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sales@macvalves.co.nz
The patented Bullet Valve® 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**

The threaded cartridge configuration allows for a variety of mounting possibilities, such as direct integration into pneumatic actuators or vacuum generators without the need of external tubing or fasteners. 2-way & 3-way models of the BV cartridge are available. A surface manifold mount configuration is also offered.
**Bullet Valve®**

**BV Series**

<table>
<thead>
<tr>
<th>Function</th>
<th>Flow [max]</th>
<th>Manifold mounting</th>
<th>Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/2</td>
<td>Up to 0.07 Cv</td>
<td>Cartridge</td>
<td>BV209A</td>
</tr>
</tbody>
</table>

**Operational Benefits**

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

**How To Order**

**Valve**

<table>
<thead>
<tr>
<th>Type</th>
<th>2 Way</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cartridge (Standard)</td>
<td>BV209A-CA1-00-xxxx-xxxx</td>
</tr>
<tr>
<td>Cartridge (Axial Flow)</td>
<td>BV209A-CB0-00-xxxx-xxxx</td>
</tr>
</tbody>
</table>

**Solenoid Operator**

<table>
<thead>
<tr>
<th>Solenoid</th>
<th>Voltage</th>
<th>Lead wire length</th>
<th>Solenoid can (round)</th>
<th>Solenoid cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Round</td>
<td>GC 24VDC (2.5W)</td>
<td>(0) No lead wire, (A) 18&quot;, (B) 24&quot;, (C) 36&quot;, (D) 48&quot;, (E) 72&quot;, (F) 96&quot;, (H) 144&quot;</td>
<td>C For Top Cover Option and Can w/ Outer Threads</td>
<td>JST Connector, Flying Leads</td>
</tr>
</tbody>
</table>

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

*High wattage - high speed options - consult factory*

**Circuit Bar**

<table>
<thead>
<tr>
<th>Bullet valve type</th>
<th>Cyl. port size</th>
<th>Spacing (mm)</th>
<th>Side cylinder port</th>
<th>Bottom cylinder port</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>#10-32 UNF</td>
<td>11</td>
<td>CCMV09A-00AAA-xx</td>
<td>CCMV09A-00BAA-xx</td>
</tr>
<tr>
<td></td>
<td>M5</td>
<td>11</td>
<td>CCMV09A-00AAB-xx</td>
<td>CCMV09A-00BAB-xx</td>
</tr>
<tr>
<td></td>
<td>M7</td>
<td>11</td>
<td>CCMV09A-00AAC-xx</td>
<td>CCMV09A-00BAC-xx</td>
</tr>
<tr>
<td>Axial flow</td>
<td>#10-32 UNF</td>
<td>11</td>
<td>-</td>
<td>CCMV09A-00BDA-xx</td>
</tr>
<tr>
<td></td>
<td>M5</td>
<td>11</td>
<td>-</td>
<td>CCMV09A-00BDB-xx</td>
</tr>
<tr>
<td></td>
<td>M7</td>
<td>11</td>
<td>-</td>
<td>CCMM09A-00BDBC-xx</td>
</tr>
</tbody>
</table>

\(xx\) = Number of stations

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

**High wattage configurations require intermittent duty cycles.**

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

**ERC wattage reduction options - consult factory**
**Technical Data**

- **Fluid:** Compressed air, vacuum, inert gases
- **Pressure range:** Vacuum to 120 PSI
- **Lubrication:** Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
- **Filtration:** 40µ
- **Temperature range:** 0°F to 120°F (-18°C to +50°C)
- **Flow (at 6 bar ΔP=1bar):** Up to 0.07 Cv
- **Voltage range:** -15% to +10% of nominal voltage

**Tools:** Manifold cavity step reamer: T-6961 • Insertion/removal socket: AT-1180 (Bit) AT-1185 (Bit Holder) AT-1184 (Handle)

**Dimensions**

- **Bullet Valve with “JST” Cover and Circuit Board for LED., MOV., & Diode Options**
- **BV209A (2-way) - Standard Watt**

**CCMV09A - Side ports**

<table>
<thead>
<tr>
<th>CYL.</th>
<th>DIMENSION &quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>#10-32</td>
<td>17.20</td>
</tr>
<tr>
<td>M5x0.8</td>
<td>17.20</td>
</tr>
<tr>
<td>M7x1.0</td>
<td>17.20</td>
</tr>
</tbody>
</table>
**OPERATIONAL BENEFITS**

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

---

**How To Order**

**VALVE**

<table>
<thead>
<tr>
<th>Type</th>
<th>3 Way N.C.</th>
<th>3 Way Universal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cartridge</td>
<td>BV309A-CC1-00-xxxxxxx</td>
<td>BV309A-CD1-00-xxxxxxx</td>
</tr>
</tbody>
</table>

**Solenoid Operator**

<table>
<thead>
<tr>
<th>Solenoid</th>
<th>Voltage</th>
<th>Lead wire length</th>
<th>Solenoid can (round)</th>
<th>Solenoid cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Round</td>
<td>GA  24VDC (1.0W)</td>
<td>† 0 No lead wire</td>
<td>C For Top Cover Option and Can w/ Outer Threads</td>
<td>JST Connector TA No ground wire</td>
</tr>
<tr>
<td></td>
<td>GB  24VDC (1.8W)</td>
<td>A 18”</td>
<td></td>
<td>Blocking &amp; suppr. diode &amp; LED (no ground)</td>
</tr>
<tr>
<td></td>
<td>GC  24VDC (2.5W)</td>
<td>B 24”</td>
<td></td>
<td>TE Blocking &amp; suppr. diode (no ground)</td>
</tr>
<tr>
<td></td>
<td>GD  24VDC (3.0W)</td>
<td>C 36”</td>
<td></td>
<td>TG LED (no ground)</td>
</tr>
<tr>
<td></td>
<td>GE  24VDC (4.0W)</td>
<td>D 48”</td>
<td></td>
<td>TJ MOV (no ground)</td>
</tr>
<tr>
<td></td>
<td>GF  12VDC (1.0W)</td>
<td>E 72”</td>
<td></td>
<td>BL LED &amp; MOV (no ground)</td>
</tr>
<tr>
<td></td>
<td>GG  12VDC (1.8W)</td>
<td>F 96”</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GH  12VDC (2.5W)</td>
<td>H 144”</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GJ  12VDC (3.0W)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GK  12VDC (4.0W)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

† Not available for flying leads cover

* High wattage - high speed options - consult factory
** ERC wattage reduction options - consult factory

---

**Circuit Bar**

<table>
<thead>
<tr>
<th>Port size</th>
<th>Spacing (mm)</th>
<th>Side cylinder port</th>
</tr>
</thead>
<tbody>
<tr>
<td># 10-32 UNF</td>
<td>11</td>
<td>CCMV09A-00ABA-xx</td>
</tr>
<tr>
<td>M5</td>
<td>11</td>
<td>CCMV09A-00ABB-xx</td>
</tr>
<tr>
<td>M7</td>
<td>11</td>
<td>CCMV09A-00ABC-xx</td>
</tr>
</tbody>
</table>

xx = Number of stations

* High wattage configurations require intermittent duty cycles.
** ERC - Energy Reduction Circuitry - Reduces the effective wattage at continuous duty.
### Technical Data

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Compressed air, vacuum, inert gases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure range</td>
<td>Vacuum to 120 PSI</td>
</tr>
<tr>
<td>Lubrication</td>
<td>Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)</td>
</tr>
<tr>
<td>Filtration</td>
<td>40μ</td>
</tr>
<tr>
<td>Temperature range</td>
<td>0°F to 120°F (-18°C to +50°C)</td>
</tr>
<tr>
<td>Flow (at 6 bar ΔP=1bar)</td>
<td>Up to 0.06 Cv</td>
</tr>
<tr>
<td>Voltage range</td>
<td>-15% to +10% of nominal voltage</td>
</tr>
</tbody>
</table>

**Tools:** Manifold cavity step reamer: T-6962  • Insertion/removal socket: AT-1180 (Bit) AT-1185 (Bit Holder) AT-1184 (Handle)

### Dimensions

#### Bullet Valve with “JST” Cover and Circuit Board for LED., MOV., & Diode Options

**BV309A (3-way) - Standard Watt**

**CCMV09A - Side ports**

<table>
<thead>
<tr>
<th>CYL</th>
<th>DIMENSION &quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>#10-32</td>
<td>17.4</td>
</tr>
<tr>
<td>M5 X 0.8</td>
<td>17.4</td>
</tr>
<tr>
<td>M7 X 1.0</td>
<td>18.9</td>
</tr>
</tbody>
</table>

"P" INDICATES B.S.P.P.L.  "T" INDICATES B.S.P.T.R.
**OPERATIONAL BENEFITS**

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

**How To Order**

**VALVE**

<table>
<thead>
<tr>
<th>Type</th>
<th>2 Way</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cartridge (Standard)</td>
<td>BV210A-CA1-00-xxxx-xxx</td>
</tr>
<tr>
<td>Cartridge (Axial Flow)</td>
<td>BV210A-CB0-00-xxxx-xxx</td>
</tr>
</tbody>
</table>

**SOLENOID OPERATOR**

<table>
<thead>
<tr>
<th>Solenoid</th>
<th>Voltage</th>
<th>Lead wire length</th>
<th>Solenoid can (round)</th>
<th>Solenoid cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Round</td>
<td>24VDC (2.5W)</td>
<td>0 † No lead wire</td>
<td>C For Top Cover</td>
<td>JST</td>
</tr>
<tr>
<td>EG</td>
<td>24VDC (4.0W)</td>
<td>A 18”</td>
<td>Option and Can w/</td>
<td>TA</td>
</tr>
<tr>
<td>EK</td>
<td>12VDC (2.5W)</td>
<td>B 24”</td>
<td>Outer Threads</td>
<td>TC</td>
</tr>
<tr>
<td>EJ</td>
<td>12VDC (4.0W)</td>
<td>C 36”</td>
<td></td>
<td>TE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D 48”</td>
<td></td>
<td>TG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>E 72”</td>
<td></td>
<td>PJ</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F 96”</td>
<td></td>
<td>BJ</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H 144” † Not</td>
<td></td>
<td>TJ</td>
</tr>
<tr>
<td></td>
<td></td>
<td>available for flying leads cover</td>
<td></td>
<td>TL</td>
</tr>
</tbody>
</table>

Note: Pico covers PC-PL have a 3rd Pin which is a location pin

**CIRCUIT BAR**

<table>
<thead>
<tr>
<th>Bullet valve type</th>
<th>Cyl. port size</th>
<th>Spacing (mm)</th>
<th>Side cylinder port</th>
<th>Bottom cylinder port</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>#10-32 UNF</td>
<td>12</td>
<td>CCMV10A-00AAA-xx</td>
<td>CCMV10A-00BAA-xx</td>
</tr>
<tr>
<td></td>
<td>M5</td>
<td>12</td>
<td>CCMV10A-00AAB-xx</td>
<td>CCMV10A-00BAB-xx</td>
</tr>
<tr>
<td></td>
<td>M7</td>
<td>12</td>
<td>CCMV10A-00AAC-xx</td>
<td>CCMV10A-00BAC-xx</td>
</tr>
<tr>
<td>Axial flow</td>
<td>#10-32 UNF</td>
<td>12</td>
<td>-</td>
<td>CCMV10A-00BDA-xx</td>
</tr>
<tr>
<td></td>
<td>M5</td>
<td>12</td>
<td>-</td>
<td>CCMV10A-00BDB-xx</td>
</tr>
<tr>
<td></td>
<td>M7</td>
<td>12</td>
<td>-</td>
<td>CCMV10A-00BDC-xx</td>
</tr>
</tbody>
</table>

xx = Number of stations

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

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

**ERC wattage reduction options - consult factory**

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

---

**BV Series**

**Bullet Valve**
Technical Data

**Fluid:** Compressed air, vacuum, inert gases

**Pressure range:** Vacuum to 120 PSI

**Lubrication:** Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)

**Filtration:** 40µ

**Temperature range:** 0°F to 120°F (-18°C to +50°C)

**Flow (at 6 bar ΔP=1bar):** Up to 0.08 Cv

**Voltage range:** -15% to +10% of nominal voltage

**Tools:** Manifold cavity step reamer: T-6960 • Insertion/removal socket: AT-1181 (Bit) AT-1185 (Bit Holder) AT-1184 (Handle)

Dimensions

**Bullet Valve with “JST” Cover and Circuit Board for LED., MOV., & Diode Options**

**BV210A (2-way) - Standard Watt**

**CCMV10A - Side Ports**

**BV210A SIDE PORTS**

<table>
<thead>
<tr>
<th>CYL.</th>
<th>DIMENSION &quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>#10-32</td>
<td>17.90</td>
</tr>
<tr>
<td>M5x0.8</td>
<td>17.90</td>
</tr>
<tr>
<td>M7x1.0</td>
<td>19.25</td>
</tr>
</tbody>
</table>

"P" INDICATES B.S.P.P.L. "T" INDICATES B.S.P.T.R. 
1/8"-27 N.P.T.F. OR 1/8"-28 B.S.P.P.L. OR 1/8"-28 B.S.P.T.R. TYPE (4) (2) EACH SIDE
BV Series

Bullet Valve /MT82

Function          Flow [max]                           Manifold mounting                          Series
-------------------------------------------------------------------------------------------------------------------------------------
3/2 NC, Universal  Up to 0.09 Cv                           Cartridge                                         BV310A

OPERATIONAL BENEFITS

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

How To Order

VALVE

<table>
<thead>
<tr>
<th>Type</th>
<th>3 Way N.C.</th>
<th>3 Way Universal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cartridge (Standard)</td>
<td>BV310A-CC1-00-xxxx-xxx</td>
<td>BV310A-CD1-00-xxxx-xxx</td>
</tr>
<tr>
<td>Cartridge (Diaphragm)</td>
<td>BV310A-DC1-00-xxxx-xxx</td>
<td></td>
</tr>
</tbody>
</table>

SOLENOID OPERATOR

Solenoid Voltage Lead wire length Solenoid can (round) Solenoid cover
B Round 24VDC (.75W) 24VDC (1.0W) 24VDC (1.8W) 24VDC (2.5W) 24VDC (3.0W) 24VDC (4.0W) 0 No lead wire A 18” B 24” C 36” D 48” E 72” F 96” H 144” C For Top Cover Option and Can w/ Outer Threads

Solenoide 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

Only available with Diaphragm type valve
* High wattage - high speed options - consult factory
** ERC wattage reduction options - consult factory
† Not available for flying leads cover Only option for Pico cover
Note: Pico covers PC-PL have a 3rd Pin which is a location pin

CIRCUIT BAR

<table>
<thead>
<tr>
<th>Port size</th>
<th>Spacing (mm)</th>
<th>Side cylinder port</th>
</tr>
</thead>
<tbody>
<tr>
<td># 10-32 UNF</td>
<td>12</td>
<td>CCMV10A-00ABA-xx</td>
</tr>
<tr>
<td>M5</td>
<td>12</td>
<td>CCMV10A-00ABB-xx</td>
</tr>
<tr>
<td>M7</td>
<td>12</td>
<td>CCMV10A-00ABC-xx</td>
</tr>
</tbody>
</table>

XX = Number of stations Note: for valves mounted to bar at factory, add -9 to model numbers.
* High wattage configurations require intermittent duty cycles.
** ERC - Energy Reduction Circuitry - Reduces the effective wattage at continuous duty.
**Technical Data**

**Fluid:** Compressed air, vacuum, inert gases

**Pressure range:** Vacuum to 120 PSI

**Lubrication:** Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)

**Filtration:** 40µ

**Temperature range:** 0°F to 120°F (-18°C to +50°C)

**Flow (at 6 bar ΔP=1bar):** Up to 0.09 Cv

**Voltage range:** -15% to +10% of nominal voltage

**Tools:** Manifold cavity step reamer: T-7396 • Insertion/removal socket: AT-1181 (Bit) AT-1185 (Bit Holder) AT-1184 (Handle)

**Modifications:** MOD L001 (Modified diaphragm valve for <1cc/Min leak rate)

---

**Dimensions**

**Bullet Valve with “JST” Cover and Circuit Board for LED., MOV., & Diode Options**

**BV310A (3-way) - Standard Watt**

---

**CCMV10A - Side Ports**

---

**BV310A SIDE PORTS**

<table>
<thead>
<tr>
<th>CYL</th>
<th>DIMENSION &quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>#10-32</td>
<td>13.0</td>
</tr>
<tr>
<td>M5 X 0.8</td>
<td>13.0</td>
</tr>
<tr>
<td>M7 X 1.0</td>
<td>11.5</td>
</tr>
</tbody>
</table>
**Operational Benefits**

1. Short stroke with high shifting forces
2. Balanced poppet, immune to pressure fluctuations
3. Precise repeatability
4. Solenoid isolated from contaminated air
5. Very few parts
6. Extremely long life

**How To Order**

**Valve**

<table>
<thead>
<tr>
<th>Type</th>
<th>3 Way N.C.</th>
<th>3 Way Universal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manifold Mount - Non plug-in</td>
<td>BV310A-LC1-00-xxxx-xxx</td>
<td>BV310A-LD1-00-xxxx-xxx</td>
</tr>
</tbody>
</table>

**Solenoid Operator**

<table>
<thead>
<tr>
<th>Solenoid</th>
<th>Voltage</th>
<th>Lead Wire Length</th>
<th>Solenoid can (round)</th>
<th>Solenoid Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Round</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HA</td>
<td>24VDC (1.0W)</td>
<td>B 0 No lead wire</td>
<td>Cover For</td>
<td>JST Pico Flying Leads</td>
</tr>
<tr>
<td>HB</td>
<td>24VDC (1.8W)</td>
<td>A 18”</td>
<td>Manifold Body</td>
<td>TA BA No ground wire</td>
</tr>
<tr>
<td>HC</td>
<td>24VDC (2.5W)</td>
<td>B 24”</td>
<td></td>
<td>TC PC BC Blocking &amp; suppr. diode &amp; LED(no ground)</td>
</tr>
<tr>
<td>HD</td>
<td>24VDC (3.0W)</td>
<td>C 36”</td>
<td></td>
<td>TE PE BE Blocking &amp; suppr. diode (no ground)</td>
</tr>
<tr>
<td>HE</td>
<td>24VDC (4.0W)</td>
<td>D 48”</td>
<td></td>
<td>TG PG BG LED (no ground)</td>
</tr>
<tr>
<td>HF</td>
<td>12VDC (1.0W)</td>
<td>E 72”</td>
<td></td>
<td>TJ PJ BJ MOV (no ground)</td>
</tr>
<tr>
<td>HG</td>
<td>12VDC (1.8W)</td>
<td>F 96”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HH</td>
<td>12VDC (2.5W)</td>
<td>G 144”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HJ</td>
<td>12VDC (3.0W)</td>
<td>H 144”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HK</td>
<td>12VDC (4.0W)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* High wattage - high speed options - consult factory
** ERC wattage reduction options - consult factory
† Not available for flying leads cover
Only option for Pico cover

**Non Plug-In Circuit Bar**

<table>
<thead>
<tr>
<th>Port size</th>
<th>Spacing (mm)</th>
<th>Side Cylinder Port</th>
<th>Bottom Cylinder Port</th>
</tr>
</thead>
<tbody>
<tr>
<td># 10-32 UNF</td>
<td>12</td>
<td>CBMV10A-00ABA-xx</td>
<td>CBMV10A-00BBA-xx</td>
</tr>
<tr>
<td>M5</td>
<td>12</td>
<td>CBMV10A-00ABB-xx</td>
<td>CBMV10A-00BBB-xx</td>
</tr>
<tr>
<td>M7</td>
<td>12</td>
<td>CBMV10A-00ABC-xx</td>
<td>CBMV10A-00BBC-xx</td>
</tr>
</tbody>
</table>

xx = Number of stations

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

**Options**

- Replace with “0” for no manual operator

**How to order bar configured for regulator**

CBMV10A-00 A BB-xx
Replace with D for regulator - Side ports
Replace with E for regulator - Bottom ports

Note: Regulator must be ordered separately - see next page

* High wattage configurations require intermittent duty cycles
** ERC - Energy Reduction Circuitry - Reduces the effectiveness wattage at continuous duty
**Technical Data**

**Fluid:** Compressed air, vacuum, inert gases

**Pressure range:** Vacuum to 120 PSI

**Lubrication:** Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)

**Filtration:** 40µ

**Temperature range:** 0°F to 120°F (-18°C to +50°C)

**Flow (at 6 bar ΔP=1bar):** Up to 0.08 Cv

**Voltage range:** -15% to +10% of nominal voltage

**Spare parts:**
- Pressure seal, body to base: 16985
- Mounting screw, body to base: 35166 - 2 pcs required
- Regulator for bar: PR44A-A0AX
- Blank Station Cover Plate: N-BV008

**Dimensions**

**BV310A Bar Manifold Assembly**

**CBMV10A Circuit bar for BV310**

**Without regulator:**

**With regulator:**
BV Series

Bullet Valve

Function | Flow [max] | Manifold mounting | Series
---|---|---|---
2/2 | Up to 0.24 Cv | Cartridge | BV214A

OPERATIONAL BENEFITS

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

How To Order

**VALVE**

<table>
<thead>
<tr>
<th>Type</th>
<th>2-Way (standard)</th>
<th>2-Way (axial flow)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cartridge</td>
<td>BV214A-CA1-00-xxxx-xxx</td>
<td>BV214A-CB0-00-xxxx-xxx</td>
</tr>
</tbody>
</table>

**SOLENOID OPERATOR**

<table>
<thead>
<tr>
<th>Solenoid</th>
<th>Voltage</th>
<th>Lead wire length</th>
<th>Solenoid can (round)</th>
<th>Solenoid cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Round</td>
<td>CA 24VDC (1.0W)</td>
<td>0* No lead wire</td>
<td>C For Top Cover Option and Can w/ Outer Threads</td>
<td>JST Pico Flying Leads</td>
</tr>
<tr>
<td></td>
<td>CB 24VDC (1.8W)</td>
<td>A 18”</td>
<td></td>
<td>T TA BA No ground wire</td>
</tr>
<tr>
<td></td>
<td>CC 24VDC (2.5W)</td>
<td>B 24”</td>
<td></td>
<td>TC PC BC Blocking &amp; suppr. diode &amp; LED (no ground)</td>
</tr>
<tr>
<td></td>
<td>CD 24VDC (3.0W)</td>
<td>C 36”</td>
<td></td>
<td>TE PE BE Blocking &amp; suppr. diode (no ground)</td>
</tr>
<tr>
<td></td>
<td>CE 24VDC (4.0W)</td>
<td>D 48”</td>
<td></td>
<td>TG PG BG LED (no ground)</td>
</tr>
<tr>
<td></td>
<td>CF 12VDC (1.0W)</td>
<td>E 72”</td>
<td></td>
<td>TJ PJ BJ MOV (no ground)</td>
</tr>
<tr>
<td></td>
<td>CG 12VDC (1.8W)</td>
<td>F 96”</td>
<td></td>
<td>TL PL BL LED &amp; MOV (no ground)</td>
</tr>
<tr>
<td></td>
<td>CH 12VDC (2.5W)</td>
<td>H 144”</td>
<td></td>
<td>PN Transfer Board</td>
</tr>
<tr>
<td></td>
<td>CJ 12VDC (3.0W)</td>
<td>*Not available for flying leads cover</td>
<td>Only option for Pico cover</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CK 12VDC (4.0W)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CIRCUIT BAR**

<table>
<thead>
<tr>
<th>Bullet valve type</th>
<th>Cyl. port size</th>
<th>Spacing (mm)</th>
<th>Side cylinder port</th>
<th>Bottom cylinder port</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>M7</td>
<td>17</td>
<td>CCMV14A-00AAA-xx</td>
<td>CCMV14A-00BAA-xx</td>
</tr>
<tr>
<td></td>
<td>1/8”</td>
<td>17</td>
<td>CCMV14A-00AAB-xx</td>
<td>CCMV14A-00BAB-xx</td>
</tr>
<tr>
<td></td>
<td>5/32 tube recept.</td>
<td>17</td>
<td>CCMV14A-00AAC-xx</td>
<td>CCMV14A-00BAC-xx</td>
</tr>
<tr>
<td>Axial flow</td>
<td>M7</td>
<td>17</td>
<td>-</td>
<td>CCMV14A-00BDA-xx</td>
</tr>
<tr>
<td></td>
<td>1/8”</td>
<td>17</td>
<td>-</td>
<td>CCMV14A-00BDB-xx</td>
</tr>
</tbody>
</table>

* xx = Number of stations

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

† Requires special spacing - - consult factory

Note: for BSPPL or BSPT threads consult factory
**Technical Data**

<table>
<thead>
<tr>
<th>Fluid:</th>
<th>Compressed air, vacuum, inert gases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure range:</td>
<td>Vacuum to 120 PSI</td>
</tr>
<tr>
<td>Lubrication:</td>
<td>Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)</td>
</tr>
<tr>
<td>Filtration:</td>
<td>40μ</td>
</tr>
<tr>
<td>Temperature range:</td>
<td>0°F to 120°F (-18°C to +50°C)</td>
</tr>
<tr>
<td>Flow (at 6 bar, Δ P=1bar):</td>
<td>Up to 0.24 Cv (4.0 W)</td>
</tr>
<tr>
<td>Voltage range:</td>
<td>-15% to +10% of nominal voltage</td>
</tr>
</tbody>
</table>

**Tools:** Manifold cavity step reamer: T-7331 • Insertion/removal socket: AT-1263 (Bit) AT-1185 (Bit Holder) AT-1264 (Handle)

**Dimensions**

- **Flying leads**: 69.4
- **JST Connector**: ø 16.5 66.6 ø 16.5
- **MAC Jac**: ø 21.5

**CCMV14A bar with BV214A valves**

- Ø 6.4 THRU TYP. (2)
- 5.5
- 81.0
- 92.0
- 25.4
- 50.8
- 36.0
- 73.3
- 20.5
- 17.0 TYP. VALVE SPACING

1/4" NPTF TYP (2) (1) Each side
**BV Series**

**Bullet Valve**

**Function**  | **Flow [max]** | **Manifold mounting** | **Series**
---|---|---|---
3/2 | Up to 0.24 Cv | Cartridge | BV314A

**Operational Benefits**

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

**How To Order**

**VALVE**

<table>
<thead>
<tr>
<th>Type</th>
<th>3-Way N.C.</th>
<th>3-Way universal valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cartridge</td>
<td>BV314A-CC1-00-xxxx-xxx</td>
<td>BV314A-CD1-00-xxxx-xxx</td>
</tr>
</tbody>
</table>

**Solenoid Operator**

<table>
<thead>
<tr>
<th>Solenoid</th>
<th>Voltage</th>
<th>Lead wire length</th>
<th>Solenoid can (round)</th>
<th>Solenoid cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Round</td>
<td>CA: 24VDC (1.0W)</td>
<td>0* No lead wire</td>
<td>C: For Top Cover Option and Can w/ Outer Threads</td>
</tr>
<tr>
<td>CB</td>
<td>24VDC (1.8W)</td>
<td>A: 18''</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CC</td>
<td>24VDC (2.5W)</td>
<td>B: 24''</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD</td>
<td>24VDC (3.0W)</td>
<td>C: 36''</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CE</td>
<td>24VDC (4.0W)</td>
<td>D: 48''</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CF</td>
<td>12VDC (1.0W)</td>
<td>E: 72''</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CG</td>
<td>12VDC (1.8W)</td>
<td>F: 96''</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CH</td>
<td>12VDC (2.5W)</td>
<td>H: 144''</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CJ</td>
<td>12VDC (3.0W)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CK</td>
<td>12VDC (4.0W)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>*Not available for flying leads cover</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Circuit Bar**

<table>
<thead>
<tr>
<th>Cyl. port size</th>
<th>Spacing (mm)</th>
<th>Side cylinder port</th>
<th>Bottom cylinder port</th>
</tr>
</thead>
<tbody>
<tr>
<td>M7</td>
<td>17</td>
<td>CCMV14A-00ABA-xx</td>
<td>CCMV14A-00BBA-xx</td>
</tr>
<tr>
<td>1/8''</td>
<td>17</td>
<td>CCMV14A-00ABB-xx</td>
<td>CCMV14A-00BBB-xx</td>
</tr>
<tr>
<td>5/32 tube receptacle</td>
<td>17</td>
<td>CCMV14A-00ABC-xx</td>
<td>CCMV14A-00BBC-xx</td>
</tr>
</tbody>
</table>

**xx** = Number of stations

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

1 Requires special spacing - consult factory

Note: Common inlet & exhaust are 1/4” NPTF

For BSPPL or BSPT threads consult factory
### Technical Data

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid:</td>
<td>Compressed air, vacuum, inert gases</td>
</tr>
<tr>
<td>Pressure range:</td>
<td>Vacuum to 120 PSI</td>
</tr>
<tr>
<td>Lubrication:</td>
<td>Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)</td>
</tr>
<tr>
<td>Filtration:</td>
<td>40µ</td>
</tr>
<tr>
<td>Temperature range:</td>
<td>0°F to 120°F (-18°C to +50°C)</td>
</tr>
<tr>
<td>Flow (at 6 bar, ΔP=1bar):</td>
<td>Up to 0.24 Cv (4.0 W)</td>
</tr>
<tr>
<td>Voltage range:</td>
<td>-15% to +10% of nominal voltage</td>
</tr>
</tbody>
</table>

**Tools:** Manifold cavity step reamer: T-7321 • Insertion/removal socket: AT-1263 (Bit) AT-1185 (Bit Holder) AT-1264 (Handle)

### Dimensions

- **Flying leads**
- **JST Connector**
- **MAC Jac**

---

### CCMV14A bar with BV314A valves

- 6.4 THRU TYP: (2)
Connector Options

BV210

Flying Leads (BA)

Flying Leads w/ LED (BC, BG, BL)

JST Connector (TA)

JST Connector w/ LED (TG, TL)

2 Pin PICO (PN)

3 Pin PICO (PC, PE, PG, PJ, PL)
Connector Options
BV310

- Flying Leads (BA)
- Flying Leads w/ LED (BC, BG, BL)
- JST Connector (TA)
- JST Connector w/ LED (TG, TL)
- 2 Pin PICO (PN)
- 3 Pin PICO (PC, PE, PG, PJ, PL)
Connector Options
BV214

Flying Leads (BA)

Flying Leads w/ LED (BC, BG, BL)

JST Connector (TA)

JST Connector w/ LED (TC, TG, TL)

MAC Jac (GA)

2 Pin PICO (PN)

3 Pin PICO (PC, PE, PG, PJ, PL)
Connector Options
BV314

Flying Leads (BA)

Flying Leads w/ LED (BC, BG, BL)

JST Connector (TA)

JST Connector w/ LED (TC, TG, TL)

MAC Jac (GA)

2 Pin PICO (PN)

3 Pin PICO (PC, PE, PG, PJ, PL)
Our manufacturing process of the Bullet Valve® cartridge body enables flexibility with regards to offering potential modifications that meet your specific application needs. An example of such modifications is the “axial flow” cartridge body we are currently offering for the BV209, BV210 and BV214 series.

The “axial flow” cartridge enables the valve to flow air between the bottom of the valve body and manifold it is housed in – see figure below. This modification allows for a linear flow path out of the manifold producing measurably higher outlet pulse height (force) in blow off type of applications. We have currently used this modification for applications in the sorting industry with excellent results.

If you have an application that would benefit from utilizing the axial flow cartridge option or wish to discuss other potential cartridge modifications, please consult your local MAC distributor (MDN Associate). By understanding your application and valve requirements we can optimize the valve settings accordingly.
**Bullet Valve® (BV) Series**

The Bullet Valve® represents yet another evolution in air valve technology from MAC.

- **VERY FEW PARTS**
- **LONG LIFE LIFTING SOLENOID**
- **ONE PIECE POPPET / ARMATURE** (Patents Pending)
- **BALANCED DESIGN**
- **SOLENOID ISOLATED FROM CONTAMINATED AIR**
- **UNIQUE MOUNTING**

The threaded cartridge configuration allows for a variety of mounting possibilities, such as direct integration into pneumatic actuators or vacuum generators without the need of external tubing or fasteners. 2-way & 3-way models of the BV cartridge (9mm & 10mm dia.) are available. A surface manifold mount configuration is also offered.

---

**PRECAUTIONS AND WARNINGS CONCERNING THE APPLICATION, INSTALLATION AND SERVICE OF MAC BV AND OTHER MAC VALVE PRODUCTS**

The warnings and precautions below are important to be read and understood before MAC Valves products are to be installed on applications that meet all operating specifications. Designing into a system any MAC Valves products, and before installing or servicing any MAC Valves product. Improper use, installation or servicing of any MAC Valves product in some systems could create a hazard to personnel or equipment. No distinction in importance should be made between the terms warnings and precautions.

---

**APPLICATION PRECAUTIONS:**

- **INDUSTRIAL USE:** MAC Valve products are intended for general use in industrial pneumatic and/or vacuum systems. They are general-purpose industrial products with broadly thousands of different applications in industrial systems. These products are not inherently dangerous, but they are only a component of an overall system. The system in which they are used must provide adequate safeguards to prevent injury or damage in the event failure occurs, whether it be failure of switches, regulators, c-planes, valves or any other component.

- **POWER PRESSURE:** MAC Valve products are not designed nor intended to be used to operate and/or control the operation of either and/or brake systems in power service. There are special product on the market for such use.

- **POSITIONING VALUES:** Some MAC valves are 2-4-way valves. When air is supplied to the inlet port of these valves, there will always be a flow path from the inlet one of the outlets regardless of which of the two positions the valve is situated. Therefore, any pressure in the system would prevent a valve from being moved. The valve will not allow a valve to be moved in the system. The valve is often used as a check valve, and the valve will not allow a valve to be moved in the system.

- **FILTERS:** Some MAC valves are 5-port, 4-way valves. These valves are either double solenoid or double wire solenoid type, and either the two operators in control, is applied to the inlet port(s) and valve through the valve to one of the outlet of 4 postion. 4 way valve. However, if the operator in control, the valve moves to a center position. Listed below are the various center position functions.

  - **CLOSED CENTER:**
    - With this type valve, in the inlet position on all ports are blocked (inlets and exhausts) meaning the air in both outlet ports to prevent a load to be applied to the valve. If having no air in either outlet port would prevent a load in the application or servicing; a separate method in the system must be provided to remove the trapped air. This type valve should not be used.

  - **OPEN CENTER:**
    - With this type valve, in the center position on one port is blocked (inlets and exhausts) meaning the air in both outlet ports to prevent a load to be applied to the valve. If having no air in either outlet port would prevent a load in the application or servicing; a separate method in the system must be provided to remove the trapped air. This type valve should not be used.

  - **PRESSURE CENTER:**
    - With this type valve, in the center position, the inlet port(s) is blocked and the two outlet ports are open to the exhaust port of the valve. If having no air in either outlet port would prevent a load in the application or servicing; a separate method in the system must be provided to remove the trapped air. This type valve should not be used.

---

**SERVICE PRECAUTIONS:**

- **Do not service or remove from service any MAC Valve product without first shutting off both the air and electricity to the valve and making certain no pressure air which could present a hazard is retained in the system.**

- **MAC Valve products should only be serviced from removed from service by qualified, knowledgeable personnel who understand the specific valve is to be pneumatically supplied and electrically controlled (where applicable). Flow paths through the valves are shown in the catalog and the valve by use of ANSI or ISO type standard graphic symbols. Do not install unless these symbols and the valve functions and operations are thoroughly understood.**

- **For live lubrication is used the use any lubrication other than those recommended in the catalog, parts and operating sheet by the factory.**

---

**SERVICE SPECIFICATIONS:**

- **This Guarantee is limited to the replacement or refunding of any valve or other product which should fail to operate properly. Valves or other products, under the MAC Guarantee, must be returned with both or returnable transportation prepaid and received at our factory within this Guarantee period. They will be returned to the customer at the expense of MAC Valves, Inc., and will carry the same guarantee as provided under the Flat Rate Rebuild Program.**

---

**DECLARATION OF GUARANTEE:**

No claims for labor, material, time, damage, or transportation are allowed nor will any valve or other product be replaced or refunded under guarantee which has been damaged by the purchaser not in the normal course of its use and maintenance during the warranty period. The guarantee does not apply to labor damage. Claims may be made by the owner, supplier or other party, nor will any valve be returned to the owner, supplier or other party at our factory. In the event the guarantee, nor under any implied warranties, including the implied warranties of merchantability.

The above Guarantee is our manner of extending the engineering and service resource of the MAC Valves, Inc. organization to assure our customer long, and continued satisfaction.
THINK GLOBAL  ACT LOCAL
Our global distribution network is keeping your machines running around the clock around the world

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mac@macvalves.com

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