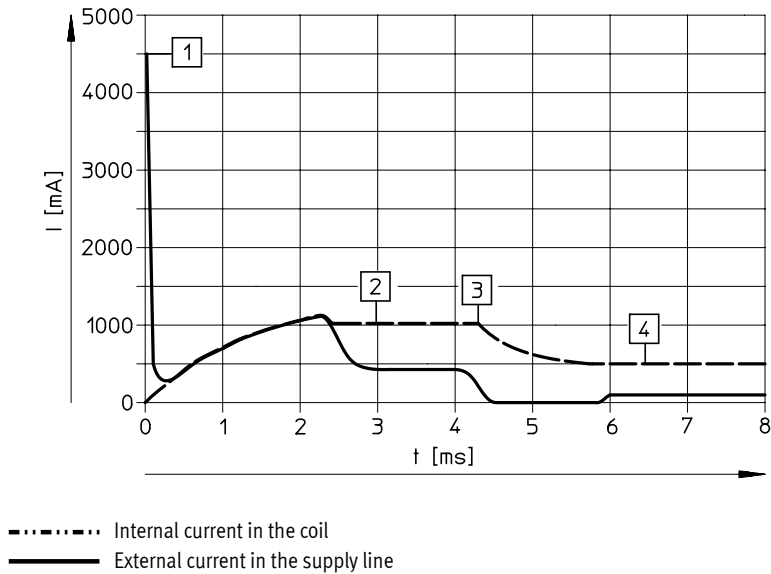
### Restricted ambient temperature and temperature of medium as a function of switching frequency



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

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

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



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

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

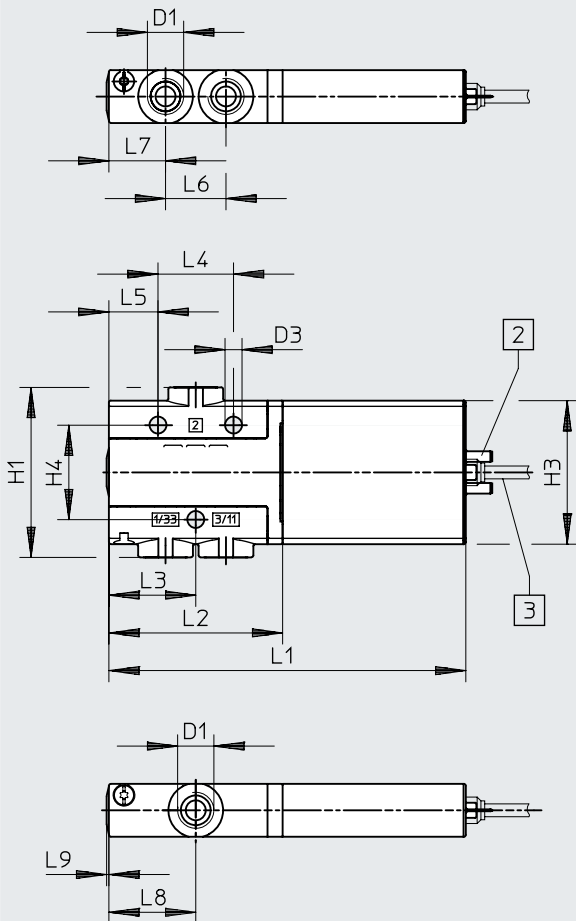
Datasheet – Individual valve

Dimensions

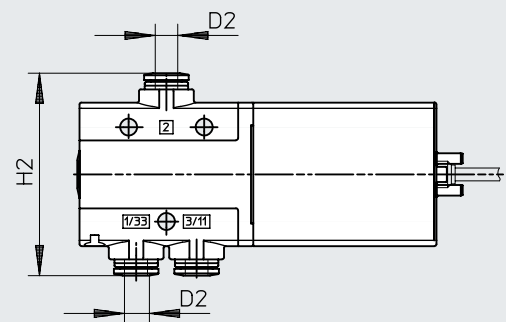
Download CAD data → [www.festo.com](http://www.festo.com)

Valve with plug vanes or moulded-in cable

MHE3-...-G1/8



MHE3-...-QS6



[1] Manual override, non-detenting

[2] Plug vanes

[3] Cable, 2.5 m

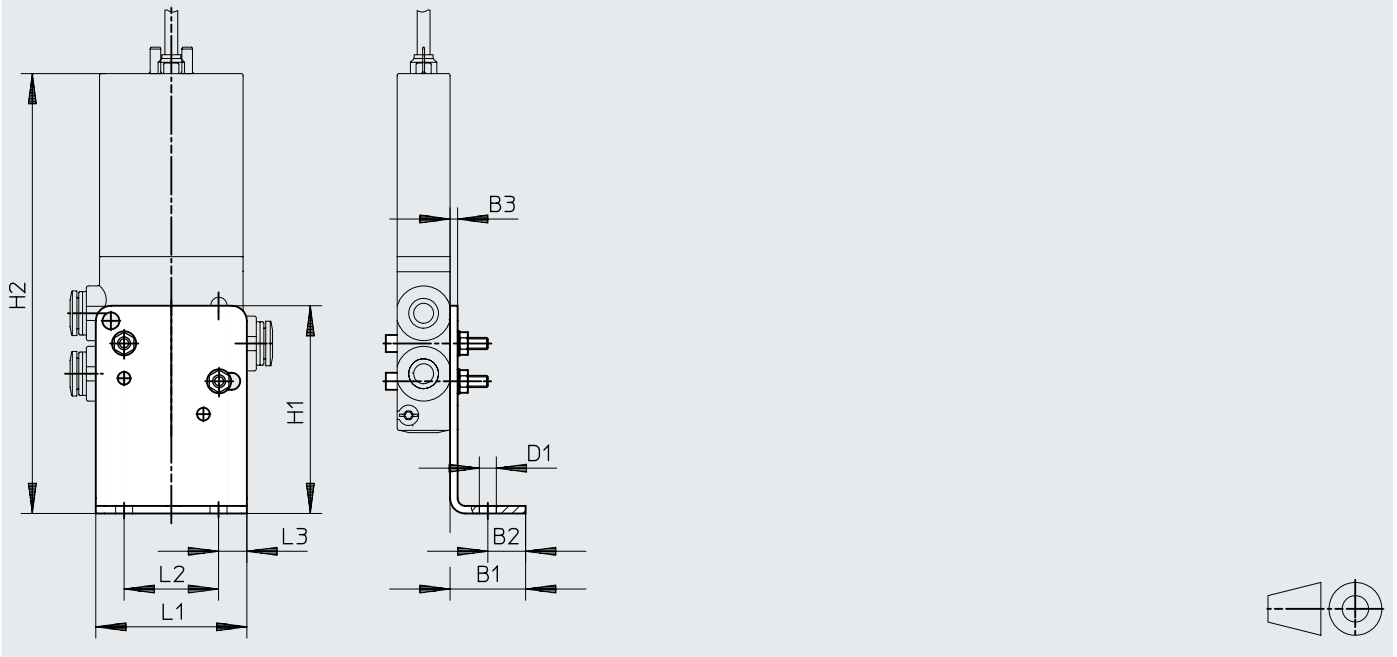
| Type              | B1 | D1   | D2<br>∅ | D3<br>∅ | H1 | H2   | H3 | H4 | L1   | L2 | L3 | L4 | L5 | L6 | L7 | L8 | L9  |
|-------------------|----|------|---------|---------|----|------|----|----|------|----|----|----|----|----|----|----|-----|
| MHE3-...-1/8-...  | 14 | G1/8 | -       | 4.5     | 45 | -    | 38 | 25 | 94.5 | 46 | 23 | 20 | 13 | 16 | 15 | 23 | 0.6 |
| MHE3-...-QS-6-... | 14 | -    | 6       | 4.5     | 45 | 53.6 | 38 | 25 | 94.5 | 46 | 23 | 20 | 13 | 16 | 15 | 23 | 0.6 |

Datasheet – Individual valve

**Dimensions**


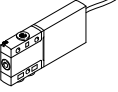
Download CAD data → [www.festo.com](http://www.festo.com)

Mounting bracket MHE2-BG-L



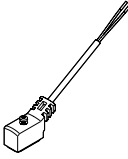
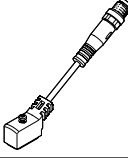

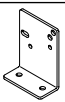


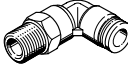
| Type      | B1 | B2 | B3 | D1  | H1 | H2    | L1 | L2 | L3  |
|-----------|----|----|----|-----|----|-------|----|----|-----|
| MHE2-BG-L | 20 | 10 | 2  | 4.5 | 55 | 113.3 | 40 | 25 | 7.5 |

Datasheet – Individual valve

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

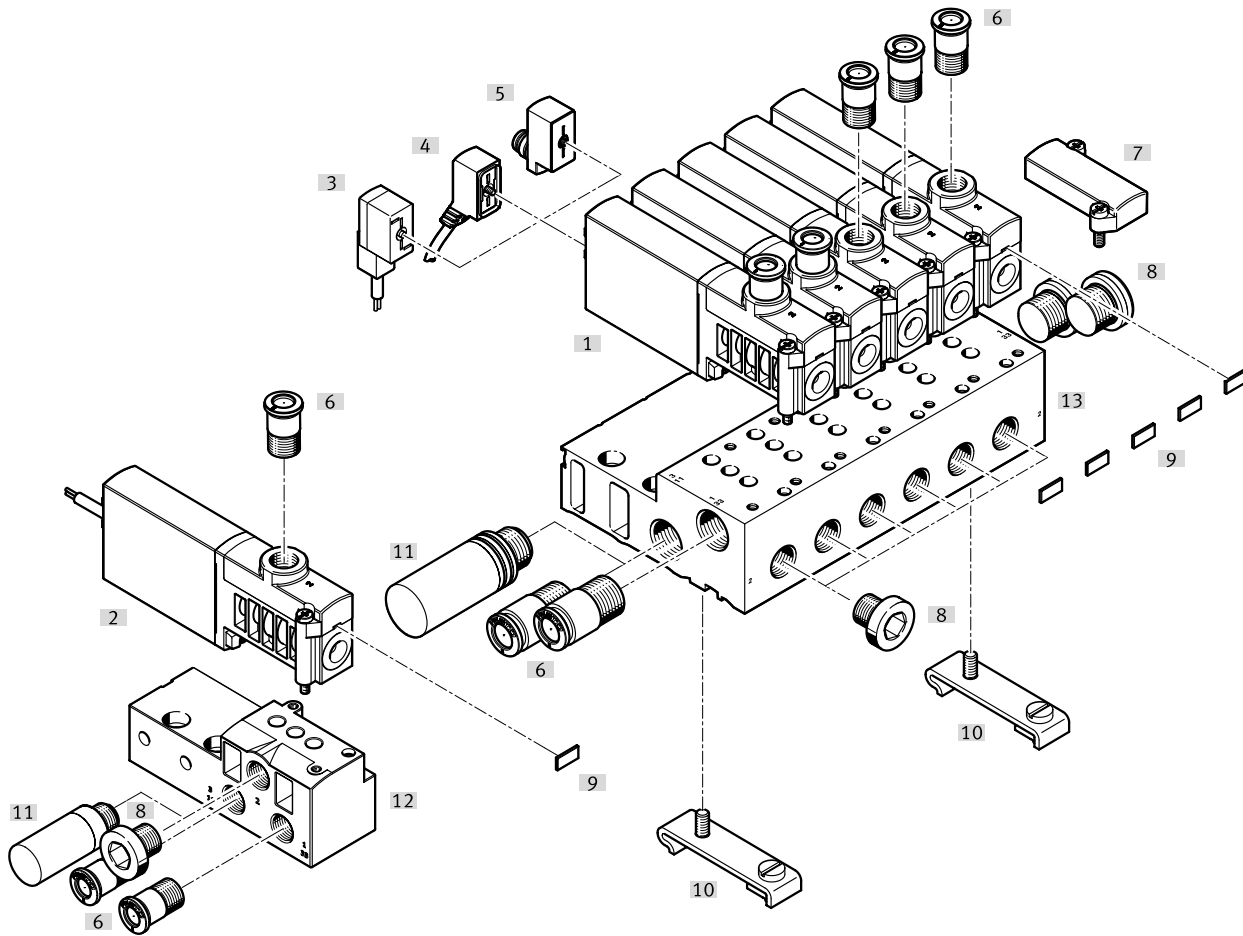


## Datasheet – Individual valve

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

Peripherals overview – Semi in-line valve

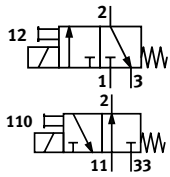
Connection with plug vanes – Connection with moulded-in cable



| Designation                | Type                  | Description                                                                                                                    | → Page/Internet |
|----------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------|-----------------|
| [1] Semi in-line valve     | MHP3                  | With plug vanes                                                                                                                | 70              |
| [2] Semi in-line valve     | MHP3-...-K            | With moulded-in cable, IP65                                                                                                    | 73              |
| [3] Plug socket with cable | KMYZ-4                | PVC cable, without signal status indication, IP50                                                                              | 73              |
| [4] Connecting cable       | NEBV                  | PUR cable, signal status indication with LED, IP65                                                                             | 73              |
| [5] Adapter                | VAVE-C8               | For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65                                                         | 73              |
| [6] Push-in fittings       | QS                    | For connecting compressed air tubing with standard O.D.                                                                        | 74              |
| [7] Cover plate            | MHAP3-BP-3            | For sealing vacant positions                                                                                                   | 73              |
| [8] Blanking plug          | B                     | For sealing unused ports                                                                                                       | 74              |
| [9] Inscription label      | MH-BZ-80X             | For identifying the valves                                                                                                     | 74              |
| [10] H-rail mounting       | CPV10/14-VI-BG-NRH-35 | For mounting the manifold block on H-rails to EN 60715                                                                         | 74              |
| [11] Silencer              | UC                    | For fitting in exhaust ports                                                                                                   | 74              |
| [12] Individual sub-base   | MHA3-AS-3-1/8         | For semi in-line valves; the individual sub-base is also used for sub-base valves and must be sealed with a blanking plug here | 73              |
| [13] Manifold block        | MHA3-PR               | For semi in-line valves                                                                                                        | 73              |

## Datasheet – Semi in-line valve

## Function



Voltage  
24 V DC



Pressure  
-0.09 ... +0.8 MPa



Temperature range  
-5 ... +40°C



## General technical data

|                            |              |                                                                |
|----------------------------|--------------|----------------------------------------------------------------|
| Valve function             |              | 3/2 way, single solenoid <sup>1)</sup>                         |
| 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 <sup>2)</sup>                     |
| 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

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

## Datasheet – Semi in-line valve

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

1) More information: [www.festo.com/x/topic/kbk](http://www.festo.com/x/topic/kbk)

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

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

3) More information: [www.festo.com/catalogue/...](http://www.festo.com/catalogue/...) → Support/Downloads.

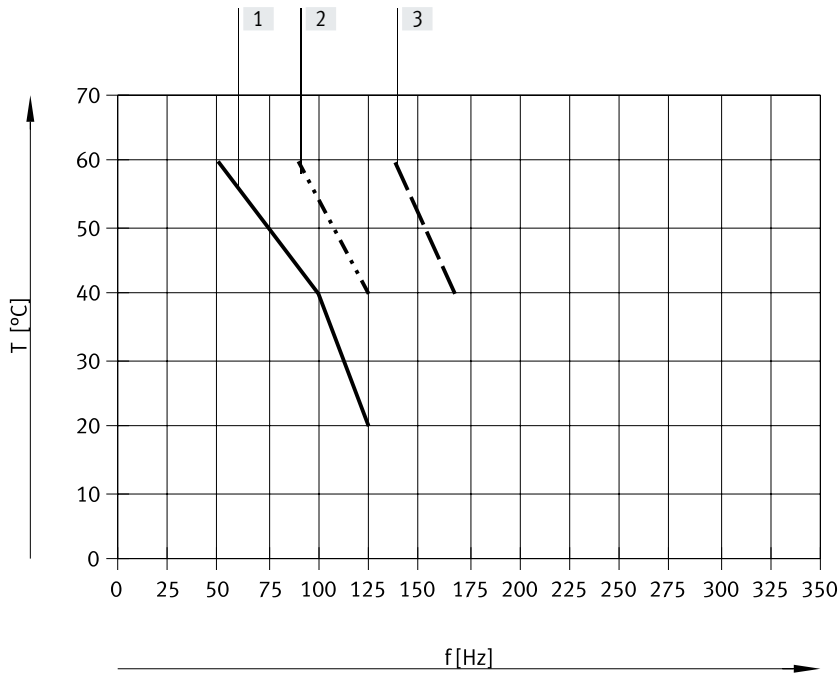
| Electrical data                  |                           | With fast-switching electronics | Without fast-switching electronics |
|----------------------------------|---------------------------|---------------------------------|------------------------------------|
| Electrical connection            |                           | 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 [%]   | +10 ... -30                     | -                                  |
|                                            | Off [%]  | +10 ... -50                     | -                                  |
| Switching time variation from 1 Hz upwards | [ms]     | 0.2                             | -                                  |
| Maximum switching frequency                | [Hz]     | 280                             | 130                                |

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

Datasheet – Semi in-line valve

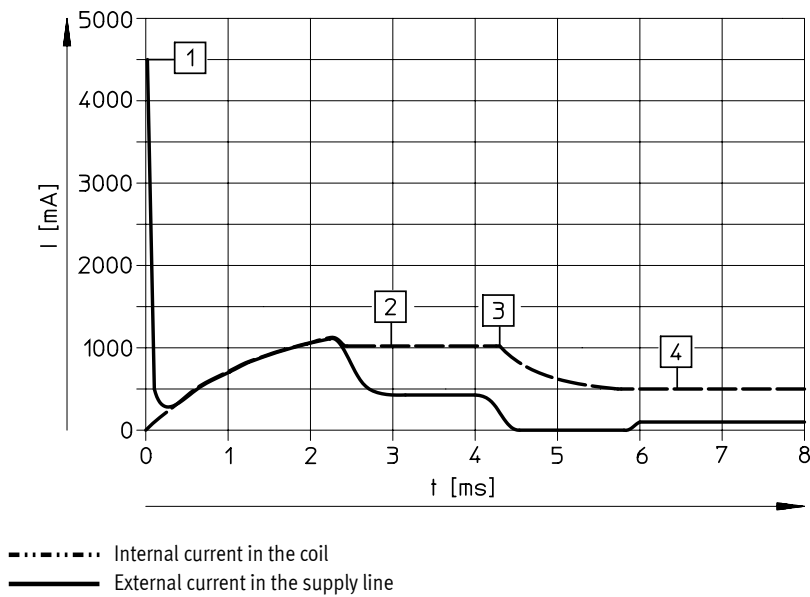
Restricted ambient temperature and temperature of medium as a function of switching frequency



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

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

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



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

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

Datasheet – Semi in-line valve

Dimensions

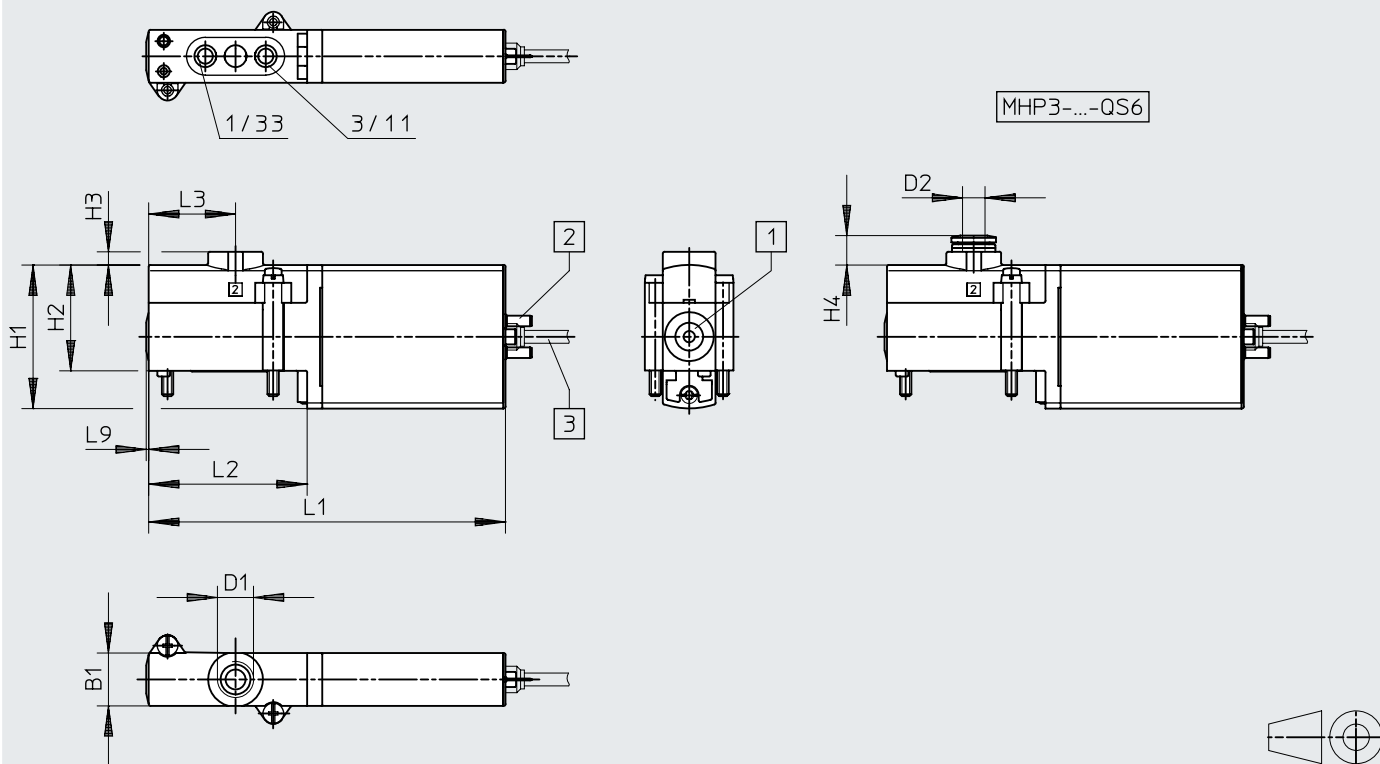
Download CAD data → [www.festo.com](http://www.festo.com)

Valve with connecting thread G1/8

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

MHP3-...-G1/8

MHP3-...-QS6



[1] Manual override, non-detenting

[2] Plug vanes

[3] Cable, 2.5 m

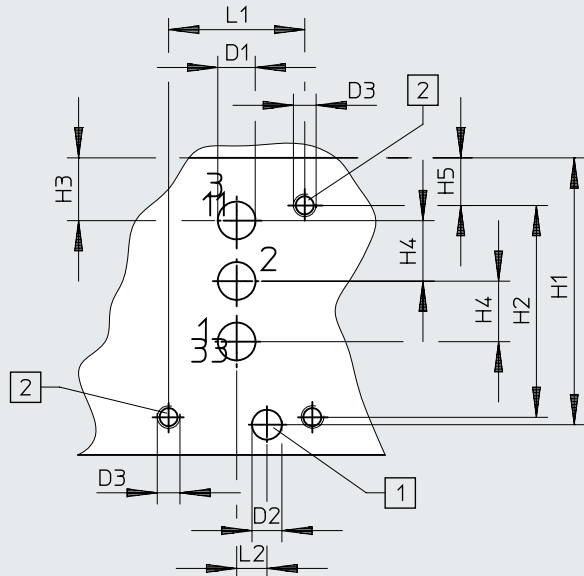
| Type            | B1 | D1   | D2<br>∅ | H1 | H2 | H3  | H4  | L1   | L2 | L3 | L9  |
|-----------------|----|------|---------|----|----|-----|-----|------|----|----|-----|
| MHP3-...-3/2... | 14 | G1/8 | 6       | 38 | 28 | 3.5 | 7.8 | 94.5 | 42 | 23 | 0.6 |

Datasheet – Semi in-line valve

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

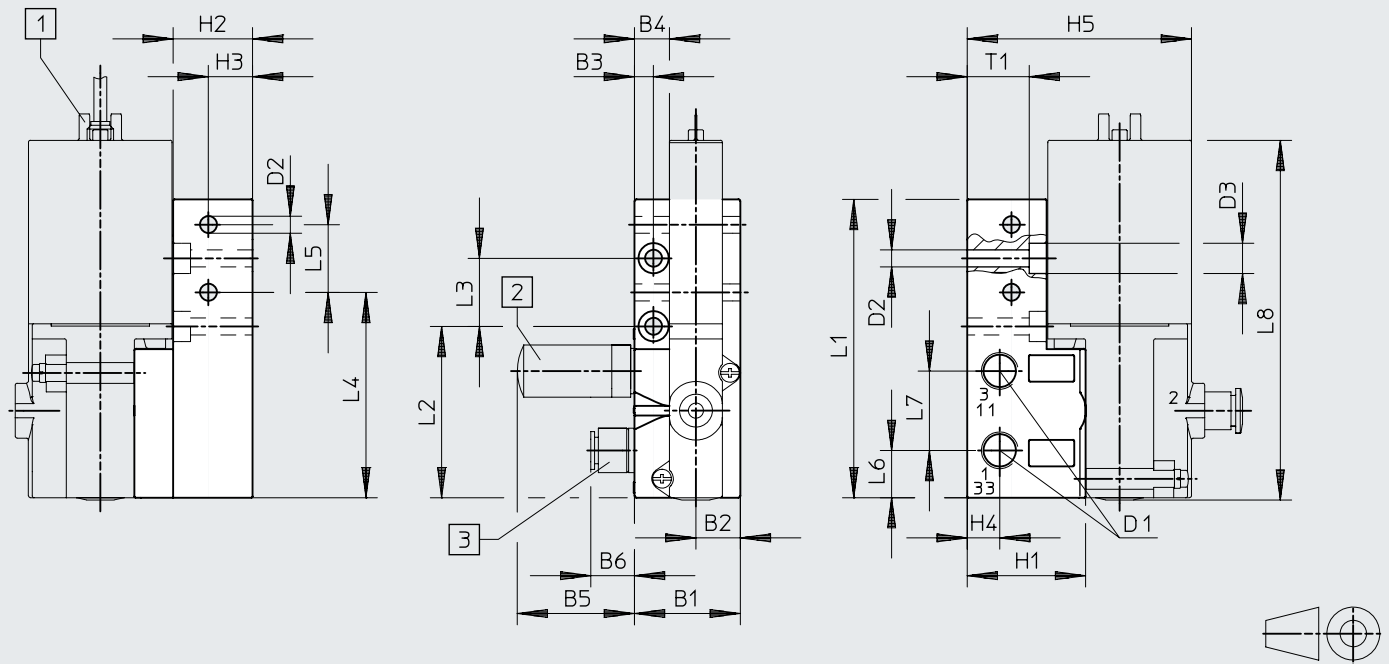
Hole pattern on sub-bases



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

**Note**  
 With semi in-line valves, port 2 is not used.  
 If used as a 2/2-way valve, normally closed, ports 3/11 are not used.  
 If used as a 2/2-way valve, normally open, ports 1/33 are not used.

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



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

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

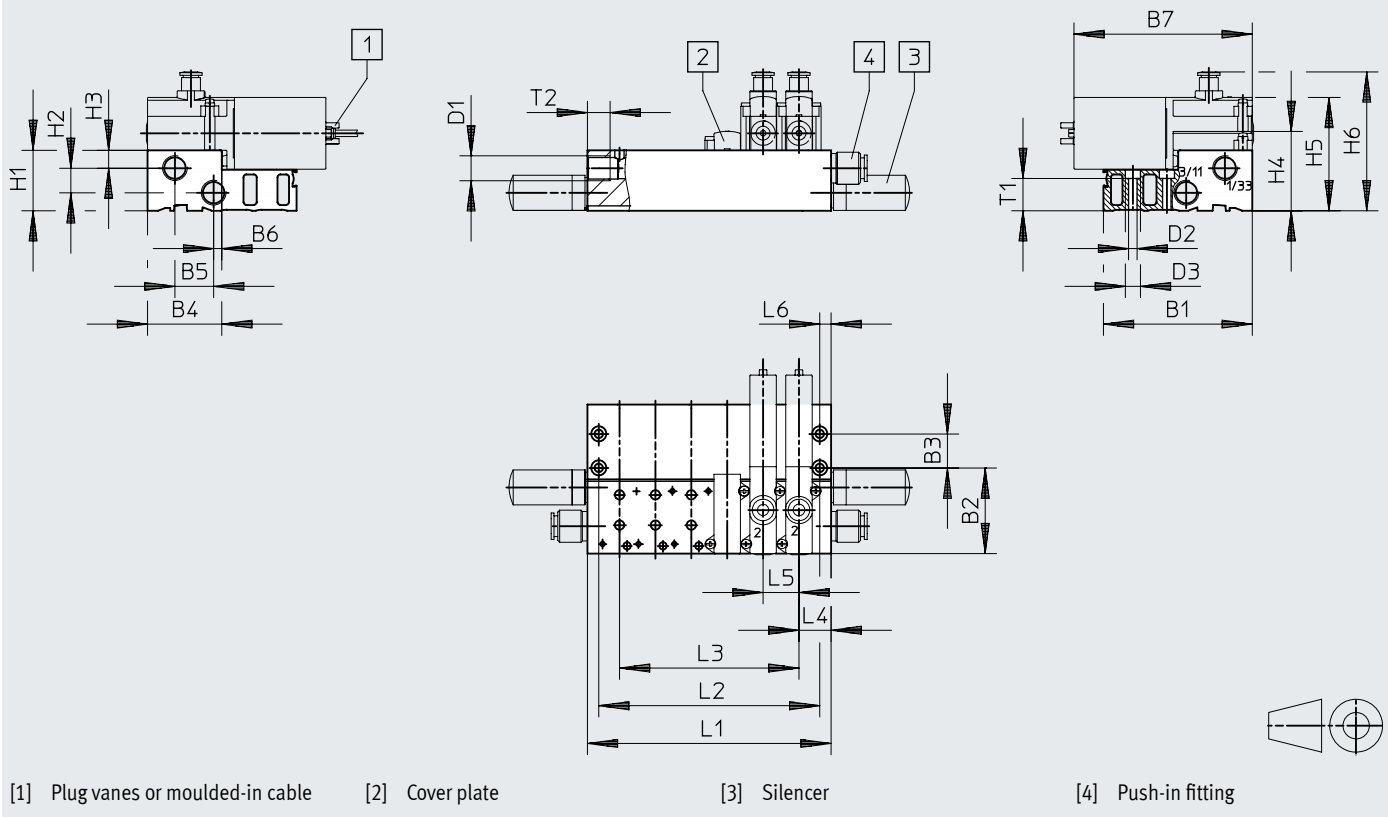
| Type          | L1   | L2   | L3 | L4   | L5   | L6   | L7 | L8 | T1   |
|---------------|------|------|----|------|------|------|----|----|------|
| Hole pattern  | 18   | 4    | -  | -    | -    | -    | -  | -  | -    |
| MHA3-AS-3-1/8 | 78.9 | 45.3 | 18 | 54.3 | 17.9 | 12.5 | 21 | 95 | 16.4 |

## Datasheet – Semi in-line valve

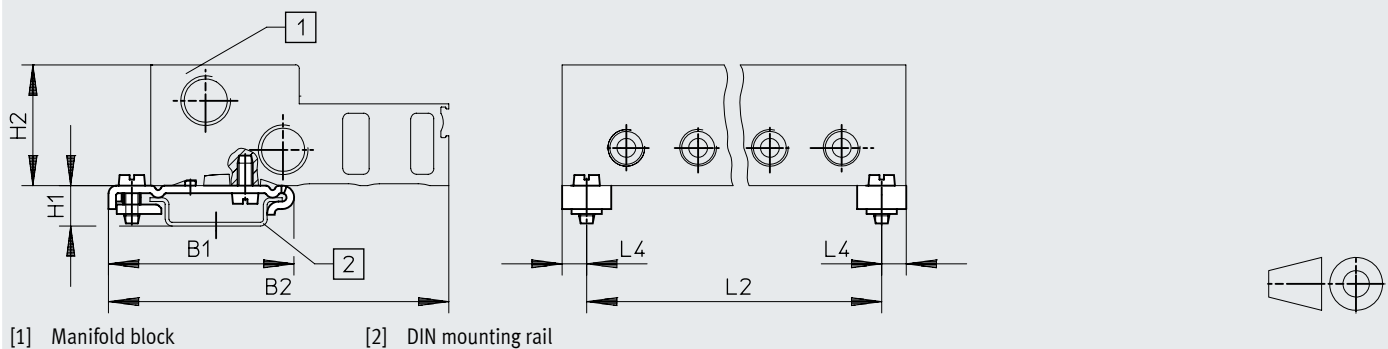
### Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

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



H-rail mounting CPV1 0/14-VI-BG-NRH-35






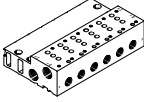

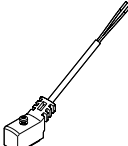
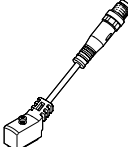

| Type               | B1   | B2   | B3 | B4   | B5   | B6  | B7   | D1   | D2<br>∅ | D3<br>∅ | H1   | H2 | H3  | H4 | H5 | H6   | L4  | L5 | L6 | T1   | T2 |
|--------------------|------|------|----|------|------|-----|------|------|---------|---------|------|----|-----|----|----|------|-----|----|----|------|----|
| MHA3-PR...-1/8     | 79   | 45.3 | 18 | 39.3 | 20.5 | 4.3 | 94.5 | G1/4 | 4.5     | 8       | 32   | 13 | 9.5 | 42 | 60 | 73.5 | 17  | 19 | 6  | 17.1 | 12 |
| CPV1 0/14-VI-BG... | 49.1 | 90   | -  | -    | -    | -   | -    | -    | -       | -       | 10.7 | 32 | -   | -  | -  | -    | 6.5 | -  | -  | -    | -  |

| Type               | Number of valve positions |    |    |     |     |
|--------------------|---------------------------|----|----|-----|-----|
|                    | 2                         | 4  | 6  | 8   | 10  |
| MHA3-PR...-1/8     | L1                        | 53 | 91 | 129 | 205 |
|                    | L2                        | 41 | 79 | 117 | 193 |
|                    | L3                        | 19 | 57 | 95  | 133 |
| CPV1 0/14-VI-BG... | L2                        | 40 | 78 | 116 | 192 |

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


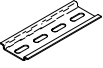


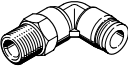

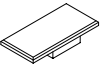


## Datasheet – Semi in-line valve

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

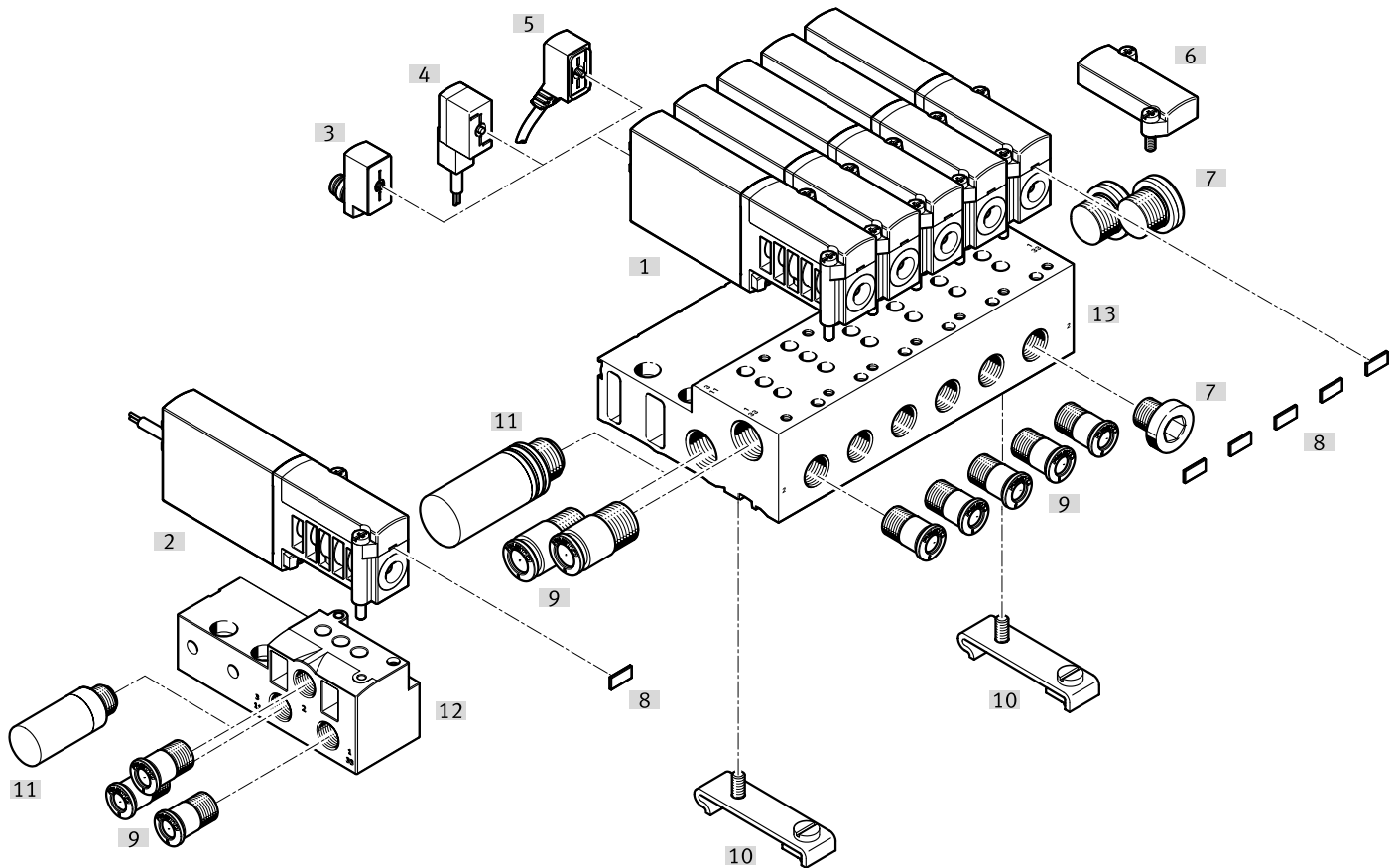
1) Seal port 2 with a blanking plug. These ports have no function when using semi in-line valves.

Datasheet – Semi in-line valve

| Ordering data                                                                       |                                                                                               |                      | Part no.   | Type                  |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------|------------|-----------------------|
| <b>H-rail mounting</b>                                                              |                                                                                               |                      |            |                       |
|     | For manifold block                                                                            |                      | 162556     | CPV10/14-VI-BG-NRH-35 |
| <b>H-rail</b>                                                                       |                                                                                               |                      |            |                       |
|     | To EN 60715                                                                                   | 2 m                  | 35430      | NRH-35-2000           |
| <b>Silencer</b> <span style="float: right;">Datasheets → Internet: uc</span>        |                                                                                               |                      |            |                       |
|     | 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      |
| <b>Push-in fitting</b> <span style="float: right;">Datasheets → Internet: qs</span> |                                                                                               |                      |            |                       |
|     | 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 rotatable through 360°, for tubing O.D. | 6 mm                 | 10 pieces  | 186117 QSL-G1/8-6     |
|                                                                                     |                                                                                               |                      | 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 rotatable through 360°, for tubing O.D. | 8 mm                 | 10 pieces  | 186120 QSL-G1/4-8     |
|                                                                                     |                                                                                               |                      | 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 |
| <b>Blanking plug</b>                                                                |                                                                                               |                      |            |                       |
|   | For thread G1/8                                                                               |                      | 10 pieces  | 3568 B-1/8            |
|                                                                                     | For thread G1/4                                                                               |                      | 10 pieces  | 3569 B-1/4            |
| <b>Inscription label</b>                                                            |                                                                                               |                      |            |                       |
|   | For solenoid valve                                                                            | 80 pieces in a frame | 197259     | MH-BZ-80X             |

## Peripherals overview – Sub-base valve

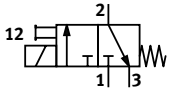
## Connection with plug vanes – Connection with moulded-in cable






| Designation                | Type                  | Description                                                            | → Page/Internet |
|----------------------------|-----------------------|------------------------------------------------------------------------|-----------------|
| [1] Sub-base valve         | MHA3                  | With plug vanes                                                        | 78              |
| [2] Sub-base valve         | MHA3-...-K            | With moulded-in cable, IP65                                            | 82              |
| [3] Adapter                | VAVE-C8               | For connecting the valves via connecting cable M8 3-pin or 4-pin, IP65 | 82              |
| [4] Plug socket with cable | KMYZ-4                | PVC cable, without signal status indication, IP50                      | 82              |
| [5] Connecting cable       | NEBV                  | PUR cable, signal status indication with LED, IP65                     | 82              |
| [6] Cover plate            | MHAP3-BP-3            | For sealing vacant positions                                           | 82              |
| [7] Blanking plug          | B                     | For sealing unused ports                                               | 83              |
| [8] Inscription label      | MH-BZ-80X             | For identifying the valves                                             | 83              |
| [9] Push-in fittings       | QS                    | For connecting compressed air tubing with standard O.D.                | 83              |
| [10] H-rail mounting       | CPV10/14-VI-BG-NRH-35 | For mounting the manifold block on H-rails to EN 60715                 | 83              |
| [11] Silencer              | UC                    | For fitting in exhaust ports                                           | 83              |
| [12] Individual sub-base   | MHA3-AS-3-1/8         | For sub-base valve                                                     | 82              |
| [13] Manifold block        | MHA3-PR-...-3-1/8     | For sub-base valve                                                     | 82              |

## Datasheet – Sub-base valve

Function



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



**General technical data**

|                            |                                             |
|----------------------------|---------------------------------------------|
| Valve function             | 3/2 way, single solenoid <sup>1)</sup>      |
| 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 <sup>2)</sup>  |
| 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                                     |

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

## Datasheet – Sub-base valve

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

1) More information: [www.festo.com/x/topic/kbk](http://www.festo.com/x/topic/kbk)

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

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

3) More information: [www.festo.com/catalogue/...](http://www.festo.com/catalogue/...) → Support/Downloads.

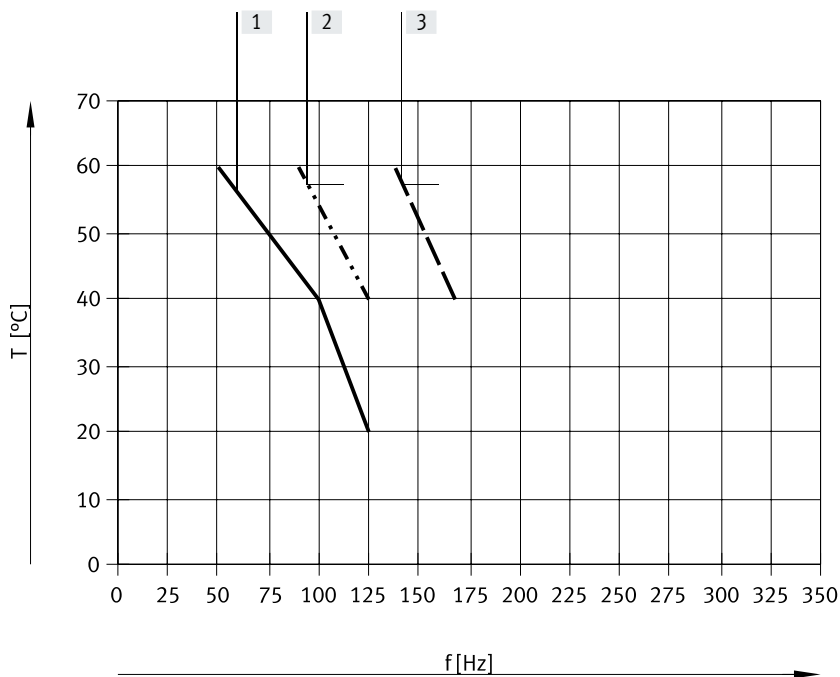
| Electrical data                  |                           | With fast-switching electronics                                 | Without fast-switching electronics |
|----------------------------------|---------------------------|-----------------------------------------------------------------|------------------------------------|
| 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 [%]   | +10 ... -30                     | -                                  |
|                                            | Off [%]  | +10 ... -50                     | -                                  |
| Switching time variation from 1 Hz upwards | [ms]     | 0.2                             | -                                  |
| Maximum switching frequency                | [Hz]     | 280                             | 130                                |

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

Datasheet – Sub-base valve

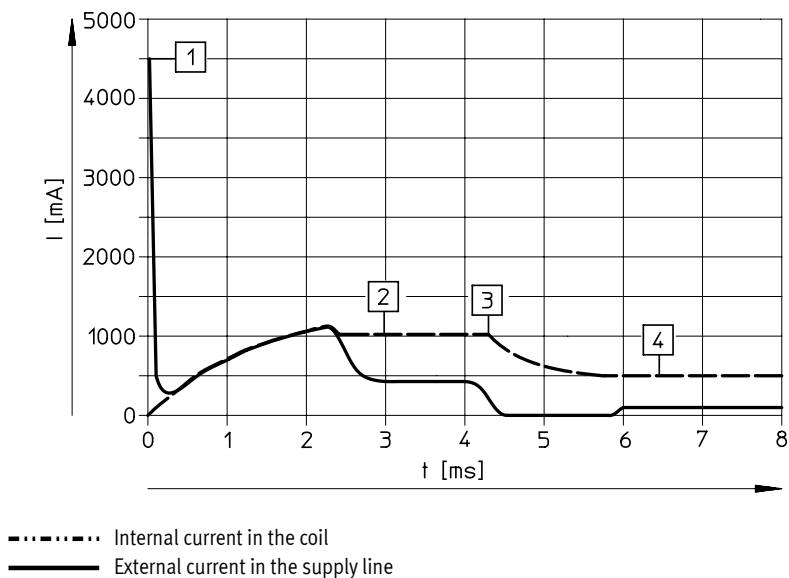
Restricted ambient temperature and temperature of medium as a function of switching frequency



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

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

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



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

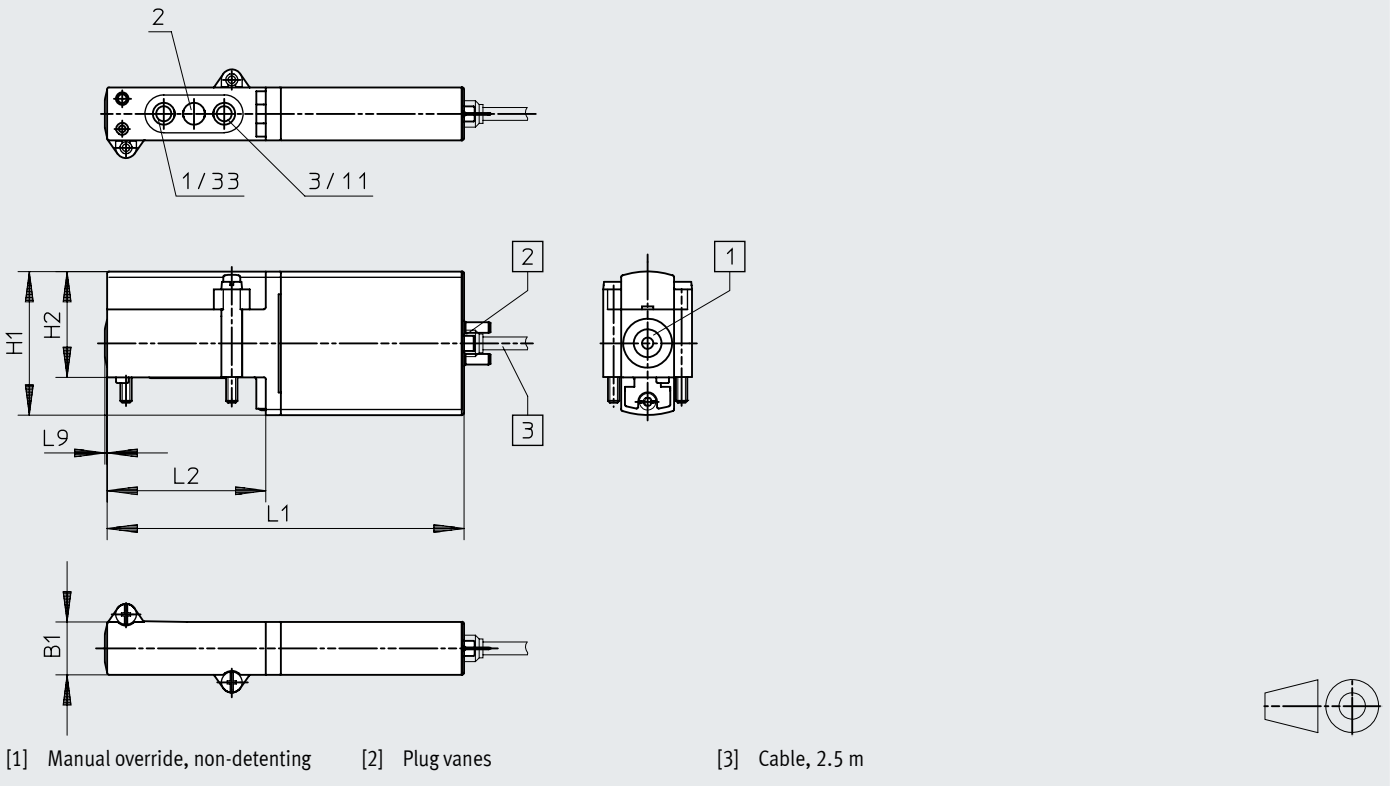
----- Internal current in the coil  
 — External current in the supply line

Datasheet – Sub-base valve

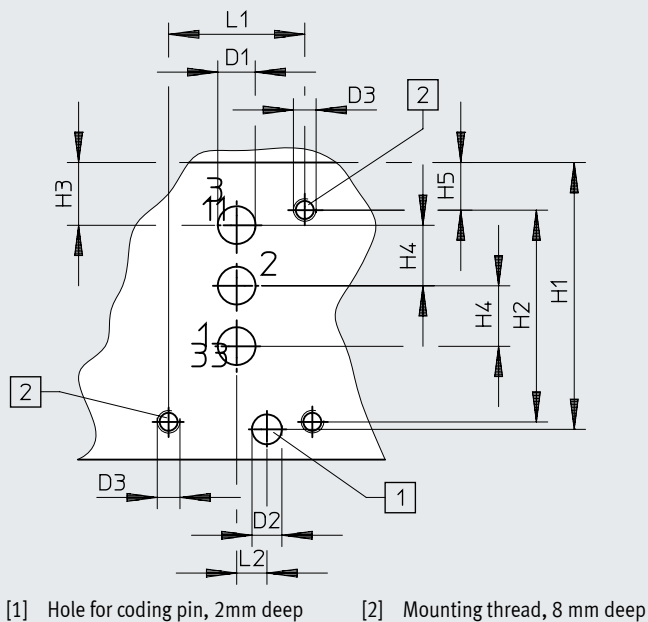
Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

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



Hole pattern on sub-bases



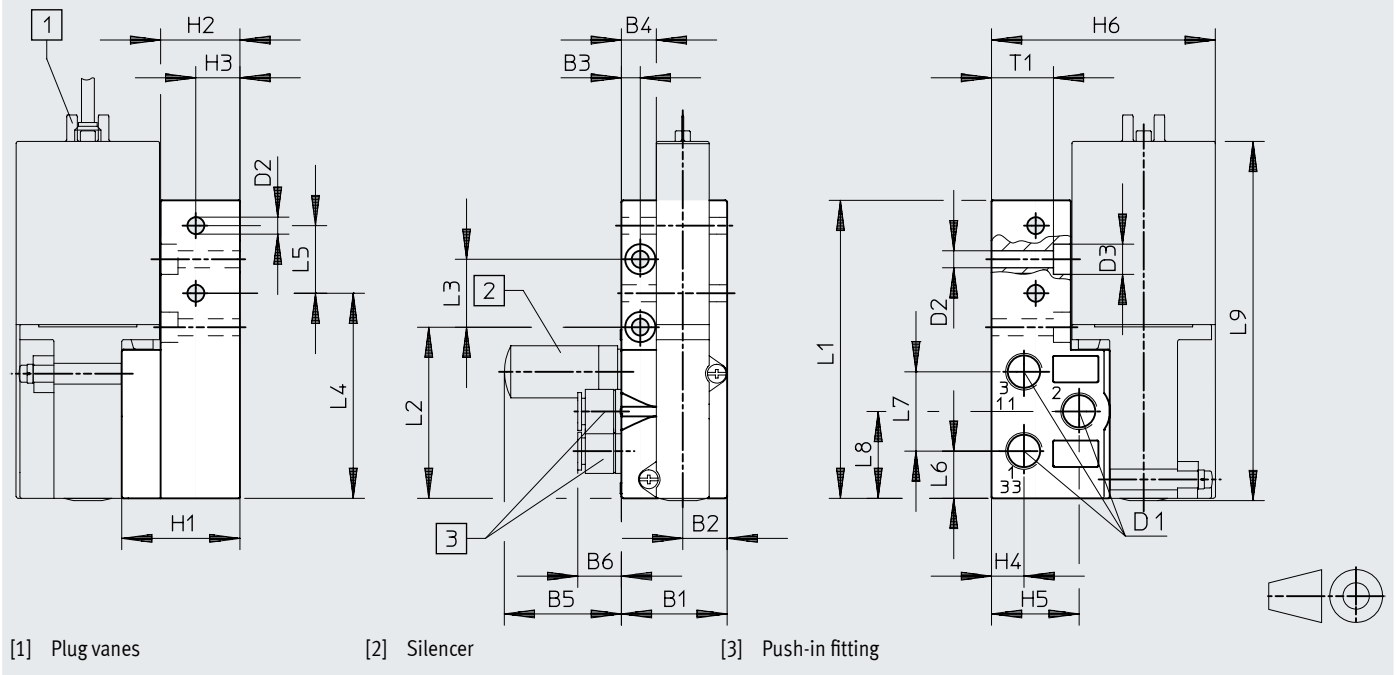
| Type             | B1 | D1 | D2<br>∅ | D3<br>∅ | H1   | H2 | H3  | H4 | H5  | L1   | L2 | L9  |
|------------------|----|----|---------|---------|------|----|-----|----|-----|------|----|-----|
| MHA3-...-3/2G... | 14 | -  | -       | -       | 38   | 28 | -   | -  | -   | 94.5 | 42 | 0.6 |
| Hole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

Datasheet – Sub-base valve

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

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



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

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

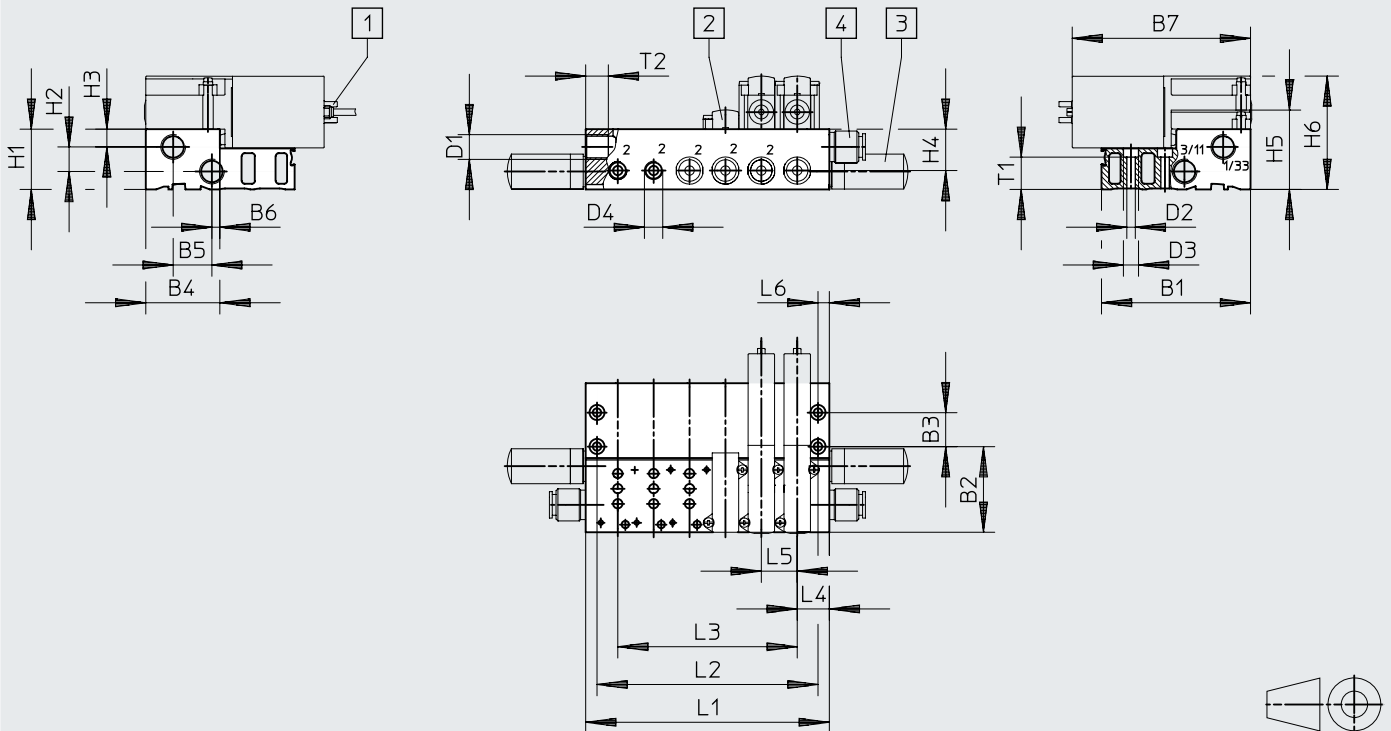


Datasheet – Sub-base valve

Dimensions

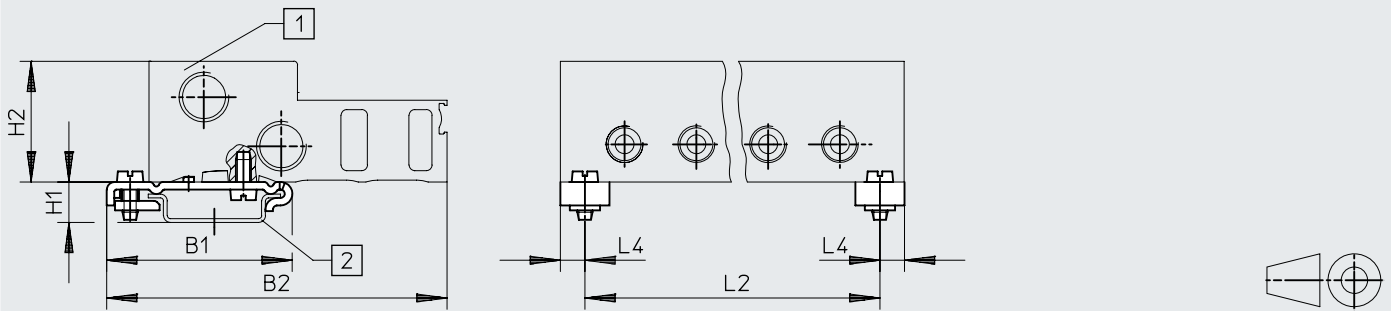
Download CAD data → [www.festo.com](http://www.festo.com)

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



[1] Plug vanes or moulded-in cable    [2] Cover plate    [3] Silencer    [4] Push-in fitting

H-rail mounting CPV1 0/14-VI-BG-NRH-35



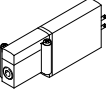
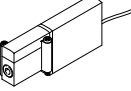

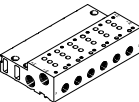

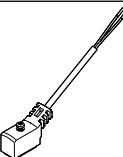
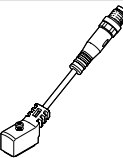

[1] Manifold block    [2] DIN mounting rail

| Type               | B1   | B2   | B3 | B4   | B5   | B6  | B7   | D1   | D2<br>∅ | D3<br>∅ | D4<br>∅ | H1   | H2 | H3  | H4 | H5 | H6 |
|--------------------|------|------|----|------|------|-----|------|------|---------|---------|---------|------|----|-----|----|----|----|
| MHA3-PR...-1/8     | 79   | 45.3 | 18 | 39.3 | 20.5 | 4.3 | 94.3 | G1/4 | 4.5     | 8       | G1/8    | 32   | 13 | 9.5 | 22 | 42 | 60 |
| CPV1 0/14-VI-BG... | 49.1 | 90   | -  | -    | -    | -   | -    | -    | -       | -       | -       | 10.7 | 32 | -   | -  | -  | -  |


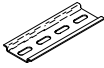


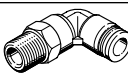

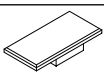
| Type               | L4  | L5 | L6 | T1   | T2 |
|--------------------|-----|----|----|------|----|
| MHA3-PR...-1/8     | 17  | 19 | 6  | 17.1 | 12 |
| CPV1 0/14-VI-BG... | 6.5 | -  | -  | -    | -  |

| Type               |    | Number of valve positions |    |     |     |     |
|--------------------|----|---------------------------|----|-----|-----|-----|
|                    |    | 2                         | 4  | 6   | 8   | 10  |
| MHA3-PR...-1/8     | L1 | 53                        | 91 | 129 | 167 | 205 |
|                    | L2 | 41                        | 79 | 117 | 155 | 193 |
|                    | L3 | 19                        | 57 | 95  | 133 | 171 |
| CPV1 0/14-VI-BG... | L2 | 41                        | 79 | 117 | 155 | 193 |

Datasheet – Sub-base valve

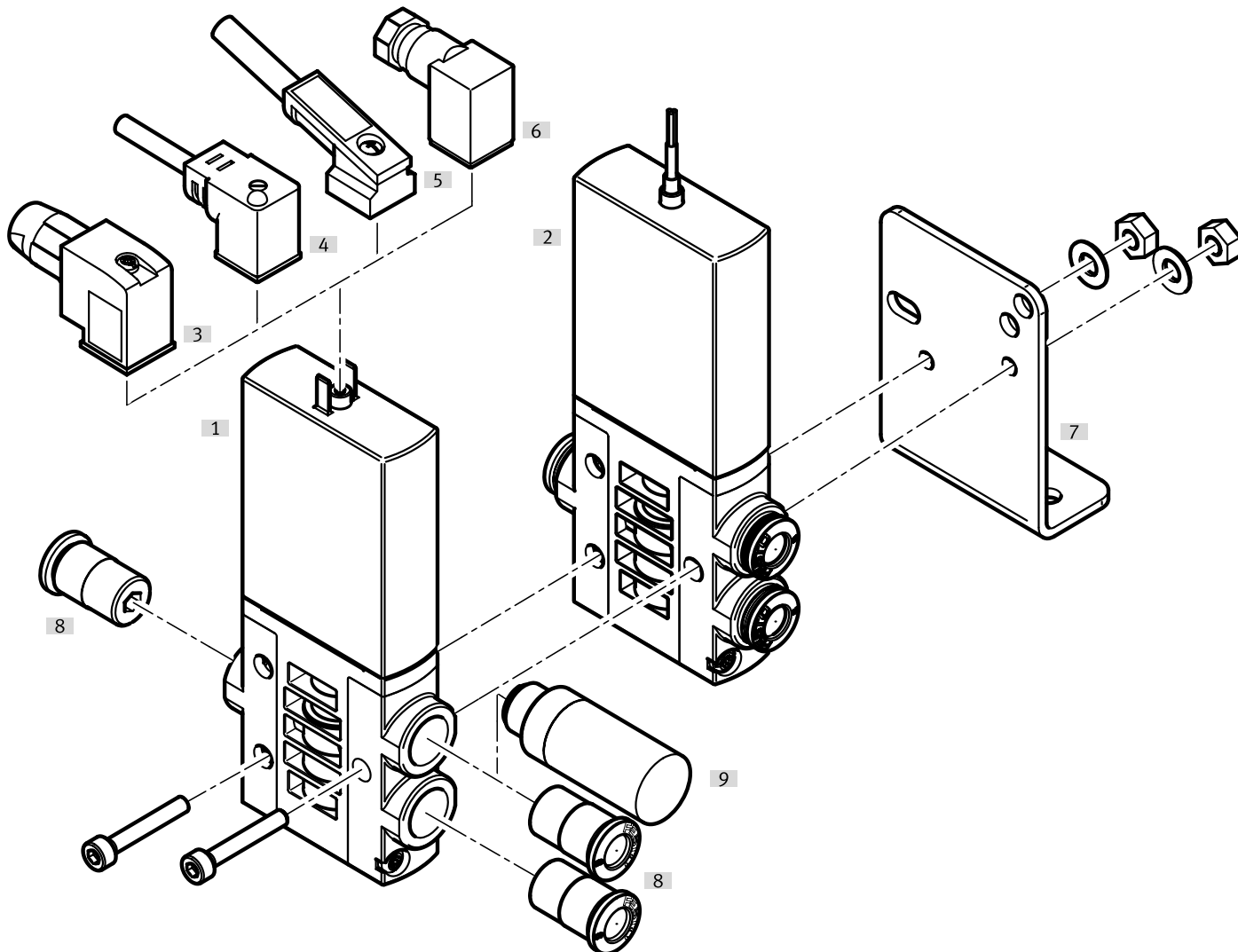
| Ordering data                                                                      |                                                                                                         |                                                           |                                   | Part no.   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

## Datasheet – Sub-base valve

| Ordering data                                                                       |                                                                                               | Part no.             | Type                  |               |                |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------|-----------------------|---------------|----------------|
| <b>H-rail mounting</b>                                                              |                                                                                               |                      |                       |               |                |
|    | For manifold block                                                                            | 162556               | CPV10/14-VI-BG-NRH-35 |               |                |
| <b>H-rail</b>                                                                       |                                                                                               |                      |                       |               |                |
|    | To EN 60715                                                                                   | 2 m                  | 35430 NRH-35-2000     |               |                |
| <b>Silencer</b> <span style="float: right;">Datasheets → Internet: uc</span>        |                                                                                               |                      |                       |               |                |
|    | 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      |
| <b>Push-in fitting</b> <span style="float: right;">Datasheets → Internet: qs</span> |                                                                                               |                      |                       |               |                |
|    | 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      |
|                                                                                     | 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     |
|  | Male thread G1/8 with external hex, push-in L-fitting rotatable through 360° for tubing O.D.  | 6 mm                 | 10 pieces             | 186117        | QSL-G1/8-6     |
|                                                                                     |                                                                                               |                      | 100 pieces            | 132049        | QSL-G1/8-6-100 |
|                                                                                     |                                                                                               | 8 mm                 | 10 pieces             | 186119        | QSL-G1/8-8     |
|                                                                                     | Male thread G1/4 with external hex, push-in L-fitting rotatable through 360°, for tubing O.D. | 8 mm                 | 50 pieces             | 132050        | QSL-G1/8-8-50  |
|                                                                                     |                                                                                               |                      | 10 pieces             | 186120        | QSL-G1/4-8     |
|                                                                                     |                                                                                               | 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        |               |                |
| <b>Blanking plug</b>                                                                |                                                                                               |                      |                       |               |                |
|  | For thread G1/8                                                                               | 10 pieces            | 3568                  | B-1/8         |                |
|                                                                                     | For thread G1/4                                                                               | 10 pieces            | 3569                  | B-1/4         |                |
| <b>Inscription label</b>                                                            |                                                                                               |                      |                       |               |                |
|  | For solenoid valve                                                                            | 80 pieces in a frame | 197259                | MH-BZ-80X     |                |

Peripherals overview – Individual valve

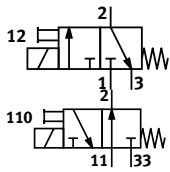
Connection with plug vanes – Connection with moulded-in cable



| Designation                | Type          | Description                                             | → Page/Internet |
|----------------------------|---------------|---------------------------------------------------------|-----------------|
| [1] Individual valve       | MHE4          | With plug vanes                                         | 84              |
| [2] Individual valve       | MHE4-...-K    | With moulded-in cable, IP65                             | 89              |
| [3] Plug socket            | MSSD-EB-S-M14 | With insulation displacement connector                  | 90              |
| [4] Plug socket with cable | KMEB-1        | PVC cable, with or without LED                          | 90              |
| [5] Plug socket with cable | KMEB-2        | With LED, without LED; PUR cable, with or without LED   | 90              |
| [6] Plug socket            | MSSD-EB       | With clamping screw                                     | 90              |
| [7] Mounting bracket       | MHE2-BG-L     | For wall mounting                                       | 90              |
| [8] Push-in fittings       | QS            | For connecting compressed air tubing with standard O.D. | 90              |
| [9] Silencer               | UC            | For fitting in exhaust ports                            | 90              |

## Datasheet – Individual valve

## Function



Voltage  
24 V DC



Pressure  
-0.09 ... +0.8 MPa



Temperature range  
-5 ... +60°C



## General technical data

|                            |                                             |
|----------------------------|---------------------------------------------|
| Valve function             | 3/2 way, single solenoid <sup>1)</sup>      |
| 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 <sup>2)</sup>  |
| 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 [7:4:4]                                                  |                                    |
| 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                                                                                |                                    |
|                                                            | 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 <sup>1)</sup>               |                                                                                  | 2                                                                                          |                                    |
| CE marking (see declaration of conformity) <sup>3)</sup>   | To EU EMC Directive <sup>2)</sup>                                                |                                                                                            | -                                  |
|                                                            | To EU RoHS Directive                                                             |                                                                                            | -                                  |
| UKCA marking (see declaration of conformity) <sup>3)</sup> | To UK instructions for EMC                                                       |                                                                                            | -                                  |
|                                                            | To UK RoHS instructions                                                          |                                                                                            | -                                  |
| Certification                                              | c UL us - Recognized (OL)                                                        |                                                                                            | c UL us - Recognized (OL)          |
|                                                            | RCM                                                                              |                                                                                            | -                                  |
| Cleanroom class                                            | Class 6 to ISO 14644-1                                                           |                                                                                            |                                    |
| Shock resistance                                           | Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27                |                                                                                            |                                    |
| Vibration resistance                                       | Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6 |                                                                                            |                                    |

- 1) More information: [www.festo.com/x/topic/kbk](http://www.festo.com/x/topic/kbk)  
 2) For information about the area of use, see the EC declaration of conformity at: [www.festo.com/catalogue/...](http://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.  
 3) More information: [www.festo.com/catalogue/...](http://www.festo.com/catalogue/...) → Support/Downloads.

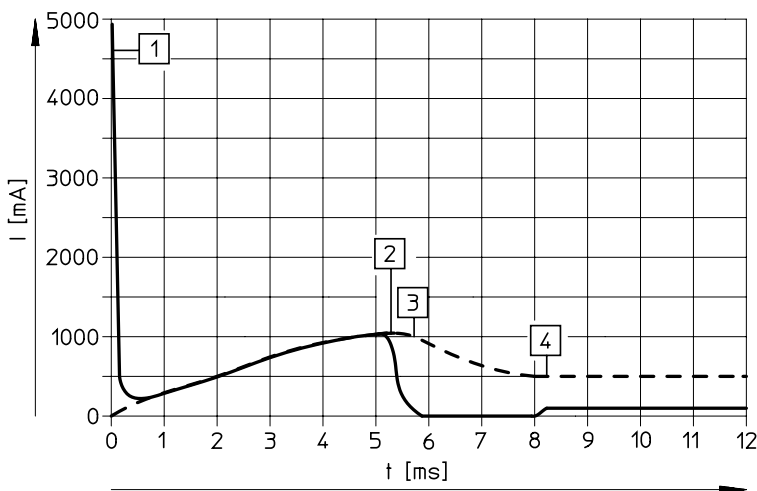
Datasheet – Individual valve

| 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                             |                                    |
| Additional functions             |        | Spark arresting                 |                                    |
|                                  |        | Holding current reduction       |                                    |
|                                  |        | Protective circuit              |                                    |
| Degree of protection to EN 60529 |        | IP65                            | IP65                               |

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

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

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



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

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

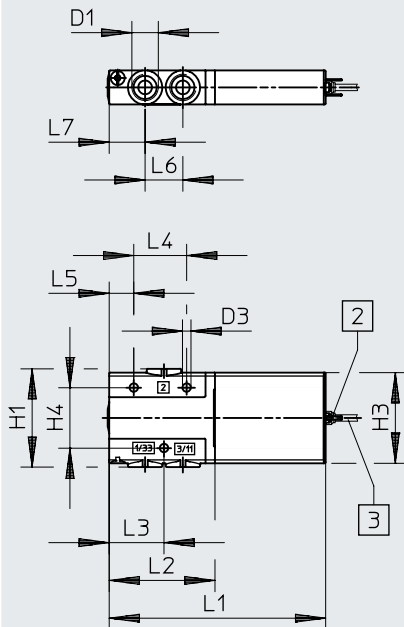
Datasheet – Individual valve

Dimensions

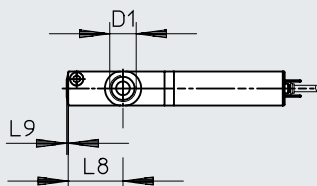
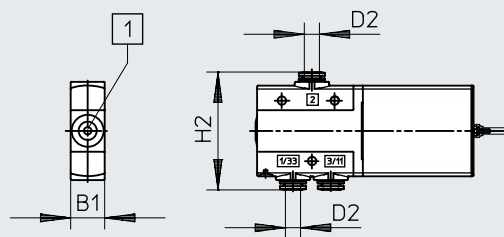
Download CAD data → [www.festo.com](http://www.festo.com)

Valve with plug vanes or moulded-in cable

MHE4-...-G-1/4



MHE4-...-QS-8



[1] Manual override, non-detenting

[2] Plug vanes

[3] Cable, 2.5 m

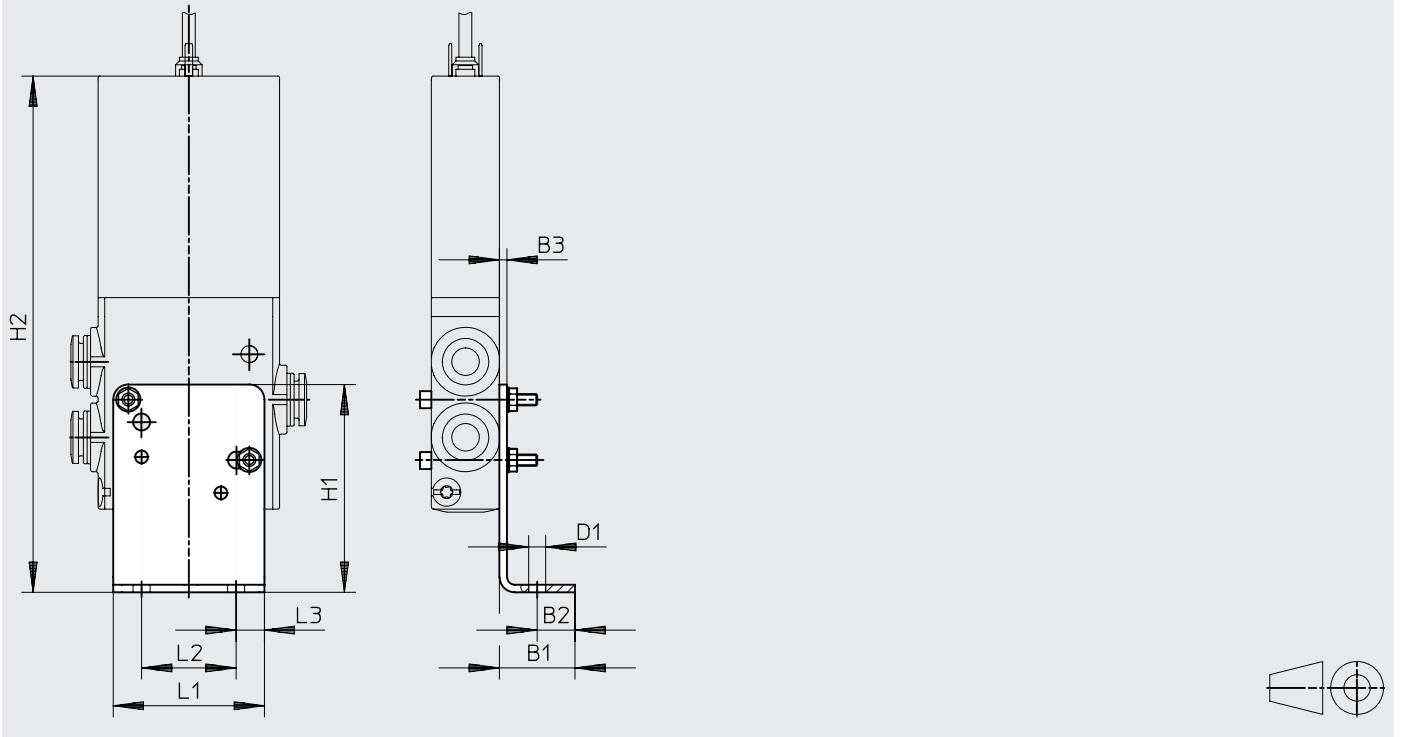
| Type              | B1 | D1   | D2<br>∅ | D3<br>∅ | H1 | H2   | H3 | H4 | L1    | L2 | L3 | L4 | L5 | L6 | L7 | L8 | L9  |
|-------------------|----|------|---------|---------|----|------|----|----|-------|----|----|----|----|----|----|----|-----|
| MHE4-...-1/4-...  | 18 | G1/4 | -       | 4.5     | 56 | -    | 48 | 32 | 114.6 | 56 | 29 | 28 | 13 | 20 | 19 | 29 | 0.8 |
| MHE4-...-QS-8-... | 18 | -    | 8       | 4.5     | 52 | 62.4 | 48 | 32 | 114.6 | 56 | 29 | 28 | 13 | 20 | 19 | 29 | 0.8 |

Datasheet – Individual valve

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)



Mounting bracket MHE2-BG-L





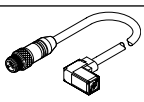

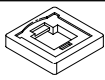



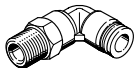

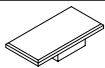
| Type      | B1 | B2 | B3 | D1  | H1 | H2  | L1 | L2 | L3  |
|-----------|----|----|----|-----|----|-----|----|----|-----|
| MHE2-BG-L | 20 | 10 | 2  | 4.5 | 55 | 134 | 40 | 25 | 7.5 |



## Datasheet – Individual valve

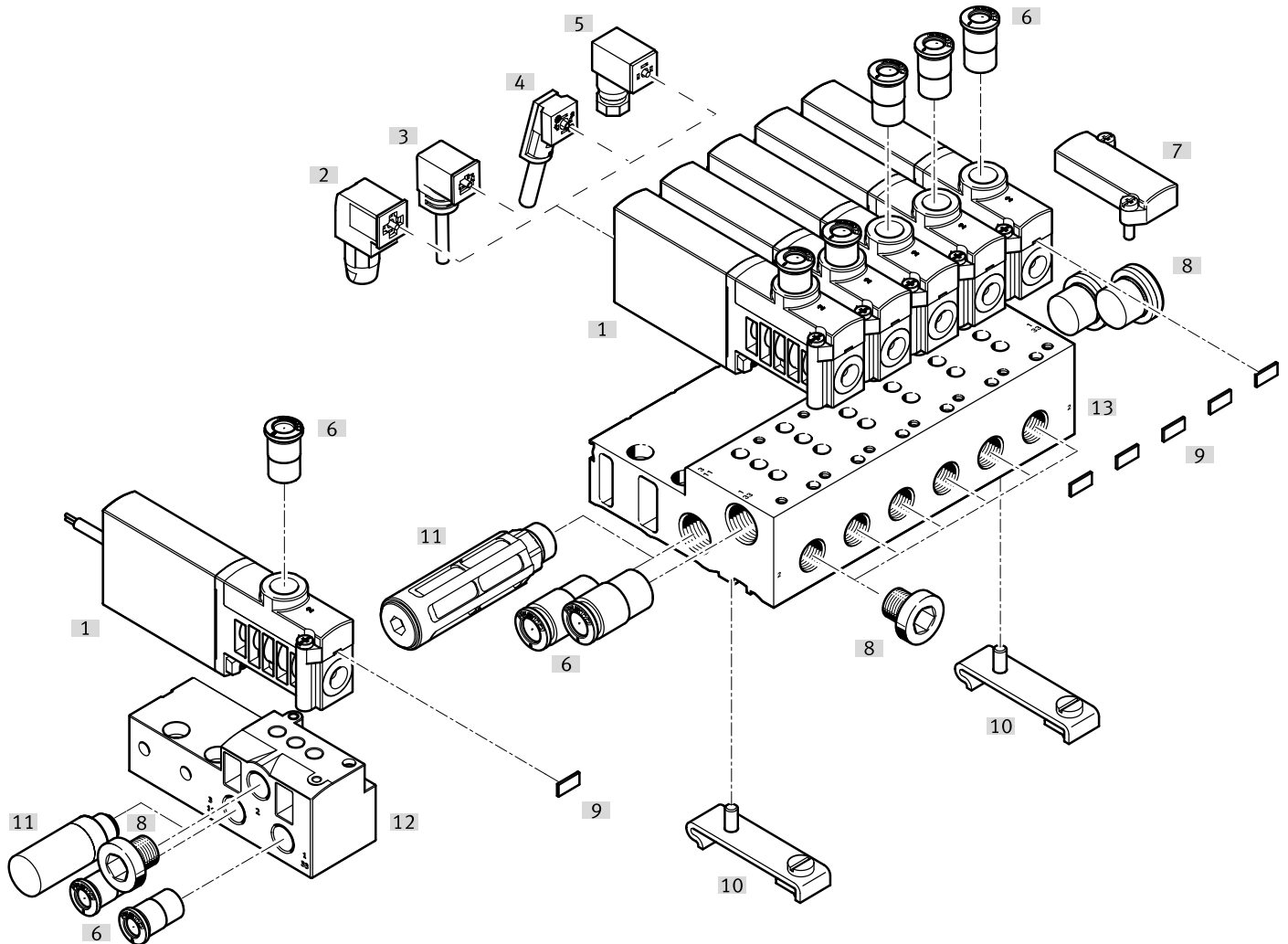
| Ordering data                                                                     |                                   |                                                            |                                                              |                 | Part no.      | Type                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

## Datasheet – Individual valve

| Ordering data                                                                       |                                                                               |                                                                    |                                                                                    | Part no.        | Type                  |                |           |      |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------|-----------------------|----------------|-----------|------|
| <b>Plug socket with cable (for valves with 2-pin plug)</b>                          |                                                                               |                                                                    |                                                                                    |                 |                       |                |           |      |
|     | 3-pin socket,<br>open cable end 3-wire<br>Signal status indication with LED   | PVC cable, degree of protection<br>IP65                            | Length 2.5 m                                                                       | 151688          | KMEB-1-24-2.5-LED     |                |           |      |
|                                                                                     |                                                                               |                                                                    | Length 5 m                                                                         | 151689          | KMEB-1-24-5-LED       |                |           |      |
|                                                                                     |                                                                               |                                                                    | Length 10 m                                                                        | 193457          | KMEB-1-24-10-LED      |                |           |      |
|     | 4-pin socket,<br>open cable end 3-wire<br>Signal status indication with LED   | PUR cable, degree of protection<br>IP65                            | Length 2.5 m                                                                       | 174844          | KMEB-2-24-2.5-LED     |                |           |      |
|                                                                                     |                                                                               |                                                                    | Length 5 m                                                                         | 174845          | KMEB-2-24-5-LED       |                |           |      |
|     | 5-pin socket, plug M12 5-pin<br>Signal status indication with LED             | Cable sheath TPE-U (PU), degree<br>of protection IP65              | Length 0.5 m                                                                       | 177677          | KMEB-2-24-M12-0.5-LED |                |           |      |
| <b>Plug socket (for valves with 2-pin plug)</b>                                     |                                                                               |                                                                    |                                                                                    |                 |                       |                |           |      |
|     | Angled socket<br>Without signal status indication                             | Screw terminal<br>Degree of protection IP65                        | 3-pin                                                                              | 151687          | MSSD-EB               |                |           |      |
|                                                                                     |                                                                               | Insulation displacement<br>technology<br>Degree of protection IP67 | 4-pin                                                                              | 192745          | MSSD-EB-S-M14         |                |           |      |
| <b>Illuminating seal</b>                                                            |                                                                               |                                                                    |                                                                                    |                 |                       |                |           |      |
|     | For mounting between plug socket (without signal status indication) and valve |                                                                    |                                                                                    | 151717          | MEB-LD-12-24DC        |                |           |      |
| <b>Wall mounting</b>                                                                |                                                                               |                                                                    |                                                                                    |                 |                       |                |           |      |
|   | Mounting bracket                                                              |                                                                    |                                                                                    | 196165          | MHE2-BG-L             |                |           |      |
| <b>Silencer</b> <span style="float: right;">Datasheets → Internet: uc</span>        |                                                                               |                                                                    |                                                                                    |                 |                       |                |           |      |
|   | Push-in sleeve                                                                | Screwed trunnion<br>PE                                             | 8 mm                                                                               | 1 piece         | 175611                | UC-QS-8H       |           |      |
|                                                                                     | Threaded connection, polymer design                                           | Screwed trunnion<br>PE                                             | G1/4                                                                               | 1 piece         | 165004                | UC-1/4         |           |      |
|                                                                                     |                                                                               |                                                                    |                                                                                    | 20 pieces       | 534220                | UC-1/4-20      |           |      |
| <b>Push-in fitting</b> <span style="float: right;">Datasheets → Internet: qs</span> |                                                                               |                                                                    |                                                                                    |                 |                       |                |           |      |
|   | 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°,<br>male thread with external hex   | G1/4                                                               | 8 mm                                                                               | 10 pieces       | 186120                | QSL-G1/4-8     |           |      |
|                                                                                     |                                                                               |                                                                    |                                                                                    | 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 |           |      |
|                                                                                     |                                                                               |                                                                    | <b>Blanking plug</b>                                                               |                 |                       |                |           |      |
|                                                                                     |                                                                               |                                                                    |  | For thread G1/4 |                       |                | 10 pieces | 3569 |
| <b>Inscription label</b>                                                            |                                                                               |                                                                    |                                                                                    |                 |                       |                |           |      |
|   | For solenoid valve                                                            |                                                                    |                                                                                    | 80 pieces       | 197259                | MH-BZ-80X      |           |      |

## Peripherals overview – Semi in-line valve

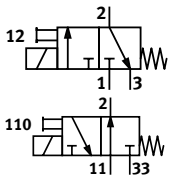
## Connection via plug vanes






| Designation                | Type                  | Description                                                                                                                             | → Page/Internet |
|----------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| [1] Semi in-line valve     | MHP4                  | With plug vanes                                                                                                                         | 92              |
| [2] Plug socket with cable | KMEB-2                | PUR cable, with or without LED                                                                                                          | 98              |
| [3] Plug socket            | MSSD-EB               | With clamping screw                                                                                                                     | 98              |
| [4] Plug socket            | MSSD-EB-S-M14         | With insulation displacement connector                                                                                                  | 98              |
| [5] Plug socket with cable | KMEB-1                | PVC cable, with or without LED                                                                                                          | 98              |
| [6] Push-in fittings       | QS                    | For connecting compressed air tubing with standard O.D.                                                                                 | 99              |
| [7] Cover plate            | MHAP4-BP-3            | For sealing vacant positions                                                                                                            | 97              |
| [8] Blanking plug          | B                     | For sealing unused ports                                                                                                                | 99              |
| [9] Inscription label      | MH-BZ-80X             | For identifying the valves                                                                                                              | 99              |
| [10] H-rail mounting       | CPV10/14-VI-BG-NRH-35 | For mounting the manifold block on H-rails to EN 60715                                                                                  | 98              |
| [11] Silencers             | UC                    | For fitting in exhaust ports                                                                                                            | 99              |
| [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 | 97              |
| [13] Manifold block        | MHA4-PR...-1/4        | For semi in-line valves                                                                                                                 | 97              |

Datasheet – Semi in-line valve

Function



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



General technical data

|                            |                                             |                                                                |
|----------------------------|---------------------------------------------|----------------------------------------------------------------|
| Valve function             | 3/2 way, single solenoid <sup>1)</sup>      |                                                                |
| 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 <sup>2)</sup>  |                                                                |
| 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.

## Datasheet – Semi in-line valve

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

1) More information: [www.festo.com/x/topic/kbk](http://www.festo.com/x/topic/kbk)

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

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

3) More information: [www.festo.com/catalogue/...](http://www.festo.com/catalogue/...) → Support/Downloads.

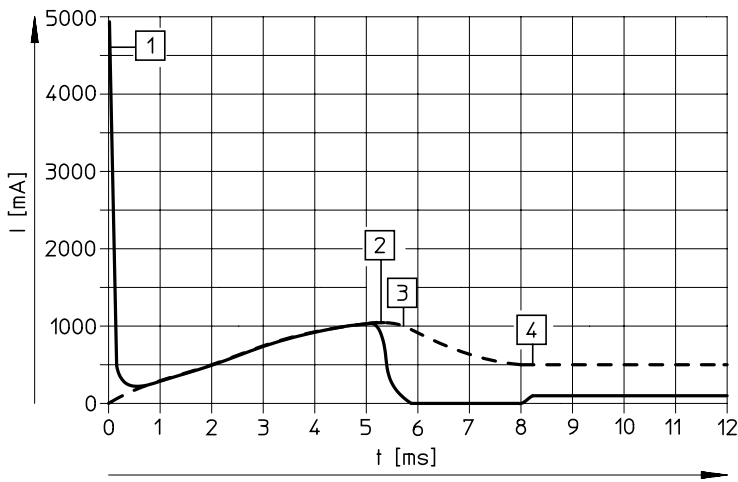
| Electrical data                  |        | With fast-switching electronics | Without fast-switching electronics |
|----------------------------------|--------|---------------------------------|------------------------------------|
| Electrical connection            |        | Plug, 2-pin         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

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

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

Datasheet – Semi in-line valve

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



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

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

Dimensions

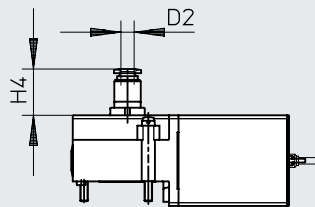
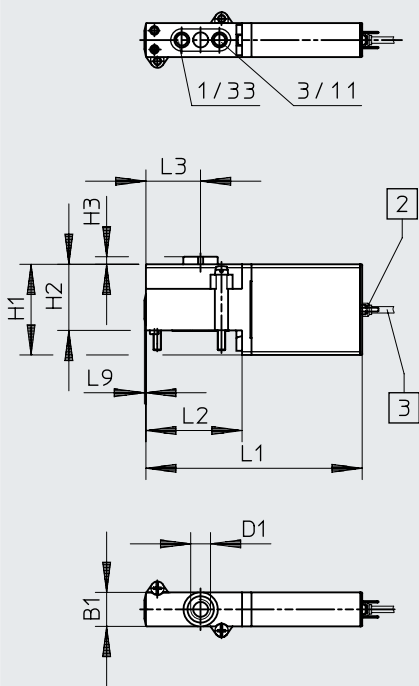
Download CAD data → [www.festo.com](http://www.festo.com)

Valve with connecting thread G1/4

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

MHP4-...-G1/4

MHP4-...-QS8



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



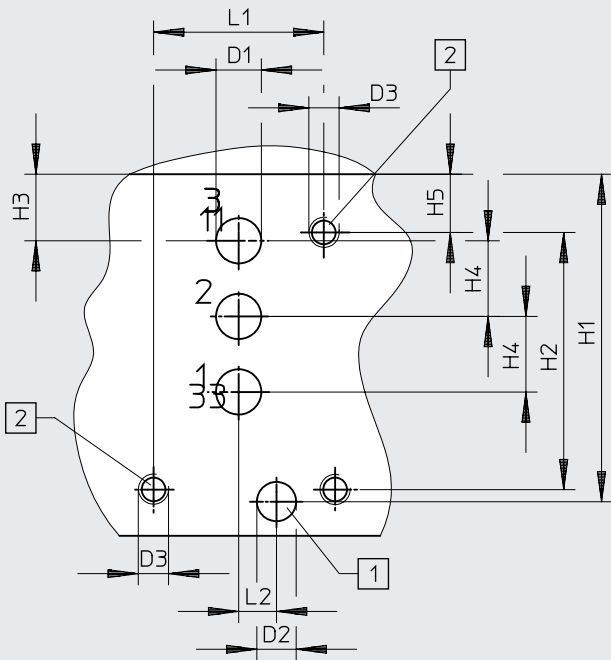
| Type            | B1 | D1   | D2<br>ø | H1 | H2 | H3 | H4   | L1    | L2 | L3 | L9  |
|-----------------|----|------|---------|----|----|----|------|-------|----|----|-----|
| MHP4-...-3/2... | 18 | G1/4 | 8       | 48 | 35 | 4  | 24.5 | 114.6 | 51 | 29 | 0.8 |

Datasheet – Semi in-line valve

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

Hole pattern on sub-bases

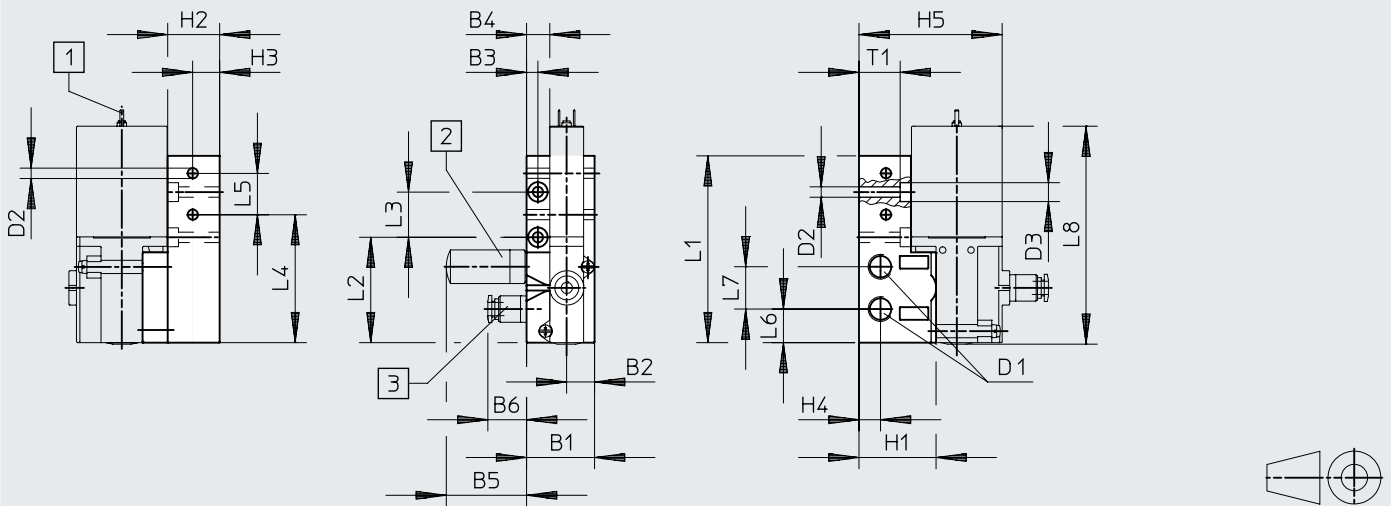


- [1] Hole for coding pin, 2.5mm deep
- [2] Mounting thread, 13 mm deep

 **Note**

With semi in-line valves, port 2 is not used.  
 If used as a 2/2-way valve, normally closed, ports 3/11 are not used.  
 If used as a 2/2-way valve, normally open, ports 1/33 are not used.

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



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

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

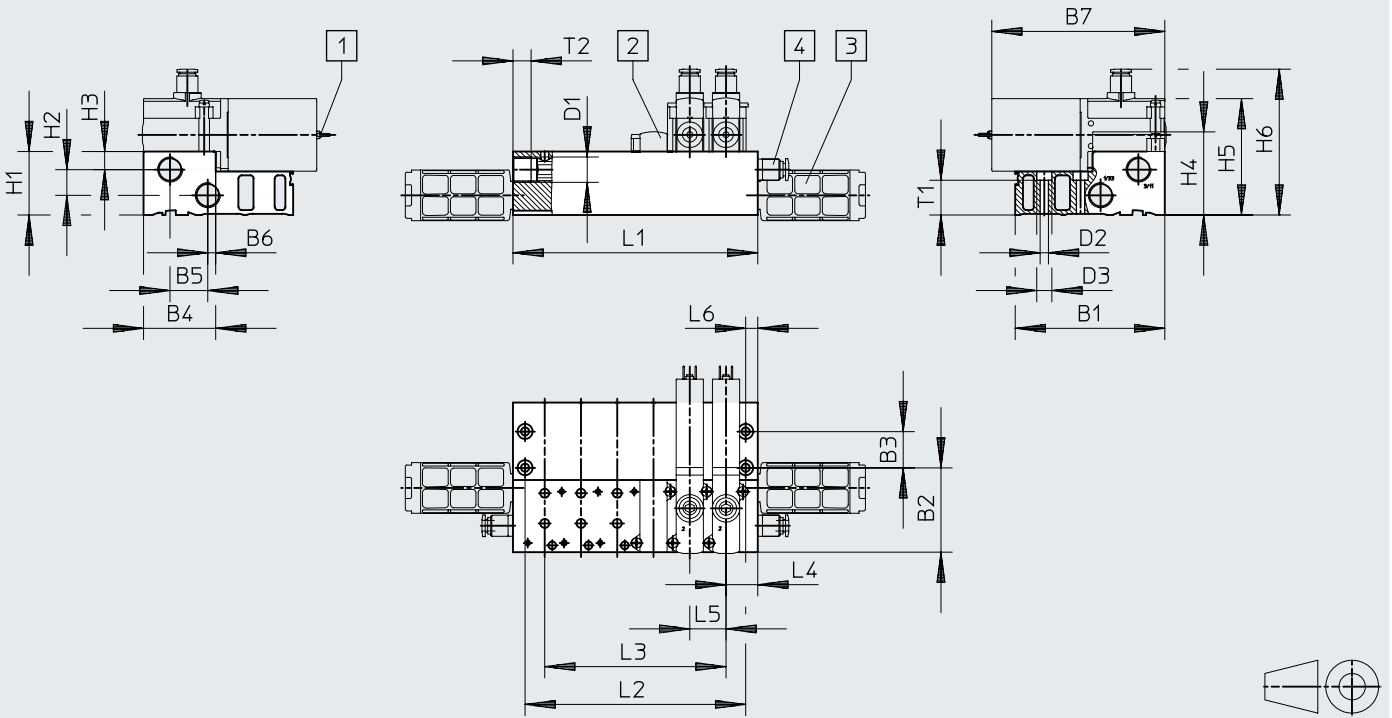
| Type          | L1   | L2   | L3 | L4   | L5   | L6   | L7   | L8    | T1   |
|---------------|------|------|----|------|------|------|------|-------|------|
| Hole pattern  | 22.5 | 5    | -  | -    | -    | -    | -    | -     | -    |
| MHA4-AS-3-1/4 | 99   | 55.8 | 24 | 67.8 | 21.9 | 17.8 | 22.4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

Datasheet – Semi in-line valve

Dimensions

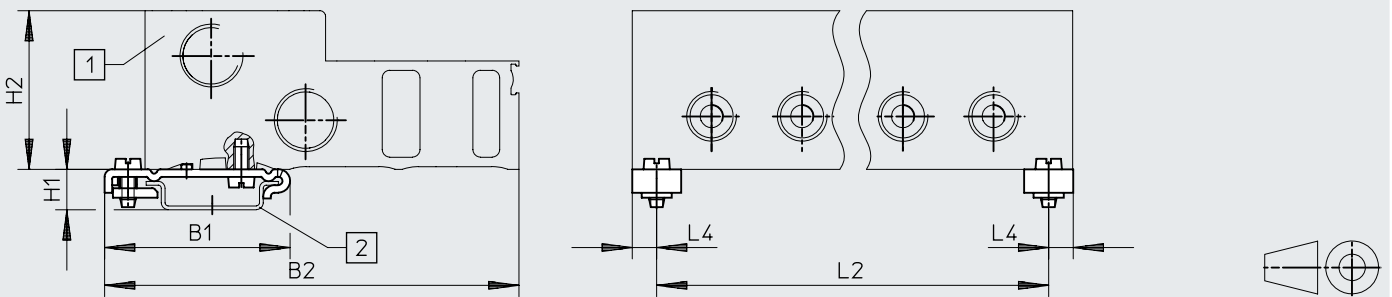
Download CAD data → [www.festo.com](http://www.festo.com)

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



[1] Plug vanes                      [2] Cover plate                      [3] Silencer                      [4] Push-in fitting

H-rail mounting CPV1 0/14-VI-BG-NRH-35



[1] Manifold block                      [2] DIN mounting rail



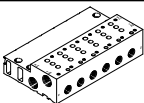

| Type               | B1   | B2   | B3 | B4   | B5 | B6  | B7    | D1   | D2<br>∅ | D3<br>∅ | H1   | H2 | H3 | H4 | H5 | H6   | L4  | L5 | L6 | T1 | T2 |
|--------------------|------|------|----|------|----|-----|-------|------|---------|---------|------|----|----|----|----|------|-----|----|----|----|----|
| MHA4-PR...-1/4     | 99   | 55.8 | 24 | 47.8 | 25 | 5.3 | 114.6 | G3/8 | 5.5     | 10      | 42   | 17 | 12 | 55 | 77 | 96.5 | 21  | 24 | 8  | 23 | 12 |
| CPV1 0/14-VI-BG... | 49.1 | 110  | -  | -    | -  | -   | -     | -    | -       | -       | 10.7 | 42 | -  | -  | -  | -    | 6.5 | -  | -  | -  | -  |

| Type               | Number of valve positions |    |     |     |     |     |
|--------------------|---------------------------|----|-----|-----|-----|-----|
|                    | 2                         | 4  | 6   | 8   | 10  |     |
| MHA4-PR...-1/4     | L1                        | 66 | 114 | 162 | 210 | 258 |
|                    | L2                        | 50 | 98  | 146 | 194 | 242 |
|                    | L3                        | 24 | 72  | 120 | 168 | 216 |
| CPV1 0/14-VI-BG... | L2                        | 53 | 101 | 149 | 197 | 245 |


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



## Datasheet – Semi in-line valve



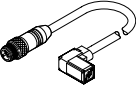

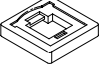


| Ordering data                                                                     |                                                                                                                       |                                                            |                                  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






 **Note**

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

## Datasheet – Semi in-line valve

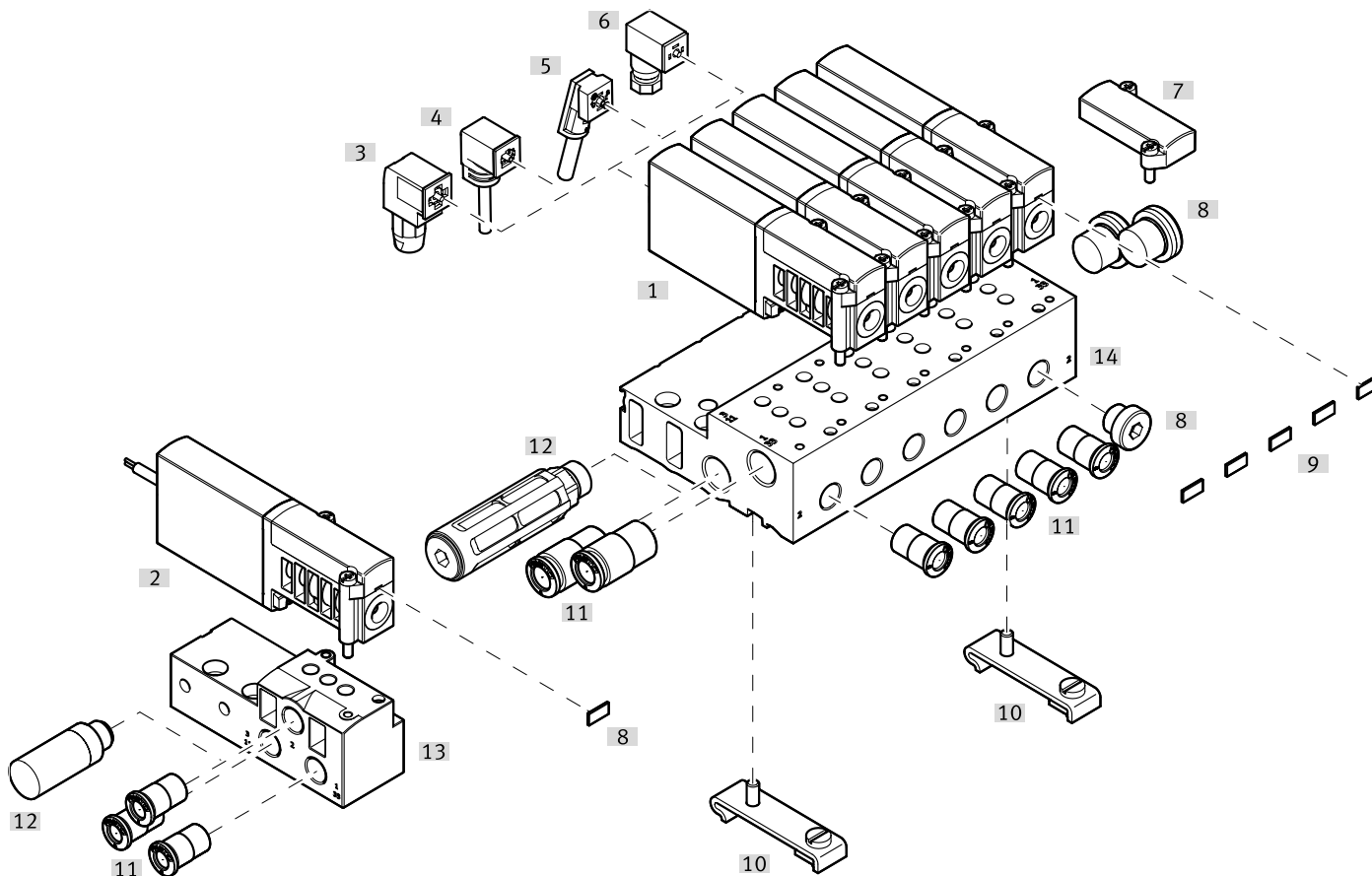
| Ordering data                                                                      |                                                                               |                                                                    |              | Part no. | Type                  |
|-----------------------------------------------------------------------------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

## Datasheet – Semi in-line valve

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

## Peripherals overview – Sub-base valve

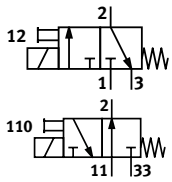
Connection with plug vanes – Connection with moulded-in cable



| Designation                | Type                  | Description                                             | → Page/Internet |
|----------------------------|-----------------------|---------------------------------------------------------|-----------------|
| [1] Sub-base valves        | MHA4                  | With plug vanes                                         | 101             |
| [2] Sub-base valves        | MHA4-...-K            | With moulded-in cable, IP65                             | 107             |
| [3] Plug socket            | MSSD-EB-S-M14         | With insulation displacement connector                  | 108             |
| [4] Plug socket with cable | KMEB-1                | PVC cable, with or without LED                          | 108             |
| [5] Plug socket with cable | KMEB-2                | PUR cable, with or without LED                          | 108             |
| [6] Plug socket            | MSSD-EB               | With clamping screw                                     | 108             |
| [7] Cover plate            | MHAP4-BP-3            | For sealing vacant positions                            | 107             |
| [8] Blanking plug          | B                     | For sealing unused ports                                | 109             |
| [9] Inscription label      | MH-BZ-80X             | For identifying the valves                              | 109             |
| [10] H-rail mounting       | CPV10/14-VI-BG-NRH-35 | For mounting the manifold block on H-rails to EN 60715  | 108             |
| [11] Push-in fittings      | QS                    | For connecting compressed air tubing with standard O.D. | 109             |
| [12] Silencer              | UC                    | For fitting in exhaust ports                            | 109             |
| [13] Individual sub-base   | MHA4-AS-3-1/4         | For sub-base valves                                     | 107             |
| [14] Manifold block        | MHA4-PR-...-1/4       | For sub-base valves                                     | 107             |

## Datasheet – Sub-base valve

## Function



Voltage  
24 V DC



Pressure  
-0.09 ... +0.8 MPa



Temperature range  
-5 ... +40°C



## General technical data

|                            |                                             |
|----------------------------|---------------------------------------------|
| Valve function             | 3/2 way, single solenoid <sup>1)</sup>      |
| 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 <sup>2)</sup>  |
| 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                             |
| Product weight             | [g] 270                                     |

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

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

## Datasheet – Sub-base valve

| Operating and environmental conditions                     |            | With fast-switching electronics                                                            | Without fast-switching electronics |  |
|------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------|------------------------------------|--|
| Operating medium                                           |            | Compressed air to ISO 8573-1:2010 [7:4:4]                                                  |                                    |  |
| Note on the operating/pilot medium                         |            | Lubricated operation possible (in which case lubricated operation will always be required) |                                    |  |
| Operating pressure                                         | [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 <sup>1)</sup>               |            | 2                                                                                          |                                    |  |
| CE marking (see declaration of conformity) <sup>3)</sup>   |            | To EU EMC Directive <sup>2)</sup>                                                          | -                                  |  |
|                                                            |            | To EU RoHS Directive                                                                       | -                                  |  |
| UKCA marking (see declaration of conformity) <sup>3)</sup> |            | To UK instructions for EMC                                                                 | -                                  |  |
|                                                            |            | To UK RoHS instructions                                                                    | -                                  |  |
| Certification                                              |            | c UL us - Recognized (OL)                                                                  | c UL us - Recognized (OL)          |  |
|                                                            |            | RCM                                                                                        | -                                  |  |
| Cleanroom class                                            |            | Class 6 to ISO 14644-1                                                                     |                                    |  |
| Shock resistance                                           |            | Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27                          |                                    |  |
| Vibration resistance                                       |            | Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6           |                                    |  |

1) More information: [www.festo.com/x/topic/kbk](http://www.festo.com/x/topic/kbk)

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

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

3) More information: [www.festo.com/catalogue/...](http://www.festo.com/catalogue/...) → Support/Downloads.

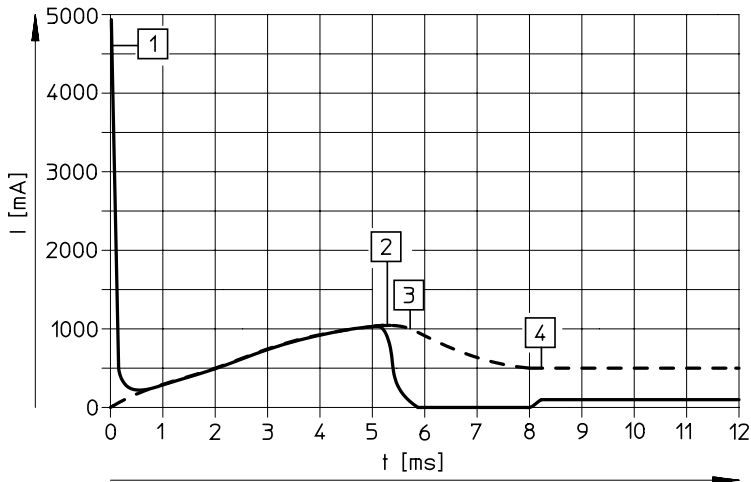
| Electrical data                  |                           | With fast-switching electronics | Without fast-switching electronics |
|----------------------------------|---------------------------|---------------------------------|------------------------------------|
| Electrical connection            |                           | 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 [%]   | +10 ... -30                     | -                                  |
|                                            | Off [%]  | +10 ... -40                     | -                                  |
| Switching time variation from 1 Hz upwards | [ms]     | 0.3                             | -                                  |
| Maximum switching frequency                | [Hz]     | 210                             | 120                                |

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

Datasheet – Sub-base valve

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



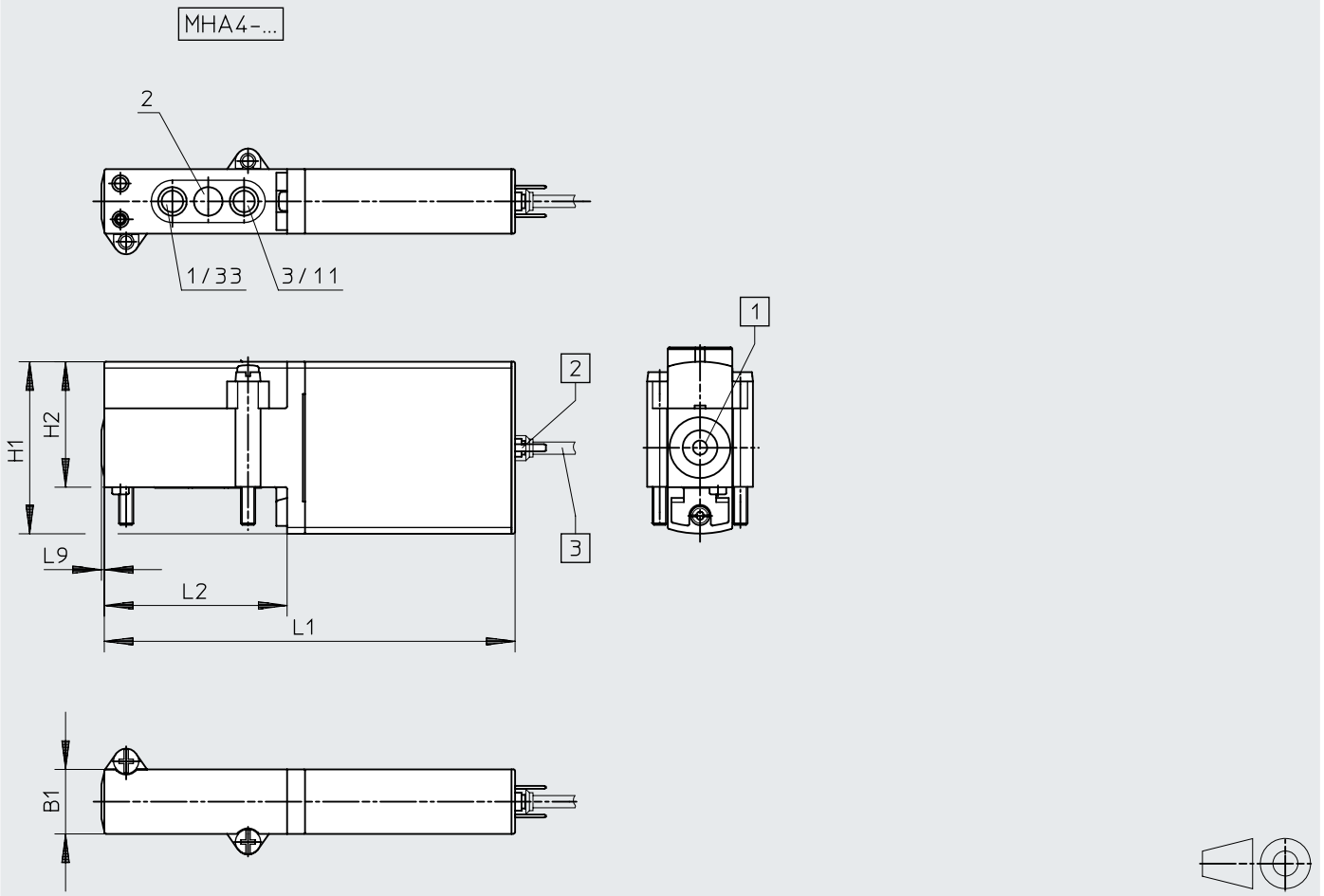
- [1] Capacitor charging
- [2] Controlled coil current 1 A
- [3] Holding current reduction
- [4] Controlled holding current 0.5 A

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

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

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



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

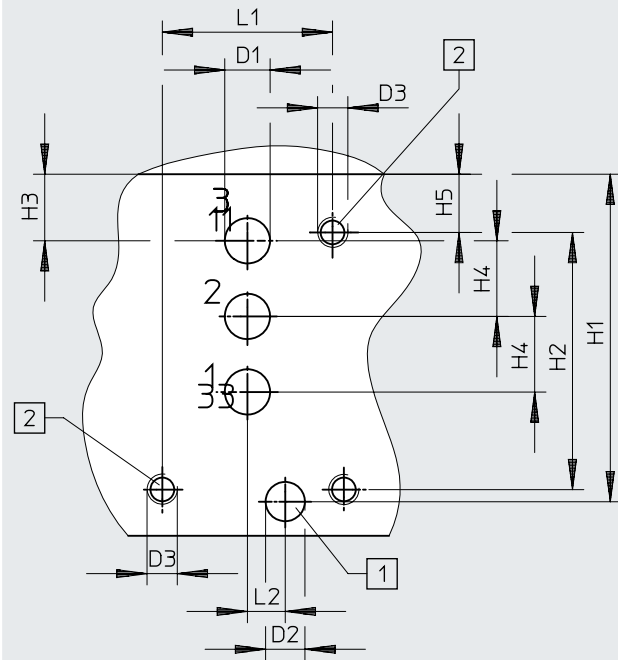
| Type            | B1 | H1 | H2 | L1    | L2 | L9  |
|-----------------|----|----|----|-------|----|-----|
| MHA4-...-3/2... | 18 | 48 | 35 | 114.6 | 51 | 0.8 |

Datasheet – Sub-base valve

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

Hole pattern on sub-bases



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

| Type         | D1 | D2<br>∅ | D3<br>∅ | H1   | H2 | H3  | H4 | H5  | L1   | L2 |
|--------------|----|---------|---------|------|----|-----|----|-----|------|----|
| Hole pattern | 6  | 5.2     | M4      | 43.3 | 34 | 8.8 | 10 | 7.7 | 22.5 | 5  |

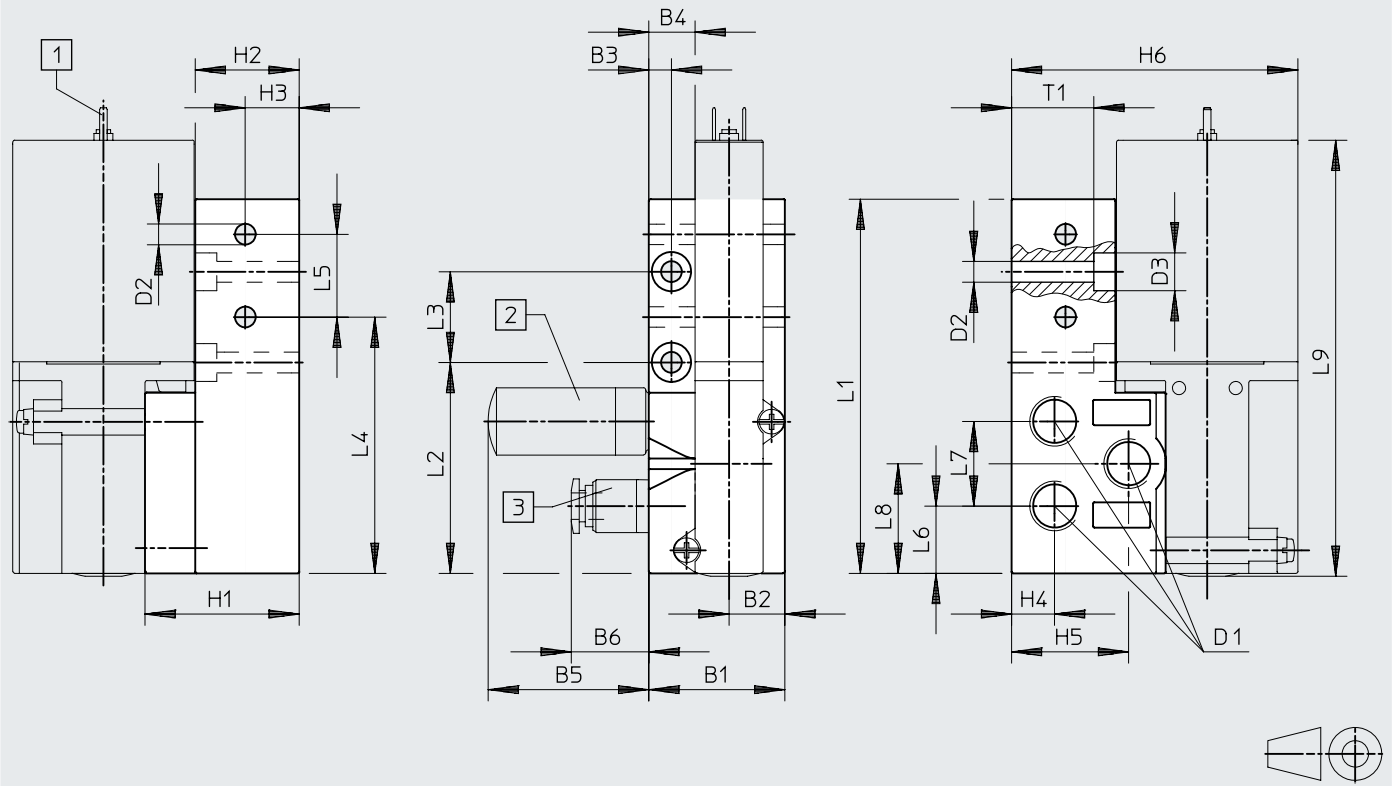


Datasheet – Sub-base valve

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

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



[1] Plug vanes

[2] Silencer

[3] Push-in fitting

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

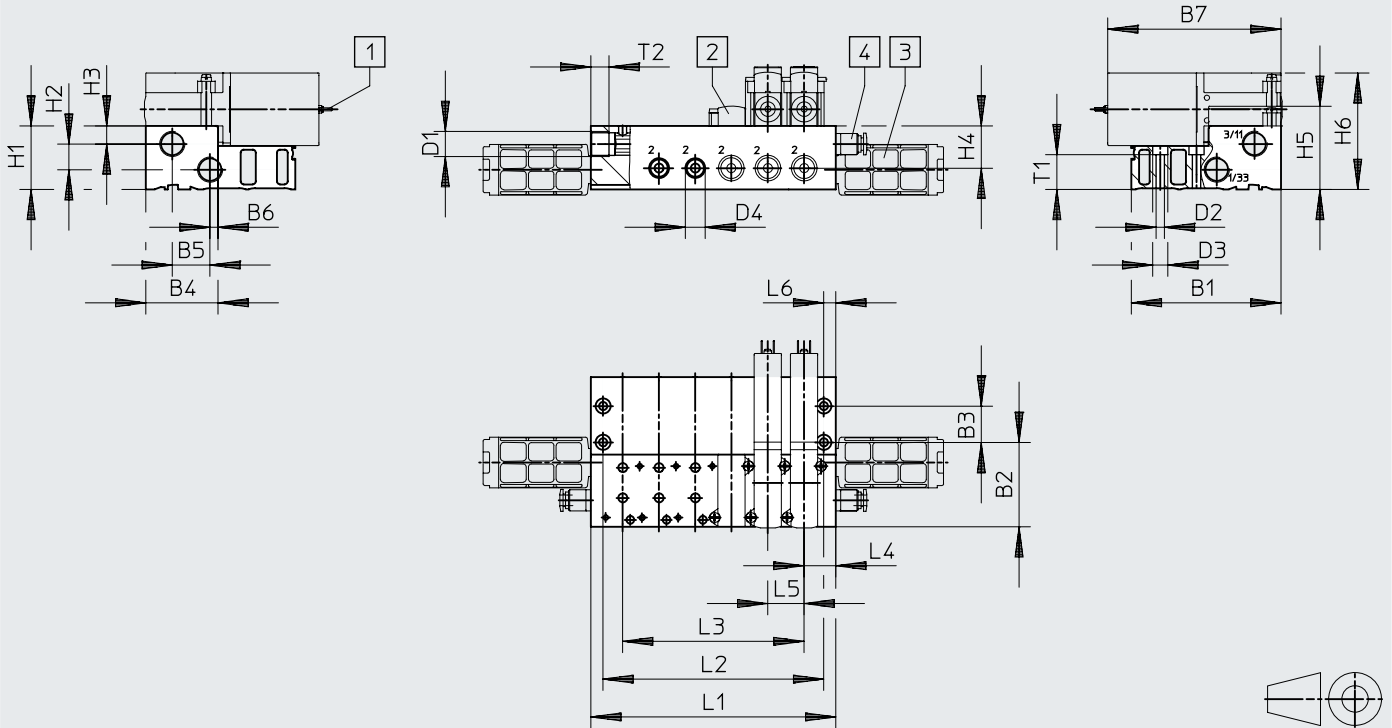
| Type          | L1 | L2   | L3 | L4   | L5   | L6   | L7   | L8 | L9    | T1   |
|---------------|----|------|----|------|------|------|------|----|-------|------|
| MHA4-AS-3-1/4 | 99 | 55.8 | 24 | 67.8 | 21.9 | 17.8 | 22.4 | 29 | 115.4 | 21.8 |

Datasheet – Sub-base valve

Dimensions

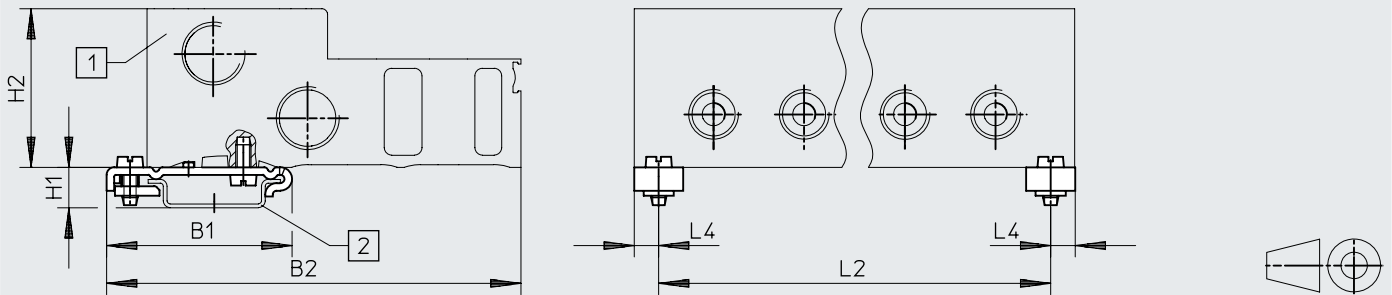
Download CAD data → [www.festo.com](http://www.festo.com)

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



[1] Plug vanes or moulded-in cable    [2] Cover plate    [3] Silencer    [4] Push-in fitting

H-rail mounting CPV1 0/14-VI-BG-NRH-35



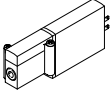
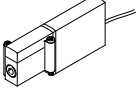

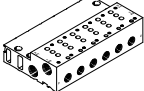

[1] Manifold block    [2] DIN mounting rail


| Type               | B1   | B2   | B3 | B4   | B5 | B6  | B7    | D1   | D2<br>∅ | D3<br>∅ | D4<br>∅ | H1   | H2 | H3 | H4 | H5 | H6 |
|--------------------|------|------|----|------|----|-----|-------|------|---------|---------|---------|------|----|----|----|----|----|
| MHA4-PR...-1/4     | 99   | 55.8 | 24 | 47.8 | 25 | 5.3 | 114.6 | G3/8 | 5.5     | 10      | G1/4    | 42   | 17 | 12 | 28 | 55 | 77 |
| CPV1 0/14-VI-BG... | 49.1 | 110  | -  | -    | -  | -   | -     | -    | -       | -       | -       | 10.7 | 42 | -  | -  | -  | -  |

| Type               | L4  | L5 | L6 | T1 | T2 |
|--------------------|-----|----|----|----|----|
| MHA4-PR...-1/4     | 21  | 24 | 8  | 23 | 12 |
| CPV1 0/14-VI-BG... | 6.5 | -  | -  | -  | -  |

| Type               |    | Number of valve positions |     |     |     |     |
|--------------------|----|---------------------------|-----|-----|-----|-----|
|                    |    | 2                         | 4   | 6   | 8   | 10  |
| MHA4-PR...-1/4     | L1 | 66                        | 114 | 162 | 210 | 258 |
|                    | L2 | 50                        | 98  | 146 | 194 | 242 |
|                    | L3 | 24                        | 72  | 120 | 168 | 216 |
| CPV1 0/14-VI-BG... | L2 | 53                        | 101 | 149 | 197 | 245 |



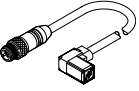

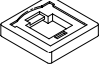


## Datasheet – Sub-base valve

| Ordering data                                                                     |                                                                                                         |                                                            | Part no.           | Type   |                    |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------|--------------------|--------|--------------------|
| <b>Valves</b>                                                                     |                                                                                                         |                                                            |                    |        |                    |
|  | 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, switching time 10.5 ms | Normally open      | 525196 | MHA4-M1H-3/20-4-K  |
|                                                                                   |                                                                                                         |                                                            | Normally closed    | 525176 | MHA4-M1H-3/2G-4-K  |
| <b>Manifold rail</b>                                                              |                                                                                                         |                                                            |                    |        |                    |
|  | Individual sub-base<br>Pneumatic connection: thread G1/4                                                |                                                            | 1 valve position   | 525227 | MHA4-AS-3-1/4      |
|  | Manifold block<br>Pneumatic connection 1, 11, 3, 33: thread G3/8<br>Pneumatic connection 2: thread G1/4 |                                                            | 2 valve positions  | 525234 | MHA4-PR2-3-1/4     |
|                                                                                   |                                                                                                         |                                                            | 4 valve positions  | 525235 | MHA4-PR4-3-1/4     |
|                                                                                   |                                                                                                         |                                                            | 6 valve positions  | 525236 | MHA4-PR6-3-1/4     |
|                                                                                   |                                                                                                         |                                                            | 8 valve positions  | 525237 | MHA4-PR8-3-1/4     |
|                                                                                   |                                                                                                         |                                                            | 10 valve positions | 525238 | MHA4-PR10-3-1/4    |
| <b>Cover plate</b>                                                                |                                                                                                         |                                                            |                    |        |                    |
|  | Vacant valve positions must be sealed with a cover plate.                                               |                                                            |                    | 525239 | MHAP4-BP-3         |






 **Note**

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

## Datasheet – Sub-base valve

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

## Datasheet – Sub-base valve

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