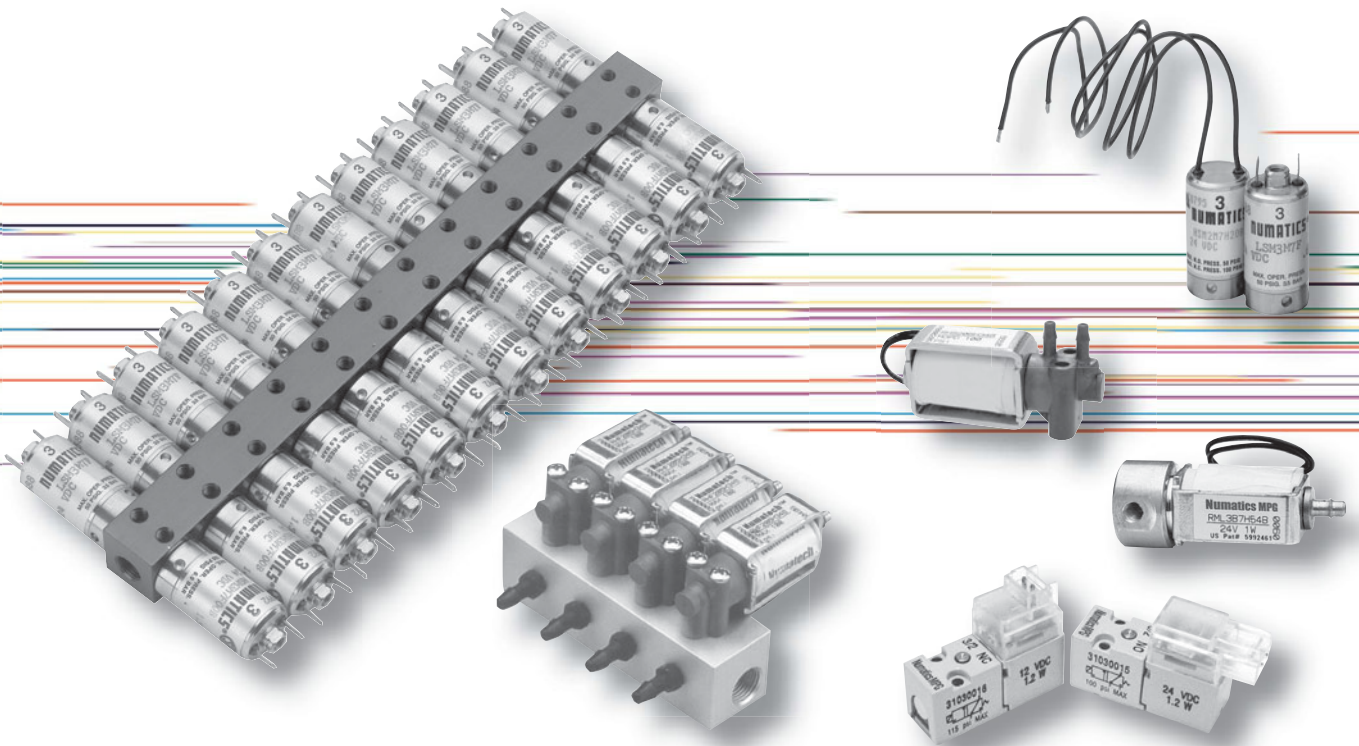




NUMATICS®

We're everywhere you need us to be!

Valves



Miniature Valves

S Series

RB Series

TM Series

ISO 9001:2000



Certificate No. FM 38113



Miniature Valves

General Information

The valve series S, RB and TM - stainless steel internal components with poppet seat design, for ultimate service life.

Due to the great variety of configuration and drive possibilities, they adapt to each task..

Characteristics:

- Modular reality, thus flexible and wear-free.
- **Rugged** due to housing made from **stainless steel**.
- Available as **2-ported and 3-ported, 2-pos. valves, normally closed (NC) or normally open (NO)**.
- **Flow capacity** up to 75 NI/min C_v 0.075
- **Low power input:** only 0.65 Watt (LS version)
- **Worldwide support** by Numatics subsidiaries and dealers in almost all countries in the world.

Common Technical Data:

- Direct solenoid pilot actuated poppet valves with spring return
- Tested in excess of 500 million cycles
- Stainless steel housing (1.40 16)
- Gaskets made from NBR, optional also from Viton® (FPM), EPDM or Neoprene
- For lubricated or unlubricated operation
- Ambient temperature -20 °C to +80 °C
- Medium temperature max. 50 °C
- Operating pressure: vacuum up to 7 bar (depends on orifice size)
- AC and DC
- Response times only 5 ms
- For flow media please refer to Operating Instructions Compressed Air on page 823

Valves



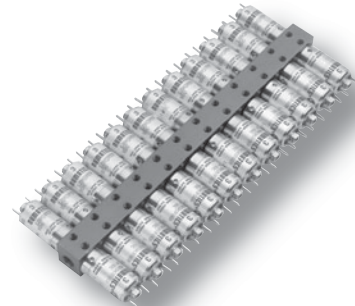
**S Series
Inline mount**

2-ported, 2-position or 3-position valves with fast-on connectors or 0.3 m cable



**S Series
Sub-base mount**

2-ported, 2-position or 3-position valves with fast-on connectors or 0.3 m cable



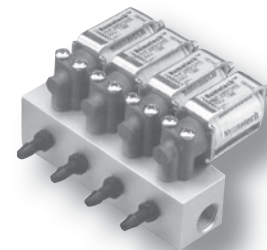
**S Series
Manifold mount**

2-ported, 2-position or 3-position valves with fast-on connectors or 0.3 m cable 2 to 24 stations



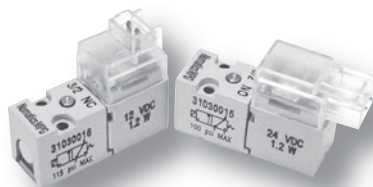
**RB Series
Inline mount**

2-ported, 2-position or 3-position valves built in barbed fittings



**RB Series
Manifold mount**

2-ported, 2-position or 3-position valves 2 to 12 stations



**TM Series
Inline mount**

2-ported, 3-position valves with fast-on connectors or cable

Subject to change without notice. Not liable for printing errors



Contents

	Series	Description	Page
	S	General Information 508 Technical Data 510 Overview 511 Manifolds • Overview 512 Electronic Boards • Overview 512 Dimensions 513 Bases 514 Accessories 515	
	RB	Technical Data 516 Overview 517 Dimensions 518 Manifold Blocks 519	
	TM	Technical Data 520 Overview 521 Dimensions 521	
	All series	Value-Added Custom Assemblies 522	

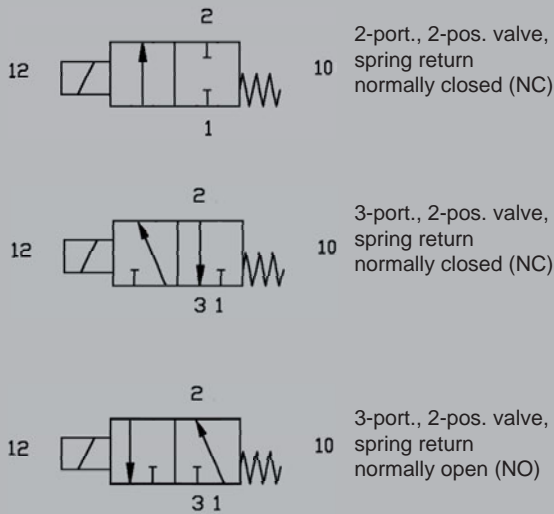
Subject to change without notice. Not liable for printing errors



Miniature Valves

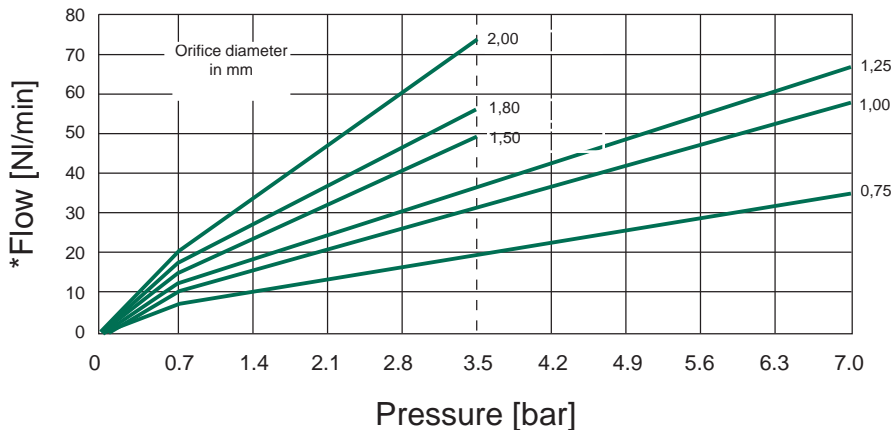
S Series • Technical Data

Direct solenoid actuated



S Series Miniature Valves with housing made from stainless steel

- Tested in excess of 500 million cycles
- Maximum leakage rate: 0.016 cm³/min (bubble tight)
- Ambient temperature range: -20 °C to +65 °C
- Class "A" insulated coils
- All valves 100 % factory tested
- #20 AWG + #24 AWG Teflon insulated lead wires
- Tin-plated brass 0.110 x 0.020 fast-on terminals
- 10 m (micron) filtration recommended
- Response time: < 0.010 seconds
- All valves rated to 28" Hg. vac
- Oxygen clean available
- Recommended for use with dry air, lubricated air, vacuum, non-corrosive, non-toxic, non-flammable dry gases
- Consult factory for other service applications.



Description	Material
Outer casing:	430 FR stainless steel
Body:	430 FR stainless steel
Plunger:	430 FR stainless steel
Stop:	430 FR stainless steel
Spool:	Polyester
Spring:	Serie 300 stainless steel
Sealing material:	Buna / Viton® (FPM) /EP

* Flow: Ports 1 and 2, valve type NC
Note: Flow tests are based on average readings and nominal components. All outlets are vented to atmosphere utilizing silencers.

Flow capacities

Valve Series	Wattage	Orifice Diameter		Flow Capacity NI/min	Flow C _v	Maximum Operating Pressure	
		Port 1	Port 2			NC	NO
LS	0.65	0.75	0.75	25	0.025	7.0	3.5
	1.5	0.75	0.75	25	0.025	7.0	7.0
	1.5	1.00	1.00	35	0.035	7.0	3.5
HS	1.5	1.25	1.25	55	0.055	7.0	3.5
	1.5	1.50	1.50	65	0.065	3.5	3.5
	1.5	1.80	1.80	75	0.075	3.5	3.5
	1.5	2.00	2.00	100	0.100	3.5	3.5

Further pressures or orifice diameters on request.

Subject to change without notice. Not liable for printing errors



Miniature Valves

S Series Valves • Overview

Valves Model Selection Table : (example)

H S O 3 M 7 H 0 0 B (*51R)

<p>Wattage</p> <p>H = Coil 1.5 Watt</p> <p>L = Coil 0.65 Watt</p>	<p>Seal Material</p> <p>B = NBR (Standard)</p> <p>V = Viton® (FPM)</p> <p>E = EPR (Ethylpropylene rubber)</p> <p>N = Neoprene</p>
<p>Service</p> <p>S = Standard valve</p> <p>O = Oxygen cleaned</p> <p>F* = Food Area</p>	<p>Orifice diameter port 3</p> <p>0 = 1.00 mm (Standard)</p> <p>1 = 1.25 mm</p>
<p>Port Threads</p> <p>O = 10-32 UNF</p> <p>M = M5</p> <p>N = 1/8 NPT (mounting option "C")</p>	<p>Orifice diameter port 1</p> <p>0 = 0.75 mm (Standard)</p> <p>1 = 1.00 mm</p> <p>2 = 1.25 mm</p> <p>3 = 1.50 mm</p> <p>4 = 1.80 mm</p> <p>5 = 2.00 mm</p>
<p>Valve Type</p> <p>2 = 2-port., 2-pos. valve</p> <p>3 = 2-port., 3-pos. valve</p>	<p>Connectors</p> <p>H = Hardwire (12"/20 AWG)</p> <p>F = 0.110 Fast-on</p> <p>S = Hardwire (12"/24 AWG)</p>
<p>Mounting</p> <p>L = Line mounted</p> <p>M = Manifold mounted</p> <p>C = Cylinder mounted (only 10-32 UNF at 0.75 mm orifice)</p>	
<p>Voltage</p> <p>6 = 12 VDC</p> <p>7 = 24 VDC</p> <p>further Voltages on request</p>	

Valves



Valve with fast-on connectors



Valve with solenoid leads



Individual base mounted valve

Piping Arrangements

Function	Port 1	Port 2	Port 3
2-port., 2-pos. valve, normally open (NO)	plugged	outlet	inlet
2-port., 2-pos. valve, normally closed (NC)	inlet	outlet	plugged
3-port., 2-pos. valve, normally open (NO)	exhaust	cylinder	inlet
3-port., 2-pos. valve, normally closed (NC)	inlet	cylinder	exhaust
Diverter	normally closed	inlet	normally open
Selector	inlet 1	outlet	inlet 2

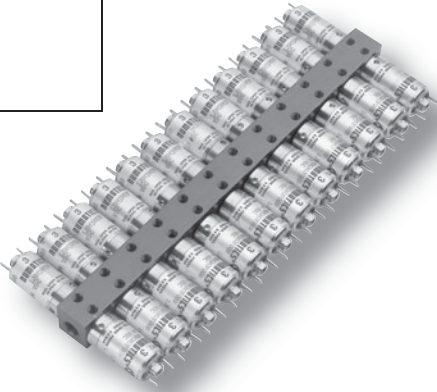
Subject to change without notice. Not liable for printing errors

Miniature Valves

S Series Manifolds • Circuit Boards

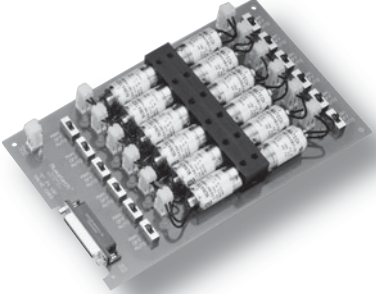
Manifold Model Selection Table: (example)

Manifold Mounting Kit	AK	H	S	2	—	10	Number of stations
Voltage							02 = 2 stations
H = Valve with 1.5 Watt coil							04 = 4 stations
L = Valve with 0.65 Watt coil							06 = 6 stations
Valve Type							08 = 8 stations
S = Standard valve							10 = 10 stations
O = Oxygen Cleaned							12 = 12 stations
Supply Ports							14 = 14 stations
2 = M5							16 = 16 stations
Ports with UNF-thread on request							18 = 18 stations
							20 = 20 stations
							24 = 24 stations

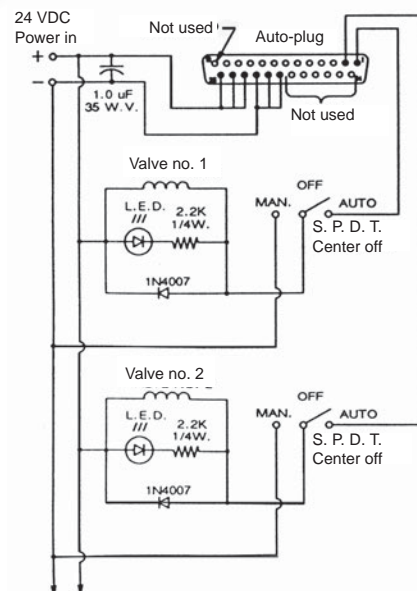
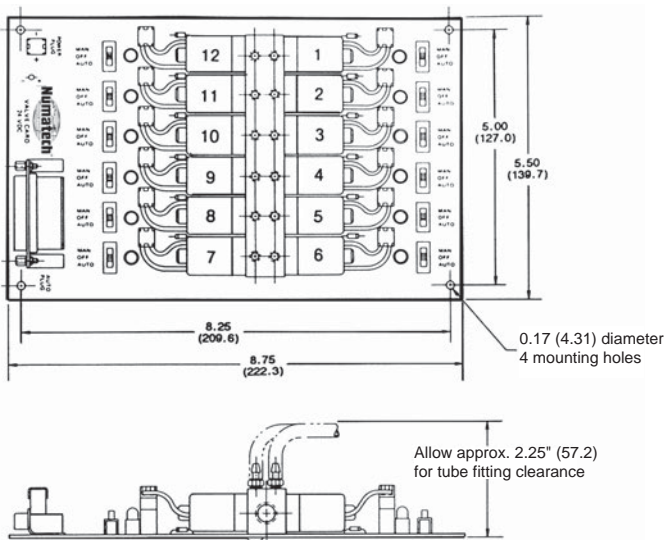


Electronic Board Model Selection Table: (example)

Manifold Mounting Kit	011	91	—10	Number of Stations
Voltage				-01 = 1 station
91 = 24 VDC				-02 = 2 stations
95 = 12 VDC				-03 = 3 stations
				-04 = 4 stations
				-05 = 5 stations
				-06 = 6 stations
				-07 = 7 stations
				-08 = 8 stations
				-09 = 9 stations
				-10 = 10 stations
				-11 = 11 stations
				(empty) = 12 stations



Note: Standard "S" Valve cards utilize LS03MXH00B with electronic connector



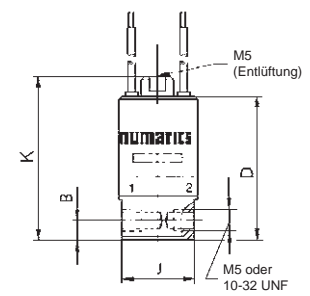
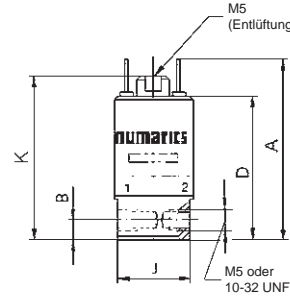
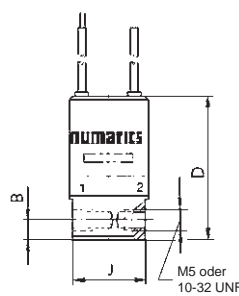
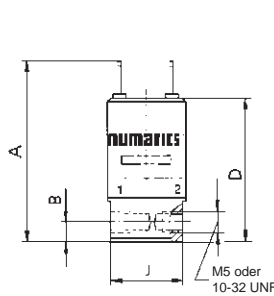
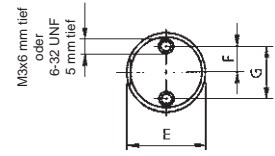
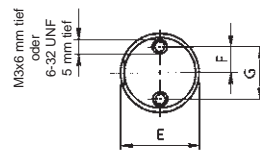
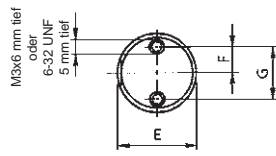
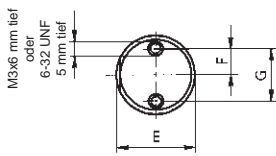
Subject to change without notice. Not liable for printing errors



Miniature Valves

S Series Valves • Dimensions

2-ported or 3-ported, 2-position valves for inline mount



2-port., 2-pos. valve with fast-on connectors

2-port., 2-pos. valve with 0.3 m solenoid leads

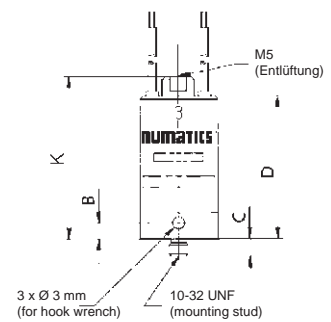
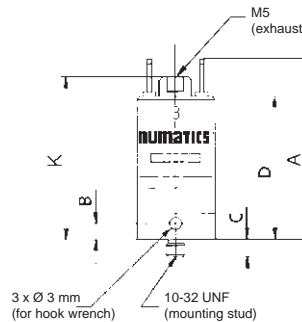
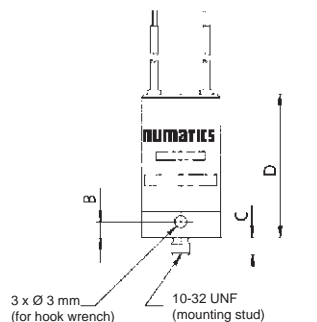
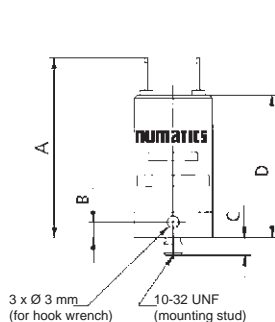
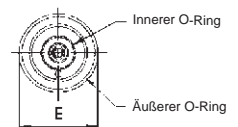
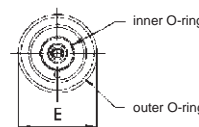
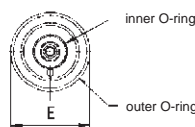
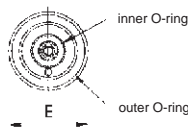
3-port., 2-pos. valve with fast-on connectors

3-port., 2-pos. valve with 0.3 m solenoid leads

Dimensions [mm]

Valve Type	A	B	D	E	F	G	J	K	Weight approx. [kg]
2-port., 2-pos. valve with fast-on connectors	49.2	4.8	39.1	19.1	6.4	12.7	17.5	—	0.059
2-port., 2-pos. valve with 0.3 m solenoid leads	—	4.8	39.1	19.1	6.4	12.7	17.5	—	0.067
2-port., 3-pos. with fast-on connectors	49.2	4.8	39.1	19.1	6.4	12.7	17.5	43.7	0.059
2-port., 3-pos. with 0.3 m solenoid leads	—	4.8	39.1	19.1	6.4	12.7	17.5	43.7	0.067

2-ported or 3-ported, 2-position valves for individual base mount or manifold mount



2-port., 2-pos. valve with fast-on connectors

2-port., 2-pos. valve with 0.3 m solenoid leads

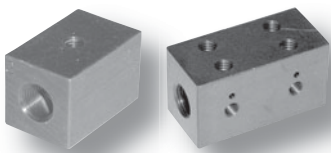
3-port., 2-pos. valve with fast-on connectors

3-port., 2-pos. valve with 0.3 m solenoid leads

Dimensions [mm]

Valve Type	A	B	C	D	E	K	Weight approx. [kg]
2-port., 2-pos. valve with fast-on connectors	45.2	4.1	4.8	35.1	19.1	—	0.053
2-port., 2-pos. valve with 0.3 m solenoid leads	—	4.1	4.8	35.1	19.1	—	0.059
2-port., 3-pos. valve with fast-on connectors	45.2	4.1	4.8	35.1	19.1	39.6	0.053
2-port., 3-pos. valve with 0.3 m solenoid leads	—	4.1	4.8	35.1	19.1	39.6	0.067

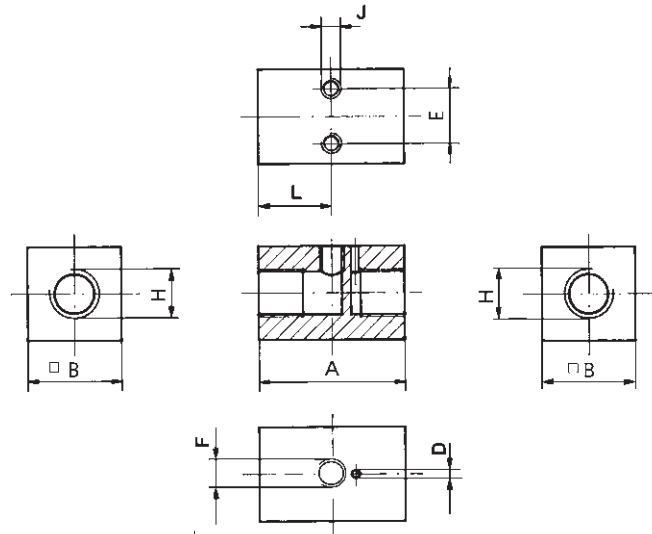
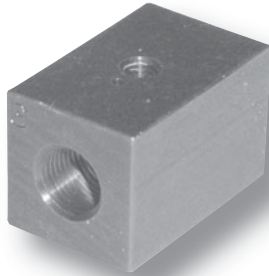
Subject to change without notice. Not liable for printing errors



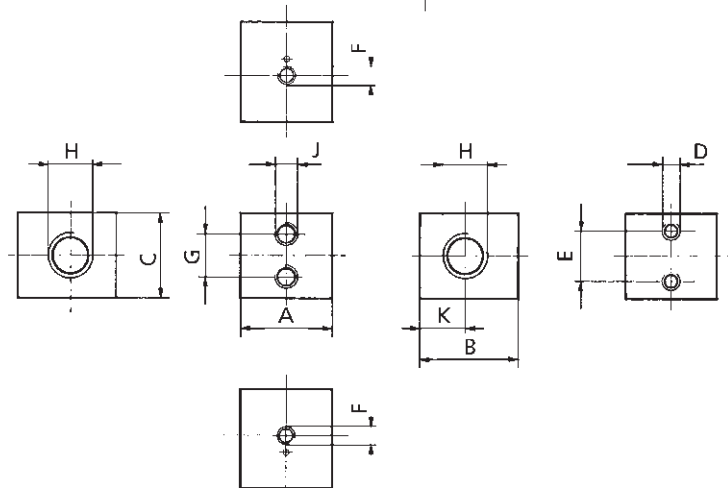
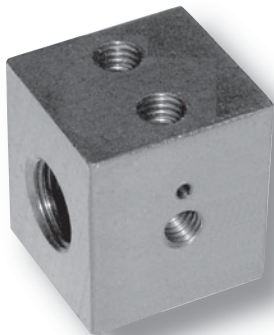
Miniature Valves

S Series Bases • Dimensions

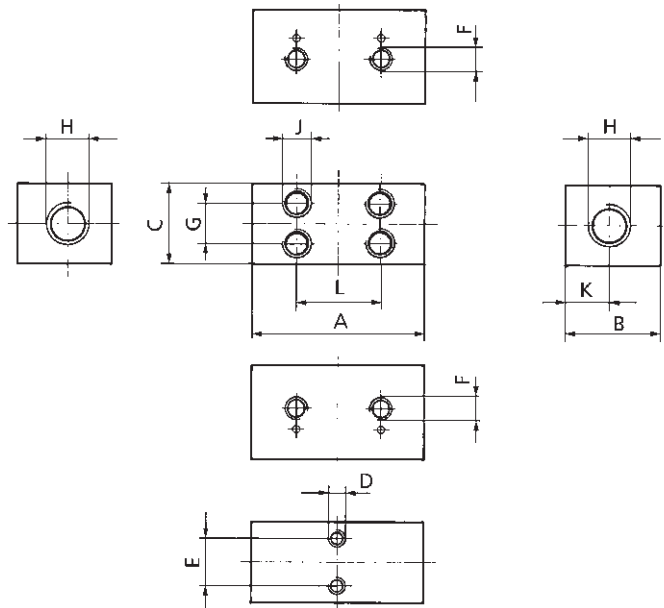
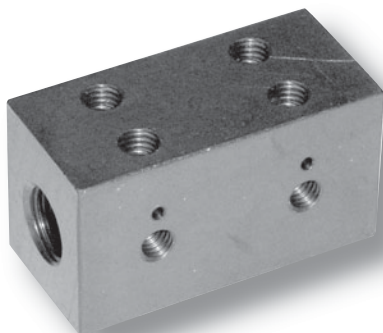
Individual base



Manifold for 2 stations

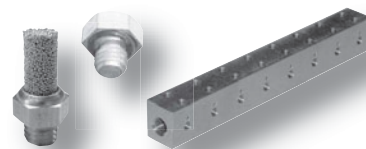


Manifold for 4 stations



Dimensions [mm]

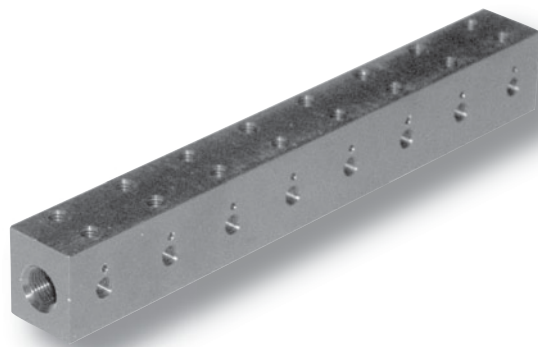
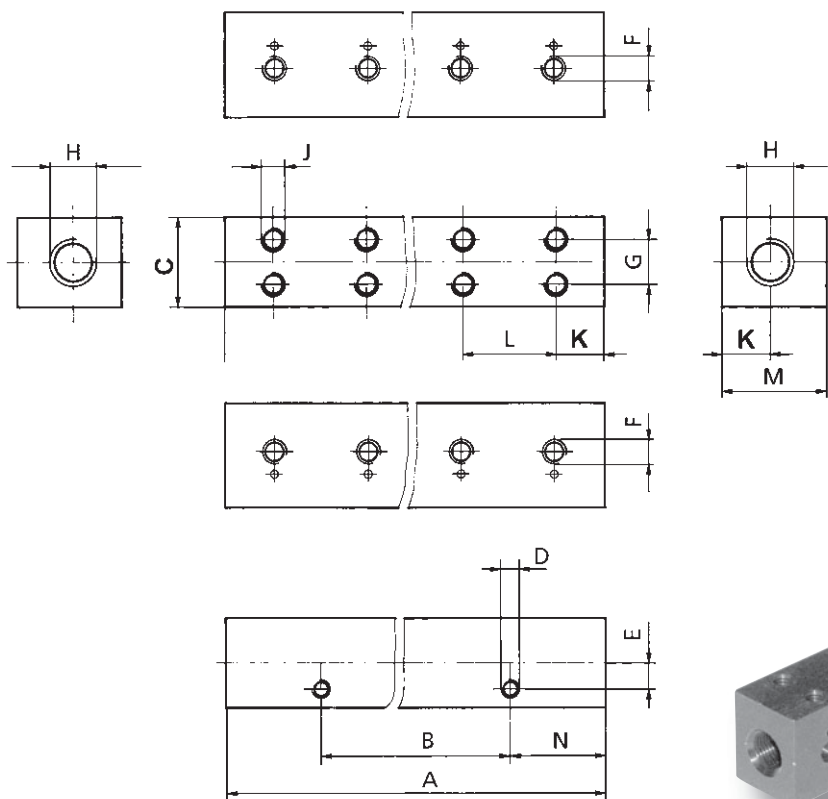
Description	A	B	C	D	E	F	G	H	J	K	L	Weight appr. [kg]	Order Code
Individual base	29.7	19.0	—	1.6	11.1	10-32 UNF	—	G 1/8	M4	—	14.8	0.019	106-473
Manifold for 2 stations	20.6	22.2	20.3	M4	11.1	10-32 UNF	9.5	G 1/8	M5	10.3	—	0.025	106-474
Manifold for 4 stations	40.5	22.2	20.3	M4	11.1	10-32 UNF	9.5	G 1/8	M5	10.3	19.8	0.030	106-475



Miniature Valves

S Series Bases • Dimensions • Accessories

Manifolds for 6 to 24 stations



Valves

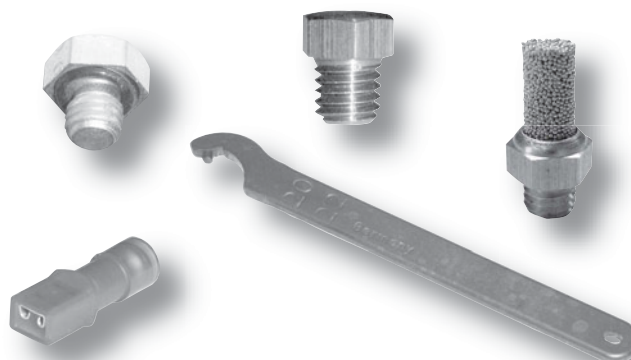
Dimensions [mm]

Number of stations	A	B	C	D	E	F	G	H	J	K	L	M	Weight appr. [kg]	Order Code
6	60.3	21.5	20.3	M4	5.6	10-32 UNF	9.5	G 1/8	M5	10.3	19.8	22.2	0.555	106-476
8	80.2	41.3	20.3	M4	5.6	10-32 UNF	9.5	G 1/8	M5	10.3	19.8	22.2	0.735	106-477
10	100.0	61.1	20.3	M4	5.6	10-32 UNF	9.5	G 1/8	M5	10.3	19.8	22.2	0.925	106-478
12	119.8	80.9	20.3	M4	5.6	10-32 UNF	9.5	G 1/8	M5	10.3	19.8	22.2	1.105	106-479
14	139.7	100.8	20.3	M4	5.6	10-32 UNF	9.5	G 1/8	M5	10.3	19.8	22.2	1.285	106-480
16	159.5	120.7	20.3	M4	5.6	10-32 UNF	9.5	G 1/8	M5	10.3	19.8	22.2	1.455	106-481
18	179.3	140.5	20.3	M4	5.6	10-32 UNF	9.5	G 1/8	M5	10.3	19.8	22.2	1.635	106-482
20	199.1	160.3	20.3	M4	5.6	10-32 UNF	9.5	G 1/8	M5	10.3	19.8	22.2	1.835	106-483
22	219.1	180.1	20.3	M4	5.6	10-32 UNF	9.5	G 1/8	M5	10.3	19.8	22.2	2.015	106-484
24	238.9	200.0	20.3	M4	5.6	10-32 UNF	9.5	G 1/8	M5	10.3	19.8	22.2	2.215	106-485

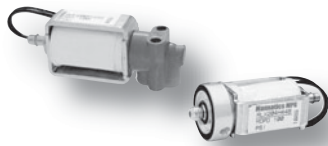
Outlet ports with 1/8 NPTF-thread on request

Accessories

Description	Outlet Ports	Order Code
Plugs for manifolds	10-32 UNF	213-347
Plugs for all ports	M5	213-369
	10-32 UNF	129-127
Sintered muffler	M5	SE05S
	10-32 UNF	141-104
Cable sockets for insulating fast-on connectors	—	EL003-0005
Hook wrench for mounting valves on manifold	—	102.1651



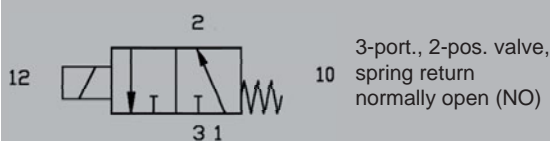
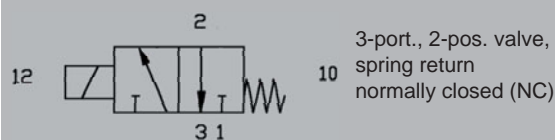
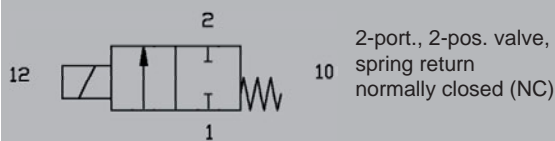
Subject to change without notice. Not liable for printing errors



Miniature Valves

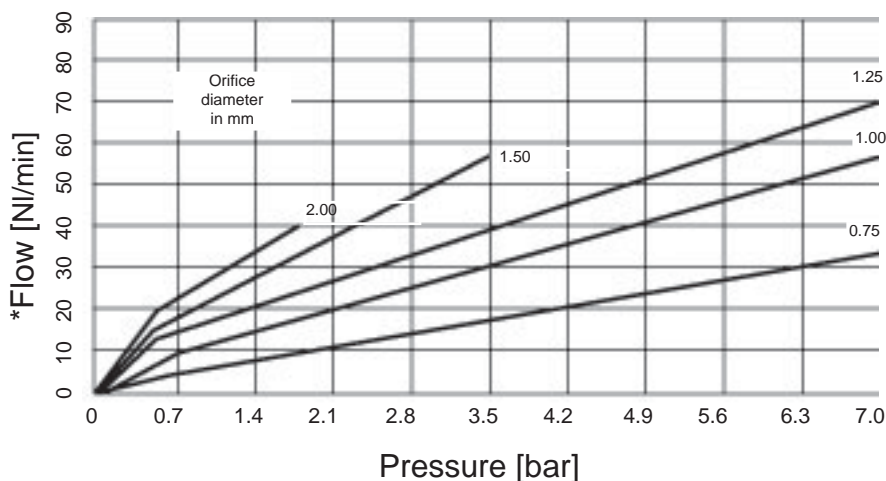
RB Series • Technical Data

Direct solenoid actuated



RB Series Miniature Valves

- Tested in excess of 500 million cycles
- Maximum leakage rate: 0.016 cm³/min (bubble tight)
- Ambient temperature range: -20 °C to +65 °C
- Class "A" insulated coils
- All valves 100 % factory tested
- #26 AWG Teflon insulated lead wires
- Circuit board mountable
- 10 µm (micron) filtration recommended
- Response time: < 0.010 seconds
- All valves rated to 28" Hg. vac
- Oxygen clean available
- Recommended for use with dry air, lubricated air, vacuum, non-corrosive, non-toxic, non-flammable dry gases
- Consult factory for other service applications.



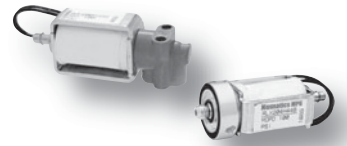
Description	Material
Brackets:	Zinc / nickel
Body:	Brass 360 1/2 hard PPS - Polyphenyo-sulfate
Plunger:	400 series stainless steel
Stop:	400 series stainless steel
Spool:	Polyester
Spring:	300 series stainless steel
Sealing material:	Buna / Viton® / EP

2,00 orifices are not available in 2,00 barbed body styles
 Flow: Ports 1 and 2, valve normally closed NC
Note: Flow tests are based on average readings and nominal components.
 All outlets are vented to atmosphere utilizing silencers.

Flow Capacities

Valve Series	Wattage	Orifice diameter	Flow capacity NI/min	Flow capacity C _v	Maximum Operating Pressure [bar]	
					Brass	Plastic
RB	0.5	0.75	25	0.025	3.5	1.0
RB	0.5	1.00	35	0.035	3.5	0.7
RB	0.5	1.25	55	0.055	1.7	0.7
RB	1.0	0.75	25	0.025	7.0	3.5
RB	1.0	1.00	35	0.035	3.5	3.5
RB	1.0	1.25	55	0.055	3.5	2.5
RB	2.0	0.75	25	0.025	7.0	7.0
RB	2.0	1.00	35	0.035	7.0	5.0
RB	2.0	1.25	55	0.055	7.0	5.0
RB	2.0	1.50	60	0.060	3.5	3.5
RB	2.0	2.00	80	0.080	1.7	1.7

Further pressures or orifice diameters on request.



Miniature Valves

RB Series Valves • Overview

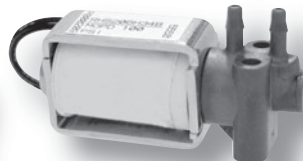
Valve Model Selection Table : (example)

	R	H	L	2	0	6	H	3	0	B	
Valve Series	R = RB										Seal Material
Power	L = 0.5 Watt M = 1 Watt H = 2 Watt										B = NBR (Standard) V = Viton® (FPM) O = Oxygen cleaned (Viton® FPM)
Body Style	M = Brass, manifold mount 10-32 UNF L = Brass, line mount S = 2.00 mm barb B = 3.18 mm barb F = Face seal mount										Orifice Diameter Port 3
Valve Type	2 = 2-port., 2-pos. valve 3 = 2-port., 3-pos. valve										Orifice Diameter Port 1
Connection Port 3	0 = 2-port., 2-pos. only S = 2.00 mm barb (3-port., 2-pos. only) B = 3.18 mm barb (3-port., 2-pos. only) F = 10-32 UNF female connector (3-port., 2-pos. only)										3 = 0.75 mm 4 = 1.00 mm 5 = 1.25 mm 6 = 1.50 mm 8 = 2.00 mm
											Electrical Connection
											H = Hardwire (12"/26 AWG) P = PCP Pins (Printed Circuit Board)
											Voltage
											6 = 12 VDC 7 = 24 VDC further Voltages on request

Valves



Face seal valve option F



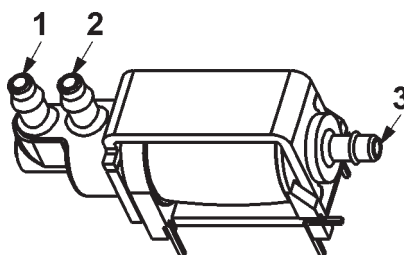
Body ported valve with mounting holes option S or B



Manifold mounted valve option M



Inline mounted valve option L



Valve ports

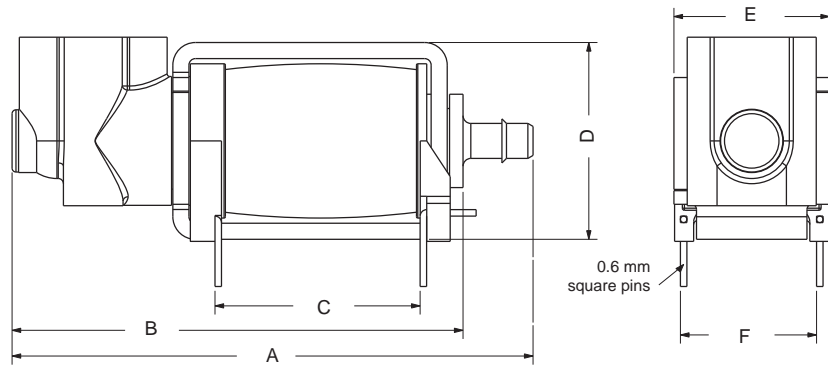
- 1 = Supply
- 2 = Actuator port
- 3 = Exhaust

Subject to change without notice. Not liable for printing errors

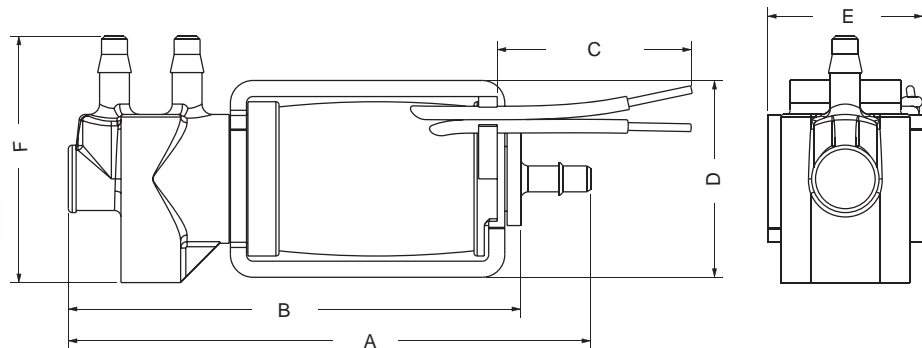
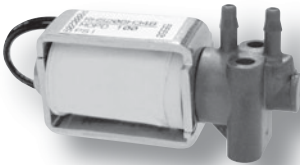
Miniature Valves

RB Series Valves • Dimensions

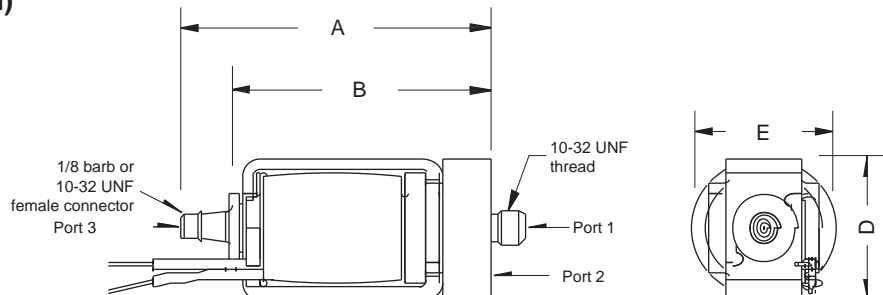
Face seal RB valve (Option F)



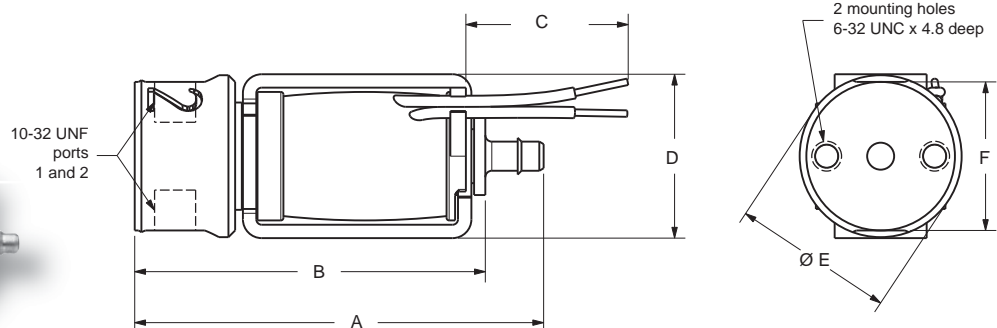
Body ported RB valve with mounting holes (Option S und B)



Manifold mount valve (Option M)

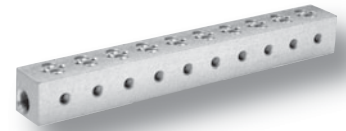


Inline mount valve (Option L)



Dimensions [mm]

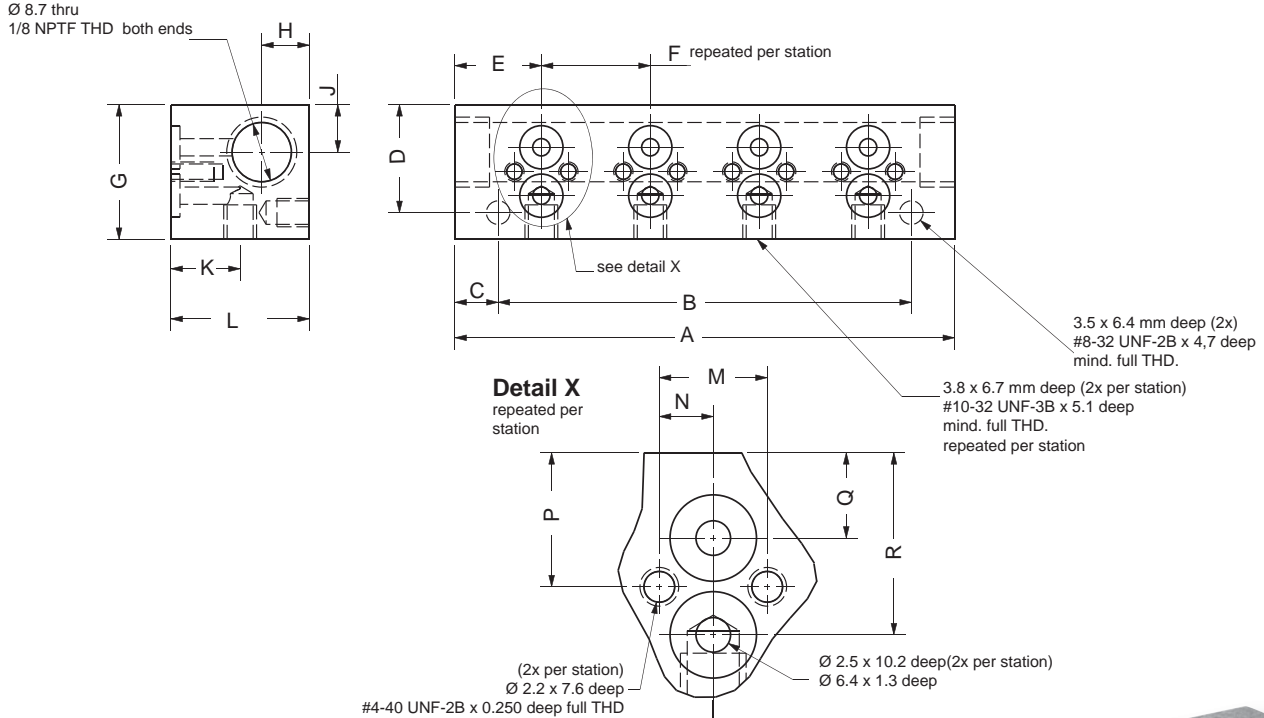
Description	A	B	C	D	E	F
Face seal valve	51.0	44.2	20.1	19.3	15.2	13.3
Body ported valve with mounting holes	51.0	44.2	3-m leadwire	19.3	15.2	24.1
Manifold mount valve	42.4	35.6	—	19.3	19.4	—
Inline mount valve	48.0	41.1	3-m leadwire	19.3	Ø 19.1	17.5



Miniature Valves

RB Series Manifold Blocks • Dimensions

Manifold Blocks (Face seal mount)

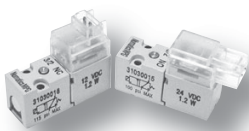


Subject to change without notice. Not liable for printing errors

Number of stations	Order Code
1	106-1297
2	106-1298
4	106-1300
6	106-1302
8	106-1304
10	106-1295
12	106-1307

Dimensions [mm]

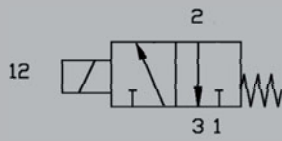
Number of stations	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
1	25.4	12.7	6.4	15.9	12.7	16.0	19.8	7.0	7.0	10.2	20.2	7.9	4.0	9.9	6.3	13.4
2	41.4	28.7	6.4	15.9	12.7	16.0	19.8	7.0	7.0	10.2	20.2	7.9	4.0	9.9	6.3	13.4
4	73.4	60.7	6.4	15.9	12.7	16.0	19.8	7.0	7.0	10.2	20.2	7.9	4.0	9.9	6.3	13.4
6	105.4	92.7	6.4	15.9	12.7	16.0	19.8	7.0	7.0	10.2	20.2	7.9	4.0	9.9	6.3	13.4
8	137.4	124.7	6.4	15.9	12.7	16.0	19.8	7.0	7.0	10.2	20.2	7.9	4.0	9.9	6.3	13.4
10	169.4	156.7	6.4	15.9	12.7	16.0	19.8	7.0	7.0	10.2	20.2	7.9	4.0	9.9	6.3	13.4
12	201.4	188.7	6.4	15.9	12.7	16.0	19.8	7.0	7.0	10.2	20.2	7.9	4.0	9.9	6.3	13.4



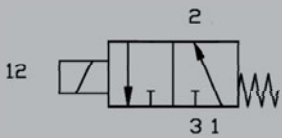
Miniature Valves

TM Series • Technical Data

Direct solenoid actuated



10 3-port., 2-pos. valve, spring return normally closed (NC)

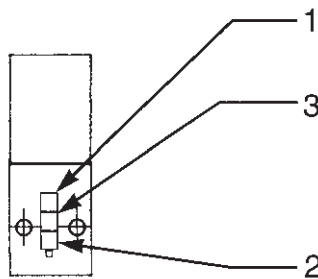
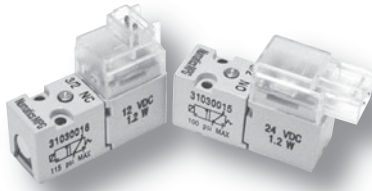


10 3-port., 2-pos. valve, spring return normally open (NO)

TM Series Miniature Valves 10 mm type

- Epoxid impregnated, nylon encapsulated class "F" continuous duty (ED 100%)
- All valves 100 % factory tested
- All valves rated to 28" Hg. vac
- Oxygen clean available
- Female locking connector or hardwire leads available

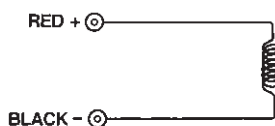
Valves



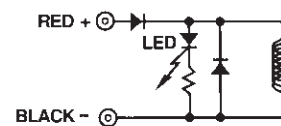
Valve ports

Description	Material
Outer Cover:	Cast aluminium alloy
Body:	Polyester PBT
Plunger:	430 FR Stainless steel
Stop:	430 FR Stainless steel
Spool:	Polyester PBT
Spring:	Serie 300 Stainless steel
Stop:	430 FR Stainless steel
Sealing material:	Viton®
Fork:	Nylon / delrin
Cover:	Nickel-plated brass
Override:	360 brass1/2 hard - electro less nickel plated
Core tube:	360 brass1/2 hard - electro less nickel plated

Electrical circuit layout



Hardwire circuit board mountable coils



"up" and "out" coils

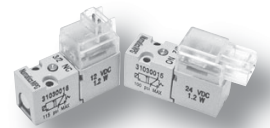
Technical Data

Direct solenoid pilot actuated 3-ported, 2-position valve

Flow capacity:	10 NI/min C _v 0.010 (Standard); optional 14.0 NI/min C _v 0.014
Operating pressure:	Vacuum to 7 bar
Ambient temperature range:	-5 °C to +50 °C
Medium temperature:	0 °C to +50 °C
Voltage:	12 and 24 VDC
Power:	0.75 Watt (0.95 Watt with LED)
Response tim:	< 10 ms
Filtration:	10 µm recommended
Wire gauge:	#24 AWG teflon insulated lead wires
Sealing material:	Viton® (FPM)
Service:	Recommended for use with dry air, lubricated air, vacuum, non-corrosive, non-toxic, non-flammable dry gases.

Consult factory for other service applications.

Subject to change without notice. Not liable for printing errors

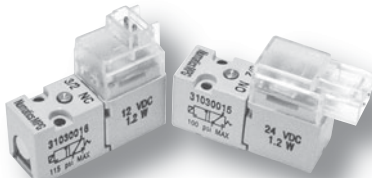


Miniature Valves

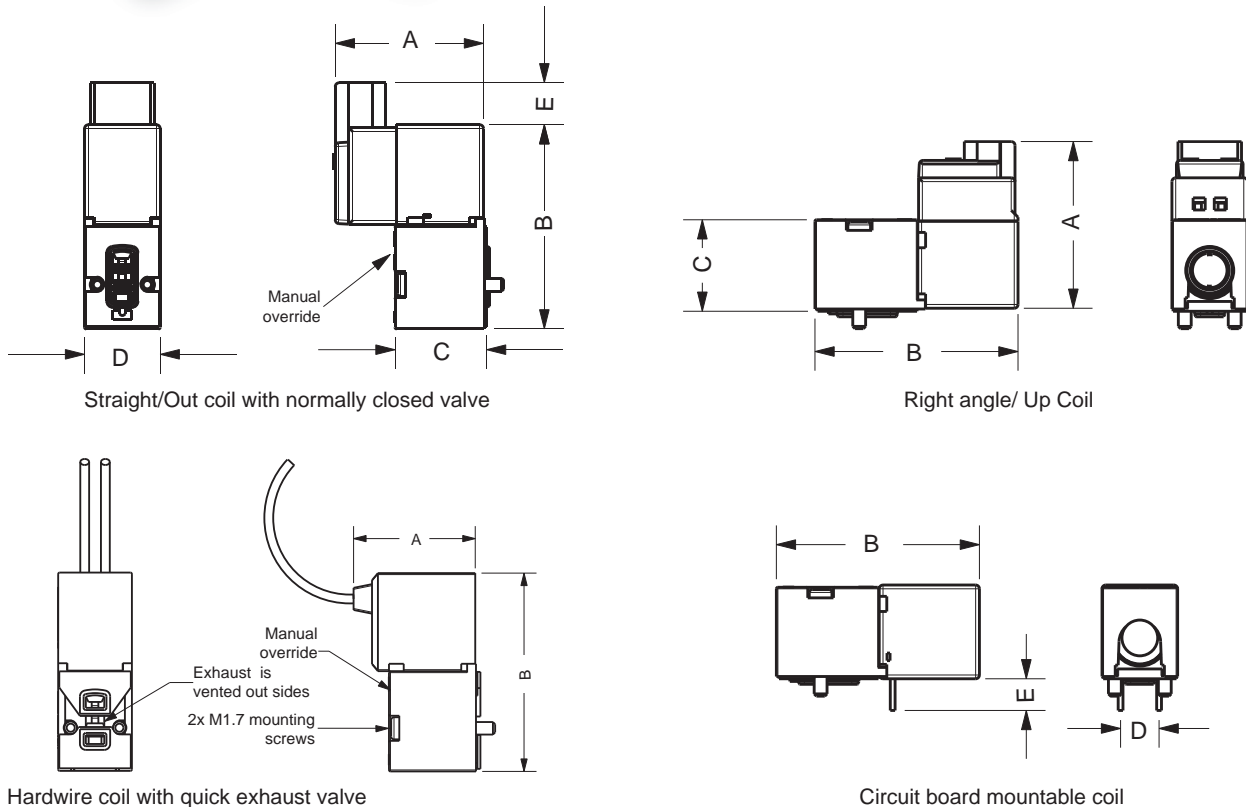
TM Series Valves • Overview • Dimensions

Model Selection Table: (example)

Valve Series	TM	101	V	12	R	2	Coil and Connection Type
TM = 10 mm type							1 = Hard wire with 300 mm lead
Configuration							2 = "up" connector with diode and LED
101 = Normally closed (NC)							3 = "out" connector with diode and LED
102 = Quick exhaust (NC)							4 = Circuit board mountable
121 = Normally open (NO)							
Seal Material							Power
V = Viton®* (FPM) (Standard)							R = 0.75 watt (0.95 watt with LED) Nozzle 0.7 / 0.8 mm
* For further information see page 9							S = 0.5 watt (0.75 watt with LED) Nozzle 0.4 / 0.5 mm
							Voltage
							12 = 12 VDC
							24 = 24 VDC



Dimensions



Dimensions [mm]

Description	Option 10th digit in Order Code	A	B	C	D	E
Straight/Out coil	3	19.6	26.9	12.2	10.2	5.6
Right angle/Up Coil	2	22.1	26.9	12.2	—	—
Hardwire coil	1	16.5	26.9	—	19.3	19.4
Circuit board mountable coil	4	—	26.9	—	5.1	—

Subject to change without notice. Not liable for printing errors

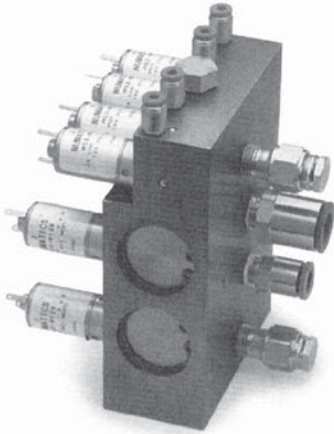
Valves



Miniature Valves

Value-Added Custom Assemblies

Specialize in "Value-Added" and Custom Built Assemblies



Numatics MPG continues to be "Everywhere you need us to be" when it comes to OEM custom and "Value Added" assemblies.

Our commitment towards total product management allows for one on one engineering, innovative design and cost-effective manufacturable products to be provided to our customers. This unique approach encourages close customer/supplier interaction, dramatically reducing the lead-times associated with the process of taking concepts in production.

"We're everywhere you need us to be"

- Custom Engineering of manifold assemblies
- Serial interfacing
- Custom wire harness assemblies
- Rapid prototype turnaround
- State of the art testing capabilities
- Pioneered in the area of specifically designed plastic valve components
- Special valve performance capabilities
- Application specific valve designs
- Custom labeling
- Custom circuit boards

