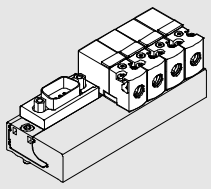
Miniature valve terminal type MH1 and MH2



FESTO

Brief description
Original instructions

Festo SE & Co. KG
Ruiter Straße 82
73734 Esslingen
Germany
+49/711/347-0
www.festo.com

8067842 [8067844]

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Miniature valve terminal type MH1 and MH2 ..... en

For all available product documentation
➔ www.festo.com/pk

1 User instructions

The miniature valves type MH1 and MH2 are intended exclusively for controlling pneumatic actuators. If additional commercially-available components such as actuators are connected, the specified limits for pressures, temperatures, electrical data, torques, etc. must not be exceeded. Observe the regulations of the trade associations, German Technical Control Board (TÜV), VDE stipulations or corresponding national regulations.
Miniature valve terminals may only be installed by trained personnel.

Warning

- Before carrying out installation and/or maintenance work, switch off the power supply for the valve solenoid coils and the compressed air supply.

Note

- Commission only miniature valve terminals that are completely mounted and electrically wired

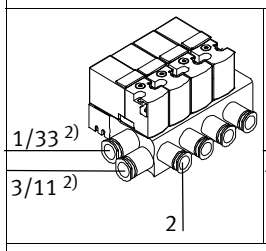
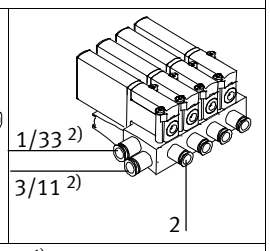
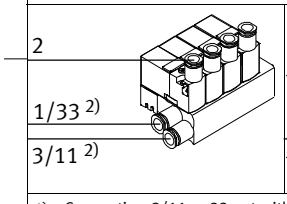
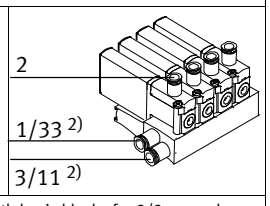
The individual valves are marked as follows:

Designation	Function
2/2G	2/2-way valve, normally closed
3/2G	3/2-way valve, normally closed
3/2O	3/2-way valve, normally open

Pneumatic connection of miniature valves

Caution

The position of the pneumatic connections depends on the manifold block, valve type (sub-base valves or semi in-line valves) and on the size of the valve (MH1 or MH2).

Valve size MH1 2)	Valve size MH2 2)
Manifold block for sub-base valves 1)	
	
Manifold block for semi in-line valves 1)	
	

1) Connection 3/11 or 33 not with basis blocks for 2/2-way valve
2) Connections on both sides on the manifold block

Connect the air supply and exhaust lines to the following connections:

Basis block with ...	Compressed air at connection:	Exhaust air at connection:
... 2/2-way valve, closed	1	–
... 3/2-way valve, closed	1	3
... 3/2-way valve, open	11	33

Note

If elbow screw connectors or multiple distributors are used, the airflow will be reduced slightly.
- Place a suitable sealing ring under each fitting to avoid leakage.
- If you wish to switch over 15 valves simultaneously, attach the supply and exhaust air to both sides of the manifold block.
- Seal unused pneumatic connections with blanking plugs. In this way, you can prevent contamination from entering the pneumatic components and ensure the corresponding protection class (➔ Technical data).

Electrical connection of miniature valves

Warning

- Only use PELV circuits in accordance with IEC/EN 60204-1 (protective extra-low voltage, PELV) for the electrical power supply.
- Observe the general requirements of IEC/EN 62004-1 for PELV circuits.
- Use only voltage sources that guarantee a reliable electric separation of operating and load voltage in accordance with IEC/EN 62004-1.
- Always connect both circuits for operating and load voltage supply.

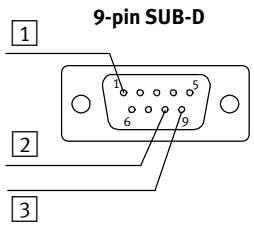
2 Multi-pin plug connection

For controlling the valves, each solenoid coil is assigned to a certain pin of the multi-pin plug. A valve location therefore always occupies one address. Unused valve locations, e.g. blanking plates, also occupy one address.

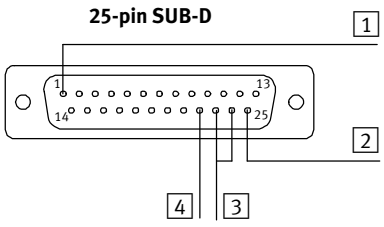
Warning

Fast-switching valves of size MH2 contain electrostatically sensitive components. The components can be damaged if you touch the contact surfaces of the plug connectors or if you do not observe the handling specifications for electrostatically sensitive devices.

9-pin SUB-D



25-pin SUB-D



9-pin SUB-D
1 Pin 1/coil 1
2 Pin 8/coil 8
3 Pin 9/0 V 1)

25-pin SUB-D
1 Pin 1/coil 1
2 Pin 25/0 V 1)
3 Pin 23... 24 2)
4 Pin 22/coil 22

1) 0 V for positive switching control signals; connect 24 V operating voltage for negative switching control signals; mixed operation is impermissible!

2) Manifold blocks with 24 valve positions: pin 23/coil 23; pin 24/coil 24
manifold blocks with max. 22 valve positions: pin 23 ... 25/0 V

Caution

Observe the following restrictions if all valves mounted on the manifold block should be switched simultaneously:

Valve size	Solenoid voltage	Electrical resistance at the neutral conductor	Length of connecting cable
MH1 1)	5 V	max. 0.27 Ω	max. 5.0 m
MH2 2)	5 V	max. 0.10 Ω	max. 2.5 m

1) With valve types MHA1 or MHP1
2) With valve types MHA2 or MHP2

Controlling the valves

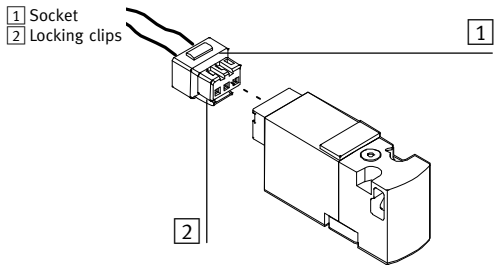
Control the valves in a uniform manner. Preferably all control signals should be positive-switching (1-switching), otherwise all control signals negative-switching (0-switching). Mixed mode control is not permissible.

Address assignment of the valves

- Address allocation in ascending order without gaps
- A valve position always occupies one address
- Counting mode starting from left to right (alignment: position of multi-pin connection is on the left on the manifold block).

3 Individual connection

Mounting:
Insert the socket onto the terminal lugs of the solenoid coil until it snaps into place.
Dismantling:
Press the locking hook on the socket and hold it down.
Pull socket from the solenoid coil (➔ Figure).



4 Display and control elements

Position of the LED

The miniature valves of type ....MHA1-..L... are equipped with an LED. The LED indicates the switching status of the solenoid coil. The position of the LED is behind the solenoid in the transparent cover (➔ following Table).

Note

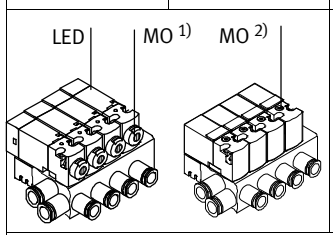
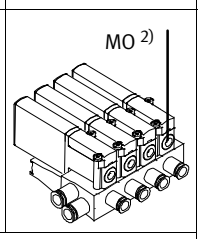
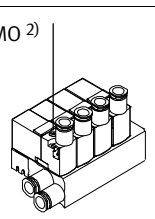
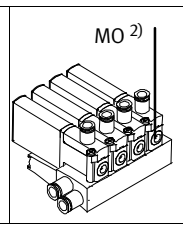
The LED does not light up until 30 ms after switching. If the switching status lasts less than 30 ms, the LED does not light up.

Function and position of the manual override (MO)

The position of the MO is different for the different variants of the miniature valves (➔ subsequent table):
- For the valves of type ....MHA1-.. and MHP1-..., the non-detenting MO is on top of the valve.
- For the valves of type ....MHA1-..L..., the non-detenting/detenting MO is on the front side of the valve.
- For the valves of type ....MHA2-, the non-detenting MO is on the front side of the valve.

MO coding caps

For the valves of type ....MHA1-..L..., the function of the MO can be changed with coding caps:
- With the coding cap of type MH1, the MO can only be operated as non-detenting.
- With the coding cap type MH1 GESCHL. (CLOSED), the MO is concealed. The MO cannot be operated.

Valve size MH1	Valve size MH2
Sub-base valve type MHA...	
With LED / Without LED	Without LED
	
Semi in-line valve MHP...	
	

1) Non-detenting/detenting MO, actuation only with max. 25 N
2) Non-detenting MO, actuation only with blunt pin (max. 15 N)

5 Commissioning

Valves type MH2-...

Valves of type MH2-... in the pressure range of –0.5 ... +0.5 bar have a continuing leakage of up to 10 l/hour. This leakage is due to the design.

Note

The following sequence is recommended for the commissioning of valves of type MH2-...:
- First switch on the pressure supply and then the operating voltage.

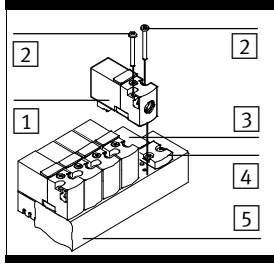
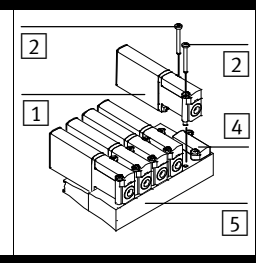
As a result, you avoid possible leakage of up to 30 l/hour in the unswitched status with operating pressures from –1 bar to +1 bar. One-time switching immediately eliminates the leakage.

6 Mounting the valve

Note

Observe the following with regard to equipment of the manifold blocks:
- Use only uniform valve functions. Valves with the function “normally closed” must **not** be combined with “normally open” valves.
- Manifold blocks with electrical multi-pin: Mount only valves of the same voltage type.
- Manifold blocks of type MHP..: Mount only semi in-line valves.
- Use the following cover plate for sealing an unassigned valve position:
  Manifold blocks of type MH...:
  - MH1: type MHAP1-BP-3
  - MH2: type MHAP2-BP-3

  Manifold blocks type MH...-PI:
  - MH1: type MHAP1-BP3-PI
  - MH2: type MHAP2-BP3-PI
- Additionally protect the electrical connections against contamination with the adhesive foil that accompanies the cover plate.

Valve size MH1	Valve size MH2
	

1 Valve
2 Mounting screw tightening torque:
MH1: 0.2 Nm –20%
MH2: 0.4 Nm ± 10%
3 Adhesive foil
4 Cover plate
5 Manifold block

7 Technical data

Miniature valve terminal	MH1	MH2
Number of valve positions	2 ... 22 (24 1))	2 ... 10
Protection class in accordance with DIN 40050: (completely mounted)	IP40	IP40 (IP65 2))
Permitted temperature ranges: Operation 3)		
– Mounted on manifold block	–5 ° ... +40 °C	–5 ° ... +40 °C
– Mounted on individual connection	–5 ° ... +50 °C	–5 ° ... +60 °C
Storage	–20 ° ... +60 °C	–20 ° ... +40 °C
Medium – Compressed air	Compressed air to ISO 8573-1:2010 [7:4:4]; operation with lubricated medium possible (required during subsequent operation)	
Operating voltage: – Nominal value – permitted tolerance	Reverse polarity protected DC 5 V, 12 V or 24 V 4) ± 10 %	
Power consumption per valve:		
– Size MH1 (without LED/ with LED)	1 W/1.1 W	
– size MH2	2.88 W	
– Size MH2, fast-switching valve	5 W	
Starting current	—	1 A 1)
Electromag. compatibility 5) – EMC interference emission – EMC resistance to interference	**MH1 with LED** — checked in accordance with EN 61000-6-2	**...-MS1H** See declaration of conformity ➔ www.festo.com
Max. switching frequency:	20 Hz	130 Hz (330 Hz 6))
Pressure range (connection 1 and 11):		
2/2-way valve, closed	–0.9 ... 2 bar	—
3/2-way valve, open	0 ... 6 bar	-0.9 ... 8 bar
3/2-way valve, closed	0 ... 8 bar	-0.9 ... 8 bar
Flow rate:		
– 2/2-way valves (2 toward 0 bar)	14 l/min	—
– 3/2-way valves (qnN)	10 l/min	100 l/min
Valve switching times:	**On/off**	**On/off**
– 2/2-way valve	4 ms/4 ms	— / —
– 3/2-way valves	4 ms/4 ms	7 ms/3.5 ms
– 3/2-way fast switching valve 1)	— / —	1.7 ms/2 ms
Torques:		
– Multi-pin plug	0.5 Nm	0.5 Nm
– Plug socket 1)	0.25 Nm	0.25 Nm
– QS fitting on valve type MHP1...	0.7 Nm	—
– Valve/cover plate	0.2 Nm	0.4 Nm ± 10 %

Pneumatic connections:	1 (11)	3 (33)	2
– Individual connection bl. MH1/MH2	M3/M5	M3/M5	M3/M5
– Manifold block MH1/MH2	M7/M7	M7/M7	M3/M5

1) Only with 24 V valves
2) Valve with socket KMYZ-3... or valve MH2-M1H-3/2G-K (with cable end)
3) At 100% ED, max. 40°C ambient temperature
4) Valves with LED only in 24 V design
5) The device is intended for use in an industrial environment. Outside of industrial environments, e.g. in commercial and mixed-residential areas, actions to suppress interference may have to be taken.
6) Only for fast-switching valve type MH2...-MS1H