

Bellows-Sealed Metering Valves



BM Series

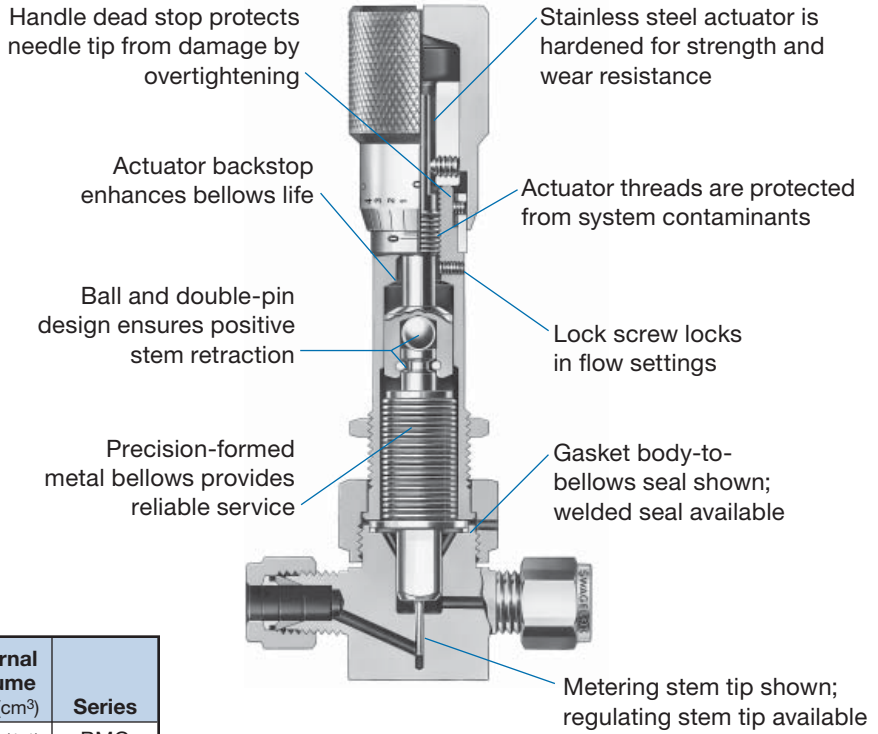
- Micrometer handle for precise, repeatable flow settings
- Working pressures up to 700 psig (48.2 bar)
- Temperatures up to 900°F (482°C)
- 316 stainless steel construction

Features

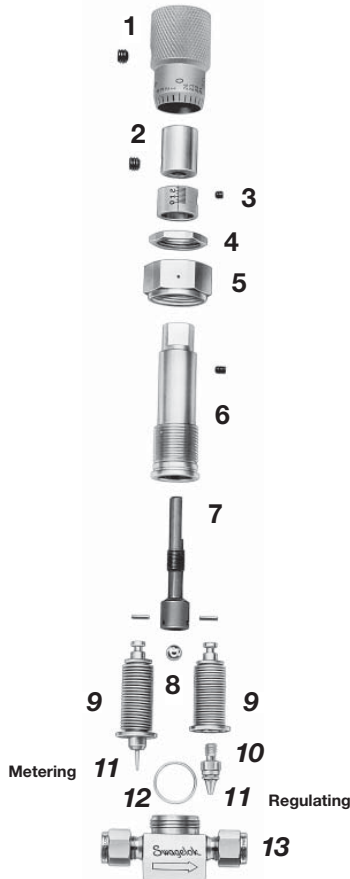
- Flow coefficients:
 - 0.019 with metering stem tip
 - 0.30 with regulating stem tip
- Micrometer handles measure stem position in 0.001 in. (0.025 mm) increments.
- Valves open to maximum flow in six turns.
- Slotted handle tops enable adjustments with a screwdriver.
- Panel and bottom mounting are standard.
- Swagelok® tube fitting, tube socket weld, tube butt weld, and Swagelok VCR® fitting end connections are available.

Technical Data

Body-to-Bellows Seal	Stem Tip	Stem Taper	C _v	Internal Volume in. ³ (cm ³)	Series
Gasket	Metering	3°	0.019	0.07 (1.1)	BMG
	Regulating	20°	0.30	0.11 (1.6)	BMRG
Welded	Metering	3°	0.019	0.07 (1.1)	BMW
	Regulating	20°	0.30	0.11 (1.6)	BMRW



Materials of Construction



Component	Series	Material Grade/ASTM Specification	
1 Handle	All	Silver-mist chrome-plated 316 SS/A582	
		Set screw	Alloy steel/ANSI 18.3
2 Bushing	All	303 SS/A582	
		Set screw	Alloy steel/ANSI 18.3
3 Barrel	All	Silver-mist chrome-plated 316 SS/A582	
		Set screw	Alloy steel/ANSI 18.3
4 Panel mount nut	All	316 SS/B783	
5 Bonnet nut	All	Silver-plated 316 SS/A479	
6 Bonnet	All	316 SS/A479	
		Lock screw	Alloy steel/ANSI 18.3
7 Actuator	All	416 SS/A582	
		Actuator pins	420 SS/A276
8 Bearing	All	420C SS	
9 Stem	All	316 SS/A479	
		Bellows	321 SS/A269
		Weld ring	316 SS/A479
10 Stem adapter	BMRG, BMRW	316 SS/A479	
11 Stem tip	All	Hard chrome-plated 316 SS/A479	
12 Gasket	BMG, BMRG	Silver-plated 316 SS/A580	
13 Body	All	316 SS/A479	
		Lubricants	Molybdenum disulfide-based dry film and paste

Wetted components listed in *italics*.

Pressure-Temperature Ratings

Material	316 SS	
	BMW, BMRW	BMG, BMRG
Series		
Temperature, °F (°C)	Working Pressure, psig (bar)	
-20 (-28) to 100 (37)	700 (48.2)	700 (48.2)
200 (93)	610 (42.0)	610 (42.0)
300 (148)	530 (36.5)	530 (36.5)
400 (204)	450 (31.0)	450 (31.0)
500 (260)	375 (25.8)	375 (25.8)
600 (315)	300 (20.6)	300 (20.6)
650 (343)	260 (17.9)	—
700 (371)	230 (15.8)	—
750 (398)	200 (13.7)	—
800 (426)	160 (11.0)	—
850 (454)	130 (8.9)	—
900 (482)	100 (6.8)	—

Handle Temperature Gradient

When Valve Seat Is	Valve Handle Is
600°F (315°C)	250°F (121°C)
900°F (482°C)	325°F (162°C)

Testing

Every BM series metering valve is helium leak tested to a maximum leak rate of 4×10^{-9} std cm³/s at the envelope and body seal.

Cleaning and Packaging

Swagelok BM series metering valves with VCR end connections are processed in accordance with Swagelok *Special Cleaning and Packaging (SC-11)*, MS-06-63, to ensure compliance with product cleanliness requirements stated in ASTM G93 Level C.

Swagelok BM series metering valves with other end connections are processed in accordance with Swagelok *Standard Cleaning and Packaging (SC-10)*, MS-06-62; special cleaning and packaging are available as an option.

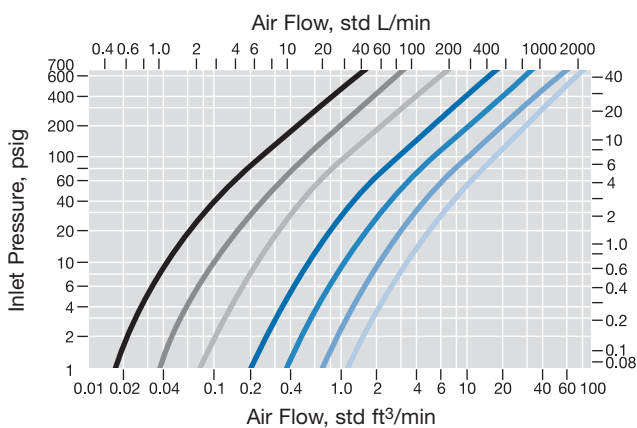
Oxygen Service Hazards

For more information about hazards and risks of oxygen-enriched systems, see the Swagelok *Oxygen System Safety* technical report, MS-06-13.

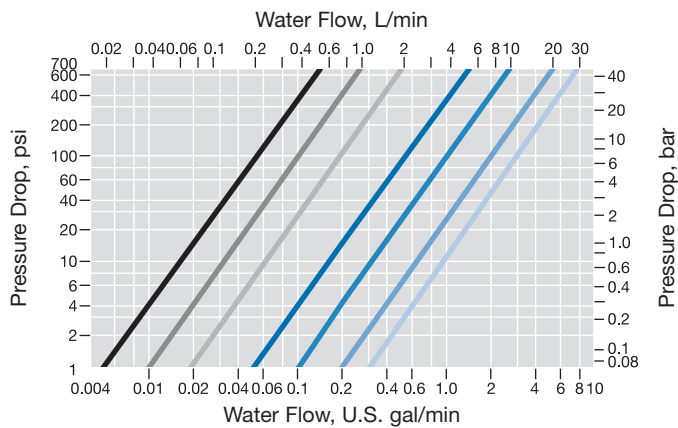
Flow Data at 70°F (20°C)

BMG, BMW C_v — 0.005 — 0.010 — 0.019
 BMRG, BMRW C_v — 0.05 — 0.10 — 0.20 — 0.30

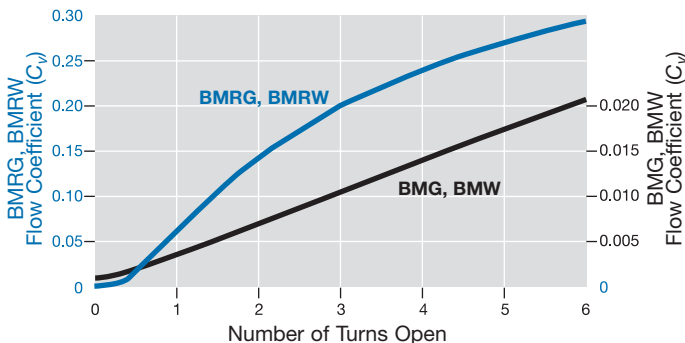
Air



Water



Flow Coefficient at Turns Open



Factory Flow Settings

BMG and BMW Series

With 10 psig (0.68 bar) inlet pressure and the flow rate from 10 to 15 cm³/min, the handle is set at 0. BMG and BMW series valves are not intended for shutoff service.

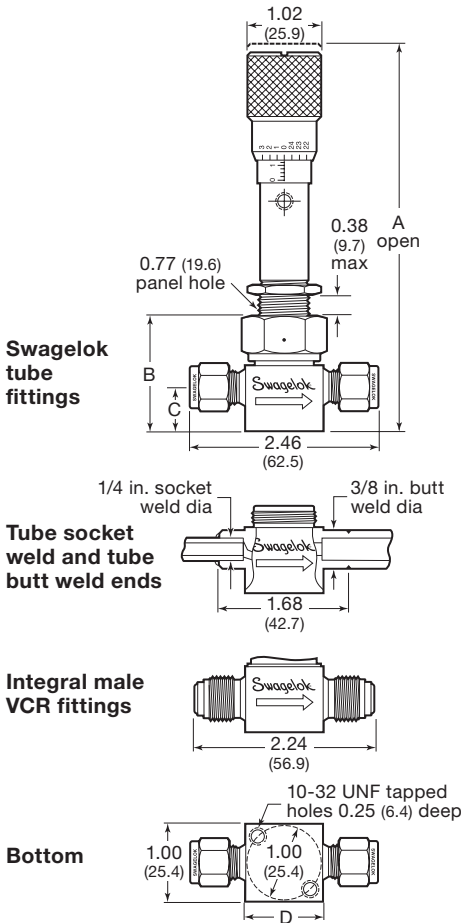
BMRG and BMRW Series

Following a helium leak test and the valve seat to a maximum leak rate of 7×10^{-7} std cm³/s, the handle is set at 0. BMRW series valves are not recommended for shutoff above 600°F (315°C).

Ordering Information and Dimensions

Select an ordering number.

Dimensions, in inches (millimeters), are for reference only and are subject to change.



End Connections		Series	Ordering Number	Dimensions, in. (mm)				
Type	Size			Orifice	A	B	C	D
Fractional Swagelok tube fitting	1/4 in.	BMG	SS-4BMG	0.057 (1.4)	5.24 (133)	1.45 (36.8)	0.56 (14.2)	1.06 (26.9)
		BMRG	SS-4BMRG	0.166 (4.2)	5.22 (133)			
		BMW	SS-4BMW	0.057 (1.4)	5.17 (131)	1.42 (36.1)		
		BMRW	SS-4BMRW	0.166 (4.2)	5.15 (131)			
Metric Swagelok tube fitting	6 mm	BMG	SS-6BMG-MM	0.057 (1.4)	5.24 (133)	1.45 (36.8)	0.56 (14.2)	1.06 (26.9)
		BMRG	SS-6BMRG-MM	0.166 (4.2)	5.22 (133)			
		BMW	SS-6BMW-MM	0.057 (1.4)	5.17 (131)	1.42 (36.1)		
		BMRW	SS-6BMRW-MM	0.166 (4.2)	5.15 (131)			
Tube socket and tube butt weld	1/4 in. and 3/8 in.	BMG	SS-4BMG-TW	0.057 (1.4)	5.24 (133)	1.45 (36.8)	0.56 (14.2)	1.00 (25.4)
		BMRG	SS-4BMRG-TW	0.166 (4.2)	5.22 (133)			
		BMW	SS-4BMW-TW	0.057 (1.4)	5.17 (131)	1.42 (36.1)		
		BMRW	SS-4BMRW-TW	0.166 (4.2)	5.15 (131)			
Integral male VCR fitting	1/4 in.	BMG	SS-4BMG-VCR	0.057 (1.4)	5.24 (133)	1.45 (36.8)	0.44 (11.2)	1.00 (25.4)
		BMRG	SS-4BMRG-VCR	0.166 (4.2)	5.22 (133)			
		BMW	SS-4BMW-VCR	0.057 (1.4)	5.17 (131)	1.42 (36.1)		
		BMRW	SS-4BMRW-VCR	0.166 (4.2)	5.15 (131)			

Dimensions shown with Swagelok tube fitting nuts finger-tight.

Special Cleaning and Packaging (SC-11)

Swagelok BM series metering valves with VCR end connections are processed in accordance with Swagelok *Special Cleaning and Packaging (SC-11)*, MS-06-63, to ensure compliance with product cleanliness requirements stated in ASTM G93 Level C.

To order special cleaning and packaging for BM series valves with other end connections, add **-SC11** to the valve ordering number.

Example: SS-4BMG-**SC11**

Welded Female VCR Face Seal Fittings

- Factory welded to valves with tube butt weld end connections
 - 316 SS fittings on stainless steel valves
- To order, add a designator to the ordering number for a valve with fractional Swagelok tube fitting end connections.

Fitting Size	Designator	Overall Length in. (mm)
1/4 in.	-V51	2.76 (70.1)
1/2 in.	-V16	4.60 (117)

Example: SS-4BMG-**V51**

Special Alloys

Many BM series valves are available in brass and alloy 400 materials. BMW and BMRW series valves are not available in brass. Contact your authorized Swagelok sales and service representative for more information.

Maintenance Kits

Bellows, stem tip/adaptor, and gasket kits are available for BMG and BMRG series valves. See the Swagelok *Bellows-Sealed Valve Maintenance Kits* catalog, MS-02-66.

Safe Product Selection

When selecting a product, the total system design must be considered to ensure safe, trouble-free performance. Function, material compatibility, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system designer and user.

Caution: Do not mix or interchange parts with those of other manufacturers.

Warranty Information

Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit swagelok.com or contact your authorized Swagelok representative.