SERIES FEATURES

- Patented MACSOLENOID® for fastest possible response times and virtually burn-out proof AC solenoid operation.
- Optional low watt DC solenoids.
- Various manual operators.
- Optional memory spring.
- 2 position or 3 position valve configurations.
- Internal or external pilot.
**OPERATIONAL BENEFITS**

1. The 4-way pilot develops maximum shifting forces both ways.
2. Memory spring available.
3. Balanced spool, immune to variations of pressure, also provides high flow.
4. Short stroke with high flow.
5. Bonded spool with minimum friction, shifting in a glass-like finished bore.
6. Pilot with balanced poppet, high flow, short and consistent response times.
7. Wiping effect eliminates sticking.
8. Long service life.

**HOW TO ORDER**

```
xxxx-xxx-DM-Dxx-x-x
```

**HOW TO ORDER VALVE FOR CIRCUIT BAR MOUNTING**

<table>
<thead>
<tr>
<th>Port size</th>
<th>Pilot air</th>
<th>Function</th>
<th>Circuit bar mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8&quot; NPTF</td>
<td>Internal</td>
<td>Single operator</td>
<td>Low profile cylinder ports in valve</td>
</tr>
<tr>
<td>1/4&quot; NPTF</td>
<td>Internal</td>
<td>Double operator</td>
<td></td>
</tr>
</tbody>
</table>

**SOLENOID OPERATOR **

```
XX Voltage
JB 240/60, 220/50
JA 120/60, 110/50
JK 24/60, 24/50
FB 24VDC (1.8 W)
DA 24VDC (5.4 W)
DF 24VDC (12.7 W)
xx Other Options
```

```
X Wire length
A 18" (Flying leads)
J Connector
x Other Options
```

```
X Manual operator
1 Non-locking
2 Locking
x Other Options
```

```
XX Electrical connection
KA Square connector
KD Square connector with light
JB Rectangular connector
JD Rectangular connector with light
BA Flying leads
xx Other Options
```

**HOW TO ORDER CIRCUIT BAR **

```
Port size Pilot air Spacing standard 19.5 mm Spacing 26 mm (Rectangular connector) 26 mm (Rectangular connector)
w/o flow controls w/o flow controls w/ flow controls w/ flow controls
3/8" NPTF Internal CBM401A-00AAA-xx CBM401A-00BAA-xx CBM401A-02AAA-xx CBM401A-02BAA-xx
```

Number of stations (03=3 stations)

** Other options available. Consult factory.**

**Options**

```
411A-ACO-DM-Dxxx-xx
```

Consult “Precautions” before use, installation or service of MAC Valves.
**TECHNICAL DATA**

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid</td>
<td>Compressed air, vacuum, inert gases</td>
</tr>
<tr>
<td>Pressure range</td>
<td>20 - 150 PSI</td>
</tr>
<tr>
<td>Pilot pressure</td>
<td>20 - 150 PSI</td>
</tr>
<tr>
<td>Lubrication</td>
<td>Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)</td>
</tr>
<tr>
<td>Filtration</td>
<td>40 µ</td>
</tr>
<tr>
<td>Temperature range</td>
<td>0°F to 120°F (-18°C to +50°C)</td>
</tr>
<tr>
<td>Orifice</td>
<td>6.2 mm</td>
</tr>
<tr>
<td>Flow</td>
<td>1.0 Cv</td>
</tr>
<tr>
<td>Coil</td>
<td>General purpose class A, continuous duty, encapsulated</td>
</tr>
<tr>
<td>Voltage range</td>
<td>-15% to +10% of nominal voltage</td>
</tr>
<tr>
<td>Protection</td>
<td>NEMA 4</td>
</tr>
<tr>
<td>Power</td>
<td>Inrush: 10.9 VA</td>
</tr>
<tr>
<td></td>
<td>Holding: 7.7 VA</td>
</tr>
<tr>
<td></td>
<td>= 1.8 to 12.7 W</td>
</tr>
<tr>
<td>Response times</td>
<td>24 V=5.4 W Energize: 7.3 ms De-energize: 5.3 ms</td>
</tr>
<tr>
<td></td>
<td>60Hz/6 W Energize: 8-12 ms De-energize: 7-11 ms</td>
</tr>
<tr>
<td>Spare parts</td>
<td>Pilot valve: DMB-DXXX-XXX-1, including mounting screws 35069 and seal 16524.</td>
</tr>
<tr>
<td>Accessories</td>
<td>Blanking plate: M-04001. Flow control [x2]: N-04001. Seal [x2]: 17013-01, [x1]: 17015-01. Mounting screw [x2]: 35043.</td>
</tr>
<tr>
<td>Options</td>
<td>BSPP threads. Isolation of inlet and/or exhaust.</td>
</tr>
</tbody>
</table>

**DIMENSIONS**

Consult "Precautions" before use, installation or service of MAC Valves.
### Operational Benefits

1. The 4-way pilot develops maximum shifting forces both ways.
2. Memory spring available.
3. Balanced spool, immune to variations of pressure, also provides high flow.
4. Short stroke with high flow.
5. Bonded spool with minimum friction, shifting in a glass-like finished bore.
6. Pilot with balanced poppet, high flow, short and consistent response times.
7. Wiping effect eliminates sticking.
8. Long service life.

### How to Order

#### Valve for Circuit Bar Mounting

<table>
<thead>
<tr>
<th>Pilot air</th>
<th>5/2 Single operator</th>
<th>5/2 Double operator</th>
<th>5/3 Closed center</th>
<th>5/3 Open center</th>
<th>5/3 Pressure center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JB</td>
<td>240/60, 220/50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JA</td>
<td>120/60, 110/50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JE</td>
<td>24/60, 24/50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FB</td>
<td>24VDC (1.8 W)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DA</td>
<td>24VDC (5.4 W)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DF</td>
<td>24VDC (12.7 W)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>XX</td>
<td>Other Options</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Wire length**

- A: 18” (Flying leads)
- J: Connector

**Manual operator**

- 1: Non-locking
- 2: Locking
- X: Other Options

**Electrical connection**

- KA: Square connector
- KD: Square connector with light
- JB: Rectangular connector
- JD: Rectangular connector with light
- BA: Flying leads
- XX: Other Options

### How to Order Circuit Bar (Bottom Cylinder Ports)

<table>
<thead>
<tr>
<th>Port size</th>
<th>Pilot air</th>
<th>Spacing standard 19.5 mm w/ flow controls</th>
<th>Spacing 26 mm (Rectangular connector) w/ flow controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8” NPTF</td>
<td>Internal</td>
<td>CBM402A-00AAA-xx</td>
<td>CBM402A-02AAA-xx</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CBM402A-00BAA-xx</td>
<td>CBM402A-02BAA-xx</td>
</tr>
</tbody>
</table>

Number of stations (03=3 stations)

**Other options available. Consult factory:**

### Options

- CBM402A-xxxx-xx

Consult "Precautions" before use, installation or service of MAC Valves.
**Technical Data**

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Compressed air, vacuum, inert gases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure range</td>
<td>20 - 150 PSI</td>
</tr>
<tr>
<td>Pilot pressure</td>
<td>20 - 150 PSI</td>
</tr>
<tr>
<td>Lubrication</td>
<td>Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)</td>
</tr>
<tr>
<td>Filtration</td>
<td>40 µ</td>
</tr>
<tr>
<td>Temperature range</td>
<td>0°F to 120°F (-18°C to +50°C)</td>
</tr>
<tr>
<td>Orifice</td>
<td>6.2 mm</td>
</tr>
<tr>
<td>Flow</td>
<td>1.0Cv</td>
</tr>
<tr>
<td>Coil</td>
<td>General purpose class A, continuous duty, encapsulated</td>
</tr>
<tr>
<td>Voltage range</td>
<td>-15% to +10% of nominal voltage</td>
</tr>
<tr>
<td>Protection</td>
<td>NEMA 4</td>
</tr>
<tr>
<td>Power</td>
<td>Inrush : 10.9 VA, Holding : 7.7 VA, = 1.8 to 12.7 W</td>
</tr>
<tr>
<td>Response times</td>
<td>24 V/5.4 W Energize : 7.3 ms De-energize : 5.3 ms</td>
</tr>
<tr>
<td></td>
<td>60Hz/6 W Energize : 8-12 ms De-energize : 7-11 ms</td>
</tr>
</tbody>
</table>

- **Spare parts:** Pilot valve : DMB-DXXX-XXX-1, including mounting screws 35069 and seal 16524.
- **Accessories:** Blanking plate : M-04002. Flow control (x2) : N-04001. Seal : 16525.
- **Options:** Mounting screw (x2) : 35043. BSP threads. Isolation of inlet and/or exhaust.

**Dimensions**

![Diagram](image)
### Operational Benefits

1. The 4-way pilot develops maximum shifting forces both ways.
2. Memory spring available.
3. Balanced spool, immune to variations of pressure, also provides high flow.
4. Short stroke with high flow.
5. Bonded spool with minimum friction, shifting in a glass-like finished bore.
6. Pilot with balanced poppet, high flow, short and consistent response times.
7. Wiping effect eliminates sticking.
8. Long service life.

### How to Order Valve for Circuit Bar Mounting

<table>
<thead>
<tr>
<th>Port size</th>
<th>Pilot air</th>
<th>5/2 Single operator</th>
<th>5/2 Double operator</th>
<th>5/3 Closed center</th>
<th>5/3 Open center</th>
<th>5/3 Pressure center</th>
</tr>
</thead>
</table>

### Solenoid Operator

- **Voltage:**
  - JA: 240V, 220V, 50Hz
  - JA: 120V, 60Hz
  - JA: 24V, 50Hz
  - DB: 24VDC (5.4 W)
  - DF: 24VDC (12.7 W)

- **Wire length:**
  - JA: 18" (flying leads)
  - JA: Connector

- **Manual operator:**
  - 1: Non-locking
  - 2: Locking

- **Electrical connection:**
  - JA: Square connector
  - JA: Rectangular connector
  - JA: Flying leads

### How to Order Circuit Bar

<table>
<thead>
<tr>
<th>Port size</th>
<th>Pilot air</th>
<th>Spacing standard 19,5 mm</th>
<th>Spacing 26 mm (Rectangular connector)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8&quot; NPTF</td>
<td>Internal</td>
<td>CBM403A-00AAA-xx</td>
<td>CBM403A-02AAA-xx</td>
</tr>
<tr>
<td></td>
<td>Common external</td>
<td>CBM403A-00BAA-xx</td>
<td>CBM403A-02BAA-xx</td>
</tr>
</tbody>
</table>

**Options:**

- 411A-AOA-DM-Dxxx-xx
  - clic with memory spring (replace by 4).

Consult “Precautions” before use, installation or service of MAC Valves.
Consult “Precautions” before use, installation or service of MAC Valves.

### TECHNICAL DATA

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

**Pressure range:**
- Internal pilot: 20 - 150 PSI
- External pilot: vacuum - 150 PSI

**Pilot pressure:** 20 - 150 PSI

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

**Filtration:** 40 μ

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

**Orifice:** 6.2 mm

**Flow:** 1.0 Cv

**Coil:** General purpose class A, continuous duty, encapsulated

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

**Protection:** NEMA 4

**Power:**
- Inrush: 10.9 VA
- Holding: 7.7 VA
  - = 1.8 to 12.7 W
- Response times:
  - 24 Vdc/5.4 W: Energize: 7.3 ms De-energize: 5.3 ms
  - 60Hz/6 W: Energize: 8-12 ms De-energize: 7-11 ms

**Spare parts:**
- Pilot valve: DMB-XXX-XXX-1, including mounting screws 35069 and seal 16524.
- Blanking plate: M-04001.
- Flow control (x2): N-04001.
- Seal (x2): 17013-01, (x1): 17015-01.
- Mounting screw (x2): 35043.

**Options:**
- BSPP threads.
- Isolation of inlet and/or exhaust.

### DIMENSIONS

[Diagram showing dimensions of the valve with specific measurements.]
Consult "Precautions" before use, installation or service of MAC Valves.

### Operational Benefits
1. The 4-way pilot develops maximum shifting forces both ways.
2. Memory spring available.
3. Balanced spool, immune to variations of pressure, also provides high flow.
4. Short stroke with high flow.
5. Bonded spool with minimum friction, shifting in a glass-like finished bore.
6. Pilot with balanced poppet, high flow, short and consistent response times.
7. Wiping effect eliminates sticking.
8. Long service life.

### How to Order

**HOW TO ORDER VALVE FOR CIRCUIT BAR MOUNTING**

**Port size** | **Pilot air** | **5/2 Single operator** | **5/2 Double operator** | **5/3 Closed center** | **5/3 Open center** | **5/3 Pressure center**
--- | --- | --- | --- | --- | --- | ---

**Solenoid Operator**

- **Voltage**
  - JB: 240/60, 220/50
  - JA: 120/60, 110/50
  - JC: 24/60, 24/50
  - KB: 24VDC (1.8 W)
  - DA: 24VDC (5.4 W)
  - DF: 24VDC (12.7 W)
  - xx: Other Options

- **Wire length**
  - A: 18” (Flying leads)
  - J: Connector
  - x: Other Options

- **Manual operator**
  - Non-locking
  - Locking

- **Electrical connection**
  - KA: Square connector
  - KD: Square connector with light
  - JB: Rectangular connector
  - JD: Rectangular connector with light
  - BA: Flying leads
  - xx: Other Options

### How to Order Circuit Bar **

**Port size** | **Pilot air** | **Spacing standard 19,5 mm w/o flow controls** | **Spacing standard 19,5 mm w/ flow controls** | **Spacing standard 26 mm (Rectangular connector) w/o flow controls** | **Spacing standard 26 mm (Rectangular connector) w/ flow controls**
--- | --- | --- | --- | --- | ---
3/8” NPTF | Internal | CBM403A-00ABA-xx | CBM403A-00DBA-xx | CBM403A-02ABA-xx | CBM403A-02DBA-xx
| Common external | CBM403A-00CBA-xx | CBM403A-00DDBA-xx | CBM403A-02CBA-xx | CBM403A-02DDBA-xx

**Number of stations (03=3 stations)**

**Other options available. Consult factory. Note: add-a-unit stations may be added to above bars.**

**Options**

- 411A-AOA-DM-Dxxx-xx
  - clic with memory spring (replace by 4).
Consult "Precautions" before use, installation or service of MAC Valves.

### Technical Data

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

**Pressure range:**
- Internal pilot: 20 - 150 PSI
- External pilot: vacuum - 150 PSI

**Pilot pressure:**
20 - 150 PSI

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

**Filtration:**
40 µ

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

**Orifice:**
6.2 mm

**Flow:**
1.0Cv

**Coil:**
General purpose class A, continuous duty, encapsulated

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

**Protection:**
NEMA 4

**Power:**
- Inrush: 10.9 VA
- Holding: 7.7 VA
- = 1.8 to 12.7 W

**Response times:**
- 24V/5.4 W: Energize: 7.3 ms, De-energize: 5.3 ms
- 60Hz/6 W: Energize: 8-12 ms, De-energize: 7-11 ms

**Spare parts:**
- Pilot valve: DMB-XXXXX-XXX-1, including mounting screws 35069 and seal 16524.
- Blanking plate: M-04001.
- Flow control (x2): N-04001.
- Seal (x2): 17013-01, (x1): 17015-01.
- Mounting screw (x2): 35043.
- End plate kit: M-04003-01.
- End plate kit for common external: M-04004-01.
- BSPP threads.
- Isolation of inlet and/or exhaust.

### Dimensions

Consult "Precautions" before use, installation or service of MAC Valves.
Consult "Precautions" before use, installation or service of MAC Valves.

### OPERATIONAL BENEFITS

1. The 4-way pilot develops maximum shifting forces both ways.
2. Memory spring available.
3. Balanced spool, immune to variations of pressure, also provides high flow.
4. Short stroke with high flow.
5. Bonded spool with minimum friction, shifting in a glass-like finished bore.
6. Pilot with balanced poppet, high flow, short and consistent response times.
7. Wiping effect eliminates sticking.
8. Long service life.

### HOW TO ORDER

**xxxx-xxx-DM-Dxx-xxx**

**HOW TO ORDER VALVE FOR CIRCUIT BAR MOUNTING**

<table>
<thead>
<tr>
<th>Port size</th>
<th>Pilot air</th>
<th>5/2 Single operator</th>
<th>5/3 Closed center</th>
<th>5/3 Open center</th>
<th>5/3 Pressure center</th>
</tr>
</thead>
</table>

### SOLENOID OPERATOR

<table>
<thead>
<tr>
<th>XX</th>
<th>Voltage</th>
<th>X</th>
<th>Wire length</th>
<th>Manual operator</th>
<th>XX</th>
<th>Electrical connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>JB</td>
<td>240/60, 220/50</td>
<td>A</td>
<td>18&quot; (Flying leads)</td>
<td>Non-locking</td>
<td>K</td>
<td>Square connector</td>
</tr>
<tr>
<td>JA</td>
<td>120/60, 110/50</td>
<td></td>
<td></td>
<td>Locking</td>
<td>D</td>
<td>Square connector with light</td>
</tr>
<tr>
<td>JC</td>
<td>24/60, 24/50</td>
<td>x</td>
<td>Other Options</td>
<td>x</td>
<td>Other Options</td>
<td></td>
</tr>
<tr>
<td>FB</td>
<td>24VDC (1.8 W)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rectangular connector with light</td>
</tr>
<tr>
<td>DA</td>
<td>24VDC (5.4 W)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rectangular connector</td>
</tr>
<tr>
<td>DF</td>
<td>24VDC (12.7 W)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rectangular connector</td>
</tr>
<tr>
<td>xx</td>
<td>Other Options</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Flying leads</td>
</tr>
</tbody>
</table>

**HOW TO ORDER CIRCUIT BAR**

<table>
<thead>
<tr>
<th>Port size</th>
<th>Pilot air</th>
<th>Spacing 21 mm w/ flow controls</th>
<th>Spacing 26 mm (Rectangular connector) w/ flow controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8&quot; NPTF</td>
<td>Internal</td>
<td>CBM403A-01AEA-xx</td>
<td>CBM403A-02BEA-xx</td>
</tr>
<tr>
<td></td>
<td>Common external</td>
<td>CBM403A-01CEA-xx</td>
<td>CBM403A-02DEA-xx</td>
</tr>
</tbody>
</table>

Number of stations (01, 02, 03, or 04) □

** Other options available. Consult factory.

Options

- [x] w/o flow controls
- [ ] w/ flow controls

Consult "Precautions" before use, installation or service of MAC Valves.
**Fluid:** Compressed air, vacuum, inert gases

**Pressure range:**
- Internal pilot: 20 - 150 PSI
- External pilot: vacuum - 150 PSI

**Pilot pressure:** 20 - 150 PSI

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

**Filtration:** 40 µ

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

**Orifice:** 6.2 mm

**Flow:** 1.0 Cv

**Coil:** General purpose class A, continuous duty, encapsulated

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

**Protection:** NEMA 4

**Power:**
- Inrush: 10.9 VA
- Holding: 7.7 VA
  - Inrush: 1.8 to 12.7 W

**Response times:**
- 24 V: 5.4 W Energize: 7.3 ms De-energize: 5.3 ms
- 60 Hz: 6 W Energize: 8-12 ms De-energize: 7-11 ms

**Spare parts:**
- Pilot valve: DMB-DXXX-XXX-1, including mounting screws 35069 and seal 16524.

**Accessories:**
- Blanking plate: M-04001.
- Flow control (x2): N-04001.
- Seal (x2): 17013-01, (x1): 17015-01.
- Mounting screw (x2): 35043.
- End plate kit: M-04003-01.
- End plate kit for common external: M-04004-01.

**Options:**
- BSPP threads.
- Isolation of inlet and/or exhaust.

---

**Dimensions**

![Diagram showing technical dimensions and options for Series 400 MAC Valves.](image-url)

Consult "Precautions" before use, installation or service of MAC Valves.
**OPERATIONAL BENEFITS**

1. The 4-way pilot develops maximum shifting forces both ways.
2. Memory spring available.
3. Balanced spool, immune to variations of pressure, also provides high flow.
4. Short stroke with high flow.
5. Bonded spool with minimum friction, shifting in a glass-like finished bore.
6. Pilot with balanced poppet, high flow, short and consistent response times.
7. Wiping effect eliminates sticking.
8. Long service life.

**HOW TO ORDER**

**HOW TO ORDER VALVE FOR CIRCUIT BAR MOUNTING**

<table>
<thead>
<tr>
<th>Pilot air</th>
<th>5/2 Single operator</th>
<th>5/2 Double operator</th>
<th>5/3 Closed center</th>
<th>5/3 Open center</th>
<th>5/3 Pressure center</th>
</tr>
</thead>
</table>

**SOLENOID OPERATOR**

- **Voltage**
  - JB: 240V, 220V, 50V
  - JA: 120V, 110V, 50V
  - JC: 24V, 24V, 50V
  - FB: 24VDC (1.8 W)
  - DA: 24VDC (5.4 W)
  - DF: 24VDC (12.7 W)

- **Wire length**
  - A: 18" (Flying leads)

- **Manual operator**
  - 1: Non-locking
  - 2: Locking

- **Electrical connection**
  - KA: Square connector
  - KD: Square connector with light
  - JB: Rectangular connector
  - JD: Rectangular connector with light
  - BA: Flying leads
  - xx: Other Options

**HOW TO ORDER CIRCUIT BAR (BOTTOM CYLINDER PORTS)**

<table>
<thead>
<tr>
<th>Port size</th>
<th>Pilot air</th>
<th>Spacing standard 19.5 mm w/ flow controls</th>
<th>Spacing 26 mm (Rectangular connector) w/ flow controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8” NPTF</td>
<td>Internal</td>
<td>CMB404A-00AA-xx</td>
<td>CMB404A-02BA-xx</td>
</tr>
<tr>
<td>1/4” NPTF</td>
<td>Internal</td>
<td>CMB404A-00AD-xx</td>
<td>CMB404A-02BAD-xx</td>
</tr>
</tbody>
</table>

Number of stations (03=3 stations)

**Other Options available. Consult factory**
Consult "Precautions" before use, installation or service of MAC Valves.
Consult "Precautions" before use, installation or service of MAC Valves.

**OPERATIONAL BENEFITS**

1. The 4-way pilot develops maximum shifting forces both ways.
2. Memory spring available.
3. Balanced spool, immune to variations of pressure, also provides high flow.
4. Short stroke with high flow.
5. Bonded spool with minimum friction, shifting in a glass-like finished bore.
6. Pilot with balanced poppet, high flow, short and consistent response times.
7. Wiping effect eliminates sticking.
8. Long service life.

**HOW TO ORDER VALVE FOR CIRCUIT BAR MOUNTING**

<table>
<thead>
<tr>
<th>Pilot air</th>
<th>5/2 Single operator</th>
<th>5/2 Double operator</th>
<th>5/3 Closed center</th>
<th>5/3 Open center</th>
<th>5/3 Pressure center</th>
</tr>
</thead>
</table>

**Solenoid Operator**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Wire length</th>
<th>Manual operator</th>
<th>Electrical connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>JB 240/60, 220/50</td>
<td>A 18&quot; (Flying leads)</td>
<td>1 Non-locking</td>
<td>KA Square connector</td>
</tr>
<tr>
<td>JA 120/60, 110/50</td>
<td>J Connector</td>
<td>2 Locking</td>
<td>KD Square connector with light</td>
</tr>
<tr>
<td>JC 24/60, 24/50</td>
<td>x Other Options</td>
<td></td>
<td>JB Rectangular connector</td>
</tr>
<tr>
<td>FB 24VDC (1.8 W)</td>
<td></td>
<td></td>
<td>JD Rectangular connector with light</td>
</tr>
<tr>
<td>DA 24VDC (5.4 W)</td>
<td></td>
<td></td>
<td>BA Flying leads</td>
</tr>
<tr>
<td>DF 24VDC (12.7 W)</td>
<td></td>
<td></td>
<td>xx Other Options</td>
</tr>
</tbody>
</table>

**HOW TO ORDER CIRCUIT BAR (BOTTOM CYLINDER PORTS)**

<table>
<thead>
<tr>
<th>Port size</th>
<th>Pilot air</th>
<th>Spacing standard 19.5 mm w/ flow controls</th>
<th>Spacing 26 mm (Rectangular connector) w/ flow controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8&quot; NPTF</td>
<td>Internal</td>
<td>CBM404A-00ABA-xx</td>
<td>CBM404A-02ABA-xx</td>
</tr>
<tr>
<td>1/4&quot; NPTF</td>
<td>Internal</td>
<td>CBM404A-00ABD-xx</td>
<td>CBM404A-02ABD-xx</td>
</tr>
</tbody>
</table>

Number of stations (03=3 stations)

**Other options available. Consult factory.**

Note: add-a-unit stations may be added to above bars.

Consult "Precautions" before use, installation or service of MAC Valves.
### Technical Data

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

**Pressure range:** 20 - 150 PSI

**Pilot pressure:** 20 - 150 PSI

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

**Filtration:** 40 µ

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

**Orifice:** 6.2 mm

**Flow:** 1.0 Cv

**Coil:** General purpose class A, continuous duty, encapsulated

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

**Protection:** NEMA 4

**Power:**
- Inrush: 10.9 VA
- Holding: 7.7 VA
- = 1.8 to 12.7 W

**Response times:**
- 24 V/5.4 W Energize: 7.3 ms De-energize: 5.3 ms
- 60Hz/6 W Energize: 8-12 ms De-energize: 7-11 ms

**Spare parts:**
- Pilot valve: DMB-DXXX-XXX-1, including mounting screws 35069 and seal 16524.

**Options:**
- BSPP threads.
- Isolation of inlet and/or exhaust.

## Dimensions

Consult "Precautions" before use, installation or service of MAC Valves.
Consult "Precautions" before use, installation or service of MAC Valves.

**Operational Benefits**

1. The 4-way pilot develops maximum shifting forces both ways.
2. Memory spring available.
3. Balanced spool, immune to variations of pressure, also provides high flow.
4. Short stroke with high flow.
5. Bonded spool with minimum friction, shifting in a glass-like finished bore.
6. Pilot with balanced poppet, high flow, short and consistent response times.
7. Wiping effect eliminates sticking.
8. Long service life.

**HOW TO ORDER**

```
xxxx-xxx-DM-Dxxx-xxx
```

**HOW TO ORDER VALVE FOR CIRCUIT BAR MOUNTING**

<table>
<thead>
<tr>
<th>Pilot air</th>
<th>5/2 Single operator</th>
<th>5/2 Double operator</th>
<th>5/3 Closed center</th>
<th>5/3 Open center</th>
<th>5/3 Pressure center</th>
</tr>
</thead>
</table>

**Solenoid Operator**

```
XX Voltage
JB 240V/60, 220V/50
JA 120V/60, 110V/50
JC 24V/60, 24V/50
FB 24VDC (1.8 W)
DA 24VDC (5.4 W)
DF 24VDC (12.7 W)
xx Other Options
```

```
XX Wire length
A 18" (Flying leads)
J Connector
x Other Options
```

```
XX Manual operator
1 Non-locking
2 Locking
x Other Options
```

```
XX Electrical connection
KA Square connector
KD Square connector with light
JB Rectangular connector
JD Rectangular connector with light
RA Flying leads
xx Other Options
```

**HOW TO ORDER CIRCUIT BAR (BOTTOM CYLINDER PORTS) **

```
CBM404A-xxxxx-xx
```

<table>
<thead>
<tr>
<th>Port size</th>
<th>Pilot air</th>
<th>Spacing 21 mm w/ flow controls</th>
<th>Spacing 26 mm w/ flow controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8&quot; NPTF</td>
<td>Internal</td>
<td>CBM404A-01AEA-xx</td>
<td>CBM404A-01BEA-xx</td>
</tr>
<tr>
<td>1/4&quot; NPTF</td>
<td>Internal</td>
<td>CBM404A-01AED-xx</td>
<td>CBM404A-01BDE-xx</td>
</tr>
</tbody>
</table>

Number of stations: [01, 02, 03, or 04]

**Other options available. Consult factory.**

```
413A-OOA-DM-Dxxx-xxx
```

dic with memory spring (replace by 6).
Consult “Precautions” before use, installation or service of MAC Valves.

### Technical Data

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

**Pressure range:** 20 - 150 PSI

**Pilot pressure:** 20 - 150 PSI

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

**Filtration:** 40 μ

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

**Orifice:** 6.2 mm

**Flow:** 1.0Cv

**Coil:** General purpose class A, continuous duty, encapsulated

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

**Protection:** NEMA 4

**Power:**
- Inrush: 10.9 VA
- Holding: 7.7 VA
- = 1.8 to 12.7 W

**Response times:**
- 24 VDC/5.4 W Energize: 7.3 ms  De-energize: 5.3 ms
- 60Hz/6 W Energize: 8-12 ms  De-energize: 7-11 ms

**Spare parts:**
- Pilot valve: DMB-DXXX-XXX-1, including mounting screws 35069 and seal 16524.
- Blanking plate: M-04002.
- Flow control (x2): N-04001.
- Seal: 16525.
- Mounting screw (x2): 35043.
- End plate kit: M-04003-01.

**Accessories:**
- BSPP threads.
- Isolation of inlet and/or exhaust.

### Dimensions

![Diagram](image-url)
Consult "Precautions" before use, installation or service of MAC Valves.

**OPERATIONAL BENEFITS**

1. The 4-way pilot develops maximum shifting forces both ways.
2. Memory spring available.
3. Balanced spool, immune to variations of pressure, also provides high flow.
4. Short stroke with high flow.
5. Bonded spool with minimum friction, shifting in a glass-like finished bore.
6. Pilot with balanced poppet, high flow, short and consistent response times.
7. Wiping effect eliminates sticking.
8. Long service life.

**HOW TO ORDER VALVE FOR CIRCUIT BAR MOUNTING**

<table>
<thead>
<tr>
<th>Pilot air</th>
<th>5/2 Single operator</th>
<th>5/2 Double operator</th>
<th>5/3 Closed center</th>
<th>5/3 Open center</th>
<th>5/3 Pressure center</th>
</tr>
</thead>
</table>

**Solenoid Operator**

<table>
<thead>
<tr>
<th>XX</th>
<th>Voltage</th>
<th>X</th>
<th>Wire length</th>
<th>Manual operator</th>
<th>XX</th>
<th>Electrical connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>JB</td>
<td>240/60, 220/50</td>
<td>A</td>
<td>18” (Flying leads)</td>
<td>Non-locking</td>
<td>KA</td>
<td>Square connector</td>
</tr>
<tr>
<td>JA</td>
<td>120/60, 110/50</td>
<td>J</td>
<td>Connector</td>
<td>2 Locking</td>
<td>KD</td>
<td>Square connector</td>
</tr>
<tr>
<td>JC</td>
<td>24/60, 24/50</td>
<td>X</td>
<td>Other Options</td>
<td></td>
<td>JB</td>
<td>Rectangular connector</td>
</tr>
<tr>
<td>FB</td>
<td>24VDC (1.8 W)</td>
<td></td>
<td></td>
<td></td>
<td>JD</td>
<td>Rectangular connector</td>
</tr>
<tr>
<td>DA</td>
<td>24VDC (5.4 W)</td>
<td></td>
<td></td>
<td></td>
<td>BA</td>
<td>Flying leads</td>
</tr>
<tr>
<td>DF</td>
<td>24VDC (12.7 W)</td>
<td></td>
<td></td>
<td></td>
<td>XX</td>
<td>Other Options</td>
</tr>
<tr>
<td>XX</td>
<td>Other Options</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**HOW TO ORDER CIRCUIT BAR (SIDE CYLINDER PORTS)**

<table>
<thead>
<tr>
<th>Port size</th>
<th>Pilot air</th>
<th>Spacing standard 19,5 mm</th>
<th>Spacing 26 mm (Rectangular connector)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8” NPTF</td>
<td>Internal</td>
<td>CBM405A-00AAA-xx</td>
<td>CBM405A-02AAA-xx</td>
</tr>
<tr>
<td></td>
<td>Common external</td>
<td>CBM405A-00BAA-xx</td>
<td>CBM405A-02BAA-xx</td>
</tr>
<tr>
<td>1/4” NPTF</td>
<td>Internal</td>
<td>CBM405A-00AAD-xx</td>
<td>CBM405A-02AAD-xx</td>
</tr>
<tr>
<td></td>
<td>Common external</td>
<td>CBM405A-00BAD-xx</td>
<td>CBM405A-02BAD-xx</td>
</tr>
</tbody>
</table>

Number of stations (03 = 3 stations)

**Other Options available. Consult factory.**

Consult "Precautions" before use, installation or service of MAC Valves.
### Technical Data

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Compressed air, vacuum, inert gases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure range</td>
<td>Internal pilot: 20 - 150 PSI</td>
</tr>
<tr>
<td></td>
<td>External pilot: vacuum - 150 PSI</td>
</tr>
<tr>
<td>Pilot pressure</td>
<td>20 - 150 PSI</td>
</tr>
<tr>
<td>Lubrication</td>
<td>Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)</td>
</tr>
<tr>
<td>Filtration</td>
<td>40 µ</td>
</tr>
<tr>
<td>Temperature range</td>
<td>0°F to 120°F (-18°C to +50°C)</td>
</tr>
<tr>
<td>Orifice</td>
<td>6.2 mm</td>
</tr>
<tr>
<td>Flow</td>
<td>1.0Cv</td>
</tr>
<tr>
<td>Coil</td>
<td>General purpose class A, continuous duty, encapsulated</td>
</tr>
<tr>
<td>Voltage range</td>
<td>-15% to +10% of nominal voltage</td>
</tr>
<tr>
<td>Protection</td>
<td>NEMA 4</td>
</tr>
<tr>
<td>Power</td>
<td>- Inrush: 10.9 VA Holding: 7.7 VA</td>
</tr>
<tr>
<td></td>
<td>= 1.8 to 12.7 W</td>
</tr>
<tr>
<td>Response times</td>
<td>24 V=5.4 W Energize: 7.3 ms De-energize: 5.3ms</td>
</tr>
<tr>
<td></td>
<td>60Hz/6 W Energize: 8-12 ms De-energize: 7-11 ms</td>
</tr>
<tr>
<td>Spare parts</td>
<td>• Pilot valve: DMB-DXXX-XXX-1, including mounting screws 35069 and seal 16524.</td>
</tr>
<tr>
<td>Accessories</td>
<td>• Blanking plate: M-04002. • Seal: 16525. • Mounting screw (x2): 35043.</td>
</tr>
<tr>
<td>Options</td>
<td>• BSPP threads. • Isolation of inlet and/or exhaust.</td>
</tr>
</tbody>
</table>

### Dimensions

![Diagram of the valve with dimensions labeled]
Consult “Precautions” before use, installation or service of MAC Valves.

**Operational Benefits**

1. The 4-way pilot develops maximum shifting forces both ways.
2. Memory spring available.
3. Balanced spool, immune to variations of pressure, also provides high flow.
4. Short stroke with high flow.
5. Bonded spool with minimum friction, shifting in a glass-like finished bore.
6. Spool with balanced poppet, high flow, short and consistent response times.
7. Wiping effect eliminates sticking.
8. Long service life.

**How to Order VALVE FOR CIRCUIT BAR MOUNTING**

<table>
<thead>
<tr>
<th>Pilot Air</th>
<th>5/2 Single Operator</th>
<th>5/2 Double Operator</th>
<th>5/3 Closed Center</th>
<th>5/3 Open Center</th>
<th>5/3 Pressure Center</th>
</tr>
</thead>
</table>

**Solenoid Operator**

- **Voltage**
  - JA: 240/60, 220/50
  - JA: 120/60, 110/50
  - JA: 240/60, 24/50
  - FB: 24VDC (1.8 W)
  - DF: 24VDC (12.7 W)

- **Wire Length**
  - A: 18” (Flying leads)
  - J: Connector
  - x: Other Options

- **Manual Operator**
  - 1: Non-locking
  - 2: Locking
  - x: Other Options

- **Electrical Connection**
  - KA: Square connector
  - KD: Square connector with light
  - JA: Rectangular connector
  - JD: Rectangular connector with light
  - BA: Flying leads
  - xx: Other Options

**How to Order Circuit Bar (Side Cylinder Ports)**

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Pilot Air</th>
<th>Spacing Standard 19.5 mm</th>
<th>Spacing 26 mm (Rectangular Connector)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8” NPTF</td>
<td>Internal</td>
<td>CBM405A-00ABA-xx</td>
<td>CBM405A-02ABA-xx</td>
</tr>
<tr>
<td>1/4” NPTF</td>
<td>Internal</td>
<td>CBM405A-00ABCD-xx</td>
<td>CBM405A-02ABCD-xx</td>
</tr>
<tr>
<td>1/4” NPTF</td>
<td>Common external</td>
<td>CBM405A-00BCA-xx</td>
<td>CBM405A-02BCA-xx</td>
</tr>
<tr>
<td>1/4” NPTF</td>
<td>Common external</td>
<td>CBM405A-00ABD-xx</td>
<td>CBM405A-02ABD-xx</td>
</tr>
</tbody>
</table>

Number of stations (03=3 stations)

**Other Options Available**

- CBM405A-xxxxxx-xx

- 413A-OOA-DM-Dxxx-xxx with memory spring (replace by 6).

Consult “Precautions” before use, installation or service of MAC Valves.
**Technical Data**

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

**Pressure range:**
- Internal pilot: 20 - 150 PSI
- External pilot: vacuum - 150 PSI

**Pilot pressure:** 20 - 150 PSI

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

**Filtration:** 40 µ

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

**Orifice:** 6.2 mm

**Flow:** 1.0 Cv

**Coil:** General purpose class A, continuous duty, encapsulated

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

**Protection:** NEMA 4

**Power:**
- Inrush: 10.9 VA
- Holding: 7.7 VA

- = 1.8 to 12.7 W

**Response times:**
- 24 V/5.4 W: Energize: 7.3 ms, De-energize: 5.3 ms
- 60 Hz/6 W: Energize: 8-12 ms, De-energize: 7-11 ms

**Spare parts:**
- Pilot valve: DMB-DXXX-XXX-1, including mounting screws 35069 and seal 16524.

**Accessories:**
- Blanking plate: M-04002.
- Seal: 16525.
- Mounting screw (x2): 35043.
- End plate kit: M-04005-01.
- End plate kit for common external pilot: M-04006-01.

**Options:**
- BSPP threads.
- Isolation of inlet and/or exhaust.

**Dimensions**

Consult "Precautions" before use, installation or service of MAC Valves.
### Operational Benefits
1. The 4-way pilot develops maximum shifting forces both ways.
2. Memory spring available.
3. Balanced spool, immune to variations of pressure, also provides high flow.
4. Short stroke with high flow.
5. Bonded spool with minimum friction, shifting in a glass-like finished bore.
6. Spool with balanced poppet, high flow, short and consistent response times.
7. Wiping effect eliminates sticking.
8. Long service life.

### How to Order

#### How to Order Valve for Circuit Bar Mounting

<table>
<thead>
<tr>
<th>Pilot air</th>
<th>5/2 Single operator</th>
<th>5/2 Double operator</th>
<th>5/3 Closed center</th>
<th>5/3 Open center</th>
<th>5/3 Pressure center</th>
</tr>
</thead>
</table>

#### Solenoid Operator

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Wire length</th>
<th>Manual operator</th>
<th>Electrical connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>JA</td>
<td>240/60, 220/50</td>
<td>18&quot; (Flying leads)</td>
<td>JAXA (Square connector)</td>
</tr>
<tr>
<td>JA</td>
<td>120/60, 110/50</td>
<td>Connector</td>
<td>JADJ (Square connector with light)</td>
</tr>
<tr>
<td>JC</td>
<td>24/60, 24/50</td>
<td></td>
<td>JBSB (Rectangular connector)</td>
</tr>
<tr>
<td>FB</td>
<td>24VDC (1.8 W)</td>
<td></td>
<td>JBDA (Rectangular connector with light)</td>
</tr>
<tr>
<td>DA</td>
<td>24VDC (5.4 W)</td>
<td></td>
<td>JBDA (Rectangular connector with light)</td>
</tr>
<tr>
<td>DF</td>
<td>24VDC (12.7 W)</td>
<td></td>
<td>DBDA (Flying leads)</td>
</tr>
<tr>
<td>xx</td>
<td>Other Options</td>
<td></td>
<td>xx (Other Options)</td>
</tr>
</tbody>
</table>

#### How to Order Circuit Bar (Side Cylinder Ports)

<table>
<thead>
<tr>
<th>Port size</th>
<th>Pilot air</th>
<th>Spacing 21 mm</th>
<th>Spacing 26 mm (Rectangular connector)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8&quot; NPTF</td>
<td>Internal</td>
<td>CBM405A-01AEA-xx</td>
<td>CBM405A-02AEA-xx</td>
</tr>
<tr>
<td></td>
<td>Common external</td>
<td>CBM405A-01BEA-xx</td>
<td>CBM405A-02BEA-xx</td>
</tr>
<tr>
<td>1/4&quot; NPTF</td>
<td>Internal</td>
<td>CBM405A-01AED-xx</td>
<td>CBM405A-02AED-xx</td>
</tr>
<tr>
<td></td>
<td>Common external</td>
<td>CBM405A-01BED-xx</td>
<td>CBM405A-02BED-xx</td>
</tr>
</tbody>
</table>

---

Consult “Precautions” before use, installation or service of MAC Valves.
**TECHNICAL DATA**

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

**Pressure range:**
- Internal pilot: 20 - 150 PSI
- External pilot: vacuum - 150 PSI

**Pilot pressure:** 20 - 150 PSI

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

**Filtration:** 40 µ

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

**Orifice:** 6.2 mm

**Flow:** 1.0Cv

**Coil:** General purpose class A, continuous duty, encapsulated

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

**Protection:** NEMA 4

**Power:**
- Inrush: 10.9 VA
- Holding: 7.7 VA
- 1.8 to 12.7 W

**Response times:**
- 24 V=5.4 W Energize: 7.3 ms De-energize: 5.3 ms
- 60Hz/6 W Energize: 8-12 ms De-energize: 7-11 ms

**Spare parts:**
- Pilot valve: DMB-DXXX-XXX-1, including mounting screws 35069 and seal 16524.
- Blanking plate: M-04002.
- Seal: 16525.
- Mounting screw (x2): 35043.
- End plate kit: M-04005-01.
- End plate kit for common external pilot: M-04006-01.

**Options:**
- BSPP threads.
- Isolation of inlet and/or exhaust.

**DIMENSIONS**

- 21.0
- 16.0
- 5.5
- 10.5
- 16.0
- 21.0

Consult "Precautions" before use, installation or service of MAC Valves.
Section 2

Options
**Codification table for voltages / Wire length / Manual operator / Electrical connection**

<table>
<thead>
<tr>
<th>VALVE CODE</th>
<th>OPTIONS AVAILABLE FOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>DM- DXX X - X XX</td>
<td>- pilot operated valves 400, 52 &amp; 92 Series</td>
</tr>
</tbody>
</table>

Consult "Precautions" before use, installation or service of MAC Valves.
Consult "Precautions" before use, installation or service of MAC Valves.

## 1. Voltage

<table>
<thead>
<tr>
<th>Code</th>
<th>Voltage Type</th>
<th>Power (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB</td>
<td>12 VDC</td>
<td>5.4</td>
</tr>
<tr>
<td>DC</td>
<td>12 VDC</td>
<td>7.5</td>
</tr>
<tr>
<td>DD</td>
<td>24 VDC</td>
<td>7.3</td>
</tr>
<tr>
<td>DE</td>
<td>12 VDC</td>
<td>12.7</td>
</tr>
<tr>
<td>DK</td>
<td>110 VDC</td>
<td>5.8</td>
</tr>
<tr>
<td>DJ</td>
<td>28 VDC</td>
<td>5.7</td>
</tr>
<tr>
<td>DL</td>
<td>64 VDC</td>
<td>6.0</td>
</tr>
<tr>
<td>DM</td>
<td>36 VDC</td>
<td>5.8</td>
</tr>
<tr>
<td>DN</td>
<td>6 VDC</td>
<td>6.0</td>
</tr>
<tr>
<td>DR</td>
<td>90 VDC</td>
<td>6.6</td>
</tr>
<tr>
<td>DS</td>
<td>110 VDC, 100</td>
<td>7.3, 6.0</td>
</tr>
<tr>
<td>DT</td>
<td>75 VDC</td>
<td>5.6</td>
</tr>
<tr>
<td>DP</td>
<td>48 VDC</td>
<td>5.8</td>
</tr>
<tr>
<td>FA</td>
<td>12 VDC</td>
<td>1.8</td>
</tr>
<tr>
<td>FE</td>
<td>12 VDC</td>
<td>2.4</td>
</tr>
<tr>
<td>FF</td>
<td>24 VDC</td>
<td>2.4</td>
</tr>
<tr>
<td>JD</td>
<td>100/60, 100/50, 110/60</td>
<td></td>
</tr>
</tbody>
</table>

## 2. Wire Length

<table>
<thead>
<tr>
<th>Code</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>24&quot;</td>
</tr>
<tr>
<td>C</td>
<td>36&quot;</td>
</tr>
<tr>
<td>D</td>
<td>48&quot;</td>
</tr>
<tr>
<td>E</td>
<td>72&quot;</td>
</tr>
<tr>
<td>F</td>
<td>96&quot;</td>
</tr>
</tbody>
</table>
### 3. MANUAL OPERATOR

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No operator</td>
</tr>
<tr>
<td>1</td>
<td>Non-locking recessed</td>
</tr>
<tr>
<td>2</td>
<td>Locking recessed</td>
</tr>
<tr>
<td>3</td>
<td>Non-locking extended</td>
</tr>
<tr>
<td>4</td>
<td>Locking extended</td>
</tr>
</tbody>
</table>

### 4. ELECTRICAL CONNECTION

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA</td>
<td>Flying leads</td>
</tr>
<tr>
<td>BK</td>
<td>BA with protection diode</td>
</tr>
<tr>
<td>BL</td>
<td>BA with protection varistor</td>
</tr>
<tr>
<td>CA</td>
<td>1/2&quot; NPS conduit</td>
</tr>
<tr>
<td>JB</td>
<td>Rectangular connector</td>
</tr>
<tr>
<td>JD</td>
<td>Rectangular connector with light</td>
</tr>
<tr>
<td>JM</td>
<td>Rectangular connector, male only</td>
</tr>
<tr>
<td>KA</td>
<td>Square connector</td>
</tr>
<tr>
<td>KB</td>
<td>Square connector with protection diode</td>
</tr>
<tr>
<td>KC</td>
<td>Square connector with protection varistor</td>
</tr>
<tr>
<td>KD</td>
<td>Square connector with light</td>
</tr>
<tr>
<td>KE</td>
<td>Square connector with light and protection diode</td>
</tr>
<tr>
<td>KF</td>
<td>Square connector with light and protection varistor</td>
</tr>
<tr>
<td>KJ</td>
<td>Square connector (male only)</td>
</tr>
<tr>
<td>KK</td>
<td>Square connector with protection diode (male only)</td>
</tr>
<tr>
<td>KL</td>
<td>Square connector with protection varistor (male only)</td>
</tr>
<tr>
<td>TA</td>
<td>Dual tabs</td>
</tr>
<tr>
<td>TB</td>
<td>TA with protection diode</td>
</tr>
<tr>
<td>TD</td>
<td>TA with light</td>
</tr>
<tr>
<td>TE</td>
<td>TA with light and protection diode</td>
</tr>
<tr>
<td>TJ</td>
<td>Dual tabs (male only)</td>
</tr>
<tr>
<td>TK</td>
<td>TJ with protection diode</td>
</tr>
<tr>
<td>TM</td>
<td>TJ with light</td>
</tr>
<tr>
<td>TN</td>
<td>TJ with light and protection diode</td>
</tr>
<tr>
<td>*DN</td>
<td>Plug-in with diode</td>
</tr>
<tr>
<td>*DP</td>
<td>Plug-in with M.O.V</td>
</tr>
<tr>
<td>*DH</td>
<td>Plug-in with diode &amp; ground</td>
</tr>
<tr>
<td>*DJ</td>
<td>Plug-in with M.O.V &amp; ground</td>
</tr>
</tbody>
</table>

* These options only apply to the 92 series. All others are for the 400 and 52 series.
The precautions below are important to be read and understood before installing or servicing any MAC valve. Improper use, installation or servicing of any MAC valve in some systems could create a hazard to personnel or equipment.

**APPLICATION PRECAUTIONS:**

**INDUSTRIAL USE:**

MAC valves are intended for use in industrial pneumatic and/or vacuum systems. They are not intended for consumer use or service. They are general purpose industrial valves with literally 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, cylinders, valves or any other component.

**POWER PRESSES:**

MAC valves are not designed nor intended to be used to operate and/or control the operation of clutch and/or brake systems on power presses. There are special products on the market for such use.

**2-POSITION VALVES:**

Some MAC valves are 2-position, 4-way valves. When air is supplied to the inlet port(s) of these valves, there will always be a flow path from the inlet to one of the outlets regardless of which of the two positions the valve is situated. Therefore, if pressurized air retained in the system would present a hazard in the application or servicing of the valve or system, a separate method in the system must be provided to remove the trapped air.

**3-POSITION VALVES:**

Some MAC valves are 3-position, 4-way valves. These valves are either double solenoid or double remote air operated. If either of the two operators is in control, air supplied to the inlet port(s) will pass through the valve to one of the outlets as a 2-position, 4-way valve. However, if neither operator is in control, the valve moves to a center position. Listed below are the various center position functions:

**A. CLOSED CENTER:**

With this type valve, when in the center position all ports are blocked (inlets and exhausts) meaning the air at both outlet ports is trapped. If trapping the air in both outlet ports would present a hazard in the application or servicing, a separate method in the system must be provided to remove the trapped air or this type valve should not be used.

**B. OPEN CENTER:**

With this type valve, when in the center position, the inlet port(s) is blocked and the two outlet ports are open to the exhaust port(s) of the valve. If having no air in either outlet port would present a hazard in the application or servicing, this type valve should not be used.

**C. PRESSURE CENTER:**

With this type valve, when in the center position, the inlet port(s) is connected to both outlet ports of the valve. If having pressurized air to either or both outlet ports would present a hazard in the application or servicing of the valve or system, a separate method in the system must be provided to remove the retained air.

**OPERATING SPECIFICATIONS:**

MAC valves are to be installed only on applications that meet all operating specifications described in the MAC catalog for the valve.

**MANUAL OPERATORS:**

Most MAC valves can be ordered with manual operators. Manual operators when depressed, are designed to shift the valve to the same position as would the corresponding solenoid or remote air operated pilot valve if it were activated. Care must be taken to order a type, if any, that will be safe for the physical location of the manual operator in the system. Accidental activation of a manual operator could create a dangerous situation. If intentional or accidental operation of a valve by a manual operator could create a dangerous situation then the “no operator” option should be used.

**REMOTE AIR OPERATED VALVES**

Pilot valves supplying signal pressure to remote air operated valves should be 3-way valves with adequate supply and exhaust capacity to provide positive pressurizing and exhausting of the pilot supply line. Pilot lines should be open to exhaust when valves are deenergized.

**INSTALLATION AND SERVICE PRECAUTIONS:**

A. Do not install or service MAC valves without first making sure both the air and electrical power to the machine are off and that all air has been completely bled from the system.

B. MAC valves should only be installed and/or serviced by qualified, knowledgeable personnel who understand how the specific valve is to be pneumatically piped and electrically connected (where applicable). Flow paths through the valve are shown in the catalog and on the valve by use of ANSI or ISO type standard and graphic symbols. Do not install unless these symbols and the valve functions and operations are thoroughly understood.

C. Before service, maintenance, repair or cleaning, consult local distributor or factory for Parts & Operation Sheet and information on proper cleaning and lubrication agents. Do not subject MAC valves' parts to any foreign substance including lubricants and cleaning agents not specifically recommended by MAC valves, Inc.

D. MAC valves are never to be stepped on while working on a machine. Damage to the valve, or lines to the valve (either air or electrical lines) or accidental activating of a manual operator on the valve could result in a dangerous condition.

**WARNING:**

Under no circumstances are MAC valves to be used in any application where failure of the valve to operate as intended could jeopardize the safety of the operator or any other person.

- Do not operate outside of pressure range listed on valve label or outside of designated temperature range.
- Air supply must be clean. Contamination of valve can affect proper operation.
- Before attempting to repair, adjust or clean valve, consult catalog, parts & operation sheet, or factory for proper maintenance procedures, lubrication, and cleaning agents. Never attempt to repair or perform other maintenance with air pressure to valve.
- If airline lubrication is used, consult catalog, parts & operation sheet, or factory for recommended lubricants.

**LIMITATION OF GUARANTEE:**

This Guarantee is limited to the replacement or rebuilding of any valve which should fail to operate properly. Valves, under the MAC Guarantee, must be returned (with or without bases) transportation prepaid and received at our factory within the 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.

**DISCLAIMER OF GUARANTEE:**

No claims for labor, material, time, damage, or transportation are allowable nor will any valve be replaced or rebuilt under this 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 loss or damage caused by fire, theft, riot, explosion, labor dispute, act of God, or other causes beyond the control of MAC Valves, Inc. MAC Valves, Inc. shall in no event be liable for remote, special or consequential damages under the MAC Guarantee, nor under any implied warranties, including the implied warranty of merchantability.

The above Guarantee is our manner of extending the engineering and service resources of the MAC Valves, Inc. organization to assure our customers long and continued satisfaction.