

[®]
MAC

V A L V E S



Liquid Bullet Valve[®]

- ✓ Lasts longer and performs stronger in the toughest applications
- ✓ Fewer wear points than traditional valve technology
- ✓ Quiet operation
- ✓ Highly customizable
- ✓ Higher flow in a smaller footprint



®

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V A L V E S

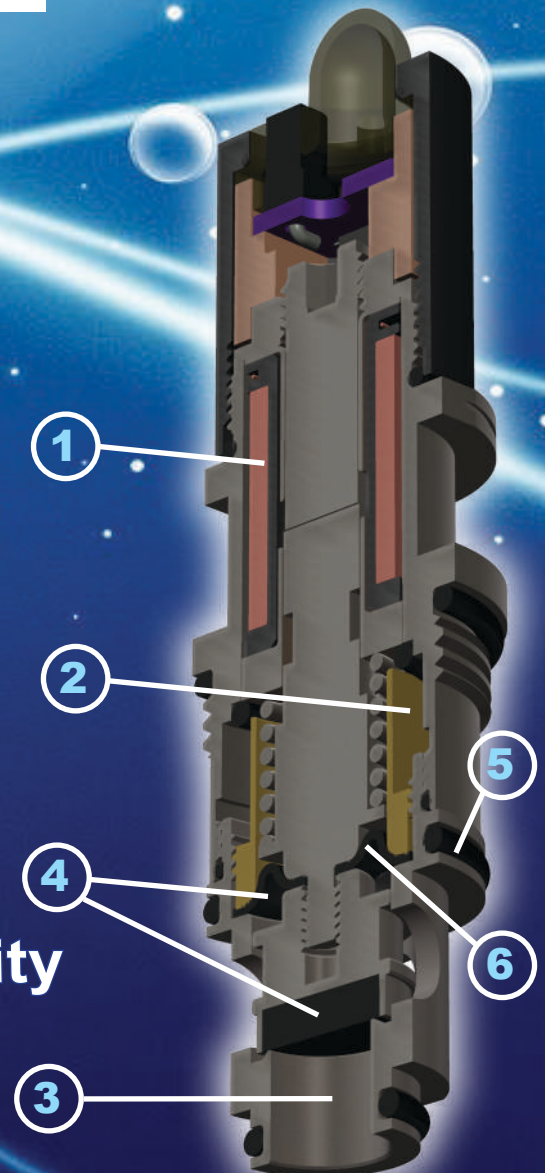
Technical Data

Configurations:	2-way & 3-way radial and axial flow
Solenoid setup:	Wetted or non-wetted ¹
Voltage:	5, 12, 24 VDC most common
Wattage:	Variable-depending on requirements
Flow:	Single digit µL per pulse up to 4 GPM
Pressure:	Vac-200 PSI
Valve body components:	Nickel plated brass, stainless, plastics (various grades and types)
Rubber components:	FKM, FFKM, Nitrile, HSN, HNBR and various FDA/NSF compliant versions
Manifold configurations:	Single station and custom manifold designs

¹ Other voltage and wattages available upon request² Seal compatibility testing may be required

Liquid Bullet Valve®

1. Fast response times
2. Reliable shifting forces
3. Repeatable doses
4. Dependable, leak-tight performance
5. Air and liquid compatibility
6. D-Flex™ technology





LBV Single Diaphragm for Liquid Applications

MAC Valves Series Liquid Bullet Valve®

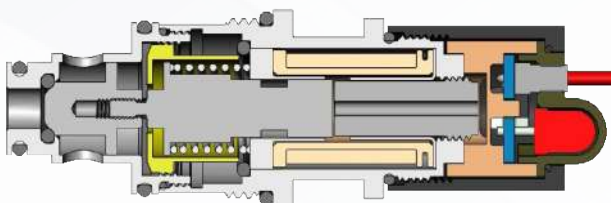
- Virtually no dead space
- Use when there is consistent pressure
- Balanced inlet
- Good for applications flowing to atmosphere
- 0-80 PSI pressure range
- Liquids or gases
- Variety of metals
- Variety of rubber – no poppet bonding required
- 2-way only
- Accurate, precise & repeatable



TECHNICAL DATA

Wattage (W)	1.8 – 16.0
Pressure (psi)	0 – 80
Air flow (Cv)	Up to 0.15
Liquid flow (G/min)	Up to 1.35

LBV SINGLE DIAPHRAGM CUTAWAY



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OPERATIONAL BENEFITS

- ✓ Extreme repeatability from cycle to cycle
- ✓ Leak tight performance
- ✓ Fast response times
- ✓ Balanced inlet design
- ✓ High resistance to contamination
- ✓ Low friction design
- ✓ Axial flow design
- ✓ Media Separated Solenoid
- ✓ Compact size for better integration
- ✓ Drop-in solution manifolds
- ✓ Adaptable for different liquids
- ✓ Different body materials available
- ✓ Optional food grade modifications

APPLICATIONS / MEDIA

- ✓ Food/Beverage – syrup/water
- ✓ Medical – aggressive medias that require FFKM rubber and PEEK plastics

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LBV Double Diaphragm for Liquid Applications

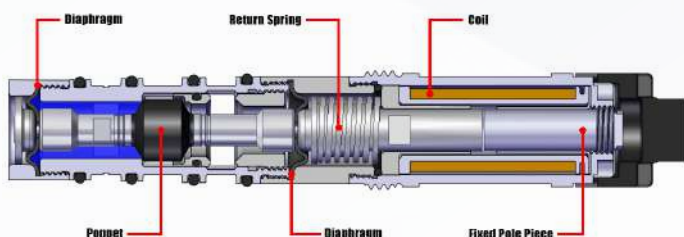
MAC Valves Series Liquid Bullet Valve®

- Balanced Design
- 0-120 PSI pressure range (200 with mod on some series)
- Good for applications with a varying pressures
- Liquids or gases
- Variety of metals, plastics and rubbers
- 3 way, 2 way
- Extremely accurate liquid dispensing
- Different flows available
- Compatible with different kind of gases and liquids



Liquid Bullet Valve® Double Diaphragm

LBV DOUBLE DIAPHRAGM CUTAWAY



OPERATIONAL BENEFITS

- ✓ Short stroke with high shifting forces
- ✓ Balanced poppet, immune to pressure fluctuations
- ✓ Extremely repeatable
- ✓ Solenoid isolated from wetted area
- ✓ Innovative design with very few parts
- ✓ Extremely long life
- ✓ Unique mounting - no fasteners or screws required
- ✓ Low power solutions available
- ✓ Plastic bodies and bases available
- ✓ Custom manifold designs

APPLICATIONS / MEDIA

- ✓ Medical - Dialysis
- ✓ Printing - Ink
- ✓ Test Equipment - Gases
- ✓ Food & Beverage - Water/CO2
- ✓ Agriculture - Water / Fertilizer
- ✓ And Many Others

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High Precision LBV Double Diaphragm for Liquid Applications

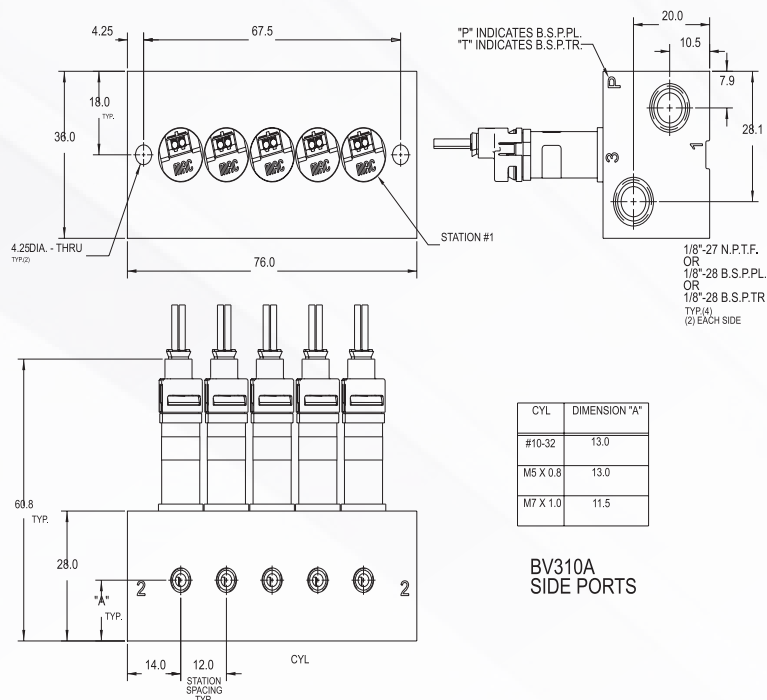
MAC Valves Series Liquid Bullet Valve®

TECHNICAL DATA

	BVX10	BVX14	BVX21
Wattage (W)	1.8 - 16	1.8 - 16	1.8 - 16
Pressure (PSI)	0 - 120	0 - 120	0 - 120
Air flow (Cv)	Up to 0.15	Up to 0.4	Up to 1.0
Liquid flow (G/min)	0 - 1.30	0 - 3.0	0 - 5.0
Fluid:	Compressed air, vacuum, gases, fluids		

DIMENSIONS

All Dimensions are metric



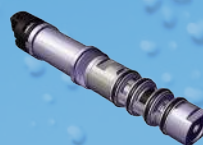
CYL	DIMENSION "A"
#10-32	13.0
M5 X 0.8	13.0
M7 X 1.0	11.5

BV310A
SIDE PORTS

MAC VALVES SOLUTIONS - HOW TO ORDER

According to your application requirements, your distributor will help you select the appropriate valve to meet your needs. Very high flexibility in manifold footprint.

CHECK OUT OUR LBV
PLAYLIST ON YOUTUBE !



3500 factory certified specialists in over 45 countries focused on optimizing customers needs

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LBV No Diaphragm for Liquid Applications

MAC Valves Series Liquid Bullet Valve®

- Good for passing contamination
- Excellent dosing capabilities
- Virtually zero dead space
- 2 way NC or NO
- Liquids or gases
- Variety of metals
- Variety of rubber
- 1.75 mm, 2.25 mm and other bore sizes options
- Accurate, precise & repeatable



TECHNICAL DATA

Bore Size (mm)	1.75 Dia.	2.25 Dia.
Pressure range (psi)	0-50	0-40
Wattage (W)	1.8-16	1.8-16
Liquid flow (G/min)	Up to 0.65	Up to 0.65

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OPERATIONAL BENEFITS

- ✓ Extreme repeatability from cycle to cycle
- ✓ Leak tight performance
- ✓ Fast response times
- ✓ High resistance to contamination
- ✓ Low friction design
- ✓ Axial flow
- ✓ Compact size for better integration
- ✓ Drop-in solution
- ✓ Adaptable for different fluids
- ✓ Different body materials available
- ✓ Optional food grade modifications

APPLICATIONS / MEDIA

- ✓ Spray Dampening - water
- ✓ Food & Beverage - water
- ✓ Medical - microdosing
- ✓ Medical - liquid/gas

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Liquid Proportional Flow Control for Liquid Applications

MAC Valves Series PFC

THE PRECISION OF STEPPER MOTOR TECHNOLOGY



- High precision
- Accurate response times
- Low hysteresis



THE POWER OF THE LIQUID BULLET VALVE®



- High repeatability
- Accurate response times
- High flow flexibility
- Wide range of gases & liquids
- Low leak performance

**HIGH PRECISION LIQUID
PROPORTIONAL FLOW CONTROL**

FEATURES

- ✓ 2 and 3-way functions
- ✓ Liquids or gases
- ✓ Diaphragm & D-seal configurations
- ✓ Various Motor Sizes
- ✓ Nema 8 (20mm x 20mm)
- ✓ Nema 14 (35 mm x 35 mm)
- ✓ MAC PCB driver power: 24 VDC
- ✓ Command signals: 4-20 mA or 0-10 VDC
- ✓ BVX10, BVX14, BVX21

BENEFITS OF PFC IN LIQUID DISPENSING ALREADY USED IN THE INDUSTRY

- ✓ Customized calibration available with optional driver circuit
- ✓ Very high flexibility in manifold footprint
- ✓ Optional food grade modification
- ✓ Small size for better integration
- ✓ Drop-in solution

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Liquid Proportional Flow Control for Liquid Applications

MAC Valves Series PFC

TECHNICAL DATA

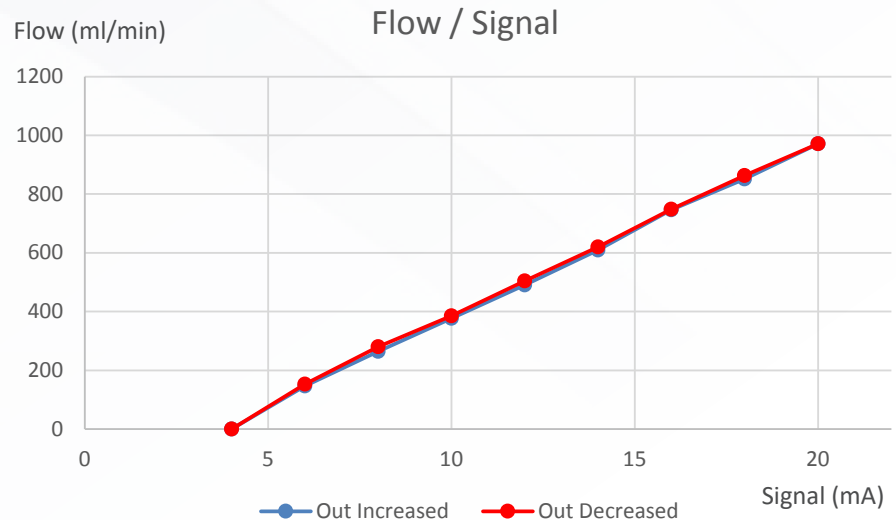
Function:	2-way and 3-way
Type:	Cartridge style
Command:	4 to 20 mA - 0 to 10 VDC (with optional driver circuit)
Manifold mounting:	Very flexible cartridge style
Media:	Liquids / fluids D-Flex™ (MAC patented diaphragm technology)

Stepper motor quickly and precisely controls fluid flow through the Bullet Valve® maintaining application requirements.

MAC PROPORTIONAL FLOW CONTROL - LINEARITY

The very low hysteresis cycle of the MAC PFC guarantees a constant flow through the PFC for opening or closing signal.

Signal	ml / min at 29 PSI	
	Out incr.	Out decr.
4	0	0
6	146.4	153.4
8	264.6	280.2
10	377	385.4
12	490.8	504.2
14	609.8	620.4
16	746.4	748
18	851.2	863.2
20	971.8	



Note: Above values result from trials and are for illustration purposes only - Flow and calibration can be adapted to customer requirements.

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Bullet Valve® Pump for Medical Applications

MAC Valves Bullet Valve® Pump

- Fixed dosing volume
- High frequency
- Fast response time
- Repeatability from cycle to cycle
- Adaptable for different liquid compositions
- Self priming
- Inline or base mount
- BV14 & BV21 Size coils & diaphragms
- Variety of metals / plastic & rubber compounds
- Liquid or gas



MAC Bullet Valve Pump Patent Pending

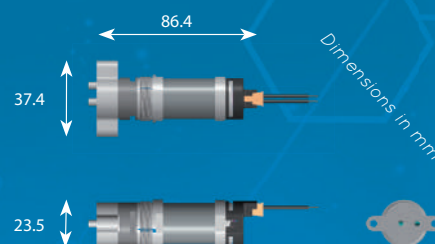


BULLET VALVE PUMP SPECS.

Wattage:	1.0 – 16.0
Suction Pressure:	Up to 0.25 Bar (air)
Output Pressure:	Up to 0.35 Bar (air), up to 0.8 Bar (water)
Flow:	Up to 100 ml/min (water)
Accuracy:	3%

* The above mentioned data are based on the test of a new valve as per the conditions described in the MAC Valves test procedures, assembly instructions and modification

DIMENSIONAL DRAWING (BV21 size shown)



MATERIAL

Body	
Brass	316 Stainless Steel
Nickel Plated Brass	Delrin
303 Stainless Steel	PEEK (FDA & NSF)

Rubber	
Nitrile (FDA Nitrile)	EPDM
Silicone (FDA)	Aflas
FKM (Viton, Viton ETP, FDA Grade)	FFKM

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LBV Flow Thru for Liquid Applications

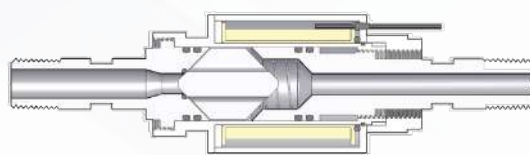
MAC Valves Series Liquid Bullet Valve®

- Large flow ranges
- Minimize Foam at output
- Laminar flow
- Perfect solution for filling applications (Beer or soft drinks)
- Removable parts for ease of cleaning (some models)
- Variety of rubber seals
- Great for direct filling applications
- Good for gravity fill



TECHNICAL DATA

Liquid flow (G/min)	Up to 3.7
Pressure (psi)	Gravity - 50
Wattage (W)	10 - 80 Watts w/ PWM



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OPERATIONAL BENEFITS

- ✓ Extreme repeatability from cycle to cycle
- ✓ Leak tight performance
- ✓ Fast response times
- ✓ High resistance to contamination
- ✓ Low friction design
- ✓ Axial flow
- ✓ Compact size for better integration
- ✓ Adaptable for different fluids

APPLICATIONS / MEDIA

- ✓ Food & Beverage - Water
- ✓ Food & Beverage - Carbonated beverages
- ✓ Applications where foaming is an issue with traditional right angle flow paths

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