



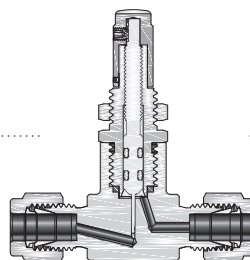
Metering Valve

MV Series

Contents

Ultra Precision Metering Valves (MV1 Series)

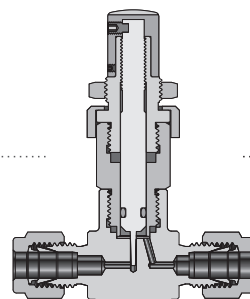
- ❖ Maximum working pressure up to 2000 psig (137 bar)
- ❖ Working temperature from -10°F to 400°F (-23°C to 204°C)
- ❖ Orifice size: 0.032" (0.81 mm)
- ❖ Straight, angle, cross and double pattern
- ❖ Cannot be used as a shut-off valve



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Precision Metering Valves (MV2 Series)

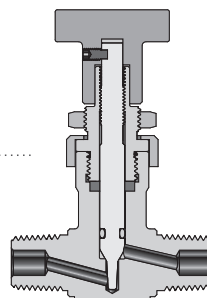
- ❖ Maximum working pressure up to 1000 psig (68.9 bar)
- ❖ Working temperature from -10°F to 400°F (-23°C to 204°C)
- ❖ Orifice size: 0.056" (1.42 mm)
- ❖ Straight, angle, cross and double pattern
- ❖ Cannot be used as a shut-off valve



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General Use Metering Valves (MV3 Series)

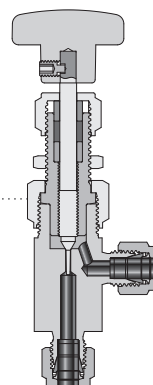
- ❖ Maximum working pressure up to 1000 psig (68.9 bar)
- ❖ Working temperature from -10°F to 400°F (-23°C to 204°C)
- ❖ Orifice size: 0.128" (3.25 mm)
- ❖ Straight, angle, cross and double pattern
- ❖ Cannot be used as a shut-off valve



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High Pressure Metering Valves (MV4 Series)

- ❖ Maximum working pressure up to 5000 psig (344 bar)
- ❖ Working temperature from -65°F to 850°F (-54°C to 454°C)
- ❖ Orifice size: 0.062" (1.6 mm)
- ❖ Straight, angle, cross and double pattern
- ❖ Cannot be used as a shut-off valve



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Ultra Precision Metering Valves

MV1 Series

Features

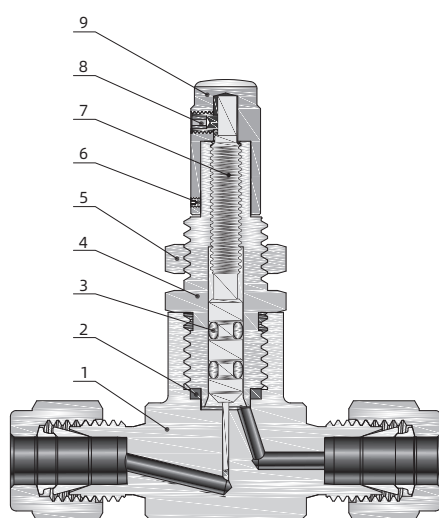
- ❖ Maximum working pressure up to 2000 psig (137 bar)
- ❖ Working temperature from -10°F to 400°F (-23°C to 204°C)
- ❖ Orifice size: 0.032" (0.81 mm)
- ❖ Stem taper: 1°
- ❖ Shutoff service: not available
- ❖ Panel mountable
- ❖ Straight, angle, cross and double pattern
- ❖ Knurled, Adjustable-Torque, Vernier handle
- ❖ Variety of end connections



Pressure-Temperature Ratings

Seal Material	Temperature Range °F(°C)
Buna N	-10 to 300 (-23 to 148)
Ethylene Propylene	-10 to 300 (-23 to 148)
Fluorocarbon FKM	-10 to 400 (-23 to 204)
Kalrez	0 to 300 (-17 to 148)
Neoprene	-10 to 250 (-23 to 121)

Standard Materials of Construction

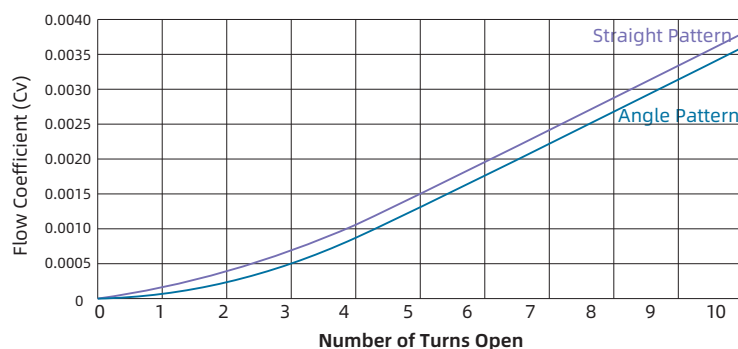


Component		Material Grade/ASTM Specification
		316 S.S.
1	Body	316 S.S./A182
2	Body seal	Fluorocarbon FKM
3	O-ring	Fluorocarbon FKM
4	Bonnet	316 S.S./A479
5	Panel nut	316 S.S./A479
6	Lock Screw	Black oxide alloy steel/ANSI 18.3
7	Handle Screw	Black oxide alloy steel/ANSI 18.3
8	Stem	Hard chrome-plated S17400 S.S./A564
9	Handle	300 S.S./A276

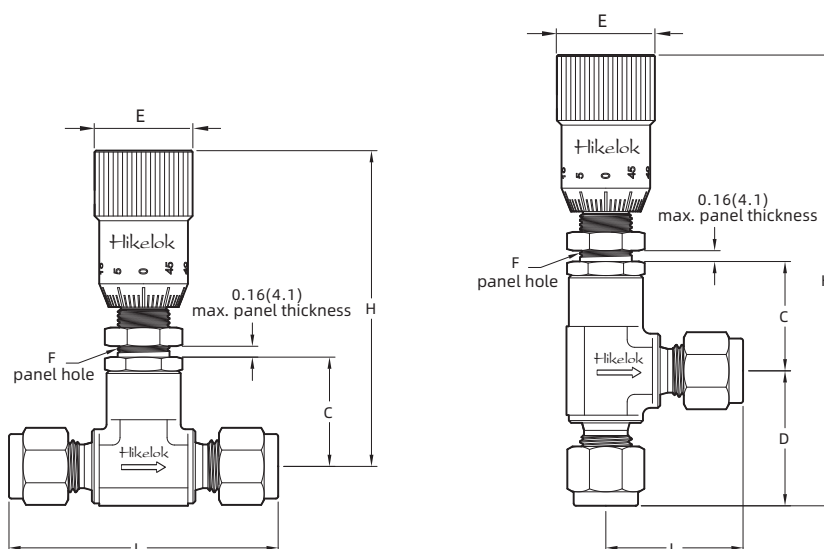
Flow Data at 70°F (20°C)

Pressure Drop to Atmosphere psig (bar)	Air Flow std ft³/min (std L/min)	Water Flow U.S. gal/min (L/min)
10 (0.69)	0.04 (1.1)	0.01 (0.03)
50 (3.45)	0.10 (2.8)	0.02 (0.07)
100 (6.90)	0.20 (5.6)	0.04 (0.15)

Flow Coefficient at Turns Open

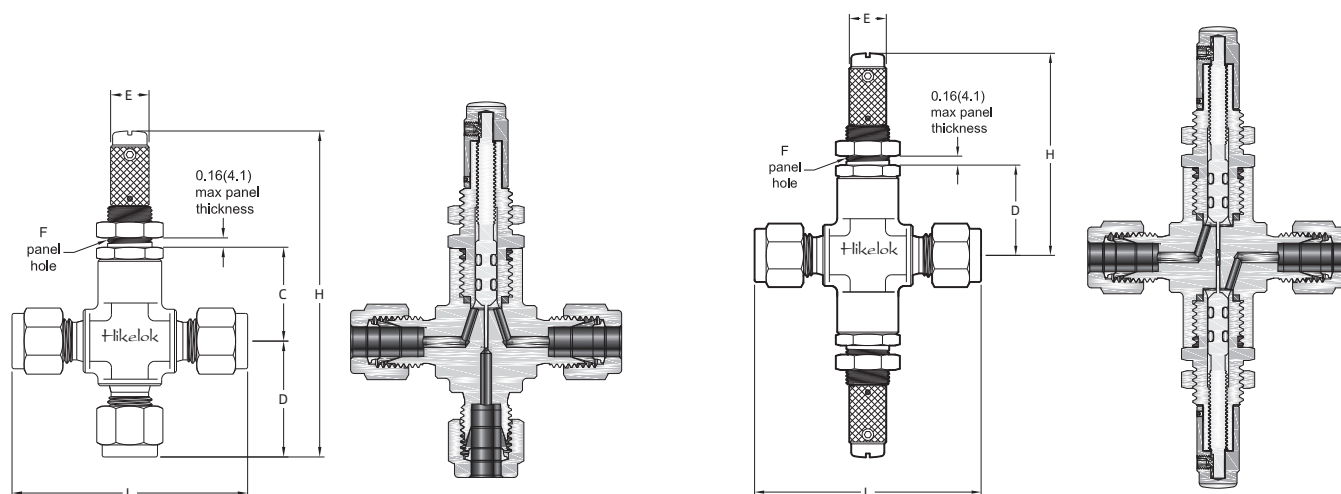


Dimensions



Basic Ordering Number	Connection Type and Size	Dimension, in. (mm)					
		H	L	C	D	E	F
Straight Pattern							
MV1-F1-	1/16" Hikelok	2.34 (59.4)	1.56 (39.6)	0.92 (23.4)	—	0.83 (21.0)	0.45 (11.4)
MV1-F2-	1/8" Hikelok		1.90 (48.3)				
MV1-F4-	1/4" Hikelok		2.04 (51.8)				
MV1-M3-	3 mm Hikelok		1.90 (48.3)				
MV1-M6-	6 mm Hikelok		2.04 (51.8)				
Angle Pattern							
MV1-F1-	1/16" Hikelok	3.22 (81.8)	0.81 (20.6)	0.92 (23.4)	0.88 (22.4)	0.83 (21.0)	0.45 (11.4)
MV1-F2-	1/8" Hikelok	3.32 (84.3)	0.98 (24.9)		0.98 (24.9)		
MV1-F4-	1/4" Hikelok	3.36 (85.3)	1.02 (25.9)		1.02 (25.9)		
MV1-M3-	3 mm Hikelok	3.32 (84.3)	0.98 (24.9)		0.99 (25.1)		
MV1-FNPT2-	1/8" Female NPT	3.07 (78.0)			0.98 (24.9)		

Optional Patterns



Cross Pattern

- ❖ Fluid flows between side ports around stem in any stem position.
- ❖ Fluid flows through branch port can be metered in both directions.

Double Pattern

- ❖ Inlet valve handle can be set and locked at desired maximum flow, outlet valve handle can be used for fine flow control up to the preset maximum of the inlet valve.

Basic Ordering Number	Connection Type and Size	Cv	Dimension, in. (mm)					
			H	L	C	D	E	F
Cross Pattern								
MV1-F2-	1/8" Hikelok	0.004	3.32 (84.3)	1.96 (49.8)	0.98 (24.9)	0.92 (23.4)	0.38 (9.6)	0.45 (11.4)
MV1-M3-	3 mm Hikelok				0.99 (25.1)			
Double Pattern								
MV1-F2-	1/8" Hikelok	0.003	2.34 (59.4)	1.90 (48.3)	—	0.92 (23.4)	0.38 (9.6)	0.45 (11.4)
MV1-M3-	3 mm Hikelok							

Optional Handles



Slotted Handle

- ❖ Flow setting adjustment is available with a screwdriver
- ❖ Ideal for installation where access to handle



Vernier Handle Valves

- ❖ Repeatable flow setting
- ❖ Adjustment accurate to 1/50 turn

How to Order

MV1 — NPT4 — M6 — EV — A1 — 316								
Series	Inlet Type	Inlet Size	Outlet Type	Outlet Size	O-Ring Material	Handle Type	Flow Pattern	Material
MV1	FNPT Female NPT	1 1/16 in.	Same as inlet type and inlet size		Fluorocarbon FKM	Knurled, round	Straight	316 316 S.S.
	NPT Male NPT	2 1/8 in.				V Vernier	A1 Angle	316L 316L S.S.
	FBT Female BSPT	3 3 mm	If outlet and inlet are the same, eliminate the outlet designator		B Buna N		D Double	304 304 S.S.
	MBT Male BSPT	4 1/4 in.			E Ethylene propylene		C Cross	304L 304L S.S.
	FMS Female Metric	6 3/8 in. or 6 mm			N Neoprene			
	MS Male Metric (for BG)	8 1/2 in. or 8 mm			Z Kalrez			
	FBP Female BSPP	10 10 mm						
	MBP Male BSPP (for BG)	12 3/4 in. or 12 mm						
	F Fractional Tube Fitting							
	M Metric Tube Fitting							
	GFS Male GFS Fitting							

Precision Metering Valves

MV2 Series

Features

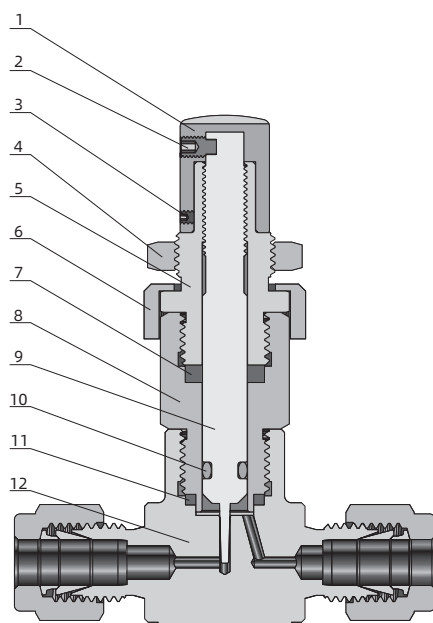
- ❖ Maximum working pressure: 1000 psig (68.9 bar)
- ❖ Working temperature: -10°F to 400°F (-23°C to 204°C)
- ❖ Orifice sizes: 0.056" (1.42 mm)
- ❖ Stem taper: 3°
- ❖ Shutoff service: not available
- ❖ Panel mountable
- ❖ Flow pattern: straight, angle, cross and double patterns
- ❖ Handle type: vernier and slotted
- ❖ Variety of end connections

Pressure-Temperature Ratings

Seal Material	Temperature Range°F (°C)
Buna N	-10 to 300 (-23 to 148)
Ethylene Propylene	-10 to 300 (-23 to 148)
Fluorocarbon FKM	-10 to 400 (-23 to 204)
Kalrez	0 to 300 (-17 to 148)
Neoprene	-10 to 250 (-23 to 121)



Standard Materials of Construction

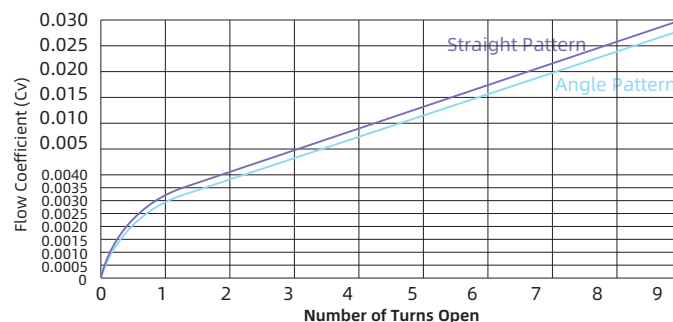


Component		Material Grade / ASTM Specification
		316 S.S.
1	Handle	300 S.S. / A276
2	Handle Screw	Black oxide alloy steel / ANSI 18.3
3	Lock Screw	Black oxide alloy steel / ANSI 18.3
4	Panel Nut	316 S.S. / B783
5	Bonnet	316 S.S. / A479
6	Bonnet Sleeve	Sintered 316 S.S.
7	Stem Guide Ring	Glass-filled PTFE
8	Body Extension	316 S.S. / A479
9	Stem	Hard chrome-plated 316 S.S. / A479
10	O-ring	Fluorocarbon FKM
11	Body Seal	Fluorocarbon FKM
12	Body	316 S.S. / A182

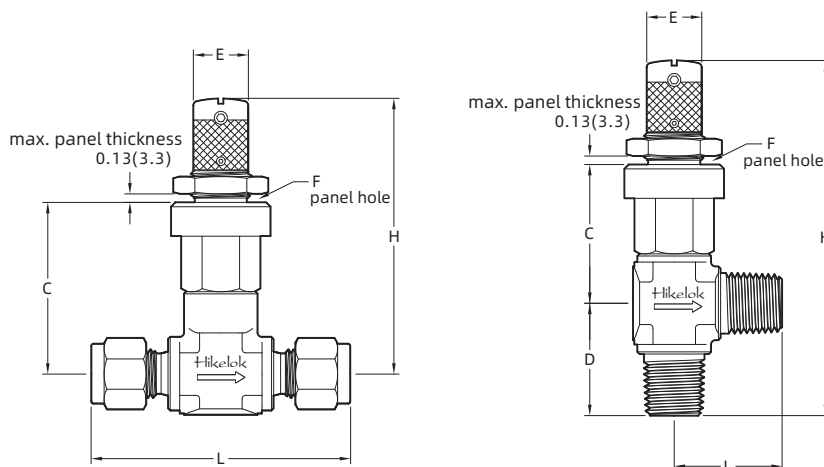
Flow Data at 70°F (20°C)

Pressure Drop to Atmosphere psig (bar)	Air Flow std ft ³ /min (std L/min)	Water Flow U.S. gal/min (L/min)
10 (0.69)	0.33 (9.3)	0.09 (0.34)
50 (3.45)	0.90 (25.4)	0.21 (0.79)
100 (6.90)	1.50 (42.4)	0.30 (1.10)

Flow Coefficient at Turns Open

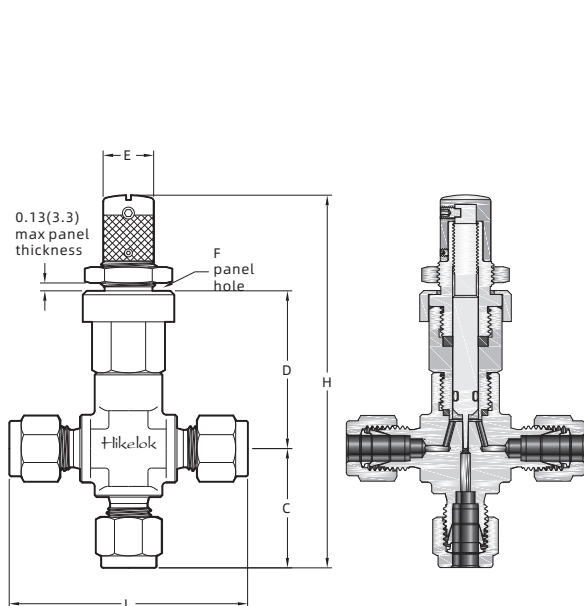


Dimensions

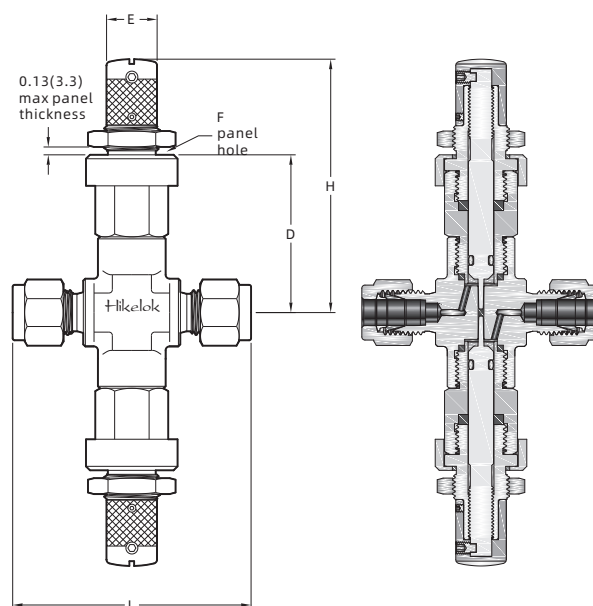


Basic Ordering Number	Connection Type and Size	Dimension, in. (mm)					
		H	L	C	D	E	F
Straight Pattern							
MV2-F2-	1/8" Hikelok	2.78 (70.6)	2.02 (51.3)	1.56 (39.6)	—	0.50 (12.7)	0.58 (14.7)
MV2-F4-	1/4" Hikelok		2.20 (55.9)				
MV2-M3-	3 mm Hikelok		2.02 (51.3)				
MV2-M6-	6 mm Hikelok		2.20 (55.9)				
MV2-NPT2-	1/8" Male NPT		1.50 (38.1)				
MV2-NPT4-	1/4" Male NPT		1.96 (49.8)				
MV2-FNPT2-	1/8" Female NPT		1.94 (49.3)				
Angle Pattern							
MV2-F2-	1/8" Hikelok	3.30 (83.8)	1.01 (25.7)	1.07 (27.2)	1.01 (25.7)	0.50 (12.7)	0.58 (14.7)
MV2-F4-	1/4" Hikelok	3.39 (86.1)	1.10 (27.9)		1.10 (27.9)		
MV2-M3-	3 mm Hikelok	3.30 (83.8)	1.01 (25.7)		1.01 (25.7)		
MV2-M6-	6 mm Hikelok	3.39 (86.1)	1.10 (27.9)		1.10 (27.9)		
MV2-NPT2-	1/8" Male NPT	3.04 (77.2)	0.75 (19.1)		0.75 (19.1)		
MV2-NPT4-	1/4" Male NPT	3.27 (83.1)	0.98 (24.9)		1.02 (25.9)		
MV2-FNPT2-	1/8" Female NPT	3.04 (77.2)	1.01 (25.7)		0.75 (19.1)		

Optional Patterns



Cross Pattern



Double Pattern

- ❖ Fluid flows between side ports around stem in any stem position.
- ❖ Fluid flows through branch port can be metered in both directions.

- ❖ Inlet valve handle can be set and locked at desired maximum flow, outlet valve handle can be used for fine flow control up to the preset maximum of the inlet valve.

Basic Ordering Number	Connection Type and Size	Cv	Dimension, in. (mm)					
			H	L	C	D	E	F
Cross Pattern								
MV2-F4-	1/4" Hikelok	0.03	3.39 (86.1)	2.20 (55.9)	1.10 (27.9)	1.07 (27.2)	0.50 (12.7)	0.58 (14.7)
MV2-M6-	6 mm Hikelok							
Double Pattern								
MV2-F4-	1/4" Hikelok	0.026	2.78 (70.6)	2.20 55.9)	—	1.56 (39.6)	0.50 (12.7)	0.58 (14.7)
MV2-M6-	6 mm Hikelok							

Optional Handles



Slotted Handle

- ❖ Flow setting adjustment is available with a screwdriver
- ❖ Ideal for installation where access to handle



Vernier Handle Valves

- ❖ Repeatable flow setting
- ❖ Adjustment accurate to 1/50 turn

How to Order

MV2 — **NPT4** — **M6** — **EV** — **A1** — **316**

Series	Inlet Type	Inlet Size	Outlet Type	Outlet Size	O-Ring Material	Handle Type	Flow Pattern	Material
MV2	FNPT Female NPT	1 1/16 in.	Same as inlet type and inlet size		Fluorocarbon FKM	Knurled, round	Straight	316 316 S.S.
	NPT Male NPT	2 1/8 in.					A1 Angle	316L 316L S.S.
		3 3 mm	If outlet and inlet are the same, eliminate the outlet designator		B Buna N	V Vernier	D Double	304 304 S.S.
	FBT Female BSPT	4 1/4 in.			E Ethylene propylene		C Cross	304L 304L S.S.
	MBT Male BSPT	6 3/8 in. or 6 mm			N Neoprene			
	FMS Female Metric	8 1/2 in. or 8 mm			Z Kalrez			
	MS Male Metric (for BG)	10 10 mm						
	FBP Female BSPP							
	MBP Male BSPP (for BG)							
	F Fractional Tube Fitting							
	M Metric Tube Fitting							
	GFS Male GFS Fitting							

General Use Metering Valves

MV3 Series

Features

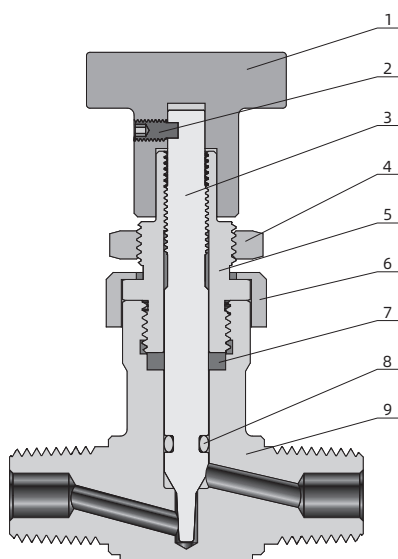
- ❖ Maximum working pressure up to 1000 psig (68.9 bar)
- ❖ Working temperature from -10°F to 400°F (-23°C to 204°C)
- ❖ Orifice size: 0.128" (3.25 mm)
- ❖ Stem taper: 6°
- ❖ Shutoff service: yes
- ❖ Panel mountable
- ❖ Straight and angle pattern
- ❖ Handle type: vernier and knurled
- ❖ Variety of end connections



Pressure-Temperature Ratings

Seal Material	Temperature Range°F (°C)
Buna N	-10 to 300 (-23 to 148)
Ethylene Propylene	-10 to 300 (-23 to 148)
Fluorocarbon FKM	-10 to 400 (-23 to 204)
Kalrez	0 to 300 (-17 to 148)
Neoprene	-10 to 250 (-23 to 121)

Standard Materials of Construction

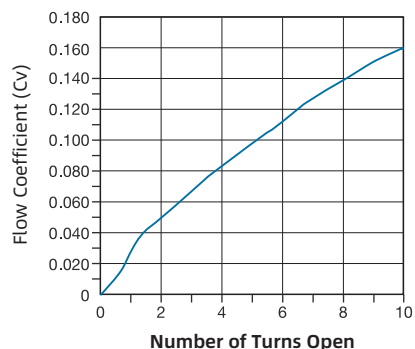


Component		Material Grade / ASTM Specification
		316 S.S.
1	Handle	Anodized aluminum
2	Handle Screw	Black oxide alloy steel / ANSI 18.3
3	Stem	Hard chrome-plated 316 S.S. / A479
4	Panel nut	316 S.S. / B783
5	Bonnet	316 S.S. / A479
6	Bonnet Sleeve	Sintered 316 S.S.
7	Stem Guide Ring	Glass-filled PTFE
8	O-ring	Fluorocarbon FKM
9	Body	316 S.S. / A182

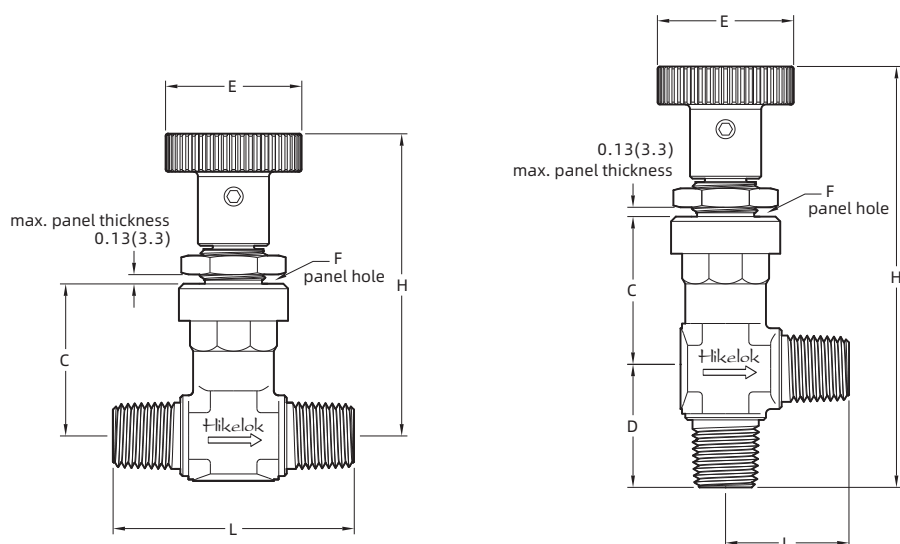
Flow Data at 70°F (20°C)

Pressure Drop to Atmosphere psig (bar)	Air Flow std ft³/min (std L/min)	Water Flow U.S. gal/min (L/min)
10 (0.69)	1.6 (45.3)	0.47 (1.7)
50 (3.45)	4.5 (127)	1.0 (3.7)
100 (6.90)	7.9 (223)	1.5 (5.6)

Flow Coefficient at Turns Open

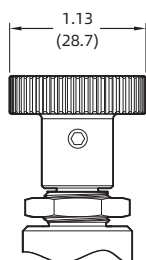


Dimensions



Basic Ordering Number	Connection Type and Size	Dimension, in. (mm)					
		H	L	C	D	E	F
Straight Pattern							
MV3-F4-	1/4" Hikelok	2.82 (71.6)	2.34 (59.4)	1.26 (32.0)	—	1.13 (28.7)	0.58 (14.7)
MV3-F6-	3/8" Hikelok		2.46 (62.5)				
MV3-M6-	6 mm Hikelok		2.34 (59.4)				
MV3-NPT4-	1/4" Male NPT		2.00 (50.8)				
Angle Pattern							
MV3-F4-	1/4" Hikelok	3.77 (95.8)	1.17 (29.7)	1.04 (26.4)	1.17 (29.7)	1.13 (28.7)	0.58 (14.7)
MV3-M6-	6 mm Hikelok						

Optional Handles



Knurled Handle



Vernier Handle

- ❖ Repeatable flow setting
- ❖ Adjustment accurate to 1/50 turn

How to Order

MV3 — NPT4 — M6 — EV — A1 — 316								
Series	Inlet Type	Inlet Size	Outlet Type	Outlet Size	O-Ring Material	Handle Type	Flow Pattern	Material
MV3	FNPT Female NPT	1 1/16 in.	Same as inlet type and inlet size		Fluorocarbon FKM	Knurled	Straight	316 316 S.S.
	NPT Male NPT	2 1/8 in.			B Buna N	V Vernier	A1 Angle	316L 316L S.S.
	FBT Female BSPT	3 3 mm	If outlet and inlet are the same, eliminate the outlet designator		E Ethylene Propylene			304 304 S.S.
	MBT Male BSPT	4 1/4 in.			N Neoprene			304L 304L S.S.
	FMS Female Metric	6 3/8 in. or 6 mm			Z Kalrez			
	MS Male Metric (for BG)	8 1/2 in. or 8 mm						
	FBP Female BSPP	10 10 mm						
	MBP Male BSPP (for BG)	12 3/4 in. or 12 mm						
	F Fractional Tube Fitting							
	M Metric Tube Fitting							
	GFS Male GFS Fitting							

High Pressure Metering Valves

MV4 Series

Features

- ❖ Maximum working pressure: 5000 psig (344 bar)
- ❖ Working temperature: -65°F to 850°F (-54°C to 454°C)
- ❖ Orifice size: 0.062" (1.6 mm)
- ❖ Flow coefficient(Cv) : 0.04
- ❖ Stem taper: 2°
- ❖ Shutoff service: available
- ❖ Variety of end connections
- ❖ Panel mountable
- ❖ Flow pattern: straight and angle
- ❖ Handle type: round

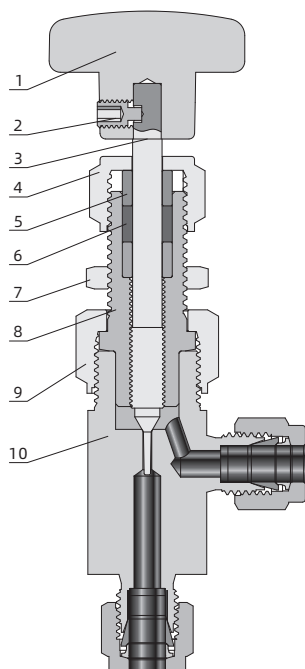


Pressure-Temperature Ratings

Body Material	316 S.S.
Temperature, °F(°C)	Working Pressure, psig(bar)
-65 (-53) to 100 (37)	5000 (344)
200 (93)	4295 (295)
300 (148)	3875 (266)
400 (204)	3560 (245)
450 (232)	3435 (236)
500 (260)	3310 (228)
600 (315)	3130 (215)
650 (343)	3080 (212)
700 (371)	3000 (206)
750 (398)	2930 (201)
800 (426)	2880 (198)
850 (454)	2815 (193)

❖ Ratings limited to 450°F (232°C) at 3435 psig (236 bar) with standard PTFE packing.

Standard Materials of Construction

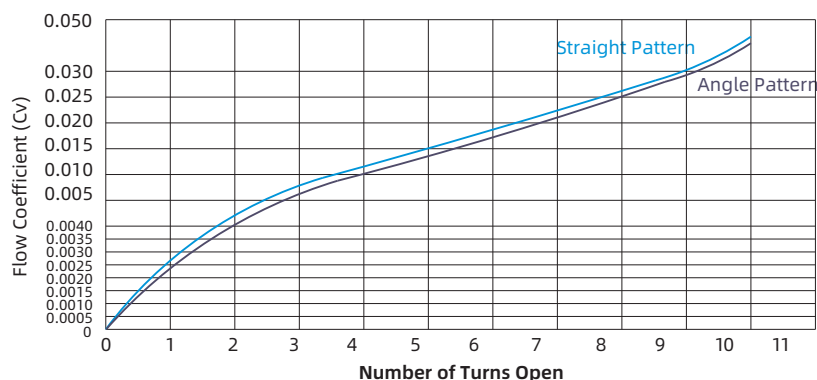


Component		Material Grade / ASTM Specification
		316 S.S.
1	Handle	Anodized aluminum
2	Handle Screw	Black oxide alloy steel / ANSI 18.3
3	Stem	440C S.S. / A276
4	Packing nut	316 S.S. / A276
5	Gland	316 S.S. / A276
6	Packing	PTFE / D1710
7	Panel Nut	316 S.S. / B783
8	Bonnet	316 S.S. / A479
9	Union nut	316 S.S. / A276
10	Body	316 S.S. / A479

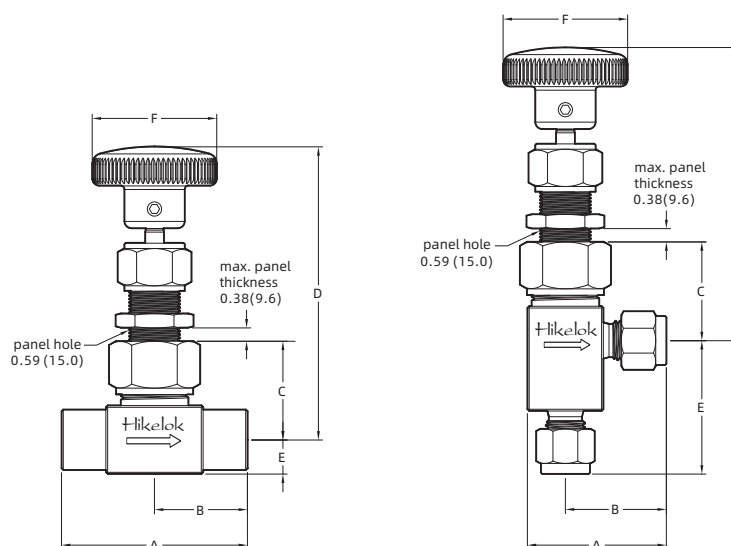
Flow Data at 70°F (20°C)

Pressure Drop to Atmosphere psig (bar)	Air Flow std ft ³ /min (std L/min)	Water Flow U.S. gal/min (L/min)
10 (0.69)	0.45 (12.7)	0.12 (0.45)
50 (3.45)	1.2 (33.9)	0.28 (1.0)
100 (6.90)	2.1 (59.4)	0.40 (1.5)

Flow Coefficient at Turns Open



Dimensions



Basic Ordering Number	Connection Type and Size	Dimension, in. (mm)					
		A	B	C	D	E	F
Straight Pattern							
MV4-F4-	1/4" Hikelok	2.40 (61.0)	1.20 (30.5)	1.09 (27.7)	3.60 (91.4)	0.38 (9.6)	1.38 (35.1)
MV4-M6-	6 mm Hikelok						
MV4-FNPT2-	1/8" Female NPT						
MV4-FNPT4-	1/4" Female NPT						
Angle Pattern							
MV4-F4-	1/4" Hikelok	1.54 (39.1)	1.16 (29.5)	1.09 (27.7)	3.60 (91.4)	1.48 (37.6)	1.38 (35.1)
MV4-M6-	6 mm Hikelok						
MV4-FNPT2-	1/8" Female NPT						
MV4-FNPT4-	1/4" Female NPT						

How to Order

MV4 — NPT4 — M6 — G — A1 — 316

Series	Inlet Type	Inlet Size	Outlet Type	Outlet Size	Packing Material	Flow Pattern	Material
MV4	FNPT Female NPT	1 1/16 in.	Same as inlet type and inlet size		PTFE	Straight	316 316 S.S.
	NPT Male NPT	2 1/8 in.			G Graphite	A1 Angle	316L 316L S.S.
	FBT Female BSPT	3 3 mm	If outlet and inlet are the same, eliminate the outlet designator				304 304 S.S.
	MBT Male BSPT	4 1/4 in.					304L 304L S.S.
	FMS Female Metric	6 3/8 in. or 6 mm					
	MS Male Metric (for BG)	8 1/2 in. or 8 mm					
	FBP Female BSPP	10 10 mm					
	MBP Male BSPP (for BG)	12 3/4 in. or 12 mm					
	F Fractional Tube Fitting						
	M Metric Tube Fitting						
	GFS Male GFS Fitting						