



### **Selection guide**

4.002

### Series MS-20

3/2-way poppet valves, M 5 (10/32 UNF), 38 NI/min (0.039 Cv)

Technical data 4.020 Dimensions 4.021 Accessories 4.063



3/2-way poppet valves, G 1/8, 56 NI/min (0.057 Cv)

Technical data 4.040 Dimensions 4.041 Accessories 4.042

### Series M-20

5/2- and 5/3-way, M5 (10/32 UNF), 220 NI/min (0.224 Cv)

Technical data 4.061 Dimensions 4.062 Accessories 4.063

### Series M-04

3/2-, 5/2- and 5/3-way, G 1/8, 360 NI/min (0.366 Cv)

Technical data 4.080 Dimensions 4.082 Accessories 4.084

### Series BM-01

2 x 3/2-, 5/2- and 5/3-way, G 1/8, 750 NI/min (0.762 Cv)

Technical data 4.090 Dimensions 4.094 Accessories 4.097

### Series M-05

3/2-, 5/2- and 5/3-way, G 1/8, 750 NI/min (0.762 Cv)

Technical data 4.110 Dimensions 4.112 Accessories 4.114

### Series KM-09

5/2- and 5/3-way, G 1/8, 950 NI/min (0.966 Cv)

Technical data 4.120 Dimensions 4.121 Accessories 4.122

### Series BM-02

2 x 3/2-, 5/2- and 5/3-way, G 1/4, 1400 NI/min

Technical data 4.130 Dimensions 4.134 Accessories 4.137















### **Electrically operated valves**





M-22-510-HNX-XXX

### Series M-07

3/2-, 5/2- and 5/3-way, G 1/4, 1580 NI/min (1.606 Cv)

Technical data 4.150 Dimensions 4.152 4.154 Accessories



5/2- and 5/3-way, G 1/4, 2100 NI/min (2.134 Cv)

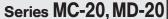
Technical data 4.160 Dimensions 4.161 Accessories 4.162



### Series M-22

3/2-, 5/2- and 5/3-way, G 1/2, 3300 NI/min (3.354 Cv)

Technical data **Dimensions** 4.182 Accessories 4.184



For sub-base mounting, 5/2- and 5/3-way, 220 NI/min (0.224 Cv)

Technical data 4.200 **Dimensions** 4.201 4.202 Accessories



For sub-base mounting, 360 NI/min (0.366 Cv)

Technical data 4.210 4.211 Dimensions 4.212 Accessories

5/2- and 5/3-way, 1200 NI/min (1.219 Cv)

Technical data 4.240 Dimensions 4.241 Accessories 4.242

### Series MF-07

For manifold mounting, 5/2- and 5/3-way, G 1/4, 1580 NI/min (1.606 Cv)

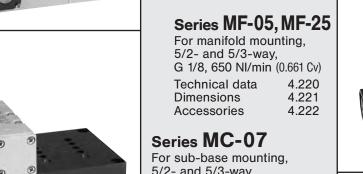
4.260 Technical data **Dimensions** 4.261 4.262 Accessories

#### **Accessories for valves**

Solenoids and sockets

4.280











### Selection guide



### **Selection of valve series**

					Valve	series					
Connection flow rate	3/2-way single solenoid	3/2-way double solenoid	5/2-way single solenoid	5/2-way double solenoid	5/3-way center position closed	5/3-way center position opened	5/3-way center position pressurized	external pilot supply	ex- plosion proof coil	mounting option (4.003)	page
M 5 (10/32 UNF) 38 NI/min	MS-20								No	1, 2	4.020
G 1/8 56 NI/min	MS-18 MSO-18								Yes¹) No	1, 2	4.040
M 5 (10/32 UNF) 220 NI/min			M-20	M-20	M-20	M-20		No	No	1	4.061
sub-base 220 NI/min			MC-20 MD-20	MC-20 MD-20	MC-20	MC-20		No	No	7	4.200
sub-base 360 NI/min			MF-04	MF-04	MF-04	MF-04		No	No	8	4.210
G 1/8 360 NI/min	M-04 MO-04	M-04	M-04	M-04	M-04	M-04		No	on request	1, 3, 4	4.080
G 1/8 750 NI/min	M-05 MO-05	M-05	M-05	M-05	M-05	M-05	M-05	Yes	Yes1)	1, 3, 4	4.110
BM-01 750 NI/min	BM-01 2 x 3/2		BM-01	BM-01	BM-01	BM-01	BM-01	Yes	on request	1, 5	4.090
sub-base 680 NI/min			MF-25	MF-05	MF-05	MF-05	MF-05	No	No	1º, 5	4.220
G 1/8 900 NI/min			KM-09	KM-09	KM-09	KM-09	KM-09	No	on request	1, 6	4.120
sub-base 1200 NI/min			MC-07	MC-07	MC-07	MC-07		No	No	7	4.240
BM-02 1400 NI/min	BM-02 2 x 3/2		BM-02	BM-02	BM-02	BM-02	BM-02	Yes	on request	1, 5	4.130
G 1/4 1500 NI/min	M-07 MO-07	M-07	M-07	M-07	M-07	M-07	M-07	Yes	Yes1)	1, 3, 4	4.150
sub-base 1580 NI/min			MF-07	MF-07	MF-07	MF-07	MF-07	No	No	1 <sup>2)</sup> , 5	4.260
G 1/4 2100 NI/min			KM-10	KM-10	KM-10	KM-10	KM-10	No	on request	1, 6	4.160
G 1/2 3300 NI/min	M-22 MO-22	M-22	M-22	M-22	M-22	M-22		Yes	Yes¹)	1	4.180

<sup>1)</sup> Please contact AIRTEC for details. 2) With single sub-base only. By plugging port 2 or 4, all 5/2-way valves can be changed into 3/2-way valves.

### Calculation of required flow rate (P = 6 bar/87 psi)

		speed									
cylin	nder-Ø	0.25 m/s	(0.82 ft/sec.)	0.5 m/s	(1.64 ft/sec.)	1 m/s (3	3.28 ft/sec.)	1.5 m/s	(4.92 ft/sec.)	2 m/s (6	6.56 ft/sec.)
mm	(inch)	NI/min	(Cv)	NI/min	(Cv)	NI/min	(Cv)	NI/min	(Cv)	NI/min	(Cv)
8	(5/16)	5	(0.005)	11	(0.011)	21	(0.021)	32	(0.032)	42	(0.043)
10	(3/8)	8	(800.0)	16	(0.016)	33	(0.033)	49	(0.050)	66	(0.067)
12	(1/2)	12	(0.012)	24	(0.024)	47	(0.048)	71	(0.072)	95	(0.096)
16	(5/8)	21	(0.021)	42	(0.043)	84	(880.0)	127	(0.129)	169	(0.172)
20	(3/4)	33	(0.033)	66	(0.067)	132	(0.134)	198	(0.201)	264	(0.268)
25	(1)	52	(0.053)	103	(0.105)	206	(0.209)	309	(0.314)	412	(0.419)
32	(1 1/4)	84	(0.085)	169	(0.172)	338	(0.343)	506	(0.514)	675	(0.686)
40	(1 1/2)	132	(0.134)	264	(0.268)	528	(0.536)	791	(0.804)	1055	(1.072)
50	(2)	206	(0.209)	412	(0.419)	824	(0.837)	1236	(1.256)	1649	(1.676)
63	(2 1/2)	327	(0.332)	654	(0.665)	1309	(1.330)	1963	(1.995)	2617	(2.659)
80	(3)	528	(0.536)	1055	(1.072)	2110	(2.144)	3165	(3.216)	4220	(4.289)
100	(4)	824	(0.837)	1649	(1.676)	3297	(3.350)	4946	(5.026)	6594	(6.701)
125	(5)	1288	(1.309)	2576	(2.618)	5152	(5.236)	7727	(7.853)	10303	(10.470)
160	(6 1/4)	2110	(2.144)	4220	(4.289)	8440	(8.577)	12660	(12.866)	16881	(17.155)
200	(8)	3297	(3.350)	6594	(6.701)	13188	(13.402)	19782	(20.104)	26376	(26.805)

Flow rates at 100 % utilization. The cylinder- $\emptyset$  in inch are approximate.

4.002 Subject to change

### Selection guide

# airec

### Mounting options (see table page 4.002)

### 1. Single attachment

All ports are threaded. Valves can be mounted individually or in groups.



### 2. Valve manifold

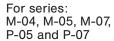
Several 3/2-way directly operated poppet valves share one basic manifold up to 6 stations.





#### 3. P-Manifold

This manifold has one common pressure supply port (1) and is suitable for 3/2-, 5/2- and 5/3-way valves. The valves are mounted by hollow bolts.





#### 4. P-R-S Manifold

This manifold has one common pressure supply port (1) and two common exhaust ports (3 and 5). It is suitable for 5/2- and 5/3-way valves. The valves are mounted by hollow bolts.

For series: M-04, M-05, M-07, P-05 and P-07



### 5. Modular manifold

This modular manifold is expandable and has one common pressure supply port (1) and two common exhaust ports (3 and 5). Screws connect the valves to the manifold.

For series: BM-01, BM-02, MF-05, MF-25 and MF-07



#### 6. Modular sub-base

This modular subbase is expandable, has one common pressure supply port (1) and two common exhaust ports (3 and 5) and allows the assembly of valves of different sizes (1/8 and 1/4) and various functions.

For series: KM-09, KM-10



#### 7. Manifold with fixed number of stations

This manifold for 5/2and 5/3-way valves is designed to change the valves without disconnecting tubes. It has one common pressure supply port (1) and two common exhaust ports (3 and 5). Screws connect the valves to the manifold.

For series: MC-07, MC-20, MD-20



#### 8. Expandable sub-base

This modular sub-base is expandable, has one common pressure supply port (1) and two common exhaust ports (3 and 5).
Additional stations can

Additional stations can be added as required. Clamps for DIN-rail mounting are available.

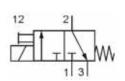
For series: MF-04





### **Technical data for series**

### **MS-20**







MS-20-310/n-HN

MS-20-310-HN

Order code	MS-20-310/n-HN-112	
Series	Number of stations	Coil options*
and	blank = 1 station	<b>111</b> = 12 V DC, 2 W, (coil 23-M-20, plug socket 28-ST-02)
function	2 = 2 stations	<b>112</b> = 24 V DC, 2 W, (coil 23-M-20, plug socket 28-ST-02)
	3 = 3 stations	411 = 12 V DC without plug socket (coil 23-M-20)
	4 = 4 stations	<b>412</b> = 24 V DC without plug socket (coil 23-M-20)
	5 = 5  stations	
	6 = 6 stations	

### **Design and function**

Directly operated poppet valve with spring return. Actuated by a permanent electrical signal.

The valves can be changed to a 2/2-way function by closing the exhaust port 3.

On type MS-20-310/n-HN, the letter "n" indicates the number of stations. Up to 6 stations are available.

The single valve MS-20-310-HN is available without a manual override. Please cancel the letters HN from the code when ordering.

The standard coil and socket (see page 4.063) are included.

Please specify required control voltage when ordering.

Accessories see page 4.063.

Order number	MS-20-310-HN	MS-20-310/n-HN		
Connection	M5 (10/32 UNF)	G 1/8 at 1, M5 (10/32 UNF) at 2 and 3		
Nominal size	1.2 mm			
Flow rate	38 NI/min (0.039 Cv)			
Pressure range	- 0.95 8 bar (- 14 116 psi)			
Response time at 6 bar	on 8 ms off 8 ms			
Temperature range	- 10 °C + 70 °C (+ 14 °F + 158 °F)			
Materials	Body: AI (anodized), plastic, Seals: NBR, Inner	parts: stainless steel and brass		
Degree of protection	IP 65 according to EN 60529			
Weight	0.064 kg (0.141 lb.) 0.01 + n • 0.066 kg (0.022 + n • 0.145 lb.)			

<sup>\*</sup>Valves with further voltages on request.

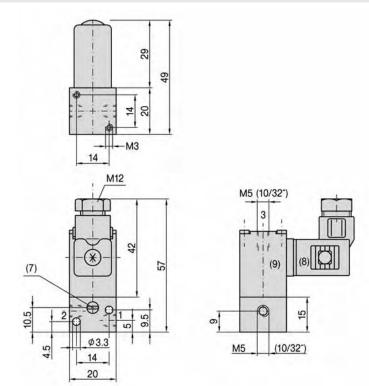
4.020 Subject to change

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### **Dimensions for series**

### **MS-20**

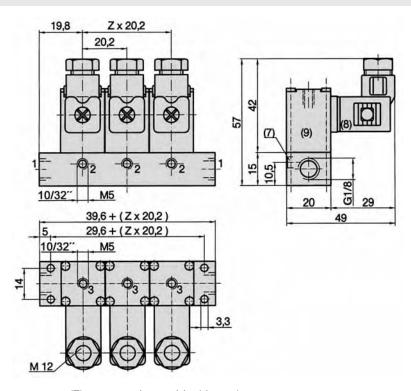
#### MS-20-310-HN



#### 1 = pressure inlet

- 2 = outlet
- 3 = exhaust
- (7) = manual override (detent)
- (8) = plug socket can be repositioned by 180°
- (9) = solenoid coil can be repositioned by 4 x 90°

### MS-20-310/n-HN



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

- (7) = manual override (detent)
- (8) = plug socket can be repositioned by  $180^{\circ}$
- (9) = solenoid coil can be repositioned by  $180^{\circ}$

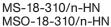
4.021



### **Technical data for series**

### **MS-18**







MS-18-310-HN MSO-18-310-HN

Order cod	<b>e</b> MS-18-310	/n-HN-112	
		Coil	options
Series and function	Number of stations blank = 1 station 2 = 2 stations 3 = 3 stations 4 = 4 stations 5 = 5 stations 6 = 6 stations	Standard coil <sup>1)</sup> (with plug socket 28-ST-01) 111 = 12 V DC, 4.2 W 112 = 24 V DC, 4.2 W 122 = 24 V AC, 7/4 VA 126 = 115 V AC, 7/4 VA 127 = 230 V AC, 7/4 VA 131 = 12 V DC, 2.2 W <sup>2)</sup> 132 = 24 V DC, 2.2 W <sup>2)</sup>	Without coil and plug socket 500 = Power consumption 4.2 W, 7/4 VA 530 = Power consumption 2.2 W <sup>2)</sup> Coils with M12 connector and LED 012 = 24 V DC, 4.8 W 032 = 24 V DC, 2.5 W <sup>2)</sup>

<sup>&</sup>lt;sup>1)</sup> When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.042.

### **Design and function**

Directly operated poppet valve with spring return. Actuated by a permanent electrical signal.

The valves can be changed to a 2/2-way function by closing the exhaust port 3.

For type MSO (Normally open) pressure supply at port 3 (M5 or 10/32 UNF at actuator 23-R-015).

On type MS-18-310/n-HN and MSO-18-310/n-HN, the letter "n" indicates the number of stations. Up to 6 stations are available.

The single valve MS-18-310 is available without a manual override. Please cancel the letters HN from the number when ordering.

Valves of this series are available in explosion proof design in accordance with 94/9/EG (ATEX). For further details see chapter 12 of this catalogue.

Order number	MS-18-310-HN	MSO-18-310-HN	MS-18-310/n-HN	MSO-18-310/n-HN		
Please complete according to order code.	12 2 NW	12 2 1 1 3 W	12 2 W	12 2 1 3 W		
Function	3/2-way, normally closed	3/2-way, normally open	3/2-way, normally closed	3/2-way, normally open		
Connection	G 1/8 at 1 and 2, M5 (1	10/32 UNF) at 3				
Nominal size	1.4 mm					
Flow rate	56 NI/min (0.057 Cv)	56 NI/min (0.057 Cv)				
Pressure range	- 0.95 10 bar (8 ba	r at 2.2 W) / - 14 145	5 psi (116 psi at 2.2 W)			
Response time at 6 bar	on 10 ms off 12 ms					
Temperature range	- 10 °C + 70 °C (+	14 °F + 158 °F)				
Materials	Body: Al (anodized), pl	lastic, Seals: NBR, Inner	parts: stainless steel a	nd brass		
Degree of protection	IP 65 according to EN	IP 65 according to EN 60529				
Weight	0.150 kg (0.33 lb.)		0.150 + 0.140 • n kg (	(0.33 + 0.31 • n lb.)		

<sup>2)</sup> max. 8 bar (max. 116 psi) at 2.2 W and 2.5 W.

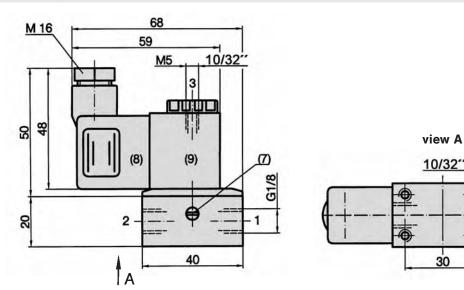
4.040 Subject to change

M 5

### **Dimensions for series**

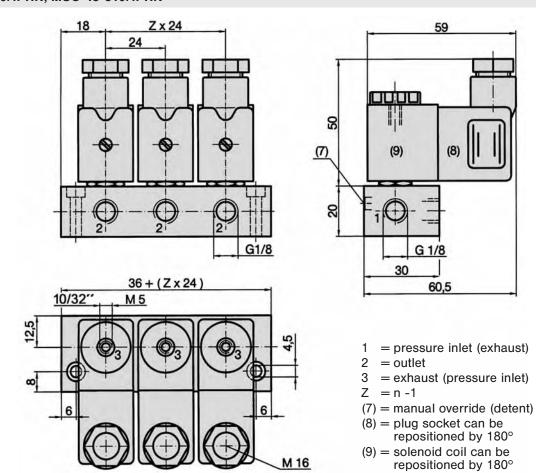
### **MS-18**

### MS-18-310-HN, MSO-18-310-HN



- 1 = pressure inlet (exhaust)
- 2 = outlet
- 3 = exhaust (pressure inlet)
- (7) = manual override (detent)
- (8) = plug socket can be repositioned by  $180^{\circ}$
- (9) = solenoid coil can be repositioned by 4 x 90°

### MS-18-310/n-HN, MSO-18-310/n-HN



# Accessories for electrically operated valves Series MS-18



### **Accessories for series**

### **MS-18**

#### Solenoid coils, actuators



Standard coil 23-SP-011-... page 4.280



Coil with 2.2 W power consumption **23-SP-012-...** page 4.280



Coil with M-12 plug connection, 4.8 W, LED and circuit protection 23-SP-011-5-012 page 4.280



Coil with M-12 plug connection, 2.5 W, LED and circuit protection 23-SP-012-5-032 page 4.280



Valves with explosion proof actuator see chapter 12.



Standard actuator 23-R-013



Low power actuator 23-R-014



Actuator for normally open type 23-R-015

### Plug sockets



Standard plug socket **28-ST-01** page 4.281



Plug socket with LED **28-ST-04-**... page 4.281



Plug socket with LED and circuit protection **28-ST-06-...** page 4.281



Plug socket with LED, circuit protection and cable **28-ST-06-K3-...** page 4.281

Subject to change

#### **User information**

Low power consumption coils (2.2 W or 2.5 W) are for pressures up to 8 bar (116 psi) only. Valve actuator 23-R-014 is required. The actuator 23-R-014 is nickel plated. Make sure that the coils with the right power consumption are used.

When using explosion proof coils the dimensions of the corresponding valve change.

For outdoor applications or in areas with high humidity use coil 23-SP-011-1-... or 23-SP-012-1-... (see page 5.120).

### The following types are available on request

Coils and sockets with contacts according to DIN EN 175301-803 type B (U-form). Plug sockets with molded cable.

4.042

# airec

### **Technical data for series**

### M-20



 Coil options\*

 and function
 111 = 12 V DC, 2 W, (coil 23-M-20, plug socket 28-ST-02)

 411 = 12 V DC without plug socket (coil 23-M-20)

 412 = 24 V DC without plug socket (coil 23-M-20)

 412 = 24 V DC without plug socket (coil 23-M-20)

### **Design and function**

Spool valve actuated by an electrical signal. The standard coil and socket (see page 4.063) are included. Please specify required control voltage when ordering.

Order number	M-20-510-HN	M-20-520-HN	M-20-530-HN	M-20-533-HN		
Please complete according to order code.	14 2 2	14 4 2 12 5 1 3	** W 4 2 W 12 ** ** ** ** ** ** ** ** ** ** ** ** **	14 W 4 2 W 12		
Function	5/2-way single solenoid	5/2-way double solenoid	5/3-way center position closed	5/3-way center position exhausted		
Connection	M 5 (10/32 UNF)					
Nominal size	3 mm					
Flow rate	220 NI/min (0.224 Cv)	220 NI/min (0.224 Cv)				
Pressure range	2.5 8 bar (36 116	psi)	3 8 bar (43 116 p	si)		
Response time at 6 bar	on 12 ms off 12 ms	11 ms	on 15 ms off 22 ms			
Temperature range	- 10 °C + 70 °C (+	14 °F + 158 °F)				
Materials	Body: AI (anodized), pl	astic, Seals: NBR and P	OM, Inner parts: AI, stainI	ess steel and brass		
Degree of protection	IP 65 according to EN	IP 65 according to EN 60529				
Weight	0.098 kg (0.216 lb.)	0.156 kg (0.343 lb.)	0.162 kg (0.356 lb.)			

<sup>\*</sup>Valves with further voltages on request.

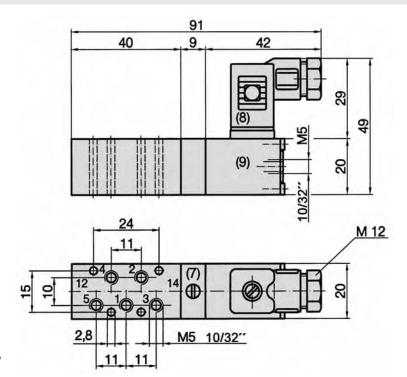
# Electrically operated valves 5/2- and 5/3-way, M 5 (10/32 UNF), 220 NI/min (0.224 CV)



### **Dimensions for series**

### **M-20**

#### M-20-510-HN



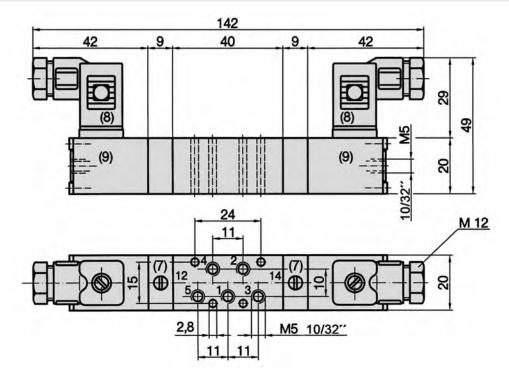
1 = pressure inlet

2, 4 = outlets

3, 5 = exhausts

- (7) = manual override (detent) can be repositioned by 4 x 90°
- (8) = plug socket can be repositioned by 180°
- (9) = solenoid coil can be repositioned by  $4 \times 90^{\circ}$

### M-20-520-HN, M-20-530-HN, M-20-533-HN



1 = pressure inlet

2, 4 = outlets

3, 5 = exhausts

(7) = manual override (detent) can be repositioned by  $4 \times 90^{\circ}$ 

(8) = plug socket can be repositioned by 180°

(9) = solenoid coil can be repositioned by 4 x 90°



### M-20, MS-20

### Solenoid coil



Standard coil 23-M-20-... page 4.282

### **Plug sockets**



Standard plug socket **28-ST-02** page 4.283



Plug socket with LED **28-ST-09-**... page 4.283



Plug socket with LED and circuit protection **28-ST-10-...** page 4.283



Socket with LED, circuit protection and built-in cable **28-ST-10-K3-...** page 4.283



Socket with M-12 sensor connection, LED and circuit protection **28-ST-02-2-07** page 4.282



Socket with M-8 sensor connection, LED and circuit protection 28-ST-02-2-05 page 4.282



### **Technical data for series**

### **M-04**



Order code	M-04-	310-HN-142	_				
			Coil op	otions¹)			
Series and	Standard coil <sup>3)</sup> (with plug socket 2			Withou	ut coil and plug sock	ret HN at ports	1+3
function	HN at port 2 141 12 V DO 142 24 V DO	-, ··· <del>-</del> ···	1 + 3 111 112	570	Power consumpt. 4.2 Power consumption	2 W, 7/4 VA	500 530
	<b>152</b> 24 V AC	C, 7/4 VA	122 126	Coils	with M12 connector	and LED HN at ports	s 1 + 3
	<b>161</b> 12 V DO	,	127 131 132	O42 O62	24 V DC, 4.8 W 24 V DC, 2.5 W <sup>2)</sup>		O12 O32

<sup>&</sup>lt;sup>1)</sup> HN = Manual override. It can be repositioned by 180°. Standard valve is supplied with HN on the same side as port 2.

### **Design and function**

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering. Valves of this series are available in explosion proof design in accordance with 94/9/EG (ATEX).

Order number	M-04-310-HN	MO-04-310-HN	M-04-320-HN	
Please complete according to order code.	12 2	10 21	12 2 10	
Function	3/2-way, normally closed	3/2-way, normally open	3/2-way, double solenoid	
Connection	G 1/8			
Nominal size	4 mm			
Flow rate	360 NI/min (0.336 Cv)			
Pressure range	2 10 bar (8 bar at 2.2 W) <sup>2)</sup> 29 145 psi (116 psi at 2.2 W)		2.5 10 bar (8 bar at 2.2 W) 2) 36 145 psi (116 psi at 2.2 W)	
Response time at 6 bar	on 13 ms off 16 ms		12 ms	
Temperature range	– 10 °C + 70 °C (+ 14 °F	+ 158 °F)		
Materials	Body: AI (anodized), plastic,	Seals: NBR and POM, Inner p	parts: Al, stainless steel and brass	
Degree of protection	IP 65 according to EN 6052	29		
Weight	0.185 kg (0.407 lb.)		0.315 kg (0.693 lb.)	

<sup>&</sup>lt;sup>2)</sup> max. 8 bar (max. 116 psi) at 2.2 W and 2.5 W.

4.080 Subject to change

<sup>&</sup>lt;sup>3)</sup> When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.084.

### **Technical data for series**

**M-04** 



Order code	M-04-510-HN-142	2		
		Coil or	ptions¹)	
Series and	Standard coil <sup>3)</sup> (with plug socket 28-ST-01)		Without coil and pa	lug socket  HN at ports 1, 3 + 5
function	HN at ports 2 + 4 HN at port 141 12 V DC, 4.2 W 142 24 V DC, 4.2 W	s 1, 3 + 5 111 112	570 Power con	sumpt. 4.2 W, 7/4 VA <b>500</b> sumption 2.2 W <sup>2)</sup> <b>530</b>
	<b>152</b> 24 V AC, 7/4 VA <b>156</b> 115 V AC, 7/4 VA	122 126	Coil with M12 con	nector and LED  HN at ports 1, 3 + 5
	157 230 V AC, 7/4 VA 161 12 V DC, 2.2 W <sup>2)</sup> 162 24 V DC, 2.2 W <sup>2)</sup>	127 131 132	<b>O42</b> 24 V DC, 4 <b>O62</b> 24 V DC, 2	.8 W <b>012</b>

<sup>&</sup>lt;sup>1)</sup> HN = Manual override. It can be repositioned by 180°. Standard valve is supplied with HN on the same side as port 2.

### **Design and function**

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering. Valves of this series are available in explosion proof design in accordance with 94/9/EG (ATEX).

Order number	M-04-510-HN	M-04-511-HN	M-04-520-HN	M-04-530-HN	M-04-533-HN	
Please complete according to order code.	12 2 2	14 2 1 V	14 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			
Function	5/2-way	5/2-way	5/2-way	5/3-way	5/3-way	
	single solenoid air spring return	single solenoid spring return	double solenoid	center position closed	center position exhausted	
Connection	G 1/8					
Nominal size	4 mm					
Flow rate	360 NI/min (0.366	Cv)				
Pressure range	2.5 10 bar <sup>2)</sup> (36 145 psi) <sup>2)</sup>	3 10 bar <sup>2)</sup> (43 145 psi) <sup>2)</sup>	2.5 10 bar <sup>2)</sup> (36 145 psi) <sup>2)</sup>	3 10 bar <sup>2)</sup> (43 145 psi) <sup>2)</sup>		
Response time at 6 bar	on 12 ms off 14 ms	on 12 ms off 16 ms	12 ms	on 15 ms off 22 ms		
Temperature range	- 10 °C + 70 °C (+ 14 °F + 158 °F)					
Materials	Body: AI (anodized), plastic, Seals: NBR and POM, Inner parts: AI, stainless steel and brass					
Degree of protection	IP 65 according to	IP 65 according to EN 60529				
Weight	0.210 kg (0.462 lb.)	0.220 kg (0.484 lb.)	0.335 kg (0.737 lb.	)		

<sup>&</sup>lt;sup>2)</sup> max. 8 bar (max. 116 psi) at 2.2 W and 2.5 W.

<sup>&</sup>lt;sup>3)</sup> When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.084.

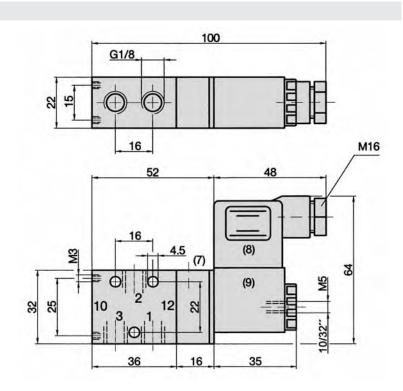


### **M-04**

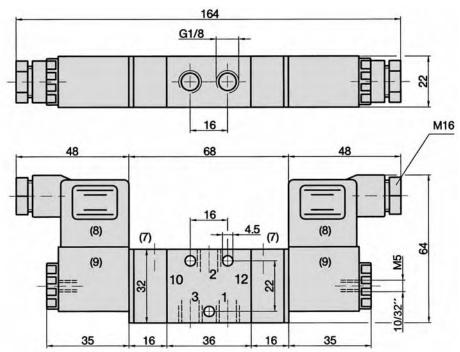
### M-04-310-HN, MO-04-310-HN

- 1 = pressure inlet
- 2 = outlet
- 3 = exhaust
- (7) = manual override (detent) can be repositioned by 180°
- (8) = plug socket can be repositioned by 180°
- (9) = solenoid coil can be repositioned by 4 x 90°

Valves MO-04-310-HN and MO-04-311-HN carry the solenoid on the opposite side (at pilot 10).



### M-04-320-HN



- 1 = pressure inlet
- 2 = outlet
- 3 = exhaust
- (7) = manual override (detent) can be repositioned by 180°
- (8) = plug socket can be repositioned by 180°
- (9) = solenoid coil can be repositioned by  $4 \times 90^{\circ}$

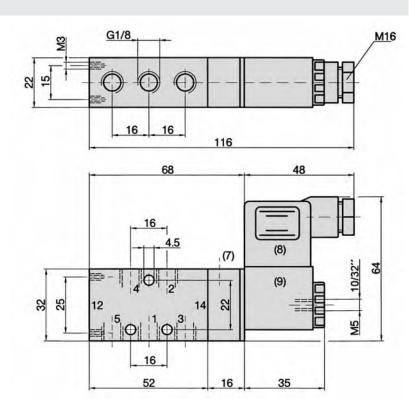
4.082

# airec

### **Dimensions for series**

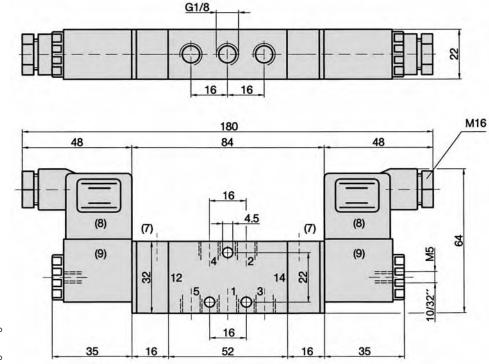
### **M-04**

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



- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (7) = manual override (detent) can be repositioned by 180°
- (8) = plug socket can be repositioned by 180°
- (9) = solenoid coil can be repositioned by 4 x 90°

### M-04-520-HN, M-04-530-HN, M-04-533-HN



- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (7) = manual override (detent) can be repositioned by 180°
- (8) = plug socket can be repositioned by 180°
- (9) = solenoid coil can be repositioned by 4 x 90°

# Accessories for electrically operated valves series M-04



### **Accessories for series**

### M-04

#### Solenoid coils, actuators



Standard coil **23-SP-011-...** page 4.280



Coil with 2.2 W power consumption **23-SP-012-...** page 4.280



Coil with M-12 plug connection, 4.8 W, LED and circuit protection 23-SP-011-5-O12 page 4.280



Coil with M-12 plug connection, 2.5 W, LED and circuit protection 23-SP-012-5-032 page 4.280



Standard actuator 23-R-011



Low power actuator 23-R-012

### **Plug sockets**



Standard plug socket 28-ST-01 page 4.281



Plug socket with LED **28-ST-04-**... page 4.281



Plug socket with LED and circuit protection **28-ST-06-...** page 4.281



Plug socket with LED, circuit protection and cable **28-ST-06-K3-...** page 4.281

#### **User information**

Low power consumption coils (2.2 W or 2.5 W) are for pressures up to 8 bar (116 psi) only. Valve actuator 23-R-012 is required. The actuator 23-R-012 is nickel plated. Make sure that the coils with the right power consumption are used.

For outdoor applications or in areas with high humidity use coil 23-SP-011-1-... or 23-SP-012-1-... (see page 5.120).

### The following types are available on request

Coils and sockets with contacts according to DIN EN 175301-803 type B (U-form). Plug sockets with molded cable.

4.084 Subject to change

# airec

### **Accessories for series**

### M-04

### **P-manifolds**



P-manifold will be delivered completely assembled with valves if requested.



Hollow bolt without O-ring **H-281** 



P-manifold with hollow bolts and O-rings. Available from 1 to 12 stations. **R-281/n** 





Blind plate for blank station **R-281-V** page 4.086



Brackets (pair) **R-281-W** page 4.086

### P-R-S manifolds



P-R-S-manifold will be delivered completely assembled with valves if requested.



Hollow bolt without O-ring **H-283** 



P-R-S-manifold with hollow bolts and O-rings. Available from 1 to 12 stations. **R-283/n** page 4.087



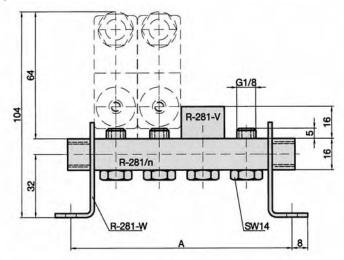
Blind plate for blank station **R-283-V** page 4.087



### **Dimensions for P-manifold**

### **R-281**





1 = pressure inlet

### R-281-V

Blind plate for blank station. Material: Al (anodized).

### R-281-W

One pair of mounting brackets for P-manifold R-281.

Material: steel (nickel-plated).

# 

#### R-281/n

P-manifold with hollow bolts and O-rings. Within the brackets the manifold can be repositioned by  $4 \times 90^{\circ}$ . Suitable for all valves of series M-04.

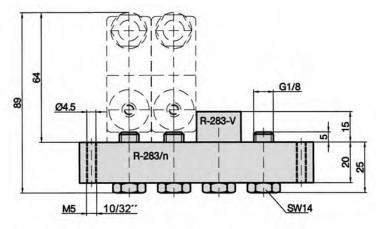
Material: AI (anodized), O-rings: NBR, hollow bolts: brass.

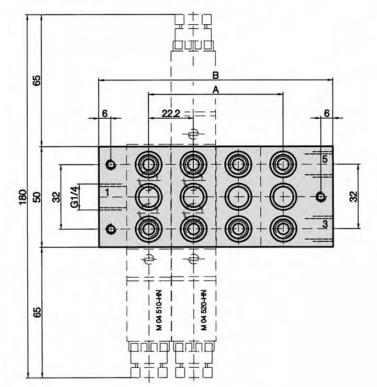
Order number	Α	В	С	Weight
R-281/1	46.2	_	50	0.032 kg (0.070 lb.)
R-281/2	68.4	22.2	72	0.053 kg (0.117 lb.)
R-281/3	90.6	44.4	94	0.074 kg (0.163 lb.)
R-281/4	112.8	66.6	116	0.095 kg (0.209 lb.)
R-281/5	135	88.8	138	0.116 kg (0.255 lb.)
R-281/6	157.2	111	160	0.137 kg (0.301 lb.)
R-281/7	179.4	133.2	182	0.158 kg (0.348 lb.)
R-281/8	201.6	155.4	204	0.179 kg (0.394 lb.)
R-281/9	223.8	177.6	226	0.199 kg (0.438 lb.)
R-281/10	246	199.8	248	0.222 kg (0.488 lb.)
R-281/11	268.2	222	270	0.243 kg (0.535 lb.)
R-281/12	290.4	244.2	292	0.265 kg (0.583 lb.)

### **Dimensions for P-R-S-manifold**

### R-283







1 = pressure inlet 3, 5 = exhaust

### R-283-V

Blind plate for blank station. Material: Al (anodized).

### R-283/n

P-R-S-manifold with hollow bolts and O-rings. Suitable for all 5/2- and 5/3-way valves of series M-04. Material: AI (anodized), O-rings: NBR, hollow bolts: brass.

Order number	A	В	Weight
R-283/1	_	50	0.127 kg (0.279 lb.)
R-283/2	22.2	72	0.192 kg (0.422 lb.)
R-283/3	44.4	94	0.258 kg (0.568 lb.)
R-283/4	66.6	116	0.322 kg (0.708 lb.)
R-283/5	88.8	138	0.387 kg (0.851 lb.)
R-283/6	111	160	0.452 kg (0.994 lb.)
R-283/7	133.2	182	0.520 kg (1.144 lbs.)
R-283/8	155.4	204	0.583 kg (1.283 lbs.)
R-283/9	177.6	226	0.651 kg (1.432 lbs.)
R-283/10	199.8	248	0.712 kg (1.566 lbs.)
R-283/11	222	270	0.778 kg (1.712 lbs.)
R-283/12	244.2	292	0.843 kg (1.855 lbs.)



### **Technical data for series**

### **BM-01**



Order code	BM-01-310-HNR-162			
		С	oil options	
Series and function	Manual override  HNT = non-detented	Standard voltage	Plug socket upward 1)	Plug socket downward 1)
BM = Standard	manual override  HNR = detented	12 V DC, 1 W 24 V DC, 1 W	161 162	131 132
	manual override	24 V AC, 3 VA 115 V AC, 3 VA 230 V AC, 3 VA	152 156 157	122 126 127

<sup>&</sup>lt;sup>1)</sup> The solenoid can be supplied with plug socket connection and manual override on the same side as ports 2 and 4 or on the same side as ports 1, 3 and 5.

When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.097.

### **Design and function**

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering.

Order number	BM-01-310-HN	BM-01-312-HN	
Please complete according to order code.  Function	12 2 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	10 2	
	3/2-way NC	3/2-way NO	
Connection	G 1/8		
Nominal size	5 mm		
Flow rate	660 NI/min (0.671 Cv) 600 NI/min (0.610 Cv)		
<b>Pressure range</b>	2 8 bar (29 116 psi)		
<b>Control pressure</b>	Control pressure is identical to main pressure ra	nge	
Response time at 6 bar	on 19 ms off 32 ms	on 16 ms off 30 ms	
Temperature range	- 5 °C + 50 °C (+ 23 °F + 122 °F)		
Materials	Body: AI (anodized) and PA, Seals: NBR and PU, Inner parts: AI, brass and POM		
Degree of protection	IP 65 according to EN 60529		
Weight	0,108 kg (0.238 lb.)	0,110 kg (0.242 lb.)	

4.090 Subject to change

# Electrically operated valves 2 x 3/2-way G 1/8, 550 - 650 NI/min (0.559 - 0.661 Cv)



### **Technical data for series**

### **BM-01**



### Order code

BM-01-310-HNR-162

### Series and function

BM = Standard

#### **Manual override**

HNT = non-detented manual override

HNR = detented manual override

Standard voltage	Plug socket upward 1)	Plug socket downward 1)
12 V DC, 1 W	161	131
24 V DC, 1 W	162	132
24 V AC, 3 VA	152	122
115 V AC, 3 VA	156	126
230 V AC, 3 VA	157	127

**Coil options** 

When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.097.

### **Design and function**

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering.

Order number	BM-01-310/2-HN	BM-01-312/2-HN	BM-01-314/2-HN		
Please complete according to order code.  Function		14 12 2	14 12 2 15 1 2 3		
	2 x 3/2-way NC	2 x 3/2-way NO	2 x 3/2-way NO/NC		
Connection	G 1/8				
Nominal size	5 mm				
Flow rate	650 NI/min (0.661 Cv)	550 NI/min (0.559 Cv)	580 NI/min (0.589 Cv)		
Pressure range	2 8 bar (29 116 psi)				
<b>Control pressure</b>	Control pressure is identical to	main pressure range			
Response time at 6 bar	on 18 ms off 34 ms		on 19 ms off 32 ms		
Temperature range	- 5 °C + 50 °C (+ 23 °F + 122 °F)				
Materials	Body: AI (anodized) and PA, Seals: NBR and PU, Inner parts: AI, brass and POM				
Degree of protection	IP 65 according to EN 60529				
Weight	0,154 kg (0.339 lb.)				

<sup>&</sup>lt;sup>1)</sup> The solenoid can be supplied with plug socket connection and manual override on the same side as ports 2 and 4 or on the same side as ports 1, 3 and 5.



### **Technical data for series**

### **BM-01**



Order code	BM-01-510-HNR-162			
		С	oil options	
Series and	Manual override	Standard voltage	Plug socket upward 1)	Plug socket downward 1)
function BM = Standard	HNT = non-detented manual override	12 V DC, 1 W	161	131
BME = Valves with external	HNR = detented	24 V DC, 1 W	162	132
pilot supply	manual override	24 V AC, 3 VA 115 V AC, 3 VA	152 156	122 126
		230 V AC, 3 VA	157	127

<sup>&</sup>lt;sup>1)</sup> The solenoid can be supplied with plug socket connection and manual override on the same side as ports 2 and 4 or on the same side as ports 1, 3 and 5.

When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.097.

### **Design and function**

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering.

Order number	BM-01-510-HN	BM-01-511-HN	BM-01-520-HN	BME-01-511-HN	BME-01-520-HN
Please complete according to order code.		14 4 21 5 1 1 3	14 4 2 12	14 2 2 MW	14 2 12
Function	5/2-way single solenoid air spring return	5/2-way single solenoid spring return	5/2-way double solenoid	5/2-way single solenoid ext. pilot supply	5/2-way double solenoid ext. pilot supply
Connection	G 1/8				
Nominal size	5 mm				
Flow rate	780 NI/min (0.793 Cv)	800 NI/min (0.813 Cv)	790 NI/min (0.803 Cv)	800 NI/min (0.813 Cv)	790 NI/min (0.803 Cv)
Pressure range	2 8 bar 3 8 bar 2 8 bar - 0,95 8 bar (29 116 psi) (43.5 116 psi) (29 116 psi) (-14 + 116 psi)				
Control pressure	Control pressure is	s identical to main p	ressure range	3 8 bar (43.5 116 psi)	2 8 bar (29 116 psi)
Response time at 6 bar	on 17 ms off 32 ms	on 15 ms off 35 ms	13 ms	on 15 ms off 35 ms	13 ms
Temperature range	- 5 °C + 50 °C (+ 23 °F + 122 °F)				
Materials	Body: AI (anodized) and PA, Seals: NBR and PU, Inner parts: AI, brass and POM				
Degree of protection	IP 65 according to EN 60529				
Weight	0,118 kg (0.260 lb.)	0,120 kg (0.264 lb.)	0,156 kg (0.344 lb.)	0,126 kg (0.278 lb.)	0,168 kg (0.370 lb.)

4.092 Subject to change

# Electrically operated valves 5/3-way G 1/8, 670 - 1030 NI/min (0.681 - 1.047 CV)



### **Technical data for series**

### **BM-01**



### Order code

BM-01-530-HNR-162

### Series and function

BM = Standard

BME = Valves with external pilot supply

### Manual override

HNT = non-detented manual override

HNR = detented manual override

### **Coil options**

Standard voltage	Plug socket upward 1)	Plug socket downward 1)
12 V DC, 1 W	161	131
24 V DC, 1 W	162	132
24 V AC, 3 VA	152	122
115 V AC, 3 VA	156	126
230 V AC, 3 VA	157	127

<sup>&</sup>lt;sup>1)</sup> The solenoid can be supplied with plug socket connection and manual override on the same side as ports 2 and 4 or on the same side as ports 1, 3 and 5.

When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.097.

### **Design and function**

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering.

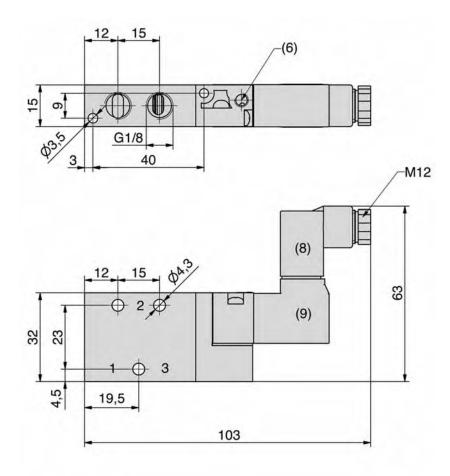
Order number	BM-01-530-HN	BM-01-533-HN	BM-01-534-HN	BME-01-530-HN	BME-01-533-HN	BME-01-534-HN
Please complete according to order code.			14 M 17 M			14 M 12 T 12
Function	5/3-way center position closed	5/3-way center position exhausted	5/3-way center position pressurized	5/3-way center position closed ext. pilot supply	5/3-way center position exhausted ext. pilot supply	5/3-way center position pressurized ext. pilot supply
Connection	G 1/8					
Nominal size	5 mm					
Flow rate	690 NI/min (0.701 Cv)	670 NI/min (0.681 Cv)	1030 NI/min (1.047 Cv)	690 NI/min (0.701 Cv)	670 NI/min (0.681 Cv)	1030 NI/min (1.047 Cv)
Pressure range	3 8 bar (43.5	116 psi)		- 0,95 8 bar	(- 14 + 116 psi)	
<b>Control pressure</b>	Control pressure	is identical to mai	n pressure range	3 8 bar (43.5	116 psi)	
Response time at 6 bar	17 ms	on 16 ms off 43 ms	on 17 ms off 49 ms	17 ms	on 16 ms off 43 ms	on 17 ms off 49 ms
Temperature range	- 5 °C + 50 °C (+ 23 °F + 122 °F)					
Materials	Body: Al (anodized) and PA, Seals: NBR and PU, Inner parts: Al, brass and POM					
Degree of protection	IP 65 according to EN 60529					
Weight	0,154 kg (0.339 l	b.)		0,166 kg (0.366 l	b.)	



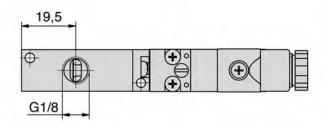
### **BM-01**

### BM-01-310-HN, BM-01-312-HN





- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (6) = Pilot air exhaust, M5
- (7) = Manual override, detented or non-detented
- (8) = plug socket can be repositioned by  $180^{\circ}$
- (9) = Solenoid, pins for plug socket connection upward or downward

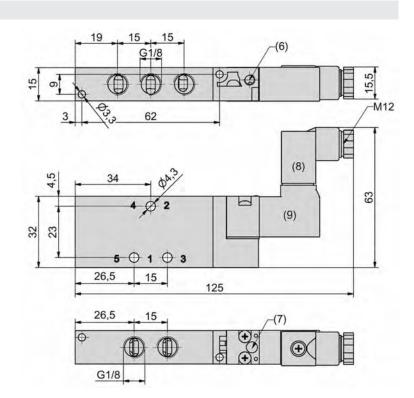


4.094

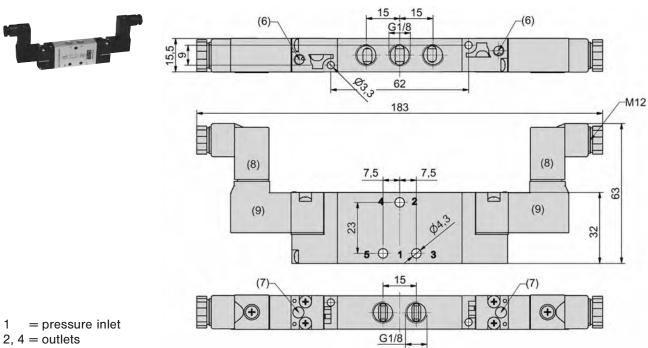
### BM-01-510-HN, BM-01-511-HN



- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (6) = Pilot air exhaust, M5
- (7) = Manual override, detented or non-detented
- (8) = plug socket can be repositioned by 180°
- (9) = Solenoid, pins for plug socket connection upward or downward



### BM-01-310/2-HN, BM-01-312/2-HN, BM-01-314/2-HN, BM-01-520-HN, BM-01-530-HN, BM-01-533-HN, BM-01-534-HN



- 3, 5 = exhausts
- (6) = Pilot air exhaust, M5
- (7) = Manual override, detented or non-detented
- (8) = plug socket can be repositioned by 180°
- (9) = Solenoid, pins for plug socket connection upward or downward

4.095 Subject to change

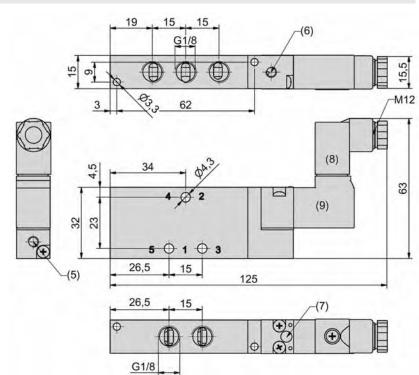


### **BME-01**

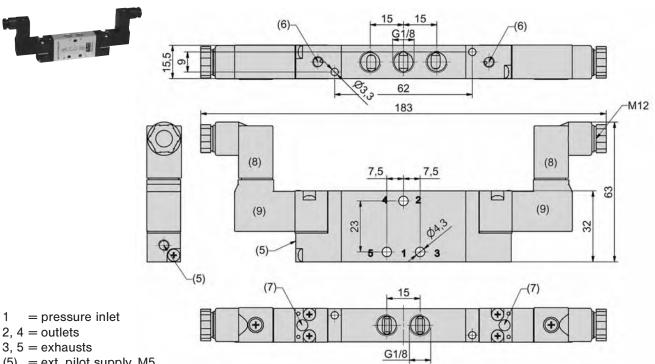
#### **BME-01-511-HN**



- = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (5) = ext. pilot supply, M5
- (6) = Pilot air exhaust, M5
- = Manual override, detented or non-detented
- = plug socket can be repositioned by  $180^{\circ}$
- (9) = Solenoid, pins for plug socket connection upward or downward



### BME-01-520-HN, BME-01-530-HN, BME-01-533-HN, BME-01-534-HN



- (5) = ext. pilot supply, M5
- (6) = Pilot air exhaust, M5
- = Manual override, detented or non-detented
- (8) = plug socket can be repositioned by 180°
- (9) = Solenoid, pins for plug socket connection upward or downward



### BM-01, BME-01

### **Solenoid**



Solenoid with pins for plug socket connection on the same side as manual override (upward).

23-M-09-19-...
page 4.284



Solenoid with pins for plug socket connection on the opposite side of the manual override (downward). **23-M-09-19-...** page 4.284

### **Plug sockets**



Standard plug socket 28-ST-02-1 page 4.284



Plug socket with LED **28-ST-09-1-...** page 4.284



Plug socket with LED and circuit protection **28-ST-10-1-...** page 4.284



### BM-01, BME-01

#### **Manifolds**



Manifold will be delivered completely assembled with valves if requested.



Manifold with n/stations. Ports on the side. **RF-01-AB/n** 



Manifold with n/stations. Ports on the side and the top. RF-01-CD/n



Manifold with n/stations. Ports on both sides and top. **RF-01-AD/n** 



One station element. **RF-01-Z** 



Blind plate for blank valve station. **RF-01-V** 



Adapter plate for additional air supply and exhaust. RF-01-PE



End plate A with side ports. **RF-01-EA** 



End plate B with side ports. **RF-01-EB** 



End plate C with side and top ports. **RF-01-EC** 



End plate D with side and top ports. **RF-01-ED** 

Subject to change

**Additional single elements: RF-01-ZE** "Add-on" element to add one valve station.

**RF-01-DT** Seal plate for two different pressures. **RE-46-RSV** Check valve for dynamic exhaust pressures.

#### **User information**

Modular manifold system for valve series BM-01. The assembled manifold consists of one station elements (RF-01-Z) and end plates with common supply and exhaust ports. The end plates contain ports to the side (RF-01-EA, RF-01-EB) or at the top and the side (RF-01-EC, RF-01-ED).

The manifolds are quickly assembled with the 4 screws and a hexagonal nut. Adding or removing stations is possible at any time.

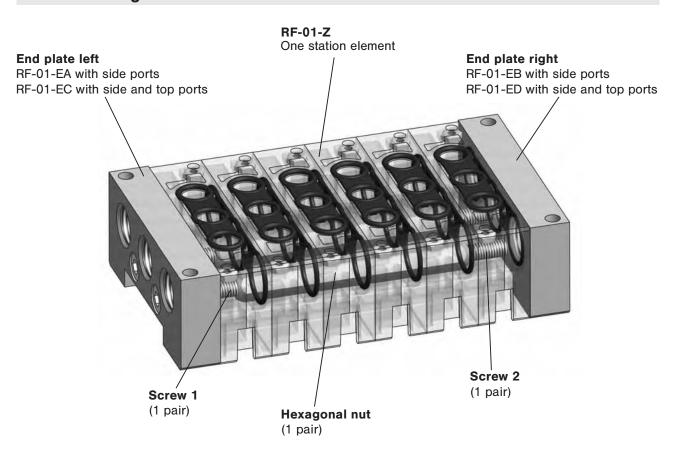
The manifold can be either DIN-rail mounted, screw on by 4 M5 screws or flange mounting via M4 screws.

The necessary seals and screws for valve mounting are included in the scope of delivery.



### **BM-01**, **BME-01**

### Manifold design



### **User information**

To add stations to the manifold without changing screws and nut, the set RF-01-ZE is available. This contains a one station element, a screw to extend the hexagonal nut and seals and screws for valve mounting.

Order number	Hexagonal nut	Screw 1	Screw 2
RF-01-AB/02	21-R-07-07/05	M 5 x 16	M 5 x 16
RF-01-AB/03	21-R-07-07/05	M 5 x 25	M 5 x 25
RF-01-AB/04	21-R-07-07/05	M 5 x 30	M 5 x 30
RF-01-AB/05	21-R-07-07/2	M 5 x 20	M 5 x 20
RF-01-AB/06	21-R-07-07/2	M 5 x 25	M 5 x 25
RF-01-AB/07	21-R-07-07/2	M 5 x 35	M 5 x 35
RF-01-AB/08	21-R-07-07/2	M 5 x 40	M 5 x 40
RF-01-AB/09	21-R-07-07/4	M 5 x 16	M 5 x 16
RF-01-AB/10	21-R-07-07/4	M 5 x 25	M 5 x 25
RF-01-AB/11	21-R-07-07/4	M 5 x 35	M 5 x 35
RF-01-AB/12	21-R-07-07/4	M 5 x 40	M 5 x 40

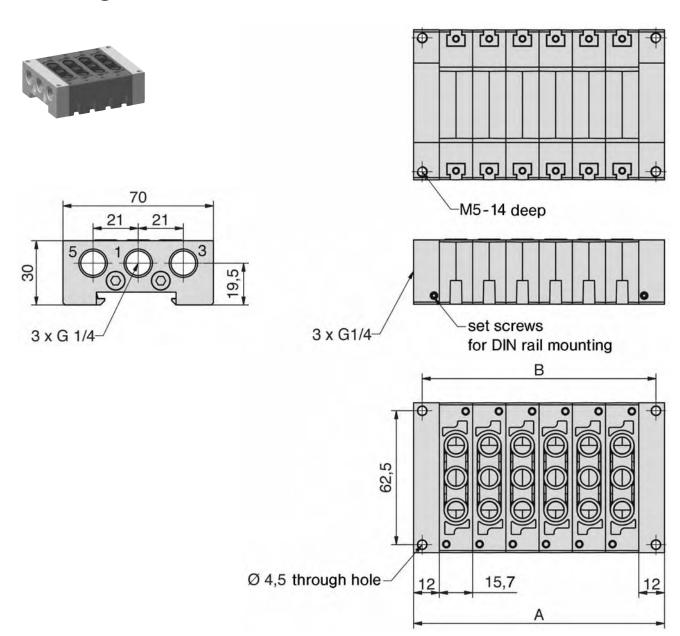
Order number	Hexagonal nut	Screw 1	Screw 2
RF-01-CD/02	21-R-07-07/05	M 5 x 30	M 5 x 30
RF-01-CD/03	21-R-07-07/05	M 5 x 35	M 5 x 35
RF-01-CD/04	21-R-07-07/05	M 5 x 45	M 5 x 45
RF-01-CD/05	21-R-07-07/2	M 5 x 30	M 5 x 30
RF-01-CD/06	21-R-07-07/2	M 5 x 40	M 5 x 40
RF-01-CD/07	21-R-07-07/2	M 5 x 45	M 5 x 45
RF-01-CD/08	21-R-07-07/2	M 5 x 55	M 5 x 55
RF-01-CD/09	21-R-07-07/4	M 5 x 30	M 5 x 30
RF-01-CD/10	21-R-07-07/4	M 5 x 40	M 5 x 40
RF-01-CD/11	21-R-07-07/4	M 5 x 45	M 5 x 45
RF-01-CD/12	21-R-07-07/4	M 5 x 55	M 5 x 55

Order number	Hexagonal nut	Screw 1	Screw 2
RF-01-AD/02	21-R-07-07/05	M 5 x 16	M 5 x 30
RF-01-AD/03	21-R-07-07/05	M 5 x 25	M 5 x 35
RF-01-AD/04	21-R-07-07/05	M 5 x 30	M 5 x 45
RF-01-AD/05	21-R-07-07/2	M 5 x 20	M 5 x 30
RF-01-AD/06	21-R-07-07/2	M 5 x 25	M 5 x 40
RF-01-AD/07	21-R-07-07/2	M 5 x 35	M 5 x 45
RF-01-AD/08	21-R-07-07/2	M 5 x 40	M 5 x 55
RF-01-AD/09	21-R-07-07/4	M 5 x 16	M 5 x 30
RF-01-AD/10	21-R-07-07/4	M 5 x 25	M 5 x 40
RF-01-AD/11	21-R-07-07/4	M 5 x 35	M 5 x 45
RF-01-AD/12	21-R-07-07/4	M 5 x 40	M 5 x 55



### **Dimensions for manifolds**

### RF-01-AB



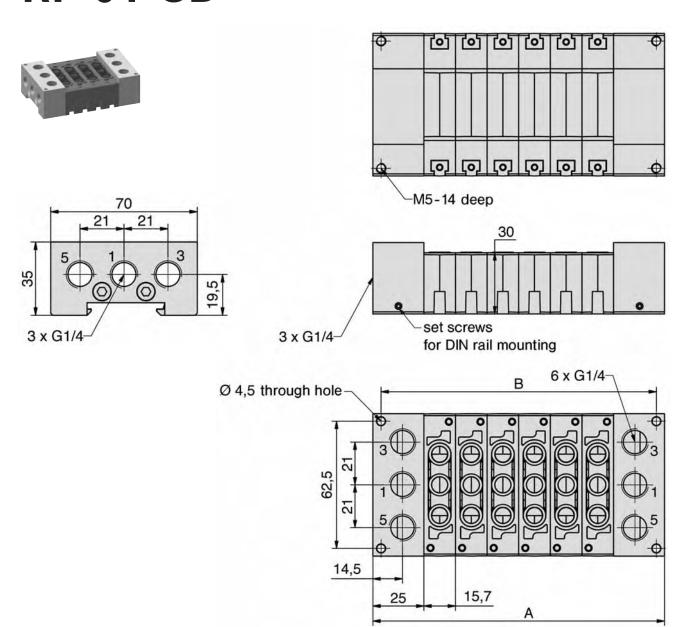
Materials: End plate AI (anodized), 1 station element PA, Seals NBR, Screws steel zinc plated

Order number	A	В	Weight
RF-01-AB/02	55.4 + 0.3 /- 0.2	47.2 + 0.2 /- 0.1	0.150 kg (0.331 lb.)
RF-01-AB/03	71.1 + 0.35/- 0.2	63.1 + 0.25/- 0.1	0.190 kg (0.419 lb.)
RF-01-AB/04	86.8 + 0.4 /- 0.2	78.8 + 0.3 /- 0.1	0.230 kg (0.507 lb.)
RF-01-AB/05	102.5 + 0.45/- 0.2	94.5 + 0.35/- 0.1	0.270 kg (0.595 lb.)
RF-01-AB/06	118.2 + 0.5 /- 0.2	110.2 + 0.4 /- 0.1	0.310 kg (0.683 lb.)
RF-01-AB/07	133.9 + 0.55/- 0.2	125.9 + 0.45/- 0.1	0.350 kg (0.772 lb.)
RF-01-AB/08	149.6 + 0.6 /- 0.2	141.6 + 0.5 /- 0.1	0.390 kg (0.860 lb.)
RF-01-AB/09	165.3 + 0.65/- 0.2	157.3 + 0.55/- 0.1	0.430 kg (0.948 lb.)
RF-01-AB/10	181 + 0.7 /- 0.2	173 + 0.6 /- 0.1	0.470 kg (1.036 lbs.)
RF-01-AB/11	196.7 + 0.75/- 0.2	188.7 + 0.65/- 0.1	0.510 kg (1.124 lbs.)
RF-01-AB/12	212.4 + 0.8 /- 0.2	204.4 + 0.7 /- 0.1	0.550 kg (1.212 lbs.)



### **Dimensions for manifolds**

### **RF-01-CD**



Materials: End plate AI (anodized), 1 station element PA, Seals NBR, Screws steel zinc plated

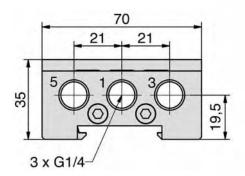
Order number	A	В	Weight
RF-01-CD/02	81.4 + 0.3 /- 0.2	73.4 + 0.2 /- 0.1	0.300 kg (0.661 lb.)
RF-01-CD/03	97.1 + 0.35/- 0.2	89.1 + 0.25/- 0.1	0.340 kg (0.750 lb.)
RF-01-CD/04	112.8 + 0.4 /- 0.2	104.8 + 0.3 /- 0.1	0.380 kg (0.838 lb.)
RF-01-CD/05	128.5 + 0.45/- 0.2	120.5 + 0.35/- 0.1	0.420 kg (0.926 lb.)
RF-01-CD/06	144.2 + 0.5 /- 0.2	136.2 + 0.4 /- 0.1	0.460 kg (1.014 lbs.)
RF-01-CD/07	159.9 + 0.55/- 0.2	151.9 + 0.45/- 0.1	0.500 kg (1.102 lbs.)
RF-01-CD/08	175.6 + 0.6 /- 0.2	167.6 + 0.5 /- 0.1	0.540 kg (1.190 lbs.)
RF-01-CD/09	191.3 + 0.65/- 0.2	183.3 + 0.55/- 0.1	0.580 kg (1.278 lbs.)
RF-01-CD/10	207 + 0.7 /- 0.2	199 + 0.6 /- 0.1	0.620 kg (1.367 lbs.)
RF-01-CD/11	222.7 + 0.75/- 0.2	214.7 + 0.65/- 0.1	0.660 kg (1.455 lbs.)
RF-01-CD/12	238.4 + 0.8 /- 0.2	230.4 + 0.7 /- 0.1	0.700 kg (1.543 lbs.)

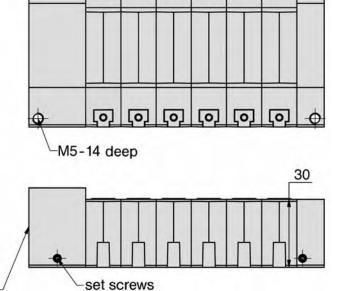


### **Dimensions for manifolds**

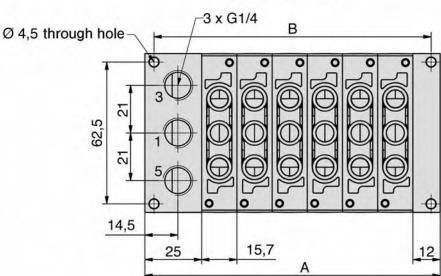
### RF-01-AD







for DIN rail mounting



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Materials: End plate AI (anodized), 1 station element PA,

Seals NBR, Screws steel zinc plated

Order number	A	В	Weight
RF-01-AD/02	68.4 + 0.3 /- 0.2	60.4 + 0.2 /- 0.1	0.230 kg (0.507 lb.)
RF-01-AD/03	84.1 + 0.35/- 0.2	76.1 + 0.25/- 0.1	0.270 kg (0.595 lb.)
RF-01-AD/04	99.8 + 0.4 /- 0.2	91.8 + 0.3 /- 0.1	0.310 kg (0.683 lb.)
RF-01-AD/05	115.5 + 0.45/- 0.2	107.5 + 0.35/- 0.1	0.350 kg (0.772 lb.)
RF-01-AD/06	131.2 + 0.5 /- 0.2	123.2 + 0.4 /- 0.1	0.390 kg (0.860 lb.)
RF-01-AD/07	146.9 + 0.55/- 0.2	138.9 + 0.45/- 0.1	0.430 kg (0.948 lb.)
RF-01-AD/08	162.6 + 0.6 /- 0.2	154.6 + 0.5 /- 0.1	0.470 kg (1.036 lbs.)
RF-01-AD/09	178.3 + 0.65/- 0.2	170.3 + 0.55/- 0.1	0.510 kg (1.124 lbs.)
RF-01-AD/10	194 + 0.7 /- 0.2	186 + 0.6 /- 0.1	0.550 kg (1.212 lbs.)
RF-01-AD/11	209.7 + 0.75/- 0.2	201.7 + 0.65/- 0.1	0.590 kg (1.301 lbs.)
RF-01-AD/12	225.4 + 0.8 /- 0.2	217.4 + 0.7 /- 0.1	0.630 kg (1.389 lbs.)

3 x G1/4

)

Note	alite



### **Technical data for series**

**M-05** 



### Order code

M-05-310-HN-142

### Series and function

		Coil o	ptions <sup>1)</sup>			
	dard coils3) olug socket 28-ST-01	1)	Witho	ut coil and plug socke	e <i>t</i> HN at ports	1+3
141 142	12 V DC, 4.2 W 24 V DC, 4.2 W	/ 112	570 560	Power consumpt. 4 Power consumption	1.2 W, 7/4 VA	
152 156	24 V AC, 7/4 V 115 V AC, 7/4		Coil w	<i>rith M12 connector ar</i> port 2	nd LED HN at ports	1 + 3
157 161	230 V AC, 7/4 12 V DC, 2.2 W	/ <sup>2)</sup> 131	O42 O62	24 V DC, 4.8 W 24 V DC, 2.5 W <sup>2)</sup>		O12 O32
162	24 V DC, 2.2 V	/ <sup>2)</sup> 132				

<sup>&</sup>lt;sup>1)</sup> HN = Manual override. It can be repositioned by 180°. Standard valve is supplied with HN on the same side as port 2.

### **Design and function**

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering.

The valve M-05-311-HN is available for use with vacuum, order number ME-05-312-HN.

Valves of this series are available in explosion proof design in accordance with 94/9/EG (ATEX). For further details see chapter 12 of this catalogue.

Order number	M-05-310-HN	MO-05-310-HN	M-05-311-HN	MO-05-311-HN	M-05-320-HN	ME-05-311-HN	ME-05-320-HN
Please complete according to order code.			The state of the s	W Z Z W	12 2 10	The state of the s	12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Function	3/2-way normally closed air spring return	3/2-way normally open air spring return	3/2-way normally closed spring return	3/2-way normally open spring return	3/2-way double solenoid	3/2-way ext. pilot supply spring return	3/2-way double solenoid ext. pilot supply
Connection	G 1/8						
Nominal size	6 mm						
Flow rate	750 NI/min(	0.762 Cv)					
Pressure range	l I				2 10 bar <sup>2)</sup> (29 145 psi)	0 10 bar <sup>2)</sup> (0 145 psi)	
Control pressure	Control press	sure is identica	al to main pres	ssure range		3 10 bar <sup>2)</sup> (43 145 psi)	2 10 bar <sup>2)</sup> (29 145 psi)
Response time at 6 bar	on 13 ms off 16 ms				12 ms	on 13 ms off 18 ms	12 ms
Temperature range	- 10 ℃ +	- 10 °C + 70 °C (+ 14 °F + 158 °F)					
Materials	Body: Al (anodized), Seals: NBR and POM, Inner parts: Al, stainless steel and brass						s
Degree of protection	IP 65 according to EN 60529						
Weight	0.255 kg (0.561 lb.)		0.260 kg (0.572 lb.)		0.400 kg (0.88 lb.)	0.308 kg (0.678 lb.)	0.426 kg (0.937 lb.)

<sup>&</sup>lt;sup>2)</sup> max. 8 bar (max. 116 psi) at 2.2 W and 2.5 W.

4.110 Subject to change

<sup>&</sup>lt;sup>3)</sup> When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.114.

# Electrically operated valves 5/2- and 5/3-way, G 1/8, 750 NI/min (0.762 Cv)



### **Technical data for series**

**M-05** 



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$\mathbf{v}$	u	CI	CU	ue

M-05-510-HN-142

### Coil options1)

Series
and
function

Stand	lard coils <sup>3)</sup>		Withou	ut coil and plug sock	ret	
(with p	lug socket 28-ST-01)		HN at p	orts 2 + 4	HN at ports 1,	3 + 5
HN at	ports 2 + 4 HN at ports	1, 3 + 5	570	Power consumpt.	4.2 W, 7/4 VA	500
141	12 V DC, 4.2 W	111	560	Power consumption		530
142	24 V DC, 4.2 W	112				
152	24 V AC, 7/4 VA	122	Coil w	ith M12 connector a	nd LED	
156	115 V AC, 7/4 VA	126	HN at p	orts 2 + 4	HN at ports 1,	3 + 5
157	230 V AC, 7/4 VA	127	042	24 V DC, 4.8 W	,	012
161	12 V DC, 2.2 W <sup>2)</sup>	131	062	24 V DC, 2.5 W <sup>2)</sup>		032
162	24 V DC, 2.2 W <sup>2)</sup>	132		3,		

<sup>&</sup>lt;sup>1)</sup> HN = Manual override. It can be repositioned by 180°. Standard valve is supplied with HN on the same side as port 2.

### **Design and function**

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering. Valves ME-05-511-HN and ME-05-520-HN are available for use with vacuum (-0.95...10 bar/-14...175 psi). Order number changes to ME-05-511-HN-Q and ME-05-520-HN-Q.

Valves of this series are available in explosion proof design in accordance with 94/9/EG (ATEX). For further details see chapter 12 of this catalogue.

Order number	M-05-510-HN	M-05-511-HN	M-05-520-HN	M-05-530-HN	M-05-533-HN	M-05-534-HN	ME-05-511-HN	ME-05-520-HN
Please complete according to order code.		<del>ZD</del> ZJŽM					<u> </u>	<u>ā viļās</u>
Function	5/2-way single solenoid air spring return	5/2-way single solenoid spring return	5/2-way double solenoid	5/3-way center position closed	5/3-way center position exhausted	5/3-way center position pressurized	5/2-way single solenoid ext. pilot supply	5/2-way double solenoid ext. pilot supply
Connection	G 1/8							
Nominal size	6 mm			5 mm			6 mm	
Flow rate	750 NI/min	(0.762 Cv)		650 NI/min	(0.661 Cv)		750 NI/min	(0.762 Cv)
Pressure range	2 10 bar <sup>2)</sup> 3 10 bar <sup>2)</sup> 2 10 bar <sup>2)</sup> 3 10 bar <sup>2)</sup> 3 10 bar <sup>2)</sup> (29 145 psi) (43 145 psi) (43 145 psi) (0 145 psi)					)		
Control pressure	Control pre	ssure is ider	itical to mair	n pressure ra	ınge		3 10 bar <sup>2)</sup> (43 145 psi)	2 10 bar <sup>2)</sup> (29 145 psi)
Response time at 6 bar	on 13 ms off 16 ms	on 13 ms off 18 ms	12 ms	on 13 ms off 18 ms		on 13 ms off 16 ms	12 ms	
Temperature range	– 10 °C	- 10 °C + 70 °C (+ 14 °F + 158 °F)						
Materials	Body: Al (ar	Body: Al (anodized), Seals: NBR and POM, Inner parts: Al, stainless steel and brass						
Degree of protection	IP 65 according to EN 60529							
Weight	0.295 kg (0.649 lb.)	0.300 kg (0.660 lb.)	0.440 kg (0.968 lb.)				0.360 kg (0.792 lb.)	0.470 kg (1.034 lbs.)

<sup>&</sup>lt;sup>2)</sup> max. 8 bar (max. 116 psi) at 2.2 W and 2.5 W.

<sup>&</sup>lt;sup>3)</sup> When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.114.



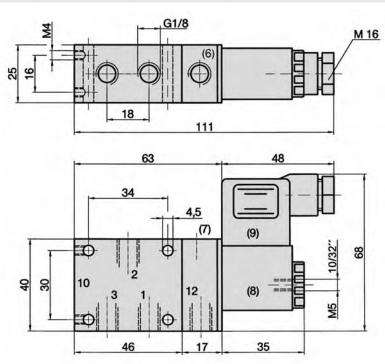
### **Dimensions for series**

### **M-05**

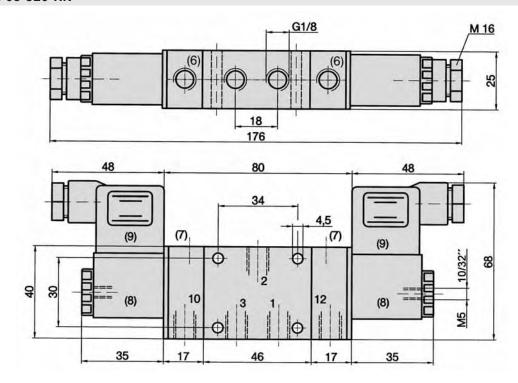
### M-05-310-HN, M-05-311-HN, MO-05-310-HN, MO-05-311-HN, ME-05-311-HN, ME-05-312-HN

- 1 = pressure inlet
- 2 = outlet
- 3 = exhaust
- (6) = Only valve ME-05-311-HN includes G 1/8 at port 12 for external pilot supply.
- (7) = manual override (detent) can be repositioned by 180°
- (8) = solenoid coil can be repositioned by 4 x 90°
- (9) = plug socket can be repositioned by 180°

Valves MO-05-310-HN and MO-05-311-HN carry the solenoid on the opposite side (at pilot 10).



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



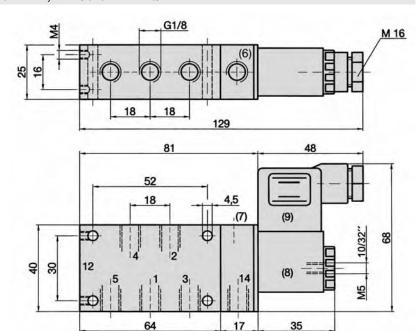
- 1 = pressure inlet
- 2 = outlet
- 3 = exhaust
- (7) = manual override (detent) can be repositioned by  $4 \times 90^{\circ}$
- (8) = solenoid coil can be repositioned by 4 x 90°
- (9) = plug socket can be repositioned by  $180^{\circ}$
- (6) = Only valve ME-05-320-HN includes G 1/8 at ports 10 and 12 for external pilot supply.

## airec

### **Dimensions for series**

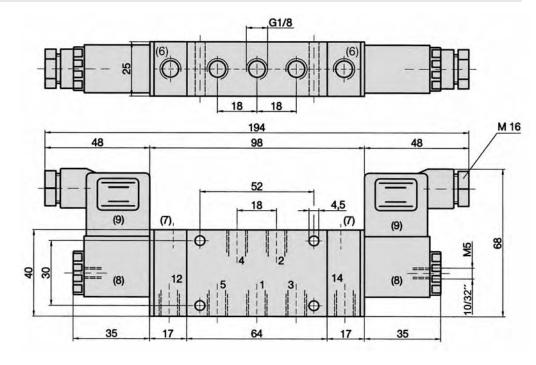
### **M-05**

### M-05-510-HN, M-05-511-HN, ME-05-511-HN, ME-05-511-HN-Q



- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (6) = Only valve ME-05-511-HN includes G 1/8 at port 14 for external pilot supply.
- (7) = manual override (detent) can be repositioned by 180°
- (8) = solenoid coil can be repositioned by 4 x 90°
- (9) = plug socket can be repositioned by 180°

### M-05-520-HN, ME-05-520-HN, ME-05-520-HN-Q, M-05-530-HN, M-05-533-HN, M-05-534-HN



- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (7) = manual override (detent) can be repositioned by  $180^{\circ}$
- (8) = solenoid coil can be repositioned by  $4 \times 90^{\circ}$
- (9) = plug socket can be repositioned by 180°
- (6) = Only valve ME-05-520-HN includes G 1/8 at ports 12 and 14 for external pilot supply.

# Accessories for electrically operated valves series M-05



### **Accessories for series**

### **M-05**

#### Solenoid coils, actuators



Standard coil 23-SP-011-... page 4.280



Coil with 2.2 W power consumption **23-SP-012-...** page 4.280



Coil with M-12 plug connection, 4.8 W, LED and circuit protection 23-SP-011-5-O12 page 4.280



Coil with M-12 plug connection, 2.5 W, LED and circuit protection 23-SP-012-5-032 page 4.280



Valves with explosion proof actuator see chapter 12.



Standard actuator 23-R-011



Low power actuator 23-R-012

#### Plug sockets



Standard plug socket **28-ST-01** page 4.281



Plug socket with LED **28-ST-04-**... page 4.281



Plug socket with LED and circuit protection **28-ST-06-...** page 4.281



Plug socket with LED, circuit protection and cable **28-ST-06-K3-...** page 4.281

#### **User information**

Low power consumption coils (2.2 W or 2.5 W) are for pressures up to 8 bar (116 psi) only. Valve actuator 23-R-012 is required. The actuator 23-R-012 is nickel plated. Make sure that the coils with the right power consumption are used.

When using explosion proof coils the dimensions of the corresponding valve change.

For outdoor applications or in areas with high humidity use coil 23-SP-011-1-... or 23-SP-012-1-... (see page 5.120).

### The following types are available on request

Coils and sockets with contacts according to DIN EN 175301-803 type B (U-form). Plug sockets with molded cable.

4.114 Subject to change

# airec

### **Accessories for series**

### M-05, P-05

### P-manifolds



P-manifold will be delivered completely assembled with valves if requested.



Hollow bolt with O-ring **H-183** 



Manifold with hollow bolts and O-rings. Available from 1 to 12 stations **R-181/n** page 4.116



Blind plate for blank station **R-181-V** page 4.116



Brackets (pair) R-181-W page 4.116

### P-R-S manifolds



P-R-S-manifold will be delivered completely assembled with valves if requested.



Hollow bolt with O-ring **H-183** 



Manifold with hollow bolts and O-rings. Available from 1 to 12 stations. **R-183/n** page 4.117

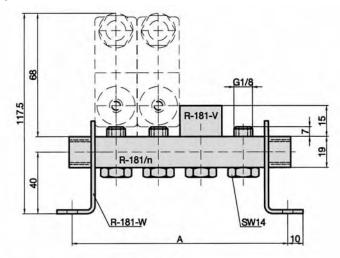


Blind plate for blank station **R-183-V** page 4.117



### **R-181**





1 = pressure inlet

### R-181-V

Blind plate for blank station. Material: Al (anodized).

#### R-181-W

One pair of mounting brackets for P-manifold R-181.

Material: steel (nickel-plated).

# 

### R-181/n

P-manifold with hollow bolts and O-rings. Within the brackets the manifold can be repositioned by 4 x  $90^{\circ}$ . Suitable for all valves of series M-05 and P-05.

Material: AI (anodized), O-rings: NBR, hollow bolts: brass.

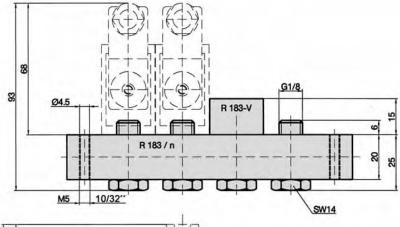
Order number	Α	В	С	Weight
R-181/1	55.25	-	60	0.054 kg (0.119 lb.)
R-181/2	80.5	25.25	85	0.084 kg (0.185 lb.)
R-181/3	105.75	50.5	110	0.113 kg (0.249 lb.)
R-181/4	131	75.75	135	0.144 kg (0.317 lb.)
R-181/5	156.25	101	160	0.174 kg (0.383 lb.)
R-181/6	181.5	126.25	185	0.215 kg (0.473 lb.)
R-181/7	206.75	151.5	210	0.235 kg (0.517 lb.)
R-181/8	232	176.75	235	0.266 kg (0.585 lb.)
R-181/9	257.25	202	260	0.297 kg (0.653 lb.)
R-181/10	282.5	227.25	285	0.326 kg (0.717 lb.)
R-181/11	307.75	252.5	310	0.357 kg (0.785 lb.)
R-181/12	333	277.75	335	0.385 kg (0.788 lb.)

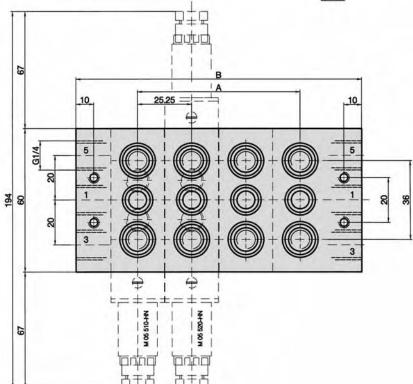


### **Dimensions for P-R-S-manifold**

### R-183







1 = pressure inlet 3, 5 = exhaust

#### R-183-V

Blind plate for blank station. Material: Al (anodized).

### R-183/n

P-R-S-manifold with hollow bolts and O-rings. Suitable for all 5/2- and 5/3-way valves of series M-05 and P-05. Material: AI (anodized), O-rings: NBR, hollow bolts: brass.

Order number	Α	В	Weight
R-183/1	_	60	0.163 kg (0.359 lb.)
R-183/2	25.25	85	0.246 kg (0.541 lb.)
R-183/3	50.5	110	0.330 kg (0.726 lb.)
R-183/4	75.75	135	0.415 kg (0.913 lb.)
R-183/5	101	160	0.500 kg (1.100 lbs.)
R-183/6	126.25	185	0.580 kg (1.276 lbs.)
R-183/7	151.5	210	0.670 kg (1.474 lbs.)
R-183/8	176.75	235	0.750 kg (1.650 lbs.)
R-183/9	202	260	0.840 kg (1.848 lbs.)
R-183/10	227.25	285	0.910 kg (2.002 lbs.)
R-183/11	252.5	310	1.000 kg (2.200 lbs.)
R-183/12	277.75	335	1.090 kg (2.398 lbs.)



### **Technical data for series**

### **KM-09**



Order code		KM-09-51	0-HN-142	2			
				Coil	_ options¹	)	
Series		ard coils <sup>3)</sup>			Withou	ut coil and plug soci	ket
and	(with p	lug socket 28-	-ST-01)		HN at p	orts 2 + 4	HN at ports 1, 3 +
function	HN at p	ports 2 + 4	HN at ports	s 1, 3 + 5	570	Power consumpt.	4.2 W, 7/4 VA 50
	141	12 V DC,	4.2 W	111	560	Power consumption	on 2.2 W <sup>2)</sup> 53
	142	24 V DC,	4.2 W	112			
	152	24 V AC,	7/4 VA	122	Coil w	ith M12 connector a	and LED
	156	115 V AC,	7/4 VA	126	HN at p	orts 2 + 4	HN at ports 1, 3 +
	157	230 V AC	, 7/4 VA	127	042	24 V DC, 4.8 W	01
	161	12 V DC,	2.2 W <sup>2)</sup>	131	062	24 V DC. 2.5 W <sup>2)</sup>	03
	162	24 V DC,	2.2 W <sup>2)</sup>	132	002	Z+ V DO, Z.O VV	

 $<sup>^{1)}</sup>$  HN = Manual override. It can be repositioned by 180°. Standard valve is supplied with HN on the same side as port 2.

### **Design and function**

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering. Valves of this series are available in explosion proof design in accordance with 94/9/EG (ATEX). For further details see chapter 12 of this catalogue.

Order number	KM-09-510-HN	KM-09-511-HN	KM-09-520-HN	KM-09-530-HN	KM-09-533-HN	KM-09-534-HN	
Please complete according to order code.	M 4 2 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3	14 2 2 1 1 3 1 W					
Function	5/2-way single solenoid air spring return	5/2-way single solenoid spring return	5/2-way double solenoid	5/3-way center position closed	5/3-way center position exhausted	5/3-way center position pressurized	
Connection	G 1/8						
Nominal size	6 mm						
Flow rate	950 NI/min (0.966 Cv)	810 NI/min (0.823 Cv)	950 NI/min (0.966 Cv)	n 680 NI/min (0.691 Cv)			
Pressure range	3 10 bar (43	145 psi) <sup>2)</sup>					
Response time at 6 bar	on 15 ms off 16 ms	on 13 ms off 28 ms	15 ms	on 14 ms off 16 ms			
Temperature range	- 10 °C + 70	) °C (+ 14 °F +	158 °F)				
Materials	Body: Al (anodi	Body: Al (anodized), Seals: NBR, Inner parts: Al, stainless steel and brass					
Degree of protection	IP 65 according to EN 60529						
Weight	0.230 kg (0.507 lb.)	0.231 kg (0.509 lb.)	0.330 kg (0.727 lb.)			_	

<sup>&</sup>lt;sup>2)</sup> max. 8 bar (max. 116 psi) at 2.2 W and 2.5 W.

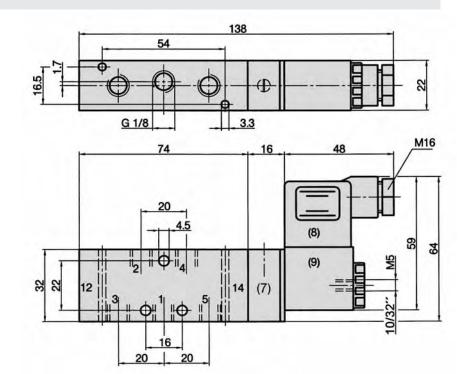
4.120 Subject to change

<sup>&</sup>lt;sup>3)</sup> When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.122.

### **Dimensions for series**

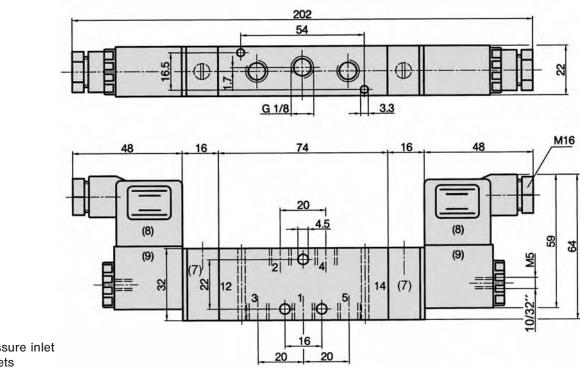
### **KM-09**

### KM-09-510-HN, KM-09-511-HN



- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (7) = manual override (detent) can be repositioned by 180°
- (8) = plug socket can be repositioned by 180°
- (9) = solenoid coil can be repositioned by 4 x 90°

### KM-09-520-HN, KM-09-530-HN, KM-09-533-HN, KM-09-534-HN



- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (7) = manual override (detent) can be repositioned by  $180^{\circ}$
- (8) = plug socket can be repositioned by  $180^{\circ}$
- (9) = solenoid coil can be repositioned by  $4 \times 90^{\circ}$

# Accessories for electrically operated valves series KM-09



### **Accessories for series**

### **KM-09**

#### Solenoid coils, actuators



Standard coil **23-SP-011-...** page 4.280



Coil with 2.2 W power consumption **23-SP-012-...** page 4.280



Coil with M-12 plug connection, 4.8 W, LED and circuit protection 23-SP-011-5-O12 page 4.280



Coil with M-12 plug connection, 2.5 W, LED and circuit protection 23-SP-012-5-032 page 4.280



Standard actuator 23-R-011



Low power actuator 23-R-012

### Plug sockets



Standard plug socket **28-ST-01** page 4.281



Plug socket with LED **28-ST-04-**... page 4.281



Plug socket with LED and circuit protection **28-ST-06-...** page 4.281



Plug socket with LED, circuit protection and cable **28-ST-06-K3-...** page 4.281

#### **User information**

Low power consumption coils (2.2 W or 2.5 W) are for pressures up to 8 bar (116 psi) only. Valve actuator 23-R-012 is required. The actuator 23-R-012 is nickel plated. Make sure that the coils with the right power consumption are used.

For outdoor applications or in areas with high humidity use coil 23-SP-011-1-... or 23-SP-012-1-... (see page 5.120).

### The following types are available on request

Coils and sockets with contacts according to DIN EN 175301-803 type B (U-form). Plug sockets with molded cable.

4.122 Subject to change



### KM-09, KM-10

#### **Manifolds**



Manifold will be delivered completely assembled with valves if requested.



Manifold G 1/8 with "n" stations. **RF-09/n** page 4.124



Manifold G 1/4 with "n" stations. **RF-10/n** page 4.125



End plate for size G 1/8 and G 1/4. RF-19-E page 4.126



End plate with one valve station G 1/8. **RF-09-E1** page 4.126



End plate with one valve station G 1/4. **RF-10-E1** page 4.126



End plate with two valve stations G 1/8. **RF-09-E2** page 4.126



End plate with two valve stations G 1/4. **RF-10-E2** page 4.126



One station element G 1/8. **RF-09-Z1** page 4.127



One station element G 1/4. **RF-10-Z1** page 4.127



Four station element G 1/8. RF-09-Z4 page 4.127



Four station element G 1/4. **RF-10-Z4** page 4.127



Blind plate for blank valve station G 1/8. **RF-09-V** page 4.124



Blind plate for blank valve station G 1/4. **RF-10-V** page 4.125



Seal plate (two different pressures). **RF-19-01** 



Pressure separator.

RE-19-DT

**Further single elements: RF-19-02** Assembly kit, 2 grub screws, O-rings, studs. **RF-19-03** 3 x O-rings for valve assembly G 1/8 and G 1/4.

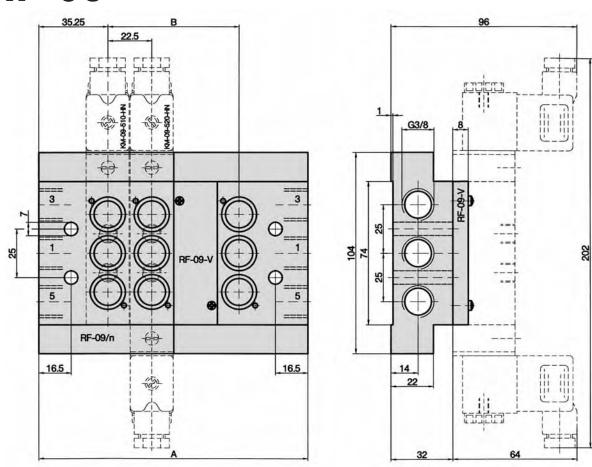
#### **User information**

Modular manifold system suitable for combined mounting of G 1/8 (6 mm) and G 1/4 (9 mm) valves. Any number of stations is possible if proper supply and exhaust of air is guaranteed. Adding or removing stations is possible at any time.

The necessary seals, mounting screws, grub screws and studs are included when ordering plates. The manifold system is delivered pre-assembled and function-tested. If not specified with the order, valve configuration is as follows: The valves are mounted according to their order number, starting with high numbers on the left, ending with low numbers on the right, followed by blind plates (if ordered).



### **RF-09**



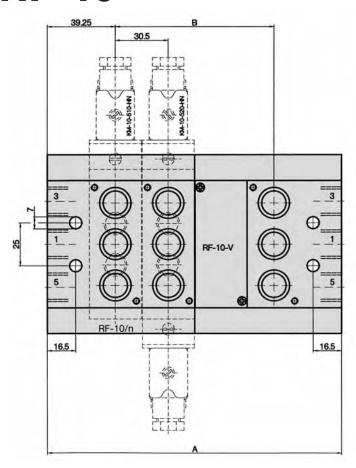
1 = pressure inlet 3, 5 = exhaust

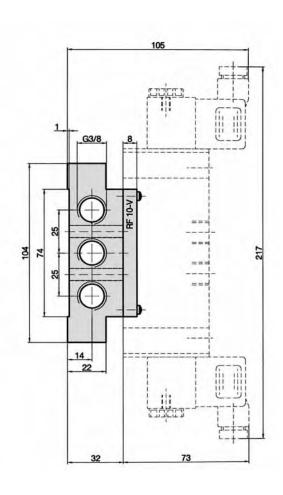
Material: AI (anodized), Studs and grub screws: Stainless steel, Screws: Steel (nickel-plated), O-rings: NBR. Completely assembled manifolds for valve series KM-09 (G 1/8) will be supplied with order number RF-09/n. The letter "n" indicates the number of stations. The single elements can be used for any configuration. For combined mounting of valve series KM-09 (G 1/8) and series KM-10 (G 1/4), the system has to be built up from single elements (see pages 4.126 and 4.127).

Order number	Α	В	Weight	Consist of single elements
RF-09/1	64.5	-	0.415 kg (0.915 lb.)	1 x RF-19-E, 1 x RF-09-E1
RF-09/2	87	22.5	0.550 kg (5.159 lbs.)	1 x RF-19-E, 1 x RF-09-E2
RF-09/3	109.5	45	0.680 kg (1.499 lbs.)	1 x RF-09-E2, 1 x RF-09-E1
RF-09/4	132	67.5	0.810 kg (1.786 lbs.)	2 x RF-09-E2
RF-09/5	154.5	90	0.990 kg (2.182 lbs.)	2 x RF-09-E2, 1 x RF-09-Z1
RF-09/6	177	112.5	1.060 kg (2.337 lbs.)	2 x RF-09-E1, 1 x RF-09-Z4
RF-09/7	199.5	135	1.190 kg (2.623 lbs.)	1 x RF-09-E2, 1 x RF-09-E1, 1 x RF-09-Z4
RF-09/8	222	157.5	1.320 kg (2.910 lbs.)	2 x RF-09-E2, 1 x RF-09-Z4
RF-09/9	244.5	180	1.500 kg (3.307 lbs.)	2 x RF-09-E2, 1 x RF-09-Z4, 1 x RF-09-Z1
RF-09/10	267	202.5	1.565 kg (3.450 lbs.)	1 x RF-09-E2, 2 x RF-09-Z4, 1 x RF-19-E
RF-09/11	289.5	225	1.700 kg (3.748 lbs.)	1 x RF-09-E2, 1 x RF-09-E1, 2 x RF-09-Z4
RF-09/12	312	247.5	1.830 kg (4.034 lbs.)	2 x RF-09-E2, 2 x RF-09-Z4
RF-09/13	334.5	270	2.010 kg (4.431 lbs.)	2 x RF-09-E2, 2 x RF-09-Z4, 1 x RF-09-Z1
RF-09/14	357	292.5	2.075 kg (4.574 lbs.)	1 x RF-19-E, 1 x RF-09-E2, 3 x RF-09-Z4
RF-09/15	379.5	315	2.210 kg (4.872 lbs.)	1 x RF-09-E2, 3 x RF-09-Z4, 1 x RF-09-E1
RF-09/16	402	337.5	2.340 kg (5.159 lbs.)	2 x RF-09-E2, 3 x RF-09-Z4

Additional numbers of stations are available.

### **RF-10**





1 = pressure inlet 3, 5 = exhaust

Material: AI (anodized), Studs and grub screws: Stainless steel, Screws: Steel (nickel-plated), O-rings: NBR. Completely assembled manifolds for valve series KM-10 (G 1/4) will be supplied with order number RF-10/n. The letter "n" indicates the number of stations. The single elements can be used for any configuration. For combined mounting of valve series KM-09 (G 1/8) and series KM-10 (G 1/4), the system has to be built up from single elements (see pages 4.126 and 4.127).

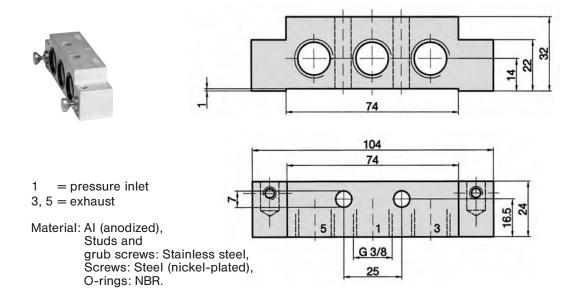
Order number	Α	В	Weight	Consist of single elements
RF-10/1	78.5	ı	0.470 kg (1.036 lbs.)	1 x RF-19-E, 1 x RF-10-E1
RF-10/2	109	30.5	0.660 kg (7.055 lbs.)	1 x RF-19-E, 1 x RF-10-E2
RF-10/3	139.5	61	0.850 kg (1.874 lbs.)	1 x RF-10-E2, 1 x RF-10-E1
RF-10/4	170	91.5	1.040 kg (2.293 lbs.)	2 x RF-10-E2
RF-10/5	200.5	122	1.250 kg (2.756 lbs.)	2 x RF-10-E2, 1 x RF-10-Z1
RF-10/6	231	152.5	1.380 kg (3.042 lbs.)	2 x RF-10-E1, 1 x RF-10-Z4
RF-10/7	261.5	183	1.570 kg (3.461 lbs.)	1 x RF-10-E2, 1 x RF-10-E1, 1 x RF-10-Z4
RF-10/8	292	213.5	1.760 kg (3.880 lbs.)	2 x RF-10-E2, 1 x RF-10-Z4
RF-10/9	322.5	244	1.970 kg (4.343 lbs.)	2 x RF-10-E2, 1 x RF-10-Z4, 1 x RF-10-Z1
RF-10/10	353	274.5	2.100 kg (4.630 lbs.)	1 x RF-10-E2, 2 x RF-10-Z4, 1 x RF-19-E
RF-10/11	383.5	305	2.290 kg (5.048 lbs.)	1 x RF-10-E2, 1 x RF-10-E1, 2 x RF-10-Z4
RF-10/12	414	335.5	2.480 kg (5.467 lbs.)	2 x RF-10-E2, 2 x RF-10-Z4
RF-10/13	444.5	366	2.690 kg (5.930 lbs.)	2 x RF-10-E2, 2 x RF-10-Z4, 1 x RF-10-Z1
RF-10/14	475	396.5	2.820 kg (6.217 lbs.)	1 x RF-19-E, 1 x RF-10-E2, 3 x RF-10-Z4
RF-10/15	505.5	427	3.010 kg (6.636 lbs.)	1 x RF-10-E2, 3 x RF-10-Z4, 1 x RF-10-E1
RF-10/16	536	457.5	3.200 kg (7.055 lbs.)	2 x RF-10-E2, 3 x RF-10-Z4

Additional number of stations are available.

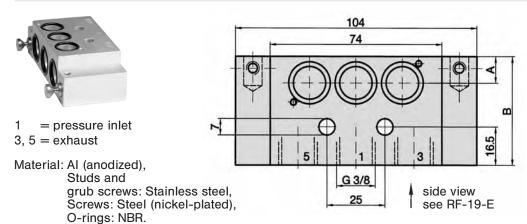


### **Dimensions for manifolds (single elements)**

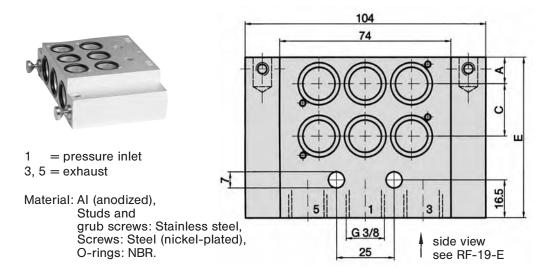
### RF-19-E



### RF-09-E1, RF-10-E1



### RF-09-E2, RF-10-E2

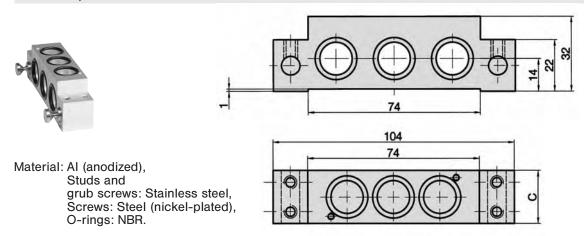


4.126

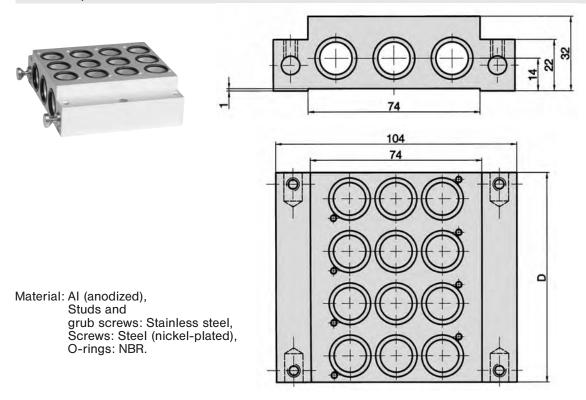


### **Dimensions for manifolds (single elements)**

### RF-09-Z1, RF-10-Z1



### RF-09-Z4, RF-10-Z4



Studs, O-rings and grub screws are included when ordering plates.

Order number	Α	В	С	D	E	Weight
RF-19-E	_	_	_	_	_	0.140 kg (0.308 lb.)
RF-09-E1	11.25	46.5	_	_	_	0.275 kg (0.606 lb.)
RF-09-E2	11.25	-	22.5	-	69	0.405 kg (0.893 lb.)
RF-09-Z1	_	-	22.5	_	_	0.180 kg (0.397 lb.)
RF-09-Z4	_	-	-	90	_	0.510 kg (1.124 lbs.)
RF-10-E1	15.25	54.5	-	-	_	0.330 kg (0.727 lb.)
RF-10-E2	15.25	-	30.5	_	85	0.520 kg (1.146 lbs.)
RF-10-Z1	_	-	30.5	_	_	0.210 kg (0.463 lb.)
RF-10-Z4	_	-	-	122	_	0.720 kg (1.587 lbs.)



### **Technical data for series**

### **BM-02**



Order code	BM-02-310-HNR-162			
		С	oil options	
Series and function	Manual override  HNT = non-detented	Standard voltage	Plug socket upward 1)	Plug socket downward 1)
BM = Standard	manual override HNR = detented	12 V DC, 1 W 24 V DC, 1 W	161 162	131 132
	manual override	24 V AC, 3 VA 115 V AC, 3 VA 230 V AC, 3 VA	152 156 157	122 126 127

<sup>&</sup>lt;sup>1)</sup> The solenoid can be supplied with plug socket connection and manual override on the same side as ports 2 and 4 or on the same side as ports 1, 3 and 5.

When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.137.

### **Design and function**

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering.

Order number	BM-02-310-HN	BM-02-312-HN			
Please complete according to order code.	12 2	10 2			
runction	3/2-way	3/2-way			
Connection	NC G 1/4	NO			
Nominal size	8 mm				
Flow rate	1090 NI/min (1.001 Cv)	920 NI/min (0.935 Cv)			
<b>Pressure range</b>	2 8 bar (29 116 psi)				
Control pressure	Control pressure is identical to main pressure ra	nge			
Response time at 6 bar	on 19 ms off 23 ms	on 25 ms off 23 ms			
Temperature range	- 5 °C + 60 °C (+ 23 °F + 140 °F)				
Materials	Body: Al (anodized) and PA-GF, Seals: NBR and PU, Inner parts: Al, brass and POM				
Degree of protection	IP 65 according to EN 60529				
Weight	0,150 kg (0.331 lb.)				

4.130 Subject to change

### **Electrically operated valves** 2 x 3/2-way G 1/4, 920 - 1050 NI/min (0.935 - 1.067 Cv)



### **Technical data for series**

### **BM-02**



115 V AC, 3 VA

230 V AC, 3 VA

Order code BM-02-310-HNR-162

### Series and function

BM = Standard

#### Manual override

HNT = non-detented manual override

HNR = detented manual override

Standard voltage	Plug socket upward 1)	Plug socket downward 1)
12 V DC, 1 W	161	131
24 V DC, 1 W	162	132
24 V AC, 3 VA	152	122

156

157

126

127

**Coil options** 

When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.137.

### **Design and function**

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering.

Order number	BM-02-310/2-HN	BM-02-312/2-HN	BM-02-314/2-HN					
Please complete according to order code.  Function			14 12 12 12 13					
	2 x 3/2-way NC	2 x 3/2-way NO	2 x 3/2-way NO/NC					
Connection	G 1/4	G 1/4						
Nominal size	7 mm							
Flow rate	1050 NI/min (1.067 Cv)	1030 NI/min (1.047 Cv)	NC 1050 NI/min, NO 920 NI/min (NC 1.067 Cv, NO 0.935 Cv)					
Pressure range	2 8 bar (29 116 psi)							
<b>Control pressure</b>	Control pressure is identical to	main pressure range						
Response time at 6 bar	on 22 ms off 24 ms							
Temperature range	- 5 °C + 60 °C (+ 23 °F + 140 °F)							
Materials	Body: AI (anodized) and PA-GF, Seals: NBR and PU, Inner parts: AI, brass and POM							
Degree of protection	IP 65 according to EN 60529							
Weight	0,250 kg (0.551 lb.)							

4.131 Subject to change

<sup>&</sup>lt;sup>1)</sup> The solenoid can be supplied with plug socket connection and manual override on the same side as ports 2 and 4 or on the same side as ports 1, 3 and 5.



### **Technical data for series**

### **BM-02**



Order code BM-02-510-HNR-162 **Coil options** Series and Standard Plug socket Plug socket Manual override voltage upward 1) downward 1) **function** HNT = non-detented 12 V DC, 1 W 161 131 manual override BM = Standard24 V DC, 1 W 162 132 HNR = detented BME = Valves with external manual override 24 V AC, 3 VA 152 122 pilot supply 115 V AC, 3 VA 156 126 230 V AC, 3 VA 157 127

When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.137.

#### **Design and function**

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering.

Order number	BM-02-510-HN	BM-02-511-HN	BM-02-520-HN	BME-02-511-HN	BME-02-520-HN			
Please complete according to order code.		14 4 21 5 1 1 3	14 4 2 12	14 2 2 MW	14 2 12			
Function	5/2-way single solenoid air spring return	5/2-way single solenoid spring return	5/2-way double solenoid	5/2-way single solenoid ext. pilot supply	5/2-way double solenoid ext. pilot supply			
Connection	G 1/4							
Nominal size	7 mm							
Flow rate	1700 NI/min (1.728 Cv)	1600 NI/min (1.626 Cv)	1540 NI/min (1.565 Cv)	1600 NI/min (1.626 Cv)	1540 NI/min (1.565 Cv)			
Pressure range	2 8 bar (29 116 psi)	3 8 bar (43.5 116 psi)	2 8 bar (29 116 psi)	- 0,95 8 bar (- 14 + 116 psi)				
Control pressure	Control pressure is	s identical to main p	ressure range	3 8 bar (43.5 116 psi)	2 8 bar (29 116 psi)			
Response time at 6 bar	on 23 ms off 33 ms	on 13 ms off 35 ms	11 ms	on 13 ms off 35 ms	11 ms			
Temperature range	- 5 °C + 60 °C (+ 23 °F + 140 °F)							
Materials	Body: AI (anodized) and PA-GF, Seals: NBR and PU, Inner parts: AI, brass and POM							
Degree of protection	IP 65 according to	IP 65 according to EN 60529						
Weight	0,220 kg (0.485 lb.)	_	0,270 kg (0.595 lb.)	0,220 kg (0.485 lb.)	0,270 kg (0.595 lb.)			

4.132 Subject to change

 $<sup>^{1)}</sup>$  The solenoid can be supplied with plug socket connection and manual override on the same side as ports 2 and 4 or on the same side as ports 1, 3 and 5.

### **Electrically operated valves** 5/3-way G 1/4, 1300 - 1660 NI/min (1.321 - 1.687 Cv)



### **Technical data for series**

### **BM-02**



### Order code

BM-02-530-HNR-162

### Series and function

BM = Standard

BME = Valves with external pilot supply

### **Manual override**

HNT = non-detented manual override HNR = detented

manual override

Coil options
--------------

Standard voltage	Plug socket upward 1)	Plug socket downward 1)
12 V DC, 1 W	161	131
24 V DC, 1 W	162	132
24 V AC, 3 VA	152	122
115 V AC, 3 VA	156	126
230 V AC, 3 VA	157	127

<sup>&</sup>lt;sup>1)</sup> The solenoid can be supplied with plug socket connection and manual override on the same side as ports 2 and 4 or on the same side as ports 1, 3 and 5.

When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.137.

### **Design and function**

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering.

Order number	BM-02-530-HN	BM-02-533-HN	BM-02-534-HN	BME-02-530-HN	BME-02-533-HN	BME-02-534-HN
Please complete according to order code.			** W ** ** ** ** ** ** ** ** ** ** ** **		***************************************	14 M 12 T 12
Function	5/3-way center position closed	5/3-way center position exhausted	5/3-way center position pressurized	5/3-way center position closed ext. pilot supply	5/3-way center position exhausted ext. pilot supply	5/3-way center position pressurized ext. pilot supply
Connection	G 1/4					
Nominal size	7 mm					
Flow rate	1300 NI/min (1.321 Cv)	1470 NI/min (1.494 Cv)	1660 NI/min (1.687 Cv)	1300 NI/min (1.321 Cv)	1470 NI/min (1.494 Cv)	1660 NI/min (1.687 Cv)
Pressure range	3 8 bar (43.5	116 psi)		- 0,95 8 bar (- 14 + 116 psi)		
<b>Control pressure</b>	Control pressure	is identical to mai	n pressure range	3 8 bar (43.5 116 psi)		
Response time at 6 bar	on 20 ms off 26 ms	on 26 ms off 28 ms	on 26 ms off 33 ms	on 20 ms off 26 ms	on 26 ms off 28 ms	on 26 ms off 33 ms
Temperature range	- 5 °C + 60 °C (+ 23 °F + 140 °F)					
Materials	Body: AI (anodized) and PA-GF, Seals: NBR and PU, Inner parts: AI, brass and POM					MC
Degree of protection	IP 65 according to EN 60529					
Weight	0,260 kg (0.573 l	b.)				

4.133 Subject to change

# Electrically operated valves 3/2-way G 1/4, 750 - 920 NI/min (0.762 - 0.935 Cv)

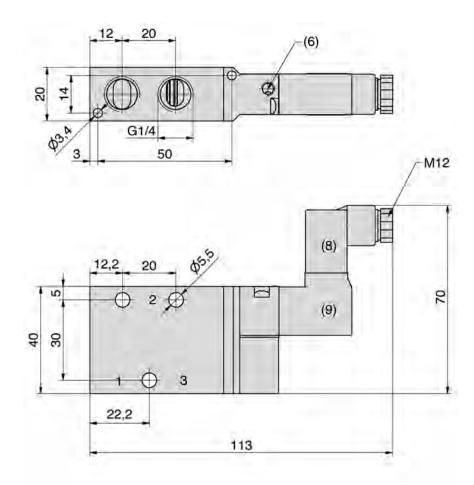


### **Dimensions for series**

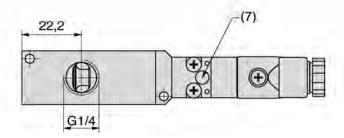
### **BM-02**

### BM-02-310-HN, BM-02-312-HN





- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (6) = Pilot air exhaust, M5
- (7) = Manual override, detented or non-detented
- (8) = plug socket can be repositioned by 180°
- (9) = Solenoid, pins for plug socket connection upward or downward



4.134

# airec

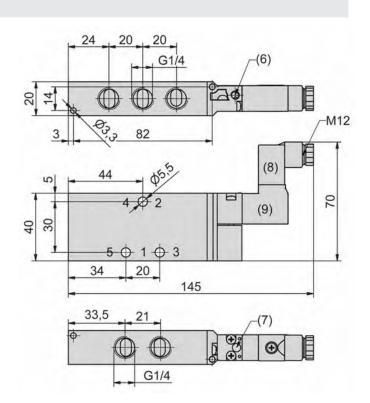
### **Dimensions for series**

### **BM-02**

### BM-02-510-HN, BM-02-511-HN

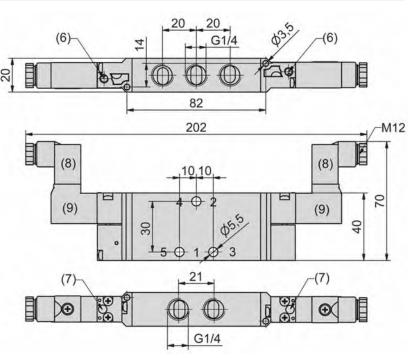


- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (6) = Pilot air exhaust, M5
- (7) = Manual override, detented or non-detented
- (8) = plug socket can be repositioned by  $180^{\circ}$
- (9) = Solenoid, pins for plug socket connection upward or downward



### BM-02-310/2-HN, BM-02-312/2-HN, BM-02-314/2-HN, BM-02-520-HN, BM-02-530-HN, BM-02-533-HN, BM-02-534-HN





- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (6) = Pilot air exhaust, M5
- (7) = Manual override, detented or non-detented
- (8) = plug socket can be repositioned by  $180^{\circ}$
- (9) = Solenoid, pins for plug socket connection upward or downward



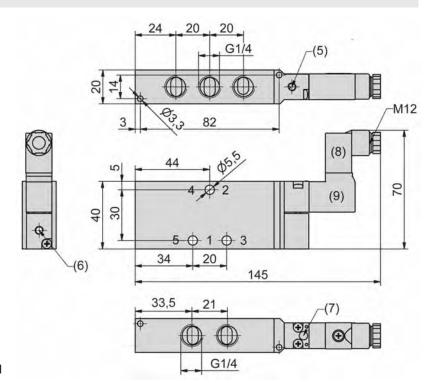
### **Dimensions for series**

### **BME-02**

#### BME-02-511-HN

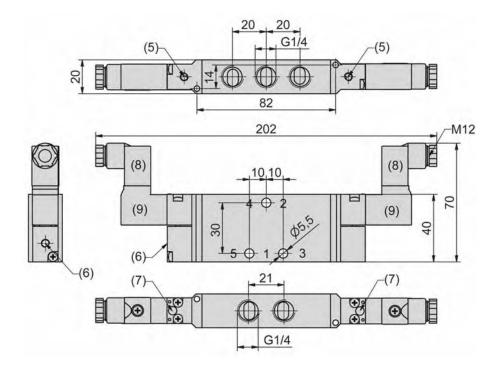


- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (5) = ext. pilot supply, M5
- (6) = Pilot air exhaust, M5
- (7) = Manual override, detented or non-detented
- (8) = plug socket can be repositioned by 180°
- (9) = Solenoid, pins for plug socket connection upward or downward



### BME-02-520-HN, BME-02-530-HN, BME-02-533-HN, BME-02-534-HN





- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (5) = ext. pilot supply, M5
- (6) = Pilot air exhaust, M5
- (7) = Manual override, detented or non-detented
- (8) = plug socket can be repositioned by  $180^{\circ}$
- (9) = Solenoid, pins for plug socket connection upward or downward



### **BM-02**, **BME-02**

### **Solenoid**



Solenoid with pins for plug socket connection on the same side as manual override (upward).

23-M-09-19-...
page 4.284



Solenoid with pins for plug socket connection on the opposite side of the manual override (downward). **23-M-09-19-...** page 4.284

### **Plug sockets**



Standard plug socket 28-ST-02-1 page 4.284



Plug socket with LED **28-ST-09-1-...** page 4.284



Plug socket with LED and circuit protection **28-ST-10-1-...** page 4.284



### **BM-02**, **BME-02**

#### **Manifolds**



Manifold will be delivered completely assembled with valves if requested.



Manifold with n/stations. Ports on the side. **RF-02-AB/n** 



Manifold with n/stations. Ports on the side and the top.

RF-02-CD/n



Manifold with n/stations. Ports on both sides and top.

RF-02-AD/n



One station element. **RF-02-Z** 



Blind plate for blank valve station. **RF-02-V** 



Adapter plate for additional air supply and exhaust.

RF-02-PE



End plate A with side ports. **RF-02-EA** 



End plate B with side ports. **RF-02-EB** 



End plate C with side and top ports. **RF-02-EC** 



End plate D with side and top ports. **RF-02-ED** 

Subject to change

**Additional single elements: RF-02-ZE** "Add-on" element to add one valve station.

**RF-02-DT** Seal plate for two different pressures. **RF-02-RSV** Check valve for dynamic exhaust pressures.

RF-01-M5 Mounting bolt (1 pair)

#### **User information**

Modular manifold system for valve series BM-01. The assembled manifold consists of one station elements (RF-01-Z) and end plates with common supply and exhaust ports. The end plates contain ports to the side (RF-01-EA, RF-01-EB) or at the top and the side (RF-01-EC, RF-01-ED).

The manifolds are quickly assembled with the 4 screws and a hexagonal nut. Adding or removing stations is possible at any time.

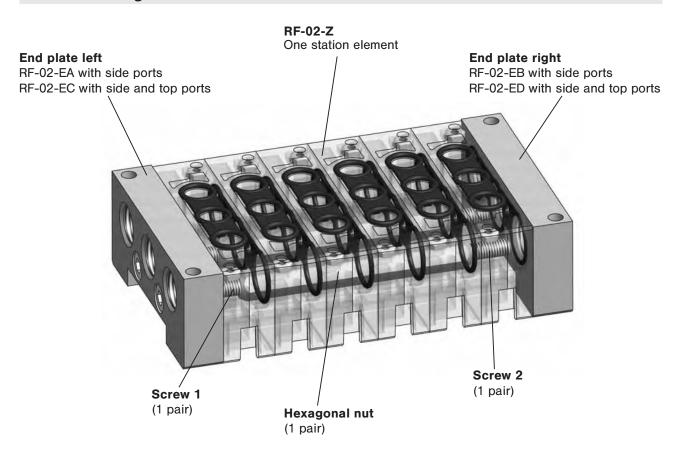
The manifold can be either DIN-rail mounted, screw on by 4 M5 screws or flange mounting via M4 screws.

The necessary seals and screws for valve mounting are included in the scope of delivery.



### **BM-02**, **BME-02**

### Manifold design



### **User information**

To add stations to the manifold without changing screws and nut, the set RF-01-ZE is available. This contains a one station element, a screw to extend the hexagonal nut and seals and screws for valve mounting.

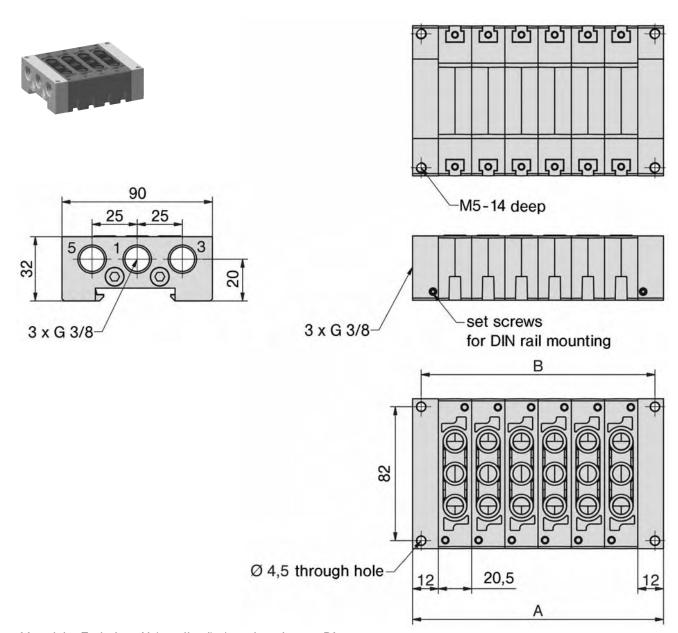
Order number	Hexagonal nut	Screw 1	Screw 2
RF-02-AB/02	21-R-07-07/05	M 5 x 20	M 5 x 20
RF-02-AB/03	21-R-07-07/05	M 5 x 30	M 5 x 30
RF-02-AB/04	21-R-07-07/2	M 5 x 20	M 5 x 20
RF-02-AB/05	21-R-07-07/2	M 5 x 30	M 5 x 30
RF-02-AB/06	21-R-07-07/2	M 5 x 40	M 5 x 40
RF-02-AB/07	21-R-07-07/4	M 5 x 20	M 5 x 20
RF-02-AB/08	21-R-07-07/4	M 5 x 30	M 5 x 30
RF-02-AB/09	21-R-07-07/4	M 5 x 40	M 5 x 40
RF-02-AB/10	21-R-07-07/6	M 5 x 16	M 5 x 16
RF-02-AB/11	21-R-07-07/6	M 5 x 25	M 5 x 25
RF-02-AB/12	21-R-07-07/6	M 5 x 35	M 5 x 35

Order number	Hexagonal nut	Screw 1	Screw 2
RF-02-CD/02	21-R-07-07/05	M 5 x 35	M 5 x 35
RF-02-CD/03	21-R-07-07/05	M 5 x 45	M 5 x 45
RF-02-CD/04	21-R-07-07/2	M 5 x 35	M 5 x 35
RF-02-CD/05	21-R-07-07/2	M 5 x 45	M 5 x 45
RF-02-CD/06	21-R-07-07/2	M 5 x 55	M 5 x 55
RF-02-CD/07	21-R-07-07/4	M 5 x 30	M 5 x 30
RF-02-CD/08	21-R-07-07/4	M 5 x 40	M 5 x 40
RF-02-CD/09	21-R-07-07/4	M 5 x 50	M 5 x 50
RF-02-CD/10	21-R-07-07/6	M 5 x 30	M 5 x 30
RF-02-CD/11	21-R-07-07/6	M 5 x 40	M 5 x 40
RF-02-CD/12	21-R-07-07/6	M 5 x 50	M 5 x 50

Order number	Hexagonal nut	Screw 1	Screw 2
RF-02-AD/02	<b>RF-02-AD/02</b> 21-R-07-07/05		M 5 x 35
RF-02-AD/03	21-R-07-07/05	M 5 x 30	M 5 x 45
RF-02-AD/04	21-R-07-07/2	M 5 x 20	M 5 x 35
RF-02-AD/05	21-R-07-07/2	M 5 x 30	M 5 x 45
RF-02-AD/06	21-R-07-07/2	M 5 x 40	M 5 x 55
RF-02-AD/07	21-R-07-07/4	M 5 x 20	M 5 x 30
RF-02-AD/08	21-R-07-07/4	M 5 x 30	M 5 x 40
RF-02-AD/09	21-R-07-07/4	M 5 x 40	M 5 x 50
RF-02-AD/10	21-R-07-07/6	M 5 x 16	M 5 x 30
RF-02-AD/11	21-R-07-07/6	M 5 x 25	M 5 x 40
RF-02-AD/12	21-R-07-07/6	M 5 x 35	M 5 x 50



### RF-02-AB

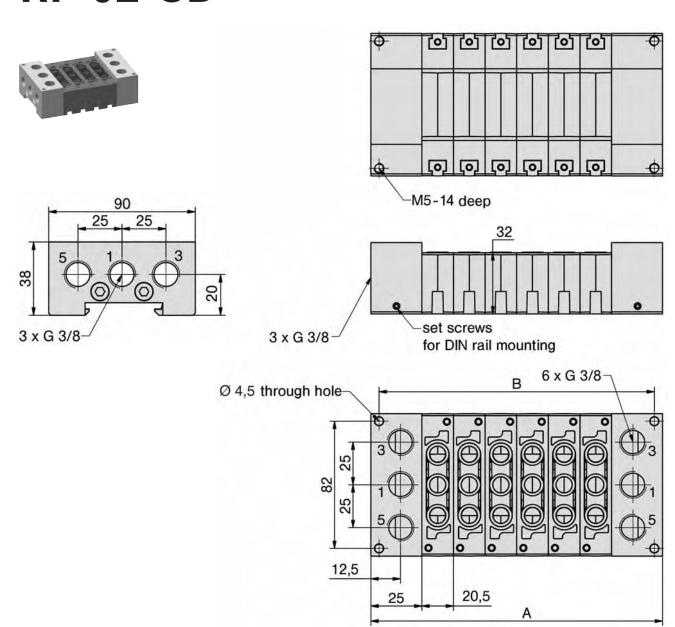


Materials: End plate AI (anodized), 1 station element PA, Seals NBR, Screws steel zinc plated

Order number	Α	В	Weight
RF-02-AB/02	65 ± 0.3	57 ± 0.3	0.230 kg (0.507 lb.)
RF-02-AB/03	85.5 ± 0.35	77.5 ± 0.35	0.270 kg (0.595 lb.)
RF-02-AB/04	106 ± 0.4	98 ± 0.4	0.310 kg (0.683 lb.)
RF-02-AB/05	126.5 ± 0.45	118.5 ± 0.45	0.350 kg (0.772 lb.)
RF-02-AB/06	147 ± 0.5	139 ± 0.5	0.390 kg (0.860 lb.)
RF-02-AB/07	167.5 ± 0.55	159.5 ± 0.55	0.430 kg (0.948 lb.)
RF-02-AB/08	188 ± 0.6	180 ± 0.6	0.470 kg (1.036 lbs.)
RF-02-AB/09	208.5 ± 0.65	200.5 ± 0.65	0.510 kg (1.124 lbs.)
RF-02-AB/10	229 ± 0.7	221 ± 0.7	0.550 kg (1.212 lbs.)
RF-02-AB/11	249.5 ± 0.75	241.5 ± 0.75	0.590 kg (1.301 lbs.)
RF-02-AB/12	270 ± 0.8	262 ± 0.8	0.630 kg (1.389 lbs.)



### **RF-02-CD**



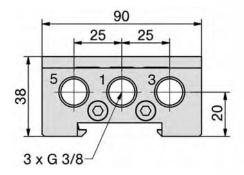
Materials: End plate AI (anodized), 1 station element PA, Seals NBR, Screws steel zinc plated

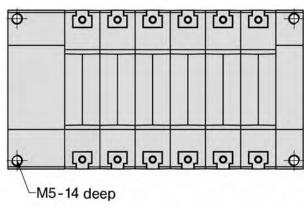
Order number	Α	В	Weight
RF-02-CD/02	91 ± 0.3	83 ± 0.3	0.420 kg (0.926 lb.)
RF-02-CD/03	111.5 ± 0.35	103.5 ± 0.35	0.460 kg (1.014 lbs.)
RF-02-CD/04	132 ± 0.4	124 ± 0.4	0.500 kg (1.102 lbs.)
RF-02-CD/05	152.5 ± 0.45	144.5 ± 0.45	0.540 kg (1.190 lbs.)
RF-02-CD/06	173 ± 0.5	165 ± 0.5	0.580 kg (1.279 lbs.)
RF-02-CD/07	193.5 ± 0.55	185.5 ± 0.55	0.620 kg (1.367 lbs.)
RF-02-CD/08	214 ± 0.6	206 ± 0.6	0.660 kg (1.455 lbs.)
RF-02-CD/09	234.5 ± 0.65	226.5 ± 0.65	0.700 kg (1.543 lbs.)
RF-02-CD/10	255 ± 0.7	247 ± 0.7	0.740 kg (1.631 lbs.)
RF-02-CD/11	275.5 ± 0.75	267.5 ± 0.75	0.780 kg (1.719 lbs.)
RF-02-CD/12	296 ± 0.8	288 ± 0.8	0.820 kg (1.808 lbs.)

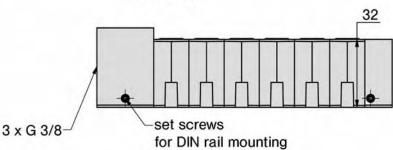


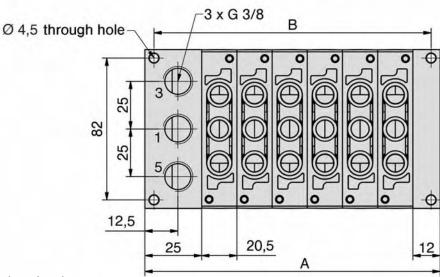
### RF-02-AD











Materials: End plate AI (anodized), 1 station element PA,

Seals NBR, Screws steel zinc plated

Order number	Α	В	Weight
RF-02-AD/02	78 ± 0.3	70 ± 0.3	0.320 kg (0.705 lb.)
RF-02-AD/03	98.5 ± 0.35	90.5 ± 0.35	0.360 kg (0.794 lb.)
RF-02-AD/04	119 ± 0.4	111 ± 0.4	0.400 kg (0.882 lb.)
RF-02-AD/05	139.5 ± 0.45	131.5 ± 0.45	0.440 kg (0.970 lb.)
RF-02-AD/06	160 ± 0.5	152 ± 0.5	0.480 kg (1.058 lbs.)
RF-02-AD/07	180.5 ± 0.55	172.5 ± 0.55	0.520 kg (1.146 lbs.)
RF-02-AD/08	201 ± 0.6	193 ± 0.6	0.560 kg (1.234 lbs.)
RF-02-AD/09	221.5 ± 0.65	213.5 ± 0.65	0.600 kg (1.323 lbs.)
RF-02-AD/10	242 ± 0.7	234 ± 0.7	0.640 kg (1.411 lbs.)
RF-02-AD/11	262.5 ± 0.75	254.5 ± 0.75	0.680 kg (1.499 lbs.)
RF-02-AD/12	283 ± 0.8	275 ± 0.8	0.720 kg (1.587 lbs.)

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### **Technical data for series**

**M-07** 



### Order code

M-07-310-HN-142

Series and function

		Coil o	ptions <sup>1)</sup>			
	lard coils3) lug socket 28-ST-01)		Witho	ut coil and plug sock	et HN at port	1 + 3
HN at 141 142 152	port 2 HN 12 V DC, 4.2 W 24 V DC, 4.2 W 24 V AC, 7/4 VA	l at port 1 + 3 111 112 122	570 560	Power consumpt. 4 Power consumption	.2 W, 7/4 VA n 2.2 W <sup>2)</sup>	
156 157 161	115 V AC, 7/4 V 230 V AC, 7/4 V 12 V DC, 2.2 W	7A 126 7A 127 2) 131	Coll w HN at p O42 O62	vith M12 connector as port 2 24 V DC, 4.8 W 24 V DC, 2.5 W <sup>2</sup>	nd LED HN at port	1 + 3 O12 O32
162	24 V DC, 2.2 W	132				

<sup>&</sup>lt;sup>1)</sup> HN = Manual override. It can be repositioned by 180°. Standard valve is supplied with HN on the same side as port 2.

### **Design and function**

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering. The valve M-07-311-HN is available for use with vacuum, order number ME-07-312-HN.

Valves of this series are available in explosion proof design in accordance with 94/9/EG (ATEX). For further details see chapter 12 of this catalogue.

Order number	M-07-310-HN	MO-07-310-HN	M-07-311-HN	MO-07-311-HN	M-07-320-HN	ME-07-311-HN	ME-07-320-HN	
Please complete according to order code.			75 T.J., w	75 N	12 2 10	Z III.	12 2 19 19 19 19 19 19 19 19 19 19 19 19 19	
Function	3/2-way	3/2-way	3/2-way	3/2-way	3/2-way	3/2-way	3/2-way	
	normally closed	normally open	normally closed	normally open	double solenoid	ext. pilot supply	double solenoid	
	air spring return	air spring return	spring return	spring return		spring return	ext. pilot supply	
Connection	G 1/4							
Nominal size	9 mm							
Flow rate	1580 NI/min (1.606 Cv)							
Pressure range						0 10 bar <sup>2)</sup> (0 145 psi)		
Control pressure	Control pressure is identical to main pressure range 2.5 10 bar <sup>2</sup> 1.5 10 ba (36 145 psi) (22 145 ps							
Response time at 6 bar	on 15 ms off 19 ms					on 15 ms off 22 ms	14 ms	
Temperature range	- 10 °C + 70 °C (+ 14 °F + 158 °F)							
Materials	Body: Al (anodized), Seals: NBR and POM, Inner parts: Al, stainless steel and brass							
Degree of protection	IP 65 according to EN 60529							
Weight	0.375 kg (0.827 lb.)				0.520 kg (1.146 lbs.)	0.450 kg (0.992 lb.)	0.578 kg (1.274 lbs.)	

<sup>&</sup>lt;sup>2)</sup> max. 8 bar (max. 116 psi) at 2.2 W and 2.5 W.

4.150 Subject to change

<sup>&</sup>lt;sup>3)</sup> When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.154.

# Electrically operated valves 5/2- and 5/3-way, G 1/4, 1580 NI/min (1.606 Cv)



### **Technical data for series**

**M-07** 



### Order code

M-07-510-HN-142

### Coil options<sup>1)</sup>

Series	Sta
and	(wit
function	HN
	14

Standard coils <sup>3)</sup>			Without coil and plug socket			
(with pl	ug socket 28-ST-01)		HN at ports 2 + 4 HN at ports 1, 3 + 5			
HN at p	oorts 2 + 4 HN at ports	1, 3 + 5	570	Power consumpt.	4.2 W, 7/4 VA <b>500</b>	
141	12 V DC, 4.2 W	111	560	Power consumption		
142	24 V DC, 4.2 W	112		•		
152	24 V AC, 7/4 VA	122	Coil w	vith M12 connector	and LED	
156	115 V AC, 7/4 VA	126	HN at p	orts 2 + 4	HN at ports 1, 3 + 5	
157	230 V AC, 7/4 VA	127	042	24 V DC, 4.8 W	012	
161	12 V DC, 2.2 W <sup>2)</sup>	131	062	24 V DC, 2.5 W <sup>2)</sup>	032	
162	24 V DC, 2.2 W <sup>2)</sup>	132				

<sup>&</sup>lt;sup>1)</sup> HN = Manual override. It can be repositioned by 180°. Standard valve is supplied with HN on the same side as port 2.

#### **Design and function**

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering. Valves ME-07-511-HN and ME-07-520-HN are available for use with vacuum (- 0.95 ... 10 bar/-14 ... 175 psi). Order number changes to ME-07-511-HN-Q and ME-07-520-HN-Q.

Valves of this series are available in explosion proof design in accordance with 94/9/EG (ATEX). For further details see chapter 12 of this catalogue.

Order number	M-07-510-HN	M-07-511-HN	M-07-520-HN	M-07-530-HN	M-07-533-HN	M-07-534-HN	ME-07-511-HN	ME-07-520-HN	
Please complete according to order code.							<u> </u>		
Function	5/2-way single solenoid air spring return	5/2-way single solenoid spring return	5/2-way double solenoid	5/3-way center position closed	5/3-way center position exhausted	5/3-way center position pressurized	5/2-way single solenoid ext. pilot supply	5/2-way double solenoid ext. pilot supply	
Connection	G 1/4	G 1/4							
Nominal size	9 mm	9 mm							
Flow rate	1580 NI/min (1.606 Cv) 13			1300 NI/mir	1300 NI/min (1.321 Cv)			1580 NI/min (1.606 Cv)	
Pressure range		l	0 bar <sup>2)</sup> 2 10 bar <sup>2)</sup> 3 10 bar <sup>2)</sup> 45 psi) (29 145 psi) (43 145 psi)			0 10 bar²) (0 145 psi)			
Control pressure	Control pressure is identical to main pressure range  2.510 bar <sup>2</sup> (36 145 psi) (29 145 psi					210 bar <sup>2)</sup> (29 145 psi)			
Response time at 6 bar	on 15 ms off 19 ms	on 15 ms off 22 ms	14 ms	on 15 ms off 22 ms			on 15 ms off 19 ms	14 ms	
Temperature range	- 10 °C + 70 °C (+ 14 °F + 158 °F)								
Materials	Body: Al (anodized), Seals: NBR and POM, Inner parts: Al, stainless steel and brass								
Degree of protection	IP 65 according to EN 60529								
Weight	0.455 kg (1.003 lbs.)	0.465 kg (1.025 lbs.)	0.620 kg (1.367 lbs.)				0.530 kg (1.168 lbs.)	0.650 kg (1.433 lbs.)	

<sup>&</sup>lt;sup>2)</sup> max. 8 bar (max. 116 psi) at 2.2 W and 2.5 W.

<sup>&</sup>lt;sup>3)</sup> When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.154.



### **Dimensions for series**

### **M-07**

### M-07-310-HN, MO-07-310-HN, M-07-311-HN, MO-07-311-HN, ME-07-311-HN, ME-07-312-HN

1 = pressure inlet

2 = outlet

3 = exhaust

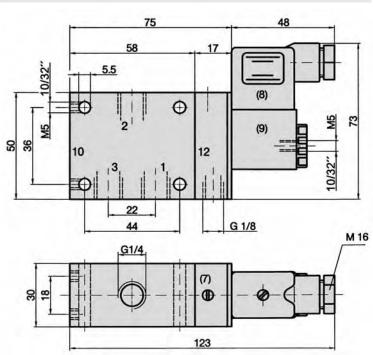
(7) = manual override (detent) can be repositioned by 180°

(8) =plug socket can be repositioned by  $180^{\circ}$ 

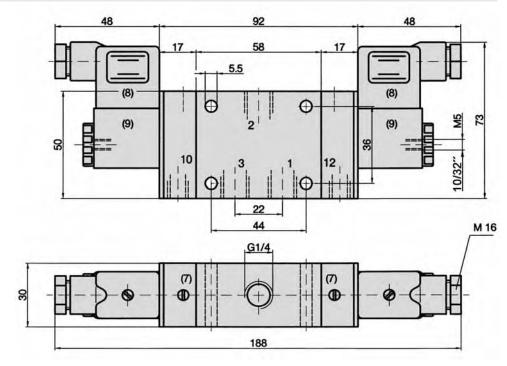
(9) = solenoid coil can be repositioned by 4 x 90°

Valves MO-07-310-HN and MO-07-311-HN carry the solenoid on the opposite side (at pilot 10).

Only valve ME-07-311-HN includes G 1/8 at port 12 for external pilot supply.



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



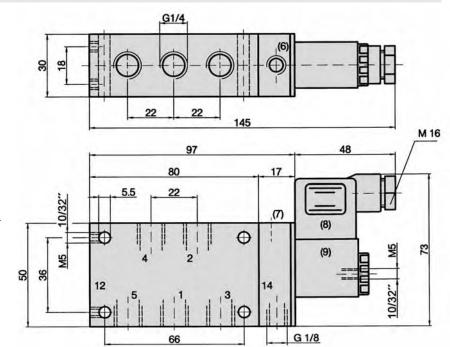
- 1 = pressure inlet
- 2 = outlet
- 3 = exhaust
- $^{(7)}$  = manual override (detent) can be repositioned by  $180^{\circ}$
- (8) = plug socket can be repositioned by  $180^{\circ}$
- (9) = solenoid coil can be repositioned by 4 x 90°

Only valve ME-07-320-HN includes G 1/8 at ports 10 and 12 for external pilot supply.

### **Dimensions for series**

### **M-07**

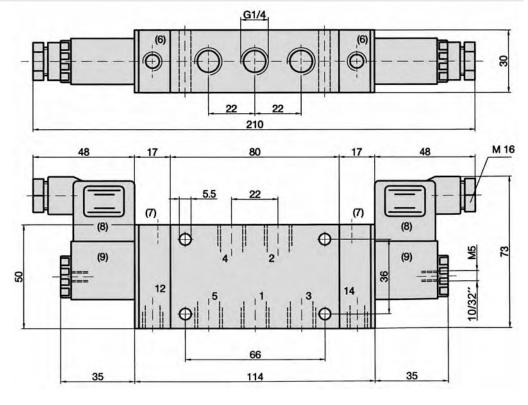
### M-07-510-HN, M-07-511-HN, ME-07-511-HN, ME-07-511-HN-Q



#### 1 = pressure inlet

- 2, 4 = outlets
- 3, 5 = exhausts
- (6) = Only valve ME-07-511-HN includes G 1/8 at port 14 for external pilot supply.
- (7) = manual override (detent) can be repositioned by 180°
- (8) = plug socket can be repositioned by 180°
- (9) = solenoid coil can be repositioned by 4 x 90°

### M-07-520-HN, ME-07-520-HN, ME-07-520-HN-Q, M-07-530-HN, M-07-533-HN, M-07-534-HN



- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (7) = manual override (detent) can be repositioned by  $180^{\circ}$
- (8) = plug socket can be repositioned by 180°
- (9) = solenoid coil can be repositioned by  $4 \times 90^{\circ}$
- (6) = Only valve ME-07-520-HN includes G 1/8 at ports 12 and 14 for external pilot supply.

4.153

# Accessories for electrically operated valves series M-07



### **Accessories for series**

### M-07

#### Solenoid coils, actuators



Standard coil **23-SP-011-...** page 4.280



Coil with 2.2 W power consumption **23-SP-012-...** page 4.280



Coil with M-12 plug connection, 4.8 W, LED and circuit protection 23-SP-011-5-O12 page 4.280



Coil with M-12 plug connection, 2.5 W, LED and circuit protection 23-SP-012-5-O32 page 4.280



Valves with explosion proof actuator see chapter 12.



Standard actuator

23-R-011



Low power actuator

23-R-012

### Plug sockets



Standard plug socket **28-ST-01** page 4.281



Plug socket with LED **28-ST-04-**... page 4.281



Plug socket with LED and circuit protection **28-ST-06-...** page 4.281



Plug socket with LED, circuit protection and cable **28-ST-06-K3-...** page 4.281

#### **User information**

Low power consumption coils (2.2 W or 2.5 W) are for pressures up to 8 bar (116 psi) only. Valve actuator 23-R-012 is required. The actuator 23-R-012 is nickel plated. Make sure that the coils with the right power consumption are used.

When using explosion proof coils the dimensions of the corresponding valve change.

For outdoor applications or in areas with high humidity use coil 23-SP-011-1-... or 23-SP-012-1-... (see page 5.120).

### The following types are available on request

Coils and sockets with contacts according to DIN EN 175301-803 type B (U-form). Plug sockets with molded cable.

4.154 Subject to change



### M-07, P-07

### P-manifolds



P-manifold will be delivered completely assembled with valves if requested.



Hollow bolt with O-ring **H-143** 



Manifold with hollow bolts and O-rings. Available from 1 to 12 stations **R-141/n** page 4.156



Blind plate for blank station **R-141-V** page 4.156



Brackets (pair) R-141-W page 4.156

### P-R-S manifolds



P-R-S-manifold will be delivered completely assembled with valves if requested.



Hollow bolt with O-ring **H-143** 



Manifold with hollow bolts and O-rings. Available from 1 to 12 stations R-143/n page 4.157

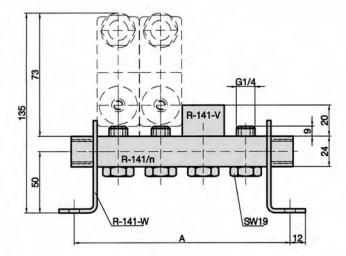


Blind plate for blank station **R-143-V** page 4.157



### R-141





1 = pressure inlet

### R-141-V

Blind plate for blank station. Material: Al (anodized).

### R-141-W

One pair of mounting brackets for P-Manifold R-141.

Material: steel (nickel-plated).

# 

#### R-141/n

P-manifold with hollow bolts and O-rings. Within the brackets the manifold can be repositioned by 4 x  $90^{\circ}$ . Suitable for all valves of series M-07 and P-07.

Material: Al (anodized), O-rings: NBR, hollow bolts: brass.

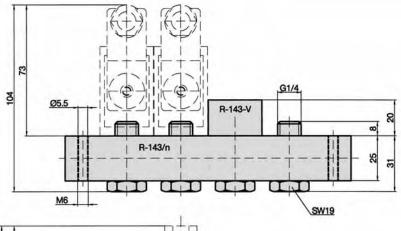
Order number	Α	В	С	Weight
R-141/1	66.3	_	70	0.104 kg (0.229 lb.)
R-141/2	96.6	30.3	100	0.165 kg (0.364 lb.)
R-141/3	126.9	60.6	130	0.227 kg (0.500 lb.)
R-141/4	157.2	90.9	160	0.287 kg (0.633 lb.)
R-141/5	187.5	121.2	190	0.349 kg (0.769 lb.)
R-141/6	217.8	151.5	220	0.412 kg (0.908 lb.)
R-141/7	248.1	181.8	250	0.473 kg (1.043 lbs.)
R-141/8	278.4	212.1	280	0.532 kg (1.173 lbs.)
R-141/9	308.7	242.4	310	0.595 kg (1.312 lbs.)
R-141/10	339	272.7	340	0.659 kg (1.453 lbs.)
R-141/11	369.3	303	370	0.719 kg (1.585 lbs.)
R-141/12	399.6	333.3	400	0.781 kg (1.722 lbs.)

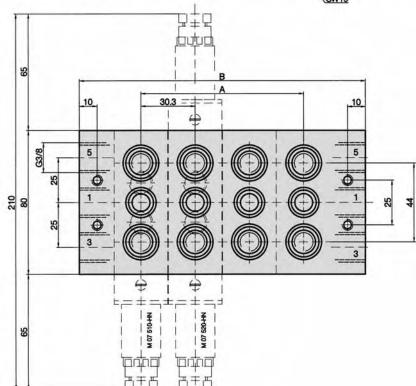


### **Dimensions for P-R-S-manifold**

### R-143







1 = pressure inlet 3, 5 = exhaust

### R-143-V

Blind plate for blank station. Material: Al (anodized).

### R-143/n

P-R-S-manifold with hollow bolts and O-rings. Suitable for all 5/2- and 5/3-way valves of series M-07 and P-07. Material: AI (anodized), O-rings: NBR, hollow bolts: brass.

Order number	Α	В	Weight
R-143/1	_	70	0.324 kg (0.714 lb.)
R-143/2	30.3	100	0.506 kg (1.115 lbs.)
R-143/3	60.6	130	0.669 kg (1.475 lbs.)
R-143/4	90.9	160	0.841 kg (1.854 lbs.)
R-143/5	121.2	190	1.018 kg (2.244 lbs.)
R-143/6	151.5	220	1.211 kg (2.670 lbs.)
R-143/7	181.8	250	1.378 kg (3.038 lbs.)
R-143/8	212.1	280	1.539 kg (3.393 lbs.)
R-143/9	242.4	310	1.727 kg (3.807 lbs.)
R-143/10	272.7	340	1.915 kg (4.222 lbs.)
R-143/11	303	370	2.125 kg (4.685 lbs.)
R-143/12	333.3	400	2.240 kg (4.938 lbs.)



### **Technical data for series**

## **KM-10**



Order code		KM-10-5	10-HN-142	2			
				Coil	options <sup>1</sup>	)	
Series	Stand	ard coils 3)			Withou	ut coil and plug soc	ket
and	(with p	lug socket 28	3-ST-01)		HN at p	orts 2 + 4	HN at ports 1, 3 + 5
function	HN at p	ports 2 + 4	HN at ports	s 1, 3 + 5	570	Power consumpt.	4.2 W, 7/4 VA <b>500</b>
	141	12 V DC,	4.2 W	111	560	Power consumpti	
	142	24 V DC,	4.2 W	112		, , , , , , , , , , , , , , , , , , ,	
	152	24 V AC,	7/4 VA	122	Coil w	ith M12 connector a	and LED
	156	115 V AC	, 7/4 VA	126	HN at p	orts 2 + 4	HN at ports 1, 3 + 5
	157	230 V AC	C, 7/4 VA	127	042	24 V DC, 4.8 W	012
	161	12 V DC,	2.2 W <sup>2)</sup>	131	062	24 V DC. 2.5 W <sup>2)</sup>	032
	162	24 V DC,	2.2 W <sup>2)</sup>	132	302	2 23, 2.0 11	302

<sup>&</sup>lt;sup>1)</sup> HN = Manual override. It can be repositioned by 180°. Standard valve is supplied with HN on the same side as port 2.

### **Design and function**

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering. Valves of this series are available in explosion proof design in accordance with 94/9/EG (ATEX). For further details see chapter 12 of this catalogue.

Function  5/2-way single solenoid air spring return  Connection  G 1/4  Nominal size  Flow rate  2100 NI/min (2.134 Cv)  Pressure range  2100 bar (8 bar at 2.2 W)  36 145 psi (116 psi at 2.2 W)  36 145 psi (116 psi at 2.2 W)	4-HN						
single solenoid air spring return spring return double solenoid center position closed center position exhausted pressurize  Connection G 1/4  Nominal size 9 mm  Flow rate 2100 NI/min (2.134 Cv) 1800 NI/min (2.134 Cv) 1500 NI/min (1.524 Cv)  Pressure 2.5 10 bar (8 bar at 2.2 W) 3 10 bar (8 bar at 2.2 W)	7/45						
Nominal size         9 mm           Flow rate         2100 NI/min (2.134 Cv)         1800 NI/min (2.134 Cv)         2100 NI/min (2.134 Cv)         1500 NI/min (1.524 Cv)           Pressure         2.5 10 bar (8 bar at 2.2 W)         3 10 bar (8 bar at 2.2 W)							
Flow rate         2100 NI/min (2.134 Cv)         1800 NI/min (2.134 Cv)         2100 NI/min (1.524 Cv)         1500 NI/min (1.524 Cv)           Pressure         2.5 10 bar (8 bar at 2.2 W)         3 10 bar (8 bar at 2.2 W)	3 1/4						
(2.134 Cv)     (1.830 Cv)     (2.134 Cv)     (1.524 Cv)       Pressure     2.5 10 bar (8 bar at 2.2 W)     3 10 bar (8 bar at 2.2 W)							
Response on 18 ms off 19 ms off 27 ms off 22 ms on 16 ms							
Temperature - 10 °C + 70 °C (+ 14 °F + 158 °F)							
Materials Body: Al (anodized), Seals: NBR, Inner parts: Al, stainless steel and brass	Body: Al (anodized), Seals: NBR, Inner parts: Al, stainless steel and brass						
Degree of protection IP 65 according to EN 60529	IP 65 according to EN 60529						
Weight 0.470 kg (1.034 lbs.) 0.630 kg (1.386 lbs.)							

<sup>&</sup>lt;sup>2)</sup> max. 8 bar (max. 116 psi) at 2.2 W and 2.5 W.

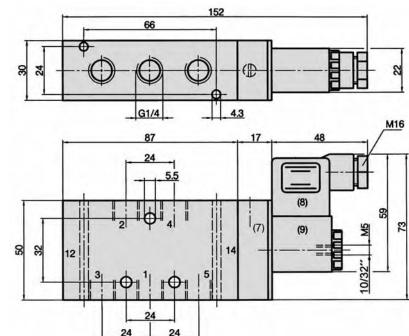
4.160 Subject to change

<sup>&</sup>lt;sup>3)</sup> When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.162.

### **Dimensions for series**

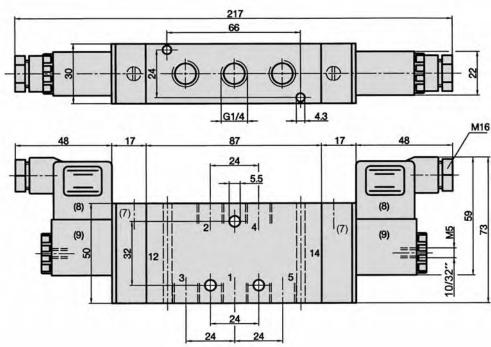
## **KM-10**

### KM-10-510-HN, KM-10-511-HN



- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (7) = manual override (detent) can be repositioned by 180°
- (8) = plug socket can be repositioned by 180°
- (9) = solenoid coil can be repositioned by 4 x 90°

### KM-10-520-HN, KM-10-530-HN, KM-10-533-HN, KM-10-534-HN



- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (7) = manual override (detent) can be repositioned by  $180^{\circ}$
- (8) = plug socket can be repositioned by  $180^{\circ}$
- (9) = solenoid coil can be repositioned by  $4 \times 90^{\circ}$



### **Accessories for series**

## **KM-10**

### Solenoid coils, actuators



Standard coil **23-SP-011-...** page 4.280



Coil with 2.2 W power consumption **23-SP-012-**... page 4.280



Coil with M-12 plug connection, 4.8 W, LED and circuit protection 23-SP-011-5-O12 page 4.280



Coil with M-12 plug connection, 2.5 W, LED and circuit protection 23-SP-012-5-032 page 4.280



Standard actuator



Low power actuator

23-R-011

23-R-012

### Plug sockets



Standard plug socket **28-ST-01** page 4.281



Plug socket with LED **28-ST-04-...** page 4.281



Plug socket with LED and circuit protection **28-ST-06-...** page 4.281



Plug socket with LED, circuit protection and cable **28-ST-06-K3-...** page 4.281

### **User information**

Low power consumption coils (2.2 W or 2.5 W) are for pressures up to 8 bar (116 psi) only. Valve actuator 23-R-012 is required. The actuator 23-R-012 is nickel plated. Make sure that the coils with the right power consumption are used.

For outdoor applications or in areas with high humidity use coil 23-SP-011-1-... or 23-SP-012-1-... (see page 5.120).

### The following types are available on request

Coils and sockets with contacts according to DIN EN 175301-803 type B (U-form). Plug sockets with molded cable.

4.162 Subject to change



### **Accessories for series**

## KM-09, KM-10

Dimensions see pages 4.125 to 4.127.

### **Manifolds**



Manifold will be delivered completely assembled with valves if requested.



Manifold G 1/8 with "n" stations. **RF-09/n** page 4.124



Manifold G 1/4 with "n" stations. **RF-10/n** page 4.125



End plate for size G 1/8 and G 1/4. **RF-19-E** page 4.126



End plate with one valve station G 1/8. **RF-09-E1** page 4.126



End plate with one valve station G 1/4. **RF-10-E1** page 4.126



End plate with two valve stations G 1/8. **RF-09-E2** page 4.126



End plate with two valve stations G 1/4. **RF-10-E2** page 4.126



One station element G 1/8. **RF-09-Z1** page 4.127



One station element G 1/4. RF-10-Z1 page 4.127



Four station element G 1/8. RF-09-Z4 page 4.127



Four station element G 1/4. **RF-10-Z4** page 4.127



Blind plate for blank valve station G 1/8. **RF-09-V** page 4.124



Blind plate for blank valve station G 1/4. **RF-10-V** page 4.125



Seal plate (two different pressures). **RF-19-01** 



Pressure separator.

RE-19-DT

Further single elements: RF-19-02 Assembly kit, 2 grub screws, O-rings, studs. RF-19-03 3 x O-ring for valve assembly G 1/8 and G 1/4.

### **User information**

Modular manifold system suitable for combined mounting of G 1/8 (6 mm) and G 1/4 (9 mm) valves. Any number of stations is possible if proper supply and exhaust of air is guaranteed. Adding or removing stations is possible at any time.

The necessary seals, mounting screws, grub screws and studs are included when ordering plates. The manifold system is delivered pre-assembled and function-tested. If not specified with the order, valve configuration is as follows: The valves are mounted according to their order number, starting with high numbers on the left, ending with low numbers on the right, followed by blind plates (if ordered).



### **Technical data for series**

M-22



Order code M-22-310-HN-112 **Coil options** Series and function Standard coils1) Without coil and plug socket (with plug socket 28-ST-01) 500 = Power consumption 4.2 W, 7/4 VA **111** = 12 V DC, 4.2 W **530** = Power consumption 2.2 W<sup>2)</sup> **112** = 24 V DC, 4.2 W Coil with M12 connector and LED **122** = 24 V AC, 7/4 VA **O12** = 24 V DC, 4.8 W **126** = 115 V AC, 7/4 VA **O32** = 24 V DC, 2.5 W<sup>2)</sup> **127** = 230 V AC, 7/4 VA  $131 = 12 \text{ V DC}, 2.2 \text{ W}^2$ **132** = 24 V DC, 2.2 W<sup>2)</sup>

### **Design and function**

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering. Valves ME-22-311-HN and ME-22-320-HN are available for use with vacuum (- 0.95 ... 10 bar/-14 ... 175 psi). Order number changes to ME-22-311-HN-Q and ME-22-320-HN-Q.

Valves of this series are available in explosion proof design in accordance with 94/9/EG (ATEX). For further details see chapter 12 of this catalogue.

Order number	M-22-310-HN	MO-22-310-HN	M-22-311-HN	MO-22-311-HN	M-22-320-HN	ME-22-311-HN	ME-22-320-HN
Please complete according to order code.			75 1 J. M	W Z W	12 2 90	T I I W	12 2 19 12 1 1 1 10
Function	3/2-way	3/2-way	3/2-way	3/2-way	3/2-way	3/2-way	3/2-way
	normally closed	normally open	normally closed	normally open	double solenoid		double solenoid
	air spring return	air spring return	spring return	spring return		spring return	ext. pilot supply
Connection	G 1/2						
Nominal size	14 mm						
Flow rate	3300 NI/min	(3.354 Cv)					
Pressure range	1 10 bar <sup>2)</sup> 2 10 bar <sup>2)</sup> (14 145 psi) (29 145 psi)			1 10 bar <sup>2)</sup> (14 145 psi)			
Control pressure	Control press	sure is identica	al to main pres	ssure range			1 10 bar <sup>2)</sup> (14 145 psi)
Response time at 6 bar	on 30 ms off 58 ms		on 28 ms off 68 ms		20 ms	on 28 ms off 68 ms	20 ms
Temperature range	- 10 °C + 70 °C (+ 14 °F + 158 °F)						
Materials	Body: Al (anodized), Seals: NBR and POM, Inner parts: Al, stainless steel, brass						
Degree of protection	IP 65 accordi	P 65 according to EN 60529					
Weight	0.910 kg (2.002 lbs.)		0.965 kg (2.123 lbs.)		0.984 kg (2.165 lbs.)	0.965 kg (2.123 lbs.)	0.984 kg (2.165 lbs.)

<sup>&</sup>lt;sup>2)</sup> max. 8 bar (max. 116 psi) at 2.2 W and 2.5 W.

4.180 Subject to change

<sup>&</sup>lt;sup>1)</sup> When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.184.

# Electrically operated valves 5/2- and 5/3-way, G 1/2, 3300 NI/min (3.354 Cv)



### Technical data for series

**M-22** 



### Order code M-22-510-HN-112 **Coil options** Series and function Without coil and plug socket Standard coils1) (with plug socket 28-ST-01) 500 = Power consumption 4.2 W, 7/4 VA **111** = 12 V DC, 4.2 W **530** = Power consumption 2.2 W<sup>2)</sup> **112** = 24 V DC, 4.2 W Coil with M12 connector and LED **122** = 24 V AC, 7/4 VA **O12** = 24 V DC, 4.8 W **126** = 115 V AC, 7/4 VA **O32** = 24 V DC, 2.5 W<sup>2)</sup> **127** = 230 V AC, 7/4 VA $131 = 12 \text{ V DC}, 2.2 \text{ W}^2$ **132** = 24 V DC, 2.2 W<sup>2)</sup>

### **Design and function**

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering. Valves ME-22-511-HN and ME-22-520-HN are available for use with vacuum (-0.95...10 bar/-14...175 psi). Order number changes to ME-22-511-HN-Q and ME-22-520-HN-Q.

Valves of this series are available in explosion proof design in accordance with 94/9/EG (ATEX). For further details see chapter 12 of this catalogue.

Order number	M-22-510-HN	M-22-511-HN	M-22-520-HN	M-22-530-HN	M-22-533-HN	ME-22-511-HN	ME-22-520-HN
Please complete according to order code.	**************************************	1 2 M	W			54 4 2 W	学区直径
Function	5/2-way single solenoid air spring return	5/2-way single solenoid spring return	5/2-way double solenoid	5/3-way center position closed	5/3-way center position exhausted	5/2-way single solenoid ext. pilot supply	
Connection	G 1/2						
Nominal size	14 mm						
Flow rate	3300 NI/min	(3.354 Cv)					
Pressure range		2 10 bar <sup>2)</sup> (29 145 psi)				0 10 bar <sup>2)</sup> (0 145 psi)	
Control pressure	Control press	ure is identica	al to main pres	ssure range		2 10 bar <sup>2)</sup> (29 145 psi)	
Response time at 6 bar	on 30 ms off 59 ms	on 20 ms off 80 ms	22 ms	on 30 ms off 50 ms			22 ms
Temperature range	- 10 °C + 70 °C (+ 14 °F + 158 °F)						
Materials	Body: Al (anodized), Seals: NBR and POM, Inner parts: Al, stainless steel, brass						
Degree of protection	IP 65 according to EN 60529						
Weight	1.150 kg (2.530 lbs.)	1.180 kg (2.596 lbs.)	1.260 kg (2.772 lbs.)	1.250 kg (2.750 lbs.)		1.160 kg (2.552 lbs.)	1.260 kg (2.772 lbs.)

<sup>&</sup>lt;sup>2)</sup> max. 8 bar (max. 116 psi) at 2.2 W and 2.5 W.

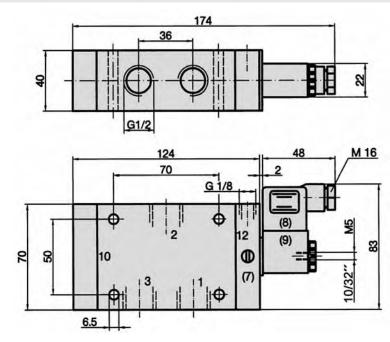
<sup>&</sup>lt;sup>1)</sup> When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.184.



### **Dimensions for series**

## **M-22**

### M-22-310-HN, M-22-311-HN, MO-22-310-HN, MO-22-311-HN, ME-22-311-HN, ME-22-311-HN-Q

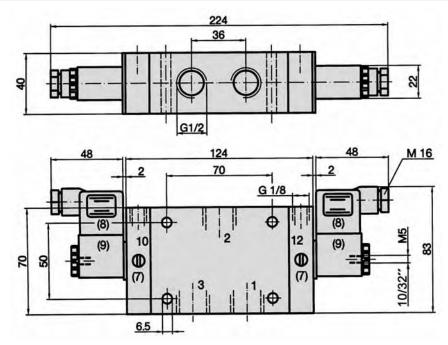


- 1 = pressure inlet
- 2 = outlet
- 3 = exhaust
- (7) = manual override (detent) can be repositioned by 180°
- (8) = plug socket can be repositioned by  $180^{\circ}$
- (9) = solenoid coil can be repositioned by 4 x 90°

Valves MO-22-310-HN and MO-22-311-HN carry the solenoid on the opposite side (at pilot 10).

Only valve ME-22-311-HN includes G 1/8 at port 12 for external pilot supply.

### M-22-320-HN, ME-22-320-HN, ME-22-320-HN-Q



- 1 = pressure inlet
- 2 = outlet
- 3 = exhaust
- $^{(7)}$  = manual override (detent) can be repositioned by  $180^{\circ}$
- (8) = plug socket can be repositioned by  $180^{\circ}$
- (9) = solenoid coil can be repositioned by 4 x  $90^{\circ}$

Only valve ME-22-320-HN includes G 1/8 at ports 10 and 12 for external pilot supply.

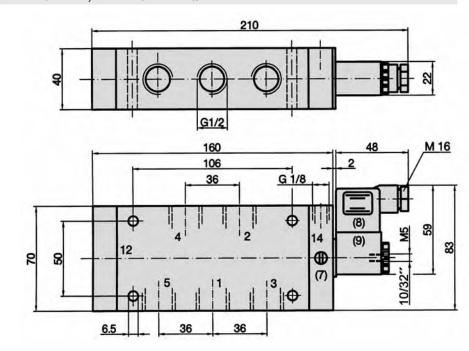
4.182



### **Dimensions for series**

## **M-22**

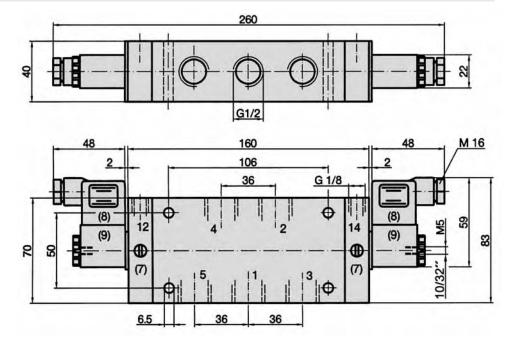
### M-22-510-HN, M-22-511-HN, ME-22-511-HN, ME-22-511-HN-Q



- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (7) = manual override (detent) can be repositioned by  $180^{\circ}$
- (8) = plug socket can be repositioned by 180°
- (9) = solenoid coil can be repositioned by  $4 \times 90^{\circ}$

Only valve ME-22-511-HN includes G 1/8 at port 14 for external pilot supply.

### M-22-520-HN, ME-22-520-HN, ME-22-520-HN-Q, M-22-530-HN, M-22-533-HN



- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (7) = manual override (detent) can be repositioned by  $180^{\circ}$
- (8) = plug socket can be repositioned by  $180^{\circ}$
- (9) = solenoid coil can be repositioned by  $4 \times 90^{\circ}$

Only valve ME-22-520-HN includes G 1/8 at ports 12 and 14 for external pilot supply.

# Accessories for electrically operated valves Series M-22



### **Accessories for series**

## **M-22**

### Solenoid coils, actuators



Standard coil 23-SP-011-... page 4.280



Coil with 2.2 W power consumption **23-SP-012-...** page 4.280



Coil with M-12 plug connection, 4.8 W, LED and circuit protection 23-SP-011-5-012 page 4.280



Coil with M-12 plug connection, 2.5 W, LED and circuit protection 23-SP-012-5-O32 page 4.280



Valves with explosion proof actuator see chapter 12.



Standard actuator

23-R-011



Low power actuator

23-R-012

### Plug sockets



Standard plug socket **28-ST-01** page 4.281



Plug socket with LED **28-ST-04-**... page 4.281



Plug socket with LED and circuit protection **28-ST-06-...** page 4.281



Plug socket with LED, circuit protection and cable **28-ST-06-K3-...** page 4.281

### **User information**

Low power consumption coils (2.2 W or 2.5 W) are for pressures up to 8 bar (116 psi) only. Valve actuator 23-R-012 is required. The actuator 23-R-012 is nickel plated. Make sure that the coils with the right power consumption are used.

When using explosion proof coils the dimensions of the corresponding valve change.

For outdoor applications or in areas with high humidity use coil 23-SP-011-1-... or 23-SP-012-1-... (see page 5.120).

### The following types are available on request

Coils and sockets with contacts according to DIN EN 175301-803 type B (U-form). Plug sockets with molded cable.

4.184 Subject to change

Note	antet



### **Technical data for series**

## MC-20, MD-20



Order code

MC-20-510-HN-112

**Series and function** 

### Coil options\*

141 = 12 V DC, 2 W, (plug socket on top, see pictures)

142 = 24 V DC, 2 W, (plug socket on top, see pictures)

**441** = 12 V DC, 2 W, without plug socket (plug pins on top)

**442** = 24 V DC, 2 W, without plug socket (plug pins on top)

**111** = 12 V DC, 2 W, (plug socket bottom, at ports 1, 2, 3, 4, 5)

112 = 24 V DC, 2 W, (plug socket bottom, at ports 1, 2, 3, 4, 5)

411 = 12 V DC, 2 W, without plug socket (plug pins bottom)

412 = 24 V DC, 2 W, without plug socket (plug pins bottom)

### **Design and function**

Spool valve actuated by an electrical signal.

The standard coil, the standard socket (see page 4.202), all mounting screws and sealing for sub-base mounting (see page 4.203) are included.

Please specify required control voltage when ordering.

Order number	MC-20-510-HN	MC-20-520-HN	MC-20-530-HN	MC-20-533-HN	MD-20-510-HN	MD-20-520-HN
Please complete according to order code.	14 2 2 2 2 3 3 3					##*
Function	5/2-way single solenoid	5/2-way double solenoid	5/3-way center position closed	5/3-way center position exhausted	5/2-way single solenoid with exhaust throttles	5/2-way double solenoid with exhaust throttles
Connection	Sub-base mour	nting				
Nominal size	3 mm					
Flow rate	220 NI/min (0.2	220 NI/min (0.224 Cv)				
Pressure range	2.5 8 bar (36 116 psi)		3 8 bar (43 116 psi)		2.5 8 bar (36 116 psi)	
Response time at 6 bar	on 12 ms off 12 ms	11 ms	on 15 ms off 22 ms			11 ms
Temperature range	- 10 °C + 70 °C (+ 14 °F + 158 °F)					
Materials	Body: AI (anodized), plastic, Seals: NBR and POM, Inner parts: AI, stainless steel, brass					
Degree of protection	IP 65 according to EN 60529					
Weight	0.100 kg (0.220 lb.)	0.156 kg (0.343 lb.)	0.162 kg (0.356 lb.)		0.100 kg (0.220 lb.)	0.156 kg (0.343 lb.)

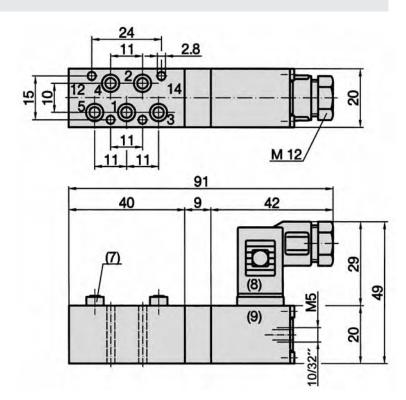
<sup>\*</sup>Valves with other control voltages on request.

4.200 Subject to change

### **Dimensions for series**

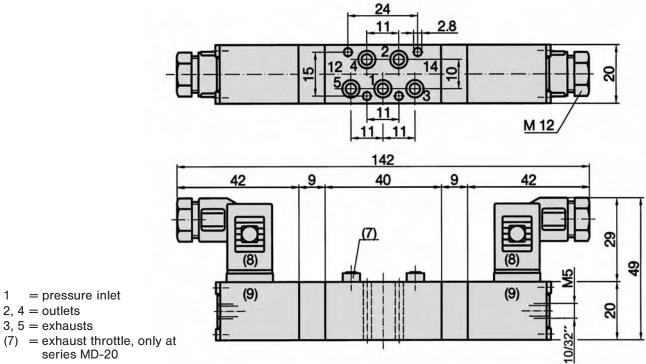
## MC-20, MD-20

### MC-20-510-HN, MD-20-510-HN



- = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (7) = exhaust throttle, only at series MD-20
- (8) = plug socket can be repositioned by 180°
- (9) = manual override (detent) can be repositioned by 4 x 90°

### MC-20-520-HN, MC-20-530-HN, MC-20-533-HN, MD-20-520-HN



- (7) = exhaust throttle, only at
- (8) = plug socket can be repositioned by 180°
- (9) = manual override (detent) can be repositioned by 4 x 90°

4.201 Subject to change



### **Accessories for series**

## MC-20, MD-20

### Solenoid coil



Standard coil 23-M-20-... page 4.282

### **Plug sockets**



Standard plug socket **28-ST-02** page 4.283



Plug socket with LED **28-ST-09-**... page 4.283



Plug socket with LED and circuit protection **28-ST-10-...** page 4.283



Socket with LED, circuit protection and cable **28-ST-10-K3-...** page 4.283



Socket with M-12 sensor connection, LED and circuit protection 28-ST-02-2-07 page 4.282



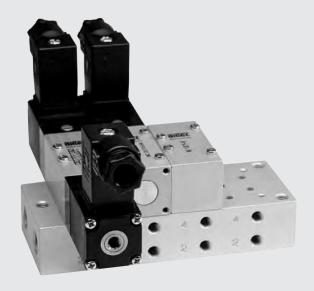
Socket with M-8 sensor connection, LED and circuit protection **28-ST-02-2-05** page 4.282



### **Accessories for series**

## MC-20, MD-20

### **Sub-bases**



Sub-bases will be delivered completely assembled with valves if requested



Sub-base G 1/8. Available from 1 to 12 stations **M-122/n** page 4.204



Sub-base M 5 (10/32 UNF). Available from 1 to 12 stations **M-123/n** page 4.205



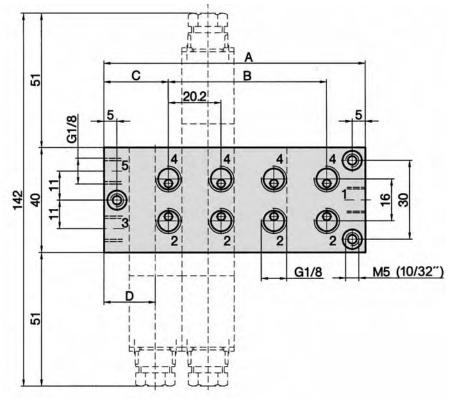
Blind plate for blank valve station **M-121-V** 

### **Electrically operated valves** 5/2- and 5/3-way, for sub-base mounting, 220 NI/min (0.224 Cv)



### **Dimensions for sub-base**

## **M-122**

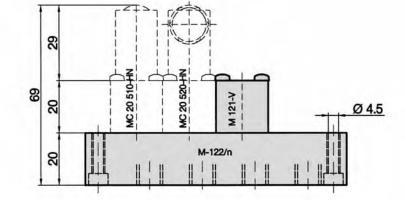


- = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts

M-121-V

Blind plate for blank station.

Material: AI (anodized).



### M-122/n

Sub-base suitable for valve series MC-20 and MD-20.

Material: AI (anodized).

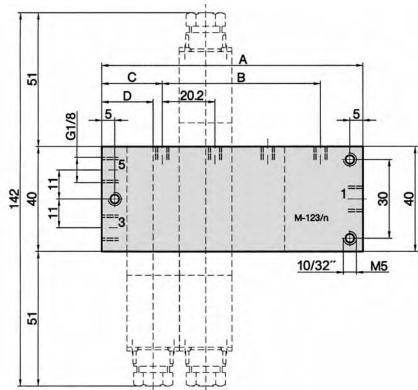
Order number	Α	В	С	D	Weight
M-122/1	40	_	25.0	20.0	0.080 kg (0.176 lb.)
M-122/2	60	20.2	24.9	19.9	0.122 kg (0.269 lb.)
M-122/3	80	40.4	24.8	19.8	0.164 kg (0.362 lb.)
M-122/4	100	60.6	24.7	19.7	0.206 kg (0.454 lb.)
M-122/5	120	80.8	24.6	19.6	0.248 kg (0.547 lb.)
M-122/6	140	101	24.5	19.5	0.290 kg (0.639 lb.)
M-122/7	160	121.2	24.4	19.4	0.332 kg (0.732 lb.)
M-122/8	180	141.4	24.3	19.3	0.374 kg (0.824 lb.)
M-122/9	200	161.6	24.2	19.2	0.416 kg (0.917 lb.)
M-122/10	220	181.8	24.1	19.1	0.458 kg (1.010 lbs.)
M-122/11	240	202	24.0	19.0	0.500 kg (1.102 lbs.)
M-122/12	260	222.2	23.9	18.9	0.542 kg (1.195 lbs.)



### **Dimensions for sub-base**

## **M-123**

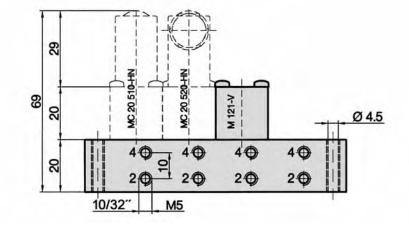




- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts

M-121-V

Blind plate for blank station. Material: Al (anodized).



### M-123/n

Sub-base suitable for valves series MC-20 and MD-20. Material: AI (anodized).

Order number	Α	В	С	D	Weight
M-123/1	40	_	23.5	20.0	0.083 kg (0.183 lb.)
M-123/2	60	20.2	23.4	19.9	0.128 kg (0.282 lb.)
M-123/3	80	40.4	23.3	19.8	0.173 kg (0.381 lb.)
M-123/4	100	60.6	23.2	19.7	0.218 kg (0.480 lb.)
M-123/5	120	80.8	23.1	19.6	0.263 kg (0.580 lb.)
M-123/6	140	101	23.0	19.5	0.308 kg (0.679 lb.)
M-123/7	160	121.2	22.9	19.4	0.353 kg (0.778 lb.)
M-123/8	180	141.4	22.8	19.3	0.398 kg (0.877 lb.)
M-123/9	200	161.6	22.7	19.2	0.443 kg (0.977 lb.)
M-123/10	220	181.8	22.6	19.1	0.488 kg (1.076 lbs.)
M-123/11	240	202	22.5	19.0	0.533 kg (1.175 lbs.)
M-123/12	260	222.2	22.4	18.9	0.578 kg (1.274 lbs.)

# Electrically operated valves 5/2- and 5/3-way for manifold mounting G 1/8, 360 NI/min (0.366 CV)

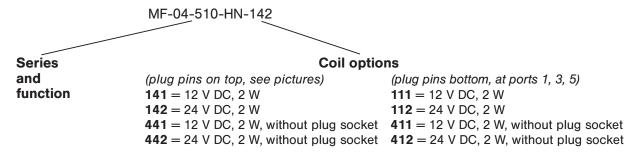


### **Technical data for series**

## **MF-04**



### Order code



### **Design and function**

Spool valve actuated by an electrical signal.

The standard coil, the standard socket (see page 4.202) and all mounting screws for sub-base mounting (see page 4.214) and seals are included.

Order number	MF-04-510-HN	MF-04-520-HN	MF-04-530-HN	MF-04-533-HN			
Please complete according to order code.	14 4 2		" M 4 2 M 12				
Function	5/2-way single solenoid	5/2-way double solenoid	5/3-way center position exhausted	5/3-way center position open			
Connection	G 1/8 at 2 and 4, flange at 1, 3, 5						
Nominal size	4 mm	4 mm					
Flow rate	360 NI/min (0.366 Cv)						
Pressure range	2.5 8 bar (36 116 psi) 3 8 bar (43 116 psi)						
Response time at 6 bar	on 13 ms off 16 ms off 22 ms						
Temperature range	- 10 °C + 70 °C (+	14 °F + 158 °F)					
Materials	Body: AI (anodized), plastic, Seals: NBR and POM, Inner parts: AI, stainless steel, brass						
Standard voltage	24 V DC						
Power consumption	2 W						
Degree of protection	IP 65 according to EN 60529						
Weight	0.112 kg (0.246 lb.)	0.181 kg (0.398 lb.)	0.180 kg (0.396 lb.)	0.178 kg (0.392 lb.)			

4.210 Subject to change

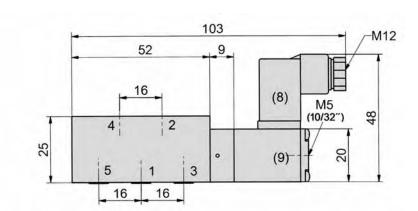
# Electrically operated valves 5/2- and 5/3-way for manifold mounting G 1/8, 360 NI/min (0.366 CV)



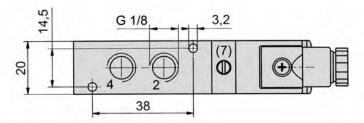
### **Dimensions for series**

## MF-04

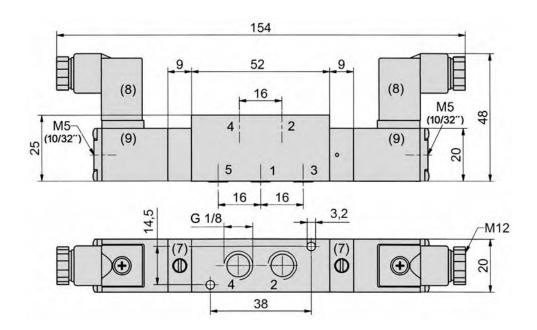
### MF-04-510-HN



- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (7) = manual override (detent) can be repositioned by 4 x 90°
- (8) = plug socket can be repositioned by 180°
- (9) = solenoid coil can be repositioned by 4 x 90°



### MF-04-520-HN, MF-04-530-HN, MF-04-533-HN



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

- (7) = manual override (detent) can be repositioned by  $4 \times 90^{\circ}$
- (8) = plug socket can be repositioned by  $180^{\circ}$
- (9) = solenoid coil can be repositioned by 4 x 90°

# airec

### **Accessories for series**

## **MF-04**

### Solenoid coil



Standard coil 23-M-20-... page 4.282

### **Plug sockets**



Standard plug socket **28-ST-02** page 4.283



Plug socket with LED **28-ST-09-...** page 4.283



Plug socket with LED and circuit protection **28-ST-10-...** page 4.283



Plug socket with LED, circuit protection and cable **28-ST-10-K3-...** page 4.283



Plug socket with M-12 plug connection, LED and circuit protection **28-ST-02-2-07** page 4.282



Plug socket with M-8 plug connection, LED and circuit protection 28-ST-02-2-05 page 4.282

# Manifolds for electrically operated valves Series MF-04



### **Accessories for series**

## **MF-04**

### Modular manifolds



Manifolds will be delivered completely assembled upon request.



Base element, available with 1, 3, 5, 7, 9 and 11 stations. **RF-24/n-G** 



Manifold. Available from 2 to 12 stations RF-24/n-P page 4.214



End plate with one valve station **RF-24-E** 



Add-on element 1 RF-24-W1



Add-on element 2 RF-24-W2



Clamp for DIN-rail mounting **RF-04-K** 

Other elements: RF-04-V Blind plate for blank valve station

**RE-04-DT** Seal plate for two different pressures

### **User Information**

The manifold RF-24 is an expandable system for valve series MF-04. The assembled manifold includes the base element (RF-24/n-G) and the end plate (RF-24-E).

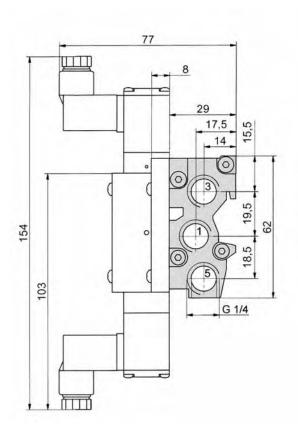
The base element is available with 1, 3, 5, 7, 9 and 11 valve stations. The end plate includes 1 valve station. For odd-numbered stations one element RF-24-W1 is mounted between the base element and end plate.

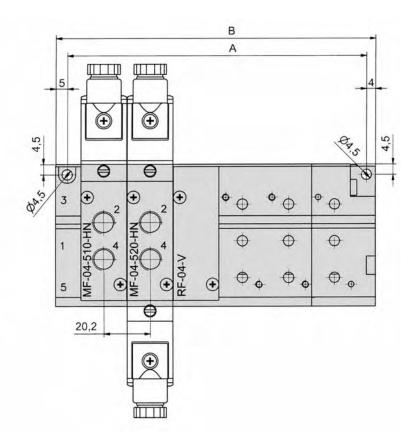
For future expansion add-on elements are required. For even numbered stations begin with the element RF-24-W1. For odd numbered stations begin with the element RF-24-W2. All necessary seals and mounting screws are included with each element.

Manifolds can be mounted using the through holes or on a DIN rail using RF-04-K clamp.



## **RF-24**





Side view for any number of stations.

Manifolds with 2 to 7 stations.

1 = pressure inlet

2, 4 = outlet

3, 5 = exhaust

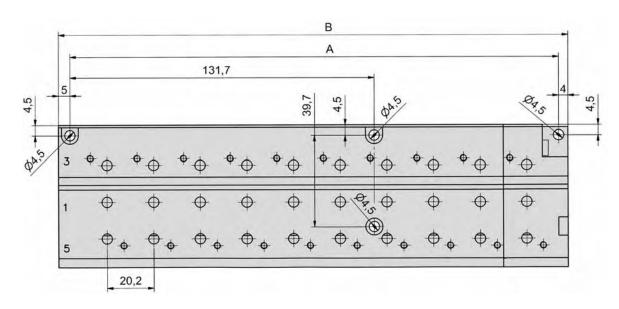
If the manifold is extended, the dimensions A and B will increase by 20.2 mm for each station.

Material: AI (anodized)

Order number	Α	В	Weight	Included elements
RF-24/2-P	50	59	0.202 kg (0.445 lb.)	1 x RF-24/1-G, 1 x RF-24-E
RF-24/3-P	70.2	79.2	0.264 kg (0.582 lb.)	1 x RF-24/1-G, 1 x RF-24-W1, 1 x RF-24-E
RF-24/4-P	90.4	99.4	0.324 kg (0.714 lb.)	1 x RF-24/3-G, 1 x RF-24-E
RF-24/5-P	110.6	119.6	0.387 kg (0.853 lb.)	1 x RF-24/3-G, 1 x RF-24-W1, 1 x RF-24-E
RF-24/6-P	130.8	139.8	0.447 kg (0.985 lb.)	1 x RF-24/5-G, 1 x RF-24-E
RF-24/7-P	151	160	0.510 kg (1.124 lbs.)	1 x RF-24/5-G, 1 x RF-24-W1, 1 x RF-24-E



## **RF-24**



Manifolds with 8 to 12 stations.

1 = pressure inlet

3, 5 = exhaust

If the manifold is extended, the dimensions A and B will increase by 20.2 mm for each station.

### Material: Al (anodized)

Order number	Α	В	Weight	Included elements
RF-24/8-P	171.2	180.2	0.567 kg (1.250 lbs.)	1 x RF-24/7-G, 1 x RF-24-E
RF-24/9-P	191.4	200.4	0.629 kg (1.387 lbs.)	1 x RF-24/7-G, 1 x RF-24-W1, 1 x RF-24-E
RF-24/10-P	211.6	220.6	0.708 kg (1.561 lbs.)	1 x RF-24/9-G, 1 x RF-24-E
RF-24/11-P	231.8	240.8	0.771 kg (1.700 lbs.)	1 x RF-24/9-G, 1 x RF-24-W1, 1 x RF-24-E
RF-24/12-P	252	261	0.831 kg (1.832 lbs.)	1 x RF-24/11-G, 1 x RF-24-E

# Electrically operated valves 5/2- and 5/3-way for manifold mounting, G 1/8, 650 NI/min (0.661 CV)



### **Technical data for series**

## MF-05, MF-25



Order code	MF-25-510-HN-142	
	Coil op	otions
Series and function	Standard coils <sup>1)</sup> (with plug socket 28-ST-01) 141 = 12 V DC, 4.2 W 142 = 24 V DC, 4.2 W 152 = 24 V AC, 7/4 VA 156 = 115 V AC, 7/4 VA 157 = 230 V AC, 7/4 VA 161 = 12 V DC, 2.2 W <sup>2)</sup> 162 = 24 V DC, 2.2 W <sup>2)</sup>	Without coil and plug socket 570 = Power consumption 4.2 W, 7/4 VA 560 = Power consumption 2.2 W <sup>2)</sup> Coil with M12 connector and LED 042 = 24 V DC, 4.8 W 062 = 24 V DC, 2.5 W <sup>2)</sup>

<sup>&</sup>lt;sup>1)</sup> When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.222.

### **Design and function**

Spool valve actuated by an electrical signal.

This valve series is designed for the mounting on modular manifolds series RF-05.

The standard coil, the standard socket (see page 4.222) and all mounting screws for sub-base mounting (see page 4.223) are included.

Order number	MF-25-510-HN	MF-25-511-HN	MF-05-520-HN	MF-05-530-HN	MF-05-533-HN
Please complete according to order code.		14 2 W			
Function	5/2-way	5/2-way	5/2-way	5/3-way	5/3-way
	single solenoid air spring return	single solenoid spring return	double solenoid	center position exhausted	center position open
Connection	G 1/8 at 2 and 4, f	lange port at 1, 3 ar	nd 5.		
Nominal size	6 mm			5 mm	
Flow rate	650 NI/min (0.661	Cv)		560 NI/min (0.569	Cv)
Pressure range	2 10 bar <sup>2)</sup> (29 145 psi)	3 10 bar <sup>2)</sup> (43 145 psi)	2 10 bar <sup>2)</sup> (29 145 psi)	3 10 bar <sup>2)</sup> (43 145 psi)	
Response time at 6 bar	on 13 ms off 16 ms	on 11 ms off 18 ms	12 ms	on 13 ms off 15 ms	
Temperature range	– 10 °C + 70 °C (+ 14 °F + 158 °F)				
Materials	Body: Al (anodized), Seals: NBR and POM, Inner parts: Al, stainless steel and brass				
Degree of protection	IP 65 according to EN 60529				
Weight	0.243 kg (0.536 lb.)	0.244 kg (0.538 lb.)	0.352 kg (0.776 lb.)	0.351 kg (0.774 lb.)	

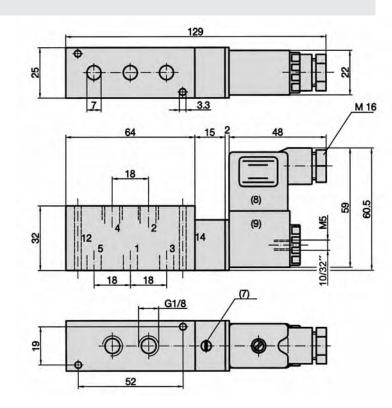
<sup>&</sup>lt;sup>2)</sup> max. 8 bar (max. 116 psi) at 2.2 W and 2.5 W.

4.220 Subject to change

### **Dimensions for series**

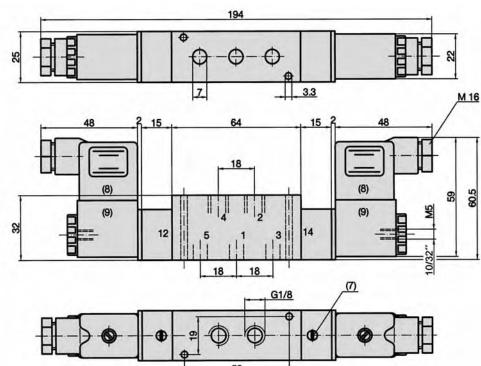
## MF-05, MF-25

### MF-25-510-HN, MF-25-511-HN



- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (7) = manual override (detent) can be repositioned by 4 x 90°
- (8) = plug socket can be repositioned by 180°
- (9) = solenoid coil can be repositioned by 4 x 90°

### MF-05-520-HN, MF-05-530-HN, MF-05-533-HN



- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (7) = manual override (detent) can be repositioned by 4 x 90°
- (8) = plug socket can be repositioned by 180°
- (9) = solenoid coil can be repositioned by 4 x 90°



### **Accessories for series**

## MF-05, MF-25

### Solenoid coils, actuators



Standard coil **23-SP-011-...** page 4.280



Coil with 2.2 W power consumption **23-SP-012-...** page 4.280



Coil with M-12 plug connection, 4.8 W, LED and circuit protection 23-SP-011-5-O12 page 4.280



Coil with M-12 plug connection, 2.5 W, LED and circuit protection 23-SP-012-5-032 page 4.280



Standard actuator 23-R-011



Low power actuator 23-R-012

### Plug sockets



Standard plug socket **28-ST-01** page 4.281



Plug socket with LED **28-ST-04-**... page 4.281



Plug socket with LED and circuit protection **28-ST-06-...** page 4.281



Plug socket with LED, circuit protection and cable **28-ST-06-K3-...** page 4.281

### **User information**

Low power consumption coils (2.2 W or 2.5 W) are for pressures up to 8 bar (116 psi) only. Valve actuator 23-R-012 is required. The actuator 23-R-012 is nickel plated. Make sure that the coils with the right power consumption are used.

For outdoor applications or in areas with high humidity use coil 23-SP-011-1-... or 23-SP-012-1-... (see page 5.120).

### The following types are available on request

Coils and sockets with contacts according to DIN EN 175301-803 type B (U-form). Plug sockets with molded cable.

4.222 Subject to change

### **Accessories for series**

## MF-05, MF-25

### Modular manifolds



Manifolds will be delivered completely assembled upon request.



Manifold. Available from 1 to 12 stations RF-05/n page 4.224



Single sub-base G 1/8 side ports RF-051 page 4.225



Single sub-base G 1/8 bottom ports RF-052 page 4.225



Blind plate for blank valve station RF-05-V



Single sub-base **RF-05** 



End-plate (pair) RF-05-E



Adapter plate for external pressure RF-05/ZE

Other elements: RO-050 3 O-rings for sealing between two elements RO-051 Separation plate to feed in different pressures

**RO-052** Seal between valve and manifold

RZ-05/n Tie rods (1 pair), n = indicates the number of stations

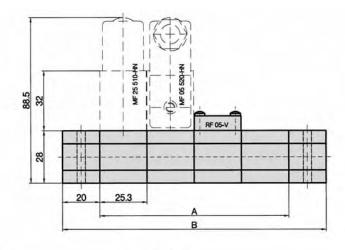
**RZ-05** Tie rod extensions for one station (1 pair)

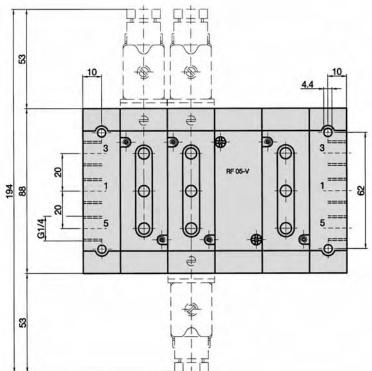
4.223 Subject to change



## **RF-05**







1 = pressure inlet 3, 5 = exhausts

### RF-05-V

Blind plate for blank station. Material: Al (anodized).

### RF-05/n

Manifold suitable for valve series MF-05 and MF-25. The seal (RO-052) between the valve and manifold is included.

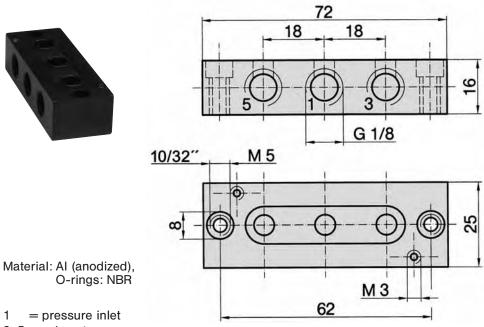
Material: plastic, brass, NBR.

Order number	Α	В	Weight
RF-05/1	25.3	65.3	0.160 kg (0.353 lb.)
RF-05/2	50.6	90.6	0.205 kg (0.452 lb.)
RF-05/3	75.9	115.9	0.250 kg (0.551 lb.)
RF-05/4	101.2	141.2	0.295 kg (0.650 lb.)
RF-05/5	126.5	166.5	0.340 kg (0.749 lb.)
RF-05/6	151.8	191.8	0.385 kg (0.849 lb.)
RF-05/7	177.1	217.1	0.430 kg (0.948 lb.)
RF-05/8	202.4	242.4	0.475 kg (1.047 lbs.)
RF-05/9	227.7	267.7	0.520 kg (1.146 lbs.)
RF-05/10	253	293	0.565 kg (1.245 lbs.)
RF-05/11	278.3	318.3	0.610 kg (1.345 lbs.)
RF-05/12	303.6	343.6	0.655 kg (1.444 lbs.)

# Manifolds for electrically operated valves Series MF-05 and MF-25

### **Dimensions for single sub-base**

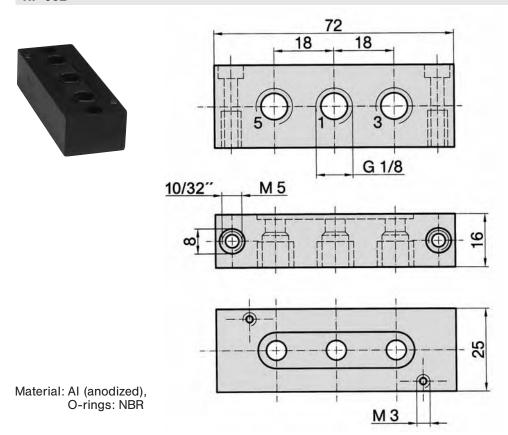
### RF-051



3, 5 = exhausts

The seal (RO-052) between valve and sub-base are included.

### RF-052



1 = pressure inlet

3, 5 = exhausts

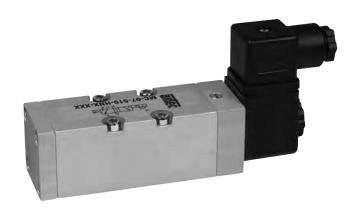
The seal (RO-052) between valve and sub-base are included.

# Electrically operated valves 5/2- and 5/3-way, for manifold mounting, 1200 NI/min (1.219 Cv)



### **Technical data for series**

## **MC-07**





MC-07-510-HN-812

Series and function

### **Coil options**

with plug socket 28-ST-03

812 = 24 V DC, 4.8 W

**822** = 24 V AC, 7.9/5.5 VA

826 = 115 V AC, 7.9/5.5 VA

**827** = 230 V AC, 79/5.5 VA

### without plug socket

**712** = 24 V DC, 4.8 W

**722** = 24 V AC, 7.9/5.5 VA

**726** = 115 V AC, 7.9/5.5 VA

**727** = 230 V AC, 7.9/5.5 VA

### **Design and function**

Spool valve actuated by an electrical signal.

This valve series is designed for monting on manifold series RF-C-07.

The standard coil, the standard socket, all mounting screws and seals for sub-base mounting (see page 4.242) are included.

Please specify required control voltage when ordering.

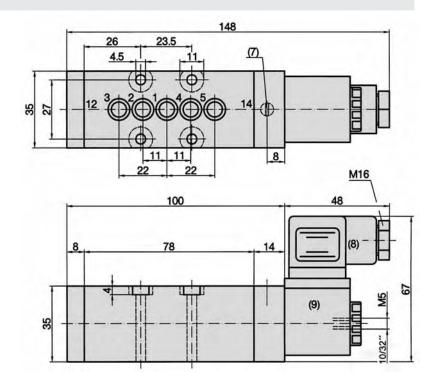
Order number	MC-07-510-HN	MC-07-520-HN	MC-07-530-HN	MC-07-533-HN	
Please complete according to order code.	14 2 2	14 4 2 12	14 W 12 W 12	14 MM 12 MM 12 S MM 12 S MM 12 S MM 12 MM	
Function	5/2-way single solenoid	5/2-way double solenoid	5/3-way center position closed	5/3-way center position exhausted	
Connection	sub-base mounting				
Nominal size	7 mm				
Flow rate	1200 NI/min (1.219 Cv)				
Pressure range	1.5 10 bar (22 145 psi)	2 10 bar (29 145 psi)	3 10 bar (43 145 psi)		
Response time at 6 bar	on 15 ms off 19 ms	14 ms	on 15 ms off 22 ms		
Temperature range	- 10 °C + 70 °C (+ 14 °F + 158 °F)				
Materials	Body: Al (anodized), Seals: NBR and POM, Inner parts: Al, stainless steel, brass				
Degree of protection	IP 65 according to EN 60529				
Weight	0.470 kg (1.036 lbs.)	0.660 kg (1.455 lbs.)			



### **Dimensions for series**

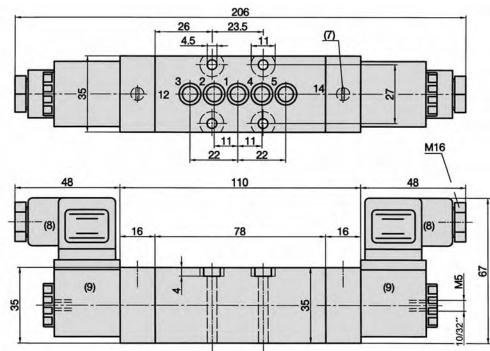
## **MC-07**

### MC-07-510-HN



- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (7) = manual override (detent) can be repositioned by 180°
- (8) = plug socket can be repositioned by 4 x 90°
- (9) = solenoid coil can be repositioned by 4 x 90°

### MC-07-520-HN, MC-07-530-HN, MC-07-533-HN



- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (7) = manual override (detent) can be repositioned by 180°
- (8) = plug socket can be repositioned by 4 x 90°
- (9) = solenoid coil can be repositioned by 4 x 90°



### **Accessories for series**

## **MC-07**

### Solenoid coil, plug socket, actuator



Standard coil 23-SP-016-... page 4.283



Standard plug socket **28-ST-03** page 4.283



Standard actuator 23-R-013

### **Sub-bases**



Manifold will be delivered completely assembled with valves if requested

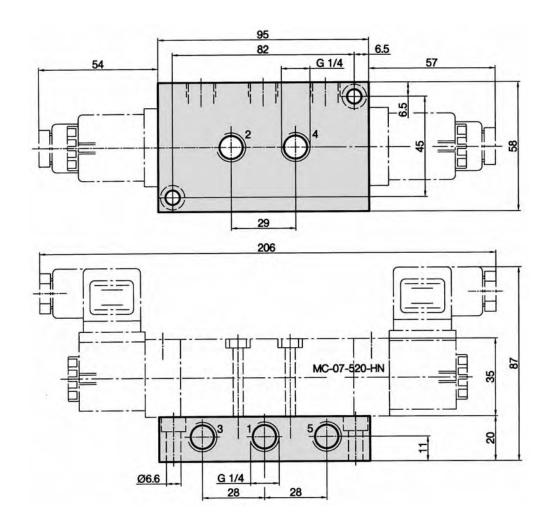


Manifold Available with 1, 4 or 6 stations **RF-C-07/n** page 4.243



Blind plate for blank valve stations RF-C-07-V

## RF-C-07/1



1 = pressure inlet 2, 4 = outlets

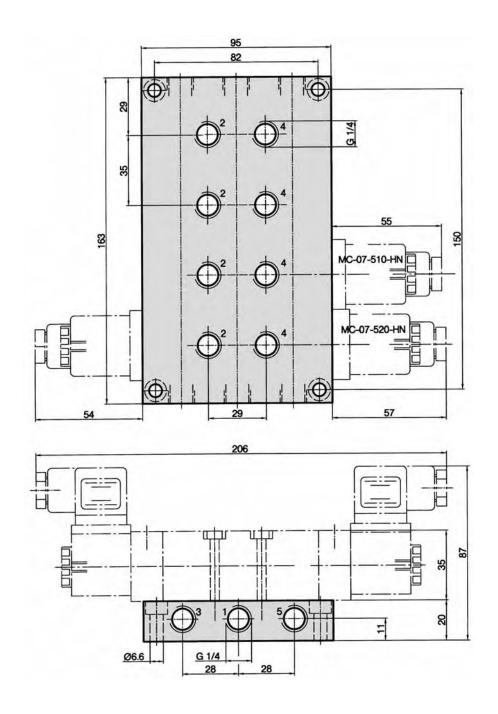
3, 5 = exhausts

Weight: 0.260 kg (0.573 lb.) Material: Al (black anodized)

4.243 Subject to change



## RF-C-07/4



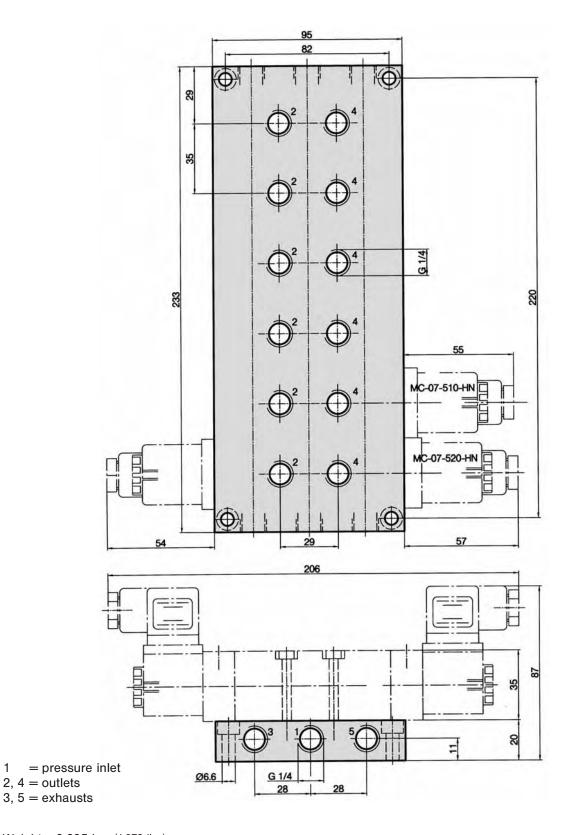
1 = pressure inlet

2, 4 = outlets

3, 5 = exhausts

Weight: 0.625 kg (1.378 lbs.) Material: AI (black anodized)

## RF-C-07/6



Weight: 0.895 kg (1.973 lbs.) Material: AI (black anodized)

# Electrically operated valves 5/2- and 5/3-way for manifold mounting, G 1/4, 1500 - 1720 NI/min (1.524 - 1.748 CV)



### **Technical data for series**

**MF-07** 



Order code	MF-07-510-HN-142	
	Coil op	otions
Series and function	Standard coils <sup>1)</sup> (with plug socket 28-ST-01) 141 = 12 V DC, 4.2 W 142 = 24 V DC, 4.2 W 152 = 24 V AC, 7/4 VA 156 = 115 V AC, 7/4 VA 157 = 230 V AC, 7/4 VA 161 = 12 V DC, 2.2 W <sup>2)</sup> 162 = 24 V DC, 2.2 W <sup>2)</sup>	Without coil and plug socket 570 = Power consumption 4.2 W, 7/4 VA 560 = Power consumption 2.2 W <sup>2)</sup> Coil with M12 connector and LED O42 = 24 V DC, 4.8 W O62 = 24 V DC, 2.5 W <sup>2)</sup>

<sup>&</sup>lt;sup>1)</sup> When the valve is requested without the plug socket, the first digit of the order code for standard coils must be changed from 1 to 4. For optional plug sockets see page 4.262.

### **Design and function**

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering.

This valve series is designed for the mounting on the modular manifolds series RF-07.

The standard coil, the standard socket (see page 4.262) and all mounting screws for manifold mounting (see page 4.263) are included.

Please specify required voltage when ordering.

Order number	MF-07-510-HN	MF-07-511-HN	MF-07-520-HN	MF-07-530-HN	MF-07-533-HN
Please complete according to order code.	14 4 2	14 2 W			**************************************
Function	5/2-way single solenoid air spring return	5/2-way single solenoid spring return	5/2-way double solenoid	5/3-way center position exhausted	5/3-way center position open
Connection	G 1/4 at 2 and 4, f	lange at 1, 3, 5			
Nominal size	10 mm			9 mm	
Flow rate	1720 NI/min (1.74	8 Cv)		1500 NI/min (1.52	4 Cv)
Pressure range	1.5 10 bar <sup>2)</sup> (22 145 psi)	2.5 10 bar <sup>2)</sup> (36 145 psi)	2 10 bar <sup>2)</sup> (29 145 psi)	3 10 bar <sup>2)</sup> (43 145 psi)	
Response time at 6 bar	on 19 ms off 27 ms	on 19 ms off 33 ms	13 ms	on 14 ms off 16 ms	
Temperature range	– 10 °C + 70 °C (+ 14 °F + 158 °F)				
Materials	Body: Al (anodized), Seals: NBR and POM, Inner parts: Al, stainless steel and brass				
Degree of protection	IP 65 according to EN 60529				
Weight	0.409 kg (0.902 lb.)	0.414 kg (0.913 lb.)	0.573 kg (1.263 lbs.)	0.545 kg (1.201 lbs.)	-

<sup>&</sup>lt;sup>2)</sup> max. 8 bar (max. 116 psi) at 2.2 W and 2.5 W.

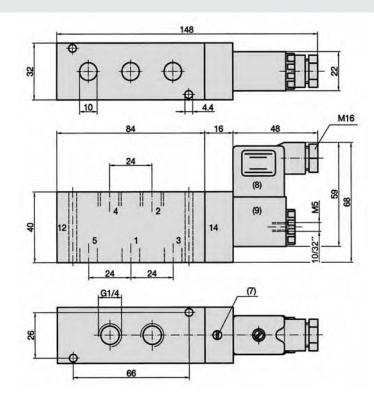
4.260 Subject to change



### **Dimensions for series**

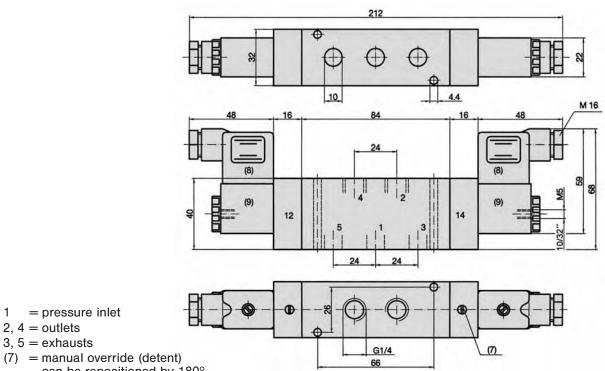
## MF-07

### MF-07-510-HN, MF-07-511-HN



- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (7) = manual override (detent) can be repositioned by 180°
- (8) = plug socket can be repositioned by 180°
- (9) = solenoid coil can be repositioned by 4 x 90°

### MF-07-520-HN, MF-07-530-HN, MF-07-533-HN



- 2, 4 = outlets
- can be repositioned by 180°
- (8) = plug socket can be repositioned by 180°
- (9) = solenoid coil can be repositioned by 4 x 90°

4.261 Subject to change

# Accessories for electrically operated valves Series MF-07



### **Accessories for series**

## **MF-07**

### Solenoid coils, actuators



Standard coil **23-SP-011-...** page 4.280



Coil with 2.2 W power consumption **23-SP-012-...** page 4.280



Coil with M-12 plug connection, 4.8 W, LED and circuit protection 23-SP-011-5-012 page 4.280



Coil with M-12 plug connection, 2.5 W, LED and circuit protection 23-SP-012-5-O32 page 4.280



Standard actuator 23-R-013



Low power actuator 23-R-014

### Plug sockets



Standard plug socket 28-ST-01 page 4.281



Plug socket with LED **28-ST-04-**... page 4.281



Plug socket with LED and circuit protection **28-ST-06-...** page 4.281



Plug socket with LED, circuit protection and cable **28-ST-06-K3-...** page 4.281

### **User information**

Low power consumption coils (2.2 W or 2.5 W) are for pressures up to 8 bar (116 psi) only. Valve actuator 23-R-012 is required. The actuator 23-R-012 is nickel plated. Make sure that the coils with the right power consumption are used.

For outdoor applications or in areas with high humidity use coil 23-SP-011-1-... or 23-SP-012-1-... (see page 5.120).

### The following options are available on request

Coils and sockets with contacts according to DIN EN 175301-803 type B (U-form). Plug sockets with molded cable.

4.262 Subject to change

# airec

### **Accessories for series**

## **MF-07**

### Modular manifolds



Manifolds will be delivered completely assembled with valves if requested.



Manifold. Available from 1 to 12 stations **RF-07/n** page 4.264



Single sub-base G 1/4 side ports RF-071 page 4.265



Single sub-base G 1/4 bottom ports **RF-072** page 4.265



Blind plate for blank valve station **RF-07-V** 



Single sub-base RF-07



End plate (pair) **RF-07-E** 



Adapter plate for external pressure **RF-07/ZE** 

Other elements: RO-070 3 O-ring for sealing between two elements

RO-071 Separation plate to feed in different pressures

RO-072 Seal between valve and manifold

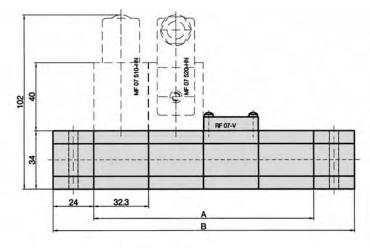
RZ-07/n Tie rods (1 pair), n = indicates the number of stations

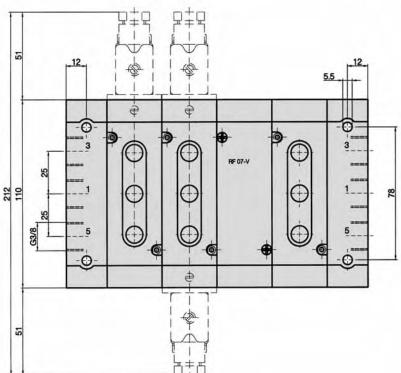
RZ-07 Tie rod extensions for one station (1 pair)



## **RF-07**







1 = pressure inlet 3, 5 = exhausts

### RF-07-V

Blind plate for blank station. Material: Al (anodized).

### RF-07/n

Sub-base suitable for valve series MF-07. The seal (RO-072) between valve and manifold is included. Material: plastic, brass, NBR.

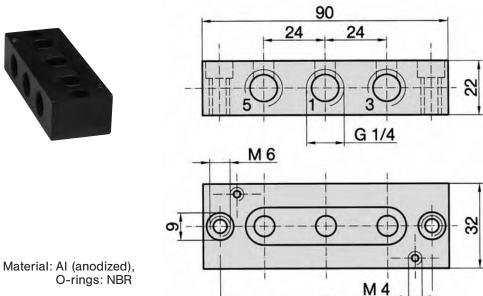
Order number	Α	В	Weight
RF-07/1	32.3	80.3	0.280 kg (0.617 lb.)
RF-07/2	64.6	112.6	0.360 kg (0.794 lb.)
RF-07/3	96.9	144.9	0.440 kg (0.970 lb.)
RF-07/4	129.2	177.2	0.520 kg (1.146 lbs.)
RF-07/5	161.5	209.5	0.600 kg (1.323 lbs.)
RF-07/6	193.8	241.8	0.680 kg (1.499 lbs.)
RF-07/7	226.1	274.1	0.760 kg (1.675 lbs.)
RF-07/8	258.4	306.4	0.840 kg (1.852 lbs.)
RF-07/9	290.7	338.7	0.920 kg (2.028 lbs.)
RF-07/10	323	371	1.000 kg (2.204 lbs.)
RF-07/11	355.3	403.3	1.080 kg (2.381 lbs.)
RF-07/12	387.6	435.6	1.160 kg (2.557 lbs.)

### **Sub-base for** electrically operated valves **Series MF-07**



### **Dimensions for single sub-base**

### RF-071

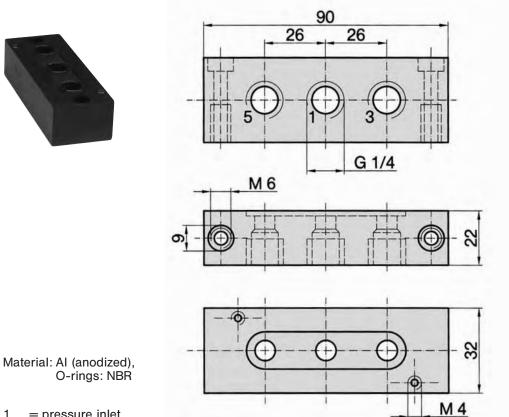


78

- = pressure inlet
- 3, 5 = exhausts

The seal (RO-072) between valve and sub-base is included.

### RF-072



- = pressure inlet
- 3, 5 = exhausts

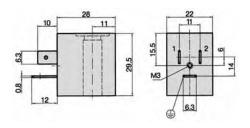
The seal (RO-072) between valve and sub-base is included.

4.265 Subject to change

## Accessories for electrically operated valves solenoid coils, size 22 mm







### Solenoid coil with pin distance of 11 mm.

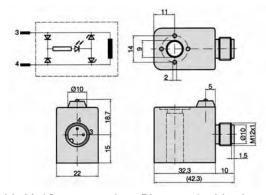
Order number	23-SP-011-411	23-SP-011-412	23-SP-011-422	23-SP-011-426	23-SP-011-427	23-SP-012-431	23-SP-012-432
Standard voltage	12 V DC	24 V DC	24 V AC	115 V AC	230 V AC	12 V DC	24 V DC
Power consumption	4.2 W		7/4 VA			2.2 W	
Degree of protection	IP 65 accor	ding to EN 6	0529 with co	nnected plug	gs and additi	onal O-rings	
Duty cycle	100 % cont	inous operat	ion				
Material	Thermoplas	Thermoplast					
Temperature range	– 20 ℃	– 20 °C + 50 °C					
Voltage tolerance	± 10 %						
Standard actuator	23-R-011 a	23-R-011 and 23-R-013 23-R-012 and 23-R-014					nd 23-R-014

Other voltages on request.

### Humidity resistant coil (Pin distance 11 mm)

Order number	23-SP-011-1-711	23-SP-011-1-712	23-SP-011-1-722		23-SP-011-1-726	23-SP-011-1-727	23-SP-012-1-732
Standard voltage	12 V DC	24 V DC	24 V AC	12 V DC	115 V AC	230 V AC	24 V DC
Power consumption	4,6 W	4,8 W	8,9/7,3 VA	8,9/7,3 VA 5,5 W			2,5 W
Degree of protection	IP 65 accor	IP 65 according to EN 60529 with connected plugs and additional O-rings					
Duty cycle	100 %	100 %					
Material	Duroplast	Duroplast					
Temperatur range	– 20 °C + 50 °C						
Voltage tolerance	± 10 %	± 10 %					





Solenoid coil, connection with M-12 sensor plug. Pins are inside the coil. LED and circuit protection are included.

Order number	23-SP-011-5-O12	23-SP-012-5-O32		
Duty cycle	100 % continous operation			
Standard voltage	24 V DC			
Power consumption	4.8 W 2.5 W			
Degree of protection	IP 65 according to EN 60529 with connected cable			
Material	Duroplast			

Other voltages on request.

<sup>\*</sup>Using the coil 23-SP-011-412 with the actuator 23-R-012 or 23-R-014 the voltage tolerance is  $\pm$  30 %.

## Accessories for electrically operated valves Plug socket connector, 11 mm pin distance



### Plug socket for solenoid coil 23-SP-011, 23-SP-012, 23-SP-011-1, 23-SP-012-1



### 28-ST-01

AIRTEC solenoid sockets (type 28-ST-01) are a standard feature of all solenoid valves equiped with coil type 23-SP-011, 23-SP-011-1, 23-SP-012 and 23-SP-012-1.

Cable- $\emptyset$ : 6 to 8 mm (0.24 to 0.31 in).

Conductor size: max. 1.5 mm<sup>2</sup> (16 gauge).

Degree of protection: IP 65 according to VDE 0470/EN 60529 with additional O-ring.

### Plug socket with LED



28-ST-04 + 28-ST-06

AIRTEC solenoid sockets type 28-ST-04 and 28-ST-06 have a green LED.

28-ST-06 has an additional integrated circuit to protect against voltage peaks.

Available with 24 V DC or 230 V AC.

Please indicate requested voltage with order.

Order number	28-ST-04-112	28-ST-04-127	28-ST-06-112	28-ST-06-127		
Standard voltage	24 V DC	230 V AC	24 V AC/DC	230 V AC		
Protective circuit	N	0	Varistor 507K30	Varistor		
Status indicator	LED green					
Pin distance		11 mm				

### Plug socket with molded cable



### 28-ST-06-K3

In addition to the features of type 28-ST-06 AIRTEC solenoid socket type 28-ST-06-K3 has a cable molded into the housing.

Length of cable: 3.0 m (9.0 ft). Other lengths on request. Cable size:  $3 \times 0.75 \text{ mm}^2$  (three 18-gauge).

Please indicate requested voltage with order. Protection = IP 65.

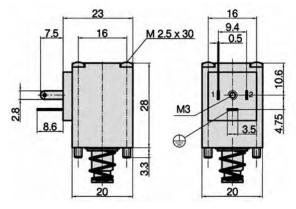
Order number	28-ST-06-K3-112	28-ST-06-K3-127		
Standard voltage	24 V AC/DC	230 V AC		
Protective circuit	Yes			
Status indicator	LED green			

### **Accessories for electrically operated valves**



### Solenoid coil 23-M-20 (Contact distance 9,4 mm)

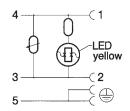


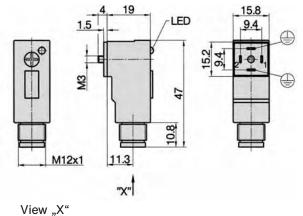


Order number	23-M-20-411	23-M-20-412	
Standard voltage	12 V DC	24 V DC	
Power consumption	2 W		
Degree of protection	IP 65 according to EN 60529 with connected plug socket		
Duty cycle	100 % continous operation		

### Plug socket 28-ST-02-2-07 (Contact distance 9,4 mm)







1 = not connected 2 = not connected

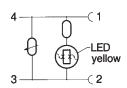
4 = 24 Volt (+)5⊕ 3 = 0 Volt (-)

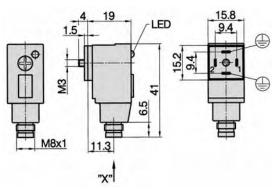
## circuit protection are included.

Plug socket 28-ST-02-2-05 (Contact distance 9,4 mm)

Plug socket with M12 connection. LED and







View "X"

1 = not connected

3 = 0 Volt (-)

4 = 24 Volt (+)

Plug socket with M8 connection. LED and circuit protection are included.

# airlec

### Accessories for electrically operated valves

### Plug socket 28-ST-02-01 (Pin distance 9.4 mm, 2 wire, PE, similar type C)



AIRTEC solenoid sockets type 28-ST-02 are a standard feature of all solenoid valves series using coil type 23-M-20.

Cable- $\emptyset$ : max. 4 - 6 mm (0.16 - 0.24 in).

Conductor size: max. is 0.75 mm<sup>2</sup> (8 gauge).

Degree of protection: IP 65 according to VDE 0470/EN 60529 with M12 gland nut +

NBR gasket to the coil side. Useable for all available coil voltages.

Temperature range: - 40 °C ... + 90 °C

### Plug socket 28-ST-09 and 28-ST-10 (Pin distance 9.4 mm, 2 wire, PE, similar type C)



AIRTEC solenoid sockets type 28-ST-09 and 28-ST-10 have a green LED. 28-ST-10 has an additional integrated circuit to protect against voltage peaks. Please indicate requested voltage with order.

Order number	28-ST-09-112	28-ST-09-127	28-ST-10-112	28-ST-10-127
Standard voltage	24 V AC/DC	230 V AC	24 V AC/DC	230 V AC

### Plug socket 28-ST-10-K3 (Contact distance 9.4 mm)



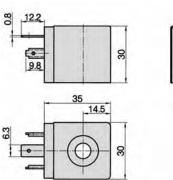
In addition to the features of type 28-ST-10 AIRTEC solenoid socket type 28-ST-10-K3 has a cable molded into the housing.

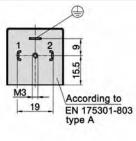
Length of cable: 3.0 m (9.0 ft). Other lengths on request. Cable size:  $3 \times 0.5 \text{ mm}^2$  (three 18-gauge). Degree of protection: IP 65 according to EN 60529. Please indicate requested voltage with order.

Order number	28-ST-10-K3-112	28-ST-10-K3-127	
Standard voltage	24 V AC/DC	230 V AC	

### Coil 23-SP-016







Order number	23-SP-016-712	23-SP-016-726	23-SP-016-727	
Standard voltage	24 V DC	115 V AC	230 V AC	
Power consumption	4.8 W	7.9/5.5 VA		
Degree of protection	IP 65 according to EN 60529 with connected plug socket			
Duty cycle	100 % continous operation			

### Plug socket 28-ST-03 (2 wire, PE, crumped pins, EN 175301-803 type A)



The plug socket 28-ST-03 is a standard feature of all solenoid valves with coil 23-SP-016.

Cable- $\phi$ : 6 to 8 mm (0.24 to 0.31 in).

Useable for all available coil voltages.

Conductor size: max. 1.5 mm<sup>2</sup>.

Degree of protection: IP 65 according to VDE 0470/EN 60529 with PG9/M16 gland nut + NBR gasket to the coil side.

## Accessories for electrically operated valves serie BM-01 and BM-02



### Solenoid coil 23-M-09-19 (Contact distance 8 mm)



Solenoid pins at the same side as the manual override (HN).



Solenoid pins at the opposite side as the manual override (HN).

The connection patten of the pins is according to EN 175301-803 form C. Duty cycle 100 %.

Order number	Standard voltage	Power consumption	Manual override (HN)	Position contact pins
23-M-09-19-461-T	12 V DC	1 W	Non detented	same side as HN
23-M-09-19-431-T				opposite side as HN
23-M-09-19-461-R			Detented	same side as HN
23-M-09-19-431-R				opposite side as HN
23-M-09-19-462-T		1 W	Non detented	same side as HN
23-M-09-19-432-T	24 V DC			opposite side as HN
23-M-09-19-462-R	24 V DC		Detented	same side as HN
23-M-09-19-432-R				opposite side as HN
23-M-09-19-452-T		3 VA	Non detented	same side as HN
23-M-09-19-422-T	24 V AC			opposite side as HN
23-M-09-19-452-R	24 V AC		Detented	same side as HN
23-M-09-19-422-R				opposite side as HN
23-M-09-19-456-T		3 VA	Non detented	same side as HN
23-M-09-19-426-T	115 V AC			opposite side as HN
23-M-09-19-456-R	115 V AC		Detented	same side as HN
23-M-09-19-426-R				opposite side as HN
23-M-09-19-457-T	230 V AC	3 VA -	Non detented	same side as HN
23-M-09-19-427-T				opposite side as HN
23-M-09-19-457-R			Detented	same side as HN
23-M-09-19-427-R				opposite side as HN

### Plug socket 28-ST-02-1 (Pin distance 8 mm)



AIRTEC solenoid sockets with seal type 28-ST-02-1 are a standard feature of all solenoid valves series using coil type 23-M-09-19-...

Cable-Ø: max. 6.5 mm (0.26 in).

Conductor size: max. is 0.75 mm<sup>2</sup> (8 gauge).

Degree of protection: IP 65 according to VDE 0470/EN 60529.

Useable for all available coil voltages.

### Plug socket 28-ST-09 and 28-ST-10 (Contact distance 8 mm)



AIRTEC solenoid sockets type 28-ST-09-1 and 28-ST-10-1 have a green LED. 28-ST-10-1 has an additional integrated circuit to protect against voltage peaks. Please indicate requested voltage with order.

Order number	28-ST-09-1-112	28-ST-09-1-127	28-ST-10-1-112	28-ST-10-1-127
Standard voltage	24 V AC/DC	230 V AC	24 V AC/DC	230 V AC

4.284 Subject to change