

Micro Valve[®]

Bulletin SSIN064 Issue/Rev. 0.0 (2/18)

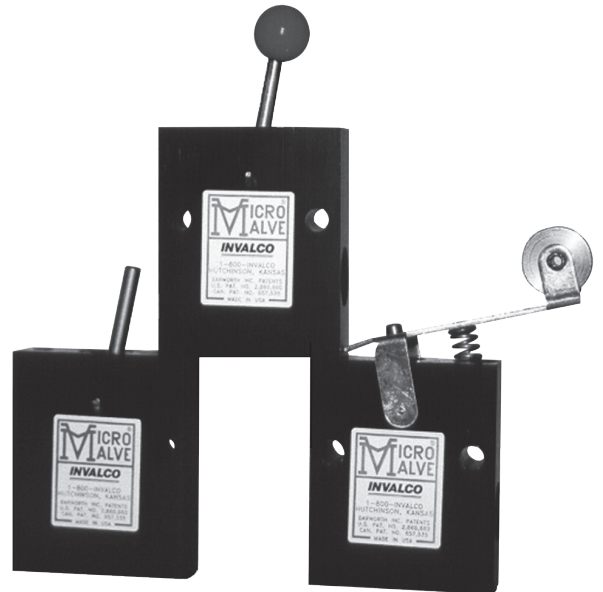
Since its introduction in 1956, Micro Valve has provided successful service through thousands of applications. This makes choosing the right miniature instrument and control valve a snap. Choose Micro Valve, the best valve to solve liquid, air, and gas service design problems. It absolutely will not leak. With other miniature valves, leakage occurs when flow is redirected from one port to another. But with the Micro Valve, flow is instantly redirected so there is no leakage.

Features and Benefits

- Flow is instantly redirected, so there is no leakage.
- Unique over-center snap action provides quick, sure response
- No sliding seals, packing or tight-fitting moving parts to leak or wear out
- Requires no lubrication; no need to introduce a system lubricator.

Applications

- Pressure switches
- Level controls
- Air switch to operate pneumatic tool
- Pilot operation of main valves
- Limit switches on cylinder actuated devices
- Diverting valve used to introduce additive to two independent flow systems
- Vial or container filling or sampling with instant and dripless shut off
- Machine shop and assembly area for parts “blow off”



The Micro Valve is a unique miniature valve offering versatility and rugged construction.

Quick, Sure Response with Design Adaptability

With a unique, over-center snap-action you get a quick, sure response. There are no sliding seals, packing, or tight-fitting moving parts to leak, wear out or stick. Therefore, no lubricants are required. All models have been tested through several million cycles without maintenance, thus guaranteeing your systems' performance.

Micro Valves will withstand abrasive bearing fluids. With all ports having some connection, external contaminants cannot enter the units. Dirt and grit will not prevent tight seating and will not cause the valve to stick.

Dependable Performance

The valve offers sure response, with no “neutral” position, and no varying time lag between positions. Micro Valves maintains either position without holding force, and cannot be vibrated or jarred out of position.

Valve action is full-speed regardless of operator speed or force applied. Trippoint position repeats accurately and is essentially independent of the speed of the external actuating device.

Light operating forces are required and not affected by operating pressure or flow rate. Shut-off is bubble-tight up to rated pressures.

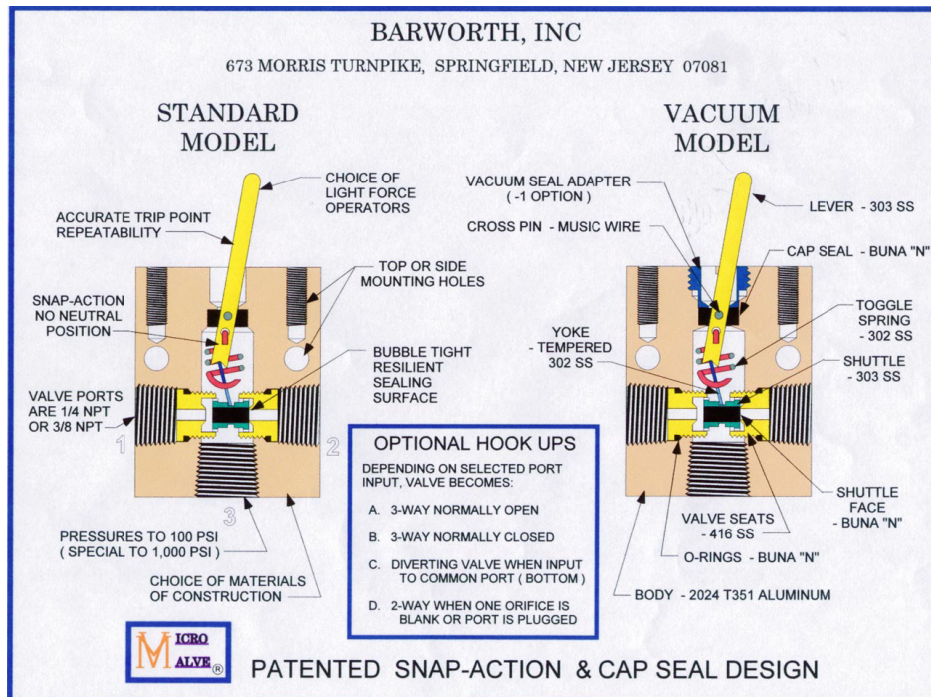
Product Specifications

Operators	Straight Handle	Plastic Ball Tip	Roller Lever	Over-Ride Spring	Panel Mount
316 Series 3-way 2-position Orifice Diameters 1/16" (Standard) 1/32" or 3/32" '	*316 F1	*316 F1-178		*316 F1-221	*P316 F1-178
					
38 Series 3-way 2 position Orifice Diameters 1/8" (Standard) 1/16" or 3/16"	**316 F2	**316 F2-178	**316	**316 F2-221	
	*38 F1	*38 F1-178	F3	*38 F1-221	*P38 F1-178
					
Pipe Thread Female 1/4" N.P.T.	**38 F2	**38 F2-178	**38 F3	**38 F2-221	
Pipe Thread Female 3/8" N.P.T					

* Manual return.

** Spring return.

Note: Plastic ball tips may be red, black, white, yellow, blue, or green. Specify color when ordering.



Body Materials	Trim Materials Seal	Materials
Standard	Standard	Standard
Anodized Aluminum, 2024-T3	Orifice Seat - 416 S.S. Shuttle - 303 S.S. Operator - 303 S.S. Spring - 302 S.S. Yoke - 302 S.S.	Operator Seal - Neoprene Shuttle Face - Buna-N O Rings - Buna-N
Optional	Optional	Optional
Brass 303 or 316 Stainless Steel Polyvinyl Chloride Plexiglass (demo purposes only)	All above in 316 S.S. for 316 Series only	All above of Buna-N, Neoprene, or Viton*. Viton* supplied only with (-1 options) vacuum seal. Special seal requests considered.

* Viton is a trademark of E.I. duPont de Nemours Co. (Inc.)

316 Series		
Orifice Size	Maximum Working Pressure	Operating Force
	Straight Handle - Manual Return	Approx.
1/16" (Standard)	100 PSI	22 Ounces
1/16" (Special)	150 PSI	25 Ounces
1/32" (Special)	250 PSI	22 Ounces
3/32" (Special)	60 PSI	22 Ounces
3/32" (Special)	100 PSI	25 Ounces
Straight Handle - Spring Return		
1/16" (Standard)	100 PSI	32 Ounces
Lever Operator - Spring Return		
1/16" (Standard)	100 PSI	24 Ounces

38 Series		
Orifice Size	Maximum Working Pressure	Operating Force
	Straight Handle - Manual Return	Approx.
1/8" (Standard)	100 PSI	3.5 lbs.
1/16" (Special)	250 PSI	3.5 lbs.
3/16" (Special)	75 PSI	4 lbs.
Straight Handle - Spring Return		
1/8" (Standard)	100 PSI	4 lbs.
Lever Operator - Spring Return		
1/8" (Standard)	100 PSI	4.5 lbs.

Product Specifications

Quantity	Discount
0-9	Net
10-49	5%
50-99	10%
100-249	15%
250-499	20%
500+	25%

38 Series – Micro Valve

Three-way, two position, 1/8" orifice, 0-100 psi, aluminum body, stainless steel working parts, Buna-N shuttle faces and o-ring and neoprene seals.

Model	Description	Part Number
38F1	Straight Handle Operator, Neoprene Seals	87000001
38F1-B-1	Straight Handle Operator, Buna-N Seals, Vacuum Service	87000019
38F1-178	Straight Handle Operator with Plastic Ball Knob	87000008
38F1-221	Straight Handle Operator with Spring Extention	87000024
38F2	Straight Handle, Spring Return	87000025
38F2-178	Straight Handle with Plastic Ball Knob	87000219
38F2-221	Straight Handle with Spring Extention	87000035
38F3	Roller Lever Operator	87000037
38F3-178	Ball Knob Lever Operator	87000041
xxxx-x-1	Vacuum Service (add suffix -1 to model)	
	Special 1/16" Orifice Size	
	Special 3/16" Orifice Size	
	Special Pressure Rating up to 200 PSI	
	Special Operating Force	

1. 38F Model Micro-Valves have female 3/8" NPT connections at all three (3) ports.
2. Standard colors for plastic ball knobs are red, black, yellow, blue and green. Specify color desired.

38 Series – Special Price Adders

Special Body Materials	Special Seal, Shuttle Face, and O-Ring Materials
Brass	Neoprene
Polyvinyl Chloride	Silicone Rubber
Plexiglass	Viton A
303 Stainless Steel	
316 Stainless Steel	

Manifold Plate with 6 - O-Rings, for assembly by customer. Call factory for pricing and availability.

Manifold Assembly complete with valves interconnected and ports plugged per customer specifications. Call factory for pricing and availability.

*Part numbers apply to standard models only. If any options are selected, disregard part numbers and consult factory.

316 Series – Micro Valve

Four-way, two position, 1/16" orifice, 0-100 psi, aluminum body, stainless steel working parts, Buna-N shuttle faces and o-rings and neoprene seals

Model	Description	Part Number
316F1-B	Straight Handle Operator, Buna-N Seals	87000214
316F1-178	Straight Handle Operator with Plastic Ball Knob	87000207
316F1-221	Straight Handle Operator with Spring Extension	87000216
316F2	Straight Handle, Spring Return	87000218
316F2-178	Straight Handle, Spring Return with Plastic Ball Knob	87000029
316F2-221	Straight Handle, Spring Return with Spring Extension	87000226
316F3	Roller Lever Operator	87000228
316F3-178	Ball Knob Lever Operator	87000234
P-316F1	Straight Handle Operator, Panel Mounting	87000327
P-316F1-178	Straight Handle Operator, Panel Mounting with Plastic Ball Knob	87000101
xxxx-x-1	Vacuum Service (add suffix -1 to model)	
	Special 1/32" Orifice Size	
	Special 3/32" Orifice Size	
	Stainless Steel Trim	
	Special Pressure Rating up to 250 PSI	
	Special Operating Force	

1. 316F Model Micro Valves have female 1/4" NPT connections at all three (3) ports.
2. Standard colors for plastic ball knobs are red, black, yellow, blue and green. Specify color desired.

316 Series – Special Price Adders

Special Body Materials	Special Seal, Shuttle Face, and O-Ring Materials
Brass	Neoprene
Polyvinyl Chloride	Silicone Rubber
Plexiglass	Viton A
303 Stainless Steel	
316 Stainless Steel	

416 Series – Micro Valve

Four-way, two position, 1/16" orifice, 0-100 psi, aluminum body, stainless steel working parts, Buna-N shuttle faces and o-rings and neoprene seals.

Model	Description	Part Number
416EF1	Straight Handle Operator, Neoprene Seals	87000289
416EF1-178	Straight Handle Operator with Plastic Ball Knob	87000291
416EF1-221	Straight Handle Operator with Spring Extension	87000329
416EF3	Roller Lever Operator	87000292
416EF3-178	Ball Knob Lever Operator	87000330
xxxx-x-1	Vacuum Service (add suffix -1 to model)	
	Special 1/32" Orifice Size	
	Special 3/32" Orifice Size	
	Stainless Steel Trim	
	Special Body Materials (2 x 316 Series Special Body Materials)	
	Special Pressure Rating up to 250 PSI	
	Special Operating Force	

1. 416EF Model Micro-Valves have female 1/4" NPT connections at all five (5) ports.
2. Standard colors for plastic ball knobs are red, black, yellow, blue and green. Specify color desired.

Operating Range

The Micro Valve is available with 1/4" and 3/8" NPT type connections and in orifice sizes from 1/32" to 3/16". They can handle flow ranges from 6.3 to 2535 SCFH for gas applications and .02 to 6.5 gpm for liquid applications.

Gas

Series 316 Micro Valve Gas Flow				Series 38 Micro Valve Gas Flow		
ΔP (psig)	Q (SCFH*)			Q (SCFH*)		
	1/16" Orifice	1/32" Orifice	3/32" Orifice	1/8" Orifice	1/16" Orifice	3/16" Orifice
1	23.6	6.3	59.4	98.4	23.6	222.5
2	33.1	8.9	79.6	138.3	33.1	296.0
3	40.6	11.0	98.1	168.4	40.6	362.1
4	46.7	12.6	112.1	194.6	46.7	415.5
5	52.0	14.0	125.0	217.0	52.0	464.3
6	57.1	15.4	137.3	237.2	57.1	509.1
7	61.3	16.5	147.4	255.8	61.3	547.6
8	65.2	17.6	156.6	272.7	65.2	580.1
9	69.1	18.7	165.9	289.7	69.1	613.0
10	75.0	20.0	183.0	304.0	75.0	686.3
20	110.0	29.0	250.0	439.0	110.0	948.3
30	143.0	37.0	330.0	622.0	143.0	1,275.4
40	170.0	45.0	390.0	789.0	170.0	1,473.3
50	197.0	53.0	475.0	915.0	197.0	1,765.6
60	235.0	61.0	530.0	1,042.0	235.0	2,041.8
70	270.0	69.0	-	1,182.0	270.0	2,347.8
80	305.0	77.0	-	1,345.0	305.0	2,535.1
90	337.2	85.0	-	1,487.0	337.2	-
100	369.4	93.0	-	1,629.1	369.4	-
110	-	101.0	-	-	401.6	-
120	-	110.0	-	-	433.8	-
130	-	119.0	-	-	466.0	-
140	-	128.0	-	-	498.2	-
150	-	136.0	-	-	530.4	-
160	-	144.0	-	-	562.7	-
170	-	153.0	-	-	594.9	-
180	-	161.0	-	-	627.1	-
190	-	170.0	-	-	659.3	-
200	-	178.0	-	-	691.5	-
210	-	186.0	-	-	723.7	-
220	-	194.0	-	-	755.9	-
230	-	202.0	-	-	788.1	-
240	-	210.0	-	-	820.3	-
250	-	218.0	-	-	852.5	-

Note: The above flow rates are for air. To find the flow rate of other gases, divide the flow rate by the square root of the gas's specific gravity.

*Standard cubic feet per hour.

Liquid

Series 316 Micro Valve Liquid Flow				Series 38 Micro Valve Liquid Flow		
ΔP (psig)	Q (SCFH*)			Q (SCFH*)		
	1/16" Orifice	1/32" Orifice	3/32" Orifice	1/8" Orifice	1/16" Orifice	3/16" Orifice
1	0.09	0.02	0.20	0.37	0.09	0.73
2	0.12	0.03	0.28	0.52	0.12	1.03
3	0.15	0.04	0.35	0.64	0.15	1.26
4	0.18	0.05	0.40	0.74	0.18	1.46
5	0.20	0.05	0.45	0.83	0.20	1.63
6	0.22	0.06	0.49	0.91	0.22	1.79
7	0.23	0.06	0.53	0.98	0.23	1.93
8	0.25	0.07	0.57	1.05	0.25	2.06
9	0.26	0.07	0.60	1.11	0.26	2.19
10	0.28	0.08	0.63	1.17	0.28	2.31
20	0.39	0.11	0.89	1.65	0.39	3.26
30	0.48	0.13	1.10	2.03	0.48	4.00
40	0.56	0.15	1.26	2.34	0.56	4.62
50	0.62	0.17	1.41	2.62	0.62	5.16
60	0.68	0.19	1.55	2.87	0.68	5.65
70	0.74	0.20	-	3.10	0.74	6.11
80	0.79	0.21	-	3.31	0.79	6.53
90	0.83	0.23	-	3.51	0.88	-
100	0.88	0.24	-	3.70	0.88	-
110	-	0.25	-	-	0.92	-
120	-	0.26	-	-	0.96	-
130	-	0.27	-	-	1.00	-
140	-	0.28	-	-	1.04	-
150	-	0.29	-	-	1.08	-
160	-	0.30	-	-	1.11	-
170	-	0.31	-	-	1.15	-
180	-	0.32	-	-	1.18	-
190	-	0.33	-	-	1.21	-
200	-	0.34	-	-	1.24	-
210	-	0.35	-	-	1.28	-
220	-	0.36	-	-	1.31	-
230	-	0.36	-	-	1.33	-
240	-	0.37	-	-	1.36	-

Note: The above flow rates are for water. To find the flow rate of other fluids, divide the flow rate by the square root of the fluid's specific gravity.

The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

Contact information is subject to change. For the most current contact information, visit our website at www.fmctechnologies.com/measurementsolutions and click on the "Contact Us" link in the left-hand column.

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