

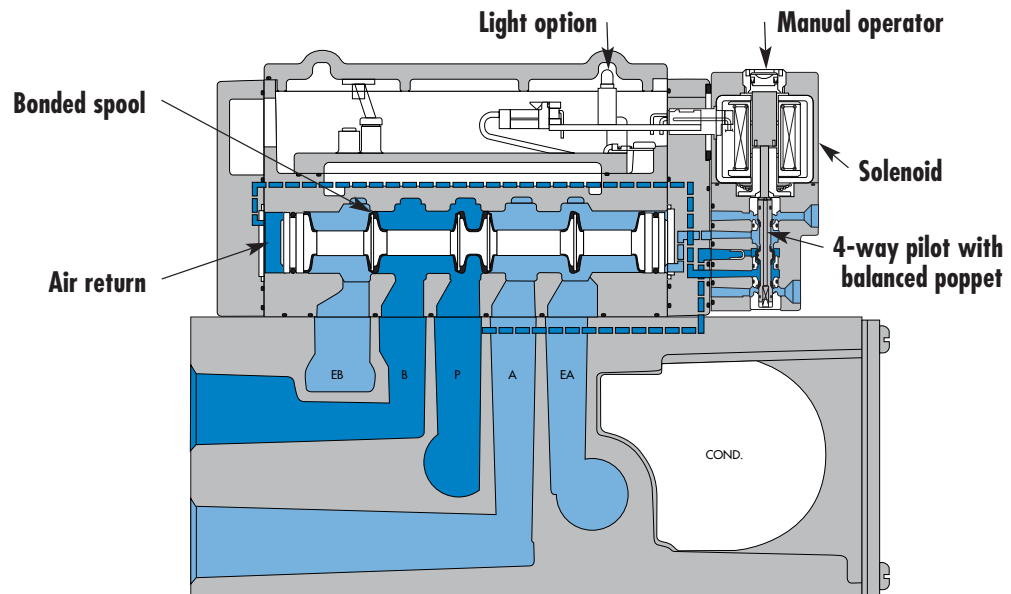
Individual mounting

|        |                        |                    |
|--------|------------------------|--------------------|
| Inline | Sub-base non "plug-in" | Sub-base "plug-in" |
|--------|------------------------|--------------------|

Series

Manifold mounting

|                        |                    |
|------------------------|--------------------|
| Sub-base non "plug-in" | Sub-base "plug-in" |
|------------------------|--------------------|



**SERIES FEATURES**

- Patented MACSOLENOID® for fastest possible response times and virtually burn-out proof AC solenoid operation.
- Optional low watt DC solenoids.
- Optional memory spring.
- Plug-in design of valves and bases for ease of maintenance.
- 2 position or 3 position valve configurations.

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ISO 01

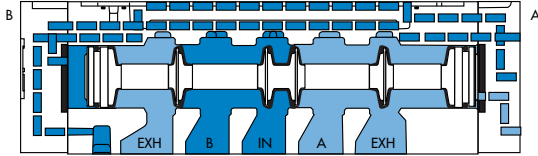
ISO 02

ISO 1

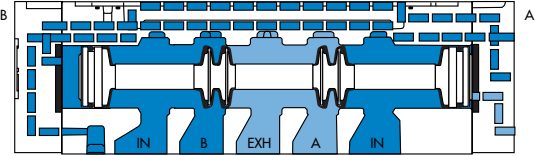
ISO 2

ISO 3

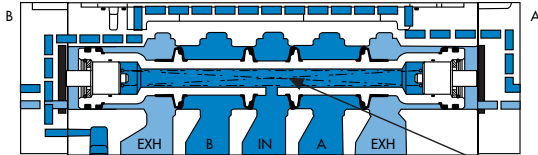
**SPOOL CONFIGURATIONS**



2 POSITION SINGLE PRESSURE  
SHOWN WITH "B" OPERATOR ENERGIZED

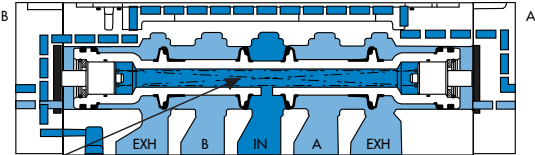


2 POSITION DUAL PRESSURE  
SHOWN WITH "B" OPERATOR ENERGIZED

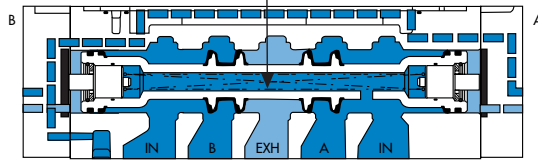


3 POSITION CLOSED CENTER

**SPRING CENTERING**



3 POSITION OPEN CENTER



3 POSITION DUAL PRESSURE, PRESSURE CENTER

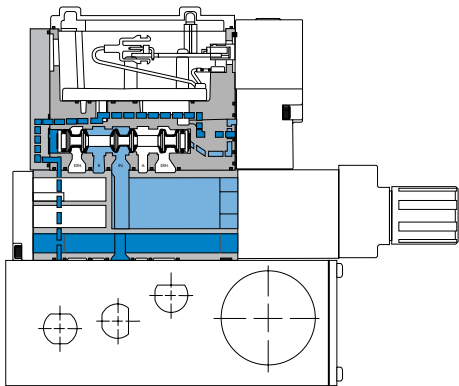
**REGULATOR CONFIGURATIONS**

**SINGLE REGULATOR - SINGLE PRESSURE**

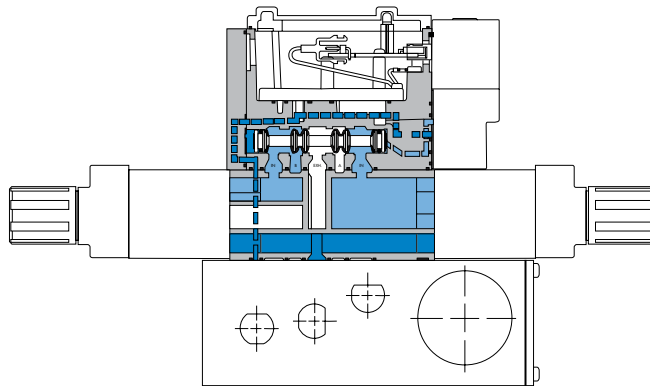
Pressure supplied to the individual or manifold base passes through the regulator. Regulated pressure is supplied to the pressure path of the valve.

**DUAL REGULATOR - DUAL PRESSURE**

Pressure supplied from each regulator is divided in the block. Regulated pressure from "A" regulator supplies cylinder port "A". Regulated pressure from "B" regulator supplies cylinder port "B". Dual pressure regulators require dual pressure spool in valve.



**MANIFOLD WITH REGULATOR - SINGLE PRESSURE**



**MANIFOLD WITH REGULATOR - DUAL PRESSURE**

**Note:** For both single and dual pressure, air supply to the pilot system is never regulated.


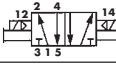

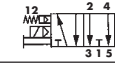
| Function        | Port size          | Flow (Max)               | Individual mounting | Series |
|-----------------|--------------------|--------------------------|---------------------|--------|
| <b>5/2, 5/3</b> | <b>3/8" - 1/2"</b> | <b>3.8 C<sub>v</sub></b> | Inline              |        |

### OPERATIONAL BENEFITS

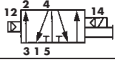
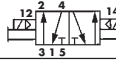
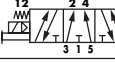
1. Unique patented Macsolenoid® for fastest possible response times and virtually burn-out proof solenoid operation.
2. Balanced poppet 4-way pilot valve provides maximum shifting forces, precise repeatability and consistent operation.
3. Air only return. Optional memory spring is also available.
4. Optional low wattage DC solenoid down to 1 watt.
5. MAC spool and bore combination wipes away contamination, eliminates sticking and allows for use on non-lube service.

### HOW TO ORDER

#### SINGLE PRESSURE MODELS

| Port size        | Pilot air | 5/2 Single operator   | 5/2 Double operator   | 5/3 Closed center  | 5/3 Open center   |
|------------------|-----------|---|---|--|---|
|                  |           |  |  |  |  |
| <b>3/8" NPTF</b> | Internal  | 93A-AJ0-B0J-DM-Dxxx-xxx   | 93A-BJ0-B0J-DM-Dxxx-xxx   | 93A-EJ0-B0J-DM-Dxxx-xxx  | 93A-FJ0-B0J-DM-Dxxx-xxx   |
| <b>1/2" NPTF</b> | Internal  | 93A-AJ0-C0J-DM-Dxxx-xxx   | 93A-BJ0-C0J-DM-Dxxx-xxx   | 93A-EJ0-C0J-DM-Dxxx-xxx  | 93A-FJ0-C0J-DM-Dxxx-xxx   |
| <b>3/8" NPTF</b> | External  | 93A-AJ0-B0K-DM-Dxxx-xxx   | 93A-BJ0-B0K-DM-Dxxx-xxx   | 93A-EJ0-B0K-DM-Dxxx-xxx  | 93A-FJ0-B0K-DM-Dxxx-xxx   |
| <b>1/2" NPTF</b> | External  | 93A-AJ0-C0K-DM-Dxxx-xxx   | 93A-BJ0-C0K-DM-Dxxx-xxx   | 93A-EJ0-C0K-DM-Dxxx-xxx  | 93A-FJ0-C0K-DM-Dxxx-xxx   |

#### DUAL PRESSURE MODELS

| Port size        | Pilot air | 5/2 Single operator   | 5/2 Double operator  | 5/3 Pressure center   |
|------------------|-----------|---|--|---|
|                  |           |  |  |  |
| <b>3/8" NPTF</b> | Internal  | 93A-CJ0-B0J-DM-Dxxx-xxx   | 93A-DJ0-B0J-DM-Dxxx-xxx  | 93A-HJ0-B0J-DM-Dxxx-xxx   |
| <b>1/2" NPTF</b> | Internal  | 93A-CJ0-C0J-DM-Dxxx-xxx   | 93A-DJ0-C0J-DM-Dxxx-xxx  | 93A-HJ0-C0J-DM-Dxxx-xxx   |
| <b>3/8" NPTF</b> | External  | 93A-CJ0-B0K-DM-Dxxx-xxx   | 93A-DJ0-B0K-DM-Dxxx-xxx  | 93A-HJ0-B0K-DM-Dxxx-xxx   |
| <b>1/2" NPTF</b> | External  | 93A-CJ0-C0K-DM-Dxxx-xxx   | 93A-DJ0-C0K-DM-Dxxx-xxx  | 93A-HJ0-C0K-DM-Dxxx-xxx   |

#### SOLENOID OPERATOR >

### DM-D **XXX-XXX**\*

| XX Voltage               | X Wire length               | X Manual operator             | XX Electrical connection                   |
|--------------------------|-----------------------------|-------------------------------|--|
| <b>JA</b> 110/50, 120/60 | <b>A</b> 18" (Flying leads) | <b>1</b> Non-locking recessed | <b>KA</b> Square connector                 |
| <b>JB</b> 220/50, 240/60 | <b>B</b> 24" (Flying leads) | <b>2</b> Locking recessed     | <b>KD</b> Square connector with light      |
| <b>JC</b> 24/50, 24/60   | <b>J</b> Connector          |                               | <b>JB</b> Rectangular connector            |
| <b>FB</b> 24 VDC (1.8W)  |                             |                               | <b>JD</b> Rectangular connector with light |
| <b>DA</b> 24 VDC (5.4W)  |                             |                               | <b>BA</b> Flying leads                     |
| <b>DF</b> 24 VDC (12.7W) |                             |                               |  |

\* Other options available, see page 309.

### OPTIONS

Pilot exhaust : 93A-XJX-XXX-DM-Dxxx-xxx

- J** Standard pilot exhaust
- K** Pilot exhaust to main exhaust (use DU pilot)

Other options available for the 93 series valves, see page 169.

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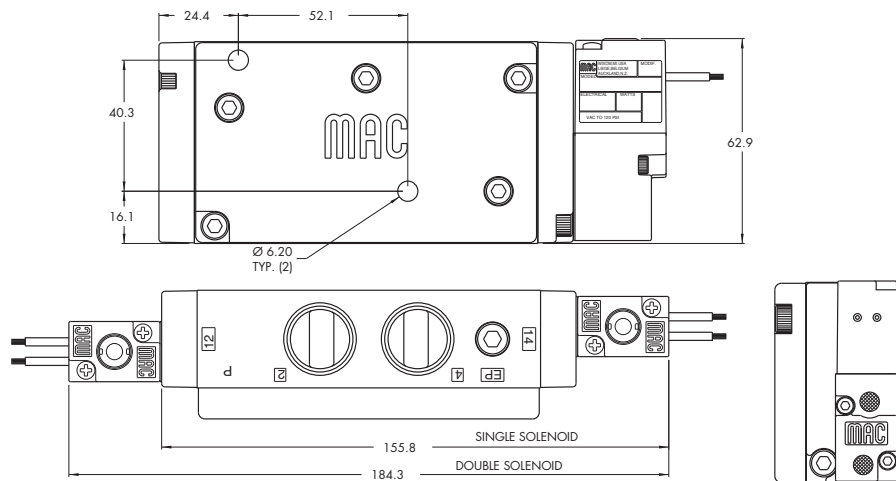
**TECHNICAL DATA**

|   |   |
|---|---|
| <b>Fluid :</b>                                | Compressed air, vacuum, inert gases   |
| <b>Pressure range :</b>                       | Internal Pilot: 20 to 120 PSI<br>External Pilot: Vacuum to 120 PSI                      |
| <b>Lubrication :</b>                          | Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) |
| <b>Filtration :</b>                           | 40 µ  |
| <b>Temperature range :</b>                    | 0°F to 120°F (-18°C to +50°C)   |
| <b>Flow :</b>                                 | 3.8 C <sub>v</sub>  |
| <b>Coil :</b>                                 | Class A continuous duty, #22 AWG x 18 leads   |
| <b>Voltage range :</b>                        | -1.5% to +10% of nominal voltage  |
| <b>Protection :</b>                           | Consult factory   |
| <b>Power :</b>                                | ~ Inrush 7.6 VA    Holding: 4.8 VA<br>= 1.8 to 12.7 W                                   |
| <b>Response times :<br/>(with 5.4 W coil)</b> | Energize : 13 ms<br>De-energize : 10 ms   |

Option :                    • BSPP threads

**DIMENSIONS**

Dimensions shown are metric (mm)





# Direct solenoid and solenoid pilot operated valves

| Function        | Port size                 | Flow (Max)               | Individual mounting    | Series |
|-----------------|---------------------------|--------------------------|------------------------|--------|
| <b>5/2, 5/3</b> | <b>1/4" - 3/8" - 1/2"</b> | <b>3.4 C<sub>v</sub></b> | Sub-base non "plug-in" |        |

### OPERATIONAL BENEFITS

1. Unique patented Macsolenoid® for fastest possible response times and virtually burn-out proof solenoid operation.
2. Balanced poppet 4-way pilot valve provides maximum shifting forces, precise repeatability and consistent operation.
3. Air only return. Optional memory spring is also available.
4. Optional low wattage DC solenoid down to 1 watt.
5. MAC spool and bore combination wipes away contamination, eliminates sticking and allows for use on non-lube service.

### HOW TO ORDER

SINGLE PRESSURE MODELS (1/4" MODELS ARE BOTTOM PORTED)

| Port size              | Pilot air | 5/2 Single operator     | 5/2 Double operator     | 5/3 Closed center       | 5/3 Open center         |
|------------------------|-----------|-------------------------|-------------------------|-------------------------|-------------------------|
|                        |           |                         |                         |                         |                         |
| <b>Valve less base</b> |           | 93A-ABA-000-DM-Dxxx-xxx | 93A-BBA-000-DM-Dxxx-xxx | 93A-EBA-000-DM-Dxxx-xxx | 93A-FBA-000-DM-Dxxx-xxx |
| <b>1/4" NPTF</b>       |           | 93A-ABA-ABG-DM-Dxxx-xxx | 93A-BBA-ABG-DM-Dxxx-xxx | 93A-EBA-ABG-DM-Dxxx-xxx | 93A-FBA-ABG-DM-Dxxx-xxx |
| <b>3/8" NPTF</b>       | Internal  | 93A-ABA-BAG-DM-Dxxx-xxx | 93A-BBA-BAG-DM-Dxxx-xxx | 93A-EBA-BAG-DM-Dxxx-xxx | 93A-FBA-BAG-DM-Dxxx-xxx |
| <b>1/2" NPTF</b>       |           | 93A-ABA-CAG-DM-Dxxx-xxx | 93A-BBA-CAG-DM-Dxxx-xxx | 93A-EBA-CAG-DM-Dxxx-xxx | 93A-FBA-CAG-DM-Dxxx-xxx |
| <b>1/4" NPTF</b>       |           | 93A-ABA-ABH-DM-Dxxx-xxx | 93A-BBA-ABH-DM-Dxxx-xxx | 93A-EBA-ABH-DM-Dxxx-xxx | 93A-FBA-ABH-DM-Dxxx-xxx |
| <b>3/8" NPTF</b>       | External  | 93A-ABA-BAH-DM-Dxxx-xxx | 93A-BBA-BAH-DM-Dxxx-xxx | 93A-EBA-BAH-DM-Dxxx-xxx | 93A-FBA-BAH-DM-Dxxx-xxx |
| <b>1/2" NPTF</b>       |           | 93A-ABA-CAH-DM-Dxxx-xxx | 93A-BBA-CAH-DM-Dxxx-xxx | 93A-EBA-CAH-DM-Dxxx-xxx | 93A-FBA-CAH-DM-Dxxx-xxx |

DUAL PRESSURE MODELS REQUIRE SANDWICH REGULATOR, SEE „REGULATORS“ SECTION (1/4" MODELS ARE BOTTOM PORTED)

| Port size              | Pilot air | 5/2 Single operator     | 5/2 Double operator     | 5/3 Pressure center     |
|------------------------|-----------|-------------------------|-------------------------|-------------------------|
|                        |           |                         |                         |                         |
| <b>Valve less base</b> |           | 93A-CBA-000-DM-Dxxx-xxx | 93A-DBA-000-DM-Dxxx-xxx | 93A-HBA-000-DM-Dxxx-xxx |
| <b>1/4" NPTF</b>       |           | 93A-CBA-ABG-DM-Dxxx-xxx | 93A-DBA-ABG-DM-Dxxx-xxx | 93A-HBA-ABG-DM-Dxxx-xxx |
| <b>3/8" NPTF</b>       | Internal  | 93A-CBA-BAG-DM-Dxxx-xxx | 93A-DBA-BAG-DM-Dxxx-xxx | 93A-HBA-BAG-DM-Dxxx-xxx |
| <b>1/2" NPTF</b>       |           | 93A-CBA-CAG-DM-Dxxx-xxx | 93A-DBA-CAG-DM-Dxxx-xxx | 93A-HBA-CAG-DM-Dxxx-xxx |
| <b>1/4" NPTF</b>       |           | 93A-CBA-ABH-DM-Dxxx-xxx | 93A-DBA-ABH-DM-Dxxx-xxx | 93A-HBA-ABH-DM-Dxxx-xxx |
| <b>3/8" NPTF</b>       | External  | 93A-CBA-BAH-DM-Dxxx-xxx | 93A-DBA-BAH-DM-Dxxx-xxx | 93A-HBA-BAH-DM-Dxxx-xxx |
| <b>1/2" NPTF</b>       |           | 93A-CBA-CAH-DM-Dxxx-xxx | 93A-DBA-CAH-DM-Dxxx-xxx | 93A-HBA-CAH-DM-Dxxx-xxx |

SOLENOID OPERATOR >

DM-D **XXX-XXX**\*

| XX Voltage               | X Wire length               | X Manual operator             | XX Electrical connection                   |
|--------------------------|-----------------------------|-------------------------------|--|
| <b>JA</b> 110/50, 120/60 | <b>A</b> 18" (Flying leads) | <b>1</b> Non-locking recessed | <b>BM</b> Flying leads                     |
| <b>JB</b> 220/50, 240/60 | <b>B</b> 24" (Flying leads) | <b>2</b> Locking recessed     | <b>BN</b> Flying leads with diode          |
| <b>JC</b> 24/50, 24/60   | <b>J</b> Connector          |                               | <b>BP</b> Flying leads with M.O.V.         |
| <b>FB</b> 24 VDC (1.8W)  |                             |                               | <b>BG</b> Flying leads with ground         |
| <b>DA</b> 24 VDC (5.4W)  |                             |                               | <b>JB</b> Rectangular connector            |
| <b>DF</b> 24 VDC (12.7W) |                             |                               | <b>JD</b> Rectangular connector with light |

\* Other options available, see page 309.  
Other options available for the 93 series valves, see page 169.

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ISO 01  
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# Direct solenoid and solenoid pilot operated valves

| Function        | Port size                 | Flow (Max)               | Individual mounting | Series |
|-----------------|---------------------------|--------------------------|---------------------|--------|
| <b>5/2, 5/3</b> | <b>1/4" - 3/8" - 1/2"</b> | <b>3.4 C<sub>v</sub></b> | Sub-base "plug-in"  |        |

### OPERATIONAL BENEFITS

1. Unique patented Macsolenoid® for fastest possible response times and virtually burn-out proof solenoid operation.
2. Balanced poppet 4-way pilot valve provides maximum shifting forces, precise repeatability and consistent operation.
3. Air only return. Optional memory spring is also available.
4. Optional low wattage DC solenoid down to 1 watt.
5. MAC spool and bore combination wipes away contamination, eliminates sticking and allows for use on non-lube service.

### HOW TO ORDER

SINGLE PRESSURE MODELS (1/4" MODELS ARE BOTTOM PORTED)

| Port size              | Pilot air | 5/2 Single operator     | 5/2 Double operator     | 5/3 Closed center       | 5/3 Open center         |
|------------------------|-----------|-------------------------|-------------------------|-------------------------|-------------------------|
|                        |           |                         |                         |                         |                         |
| <b>Valve less base</b> |           | 93A-AAA-000-DM-DxxP-xxx | 93A-BAA-000-DM-DxxP-xxx | 93A-EAA-000-DM-DxxP-xxx | 93A-FAA-000-DM-DxxP-xxx |
| <b>1/4" NPTF</b>       |           | 93A-AAA-ABA-DM-DxxP-xxx | 93A-BAA-ABA-DM-DxxP-xxx | 93A-EAA-ABA-DM-DxxP-xxx | 93A-FAA-ABA-DM-DxxP-xxx |
| <b>3/8" NPTF</b>       | Internal  | 93A-AAA-BAA-DM-DxxP-xxx | 93A-BAA-BAA-DM-DxxP-xxx | 93A-EAA-BAA-DM-DxxP-xxx | 93A-FAA-BAA-DM-DxxP-xxx |
| <b>1/2" NPTF</b>       |           | 93A-AAA-CAA-DM-DxxP-xxx | 93A-BAA-CAA-DM-DxxP-xxx | 93A-EAA-CAA-DM-DxxP-xxx | 93A-FAA-CAA-DM-DxxP-xxx |
| <b>1/4" NPTF</b>       |           | 93A-AAA-ABD-DM-DxxP-xxx | 93A-BAA-ABD-DM-DxxP-xxx | 93A-EAA-ABD-DM-DxxP-xxx | 93A-FAA-ABD-DM-DxxP-xxx |
| <b>3/8" NPTF</b>       | External  | 93A-AAA-BAD-DM-DxxP-xxx | 93A-BAA-BAD-DM-DxxP-xxx | 93A-EAA-BAD-DM-DxxP-xxx | 93A-FAA-BAD-DM-DxxP-xxx |
| <b>1/2" NPTF</b>       |           | 93A-AAA-CAD-DM-DxxP-xxx | 93A-BAA-CAD-DM-DxxP-xxx | 93A-EAA-CAD-DM-DxxP-xxx | 93A-FAA-CAD-DM-DxxP-xxx |

DUAL PRESSURE MODELS REQUIRE SANDWICH REGULATOR, SEE „REGULATORS“ SECTION (1/4" MODELS ARE BOTTOM PORTED)

| Port size              | Pilot air | 5/2 Single operator     | 5/2 Double operator     | 5/3 Pressure Center     |
|------------------------|-----------|-------------------------|-------------------------|-------------------------|
|                        |           |                         |                         |                         |
| <b>Valve less base</b> |           | 93A-CAA-000-DM-DxxP-xxx | 93A-DAA-000-DM-DxxP-xxx | 93A-HAA-000-DM-DxxP-xxx |
| <b>1/4" NPTF</b>       |           | 93A-CAA-ABA-DM-DxxP-xxx | 93A-DAA-ABA-DM-DxxP-xxx | 93A-HAA-ABA-DM-DxxP-xxx |
| <b>3/8" NPTF</b>       | Internal  | 93A-CAA-BAA-DM-DxxP-xxx | 93A-DAA-BAA-DM-DxxP-xxx | 93A-HAA-BAA-DM-DxxP-xxx |
| <b>1/2" NPTF</b>       |           | 93A-CAA-CAA-DM-DxxP-xxx | 93A-DAA-CAA-DM-DxxP-xxx | 93A-HAA-CAA-DM-DxxP-xxx |
| <b>1/4" NPTF</b>       |           | 93A-CAA-ABD-DM-DxxP-xxx | 93A-DAA-ABD-DM-DxxP-xxx | 93A-HAA-ABD-DM-DxxP-xxx |
| <b>3/8" NPTF</b>       | External  | 93A-CAA-BAD-DM-DxxP-xxx | 93A-DAA-BAD-DM-DxxP-xxx | 93A-HAA-BAD-DM-DxxP-xxx |
| <b>1/2" NPTF</b>       |           | 93A-CAA-CAD-DM-DxxP-xxx | 93A-DAA-CAD-DM-DxxP-xxx | 93A-HAA-CAD-DM-DxxP-xxx |

SOLENOID OPERATOR >

DM-D **XX** P-**XXX**\*

Above models are shown without light.

| XX Voltage                      | X Manual operator             | XX Electrical connection      |
|---------------------------------|-------------------------------|-------------------------------|
| <b>JA</b> 110/50, 120/60 (2.9W) | <b>1</b> Non-locking recessed | <b>DM</b> Plug-in             |
| <b>JB</b> 220/50, 240/60 (2.9W) | <b>2</b> Locking recessed     | <b>DN</b> Plug-in with diode  |
| <b>JC</b> 24/50, 24/60 (2.9W)   |                               | <b>DP</b> Plug-in with M.O.V. |
| <b>FB</b> 24 VDC (1.8W)         |                               | <b>DG</b> Plug-in with ground |
| <b>DA</b> 24 VDC (5.4W)         |                               |                               |
| <b>DF</b> 24 VDC (12.7W)        |                               |                               |

\* Other options available, see page 309.  
Note: Ground required for 30 Volts or higher.  
Other options available for the 93 series valves, see page 170.

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92  
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ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3









# Direct solenoid and solenoid pilot operated valves

| Function        | Port size          | Flow (Max)               | Manifold mounting      | Series |
|-----------------|--------------------|--------------------------|------------------------|--------|
| <b>5/2, 5/3</b> | <b>3/8" - 1/2"</b> | <b>3.8 C<sub>v</sub></b> | Sub-base non "plug-in" |        |

### OPERATIONAL BENEFITS

1. Unique patented Macsolenoid® for fastest possible response times and virtually burn-out proof solenoid operation.
2. Balanced poppet 4-way pilot valve provides maximum shifting forces, precise repeatability and consistent operation.
3. Air only return. Optional memory spring is also available.
4. Optional low wattage DC solenoid down to 1 watt.
5. MAC spool and bore combination wipes away contamination, eliminates sticking and allows for use on non-lube service.

### HOW TO ORDER

#### SINGLE PRESSURE MODELS

| Port size              | Pilot air | 5/2 Single operator     | 5/2 Double operator     | 5/3 Closed center       | 5/3 Open center         |
|------------------------|-----------|-------------------------|-------------------------|-------------------------|-------------------------|
|                        |           |                         |                         |                         |                         |
| <b>Valve less base</b> |           | 93A-ABA-000-DM-Dxxx-xxx | 93A-BBA-000-DM-Dxxx-xxx | 93A-EBA-000-DM-Dxxx-xxx | 93A-FBA-000-DM-Dxxx-xxx |
| <b>3/8" NPTF</b>       | Internal  | 93A-ABA-BJG-DM-Dxxx-xxx | 93A-BBA-BJG-DM-Dxxx-xxx | 93A-EBA-BJG-DM-Dxxx-xxx | 93A-FBA-BJG-DM-Dxxx-xxx |
| <b>1/2" NPTF</b>       |           | 93A-ABA-CJG-DM-Dxxx-xxx | 93A-BBA-CJG-DM-Dxxx-xxx | 93A-EBA-CJG-DM-Dxxx-xxx | 93A-FBA-CJG-DM-Dxxx-xxx |
| <b>3/8" NPTF</b>       | External  | 93A-ABA-BJH-DM-Dxxx-xxx | 93A-BBA-BJH-DM-Dxxx-xxx | 93A-EBA-BJH-DM-Dxxx-xxx | 93A-FBA-BJH-DM-Dxxx-xxx |
| <b>1/2" NPTF</b>       |           | 93A-ABA-CJH-DM-Dxxx-xxx | 93A-BBA-CJH-DM-Dxxx-xxx | 93A-EBA-CJH-DM-Dxxx-xxx | 93A-FBA-CJH-DM-Dxxx-xxx |

#### DUAL PRESSURE MODELS (REQUIRE SANDWICH REGULATOR, SEE „REGULATORS“ SECTION)

| Port size              | Pilot air | 5/2 Single operator     | 5/2 Double operator     | 5/3 Pressure center     |
|------------------------|-----------|-------------------------|-------------------------|-------------------------|
|                        |           |                         |                         |                         |
| <b>Valve less base</b> |           | 93A-CBA-000-DM-Dxxx-xxx | 93A-DBA-000-DM-Dxxx-xxx | 93A-HBA-000-DM-Dxxx-xxx |
| <b>3/8" NPTF</b>       | Internal  | 93A-CBA-BJG-DM-Dxxx-xxx | 93A-DBA-BJG-DM-Dxxx-xxx | 93A-HBA-BJG-DM-Dxxx-xxx |
| <b>1/2" NPTF</b>       |           | 93A-CBA-CJG-DM-Dxxx-xxx | 93A-DBA-CJG-DM-Dxxx-xxx | 93A-HBA-CJG-DM-Dxxx-xxx |
| <b>3/8" NPTF</b>       | External  | 93A-CBA-BJH-DM-Dxxx-xxx | 93A-DBA-BJH-DM-Dxxx-xxx | 93A-HBA-BJH-DM-Dxxx-xxx |
| <b>1/2" NPTF</b>       |           | 93A-CBA-CJH-DM-Dxxx-xxx | 93A-DBA-CJH-DM-Dxxx-xxx | 93A-HBA-CJH-DM-Dxxx-xxx |

#### SOLENOID OPERATOR >

DM-D **XXX-XXX\***

Above models are shown with side ports.

| XX Voltage               | X Wire length               | X Manual operator             | XX Electrical connection              |
|--------------------------|-----------------------------|-------------------------------|---------------------------------------|
| <b>JA</b> 110/50, 120/60 | <b>A</b> 18" (Flying leads) | <b>1</b> Non-locking recessed | <b>BM</b> Flying leads                |
| <b>JB</b> 220/50, 240/60 | <b>B</b> 24" (Flying leads) | <b>2</b> Locking recessed     | <b>BN</b> Flying leads with diode     |
| <b>JC</b> 24/50, 24/60   | <b>J</b> Connector          |                               | <b>KA</b> Square connector            |
| <b>FB</b> 24 VDC (1.8W)  |                             |                               | <b>KD</b> Square connector with light |
| <b>DA</b> 24 VDC (5.4W)  |                             |                               |                                       |
| <b>DF</b> 24 VDC (12.7W) |                             |                               |                                       |

\* Other options available, see page 309.  
End plate kit required (1/2" ports): M-93001-01-01 internal pilot.  
M-93001-02-01 external pilot.

Other options available for the 93 series valves, see page 169.



- 33
- 34
- 36
- 32
- 37
- 38
- 52
- 67
- 69
- 44
- 46
- 42
- 47
- 48P
- 48
- 400
- 92
- 93
- ISO 01
- ISO 02
- ISO 1
- ISO 2
- ISO 3

**TECHNICAL DATA**

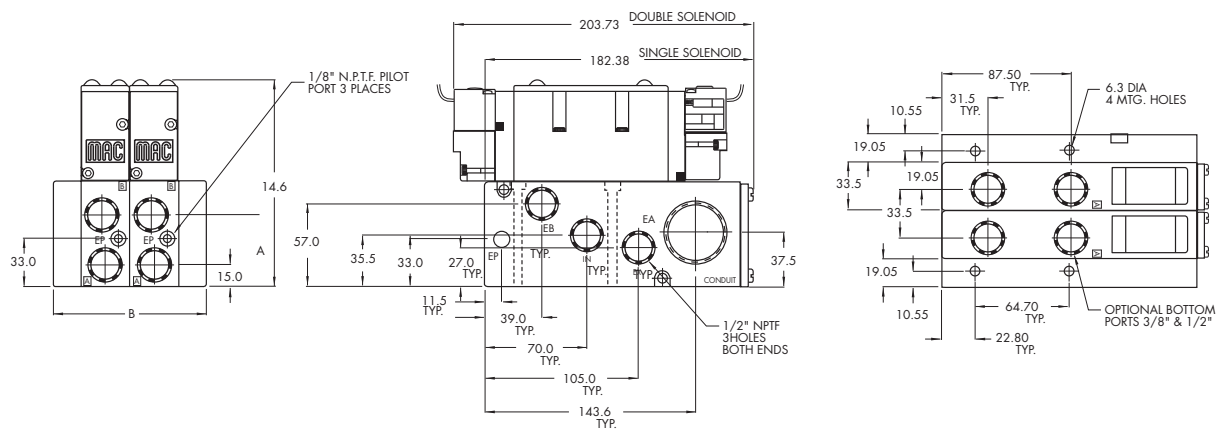
|   |   |
|---|---|
| <b>Fluid :</b>                                | Compressed air, vacuum, inert gases   |
| <b>Pressure range :</b>                       | Internal Pilot: 20 to 120 PSI<br>External Pilot: Vacuum to 120 PSI                      |
| <b>Lubrication :</b>                          | Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) |
| <b>Filtration :</b>                           | 40 µ  |
| <b>Temperature range :</b>                    | 0°F to 120°F (-18°C to +50°C)   |
| <b>Flow :</b>                                 | 3/8" : (3.4 C <sub>v</sub> ) - 1/2" : (3.8 C <sub>v</sub> )                             |
| <b>Coil :</b>                                 | Class A continuous duty, #22 AWG x 18 leads   |
| <b>Voltage range :</b>                        | -15% to +10% of nominal voltage   |
| <b>Protection :</b>                           | Consult factory   |
| <b>Power :</b>                                | ~ Inrush 7.6 VA    Holding: 4.8 VA<br>= 1 to 12.7 W                                     |
| <b>Response times :<br/>(with 5.4 W coil)</b> | Energize : 13 ms<br>De-energize : 10 ms   |

- Options :
- BSPP thread • Sandwich regulator (see ,regulators' section)
  - Sandwich flow controls FC93A-BA (screwdriver slot adjustment), FC93A-BB (locking knob adjustment)

- Spare parts :
- Pilot valve: DM-Dxxx-xxx • Valve to base pressure seal: 16622
  - Pilot valve pressure seal: 16542 • Mounting screws valve to base (x4): 35249
  - Inlet/exh. Isolator disc: N-93008 • Valve blanking plate: M-93002

**DIMENSIONS**

Dimensions shown are metric (mm)



| #        | 1    | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    |
|----------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>B</b> | 71.6 | 105.1 | 138.6 | 172.1 | 205.6 | 239.1 | 272.6 | 306.1 | 339.6 | 373.1 |

| DIM.        | A     |
|-------------|-------|
| <b>3/8"</b> | 47.66 |
| <b>1/2"</b> | 49.32 |



# Direct solenoid and solenoid pilot operated valves

| Function        | Port size          | Flow (Max)               | Manifold mounting  | Series |
|-----------------|--------------------|--------------------------|--------------------|--------|
| <b>5/2, 5/3</b> | <b>3/8" - 1/2"</b> | <b>3.8 C<sub>v</sub></b> | Sub-base "plug-in" |        |

### OPERATIONAL BENEFITS

1. Unique patented Macsolenoid® for fastest possible response times and virtually burn-out proof solenoid operation.
2. Balanced poppet 4-way pilot valve provides maximum shifting forces, precise repeatability and consistent operation.
3. Air only return. Optional memory spring is also available.
4. Optional low wattage DC solenoid down to 1 watt.
5. MAC spool and bore combination wipes away contamination, eliminates sticking and allows for use on non-lube service.



### HOW TO ORDER

#### SINGLE PRESSURE MODELS

| Port size              | Pilot air | 5/2 Single operator     | 5/2 Double operator     | 5/3 Closed center       | 5/3 Open center         |
|------------------------|-----------|-------------------------|-------------------------|-------------------------|-------------------------|
|                        |           |                         |                         |                         |                         |
| <b>Valve less base</b> |           | 93A-AAA-000-DM-DxxP-xxx | 93A-BAA-000-DM-DxxP-xxx | 93A-EAA-000-DM-DxxP-xxx | 93A-FAA-000-DM-DxxP-xxx |
| <b>3/8" NPTF</b>       | Internal  | 93A-AAA-BJA-DM-DxxP-xxx | 93A-BAA-BJA-DM-DxxP-xxx | 93A-EAA-BJA-DM-DxxP-xxx | 93A-FAA-BJA-DM-DxxP-xxx |
| <b>1/2" NPTF</b>       |           | 93A-AAA-CJA-DM-DxxP-xxx | 93A-BAA-CJA-DM-DxxP-xxx | 93A-EAA-CJA-DM-DxxP-xxx | 93A-FAA-CJA-DM-DxxP-xxx |
| <b>3/8" NPTF</b>       | External  | 93A-AAA-BJD-DM-DxxP-xxx | 93A-BAA-BJD-DM-DxxP-xxx | 93A-EAA-BJD-DM-DxxP-xxx | 93A-FAA-BJD-DM-DxxP-xxx |
| <b>1/2" NPTF</b>       |           | 93A-AAA-CJD-DM-DxxP-xxx | 93A-BAA-CJD-DM-DxxP-xxx | 93A-EAA-CJD-DM-DxxP-xxx | 93A-FAA-CJD-DM-DxxP-xxx |

#### DUAL PRESSURE MODELS (REQUIRE SANDWICH REGULATOR, SEE "REGULATORS" SECTION)

| Port size              | Pilot air | 5/2 Single operator     | 5/2 Double operator     | 5/3 Pressure Center     |
|------------------------|-----------|-------------------------|-------------------------|-------------------------|
|                        |           |                         |                         |                         |
| <b>Valve less base</b> |           | 93A-CAA-000-DM-DxxP-xxx | 93A-DAA-000-DM-DxxP-xxx | 93A-HAA-000-DM-DxxP-xxx |
| <b>3/8" NPTF</b>       | Internal  | 93A-CAA-BJA-DM-DxxP-xxx | 93A-DAA-BJA-DM-DxxP-xxx | 93A-HAA-BJA-DM-DxxP-xxx |
| <b>1/2" NPTF</b>       |           | 93A-CAA-CJA-DM-DxxP-xxx | 93A-DAA-CJA-DM-DxxP-xxx | 93A-HAA-CJA-DM-DxxP-xxx |
| <b>3/8" NPTF</b>       | External  | 93A-CAA-BJD-DM-DxxP-xxx | 93A-DAA-BJD-DM-DxxP-xxx | 93A-HAA-BJD-DM-DxxP-xxx |
| <b>1/2" NPTF</b>       |           | 93A-CAA-CJD-DM-DxxP-xxx | 93A-DAA-CJD-DM-DxxP-xxx | 93A-HAA-CJD-DM-DxxP-xxx |

#### SOLENOID OPERATOR ►

DM-D **XX** P-**XXX**\*

Above model numbers are shown with side ports without light.

| XX Voltage                      | X Manual operator             | XX Electrical connection      |
|---------------------------------|-------------------------------|-------------------------------|
| <b>JA</b> 110/50, 120/60 (2.9W) | <b>1</b> Non-locking recessed | <b>DM</b> Plug-in             |
| <b>JB</b> 220/50, 240/60 (2.9W) | <b>2</b> Locking recessed     | <b>DN</b> Plug-in with diode  |
| <b>JC</b> 24/50, 24/60 (2.9W)   |                               | <b>DP</b> Plug-in with M.O.V. |
| <b>FB</b> 24 VDC (1.8W)         |                               | <b>DG</b> Plug-in with ground |
| <b>DA</b> 24 VDC (5.4W)         |                               |                               |
| <b>DF</b> 24 VDC (12.7W)        |                               |                               |

\* Other options available, see page 309.  
 End plate required (1/2" ports): M-93001-01-01 Internal pilot.  
 M-93001-02-01 External pilot.  
 Other options available for the 93 series valves, see page 170.

33  
34  
36  
32  
37  
38  
52  
67  
69  
44  
46  
42  
47  
48P  
48  
400  
92  
93  
ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

**TECHNICAL DATA**

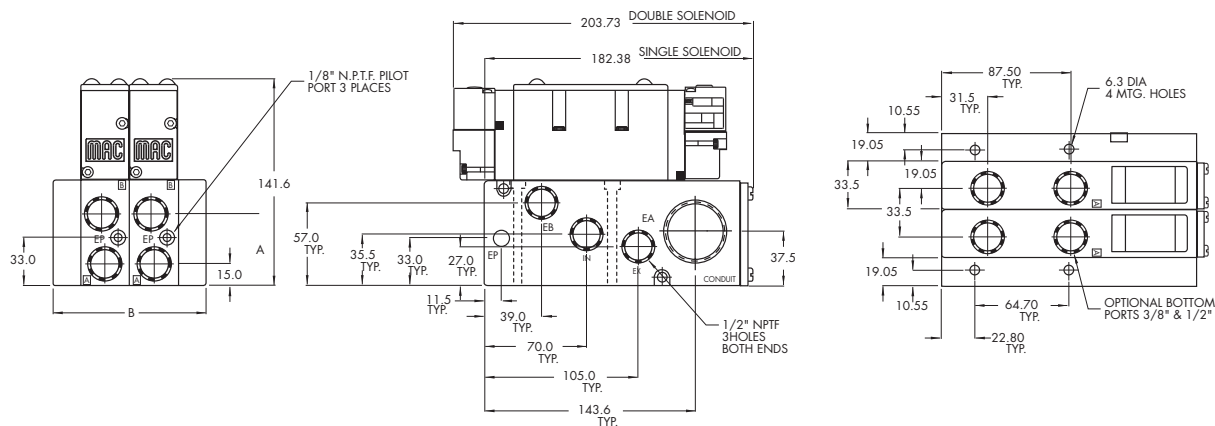
|   |   |
|---|---|
| <b>Fluid :</b>                                | Compressed air, vacuum, inert gases   |
| <b>Pressure range :</b>                       | Internal Pilot: 20 to 120 PSI<br>External Pilot: Vacuum to 120 PSI                      |
| <b>Lubrication :</b>                          | Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) |
| <b>Filtration :</b>                           | 40 µ  |
| <b>Temperature range :</b>                    | 0°F to 120°F (-18°C to +50°C)   |
| <b>Flow :</b>                                 | 3/8" : (3.4 C <sub>v</sub> ) - 1/2" : (3.8 C <sub>v</sub> )                             |
| <b>Coil :</b>                                 | Class A continuous duty, #22 AWG x 18 base leads  |
| <b>Voltage range :</b>                        | -1.5% to +10% of nominal voltage  |
| <b>Protection :</b>                           | Consult factory   |
| <b>Power :</b>                                | ~ Inrush 7.6 VA    Holding: 4.8 VA<br>= 1 to 12.7 W                                     |
| <b>Response times :<br/>(with 5.4 W coil)</b> | Energize : 13 ms<br>De-energize : 10 ms   |

Options :                    • BSPP thread • Sandwich regulator (see ,regulators' section)  
                                  • Sandwich flow controls FC93A-AA (screwdriver slot adjustment), FC93A-AB (locking knob adjustment)

Spare parts :             • Pilot valve: DM-DxxP-xxx • Valve to base pressure seal: 16622  
                                  • Pilot valve pressure seal: 16542 • Mounting screws valve to base (x4): 35249  
                                  • Inlet/exh. Isolator disc: N-93008 • Valve blanking plate: M-93002

**DIMENSIONS**

Dimensions shown are metric (mm)



| #        | 1    | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    |
|----------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>B</b> | 71.6 | 105.1 | 138.6 | 172.1 | 205.6 | 239.1 | 272.6 | 306.1 | 339.6 | 373.1 |

| DIM.        | A     |
|-------------|-------|
| <b>3/8"</b> | 47.66 |
| <b>1/2"</b> | 49.32 |

|  |  |
|--|--|
| <b>OPTIONS FOR NON PLUG-IN AND INLINE VALVES</b>   | <b>33</b>                                      |
|  | <b>34</b>                                      |
| <b>Valve function</b>  | <b>36</b>                                      |
| 93A-LXX-XXX-XX-Dxxx-xxx  |  |
| <ul style="list-style-type: none"> <li><b>L</b> for single operator, single pressure with memory spring</li> <li><b>N</b> for single operator, dual pressure with memory spring</li> <li><b>R</b> for single operator universal spool (ext. pilot only)</li> <li><b>S</b> for double operator universal spool (ext. pilot only)</li> </ul> | <b>32</b>                                      |
|  | <b>37</b>                                      |
|  | <b>38</b>                                      |
| <b>Pilot exhaust</b>   | <b>52</b>                                      |
| 93A-XBX-XXX-XX-Dxxx-xxx  |  |
| <ul style="list-style-type: none"> <li><b>B</b> standard pilot exhaust</li> <li><b>D</b> pilot exhaust to main valve exhaust*</li> </ul>   | <b>67</b>                                      |
|  | <b>69</b>                                      |
|  | <b>44</b>                                      |
| <b>Port configuration :</b>  | <b>46</b>                                      |
| <b>Individual sub-base</b>   |  |
| 93A-XXX-XAX-XX-Dxxx-xxx  |  |
| <ul style="list-style-type: none"> <li><b>A</b> side ports (3/8" &amp; 1/2" only)</li> <li><b>B</b> bottom ports (1/4" &amp; 3/8" only)</li> <li><b>C</b> side &amp; bottom ports (1/4" &amp; 3/8" only)</li> <li><b>D</b> side inlet &amp; exhaust with bottom cylinder ports (1/4" &amp; 3/8" only)</li> </ul>                           | <b>42</b>                                      |
|  | <b>47</b>                                      |
|  | <b>48P</b>                                     |
| <b>Pilot style :</b>   | <b>48</b>                                      |
| 93A-XXX-XXX-DM-Dxxx-xxx  |  |
| <ul style="list-style-type: none"> <li><b>DM</b> pilot exhaust muffled</li> <li><b>DP</b> pilot exhaust piped (#10-32)</li> <li><b>DU</b> pilot exhaust to main exhaust</li> </ul>   | <b>400</b>                                     |
| <b>Base only :</b>   | <b>92</b>                                      |
| 93A-000-XXX (i.e. 93A-000-BAG) - Individual base   | 93A-000-XXX (i.e. 93A-000-BJG) - Manifold base |

\* Must use DU pilot. Main valve exhaust cannot be restricted.

**OPTIONS FOR  
PLUG-IN VALVES**

**Valve function**

93A-LXX-XXX-XX-DxxP-xxx

- L** for single operator, single pressure with memory spring
- N** for single operator, dual pressure with memory spring
- R** for single operator universal spool (ext. pilot only)
- S** for double operator universal spool (ext. pilot only)

**Pilot exhaust**

93A-XAX-XXX-XX-DxxP-xxx

- A** standard pilot exhaust
- C** pilot exhaust to main valve exhaust\*

**Body electrical**

92B-XXA-XXX-XX-DxxP-xxx

- A** no light
- B** light(s)

**Port configuration :**

**Individual sub-base**

93A-XXX-XAX-XX-DxxP-xxx

- A** side ports (3/8" & 1/2" only)
- B** bottom ports (1/4" & 3/8" only)
- C** side & bottom ports (1/4" & 3/8" only)
- D** side inlet & exhaust with bottom cylinder ports (1/4" & 3/8" only)

**Manifold sub-base**

93A-XXX-XJX-XX-DxxP-xxx

- J** side ports
- K** bottom ports

**Base/manifold int./ext. pilot**

93A-XXX-XXA-XX-DxxP-xxx

- A** internal pilot no light
- B** internal pilot single light
- C** internal pilot double light
- D** external pilot no light
- E** external pilot single light
- F** external pilot double light

**Pilot style :**

93A-XXX-XXX-DM-DxxP-xxx

- DM** pilot exhaust muffled
- DP** pilot exhaust piped (#10-32)
- DU** pilot exhaust to main exhaust

**Base only :**

93A-000-XXX (i.e. 93A-000-BAA) - Individual base  
(Note: bases are wired for double solenoid valves)

93A-000-XXX (i.e. 93A-000-BJA) - Manifold base

\* Must use DU pilot. Main valve exhaust cannot be restricted.