

INDUSTRIAL PNEUMATICS - valves

Ball valves



Mini ball valve 6560 type

Body material: Nickel-plated brass
Ball material: Chromium-plated brass
Ball seal: PTFE
Spindle seal: NBR
Working temp.: From -20°C up to +80°C

General purpose valve designed for industrial installations. Widely used for air, gases, water, chemicals, petro-chemical products.

code	hose O.D. [mm]	flow diameter [mm]	length [mm]	working pressure [bar]
AI-6560-04	4	3	44	20
AI-6560-06	6	5	48	20
AI-6560-08	8	5.5	48	20
AI-6560-10	10	8	58.5	20
AI-6560-12	12	10	66	20



Mini ball valve HVFF type

Body material: Plastic
Spindle seal: NBR
Working temp.: From -20°C up to +80°C

A valve intended for pneumatic installations. When power supply is shut off, the system is vented through the holes in the handle to enable maintenance and repairs.

code	hose O.D. [mm]	height [mm]	length [mm]	working pressure [bar]
SH-HVFF-06	6	40.5	52.4	10
SH-HVFF-08	8	40.5	55	10
SH-HVFF-10	10	41	62	10
SH-HVFF-12	12	41	68.4	10

Distribution valves

Distribution valves control flow direction of compressed air to enable connection or separation of air streams. Most often distribution valves play a role of simple controllers for regulating units in a pneumatic system. They are used to start and stop e.g. a pneumatic actuator either one or two-directionally, depending on the valve type. Separation and switching of streams are performed by cooperation of movable and fixed mechanical parts of the valve.

According to the type of actuation, the valves are divided into:

- manual,
- mechanical,
- electric,
- pneumatic.

In pneumatic systems, distribution valves are located between basic pneumatic units and elements, to which they are connected with hose assemblies or mounting panels. Every change of the position of a control element allows to obtain different combinations of connection between different units of the pneumatic system. The distribution valve can connect the compressed air outlet with one working chamber of the pneumatic system, simultaneously the other chamber to the atmosphere, to cause movement of the actuator in a specific direction (fig. 1a). If the actuator is to move in the opposite direction, the connections need to be reversed. It is achieved by changing the position of the valve control element (fig. 1b). It is also possible to stop the actuator by disconnection of the compressed air and atmosphere chambers of the actuator (fig. 1c). Thus the distribution valves can start, stop and reverse the operation of the actuator.

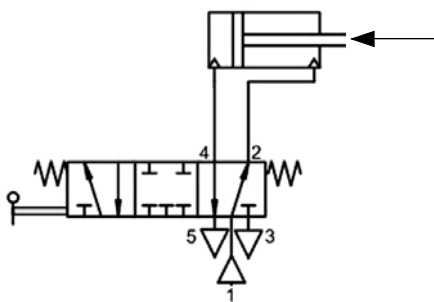


fig. 1a

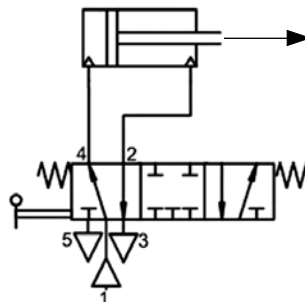


fig. 1b

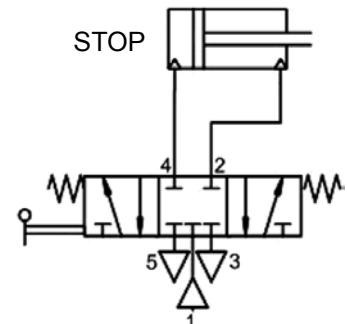
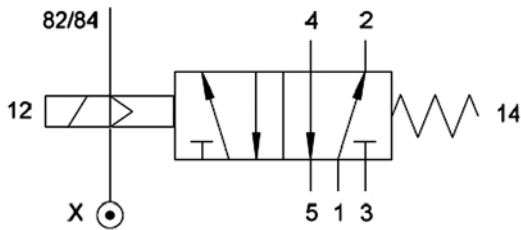


fig. 1c

The distribution valves are pictured using graphic symbols in the form of a set of adjacent equal squares. The number of squares corresponds to the number of modes of the distribution valve control unit. The number of connection ports drawn next to one of the squares indicates the number of paths in the valve. These connections are drawn outside of that particular square which corresponds to normal (initial) position of the valve. The lines drawn inside the squares show paths between connections for the corresponding position of the valve control element, the arrows show the direction of air flow. A cut-off of the flow to a particular connection port is depicted by transverse lines whereas connections of paths inside the valve are signified by dots at the intersection of those lines. Air outlet to the atmosphere is marked by empty triangle whose vertex indicates the direction of the outlet flow. In the case of direct outlet flow into the atmosphere the triangle is drawn next to the valve symbol. In the case of outlet flow to the atmosphere through the connection port which allows connection of a hose assembly, a triangle is drawn away from the valve symbol. Symbols indicating the external type of control are added to the distribution valve symbol perpendicular to the direction of connection port. The power supply of the valve as well as the outlet flow to the atmosphere is signified by an empty triangle placed away from the distribution valve symbol in the way that the vertex faces the valve. The complete valve symbol should also include designation of all the connection ports that are built into the valve. A designation system is defined by ISO 5599/3 standard. According to the standard, the connection ports are labelled by digits. The port designations according to ISO 5599/3 standard are described further in the catalogue.

INDUSTRIAL PNEUMATICS - valves

Distribution valves



- 1 - supply connection port,
- 2, 4 - working or outlet connection ports,
- 3, 5 - outlet to the atmosphere (venting connection ports),
- 12, 14 - control connection ports,
- 82, 84 - venting connection ports of supporting valves,
- X - pilots external supply

fig. 2. Types and markings of connection ports in control valves.

Classification of basic valves:

According to the number of ways (equal to the number of connection ports):

- 2-way,
- 3-way,
- 5-way.

According to the number of positions (number of adjacent squares on a valve symbol):

- 2-position,
- 3-position.

Note: Please remember that only one valve position can be active at the time.

Functional valve symbols	
Valve 2/2 NC (2-way / 2-position, normally closed)	
Valve 2/2 NO (2-way / 2-position, normally open)	
Valve 3/2 NC (3-way / 2-position, normally closed)	
Valve 3/2 NO (3-way / 2-position, normally open)	
Valve 5/2 (5-way / 2-position)	
Valve 5/3 CC (5-way / 3-position, shut-off in the middle position)	
Valve 5/3 OC (5-way / 3-position, deaerated in middle position)	
Valve 5/3 PC (5-way / 3-position, aerated in middle position)	
Mechanical plunger control	
Mechanical roller cam control	
Mechanical bent roller cam control	
Manual button control	
Manual lever control	
Manual foot-operated control	
Direct electric control	
Pneumatic control	
Indirect electric control with inside pneumatic support	
Cancelling spring (this symbol always occurs in monostable controlled valves)	

INDUSTRIAL PNEUMATICS - valves

Series 70 - manual control



MAV distribution valve - 90° lever

Type: 3/2, 5/2, 5/3
Size: 1/8", 1/4", 1/2"
Working press.: Up to 10 bar
Working temp.: From -10°C up to +60°C
Connection: 1/8", 1/4", 1/2" BSP thread
Flow rate: 550 l/min - 1/8"
 1100 l/min - 1/4"
 4600 l/min - 1/2"
 (input pressure 6 bar and $\Delta p = 1$ bar)

Material: Valve body made of aluminium, spool of nickel-plated aluminium, seal of NBR and cover of Hostaform®.
Description: General purpose manual control distribution valves used mostly to control work of actuators. Can be mounted in line, on the wall, directly to actuators or on manifold base.

MAV	2	3	LE	S	NC
series	size	function	controlling (14)	return (12)	further details
MAV - manual valve	2 - 1/8" 3 - 1/4" 4 - 1/2"	3 - 3/2 5 - 5/2 6 - 5/3	PP - drawer VL - lever LE - lever 90° BRE - pilot-assisted plunger for panel actuators	S - mechanical spring B - bi-stable O - stable for 5/3 D - differential A - pneumatic / mechanical spring	NC - normally closed NO - normally opened OO - 3/2 bi-stable or 5/2 CC - closed outlets OC - deaerated outlets PC - aerated outlets

1/8"		1/4"		1/2"		function and symbol	
code	type	code	type	code	type		
MW-7010000100	MAV 23 LES NC	MW-7020000100	MAV 33 LES NC	MW-7030000100	MAV 43 LES NC	3/2	
MW-7010000200	MAV 23 LEB OO	MW-7020000200	MAV 33 LEB OO	MW-7030000200	MAV 43 LEB OO		
MW-7010000300	MAV 25 LES OO	MW-7020000300	MAV 35 LES OO	MW-7030000300	MAV 45 LES OO	5/2	
MW-7010000400	MAV 25 LEB OO	MW-7020000400	MAV 35 LEB OO	MW-7030000400	MAV 45 LEB OO		
MW-7010000500	MAV 26 LEO CC	MW-7020000500	MAV 36 LEO CC	MW-7030000500	MAV 46 LEO CC	5/3	
MW-7010000600	MAV 26 LEO OC	MW-7020000600	MAV 36 LEO OC	MW-7030000600	MAV 46 LEO OC		
MW-7010000700	MAV 26 LEO PC	MW-7020000700	MAV 36 LEO PC	MW-7030000700	MAV 46 LEO PC		
MW-7010000900	MAV 26 LES OC	MW-7020000900	MAV 36 LES OC	MW-7030000900	MAV 46 LES OC		
MW-7010001000	MAV 26 LES CC	MW-7020001000	MAV 36 LES CC	MW-7030001000	MAV 46 LES CC		
MW-7010001100	MAV 26 LES PC	MW-7020001100	MAV 36 LES PC	MW-7030001100	MAV 46 LES PC		

INDUSTRIAL PNEUMATICS - valves

Series 70 - manual control



MAV distribution valve - front lever

Type: 3/2, 5/2, 5/3
Size: 1/8", 1/4"
Working press.: Up to 10 bar
Working temp.: From -10°C up to +60°C
Connection: 1/8", 1/4" BSP thread
Flow rate: 550 l/min - 1/8"
 1100 l/min - 1/4"
 (input pressure 6 bar and $\Delta p = 1$ bar)

Material: Valve body made of aluminium, spool of nickel-plated aluminium, seal of NBR and cover of Hostaform®.
Description: General purpose manual distribution valves used mostly to control work of actuators. Can be mounted in line, on the wall, directly to actuators or on manifold base.

MAV	2	3	VL	B	NC
series	size	function	controlling (14)	return (12)	further details
MAV - manual valve	2 - 1/8" 3 - 1/4"	3 - 3/2 5 - 5/2 6 - 5/3 8 - 2x3/2	PP - drawer VL - lever LE - lever 90° BRE - pilot-assisted plunger for panel actuators	S - mechanical spring B - bi-stable O - stable for 5/3 D - differential A - pneumatic / mechanical spring	NC - normally closed NO - normally opened OO - 3/2 bi-stable or 5/2 CC - closed outlets OC - deaerated outlets PC - aerated outlets

1/8"		1/4"		1/2"		function and symbol	
code	type	code	type	code	type		
MW-7010001400	MAV 23 VLB OO	MW-7020001400	MAV 33 VLB OO	-	-	3/2	
MW-7010001700	MAV 25 VLB OO	MW-7020001700	MAV 35 VLB OO	-	-	5/2	
MW-7010001150	MAV 28 VLO OC	-	-	-	-	2x3/2	
MW-7010001160	MAV 28 VLS OC	-	-	-	-		

INDUSTRIAL PNEUMATICS - valves

Series 70 - solenoid control



SOV distribution valve - solenoid

Type: 3/2, 5/2, 5/3
Size: 1/8", 1/4", 1/2"
Working press.: Up to 10 bar
Working temp.: From -10°C up to +60°C
Connection: 1/8", 1/4", 1/2" BSP thread
Voltage: 12 V / 24 V / 110 V / 220 V
Flow rate: 550 l/min - 1/8"
 1100 l/min - 1/4"
 4600 l/min - 1/2"
 (input pressure 6 bar and $\Delta p = 1$ bar)

Material: Valve body made of aluminium, spool of nickel-plated aluminium, seal of NBR and cover of Hostaform®.
Description: General purpose valves with electric control (solenoid valves), used mostly to control actuators. Can be mounted in line, to the wall, directly to actuators or on manifold base.

SOV	2	3	SO	S	NC
series	size	function	controlling(14)	return (12)	further details
SOV - solenoid valve	2 - 1/8" 3 - 1/4" 4 - 1/2"	3 - 3/2 5 - 5/2 6 - 5/3	SO - solenoid SE - solenoid assisted	S - mechanical springs B - bi-stable D - differential P - pneumatic A - pneumatic / mechanical spring	NC - normally closed NO - normally opened OO - 3/2 bi-stable or 5/2 CC - closed outlets OC - deaerated outlets PC - aerated outlets

1/8"		1/4"		1/2"		function and symbol
code	type	code	type	code	type	
MW-7010020100	SOV 23 SOB OO	MW-7020020100	SOV 33 SOB OO	MW-7030020100	SOV 43 SOB OO	3/2
MW-7010020200	SOV 23 SOS NC	MW-7020020200	SOV 33 SOS NC	MW-7030020200	SOV 43 SOS NC	
MW-7010020300	SOV 23 SEB OO	MW-7020020300	SOV 33 SEB OO	MW-7030020300	SOV 43 SEB OO	
MW-7010020400	SOV 23 SOS NO	MW-7020020400	SOV 33 SOS NO	MW-7030020400	SOV 43 SOS NO	
MW-7010020500	SOV 23 SES NC	MW-7020020500	SOV 33 SES NC	MW-7030020500	SOV 43 SES NC	
MW-7010021100	SOV 25 SOS OO	MW-7020021100	SOV 35 SOS OO	MW-7030021100	SOV 45 SOS OO	5/2
MW-7010021200	SOV 25 SOB OO	MW-7020021200	SOV 35 SOB OO	MW-7030021200	SOV 45 SOB OO	
MW-7010021300	SOV 25 SOD OO	MW-7020021300	SOV 35 SOD OO	MW-7030021300	SOV 45 SOD OO	
MW-7010021500	SOV 25 SES OO	MW-7020021500	SOV 35 SES OO	MW-7030021500	SOV 45 SES OO	
MW-7010021600	SOV 25 SEB OO	MW-7020021600	SOV 35 SEB OO	MW-7030021600	SOV 45 SEB OO	
MW-7010022100	SOV 26 SOS CC	MW-7020022100	SOV 36 SOS CC	MW-7030022100	SOV 46 SOS CC	5/3
MW-7010022200	SOV 26 SOS OC	MW-7020022200	SOV 36 SOS OC	MW-7030022200	SOV 46 SOS OC	
MW-7010022300	SOV 26 SOS PC	MW-7020022300	SOV 36 SOS PC	MW-7030022300	SOV 46 SOS PC	
MW-7010022400	SOV 26 SES CC	MW-7020022400	SOV 36 SES CC	MW-7030022400	SOV 46 SES CC	
MW-7010022500	SOV 26 SES OC	MW-7020022500	SOV 36 SES OC	MW-7030022500	SOV 46 SES OC	
MW-7010022600	SOV 26 SES PC	MW-7020022600	SOV 36 SES PC	MW-7030022600	SOV 46 SES PC	

INDUSTRIAL PNEUMATICS - valves

Series 70 - solenoid control - accessories

Coils for series 70 valves of 1/8" and 1/4" size

code	type	nominal voltage	power	
			starting	continuous work
MW-W0215000151	22 Ø 8 BA 2 VA, 12 V DC	12 V DC	2 VA	2 VA
MW-W0215000101	22 Ø 8 BA 2 VA, 24 V DC	24 V DC	2 VA	2 VA
MW-W0215000111	22 Ø 8 BA 3 VA, 24 V AC	24 V, 50/60 Hz	4 VA	3 VA
MW-W0215000121	22 Ø 8 BA 3 VA, 110 V AC	110 V, 50/60 Hz	4 VA	3 VA
MW-W0215000131	22 Ø 8 BA 3 VA, 220 V AC	220 V, 50/60 Hz	4 VA	3 VA

Coils for series 70 valves of 1/8" and 1/2" size

code	type	nominal voltage	power	
			starting	continuous work
MW-W0215000051	22 Ø 8 5 VA, 12 V DC	12 V DC	5 VA	5 VA
MW-W0215000001	22 Ø 8 5 VA, 24 V DC	24 V DC	5 VA	5 VA
MW-W0215000011	22 Ø 8 5 VA, 24 V AC	24 V, 50/60 Hz	8 VA	5 VA
MW-W0215000021	22 Ø 8 5 VA, 110 V AC	110 V, 50/60 Hz	8 VA	5 VA
MW-W0215000031	22 Ø 8 5 VA, 220 V AC	220 V, 50/60 Hz	8 VA	5 VA

Electric plug 22 mm

code	type	Ø cable	colour
MW-W0970510011	standard	PG9	black
MW-W0970510012	LED 24 V	PG9	transparent
MW-W0970510013	LED 110 V	PG9	transparent
MW-W0970510014	LED 220 V	PG9	transparent
MW-W0970510015	LED + VDR 24 V	PG9	transparent
MW-W0970510016	LED + VDR 110 V	PG9	transparent
MW-W0970510017	LED + VDR 220 V	PG9	transparent

VDR - circuit protection.

INDUSTRIAL PNEUMATICS - valves

Series 70 - pneumatic control



Distribution valves PNV

Type: 3/2, 5/2, 5/3
Size: 1/8", 1/4", 1/2"
Working press.: Up to 10 bar
Min. press. control: 2.5 bar (monostable)
 1 bar (bistable)
Working temp.: From -10°C up to +60°C
Connection: 1/8", 1/4", 1/2" BSP female thread
Flow rate: 550 l/min - 1/8"
 1100 l/min - 1/4"
 4600 l/min - 1/2"
 (input pressure 6 bar and $\Delta p = 1$ bar)

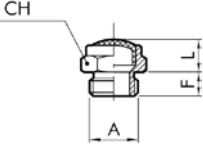
Material: Valve body made of aluminium, spool of nickel-plated aluminium, seal of NBR and cover of Hostaform®.
Description: General purpose pneumatic distribution valves most often used to control actuators. Can be mounted in line, on the wall, directly to actuators or on manifold base.

PNV	2	3	PN	S	NC
series	size	function	controlling (14)	return (12)	further details
PNV - pneumatic valve	2 - 1/8" 3 - 1/4" 4 - 1/2"	3 - 3/2 5 - 5/2 6 - 5/3	PN- pneumatic	S - mechanical spring B - bi-stable D - differential O - stable for 5/3 A - pneumatic / mechanical spring	NC - normally closed NO - normally opened OO - 3/2 bi-stable or 5/2 CC - closed outlets OC - deaerated outlets PC - aerated outlets

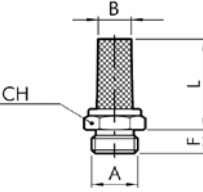
1/8"		1/4"		1/2"		function and symbol	
code	type	code	type	code	type		
MW-7010010100	PNV 23 PNB OO	MW-7020010100	PNV 33 PNB OO	MW-7030010100	PNV 43 PNB OO	3/2	
MW-7010010200	PNV 23 PNS NC	MW-7020010200	PNV 33 PNS NC	MW-7030010200	PNV 43 PNS NC		
MW-7010010400	PNV 23 PNS NO	MW-7020010400	PNV 33 PNS NO	MW-7030010400	PNV 43 PNS NO		
MW-7010011100	PNV 25 PNS OO	MW-7020011100	PNV 35 PNS OO	MW-7030011100	PNV 45 PNS OO	5/2	
MW-7010011200	PNV 25 PNB OO	MW-7020011200	PNV 35 PNB OO	MW-7030011200	PNV 45 PNB OO		
MW-7010011300	PNV 25 PND OO	MW-7020011300	PNV 35 PND OO	MW-7030011300	PNV 45 PND OO		
MW-7010012100	PNV 26 PNS CC	MW-7020012100	PNV 36 PNS CC	MW-7030012100	PNV 46 PNS CC	5/3	
MW-7010012200	PNV 26 PNS OC	MW-7020012200	PNV 36 PNS OC	MW-7030012200	PNV 46 PNS OC		
MW-7010012300	PNV 26 PNS PC	MW-7020012300	PNV 36 PNS PC	MW-7030012300	PNV 46 PNS PC		

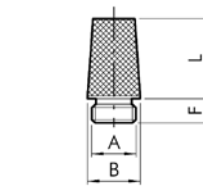
INDUSTRIAL PNEUMATICS - valves

Accessories - silencers

	code	A	F	L	CH	description MW SFE silencer. Material: nickel-plated brass, stainless steel wire. Working press.: up to 12 bar. Working temp.: from -10°C up to +80°C.
	MW-W0970530051	M5	3.7	4.7	8	
	MW-W0970530052	1/8"	6.2	8.2	13	
	MW-W0970530053	1/4"	7.7	11.3	16	
	MW-W0970530054	3/8"	8	11.5	19	
	MW-W0970530055	1/2"	10.3	13	24	
	MW-W0970530056	3/4"	10	15	30	
	MW-W0970530057	1"	12	18	36	

	code	A	B	F	L	CH	description MW SCQ silencer for booster. Material: nickel-plated brass, sintered nickel-plated bronze. Working press.: up to 12 bar. Working temp.: from -10°C up to +80°C.
	MW-W0970530012	1/8"	12	6	15	7	
	MW-W0970530013	1/4"	15	7.5	19	8	
	MW-W0970530014	3/8"	19	8.5	29.2	10	
	MW-W0970530015	1/2"	23	9	31.5	14	
	MW-W0970530016	3/4"	29	10	41.5	17	
	MW-W0970530017	1"	36	12	51.2	23	

	code	A	B	F	L	CH	description MW SE silencer. Material: nickel-plated brass, sintered nickel-plated bronze. Working press.: up to 12 bar. Working temp.: from -10°C up to +80°C.
	MW-W0970530021	M5	4	4	13	8	
	MW-W0970530020	M7	5	5	21	10	
	MW-W0970530022	1/8"	7	6	21	13	
	MW-W0970530023	1/4"	8.5	8	23.5	16	
	MW-W0970530024	3/8"	11	8	33	19	
	MW-W0970530025	1/2"	15	10	37	24	
	MW-W0970530026	3/4"	21.5	10	43.5	30	
	MW-W0970530027	1"	27	11.5	56	36	

	code	A	B	F	L	CH	description MW SC silencer. Material: nickel-plated brass, sintered nickel-plated bronze. Working press.: up to 12 bar. Working temp.: from -10°C up to +80°C.
	MW-W0970530001	M5	6	4.5	10		
	MW-W0970530002	1/8"	12	6	15		
	MW-W0970530003	1/4"	15	6.7	19		
	MW-W0970530004	3/8"	19	8.5	28.5		
	MW-W0970530005	1/2"	23	8.7	33		
	MW-W0970530006	3/4"	29	11	40.5		
	MW-W0970530007	1"	36	11.5	50.5		

Throttle and throttle check valves

Throttle and throttle check valves are used in pneumatic systems to control the flow rate of compressed air stream and its direction.

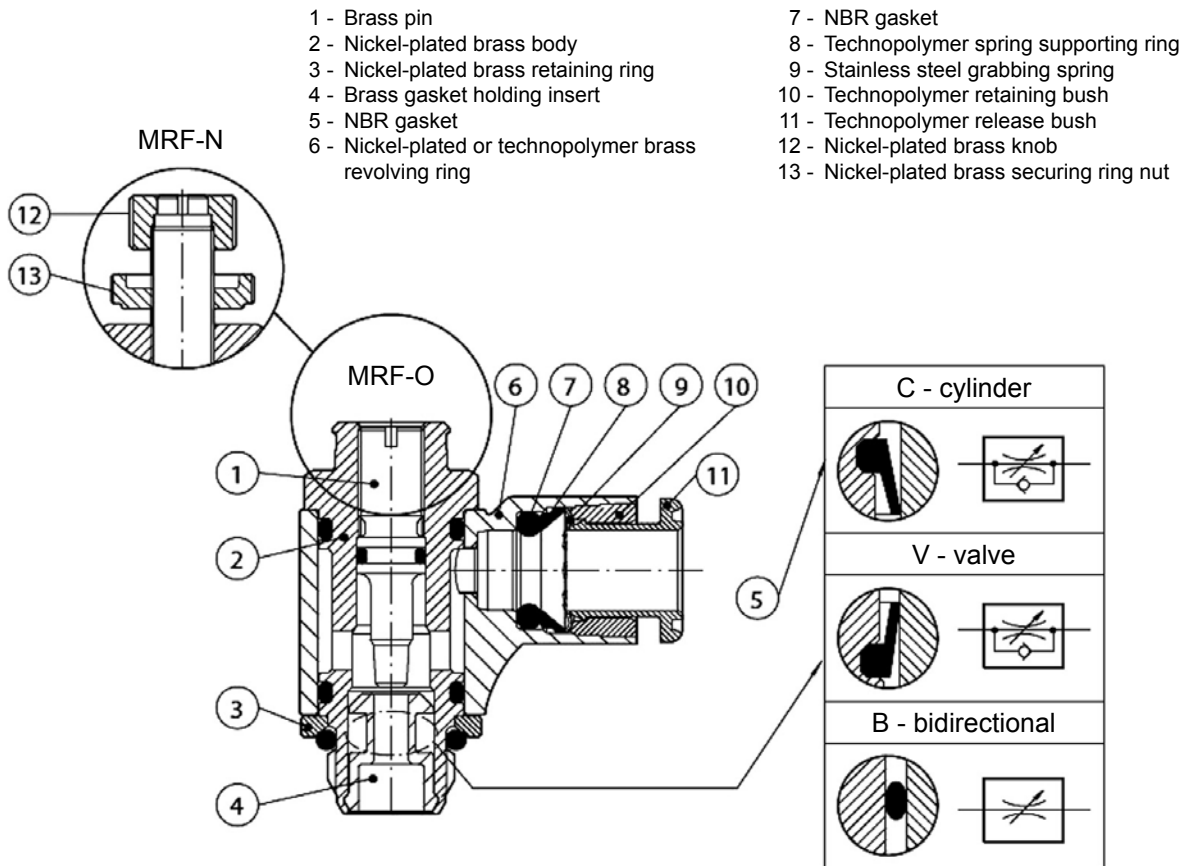


Valves MRF-N, MRF-O type

- Size:** M5, 1/8", 1/4", 3/8", 1/2"
- Working press.:** Up to 10 bar
- Working temp.:** From -10°C up to +50°C (plastic)
From -10°C up to +70°C (brass)
- Adjustment:** Manual or with screwdriver

MRF valves are designed for continuous speed control of pneumatic actuators. Throttle check valves can be mounted directly in the connection port of an actuator (letter C at the end of the code) or distribution valve (letter V at the end of the code). In both cases, the seal ensures a full flow rate during supply and flow rate control during deaeration. Throttle valves (letter B at the end of the code) can be used for the control of the flow rate in both directions - during aeration and deaeration.

Construction of throttle and throttle check valves MRF-N and MRF-O



INDUSTRIAL PNEUMATICS - valves

Throttle and throttle check valves

MRF	N	M	C	4	M5
element	type	body	function	plug connection	thread connection
MRF - valve	N - with knob and ring nut O - flash pin	M - nickel-plated brass T - technopolymer	C - for cylinder V - for valve B - bidirectional	4 - \varnothing 4 5 - \varnothing 5 6 - \varnothing 6 8 - \varnothing 8 10 - \varnothing 10 12 - \varnothing 12	M5 - M5 1/8 - G 1/8" 1/4 - G 1/4" 3/8 - G 3/8" 1/2 - G 1/2"

connection / hose I.D.		MRF COMPACT "O"				MRF COMPACT "N"			
		brass		technopolymer		brass		technopolymer	
		code	type	code	type	code	type	code	type
M5	4	MW-9001001C	MRF O M C 4 M5	MW-9011001C	MRF O T C 4 M5	MW-9031001C	MRF N M C 4 M5	MW-9021001C	MRF N T C 4 M5
		MW-9001110V	MRF O M V 4 M5	MW-9011110V	MRF O T V 4 M5	MW-9031101V	MRF N M V 4 M5	MW-9021101V	MRF N T V 4 M5
		MW-9001601B	MRF O M B 4 M5	MW-9011601B	MRF O T B 4 M5	MW-9031201B	MRF N M B 4 M5	MW-9021201B	MRF N T B 4 M5
	5	MW-9001002C	MRF O M C 5 M5	-	-	MW-9031003C	MRF N M C 5 M5	-	-
		MW-9001113V	MRF O M V 5 M5	-	-	MW-9031103V	MRF N M V 5 M5	-	-
		MW-9001603B	MRF O M B 5 M5	-	-	MW-9031203B	MRF N M B 5 M5	-	-
	6	MW-9001007C	MRF O M C 6 M5	MW-9011007C	MRF O T C 6 M5	MW-9031005C	MRF N M C 6 M5	MW-9021005C	MRF N T C 6 M5
		MW-9001105V	MRF O M V 6 M5	MW-9011105V	MRF O T V 6 M5	MW-9031105V	MRF N M V 6 M5	MW-9021105V	MRF N T V 6 M5
		MW-9001612B	MRF O M B 6 M5	MW-9011612B	MRF O T B 6 M5	MW-9031205B	MRF N M B 6 M5	MW-9021205B	MRF N T B 6 M5
1/8"	4	MW-9001011C	MRF O M C 4 1/8	MW-9011011C	MRF O T C 4 1/8	MW-9031002C	MRF N M C 4 1/8	MW-9021002C	MRF N T C 4 1/8
		MW-9001111V	MRF O M V 4 1/8	MW-9011111V	MRF O T V 4 1/8	MW-9031102V	MRF N M V 4 1/8	MW-9021102V	MRF N T V 4 1/8
		MW-9001602B	MRF O M B 4 1/8	MW-9011602B	MRF O T B 4 1/8	MW-9031202B	MRF N M B 4 1/8	MW-9021202B	MRF N T B 4 1/8
	5	MW-9001012C	MRF O M C 5 1/8	-	-	MW-9031004C	MRF N M C 5 1/8	-	-
		MW-9001112V	MRF O M V 5 1/8	-	-	MW-9031104V	MRF N M V 5 1/8	-	-
		MW-9001604B	MRF O M B 5 1/8	-	-	MW-9031204B	MRF N M B 5 1/8	-	-
	6	MW-9001003C	MRF O M C 6 1/8	MW-9011003C	MRF O T C 6 1/8	MW-9031006C	MRF N M C 6 1/8	MW-9021006C	MRF N T C 6 1/8
		MW-9001101V	MRF O M V 6 1/8	MW-9011101V	MRF O T V 6 1/8	MW-9031106V	MRF N M V 6 1/8	MW-9021106V	MRF N T V 6 1/8
		MW-9001605B	MRF O M B 6 1/8	MW-9011605B	MRF O T B 6 1/8	MW-9031206B	MRF N M B 6 1/8	MW-9021206B	MRF N T B 6 1/8
	8	MW-9001005C	MRF O M C 8 1/8	MW-9011005C	MRF O T C 8 1/8	MW-9031008C	MRF N M C 8 1/8	MW-9021008C	MRF N T C 8 1/8
		MW-9001103V	MRF O M V 8 1/8	MW-9011103V	MRF O T V 8 1/8	MW-9031108V	MRF N M V 8 1/8	MW-9021108V	MRF N T V 8 1/8
		MW-9001607B	MRF O M B 8 1/8	MW-9011607B	MRF O T B 8 1/8	MW-9031208B	MRF N M B 8 1/8	MW-9021208B	MRF N T B 8 1/8
1/4"	6	MW-9001004C	MRF O M C 6 1/4	MW-9011004C	MRF O T C 6 1/4	MW-9031007C	MRF N M C 6 1/4	MW-9021007C	MRF N T C 6 1/4
		MW-9001102V	MRF O M V 6 1/4	MW-9011102V	MRF O T V 6 1/4	MW-9031107V	MRF N M V 6 1/4	MW-9021107V	MRF N T V 6 1/4
		MW-9001606B	MRF O M B 6 1/4	MW-9011606B	MRF O T B 6 1/4	MW-9031207B	MRF N M B 6 1/4	MW-9021207B	MRF N T B 6 1/4
	8	MW-9001006C	MRF O M C 8 1/4	MW-9011006C	MRF O T C 8 1/4	MW-9031009C	MRF N M C 8 1/4	MW-9021009C	MRF N T C 8 1/4
		MW-9001104V	MRF O M V 8 1/4	MW-9011104V	MRF O T V 8 1/4	MW-9031109V	MRF N M V 8 1/4	MW-9021109V	MRF N T V 8 1/4
		MW-9001608B	MRF O M B 8 1/4	MW-9011608B	MRF O T B 8 1/4	MW-9031209B	MRF N M B 8 1/4	MW-9021209B	MRF N T B 8 1/4
	10	MW-9001008C	MRF O M C 10 1/4	MW-9011008C	MRF O T C 10 1/4	MW-9031011C	MRF N M C 10 1/4	MW-9021011C	MRF N T C 10 1/4
		MW-9001106V	MRF O M V 10 1/4	MW-9011106V	MRF O T V 10 1/4	MW-9031111V	MRF N M V 10 1/4	MW-9021111V	MRF N T V 10 1/4
		MW-9001609B	MRF O M B 10 1/4	MW-9011609B	MRF O T B 10 1/4	MW-9031211B	MRF N M B 10 1/4	MW-9021211B	MRF N T B 10 1/4
	12	MW-9001014C	MRF O M C 12 1/4	MW-9011014C	MRF O T C 12 1/4	MW-9031014C	MRF N M C 12 1/4	MW-9021014C	MRF N T C 12 1/4
		MW-9001123V	MRF O M V 12 1/4	MW-9011123V	MRF O T V 12 1/4	MW-9031114V	MRF N M V 12 1/4	MW-9021114V	MRF N T V 12 1/4
		MW-9001623B	MRF O M B 12 1/4	MW-9011623B	MRF O T B 12 1/4	MW-9031214B	MRF N M B 12 1/4	MW-9021214B	MRF N T B 12 1/4
3/8"	10	MW-9001009C	MRF O M C 10 3/8	MW-9011009C	MRF O T C 10 3/8	MW-9031012C	MRF N M C 10 3/8	MW-9021012C	MRF N T C 10 3/8
		MW-9001114V	MRF O M V 10 3/8	MW-9011114V	MRF O T V 10 3/8	MW-9031112V	MRF N M V 10 3/8	MW-9021112V	MRF N T V 10 3/8
		MW-9001610B	MRF O M B 10 3/8	MW-9011610B	MRF O T B 10 3/8	MW-9031212B	MRF N M B 10 3/8	MW-9021212B	MRF N T B 10 3/8
	12	MW-9001015C	MRF O M C 12 3/8	MW-9011015C	MRF O T C 12 3/8	MW-9031015C	MRF N M C 12 3/8	MW-9021015C	MRF N T C 12 3/8
		MW-9001124V	MRF O M V 12 3/8	MW-9011124V	MRF O T V 12 3/8	MW-9031115V	MRF N M V 12 3/8	MW-9021115V	MRF N T V 12 3/8
1/2"	12	MW-9001624B	MRF O M B 12 3/8	MW-9011624B	MRF O T B 12 3/8	MW-9031215B	MRF N M B 12 3/8	MW-9021215B	MRF N T B 12 3/8
		MW-9001016C	MRF O M C 12 1/2	MW-9011016C	MRF O T C 12 1/2	MW-9031016C	MRF N M C 12 1/2	MW-9021016C	MRF N T C 12 1/2
		MW-9001125V	MRF O M V 12 1/2	MW-9011125V	MRF O T V 12 1/2	MW-9031116V	MRF N M V 12 1/2	MW-9021116V	MRF N T V 12 1/2
		MW-9001625B	MRF O M B 12 1/2	MW-9011625B	MRF O T B 12 1/2	MW-9031216B	MRF N M B 12 1/2	MW-9021216B	MRF N T B 12 1/2

INDUSTRIAL PNEUMATICS - valves



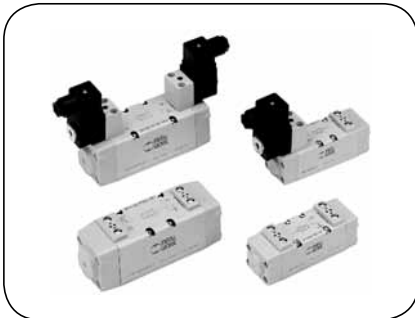
Minivalves - VME 1 series

- Type: 3/2, NC, NO, monostable
- Version: valves with fittings
- Control: mechanical or manual
- Nominal flow rate (at 6 bar $\Delta p = 1$ bar): 60 l/min
- Connection: push-in fittings $\varnothing 4$
- Low actuation force: 8 N
- Working pressure range: 2 + 10 bar
- Working temperature range: -10°C up to +60°C
- Operation with unlubricated compressed air also possible



Pedal operated valves - PEV series

- Type: 5/2, mono and bi-stable
- Version: valves with fittings
- Control: pedal operated
- Nominal flow rate (at 6 bar $\Delta p = 1$ bar): 650 l/min
- Connection: G 1/4"
- Working pressure range: 2 + 10 bar
- Working temperature range: -10°C up to +60°C
- Operation with unlubricated compressed air also possible



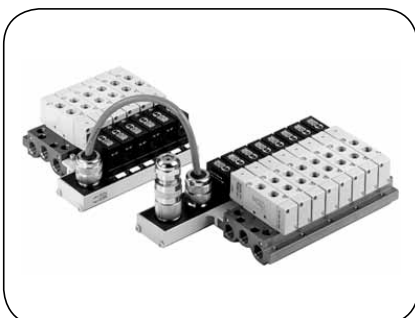
Distribution valves according to ISO 5599/1 - IPV-ISV series

- Type: 5/2, 5/3, mono and bi-stable
- Version: for board assembly with normalised connection surface
- Control: electric, pneumatic, manually supported
- Nominal flow rate (at 6 bar $\Delta p = 1$ bar): 1100 + 2700 l/min (depending on size)
- Size: ISO 1, ISO 2
- Working pressure range: vacuum + 10 bar (depending on type)
- Working temperature range: -10°C up to +60°C



Distribution valves - MACH 11, 16, 18 series

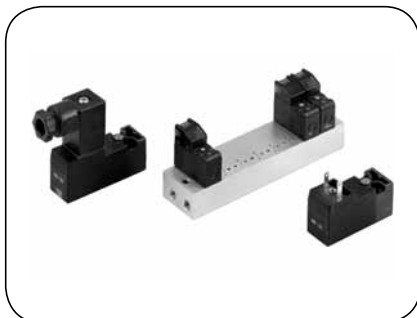
- Type: 5/2, 5/3, mono and bi-stable
- Version: for board assembly with normalised connection surface
- Control: electric, pneumatic, manually supported
- Nominal flow rate (at 6 bar $\Delta p = 1$ bar): 470 l/min
- Electrical connection: according to DIN 43650, shape C
- Working pressure range: vacuum + 10 bar (depending on type)
- Working temperature range: -10°C up to +60°C
- Operation with unlubricated compressed air also possible



Valves island for MACH 16 series

- Type: for MACH 16 valves with electric control
- Versions: with board for mono or bi-stable valves, optional connection of additional board for monostable valves
- Max. number of coils: 16
- Operation voltage: 24 V DC, 24 V AC
- Valve actuation indicator: LED;
- Internal protection: IP 65
- Optional island reconfiguration (board for bi-stable valves exchanged for board for monostable valves)

INDUSTRIAL PNEUMATICS - valves



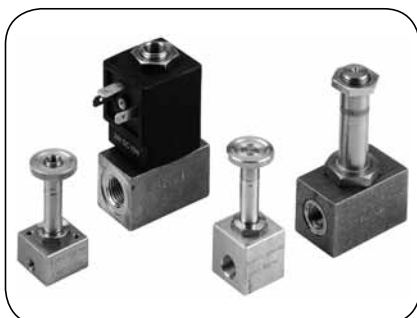
Distribution valves - PIV.P 10 mm, PIV.M 15 mm series

- Type: 3/2, NC, NO, monostable
- Version: for board assembly
- Control: electric, direct
- Service life: more than 50 million cycles
- Connection: M3, M5 (depending on size)
- Internal protection: IP60
- Maximum operation frequency: 30 Hz
- Working temperature range: +5°C up to +50°C
- Operation with unlubricated compressed air also possible



Distribution valve - PIV.I, PIV.T, PIV.B series

- Type: 2/2, 3/2, NC, NO, monostable
- Version: for board assembly
- Control: electric, direct
- Service life: 25 million cycles
- Power consumption: 2 + 16 W (depending on series)
- Internal protection: IP65
- Max. operation frequency: 15 to 30 Hz (depending on series)
- Used when high operation frequency and short response time are required
- Operation with unlubricated compressed air also possible



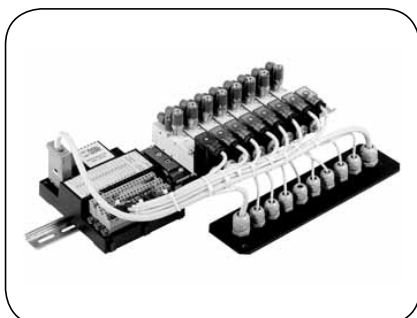
Distribution valve - PIV series

- Type: 2/2, 3/2, NC, NO, monostable,
- Version: valves with fittings
- Control: electric, direct
- Service life: 25 million cycles (depending on series)
- Power consumption: 2 + 16 W (depending on series)
- Internal protection: IP65
- Maximum operation frequency: 15 + 30 Hz (depending on series)
- Used when high operation frequency and short response time are required
- Operation with unlubricated compressed air also possible



Distribution valve according to CNOMO 060580

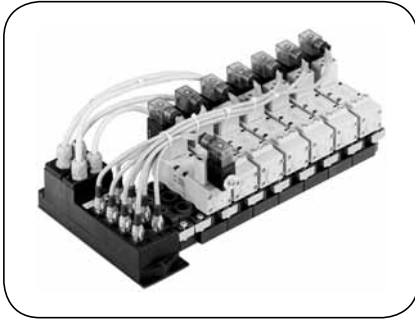
- Type: 3/2, NC, monostable,
- Versions: for board assembly, mono or bi-stable manual actuation
- Control: electric, direct
- Nominal flow rate (at 6 bar $\Delta p = 1$ bar): 40 l/min
- Internal protection: IP65
- Operational voltage: 24 V DC, 24 V, 110 V, 220 V AC
- Operation with unlubricated compressed air also possible



Modular slave IP 20

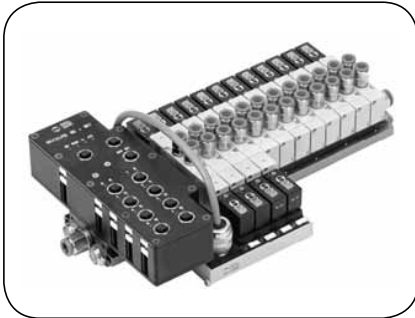
- Type: PROFIBUS-DP, INTERBUS-S
- Versions: 16 inputs / 32 inputs, 16 inputs, 16 inputs + 16 outputs
- Operational voltage: 24 V DC (18 V + 30 V), around 100 mA
- Internal protection: IP20
- Working temperature range: 0°C up to +55°C

INDUSTRIAL PNEUMATICS - valves



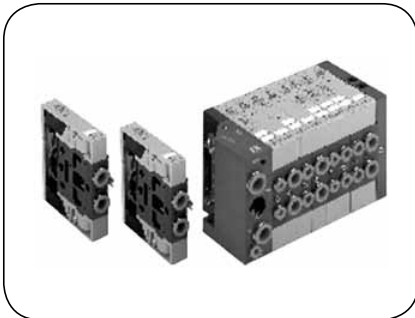
Modular slave IP 65

- Type: PROFIBUS-DP, INTERBUS-S
- Versions: 8 outputs, 16 inputs, 8 inputs + 4 outputs
- Operational voltage: 24 V DC (18 V ÷ 30 V), around 100 mA
- Internal protection: IP65
- Working temperature range: from 0 up to +55°C



Modular slave IP 65 for MACH 16 valves

- Type: PROFIBUS-DP, INTERBUS-S
- Versions: 8 outputs, 16 inputs, 8 inputs + 4 outputs
- Operational voltage: 24 V DC (18 V ÷ 30 V), around 100 mA
- Internal protection: IP65
- Working temperature range: from 0 up to +55°C



MULTIMACH valves island

- Valve connection: connection ports 2 and 4, Ø 4, 6, 8 mm threaded exhaust outlet port 3/8 or fitting Ø 8
- Working temperature range: 0°C up to +55°C
- Nominal flow rate (at 6 bar $\Delta p = 1$ bar): 150 - 400 - 800 l/min (depending on size)
- Coil operational voltage: 24 V DC
- Power consumption: 1.2 W
- Electrical connection: 9 or 25 pin plug connector
- Internal protection: IP51
- Valves with three different values of a nominal flow rate can mounted together



In-line flow micro regulators - RFL series

- Type: throttle check, throttle valve
- Connection: M5, 1/8", 1/4", 3/8", 1/2"
- Max. working pressure: 10 bar
- Max. working temperature: +70°C



Quick drain valves - VSR series

- Connection: 1/8", 1/4", 1/2"
- Nominal flow rate (at 6 bar, P>A): 900 ÷ 3500 l/min
- Nominal flow rate (at 6 bar, A>R): 1700 ÷ 7800 l/min
- Max. working pressure: 12 bar
- Min. working pressure: 0.5 bar
- Max. working temperature: +80°C
- (P - supply connection, A - working, R - venting)

INDUSTRIAL PNEUMATICS - valves



Check and controlled throttle check valves - STP series

- Type: controlled check valve, controlled throttle check valve
- Connection: 1/8", 1/4", 3/8", 1/2"
- Pilot wire outside diameter: 4 mm
- Supply pipe outside diameter: 6 - 8 - 10 - 12 mm
- Nominal flow rate (at 6 bar): 250 ÷ 1700 l/min
- Working pressure range: 0.5 ÷ 10 bar
- Working temperature range: from -10°C up to 70°C
- Operation with unlubricated compressed air also possible



Start-up valves - VCS series

- Type: start-up valve
- Connection: 1/8", 1/4", 3/8", 1/2"
- Working pressure range: 0 ÷ 10 bar
- Working temperature range: from -10°C up to +80°C
- Operation with unlubricated compressed air also possible



Shuttle valves - VOR series

- Type: circuit selector
- Connection: 1/8", 1/4"
- Nominal diameter: 2.5 mm
- Working pressure range: 2 ÷ 10 bar
- Working temperature range: from -10°C up to +80°C
- Operation with unlubricated compressed air also possible



Check valves - VNR series

- Type: check valve
- Connection: 1/8", 1/4"
- Nominal diameters: 5, 2.7 mm
- Working pressure range: 2 ÷ 10 bar
- Working temperature range: from -10°C up to +70°C
- Valve opening pressure: 0.05 bar
- Operation with unlubricated compressed air also possible



Logic valve

- Type: logic valve
- Versions: basic logic functions: OR, AND, YES, NOT, MEMORY
- Connection: push-in fitting Ø 4 mm
- Nominal diameter: 2.7 mm
- Working pressure range: 0 ÷ 8 bar (depends on version)
- Working temperature range: from -10 up to +60°C
- Nominal flow rate (at 6 bar $\Delta p=1$ bar): 100 l/min
- Operation with unlubricated compressed air also possible