

# MAC BULLET VALVE

The Bullet Valve® (BV) represents yet another evolution in air valve technology from MAC. Very few parts, long life, lifting solenoid, one piece poppet/armature, balanced design, solenoid isolated from contaminated air, & unique mounting.

Patents and Patents Pending

## BULLET VALVE

BV09, BV10, BV14, BV21 SERIES (Cv from 0.07)



**BV209**

9mm - 2-Way, Cartridge Style  
- 0.07Cv



**BV210**

10mm - 2-Way, Axial Cartridge Style  
- 0.08Cv



**BV314**

14mm - 3-Way, Universal Cartridge Style  
- 0.24Cv



**BV21**

21mm - 2-Way, Cartridge Style  
- 1.0Cv



**LIQUID BULLET VALVE**

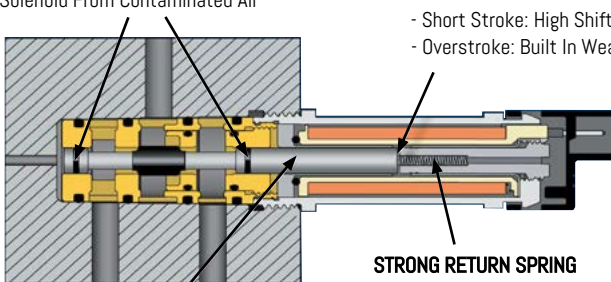
The Bullet Valve® (BV) represents yet another evolution in air valve technology from MAC. The Bullet Valve utilizes "lifting" solenoid technology. The MAC "lifting" configuration is unique, however, in that the valve maintains a balanced design – a signature feature of a MAC valve – shifting forces are consistently high and response times are repeatable regardless of inlet pressure fluctuations. 2-way and 3-way configurations of the BV cartridge (9mm, 10mm, 14mm, and 21mm) are available.

### D-SEAL TECHNOLOGY

- Minimum Friction
- Wiping Action
- Isolates Solenoid From Contaminated Air

### LONG LIFE LIFTING SOLENOID

- Short Stroke: High Shifting Forces (Energised)
- Overstroke: Built In Wear Compensation



### STRONG RETURN SPRING

- High Shifting Forces (De-energized)

### ONE PIECE POPPET/ARMATURE

- Balanced & Repeatable
- Cushioning - Alleviates Solenoid Wear



- SMALL 3-WAY
- LARGE 3-WAY
- SMALL 4-WAY
- LARGE 4-WAY
- ISO VALVES
- PPC VALVES
- PULSE VALVES
- BULLET VALVES

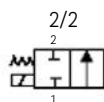
# BV09 - 9mm BULLET VALVE

The BV09 represents yet another evolution in air valve technology from MAC. The Bullet Valve® utilizes “lifting” solenoid technology. The MAC “lifting” configuration is unique, however, in that the valve maintains a balanced design – a signature feature of a MAC valve – shifting forces are consistently high and response times are repeatable regardless of inlet pressure fluctuations. 2-way and 3-way configurations of the BV09 cartridge are available.

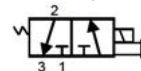
Function	Flow [max]	Manifold mounting	Series
2/2, 3/2 N.C., Universal	Up to 0.07 Cv	Cartridge	BV209A, BV309A

## OPERATIONAL BENEFITS

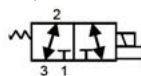
- Short stroke with high shifting forces
- Balanced poppet, immune to pressure fluctuations
- Precise repeatability
- Solenoid isolated from contaminated air
- Very few parts
- Extremely long life
- Unique mounting - no fasteners or screws required



3/2 Normally Closed



3/2 Universal



BV309

3-Way, Universal, Cartridge Style  
- 0.07Cv

## 2&3-Way BV209A 9mm BULLET VALVE

BV209A - C X 1 - 00 - X XX X - X XX

1
2
3
4
5
6

### 1 - Spool Type

A 2-Way      C 3-Way N.C.      D 3-Way Universal

### 2 - Solenoid

B Round

### 3 - Voltage

#### 2-Way

GC 24VDC (2.5W)      GE 24VDC (4.0W)  
GH 12VDC (2.5W)      GK 12VDC (4.0W)

#### 3-Way

GA 24VDC (1.0W)      GB 24VDC (1.8W)  
GC 24VDC (2.5W)      GD 24VDC (3.0W)  
GE 24VDC (4.0W)      GF 12VDC (1.0W)  
GG 12VDC (1.8W)      GH 12VDC (2.5W)  
GJ 12VDC (3.0W)      GK 12VDC (4.0W)

### 4 - Lead Length Options

O No Leads      A 18"      B 24"      C 36"  
D 48"      E 72"      F 96"      H 144"

### 5 - Solenoid Can (Round)

C For Top Cover Option and Can w/ Outer Threads

### 6 - Solenoid Cover

JST Pico Flying Leads

JST	Pico	Flying Leads	
TA		BA	No ground wire
TC	PC	BC	Blocking & suppr. diode & LED (no ground)
TE	PE	BE	Blocking & suppr. diode (no ground)
TG	PG	BG	LED (no ground)
TJ	PJ	BJ	MOV (no ground)
TL	PL	BL	LED & MOV (no ground)
	PN		Transfer Board

Note: Pico covers PC-PL have a 3rd pin which is an isolation pin



BV309

3-Way, Manifold Mount, POP with  
BV309 Pilot - 0.25Cv



BV309

4-Way, Manifold Mount, BV309  
Pilot Operated. Paintball Industry

### Modifications

MOD L001 Low Leak Mod for Diaphragm Valve (09 & 10 only)

### How To Order Circuit Bar

Port size	Spacing	Side Cylinder Port	
#10-32 UNF	11mm	*CCMV09A-00AAA-XX	**CCMV09A-00ABA-XX
M5	11mm	*CCMV09A-00AAB-XX	**CCMV09A-00ABB-XX
M7	11mm	*CCMV09A-00AAC-XX	**CCMV09A-00ABC-XX

\* - 2-Way

\*\* - 3-Way

XX = Number of stations

Note: for valves mounted to bar at factory, add -9 to model number.



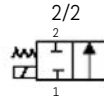
# BV10 - 10mm BULLET VALVE

The BV10 represents yet another evolution in air valve technology from MAC. The Bullet Valve® utilizes "lifting" solenoid technology. The MAC "lifting" configuration is unique, however, in that the valve maintains a balanced design – a signature feature of a MAC valve – shifting forces are consistently high and response times are repeatable regardless of inlet pressure fluctuations. 2-way and 3-way configurations of the BV10 cartridge are available.

Function	Flow [max]	Manifold mounting	Series
2/2	Up to 0.08 Cv	Cartridge	BV210A
3/2 N.C. or Universal	Up to 0.09 Cv	Manifold Mount - Non plug-in	BV310A

### OPERATIONAL BENEFITS

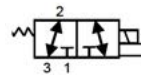
- Short stroke with high shifting forces
- Balanced poppet, immune to pressure fluctuations
- Precise repeatability
- Solenoid isolated from contaminated air
- Very few parts
- Extremely long life
- Unique mounting - no fasteners or screws required



3/2 Normally Closed



3/2 Universal



EBA-BV042 BV210

Axial 2-Way, Cartridge Style  
- 0.08Cv

## 2-Way BV210A 10mm BULLET VALVE

BV210A - C XX - 00 - X XX X - X XX  
                   1          2 3 4 5 6

### 1 - Spool Type

A1 2-Way(Standard)      B0 2-Way(Axial Flow)

### 2 - Base Type

B Round

### 3 - Voltage

EH 24 VDC (2.5w)      EG 24 VDC (4.0w)  
 EK 12 VDC (2.5w)      EJ 12 VDC (4.0w)

### 4 - Lead Length Options

0 No Leads    A 18"    B 24"    C 36"  
 D 48"    E 72"    F 96"    H 144"

### 5 - Solenoid Can (round)

C For Top Cover Option and Can w/ Outer Threads

### 6 - Solenoid Cover

JST	Pico	Flying Leads	
TA		BA	No ground wire
TC	PC	BC	Blocking & suppr. diode & LED (no ground)
TE	PE	BE	Blocking & suppr. diode (no ground)
TG	PG	BG	LED (no ground)
TJ	PJ	BJ	MOV (no ground)
TL	PL	BL	LED & MOV (no ground)
	PN		Transfer Board

Note: Pico covers PC-PL have a 3rd pin which is an isolation pin

### Modifications

MOD L001 Low Leak Mod for Diaphragm Valve (09 & 10 only)



BV210

2-Way, Cartridge Style - 0.08Cv



BV210

2-Way, Axial Cartridge Style - 0.08Cv

### How To Order Circuit Bar

#### 2-Way - Standard

Port size	Spacing	Cylinder Port	
#10-32 UNF	12mm	*CCMV10A-00AAA-XX	**CCMV10A-00ABA-XX
M5	12mm	*CCMV10A-00AAB-XX	**CCMV10A-00ABB-XX
M7	12mm	*CCMV10A-00AAC-XX	**CCMV10A-00ABC-XX

#### 2-Way - Axial Flow

#10-32 UNF	12mm	**CCMV10A-00BDA-XX
M5	12mm	**CCMV10A-00BDB-XX
M7	12mm	**CCMV10A-00BDC-XX

\* - Side Cylinder Port

\*\* - Bottom Cylinder Port

XX = Number of stations

Note: for valves mounted to bar at factory, add -9 to model number.

### 3-Way BV310A 10mm BULLET VALVE

BV310A - C<sup>1</sup> - 00 - X<sup>2</sup> X<sup>3</sup> X<sup>4</sup> - X<sup>5</sup> X<sup>6</sup>

1
2
3
4
5
6

#### 1 - Spool Type

C 3-Way Normally Closed    D 3-Way Universal

#### 2 - Solenoid

B Round

#### 3 - Voltage

HA 24VDC (1.0W)	HB 24VDC (1.8W)	HC 24VDC (2.5W)
HD 24VDC (3.0W)	HE 24VDC (4.0W)	HF 12VDC (1.0W)
HG 12VDC (1.8W)	HH 12VDC (2.5W)	HJ 12VDC (3.0W)
HK 12VDC (4.0W)		

#### 4 - Lead Length Options

O No Leads	A 18"	B 24"	C 36"
D 48"	E 72"	F 96"	H 144"

#### 5 - Solenoid Can (round)

C For Top Cover Option and Can w/ Outer Threads

#### 6 - Solenoid Cover

JST	Pico	Flying Leads	
TA		BA	No ground wire
TC	PC	BC	Blocking & suppr. diode & LED (no ground)
TE	PE	BE	Blocking & suppr. diode (no ground)
TG	PG	BG	LED (no ground)
TJ	PJ	BJ	MOV (no ground)
TL	PL	BL	LED & MOV (no ground)
	PN		Transfer Board

Note: Pico covers PC-PL have a 3rd pin which is an isolation pin

### 3-Way BV310A 10mm MANIFOLD MOUNT - NON PLUG-IN

BV310A - L<sup>1</sup> - 00 - X<sup>2</sup> X<sup>3</sup> X<sup>4</sup> - X<sup>5</sup> X<sup>6</sup>

1
2
3
4
5
6

#### 1 - Spool Type

C 3-Way Normally Closed    D 3-Way Universal

#### 2 - Solenoid

B Round

#### 3 - Voltage

HA 24VDC (1.0W)	HB 24VDC (1.8W)	HC 24VDC (2.5W)
HD 24VDC (3.0W)	HE 24VDC (4.0W)	HF 12VDC (1.0W)
HG 12VDC (1.8W)	HH 12VDC (2.5W)	HJ 12VDC (3.0W)
HK 12VDC (4.0W)		

#### 4 - Lead Length Options

O No Leads	A 18"	B 24"	C 36"
D 48"	E 72"	F 96"	H 144"

#### 5 - Solenoid Can (round)

B Cover for manifold body

#### 6 - Solenoid Cover

JST	Pico	Flying Leads	
TA		BA	No ground wire
TC	PC	BC	Blocking & suppr. diode & LED (no ground)
TE	PE	BE	Blocking & suppr. diode (no ground)
TG	PG	BG	LED (no ground)
TJ	PJ	BJ	MOV (no ground)
TL	PL	BL	LED & MOV (no ground)
	PN		Transfer Board

Note: Pico covers PC-PL have a 3rd pin which is an isolation pin



BV310  
3-Way, Normally Closed  
Cartridge Style - 0.08Cv



BV310  
3-Way, Axial Inlet Direction  
Operation - 0.08Cv

#### Modifications

MOD L001 Low Leak Mod for Diaphragm Valve (09 & 10 only)

#### How To Order Circuit Bar

Port size	Spacing	Cylinder Port
#10-32 UNF	12mm	*CVMV10A-00ABA-XX
M5	12mm	*CVMV10A-00ABB-XX
M7	12mm	*CVMV10A-00ABC-XX

\* - Side Cylinder Port

XX = Number of stations

Note: for valves mounted to bar at factory, add -9 to model number.

\* High wattage configurations require intermittent duty cycles.

\*\* ERC - Energy Reduction Circuitry - Reduces the effective wattage at continuous duty



BV310  
3-Way, Manifold Mount,  
Non Plug-In - 0.08Cv



BV310  
3-Way, Universal Manifold  
Mount - 0.08Cv

#### How To Order Non Plug-In Circuit Bar

##### 2-Way - Standard

Port size	Spacing	Cylinder Port	Cylinder Port
#10-32 UNF	12mm	*CBMV10A-00ABA-XX	**CBMV10A-00BBA-XX
M5	12mm	*CBMV10A-00ABB-XX	**CBMV10A-00BBB-XX
M7	12mm	*CBMV10A-00ABC-XX	**CBMV10A-00BBC-XX

\* - Side Cylinder Port

\*\* - Bottom Cylinder Port

XX = Number of stations

Note: for valves mounted to bar at factory, add -9 to model number.

#### Options

**BV310A - LC1-00-XXXX-XXX:** Replace "1" with "0" for no manual operator

How to order bar configured for regulator:

**CBMV10A-00ABB-XX:** Replace with D for regulator - Side ports

Replace with E for regulator - Bottom ports



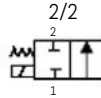
# BV14 - 14mm BULLET VALVE

The BV14 represents yet another evolution in air valve technology from MAC. The Bullet Valve® utilizes "lifting" solenoid technology. The MAC "lifting" configuration is unique, however, in that the valve maintains a balanced design – a signature feature of a MAC valve – shifting forces are consistently high and response times are repeatable regardless of inlet pressure fluctuations. 2-way and 3-way configurations of the BV14 cartridge are available.

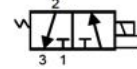
Function	Flow [max]	Manifold mounting	Series
2/2, 3/2 N.C., Universal	Up to 0.24Cv	Cartridge	BV214, BV314

### OPERATIONAL BENEFITS

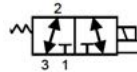
- 2-Way (BV214) & 3-Way (BV314) configurations available
- Very few parts
- Long life lifting solenoid
- One piece poppet / armature
- Balanced Design
- Solenoid isolated from contaminated air
- Unique mounting



3/2 Normally Closed



3/2 Universal



BV314

3-Way, Universal Cartridge Style  
- 0.24Cv

### 2-Way 14mm Bullet Valve

BV214A - C X 1 - 00 - B XX X - X XX  
                   1                  2 3 4 5 6

#### 1 - Spool Type

A 2-Way (Standard)      B 2-Way (Axial Flow)

#### 2 - Solenoid

B Round

#### 3 - Voltage

2-Way

EH 24 VDC (2.5w)      EG 24 VDC (4.0w)  
 EK 12 VDC (2.5w)      EJ 12 VDC (4.0w)

#### 4 - Lead Length Options

O No Leads      A 18"      B 24"      C 36"  
 D 48"      E 72"      F 96"      H 144"

#### 5 - Solenoid Can (round)

C For Top Cover Option and Can with Outer Threads

#### 6 - Solenoid Cover

JST	Pico	Flying Leads	
TA		BA	No ground wire
TC	PC	BC	Blocking & suppr. diode & LED (no ground)
TE	PE	BE	Blocking & suppr. diode (no ground)
TG	PG	BG	LED (no ground)
TJ	PJ	BJ	MOV (no ground)
TL	PL	BL	LED & MOV (no ground)
	PN		Transfer Board
		†GA	MAC JAC Connector

Note: Pico covers PC-PL have a 3rd Pin which  
 † Requires special spacing - consult MVP

#### Modifications

MOD L001 Low Leak Mod for Diaphragm Valve (09 & 10 only)



BV214

2-Way, Cartridge Style - 0.08Cv



BV214

2-Way, Normally Closed, Plastic  
Cartridge Style - 0.24Cv

#### How To Order Circuit Bar

##### Standard 2-Way

Port Size	Spacing	Cylinder Port	
M7	17mm	*CCMV14A-00AAA-XX	**CCMV14A-00BAA-XX
1/8"	17mm	*CCMV14A-00AAB-XX	**CCMV14A-00BAB-XX
5/32"***	17mm	*CCMV14A-00AAC-XX	**CCMV14A-00BAC-XX

##### Axial Flow 2-Way

M7	17mm	**CCMV14A-00BDA-XX
1/8"	17mm	**CCMV14A-00BDB-XX

\* - Side Cylinder Port      \*\* - Bottom Cylinder Port

XX = Number of stations

Note: For valves mounted to bar at factory, add -9 to model number.  
 Common inlet & exhaust are 1/4" NPTF. For BSPPL or BSPTR threads consult MVP



BVP214

2-Way, Normally Closed or Normally  
Open, Plastic Cartridge Body - 0.4Cv

SMALL  
3-WAY

LARGE  
3-WAY

SMALL  
4-WAY

LARGE  
4-WAY

ISO  
VALVES

PPC  
VALVES

PULSE  
VALVES

BULLET  
VALVES

### 3-WAY 14mm Bullet Valve

BV314A - C<sup>X</sup>1 - 00 - X<sup>XX</sup>X<sup>X</sup> - X<sup>XX</sup>

1
2
3
4
5
6

#### 1 - Spool Type

C 3-Way Normally Closed    D 3-Way Universal

#### 2 - Solenoid

B Round

#### 3 - Voltage

HA 24VDC (1.0W)	HB 24VDC (1.8W)
HC 24VDC (2.5W)	HD 24VDC (3.0W)
HE 24VDC (4.0W)	HF 12VDC (1.0W)
HG 12VDC (1.8W)	HH 12VDC (2.5W)
HJ 12VDC (3.0W)	HK 12VDC (4.0W)

#### 4 - Lead Length Options

O No Leads	A 18"	B 24"	C 36"
D 48"	E 72"	F 96"	H 144"

#### 5 - Solenoid Can (round)

C For Top Cover Option and Can w/ Outer Threads

#### 6 - Solenoid Cover

JST	Pico	Flying Leads	
TA		BA	No ground wire
TC	PC	BC	Blocking & suppr. diode & LED (no ground)
TE	PE	BE	Blocking & suppr. diode (no ground)
TG	PG	BG	LED (no ground)
TJ	PJ	BJ	MOV (no ground)
TL	PL	BL	LED & MOV (no ground)
	PN		Transfer Board
	†GA		MAC JAC Connector

Note: Pico covers PC-PL have a 3rd Pin which  
 † Requires special spacing - consult MVP



BV314

3-Way, Conveyer Ind. - 0.24Cv



BV314

3-Way, Manifold Mount,  
Non Plug-In - 0.24Cv

#### Modifications

MOD L001 Low Leak Mod for Diaphragm Valve (09 & 10 only)

#### How To Order Circuit Bar






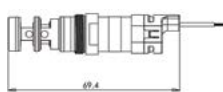
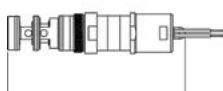
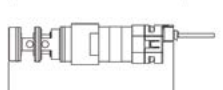
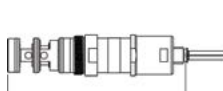

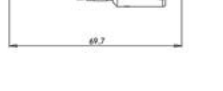
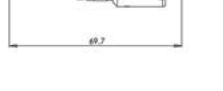
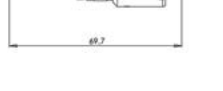
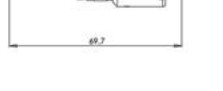


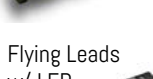


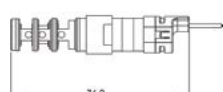
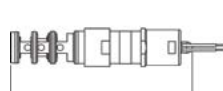

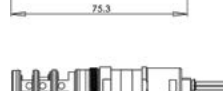
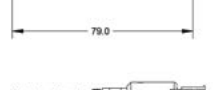
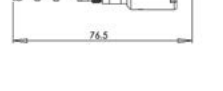
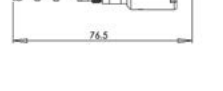
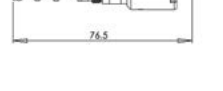
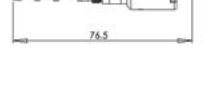












##### Standard 2-Way

Port Size	Spacing	*Cylinder Port	
M7	17mm	*CCMV14A-00ABA-XX	**CCMV14A-00BBA-XX
1/8"	17mm	*CCMV14A-00ABB-XX	**CCMV14A-00BBB-XX
5/32"***	17mm	*CCMV14A-00ABC-XX	**CCMV14A-00BBC-XX

\* - Side Cylinder Port  
 \*\* - Bottom Cylinder Port  
 \*\*\* - Tube Receptacle  
 XX = Number of stations

Note: For valves mounted to bar at factory, add -9 to model number.  
 Common inlet & exhaust are 1/4" NPTF. For BSPL or BSPT threads consult MVP

### BV214/314 CONNECTOR OPTIONS

<p>BV214</p>  <p>Flying Leads</p>  <p>Flying Leads w/ LED</p>  <p>JST Connector</p>  <p>JST Connector w/ LED</p>  <p>MAC Jac</p>	 <p>Ø9.4</p>  <p>72.1</p>  <p>66.6</p>  <p>72.1</p>  <p>69.7</p>  <p>Ø15.5</p>  <p>Ø16.5</p>  <p>Ø16.5</p>  <p>Ø21.5</p>	<p>BV314</p>  <p>Flying Leads</p>  <p>Flying Leads w/ LED</p>  <p>JST Connector</p>  <p>JST Connector w/ LED</p>  <p>MAC Jac</p>	 <p>76.2</p>  <p>79.0</p>  <p>75.3</p>  <p>79.0</p>  <p>76.5</p>  <p>Ø15.5</p>  <p>Ø16.5</p>  <p>Ø16.5</p>  <p>Ø21.5</p>	           
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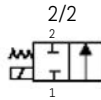
# BV21 - 21mm BULLET VALVE

The BV21 represents yet another evolution in air valve technology from MAC. The Bullet Valve® utilizes “lifting” solenoid technology. The MAC “lifting” configuration is unique, however, in that the valve maintains a balanced design – a signature feature of a MAC valve – shifting forces are consistently high and response times are repeatable regardless of inlet pressure fluctuations. 2-way and 3-way configurations of the BV21 cartridge are available.

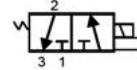
Function	Flow [max]	Manifold mounting	Series
2/2, 3/2 N.C., Universal	Up to 0.6 Cv	Cartridge	BV221, BV321

### OPERATIONAL BENEFITS

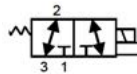
- 2-Way (BV221) & 3-Way (BV321) configurations available
- Very few parts
- Long life lifting solenoid
- One piece poppet / armature
- Balanced Design
- Solenoid isolated from contaminated air
- Unique mounting



3/2 Normally Closed



3/2 Universal



BV221

2-Way, Cartridge Style - 1.0Cv

### 2-Way 21mm BULLET VALVE

BV221A - C<sup>1</sup> - 00 - X<sup>2</sup> X<sup>3</sup> X<sup>4</sup> - X<sup>5</sup> X<sup>6</sup>

#### 1 - Spool Type

- A 2-Way (Standard)      B 2-Way (Axial Flow)

#### 2 - Base Type

- B Round

#### 3 - Voltage

- EH 24 VDC (2.5w)      EG 24 VDC (4.0w)  
EK 12 VDC (2.5w)      EJ 12 VDC (4.0w)

#### 4 - Lead Length Options

- O No Leads      A 18"      B 24"      C 36"  
D 48"      E 72"      F 96"      H 144"

#### 5 - Solenoid Can (round)

- C For Top Cover Option and Can w/ Outer Threads

#### 6 - Solenoid Cover

JST	Pico	Flying Leads	
TA		BA	No ground wire
TC	PC	BC	Blocking & suppr. diode & LED (no ground)
TE	PE	BE	Blocking & suppr. diode (no ground)
TG	PG	BG	LED (no ground)
TJ	PJ	BJ	MOV (no ground)
TL	PL	BL	LED & MOV (no ground)
	PN		Transfer Board

Note: Pico covers PC-PL have a 3rd pin which is an isolation pin

For CIRCUIT BAR ordering information please consult MVP

- SMALL 3-WAY
- LARGE 3-WAY
- SMALL 4-WAY
- LARGE 4-WAY
- ISO VALVES
- PPC VALVES
- PULSE VALVES
- BULLET VALVES

### 3-Way 21mm BULLET VALVE

BV321A - C X1 - 00 - X XX X - X XX  
                   T          T T T T T T  
                   1          2 3 4 5 6

#### 1 - Spool Type

C 3-Way Normally Closed    D 3-Way Universal

#### 2 - Solenoid

B Round

#### 3 - Voltage

HA 24VDC (1.0W)	HB 24VDC (1.8W)	HC 24VDC (2.5W)
HD 24VDC (3.0W)	HE 24VDC (4.0W)	HF 12VDC (1.0W)
HG 12VDC (1.8W)	HH 12VDC (2.5W)	HJ 12VDC (3.0W)
HK 12VDC (4.0W)		

#### 4 - Lead Length Options

O No Leads	A 18"	B 24"	C 36"
D 48"	E 72"	F 96"	H 144"

#### 5 - Solenoid Can (round)

C For Top Cover Option and Can w/ Outer Threads

#### 6 - Solenoid Cover

JST	Pico	Flying Leads	
TA		BA	No ground wire
TC	PC	BC	Blocking & suppr. diode & LED (no ground)
TE	PE	BE	Blocking & suppr. diode (no ground)
TG	PG	BG	LED (no ground)
TJ	PJ	BJ	MOV (no ground)
TL	PL	BL	LED & MOV (no ground)
	PN		Transfer Board
	fGA		MAC JAC Connector

Note: Pico covers PC-PL have a 3rd pin which is an isolation pin



BV321  
 3-Way, Cartridge Style, Universal or Normally Closed - 1.0Cv

#### How To Order Circuit Bar

##### 3-Way

Port Size	Spacing	*Cylinder Port	*Cylinder Port
1/8"	25mm	*CCMV21A-00ABA-XX	**CCMV21A-00BBA-XX
1/4"	25mm	*CCMV21A-00ABB-XX	**CCMV21A-00BBB-XX

\* - Side Cylinder Port                      \*\* - Bottom Cylinder Port

XX = Number of stations

Note: For valves mounted to bar at factory, add -9 to model number.  
 Common inlet & exhaust are 1/4" NPTF. For BSPPL or BSPTR threads consult MVP





# LIQUID BULLET VALVE

The Liquid Bullet Valve® (LBV) is the latest design innovation from MAC. With fast response times, reliable shifting forces and repeatable results – due to its patented balanced design – the MAC LBV is ideal for applications that demand reliable, low-leak performance. The LBV performs with both gas and liquid\*, and is engineered to perform at the highest level throughout its life. The MAC LBV employs D-Flex™ technology to provide an exceptionally tight seal; preventing leakage and saving you product and money. D-Flex™ technology also allows the LBV to last longer and perform stronger in the toughest applications. With fewer wear points than traditional valve technology the LBV is designed to last. \*Seal compatibility testing may be required.

Function	Flow [max]	Manifold mounting	Series
2/2, 3/2	Up to 0.08 Cv	Cartridge	LBV210A, LBV310A

## OPERATIONAL BENEFITS

- 2-Way & 3-Way configurations available
- Non-wetted solenoid
- Accurate and repeatable dosing
- D-Flex™ technology
- Reliable operation in extreme environments



LBV



LBV - Plastic Type



LBV



MAC Valves, Inc. has developed yet another version of its MACNoid™ solenoid for use in the newest Planet Eclipse® Ego11 paintball marker. This version of the MACNoid™ solenoid utilizes MAC® four-way Bullet Valve® lifting solenoid technology (patents pending) with integrated flow controls.

According to Jack Wood of Planet Eclipse LTD, Manchester UK; "Our newest paintball marker – Ego11 comes equipped with an industry first, a bespoke (proprietary) MACNoid™ solenoid – manufactured by MAC Valves, Inc. USA that incorporates twin flow control devices. These Solenoid Flow Controls each comprise a quarter-turn adjuster which has a pointer to indicate position on an incremental scale etched into the body of the solenoid. The Solenoid Flow Controls are used to independently control both the forward and rearward speed of the rammer and bolt so that, for the first time ever in a poppet marker, the user can tune the feel of the marker with a simple twist of a screwdriver.

In the time it takes to turn off the tourney-lock, the EGO11 can be switched from a high speed, uncapped, free-for-all machine to the softest, gentlest, smoothest shooting poppet you have ever felt — or anything in-between.

The analogue adjustment allows an infinite level of control over the speed of the rammer and bolt in either direction, providing unprecedented influence over the dynamic characteristics of the marker. With the Ego11 it looks like you really can have your cake and eat it!"



**BV412 MACNoid**  
4-Way, Manifold Mount, Paintball

