

Series M-04

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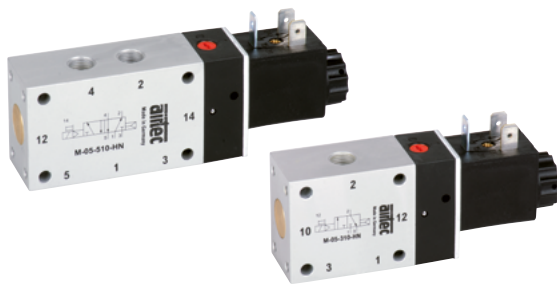
Series KM-10

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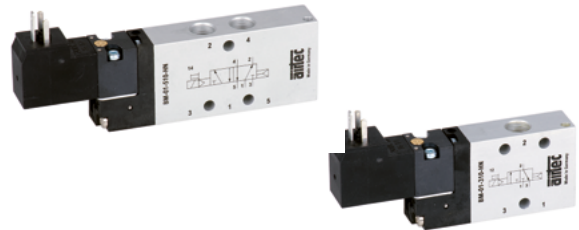
Series M-05

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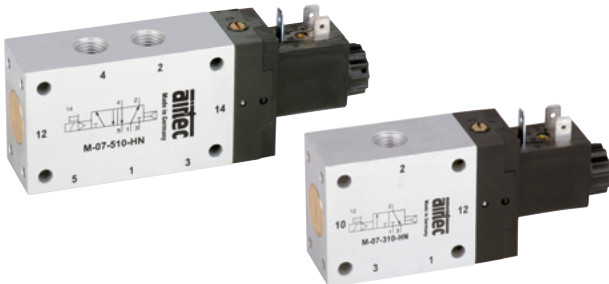
Series BM-01

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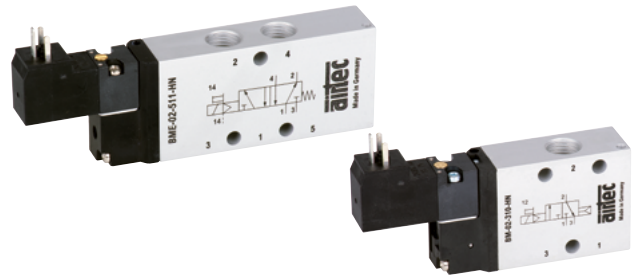
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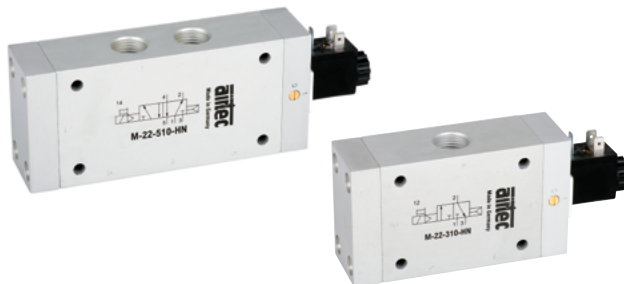
Series BM-02

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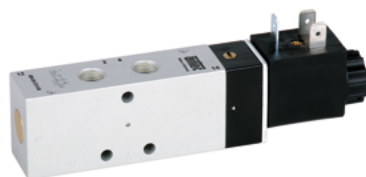
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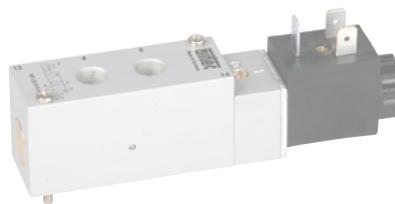
Series MC-20

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Series MF-05/ MF-25

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Accessories

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Series MF-07

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Spare parts

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Series MC-07

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Technical information

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Technical details

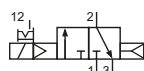
Connection	G1/8
Nominal size	4 mm
Temperature range	-10°C ... +70°C
Medium	Filtered, oil-free and dried compressed air according to ISO 8573-1:2010, Class 7:2:4, instrument air, free of aggressive additives. Alternatively the pressure dew point must be at least 10°C below lowest occurring ambient temperature.
Materials	Body: Al (anodized), plastic, seals: NBR, inner parts: Al, steel and plastic
Protection	IP 65 according to EN 60529
	Valves in accordance with 2014/34/EU (ATEX) available. (Chapter 13)



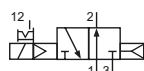
4

Electrically operated spool valve. The manual override is detent and is operated by screwdriver.

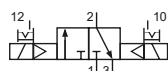
3/2-way valves



M-04-310-HN-xxx
3/2-way, single solenoid, air spring return, NC



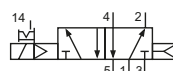
MO-04-310-HN-xxx
3/2-way, single solenoid, air spring return, NO



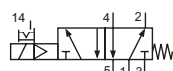
M-04-320-HN-xxx
3/2-way, double solenoid

Please complete: xxx = electrical option

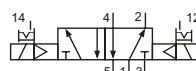
5/2- and 5/3-way valves



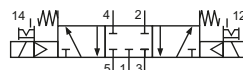
M-04-510-HN-xxx
5/2-way, single solenoid, air spring return



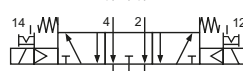
M-04-511-HN-xxx
5/2-way, single solenoid, mechanical spring return



M-04-520-HN-xxx
5/2-way, double solenoid



M-04-530-HN-xxx
5/3-way, center position closed



M-04-533-HN-xxx
5/3-way, center position exhausted

Electrical options

Nominal voltage	Power consumption	Specifics	Plug connection*1	-xxx Manual override on same side of ports	
				2 or 2 and 4	1, 3 or 1, 3 and 5
12 V DC	4.2 W		Form B industrial norm	-441	-411
12 V DC	2.2 W	max. 8 bar	Form B industrial norm	-461	-431
24 V DC	4.2 W		Form B industrial norm	-442	-412
24 V DC	4.8 W		M 12	-O42	-O12
24 V DC	2.2 W	max. 8 bar	Form B industrial norm	-462	-432
24 V DC	2.5 W	max. 8 bar	M 12	-O62	-O32
24 V AC	7/4 VA		Form B industrial norm	-452	-422
115 V AC	7/4 VA		Form B industrial norm	-456	-426
230 V AC	7/4 VA		Form B industrial norm	-457	-427

*1 Plug socket not included, suitable plug sockets see page 4-38.

Series M-04

Technical data

Model-no.:	M-04-310	MO-04-310	M-04-320	M-04-510	M-04-511	M-04-520	M-04-530	M-04-533
Operating pressure* (bar)	2 ... 10	2 ... 10	2.5 ... 10	2,5 ... 10	3 ... 10	2,5 ... 10	3 ... 10	3 ... 10
Pilot pressure* (bar)	2 ... 10	2 ... 10	2.5 ... 10	2,5 ... 10	3 ... 10	2,5 ... 10	3 ... 10	3 ... 10
Flow rate (NI/min)	360	360	360	360	360	360	360	360
Response time (ms) at 6 bar	on: 13 off: 16	on: 13 off: 16	on: 12 off: 12	on: 12 off: 14	on: 13 off: 16	on: 12 off: 12	on: 15 off: 22	on: 15 off: 22
Weight (kg)	0.185	0.185	0.315	0.210	0.220	0.335	0.335	0.335

* max. 8 bar at 2.2 W and 2.5 W

Accessories



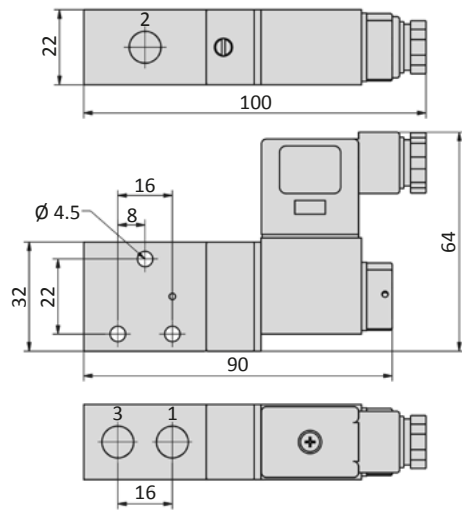
Plug sockets: page 4-38



Manifolds: page 4-06

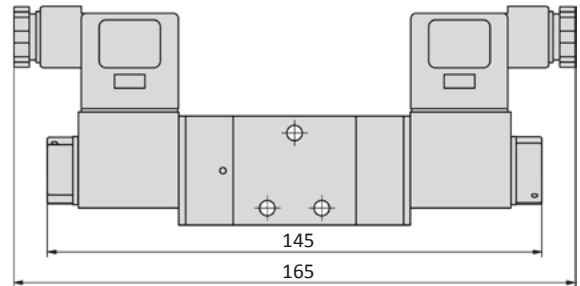
Dimensions

M-04-310-HN, MO-04-310-HN*

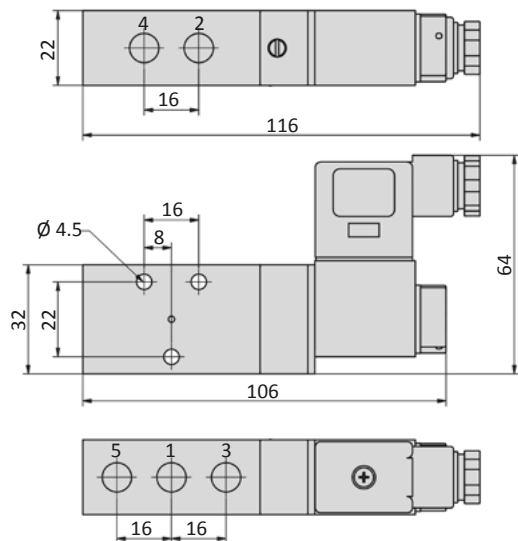


*For the NO version MO-04 the ports 1 and 3 are inverted.

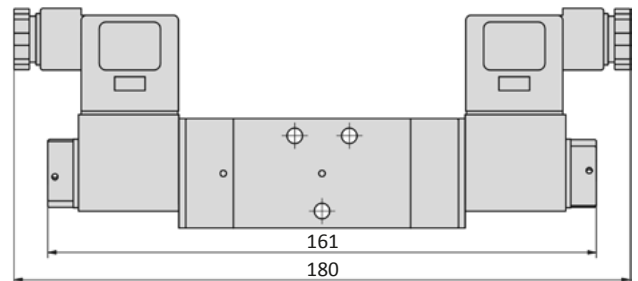
M-04-320-HN



M-04-510-HN, M-04-511-HN



M-04-520-HN, M-04-53x-HN



- 1 = pressure inlet
- 2,4 = outlets
- 3,5 = exhausts

Plug socket (not included in scope of delivery) can be repositioned by 180°.
Solenoid coil can be repositioned by 4 x 90°.

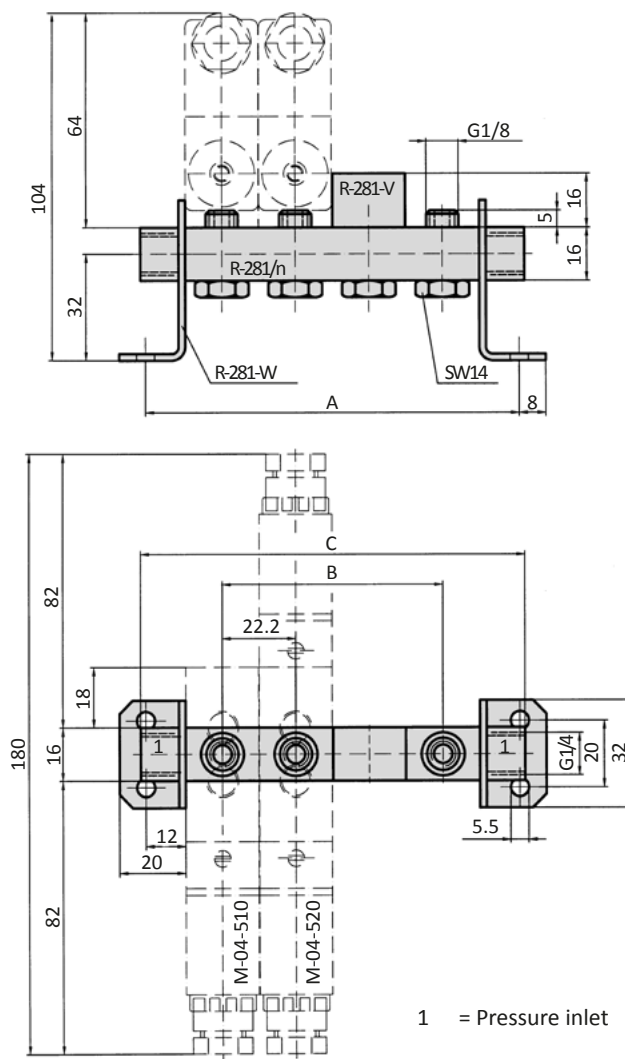
Series M-04

General information

The R-281/n manifold is suitable for the M-04 valve series. As well available are blind plates R-281-V for blank stations and mounting brackets R-281-W (pair). Hollow bolts and gaskets are included.



Dimensions



Model-no.:	A	B	C	Weight (kg)
R-281/2	68.4	22.2	72	0.053
R-281/3	90.6	44.4	94	0.074
R-281/4	112.8	66.6	116	0.095
R-281/5	135	88.8	138	0.116
R-281/6	157.2	111	160	0.137
R-281/8	201.6	155.5	204	0.179
R-281/10	246	199.8	248	0.222

Technical details

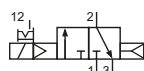
Connection	G1/8
Nominal size	6 mm
Temperature range	-10°C ... +70°C
Medium	Filtered, oil-free and dried compressed air according to ISO 8573-1:2010, Class 7:2:4, instrument air, free of aggressive additives. Alternatively the pressure dew point must be at least 10°C below lowest occurring ambient temperature.
Materials	Body: Al (anodized), plastic, seals: NBR, inner parts: Al, steel and plastic
Protection	IP 65 according to EN 60529
	Valves in accordance with 2014/34/EU (ATEX) available. (Chapter 13)



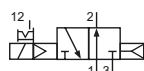
4

Electrically operated spool valve. The manual override is detent and is operated by screwdriver.

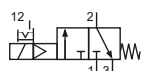
3/2-way valves



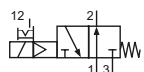
M-05-310-HN-xxx
3/2-way, single solenoid, air spring return, NC



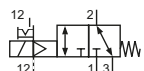
MO-05-310-HN-xxx
3/2-way, single solenoid, air spring return, NO



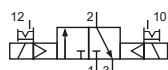
M-05-311-HN-xxx
3/2-way, single solenoid, mechanical spring return, NC



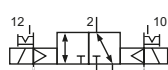
MO-05-311-HN-xxx
3/2-way, single solenoid, mechanical spring return, NO



ME-05-311-HN-xxx
3/2-way, single solenoid, external pilot pressure, mechanical spring return



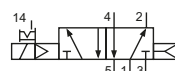
M-05-320-HN-xxx
3/2-way, double solenoid



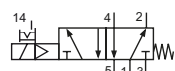
ME-05-320-HN-xxx
3/2-way, double solenoid, external pilot pressure

Please complete: xxx = electrical option

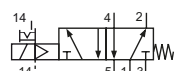
5/2- and 5/3-way valves



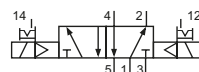
M-05-510-HN-xxx
5/2-way, single solenoid, air spring return



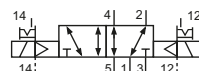
M-05-511-HN-xxx
5/2-way, single solenoid, mechanical spring return



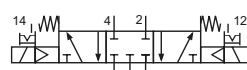
ME-05-511-HN-xxx
5/2-way, single solenoid, external pilot pressure, mechanical spring return



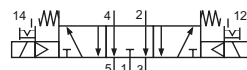
M-05-520-HN-xxx
5/2-way, double solenoid



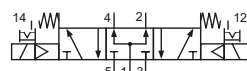
ME-05-520-HN-xxx
5/2-way, double solenoid, external pilot pressure



M-05-530-HN-xxx
5/3-way, center position closed



M-05-533-HN-xxx
5/3-way, center position exhausted



M-05-534-HN-xxx
5/3-way, center position pressurized

Electrical options

Nominal voltage	Power consumption	Specifics	Plug connection*1	-xxx Manual override on same side of ports	
				2 or 2 and 4	1, 3 or 1, 3 and 5
12 V DC	4.2 W		Form B industrial norm	-441	-411
12 V DC	2.2 W	max. 8 bar	Form B industrial norm	-461	-431
24 V DC	4.2 W		Form B industrial norm	-442	-412
24 V DC	4.8 W		M 12	-O42	-O12
24 V DC	2.2 W	max. 8 bar	Form B industrial norm	-462	-432
24 V DC	2.5 W	max. 8 bar	M 12	-O62	-O32
24 V AC	7/4 VA		Form B industrial norm	-452	-422
115 V AC	7/4 VA		Form B industrial norm	-456	-426
230 V AC	7/4 VA		Form B industrial norm	-457	-427

*1 Plug socket not included, suitable plug sockets see page 4-38.

Series M-05

Technical data

Model-no.:	M-05-310	MO-05-310	M-05-311	MO-05-311	ME-05-311	M-05-320	ME-05-320
Operating pressure* (bar)	2 ... 10	2 ... 10	3 ... 10	3 ... 10	0 ... 10	2 ... 10	0 ... 10
Pilot pressure* (bar)	2 ... 10	2 ... 10	3 ... 10	3 ... 10	3 ... 10	2 ... 10	2 ... 10
Flow rate (Nl/min)	750	750	750	750	750	750	750
Response time (ms) at 6 bar	on: 13 off: 16	on: 13 off: 16	on: 13 off: 16	on: 13 off: 16	on: 13 off: 18	on: 12 off: 12	on: 12 off: 12
Weight (kg)	0.255	0.255	0.260	0.260	0.308	0.400	0.426

Model-no.:	M-05-510	M-05-511	ME-05-511	M-05-520	ME-05-520	M-05-530	M-05-533	M-05-534
Operating pressure* (bar)	2 ... 10	3 ... 10	0 ... 10	2 ... 10	0 ... 10	3 ... 8	3 ... 8	3 ... 8
Pilot pressure* (bar)	2 ... 10	3 ... 10	3 ... 10	2 ... 10	2 ... 10	3 ... 8	3 ... 8	3 ... 8
Flow rate (Nl/min)	750	750	750	750	750	650	650	650
Response time (ms) at 6 bar	on: 13 off: 16	on: 13 off: 18	on: 15 off: 19	on: 12 off: 12	on: 12 off: 12	on: 13 off: 18	on: 13 off: 18	on: 13 off: 18
Weight (kg)	0.295	0.300	0.360	0.440	0.470	0.440	0.440	0.440

* max. 8 bar at 2.2 W and 2.5 W

Accessories



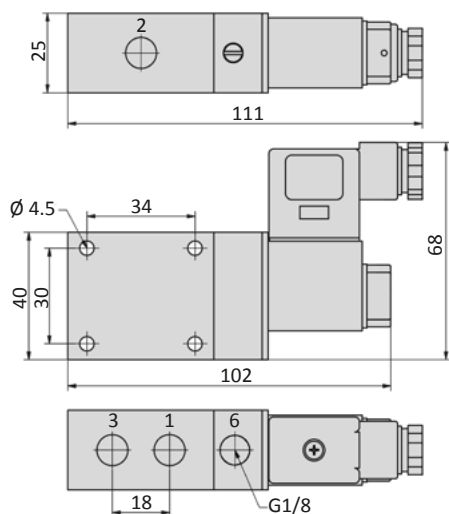
Plug sockets: page 4-38



Manifolds: page 4-10

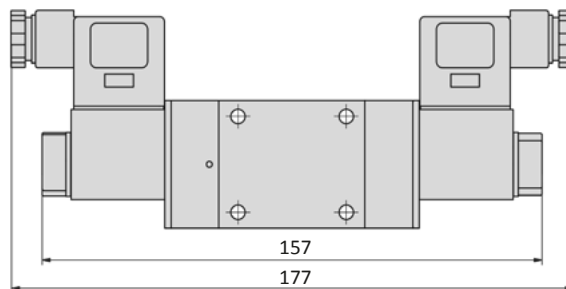
Dimensions

M-05-31x-HN, MO-05-31x-HN*, ME-05-31x-HN

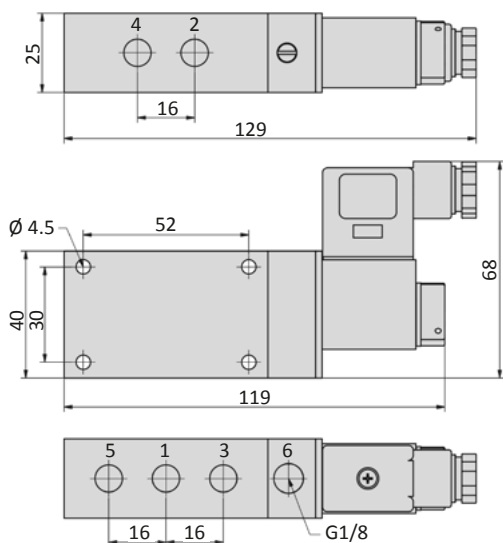


*For the NO version MO-05 the ports 1 and 3 are inverted.

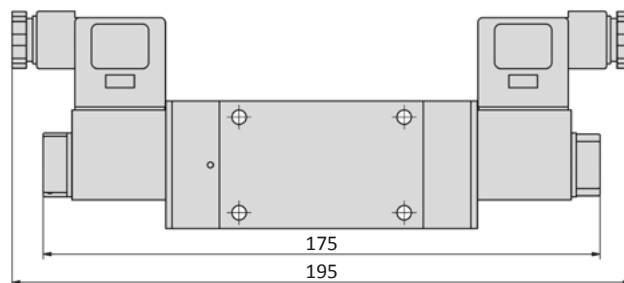
M-05-320-HN, ME-05-320-HN



M-05-51x-HN, ME-05-511-HN



M-05-520-HN, ME-05-520-HN, M-05-53x-HN



- 1 = pressure inlet
- 2,4 = outlets
- 3,5 = exhausts
- 6 = external pilot pressure supply (only at ME-valves)

Plug socket (not included in scope of delivery) can be repositioned by 180°.
Solenoid coil can be repositioned by 4 x 90°.

Series M-05

General information

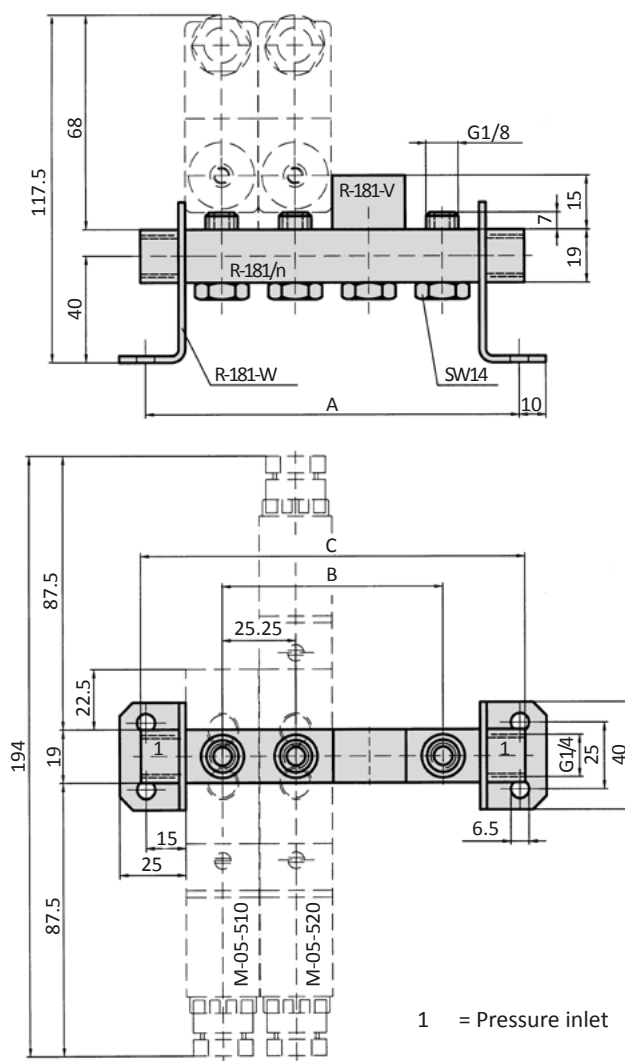
The R-181/n manifold is suitable for the M-05 valve series. As well available are blind plates R-181-V for blank stations and mounting brackets R-181-W (pair).

Hollow bolts and gaskets are included.

The manifold is as well suitable for the pneumatically operated valve series P-05.



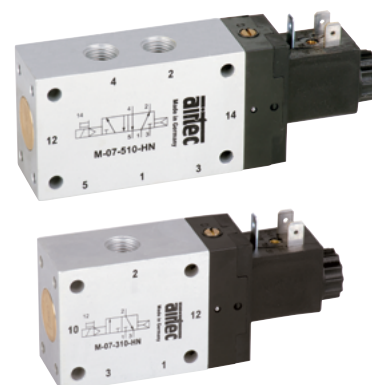
Dimensions



Model-no.:	A	B	C	Weight (kg)
R-181/2	80.5	25.25	85	0.084
R-181/3	105.75	50.5	110	0.113
R-181/4	131	75.75	135	0.144
R-181/5	156.25	101	160	0.174
R-181/6	181.5	126.25	185	0.215
R-181/8	232	176.75	235	0.266
R-181/10	282.5	227.25	285	0.326
R-181/12	333	277.75	335	0.385

Technical details

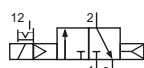
Connection	G1/4
Nominal size	9 mm
Temperature range	-10°C ... +70°C
Medium	Filtered, oil-free and dried compressed air according to ISO 8573-1:2010, Class 7:2:4, instrument air, free of aggressive additives. Alternatively the pressure dew point must be at least 10°C below lowest occurring ambient temperature.
Materials	Body: Al (anodized), plastic, seals: NBR, inner parts: Al, steel and plastic
Protection	IP 65 according to EN 60529
	Valves in accordance with 2014/34/EU (ATEX) available. (Chapter 13)



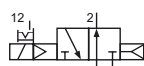
4

Electrically operated spool valve. The manual override is detent and is operated by screwdriver.

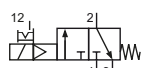
3/2-way valves



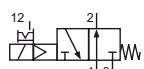
M-07-310-HN-xxx
3/2-way, single solenoid, air spring return, NC



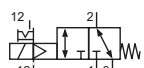
MO-07-310-HN-xxx
3/2-way, single solenoid, air spring return, NO



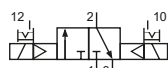
M-07-311-HN-xxx
3/2-way, single solenoid, mechanical spring return, NC



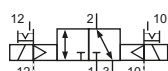
MO-07-311-HN-xxx
3/2-way, single solenoid, mechanical spring return, NO



ME-07-311-HN-xxx
3/2-way, single solenoid, external pilot pressure, mechanical spring return



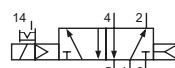
M-07-320-HN-xxx
3/2-way, double solenoid



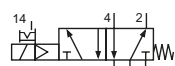
ME-07-320-HN-xxx
3/2-way, double solenoid, external pilot pressure

Please complete: xxx = electrical option

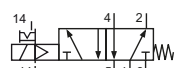
5/2- and 5/3-way valves



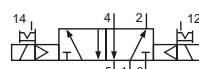
M-07-510-HN-xxx
5/2-way, single solenoid, air spring return



M-07-511-HN-xxx
5/2-way, single solenoid, mechanical spring return



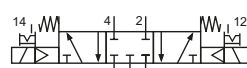
ME-07-511-HN-xxx
5/2-way, single solenoid, external pilot pressure, mechanical spring return



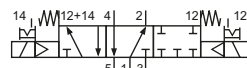
M-07-520-HN-xxx
5/2-way, double solenoid



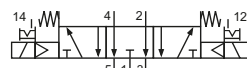
ME-07-520-HN-xxx
5/2-way, double solenoid, external pilot pressure



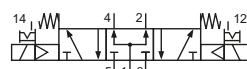
M-07-530-HN-xxx
5/3-way, center position closed



M-07-532-HN-xxx
5/3-way, center position safety



M-07-533-HN-xxx
5/3-way, center position exhausted



M-07-534-HN-xxx
5/3-way, center position pressurized

Electrical options

Nominal voltage	Power consumption	Specifics	Plug connection*1	-xxx Manual override on same side of ports	
				2 or 2 and 4	1, 3 or 1, 3 and 5
12 V DC	4.2 W		Form B industrial norm	-441	-411
12 V DC	2.2 W	max. 8 bar	Form B industrial norm	-461	-431
24 V DC	4.2 W		Form B industrial norm	-442	-412
24 V DC	4.8 W		M 12	-042	-012
24 V DC	2.2 W	max. 8 bar	Form B industrial norm	-462	-432
24 V DC	2.5 W	max. 8 bar	M 12	-062	-032
24 V AC	7/4 VA		Form B industrial norm	-452	-422
115 V AC	7/4 VA		Form B industrial norm	-456	-426
230 V AC	7/4 VA		Form B industrial norm	-457	-427

*1 Plug socket not included, suitable plug sockets see page 4-38.

Series M-07

Technical data

Model-no.:	M-07-310	MO-07-310	M-07-311	MO-07-311	ME-07-311	M-07-320	ME-07-320
Operating pressure* (bar)	1.5 ... 10	1.5 ... 10	2.5 ... 10	2.5 ... 10	0 ... 10	1.5 ... 10	0 ... 10
Pilot pressure* (bar)	1.5 ... 10	1.5 ... 10	2.5 ... 10	2.5 ... 10	2.5 ... 10	1.5 ... 10	1.5 ... 10
Flow rate (l/min)	1580	1580	1580	1580	1580	1580	1580
Response time (ms) at 6 bar	on: 15 off: 19	on: 15 off: 19	on: 15 off: 19	on: 15 off: 19	on: 15 off: 22	on: 14 off: 14	on: 14 off: 14
Weight (kg)	0.375	0.375	0.380	0.380	0.450	0.520	0.578

Model-no.:	M-07-510	M-07-511	ME-07-511	M-07-520	ME-07-520
Operating pressure* (bar)	1.5 ... 10	2.5 ... 10	0 ... 10	2 ... 10	0 ... 10
Pilot pressure* (bar)	1.5 ... 10	2.5 ... 10	2.5 ... 10	2 ... 10	2 ... 10
Flow rate (l/min)	1580	1580	1580	1580	1580
Response time (ms) at 6 bar	on: 15 off: 19	on: 15 off: 22	on: 15 off: 19	on: 14 off: 14	on: 14 off: 14
Weight (kg)	0.455	0.465	0.530	0.620	0.650

Model-no.:	M-07-530	M-07-532	M-07-533	M-07-534
Operating pressure* (bar)	3 ... 8	3 ... 8	3 ... 8	3 ... 8
Pilot pressure* (bar)	3 ... 8	3 ... 8	3 ... 8	3 ... 8
Flow rate (l/min)	1300	1280	1300	1300
Response time (ms) at 6 bar	on: 15 off: 22	on: 35 off: 42	on: 15 off: 22	on: 15 off: 22
Weight (kg)	0.620	0.620	0.620	0.620

* max. 8 bar at 2.2 W and 2.5 W

Accessories



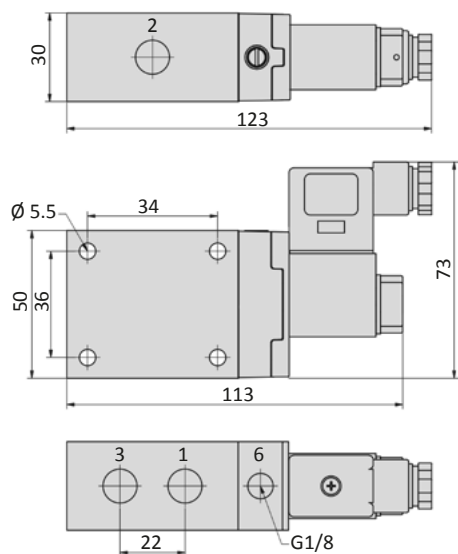
Plug sockets: page 4-38



Manifolds: page 4-14

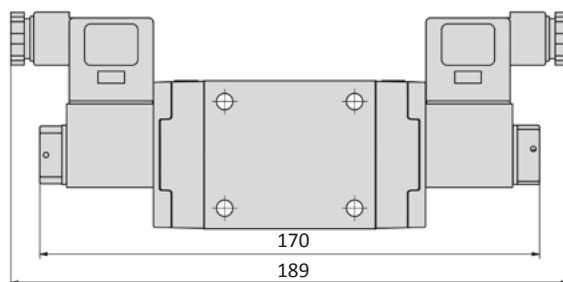
Dimensions

M-07-31x-HN, MO-07-31x-HN*, ME-07-31x-HN



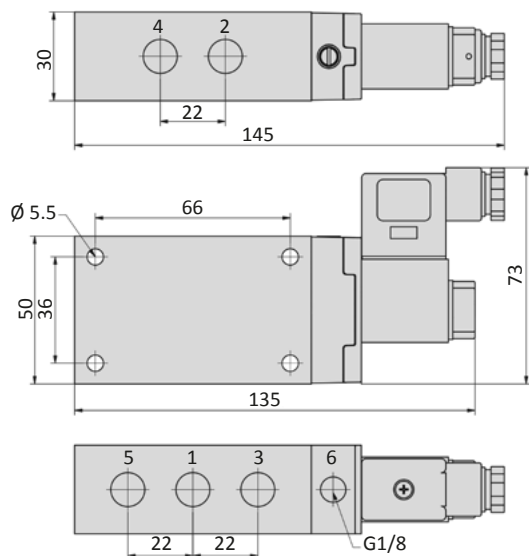
*For the NO version MO-07 the ports 1 and 3 are inverted.

M-07-320-HN, ME-07-320-HN

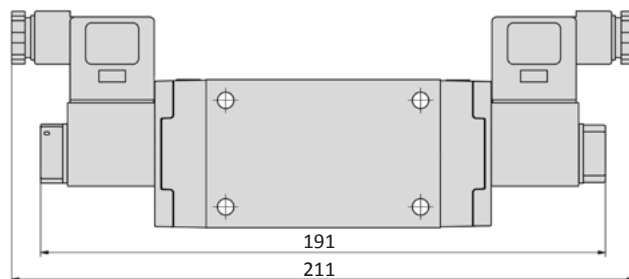


4

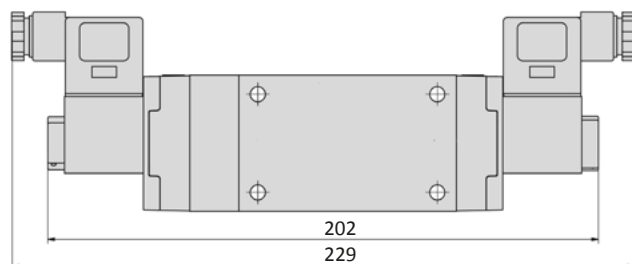
M-07-51x-HN, ME-07-511-HN



M-07-520-HN, ME-07-520-HN, M-07-53x-HN



M-07-532-HN



- 1 = pressure inlet
- 2,4 = outlets
- 3,5 = exhausts
- 6 = external pilot pressure supply (only at ME-valves)

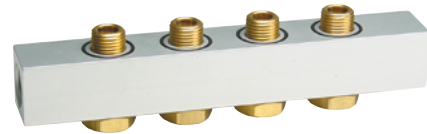
Plug socket (not included in scope of delivery) can be repositioned by 180°.
Solenoid coil can be repositioned by 4 x 90°.

Series M-07

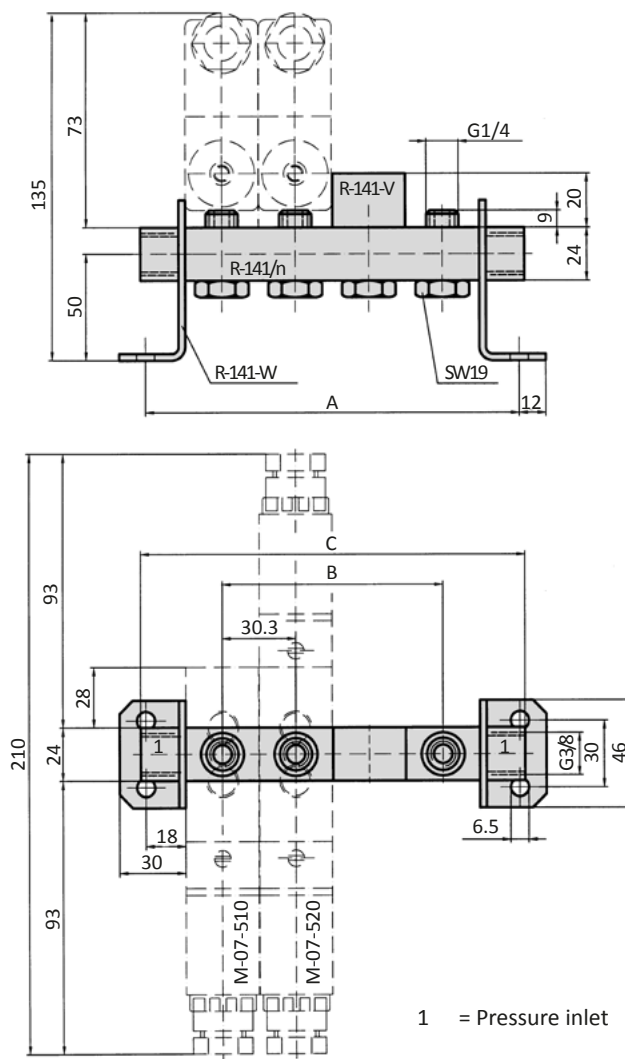
General information

The R-141/n manifold is suitable for the M-07 valve series. As well available are blind plates R-141-V for blank stations and mounting brackets R-141-W (pair). Hollow bolts and gaskets are included.

The manifold is as well suitable for the pneumatically operated valve series P-07.



Dimensions



Model-no.:	A	B	C	Weight (kg)
R-141/2	96.6	30.3	100	0.165
R-141/3	126.9	60.6	130	0.227
R-141/4	157.2	90.9	160	0.287
R-141/5	187.5	121.2	190	0.349
R-141/6	217.8	151.5	220	0.412
R-141/8	248.1	181.8	250	0.473
R-141/12	399.6	333.3	400	0.781

Technical details

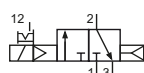
Connection	G1/2
Nominal size	14 mm
Temperature range	-10°C ... +70°C
Medium	Filtered, oil-free and dried compressed air according to ISO 8573-1:2010, Class 7:2:4, instrument air, free of aggressive additives. Alternatively the pressure dew point must be at least 10°C below lowest occurring ambient temperature.
Materials	Body: Al (anodized), seals: NBR, inner parts: Al, steel and plastic
Protection	IP 65 according to EN 60529
	Valves in accordance with 2014/34/EU (ATEX) available. (Chapter 13)



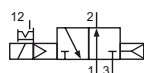
4

Electrically operated spool valve. The manual override is detent and is operated by screwdriver.

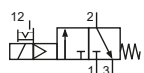
3/2-way valves



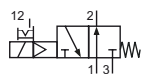
M-22-310-HN-xxx
3/2-way, single solenoid, air spring return, NC



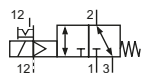
MO-22-310-HN-xxx
3/2-way, single solenoid, air spring return, NO



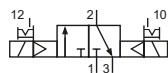
M-22-311-HN-xxx
3/2-way, single solenoid, mechanical spring return, NC



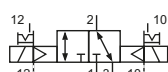
MO-22-311-HN-xxx
3/2-way, single solenoid, mechanical spring return, NO



ME-22-311-HN-xxx
3/2-way, single solenoid, external pilot pressure, mechanical spring return

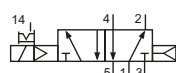


M-22-320-HN-xxx
3/2-way, double solenoid

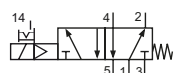


ME-22-320-HN-xxx
3/2-way, double solenoid, external pilot pressure

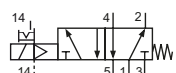
5/2- and 5/3-way valves



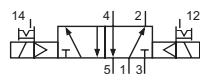
M-22-510-HN-xxx
5/2-way, single solenoid, air spring return



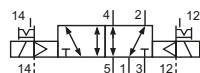
M-22-511-HN-xxx
5/2-way, single solenoid, mechanical spring return



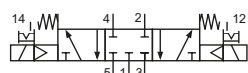
ME-22-511-HN-xxx
5/2-way, single solenoid, external pilot pressure, mechanical spring return



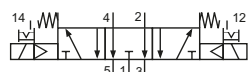
M-22-520-HN-xxx
5/2-way, double solenoid



ME-22-520-HN-xxx
5/2-way, double solenoid, external pilot pressure



M-22-530-HN-xxx
5/3-way, center position closed



M-22-533-HN-xxx
5/3-way, center position exhausted

Please complete: xxx = electrical option

Electrical options

Nominal voltage	Power consumption	Specifics	Plug connection*1	-xxx
12 V DC	4.2 W		Form B industrial norm	-411
12 V DC	2.2 W	max. 8 bar	Form B industrial norm	-431
24 V DC	4.2 W		Form B industrial norm	-412
24 V DC	4.8 W		M 12	-O12
24 V DC	2.2 W	max. 8 bar	Form B industrial norm	-432
24 V DC	2.5 W	max. 8 bar	M 12	-O32
24 V AC	7/4 VA		Form B industrial norm	-422
115 V AC	7/4 VA		Form B industrial norm	-426
230 V AC	7/4 VA		Form B industrial norm	-427

*1 Plug socket not included, suitable plug sockets see page 4-38.

Series M-22

Technical data

Model-no.:	M-22-310	MO-22-310	M-22-311	MO-22-311	ME-22-311	M-22-320	ME-22-320
Operating pressure* (bar)	1 ... 10	1 ... 10	2 ... 10	2 ... 10	0 ... 10	1 ... 10	0 ... 10
Pilot pressure* (bar)	1 ... 10	1 ... 10	2 ... 10	2 ... 10	2 ... 10	1 ... 10	1 ... 10
Flow rate (l/min)	3300	3300	3300	3300	3300	3300	3300
Response time (ms) at 6 bar	on: 30 off: 58	on: 30 off: 58	on: 28 off: 68	on: 28 off: 68	on: 28 off: 68	on: 20 off: 20	on: 20 off: 20
Weight (kg)	0.910	0.910	0.965	0.965	0.965	0.984	0.984

Model-no.:	M-22-510	M-22-511	ME-22-511	M-22-520	ME-22-520	M-22-530	M-22-533
Operating pressure* (bar)	1 ... 10	2 ... 10	0 ... 10	1 ... 10	0 ... 10	3 ... 10	3 ... 10
Pilot pressure* (bar)	1 ... 10	2 ... 10	2 ... 10	1 ... 10	1 ... 10	3 ... 10	3 ... 10
Flow rate (l/min)	3300	3300	3300	3300	3300	3300	3300
Response time (ms) at 6 bar	on: 30 off: 59	on: 20 off: 80	on: 20 off: 80	on: 22 off: 22	on: 22 off: 22	on: 30 off: 50	on: 30 off: 50
Weight (kg)	1.150	1.180	1.160	1.260	1.260	1.250	1.250

* max. 8 bar at 2.2 W and 2.5 W

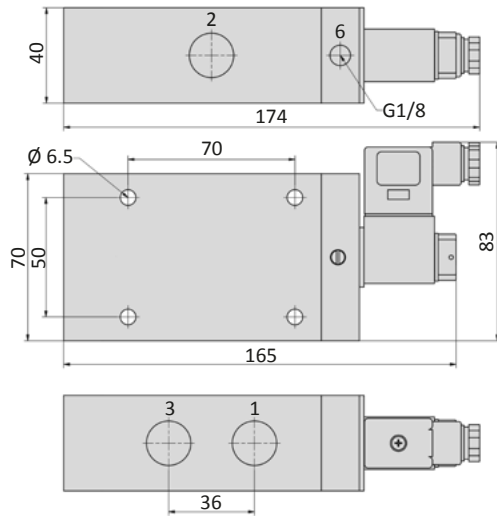
Accessories



Plug sockets: page 4-38

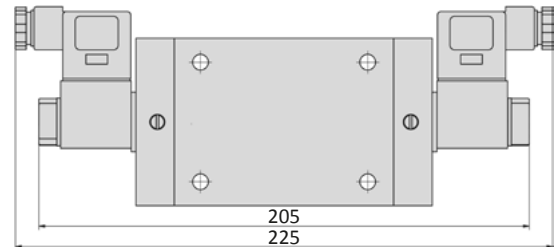
Dimensions

M-22-31x-HN, MO-22-31x-HN*, ME-22-31x-HN



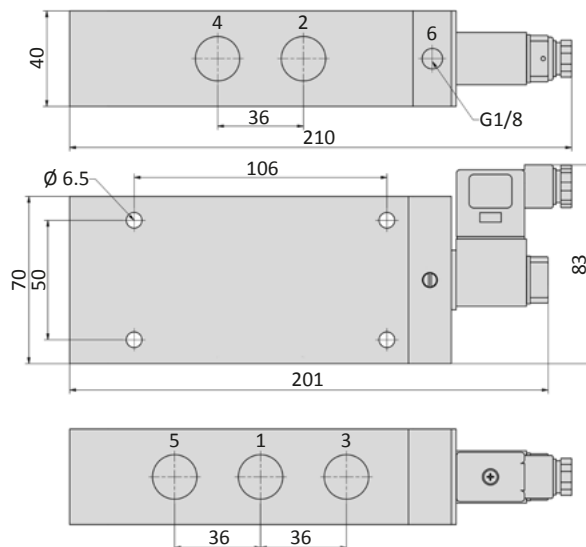
*For the NO version MO-22 the ports 1 and 3 are inverted.

M-22-320-HN, ME-22-320-HN



4

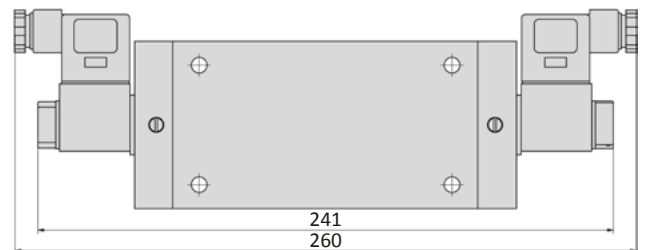
M-22-51x-HN, ME-22-511-HN



- 1 = pressure inlet
2,4 = outlets
3,5 = exhausts
6 = external pilot pressure supply (only at ME-valves)

Plug socket (not included in scope of delivery) can be repositioned by 180°.
Solenoid coil can be repositioned by 4 x 90°.


M-22-520-HN, ME-22-520-HN, M-22-53x-HN



Series KM-09 and KM-10



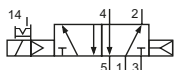
Technical details

Connection	KM-09: G1/8 KM-10: G1/4
Nominal size	KM-09: 6 mm KM-10: 9 mm
Temperature range	-10°C ... +70°C
Medium	Filtered, oil-free and dried compressed air according to ISO 8573-1:2010, Class 7:2:4, instrument air, free of aggressive additives. Alternatively the pressure dew point must be at least 10°C below lowest occurring ambient temperature.
Materials	Body: Al (anodized), plastic, seals: NBR, inner parts: Al, stainless steel and brass
Protection	IP 65 according to EN 60529
	Valves in accordance with 2014/34/EU (ATEX) available. (Chapter 13)

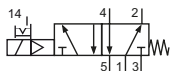


Electrically operated spool valve. The manual override is detent and is operated by screwdriver.

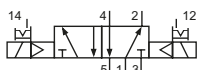
5/2-way valves



KM-09-510-HN-xxx
KM-10-510-HN-xxx
5/2-way, single solenoid, air spring return

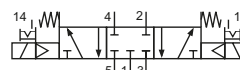


KM-09-511-HN-xxx
KM-10-511-HN-xxx
5/2-way, single solenoid, mechanical spring return

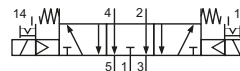


KM-09-520-HN-xxx
KM-10-520-HN-xxx
5/2-way, double solenoid

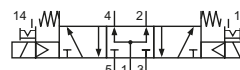
5/3-way valves



KM-09-530-HN-xxx
KM-10-530-HN-xxx
5/3-way, center position closed



KM-09-533-HN-xxx
KM-10-533-HN-xxx
5/3-way, center position exhausted



KM-09-534-HN-xxx
KM-10-534-HN-xxx
5/3-way, center position pressurized

Please complete: xxx = electrical option

Electrical options

Nominal voltage	Power consumption	Specifics	Plug connection*1	-xxx Manual override on same side of ports	
				2 and 4	1, 3 and 5
12 V DC	4.2 W		Form B industrial norm	-441	-411
12 V DC	2.2 W	max. 8 bar	Form B industrial norm	-461	-431
24 V DC	4.2 W		Form B industrial norm	-442	-412
24 V DC	4.8 W		M 12	-O42	-O12
24 V DC	2.2 W	max. 8 bar	Form B industrial norm	-462	-432
24 V DC	2.5 W	max. 8 bar	M 12	-O62	-O32
24 V AC	7/4 VA		Form B industrial norm	-452	-422
115 V AC	7/4 VA		Form B industrial norm	-456	-426
230 V AC	7/4 VA		Form B industrial norm	-457	-427

*1 Plug socket not included, suitable plug sockets see page 4-38.

Series KM-09 and KM-10

Technical data

Model-no.:	KM-09-510	KM-09-511	KM-09-520	KM-09-530	KM-09-533	KM-09-534
Operating pressure* (bar)	3 ... 10	3 ... 10	3 ... 10	3 ... 10	3 ... 10	3 ... 10
Pilot pressure* (bar)	3 ... 10	3 ... 10	3 ... 10	3 ... 10	3 ... 10	3 ... 10
Flow rate (NI/min)	950	810	950	680	680	680
Response time (ms) at 6 bar	on: 15 off: 16	on: 13 off: 28	on: 15 off: 15	on: 14 off: 16	on: 14 off: 16	on: 14 off: 16
Weight (kg)	0.230	0.231	0.330	0.330	0.330	0.330

Model-no.:	KM-10-510	KM-10-511	KM-10-520	KM-10-530	KM-10-533	KM-10-534
Operating pressure* (bar)	2.5 ... 10	2.5 ... 10	2.5 ... 10	3 ... 10	3 ... 10	3 ... 10
Pilot pressure* (bar)	2.5 ... 10	2.5 ... 10	2.5 ... 10	3 ... 10	3 ... 10	3 ... 10
Flow rate (NI/min)	2100	1800	2100	1500	1500	1500
Response time (ms) at 6 bar	on: 18 off: 19	on: 16 off: 27	on: 18 off: 18	on: 16 off: 22	on: 16 off: 22	on: 16 off: 22
Weight (kg)	0.470	0.470	0.630	0.630	0.630	0.630

* max. 8 bar at 2.2 W and 2.5 W

Accessories



Plug sockets: page 4-38



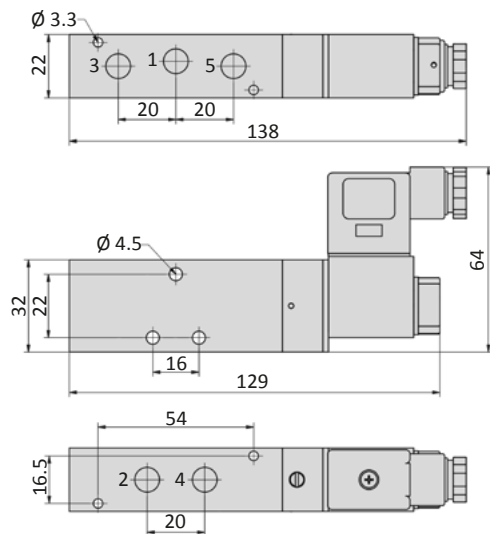
Manifolds and accessories: page 4-21



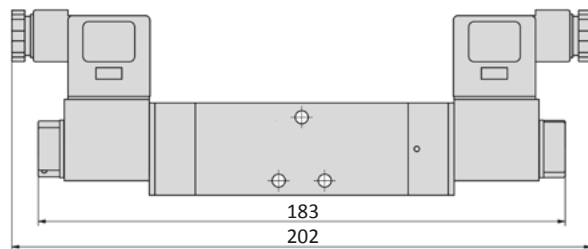
Series KM-09 and KM-10

Dimensions

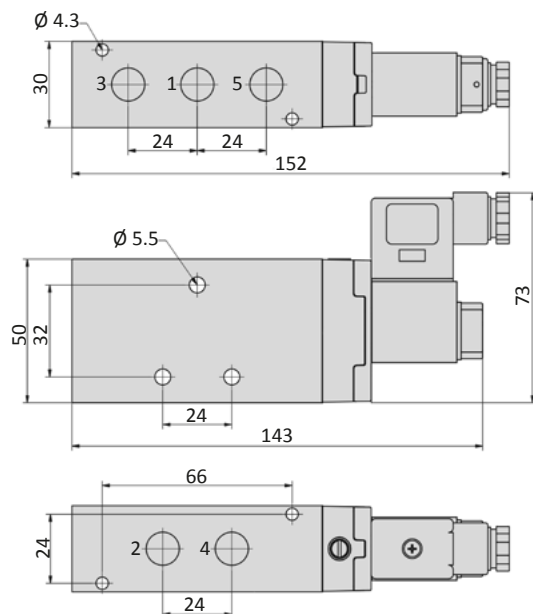
KM-09-51x-HN



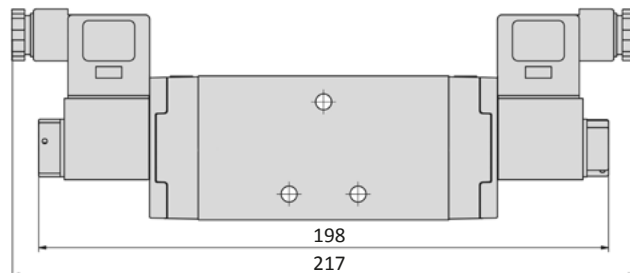
KM-09-520-HN, KM-09-53x-HN



KM-10-51x-HN



KM-10-520-HN, KM-10-53x-HN



- 1 = pressure inlet
- 2,4 = outlets
- 3,5 = exhausts

Plug socket (not included in scope of delivery) can be repositioned by 180°.
Solenoid coil can be repositioned by 4 x 90°.

General information

The RF-09/n and RF-10/n manifolds are suitable for the KM-09 and KM-10 valve series. This is a modular system and extendable.

The RF-09 and RF-10 can be combined into one manifold with different valve sizes.

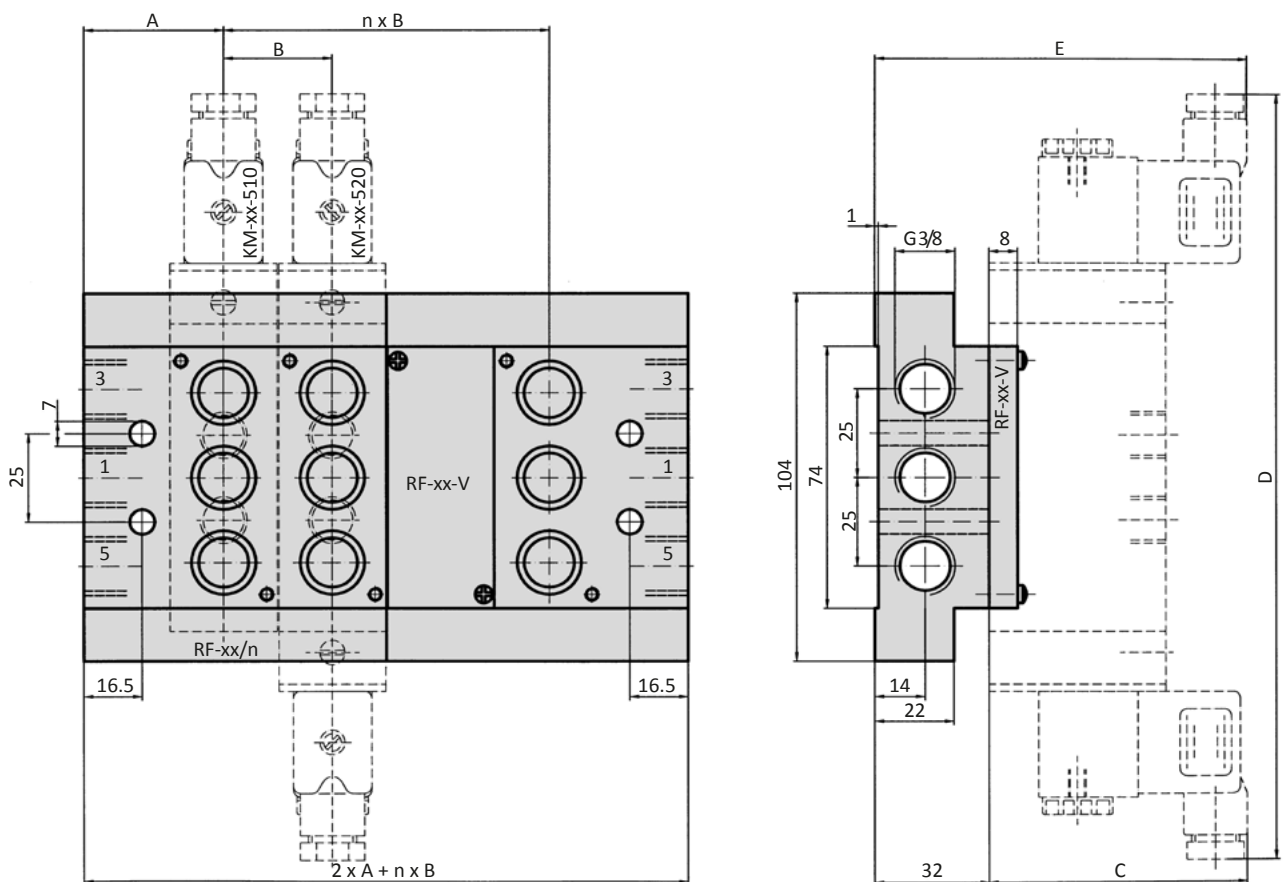
Blind plates RF-09-V and RF-10-V are available for blank stations.

All mounting screws and o-rings are included.



4

Dimensions



n = number of stations
1 = pressure inlet
3,5 = exhausts

Model-no.:	A	B	C	D	E
RF-09/n	35.25	22.5	64	202	96
RF-10/n	39.25	30.5	73	217	105

Model-no.:	n	1	2	3	4	5	6	7	8
Weight (kg)	RF-09/n	0.415	0.550	0.680	0.810	0.990	1.060	1.190	1.320
	RF-10/n	0.470	0.660	0.850	1.040	1.250	1.380	1.570	1.760

Model-no.:	n	9	10	11	12	13	14	15	16
Weight (kg)	RF-09/n	1.500	1.565	1.700	1.830	2.010	2.075	2.210	2.340
	RF-10/n	1.970	2.100	2.290	2.480	2.690	2.820	3.010	3.200

Series BM-01 and BM-02



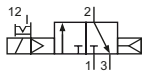
Technical details

Connection	BM-01: G1/8 BM-02: G1/4
Nominal size	BM-01: 5 mm BM-02: 7 mm
Temperature range	-10°C ... +60°C
Medium	Filtered, oil-free and dried compressed air according to ISO 8573-1:2010, Class 7:2:4, instrument air, free of aggressive additives. Alternatively the pressure dew point must be at least 10°C below lowest occurring ambient temperature.
Materials	Body: Al (anodized), plastic, seals: NBR, FKM and PU, inner parts: Al, steel and plastic
Protection	IP 65 according to EN 60529

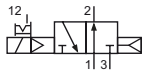


Electrically operated spool valve. The manual override is non-detent (HNT) or detent (HNR) and is operated by bolt or screwdriver.

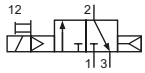
3/2-way valves



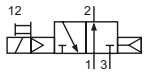
BM-01-310-HNR-xxx
BM-02-310-HNR-xxx
3/2-way, single solenoid, air spring return, NC



BM-01-312-HNR-xxx
BM-02-312-HNR-xxx
3/2-way, single solenoid, air spring return, NO

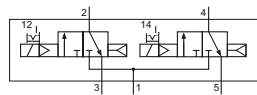


BM-01-310-HNT-xxx
BM-02-310-HNT-xxx
3/2-way, single solenoid, air spring return, NC

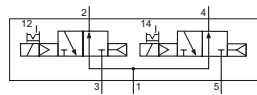


BM-01-312-HNT-xxx
BM-02-312-HNT-xxx
3/2-way, single solenoid, air spring return, NO

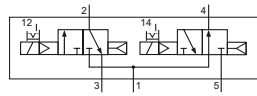
2 x 3/2-way valves



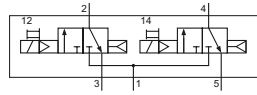
BM-01-310/2-HNR-xxx
BM-02-310/2-HNR-xxx
2 x 3/2-way, single solenoid, air spring return, NC



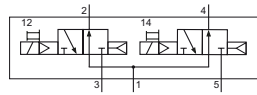
BM-01-312/2-HNR-xxx
BM-02-312/2-HNR-xxx
2 x 3/2-way, single solenoid, air spring return, NO



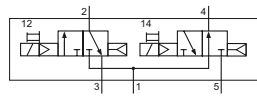
BM-01-314/2-HNR-xxx
BM-02-314/2-HNR-xxx
2 x 3/2-way, single solenoid, air spring return, 1 x NC, 1 x NO



BM-01-310/2-HNT-xxx
BM-02-310/2-HNT-xxx
2 x 3/2-way, single solenoid, air spring return, NC



BM-01-312/2-HNT-xxx
BM-02-312/2-HNT-xxx
2 x 3/2-way, single solenoid, air spring return, NO



BM-01-314/2-HNT-xxx
BM-02-314/2-HNT-xxx
2 x 3/2-way, single solenoid, air spring return, 1 x NC, 1 x NO

Please complete: xxx = electrical option

Electrical options

Nominal voltage	Power consumption	Specifics	Plug connection ^{*1}	-xxx electrical pins on same side of ports	
				2 or 2 and 4	1, 3 or 1, 3 and 5
12 V DC	1 W		Form C	-461	-431
24 V DC	1 W		Form C	-462	-432
24 V DC	1 W		M12	-N62	-
24 V AC	3 VA		Form C	-452	-422
115 V AC	3 VA		Form C	-456	-426
230 V AC	3 VA		Form C	-457	-427

^{*1} Plug socket not included, suitable plug sockets see page 4-39.

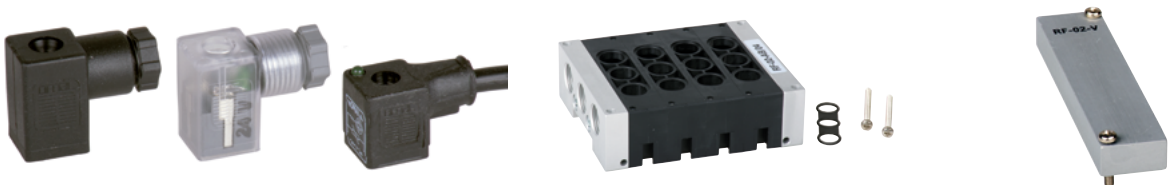
Series BM-01 and BM-02

Technical data

Model-no.:	BM-01-310	BM-01-312	BM-01-310/2	BM-01-312/2	BM-01-314/2
Operating pressure (bar)	2 ... 8	2 ... 8	2 ... 8	2 ... 8	2 ... 8
Pilot pressure (bar)	2 ... 8	2 ... 8	2 ... 8	2 ... 8	2 ... 8
Flow rate (NI/min)	660	600	650	550	580
Response time (ms) at 6 bar	on: 19 off: 32	on: 16 off: 30	on: 18 off: 34	on: 18 off: 34	on: 18 off: 34
Weight (kg)	0.108	0.110	0.154	0.154	0.154

Model-no.:	BM-02-310	BM-02-312	BM-02-310/2	BM-02-312/2	BM-02-314/2
Operating pressure (bar)	2 ... 8	2 ... 8	2 ... 8	2 ... 8	2 ... 8
Pilot pressure (bar)	2 ... 8	2 ... 8	2 ... 8	2 ... 8	2 ... 8
Flow rate (NI/min)	1090	920	1050	1030	NC: 1050. NO: 920
Response time (ms) at 6 bar	on: 19 off: 23	on: 25 off: 27	on: 22 off: 24	on: 22 off: 24	on: 22 off: 24
Weight (kg)	0.150	0.150	0.250	0.250	0.250

Accessories



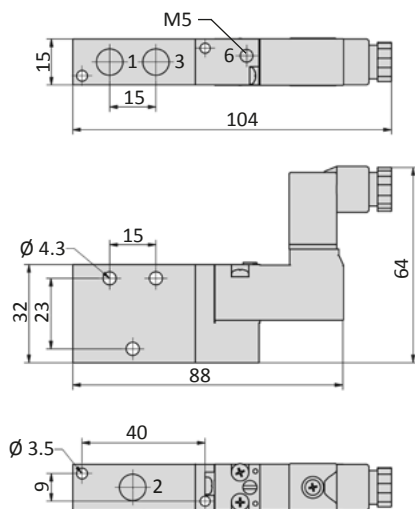
Plug sockets: page 4-39

Manifolds and accessories: page 4-29

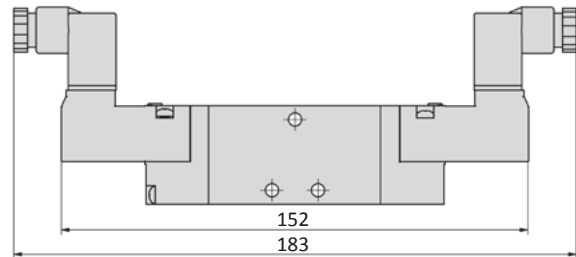
Series BM-01 and BM-02

Dimensions

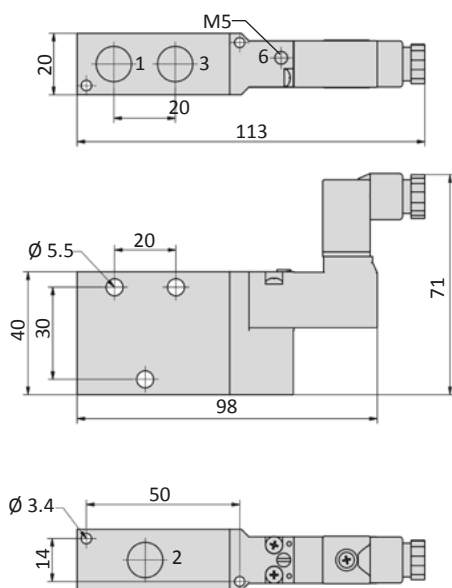
BM-01-31x-HNx



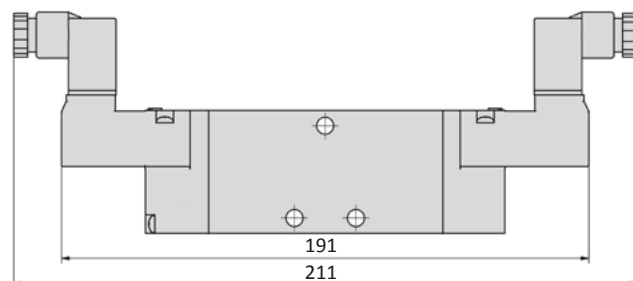
BM-01-31x/2-HNx



BM-02-31x-HNx



BM-02-31x/2-HNx

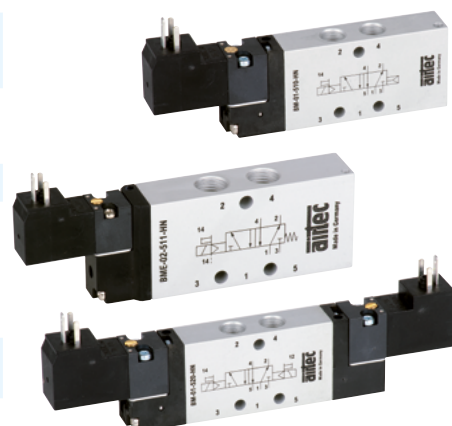


- 1 = pressure inlet
- 2,4 = outlets
- 3,5 = exhausts
- 6 = pilot air exhaust (only at BM-valves)
- 6 = external pilot pressure supply (only at BME-valves)

Plug socket (not included in scope of delivery) can be repositioned by 180°.

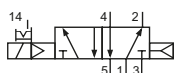
Technical details

Connection	BM-01: G1/8 BM-02: G1/4
Nominal size	BM-01: 5 mm BM-02: 7 mm
Temperature range	-10°C ... +60°C
Medium	Filtered, oil-free and dried compressed air according to ISO 8573-1:2010, Class 7:2:4, instrument air, free of aggressive additives. Alternatively the pressure dew point must be at least 10°C below lowest occurring ambient temperature.
Materials	Body: Al (anodized), plastic, seals: NBR, FKM and PU, inner parts: Al, steel and plastic
Protection	IP 65 according to EN 60529

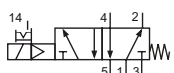


Electrically operated spool valve. The manual override is non-detent or detent and is operated by bolt or screwdriver.

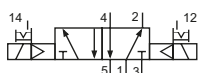
5/2-way valves



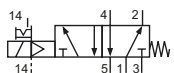
BM-01-510-HNR-xxx
BM-02-510-HNR-xxx
5/2-way, single solenoid, air spring return



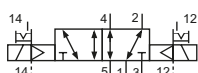
BM-01-511-HNR-xxx
BM-02-511-HNR-xxx
5/2-way, single solenoid, mechanical spring return



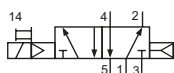
BM-01-520-HNR-xxx
BM-02-520-HNR-xxx
5/2-way, double solenoid



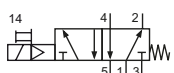
BME-01-511-HNR-xxx
BME-02-511-HNR-xxx
5/2-way, single solenoid, external pilot pressure, mechanical spring return



BME-01-520-HNR-xxx
BME-02-520-HNR-xxx
5/2-way, double solenoid, external pilot pressure



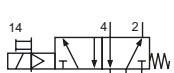
BM-01-510-HNT-xxx
BM-02-510-HNT-xxx
5/2-way, single solenoid, air spring return



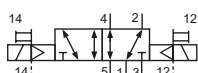
BM-01-511-HNT-xxx
BM-02-511-HNT-xxx
5/2-way, single solenoid, mechanical spring return



BM-01-520-HNT-xxx
BM-02-520-HNT-xxx
5/2-way, double solenoid



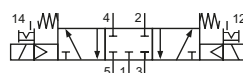
BME-01-511-HNT-xxx
BME-02-511-HNT-xxx
5/2-way, single solenoid, external pilot pressure, mechanical spring return



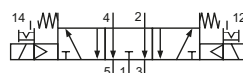
BME-01-520-HNT-xxx
BME-02-520-HNT-xxx
5/2-way, double solenoid, external pilot pressure

Please complete: xxx = electrical option

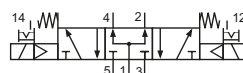
5/3-way valves



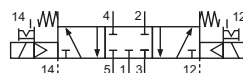
BM-01-530-HNR-xxx
BM-02-530-HNR-xxx
5/3-way, center position closed



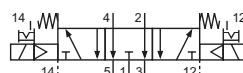
BM-01-533-HNR-xxx
BM-02-533-HNR-xxx
5/3-way, center position exhausted



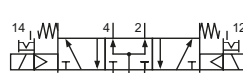
BM-01-534-HNR-xxx
BM-02-534-HNR-xxx
5/3-way, center position pressurized



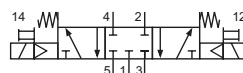
BME-01-530-HNR-xxx
BME-02-530-HNR-xxx
5/3-way, center position closed, external pilot pressure



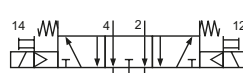
BME-01-533-HNR-xxx
BME-02-533-HNR-xxx
5/3-way, center position exhausted, external pilot pressure



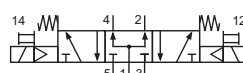
BME-01-534-HNR-xxx
BME-02-534-HNR-xxx
5/3-way, center position pressurized, external pilot pressure



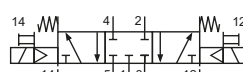
BM-01-530-HNT-xxx
BM-02-530-HNT-xxx
5/3-way, center position closed



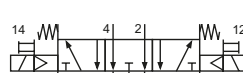
BM-01-533-HNT-xxx
BM-02-533-HNT-xxx
5/3-way, center position exhausted



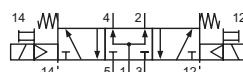
BM-01-534-HNT-xxx
BM-02-534-HNT-xxx
5/3-way, center position pressurized



BME-01-530-HNT-xxx
BME-02-530-HNT-xxx
5/3-way, center position closed, external pilot pressure



BME-01-533-HNT-xxx
BME-02-533-HNT-xxx
5/3-way, center position exhausted, external pilot pressure



BME-01-534-HNT-xxx
BME-02-534-HNT-xxx
5/3-way, center position pressurized, external pilot pressure

Series BM-01 and BM-02

Electrical options

Nominal voltage	Power consumption	Specifics	Plug connection* ¹	-XXX electrical pins on same side of ports	
				2 and 4	1. 3 and 5
12 V DC	1 W		Form C	-461	-431
24 V DC	1 W		Form C	-462	-432
24 V DC	1 W		M12	-N62	-
24 V AC	3 VA		Form C	-452	-422
115 V AC	3 VA		Form C	-456	-426
230 V AC	3 VA		Form C	-457	-427

*¹ Plug socket not included. suitable plug sockets see page 4-39.

Technical data

Model-no.:	BM-01-510	BM-01-511	BM-01-520	BME-01-511	BME-01-520
Operating pressure (bar)	2 ... 8	3 ... 8	2 ... 8	-0.95 ... 8	-0.95 ... 8
Pilot pressure (bar)	2 ... 8	3 ... 8	2 ... 8	3 ... 8	2 ... 8
Flow rate (NI/min)	780	800	790	800	790
Response time (ms) at 6 bar	on: 17 off: 32	on: 15 off: 35	on: 13 off: 13	on: 15 off: 35	on: 13 off: 13
Weight (kg)	0.118	0.120	0.156	0.126	0.168

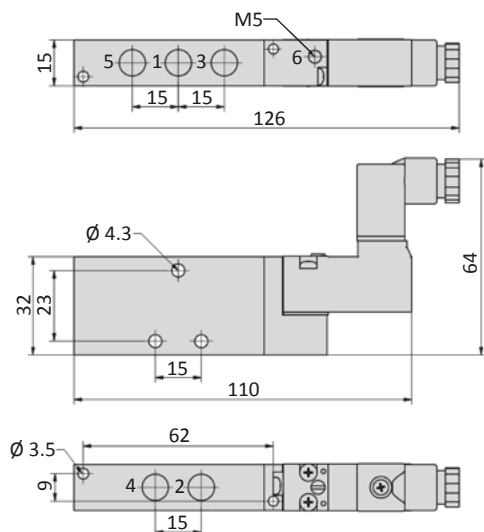
Model-no.:	BM-01-530	BM-01-533	BM-01-534	BME-01-530	BME-01-533	BME-01-534
Operating pressure (bar)	3 ... 8	3 ... 8	3 ... 8	-0.95 ... 8	-0.95 ... 8	-0.95 ... 8
Pilot pressure (bar)	3 ... 8	3 ... 8	3 ... 8	3 ... 8	3 ... 8	3 ... 8
Flow rate (NI/min)	690	670	1030	690	670	1030
Response time (ms) at 6 bar	on: 17 off: 17	on: 16 off: 43	on: 17 off: 49	on: 17 off: 17	on: 16 off: 43	on: 17 off: 49
Weight (kg)	0.154	0.154	0.154	0.166	0.166	0.166

Model-no.:	BM-02-510	BM-02-511	BM-02-520	BME-02-511	BME-02-520
Operating pressure (bar)	2 ... 8	3 ... 8	2 ... 8	-0.95 ... 8	-0.95 ... 8
Pilot pressure (bar)	2 ... 8	3 ... 8	2 ... 8	3 ... 8	2 ... 8
Flow rate (NI/min)	1700	1600	1540	1600	1540
Response time (ms) at 6 bar	on: 23 off: 33	on: 13 off: 35	on: 11 off: 11	on: 13 off: 35	on: 11 off: 11
Weight (kg)	0.220	0.220	0.270	0.220	0.270

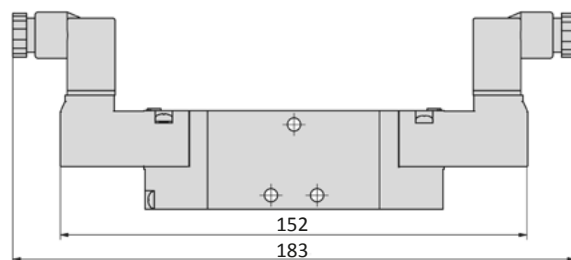
Model-no.:	BM-02-530	BM-02-533	BM-02-534	BME-02-530	BME-02-533	BME-02-534
Operating pressure (bar)	3 ... 8	3 ... 8	3 ... 8	-0.95 ... 8	-0.95 ... 8	-0.95 ... 8
Pilot pressure (bar)	3 ... 8	3 ... 8	3 ... 8	3 ... 8	3 ... 8	3 ... 8
Flow rate (NI/min)	1300	1470	1660	1300	1470	1660
Response time (ms) at 6 bar	on: 20 off: 26	on: 26 off: 28	on: 26 off: 33	on: 20 off: 26	on: 26 off: 28	on: 26 off: 33
Weight (kg)	0.260	0.260	0.260	0.260	0.260	0.260

Dimensions

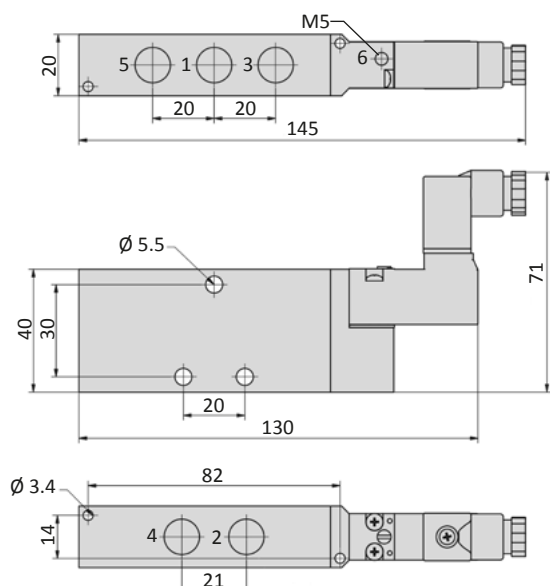
BM-01-51x-HNx, BME-01-51x-HNx



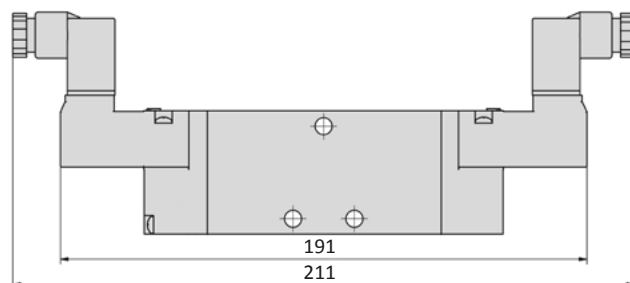
BM-01-520-HNx, BME-01-520-HNx, BM-01-53x-HNx, BME-01-53x-HNx



BM-02-51x-HNx, BME-02-51x-HNx



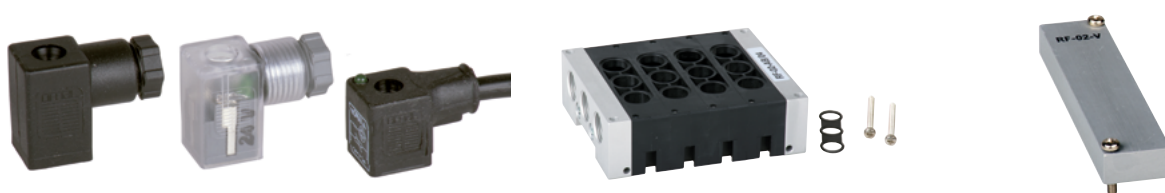
BM-02-520-HNx, BME-02-520-HNx, BM-02-53x-HNx, BME-02-53x-HNx



- 1 = pressure inlet
- 2,4 = outlets
- 3,5 = exhausts
- 6 = pilot air exhaust

Plug socket (not included in scope of delivery) can be repositioned by 180°.

Accessories



Plug sockets: page 4-39

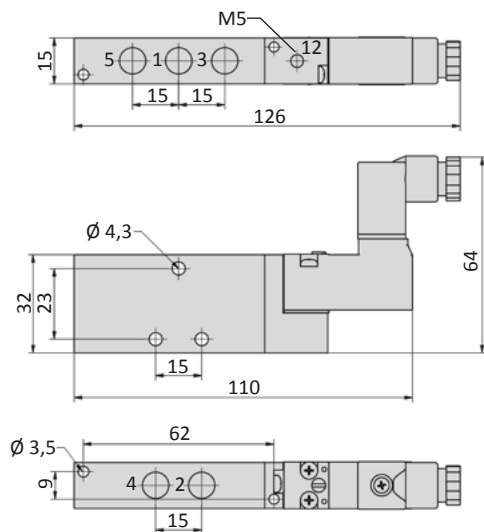
Manifolds and accessories: page 4-29

Series BM-01 and BM-02

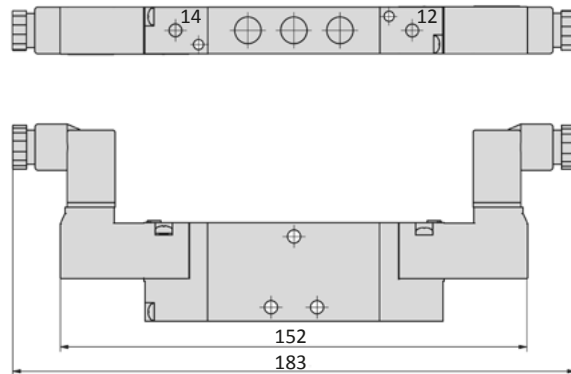


Dimensions

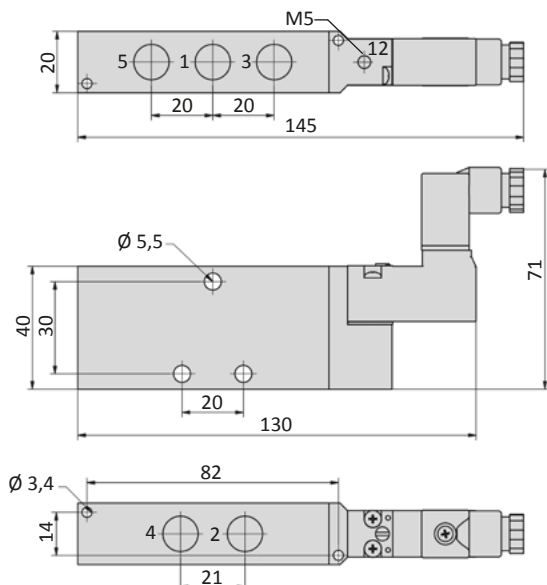
BME-01-51x-HNx



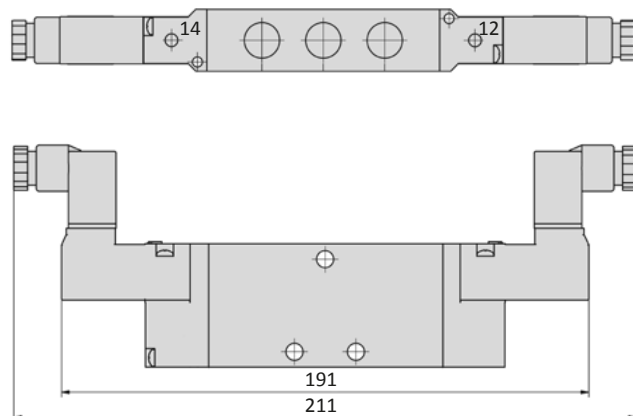
BME-01-520-HNx, BME-01-53x-HNx



BME-02-51x-HNx



BME-02-520-HNx, BME-02-53x-HNx



- 1 = pressure inlet
- 2,4 = outlets
- 3,5 = exhausts
- 12,14 = external pilot pressure supply

Plug socket (not included in scope of delivery) can be repositioned by 180°.

Accessories



Plug sockets: page 4-39



Manifolds and accessories: page 4-29



Series BM-01 and BM-02

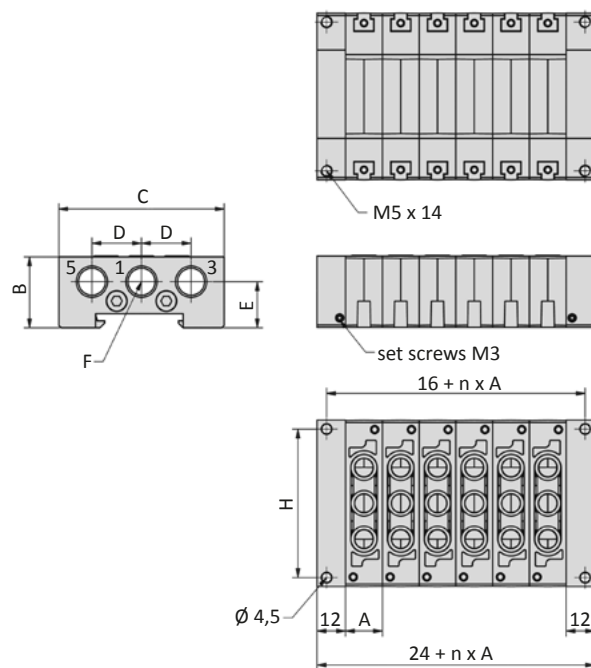
General information

The RF-01-xx/n and RF-02-xx/n manifolds are suitable for the BM-01 and BM-02 valve series. The system is modular and can be extended up to 12 stations. Blind plates RF-01-V and RF-02-V are available. All mounting screws and gaskets are included.

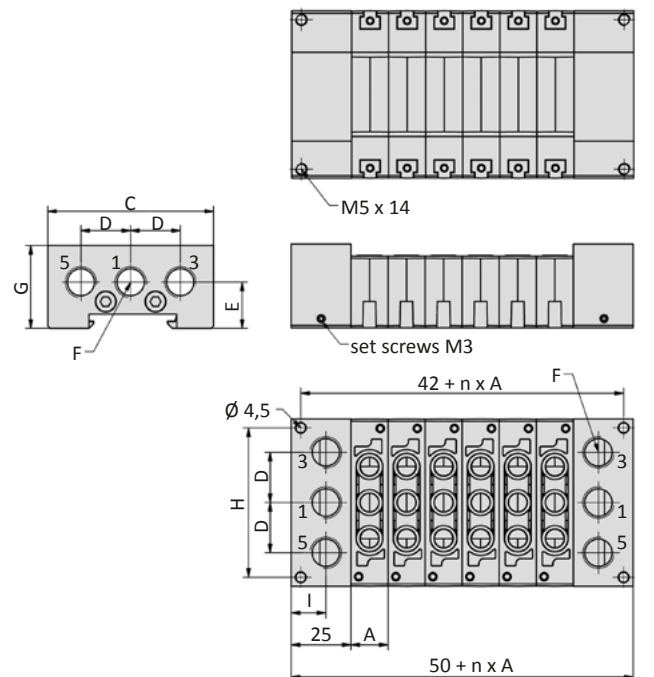


Dimensions

RF-01-AB, RF-02-AB



RF-01-CD, RF-02-CD



n = number of stations
1 = pressure inlet
3,5 = exhausts

Model-no.:	A	B	C	D	E	F	G	H	I
RF-01-xx/n	15.7	30	70	21	19.5	G1/4	35	62.5	14.5
RF-02-xx/n	20.5	32	90	25	20	G3/8	38	82	12.5

Model-no.:	nn	02	03	04	05	06	07	08	09	10	11	12
Weight (kg)	RF-01-AB/nn	0.150	0.190	0.230	0.270	0.310	0.350	0.390	0.430	0.470	0.510	0.550
	RF-02-AB/nn	0.230	0.270	0.310	0.350	0.390	0.430	0.470	0.510	0.550	0.590	0.630

Model-no.:	nn	02	03	04	05	06	07	08	09	10	11	12
Weight (kg)	RF-01-CD/nn	0.300	0.340	0.380	0.420	0.460	0.500	0.540	0.580	0.620	0.660	0.700
	RF-02-CD/nn	0.420	0.460	0.500	0.540	0.580	0.620	0.660	0.700	0.740	0.780	0.820

Series M-20

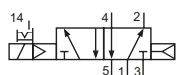
Technical details

Connection	M5
Nominal size	3 mm
Temperature range	-10°C ... +70°C
Medium	Filtered, oil-free and dried compressed air according to ISO 8573-1:2010, Class 7:2:4, instrument air, free of aggressive additives. Alternatively the pressure dew point must be at least 10°C below lowest occurring ambient temperature.
Materials	Body: Al (anodized), plastic, seals: NBR, inner parts: Al, steel and plastic
Protection	IP 65 according to EN 60529

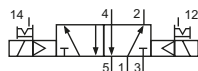


Electrically operated pool valve. The manual override is detent and is operated by screwdriver.

5/2-way valves

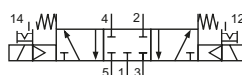


M-20-510-HN-xxx
5/2-way, single solenoid, air spring return

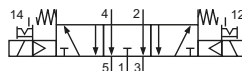


M-20-520-HN-xxx
5/2-way, double solenoid

5/3-way valves



M-20-530-HN-xxx
5/3-way, center position closed



M-20-533-HN-xxx
5/3-way, center position exhausted

Please complete: xxx = electrical option

Electrical options

Nominal voltage	Power consumption	Specifics	Plug connection ^{*1}	-xxx
12 V DC	2 W		Form C industrial norm	-411
24 V DC	2 W		Form C industrial norm	-412

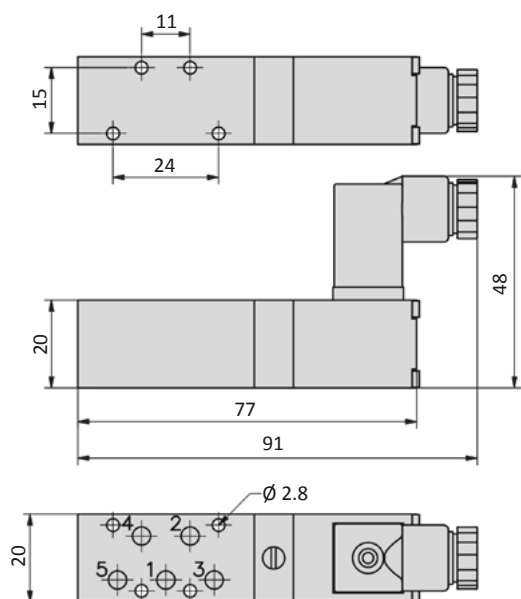
^{*1} Plug socket not included, suitable plug sockets see page 4-39.

Technical data

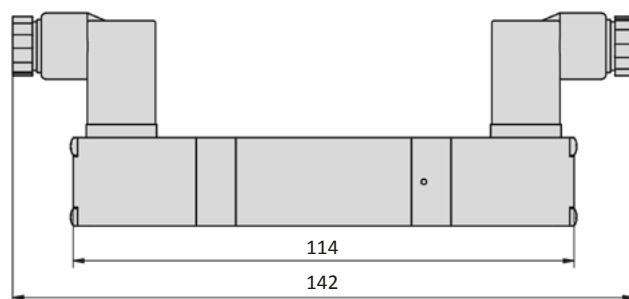
Model-no.:	M-20-510	M-20-520	M-20-530	M-20-533
Operating pressure (bar)	2.5 ... 8	2.5 ... 8	3 ... 8	3 ... 8
Pilot pressure (bar)	2.5 ... 8	2.5 ... 8	3 ... 8	3 ... 8
Flow rate (NI/min)	220	220	220	220
Response time (ms) at 6 bar	on: 12 off: 12	on: 11 off: 11	on: 15 off: 22	on: 15 off: 22
Weight (kg)	0.098	0.156	0.162	0.162

Dimensions

M-20-510-HN



M-20-520-HN, M-20-53x-HN



- 1 = pressure inlet
- 2,4 = outlets
- 3,5 = exhausts

Plug socket (not included in scope of delivery) can be repositioned by 180°.
Solenoid coil and manual override can be repositioned by 4 x 90°.

Accessories




Plug sockets: page 4-39

Series MS-18



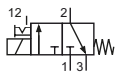
Technical details

Connection	G1/8
Nominal size	1.4 mm
Temperature range	-10°C ... +70°C
Medium	Filtered, oil-free and dried compressed air according to ISO 8573-1:2010, Class 7:2:4, instrument air, free of aggressive additives. Alternatively the pressure dew point must be at least 10°C below lowest occurring ambient temperature.
Materials	Body: Al (anodized), plastic, seals: NBR, inner parts: Al, steel and plastic
Protection	IP 65 according to EN 60529
	Valves in accordance with 2014/34/EU (ATEX) available. (Chapter 13)

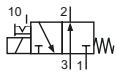


Electrically operated poppet valve. The manual override is detent and is operated by screwdriver.

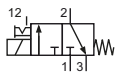
3/2-way valves



MS-18-310-HN-xxx
3/2-way, single solenoid, mechanical spring return, NC



MSO-18-310-HN-xxx
3/2-way, single solenoid, mechanical spring return, NO



MS-18-310/n-HN-xxx
3/2-way, single solenoid, mechanical spring return, NC

Please complete: xxx = electrical option
n = number of stations (2 to 6)

Electrical options

Nominal voltage	Power consumption	Specifics	Plug connection ^{*1}	-xxx
12 V DC	4.2 W		Form B industrial norm	-411
12 V DC	2.2 W	max. 8 bar	Form B industrial norm	-431
24 V DC	4.2 W		Form B industrial norm	-412
24 V DC	4.8 W		M 12	-O12
24 V DC	2.2 W	max. 8 bar	Form B industrial norm	-432
24 V DC	2.5 W	max. 8 bar	M 12	-O32
24 V AC	7/4 VA		Form B industrial norm	-422
115 V AC	7/4 VA		Form B industrial norm	-426
230 V AC	7/4 VA		Form B industrial norm	-427

^{*1} Plug socket not included. suitable plug sockets see page 4-38.

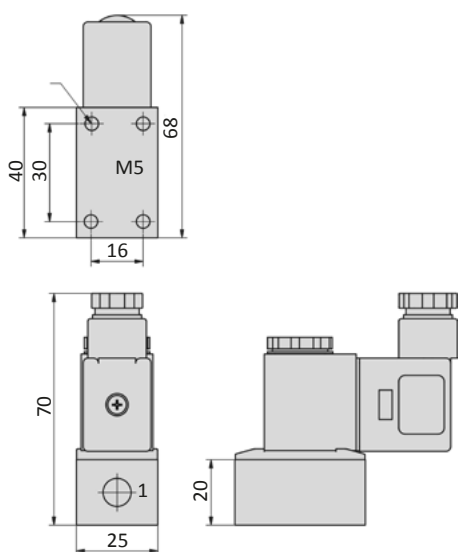
Technical data

Model-no.:	MS-18-310	MSO-18-310	MS-18-310/n
Pressure range* (bar)	- 0.95 ... 10	- 0.95 ... 10	- 0.95 ... 10
Flow rate (NI/min)	56	56	56
Response time (ms) at 6 bar	on: 10 off: 12	on: 10 off: 12	on: 10 off: 12
Weight (kg)	0.150	0.150	0.150 + 0.140 * n

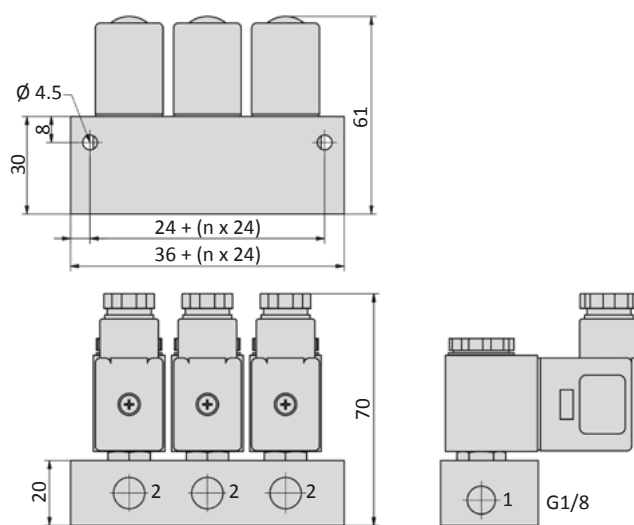
* max. 8 bar at 2.2 W and 2.5 W

Dimensions

MS-18-310-HN



MS-18-310/n-HN



n = number of stations (2 to 6)

- 1 = pressure inlet (outlet by MSO)
- 2 = outlet
- 3 = exhaust (pressure inlet by MSO)

Plug socket (not included in scope of delivery) can be repositioned by 180°.
Solenoid coil can be repositioned by 4 x 90°.

Accessories



Plug sockets: page 4-38

Series MS-20

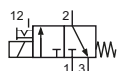
Technical details

Connection	M5
Nominal size	1.2 mm
Temperature range	-10°C ... +70°C
Medium	Filtered, oil-free and dried compressed air according to ISO 8573-1:2010, Class 7:2:4, instrument air, free of aggressive additives. Alternatively the pressure dew point must be at least 10°C below lowest occurring ambient temperature.
Materials	Body: Al (anodized), seals: NBR, inner parts: Al, steel and plastic
Protection	IP 65 according to EN 60529

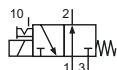


Electrically operated poppet valve. The manual override is detent and is operated by screwdriver.

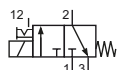
3/2-way-valves



MS-20-310-HN-xxx
3/2-way, single solenoid, mechanical
spring return, NC



MSO-20-310-HN-xxx
3/2-way, single solenoid, mechanical
spring return, NO



MS-20-310/n-HN-xxx
3/2-way, single solenoid, mechanical
spring return, NC

Please complete: xxx = electrical option
n = number of stations (2 to 6)

Electrical options

Nominal voltage	Power consumption	Specifics	Plug connection ^{*1}	-xxx
12 V DC	2 W		Form C industrial norm	-411
24 V DC	2 W		Form C industrial norm	-412

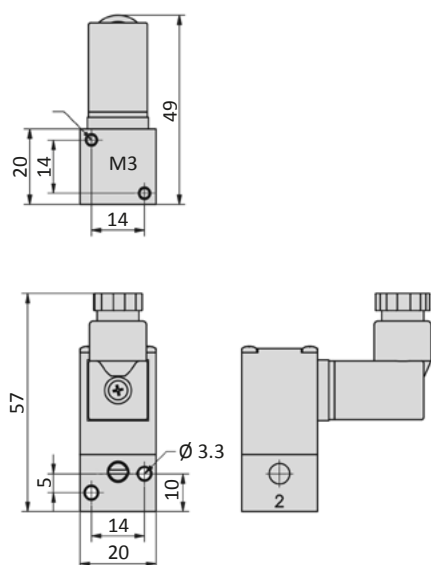
^{*1} Plug socket not included, suitable plug sockets see page 4-39.

Technical data

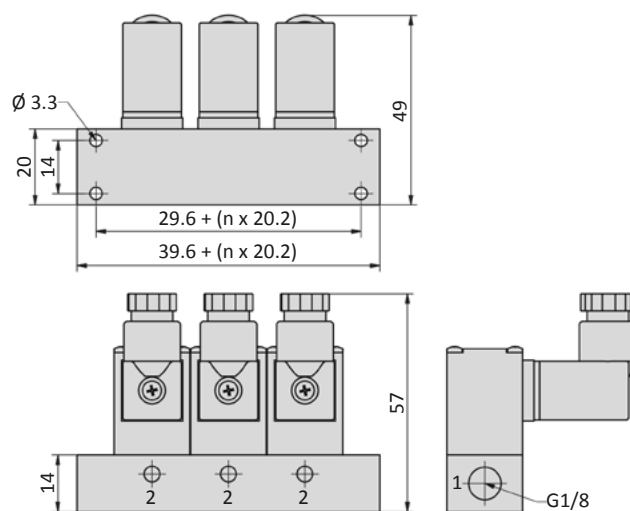
Model-no.:	MS-20-310	MSO-20-310	MS-20-310/n
Pressure range (bar)	-0.95 ... 8	-0.95 ... 8	-0.95 ... 8
Pilot pressure (bar)	-	-	-
Flow rate (NI/min)	38	38	38
Response time (ms) at 6 bar	on: 8 off: 8	on: 8 off: 8	on: 8 off: 8
Weight (kg)	0.064	0.064	0.01 + 0.066 x n

Dimensions

MS-20-310-HN, MSO-20-310-HN



MS-20-310/n-HN



n = number of stations (2 to 6)

- 1 = pressure inlet
- 2 = outlet
- 3 = exhaust

Plug socket (not included in scope of delivery) can be repositioned by 180°.
Solenoid coil can be repositioned by 4 x 90°.

Accessories



Plug sockets: page 4-39

Series MC-20 and MD-20



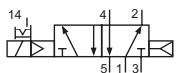
Technical details

Connection	Sub-base mounting
Nominal size	3 mm
Temperature range	-10°C ... +70°C
Medium	Filtered, oil-free and dried compressed air according to ISO 8573-1:2010, Class 7:2:4, instrument air, free of aggressive additives. Alternatively the pressure dew point must be at least 10°C below lowest occurring ambient temperature.
Materials	Body: Al (anodized), plastic, seals: NBR, inner parts: Al, steel and plastic
Protection	IP 65 according to EN 60529

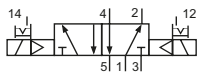


Electrically operated spool valve. The manual override is detent and is operated by screwdriver. Gaskets and screws are part of delivery.

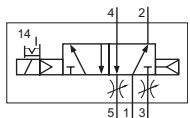
5/2-way valves



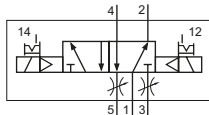
MC-20-510-HN-xxx
5/2-way, single solenoid, air spring return



MC-20-520-HN-xxx
5/2-way, double solenoid



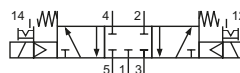
MD-20-510-HN-xxx
5/2-way, single solenoid, air spring return, with exhaust throttles



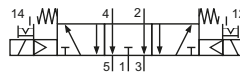
MD-20-520-HN-xxx
5/2-way, double solenoid, with exhaust throttles

Please complete: xxx = electrical option

5/3-way valves



MC-20-530-HN-xxx
5/3-way, center position closed



MC-20-533-HN-xxx
5/3-way, center position exhausted

Electrical options

Nominal voltage	Power consumption	Specifics	Plug connection*1	-xxx Plug connections	
				opposite 1,2,3,4,5	at 1,2,3,4,5
12 V DC	1 W		Form C industrial norm	-411	-441
24 V DC	1 W		Form C industrial norm	-412	-442

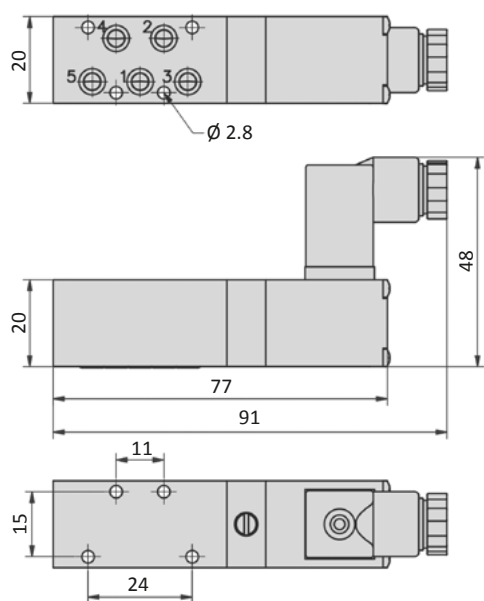
*1 Plug socket not included, suitable plug sockets see page 4-39.

Technical data

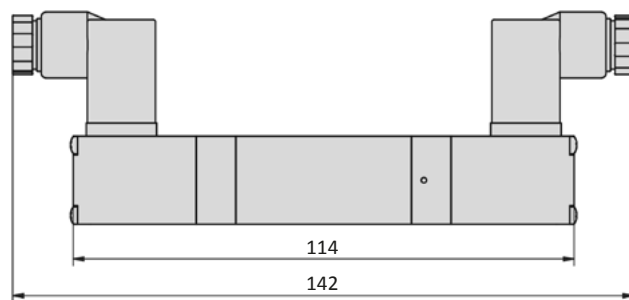
Model-no.:	MC-20-510 MD-20-510	MC-20-520 MD-20-520	MC-20-530	MC-20-533
Operating pressure (bar)	2.5 ... 8	2.5 ... 8	3 ... 8	3 ... 8
Pilot pressure (bar)	2.5 ... 8	2.5 ... 8	3 ... 8	3 ... 8
Flow rate (NI/min)	220	220	220	220
Response time (ms) at 6 bar	on: 12 off: 12	on: 11 off: 11	on: 15 off: 22	on: 15 off: 22
Weight (kg)	0.100	0.156	0.162	0.162

Dimensions

MC-20-510-HN



MC-20-520-HN, MC-20-53x-HN



- 1 = pressure inlet
2,4 = outlets
3,5 = exhausts

Plug socket (not included in scope of delivery) can be repositioned by 180°.
Solenoid coil can be repositioned by 4 x 90°.

Accessories



Plug sockets: page 4-39

Plug sockets

Form A according to DIN EN 175301-803

Overall width	27 mm
Contact distance	18 mm
Contacts	2P + E
Protection	IP 65 according to EN 60529 requires a profile gasket
For use with series	no standard



Model-no.:	28-ST-03	28-ST-11-112
Voltage (AC/DC)	0 - 250 V	24 V
Status indicator	no	yes
Protective circuit	no	yes (varistor)
Connecting cable	without	without
Wire cross section	max. 1.5 mm ²	max. 1.5 mm ²
Ø Connecting cable	6 - 8 mm	6 - 8 mm

Form B according to DIN EN 175301-803

Overall width	22 mm
Contact distance	10 mm
Contacts	2P + E
Protection	IP 65 according to EN 60529 requires a flat gasket
For use with series	no standard



Model-no.:	28-ST-01-G
Voltage (AC/DC)	0 - 250 V
Status indicator	no
Protective circuit	no
Connecting cable	without
Wire cross section	max. 1.5 mm ²
Ø Connecting cable	6 - 8 mm

Form B industrial norm

Overall width	22 mm
Contact distance	11 mm
Contacts	2P + E
Protection	IP 65 according to EN 60529 requires a flat gasket
For use with series	M-04, M-05, M-07, M-22, KM-09, KM-10, MS-18, KN-05, MN-06, MI-01, MI-02, MI-03



Model-no.:	28-ST-01	28-ST-04-112	28-ST-04-127	28-ST-06-112	28-ST-06-127	28-ST-06-K3-112*	28-ST-06-K3-127*
Voltage (AC/DC)	0 - 250 V	10 - 50 V	70 - 250 V	24 V	230 V	24 V	230 V
Status indicator	no	yes	yes	yes	yes	yes	yes
Protective circuit	no	no	no	yes (varistor)	yes (varistor)	yes (varistor)	yes (varistor)
Connecting cable	without	without	without	without	without	3 m	3 m
Wire cross section	max. 1.5 mm ²	max. 1.5 mm ²	max. 1.5 mm ²	max. 1.5 mm ²	max. 1.5 mm ²	3 x 0.75 mm ²	3 x 0.75 mm ²
Ø Connecting cable	6 - 8 mm	6 - 8 mm	6 - 8 mm	6 - 8 mm	6 - 8 mm		

* These plug sockets are fitted with integrated flat gaskets.

Form C according to DIN EN 175301-803

Overall width	15 mm
Contact distance	8 mm
Contacts	2P + E
Protection	IP 65 according to EN 60529 requires a flat gasket
For use with series	BM-01, BM-02



Model-no.:	28-ST-02-1	28-ST-09-1-112	28-ST-09-1-127	28-ST-10-1-112	28-ST-10-1-127	28-ST-10-1-K3-112 *
Voltage (AC/DC)	0 - 250 V	10 - 50 V	70 - 250 V	24 V	230 V	24 V
Status indicator	no	yes	yes	yes	yes	yes
Protective circuit	no	no	no	yes (varistor)	yes (varistor)	yes (varistor)
Connecting cable	without	without	without	without	without	3 m
Wire cross section	max. 0.75 mm ²	max. 0.75 mm ²	max. 0.75 mm ²	max. 0.75 mm ²	max. 0.75 mm ²	3 x 0.5 mm ²
Ø Connecting cable	4 - 6 mm	4 - 6 mm	4 - 6 mm	4 - 6 mm	4 - 6 mm	

Model-no.:	28-ST-02-1-05
Voltage (AC/DC)	24 V
Status indicator	yes
Protective circuit	yes (varistor)
Connection	M8



Form C industrial norm

Overall width	15 mm
Contact distance	9.4 mm
Contacts	2P + E
Protection	IP 65 according to EN 60529 requires a flat gasket
For use with series	M-20, MC-20, MD-20, MS-20



Model-no.:	28-ST-02-01	28-ST-09-112	28-ST-09-127	28-ST-10-112	28-ST-10-127	28-ST-10-K3-112 *
Voltage (AC/DC)	0 - 250 V	10 - 50 V	70 - 250 V	24 V	230 V	24 V
Status indicator	no	yes	yes	yes	yes	yes
Protective circuit	no	no	no	yes (varistor)	yes (varistor)	yes (varistor)
Connecting cable	without	without	without	without	without	3 m
Wire cross section	max. 0.75 mm ²	max. 0.75 mm ²	max. 0.75 mm ²	max. 0.75 mm ²	max. 0.75 mm ²	3 x 0.5 mm ²
Ø Connecting cable	4 - 6 mm	4 - 6 mm	4 - 6 mm	4 - 6 mm	4 - 6 mm	

Model-no.:	28-ST-02-2-05	28-ST-02-2-07
Voltage (AC/DC)	24 V	24 V
Status indicator	yes	yes
Protective circuit	yes (varistor)	yes (varistor)
Connection	M8	M12

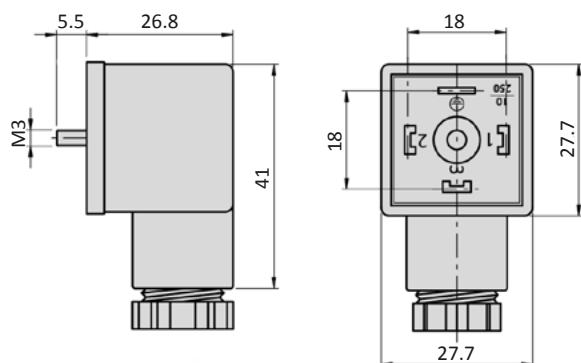


* These plug sockets are fitted with integrated flat gaskets.

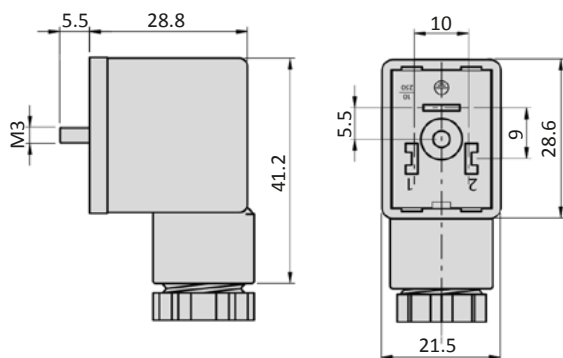
Plug sockets

Dimensions

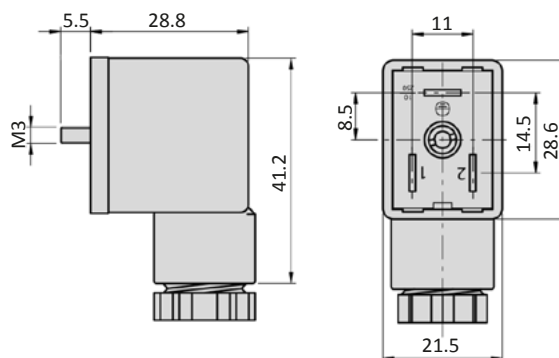
Form A according to DIN EN 175301-803



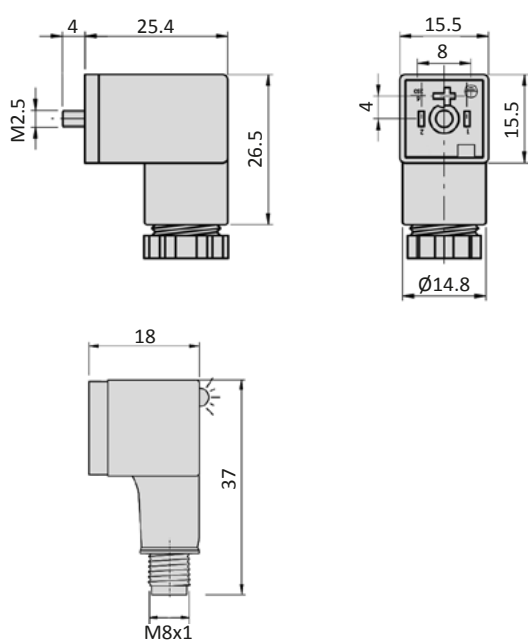
Form B according to DIN EN 175301-803



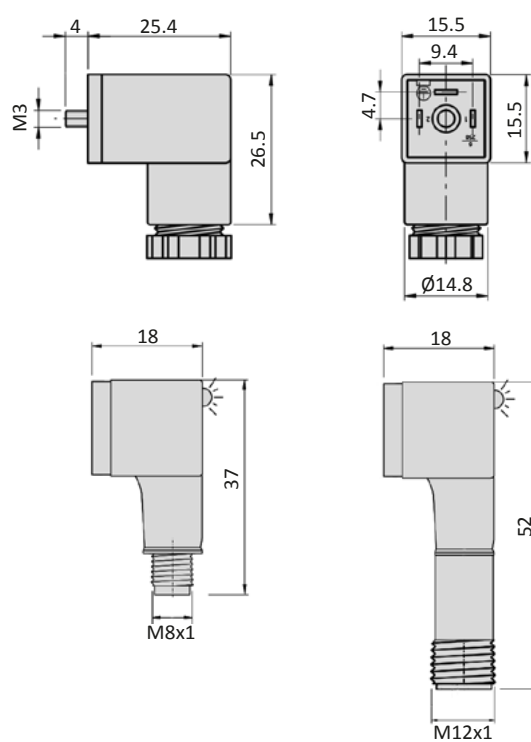
Form B industrial norm



Form C according to DIN EN 175301-803

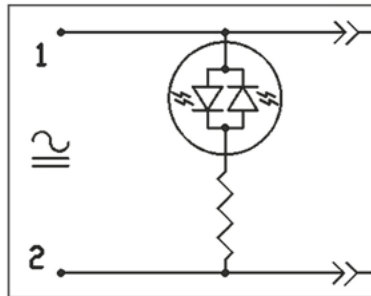


Form C industrial norm

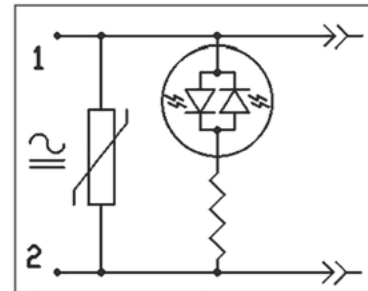


Electrically circuits

Status indicator (LED)



Status indicator (LED) and protective circuit (varistor)



Solenoid coils

Form A according to DIN EN 175301-803

Overall width	30 mm
Contact distance	18 mm
Contacts	2P + E
Protection	IP 65 according to EN 60529 with connected plug socket
Duty cycle	100 %
Temperature range*	-20°C ... +50°C
Voltage tolerance	± 10 %
For use with series	no standard



* The max. applicable operating temperature depends on the temperature specification of the used valve.

Model-no.:	23-SP-016-712	23-SP-016-722	23-SP-016-726	23-SP-016-727
Voltage	24 V DC	24 V AC	110/115 V AC	230 V AC/ 110 V DC
Power consumption DC	4.5 W	-	-	5.3 W
Power consumption AC	-	8.0 VA	7.6 VA/ 8.6 VA	7.9 VA
Specifics	enhanced humidity resistance			

Form B according to DIN EN 175301-803

Overall width	22 mm
Contact distance	10 mm
Contacts	2P + E
Protection	IP 65 according to EN 60529 with connected plug socket
Duty cycle	100 %
Temperature range*	-20°C ... +50°C
Voltage tolerance	± 10 %
For use with series	no standard



* The max. applicable operating temperature depends on the temperature specification of the used valve.

Model-no.:	23-SP-011-G-412	23-SP-011-G-427
Voltage	24 V DC	230 V AC
Power consumption DC	4.2 W	-
Power consumption AC	-	4.0 VA

Form B industrial norm

Overall width	22 mm
Contact distance	11 mm
Contacts	2P + E
Protection	IP 65 according to EN 60529 with connected plug socket
Duty cycle	100 %
Temperature range*	-20°C ... +50°C
Voltage tolerance	± 10 %
For use with series	M-04, M-05, M-07, M-22, KM-09, KM-10, MS-18, KN-05, MN-06, MI-01, MI-02, MI-03

* The max. applicable operating temperature depends on the temperature specification of the used valve.



4

Model-no.:	23-SP-011-411	23-SP-011-412	23-SP-011-422	23-SP-011-426	23-SP-011-427	23-SP-012-431	23-SP-012-432
Voltage	12 V DC	24 V DC	24 V AC	115 V AC	230 V AC	12 V DC	24 V DC
Power consumption DC	4.2 W	4.2 W	-	-	-	2.2 W	2.2 W
Power consumption AC	-	-	4 VA	4 VA	4 VA	-	-

Model-no.:	23-SP-011-1-711	23-SP-011-1-712	23-SP-011-1-725	23-SP-011-1-727	23-SP-012-1-732
Voltage	12 V DC/ 24V AC	24 V DC/ 48 V AC	110/115 V AC	230 V AC	24 V DC
Power consumption DC	4.6 W	4.8 W	-	-	2.5 W
Power consumption AC	7.1 VA	7.7 VA	6.0 VA/ 7.6 VA	7.9 VA	-
Specifics	enhanced humidity resistance				

M12 connection

Overall width	22 mm
Contact distance	-
Contacts	2P
Protection	IP 65 according to EN 60529 with connected plug socket
Duty cycle	100 %
Temperature range*	-20°C ... +50°C
Voltage tolerance	± 10 %
For use with series	no standard

* The max. applicable operating temperature depends on the temperature specification of the used valve.



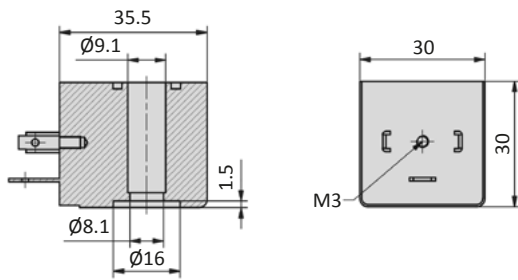
Model-no.:	23-SP-011-5-O12	23-SP-012-5-O32
Voltage	24 V DC	24 V DC
Power consumption DC	4.8 W	2.5 W
Power consumption AC	-	-
Specifics	Mounting on manifold not allowed. With integrated LED and protective circuit.	Min. mounting distance for manifold mounting is 20 mm. With integrated LED and protective circuit.

Solenoid coils

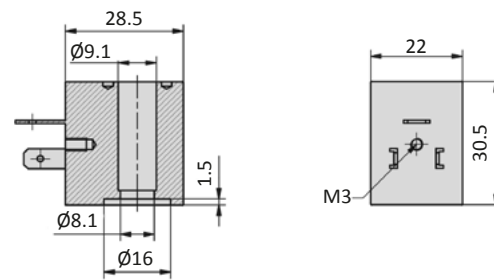


Dimensions

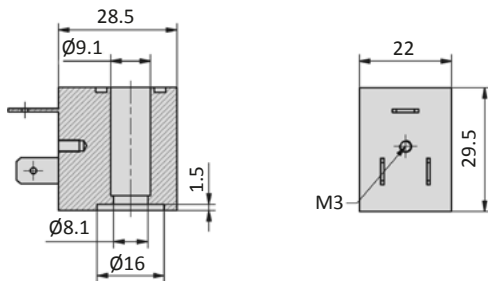
Form A according to DIN EN 175301-803



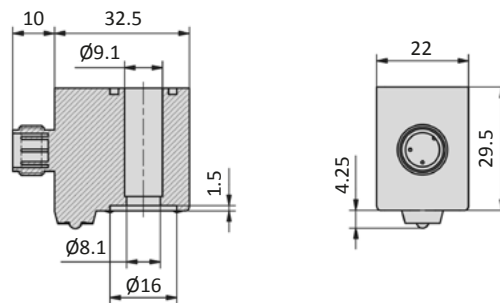
Form B according to DIN EN 175301-803



Form B industrial norm



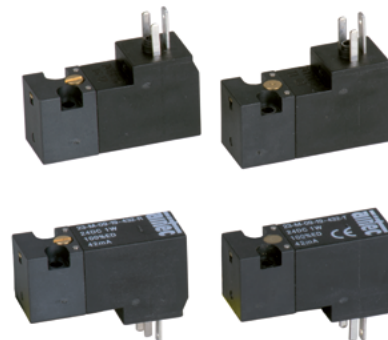
M12 connection



Plug connection shape C according to DIN EN 175301-803

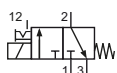
Overall width	15 mm
Contact distance	8 mm
Contacts	2P + E
Protection	IP 65 according to EN 60529 with connected plug socket
Duty cycle	100 %
Temperature range*	-10°C ... +50°C
Voltage tolerance	± 10 %
For use with series	BM-01, BM-02

* The max. applicable operating temperature depends on the temperature specification of the used valve.

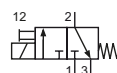


4

3/2-way valves



23-M-09-19-xxx-R
3/2-way, single solenoid, mechanical spring return, NC, manual override detent



23-M-09-19-xxx-T
3/2-way, single solenoid, mechanical spring return, NC, manual override non-detent

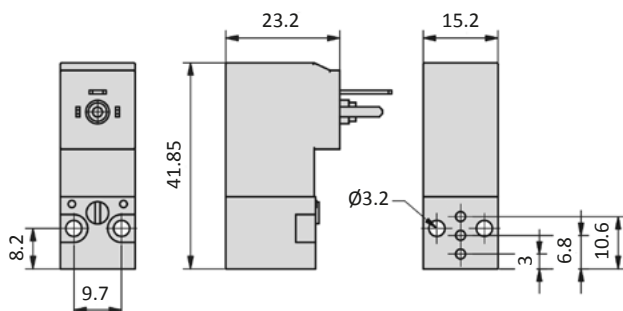
Please complete: xxx = electrical option

Model-no.:	23-M-09-19-461-y	23-M-09-19-462-y	23-M-09-19-452-y	23-M-09-19-456-y	23-M-09-19-457-y
Voltage	12 V DC	24 V DC	24 V AC	115 V AC	230 V AC
Power consumption DC	1 W	1 W	-	-	-
Power consumption AC	-	-	3 VA	3 VA	3 VA
electric connector on side of manual override					

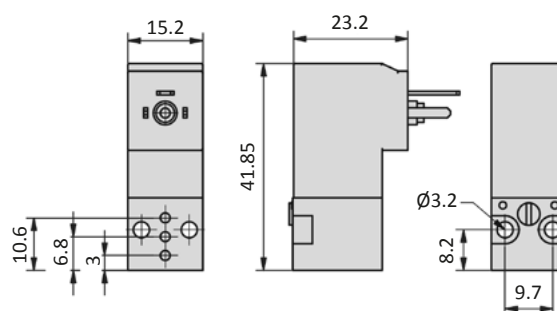
Model-no.:	23-M-09-19-431-y	23-M-09-19-432-y	23-M-09-19-422-y	23-M-09-19-426-y	23-M-09-19-427-y
Voltage	12 V DC	24 V DC	24 V AC	115 V AC	230 V AC
Power consumption DC	1 W	1 W	-	-	-
Power consumption AC	-	-	3 VA	3 VA	3 VA
electric connector opposite of manual override y = manual override (R = detent, T = non-detent)					

Dimensions

electric connector on side of manual override



electric connector opposite side of manual override



Pilot valves

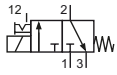
M12 connection

Overall width	15 mm
Contact distance	-
Contacts	M12 plug
Protection	IP 67 according to EN 60529 with connected plug socket
Duty cycle	100 %
Temperature range*	-10°C ... +50°C
Voltage tolerance	± 10 %
For use with series	BM-01, BM-02

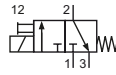
* The max. applicable operating temperature depends on the temperature specification of the used valve.



3/2-way valves



23-M-09-19-xxx-R
3/2-way, single solenoid, mechanical
spring return, NC, manual override
detent



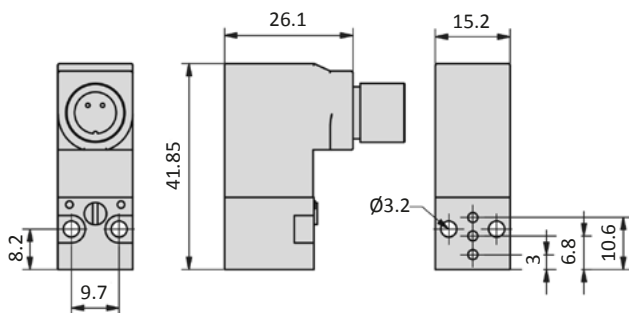
23-M-09-19-xxx-T
3/2-way, single solenoid, mechanical
spring return, NC, manual override
non-detent

Please complete: xxx = electrical option

Model-no.:	23-M-09-19-N42-T	23-M-09-19-N62-R
Voltage	24 V DC	24 V DC
Power consumption DC	2.5 W	1 W
Power consumption AC	-	-
electric connector on side of manual override		

Dimensions

electric connector on side of manual override



Voltage code

- HN * - * * *									
Manual override		Coil and plug options		Coil type		Manual override position on side of		Voltage	
HN	detent	0	ATEX 2GD, encapsulated with casting compound width 30 mm	23-SP-037		0	without indication ports 1/3/(5)	0	without indication
HNR	detent	1	with coil and plug	according to valve		1	DC ports 1/3/(5)	1	12 V
HNT	non-detent	2				2	AC ports 1/3/(5)	2	24 V
		3				3	DC, low power consumption ports 1/3/(5)	3	42 V
		4	with coil, without plug	according to valve		4	DC ports 2/(4)	4	48 V
		5	without coil	no		5	AC ports 2/(4)	5	110 V
		6	without pilot valve	no		6	DC ports 2/(4)	6	115 V
		7	with coil, with enhanced humidity resistance, without plug	according to valve		7	without indication ports 2/(4)	7	230 V
		8	with coil, with enhanced humidity resistance, with plug	according to valve		8		8	240 V
		9	ATEX 2GD, intrinsically safe, with plug width 30 mm	23-SP-038		9		9	
		A	ATEX 3GD, without plug, width 30 mm	23-SP-040		A		A	4 V
		B	ATEX 3GD, with plug, width 30 mm	23-SP-040		B		B	6 V
		C	ATEX 3GD, without plug, width 22 mm	23-SP-041		C		C	8 V
		D				D		D	61 V
		E	ATEX 2GD, encapsulated with casting compound width 22 mm	23-SP-036		E		E	36 V
		F	with coil, with enhanced humidity resistance, without plug, low temperature version	23-SP-060-1		F		F	9 V
		G							
		H	with coil shape B according to DIN EN 175301-803, with plug	23-SP-011-G					
		I	with coil shape B according to DIN EN 175301-803, without plug	23-SP-011-G					
		J	with coil shape A according to DIN EN 175301-803, without plug (if not standard)	23-SP-016					
		K	with coil shape A according to DIN EN 175301-803, with plug (if not standard)	23-SP-016					
		L	with coil, with plug with LED and protective circuit	according to valve					
		M	with coil, with plug with LED, without protective circuit	according to valve					
		N	with coil with M12 connection	according to valve					
		O	with coil with M12 connection with LED and protective circuit	according to valve					
		P	without connector bridge, without plug						
		Q	with coil with cable	according to valve					
		R	with cable up to 1 m length	according to valve					
		S	with connector bridge, without plug						
		T							
		U	ATEX 2GD, without coil (for coil 23-SP-036)	no					
		V	ATEX 2GD, Flame proof enclosure and encapsulated with casting compound	23-SP-045					
		W	ATEX 2GD / 3GD, without coil (for coil 23-SP-041 and 23-SP-045)	no					
		X	ATEX 3GD, without coil (for coil 23-SP-040 in 230V AC and 115V AC)	no					
		Y	ATEX 2GD, without coil (for coil 23-SP-038)	no					
		Z	ATEX 2GD / 3GD, without coil (for coil 23-SP-040 in 24V DC and 23-SP-037)	no					