

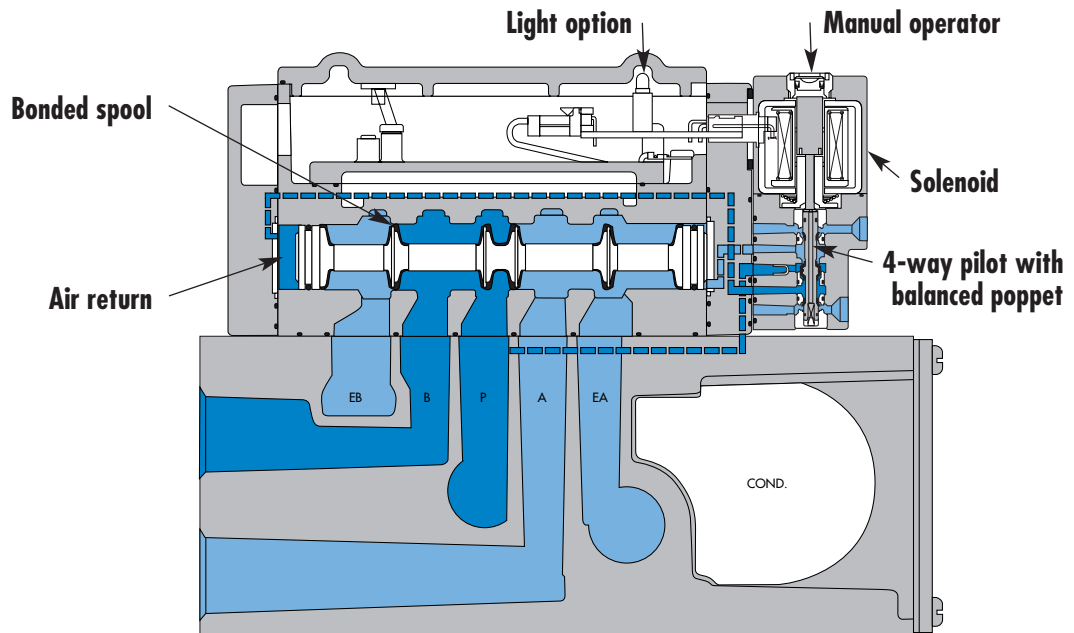
Individual mounting

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

Series

Manifold mounting

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



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**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.

93

ISO 01

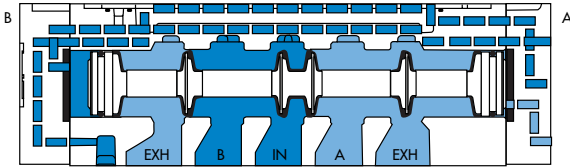
ISO 02

ISO 1

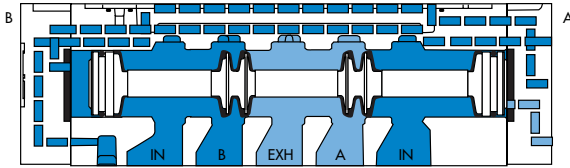
ISO 2

ISO 3

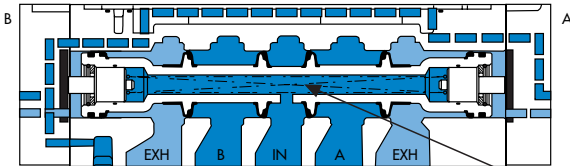
**SPOOL CONFIGURATIONS**



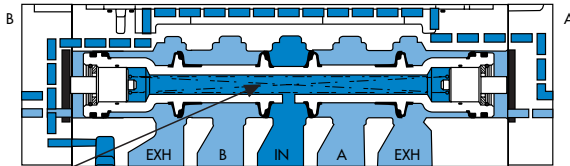
2 POSITION SINGLE PRESSURE  
SHOWN WITH "B" OPERATOR ENERGIZED



2 POSITION DUAL PRESSURE  
SHOWN WITH "B" OPERATOR ENERGIZED

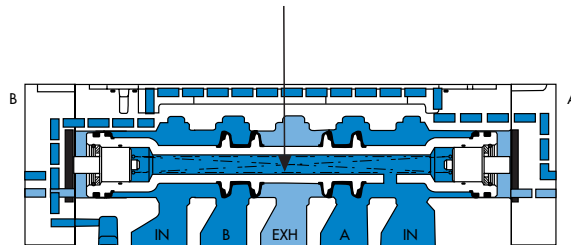


3 POSITION CLOSED CENTER



3 POSITION OPEN CENTER

**SPRING CENTERING**

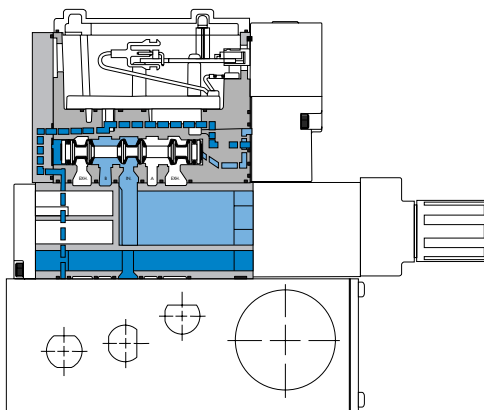


3 POSITION DUAL PRESSURE, PRESSURE CENTER

**REGULATOR CONFIGURATIONS**

**SINGLE REGULATOR - SINGLE PRESSURE**

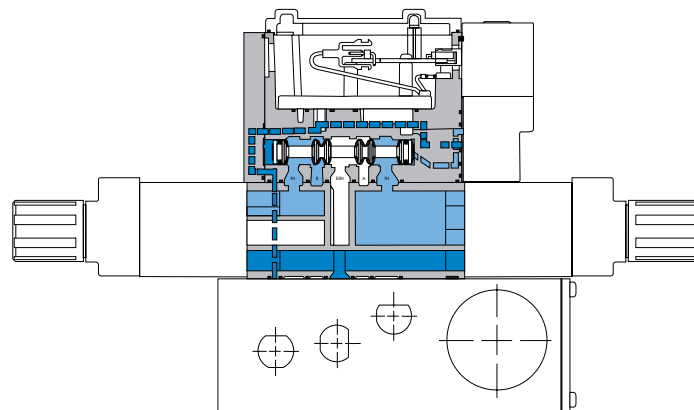
Pressure supplied to the individual or manifold base passes through the regulator. Regulated pressure is supplied to the pressure path of the valve.



**MANIFOLD WITH REGULATOR - SINGLE PRESSURE**

**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 - DUAL PRESSURE**

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



# Direct solenoid and solenoid pilot operated valves

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-BOJ-DM-Dxxx-xxx	93A-BJ0-BOJ-DM-Dxxx-xxx	93A-EJ0-BOJ-DM-Dxxx-xxx	93A-FJ0-BOJ-DM-Dxxx-xxx
<b>1/2" NPTF</b>	Internal	93A-AJ0-COJ-DM-Dxxx-xxx	93A-BJ0-COJ-DM-Dxxx-xxx	93A-EJ0-COJ-DM-Dxxx-xxx	93A-FJ0-COJ-DM-Dxxx-xxx
<b>3/8" NPTF</b>	External	93A-AJ0-BOK-DM-Dxxx-xxx	93A-BJ0-BOK-DM-Dxxx-xxx	93A-EJ0-BOK-DM-Dxxx-xxx	93A-FJ0-BOK-DM-Dxxx-xxx
<b>1/2" NPTF</b>	External	93A-AJ0-COK-DM-Dxxx-xxx	93A-BJ0-COK-DM-Dxxx-xxx	93A-EJ0-COK-DM-Dxxx-xxx	93A-FJ0-COK-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-BOJ-DM-Dxxx-xxx	93A-DJ0-BOJ-DM-Dxxx-xxx	93A-HJ0-BOJ-DM-Dxxx-xxx
<b>1/2" NPTF</b>	Internal	93A-CJ0-COJ-DM-Dxxx-xxx	93A-DJ0-COJ-DM-Dxxx-xxx	93A-HJ0-COJ-DM-Dxxx-xxx
<b>3/8" NPTF</b>	External	93A-CJ0-BOK-DM-Dxxx-xxx	93A-DJ0-BOK-DM-Dxxx-xxx	93A-HJ0-BOK-DM-Dxxx-xxx
<b>1/2" NPTF</b>	External	93A-CJ0-COK-DM-Dxxx-xxx	93A-DJ0-COK-DM-Dxxx-xxx	93A-HJ0-COK-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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- 400
- 92
- 93
- ISO 01
- ISO 02
- ISO 1
- ISO 2
- ISO 3

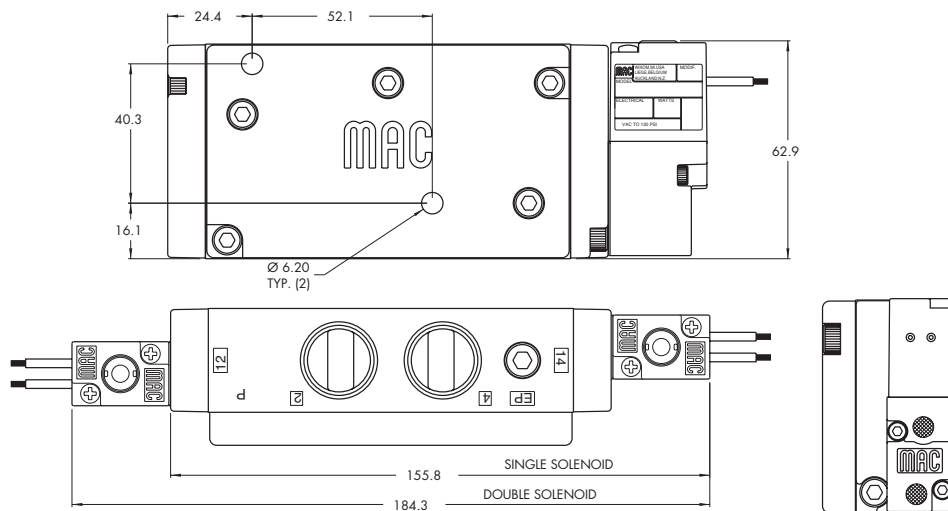
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal Pilot: 20 to 120 PSI 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>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	~ Inrush 7.6 VA    Holding: 4.8 VA = 1.8 to 12.7 W
<b>Response times : (with 5.4 W coil)</b>	Energize : 13 ms De-energize : 10 ms

Option :                    • BSPP threads

**DIMENSIONS**

Dimensions shown are metric (mm)



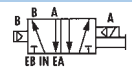
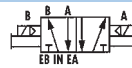
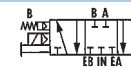
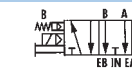
Function	Port size	Flow [Max]	Individual mounting	Series
<b>5/2, 5/3</b>	<b>1/4" - 3/8" - 1/2"</b>	<b>3.4 C<sub>v</sub></b>	Sub-base non "plug-in"	

### OPERATIONAL BENEFITS

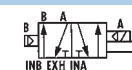
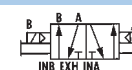
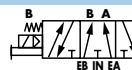
1. Unique patented Macsolenoid® for fastest possible response times and virtually burn-out proof solenoid operation.
2. Balanced poppet 4-way pilot valve provides maximum shifting forces, precise repeatability and consistent operation.
3. Air only return. Optional memory spring is also available.
4. 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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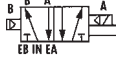


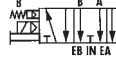
Function	Port size	Flow [Max]	Individual mounting	Series
<b>5/2, 5/3</b>	<b>1/4" - 3/8" - 1/2"</b>	<b>3.4 C<sub>v</sub></b>	Sub-base "plug-in"	

### OPERATIONAL BENEFITS



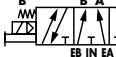
1. Unique patented Macsolenoid® for fastest possible response times and virtually burn-out proof solenoid operation.
2. Balanced poppet 4-way pilot valve provides maximum shifting forces, precise repeatability and consistent operation.
3. Air only return. Optional memory spring is also available.
4. 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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ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3



**TECHNICAL DATA**

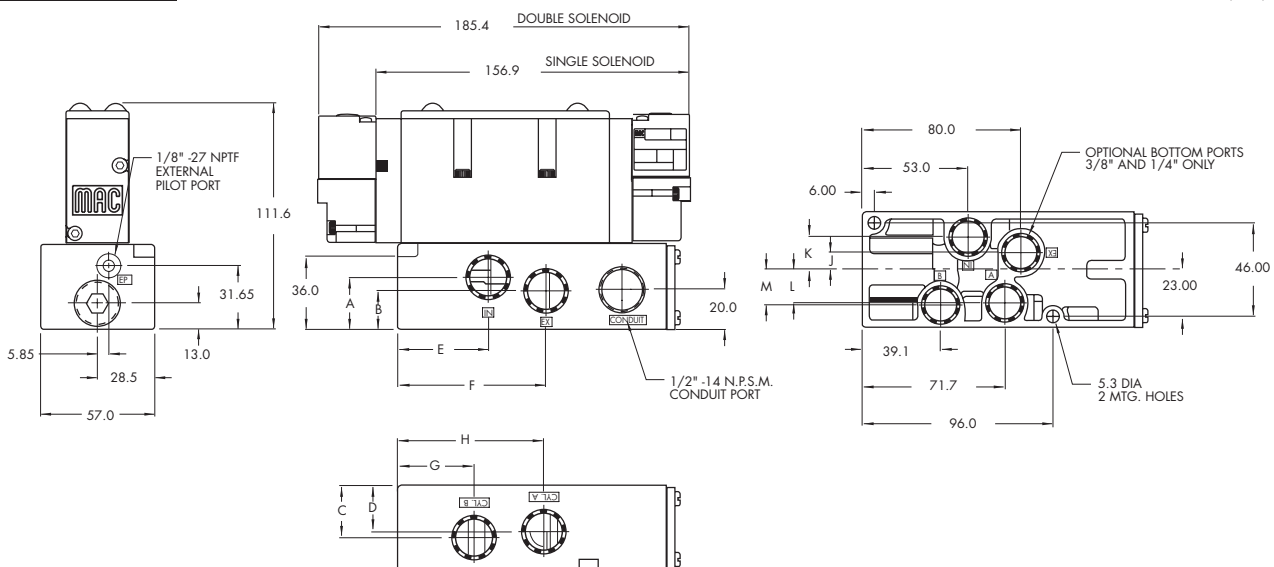
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal Pilot: 20 to 120 PSI External Pilot: Vacuum to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	1/4", 3/8" : (3.0 C <sub>v</sub> ) - 1/2" : (3.4 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG x 18 base 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 = 1 to 12.7 W
<b>Response times : (with 5.4 W coil)</b>	Energize : 13 ms 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
  - Pilot valve mounting screws (x2): 35069

**DIMENSIONS**

Dimensions shown are metric (mm)



DIM.	A	B	C	D	E	F	G	H	DIM.	J	K	L	M
3/8"	27.15	20.65	27.15	24.15	54.1	81.7	38.2	73.5	1/4"	7.0	14.7	15.0	16.5
1/2"	25.5	19.0	25.5	22.5	45.8	75.3	38.2	73.5	3/8"	8.5	16.2	16.5	17.5





# 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\***

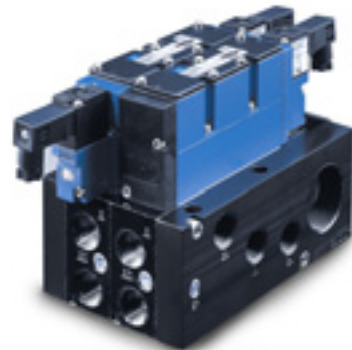
Above models are shown with side ports.

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**

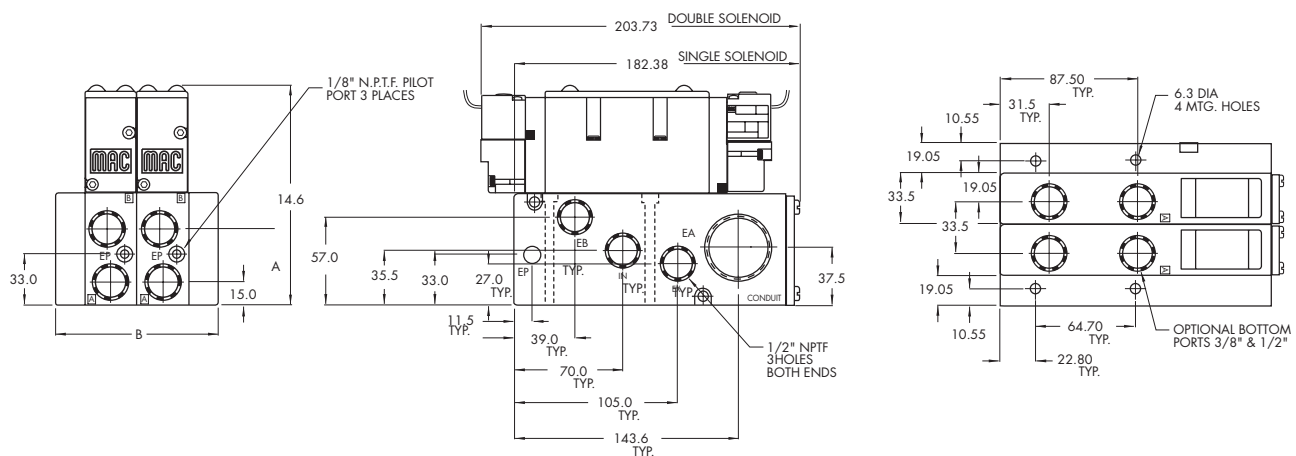
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal Pilot: 20 to 120 PSI External Pilot: Vacuum to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
<b>Filtration :</b>	40 µ
<b>Temperature range :</b>	0°F 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 = 1 to 12.7 W
<b>Response times : (with 5.4 W coil)</b>	Energize : 13 ms 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
3/8"	47.66
1/2"	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

Above model numbers are shown with side ports without light.

#### SOLENOID OPERATOR >

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

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**

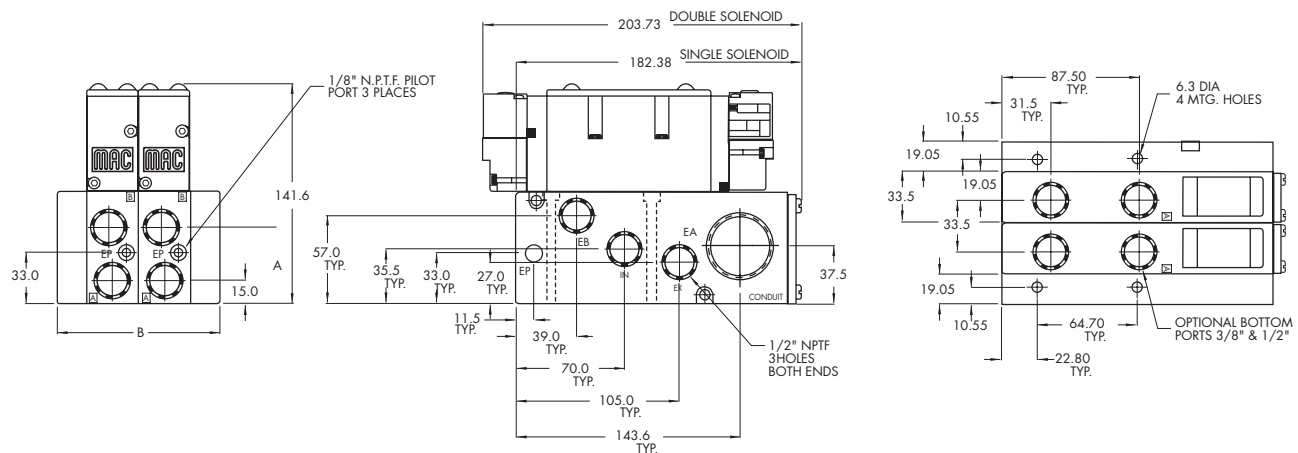
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal Pilot: 20 to 120 PSI External Pilot: Vacuum to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F 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>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	~ Inrush 7.6 VA    Holding: 4.8 VA = 1 to 12.7 W
<b>Response times :</b> (with 5.4 W coil)	Energize : 13 ms 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>Valve function</b>	<b>34</b>
93A-LXX-XXX-XX-DXXX-XXX	<b>36</b>
<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>Pilot exhaust</b>	<b>37</b>
93A-XBX-XXX-XX-DXXX-XXX	<b>38</b>
<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>52</b>
<b>Port configuration :</b>	<b>67</b>
<b>Individual sub-base</b>	<b>69</b>
93A-XXX-XAX-XX-DXXX-XXX	<b>44</b>
<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>46</b>
<b>Manifold sub-base</b>	<b>42</b>
93A-XXX-XJX-XX-DXXX-XXX	<b>47</b>
<ul style="list-style-type: none"> <li><b>J</b> side ports</li> <li><b>K</b> bottom ports</li> </ul>	<b>48P</b>
<b>Pilot style :</b>	<b>48</b>
93A-XXX-XXX-DM-DXXX-XXX	<b>400</b>
<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>92</b>
<b>Base only :</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.



# Direct solenoid and solenoid pilot oper

## OPTIONS FOR PLUG-IN VALVES

### Valve function

93A- LXX-XXX-XX-D xx P-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-X A X-XXX-XX-D xx P-xxx

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

### Body electrical

93A-XXA-XXX-XX-D xx P-xxx

- A no light
- B light(s)

### Port configuration :

#### Individual sub-base

93A-XXX-X A X-XX-D xx P-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-X JX-XX-D xx P-xxx

- J side ports
- K bottom ports

### Base/manifold int./ext. pilot

93A-XXX-XX A -XX-D xx P-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 -Dxx P-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.



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**Codification table for voltages / Manual operator / Electrical connection**

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VALVE CODE > **-DM- D XX X-X XX**  
**1 2 3 4**

**OPTIONS AVAILABLE FOR**

- Pilot operated valves 52, 67, 92, 93, 400, ISO1, ISO2, ISO3 Series

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**1. VOLTAGE**

D-XX X-X XX	VOLTAGE
DA	24 VDC (5.4W)
DB	12 VDC (5.4W)
DC	12 VDC (7.5W)
DD	24 VDC (7.3W)
DE	12 VDC (12.7W)
DF	24 VDC (12.7W)
DK	110 VDC (4.7W)
DJ	28 VDC (5.2W)
DL	64 VDC (6.0W)
DM	36 VDC (5.3W)
DN	6 VDC (6.0W)
DR	90 VDC (6.6W)
DS	110 VDC (7.3W)
DT	75 VDC (5.6W)
DP	48 VDC (5.8W)
FA	12 VDC (1.8W)
FB	24 VDC (1.8W)
FE	12 VDC (2.4W)
FF	24 VDC (2.4W)
JA	120/60, 110/50 (2.9W)
JB	240/60, 220/50 (2.9W)
JC	24/60, 24/50 (3.7W)
JD	100/60, 100/50, 110/60 (3.9W)
JE	220/60 (3.4W)
JF	240/50 (2.8W)
JG	200/60, 200/50 (3.9W)

**2. WIRE LENGTH**

D-XX X-X XX	WIRE LENGTH
0	No wires
A	18"
B	24"
C	36"
D	48"
E	72"
F	96"

**3. MANUAL OPERATOR**

D-XX X-X XX	MANUAL OPERATOR
0	No operator
1	Non-locking recessed
2	Locking recessed
3	Non-locking extended
4	Locking extended

**4. ELECTRICAL CONNECTION**

D-XX X-X XX	ELECTRICAL CONNECTION
BA*	Flying leads (grommet)
BK*	BA with protection diode
BL*	BA with protection varistor
BM**	Flying leads (solenoid plug-in)
BN**	BM with protection diode
BP**	BM with protection varistor
BG**	BM with ground
BH**	BM with protection diode & ground
BJ**	BM with protection varistor & ground
CA*	1/2" NPS conduit with flying leads
CM*	1/2" NPS metal conduit with flying leads
CN*	1/2" NPS metal conduit with flying leads & ground
JB	Rectangular connector
JD	JB with light
JM	Rectangular connector (male only)
KA	Mini square connector
KB	KA with protection diode
KC	KA with protection varistor
KD	KA with light
KE	KA with light and protection diode
KF	KA with light and protection varistor
KG	KA with light & diode
KJ	Mini square connector (male only)
KK	KJ with protection diode (male only)
KL	KJ with protection varistor (male only)
TA	Dual tabs with receptacles
TB	TA with protection diode
TD	TA with light
TE	TA with light and protection diode
TJ	Dual tabs (male only)
TK	TJ with protection diode
TM	TJ with light
TN	TJ with light and protection diode

\* From Lead wire length options choose A through F  
 \*\* From Lead wire length options choose 0 through F  
 Note: When coil is above 30 volts, a ground wire is required. Applies to options with flying leads.